



Operation and Maintenance Manual

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

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

Language: Original Instructions



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



Important Safety Information

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

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

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

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

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



The meaning of this safety alert symbol is as follows:

Attention! Become Alert! Your Safety is Involved.

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

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

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

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

NOTICE

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

Other parts may not meet certain original equipment specifications.

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

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

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Foreword

California Proposition 65 Warning

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



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

www.P65Warnings.ca.gov

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



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

www.P65Warnings.ca.gov

Wash hands after handling components that may contain lead.

Literature Information

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

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

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

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

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

Safety

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

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

Operation

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

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

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

Maintenance

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

Maintenance Intervals

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

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

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

Certified Engine Maintenance

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

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

Machine Capacity

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

Product Identification Number

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

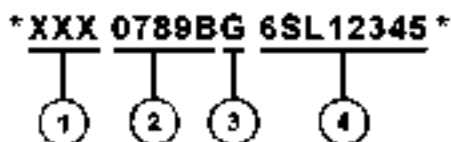


Illustration 1

g03891925

Where:

1. World Manufacturing Code (characters 1-3)

2. Machine Descriptor (characters 4-8)

3. Check Character (character 9)

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

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

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

Safety Section

i07929081

Safety Messages

SMCS Code: 7000; 7405

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

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

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

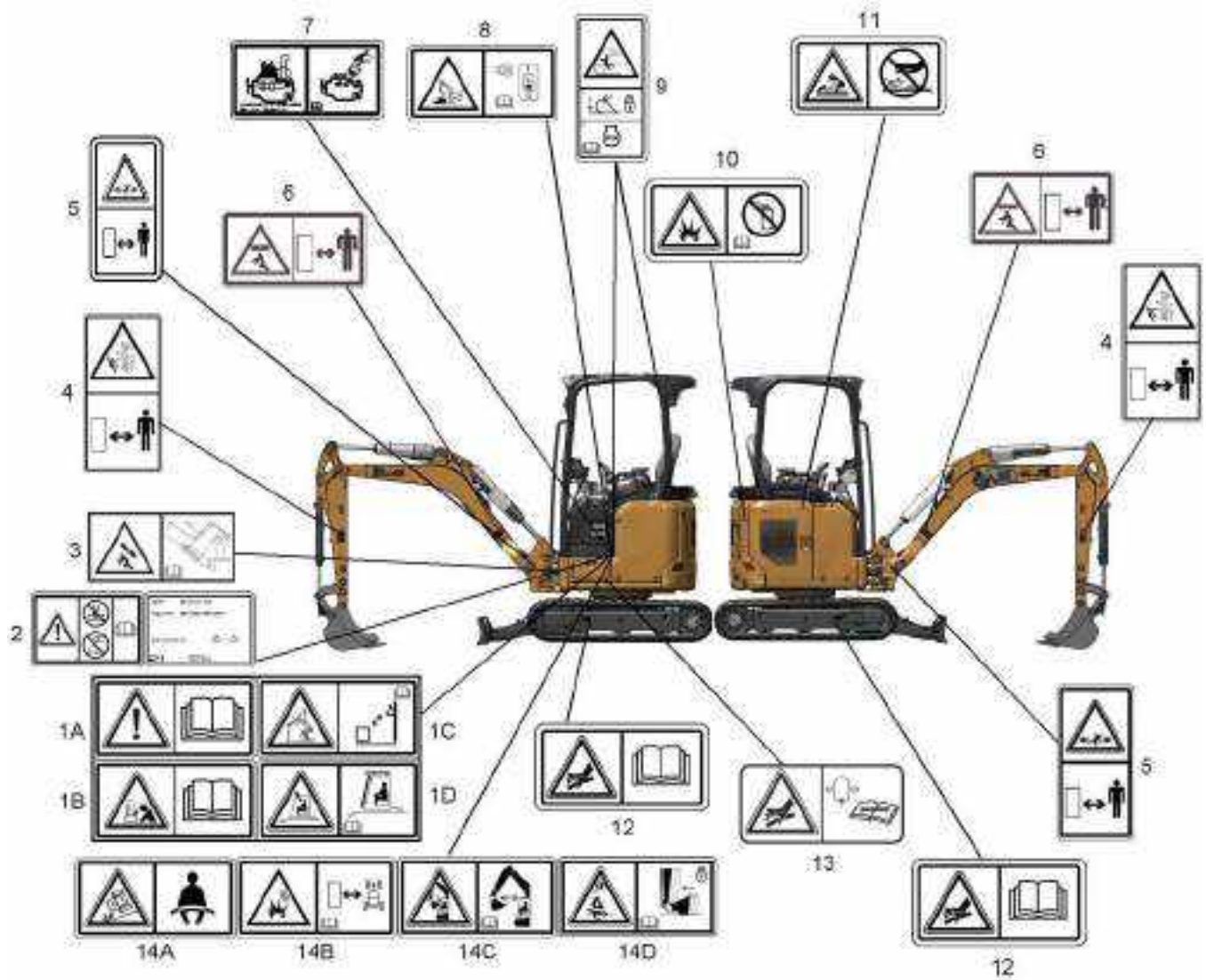


Illustration 2

g06275043

Warnings for canopy and cab machines

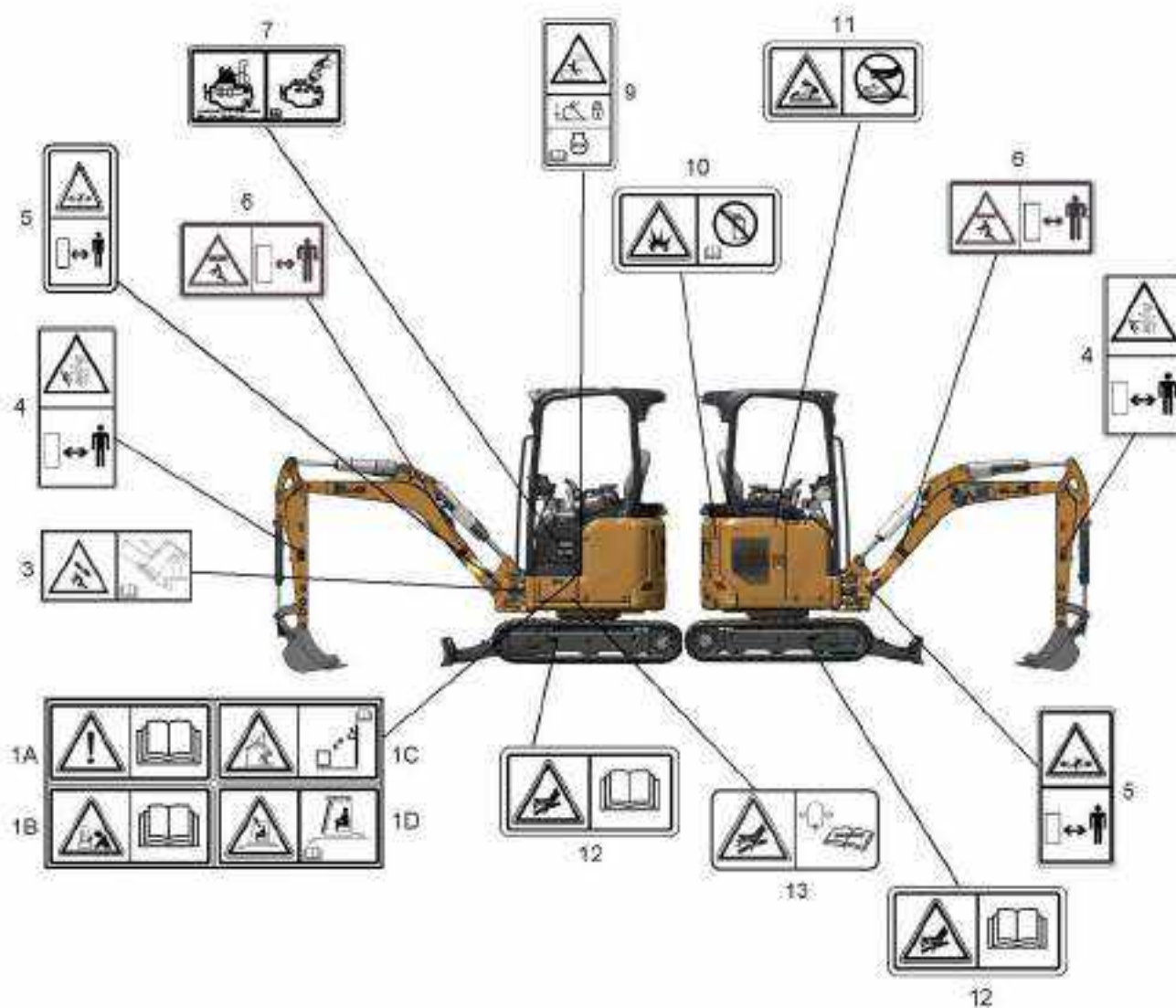


Illustration 3

g06482844

Japan machines

Warnings for canopy and cab machines

Do Not Operate (1A)

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



Illustration 4

g01370904

⚠ WARNING

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

Improper Connections For Jump-Start Cables (1B)

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

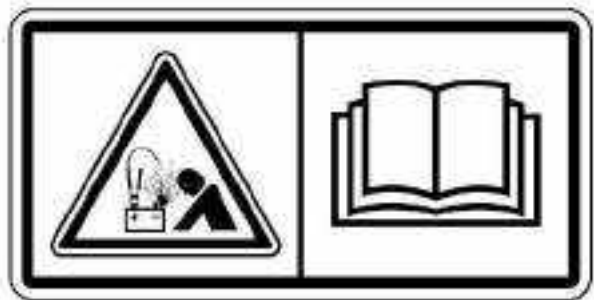


Illustration 5

g01370909

⚠ WARNING

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

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

Electrical Power Lines (1C)

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



Illustration 6

g01374045

⚠ DANGER

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

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

Crushing Hazard (1D)

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



Illustration 7

g01374048

WARNING

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

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

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

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

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



Illustration 8

g06317435

WARNING

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

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

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

Crushing Hazard (3)

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



Illustration 9

g06275277

WARNING

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

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

Crushing Hazard (4)

This safety message is on both sides of the stick.



Illustration 10

g01385579

WARNING

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

Crushing Hazard (5)

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



Illustration 11

g01958622

WARNING

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

Crushing Hazard (6)

This safety message is on both sides of the boom.

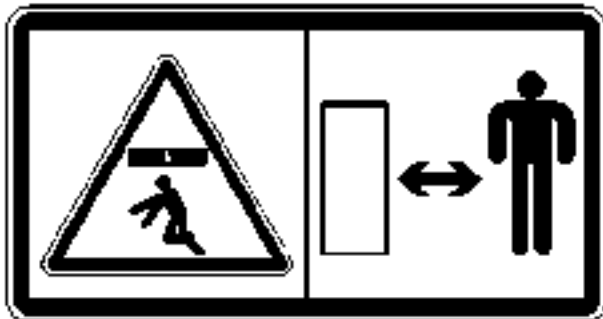


Illustration 12

g02470918

WARNING

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

Keep Engine Clean (7)

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

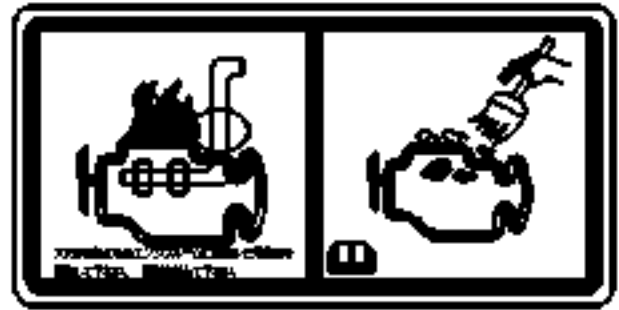


Illustration 13

g03173221

WARNING

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

Overload Warning Device (8)

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



Illustration 14

g01602013

WARNING

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

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

Crushing Hazard (9)

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



Illustration 15

g02282255

WARNING

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

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

Aerosol Starting Aid (10)

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



Illustration 16

g01372254

WARNING

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

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

Pressurized System (11)

This safety message is on the right side access door.



Illustration 17

g01371640

WARNING

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

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

High-Pressure Cylinder (12)

This safety message is positioned on the track adjusters.



Illustration 18

g06266697

WARNING

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

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

High-Pressure Gas (13)

This safety message is on the accumulator.

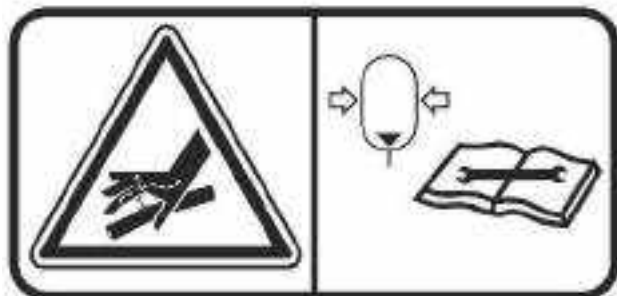


Illustration 19

g06275274

Seat Belt (14a)

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



Illustration 20

g01370908

WARNING

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

Product Link (14b)

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

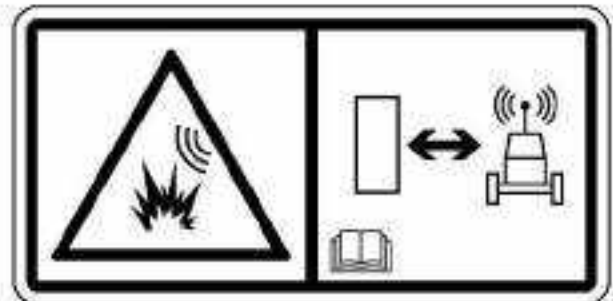


Illustration 21

g01370917

Crushing Hazard (14c)

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



Illustration 22

g01373971

WARNING

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

Crushing Injury (14d)

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



Illustration 23

g01374035

WARNING

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

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

i08644737

Additional Messages

SMCS Code: 7000; 7405

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

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

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

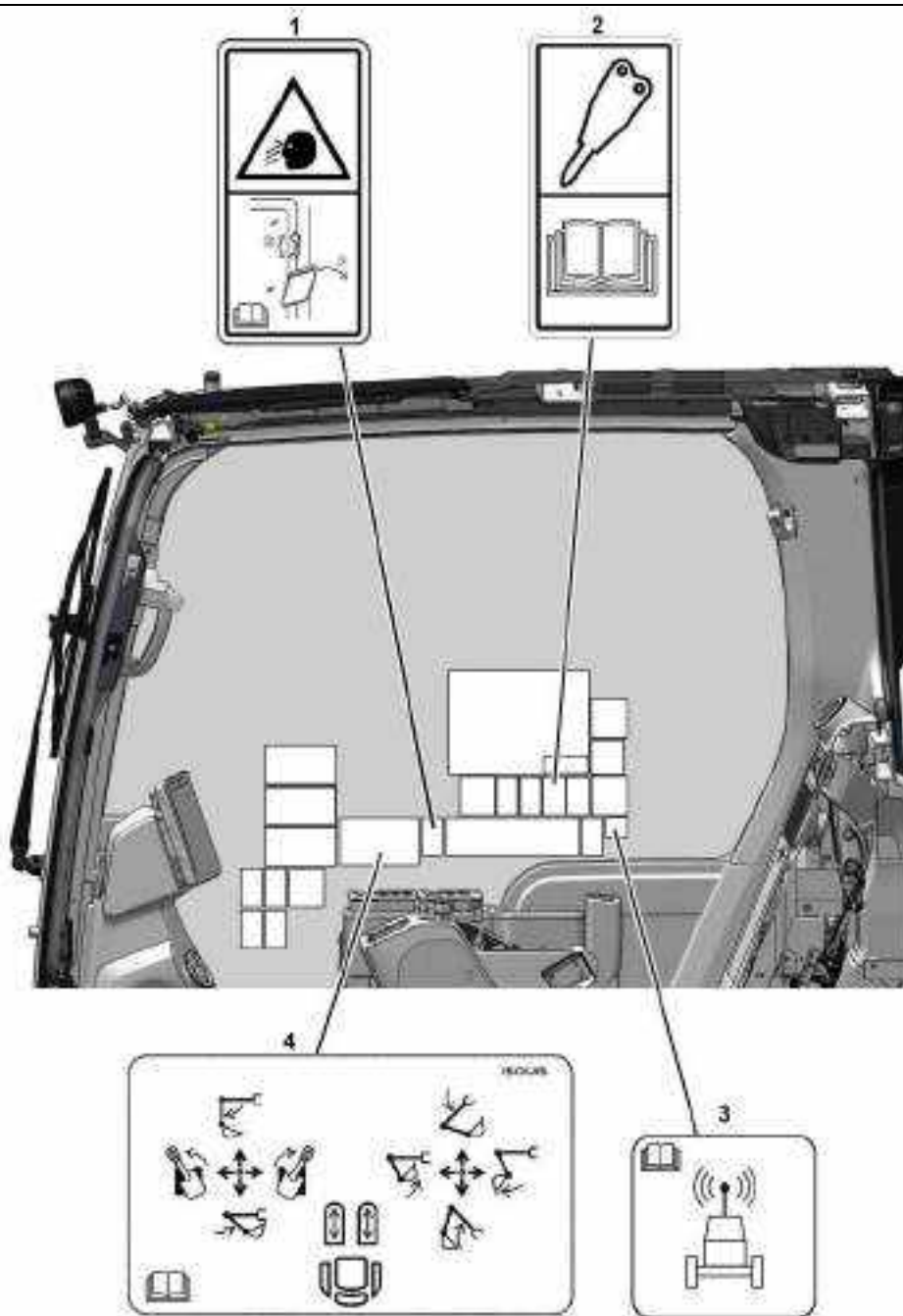


Illustration 24

g06696953

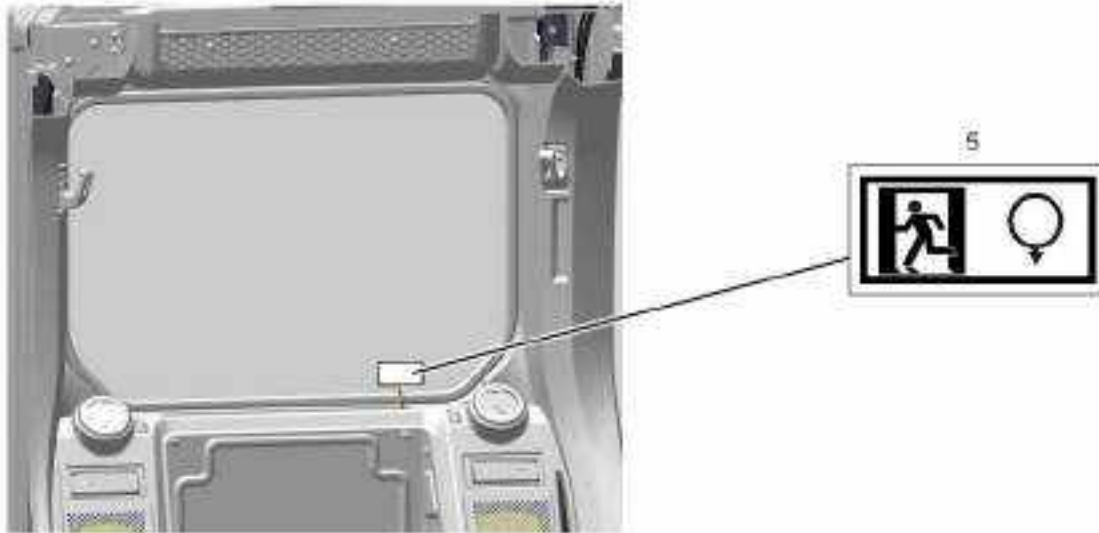


Illustration 25

g06696954

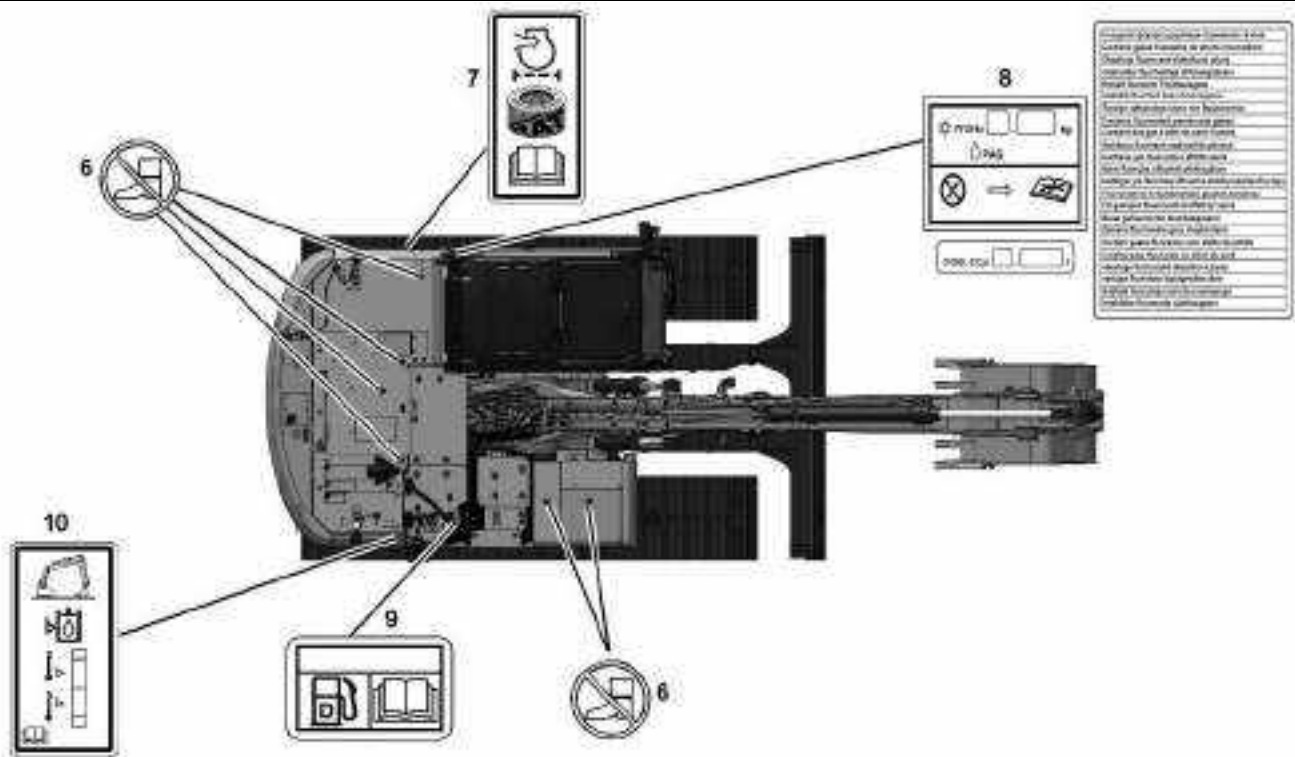


Illustration 26

g06696955

Front Window Usage (1)



Illustration 27

g06214810

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

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

Hammer Operation (2)

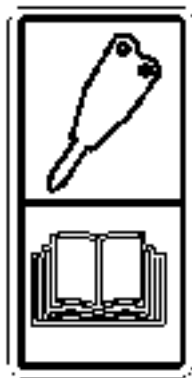


Illustration 28

g06189240

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

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

Cat[®]Product Link[™] (3)



Illustration 29

g01418953

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

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

Refer to “Product Link” for more information.

Joystick Controls Alternate Patterns (4)

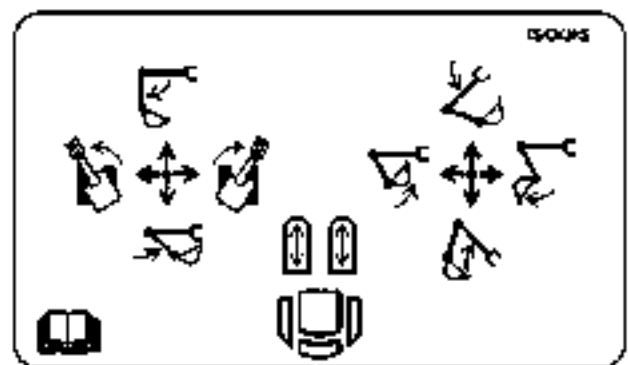


Illustration 30

g06214805

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

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

Alternate Exit (5)



Illustration 31

g06189112

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

Refer to “Alternate Exit” for more information.

No Step (6)

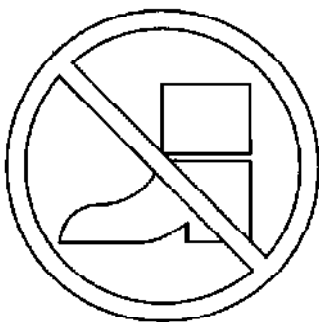


Illustration 32

g00911158

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

Do not step in this area.

Radial Seal Air Filters (7)



Illustration 33

g01134494

This message is located on the air cleaner.

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

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

Air Conditioner (8)

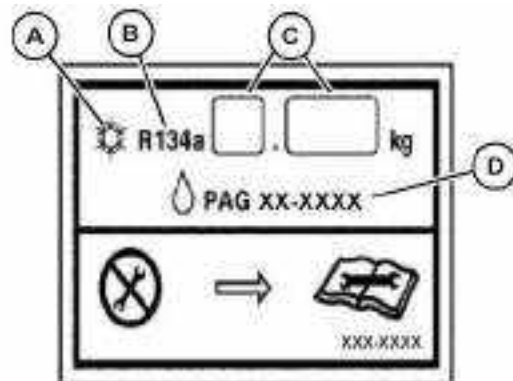


Illustration 34

g06650123

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

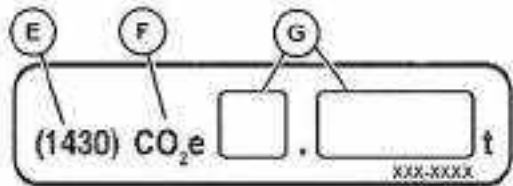


Illustration 35 g06650124

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

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



Illustration 36 g06685232

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

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

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

Diesel Fuel Requirements (9)

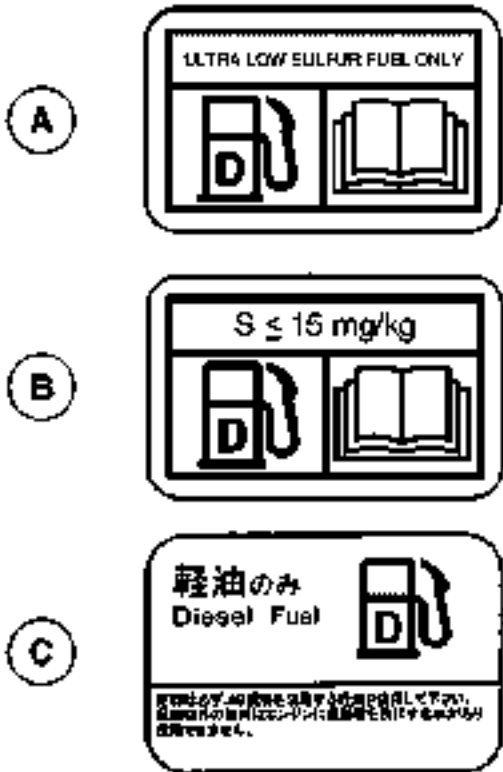


Illustration 37 g03218956

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

This message is located by the fuel tank.

Hydraulic Oil Level Check (10)

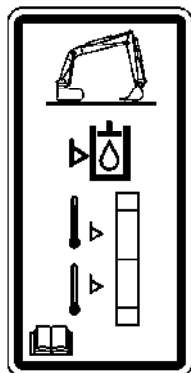


Illustration 38

g01069075

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

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

i07920557

General Hazard Information

SMCS Code: 7000

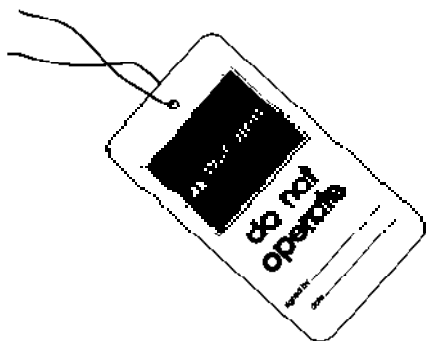


Illustration 39

g00104545

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

WARNING

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

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

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



Illustration 40

g00702020

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

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

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

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

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

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

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

Obey all local regulations for the disposal of liquids.

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

Do not allow unauthorized personnel on the equipment.

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

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

Pressurized Air and Water

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

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

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

Trapped Pressure

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

Fluid Penetration

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

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

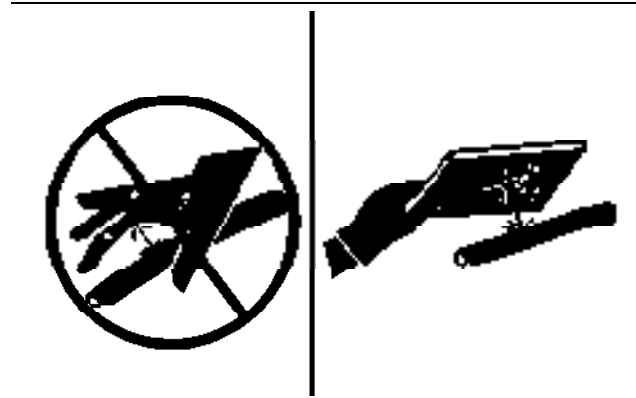


Illustration 41

g00687600

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

Containing Fluid Spillage

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

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

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

Obey all local regulations for the disposal of liquids.

Inhalation



Illustration 42

g02159053

Exhaust

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

Asbestos Information

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

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

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

- Never use compressed air for cleaning.
- Avoid brushing materials that contain asbestos.
- Avoid grinding materials that contain asbestos.
- Use a wet method to clean up asbestos materials.
- A vacuum cleaner that is equipped with a high efficiency particulate air filter (HEPA) can also be used.

- Use exhaust ventilation on permanent machining jobs.
- Wear an approved respirator if there is no other way to control the dust.
- Comply with applicable rules and regulations for the work place. In the United States, use Occupational Safety and Health Administration (OSHA) requirements. These OSHA requirements can be found in "29 CFR 1910.1001". In Japan, use the requirements found in the "Ordinance on Prevention of Health Impairment due to Asbestos" in addition to the requirements of the Industrial Safety and Health Act.
- Obey environmental regulations for the disposal of asbestos.
- Stay away from areas that might have asbestos particles in the air.

Dispose of Waste Properly

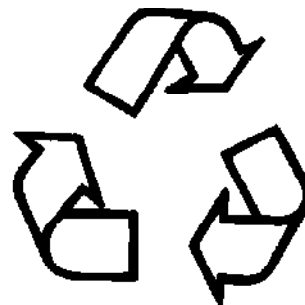


Illustration 43

g00706404

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

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

i05374155

Crushing Prevention and Cutting Prevention

SMCS Code: 7000

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

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

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

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

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

Stay clear of all rotating and moving parts.

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

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

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

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

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

i07746334

Burn Prevention

SMCS Code: 7000

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

Coolant

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

Any contact with hot coolant or with steam can cause severe burns. Allow cooling system components to cool before the cooling system is drained.

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

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

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

Oils

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

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

Batteries

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

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

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

i07746336

Fire Prevention and Explosion Prevention

SMCS Code: 7000



Illustration 44

g00704000

General

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

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

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

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

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

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

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

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

Do not operate the machine near any flame.

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

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

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

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

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



Illustration 45

g03839130

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

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

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

Battery and Battery Cables



Illustration 46

g03839133

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

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

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

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

Gases from a battery can explode. Keep any open flames or sparks away from the top of a battery. Do not smoke in battery charging areas. Do not use cell phones or other electronic devices in battery charging areas.

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

Daily inspect battery cables that are in areas that are visible. Inspect cables, clips, straps, and other restraints for damage. Replace any damaged parts. Check for signs of the following, which can occur over time due to use and environmental factors:

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

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

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

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

WARNING

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

Wiring

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

- Fraying
- Signs of abrasion or wear
- Cracking
- Discoloration

- Cuts on insulation
- Other damage

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

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

Consult your Cat dealer for repair or for replacement parts.

Keep wiring and electrical connections free of debris.

Lines, Tubes, and Hoses

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

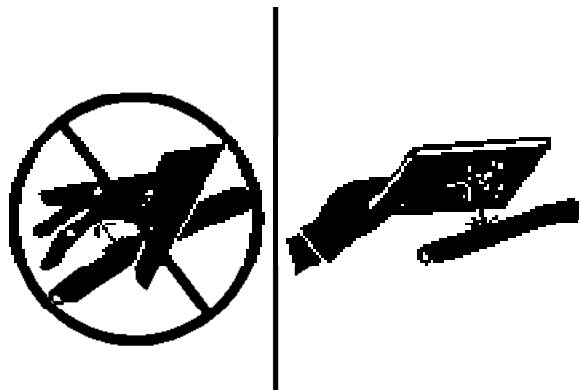


Illustration 47

g00687600

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

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

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

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

Do not operate a machine when a fire hazard exists. Repair any lines that are corroded, loose, or damaged. Leaks may provide fuel for fires. Consult your Cat dealer for repair or for replacement parts. Use genuine Cat parts or the equivalent, for capabilities of both the pressure limit and temperature limit.

Ether

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

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

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

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

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

Fire Extinguisher

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

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

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

i07374620

Fire Extinguisher Location

SMCS Code: 7000; 7419

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

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

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

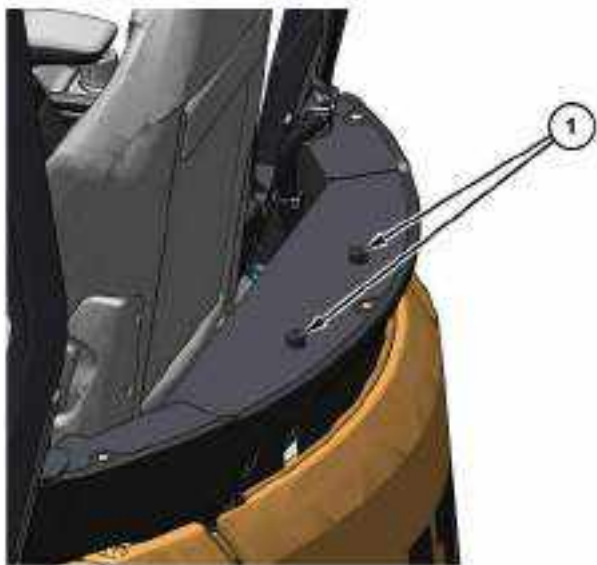


Illustration 48

g06264794

(1) Mounting brackets

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



Illustration 49

g06264969

(1) Mounting brackets



Illustration 50

g06298662

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

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

i01329108

Track Information

SMCS Code: 4170; 7000

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

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

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

i04243389

Electrical Storm Injury Prevention

SMCS Code: 7000

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

i04415163

Before Starting Engine

SMCS Code: 1000; 7000

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

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

Adjust the seat so that full pedal travel can be achieved. Adjust the seat so that full lever travel can be achieved. Make sure that your back is against the back of the seat.

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

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

WARNING

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

Personal injury or death may occur from sudden machine movement.

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

i04450732

Visibility Information

SMCS Code: 7000

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

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

Your machine may be equipped with visual aids. Examples of visual aids are mirrors. Before operating the machine, ensure that the visual aids are in proper working condition and that the visual aids are clean. Adjust the visual aids using the procedures that are located in this Operation and Maintenance Manual.

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

- Safety instructions
- Controlled patterns of machine movement and vehicle movement
- Workers that direct traffic to move when safe
- Restricted areas
- Operator training
- Warning symbols or warning signs on machines or on vehicles

- A system of communication
- Communication between workers and operators prior to approaching the machine

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

Restricted Area

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

- machine
- work equipment
- additional equipment or
- material

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

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

- buildings
- scaffolds or
- other elements of construction

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

i07404203

Restricted Visibility

SMCS Code: 7000

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

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



Illustration 51

g06319431

301.5

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

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



Illustration 52

g06321873

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

(A) 12 m (39 ft)

301.6

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

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



Illustration 53

g06321901

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

(A) 12 m (39 ft)

301.7 CR

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

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



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

301.8

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

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

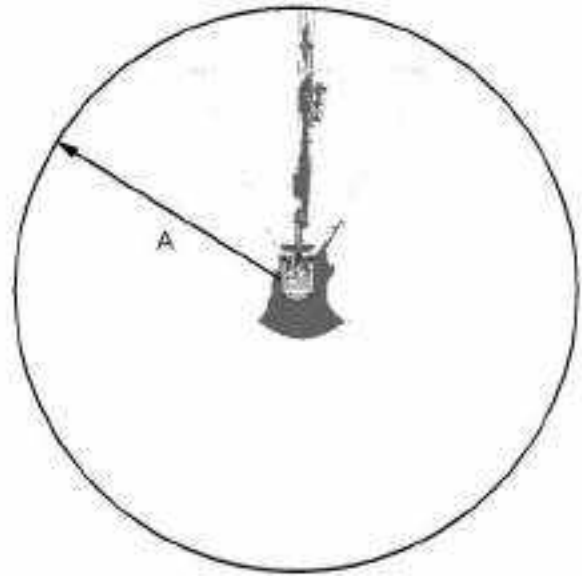


Illustration 55 g06321908
Top view of the machine, ground level visibility, with available left side mirror and right side mirror
(A) 12 m (39 ft)

302 CR

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

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

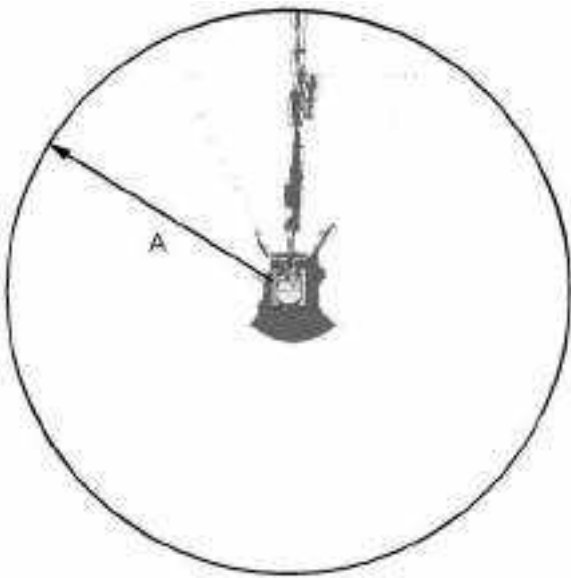


Illustration 56

g06321910

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

(A) 12 m (39 ft)

i07246291

Engine Starting

SMCS Code: 1000; 7000

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

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



Illustration 57

g06264973

Put the hydraulic lockout control in the RAISED position.

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

Briefly sound the horn before you start the engine.

i07246046

Before Operation

SMCS Code: 7000

Clear all personnel from the machine and from the area.

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

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

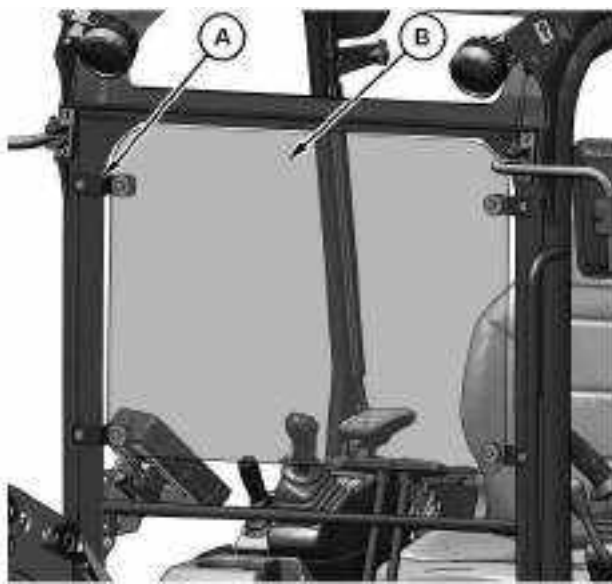


Illustration 58

g06264919

(A) Bracket
(B) Protection screen

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

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

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

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

Fasten the seat belt securely.

i05333458

Work Tools

SMCS Code: 6700

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

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

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

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

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

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

Always wear protective glasses. Always wear the protective equipment that is recommended in the operation manual for the work tool. Wear any other protective equipment that is required for the operating environment.

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

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

Never use the work tool for a work platform.

i08481684

Operation

SMCS Code: 7000

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

Machine Operating Temperature Range

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

Limiting Conditions and Criteria

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

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

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

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

Critical Failures

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

Safety Section
Operation

Table 1

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

(continued)

(Table 1, contd)

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

Machine Operation

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

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

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

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

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

Never use the work tool for a work platform.

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

Know the maximum dimensions of your machine.

Watch the load at all times.

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

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

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

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

Machine Operation when the Machine is not Completely Assembled

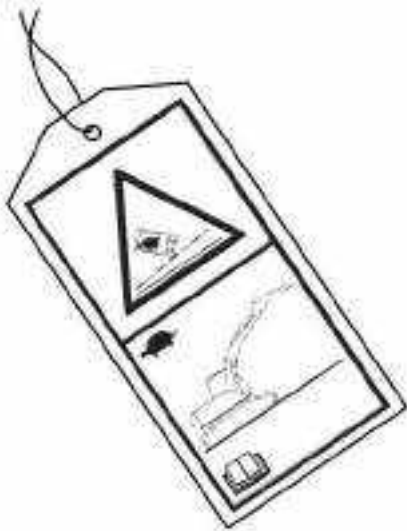


Illustration 59

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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.

i04258934

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.

i08482864

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 windscreen wipers and washers.

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

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

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.

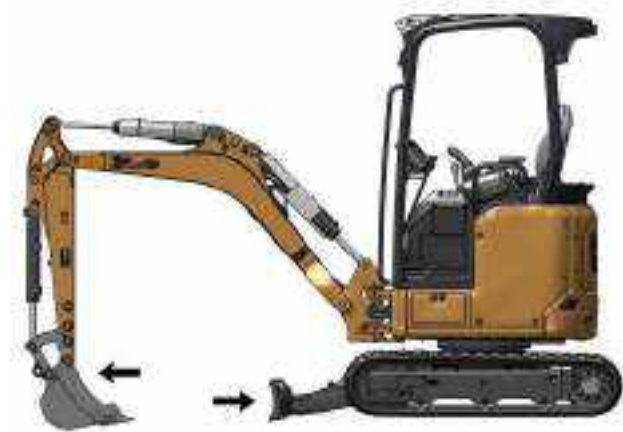


Illustration 60

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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.

i04258937

Slope Operation

SMCS Code: 7000

WARNING

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

WARNING

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

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

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

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

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

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

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

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

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

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

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

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

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

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

Operating techniques – Keep all work tools low to the ground for optimum stability.

Machine systems have limitations on slopes – Slopes can affect the proper function and operation

of the various machine systems. These machine systems are needed for machine control.

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

i08229294

Equipment Lowering with Engine Stopped

SMCS Code: 7000-II

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

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Sound Information and Vibration Information

SMCS Code: 7000

Sound Level Information

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

Table 2

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

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

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

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

Sound Level Information for Machines Required by the Applicable Regional Regulations

- **European Union Countries**
- **United Kingdom**
- **Eurasian Economic Union Countries**
- **Ukraine**
- **Countries that Adopt the "EU Directives"**

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

Table 3

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

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

Table 4

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

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

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

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

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

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

Vibration Information Applicable to Regional Regulations

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

Vibration Data for Track Type Excavator

Information Concerning Hand/Arm Vibration Level

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

Information Concerning Whole Body Vibration Level

This section provides vibration data and a method for estimating the vibration level for track type excavators.

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

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

It is not possible to get precise vibration levels for this machine. The expected vibration levels can be estimated with the information in Table 5 to calculate the daily vibration exposure. A simple evaluation of the machine application can be used.

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

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

Table 5

"ISO Reference Table A - Equivalent vibration levels of whole body vibration emission for earthmoving equipment."							
Machine Type	Typical Operating Activity	Vibration Levels			Scenario Factors		
		X axis	Y axis	Z axis	X axis	Y axis	Z axis
Track Type Excavators	excavating	0.44	0.27	0.30	0.24	0.16	0.17
	hydraulic breaker application	0.53	0.31	0.55	0.30	0.18	0.28
	mining application	0.65	0.42	0.61	0.21	0.15	0.32
	transfer	0.48	0.32	0.79	0.19	0.20	0.23

Note: Refer to "ISO/TR 25398 Mechanical Vibration - Guideline for the assessment of exposure to whole body vibration of ride on operated earthmoving machines" for more information about vibration. This publication uses data that is measured by international institutes, organizations, and manufacturers. This document provides information about the whole body exposure of operators of earthmoving equipment.

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

Guidelines for Reducing Vibration Levels on Earthmoving Equipment

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

1. Use the right type and size of machine, equipment, and attachments.
2. Maintain machines according to the manufacturer recommendations.
 - a. Tire pressures
 - b. Brake and steering systems
 - c. Controls, hydraulic system, and linkages
3. Keep the terrain in good condition.
 - a. Remove any large rocks or obstacles.
 - b. Fill any ditches and holes.
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. Provide machines and schedule time to maintain the conditions of the terrain.

- c. If no ride control system is available, reduce speed to prevent bounce.
 - d. Haul the machines between workplaces.
9. Less operator comfort may be caused by other risk factors. The following guidelines can be effective to provide better operator comfort:
- a. Adjust the seat and adjust the controls to achieve good posture.
 - b. Adjust the mirrors to minimize twisted posture.
 - c. Provide breaks to reduce long periods of sitting.
 - d. Avoid jumping from the cab.
 - e. Minimize repeated handling of loads and lifting of loads.
 - f. Minimize any shocks and impacts during sports and leisure activities.

Sources

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

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

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

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

Use the following web site to find your local dealer:

Caterpillar, Inc.
www.cat.com

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Operator Station

SMCS Code: 7300; 7301; 7325

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

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

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Guards (Operator Protection)

SMCS Code: 7000; 7150

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

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

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

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

The ROPS/TOPS structure (canopy) and if equipped, the FOPS structure (roof guard) on your machine is designed, tested, and certified for that machine. Any alteration or any modification to the ROPS/TOPS and FOPS structure could weaken the structure. This places the operator into an unprotected environment. Modifications or attachments that cause the machine to exceed the weight that is stamped on the certification plate also place the operator into an unprotected environment. Excessive weight may inhibit the ROPS/TOPS and FOPS structure. The protection that is offered by the ROPS/TOPS and FOPS structure will be impaired if the ROPS/TOPS and FOPS structure has structural damage. Damage to the structure can be caused by an overturn, a falling object, a collision, etc.

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

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

Other Guards (If Equipped)

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

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

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

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

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

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

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

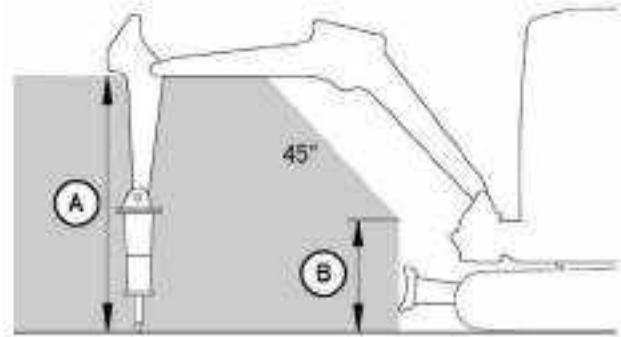


Illustration 62

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



Illustration 63

g06276140

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

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

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

Product Information Section

General Information

i07105852

Regulatory Information (Japan)

SMCS Code: 7000

S/N: JH71-Up

S/N: RHM1-Up

Qualifications for Machine Operation

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

Excavation and Loading

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

Demolition

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

Mining Jobs

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

Crane Slings for the Bucket with a Hook

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

Trailer Transportation

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

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

Load

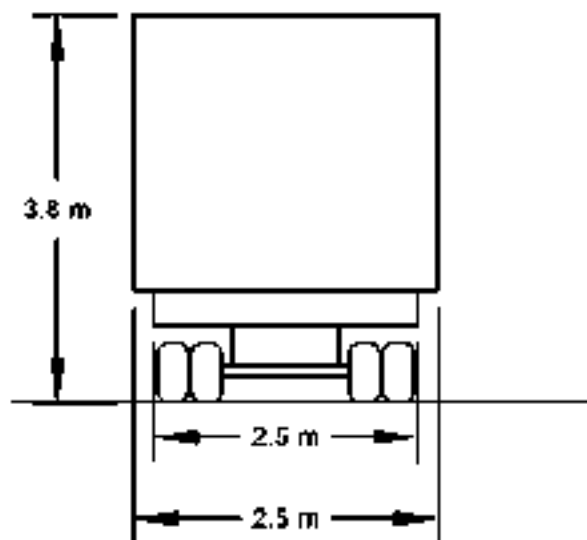


Illustration 64

g02698738

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

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

Table 6

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

(continued)

(Table 6, contd)

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

Operation of Construction Equipment and the Governing Laws and Regulations

NOTICE

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

NOTICE

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

Qualification of Operators

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

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

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

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

Acquisition of the Qualifications

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

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

Subsidy System

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

Operation of Construction Equipment and the Governing Laws and Regulations

NOTICE

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

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

Request for Periodical Self-Inspection

Rules of Periodical Self-Inspection

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

Ordinance on Industrial Safety and Hygiene

Periodical self-inspections Article 167

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

(2) The employer shall, as regards a vehicle type construction machine set forth in the proviso of the 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
- 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:

- In performing cargo lifting, any one of the following may be applicable.
 - Cannot be avoided due to the nature of the work or necessary in view of performing work in safe.
 - 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.
- 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.

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

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

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

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

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

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

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

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Specifications

SMCS Code: 7000

Intended Use

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

Expected Life

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

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

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

Carbon Dioxide (CO₂) Emissions Statement

Table 7

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

(continued)

(Table 7, contd)

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

Specification Data

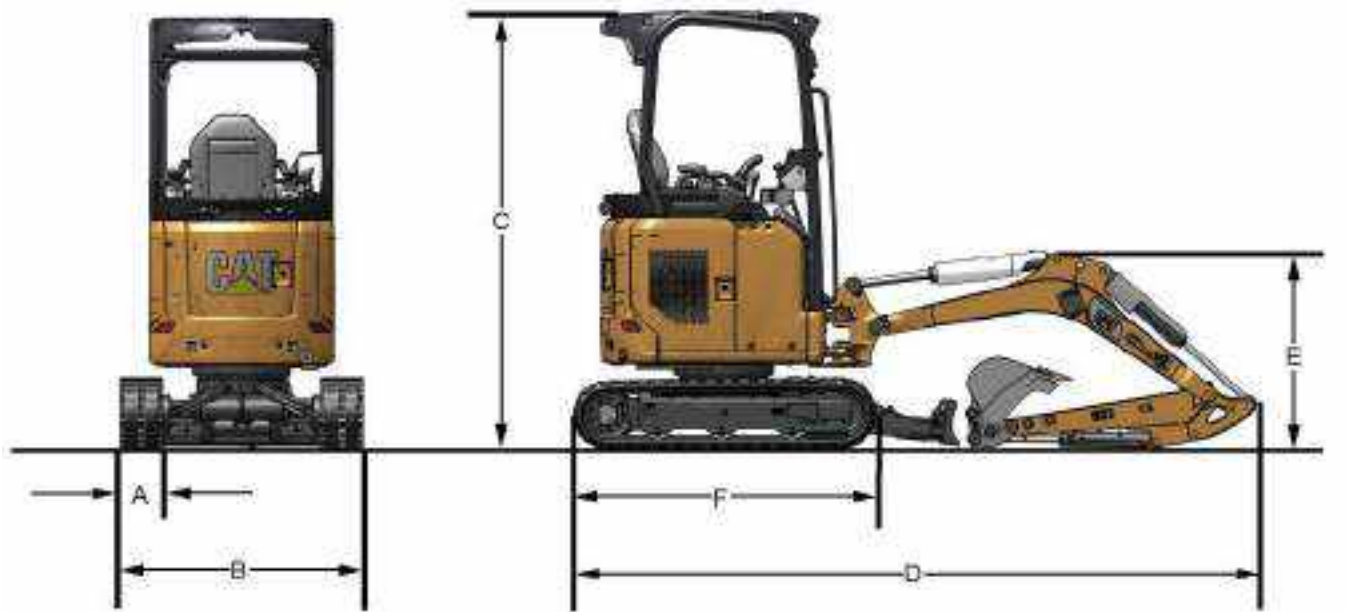


Illustration 65

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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

301.7 CR

Table 10

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

⁽¹⁾ Includes operator, no bucket, full fuel tank⁽²⁾ Japan machines⁽³⁾ Includes operator, with bucket, full fuel tank⁽⁴⁾ Does not include operator, no bucket, full fuel tank⁽⁵⁾ Does not include operator, with bucket, full fuel tank⁽⁶⁾ Undercarriage retracted⁽⁷⁾ Undercarriage expanded

301.8

Table 11

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

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

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

(3) Undercarriage retracted

(4) Undercarriage expanded

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Table 12

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

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

(2) Japan machines

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

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

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

(6) Undercarriage retracted

(7) Undercarriage expanded

Working Ranges

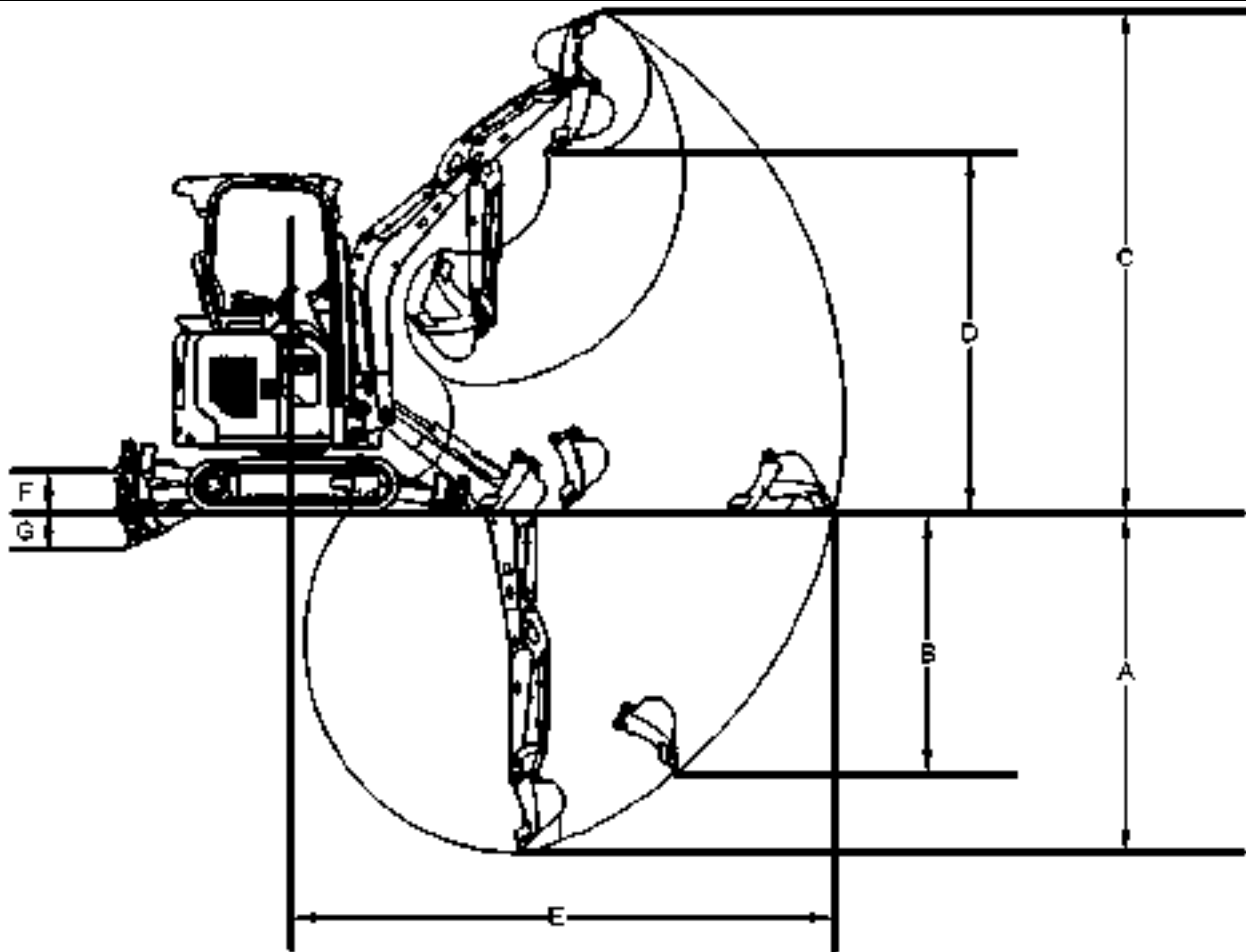


Illustration 66

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Table 13

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

301.6

Table 14

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

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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

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

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

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

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

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

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

Product Information Section

Lifting Capacities

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

Table 18

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

Table 19

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

Table 20

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

(1) Japan market only

(2) ESCO teeth required

i08644901

Lifting Capacities

SMCS Code: 7000

WARNING

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

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

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

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

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

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

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

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

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

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

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

Contact your Cat® dealer for additional information.

Configuration Identification

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

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

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

Table 21

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

(continued)

(Table 21, contd)

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

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

Symbols Found in the Lifting Capacity Charts

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

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

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



Lift Capacities are provided in kilograms and pounds



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



Lift point radius



Lift point height



Lifting capacity over the front of the machine



Lifting capacity over the side of the machine



Heavy Lift ON

(mm) (inch)	1000 40	1500 60	2000 80	2500 100	3000 120		
							(mm) (inch)
120						* 499 * 499	90
2500 100				* 244 * 244 * 559 * 559		* 225 * 225 * 498 * 498	2750 110
2000 80				* 256 * 256 * 573 * 573	227 263	* 217 * 219 * 483 * 493	3000 120
1500 60			* 299 * 299 * 643 * 643	* 307 * 320 * 689 * 689	225 260	* 191 * 221 * 424 * 497	3280 130
1000 40			419 482 903 939	495 541 635 733	219 255 471 547	176 207 385 456	3400 140
900 20			395 458 852 987	483 528 609 707	213 249 457 534	171 201 379 443	3420 140
0 0			383 446 825 960	474 520 591 688	206 243 447 524	165 206 368 453	3350 140
-500 -20	* 602 * 602 * 1349 * 1349	611 713 1090 1528	389 443 818 953	271 316 583 680	266 241 443 529	189 222 416 491	3180 130
-1000 -40		617 719 1224 1542	383 446 824 959	272 317 586 684		222 260 494 577	2680 120
-1500 -60		* 604 * 604 * 1284 * 1284	392 411 845 867			* 298 * 298 * 660 * 660	2280 90

g06363837

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

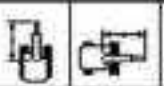
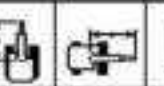
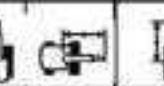
[mm] [inch]	1000 40	1500 60	2000 80	2500 100	3000 120				(mm) (inch)
									
320							439	459	90
2500							225	225	2760
300							491	490	100
2000							219	219	2080
60							403	403	120
1500							221	221	3280
60							487	487	130
1000							225	207	3600
40							486	456	140
500							239	201	3420
20							504	443	140
0							249	206	3750
0							524	453	140
500							283	222	3180
20							646	491	130
1000							291	260	2980
40							642	577	120
1500							298	298	2380
60							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)	1000 40		1500 60		2000 80		2500 100		3000 120				(mm) (inch)
													
120											* 499	* 499	90
2500							* 244	238			* 225	198	2760
100							* 559	509			* 493	448	110
2000							* 356	225	227	300	217	160	3080
80							* 573	505			* 493	356	120
1500					* 299	* 299	307	228	225	305	191	139	3280
60					* 643	* 643	660	480	482	354	424	308	130
1000					419	386	295	217	209	169	176	127	3400
40					903	660	635	467	471	343	389	280	140
500					395	294	283	205	203	154	171	122	3420
20					952	693	609	443	457	321	379	270	140
0					383	273	274	199	200	149	175	125	3350
0					625	560	591	429	447	321	386	275	140
-500	* 602	* 602	611	422	309	270	271	194	206	147	169	135	3180
-20	* 1049	* 1049	1090	997	819	582	583	419	443	317	412	299	130
-1000			617	428	383	273	272	195			222	160	2880
-40			1324	920	824	667	586	421			494	355	120
-1500			* 684	439	392	301					* 298	220	2380
-80			* 1294	945	845	687					* 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											* 490	* 490	90
2500 100							* 244	238			* 225	198	2760
							* 559	503			* 488	448	110
2000 80							* 256	235	* 308	181	* 219	160	1080
							* 573	505			* 482	356	120
1500 60					* 290	* 290	* 320	228	* 320	165	* 221	139	1200
					* 843	* 843	* 699	490	* 763	354	* 487	308	130
1000 40					* 534	308	* 410	217	* 349	189	* 225	127	1400
					* 1135	660	* 885	467	* 757	343	* 496	280	140
500 20					* 671	284	* 472	265	* 369	154	* 239	122	1420
					* 1438	813	* 1017	443	* 737	321	* 526	270	140
0 0					* 673	273	* 484	288	* 346	149	* 265	125	1350
					* 1451	568	* 1041	425	* 767	323	* 594	275	140
500 20	* 602	* 602	* 858	432	* 617	270	* 452	194	* 334	147	* 292	135	1380
	* 1349	* 1349	* 1874	907	* 1338	582	* 872	418	* 712	317	* 646	299	130
1000 40			* 759	428	* 533	273	* 387	185			* 291	160	1680
			* 1633	920	* 1844	587	* 826	421			* 842	355	120
1500 60			* 804	439	* 411	281					* 298	220	1380
			* 1284	945	* 867	607					* 660	495	100

Illustration 70

g06364034

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

Product Information Section
Lifting Capacities

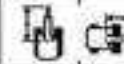
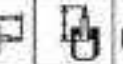
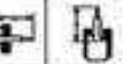
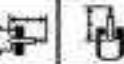
(mm) (inch)	1000 40	1500 60	2000 80	2500 100	3000 120	3500 140		
								(mm) (inch)
2000								196 196 2470
2500								176 176 2960
100				388 388				384 384 120
2000				181 181 228 259				174 174 3290
80				412 412 487 584				384 384 120
1500				354 354 284 248				179 179 3490
60				553 553 481 558				383 383 140
3000		674 674 425 431	296 341	218 257	85 194			160 179 3590
40		1390 1390 914 919	636 714	467 544				353 395 140
500			297 488 282 377	290 245	161 180			355 183 2590
20			856 890	606 704	452 528	240 400		241 404 150
0		563 563 280 442	271 316	204 239	159 188			157 186 3520
0		1282 1307 817 862	583 680	438 506				347 411 140
100	578 578 1097 699	1293 1282 1499 803	373 438 295 310	200 236				168 189 3390
20	1293 1293 1282 1499	803 808 578 668	310 373 284 310	200 236				373 440 140
3000	691 691 1111 704	1293 1293 1511 804	303 329 553 667	434 500				184 229 3080
40	2000 2000 1293 1511	804 809 553 667	434 500					431 507 120
1500		818 881 380 443	270 315					251 285 3630
60		1310 1450 819 954	593 660					564 631 110
2000		480 480						332 332 1830
80		945 945						350 381 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.

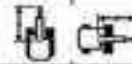
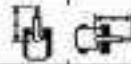
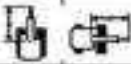
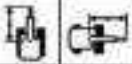
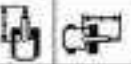
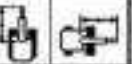
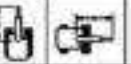
(mm) (inch)	1000 40	1500 60	2000 80	2500 100	3000 120	3500 140		
								(mm) (inch)
3000								196 196 2470
2500								176 176 2960
300				386 386				394 394 120
2000				181 181 259 259				174 174 3090
00				412 412 582 584				384 384 120
1500				264 264 291 291				176 176 3490
60				553 553 618 558				385 385 140
9000		674 874	431 431	363 343	321 253	268 194		179 179 3580
40		1393 1390	309 309	775 724	650 544			395 395 140
500				626 499	445 327	354 246	231 190	192 183 3590
20			1029 890	953 704	766 528	523 409		422 414 150
0			563 563	675 442	478 336	364 233	244 188	203 186 3520
0			1307 1307	1451 952	1028 680	784 585		471 411 140
500	578 578	861 699	639 436	482 310	346 238			251 199 3360
20	1293 1293	1963 1499	1375 938	932 668	740 567			555 443 140
1000	091 091	928 704	568 407	410 310	294 236			276 229 3090
40	2000 2000	1778 1511	1213 903	877 667	618 500			610 567 120
1500		681 681	460 442	320 315				285 285 2630
60		1450 1450	379 354	668 668				631 631 110
2000		460 460						332 332 1630
80		345 345						261 261 70

Illustration 72

g06364041

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

Product Information Section
Lifting Capacities

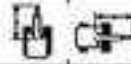
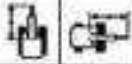
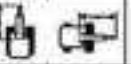
(mm) (inch)	1600 63	1500 60	2000 80	2500 100	3000 120	3500 140		
								(mm) (inch)
3000								196 196 2470
2500								176 174 2960
300					386 386			194 252 120
2000					181 181 228 168			174 140 3090
00					412 412 487 359			264 238 120
1500					264 218 324 169			179 124 3490
60					559 492 461 352			282 275 140
9000		674 480	425 380	298 207	218 158	165 107		160 10 3580
40		1282 1029	914 683	636 467	467 333			252 250 140
500				297 295 292 204	210 161	161 114		155 109 3590
20				656 614 606 439	452 324	246 244		241 240 150
0								
0								
		562 409	380 263	271 194	204 145	159 111		157 10 3520
		1282 880	817 580	583 407	428 312			247 243 140
500	578 578	597 409	373 263	265 188	200 142			168 10 3280
20	1293 1293	1292 880	803 567	579 405	421 305			273 262 140
1000	091 837	603 414	374 264	264 188	201 142			164 107 3090
40	2000 1791	1293 890	604 589	589 404	434 307			431 385 120
1500		614 424	380 270	270 180				251 180 2630
60		1719 113	889 582	592 407				564 486 110
2000		460 444						332 328 1630
80		345 345						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 60		2000 80		2500 100		3000 120		3500 140				(mm) (inch)
3800													* 195	* 195	2470
2500							* 388	* 388					* 178	* 174	2060
2000							* 412	* 412	* 592	* 592			* 384	* 382	120
1500							* 181	* 181	* 259	* 259			* 174	* 140	3050
1000							* 254	* 254	* 361	* 361			* 384	* 318	130
500							* 550	* 432	* 418	* 352			* 175	* 124	3160
40			* 674	* 488	* 431	* 310	* 360	* 217	* 321	* 158	* 266	* 17	* 179	* 113	3560
25			* 1360	* 1003	* 819	* 693	* 770	* 467	* 636	* 339			* 395	* 290	140
10					* 626	* 315	* 445	* 284	* 354	* 151	* 291	* 14	* 192	* 189	3590
5					* 1339	* 614	* 950	* 439	* 756	* 324	* 520	* 244	* 422	* 240	150
3			* 563	* 488	* 875	* 269	* 478	* 314	* 364	* 145	* 244	* 11	* 213	* 190	3520
2			* 1307	* 1110	* 1451	* 590	* 1028	* 417	* 784	* 310			* 471	* 243	140
1000	* 578	* 578	* 891	* 489	* 879	* 263	* 462	* 310	* 346	* 142			* 251	* 189	3560
500	* 1293	* 1293	* 1969	* 1110	* 1375	* 667	* 992	* 485	* 749	* 305			* 959	* 262	140
250	* 890	* 897	* 1309	* 614	* 968	* 304	* 490	* 318	* 394	* 142			* 276	* 137	3080
100	* 2060	* 1791	* 1778	* 1110	* 1213	* 550	* 1177	* 464	* 618	* 307			* 619	* 305	120
50			* 681	* 424	* 489	* 270	* 320	* 193					* 285	* 180	2630
25			* 1450	* 313	* 378	* 512	* 660	* 417					* 631	* 404	110
10			* 460	* 444									* 332	* 329	1530
5			* 945	* 945									* 751	* 751	70

Illustration 74

g06364047

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

Product Information Section
Lifting Capacities

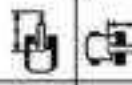
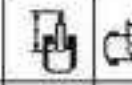
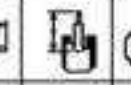
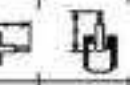
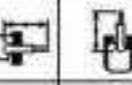
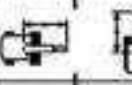
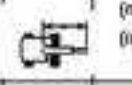
(mm) (inch)	1000 40		1500 60		2000 80		2500 100		3000 120				(mm) (inch)
													
100													90
2500													2760
900													100
2000													3080
80													120
1500													3280
60													130
1000													3400
40													140
500													3420
20													140
0													3350
0													140
-500													3180
-20													130
-1000													2880
-40													120
-1500													2380
-60													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.

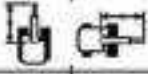
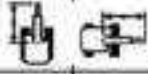
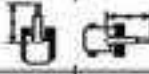
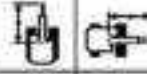
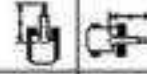
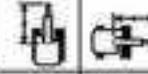
[mm] [inch]	1000 40	1500 60	2000 80	2500 100	3000 120			
								(mm) (inch)
120								493 493 90
2500 100								244 227 2760 559 406 100
2000 80								256 228 2080 573 482 80
1500 60								299 218 152 3280 643 468 700 335 487 291 130
1000 40								534 292 410 206 349 151 225 119 3600 1036 630 809 444 757 325 486 264 140
500 20								671 270 472 195 369 145 239 115 3420 1438 503 1017 420 797 312 526 254 140
0 0								673 259 484 187 366 141 265 117 3350 1451 508 1041 402 787 302 584 253 140
-500 -20								602 402 698 402 617 267 452 184 334 109 283 127 3180 1349 1349 1874 864 1339 562 872 385 782 299 646 282 130
-1000 -40								759 407 533 269 387 185 291 151 2880 1633 876 1044 557 826 298 642 335 120
-1500 -60								604 419 411 267 298 209 2380 1294 991 867 577 660 470 100

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

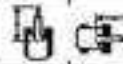
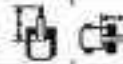
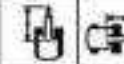
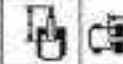
(mm) (inch)	1000 40	1500 60	2000 80	2500 100	3000 120	3500 140		
								(mm) (inch)
2000								196 196 2470
2500								178 166 2960
100				388 388				384 370 120
2000				181 181 211 359				174 165 1290
80				412 412 450 340				384 360 120
1500				354 338 207 184				180 97 1490
60				553 468 444 324				250 259 160
1000		603 460 385 295	274 206 200 150	150 110				146 188 3590
40		1366 895 651 639	585 444 450 321					321 235 160
500			367 271 249 193	190 142 147 107				343 162 2590
20			791 594 559 416	414 346 315 220				300 225 150
0			553 389 350 255	249 180 187 127	144 104			145 180 3520
0		1186 837 754 550	536 384 401 232					215 220 140
1500	578 578	653 389 344 249	243 178 180 133					154 81 1390
20	1293 1293	1695 837 740 537	523 382 382 286					338 240 160
1000	891 799 658 394	345 250 243 177	184 114					177 129 3080
40	2000 1711	1197 847 741 538	522 381 286 289					280 287 120
1500		668 404 351 256	248 183					201 170 3630
40		1222 869 756 552	536 384					538 381 110
1500		480 424						332 312 1830
80		445 396						350 742 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.

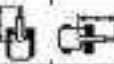
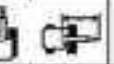
(mm) (inch)	1000 40	1500 60	2000 80	2500 100	3000 120	3500 140		(mm) (inch)
3000								156 156 2470
2500								176 168 2960
300				386 386				394 373 120
2000				181 181 412 412	259 249			174 135 3090
00								264 300 120
1500				254 288 553 468	201 184 618 324			176 117 3490
60								285 289 140
9000		674 460	431 296	363 206	321 150	266 110		178 168 3580
40		1393 905	909 639	775 444	650 321			395 235 140
500			626 271	445 193	354 143	291 107		192 162 3590
20			1029 584	953 496	766 360	523 238		422 225 150
0		563 339	675 255	478 183	364 127	244 104		210 163 3520
0		1307 837	1451 550	1028 394	764 253			471 229 140
500	578 578	861 389	639 249	482 178	346 113			251 11 3360
20	1293 1293	1963 837	1075 537	932 382	740 286			555 245 140
1000	091 793	828 394	568 250	410 177	294 114			276 123 3090
40	2000 1711	1778 947	1213 539	877 351	618 289			610 287 120
1500		601 404	460 256	320 110				285 170 2630
60		1450 859	970 552	668 294				621 261 110
2000		460 424						332 312 1630
80		345 196						361 242 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.

(mm) (inch)	1000 40	1500 60	2000 80	2500 100	3000 120		(mm) (inch)
	 	 	 	 	 	 	
2500 100				335 * 348		* 316 * 316 * 703 * 703	2540 100
2000 80				* 329 * 329 722 * 733		260 * 290 580 * 641	2530 120
1500 60			* 384 * 384 * 828 * 828	329 375 709 807	248 283 533 610	229 262 507 580	3150 130
1000 40			441 504 951 1087	318 364 687 785	243 279 524 601	213 245 471 541	3270 130
500 20			420 483 906 1041	308 353 654 761	238 273 513 589	209 240 460 529	3290 130
0 0		* 625 * 625 1362 * 1446	409 471 881 1016	300 345 647 746	234 269 565 681	213 246 470 542	3210 130
-500 -20	* 677 * 677 * 1510 * 1510	631 733 1356 1573	406 468 873 1008	297 342 640 738	233 268	230 265 508 586	3130 120
-1000 -40		638 739 1370 1507	406 471 879 1014	299 344 643 743		269 309 536 606	2720 110
-1500 -60		* 639 * 639 * 1366 * 1366	418 * 426 * 896 * 896			* 359 * 359 * 796 * 796	2200 90

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)
													(mm) (inch)
2500 100							* 348	* 348			* 315	* 315	2540 100
2000 80							* 329	* 329			* 290	* 290	2030 80
1500 60					* 384	* 384	* 383	375	* 371	283	* 283	262	3150 120
1000 40					* 828	* 828	* 835	807	* 813	613	* 625	580	130
500 20					* 584	504	* 457	364	* 390	279	* 289	245	3270 130
0 0					* 1249	1067	* 998	785	* 847	601	* 637	541	3280 130
0 0					* 700	483	* 507	353	* 482	273	* 308	240	3290 130
0 0					* 1503	1041	* 1194	751	* 868	588	* 678	529	3210 130
0 0					* 825	* 625	* 704	471	* 512	345	* 392	268	3030 120
0 0					* 1446	* 1446	* 1516	1016	* 1105	745	* 843	581	265 10
0 0	* 577	* 577	* 938	733	* 656	468	* 478	342	* 351	258	* 343	265	3030 120
0 0	* 1510	* 1510	* 2023	1573	* 5400	1008	* 1828	738			* 755	586	120
0 0					* 812	739	* 592	471	* 406	344			2720 110
0 0					* 1745	1087	* 1205	1014	* 864	743			110
0 0					* 639	* 639	* 426	* 426			* 359	* 359	2200 90
0 0					* 1356	* 1356	* 896	* 896			* 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)
2500 100				336 266			* 316 * 703 249 562 2540 100
2000 80				* 329 722 257 553			260 586 198 442 2030 120
1500 60			* 384 828 349 754	329 709 251 540	248 533 188 406	188 406	225 507 174 385 3150 130
1000 40			441 951 328 710	318 687 241 519	243 524 184 397	184 397	213 471 161 356 3270 130
500 20			420 906 309 668	308 664 230 498	238 513 179 387	179 387	289 460 157 347 3280 130
0 0		* 625 1352	442 952 601 645	300 647 223 482	234 505 175 379	175 379	213 470 160 353 3210 130
-500 -20	* 577 1510	* 577 1510	631 1356 443 955	405 873 296 638	297 640 220 475	233 475	230 508 173 381 3030 120
-1000 -40			638 1370 449 988	408 879 298 644	299 645 222 481		269 598 201 446 2720 110
-1500 -60		* 639 1356	461 995 418 895	308 666			* 359 * 795 273 617 2280 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)							(mm) (inch)
2600 100				* 340 266			* 316 249 2640 100
2000 80				* 329 257 * 733 563			* 298 198 * 641 442 2030 120
1500 60			* 384 298 * 828 644	* 383 251 * 835 640	* 371 188 * 813 606	* 283 174 * 625 485	3450 130
1000 40			* 584 451 * 1249 975	* 457 341 * 988 769	* 390 184 * 847 661	* 288 161 * 637 496	3270 130
500 20			* 700 540 * 1503 1166	* 507 381 * 1194 924	* 462 351 * 868 668	* 308 157 * 678 524	3280 130
0 0		* 625 492 * 1446 1125	* 704 540 * 1518 1166	* 512 381 * 1105 854	* 382 175 * 843 658	* 343 160 * 756 589	3210 130
-500 -20	* 577 451 * 1510 1166	* 577 451 * 1510 1166	* 938 725 * 2023 1575	* 650 500 * 1400 1094	* 478 361 * 1128 875	* 351 175 * 755 589	3030 120
-1000 -40		* 812 625 * 1745 1366	* 449 341 * 988 769	* 582 441 * 1205 924	* 406 301 * 864 668	* 344 201 * 758 589	2720 110
-1500 -60		* 639 492 * 1356 1044	* 426 321 * 895 694	* 308 231 * 666 512		* 359 273 * 795 617	2280 90

Illustration 82

g06364088

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

Product Information Section
Lifting Capacities

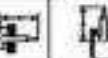
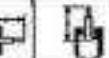
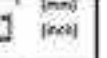
[mm] [inch]	500 20		1000 40		1500 60		2000 80		2500 100		3000 120				[mm] [inch]	
														[mm] [inch]		
2000														260	263	260
2500														245	245	2760
3000														545	545	110
2000														250	250	310
80														570	508	130
2500														302	309	3020
60														707	561	130
1000					695	743	445	485	288	384	262	277	186	225	2430	
40					1490	1540	993	1050	686	784	520	550	432	458	140	
500					600	696	420	460	366	361	235	270	191	221	3490	
20					1075	1093	906	1042	650	757	506	550	421	406	140	
0					621	710	404	447	296	341	223	265	184	225	3390	
0					1034	1051	872	1007	638	736	495	571	429	436	140	
500		610	610	623	623	610	710	399	451	291	336	227	262	208	240	3210
-20		1384	1384	1392	1392	1329	1545	897	952	627	725	483	566	456	530	130
-1000		760	795	890	890	620	710	399	451	291	336			257	275	2900
-40		1745	1745	1897	1897	1020	1555	850	930	627	725			525	606	120
-1500					605	717	406	448						305	341	2490
-60					1365	1526	875	1000						664	755	100
-2000					468	468								425	425	1090
-80														862	862	

Illustration 83

g06364094

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

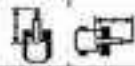
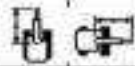
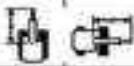
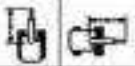
(mm) (inch)	588 23	1001 40	1510 60	2000 80	2500 100	3000 120		(mm) (inch)	
 3000								2190	
2500					255	255	245	245	2760
2000					583	583	545	545	180
1500					258	258	230	230	3110
1000					579	579	566	566	130
500					322	322	305	305	3320
250					767	767	735	735	130
100			743	743	435	435	412	384	3430
50			1546	1546	1059	1059	834	784	180
25			696	696	889	493	493	351	3390
10			1601	1593	1417	1042	757	644	180
5			713	713	700	467	506	341	3390
2.5			1546	1551	1514	1067	1055	736	180
1.25	618	419	623	623	947	720	669	461	3210
0.625	1364	1364	1392	1392	2146	1545	1440	962	130
0.3125	168	798	990	806	676	728	594	401	2920
0.15625	1745	1745	1997	1997	1879	1556	1275	990	120
0.078125					717	717	482	468	2460
0.0390625					1526	1526	1023	1000	100
0.01953125					468	468			590
0.009765625									60

Illustration 84

g06364099

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

Product Information Section

Lifting Capacities

(mm) (inch)	500 20	1000 40	1500 60	2000 80	2500 100	3000 120		(mm) (inch)
3000							* 260 * 260	2600
2500 100					* 255 593	* 255 596	* 245 545	2450 100
2000 80					* 258 579	* 258 595	250 538	230 508
1500 60					* 262 707	261 543	247 532	239 494
1000 40			685 1438	449 1079	445 569	331 715	240 507	242 520
500 20			638 1275	449 571	420 506	369 667	225 492	196 506
300 12			623 1234	433 834	404 872	254 625	219 628	229 472
1500 -20	* 648 1264	* 639 1304	* 623 1292	* 623 1282	618 1223	432 830	268 557	288 622
1000 -40	* 785 1245	* 795 1245	* 690 1207	* 691 1203	623 1233	436 829	399 856	289 623
1500 -60					635 1265	446 912	408 675	295 638
2000 -80								

q06364100

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)
3800															2600
2500 100									255	295			245	285	2760
2000 80									593	596			545	491	190
1500 60									258	258	320	390	230	179	310
1000 40									579	555	635	408	508	386	130
500 20									322	251	205	98	227	152	3200
									707	541	725	404	581	390	100
1800 70					743	489	485	331	412	240	366	382	234	187	3430
1400 55					1546	1019	1059	705	834	507	796	500	514	324	140
900 35					494	449	440	369	493	228	290	076	249	162	3450
					1601	971	1017	667	1043	492	644	273	580	285	140
600 25					713	433	700	294	598	219	593	171	277	145	3580
					1046	834	754	625	1035	473	847	368	618	310	140
300 12	608	609	623	623	947	432	669	281	498	214	369	368	323	154	3210
-25	1264	1364	1332	1332	2148	950	1440	622	1650	462	789	363	713	341	130
1000 40	786	706	890	846	976	436	684	298	433	214			327	176	2900
-40	1745	1745	2897	1803	1679	839	1275	623	926	463			721	330	320
1500 60					717	446	482	295					341	236	2460
-60					1526	962	1023	638					755	507	300
2000 80					468	468							429	425	690
													982	982	60

Illustration 86

g06364101

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

(mm) (inch)	1000 40		1500 60		2000 80		2500 100		3000 120				
													(mm) (inch)
2500 100							313 12.3	245 9.6			304 12.0	230 9.1	2540 100
2000 80							314 12.3	246 9.7			242 9.5	190 7.5	2030 80
1500 60					* 384 15.1	335 13.2	307 12.1	240 9.4	231 9.1	189 7.4	212 8.3	166 6.5	3150 124
1000 40					* 828 32.6	724 28.5	662 26.1	617 24.3	496 19.5	387 15.2	471 18.5	367 14.4	1300 51
500 20						412 16.2	314 12.3	297 11.7	230 9.1	226 8.9	175 6.9	198 7.8	3270 129
0 0						686 27.0	606 23.9	540 21.3	496 19.5	487 19.2	379 14.9	437 17.2	1300 51
0 0						391 15.4	295 11.6	266 10.5	220 8.7	221 8.7	171 6.7	193 7.6	3290 129
-500 -20						843 33.2	638 25.1	617 24.3	475 18.7	475 18.7	368 14.5	426 16.8	1300 51
-500 -20			585 23.0	422 16.6	379 14.9	285 11.2	278 10.9	213 8.4	217 8.5	167 6.6	197 7.7	152 6.0	3210 126
-1000 -40	* 577 22.7	* 577 22.7	587 23.1	423 16.7	376 14.8	282 11.1	275 10.8	210 8.3	215 8.5	165 6.5	213 8.4	164 6.5	3030 120
-1000 -40			593 23.3	429 16.9	375 14.8	284 11.2	277 10.9	212 8.4			245 9.7	191 7.5	2720 107
-1500 -60			607 23.9	441 17.4	389 15.3	294 11.6					343 13.5	261 10.3	2260 89

Illustration 87

q06364102

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

(mm) (inch)	1000 40		1500 60		2000 80		2500 100		3000 120				
													(mm) (inch)
2500 100							* 348	245			* 315	238	2540
											* 703	538	100
2000 80							* 329	246			* 290	190	2930
							* 733	530			* 641	423	120
1500 60					* 384	335	* 383	240	* 371	188	* 283	166	3450
					* 828	724	* 835	517	* 813	387	* 625	367	130
1000 40					* 584	314	* 457	230	* 390	175	* 289	154	3070
					* 1249	600	* 988	496	* 847	379	* 637	339	130
500 20					* 706	295	* 507	220	* 482	171	* 305	150	3290
					* 1503	638	* 1094	475	* 868	368	* 678	330	130
0 0			* 625	422	* 704	285	* 512	213	* 392	167	* 343	152	3210
			* 1448	908	* 1518	615	* 1105	459	* 843	368	* 756	336	130
-500 -20	* 577	* 677	* 938	423	* 650	282	* 478	210	* 351	166	* 343	164	3030
	* 1510	* 1510	* 2023	911	* 1406	508	* 1028	453			* 755	363	120
-1000 -40			* 812	425	* 562	284	* 405	212			* 344	191	2720
			* 1745	924	* 1205	614	* 864	456			* 758	425	110
-1500 -60			* 639	441	* 425	294					* 359	261	2200
			* 1356	952	* 895	636					* 795	589	90

Illustration 88

g06364104

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

Product Information Section
Lifting Capacities

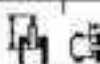
(mm) (inch)	500 20	1000 40	1500 60	2000 80	2500 100	3000 120	
							(mm) (inch)
3000							* 290 * 290 290
2500					* 255 249		* 245 239 230
2000					* 553 520		* 545 470 180
1500					* 258 247 233 222		218 170 110
1000					* 579 522 499 488		487 390 120
500					398 246 200 179		184 150 100
400					663 588 495 466		429 333 130
300			858 478	475 317	238 229 224 174		181 140 140
200			1402 1335 1290 1265	1291 1255 1210 1175	1139 1095 1050 1015		989 945 900 865
100			594 429 391 355	284 258 234 208	218 188 164 138		119 138 140
50			1079 927 840 757	617 542 470 409	369 301 234 169		229 229 229 229
25			576 413 375 339	288 274 268 262	208 202 196 190		173 137 137 137
12.5			1238 891 808 725	665 591 518 445	450 457 451 445		395 330 330 330
6.25	* 618 * 618 * 623 * 623	* 1264 * 1264 * 1292 * 1292	574 411 369 333	275 269 263 257	204 209 203 197		182 146 146 146
3.125	* 1364 * 1364 * 1392 * 1392	1233 896 794 692	599 599 599 599	599 599 599 599	440 452 445 439		423 323 323 323
1.5625	* 788 * 788 * 800 * 800	688 579 485 399	275 269 263 257	249 244 238 232			219 167 167 167
0.78125	* 1745 * 1745 * 1897 * 1897	1733 1243 895 795	593 593 593 593	593 593 593 593	440		495 321 321 321
0.390625			998 436 376 311				283 28 2460
0.1953125			1263 583 312 166				535 423 100
0.09765625			458 449				* 429 415 1580
0.048828125							* 932 * 932 60

Illustration 89

g06364112

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

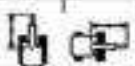
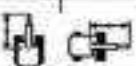
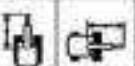
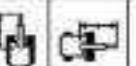
(mm) (inch)	500 20	1000 40	1500 60	2000 80	2500 100	3000 120			(mm) (inch)		
											
3800									* 200	* 200	200
2500									* 245	200	2760
100									* 545	470	180
2000									* 258	247	230
80									* 579	532	380
1500									* 332	290	205
60									* 707	530	380
1800									* 412	228	174
40									* 854	495	314
500									* 483	230	200
25									* 1042	470	344
8									* 598	208	162
8									* 1035	490	347
1000									* 488	204	169
20									* 1950	440	789
1000									* 433	204	169
40									* 326	440	
1800											
60									* 717	426	462
2000									* 1526	390	820
80									* 488	443	

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)	1090 43		1590 63		2090 82		2590 102		3090 122				(mm) (inch)
													(mm) (inch)
129													90
2500							* 244	* 244			* 225	* 225	2700
100							* 459	* 459			* 498	* 498	110
2000							* 256	* 256	282	* 359	* 219	* 219	3080
80							* 574	* 574			* 483	* 483	120
1500					* 398	* 300	* 321	* 321	279	317	* 221	* 221	3280
60					* 644	* 644	* 700	* 700	600	681	* 487	* 487	130
1000					511	* 534	364	* 410	274	311	224	* 225	3400
40					1102	* 1137	784	* 886	509	669	494	* 496	140
500					488	654	352	399	268	305	218	* 209	3420
20					1051	1194	758	861	576	656	481	* 526	140
0					475	542	343	391	263	300	223	265	3350
0					1024	1167	739	842	565	646	491	562	140
600	* 602	* 602	752	860	473	539	339	387	261	298	241	275	3180
-20	* 1345	* 1345	1612	1843	1017	1160	731	834	560	642	531	607	130
-1000			758	* 760	475	* 533	341	* 398			288	* 291	2880
-40			1626	* 1633	1023	* 1144	734	* 826			621	* 643	120
-1500			* 904	* 934	* 411	* 411					* 299	* 299	2380
-60			* 1284	* 1284	* 867	* 867					* 660	* 660	100

Illustration 91

g06364121

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

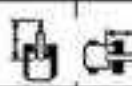
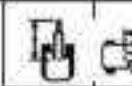
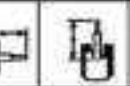
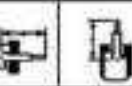
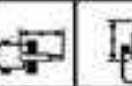
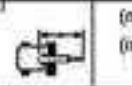
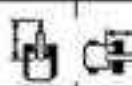
(mm) (inch)	1000 40	1500 60	2000 80	2500 100	3000 120							(mm) (inch)
												
100												90
2500												2760
200												190
2000												3060
80												120
1500												3280
60												130
1000												3400
40												140
500												3420
20												140
0												3350
0												140
-500												3180
-20												130
-1000												2800
-40												120
-1500												2380
-80												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

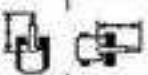
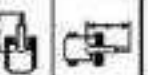
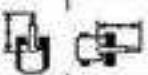
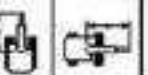
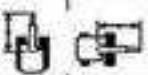
(mm) (inch)	1000 40		1500 60		2000 80		2500 100		3000 120				(mm) (inch)
A													(mm) (inch)
120													500 20 500 20 30
2500								244 10 244 10					225 9 225 9 2780
100								559 22 559 22					498 20 498 20 110
2000								266 11 266 11	262 11 262 11	212 8 212 8			219 9 204 8 2020
60								574 23 574 23					483 19 453 18 120
1500								308 12 308 12	279 11 279 11	210 8 210 8			221 9 180 7 3280
60								644 26 644 26	600 24 600 24	401 16 401 16			487 19 398 16 130
1000								379 15 379 15	273 11 273 11	205 8 205 8			224 9 166 7 3400
40								1102 44 1102 44	784 31 784 31	587 23 587 23			580 23 440 18 306 12 140
500								488 19 488 19	357 14 352 14	261 10 260 10			268 11 199 8 216 9 161 7 3420
20								1055 42 1055 42	771 31 768 31	563 22 576 23			628 25 481 19 355 14 140
0								476 19 476 19	346 14 343 14	253 10 263 11			184 7 223 9 164 7 3350
0								1024 41 1024 41	747 30 739 30	546 22 545 22			418 17 491 19 362 14 140
-500								602 24 602 24	339 14 339 14	260 10 261 10			192 8 241 10 177 7 3180
-20								1249 50 1249 50	740 30 731 30	538 21 562 22			445 18 531 21 392 16 130
-1000								758 30 758 30	534 21 475 19	346 14 341 14			251 10 280 11 207 8 2880
-40								1626 65 1626 65	1180 47 1023 41	745 30 734 30			541 21 621 25 460 18 120
-1500								604 24 604 24	345 14 354 14				299 12 279 11 2380
-60								1284 51 1284 51	765 30 887 35				660 26 628 25 100

Illustration 93

g06364147

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

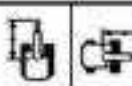
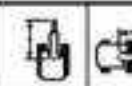
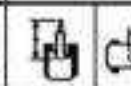
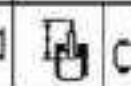
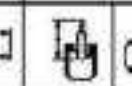
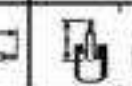
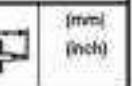
(mm) (inch)	1000 40		1500 60		2000 80		2500 100		3000 120				(mm) (inch)
													
120													90
2500													2760
100													110
2000													3080
80													120
1500													3280
60													130
1000													3400
40													140
500													3420
20													140
0													3350
0													140
-500													3180
-20													130
-1000													2880
-40													120
-1500													2300
-80													100

Illustration 94

g06364148

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

Product Information Section
Lifting Capacities

(mm) (inch)	1600 63	1500 60	2000 80	2500 100	3000 120	3500 140		(mm) (inch)
3000								186 " 186 2470
2500								170 " 170 2960
100								284 " 284 120
2000								174 " 174 3250
00								384 " 384 130
1500								175 " 175 3490
60								385 " 385 140
1000								179 " 179 2980
40								395 " 395 160
500								182 " 182 3930
20								422 " 422 150
0								202 " 202 3500
0								447 " 447 160
-500								249 " 249 3360
-20								549 " 549 160
-1000								247 " 247 3090
-40								546 " 546 120
-1500								285 " 285 2930
-60								631 " 631 110
-2000								332 " 332 800
-00								781 " 781 70

Illustration 95

g06364152

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

[illegible]

Illustration 96

q06364155

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

Product Information Section
Lifting Capacities

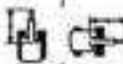
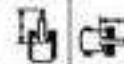
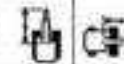
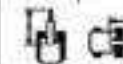
(mm) (inch)	1000 40	1500 60	2000 80	2500 100	3000 120	3500 140		(mm) (inch)
								
3600								* 195 * 195 2470
2500								* 178 * 178 2960
1000				* 306 * 306				* 334 * 334 120
2000				* 181 * 181	* 259 * 213			* 174 * 174 3200
80				* 413 * 413	* 562 * 496			* 384 * 384 120
1500				* 266 * 266	* 279 * 209			* 175 * 182 2460
60				* 560 * 560	* 599 * 490			* 385 * 360 140
1000		* 674 * 587	* 432 * 383	* 360 * 273	* 272 * 203	* 210 * 155		* 179 * 150 2960
40		* 1381 * 1269	* 920 * 827	* 779 * 587	* 586 * 437			* 395 * 332 140
500			* 488 * 399	* 350 * 258	* 265 * 196	* 207 * 152		* 192 * 146 2960
20			* 1054 * 775	* 764 * 589	* 578 * 421	* 444 * 325		* 422 * 321 150
10		* 583 * 508	* 472 * 362	* 340 * 249	* 259 * 190	* 204 * 143		* 203 * 143 2520
5		* 1307 * 1100	* 1046 * 738	* 731 * 527	* 557 * 409			* 447 * 326 140
1500	* 578 * 578	* 738 * 598	* 486 * 336	* 334 * 244	* 255 * 187			* 217 * 158 3360
20	* 1293 * 1293	* 894 * 688	* 632 * 425	* 419 * 308	* 249 * 182			* 479 * 349 140
1000	* 600 * 491	* 743 * 521	* 466 * 337	* 333 * 243	* 256 * 187			* 247 * 181 2960
40	* 2060 * 2000	* 1595 * 1120	* 1093 * 728	* 718 * 525	* 552 * 404			* 568 * 402 120
1500		* 681 * 531	* 469 * 343	* 320 * 249				* 285 * 232 2630
60		* 1451 * 1142	* 979 * 729	* 668 * 517				* 621 * 521 180
2500		* 460 * 460						* 332 * 332 830
80		* 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 60	2000 80	2500 100	3000 120	3500 140		(mm) (inch)
								
3800								* 195 * 195 2470
2500								* 175 * 175 2060
1000				* 388 * 388				* 334 * 334 120
2000				* 181 * 181	* 259 210			* 174 * 174 3050
80				* 413 * 413	* 582 456			* 384 * 384 130
1500				* 265 * 265	* 361 289			* 175 * 182 3160
60				* 560 * 560	* 618 490			* 385 * 390 340
1800		* 674 507	* 432 383	* 360 273	* 321 203	* 266 195		* 179 * 180 3580
40		* 1381 1289	* 928 827	* 779 587	* 639 437			* 395 * 332 140
500			* 627 359	* 446 259	* 355 186	* 291 152		* 192 * 146 3590
25			* 1348 770	* 900 589	* 766 421	* 520 325		* 422 * 321 180
10		* 563 316	* 875 382	* 478 249	* 364 190	* 244 143		* 210 * 149 3520
5		* 1307 770	* 1452 738	* 1029 537	* 784 409			* 471 * 326 340
1500	* 578 578	* 891 795	* 639 536	* 462 244	* 346 157			* 251 * 158 3590
20	* 1293 1293	* 1969 188	* 1375 725	* 993 526	* 749 402			* 999 * 343 140
1000	* 890 891	* 628 625	* 565 337	* 430 243	* 334 167			* 277 * 181 3080
40	* 2060 2060	* 1779 1010	* 1214 726	* 879 505	* 618 404			* 619 * 402 320
1800		* 681 538	* 488 383	* 320 249				* 285 * 232 2630
60		* 1451 1142	* 978 739	* 660 507				* 631 * 521 110
2000		* 460 460						* 332 * 332 1830
80		* 945 945						* 751 * 751 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												90
2500												2760
200												190
2000												3080
80												120
1500												3280
60												130
1000												3400
40												140
500												3420
20												140
0												3350
0												140
-500												3180
-20												130
-1000												2800
-40												120
-1500												2380
-80												100

Illustration 99

g06364160

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

(mm) (inch)	1000 40	1500 60	2000 80	2500 100	3000 120			(mm) (inch)
100						500	500	90
2500 900				244 569	244 569	225 499	225 499	2760 100
2000 80				268 574	268 574	309 483	204 435	3080 120
1500 60			309 644	309 700	321 589	321 704	202 433	3280 130
1000 40			534 1037	365 788	410 885	349 758	186 422	3400 140
500 20			672 1439	343 741	473 1018	251 540	370 797	3620 140
0 0			674 1452	332 717	484 1042	243 523	367 788	3650 140
-500 -20	502 1249	502 1249	667 1875	509 1094	617 1331	339 710	335 732	3180 130
-1000 -40		769 1833	514 1006	533 1044	388 716	388 828	240 519	2880 120
-1500 -60		604 1284	505 1131	411 887	340 735			2380 100

Illustration 100

g06364162

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

Product Information Section
Lifting Capacities

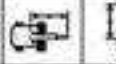
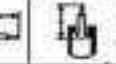
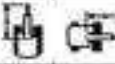
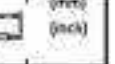
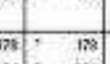
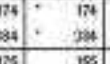
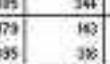
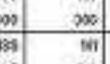
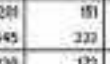
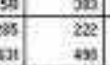
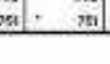
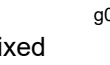
(mm) (inch)	1000 40	1500 60	2000 80	2500 100	3000 120	3500 140		(mm) (inch)
3800								2470
3500								2160
3200								1920
2900								1680
2600								1440
2300								1200
2000								960
1700								720
1400								480
1100								240
800								120
500								60
200								30
100								15
50								7
25								3
12								1
6								0
3								0
1								0
0								0

Illustration 101

g06364163

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

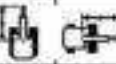
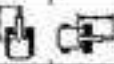
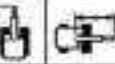
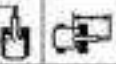
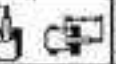
(mm) (inch)	1000 40	1500 60	2000 80	2500 100	3000 120	3500 140		(mm) (inch)
3800								2470
2500 100				388 153	388 153		178 70	2160 85
2000 80				181 71	181 71	259 102	174 68	3250 128
1500 60				265 104	265 104	361 142	175 69	3160 124
1000 40		674 265	567 223	432 169	370 146	262 103	185 73	3580 141
500 20			627 247	344 135	446 175	249 98	355 139	3590 141
250 10			1348 531	763 300	800 315	536 211	520 205	422 166
150 6		563 221	496 195	875 344	328 129	478 188	238 94	364 143
100 4		1307 518	1067 419	1452 575	700 276	1029 405	588 231	784 308
500 20	578 228	578 228	821 323	496 195	639 251	323 127	462 182	213 84
1000 40	880 346	891 351	828 326	608 239	966 380	323 127	490 193	346 136
1500 60			1773 697	1077 423	1214 478	636 250	879 346	334 131
2000 80			1451 571	1089 427	1378 541	820 323	1100 433	332 131
2500 100			945 371	685 270				251 99

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)
													(mm) (inch)
2500 100							* 349	* 349			* 315	* 315	2540 100
2000 80							* 329	* 329			* 290	* 290	2500 100
1500 60							* 794	* 794			* 641	* 641	1500 60
1000 40					* 384	* 384	* 383	* 383	343	343	280	* 283	1000 40
500 20					* 829	* 829	* 806	* 806	451	732	621	* 625	500 20
0 0					533	* 584	387	435	258	335	263	* 269	0 0
-500 -20					1151	* 1250	835	938	642	723	580	* 637	-500 -20
-1000 -40					512	579	376	424	243	338	258	291	-1000 -40
-1500 -60					1105	1240	812	915	631	71	563	641	-1500 -60
-2000 -80			* 625	* 625	501	567	369	416	249	325	264	298	-2000 -80
-2500 -100			* 1446	* 1446	1089	1222	796	898	623	703	582	656	-2500 -100
-3000 -120	* 677	* 677	772	879	499	564	365	413	246	325	264	321	-3000 -120
-3500 -140	* 1510	* 1510	1658	1888	1073	1235	789	891			628	709	-3500 -140
-4000 -160			778	* 813	509	* 562	367	* 407			330	* 344	-4000 -160
-4500 -180			1672	* 1745	1079	* 1206	794	* 865			733	* 756	-4500 -180
-5000 -200			* 639	* 639	* 426	* 426					* 359	* 359	-5000 -200
-5500 -220			* 1356	* 1356	* 885	* 885					* 795	* 795	-5500 -220

Illustration 103

g06364168

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

(mm) (inch)	1000 40		1500 60		2000 80		2500 100		3000 120				(mm) (inch)
  	 	 	 	 	 	 	 					(mm) (inch)	
2500 100							* 348 * 348					* 315 * 315	2540 100
2000 80							* 329 * 329 * 734 * 734					* 290 * 290 * 641 * 641	2300 100
1500 60					* 384 * 384 * 829 * 829		* 383 * 383 * 836 * 836		* 371 * 371 * 804 * 804	348 732		* 283 * 283 * 625 * 625	3150 100
1000 40					* 584 * 584 * 1250 * 1250		* 457 * 457 * 989 * 989		* 350 * 350 * 847 * 847	335 723		* 289 * 289 * 637 * 637	3270 100
500 20					* 701 * 701 * 1504 * 1504	579 1248	* 507 * 507 * 1094 * 1094	424 935	* 462 * 462 * 969 * 969	339 71		* 308 * 308 * 678 * 678	3290 100
0 0			* 625 * 625 * 1446 * 1446		* 705 * 705 * 1519 * 1519	567 1222	* 513 * 513 * 1005 * 1005	496 888	* 393 * 393 * 843 * 843	325 703		* 343 * 343 * 756 * 756	3210 100
-500 -20	* 677 * 677 * 1510 * 1510	* 677 * 677 * 1510 * 1510	* 818 * 818 * 2024 * 2024	879 1988	* 659 * 659 * 1401 * 1401	564 1215	* 478 * 478 * 1028 * 1028	413 891	* 351 * 351 * 825 * 825			* 343 * 343 * 766 * 766	3000 100
-1000 -40				* 813 * 813 * 1745 * 1745	* 662 * 662 * 1205 * 1205	* 562 * 562 * 1206 * 1206	* 407 * 407 * 865 * 865					* 344 * 344 * 758 * 758	2720 100
-1500 -60				* 839 * 839 * 1358 * 1358	* 639 * 639 * 895 * 895	* 426 * 426 * 895 * 895						* 359 * 359 * 795 * 795	2200 80

Illustration 104

g06364170

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

Product Information Section
Lifting Capacities

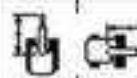
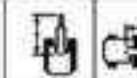
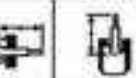
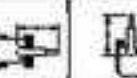
[mm] [inch]	1000 40	1500 60	2000 80	2500 100	3000 120	
 (mm) (inch)						 (mm) (inch)
2500 100				* 348 311		* 315 303 2540 * 703 685 100
2000 80				* 329 303 * 734 673		* 290 245 2500 * 641 545 120
1900 80			* 384 384 * 829 829	* 383 308 * 836 661	383 234 651 503	288 216 3150 621 479 130
1800 40			533 402 1151 868	387 286 835 640	258 229 642 495	263 202 3270 588 446 130
900 20			512 382 1105 827	376 288 812 618	253 224 631 484	258 188 3290 563 436 120
0 0		* 625 549 * 1446 1182	501 372 1080 803	369 279 796 603	249 229 623 476	264 202 3219 582 445 130
-500 -20	* 677 677 * 1510 1510	772 598 1858 1185	499 369 1073 798	365 276 785 598	248 219	264 217 3030 628 478 120
-1000 -40		778 595 1872 1188	503 371 1073 802	367 278 794 601		330 251 2720 733 558 110
-1500 -60		* 839 568 * 1356 1225	* 426 381 895 823			* 359 339 2200 * 795 763 80

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)
													(mm) (inch)
2500 100							* 349	311			* 315	303	2540 100
2000 80							* 329	313			* 290	245	2330 120
							* 734	673			* 641	545	
1500 60					* 384	* 384	* 383	308	* 371	234	* 283	238	3150 130
					* 823	* 825	* 835	661	* 896	503	* 625	479	
1000 40					* 594	402	* 457	286	* 380	229	* 289	202	3270 130
					* 1259	863	* 989	640	* 847	485	* 637	446	
500 20					* 701	382	* 507	206	* 402	224	* 308	198	3290 130
					* 1504	827	* 1094	619	* 869	484	* 679	436	
0 0			* 625	549	* 705	372	* 513	279	* 393	220	* 343	202	3290 130
			* 1448	1082	* 1519	803	* 1005	603	* 843	476	* 706	445	
-500 -20	* 677	* 677	* 808	550	* 459	368	* 478	276	* 351	218	* 343	217	3030 120
	* 1510	* 1510	* 2024	1095	* 1401	796	* 1028	506			* 756	479	
-1000 -40			* 813	566	* 562	375	* 407	278			* 344	261	2730 100
			* 1745	1088	* 1206	802	* 865	601			* 753	558	
-1500 -60			* 639	568	* 426	381					* 353	339	2200 90
			* 1358	1225	* 895	823					* 795	763	

Illustration 106

g06364172

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

Product Information Section
Lifting Capacities

(mm) (inch)	500 20	1000 40	1500 60	2000 80	2500 100	3000 120			
									(mm) (inch)
2000									260 * 281 2790
2500									245 * 245 2760
100									545 * 545 180
2000									250 * 250 305 * 321 230 * 230 3100
80									580 * 580 635 * 635 568 * 568 130
1500									320 * 320 302 * 316 227 * 227 3320
60									707 * 707 650 731 501 * 501 130
1000									744 * 744 435 * 435 387 * 403 296 333 234 * 234 3430
40									1547 * 1547 1090 * 1090 934 * 934 639 719 514 * 514 140
500									696 * 696 512 * 512 374 422 290 327 237 * 243 3450
20									1070 * 1070 1105 1240 807 893 626 706 520 * 540 140
0									710 * 710 497 * 563 385 412 284 321 242 274 3390
0									1037 * 1046 1171 1210 787 869 613 693 533 603 140
1500									618 * 618 419 * 623 * 623 759 857 490 556 359 447 291 318 258 292 3210
20									1364 * 1364 1392 * 1392 831 1061 1056 1189 725 879 607 687 570 648 130
1000									768 * 795 * 890 * 890 764 871 441 667 359 447 291 318 258 292 3210
40									1745 * 1745 1397 * 1397 1041 1172 1057 1200 775 879 607 687 570 648 130
1500									717 * 717 432 * 432 341 * 341 2480
60									1527 * 1527 1024 * 1024 755 * 755 130
2000									468 * 468 425 * 425 330
80									982 * 982 40

Illustration 107

g06364173

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

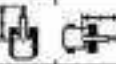
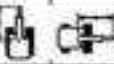
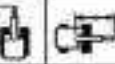
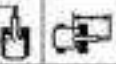
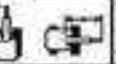
(mm) (inch)	500 20	1000 40	1500 60	2000 80	2500 100	3000 120		(mm) (inch)
3800								260
2500								245
1000								545
2000								250
80								590
1500								320
60								707
1800								413
40								834
500								422
25								845
8								394
8								840
1000								497
20								870
1000								407
40								870
1800								482
60								904
2000								425
80								902

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

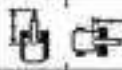
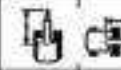
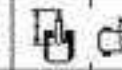
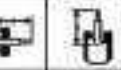
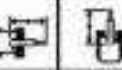
(mm) (inch)	500 20	1000 40	1500 60	2000 80	2500 100	3000 120		(mm) (inch)
								
3800								291 291 290
2500 100					255 255 583 593		245 245 545 545	2760 190
2000 80					258 258 588 598	305 305 635 645	238 238 508 508	222 222 894 904
1500 60					323 307 787 591	302 302 650 650	227 227 501 501	190 190 438 438
1100 40			744 695 1547 1393	435 404 1060 874	387 356 934 838	286 286 638 638	227 227 498 498	234 185 514 409
500 20			536 556 1878 1201	512 506 1306 826	374 384 987 615	280 280 626 437	221 221 521 437	181 181 389 389
3 0			713 540 1837 1165	497 407 1071 784	365 275 797 593	284 284 610 468	246 246 533 408	194 194 408 408
500 20	638 1364 25 1364	839 1364 25 1364	623 1382 25 1382	759 1839 25 1839	538 1960 25 1960	480 1906 25 1906	359 1775 25 1775	262 583 25 583
1000 40	785 1745 25 1745	705 1745 25 1745	650 1897 25 1897	764 1841 25 1841	542 1859 25 1859	491 1957 25 1957	362 1781 25 1781	262 725 25 725
1500 60			717 1527 25 1527	553 1591 25 1591	482 1624 25 1624	368 796 25 796		241 755 25 755
2000 80			468 468 25 468				425 425 25 425	825 825 25 825

Illustration 109

g06364176

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

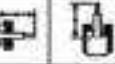
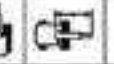
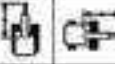
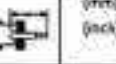
(mm) (inch)	500 20		1000 40		1500 60		2000 80		2500 100		3000 120				(mm) (inch)
															
3800													* 267	* 241	2600
2500									* 255	* 235			* 245	* 245	2760
1000									* 593	* 593			* 545	* 545	180
2000									* 258	* 258	* 321	235	* 238	222	3180
80									* 590	* 590	* 635	505	* 598	494	130
1500									* 323	397	* 295	209	* 227	182	3020
60									* 797	661	* 736	581	* 581	438	130
1800					* 744	605	* 485	464	* 413	296	* 366	227	* 334	185	3430
40					* 1547	1393	* 1060	874	* 854	636	* 796	458	* 514	409	140
500					* 636	556	* 661	382	* 494	284	* 290	221	* 249	181	3450
25					* 1681	1291	* 1130	825	* 1044	813	* 845	477	* 549	399	140
8					* 713	540	* 704	367	* 598	275	* 394	26	* 277	184	3580
8					* 1646	1185	* 755	734	* 1035	533	* 848	465	* 618	406	140
1000	* 608	* 499	* 623	* 623	* 947	538	* 669	362	* 488	270	* 369	20	* 323	196	3210
20	* 1364	* 1364	* 1392	* 1392	* 2158	1860	* 1441	788	* 1958	583	* 790	463	* 713	433	130
1000	* 788	* 706	* 890	* 888	* 978	512	* 694	342	* 433	270			* 327	222	2820
40	* 1745	* 1745	* 2097	* 2097	* 1889	1869	* 275	761	* 327	583			* 721	433	130
1800					* 717	553	* 482	368					* 341	283	2480
60					* 1527	1191	* 824	735					* 795	624	300
2000					* 488	468							* 425	* 425	2580
80													* 932	* 932	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

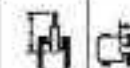
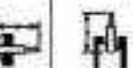
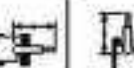
(mm) (inch)	1000 40		1500 60		2000 80		2500 100		3000 120				
									(mm) (inch)				
2500 100							* 349 301			* 315 293	2540 100		
2000 80							* 329 302 * 734 650			* 290 236 * 641 526	2930 120		
1500 60					* 384 829	* 384 829	376 811	296 638	285 614	225 485	264 585	208 461	3150 130
1000 40					504 1086	388 838	365 788	286 617	281 685	221 475	247 546	194 429	3270 130
500 20					483 1043	369 797	355 765	276 596	275 594	215 465	242 534	190 419	3290 130
0 0			* 825 1446	528 1139	472 1017	358 774	347 749	269 580	271 586	212 458	248 547	194 428	3210 130
-500 -20	* 577 1510	* 577 1510	727 1562	530 1142	465 1010	355 767	344 742	256 574	270 574	211 574	267 590	209 461	3030 120
-1000 -40			734 1577	538 1154	471 1016	357 772	346 747	257 578			311 696	242 537	2720 110
-1500 -60			* 639 1356	548 1182	* 426 896	367 794					* 359 795	326 736	2200 90

Illustration 111

g06364185

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

(mm) (inch)	1000 40		1500 60		2000 80		2500 100		3000 120				
												(mm) (inch)	
2500 100							* 349	301			* 316	293	2540 100
2000 80							* 329	300			* 290	236	2130 80
							* 734	660			* 641	526	120
1500 60					* 384	* 384	* 383	296	* 371	225	* 283	208	3150 60
					* 829	* 829	* 836	638	* 814	485	* 625	461	130
1000 40					* 584	388	* 457	286	* 350	221	* 280	194	3270 40
					* 1250	838	* 989	617	* 847	478	* 637	429	130
500 20					* 701	369	* 507	276	* 462	216	* 308	190	3290 20
					* 1504	797	* 1184	596	* 869	466	* 578	415	130
0 0			* 625	528	* 705	358	* 513	269	* 353	212	* 343	194	3210 0
			* 1445	1139	* 1519	774	* 1105	580	* 843	458	* 756	428	130
-500 -20	* 677	* 677	* 938	530	* 650	355	* 478	268	* 351	211	* 343	209	3130 -20
	* 1510	* 1510	* 2024	1142	* 1401	767	* 1028	574			* 756	461	120
-1000 -40			* 813	536	* 562	357	* 407	267			* 344	242	2720 -40
			* 1745	1154	* 1206	772	* 865	578			* 758	537	110
-1500 -60			* 639	548	* 426	367					* 359	325	2200 -60
			* 1356	1182	* 895	794					* 795	735	90

Illustration 112

g06364187

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

Product Information Section
Lifting Capacities

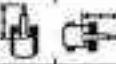
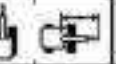
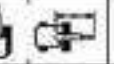
(mm) (inch)	500 20	1000 40	1500 60	2000 80	2500 100	3000 120		(mm) (inch)
3800								260
2500								245
100								545
2000								230
80								990
1500								227
60								581
1000								220
40								178
500								330
25								174
8								380
8								340
100								242
20								188
1000								274
40								24
1500								272
60								341
2000								755
80								425

Illustration 113

g06364189

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

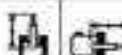
(mm) (inch)	500 20	1000 40	1500 60	2000 80	2500 100	3000 120		(mm) (inch)							
								(mm) (inch)							
3800							* 261 * 261	260							
2500					* 255 * 255		* 245 * 245	2760							
100					* 593 * 593		* 545 * 545	180							
2000					* 258 * 258	* 321	227 * 230	214	3180						
80					* 590 * 590	* 635	482 * 998	478	130						
1500					* 323 * 323	* 395	324 * 227	190	3080						
60					* 707 * 639	* 736	463 * 581	421	130						
1800			* 744	585	* 485	385	* 413	385	366	249	334	178	3430		
40			* 1547	1298	* 1060	844	* 934	615	796	472	514	330	340		
500			* 636	536	* 661	368	* 494	273	390	210	249	174	3450		
25			* 1681	1350	* 1130	785	* 1044	580	645	458	549	383	340		
8			* 713	520	* 704	354	* 568	264	394	207	277	177	3580		
8			* 1646	1321	* 1075	764	* 1035	571	848	447	618	330	340		
1000	* 608	* 499	* 623	623	* 347	518	* 669	349	* 488	259	* 369	205	323	188	3230
-25	* 1364	* 1304	* 1392	1382	* 2158	1396	* 1441	128	* 1858	560	* 790	442	* 713	478	130
1000	* 788	* 706	* 890	886	* 978	552	* 694	348	* 433	259			* 327	214	2820
-40	* 1745	* 1745	* 1897	1897	* 1889	1025	* 1275	781	* 327	560			* 721	473	130
1800					* 717	552	* 482	385					* 341	272	2480
-60					* 1527	1149	* 1024	766					* 799	610	300
2000					* 488	468							* 425	425	425
-80													* 932	932	932

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)
															
3000 120													* 991	* 391	100
2500 100							* 345	* 283					260	* 365	2850
2000 80							* 569	* 563					586	* 567	120
1500 60							* 268	* 268	247	261			213	228	2250
1000 40							* 604	* 604	528	559			475	504	150
500 20							333	350	243	267			188	201	3440
0 0							716	753	521	552			417	445	140
-500 -20					454	476	318	336	238	250	100	192	174	186	3570
-1000 -40					970	1027	686	723	606	637			384	410	140
-1500 -60					425	447	354	371	228	242	178	189	169	181	3560
-2000 -80					915	964	654	682	490	521			372	396	150
-2500 -100					414	437	294	312	222	236			172	184	3530
-3000 -120					891	940	633	671	475	509			360	406	140
-3500 -140			857	718	413	436	290	308	219	234			188	199	3580
-4000 -160	* 1081	* 1061	1469	1530	850	907	624	663	472	503			411	439	140
-4500 -180	* 1174	* 1174	605	723	417	439	292	309					217	231	3650
-5000 -200	* 2638	* 2638	1492	1549	805	945	626	666					482	513	120
-5500 -220			706	737	426	449	300	318					202	310	2550
-6000 -240			1512	1579	917	966							658	697	100

Illustration 115

g06615559

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

(mm) (inch)	1000 40		1500 60		2000 80		2500 100		3000 120		3500 140				(mm) (inch)
															
3000 120													* 691	* 695	100
2500 100							* 245	* 245					* 265	* 265	2930
2000 80							* 563	* 563					* 587	* 587	120
1500 60							* 268	* 268	* 303	261			* 209	226	3250
1000 40							* 604	* 604	* 792	659			* 570	604	130
500 20							* 375	350	* 383	257			* 261	201	3440
0 0							* 816	753	* 838	552			* 576	445	140
-500 -20					* 724	478	* 620	330	* 436	290	* 379	100	* 188	189	3670
-1000 -40					* 1526	1027	* 1111	725	* 941	537			* 586	450	140
-1500 -50					* 825	447	* 619	321	* 473	242	* 381	169	* 262	181	3590
-2000 -80					* 1975	964	* 1325	680	* 1021	521			* 628	399	150
-2500 -100					* 600	437	* 636	312	* 478	238			* 311	184	3520
-3000 -120					* 1938	940	* 1363	671	* 1037	509			* 687	406	140
-3500 -140			* 875	716	* 817	436	* 696	368	* 444	234			* 352	199	3390
-4000 -160	* 1891	* 1681	* 2800	1636	* 1761	957	* 1281	663	* 961	603			* 776	499	140
-4500 -180	* 1174	* 1174	* 1549	725	* 703	439	* 516	308					* 351	231	3050
-5000 -200	* 2638	* 2638	* 2247	1549	* 1520	945	* 1103	666					* 174	513	120
-5500 -220			* 845	737	* 558	449	* 376	318					* 360	310	2510
-6000 -240			* 1703	1579	* 1152	966							* 796	607	100

Illustration 116

g06615561

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

Product Information Section
Lifting Capacities

(mm) (inch)	1000 40		1500 60		2000 80		2500 100		3000 120		3500 140				(mm) (inch)
3000 120															
2500 100							* 245 * 563	327 486					601 586	643 378	100 120
2000 80							* 258 * 604	224 481	247 528	158 307			213 475	134 299	3250 100
1500 60							333 716	215 463	243 521	154 331			188 417	116 257	3440 140
1000 40					454 979	286 617	318 685	262 435	239 505	148 317	180 109	109	174 384	106 230	3570 140
500 20					425 915	259 561	304 654	189 406	225 490	140 301	176 106	106	169 372	101 222	3580 100
0 0					414 891	250 539	294 633	180 387	222 473	135 290			172 380	100 228	3520 140
-500 20	* 1681	* 1681	987 1489	401 860	413 888	249 536	390 824	176 379	219 472	132 285			166 411	111 246	3350 140
-1000 40	* 1174 * 2636	857 1831	692 1482	406 871	417 895	252 543	290 626	178 382					217 482	132 290	3040 120
-1500 60			706 1512	417 897	426 917	251 552	300 652	186					202 658	181 407	2550 100

Illustration 117

g06615565

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

(mm) (inch)	1000 40		1500 60		2000 80		2500 100		3000 120		3500 140				
															(mm) (inch)
3000 120													* 391	543	100
2500 100							* 243	227					* 365	168	2930
							* 565	486					* 587	578	120
2000 80							* 268	224	* 350	158			* 258	134	3290
							* 604	481	* 702	337			* 670	299	130
1500 60							* 375	215	* 363	154			* 261	175	3440
							* 836	493	* 838	301			* 576	257	140
1000 40					* 724	266	* 695	302	* 435	148	* 379	100	* 366	105	3670
					* 1025	817	* 1117	435	* 941	312			* 886	232	140
500 20					* 925	259	* 819	189	* 474	140	* 381	106	* 282	101	3590
					* 1975	561	* 1328	406	* 1021	301			* 420	222	150
0 0					* 900	200	* 606	180	* 478	130			* 311	103	3620
					* 1938	539	* 1368	387	* 1027	290			* 687	226	140
-500 -20	* 1601	* 1681	* 2900	864	* 1761	536	* 1281	379	* 961	285			* 382	111	3390
													* 776	245	140
-1000 -40	* 1174	857	* 1049	406	* 708	252	* 516	178					* 351	132	3050
	* 2638	1831	* 2247	871	* 1520	543	* 1103	332					* 774	293	120
-1500 -60			* 846	417	* 558	261	* 378	185					* 360	181	2550
			* 1793	897	* 1182	542							* 786	407	100

Illustration 118

g06615567

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

Product Information Section
Lifting Capacities

(mm) (inch)	1000 40		1500 60		2000 80		2500 100		3000 120		3500 140				(mm) (inch)	
															(mm) (inch)	
3000 120														* 233	+ 233	2640
2500 100									248 98	263 103				* 212	+ 212	3130 123
2000 80									248 98	262 103				193 76	205 81	3420 135
1500 60							* 262 + 820	* 262 + 820	243 96	257 101	182 71	194 76	178 70	182 71	182 71	3620 143
1000 40					462 18	485 19	520 20	537 21	535 21	549 21	598 23	601 23	607 23	548 21	599 23	3730 147
500 20					428 17	453 18	503 20	520 21	525 21	540 21	573 22	585 23	585 23	553 21	564 22	3760 148
0 0			* 488 + 1076	* 488 + 1073	410 16	433 17	500 20	506 20	518 20	523 20	569 22	582 23	582 23	555 21	567 22	3800 150
-500 -20	* 851 + 1447	* 851 + 1447	889 35	700 28	405 16	423 17	584 23	580 23	514 20	528 20	588 23	588 23	588 23	564 22	578 22	3530 139
-1000 -40	* 984 + 2199	* 984 + 2199	676 27	707 28	407 16	429 17	584 23	581 23	514 20	528 20	588 23	588 23	588 23	564 22	583 22	3200 126
-1500 -60	* 1341 + 3018	* 1341 + 3018	688 27	719 28	414 16	438 17	589 23	587 23	514 20	528 20	588 23	588 23	588 23	564 22	589 22	2810 111
-2000 -80			* 663 + 1395	* 663 + 1393	* 402 + 402	* 402 + 402								* 408 + 908	* 408 + 906	2010 80

Illustration 119

g06615589

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

(mm) (inch)	1000 40		1500 60		2000 80		2500 100		3000 120		3500 140				(mm) (inch)
															
3000 120													* 233	* 233	2640
2500 100									* 293	293			* 212	* 212	3130
									* 545	553			* 476	* 476	130
2000 80									* 286	292			* 208	205	3420
									* 645	551			* 455	455	140
1500 60							* 282	* 282	* 329	257	* 341	194	* 209	182	3620
							* 620	* 620	* 725	552	* 623	414	* 450	403	150
1000 40					* 551	485	* 448	337	* 397	249	* 359	190	* 214	169	3730
					* 1183	1044	* 865	726	* 851	635	* 780	487	* 472	373	150
500 20					* 858	450	* 581	320	* 453	240	* 374	185	* 228	164	3780
					* 1645	971	* 1248	600	* 977	518	* 808	398	* 590	362	150
0 0			* 488	* 468	* 317	433	* 630	308	* 474	233	* 371	182	* 253	187	3890
			* 1078	* 1071	* 1568	931	* 1354	663	* 1019	590	* 794	390	* 558	367	150
-500 -20	* 851	* 851	* 834	700	* 956	428	* 510	302	* 456	228	* 339	180	* 297	178	3530
	* 1447	* 1447	* 1332	1433	* 1841	918	* 1310	650	* 977	491			* 656	393	140
-1000 -40	* 864	* 834	* 1181	707	* 757	626	* 585	301	* 430	228			* 334	203	3250
	* 2199	* 2199	* 2493	1513	* 1623	923	* 1107	640	* 850	432			* 736	451	130
-1500 -60	* 1341	* 1341	* 853	718	* 522	438	* 438	307					* 348	209	2810
	* 3018	* 3018	* 2843	1541	* 1323	938	* 824	561					* 753	581	110
-2000 -80			* 663	* 563	* 402	* 402							* 406	* 406	2010
			* 1386	* 1386									* 806	* 806	80

Illustration 120

g06615590

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

Product Information Section
Lifting Capacities

(mm) (inch)	1000 40		1500 60		2000 80		2500 100		3000 120		3500 140				(mm) (inch)
															
3000 120													* 233	205	2640
2500 100									249	160			* 212	147	3130
2000 80									533	340			* 470	330	138
1500 60									248	158			193	119	3420
1000 40									530	330			429	265	148
500 20							* 282	217	243	154	182	111	170	102	3620
0 0							* 620	466	521	329	388	235	378	227	153
-500 -20					462	292	320	203	235	146	178	107	158	93	3730
-1000 -40					995	631	667	426	504	312	361	228	348	205	152
-1500 -60					428	262	303	187	226	138	173	103	153	89	3760
-2000 -80					922	569	650	403	485	290	372	220	337	196	151
-2500 -100			* 466	383	410	245	290	178	218	131	169	98	155	80	3680
-3000 -120			* 1078	822	682	529	625	373	469	261	354	212	342	198	153
-3500 -140	* 651	* 651	669	395	405	241	284	170	214	127	158	98	166	96	3630
-4000 -160	* 1447	* 1447	1431	826	679	519	611	388	480	272			367	213	146
-4500 -180	* 934	828	675	390	407	243	284	170	214	127			190	112	3250
-5000 -200	* 2189	1764	1446	838	673	521	610	385	480	273			421	249	138
-5500 -220	* 1341	842	688	401	414	249	289	175					244	147	2810
-6000 -240	* 3018	1800	1473	862	693	536	623	377					545	330	111
-6500 -260			* 883	421	* 402	265							* 400	264	2910
-7000 -280			* 1395	900									* 808	525	80

Illustration 121

g06615593

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

(mm) (inch)	1000 40		1500 60		2000 80		2500 100		3000 120		3500 140				(mm) (inch)		
																	
3500 120														* 233	255	2540	
2500 100									* 283	160				* 212	147	3130	
2000 80									* 365	340				* 479	330	133	
1500 60									* 285	158				* 208	119	3420	
1000 40									* 545	338				* 459	285	145	
500 20								* 292	217	* 329	154	* 341	111	* 209	102	3600	
0 0								* 520	485	* 725	329	* 623	235	* 460	227	153	
-500 -20					* 561	292	* 448	203	* 397	146	* 359	107	* 214	83		3730	
-1000 -40					* 1183	631	* 365	438	* 861	313	* 780	229	* 472	205		156	
-1500 -60					* 968	282	* 581	187	* 453	138	* 374	103	* 228	89		3760	
-2000 -80					* 1045	565	* 1248	403	* 877	296	* 806	220	* 502	186		153	
-2500 -100					* 488	383	* 917	245	* 830	175	* 474	131	* 371	99	* 252	90	3600
-3000 -120					* 1078	622	* 1988	629	* 1354	378	* 1019	261	* 794	212	* 569	188	153
-3500 -140	* 851	* 851	* 834	385	* 858	241	* 910	170	* 495	127	* 339	98	* 297	86		3530	
-4000 -160	* 1447	* 1447	* 1892	826	* 1841	519	* 1310	365	* 877	272			* 656	213		148	
-4500 -180	* 984	826	* 1161	390	* 757	243	* 545	170	* 400	127			* 334	112		3280	
-5000 -200	* 2199	1754	* 2483	838	* 1623	521	* 1167	385	* 859	273			* 738	249		138	
-5500 -220	* 1341	842	* 963	401	* 622	249	* 438	175					* 345	147		2810	
-6000 -240	* 3018	1800	* 2043	852	* 1323	536	* 324	377					* 763	330		118	
-6500 -260			* 553	421	* 402	205							* 400	254		2010	
-7000 -280			* 1365	908									* 808	825		30	

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)
													(mm) (inch)
2500 100							* 367 780	* 367 818			317 716	333 752	2730 111
2000 80							* 367 781	* 367 797	269 576	283 607	266 569	269 599	3090 125
1500 60					* 442 946	* 442 946	354 763	372 801	266 572	280 603	225 499	238 527	3320 131
1000 40					476 1027	499 1076	341 736	359 774	260 560	274 591	211 465	223 492	3440 143
500 20					451 973	474 1022	328 708	345 746	253 546	267 577	206 454	218 481	3460 143
0 0					448 947	463 997	320 689	337 726	248 535	262 566	210 464	223 491	3360 143
-500 -20	* 766 1699	* 766 1699	704 1507	735 1575	438 942	461 991	316 682	334 720	246 531	261 562	226 499	240 529	3200 131
-1000 -40	* 1121 2510	* 1121 2510	711 1524	742 1591	441 956	464 999	318 686	336 724			202 582	277 615	2890 121
-1500 -60	* 1567 3535	* 1567 3535	726 1557	757 1624	451 973	474 1022					354 790	373 840	2370 105

Illustration 123

g06615545

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

(mm) (inch)	1000 40		1500 60		2000 80		2500 100		3000 120				(mm) (inch)
													
2500 100							* 357 * 830	* 357 * 838			* 366 * 815	333 752	2710 110
2000 80							* 357 * 797	* 357 * 797	* 423 * 854	283 607	* 336 * 744	269 599	3090 120
1500 60					* 442 * 946	* 442 * 946	* 450 * 979	* 372 * 801	* 441 * 965	280 603	* 329 * 726	238 527	3320 130
1000 40					* 775 * 1644	499 1076	* 572 * 1232	359 774	* 481 * 1043	274 591	* 336 * 740	223 492	3440 140
500 20					* 945 * 2029	474 1022	* 653 * 1406	345 746	* 508 * 1097	287 577	* 357 * 787	278 481	3460 140
0 0					* 938 * 2018	463 997	* 665 * 1432	337 728	* 505 * 1066	262 566	* 398 * 877	223 491	3380 140
-500 -20	* 766 * 1699	* 766 * 1699	* 852 * 2163	735 1575	* 858 * 1847	461 991	* 622 * 1338	334 720	* 465 * 993	261 562	* 405 * 893	240 529	3200 130
-1000 -40	* 1121 * 2510	* 1121 * 2510	* 1128 * 2412	742 1591	* 744 * 1595	454 999	* 537 * 1147	336 724			* 407 * 898	277 615	2890 120
-1500 -60	* 1567 * 3535	* 1567 * 3535	* 896 * 1834	757 1624	* 578 * 1228	474 1022					* 426 * 943	373 840	2370 100

Illustration 124

g06615549

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

Product Information Section
Lifting Capacities

(mm) (inch)	1030 41		1500 60		2000 80		2500 100		3000 120				(mm) (inch)
													
2500 100							* 367 780	246 528			317 716	214 483	2719 111
2000 80							* 367 781	246 528	269 576	181 386	266 569	171 381	3090 121
1500 60					* 442 946	336 722	354 763	238 512	266 572	178 383	225 499	149 331	3320 131
1000 40					476 1027	309 668	341 738	226 487	260 560	172 371	211 465	138 306	3440 140
500 20					451 973	286 619	328 708	214 462	253 546	166 358	206 454	134 296	3460 141
0 0					440 947	276 590	320 689	206 444	248 536	161 348	210 464	137 302	3380 141
-500 -20	* 766 1699	* 766 1699	704 1507	420 903	438 942	274 592	316 682	203 437	246 531	159 344	226 499	147 324	3200 130
-1000 -40	* 1121 2510	862 1843	711 1524	426 917	441 950	277 598	318 686	204 441			262 582	170 378	2890 121
-1500 -60	* 1567 3535	881 1886	726 1557	435 945	451 973	286 619					364 798	229 516	2370 101

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 100							* 357 * 836	246 528			* 366 * 815	214 483	2710 110'
2000 80							* 357 * 797	246 528	* 423 * 864	181 386	* 336 * 744	171 381	3090 120'
1500 60					* 442 * 946	335 722	* 450 * 979	238 512	* 441 * 965	178 383	* 329 * 726	149 331	3320 130'
1000 40					* 775 * 1644	309 660	* 572 * 1232	226 487	* 481 * 1043	172 371	* 336 * 740	138 306	3440 140'
500 20					* 946 * 2020	286 610	* 653 * 1408	214 462	* 508 * 1097	165 358	* 357 * 767	134 296	3460 140'
0 0					* 936 * 2018	276 596	* 665 * 1432	206 444	* 505 * 1086	161 348	* 358 * 777	137 302	3360 140'
-500 -20	* 766 * 1699	* 766 * 1699	* 852 * 2163	420 903	* 858 * 1847	274 592	* 622 * 1338	203 437	* 465 * 993	159 344	* 405 * 893	147 324	3200 130'
-1000 -40	* 1121 * 2510	862 1843	* 1128 * 2412	426 917	* 744 * 1595	277 598	* 537 * 1147	204 441			* 407 * 898	170 378	2890 120'
-1500 -80	* 1567 * 3535	881 1885	* 896 * 1894	435 945	* 578 * 1220	286 615					* 426 * 943	229 516	2370 100'

Illustration 126

g06615556

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

Product Information Section
Lifting Capacities

(mm) (inch)	1250 49		1500 59		2000 79		2500 98		3000 119		3500 140				(mm) (inch)
															
3000 120													* 305	* 305	2360
2500 100							* 577	* 577					180 630	* 264 * 635	2030 125
2000 80							* 592	* 592	270 579	264 590			231 515	244 544	3280 139
1500 59							356 757	* 355 * 799	296 571	280 592			206 457	218 483	3490 140
1000 40			1655	1715	452 1010	505 1088	342 737	359 774	288 595	273 597	285 635	215 451	183 427	259 453	3880 155
500 20					452 975	475 1024	327 705	344 743	250 539	265 570	189 428	211 454	189 416	208 442	3620 150
0 0			* 613 * 1484	* 613 * 1404	435 937	458 986	316 680	330 719	264 525	258 557	186 208	208	192 423	204 449	3550 140
-500 -20	* 696 * 1526	* 686 * 1526	688 1474	119 1542	429 924	452 974	310 660	328 706	240 518	255 549			204 451	217 479	3380 140
1000 -40	* 990 * 2147	* 960 * 2147	694 1488	126 1556	431 927	453 976	310 668	327 706	241 521	256 552			232 514	246 545	3080 130
-1000 -60	* 1275 * 2868	* 1275 * 2868	707 1517	130 1584	438 944	451 993	316 683	334 721					295 652	312 689	2630 110
-2000 -80			* 677	* 677									* 505 * 1165	* 505 * 1165	1770 70

Illustration 127

g06615573

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

(mm) (inch)	1000 40		1500 60		2000 80		2500 100		3000 120		3500 140				(mm) (inch)
3000 120															2360
2500 100							* 677	* 677					* 206	* 186	2030
2000 80									* 258	284			* 268	344	3280
1500 60							* 365	* 365	* 302	280			* 265	218	3490
1000 40							* 709	* 709	* 850	652			* 685	483	3410
500 20															
0 0															
-500 -20															
-1000 -40															
-1500 -60															
-2000 -80															

Illustration 128

g06615578

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

Product Information Section
Lifting Capacities

(mm) (inch)	1000 40		1500 60		2000 80		2500 100		3000 120		3500 140				(mm) (inch)
															
3000 125													* 305	268	2368
2500 100							* 577	534					280	188	2930
2000 80							* 592	531	270	181			231	154	3288
1500 60							566	238	266	177			206	136	3490
1000 40							767	834	671	381			467	300	3680
500 20															
0															
-500 20	* 606	* 696	683	498	423	266	310	196	240	153			204	131	3388
-1000 40	* 1526	* 1526	1474	872	924	574	668	424	518	331			461	289	3680
-1500 60	* 866	831	831	611	631	267	310	166	241	154			232	149	3088
-2000 80	* 2147	1778	1488	834	927	576	668	423	521	333			514	329	3680
-2500 100	* 1275	850	797	422	438	274	316	202					295	190	2638
-3000 125	* 2868	1821	1517	905	944	592	683	437					662	425	3110
-3500 140			* 677	644									* 505	348	3770
-4000 160													* 1166	836	78

Illustration 129

g06615579

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

(mm) (inch)	1000 40		1500 60		2000 80		2500 100		3000 120		3500 140				(mm) (inch)
3000 120															305 120
2500 100							* 677 26.6	534 21.0					* 286 11.3	188 7.4	2930 115.7
2000 80							* 602 23.7	531 20.9	* 358 14.1	181 7.1			* 268 10.5	154 6.1	3260 128.3
1500 60							* 365 14.3	239 9.4	* 382 15.0	177 7.0			* 205 8.1	135 5.3	3490 137.4
1000 40					* 438 17.2	313 12.3	* 609 23.9	226 8.9	* 447 17.6	170 6.7	* 480 18.9	132 5.2	* 273 10.7	126 5.0	3680 144.9
500 20			* 2322 91.4	1021 40.2	* 1351 53.2	677 26.6	* 1200 47.2	486 19.1	* 971 38.2	367 14.4	* 780 30.7	283 11.1	* 609 23.9	277 10.9	3860 151.9
0 0			* 813 31.9	484 19.0	* 895 35.2	285 11.2	* 621 24.4	212 8.3	* 491 19.3	163 6.4	* 485 19.1	125 4.9	* 290 11.4	122 4.8	3620 142.5
-500 -20	* 686 26.9	* 686 26.9	* 984 38.7	496 19.5	* 891 35.1	285 11.2	* 637 25.1	196 7.7	* 480 18.9	153 6.0			* 381 15.0	131 5.2	3380 133.1
-1000 -40	* 360 14.1	* 821 32.3	* 1231 48.4	411 16.2	* 798 31.2	267 10.5	* 1094 42.7	424 16.7	* 1025 40.3	331 13.0			* 842 33.1	289 11.3	3000 118.1
-1500 -60	* 1275 50.0	* 850 33.4	* 1012 39.5	422 16.6	* 647 25.5	274 10.8	* 1210 47.6	423 16.7	* 877 34.5	333 13.1			* 398 15.6	149 5.9	2630 103.3
-2000 -80			* 677 26.6	444 17.5									* 605 23.8	348 13.7	1770 69.7

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)	1000 40		1500 60		2000 80		2500 100		3000 120					
												(mm) (inch)		
3000 120												* 305 * 647	* 305 * 647	2320 90
2500 100							* 305 * 691	* 305 * 691				* 305 * 663	* 305 * 663	2840 110
2000 80							* 325 * 723	* 325 * 723	324 674	329 705		393 643	* 295 * 649	3650 120
1500 60					* 415 * 891	* 415 * 891	* 404 * 878	* 404 * 878	511 668	525 698		259 571	271 599	3350 110
1000 40					574 1236	585 1283	405 873	422 900	314 654	318 695		240 530	252 557	3470 110
500 20					547 1179	569 1236	392 844	409 881	297 639	311 679		234 517	246 543	3490 110
0 0					535 1182	557 1199	383 824	400 861	292 628	306 659		233 520	252 555	3420 110
-500 20	* 844 * 1723	* 844 * 1723	671 1365	980 1927	533 1146	555 1194	379 815	396 853	289 623	303 654		250 565	271 597	3260 100
-1000 40			* 845 * 1820	* 845 * 1820	535 1153	558 1200	380 818	387 856				293 660	312 692	2970 100
-1500 60			* 680 * 1449	* 680 * 1448	* 476 * 1003	* 476 * 1008						* 324 * 718	* 324 * 718	2490 100

Illustration 131

g06364222

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

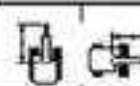
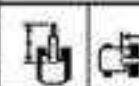
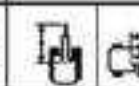
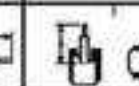
[mm] [inch]	1000 40	1500 60	2000 80	2500 100	3000 120				
							[mm] [inch]		
3000 120						* 305 * 305 * 647 * 647	2320 90		
2500 100				* 305 * 305 * 631 * 631		* 300 * 300 * 663 * 663	2840 110		
2000 80				* 325 * 325 * 723 * 723	* 319 * 319 * 805 * 805	* 295 * 295 * 649 * 649	3150 100		
1500 60			* 415 * 415 * 831 * 831	* 404 * 404 * 878 * 878	* 385 * 385 * 942 * 942	* 287 * 287 * 655 * 655	3350 140		
1000 40			* 672 * 672 * 1432 * 1432	* 595 * 595 * 1283 * 1283	* 502 * 502 * 1081 * 1081	* 418 * 418 * 865 * 865	* 303 * 303 * 668 * 668	3470 140	
500 20			* 798 * 798 * 1712 * 1712	* 569 * 569 * 1226 * 1226	* 563 * 563 * 1212 * 1212	* 430 * 430 * 945 * 945	* 321 * 321 * 706 * 706	3490 140	
0 0			* 777 * 777 * 1677 * 1677	* 557 * 557 * 1199 * 1199	* 567 * 567 * 1226 * 1226	* 431 * 431 * 928 * 928	* 322 * 322 * 659 * 659	3420 140	
500 20	* 844 * 844 * 1723 * 1723	* 844 * 844 * 1723 * 1723	* 954 * 954 * 2070 * 2070	* 705 * 705 * 1521 * 1521	* 535 * 535 * 1194 * 1194	* 394 * 394 * 853 * 853	* 300 * 300 * 654 * 654	* 220 * 220 * 727 * 727	3260 100
1000 40		* 945 * 945 * 1820 * 1820	* 809 * 809 * 1307 * 1307	* 558 * 558 * 1200 * 1200	* 451 * 451 * 964 * 964	* 397 * 397 * 856 * 856	* 324 * 324 * 715 * 715	* 312 * 312 * 632 * 632	2570 100
1500 60		* 680 * 680 * 1443 * 1443	* 476 * 476 * 1009 * 1009				* 324 * 324 * 716 * 716	* 324 * 324 * 716 * 716	2480 100

Illustration 132

g06364223

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

Product Information Section
Lifting Capacities

(mm) (inch)	1000 40		1500 60		2000 80		2500 100		3000 120				(mm) (inch)
													
3000 120											* 305	* 305	2320
											* 647	* 647	90
2500 100							* 305	* 305			* 305	* 305	2840
							* 691	* 691			* 663	* 663	110
2000 80							* 325	* 325	324	222	393	393	360
							* 723	* 653	674	475	643	653	100
1500 60					* 415	* 415	* 404	* 255	311	219	259	190	3350
					* 891	* 891	* 878	* 636	668	463	571	338	90
1000 40					574	393	405	283	384	212	240	156	3470
					1236	850	873	609	654	457	530	367	90
500 20					547	370	392	270	297	201	234	161	3490
					1079	739	844	583	639	443	517	355	90
0 0					535	359	383	262	292	201	233	164	3420
					1052	775	824	564	628	432	520	362	90
-500 -20	* 844	* 844	671	557	533	357	379	258	289	191	258	177	3260
	* 1723	* 1723	1065	1138	1045	769	815	557	623	429	569	390	100
-1000 -40			* 845	583	535	360	380	260			293	205	2970
			* 1820	1210	1053	775	818	558			660	454	120
-1500 -60			* 680	574	* 476	369					* 324	270	2490
			* 1449	1236	* 1003	794					* 718	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.

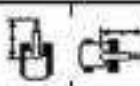
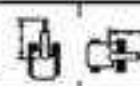
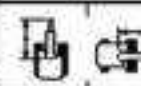
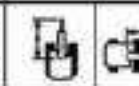
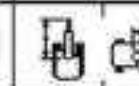
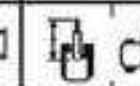
[mm] [inch]	1500 60	1500 60	2000 80	2500 100	3000 120		
							[mm] [inch]
3000 120						* 305 * 647	2320 90
2500 100				* 306 * 631	* 306 * 659	* 300 * 663	2840 110
2000 80				* 325 * 723	* 304 * 653	* 349 * 895	3750 150
1500 60			* 416 * 891	* 416 * 891	* 404 * 878	* 385 * 842	3350 140
1000 40			* 472 * 1432	* 390 * 850	* 502 * 1081	* 380 * 905	3470 140
500 20			* 798 * 1712	* 370 * 799	* 563 * 1212	* 438 * 945	3490 140
0 0			* 777 * 1677	* 359 * 776	* 567 * 1228	* 431 * 928	3420 140
500 20	* 844 * 1723	* 844 * 1723	* 954 * 2070	* 557 * 1198	* 705 * 1521	* 358 * 800	3260 129
1000 40		* 945 * 1820	* 563 * 1210	* 608 * 1307	* 360 * 775	* 451 * 984	2970 120
1500 60		* 680 * 1449	* 574 * 1236	* 476 * 1003	* 368 * 794		2490 100

Illustration 134

g06364225

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

Product Information Section
Lifting Capacities

(mm) (inch)	1000 40	1500 60	2000 80	2500 100	3000 120	3500 140		(mm) (inch)
3800 129								2500 100
2500 100								3040 120
2000 80								3320 130
1500 60								3520 140
1000 40								3630 150
500 20								3650 150
0 0								3560 150
1000 40								3430 140
1000 40								3760 150
1000 40								3740 150
2000 80								3070 120

Illustration 135

g06364227

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

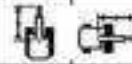
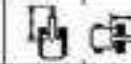
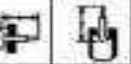
(mm) (inch)	1000 40	1500 60	2000 80	2500 100	3000 120	3500 140	
							(mm) (inch)
3800 129				* 251 * 251			* 267 * 241 2500 * 883 * 883 100
2500 100				* 222 * 222 * 280 * 280			* 242 * 242 3040 * 535 * 535 120
2000 80				* 246 * 246 * 315 * 315			* 238 * 238 3320 * 528 * 528 130
1500 60				* 224 * 224 * 245 * 245	* 325 * 325	* 204 * 204	* 239 * 239 3520 * 528 * 528 140
1000 40		* 1862 * 1862	* 987 * 987 * 1297 * 1297	* 451 * 413 * 370 * 370	* 380 * 317 * 246 * 246	* 243 * 246 * 529 * 541	* 246 * 232 3630 * 512 * 512 150
500 20			* 788 * 788 * 1026 * 1026	* 521 * 521 * 150 * 150	* 468 * 424 * 368 * 368	* 347 * 347 * 746 * 746	* 262 * 262 * 576 * 576 3650 * 100 * 100 160
0 0		* 682 * 682 * 1581 * 1581	* 788 * 788 * 1698 * 1698	* 553 * 553 * 1214 * 1214	* 385 * 385 * 828 * 828	* 431 * 431 * 890 * 890	* 305 * 305 * 714 * 714 3560 * 209 * 209 * 514 * 514 150
1000 40	* 762 * 762 * 1782 * 1782		* 735 * 735 * 1584 * 1584	* 547 * 547 * 1177 * 1177	* 399 * 399 * 859 * 859	* 487 * 487 * 972 * 972	* 298 * 298 * 642 * 642 3430 * 313 * 313 * 541 * 541 140
1000 40		* 829 * 829 * 1896 * 1896	* 847 * 847 * 1281 * 1281	* 549 * 549 * 1179 * 1179	* 477 * 477 * 1022 * 1022	* 349 * 349 * 742 * 742	* 351 * 351 * 642 * 642 3760 * 313 * 313 * 65 * 65 130
1500 60		* 767 * 767 * 1637 * 1637	* 538 * 538 * 1129 * 1129	* 590 * 590 * 1329 * 1329	* 378 * 378 * 798 * 798		* 314 * 314 2740 * 693 * 693 110
2000 80			* 538 * 538 * 1112 * 1112	* 342 * 342			* 342 * 342 3090 * 764 * 764 30

Illustration 136

g06364228

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

Product Information Section
Lifting Capacities

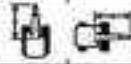
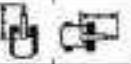
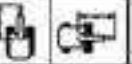
(mm) (inch)	1000 40	1500 60	2000 80	2500 100	3000 120	3500 140		(mm) (inch)
3800 129								2500 100
2500 100				222 500	222 500	280 678	224 476	3040 120
2000 80				246 552	246 552	315 678	222 476	2320 130
1500 60				284 730	287 628	38 668	288 668	2020 140
1000 40		1862 1328	587 1297	389 890	408 874	283 688	281 652	1630 150
500 20			558 1193	371 831	391 841	288 578	295 624	1650 150
0 0		682 1591	542 1165	355 788	379 836	258 588	288 618	1560 120
-500 -20	762 1782	762 1703	655 1432	543 1187	528 1138	283 753	284 803	1430 140
-1000 -40			881 1945	548 1179	528 1132	252 755	284 801	1360 130
-1500 -60			767 1637	588 1282	538 1129	257 769	257 736	1240 110
-2000 -80			536 1112	538 1192	342 312			1070 80

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)	1800 40		1901 50		2000 50		2500 105		3000 120		3500 140				
														(mm) (inch)	
3000 120							251	270					251	281	2500 100
2500 100							222	212	280	214			242	219	3040 120
2000 80							246	246	305	222			238	184	3320 120
1500 60							552	552	703	476			526	409	409
1000 40							324	297	345	218	284	184	229	163	3620 140
500 20							730	629	756	468			526	349	3820 140
0 0															
-500 20							451	283	380	28	343	161	246	150	3630 150
-1000 40							373	610	846	480	743	345	541	322	3920 150
-1500 60							538	268	424	253	347	157	282	148	3690 150
-2000 80							1158	579	996	436	746	327	576	322	409
-2500 100							594	258	431	185	305	154	289	148	2590 150
-3000 120							1214	586	928	423	716	320	627	325	359
-3500 140							735	350	633	253	407	183	303	158	3430 150
-4000 160							1559	544	873	415			689	349	340
-4500 180							847	262	561	180			310	160	3160 150
-5000 200							1022	543	742	408			584	289	190
-5500 220							767	357	379	257			314	227	2740 150
-6000 240							1537	1202	1329	749	555		692	308	110
-6500 260							536	342	342				342	342	2080 150
-7000 280							812	312					764	764	2080 150

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

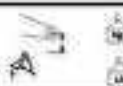
[mm] [inch]	1000 40		1500 60		2000 80		2500 100		3000 120					
												[mm] [inch]		
3000 120												* 305 * 647	* 305 * 647	2320 90
2500 100							* 306 * 630	267 625				* 300 * 663	223 514	2040 110
2000 80							* 325 * 723	284 693	295 634	205 443		272 604	188 408	3750 150
1500 60					* 416 * 891	393 848	395 853	275 592	252 628	202 434		242 535	165 366	3350 140
1000 40					542 1187	367 792	382 822	263 565	216 614	196 421		225 498	152 338	3470 140
500 20					515 1119	343 741	368 793	250 539	278 599	189 407		219 483	147 325	3490 140
0 0					503 1083	332 717	359 773	242 520	273 587	194 396		224 493	150 331	3420 140
500 20	* 844 * 1723	* 844 * 1723	820 1756	518 1112	501 1077	330 711	355 764	338 513	271 583	192 392		241 531	162 357	3260 130
1000 40			827 1721	523 1124	504 1083	333 717	356 767	339 598				279 618	188 417	2970 120
1500 60			* 880 * 1449	534 1150	* 476 * 1003	341 736						* 324 * 716	248 560	2490 100

Illustration 139

g06364233

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

(mm) (inch)	1000 40		1500 60		2000 80		2500 100		3000 120				(mm) (inch)
													
3000 120											* 305	* 305	2320
2500 100							* 305	287			* 647	* 647	90
2000 80							* 691	605			* 900	229	2840
1500 60							* 723	609	* 369	205	* 643	418	100
1000 40					* 418	380	* 404	275	* 365	202	* 297	165	3350
500 20					* 691	648	* 878	582	* 942	434	* 695	366	140
0 0					* 672	367	* 502	262	* 418	196	* 303	152	3470
					* 1432	792	* 1081	565	* 365	421	* 668	336	140
					* 799	343	* 583	250	* 438	199	* 321	147	3490
					* 1712	741	* 1212	539	* 945	407	* 706	325	140
					* 777	332	* 567	242	* 431	194	* 338	150	3420
					* 1677	717	* 1220	520	* 928	396	* 746	351	140
-500 -20	* 844	* 844	* 954	518	* 705	330	* 526	230	* 394	192	* 330	162	3260
	* 1723	* 1723	* 2070	1182	* 1521	711	* 1008	513	* 642	332	* 727	357	130
-1000 -40			* 845	523	* 609	333	* 451	229			* 324	158	2970
			* 1820	1124	* 1387	717	* 1064	516			* 715	417	120
-1500 -80			* 680	534	* 476	341					* 324	249	2490
			* 1449	1150	* 1003	738					* 718	360	100

Illustration 140

g06364234

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

Product Information Section
Lifting Capacities

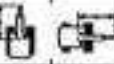
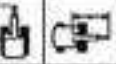
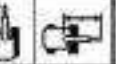
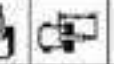
(mm) (inch)	1850 42	1901 50	2000 90	2500 135	3000 120	3500 140		(mm) (inch)
3000 120								2500 100
2500 100				222 8.8	212 8.3	280 11.0	287 11.3	3040 120
2000 80				246 9.7	246 9.7	287 11.3	288 11.3	3320 130
1500 60				324 12.7	316 12.4	292 11.5	282 11.1	3520 140
1000 40			548 21.6	372 14.7	383 15.1	284 11.2	284 11.2	3630 150
500 20		1904 75.3	1225 48.2	507 19.9	384 15.1	276 10.9	267 10.5	3690 150
0 0			1194 47.0	740 29.1	799 31.4	525 20.7	580 22.8	441 17.4
-500 -20	762 30.0	762 30.0	805 31.7	504 19.8	493 19.4	323 12.7	349 13.7	250 10.0
-1000 -40	1203 47.3	1203 47.3	1723 67.8	1002 39.4	1060 41.7	695 27.4	752 29.6	479 18.9
-1500 -60			1737 68.3	1090 42.5	1062 41.7	697 27.4	750 29.5	488 19.2
-2000 -80			1637 64.4	1196 47.0	1079 42.1	711 27.9	763 29.9	511 20.1
			1538 60.5	1316 51.8	1112 43.8	781 30.7	838 33.0	542 21.3
			1412 55.6	1212 47.7	1012 39.8	764 30.0	812 31.9	512 20.2

Illustration 141

g06364238

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

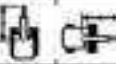
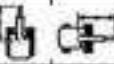
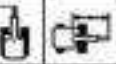
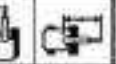
(mm) (inch)	1000 40	1500 60	2000 80	2500 100	3000 120	3500 140		(mm) (inch)
2000 80								2500 100
2500 100				222 88	222 88	260 102	267 105	3040 120
2000 80				246 97	246 97	305 120	308 121	3320 130
1500 60				334 131	336 132	345 136	362 142	3520 140
1000 40		1862 73	1235 49	567 22	372 15	263 10	380 15	3630 140
500 20				760 30	344 13	539 21	248 10	424 17
0 0				1026 40	753 30	1158 45	818 32	906 36
500 20		1561 61	1000 39	789 31	328 13	564 22	218 9	431 17
0 0				1561 61	1000 39	658 26	738 29	818 32
500 20	762 30	752 29		735 29	323 13	539 21	212 9	407 16
1000 40				1584 62	1055 41	680 27	772 30	888 35
1500 60				829 33	609 24	847 33	324 13	472 19
2000 80				1336 53	1032 41	1291 51	697 28	1022 40
2500 100				767 30	518 20	530 21	330 13	378 15
3000 120				1627 64	1100 43	1029 41	711 28	798 31
3500 140				538 21	538 21	342 13	342 13	2019 80

Illustration 142

g06364240

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

Product Information Section
Lifting Capacities

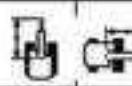
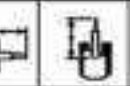
(mm) (inch)	1000 40	1500 60	2000 80	2500 100	3000 120		
							(mm) (inch)
3000 120							* 305 * 305 2320 * 647 * 647 90
2500 100				* 308 * 308 * 691 * 691			* 300 * 300 2840 * 663 * 663 100
2000 80				* 325 * 325 * 723 * 723	349 362 750 778		* 295 * 295 3150 * 649 * 649 130
1500 60			* 415 * 415 * 891 * 891	* 404 * 404 * 878 * 878	346 359 744 772	359 369	* 289 * 289 3350 * 633 * 633 140
1000 40			534 554 1386 1409	450 466 969 1003	339 353 730 759	353 363	270 281 3470 595 620 140
500 20			609 628 1309 1353	438 452 940 974	332 345 715 744	345 355	264 275 3490 581 606 140
0 0			594 615 1282 1326	427 443 920 955	327 340 704 733	340 350	269 281 3520 594 619 140
-500 -20	* 644 * 644 * 1723 * 1723	* 854 * 854 2068	594 614 1276 1320	423 439 911 946	324 338 699 728	338 348	269 282 3540 639 664 130
-1000 -40		* 845 * 845 * 1820 * 1820	597 608 1283 1307	424 441 914 949			* 324 * 324 2970 * 715 * 715 120
-1500 -60		* 680 * 680 * 1449 * 1449	* 475 * 475 * 1009 * 1009				* 324 * 324 2990 * 715 * 715 100

Illustration 143

g06364250

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

(mm) (inch)	1000 40	1500 60	2000 80	2500 100	3000 120							(mm) (inch)
												
3000 120												* 305 * 305 2320 * 647 * 647 90
2500 100												* 308 * 308 2840 * 691 * 691 100
2000 80												* 325 * 325 3150 * 723 * 723 130
1500 60												* 415 * 415 3350 * 891 * 891 140
1000 40												* 572 * 572 3670 * 1432 * 1432 140
500 20												* 799 * 799 3690 * 1712 * 1712 140
0 0												* 777 * 777 3620 * 1677 * 1677 140
-500 -20												* 644 * 644 3260 * 1723 * 1723 130
-1000 -40												* 845 * 845 2970 * 1820 * 1820 120
-1500 -60												* 680 * 680 2690 * 1449 * 1449 100

Illustration 144

g06364251

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

Product Information Section
Lifting Capacities

[mm] [inch]	1000 40		1500 60		2000 80		2500 100		3000 120			
												[mm] [inch]
3000 120											* 305 * 305 * 647 * 647	2320 90
2500 100							* 306 * 306 * 631 * 631				* 300 * 274 * 663 * 645	2840 110
2000 80							* 325 * 325 * 723 * 723	349 247 750 531			* 295 * 228 * 643 * 607	3750 130
1500 60					* 415 * 415 * 891 * 891	* 404 * 327 * 878 * 705	346 244 744 525	285 202 639 448				3350 140
1000 40					634 436 1366 341	450 315 969 679	339 238 730 512	270 188 595 435				3470 140
500 20					609 412 1309 890	436 302 940 652	332 231 715 498	264 183 591 403				3490 140
0 0					595 402 1282 866	427 294 926 634	327 225 704 483	263 186 594 411				3420 140
500 20	* 844 * 844 * 1723 * 1723	* 954 * 620 2068 1032			594 400 1275 861	423 290 911 628	324 224 699 483	283 200 633 442				3260 129
1000 40			* 945 * 625 * 1820 * 1045		597 402 1283 867	424 292 914 629				* 324 * 231 * 715 * 512		2970 120
1500 60			* 680 * 637 * 1449 * 1070	* 476 * 430 * 1003 * 886						* 324 * 302 * 716 * 678		2490 100

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.

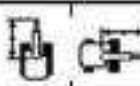
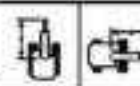
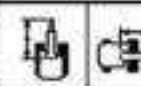
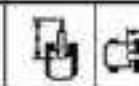
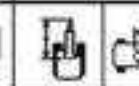
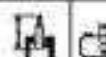
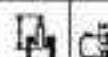
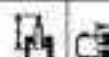
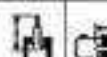
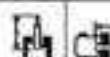
[mm] [inch]	1000 40	1500 60	2000 80	2500 100	3000 120		
							[mm] [inch]
3000 120						* 305 * 647	2320 90
2500 100				* 306 * 631	* 306 * 631	* 300 * 663	2840 110
2000 80				* 325 * 723	* 325 * 723	* 349 * 895	3150 120
1500 60			* 416 * 891	* 416 * 891	* 404 * 878	* 385 * 942	3350 140
1000 40			* 472 * 1432	* 436 * 341	* 502 * 1081	* 375 * 879	3470 140
500 20			* 798 * 1712	* 412 * 830	* 563 * 1212	* 418 * 945	3490 140
0 0			* 777 * 1677	* 402 * 866	* 567 * 1228	* 431 * 928	3420 140
500 20	* 844 * 1723	* 844 * 1723	* 954 * 2070	* 620 * 1532	* 705 * 1521	* 400 * 861	3260 129
1000 40		* 845 * 1820	* 625 * 1345	* 608 * 1307	* 491 * 867	* 382 * 864	2970 120
1500 60		* 680 * 1449	* 637 * 1370	* 476 * 1003	* 410 * 886		2490 100

Illustration 146

g06364260

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

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

(mm) (inch)	1000 40	1500 60	2000 80	2500 100	3000 120	3500 140		
								(mm) (inch)
2000 100				* 251 * 250			* 251 * 251 * 565 * 580	2500 100
2500 100				* 222 * 222 * 510 * 510	* 250 * 250		* 242 * 242 * 525 * 525	3000 120
2000 80				* 246 * 246 * 552 * 552	* 305 * 305 * 763 * 763		* 238 * 238 * 526 * 526	3500 130
1500 60				* 324 * 324 * 730 * 730	* 345 * 345 * 743 * 743	* 384 * 384	* 329 * 329 * 526 * 526	4000 160
1000 40		* 1962 * 1962	* 1607 * 1607	* 451 * 451 * 970 * 970	* 338 * 338 * 727 * 727	* 283 * 283 * 756 * 756	* 275 * 275 * 565 * 565	4500 180
500 20				* 630 * 630 * 1394 * 1394	* 495 * 495 * 970 * 970	* 350 * 350 * 739 * 739	* 259 * 259 * 597 * 597	5000 200
0 0		* 692 * 692 * 1581 * 1581	* 592 * 592 * 1274 * 1274	* 423 * 423 * 912 * 912	* 440 * 440 * 947 * 947	* 323 * 323 * 695 * 695	* 235 * 235 * 724 * 724	5500 220
-500 -20	* 762 * 762 * 1902 * 1902	* 950 * 950 * 2025 * 2025	* 978 * 978 * 2091 * 2091	* 836 * 836 * 1844 * 1844	* 417 * 417 * 899 * 899	* 309 * 309 * 687 * 687	* 302 * 302 * 716 * 716	6000 240
-1000 -40		* 929 * 929 * 1996 * 1996	* 929 * 929 * 1996 * 1996	* 697 * 697 * 1562 * 1562	* 417 * 417 * 1385 * 1385	* 319 * 319 * 932 * 932	* 302 * 302 * 688 * 688	6500 260
-1500 -60		* 767 * 767 * 1637 * 1637	* 767 * 767 * 1637 * 1637	* 520 * 520 * 1129 * 1129	* 379 * 379 * 798 * 798			7000 280
-2000 -80		* 526 * 526 * 1102 * 1102	* 526 * 526 * 1102 * 1102	* 342 * 342				7500 300

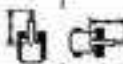
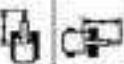
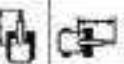
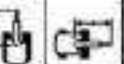
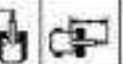
(mm) (inch)	1000 40	1500 60	2000 80	2500 100	3000 120	3500 140		(mm) (inch)
								
3800 129				* 251 * 251				* 267 * 241 2500 * 883 * 883 100
2500 100				* 222 * 222 * 280 * 280				* 242 * 242 3040 * 535 * 535 120
2000 80				* 246 * 246 * 315 * 315				* 238 * 238 3320 * 528 * 528 130
1500 60				* 224 * 224 * 245 * 245 * 264 * 264				* 239 * 239 3520 * 528 * 528 140
1000 40		* 1862 * 1862	* 887 * 887 * 1297 * 1297	* 451 * 451 * 370 * 370	* 380 * 380 * 351 * 351 * 343 * 343 * 346 * 346 * 346 * 346	* 275 * 275 * 275 * 275 * 275 * 275		* 246 * 246 3630 * 541 * 541 150
500 20			* 788 * 788 * 1026 * 1026	* 630 * 630 * 1850 * 1850	* 481 * 481 * 912 * 912 * 896 * 896 * 896 * 896	* 343 * 343 * 343 * 343 * 343 * 343 * 343 * 343	* 271 * 271 * 271 * 271 * 271 * 271 * 271 * 271	* 262 * 262 3650 * 576 * 576 160
0 0		* 682 * 682 * 1581 * 1581	* 788 * 788 * 1038 * 1038	* 564 * 564 * 1214 * 1214	* 440 * 440 * 947 * 947 * 928 * 928 * 928 * 928	* 338 * 338 * 338 * 338 * 338 * 338 * 338 * 338	* 267 * 267 * 267 * 267 * 267 * 267 * 267 * 267	* 288 * 288 3560 * 637 * 637 170
1000 40	* 762 * 762 * 1782 * 1782		* 735 * 735 * 1584 * 1584	* 836 * 836 * 1394 * 1394	* 539 * 539 * 1059 * 1059	* 433 * 433 * 873 * 873	* 332 * 332 * 736 * 736	* 313 * 313 3430 * 688 * 688 180
1500 60		* 829 * 829 * 1896 * 1896	* 847 * 847 * 1281 * 1281	* 697 * 697 * 1396 * 1396	* 477 * 477 * 1022 * 1022	* 361 * 361 * 742 * 742	* 330 * 330 * 717 * 717	* 318 * 318 3760 * 694 * 694 190
1800 72		* 767 * 767 * 1637 * 1637	* 538 * 538 * 1129 * 1129	* 590 * 590 * 1129 * 1129	* 378 * 378 * 738 * 738			* 314 * 314 2740 * 693 * 693 190
2000 80			* 538 * 538 * 1112 * 1112	* 342 * 342				* 342 * 342 3090 * 764 * 764 200

Illustration 148

g06364485

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

Product Information Section
Lifting Capacities

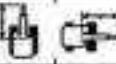
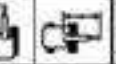
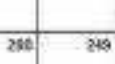
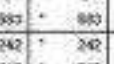
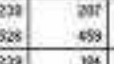
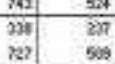
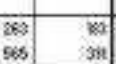
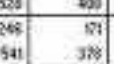
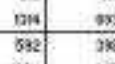
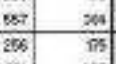
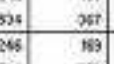
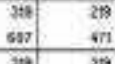
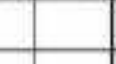
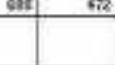
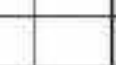
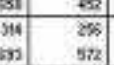
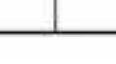
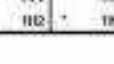
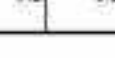
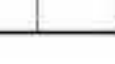
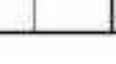
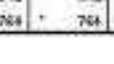
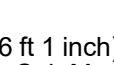
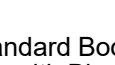
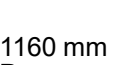
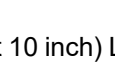
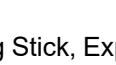
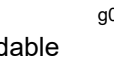
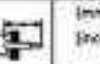
(mm) (inch)	1000 40	1500 60	2000 80	2500 100	3000 120	3500 140		(mm) (inch)
3800 129								2500 100
2500 100								3040 120
2000 80								3320 130
1500 60								3520 140
1000 40								3630 150
500 20								3650 150
0 0								3560 150
-500 -20								3430 140
-1000 -40								3360 130
-1500 -60								2740 110
-2000 -80								2070 80

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)	
3000 120							251	251					261	261	2500 100
2500 100							222	222	250	249			242	242	2040 80
2000 80							188	188	205	204			208	207	1320 50
1500 60							134	134	145	144	204	195	209	184	920 35
1000 40							730	700	756	724			528	488	480 18
500 20															
0 0															
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Product Information Section
Lifting Capacities

[mm] [inch]	1000 40		1500 60		2000 80		2500 100		3000 120				[mm] [inch]
 													
3000 120													* 305 * 305 2320 * 647 * 647 90
2500 100							* 306 * 306 * 638 * 638						* 300 * 300 2840 * 663 * 663 110
2000 80							* 325 * 325 * 723 * 723	330 769	231 495				* 295 * 295 3350 * 649 * 649 100
1500 60					* 416 * 416 * 891 * 891	* 416 * 416 * 891 * 891	* 404 * 404 * 878 * 878	307 661	327 713	223 495			* 272 * 272 3350 * 603 * 603 110
1000 40					402 1297	409 883	426 917	294 635	321 690	222 477			* 254 * 254 3470 * 561 * 561 140
500 20					576 1240	385 832	413 888	282 608	363 675	215 463			* 248 * 248 3490 * 547 * 547 140
0 0					584 1213	375 808	403 869	274 580	366 643	219 452			* 253 * 253 3420 * 569 * 569 140
500 20	* 844 * 844 * 1723 * 1723	* 844 * 844 * 1723 * 1723	895 1959	590 1247	561 1207	373 803	399 860	270 582	346 659	209 448			* 272 * 272 3260 * 601 * 601 130
1000 40			* 845 * 845 * 1820 * 1820	586 1259	564 1214	375 809	401 863	271 585					* 314 * 314 2970 * 697 * 697 120
1500 60			* 680 * 680 * 1449 * 1449	597 1285	* 476 * 476 * 1003 * 1003	384 828							* 324 * 324 2490 * 716 * 716 100

Illustration 151

g06364501

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

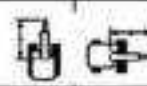
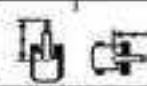
[mm] [inch]	1000 40	1500 60	2000 80	2500 100	3000 120		
							(mm) (inch)
3000 120						* 305 * 647	2320 90
2500 100				* 308 * 691	* 308 * 691	* 300 * 663	2840 110
2000 80				* 325 * 723	* 316 * 679	* 369 * 685	3150 120
1500 60			* 416 * 891	* 416 * 891	* 404 * 878	* 385 * 842	3350 140
1000 40			* 672 * 1432	* 409 * 883	* 502 * 1081	* 488 * 905	3470 140
500 20			* 799 * 1712	* 395 * 832	* 563 * 1212	* 438 * 945	3690 140
0 0			* 777 * 1677	* 375 * 803	* 567 * 1220	* 431 * 920	3420 140
-500 -20	* 644 * 1723	* 644 * 1723	* 954 * 2070	* 500 * 1247	* 705 * 1521	* 526 * 1130	3260 130
-1000 -40		* 845 * 1820	* 506 * 1259	* 603 * 1307	* 375 * 809	* 451 * 964	2970 120
-1500 -60		* 690 * 1449	* 597 * 1285	* 476 * 1003	* 384 * 828		2690 100

Illustration 152

g06364503

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

Product Information Section
Lifting Capacities

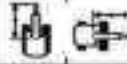
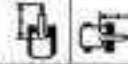
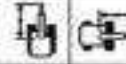
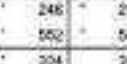
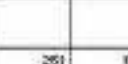
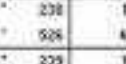
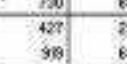
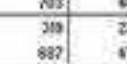
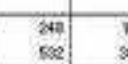
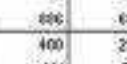
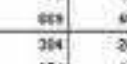
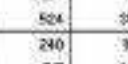
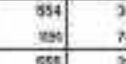
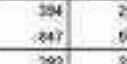
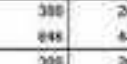
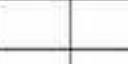
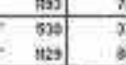
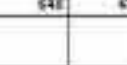
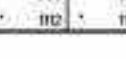
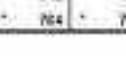
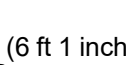
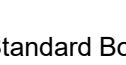
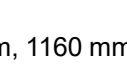
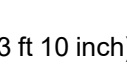
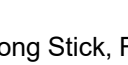
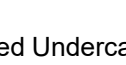
(mm) (inch)	1900 40	1600 65	2000 80	2500 100	3000 125	3500 140		(mm) (inch)
3000 120								2500 100
2500 100								3040 120
2000 80								3300 130
1500 60								3620 140
1000 40								3630 150
500 20								3650 150
0 0								3680 150
-500 -20								3430 140
-1000 -40								3160 130
-1500 -60								2740 110
-2000 -80								2080 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.

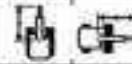
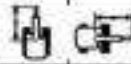
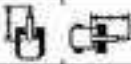
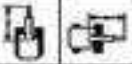
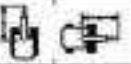
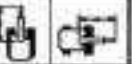
(mm) (inch)	1000 40	1500 60	2000 80	2500 100	3000 120	3500 140			(mm) (inch)
2000 80									2500 100
2500 100				222 88	222 88	260 102	223 88	242 95	3040 120
2000 80				246 97	246 97	305 120	232 91	238 94	3320 130
1500 60				334 131	309 121	345 136	227 89	204 80	3500 140
1000 40		1862 73	1369 54	567 22	414 16	451 18	285 11	380 15	3630 140
500 20				760 30	387 15	539 21	381 15	424 17	3650 140
0 0				1626 64	835 33	1158 45	608 24	806 32	3590 140
500 20				692 27	565 22	789 31	371 15	564 22	3590 140
0 0				1561 61	1214 48	1658 65	799 31	1214 48	3590 140
500 20	762 30	752 30		735 29	365 14	539 21	381 15	424 17	3430 130
1000 40				1584 62	787 31	1055 41	569 22	872 34	3460 130
1500 60				829 33	671 26	847 33	396 16	472 19	3160 120
2000 80				1336 53	1220 48	1291 51	799 31	1022 40	2740 110
2500 100				767 30	581 23	530 21	372 15	379 15	2010 80
3000 120				1627 64	1251 49	1629 64	832 33	798 31	
3500 140				538 21	536 21	342 13	362 14		

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]	1500 60	1500 60	2000 80	2500 100	3000 120		
							[mm] [inch]
3000 120			* 391 * 391			* 395 * 395	2019 80
2500 100				* 404 * 404 * 322 * 322		* 405 * 405 * 303 * 303	2540 110
2000 80				* 401 * 401 * 387 * 387		336 350 749 779	3009 120
1500 60		* 568 * 568	* 502 * 502 * 1078 * 1078	441 459 850 865	334 343 719 748	299 312 661 680	3239 130
1000 40			596 617 1284 1301	428 446 924 961	328 342 768 738	280 283 619 647	3240 140
500 20			573 594 1234 1281	416 434 898 935	322 335 695 725	275 287 606 634	3369 140
0 0		* 726 * 726 * 1705 * 1705	561 563 1203 1255	408 425 888 919	318 332 685 716	281 294 620 648	3290 130
-500 20	* 878 * 878 * 1957 * 1957	889 888 1906 1969	558 560 1201 1248	405 422 873 910	316 334 683 710	302 316 667 696	3110 130
-1000 40		896 * 908 1922 * 1953	561 563 1207 1255	406 424 877 915		343 354 774 808	2819 110
-1500 60		* 722 * 722 * 1535 * 1535	* 495 * 495 * 1045 * 1046			* 384 * 384 * 843 * 843	2310 90

Illustration 155

g06364531

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

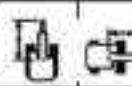
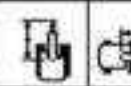
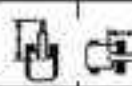
[mm] [inch]	1000 40	1500 60	2000 80	2500 100	3000 120							(mm) (inch)
												
3000 120				* 391 * 380								* 395 * 395 2000 * 847 * 847 80
2500 100						* 404 * 404 * 922 * 922						* 406 * 406 2040 * 903 * 903 100
2000 80						* 401 * 401 * 887 * 887						* 377 * 390 3000 * 833 * 779 120
1500 60			* 566 * 566	* 502 * 502 * 1078 * 1078	* 466 * 459 * 1075 * 1065	* 436 * 429 * 952 * 949	* 348 * 342 * 749 * 738					* 379 * 312 3230 * 816 * 690 130
1000 40				* 718 * 612 * 1538 * 1321	* 547 * 446 * 1183 * 961	* 458 * 458 * 994 * 738	* 342 * 339 * 738 * 634					* 379 * 293 3340 * 834 * 647 140
500 20				* 825 * 594 * 1774 * 1281	* 598 * 434 * 1286 * 935	* 470 * 338 * 1095 * 725	* 338 * 339 * 979 * 634					* 399 * 287 3360 * 979 * 634 140
0 0			* 736 * 736 * 1705 * 1705	* 811 * 583 * 1759 * 1255	* 585 * 429 * 1283 * 918	* 457 * 332 * 1095 * 716	* 332 * 339 * 979 * 634					* 389 * 294 3280 * 957 * 648 130
-500 -20	* 678 * 678 * 1557 * 1557			* 741 * 590 * 1598 * 1248	* 551 * 422 * 1186 * 910	* 432 * 330 * 1076 * 710	* 330 * 339 * 979 * 634					* 391 * 296 3100 * 840 * 698 130
-1000 -40			* 908 * 808 * 1953 * 1953	* 643 * 503 * 1374 * 1255	* 471 * 424 * 1005 * 915							* 378 * 364 2930 * 832 * 808 100
-1500 -60			* 722 * 722 * 1535 * 1535	* 495 * 495 * 1046 * 1046								* 384 * 384 2390 * 843 * 843 80

Illustration 156

g06364533

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

Product Information Section
Lifting Capacities

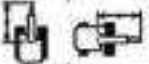
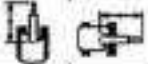
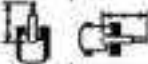
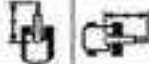
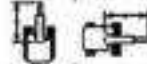
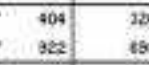
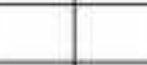
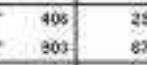
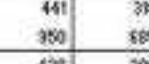
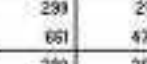
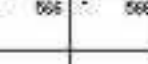
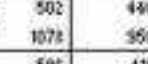
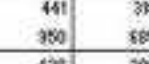
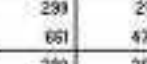
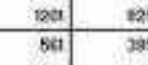
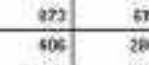
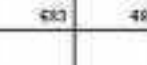
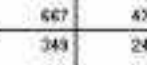
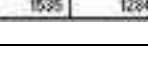
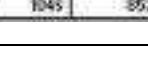
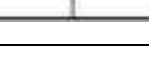
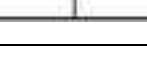
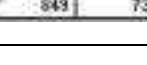
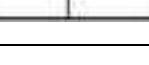
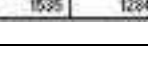
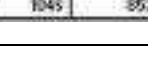
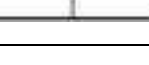
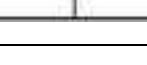
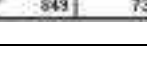
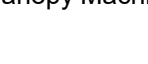
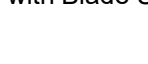
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3000 120							2000 80
2500 100							2040 80
2000 80							3000 120
1500 60							3200 130
1000 40							3340 140
500 20							3360 140
0 0							3280 130
-500 -20							3100 120
-1000 -40							2900 100
-1500 -60							2300 90

Illustration 157

g06364534

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

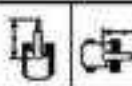
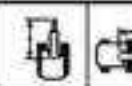
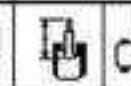
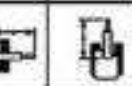
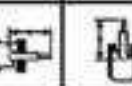
[mm] [inch]	1500 60	1500 60	2000 80	2500 100	3000 120		
							[mm] [inch]
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2500 100				* 404 326 * 322 600		* 406 239 * 303 675	2640 110
2000 80				* 401 326 * 187 701		* 377 244 * 833 543	3000 120
1500 60		* 568 * 568	* 502 440 * 1073 950	* 466 318 * 1015 665	* 436 242 * 952 521	* 370 216 * 816 479	3230 130
1000 40			* 719 436 * 1536 900	* 547 306 * 1183 662	* 458 237 * 954 518	* 379 202 * 834 447	3340 140
500 20			* 825 386 * 1774 955	* 596 295 * 1206 639	* 470 231 * 1005 499	* 398 198 * 879 436	3360 140
0 0		* 726 575 * 1705 1238	* 311 365 * 1750 832	* 595 288 * 1283 621	* 457 227 * 983 499	* 383 202 * 857 444	3390 130
-500 20	* 878 * 878 * 1857 * 1857		* 741 362 * 1593 825	* 561 285 * 1185 615	* 412 225 * 976 487	* 391 216 * 840 477	3110 125
-1000 40		* 908 594 * 1953 1258	* 649 385 * 1374 831	* 471 286 * 1105 619		* 378 248 * 832 551	2810 110
-1500 60		* 722 536 * 1535 1214	* 495 394 * 1046 852			* 384 327 * 843 734	2310 90

Illustration 158

g06364536

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

Product Information Section
Lifting Capacities

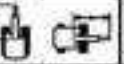
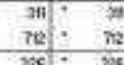
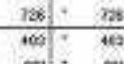
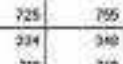
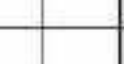
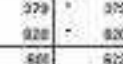
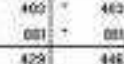
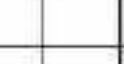
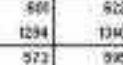
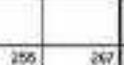
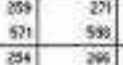
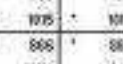
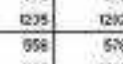
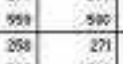
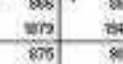
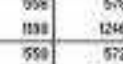
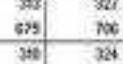
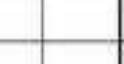
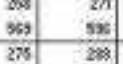
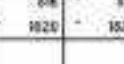
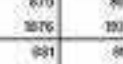
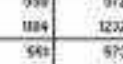
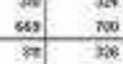
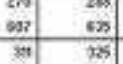
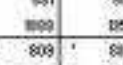
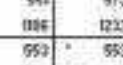
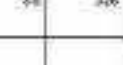
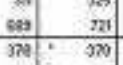
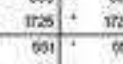
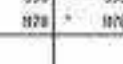
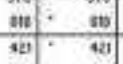
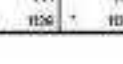
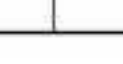
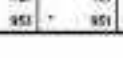
(mm) (inch)	1000 40	1500 60	2000 80	2500 100	3000 120	3500		(mm) (inch)
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2500 100								2050 180
2000 80								2090 190
1500 60								2400 240
1000 40								3000 160
500 20								3520 160
0 0								3450 240
-500 -20								3290 130
-1000 -40								3010 120
-1500 -60								2570 300
-2000 -80								1790 70

Illustration 159

g06364539

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

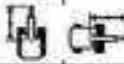
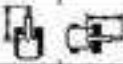
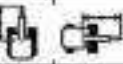
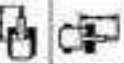
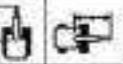
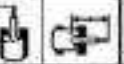
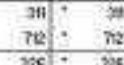
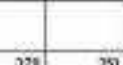
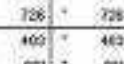
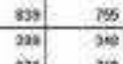
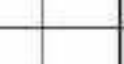
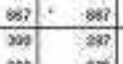
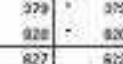
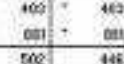
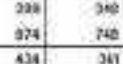
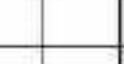
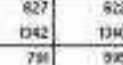
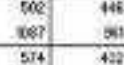
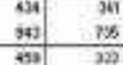
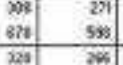
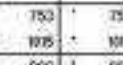
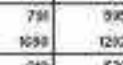
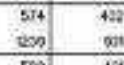
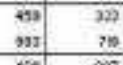
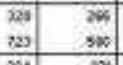
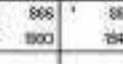
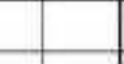
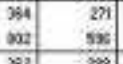
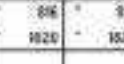
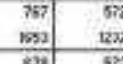
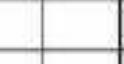
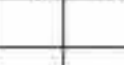
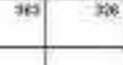
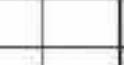
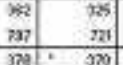
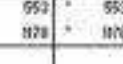
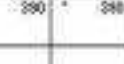
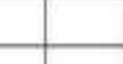
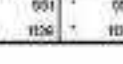
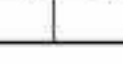
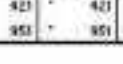
(mm) (inch)	1000 40	1500 60	2000 80	2500 100	3000 120	3500		(mm) (inch)
3800 129								2310 90
2500 100								2050 180
2000 80								2090 190
1500 60								2400 240
1000 40								3000 340
500 20								3520 360
0 0								3450 340
-500 -20								3290 190
-1000 -40								3010 320
-1500 -60								2570 300
-2000 -80								1790 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)	1800 40		2500 63		3000 80		3500 90		4000 120		4500				
														(mm) (inch)	
3600 129													* 345 * 746	* 345 * 746	2310 90
2500 80							* 311 * 702	* 308 * 707					* 319 * 708	* 285 * 557	2050 80
2000 63							* 326 * 726	* 304 * 704	337 725	245 526			* 302 * 687	* 221 * 493	1890 70
1800 63					* 379 * 828	* 379 * 828	* 400 * 891	* 388 * 866	334 718	241 519			* 275 * 599	* 199 * 438	1600 60
1600 49			853 2052	618 1563	861 1294	420 937	429 924	386 860	327 704	235 506			* 259 * 571	* 188 * 410	1500 60
1400 55			* 753 * 1645	* 578 * 1249	* 573 * 1235	* 395 * 854	* 415 * 894	* 292 * 610	318 698	228 492	255 561	83	* 254 * 559	* 181 * 400	1320 50
1200 47			* 866 * 1879	* 565 * 1217	* 556 * 1198	* 391 * 821	* 404 * 871	* 283 * 612	313 675	222 480			* 258 * 563	* 184 * 405	1150 45
1000 39	* 616 * 1826	* 316 * 1820	* 875 * 1876	* 564 * 1215	* 559 * 1184	* 375 * 809	* 389 * 859	* 278 * 606	318 689	219 473			* 275 * 607	* 195 * 421	1020 40
800 31			* 881 * 1890	* 569 * 1225	* 561 * 1186	* 375 * 810	* 390 * 859	* 278 * 606	318 689	221			* 311 * 689	* 220 * 488	900 35
600 23			* 803 * 1725	* 580 * 1249	* 553 * 1173	* 382 * 825	* 390 * 864	* 284					* 378 * 818	* 270 * 597	750 30
400 15			* 551 * 1150	* 551 * 1150									* 423 * 951	* 423 * 951	600 25

Illustration 161

g06364543

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

(mm) (inch)	1850 40		2500 80		3000 90		3500 90		4000 120		4500				(mm) (inch)
															
3000 120													* 365	* 365	2010
													* 745	* 745	80
2500 100							* 311	* 311					* 319	* 285	2050
							* 702	* 767					* 708	* 557	110
2000 80							* 326	* 304	* 378	* 245			* 302	* 221	2090
							* 726	* 764	* 839	* 526			* 687	* 493	120
1500 60					* 379	* 379	* 400	* 38	* 388	* 241			* 308	* 190	2100
					* 828	* 820	* 891	* 685	* 874	* 519			* 660	* 438	140
1000 40					* 627	* 420	* 502	* 388	* 434	* 235			* 308	* 188	2500
					* 1342	* 997	* 1087	* 660	* 943	* 506			* 678	* 410	160
500 20			* 753	* 575	* 751	* 395	* 574	* 293	* 459	* 228	* 372	* 83	* 328	* 181	3020
			* 1515	* 1249	* 1099	* 854	* 1229	* 610	* 933	* 492			* 723	* 490	160
0 0			* 866	* 565	* 818	* 391	* 583	* 283	* 468	* 222			* 384	* 194	3150
			* 1890	* 1217	* 1762	* 821	* 1779	* 612	* 898	* 480			* 902	* 495	160
-500 -20	* 616	* 316			* 767	* 375	* 565	* 278	* 438	* 219			* 362	* 195	3290
	* 1826	* 1820			* 1653	* 899	* 1216	* 606	* 922	* 473			* 798	* 421	130
-1000 -40			* 908	* 569	* 678	* 375	* 500	* 278	* 383	* 221			* 562	* 230	3040
			* 2118	* 1225	* 1457	* 890	* 1072	* 601					* 797	* 488	120
-1500 -60			* 803	* 580	* 853	* 382	* 390	* 284					* 378	* 270	2570
			* 1720	* 1249	* 1178	* 825							* 818	* 657	100
-2000 -80			* 551	* 551									* 423	* 423	1790
			* 1126	* 1126									* 953	* 951	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

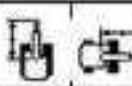
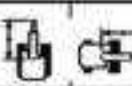
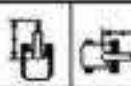
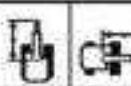
[mm] [inch]	1000 40	1500 60	2000 80	2500 100	3000 120		[mm] [inch]
							
3000 120			* 391 * 391			* 395 * 395	2019 80
2500 100				* 404 306 914 656		* 391 380 681 632	2648 110
2000 80				* 401 305 187 657		* 317 227 706 597	3000 120
1500 60		* 566 * 566	* 502 410 1078 892	* 417 297 698 641	* 35 226 678 498	* 281 201 623 445	3238 130
1000 40			* 564 389 1215 842	* 405 288 873 618	* 310 221 667 475	* 264 188 583 415	3348 140
500 20			* 549 369 1165 797	* 393 275 847 594	* 343 215 654 463	* 259 183 570 404	3368 140
0 0		* 736 538 1785 1153	* 529 358 1139 773	* 384 267 829 578	* 239 219 645 454	* 264 187 583 412	3280 130
-500 -20	* 878 * 878 1957 * 1957	* 839 538 1798 1157	* 526 356 1131 767	* 381 264 822 571	* 257 209 642 452	* 264 200 628 442	3119 120
-1000 -40		* 846 544 1884 1071	* 523 353 1138 773	* 383 266 826 575		* 259 231 729 512	2919 110
-1500 -60		* 722 556 1635 1139	* 485 367 1046 794			* 384 384 843 614	2319 90

Illustration 163

g06364552

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

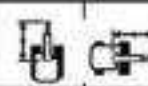
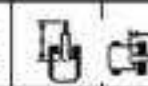
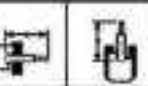
[mm] [inch]	1000 40	1500 60	2000 80	2500 100	3000 120		(mm) (inch)
							
3000 120			* 391 * 391			* 395 * 395	2090
2500 100				* 404 * 404		* 406 * 406	2640
2000 80				* 422 * 422		* 423 * 423	190
1500 60				* 441 * 441		* 442 * 442	2060
1000 40		* 568 * 568	* 502 * 502	* 466 * 466	* 436 * 436	* 379 * 379	3230
500 20			* 1078 * 1078	* 1015 * 1015	* 952 * 952	* 818 * 818	130
0 0			* 718 * 718	* 647 * 647	* 588 * 588	* 521 * 521	3340
500 20			* 1535 * 1535	* 1463 * 1463	* 1394 * 1394	* 1234 * 1234	140
0 0			* 825 * 825	* 769 * 769	* 710 * 710	* 638 * 638	3060
500 20			* 1274 * 1274	* 1208 * 1208	* 1145 * 1145	* 1005 * 1005	140
0 0		* 736 * 736	* 658 * 658	* 595 * 595	* 537 * 537	* 467 * 467	3290
500 20	* 876 * 876	* 807 * 807	* 741 * 741	* 681 * 681	* 624 * 624	* 541 * 541	3490
1000 40	* 1567 * 1567	* 1453 * 1453	* 1374 * 1374	* 1283 * 1283	* 1198 * 1198	* 1054 * 1054	130
1500 60		* 908 * 908	* 849 * 849	* 795 * 795	* 738 * 738	* 640 * 640	2890
2000 80		* 1963 * 1963	* 1871 * 1871	* 1773 * 1773	* 1668 * 1668	* 1462 * 1462	190
2500 100		* 722 * 722	* 666 * 666	* 617 * 617	* 568 * 568	* 494 * 494	2390
3000 120		* 1535 * 1535	* 1446 * 1446	* 1354 * 1354	* 1259 * 1259	* 1104 * 1104	90

Illustration 164

g06364554

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

Product Information Section
Lifting Capacities

(mm) (inch)	1000 40	1500 60	2000 80	2500 100	3000 120	3500		(mm) (inch)
								
3800 129								* 348 348 2310 * 748 * 748 80
2500 100				* 311 305 * 712 683				* 319 248 2650 * 708 558 110
2000 80				* 326 284 * 728 688	319 238 694 430			288 206 2190 642 459 130
1500 60			* 379 * 379 * 828 * 828	* 405 298 * 881 642	315 215 678 484			359 184 2400 572 487 140
1000 40		803 588 1943 1278	668 383 1225 849	405 286 873 616	388 219 684 471			243 172 3000 537 330 110
500 20		* 753 538 1607 1163	541 369 1166 796	391 273 843 589	368 212 648 456	240 89		239 160 2520 528 370 110
0 0		825 525 1770 1102	524 354 1129 763	360 263 820 568	234 206 628 444			243 170 2450 528 375 110
100 -29	* 696 * 915 * 1628 * 1520	824 525 1768 1108	519 348 1115 751	375 268 808 557	298 203 628 438			258 181 2290 578 389 130
1000 -40		639 518 1790 1140	519 349 1116 752	376 268 808 557	293 204			252 204 2010 648 452 120
1500 -60		* 809 580 * 1725 1184	526 395 1133 767	381 264				369 296 2570 * 818 573 100
2000 -80		* 891 * 660 * 1156 * 1016						* 423 * 423 1790 * 951 * 851 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.

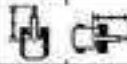
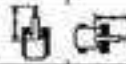
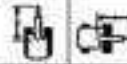
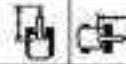
(mm) (inch)	1000 40	1500 60	2000 80	2500 100	3000 120	3500		(mm) (inch)
3800 129								346 136
2500 100				311 762	365 863			319 798
2000 80				326 728	384 868	378 839	230 430	302 667
1500 60			379 928	379 920	405 881	248 642	215 484	309 669
1000 40			827 1342	383 849	502 1087	286 686	434 943	219 471
500 20		753 1875	538 1363	791 1098	369 796	574 1259	273 589	458 933
1 0		866 1900	525 1332	818 1762	354 763	590 1279	263 568	468 998
100 -29	896 1828	915 1520		787 1953	348 791	565 1236	268 587	438 922
1000 -49		895 2104	518 1240	878 1457	319 752	600 1072	258 557	363 787
1500 -63		809 1725	540 1184	953 1178	395 767	380 264		378 818
2000 -80		691 1156	569 1016					423 953

Illustration 166

g06364567

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

Product Information Section
Lifting Capacities

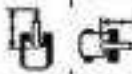
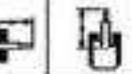
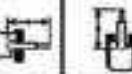
[mm] [inch]	1500 60	1500 60	2000 80	2500 100	3000 120		
							[mm] [inch]
3000 120			* 391 * 391			* 395 * 395 * 847 * 847	2010 80
2500 100				* 404 * 404 * 322 * 322		* 405 * 405 * 903 * 903	2540 100
2000 80				* 401 * 401 * 387 * 387		* 371 * 371 * 828 * 828	3000 120
1500 60		* 568 * 568	* 502 * 502 * 1078 * 1078	* 466 * 466 * 1015 * 1015	369 392 785 824	* 301 * 301 * 732 * 732	3230 130
1000 40			856 1415 676 1458	473 1020 489 1054	363 783 377 812	* 311 * 311 * 687 * 687	3240 140
500 20			633 1364 653 1408	461 994 477 1029	357 771 371 799	* 305 * 305 * 673 * 673	3360 140
0 0		* 726 * 726 * 1705 * 1705	621 1339 841 1962	452 976 469 1011	353 761 366 799	* 313 * 313 * 693 * 693	3290 130
-500 20	* 878 * 878 * 1957 * 1957		619 1331 639 1375	449 968 465 1004	351 758 365 787	* 306 * 306 * 742 * 742	3110 125
-1000 40		* 908 * 908 * 1953 * 1953	621 1338 640 1374	451 973 467 1005		* 308 * 308 * 832 * 832	2910 110
-1500 60		* 722 * 722 * 1535 * 1535	495 1048 495 1046			* 384 * 384 * 843 * 843	2310 90

Illustration 167

g06364580

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

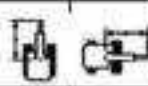
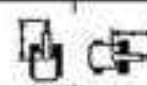
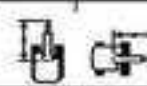
[mm] [inch]	1000 40	1500 60	2000 80	2500 100	3000 120		
							(mm) (inch)
3000 120			* 391 * 380			* 395 * 395 * 847 * 847	2000 80
2500 100				* 404 * 404 * 822 * 822		* 406 * 406 * 803 * 803	2040 100
2000 80				* 401 * 401 * 887 * 887		* 377 * 377 * 833 * 833	3000 120
1500 60		* 566 * 566	* 502 * 502 * 1078 * 1078	* 466 * 466 * 1015 * 1015	* 436 * 436 * 952 * 952	282 * 379 824 * 816	3230 130
1000 40			* 718 * 718 * 1538 * 1458	* 676 * 676 * 1183 * 1154	* 488 * 488 * 994 * 994	377 * 379 812 * 834	3340 140
500 20			* 825 * 825 * 1774 * 1408	* 653 * 653 * 1286 * 1029	* 477 * 477 * 1005 * 1005	371 * 399 799 * 879	3360 140
0 0		* 736 * 736 * 1705 * 1705	* 811 * 811 * 1759 * 1302	* 595 * 595 * 1263 * 1011	* 457 * 457 * 963 * 790	* 389 * 389 * 857 * 716	3280 130
-500 -20	* 678 * 678 * 1557 * 1557		* 741 * 741 * 1598 * 1275	* 638 * 638 * 1186 * 1004	* 482 * 482 * 876 * 787	* 391 * 391 * 840 * 770	3100 120
-1000 -40		* 908 * 908 * 1953 * 1953	* 643 * 643 * 1374 * 1374	* 471 * 471 * 1005 * 1005		* 378 * 378 * 832 * 832	2930 100
-1500 -60		* 722 * 722 * 1535 * 1535	* 495 * 495 * 1046 * 1046			* 384 * 384 * 849 * 849	2390 90

Illustration 168

g06364588

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

Product Information Section
Lifting Capacities

[mm] [inch]	1500 60	1500 60	2000 80	2500 100	3000 120		
							[mm] [inch]
3000 120			* 391 * 391			* 395 * 395	2010 80
2500 100				* 404 359 * 322 763		* 406 330 * 303 743	2540 110
2000 80				* 401 357 * 337 770		371 270 826 600	3000 120
1500 60		* 568 * 568	* 502 482 * 1073 1041	* 466 350 * 315 755	369 288 785 577	331 240 732 531	3230 130
1000 40			856 459 1415 391	473 339 1020 731	363 263 783 567	311 225 687 497	3240 140
500 20			633 438 1364 947	461 327 894 707	357 257 771 554	305 220 673 486	3360 140
0 0		* 726 638 * 1705 1373	621 428 1339 823	452 320 876 691	353 253 761 545	313 225 669 486	3290 130
-500 20	* 878 * 878 * 1857 * 1857	994 840 2109 1328	619 426 1331 907	449 317 968 684	351 251 758 543	336 241 742 532	3110 130
-1000 40		* 908 646 * 1953 1381	621 427 1338 923	451 319 973 688		* 378 276 * 832 613	2810 110
-1500 60		* 722 658 * 1535 1419	* 495 436 * 1046 944			* 384 382 * 843 813	2310 90

Illustration 169

g06364595

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

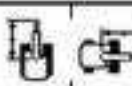
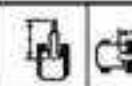
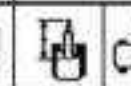
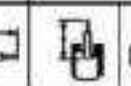
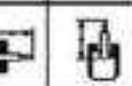
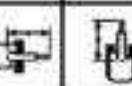
(mm) (inch)	1000 40		1500 60		2000 80		2500 100		3000 120				(mm) (inch)
													
3000 120					* 391	* 391					* 395	* 395	2010 80
2500 100							* 404	358			* 406	330	2640 105
2000 80							* 401	267			* 377	270	3000 120
1500 60							* 407	770			* 420	690	3220 130
1000 40			* 586	* 586	* 502	482	* 466	350	* 436	288	* 370	240	3340 130
500 20					* 718	459	* 547	339	* 458	263	* 379	225	3340 140
0 0					* 1536	391	* 1803	731	* 334	567	* 834	497	3360 130
					* 825	438	* 596	327	* 470	257	* 399	220	3360 140
					* 1774	947	* 1286	707	* 1085	554	* 879	486	3380 130
					* 736	638	* 811	428	* 595	320	* 457	250	3380 140
					* 1705	1073	* 1750	923	* 1263	691	* 1080	545	3400 130
-500 -20	* 878	* 878			* 741	428	* 581	317	* 492	251	* 391	241	3400 140
	* 1957	* 1957			* 1593	907	* 1886	684	* 376	543	* 840	532	3400 150
-1000 -40			* 908	646	* 649	427	* 471	318			* 378	276	3410 115
			* 1953	1385	* 1374	923	* 1805	688			* 832	610	3410 125
-1500 -60			* 722	658	* 495	436					* 384	262	3410 135
			* 1535	1418	* 1248	944					* 848	513	3410 145

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

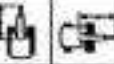
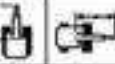
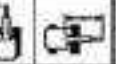
(mm) (inch)	1850 49	1901 50	2000 50	2500 63	3000 76	3500		(mm) (inch)
3000 120								3000 120
2500 100								2500 100
2000 80								2000 80
1500 60								1500 60
1000 40								1000 40
500 20								500 20
0 0								0 0
-500 -20								-500 -20
-1000 -40								-1000 -40
-1500 -60								-1500 -60
-2000 -80								-2000 -80

Illustration 171

g06364612

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

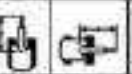
(mm) (inch)	1000 40	1500 60	2000 80	2500 100	3000 120	3500		(mm) (inch)
								
3800 129								* 348 * 345 2310 * 746 * 748 80
2500 100				* 311 * 311 * 712 * 712				* 319 * 319 2050 * 708 * 708 180
2000 80				* 305 * 305 * 726 * 726	* 378 * 378 * 839 * 839			* 302 * 302 2090 * 667 * 667 130
1500 60			* 379 * 379 * 828 * 828	* 405 * 405 * 881 * 881	* 398 * 398 * 874 * 874	* 392 * 392		* 399 * 399 2400 * 669 * 669 140
1000 40			* 827 * 827 * 1342 * 1342	* 502 * 502 * 1067 * 1064	* 434 * 434 * 943 * 943	* 375 * 375 * 806 * 806		* 308 * 308 3000 * 676 * 680 160
500 20		* 753 * 753 * 1675 * 1675	* 791 * 791 * 1698 * 1699	* 654 * 654 * 1250 * 1255	* 574 * 574 * 1025 * 1033	* 478 * 478 * 933 * 933	* 360 * 360 * 272 * 286	* 328 * 328 * 723 * 640 3520 160
0 0		* 866 * 866 * 1900 * 1903	* 888 * 888 * 1762 * 1772	* 837 * 837 * 1372 * 1372	* 590 * 590 * 1079 * 1082	* 465 * 465 * 958 * 958	* 362 * 362 * 790 * 790	* 364 * 364 * 802 * 803 3450 140
100 -29	* 898 * 898 * 1828 * 1830	* 915 * 915 * 1830	* 787 * 787 * 1653 * 1658	* 631 * 631 * 1288 * 1296	* 565 * 565 * 1216 * 1219	* 459 * 459 * 922 * 922	* 358 * 358 * 774 * 774	* 362 * 362 * 798 * 797 3290 130
1000 -49		* 895 * 895 * 2114 * 2114	* 896 * 896 * 1857 * 1860	* 831 * 831 * 1360 * 1360	* 600 * 600 * 1072 * 1072	* 458 * 458 * 900 * 900	* 363 * 363 * 780 * 780	* 362 * 362 * 797 * 796 3010 120
1500 -63		* 809 * 809 * 1725 * 1725	* 889 * 889 * 1778 * 1778	* 953 * 953 * 1870 * 1870	* 890 * 890			* 378 * 378 * 818 * 818 2570 100
2000 -80		* 691 * 691 * 1156 * 1156	* 690 * 690 * 1156					* 423 * 423 * 951 * 951 1790 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

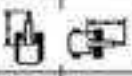
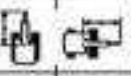
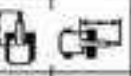
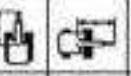
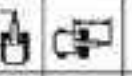
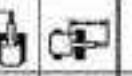
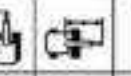
[mm] [inch]	1850 42	1901 50	2000 59	2500 135	3000 120	3500		[mm] [inch]
								
3000 120								* 346 * 346 3310 * 746 * 746 30
2500 100				* 30 * 30 * 712 * 712				* 308 * 283 3050 * 768 * 858 110
2000 80				* 328 * 306 * 726 * 726	372 271 801 562			* 362 * 245 3190 * 667 * 546 130
1500 60			* 378 * 379 * 820 * 820	* 403 * 390 * 881 * 766	369 267 794 575			* 360 * 220 3400 * 660 * 489 160
1000 40			* 627 * 462 * 1042 * 999	* 473 * 318 * 1019 * 720	362 261 780 562			* 288 * 207 3500 * 635 * 458 140
500 20		* 763 * 840 * 1215 * 1302	* 634 * 439 * 1065 * 966	* 459 * 325 * 999 * 760	354 254 764 547	284 204		* 292 * 203 3520 * 620 * 447 160
0 0		* 898 * 627 * 1883 * 1362	* 617 * 423 * 1028 * 843	* 448 * 300 * 967 * 801	248 248 751 535			* 288 * 205 3450 * 635 * 456 140
-500 -20	* 818 * 1820 * 1820	* 118 * 969 * 2079 * 1350	* 627 * 600 * 1294 * 1294	* 417 * 443 * 999 * 955	310 245 745 523			* 366 * 229 3290 * 676 * 462 130
-1000 -40		* 379 * 2091 * 1360	* 632 * 1036 * 992	* 418 * 395 * 870	310 247 745			* 346 * 246 3010 * 767 * 545 120
-1500 -60		* 803 * 1725 * 1394	* 642 * 553 * 1078	* 424 * 390 * 336				* 370 * 307 2570 * 808 * 667 100
-2000 -80		* 881 * 1036 * 1036	* 591					* 423 * 421 1730 * 951 * 951 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.

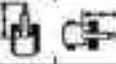
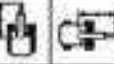
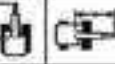
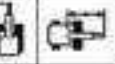
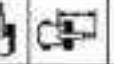
(mm) (inch)	1000 40	1500 60	2000 80	2500 100	3000 120	3500		(mm) (inch)
								
3800 129								* 348 * 345 2310 * 748 * 748 80
2500 100				* 311 * 311 * 712 * 712				* 319 233 2650 * 708 658 180
2000 80				* 305 * 305 * 728 * 728	* 378 271 * 839 582			* 302 245 2390 * 667 546 130
1500 60			* 379 * 379 * 828 * 828	* 405 368 * 881 756	* 388 367 * 874 575			* 399 320 2400 * 669 489 140
1000 40			* 427 462 * 1042 938	* 502 388 * 1087 738	* 434 261 * 943 582			* 398 287 3000 * 676 458 160
500 20		* 753 649 * 1675 1383	* 791 439 * 1698 846	* 574 329 * 1259 762	* 458 294 * 933 547	* 272 204		* 328 282 3520 * 723 447 160
0 0		* 866 627 * 1800 1352	* 848 423 * 1762 813	* 580 385 * 1279 681	* 458 248 * 958 535			* 364 206 3450 * 802 454 140
100 -29	* 898 * 915 * 1828 * 1820		* 787 417 * 1653 890	* 565 38 * 1236 678	* 438 245 * 922 519			* 362 219 3290 * 798 482 130
1000 -49		* 895 612 * 2114 1388	* 878 488 * 1857 992	* 600 388 * 1072 678	* 363 246			* 362 246 3010 * 737 545 120
1500 -69		* 809 642 * 1725 1384	* 953 424 * 1878 917	* 380 38				* 378 307 2570 * 818 617 100
2000 -89		* 691 * 669 * 1556 * 1016						* 423 * 421 1790 * 953 * 951 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

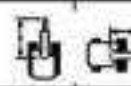
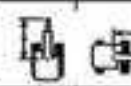
[mm] [inch]	1000 40	1500 60	2000 80	2500 100	3000 120		
							(mm) (inch)
3000 120			* 391 * 380			* 395 * 395 * 847 * 847	2000 80
2500 100				* 404 338 * 822 725		* 406 310 * 800 700	2040 80
2000 80				* 401 337 * 887 728		352 253 784 564	3000 120
1500 60		* 566 * 566	* 502 405 * 1071 903	461 329 934 711	350 252 754 542	313 225 694 490	3230 130
1000 40			624 432 1345 933	449 318 968 687	345 246 743 531	295 211 650 465	3340 140
500 20			601 410 1295 898	437 307 943 663	339 241 730 519	289 206 637 454	3360 140
0 0		* 735 588 * 1705 1268	583 401 1269 885	429 300 925 647	334 236 720 500	286 210 652 463	3280 130
-500 -20	* 678 478 * 1857 1357	678 478 2004 1252	588 401 1263 885	425 306 917 640	332 235 718 508	288 210 702 497	3190 130
-1000 -40		* 908 606 * 1853 1306	583 401 1263 885	427 298 922 644		367 259 812 573	2930 100
-1500 -60		* 722 619 * 1535 1134	* 495 410 * 1045 885			* 384 329 * 849 763	2390 90

Illustration 175

g06364639

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

(mm) (inch)	1000 40		1500 60		2000 80		2500 100		3000 120				(mm) (inch)
													
3000 120					* 391	* 391					* 395	* 395	2010 80
2500 100							* 404	338			* 406	330	2640 105
2000 80							* 401	327			* 377	259	3000 120
1500 60							* 407	326			* 400	324	3230 128
1000 40			* 586	* 586	* 502	455	* 466	329	* 436	252	* 370	225	3340 131
500 20					* 1073	983	* 1015	711	* 952	542	* 816	498	3340 131
0 0					* 718	432	* 547	318	* 458	245	* 379	211	3340 131
					* 1536	930	* 1803	687	* 934	531	* 834	465	3340 131
					* 325	411	* 596	307	* 470	241	* 399	206	3360 133
					* 1774	888	* 1286	663	* 1085	519	* 879	454	3360 133
			* 736	538	* 911	401	* 595	300	* 457	234	* 383	210	3380 134
			* 1705	1288	* 1750	865	* 1263	647	* 980	518	* 857	460	3380 134
-500 -20	* 878	* 878			* 741	398	* 581	296	* 412	235	* 381	225	3410 135
	* 1957	* 1957			* 1593	859	* 1886	640	* 976	508	* 840	497	3410 135
-1000 -40			* 938	686	* 649	401	* 471	288			* 378	259	3410 135
			* 1953	1386	* 1374	865	* 1805	644			* 832	573	3410 135
-1500 -60			* 722	819	* 495	430					* 384	339	3410 135
			* 1535	1034	* 1046	885					* 848	763	3410 135

Illustration 176

g06364650

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

Product Information Section
Lifting Capacities

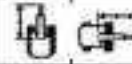
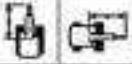
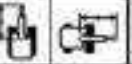
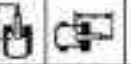
(mm) (inch)	1000 40	1500 60	2000 80	2500 100	3000 120	3500		(mm) (inch)
3800 129								2310 80
2500 100				311 712	311 712			2750 110
2000 80				326 728	326 728	354 760	354 760	2390 130
1500 60			379 820	379 820	400 881	398 712	398 712	2400 140
1000 40		897 2008	653 1412	827 1342	895 1360	943 733	943 733	3000 160
500 20		753 1975	601 1298	601 1298	411 990	405 880	336 724	3520 180
0 0		866 1973	588 1267	595 1259	396 895	425 936	295 718	3450 190
-500 -20	898 1820	915 1820	919 1971	587 1284	573 1245	390 862	419 804	3290 150
-1000 -40			805 1860	582 1275	678 1245	391 844	419 804	3010 120
-1500 -60			809 1725	683 1239	953 1178	398 859	380 298	2570 100
-2000 -80			691 1156	690 1016				1790 70

Illustration 177

g06364669

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

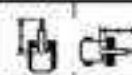
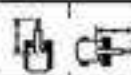
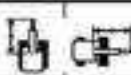
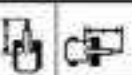
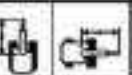
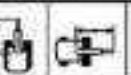
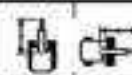
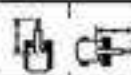
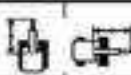
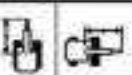
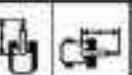
(mm) (inch)	1000 40		1500 60		2000 80		2500 100		3000 120		3500				(mm) (inch)
															(mm) (inch)
2000 80															* 246 * 246 2210 * 746 * 746 30
2500 100					* 308 * 311 * 712 * 702										* 208 * 275 2850 * 706 * 659 110
2000 80					* 328 * 306 * 726 * 706	* 378 * 378 * 838 * 848	254								* 302 * 230 2190 * 882 * 592 130
1500 60			* 278 * 279 * 820 * 820		* 403 * 381 * 881 * 702	* 389 * 378 * 874 * 548	261								* 360 * 300 3400 * 860 * 456 180
1000 40			* 627 * 435 * 1042 * 840		* 502 * 388 * 1097 * 886	* 434 * 248 * 943 * 527	248								* 286 * 184 2600 * 876 * 427 140
500 20		* 763 * 1318 * 601 * 1256	* 791 * 1650 * 411 * 888		* 574 * 1238 * 365 * 658	* 459 * 880 * 237 * 562	237			372	110				* 328 * 189 2520 * 723 * 417 160
0 0		* 896 * 1900 * 566 * 1267	* 818 * 1762 * 395 * 858		* 593 * 1278 * 295 * 637	* 460 * 950 * 232 * 580	232								* 364 * 192 2450 * 802 * 423 140
500 20	* 816 * 1820 * 116	* 116	* 767 * 1653 * 380 * 842		* 565 * 1216 * 290 * 626	* 430 * 822 * 223 * 494	223								* 362 * 204 3290 * 736 * 453 130
1000 40		* 895 * 2116 * 562 * 1275	* 878 * 1457 * 391 * 844		* 609 * 1072 * 290 * 626	* 343 * 299	299								* 362 * 230 3010 * 737 * 509 120
1500 60		* 809 * 1725 * 803 * 1290	* 553 * 1070 * 398 * 859		* 390 * 286										* 370 * 287 2570 * 698 * 843 100
2000 80		* 591 * 1136 * 591 * 1136													* 421 * 421 1790 * 951 * 951 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				
													(mm) (inch)
3000 120													* 305 * 647 2560 100
2500 100					* 506 * 506								* 300 * 663 3080 120
2000 80					* 284 * 633	* 284 * 633	* 362 * 783	* 336 * 718					* 295 * 649 3400 140
1500 60			* 419 * 882	* 419 * 882	* 419 * 888	* 419 * 888	* 389 * 838	* 329 * 708	300	254			* 287 * 638 3590 140
1000 40			725 1562	598 1291	507 1092	428 917	380 817	321 690	298 636	250	537		* 269 * 593 3790 150
500 20					499 1055	409 882	371 797	312 671	292 627	246 528			* 263 * 589 3740 150
0 0			695 1470	561 1206	483 1032	400 861	364 783	305 657	288 620	242 521			* 268 * 592 3670 150
-500 -20	* 678 * 1599	* 678 * 1599	696 1471	562 1207	476 1024	396 853	361 778	302 651					* 269 * 605 3500 140
-1000 -40			690 1481	566 1216	478 1029	398 856	362 780	304 654					* 324 * 715 3290 130
-1500 -60	* 857 * 1815	* 857 * 1815	* 562 * 1194	* 562 * 1194	* 398 * 832	* 398 * 832							* 324 * 718 2740 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.

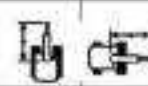
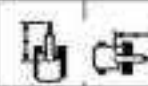
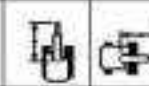
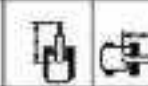
(mm) (inch)	1500 60		2000 80		2500 100		3000 120		3500 140				(mm) (inch)
													
3000 120											* 305 * 647	* 305 * 647	2500 100
2500 100					* 506 * 506						* 300 * 663	* 300 * 663	3000 120
2000 80					* 284 * 633	* 284 * 633	* 362 * 783	335 718			* 295 * 649	* 270 * 601	3100 140
1500 60			* 419 * 882	* 419 * 882	* 411 * 888	* 411 * 888	* 395 * 861	329 788	* 374 * 855	254 537	* 297 * 655	* 243 * 537	3500 140
1000 40			* 858 * 1794	588 1291	* 567 * 1213	426 917	* 454 * 980	321 690	* 388 * 834	250 537	* 303 * 668	227 500	3710 150
500 20					* 657 * 1408	409 882	* 491 * 1058	312 671	* 393 * 841	246 528	* 321 * 706	221 488	3740 150
0 0			* 908 * 1964	561 1200	* 658 * 1414	409 861	* 491 * 1055	385 837	* 378 * 823	242 521	* 339 * 745	225 498	3870 150
-500 -20	* 878 * 1999	* 878 * 1999	* 818 * 1784	562 1207	* 606 * 1302	398 853	* 455 * 974	382 851			* 330 * 727	242 534	3500 140
-1000 -40			* 708 * 1520	566 1216	* 523 * 1118	392 855	* 383 * 809	384 854			* 324 * 715	275 613	3210 130
-1500 -60	* 857 * 1815	* 857 * 1815	* 562 * 1194	* 562 * 1194	* 398 * 832	* 398 * 832					* 324 * 715	* 324 * 715	2740 110

Illustration 180

g06364693

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

Product Information Section
Lifting Capacities

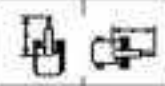
(mm) (inch)	1500 60	2000 80	2500 100	3000 120	3500 140		
							(mm) (inch)
3000 120							* 305 289 2580 * 647 * 647 100
2500 100							* 305 207 3090 * 663 466 120
2000 80							* 284 * 284 * 352 217 3450 * 633 * 633 * 783 465 * 649 382 140
1500 60		* 419 413 * 411 288 389 212 300 160 287 152 3590 * 882 * 882 * 888 619 836 455 635 335 140					
1000 40		725 375 507 272 380 204 296 156 269 140 3710 1562 813 1092 506 817 438 636 335 593 309 150					
500 20							
0 0							
500 20	* 878 554 686 343 476 244 361 186 288 146 3500 * 1966 1187 1471 737 1024 526 776 401 635 327 140						
-1000 40							
-1500 60	* 857 556 * 562 355 * 398 253 * 324 223 2740 * 1815 1217 * 1194 764 * 832 546 * 716 500 110						

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.

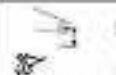
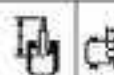
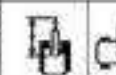
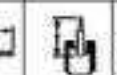
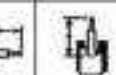
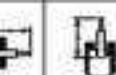
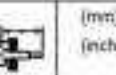
(mm) (inch)	1500 60		2000 80		2500 100		3000 120		3500 140				(mm) (inch)		
													(mm) (inch)		
3000 120												*	305	289	2560
												*	647	* 647	100
2500 100												*	300	287	3090
					*	564	* 566					*	663	466	120
2000 80					*	284	* 284	* 352	217			*	296	172	3400
					*	633	* 633	* 783	465			*	649	382	140
1500 60			*	419	413	* 411	288	* 395	212	* 374	160	*	297	162	3590
			*	882	* 882	* 888	619	* 861	455			*	655	336	140
1000 40			*	858	376	* 587	272	* 454	204	* 386	156	*	333	140	3710
			*	1794	813	* 1213	506	* 980	438	* 834	336	*	668	309	150
500 20					*	657	257	* 491	196	* 393	152	*	321	136	3740
					*	1408	653	* 1056	420	* 841	326	*	706	299	150
0 0			*	900	342	* 698	246	* 491	189	* 378	149	*	338	130	3670
			*	1964	737	* 1414	633	* 1056	407	* 800	319	*	746	304	150
400 20	*	878	554	* 810	343	* 696	244	* 455	186			*	338	140	3600
	*	1966	1187	* 1764	737	* 1300	626	* 874	401			*	727	327	140
-1000 -40			*	708	346	* 623	246	* 393	188			*	324	171	3210
			*	1520	745	* 1112	529	* 889	405			*	745	373	130
-1500 -60	*	857	566	* 562	355	* 398	253					*	324	223	2740
	*	1815	1217	* 1194	764	* 832	546					*	716	500	110

Illustration 182

g06364696

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

Product Information Section
Lifting Capacities

(mm) (inch)	1000 40	1500 60	2000 80	2500 100	3000 120	3500 140		(mm) (inch)
3800 129								2020 110
2500 100					277 638	277 630		242 535
2000 80					288 648	288 648	301 285	238 528
1500 60				396 600	396 600	329 709	299 642	239 542
1000 40			888 1438	890 1314	496 1062	438 921	378 845	320 632
500 20			696 1697	571 1230	490 1054	468 960	368 792	308 666
0 0			878 1458	595 1094	476 1024	386 852	360 774	301 648
-500 -20	762 1884	762 1884	877 1904	877 1908	576 1458	552 1196	470 1011	398 838
-1000 -40				878 1458	595 1192	470 1000	386 808	360 763
-1500 -60		888 2007	890 2008	427 1335	562 1299	448 948	386 858	
-2000 -80				428 977	428 977			382 764

Illustration 183

g06364699

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

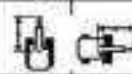
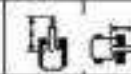
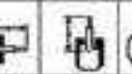
(mm) (inch)	1850 40	2500 63	3000 80	3500 90	4000 120	4500 140	
							(mm) (inch)
3600 129							* 261 * 281 2620 * 553 * 593 110
2500 100					* 277 * 277 * 638 * 620		* 242 * 242 3280 * 535 * 535 130
2000 80					* 288 * 288 * 646 * 646	* 316 * 255	* 238 * 238 3570 * 526 * 526 140
1500 63				* 318 * 318 * 688 * 688	* 343 * 318 * 750 * 708	* 342 * 283 * 750 * 542	* 239 * 225 3760 * 528 * 492 150
1000 40			* 886 * 880 * 1628 * 1214	* 498 * 428 * 1062 * 801	* 416 * 320 * 906 * 697	* 368 * 248 * 793 * 533	* 246 * 208 3980 * 541 * 460 160
500 20			* 995 * 871 * 2053 * 1210	* 625 * 468 * 1309 * 866	* 472 * 368 * 1047 * 666	* 383 * 242 * 625 * 521	* 262 * 203 3900 * 579 * 449 160
0 0			* 995 * 871 * 2053 * 1214	* 658 * 386 * 1413 * 852	* 489 * 391 * 1058 * 648	* 360 * 238 * 815 * 511	* 269 * 206 3530 * 627 * 455 150
-500 -20	* 762 * 762 * 1684 * 1684	* 877 * 877 * 1904 * 1904	* 871 * 552 * 1873 * 1186	* 624 * 390 * 1240 * 819	* 488 * 257 * 999 * 638	* 352 * 235 * 747 * 507	* 313 * 219 3680 * 688 * 494 150
-1000 -40			* 763 * 595 * 1638 * 1192	* 553 * 340 * 1183 * 819	* 410 * 236 * 873 * 538		* 310 * 246 3430 * 694 * 546 140
-1500 -63		* 806 * 504 * 2087 * 2086	* 627 * 562 * 1235 * 1239	* 448 * 395 * 948 * 858			* 314 * 305 2960 * 693 * 682 120
-2000 -80			* 428 * 428 * 877 * 877				* 342 * 342 2250 * 744 * 744 90

Illustration 184

g06364701

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

Product Information Section
Lifting Capacities

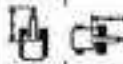
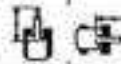
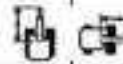
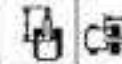
(mm) (inch)	1850 40	2500 63	3000 80	3500 90	4000 120	4500 140		
							 (mm) (inch)	
3600 129							* 261 245 2620 * 563 261 110	
2500 80					* 277 218 * 638 469		* 242 184 3280 * 535 418 130	
2000 63					* 288 217 * 646 465	301 80	* 238 195 3570 * 526 344 140	
1800 63				* 398 288 * 688 624	* 343 211 * 750 454	289 56	* 239 137 3760 * 526 303 150	
1600 49			* 686 395 * 1639 832	* 496 273 * 1062 586	379 202 815 425	254 54 632 228	* 246 126 3880 * 541 279 160	
500 20			* 936 350 * 1637 756	* 490 255 * 1064 586	368 193 732 414	289 119 620 318	242 122 3900 634 289 160	
8 8			* 679 336 * 1458 726	* 476 243 * 1024 524	368 195 774 398	284 144 610 268	246 123 3630 643 272 150	
500 20	* 762 1684 * 762 1684	* 877 1904 * 877 1904	* 514 1145 * 514 1145	* 676 333 * 1458 717	* 470 238 * 1011 502	* 355 181 * 744 368	* 291 142 * 605 305	262 131 3680 579 280 150
1800 49				* 679 336 * 1458 722	* 470 238 * 1010 502	* 355 180 * 743 368		284 140 3430 652 301 140
1500 49		* 806 1807 * 806 1807	* 548 1180 * 548 1180	* 627 343 * 1335 738	* 448 242 * 948 523		* 314 187 2960 * 633 418 120	
2000 63			* 428 397 * 428 397				* 342 390 2250 * 744 646 90	

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)
3000 120							* 260 245 2820 * 980 641 110
2500 100					* 277 29		* 242 104 1280 * 535 416 130
2000 80					* 288 27	* 315 110	* 238 185 3570 * 528 344 160
1500 60				* 316 210	* 343 31	* 340 28	* 229 157 2700 * 528 360 150
1000 40			* 668 385	* 696 273	* 416 262	* 368 154	* 246 126 3880 * 541 279 160
500 20			* 945 350	* 625 285	* 472 182	* 383 140	* 262 122 2900 * 576 269 160
0 0			* 865 336	* 658 243	* 499 185	* 390 144	* 288 120 3930 * 603 272 150
500 20	* 762 364	* 752 364	* 877 384	* 871 393	* 624 218	* 466 181	* 352 142 * 302 131 3680 * 688 230 150
1000 40				* 763 336	* 653 218	* 410 189	* 310 149 2410 * 684 201 160
1500 60		* 888 548	* 627 380	* 448 242			* 354 187 2880 * 653 418 120
2000 80		* 2097 1160	* 1035 738	* 348 513			* 342 180 2050 * 764 436 90

Illustration 186

g06364704

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

Product Information Section
Lifting Capacities

(mm) (inch)	1800 40	1500 40	2000 50	2500 60	3000 70	3500 80	4000 90	4500 100	5000 110	5500 120	6000 130	6500 140	7000 150	7500 160	8000 170	8500 180	9000 190	9500 200	10000 210	10500 220	11000 230	11500 240	12000 250	12500 260	13000 270	13500 280	14000 290	14500 300	15000 310	15500 320	16000 330	16500 340	17000 350	17500 360	18000 370	18500 380	19000 390	19500 400	20000 410	20500 420	21000 430	21500 440	22000 450	22500 460	23000 470	23500 480	24000 490	24500 500	25000 510	25500 520	26000 530	26500 540	27000 550	27500 560	28000 570	28500 580	29000 590	29500 600	30000 610	30500 620	31000 630	31500 640	32000 650	32500 660	33000 670	33500 680	34000 690	34500 700	35000 710	35500 720	36000 730	36500 740	37000 750	37500 760	38000 770	38500 780	39000 790	39500 800	40000 810	40500 820	41000 830	41500 840	42000 850	42500 860	43000 870	43500 880	44000 890	44500 900	45000 910	45500 920	46000 930	46500 940	47000 950	47500 960	48000 970	48500 980	49000 990	49500 1000	50000 1010	50500 1020	51000 1030	51500 1040	52000 1050	52500 1060	53000 1070	53500 1080	54000 1090	54500 1100	55000 1110	55500 1120	56000 1130	56500 1140	57000 1150	57500 1160	58000 1170	58500 1180	59000 1190	59500 1200	60000 1210	60500 1220	61000 1230	61500 1240	62000 1250	62500 1260	63000 1270	63500 1280	64000 1290	64500 1300	65000 1310	65500 1320	66000 1330	66500 1340	67000 1350	67500 1360	68000 1370	68500 1380	69000 1390	69500 1400	70000 1410	70500 1420	71000 1430	71500 1440	72000 1450	72500 1460	73000 1470	73500 1480	74000 1490	74500 1500	75000 1510	75500 1520	76000 1530	76500 1540	77000 1550	77500 1560	78000 1570	78500 1580	79000 1590	79500 1600	80000 1610	80500 1620	81000 1630	81500 1640	82000 1650	82500 1660	83000 1670	83500 1680	84000 1690	84500 1700	85000 1710	85500 1720	86000 1730	86500 1740	87000 1750	87500 1760	88000 1770	88500 1780	89000 1790	89500 1800	90000 1810	90500 1820	91000 1830	91500 1840	92000 1850	92500 1860	93000 1870	93500 1880	94000 1890	94500 1900	95000 1910	95500 1920	96000 1930	96500 1940	97000 1950	97500 1960	98000 1970	98500 1980	99000 1990	99500 2000	100000 2010	100500 2020	101000 2030	101500 2040	102000 2050	102500 2060	103000 2070	103500 2080	104000 2090	104500 2100	105000 2110	105500 2120	106000 2130	106500 2140	107000 2150	107500 2160	108000 2170	108500 2180	109000 2190	109500 2200	110000 2210	110500 2220	111000 2230	111500 2240	112000 2250	112500 2260	113000 2270	113500 2280	114000 2290	114500 2300	115000 2310	115500 2320	116000 2330	116500 2340	117000 2350	117500 2360	118000 2370	118500 2380	119000 2390	119500 2400	120000 2410	120500 2420	121000 2430	121500 2440	122000 2450	122500 2460	123000 2470	123500 2480	124000 2490	124500 2500	125000 2510	125500 2520	126000 2530	126500 2540	127000 2550	127500 2560	128000 2570	128500 2580	129000 2590	129500 2600	130000 2610	130500 2620	131000 2630	131500 2640	132000 2650	132500 2660	133000 2670	133500 2680	134000 2690	134500 2700	135000 2710	135500 2720	136000 2730	136500 2740	137000 2750	137500 2760	138000 2770	138500 2780	139000 2790	139500 2800	140000 2810	140500 2820	141000 2830	141500 2840	142000 2850	142500 2860	143000 2870	143500 2880	144000 2890	144500 2900	145000 2910	145500 2920	146000 2930	146500 2940	147000 2950	147500 2960	148000 2970	148500 2980	149000 2990	149500 3000	150000 3010	150500 3020	151000 3030	151500 3040	152000 3050	152500 3060	153000 3070	153500 3080	154000 3090	154500 3100	155000 3110	155500 3120	156000 3130	156500 3140	157000 3150	157500 3160	158000 3170	158500 3180	159000 3190	159500 3200	160000 3210	160500 3220	161000 3230	161500 3240	162000 3250	162500 3260	163000 3270	163500 3280	164000 3290	164500 3300	165000 3310	165500 3320	166000 3330	166500 3340	167000 3350	167500 3360	168000 3370	168500 3380	169000 3390	169500 3400	170000 3410	170500 3420	171000 3430	171500 3440	172000 3450	172500 3460	173000 3470	173500 3480	174000 3490	174500 3500	175000 3510	175500 3520	176000 3530	176500 3540	177000 3550	177500 3560	178000 3570	178500 3580	179000 3590	179500 3600	180000 3610	180500 3620	181000 3630	181500 3640	182000 3650	182500 3660	183000 3670	183500 3680	184000 3690	184500 3700	185000 3710	185500 3720	186000 3730	186500 3740	187000 3750	187500 3760	188000 3770	188500 3780	189000 3790	189500 3800	190000 3810	190500 3820	191000 3830	191500 3840	192000 3850	192500 3860	193000 3870	193500 3880	194000 3890	194500 3900	195000 3910	195500 3920	196000 3930	196500 3940	197000 3950	197500 3960	198000 3970	198500 3980	199000 3990	199500 4000	200000 4010	200500 4020	201000 4030	201500 4040	202000 4050	202500 4060	203000 4070	203500 4080	204000 4090	204500 4100	205000 4110	205500 4120	206000 4130	206500 4140	207000 4150	207500 4160	208000 4170	208500 4180	209000 4190	209500 4200	210000 4210	210500 4220	211000 4230	211500 4240	212000 4250	212500 4260	213000 4270	213500 4280	214000 4290	214500 4300	215000 4310	215500 4320	216000 4330	216500 4340	217000 4350	217500 4360	218000 4370	218500 4380	219000 4390	219500 4400	220000 4410	220500 4420	221000 4430	221500 4440	222000 4450	222500 4460	223000 4470	223500 4480	224000 4490	224500 4500	225000 4510	225500 4520	226000 4530	226500 4540	227000 4550	227500 4560	228000 4570	228500 4580	229000 4590	229500 4600	230000 4610	230500 4620	231000 4630	231500 4640	232000 4650	232500 4660	233000 4670	233500 4680	234000 4690	234500 4700	235000 4710	235500 4720	236000 4730	236500 4740	237000 4750	237500 4760	238000 4770	238500 4780	239000 4790	239500 4800	240000 4810	240500 4820	241000 4830	241500 4840	242000 4850	242500 4860	243000 4870	243500 4880	244000 4890	244500 4900	245000 4910	245500 4920	246000 4930	246500 4940	247000 4950	247500 4960	248000 4970	248500 4980	249000 4990	249500 5000	250000 5010	250500 5020	251000 5030	251500 5040	252000 5050	252500 5060	253000 5070	253500 5080	254000 5090	254500 5100	255000 5110	255500 5120	256000 5130	256500 5140	257000 5150	257500 5160	258000 5170	258500 5180	259000 5190	259500 5200	260000 5210	260500 5220	261000 5230	261500 5240	262000 5250	262500 5260	263000 5270	263500 5280	264000 5290	264500 5300	265000 5310	265500 5320	266000 5330	266500 5340	267000 5350	267500 5360	268000 5370	268500 5380	269000 5390	269500 5400	270000 5410	270500 5420	271000 5430	271500 5440	272000 5450	272500 5460	273000 5470	273500 5480	274000 5490	274500 5500	275000 5510	275500 5520	276000 5530	276500 5540	277000 5550	277500 5560	278000 5570	278500 5580	279000 5590	279500 5600	280000 5610	280500 5620	281000 5630	281500 5640	282000 5650	282500 5660	283000 5670	283500 5680	284000 5690	284500 5700	285000 5710	285500 5720	286000 5730	286500 5740	287000 5750	287500 5760	288000 5770	288500 5780	289000 5790	289500 5800	290000 5810	290500 5820	291000 5830	291500 5840	292000 5850	292500 5860	293000 5870	293500 5880	294000 5890	294500 5900	295000 5910	295500 5920	296000 5930	296500 5940	297000 5950	297500 5960	298000 5970	298500 5980	299000 5990	299500 6000	300000 6010	300500 6020	301000 6030	301500 6040	302000 6050	302500 6060	303000 6070	303500 6080	304000 6090	304500 6100	305000 6110	305500 6120	306000 6130	306500 6140	307000 6150	307500 6160	308000 6170	308500 6180	309000 6190	309500 6200	310000 6210	310500 6220	311000 6230	311500 6240	312000 6250	312500 6260	313000 6270	313500 6280	314000 6290	314500 6300	315000 6310	315500 6320	316000 6330	316500 6340	317000 6350	317500 6360	318000 6370	318500 6380	319000 6390	319500 6400	320000 6410	320500 6420	321000 6430	321500 6440	322000 6450	322500 6460	323000 6470	323500 6480	324000 6490	324500 6500	325000 6510	325500 6520	326000 6530	326500 6540	327000 6550	327500 6560	328000 6570	328500 6580	329000 6590	329500 6600	330000 6610	330500 6620	331000 6630	331500 6640	332000 6650	332500 6660	333000 6670	333500 6680	334000 6690	334500 6700	335000 6710	335500 6720	336000 6730	336500 6740	337000 6750	337500 6760	338000 6770	338500 6780	339000 6790	339500 6800	340000 6810	340500 6820	341000 6830	341500 6840	342000 6850	342500 6860	343000 6870	343500 6880	344000 6890	344500 6900	345000 6910	345500 6920	346000 6930	346500 6940	347000 6950	347500 6960	348000 6970	348500 6980	349000 6990	349500 7000	350000 7010	350500 7020	351000 7030	351500 7040	352000 7050	352500 7060	353000 7070	353500 7080	354000 7090	354500 7100	355000 7110	355500 7120	356000 7130	356500 7140	357000 7150	357500 7160	358000 7170	358500 7180	359000 7190	359500 7200	360000 7210	360500 7220	361000 7230	361500 7240	362000 7250	362500 7260	363000 7270	363500 7280	364000 7290	364500 7300	365000 7310	365500 7320	366000 7330	366500 7340	367000 7350	367500 7360	368000 7370	368500 7380	369000 7390	369500 7400

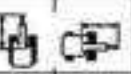
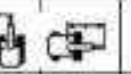
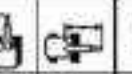
(mm) (inch)	1000 40	1500 60	2000 80	2500 100	3000 120	3500 140				(mm) (inch)
										
3000 120										300 120
2500 100					347 37					300 120
2000 80				560 640	560 640	354 705	375 676			300 120
1500 60			445 334	445 334	420 807	408 838	398 848	374 817	227 508	300 120
1000 40			373 1039	562 1213	575 1230	468 861	457 906	330 646	386 502	234 502
500 20					650 1413	264 827	493 1068	292 628	301 840	228 493
0 0			932 1953	527 1033	656 1430	374 866	438 1052	295 614	375 799	228 466
-500 -20	1500 60	1800 72	935 2090	884 2088	842 1791	528 1174	601 1293	371 799	458 1000	283 600
-1000 -40			799 1904	532 1184	517 1105	273 863	277 798	204 468		
-1500 -60			842 1781	542 1185	527 1178	301 808				

Illustration 188

g06364710

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

Product Information Section
Lifting Capacities

(mm) (inch)	1900 40	1600 60	2000 80	2500 100	3000 120	3500 140			(mm) (inch)
3000 120									2000 80
2500 100					* 277 * 638	* 277 * 600	* 241 * 534	* 241 * 534	1500 60
2000 80					* 256 * 649	205 507	* 239 * 528	* 239 * 510	1000 40
1500 60				* 306 * 769	* 306 * 769	240 607	* 227 * 528	* 227 * 457	500 20
1000 40			708 1853	573 1235	483 1040	358 771	238 544	232 497	200 8
500 20			653 1617	535 1193	464 1017	383 748	289 622	272 566	100 4
0 0			643 1392	521 1120	450 989	378 731	281 605	267 575	0 0
-500 -20	* 1726 * 1726	* 304 * 2041	663 3885	541 1279	445 986	335 723	277 596	265 571	-500 -20
-1000 -40				644 1392	521 1120	445 986	335 723	277 596	-1000 -40
-1500 -60		* 371 * 2096	682 3687	519 1314	440 1037	378 830		* 315 * 695	-1500 -60
-2000 -80				* 418 * 936	* 418 * 936			* 346 * 775	-2000 -80

Illustration 189

g06364712

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

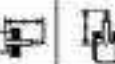
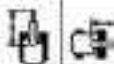
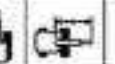
(mm) (inch)	1000 40	1500 60	2000 80	2500 100	3000 120	3500 140			
								(mm) (inch)	
3000 120									
2500 100									
2000 80									
1500 60									
1000 40									
500 20									
0 0									
-500 -20									
-1000 -40									
-1500 -60									
-2000 -80									

Illustration 190

g06364713

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

Product Information Section
Lifting Capacities

[mm] [inch]	1500 60		2000 80		2500 100		3000 120		3500 140				[mm] [inch]
													
3000 120													305 12 2560 100
2500 100					565 22	566 22							300 12 2080 80
2000 80					204 8	204 8	352 14	352 14					295 12 1400 60
1500 60			419 16	419 16	411 16	411 16	395 16	350 14	320 13	271 11			297 12 1090 40
1000 40			770 30	635 25	531 21	452 18	405 16	341 13	287 11	267 11	288 11	243 10	3710 150
500 20					522 21	436 17	395 16	332 13	302 12	263 11	282 11	237 9	3740 150
0 0			730 29	597 24	512 20	426 17	388 16	326 13	300 12	259 10	288 11	242 10	3670 150
-500 20	878 34	879 34	730 29	598 24	508 20	423 17	386 16	323 13			308 12	259 10	3500 140
-1000 40			708 28	602 24	510 20	424 17	383 16	324 13			324 13	236 9	3210 130
-1500 60	857 34	857 34	662 26	562 22	398 16	398 16					324 13	324 13	2740 110

Illustration 191

g06364791

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

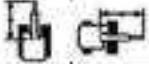
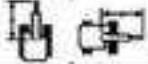
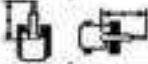
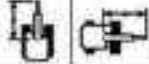
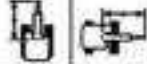
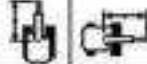
[mm] [inch]	1500 60	2000 80	2500 100	3000 120	3500 140		
							[mm] [inch]
3000 120						* 305 * 305	2560
						* 647 * 647	100
2500 100			* 565 * 565			* 300 * 300	2080
						* 663 * 663	120
2000 80			* 284 * 284	* 352 * 352		* 295 * 295	1400
			* 633 * 633	* 783 * 783		* 645 * 645	140
1500 60		* 419 * 419	* 411 * 411	* 395 * 395	* 324 * 271	* 297 * 297	1590
		* 882 * 882	* 883 * 883	* 861 * 861		* 695 * 695	140
1000 40		* 858 * 1754	* 635 * 1245	* 567 * 974	* 454 * 880	* 346 * 735	1710
						* 834 * 574	150
500 20			* 657 * 1409	* 436 * 939	* 332 * 1058	* 391 * 736	1740
						* 263 * 565	150
0 0		* 308 * 1984	* 537 * 1234	* 355 * 1411	* 426 * 938	* 326 * 1065	1670
						* 276 * 702	150
500 20	* 878 * 1899	* 879 * 1999	* 898 * 1754	* 598 * 1285	* 423 * 1302	* 455 * 980	1500
						* 323 * 874	140
1000 40		* 708 * 1520	* 682 * 1234	* 523 * 1118	* 424 * 913	* 383 * 809	1310
						* 324 * 659	130
1500 60	* 857 * 1815	* 857 * 1815	* 662 * 1194	* 582 * 1154	* 398 * 832	* 324 * 716	2740
						* 324 * 716	110

Illustration 192

g06364794

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

Product Information Section
Lifting Capacities

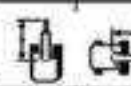
[mm] [inch]	1500 60	2000 80	2500 100	3000 120	3500 140		(mm) (inch)
							
3000 120							* 305 305 2560 * 647 * 647 100
2500 100							* 300 222 3090 * 663 490 120
2000 80							* 294 184 3400 * 633 * 633 140
1500 60							* 294 184 3400 * 633 * 633 140
1000 40							* 294 184 3400 * 633 * 633 140
500 20							* 294 184 3400 * 633 * 633 140
0 0							* 294 184 3400 * 633 * 633 140
-500 -20							* 294 184 3400 * 633 * 633 140
-1000 -40							* 294 184 3400 * 633 * 633 140
-1500 -60							* 294 184 3400 * 633 * 633 140

Illustration 193

g06364796

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

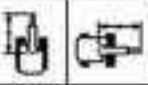
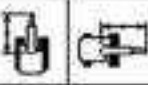
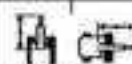
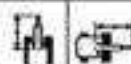
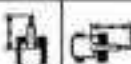
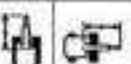
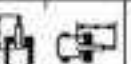
(mm) (inch)	1500 60		2000 80		2500 100		3000 120		3500 140				
								(mm) (inch)					
3000 120									* 305 * 647	* 305 * 847	2560 100		
2500 100									* 309 * 663	* 222 * 498	3080 120		
2000 80					* 294 * 633	* 294 * 633	* 352 * 783	232 497		* 295 * 649	184 410	3400 140	
1500 60			* 419 * 932	* 419 * 932	* 419 * 932	* 308 * 661	226 487	* 374 * 824	172 381	* 297 * 655	164 362	3580 140	
1000 40			* 858 * 1794	400 886	* 587 * 1213	290 625	* 454 * 980	218 470	* 388 * 834	188 381	* 303 * 669	151 334	3790 150
500 20					* 857 * 1408	275 593	* 491 * 1058	210 452	* 381 * 841	164 352	* 321 * 706	147 324	3740 150
0 0			* 908 * 1964	367 789	* 858 * 1818	266 573	* 491 * 1058	204 439	* 376 * 833	161 346	* 339 * 746	150 330	3670 150
-500 -20	* 678 * 1499	580 1265	* 618 * 1364	367 790	* 605 * 1302	263 566	* 455 * 974	201 433			* 339 * 727	160 364	3560 140
-1000 -40			* 708 * 1520	371 798	* 523 * 1118	264 569	* 383 * 809	202 436			* 324 * 715	164 409	3250 130
-1500 -60	* 857 * 1815	603 1295	* 562 * 1194	379 817	* 399 * 832	271 585					* 324 * 715	239 537	2740 110

Illustration 194

g06364798

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

Product Information Section
Lifting Capacities

(mm) (inch)	1850 40	2500 63	3000 80	3500 90	4000 120	4500 140		(mm) (inch)
								
3600 120								261 10
2500 80					277 10	277 10		242 10
2000 63					288 10	288 10	316 10	238 10
1500 40					343 10	343 10	320 10	239 10
1000 25					435 10	435 10	399 10	269 10
500 10					500 10	500 10	444 10	285 10
250 10					500 10	500 10	444 10	285 10
125 5					500 10	500 10	444 10	285 10
62 2					500 10	500 10	444 10	285 10
31 1					500 10	500 10	444 10	285 10
15 0.5					500 10	500 10	444 10	285 10
7.5 0.25					500 10	500 10	444 10	285 10
3.75 0.125					500 10	500 10	444 10	285 10
1.875 0.0625					500 10	500 10	444 10	285 10
0.9375 0.03125					500 10	500 10	444 10	285 10
0.46875 0.015625					500 10	500 10	444 10	285 10
0.234375 0.0078125					500 10	500 10	444 10	285 10
0.1171875 0.00390625					500 10	500 10	444 10	285 10
0.05859375 0.001953125					500 10	500 10	444 10	285 10
0.029296875 0.0009765625					500 10	500 10	444 10	285 10
0.0146484375 0.00048828125					500 10	500 10	444 10	285 10
0.00732421875 0.000244140625					500 10	500 10	444 10	285 10
0.003662109375 0.0001220703125					500 10	500 10	444 10	285 10
0.0018310546875 0.00006103515625					500 10	500 10	444 10	285 10
0.00091552734375 0.000030517578125					500 10	500 10	444 10	285 10
0.000457763671875 0.0000152587890625					500 10	500 10	444 10	285 10
0.0002288818359375 0.00000762939453125					500 10	500 10	444 10	285 10
0.00011444091796875 0.000003814697265625					500 10	500 10	444 10	285 10
0.000057220458984375 0.0000019073486328125					500 10	500 10	444 10	285 10
0.0000286102294921875 0.00000095367431640625					500 10	500 10	444 10	285 10
0.00001430511474609375 0.000000476837158203125					500 10	500 10	444 10	285 10
0.000007152557373046875 0.0000002384185791015625					500 10	500 10	444 10	285 10
0.0000035762786865234375 0.00000011920928955078125					500 10	500 10	444 10	285 10
0.00000178813934326171875 0.000000059604644775390625					500 10	500 10	444 10	285 10
0.000000894069671630859375 0.0000000298023223876953125					500 10	500 10	444 10	285 10
0.0000004470348358154296875 0.00000001490116119384765625					500 10	500 10	444 10	285 10
0.00000022351741790771484375 0.000000007450580596923828125					500 10	500 10	444 10	285 10
0.000000111758708953857421875 0.0000000037252902984619140625					500 10	500 10	444 10	285 10
0.0000000558793544769287109375 0.00000000186264514923095703125					500 10	500 10	444 10	285 10
0.00000002793967723846435546875 0.000000000931322574615478515625					500 10	500 10	444 10	285 10
0.000000013969838619232177734375 0.00000000046566128730773928125					500 10	500 10	444 10	285 10
0.0000000069849193096160888671875 0.000000000232830643653869640625					500 10	500 10	444 10	285 10
0.00000000349245965480804443359375 0.0000000001164153218269348203125					500 10	500 10	444 10	285 10
0.000000001746229827404022216796875 0.00000000005820766091346741015625					500 10	500 10	444 10	285 10
0.0000000008731149137020111083984375 0.000000000029103830456733705078125					500 10	500 10	444 10	285 10
0.00000000043655745685100555419921875 0.0000000000145519152283668525390625					500 10	500 10	444 10	285 10
0.000000000218278728425502777099609375 0.00000000000727595761418342626953125					500 10	500 10	444 10	285 10
0.0000000001091393642127513885498046875 0.000000000003637978807091713134765625					500 10	500 10	444 10	285 10
0.00000000005456968210637569427490234375 0.0000000000018189894035458565673828125					500 10	500 10	444 10	285 10
0.000000000027284841053187847247451171875 0.00000000000090949470177292828369140625					500 10	500 10	444 10	285 10
0.0000000000136424205265939236237255859375 0.000000000000454747350886464141795703125					500 10	500 10	444 10	285 10
0.00000000000682121026329696181186279296875 0.0000000000002273736754432320708978515625					500 10	500 10	444 10	285 10
0.000000000003410605131648480905931396484375 0.000000000000113686837721616035448928125					500 10	500 10	444 10	285 10
0.0000000000017053025658242404529656982421875 0.0000000000000568434188608030177244640625					500 10	500 10	444 10	285 10
0.00000000000085265128291212022648284912109375 0.00000000000002842170943040150886223203125					500 10	500 10	444 10	285 10
0.000000000000426325641456060113241424560546875 0.000000000000014210854715200754431116015625					500 10	500 10	444 10	285 10
0.0000000000002131628207280300566207122802734375 0.0000000000000071054273576003772155580078125					500 10	500 10	444 10	285 10
0.00000000000010658141036401502831035614013671875 0.00000000000000355271367880018860777900390625					500 10	500 10	444 10	285 10
0.000000000000053290705182007514157178070068359375 0.000000000000001776356839400094303889501953125					500 10	500 10	444 10	285 10
0.0000000000000266453525910037570785890350341796875 0.0000000000000008881784197000471519447509765625					500 10	500 10	444 10	285 10
0.00000000000001332267629550187853929451751708984375 0.000000000000000444089209850023575972375478125					500 10	500 10	444 10	285 10
0.000000000000006661338147750939269647258758542421875 0.0000000000000002220446049250117879861877390625					500 10	500 10	444 10	285 10
0.0000000000000033306690738754696348236293772712109375 0.00000000000000011102230246250589394308886953125					500 10	500 10	444 10	285 10
0.0000000000000016653345369377348174118146886356171875 0.0000000000000000555111512312529469717194428125					500 10	500 10	444 10	285 10
0.000000000000000832667268468867408705590734367809375 0.00000000000000002775557561562647348585972190625					500 10	500 10	444 10	285 10
0.0000000000000004163336342344337043529536718144046875 0.000000000000000013877787807813236742929860953125					500 10	500 10	444 10	285 10
0.00000000000000020816681711721685217647683590720234375 0.000000000000000006938893903906618371464930478125					500 10	500 10	444 10	285 10
0.000000000000000104083408558608426088238417953601171875 0.0000000000000000034694469519533091870732152390625					500 10	500 10	444 10	285 10
0.0000000000000000520417042793042130441192089768005859375 0.00000000000000000173472347597665459353660761953125					500 10	500 10	444 10	285 10
0.00000000000000002602085213965210652205960448840029296875 0.000000000000000000867361737988327296768303809765625					500 10	500 10	444 10	285 10
0.000000000000000013010426069826053261029802244200146484375 0.00000000000000000043368086899416364838415190478125					500 10	500 10	444 10	285 10
0.0000000000000000065052130349130266305149011221000732421875 0.000000000000000000216840434497081824192075952390625					500 10	500 10	444 10	285 10
0.00000000000000000325260651745651331525745006105003662109375 0.0000000000000000001084202172485409120960379761953125					500 10	500 10	444 10	285 10
0.000000000000000001626303258728256657628725003025001831171875 0.00000000000000000005421010862427045604801898809765625					500 10	500 10	444 10	285 10
0.00000000000000000081315162936412832781436250015125000915859375 0.0000000000000000000271050543121352280240094940478125					500 10	500 10	444 10	285 10
0.0000000000000000004065758146820641639071712500075625004579296875 0.00000000000000000001355252715606761401200474702390625					500 10	500 10	444 10	285 10
0.000000000000000000203287907341032081953585625003781250022896484375 0.00000000000000000000677626357803380700600237351953125					500 10	500 10	444 10	285 10
0.000000000000000000101643953670516040976782812500189062500114482421875 0.000000000000000000003388131789016903503001186759765625					500 10	500 10	444 10	285 10
0.000000000000000000050821976835258020488391406250009453125000572412109375 0.00000000000000000000169406589450845175150059337978125					500 10	500 10	444 10	285 10
0.0000000000000000000254109884176290102441957031250004726562500028620609375 0.000000000000000000000847032947250425875750029668978125					500 10	500 10	444 10	285 10
0.0000000000000000000127054942088145051220978515625000236328125000143103046875 0.00000000000000000000042351647362521293787500148344890625					500 10	500 10	444 10	285 10
0.0000000000000000000063527471044072525610489282812500011816406250000715515234375 0.00000000000000000000021175723681260646968750007417244609375					500 10	500 10	444 10	285 10
0.0000000000000000000031763735522036262805244641406250000590820312500003577576171875 0.000000000000000000000105878618406303234843750003708622390625					500 10	500 10	444 10	285 10
0.000000000000000000001588186776								

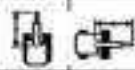
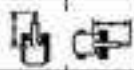
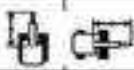
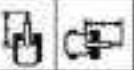
(mm) (inch)	1000 40	1500 60	2000 80	2500 100	3000 120	3500 140		
								(mm) (inch)
3000 120							* 261 * 261 2820 * 980 * 980 110	
2500 100					* 277 * 277 * 830 * 830		* 242 * 242 3280 * 535 * 535 130	
2000 80					* 288 * 288 * 846 * 846	* 315 272	* 238 * 238 3570 * 526 * 526 140	
1500 60				* 316 * 316 * 888 * 888	* 343 * 343 * 751 * 751	* 340 270 * 750 590	* 229 * 229 3760 * 528 * 528 150	
1000 40			* 668 668 * 1428 1381	* 496 454 * 1062 910	* 416 340 * 901 732	* 368 265 * 793 570	* 246 220 3880 * 541 480 160	
500 20			* 945 897 * 2053 1997	* 625 435 * 1338 937	* 472 330 * 1007 711	* 393 290 * 825 590	* 262 219 3900 * 576 481 160	
0 0			* 865 591 * 2053 1272	* 658 422 * 1413 960	* 499 322 * 850 633	* 390 295 * 815 548	* 268 222 3930 * 637 489 150	
500 20	* 762 762 * 1884 1884	* 877 877 * 1984 1984	* 871 589 * 1873 1254	* 624 416 * 1348 836	* 466 317 * 859 683	* 352 292 * 747 544	* 300 244 3480 * 688 500 150	
1000 40			* 713 591 * 1626 1270	* 653 416 * 1183 855	* 410 317 * 873 683		* 310 244 3480 * 684 500 160	
1500 60		* 888 888 * 2097 2097	* 886 589 * 1335 1287	* 448 421 * 948 907			* 314 214 3380 * 683 680 120	
2000 80			* 428 428 * 877 877				* 342 342 3250 * 764 764 90	

Illustration 196

g06364803

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

Product Information Section
Lifting Capacities

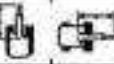
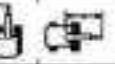
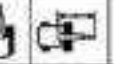
(mm) (inch)	1000 40	1500 60	2000 80	2500 100	3000 120	3500 140		(mm) (inch)
3000 120								3000 120
2500 100					277 10.9	224 8.8		2500 100
2000 80					288 11.3	232 9.1	315 12.4	2000 80
1500 60				318 12.5	243 9.6	228 9.0	171 6.7	1500 60
1000 40			666 26.2	496 19.5	404 15.9	315 12.4	186 7.3	1000 40
500 20			740 29.1	522 20.6	383 15.1	287 11.3	161 6.3	500 20
0 0			724 28.5	500 19.7	362 14.2	280 11.0	155 6.1	0 0
-500 -20	762 30.0	752 29.6	677 26.7	546 21.5	400 15.7	302 11.9	154 6.1	-500 -20
-1000 -40			723 28.4	502 19.8	378 14.9	278 10.9		-1000 -40
-1500 -60		388 15.3	586 23.1	627 24.7	448 17.6			-1500 -60
-2000 -80			428 16.8	382 15.0				-2000 -80

Illustration 197

g06364804

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

(mm) (inch)	1000 40		1500 60		2000 80		2500 100		3000 120		3500 140				(mm) (inch)
3800 129															2020 110
2500 100								277 638	234 591				242 535	193 440	2080 130
2000 80								288 648	232 457	316 77	177		239 528	167 371	2570 140
1500 60							316 600	268 662	243 595	342 750	171 245		239 528	167 328	2760 150
1000 40					888 1439	410 895	496 1062	281 627	416 904	217 486	366 790	86 206	246 541	137 300	3080 160
500 20					965 2093	374 899	625 1350	274 590	472 1047	297 646	380 845	161 245	262 576	123 283	2800 160
0 0					955 2053	360 777	656 1410	262 564	459 1058	290 629	380 845	156 208	263 577	124 286	2820 160
100 -29	762 1884	762 1884	877 1904	578 1224	821 1873	358 770	624 1340	266 582	466 939	195 420	352 747	64 131	243 533	143 316	3680 190
1000 -49					763 1626	360 775	650 1380	258 561	418 873	195 420			218 484	162 359	3410 190
1500 -62			806 2007	586 1259	627 1335	367 790	448 946	269 562					214 483	202 450	2980 160
2000 -80					428 977	362 825							242 534	321 744	2250 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)	1800 40	1900 50	2000 50	2500 100	3000 120	3500 140			(mm) (inch)
3000 120									2000 80
2500 100				568	668	347	338		1100 43
2000 80				285	289	354	326		1400 55
1500 60				643	643	785	721		1600 63
1000 40			445	445	420	420	394	323	2000 80
500 20			504	504	507	507	546	710	1500 59
0 0			722	598	510	426	385	321	1000 40
			1576	1291	1104	938	827	691	500 20
					696	600	575	502	0 0
					1066	884	806	670	
			694	563	488	401	353	285	
			1491	1211	1048	863	784	659	
-500 -20	906	1596	1918	1912	1939	2056	2180	2303	
-1000 -40			700	593	495	400	358	295	
-1500 -60			1502	1222	1043	860	730	659	
		842	842	552	552	397	397		
		1781	1781	1070	1070	808	808		

Illustration 199

g06364808

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

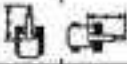
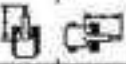
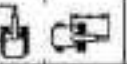
(mm) (inch)	1300 40	1500 40	2000 60	2500 80	3000 100	3500 120	4000 140		(mm) (inch)
3000 120									2610 100
2500 90					568 22	548 21	347 14	320 13	299 12
2000 80					640 25	643 25	788 31	721 28	295 12
1500 60			445 17	445 17	420 17	430 17	388 15	330 13	274 11
1000 40			304 12	304 12	307 12	367 14	388 15	710 28	817 32
500 20			1839 72	1291 51	1230 48	968 38	891 35	835 33	538 21
250 10					659 26	410 16	433 17	312 12	244 10
100 4			362 14	563 22	656 26	401 16	430 17	308 12	275 11
50 2			1953 77	1211 48	1430 56	663 26	1052 41	699 27	799 31
25 1	1900 75	1900 75	2090 82	1791 70	1202 47	1293 51	966 38	693 27	523 21
1000 40			788 31	568 22	517 20	460 18	377 15	305 12	324 13
500 20			1504 59	1212 47	1105 43	868 34	736 29	650 26	714 28
1500 60		842 33	842 33	552 22	552 22	387 15	347 14		325 13
50 2		1781 70	1781 70	1179 46	1170 46	808 32	668 26		717 28

Illustration 200

g06364809

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

Product Information Section
Lifting Capacities

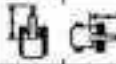
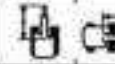
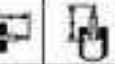
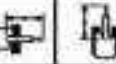
(mm) (inch)	1850 40	2500 63	3000 80	3500 90	4000 120	4500 140		
								(mm) (inch)
3600 129								255 10 259 10
2500 80					277 10	277 10		241 9 241 9
2000 63					291 11	291 11	306 12	239 9 239 9
1500 40					326 13	326 13	330 13	240 9 240 9
1000 40			713 28	693 27	508 20	428 17	384 15	298 12 243 10
500 20			793 31	571 22	496 19	448 17	373 15	330 13 243 10
250 10			883 35	621 24	466 18	402 16	329 13	243 10 243 10
125 5			957 38	657 26	482 19	402 16	329 13	243 10 243 10
63 2			1077 42	737 29	508 20	428 17	384 15	298 12 243 10
31.5 1	1726 68	1726 68	2041 80	1867 73	1471 58	1301 51	1160 46	287 11 221 9
15.75 0.6			2041 80	1867 73	1471 58	1301 51	1160 46	287 11 221 9
7.875 0.3			2041 80	1867 73	1471 58	1301 51	1160 46	287 11 221 9
3.9375 0.15			2041 80	1867 73	1471 58	1301 51	1160 46	287 11 221 9
1.96875 0.08			2041 80	1867 73	1471 58	1301 51	1160 46	287 11 221 9

Illustration 201

g06364813

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

(mm) (inch)	1850 40	2500 60	3000 60	3500 90	4000 120	4500 140			
									(mm) (inch)
3000 120									250 10
2500 100					277 10	277 10			241 10
2000 80					250 10	231 10	302 10	250 10	239 10
1500 60					226 10	206 10	247 10	243 10	240 10
1000 40			713 10	693 10	506 10	428 10	425 10	320 10	367 10
500 20			1693 10	1313 10	1063 10	822 10	910 10	689 10	786 10
250 10			370 10	321 10	629 10	468 10	474 10	330 10	383 10
125 5			2045 10	1831 10	1249 10	982 10	1022 10	867 10	1026 10
62.5 2.5			351 10	357 10	657 10	397 10	488 10	302 10	279 10
31.25 1.25			2044 10	1888 10	1412 10	854 10	1058 10	690 10	810 10
15.625 0.625		504 10	984 10	865 10	554 10	621 10	464 10	290 10	349 10
7.8125 0.3125	1726 10	1726 10	2041 10	1967 10	1859 10	1691 10	1533 10	1382 10	1234 10
3.90625 0.15625			758 10	557 10	547 10	391 10	484 10	297 10	310 10
1.953125 0.078125			1628 10	1197 10	1172 10	842 10	983 10	641 10	684 10
0.9765625 0.0390625		971 10	909 10	418 10	565 10	440 10	397 10		315 10
0.48828125 0.01953125		2056 10	2010 10	1314 10	1215 10	930 10	855 10		635 10
0.244140625 0.009765625				418 10	411 10				346 10
0.1220703125 0.0048828125				836 10	826 10				775 10

Illustration 202

g06364816

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

Product Information Section
Lifting Capacities

Without Bucket

[mm] [inch]	1500 60		2000 80		2500 100		3000 120		3500 140			
												(mm) (inch)
3000 120												* 395 * 847 2269 95
2500 100					* 346 * 794	* 346 * 794						* 406 * 903 2680 120
2000 80					* 372 * 823	* 372 * 823	417 896	167 769				366 815 3250 129
1500 60			* 528 * 1184	* 528 * 1184	* 482 * 1044	* 465 * 1001	412 897	352 759				328 727 3470 140
1000 40			749 1612	622 1343	530 1143	449 989	404 870	345 743	321 691	275 592		310 684 3590 140
500 20			719 1549	595 1283	515 1119	435 930	396 853	337 727	267 583	271 585		304 671 3600 150
0 0			710 1526	586 1262	506 1089	426 918	390 840	331 714	264 574	269 586		310 688 3530 140
-500 20			719 1524	586 1260	502 1082	422 900	387 835	328 710				313 736 3360 140
-1000 40			714 1533	590 1289	504 1086	424 914	390 831	331				* 378 * 832 3050 120
-1500 60	* 921 * 1945	* 921 * 1945	* 591 * 1251	* 591 * 1251	* 405 * 405							* 384 * 848 2560 100

Illustration 203

g06364886

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

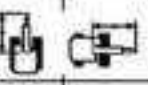
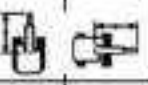
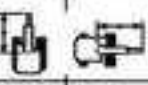
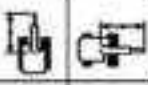
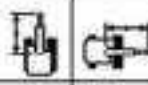
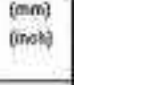
(mm) (inch)	1500 60		2000 80		2500 100		3000 120		3500 140				(mm) (inch)
3000 120													2260 90
2500 100					* 345 * 794	* 345 * 794							* 395 * 847 * 406 * 903 2850 120
2000 80					* 372 * 823	* 372 * 823	* 499 * 928	357 768					* 377 * 833 314 700 3250 130
1500 60			* 526 * 1114	* 526 * 1114	* 482 * 1044	465 1001	* 451 * 983	352 759					* 379 * 815 282 623 3470 140
1000 40			* 890 * 1000	822 1343	* 614 * 1311	443 963	* 437 * 1075	345 743	* 422 * 902	275 592			* 379 * 834 265 586 3580 140
500 20					* 689 * 1479	435 938	* 525 * 1131	337 727	* 420 * 900	271 585			* 399 * 879 261 574 3600 150
0 0			* 964 * 2079	586 1262	* 687 * 1479	426 918	* 519 * 1115	331 714	* 396 * 866	269 585			* 389 * 857 265 586 3530 140
-500 -20			* 970 * 1873	586 1260	* 634 * 1364	422 910	* 479 * 1022	329 710					* 391 * 840 264 628 3350 140
-1000 -40			* 754 * 1610	500 1269	* 547 * 1171	424 914	* 394 * 832	331 713					* 378 * 832 324 713 3050 120
-1500 -60	* 921 * 1845	* 921 * 1845	* 591 * 1251	* 591 * 1251	* 405 * 891	* 405 * 891							* 384 * 843 2560 100

Illustration 204

g06364893

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

Product Information Section
Lifting Capacities

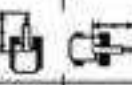
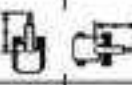
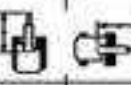
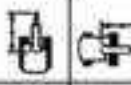
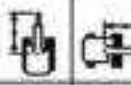
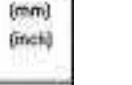
[mm] [inch]	1500 60	2000 80	2500 100	3000 120	3500 140			
								(mm) (inch)
3000 120								385 15.1 373 14.7 2250 90
2500 100								406 16.0 383 15.1 2880 113
2000 80								372 14.6 323 12.7 3250 128
1500 60								328 12.9 287 11.3 3470 137
1000 40								248 9.8 228 9.0 3580 141
500 20								179 7.0 159 6.3 3600 142
0 0								119 4.7 99 3.9 3530 139
-500 -20								708 27.9 624 24.6 333 13.1 3350 132
-1000 -40								714 28.1 633 24.9 328 12.9 3050 120
-1500 -60								921 36.3 845 33.3 306 12.0 2960 117

Illustration 205

g06364900

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

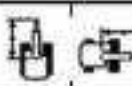
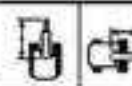
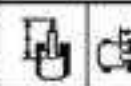
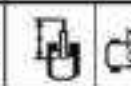
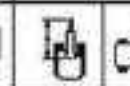
[mm] [inch]	1500 60	2000 80	2500 100	3000 120	3500 140		
							[mm] [inch]
3000 120							* 395 373 2260 * 847 * 847 99
2500 100			* 346 323 * 794 690				* 406 255 2880 * 903 575 120
2000 80			* 372 320 * 823 689	* 419 240 * 928 595			* 377 290 3250 * 833 467 100
1500 60		* 528 432 * 1194 973	* 482 390 * 1044 868	* 451 235 * 983 507			* 370 187 3470 * 816 410 140
1000 40		* 690 480 * 1880 866	* 614 296 * 1318 638	* 497 228 * 1075 492	* 422 181 * 912 399		* 379 175 3580 * 834 396 140
500 20			* 689 282 * 1479 609	* 525 221 * 1131 476	* 420 178 * 960 383		* 398 171 3600 * 879 376 150
0 0		* 964 388 * 2070 794	* 887 274 * 1870 591	* 518 205 * 1105 465	* 386 175		* 383 174 3590 * 857 383 140
-500 20		* 870 387 * 1873 782	* 634 271 * 1364 584	* 478 203 * 1022 460			* 381 185 3360 * 840 408 140
-1000 40		* 751 371 * 1630 809	* 547 272 * 1171 588	* 394 205			* 378 211 3050 * 832 489 120
-1500 60	* 821 587 * 1945 1263	* 591 380 * 1251 820	* 405 280				* 384 273 2560 * 843 610 100

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

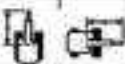
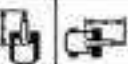
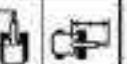
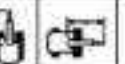
(mm) (inch)	1000 40		1500 60		2000 80		2500 100		3000 120		3500 140				(mm) (inch)
															
3800 129							226 746	204 742					346 746	345 742	2550 100
2500 100									365 742	358 742			319 708	319 708	3100 120
2000 80									358 737	350 769			302 667	299 639	3430 140
1500 60									297 604	297 604	483 882	392 750	222 694	277 595	3640 150
1000 40					749 1582	820 1350	532 1145	480 987	483 987	343 740	319 686	273 567	287 624	246 542	3750 150
500 20					721 1552	596 1296	594 1307	433 914	383 947	334 720	294 676	268 577	262 622	241 571	3770 150
0 0				567 1338	567 1338	784 1514	590 1250	501 1000	421 868	385 838	327 705	280 660	264 549	267 533	3700 150
-500 -20		793 1755	793 1755	939 2124	802 1886	709 1563	576 1240	495 1067	416 896	361 822	323 696	268 577	262 573	305 673	3530 140
-1000 -40						702 1508	579 1245	495 1067	416 896	361 822	323 697			342 753	3490 130
-1500 -60						958 1393	506 1262	468 965	421 869					378 818	2890 110
-2000 -80						433 933	433 933							421 851	2030 80

Illustration 207

g06364908

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

(mm) (inch)	1000 40	1500 60	2000 80	2500 100	3000 120	3500 140		(mm) (inch)
3800 129								2550 100
2500 100					365 742	358 742		3100 120
2000 80					358 737	358 737		3430 140
1500 60					347 884	342 882		3640 150
1000 40			749 1582	820 1358	852 1826	488 1036		3750 150
500 20			986 2102	986 1216	660 1430	423 914		3770 150
0 0		567 1338	567 1338	992 2129	590 1290	687 1476		3700 150
-500 -20	793 1755	793 1755	939 2124	902 1996	652 1461	416 924		3590 140
-1000 -40				882 1719	579 1245	416 924		3560 130
-1500 -60				958 1393	506 1262	421 965		2890 110
-2000 -80				433 433				2030 80

Illustration 208

g06364911

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

Product Information Section
Lifting Capacities

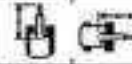
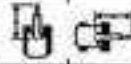
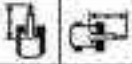
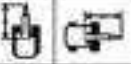
(mm) (inch)	1000 40	1500 60	2000 80	2500 100	3000 120	3500 140	
							(mm) (inch)
2000 80				325 13			244 10
2500 100					365 14	240 10	208 8
2000 80				620 25	240 10		302 12
1500 60				397 16	205 8	302 12	360 14
1000 40			748 30	497 20	532 21	403 16	287 11
500 20			721 29	376 15	514 20	280 11	282 11
0 0		597 24	550 22	704 28	362 14	581 23	268 11
500 20	792 31	793 31	939 37	552 22	700 28	359 14	495 20
0 0	1338 53	1181 47	834 33	781 31	1080 43	581 23	820 33
500 20	1755 69	1795 70	2124 84	1806 71	1503 59	772 30	1067 42
0 0			702 28	390 15	495 20	264 11	391 16
500 20			1508 60	777 31	1067 42	570 23	448 18
0 0			658 26	367 14	488 19	268 11	370 15
500 20			1359 53	732 29	995 39	562 22	448 18
0 0			433 17	394 16			421 17

Illustration 209

g06364921

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

(mm) (inch)	1000 40		1500 60		2000 80		2500 100		3000 120		3500 140				(mm) (inch)
3800 129															2550 100
2500 100									265 105	240 95			315 124	227 90	3000 120
2000 80									258 102	240 95			302 119	181 71	2430 96
1500 60									207 82	185 73			209 83	171 67	2040 80
1000 40					749 295	497 195	552 217	286 113	454 179	236 93	408 160	179 70	309 121	180 71	2750 108
500 20					986 388	376 148	660 260	288 113	589 231	290 114	496 195	174 69	328 129	156 61	2770 109
250 10					2102 828	814 320	1130 444	605 239	1937 762	869 341	1006 395	275 108	723 284	244 96	2500 100
100 4			567 223	550 217	992 387	382 150	687 269	268 105	518 203	211 83	406 159	179 70	364 143	158 62	2700 106
50 2			1338 527	1181 464	2129 837	781 307	1476 581	581 229	1018 398	455 179	871 341	267 105	802 315	249 98	2500 100
1000 40	792 312	792 312	939 368	552 217	940 368	358 140	652 257	264 103	491 193	207 81	369 145	93 37	362 142	157 62	2550 100
500 20	1755 691	1755 691	2124 835	1185 464	1862 732	772 303	1401 550	578 227	1054 412	447 176			738 289	283 111	2400 95
1000 40					882 343	360 141	679 264	264 103	438 172	207 81			362 142	188 74	2550 100
500 20					1719 673	272 106	1239 483	578 227	382 150	160 63			737 289	415 163	2300 91
1000 40					958 375	387 152	466 183	268 105					378 148	232 91	2810 110
500 20					1399 533	292 114	565 222	268 105					818 321	519 204	2500 100
2000 80					433 169	354 139							451 177	222 87	2500 100

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

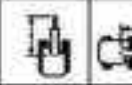
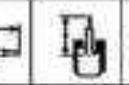
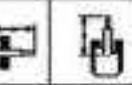
(mm) (inch)	1500 60		2000 80		2500 100		3000 120		3500 140				(mm) (inch)		
															
3000 120													* 400 * 862	* 400 * 862	2318 90
2500 100					* 344 * 768	* 344 * 768							* 403 * 898	* 354 * 797	2918 100
2000 80					* 376 * 832	* 376 * 832	397 853	397 725					346 763	294 654	3270 100
1500 60			* 549 * 1161	* 549 * 1161	* 491 * 1051	* 491 * 1051	392 843	333 735					311 687	264 584	3489 140
1000 40			711 1532	586 1285	504 1088	423 913	384 827	325 700	305 655	258 558			293 648	249 550	3580 150
500 20			683 1471	560 1238	483 1054	409 883	376 810	317 684	301 640	255 549			289 637	245 540	3600 150
0 0			675 1450	552 1188	483 1034	400 863	370 797	311 672	311 286	252 252			296 653	251 553	3520 140
-500 -20			674 1448	552 1187	477 1027	397 857	367 792	309 667					318 702	269 594	3340 140
-1000 -40			679 1458	556 1197	479 1032	399 862	370 802	312					366 812	309 685	3030 100
-1500 -60	* 903 * 997	* 803 * 1807	* 579 * 1224	* 587 * 1220	* 382 * 832	* 382 * 832							* 386 * 852	* 386 * 852	2520 100

Illustration 211

g06364924

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

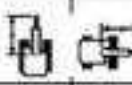
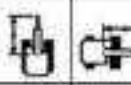
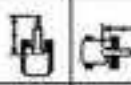
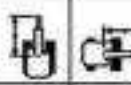
[mm] [inch]	1500 60	2000 80	2500 100	3000 120	3500 140		
							[mm] [inch]
3000 120							* 400 400 2318 * 862 * 862 90
2500 100			* 344 * 344 * 768 * 768				* 403 354 2918 * 898 757 100
2000 80			* 376 * 376 * 420 397 * 832 * 832 * 928 725				* 376 294 1270 * 801 654 100
1500 60		* 549 * 549 * 491 439 * 453 333 * 1161 * 1161 * 1051 946 * 888 716					* 370 264 1489 * 817 594 140
1000 40		* 906 586 * 620 423 * 499 325 * 422 258 * 380 249 1580 * 1915 1265 * 1332 913 * 1080 700 * 902 556 * 836 550 750					
500 20		* 1657 560 * 691 409 * 525 317 * 419 255 * 398 245 1600 * 2180 1288 * 1483 983 * 1032 684 * 838 549 * 827 540 750					
0 0		* 959 532 * 885 480 * 517 311 * 383 252 * 388 251 1520 * 2067 1189 * 1474 963 * 1112 672 * 856 553 140					
-500 20		* 963 552 * 639 397 * 474 309 * 391 249 1340 * 1959 1187 * 1305 857 * 1014 667 * 833 594 140					
-1000 40		* 743 556 * 541 389 * 387 302 * 378 309 1000 * 1592 1157 * 1056 862 * 832 685 100					
-1500 60	* 903 * 903 * 579 587 * 392 * 392 * 1907 * 1907 * 1224 1220						* 386 * 386 2520 * 852 * 852 100

Illustration 212

g06364926

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

Product Information Section
Lifting Capacities

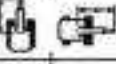
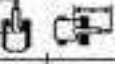
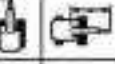
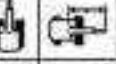
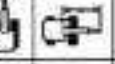
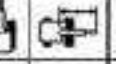
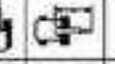
[mm] [inch]	1000 40	1500 60	2000 80	2500 100	3000 120	3500 140		[mm] [inch]
2000 80								2000 80
2500 100					362 14.2	338 13.3		2500 100
3000 120					828 32.6	728 28.6		3000 120
3500 140				281 11.1	281 11.1	260 10.2		3500 140
4000 160				406 16.0	406 16.0	382 15.0	360 14.2	4000 160
4500 180				532 20.9	532 20.9	507 19.9	480 18.9	4500 180
5000 200			720 28.3	594 23.4	505 19.9	424 16.7	382 15.0	5000 200
5500 220			855 33.5	741 29.2	639 25.1	551 21.7	480 18.9	5500 220
6000 240			973 38.3	851 33.5	739 29.1	641 25.2	551 21.7	6000 240
6500 260	808 31.8	808 31.8	668 26.3	546 21.5	478 18.8	385 15.2	337 13.3	6500 260
7000 280	1300 51.2	1300 51.2	947 37.3	806 31.7	704 27.7	587 23.1	504 19.8	7000 280
7500 300	1736 68.3	1736 68.3	1351 53.2	1157 45.5	1012 39.8	854 33.6	732 28.8	7500 300
8000 320			1627 64.1	1405 55.3	1231 48.4	1061 41.7	918 36.1	8000 320
8500 340			1820 71.7	1572 61.9	1373 54.0	1181 46.5	1027 40.4	8500 340
9000 360			2018 79.3	1753 69.0	1537 60.5	1331 52.4	1157 45.5	9000 360
9500 380			2212 87.1	1938 76.2	1701 66.9	1481 58.3	1287 50.7	9500 380
10000 400			2412 94.9	2127 83.7	1865 73.4	1631 64.2	1437 56.6	10000 400
10500 420			2618 102.7	2320 91.3	2029 80.0	1781 70.1	1587 62.5	10500 420
11000 440			2820 110.6	2518 99.1	2193 86.5	1931 76.0	1737 68.4	11000 440
11500 460			3028 118.5	2720 106.9	2357 93.0	2081 82.0	1887 74.3	11500 460
12000 480			3232 126.4	2927 114.8	2521 99.4	2231 88.0	2037 80.2	12000 480
12500 500			3442 134.3	3138 122.8	2685 105.8	2381 94.0	2187 86.1	12500 500
13000 520			3648 142.2	3353 130.8	2849 112.2	2531 100.0	2337 92.0	13000 520
13500 540			3860 150.2	3572 139.0	3013 118.6	2681 105.8	2487 97.9	13500 540
14000 560			4078 158.3	3795 147.8	3177 125.0	2831 111.6	2637 103.8	14000 560
14500 580			4292 166.5	4022 156.8	3341 131.4	2981 117.4	2787 109.7	14500 580
15000 600			4512 175.0	4253 166.3	3505 138.0	3131 123.2	2937 115.6	15000 600
15500 620			4738 184.1	4488 175.9	3669 144.4	3281 129.0	3087 121.5	15500 620
16000 640			4970 193.7	4727 185.7	3833 150.8	3431 135.1	3237 127.4	16000 640
16500 660			5208 203.1	4970 195.7	3997 157.2	3581 141.0	3387 133.3	16500 660
17000 680			5452 212.7	5218 205.8	4161 163.6	3731 146.9	3537 139.2	17000 680
17500 700			5702 222.5	5470 215.7	4325 170.0	3881 152.8	3687 145.1	17500 700
18000 720			5958 232.6	5726 225.8	4489 176.4	4031 158.7	3837 151.0	18000 720
18500 740			6220 243.1	5986 236.1	4653 182.8	4181 164.6	3987 156.9	18500 740
19000 760			6488 253.8	6250 246.8	4817 189.2	4331 170.5	4137 162.8	19000 760
19500 780			6762 264.7	6518 257.8	4981 195.6	4481 176.4	4287 168.7	19500 780
20000 800			7042 275.8	6790 268.9	5145 201.9	4631 182.3	4437 174.6	20000 800

Illustration 213

g06364928

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

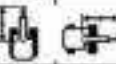
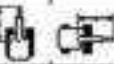
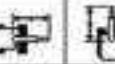
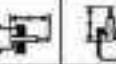
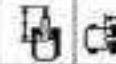
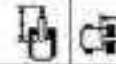
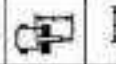
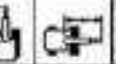
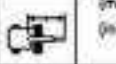
(mm) (inch)	1850 40		2500 63		3000 80		3500 90		4000 120		4500 140				(mm) (inch)
3600 120															2600 100
2500 80									362 14.25	338 13.3			317 12.5	317 12.5	3120 123
2000 63							281 11.0	281 11.0	368 14.5	338 13.3			381 15.0	288 11.3	3450 136
1800 63							630 24.8	630 24.8	900 35.4	727 28.6			665 26.2	588 23.1	3050 120
1600 49						771 30.3	594 23.4	560 22.0	424 16.7	488 19.2	323 12.7	407 16.0	256 10.1	309 12.1	3150 124
1500 49						1628 64.1	1280 50.4	1204 47.4	964 37.9	1013 39.9	636 25.0	683 26.9	552 21.7	690 27.2	2900 114
1400 49						389 15.3	581 22.9	584 23.0	467 18.4	518 20.4	314 12.3	416 16.4	251 9.9	330 13.0	2760 109
1300 49						2185 86.0	1620 63.8	1426 56.1	1078 42.4	1001 39.4	677 26.7	696 27.4	542 21.3	726 28.6	2600 102
1200 49						608 24.0	688 27.1	958 37.7	546 21.5	606 23.9	386 15.2	405 15.9	248 9.8	386 15.2	2300 91
1100 49						1383 54.5	1383 54.5	2123 83.6	1475 58.1	1475 58.1	914 35.9	862 33.9	568 22.3	905 35.6	2100 83
1000 49	808 31.8	908 35.7	961 37.8	879 34.6	907 35.7	542 21.3	648 25.5	381 15.0	489 19.2	303 12.0	366 14.4	246 9.7	362 14.3	245 9.7	1900 75
900 49	1796 70.7	1790 70.5	2172 85.5	1661 65.4	1958 77.1	1067 42.0	1283 50.4	842 33.1	1048 41.2	654 25.7			797 31.4	541 21.3	1740 69
800 49						795 31.3	548 21.6	573 22.5	381 15.0	428 16.8	304 12.0		562 22.1	276 10.9	1620 64
700 49						1793 70.6	1072 42.1	1227 48.3	843 33.1	902 35.5			798 31.4	611 24.1	1500 59
600 49						848 33.4	553 21.8	457 18.0	387 15.2				371 14.6	345 13.6	1380 54
500 49						1376 54.1	891 35.1	965 38.0	557 21.9				821 32.3	771 30.3	1260 50
400 49													431 17.0	421 16.6	1140 45
300 49													877 34.5	877 34.5	1020 40

Illustration 214

g06364934

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

Product Information Section
Lifting Capacities

(mm) (inch)	1500 60		2100 80		2500 100		3000 120		3500 140				(mm) (inch)
													
3000 120											* 395 * 847	* 395 * 847	2260 90
2500 100					* 346 * 794	* 346 * 794					* 406 * 903	* 406 * 903	2680 105
2000 80					* 372 * 823	* 372 * 823	* 419 * 928	379 813			* 377 * 833	333 741	3050 120
1500 60			* 526 * 1164	* 526 * 1164	* 482 * 1044	* 482 * 1044	437 940	373 804			349 772	299 662	3470 140
1000 40			733 1700	658 1421	562 1212	476 1026	428 924	366 788	341 735	282 623	330 727	282 623	3590 140
500 20			764 1644	635 1361	547 1179	461 995	421 907	358 772	337 727	289 622	324 714	277 611	3600 150
0 0			764 1622	622 1340	538 1189	452 975	415 894	352 759	335 735	286 624	331 731	283 624	3530 140
-500 -20			764 1619	622 1338	538 1189	449 967	412 889	350 755			358 783	302 668	3350 140
-1000 -40			* 751 * 1610	626 1347	535 1185	450 971	* 394 852	352			* 378 * 832	345 755	3050 120
-1500 -80	* 921 * 1945	* 921 * 1945	* 591 * 1251	* 591 * 1251	* 405 * 895	* 405 * 895					* 384 * 849	* 384 * 849	2560 100

Illustration 215

g06364822

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

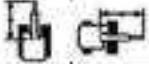
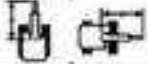
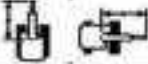
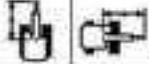
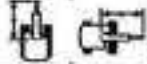
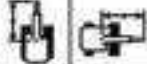
[mm] [inch]	1500 60	2000 80	2500 100	3000 120	3500 140		
							[mm] [inch]
3000 120							* 395 * 395 2260 * 847 * 847 90
2500 100			* 346 * 346 * 794 * 794				* 406 * 406 2680 * 903 * 903 100
2000 80			* 372 * 372 * 823 * 823	* 419 370 * 928 813			* 377 339 3250 * 833 741 130
1500 60		* 528 * 528 * 1194 * 1194	* 482 * 482 * 1044 * 1044	* 451 373 * 983 804			* 370 299 3470 * 816 662 140
1000 40		* 690 658 * 1580 1421	* 614 476 * 1318 1026	* 497 368 * 1075 768	* 422 292 * 902 623		* 379 282 3580 * 834 623 140
500 20			* 689 461 * 1479 995	* 525 358 * 1131 772	* 420 288 * 960 622		* 398 277 3600 * 879 611 150
0 0		* 964 622 * 2070 1340	* 887 452 * 1970 1170	* 518 352 * 1115 759	* 386 284		* 383 283 3590 * 857 624 140
-500 20		* 870 622 * 1973 1338	* 634 449 * 1364 967	* 478 350 * 1022 755			* 381 302 3360 * 840 668 140
-1000 40		* 751 626 * 1630 1247	* 547 450 * 1171 871	* 394 352			* 378 345 3050 * 832 765 100
-1500 60	* 821 * 821 * 1845 * 1845	* 591 * 591 * 1251 * 1251	* 405 * 405				* 384 * 384 2560 * 843 * 843 100

Illustration 216

g06364823

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

Product Information Section
Lifting Capacities

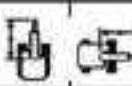
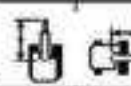
[mm] [inch]	1500 60	2000 80	2500 100	3000 120	3500 140		
							(mm) (inch)
3000 120							395 394 2250 847 847 90
2500 100			345 341 794 733				406 271 2880 803 630 120
2000 80			372 338 823 729	419 254 928 547			377 223 3250 823 437 130
1500 60		526 457 1114 586	482 326 1044 708	437 259 940 539			343 199 3470 772 440 140
1000 40		793 425 1708 919	562 314 1212 678	429 243 924 524	341 193 735 436		339 187 3580 727 412 140
500 20		764 400 1644 806	547 300 1179 649	421 236 907 508	337 190 727 410		324 182 3600 714 402 150
0 0		754 392 1622 847	538 292 1155 631	415 230 894 487	335 188		321 186 3530 731 405 140
-500 -20		754 392 1619 845	534 285 1151 624	412 228 889 482			365 198 3350 782 437 140
-1000 -40		751 385 1610 833	534 281 1155 626	394 230			378 226 3050 832 500 120
-1500 -60	921 623 1945 1341	598 404 1251 873	405 299				384 291 2560 849 653 100

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		2100 80		2500 100		3000 120		3500 140				(mm) (inch)		
															
3000 120											*	395	2260		
											*	847	90		
2500 100					*	346	341				*	406	2271		
					*	784	733				*	803	120		
2000 80					*	372	339	*	419	254		*	377	2050	
					*	823	729	*	928	547		*	820	100	
1500 60			*	526	457	*	482	320	*	451	250		*	370	199
			*	754	396	*	1044	708	*	583	533		*	816	440
1000 40			*	890	425	*	614	394	*	697	243	*	422	193	187
			*	1080	319	*	1310	678	*	1075	524	*	362	416	412
500 20			*	1618	480	*	683	300	*	525	236	*	420	190	182
			*	2179	866	*	1479	649	*	1131	508	*	360	410	402
0 0			*	964	332	*	687	292	*	519	230	*	396	188	186
			*	2070	847	*	1479	631	*	1105	487		*	857	409
-500 -20			*	870	352	*	634	289	*	479	220		*	391	180
			*	1873	845	*	1384	624	*	1022	452		*	840	437
-1000 -40			*	751	335	*	547	281	*	394	220		*	378	226
			*	1610	853	*	1171	628					*	832	360
-1500 -80	*	321	623	*	591	484	*	405	299				*	384	291
	*	1945	1341	*	1251	873							*	848	653

Illustration 218

g06364829

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

Product Information Section
Lifting Capacities

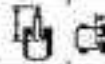
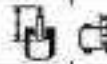
(mm) (inch)	1000 40		1500 60		2000 80		2500 100		3000 120		3500 140				(mm) (inch)
															
3800 129							* 326 * 308						* 348 * 346	* 348 * 346	2550 100
2500 100									* 365 * 365				* 319 * 319	* 319 * 319	3000 120
2000 80									* 742 * 742				* 708 * 708	* 708 * 708	3430 140
1500 60							* 820 * 820	* 820 * 820	* 797 * 797				* 867 * 867	* 867 * 867	3840 150
1000 40							* 897 * 897	* 897 * 897	* 882 * 882	943 379	943 294		* 909 * 909	* 909 * 909	3940 150
500 20					* 749 668	* 652 476	* 552 476	* 427 364	* 339 280	* 280 239	* 239 200		* 200 161	* 161 122	3760 150
250 10					* 1582 1436	* 1186 1027	* 1027 867	* 921 795	* 795 730	* 730 624	* 624 528		* 528 440	* 440 352	3770 150
100 4					* 786 633	* 546 459	* 459 382	* 382 316	* 316 254	* 254 205	* 205 161		* 161 122	* 122 93	3700 150
50 2					* 1049 1364	* 1076 891	* 891 730	* 730 605	* 605 500	* 500 408	* 408 323		* 323 254	* 254 205	3700 150
25 1															
10 0.5					* 567 1338	* 567 1338	* 1610 1320	* 1320 1049	* 1049 865	* 865 750	* 750 618		* 618 500	* 500 408	3700 150
5 0.25					* 793 1755	* 793 1755	* 939 2124	* 939 2124	* 1610 1320	* 1320 1049	* 1049 865		* 865 718	* 718 577	3590 140
2.5 0.125															
1.25 0.0625															
0.625 0.03125															
0.3125 0.015625															
0.15625 0.0078125															
0.078125 0.00390625															
0.0390625 0.001953125															
0.01953125 0.0009765625															
0.009765625 0.00048828125															
0.0048828125 0.000244140625															
0.00244140625 0.0001220703125															
0.001220703125 0.00006103515625															
0.0006103515625 0.000030517578125															
0.00030517578125 0.0000152587890625															
0.000152587890625 0.00000762939453125															
0.0000762939453125 0.000003814697265625															
0.00003814697265625 0.0000019073486328125															
0.000019073486328125 0.00000095367431640625															
0.0000095367431640625 0.000000476837158203125															
0.00000476837158203125 0.0000002384185791015625															
0.000002384185791015625 0.00000011920928955078125															
0.0000011920928955078125 0.000000059604644775390625															
0.00000059604644775390625 0.0000000298023223876953125															
0.000000298023223876953125 0.00000001490116119384765625															
0.0000001490116119384765625 0.000000007450580596923828125															
0.00000007450580596923828125 0.0000000037252902984619140625															
0.000000037252902984619140625 0.00000000186264514923095703125															
0.0000000186264514923095703125 0.000000000931322574615478515625															
0.00000000931322574615478515625 0.0000000004656612873077392578125															
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0.0000000023283064365386962890625 0.000000000116415321826934814453125															
0.00000000116415321826934814453125 0.0000000005820766091346740722265625															
0.0000000005820766091346740722265625 0.00000000029103830456733703611328125															
0.00000000029103830456733703611328125 0.000000000145519152283668518056640625															
0.000000000145519152283668518056640625 0.0000000000727595761418342590283203125															
0.0000000000727595761418342590283203125 0.00000000003637978807091712951416015625															
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0.000000000018189894035458564757080078125 0.0000000000090949470177292823785400390625															
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0.000000000002273736754432070594635009765625 0.0000000000011368683772160352973175048828125															
0.0000000000011368683772160352973175048828125 0.00000000000056843418860801764865875244140625															
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0.000000000000071054273576002206082348440555078125 0.0000000000000355271367880011030411742202775390625															
0.0000000000000355271367880011030411742202775390625 0.0000000000000177635683940005515205871101192578125															
0.0000000000000177635683940005515205871101192578125 0.0000000000000088817841970002757602935555559609375000															

Illustration 219

g06364831

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

(mm) (inch)	1000 40	1500 60	2000 80	2500 100	3000 120	3500 140		
								(mm) (inch)
3000 120				* 326 * 316			* 346 * 346	2850 100
2500 100					* 365 * 365		* 368 * 368	2000 120
2000 80					* 386 * 386		* 382 * 382	1430 140
1500 60				* 620 * 620	* 750 * 732		* 867 * 867	3940 150
1000 40				* 397 * 397	* 460 * 460	* 591 * 591	* 660 * 660	3790 150
800 32			* 748 * 748	* 868 * 868	* 1052 * 1052	* 1264 * 1264	* 1408 * 1408	3790 150
500 20			* 866 * 866	* 1032 * 1032	* 1264 * 1264	* 1508 * 1508	* 1768 * 1768	3770 150
300 12			* 1002 * 1002	* 1184 * 1184	* 1416 * 1416	* 1668 * 1668	* 1936 * 1936	3700 150
200 8		* 597 * 597	* 697 * 697	* 837 * 837	* 1008 * 1008	* 1208 * 1208	* 1436 * 1436	3530 140
100 4	* 792 * 792	* 932 * 932	* 1092 * 1092	* 1282 * 1282	* 1492 * 1492	* 1724 * 1724	* 1976 * 1976	3030 120
500 20	* 1755 * 1755	* 2124 * 2124	* 2518 * 2518	* 2938 * 2938	* 3384 * 3384	* 3956 * 3956	* 4564 * 4564	3030 120
300 12			* 800 * 800	* 938 * 938	* 1092 * 1092	* 1264 * 1264	* 1456 * 1456	2810 110
200 8			* 1030 * 1030	* 1240 * 1240	* 1468 * 1468		* 1716 * 1716	2030 80

Illustration 220

g06364834

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

Product Information Section
Lifting Capacities

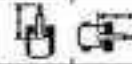
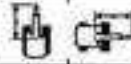
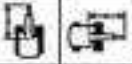
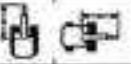
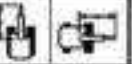
(mm) (inch)	1000 40	1500 60	2000 80	2500 100	3000 120	3500 140			
									(mm) (inch)
2000 80				326	316				244 327 2850 746 748 100
2500 100					365 295 742 545				268 241 2000 768 542 120
2000 80				820	820	258 255 750 547			362 280 3430 882 452 140
1500 60				397 260 864 710	463 249 882 527	943 285 738 410			360 180 3940 880 408 150
1000 40			748 401 1582 932	652 314 1196 616	427 241 921 520	339 181 730 411	266 171 675 378		3790 150
500 20			764 401 1640 888	546 298 1176 645	438 232 900 501	334 180 720 402	301 167 663 360		3770 150
0 0		597 586 1338 1260	749 398 1630 930	533 288 1143 623	410 228 904 487	300 163 712 394	266 170 675 374		3700 150
500 20	780 790 1755 1795	939 588 2124 1285	744 393 1588 825	527 282 1136 609	406 222 875 473	328 181	326 179 718 386		3530 140
1000 40			747 395 1604 829	527 282 1136 609	406 222 875 480		362 261 737 445		3050 130
1500 60			658 382 1358 845	488 268 995 612			370 248 688 554		2810 110
2000 80			433 488				421 461 951 928		2030 90

Illustration 221

g06364839

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

(mm) (inch)	1850 40		2500 80		3000 90		3500 90		4000 120		4500 140				(mm) (inch)
3000 120															2550 100
2500 100									365 14	295 12			319 13	241 10	2100 80
2000 80									358 14	285 11			302 12	203 8	2130 80
1500 60									620 25	547 21			687 27	452 18	2040 80
1000 40									387 15	318 13	483 19	248 10	391 15	308 12	182 7
500 20									864 34	718 28	882 35	537 21	855 34	418 17	560 22
250 10									552 22	314 12	484 19	241 10	408 16	308 12	171 7
150 6									186 7	106 4	136 5	510 20	881 35	678 27	378 15
100 4									388 15	401 16	480 19	238 9	509 20	328 13	167 7
50 2									2102 83	910 36	1110 44	645 25	1097 43	591 23	299 12
25 1									587 23	396 16	687 27	288 11	518 20	226 9	406 16
10 0.4									1308 52	824 33	1476 58	621 25	1085 43	487 19	871 34
5 0.2									792 31	793 31	909 36	588 23	1204 48	585 23	902 36
2.5 0.1									1755 69	1755 69	2104 83	1285 51	1962 77	825 33	1401 55
1.25 0.05									429 17	429 17	519 20	262 10	1054 42	479 19	954 38
0.625 0.025									392 15	395 16	470 19	222 9	962 38	281 11	3280 130
0.3125 0.0125									1719 68	1719 68	2039 81	869 34	363 14	797 31	645 25
0.15625 0.00625									658 26	658 26	782 31	388 15	918 36	248 10	2010 80
0.078125 0.003125									329 13	329 13	395 16	199 8	462 18	118 5	110 4
0.0390625 0.0015625									433 17	433 17	519 20	262 10	962 38	281 11	3280 130

Illustration 222

g06364841

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

Product Information Section
Lifting Capacities

[mm] [inch]	1500 60		2000 80		2500 100		3000 120		3500 140				[mm] [inch]
													
3000 120											* 400 * 862	* 400 * 862	2319 90
2500 100					* 344 * 789	* 344 * 789					* 403 * 895	* 376 * 846	2919 120
2000 80					* 376 * 832	* 376 * 832	* 420 * 907	350 770			368 819	313 696	3270 130
1500 60			* 549 * 1161	* 549 * 1161	* 491 * 1061	465 1003	417 897	353 761			331 733	281 623	3489 140
1000 40			756 1628	622 1343	536 1155	450 970	409 880	346 745	325 710	276 594	313 691	266 587	3589 150
500 20			728 1587	596 1286	521 1123	436 940	400 863	338 729	321 682	272 587	309 680	262 577	3609 160
0 0			719 1546	588 1267	512 1103	427 820	395 851	332 717	309 678	273 594	316 687	268 580	3529 140
-500 20			719 1544	588 1265	509 1094	424 914	392 846	330 712			340 750	287 634	3340 140
-1000 40			723 1554	592 1275	511 1101	426 919	* 387 833	323			* 378 * 832	329 730	3039 120
-1500 60	* 903 * 1907	* 903 * 1907	* 879 * 1224	* 879 * 1224	* 882 * 1924	* 882 * 1924					* 386 * 852	* 386 * 852	2520 100

Illustration 223

g06364849

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

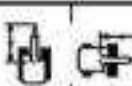
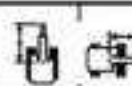
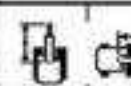
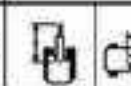
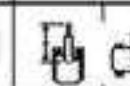
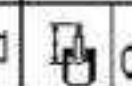
(mm) (inch)	1500 60	2100 80	2500 100	3000 120	3500 140		(mm) (inch)
							
3000 120						* 400 * 400	2310 90
2500 100			* 344 * 344 * 788 * 788			* 403 * 378 * 895 * 846	2310 120
2000 80			* 376 * 376 * 832 * 832	* 420 * 420 * 929 * 929	358 770	* 376 * 310 * 821 * 696	3270 130
1500 60		* 549 * 549 * 1261 * 1151	* 491 * 465 * 1061 * 900	* 453 * 353 * 988 * 761		* 370 * 281 * 817 * 623	3480 140
1000 40		* 906 * 622 * 1915 * 1343	* 620 * 450 * 1332 * 970	* 488 * 346 * 1080 * 745	* 422 * 276 * 962 * 594	* 380 * 266 * 838 * 587	3590 150
500 20			* 691 * 438 * 1483 * 940	* 525 * 339 * 1032 * 729	* 409 * 272 * 888 * 587	* 399 * 262 * 877 * 577	3600 150
0 0		* 959 * 588 * 2067 * 1267	* 685 * 427 * 1474 * 920	* 517 * 332 * 1012 * 717	* 393 * 279	* 388 * 268 * 856 * 590	3520 140
-500 20		* 963 * 588 * 1959 * 1265	* 639 * 424 * 1355 * 914	* 474 * 330 * 1014 * 712		* 381 * 287 * 839 * 634	3340 140
-1000 40		* 743 * 592 * 1532 * 1275	* 541 * 428 * 1055 * 809	* 387 * 333		* 378 * 329 * 832 * 730	3030 120
-1500 60	* 980 * 1907	* 803 * 1907	* 579 * 1224 * 579 * 1224	* 392 * 392		* 386 * 386 * 852 * 852	2520 100

Illustration 224

g06364853

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

Product Information Section
Lifting Capacities

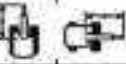
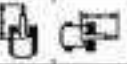
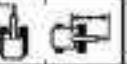
(mm) (inch)	1000 40	1500 60	2000 80	2500 100	3000 120	3500 140		(mm) (inch)
3800 129								3500 100
2500 100					362 358	828 770	317 764	3120 130
2000 80				281 630	281 630	348 889	281 685	3450 140
1500 60				406 882	446 862	497 889	390 700	3600 150
1000 40			784 1628	630 1358	537 1157	480 977	344 741	3750 150
500 20			728 1559	597 1280	520 1120	434 935	398 857	3760 150
0 0		608 1383	688 1383	713 1533	582 1254	422 900	396 841	3690 150
-500 -20	468 1736	808 1790	961 2372	916 2084	799 1523	579 1245	502 1081	3520 140
-1000 -40				712 1528	591 1250	492 1062	417 868	3230 130
-1500 -60			848 1376	589 1269	457 965	423 944		2780 110
-2000 -80							431 977	1960 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.

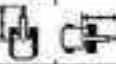
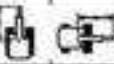
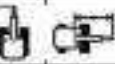
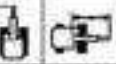
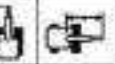
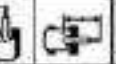
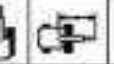
(mm) (inch)	1000 40	1500 60	2000 80	2500 100	3000 120	3500 140		(mm) (inch)
3800 129								3500 100
2500 100					362 358			317 130
2000 80				281 281	348 359			281 345
1500 60				406 406	487 487	391 391	278 278	309 309
1000 40			771 829	620 1250	560 1204	468 911	344 741	407 603
500 20			398 205	597 1290	664 1426	434 915	375 722	436 678
0 0		608 1383	688 1383	988 2123	582 1254	686 1475	422 911	517 707
-500 -20	468 1736	808 1790	961 2172	906 2084	997 1950	579 1245	648 1393	417 689
-1000 -40				798 1793	891 1250	673 1227	417 860	425 952
-1500 -60				848 1376	589 1269	457 965	423 964	
-2000 -80								

Illustration 226

g06364879

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

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.

仕様項目		単位	値
総重量	kg		
定格出力	kW		
仕場	標準仕様		付随する部品は別添付書類に記載する。
機械重量	kg		
平均燃費	kg/h		
バックホウ容量	m³		
バックホウ質量	kg		
最大掘削質量 (1斗バックホウ)	kg		
エンジン最大出力	kW		
エンジン最大トルク	kgm		
エンジン最大回転数	rpm		

この仕様書は、本機の仕様を記載するためのものです。本機の仕様は、本機の型式によって異なります。本機の仕様は、本機の型式によって異なります。本機の仕様は、本機の型式によって異なります。

キャタピラー・ジャパン合同会社

Illustration 230

g06178867

Typical example

Electromagnetic Emissions

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



Illustration 231

g06063443

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

Engine Serial Number

This label is on the engine.

Engine Serial Number _____

Sound Certification

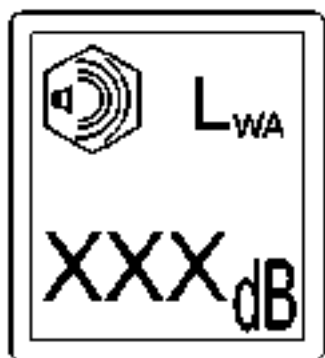


Illustration 232

g06675270

Sound certification film

A typical example of this film is shown.

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

- “ISO 6395:1988”

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



Illustration 233

g03105800

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

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

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

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

i08085827

Emissions Certification Film

SMCS Code: 1000; 7000; 7405

Consult your Cat dealer for an Emission Control Warranty Statement.

The emission certification film is on the engine.

Declaration of Conformity (European Union)

SMCS Code: 1000; 7000

Table 22

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

ORIGINAL EU DECLARATION OF CONFORMITY

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

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

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

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

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

Fulfills all the relevant provisions of the following Directives

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

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

Done at:

Signature

Date:

Name/Position

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

Declaration of Conformity (Great Britain)

SMCS Code: 1000; 7000

Table 23

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

DECLARATION OF CONFORMITY

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

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

Standards & Regulations Manager Caterpillar France SAS
40 Avenue Leon-Blum 38000 Grenoble, France

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

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

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

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

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

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

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

Done at:

Signature

Date:

Name/Position

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

Operation Section

Before Operation

i07243772

Mounting and Dismounting

SMCS Code: 6700; 7000

Illustration 234

g06263389



Illustration 235

g06265035

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

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

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

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

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

Machine Access System Specifications

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

i04555675

Daily Inspection

SMCS Code: 1000; 6319; 6700; 7000

NOTICE

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

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

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

Inspect the following additional components:

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

Operation Section
Daily Inspection

- the connecting joints
- the hydraulic fittings

Correct any leaks in the hydraulic system.

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

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

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

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

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

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

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

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

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

Inspect the exhaust system for loose connections or loose clamps.

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

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

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

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

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

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

Inspect the operator station for the following conditions:

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

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

Machine Operation

i07286539

Alternate Exit

SMCS Code: 7310

WARNING

Warning of personal injury.

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

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

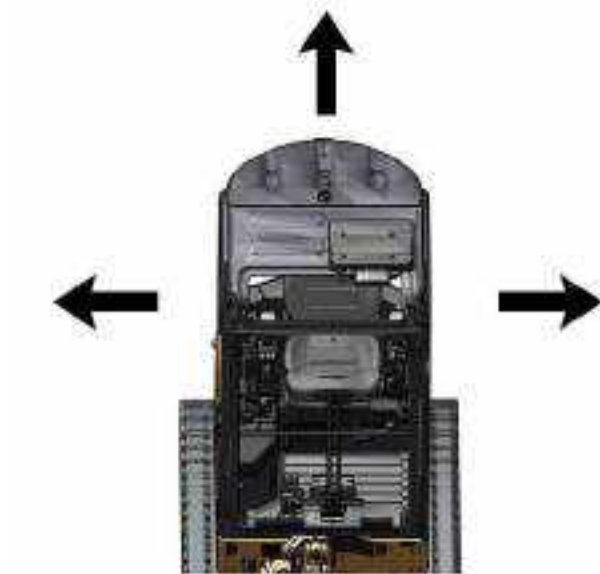


Illustration 236

g06274656



Illustration 237

g06265220



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

i07242599

Seat

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

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

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



Illustration 238

g06263293

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



Illustration 239

g06263299

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

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

i07092308

Seat Belt

SMCS Code: 7327

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

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

Seat Belt Adjustment for Retractable Seat Belts

Fastening The Seat Belt



Illustration 240

g06223891

Pull seat belt (2) out of retractor (1) in a continuous motion.

Fasten seat belt catch (3) into buckle (4). Make sure that the seat belt is placed low across the lap of the operator.

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

Releasing The Seat Belt



Illustration 241

g06223894

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

Extension of the Seat Belt

WARNING

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

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

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

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

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

i08709739

Operator Controls

SMCS Code: 7300; 7301; 7451

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

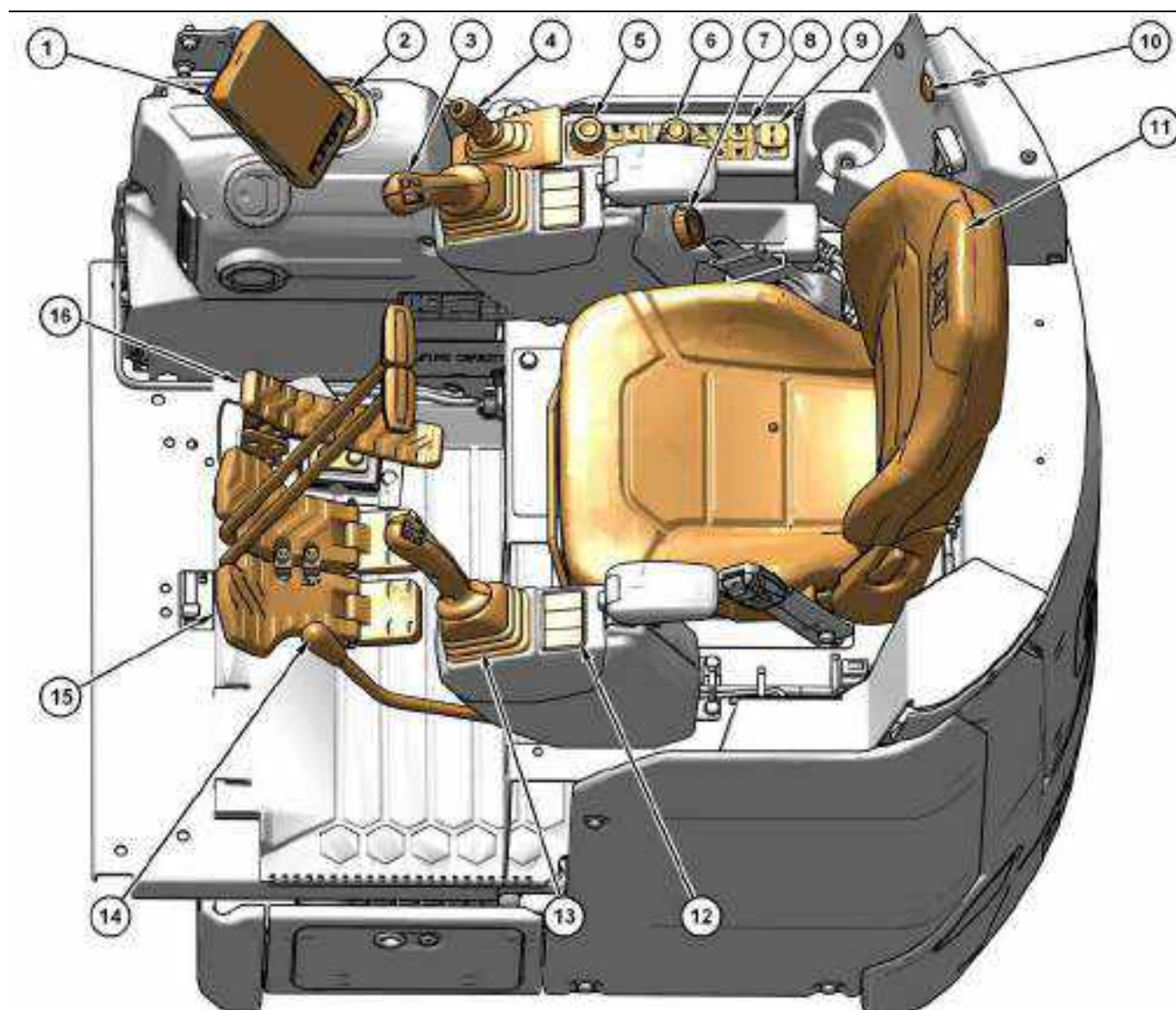


Illustration 242

g06262907

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

Monitoring System (1)

Monitor – Monitor (1) is used to display various operating information of the machine. For more information on the operation of monitor (1), refer to “Monitoring System” for more information.

Air Outlet (2)

Adjust the air outlet direction, if equipped, with air conditioning system.

Right Joystick Controls (3)

The joystick controls are used to control the functions of the machine. For more information on the individual functions of the joysticks, refer to “Joystick Controls”.

Dozer Blade Lever / Adjustable Undercarriage Control (4)



Float – Push the lever fully forward. The blade will lower to the ground. The blade will float with the contour of the ground.

The lever will return to the HOLD position.



Lower – Push lever (4) forward to lower the blade. The lever will return to the HOLD position when you release the lever.

The blade will remain in the selected position.

Hold – Lever (4) will return to the HOLD position when the lever is released from the RAISED or LOWERED position.



Raise – Pull lever (4) backward to raise the blade. The lever will return to the HOLD position when you release the lever.

The blade will remain in the selected position.

Travel Speed Control (4A)



Illustration 243

g06262962

The high-speed travel switch is on the blade control lever. Use the switch to change the travel speed.

Push the switch to the high-speed position to make the machine travel in high speed. The rabbit travel speed icon will illuminate on the monitor when the machine is in the high-speed mode.

Push the switch again to return to low speed.

Always travel at slow speeds on slopes and rough ground.

Jog Dial (5)

Jog Dial – Turn jog dial (4) to choose the desired item in the monitor and depress jog dial (4) to activate the selection. Refer to “Joystick Controls” for more information.

Engine Speed Dial (6)

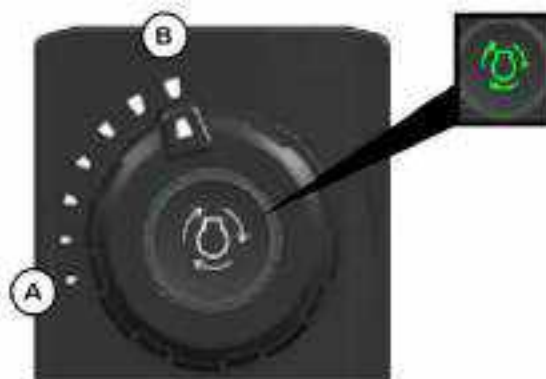


Illustration 244

g06345901

(A) Low engine idle
(B) High engine idle

Turn engine speed dial (5) to control the engine speed (engine rpm). Select desired position from the seven positions that are available. Turn engine speed dial (5) counterclockwise to decrease the engine speed (engine rpm). Turn engine speed dial (5) clockwise to increase the engine speed (engine rpm).

Low Engine Idle (A) – The engine operates in the low rpm range.

High Engine Idle (B) – The engine operates in the high rpm range.

Pressing the center of the engine speed dial can change the engine operation mode from “Power On Demand” mode to “Standard” mode (if equipped). A green illuminator on the center of the throttle dial indicates if the “Power On Demand” mode is active.

In addition to the green illuminator on the dial, a "SMART" Mode indicator, which is the indicator for "Power On Demand", will illuminate on the monitor. When the machine is in "Standard" Mode, the "Power On Demand" Mode indicator will not be illuminated on the monitor.

The default state of "Power On Demand" at key on can be changed in Cat® Electronic Technician (ET) by changing The Engine Speed Power Mode Power Up Default Configuration. Three settings are available:

ON – Will always default to the ON position when the key is turned on (this is the default state from the factory). Power on demand can be cycled ON or OFF by pressing the center of the engine speed dial.

OFF – Will always default to the OFF position when the key is turned on. Power on demand can be cycled ON or OFF by pressing the center of the engine speed dial.

ALWAYS ON – Forced to ON position all the time, pressing the center of the engine speed dial does nothing.

Note: Some machines may prohibit toggling of the "Power On Demand" mode.

Engine Start Switch (7)

NOTICE

The engine start switch must be in the ON position and the engine must be running in order to maintain electrical functions and hydraulic functions. This procedure must be followed in order to prevent serious machine damage.

Note: Always place the hydraulic lockout lever in the **RAISED** position while starting the engine. Engine start switch (8) will not function if the left hydraulic control is in the **LOWERED** position.

Key Switch (If Equipped)

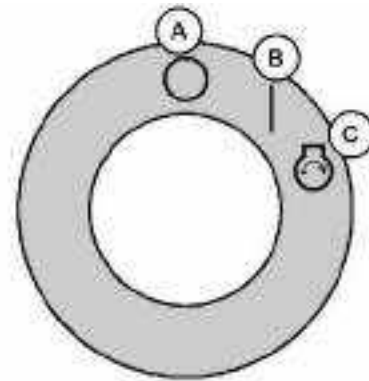


Illustration 245

g06657692

- (A) OFF position
- (B) ON position
- (C) Start position



OFF – Insert the engine start switch key only while engine start switch (8) is in the OFF position (A). Remove the engine start switch key only while engine start switch (8) is in the OFF position (A). Turn engine start switch (8) to the OFF position (A) before the operator attempts to restart the engine. Turn engine start switch (8) to the OFF position to stop the engine (A). Refer to "Stopping the Engine" for more information.



ON – To activate the electrical circuits in the cab, turn the key clockwise to the ON position (B). Refer to "Engine Starting" for more information.



START – To start the tractor engine, turn the key clockwise to the START position (C). After the engine starts, release the key. The key will return to the ON position (B).

Note: If the engine fails to start, return engine start switch key to the OFF position (A). Return the engine start key to the start position before the operator attempts to start the engine again.

Refer to "Engine Starting" for more information.

Push to Start (If Equipped)

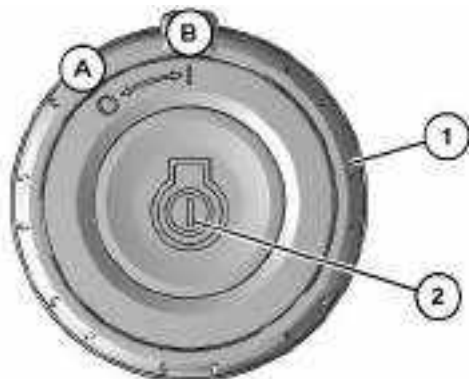


Illustration 246

g06180554

- (A) Off
(B) On
(1) Engine start ring
(2) Start button

Note: The Bluetooth key must be inside the cab to activate the electrical circuits.



OFF – Turn engine start ring (1) to the OFF position (A) to stop the engine. Refer to “Stopping the Engine” for more information.



ON – To activate the electrical circuits in the cab and enable engine starting, turn the engine start ring (1) clockwise to the ON position (B). Refer to “Engine Starting” for more information.



START – To start the engine, enter pass code in the monitor (only required if machine security is enabled). Press start button (2). After the engine starts, release the button. Refer to “Engine Starting” for more information.

Push to Start with Bluetooth Key Fob

If the machine is equipped with push to start and the Bluetooth key fob system, the machine will attempt to detect a Bluetooth key fob when the machine is turned on. If an authorized key fob is detected, the display will immediately proceed to the home screen and the engine will be allowed to start.

Note: the Bluetooth key can be detected when it is outside the cab if it is in close proximity to the machine. Ensure the Bluetooth key is in a sufficient distance from the machine when not in use to prevent unauthorized access to the machine.

Note: The Bluetooth key fob features a sleep mode to preserve battery life. If the key detects no movement for 90 seconds, it will go into sleep mode and stop communicating. While in sleep mode, it cannot be used to access a machine. The Bluetooth key will exit sleep mode and begin communicating after movement of the key is detected. When not in sleep mode, the Bluetooth key communicates every 5 seconds.

Note: If multiple key fobs are present, the first valid key fob detected by the transceiver will be read. If the machine is not able to detect a key fob when it is turned on, the display will prompt the user to enter a 4-digit numerical passcode.

If the voltage of the Bluetooth key fob used to access the machine is low (below 2.5V), a pop-up message will appear on the display indicating the low battery condition and recommend battery replacement. If this message appears, replace the battery within the Bluetooth key fob to ensure proper functionality of the key.



Illustration 247

g06752121

Right Switch Panel (8)



Illustration 248

g06757495

Heating Ventilation Air Conditioning (HVAC) Control Button (8A) (If Equipped)

Pressing this button will navigate the monitor to display the relevant screen for HVAC controls. The air conditioner provides comfort for the operator that is working under various temperature conditions. When the LED is lit, the HVAC is ON.

Display Menu Shortcut Button (8B) (If Equipped)

Press the button to return to the previous menu in the monitor.

Work Light Control Button (8C)



Lights – Push the switch to turn on the work lights. Push the switch again to turn off the work lights.

Window Washer (8D)



Window Washer (12) – Push the button to activate the window washer. The LED will illuminate while window washer control button (8D) is pressed. Two wiper cycles will be completed after releasing window washer control button (8D).

NOTICE

If the wiper does not operate with the switch in the ON position, turn the switch off immediately. Check the cause. If the switch remains on, motor failure can result.

NOTICE

If the washer is used continuously for more than 20 seconds or used when no washer solution comes out, motor failure can result.

Travel Alarm Cancel (8E)



Travel Alarm Cancel – LED will illuminate while travel alarm is canceled. Travel alarm cancel control button (8E) must be pressed every time travel command is initiated to mute the travel alarm.

Note: The travel alarm will sound when the travel levers or the travel pedals are activated.

Radio Button (8F) (If Equipped)

Pressing radio control button (8F) will navigate the monitor to display the relevant screen for radio controls. Refer to Operation and Maintenance Manual, “Radio” for more information.

Home Button (8G) (If Equipped)

Press the button to return back to the home menu on the monitor.

Overload Warning ON and OFF Control Button (8H)



Overload Warning Device – If equipped with Overload Warning, this button (8H) functions as the ON or OFF button for that feature. When ON, the overload warning system activates if the boom pressure exceeds a threshold.

ON – When the LED is illuminated, the overload warning feature is ON.

OFF – When the LED is OFF, the overload warning feature is OFF.

Window Wiper (8J)



Window Wiper – Pressing window wiper control button (8J) once turns the wiper ON with a 6 second delay. Pressing window wiper control button (8J) again changes the delay to 3 seconds. Pressing window wiper control button (8J) again turns on the wiper continuously. Pressing window wiper control button (8J) again turns OFF the wiper.

- No LED : - Wipers are OFF
- 1 LED : 6 second intermittent delay
- 2 LED : 3 second intermittent delay
- 3 LED : Full ON

Radio Mute Switch (8K)



Radio Mute Switch – If equipped, press the switch to mute the radio. The indicator lamp will turn on.

USB Port (9) (If Equipped)

The USB port is available to charge compatible electronic devices.

Note: The port is for charging purposes only.

Power Outlet (10)

A 12V power receptacle is located next to the rear side of the seat. The power receptacle can be used for powering automotive electrical equipment or accessories. Raise the cap to use.

Operators Seat (11)

The operators seat has various adjustments to meet a wide range of operators. For more information, refer to "Seat".

Adjustable Undercarriage Switch (12)

If equipped, switch (12) determines which function lever (4) controls.

Note: Before operating the dozer blade lever, refer to "Dozer Blade Lever / Adjustable Undercarriage Control (4)".

When switch (12) is pushed to the bottom position, lever (4) will control the adjustable undercarriage functions.

When switch (12) is pushed to the top position, lever (4) will control the dozer blade functions.

Left Joystick Controls (13)

The joystick controls are used to control the functions of the machine. For more information on the individual functions of the joysticks, refer to "Joystick Controls".

Hydraulic Lockout Control (14)



WARNING

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

Personal injury or death may occur from sudden machine movement.



Locked – Place the hydraulic lockout control in the RAISED position to deactivate the hydraulic controls.

Make sure that the hydraulic lockout control is in the RAISED position before you exit the machine.

Note: Always put the left hydraulic lockout control in the RAISED position before starting the engine. The engine start switch will not function if the left hydraulic control is in the LOWERED position.



Unlocked – Place the hydraulic lockout control in the LOWERED position. When the hydraulic lockout control is in the LOWERED position, the hydraulic controls are operable.

Note: The hydraulic controls will only function if the joystick levers are centered when the implements are UNLOCKED. If the joystick levers are not centered when the hydraulic controls are switched from LOCKED to UNLOCKED, the hydraulic circuit associated with the lever out of center will be disabled until the joystick lever is centered.

Travel Lever Controls (If Equipped) (15)

Note: Normal steering occurs when the operator station is facing the blade. The travel lever information given below is for when the blade is in front of the operator station. Reverse steering occurs when the blade is behind the operator station. The directional functions and the steering will be reversed.

When you travel, make sure that the blade is in front of the operator station.

When the travel levers/pedals are moved in the forward direction, the machine will always travel toward the blade. When the travel levers/pedals are moved in the reverse direction, the machine will always travel away from the blade.

If you move a travel lever/pedal farther in the forward direction, the forward travel speed will increase. If you move a travel lever/pedal farther in a backward direction, the reverse travel speed will increase.

Stop – Release the travel levers/pedals to stop the machine. When you release the travel levers/pedals from any position, the travel levers/pedals will return to the CENTER position. The travel brakes will be applied.

Move both of the travel levers equally in the same direction to travel in a straight line.

Note: In steep downhill operation, carefully operate the travel levers.

This machine is also equipped with a joystick steer mode. The left joystick can be used in the same manner as the left and the right travel levers/pedals. Refer to “Joystick Controls” for more information.

Right Travel Lever/Pedal

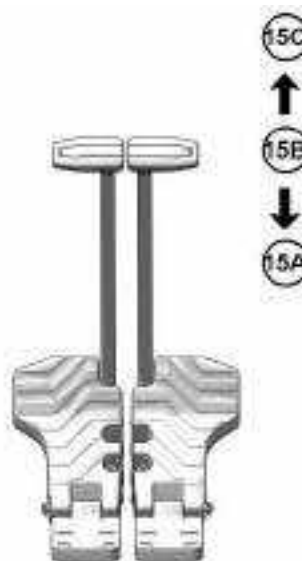


Illustration 249

g06263062

REVERSE (15A) – Move the right travel lever backward to operate the right track in a reverse direction.

STOP (15B) – Release the right travel lever to stop the right track.

FORWARD (15C) – Move the right travel lever forward to operate the right track in a forward direction.

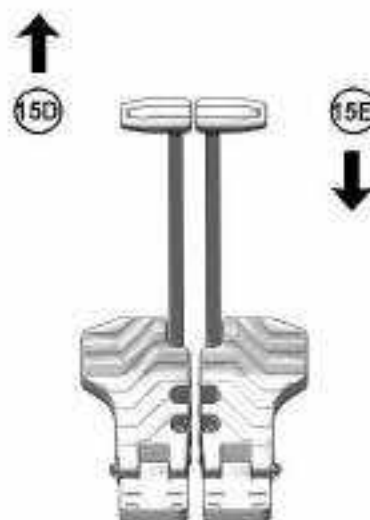


Illustration 250

g06263065

Spot Right Turn – Move the right travel lever (15E) backward. Move the left travel lever (15D) forward at

the same time. This method will turn the machine quickly to the right.

Pivot Right Turn – Move the left travel lever (15E) forward. This method will turn the machine to the right.

Left Travel Lever

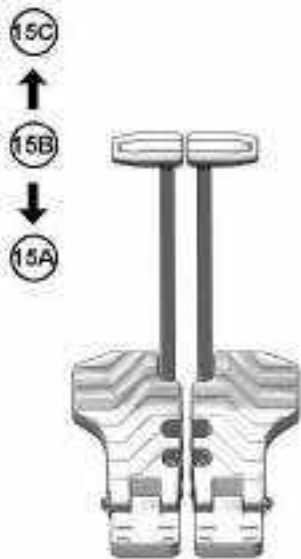


Illustration 251

g06263067

REVERSE (15A) – Move the left travel lever backward to operate the left track in a reverse direction.

STOP (15B) – Release the left travel lever to stop the left track.

FORWARD (15C) – Move the left travel lever forward to operate the left track in a forward direction.

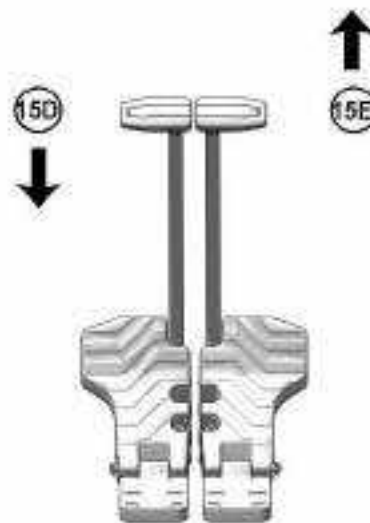


Illustration 252

g06263066

Spot Left Turn – Move the left travel lever (15D) backward. Move the right travel lever (15E) forward at the same time. This method will turn the machine quickly to the left.

Pivot Left Turn – Move the right travel lever (15E) forward. This method will turn the machine to the left.

Auxiliary Control Pedal (If Equipped) (16)

The auxiliary control pedal is used to control the work tools. For more information on the auxiliary controls, refer to "Work Tool Control".

i08265397

Cab Dome Light

SMCS Code: 1433



Illustration 253

g06466796

Dome light in the COURTESY LIGHT position

The cab dome light is located inside the cab above the door.

The lens of the lamp is a three-position switch.



Illustration 254

g06466801

Dome light in the ON position

When the front of the lamp is pressed upward, the lamp will be in the ON position.

When the rear of the lamp is pressed upward, the lamp will be in the OFF position.

When the lamp is in the middle (horizontal position), the lamp will be in the COURTESY LIGHT position.

The courtesy light allows the machine lighting to stay ON for a configurable (0 to 100 seconds) period of time after turning the key switch OFF.



Illustration 255

g06466812

Right switch panel

Note: For the lamp to illuminate in the COURTESY LIGHT position, work light switch (1) must be in an ON position, when the key is switched to OFF.

i08718859

Battery Disconnect Switch

SMCS Code: 1411-B11

NOTICE

Never move the battery disconnect switch to the OFF position while the engine is operating. Serious damage to the electrical system could result.



Illustration 256

g06756719

Some components removed for better clarity

(1) Access cover

Open access cover (1) on left side of the machine. Refer to "Access Door and Cover Locations" for more information.

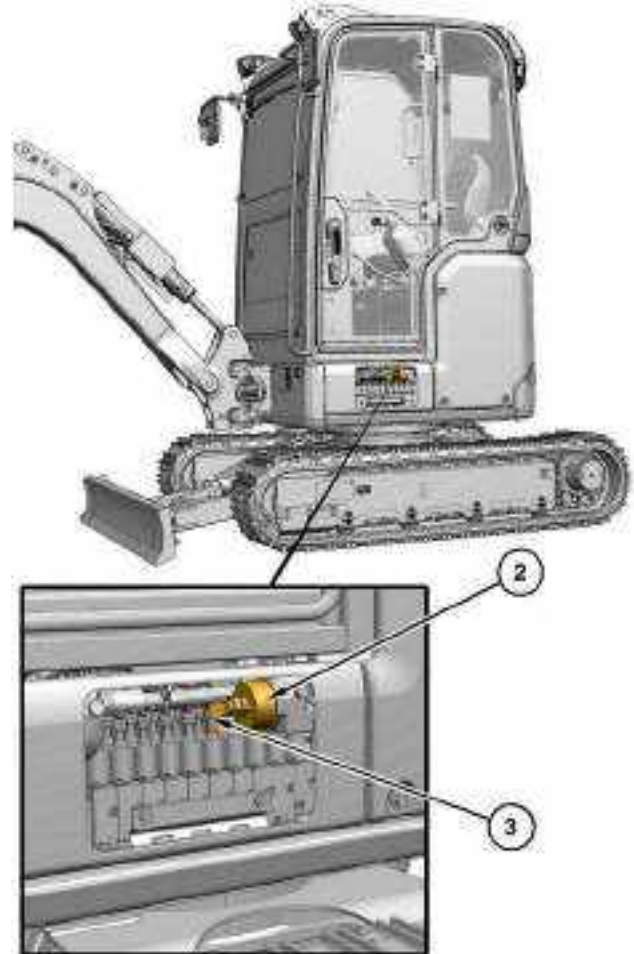


Illustration 257

g06756722

Some components removed for better clarity

(2) Battery disconnect switch

(3) Key

Battery disconnect switch (2) is on the left side of the machine behind access cover (1).



Battery Disconnect Switch – Battery disconnect switch (2) can be used to disconnect the battery from the machine electrical system. Key (3) must be inserted into battery disconnect switch (2) before battery disconnect switch (2) can be turned to ON position.



ON – To activate the electrical system, insert key (3) and turn battery disconnect switch (2) clockwise to ON position. Battery disconnect switch (2) must be turned to ON position to enable battery power to start the engine.



OFF – To deactivate the electrical system, turn battery disconnect switch (2) counterclockwise to OFF position.

Battery disconnect switch (2) and the engine start switch perform different functions. The entire electrical system is disabled when battery disconnect switch (2) turned to OFF position. The battery remains connected to the electrical system when engine start switch is turned to OFF position.

Turn battery disconnect switch (2) to OFF position and remove key (3), when the electrical system or any other machine components are serviced.

Turn battery disconnect switch (2) to OFF position and remove key (3), if the machine is not operated for a month. Turning OFF battery disconnect switch (2) will prevent the battery from being discharged.

The following problems can cause battery to discharge:

- short circuits
- current drawn via some components
- vandalism

Note: If the machine is equipped with Cat[®]Product Link[™], turning battery disconnect switch (2) to OFF position will remove power from the Cat[®]Product Link[™] module. The Cat[®]Product Link[™] module will not be able to communicate due to power unavailability.

Close access cover (1) on left side of the machine. Refer to “Access Door and Cover Locations” for more information.

i08001446

Product Link

SMCS Code: 7490; 7606

Note: Your machine may be equipped with the Cat[®]Product Link[™] system.

The Cat Product Link communication device utilizes cellular and/or satellite technology to communicate equipment information. This information is communicated to Caterpillar, Cat dealers, and Caterpillar customers. The Cat Product Link communication device uses Global Positioning System (GPS) satellite receivers.

The capability of two-way communication between the equipment and a remote user is available with the Cat Product Link communication device. The remote user can be a dealer or a customer.

Data Broadcasts

Data concerning this machine, the condition of the machine, and the operation of the machine is being transmitted by Cat Product Link to Caterpillar and/or Cat dealers. The data is used to serve the customer better and to improve upon Cat products and services. The information transmitted may include: machine serial number, machine location, and operational data, including but not limited to: fault codes, emissions data, fuel usage, service meter hours, software, and hardware version numbers and installed attachments.

Caterpillar and/or Cat dealers may use this information for various purposes. Refer to the following list for possible uses:

- Providing services to the customer and/or the machine
- Checking or maintaining Cat[®]Product Link equipment
- Monitoring the health of the machine or performance
- Helping maintain the machine and/or improve the efficiency of the machine
- Evaluating or improving Cat[®]products and services
- Complying with legal requirements and valid court orders
- Performing market research
- Offering the customer new products and services

Caterpillar may share some or all the collected information with Caterpillar affiliated companies, dealers, and authorized representatives. Caterpillar will not sell or rent collected information to any other third party and will exercise reasonable efforts to keep the information secure. Caterpillar recognizes and respects customer privacy. For more information, please contact your local Cat dealer.

Operation in a Blast Site for Product Link Radios

WARNING

This equipment is equipped with a Cat® Product Link communication device. When electric detonators are being used for blasting operations, radio frequency devices can cause interference with electric detonators for blasting operations which can result in serious injury or death. The Product Link communication device should be deactivated within the distance mandated under all applicable national or local regulatory requirements. In the absence of any regulatory requirements Caterpillar recommends the end user perform their own risk assessment to determine safe operating distance.

Refer to your products Operation and Maintenance Manual Supplement, "Regulatory Compliance Information" for more information.

For information regarding the methods to disable the Cat Product Link communication device, please refer to your specific Cat Product Link manual listed below:

- Operation and Maintenance Manual, SEBU8142, "Product Link - PL121, PL321, PL522, and PL523"
- Operation and Maintenance Manual, SEBU8832, "Product Link PLE702, PLE602, PLE601, PL641, PL631, PL542, PL240, PL241, PL243, PL141, PL131, PL161, PL083 and PL042 Systems"

Note: If no radio disable switch is installed and the equipment will be operating near a blast zone, a Product Link radio disable switch may be installed on the equipment. The switch will allow the Cat Product Link communication device to be shut off by the operator from the equipment control panel. For more details and installation procedures, refer to the following:

- Special Instruction, REHS7339, "Installation Procedure for Product Link PLE640 Systems"
- Special Instruction, REHS8850, "Installation Procedure for the Elite Product Link PLE601, PLE641, and PLE631 Systems"
- Special Instruction, SEHS0377, "Installation Procedure for the Product Link PL131, PL141, and PL161 Systems"

- Special Instruction, REHS9111, "Installation Procedure for the Pro Product Link PL641 and PL631 Systems"
- Special Instruction, M0098124, "Installation Procedure for Pro Product Link PL243 Systems"
- Special Instruction, M0109130, "Installation Procedure for Product Link PL683 and PL783 Systems"

i08258164

Machine Security System (MSS)

SMCS Code: 7631

General Information

NOTICE

This machine is equipped with a Cat® Machine Security System (MSS) that is designed to restrict operation of the machine. The system can be enabled or disabled, unless the machine is equipped with the optional push to start system. If equipped with the push to start system, machine security will always be enabled. Machines equipped with "push to start", also feature the Cat Bluetooth® key fob entry system.

Any user may start the engine and operate the machine if the security system has been disabled.



Illustration 258

g06223917

Machines that are equipped with Cat MSS can be identified by a decal in the operator station. Read the following information and know your machine settings. Your Cat dealer can identify your machine settings.

The Cat Machine Security System (MSS) discourages unwanted operation of a machine. When armed, the MSS requires operator login to start the engine. The following methods of operator login to disarm the security system are available:

- Cat Bluetooth® key fob
- Cat myEquipment mobile application

- Passcode

Components

The Machine Security System (MSS) consists of the following components:

- Engine start switch
- Electronic Control Module (ECM)
- Machine display
- Optional Cat Bluetooth key fob (CATBTFOB)
- Optional Bluetooth transceiver module (CATBTNT)

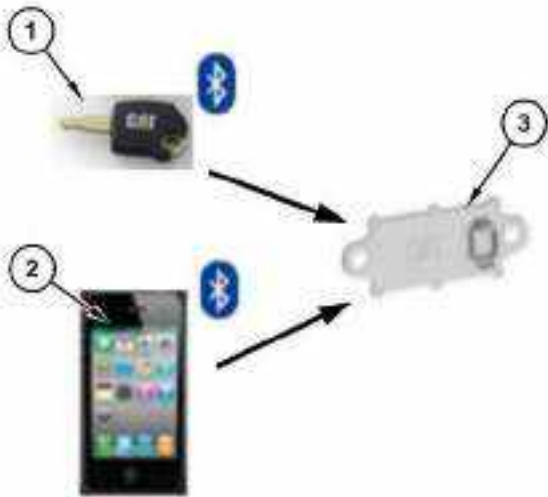


Illustration 259

g06212167

Bluetooth Connections

- (1) Cat Bluetooth key fob (CATBTFOB)
- (2) Smart phone application
- (3) Cat Bluetooth transceiver (CATBTNT)

The Cat Bluetooth key fob (1) contains an electronic chip. The electronic chip has a unique identification number (ID). A Bluetooth transceiver is mounted in the cab to read the ID of the key. The Bluetooth transceiver module translates the information received from the key fob into a J1939 message. This message is sent to the Electronic Control Module (ECM) that is connected to the MSS. The ECM is typically the Machine ECM. The ECM is set up with the ID of the keys of the intended users.

When the MSS is armed, the ECM validates the ID of the key fob. If the key ID is on the list of authorized keys in the ECM and the key is valid, the machine will operate normally. If the key ID is not on the list of authorized keys in the ECM or is not valid, the MSS will keep the critical machine functions disabled.

If the MSS is not enabled, the operator can skip the login and the machine will operate normally.

Standard Key

The machine security can be enabled or disabled using the Cat[®] Electronic Technician (Cat ET) Service Tool or within the display security settings screen (password protected). A master level access passcode must have been used to access the machine security settings in the display. If a standard level passcode was used, the user will be prompted to enter a master level passcode when accessing the machine security passcode screen.

If machine security is enabled, the display will prompt the user to enter a 4-digit numerical passcode when the machine is turned on. Prior to entering an authorized passcode, the engine starter will be disabled and you will not be allowed to proceed to the display home screen. After an authorized passcode has been entered, the display will proceed to the home screen and the engine will be allowed to start.

When turning off the key, the display will prompt the user to select between three options:

- Lock Now – Enables machine security 30 seconds after selected, will have to reenter passcode next time the machine is turned on.
- Wait XX Min – Waits the specified period of time (grace period) to enable machine security, will not have to reenter the passcode if machine is turned back on within the stated time.
- Unlimited – Does not enable machine security, will not have to reenter passcode the next time the machine is turned on.

Note: Selecting unlimited does not permanently disable machine security. The user will be prompted with the same three option above the next time the machine is turned on then back off.

The grace period can be adjusted within the display security settings screen (password protected). The time can be adjusted from 1 to 60 minutes.

Push to Start with Bluetooth Key Fob

If the machine is equipped with push to start and the Bluetooth key fob system, the machine will attempt to detect a Bluetooth key fob when the machine is turned on. If an authorized key fob is detected, the display will immediately proceed to the home screen and the engine will be allowed to start.

Note: The bluetooth key can be detected when it is outside the cab if it is in close proximity to the machine. Ensure the bluetooth key is in a sufficient distance from the machine when not in use to prevent unauthorized access to the machine.

Note: The bluetooth key fob features a sleep mode to preserve battery life. If the key detects no movement for 90 seconds, it will go into sleep mode and stop communicating. While in sleep mode, it cannot be used to access a machine. The bluetooth key will exit sleep mode and begin communicating after movement of the key is detected. When not in sleep mode, the bluetooth key communicates every 5 seconds.

Note: If multiple key fobs are present, the first valid key fob detected by the transceiver will be read. If the machine is not able to detect a key fob when it is turned on, the display will prompt the user to enter a 4-digit numerical passcode.

When the machine is turned off, the display will prompt the user with only the Lock Now and Wait XX Min options. Unlimited option is not available on machine equipped with push to start.

Adding and Removing Passcodes and Bluetooth Key Fobs

Passcodes and Bluetooth key fobs can be added and removed using the Cat[®] Electronic Technician (Cat ET) Service Tool or within the display security settings screen (password protected). A master level access passcode must have been used to access the machine security settings in the display. If a standard level passcode was used, the user will be prompted to enter a master level passcode when accessing the machine security passcode screen.

When adding a passcode or Bluetooth key fob, the user will be prompted to select the access level. A summary of the access levels is below.

Standard – A standard operator is a registered user of the machine. Operators with this access level can start the engine. This user may save a control configuration for future application.

Master – Master accounts can enable/disable machine security and add/remove passcodes in addition to all standard level functions.

Armed

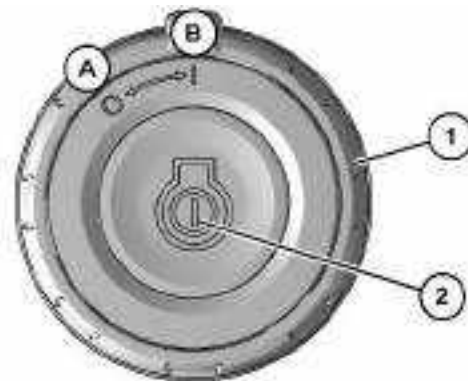


Illustration 260

g06180554

- (A) Off
(B) On
(1) Engine start switch ring
(2) Engine start button

Engine Start Ring Switch Position ON – When the engine start switch ring is first moved to the ON position, the display boots up and the system attempts to detect a Bluetooth key ID or mobile application ID. The ECM will continue reading until a valid key ID is read or a passcode is entered.

Disarmed

MSS can be disabled through the service menu.

i08709746

Monitoring System

SMCS Code: 7451; 7490

WARNING

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

The monitoring system alerts the operator of a problem or of an impending problem. The monitoring panel is designed to alert the operator of faulty machine systems. When powering on the panel, there will be an LED test for the first 2 seconds (all LEDs on). The monitoring system consists of the following components:

- Display (with numerous screens and menus)
- Indicators

Two display options are available :

- Performance : Analog gauges and LCD with push-button interface.
- Premium : Full LCD with touchscreen interface.

Most display images in this document are from the performance display. However, the navigation and general functionality is common between two displays for most features. When the functionality is different, supplemental screen images and details are provided.

Reference: For more information on the monitor functions, refer to Systems Operation, M0090757, "Monitoring System" "Performance Display".

Reference: For more information on the monitor functions, refer to Systems Operation, M0091327, "Monitoring System" "Premium Display".

Performance Display



Illustration 261

g06347988

- (1) Action Lamps
- (2) Status Indicator Area
- (3) Gauge Area
- (4) Status Information Area
- (5) Cabin Status Area
- (6) Navigation Buttons

Action Lamps (1)

The action lamps illuminate to show that a problem has occurred with the machine.

Status Indicators (2)

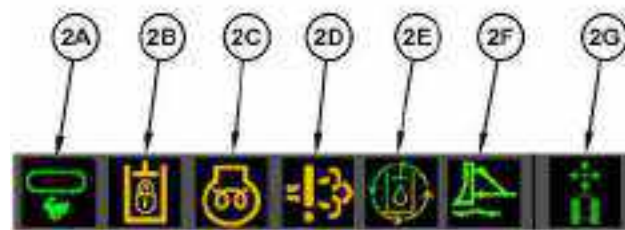


Illustration 262

g06274544

Travel Speed Indicator (2A)



(2A) Travel Speed – If the travel speed switch is moved to the high-speed position, the high-speed travel indicator illuminates.

Hydraulic Pilot Supply Solenoid Status Indicator (2B)



(2B) Hydraulic Pilot Supply Solenoid – Indicator (2B) will illuminate when the hydraulic system is locked out (left arm bar raised).

Glow Plug Indicator (2C)



(2C) Glow Plug – The alert indicator will illuminate when the engine start switch key is turned to the RUN position. After the glow plugs warm up, the LED will go out and the engine can be started. Refer to Operation and Maintenance Manual, "Engine Starting". If the alert indicator does not turn off, consult your Cat® dealer.

Engine Emission System Indicator (2D)



(2D) Engine Emission System Malfunction – Indicator (2D) will illuminate when there is a fault with the engine emission system.

Continuous Flow (2E)

(2E) Continuous Flow – Indicator (2E) will illuminate in amber color when continuous hydraulic oil flow is **ENABLED**. The icon will appear green when continuous flow is active.

Blade Float Indicator (2F)

(2F) Blade Float – Indicator (2F) will illuminate when the blade float feature is **ACTIVE**.

Joystick Steering Indicator (2G)

(2G) Joystick Steering Control – Indicator (2G) will illuminate when joystick steering control status is **ACTIVE**. This indicator is located between the gauges in area (3).

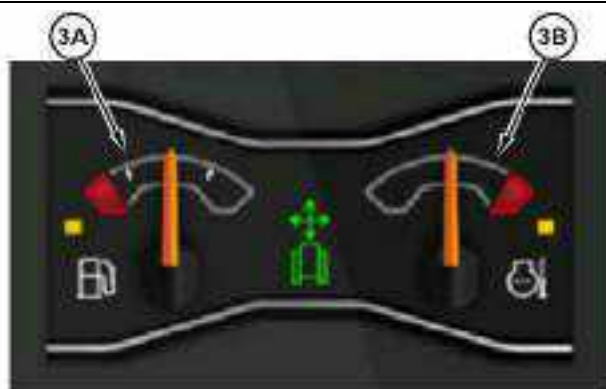
Gauge Area (3)

Illustration 263

g06274545

Fuel Level (3A)

Fuel Level – This gauge indicates the amount of fuel that is remaining in the fuel tank. When the fuel gauge is in the red range, add fuel immediately.

Engine Coolant Temperature (3B)

Engine Coolant Temperature – This gauge indicates the temperature of the engine coolant. The normal operating range is when the indicator is below the red area and not resting in the full left position. Refer to Operation and Maintenance Manual, “Engine and Machine warmup”. If the gauge reaches the red range, stop the machine and investigate the cause of the problem.

Status Information Area (4)

Illustration 264

g06346172

(4A) Service Hour meter

There are seven icon locations to the right of service hour meter (4A). All possible indicators for each location are shown below.

Service Hour Meter (4A)

(4A) Service Hour Meter – Shows the total operating hours of the engine. Use the display to determine the service-hour maintenance intervals.

Location (4B)

(4B) Cruise Control – ON



(4B) Cruise Control – SET

Location (4C)

(4C) Throttle Dial Position – Indicates the engine speed dial setting.



(4C) Auto Idle Control – Auto Idle Control has lowered the engine speed.



(4C) Auto Idle Control – Auto Idle Control is enabled, but not currently active.

Auto Idle Control – Automatically reduce the engine speed to low idle when no active commands are given for 3 seconds. Turn ON or turn OFF this feature using the monitor.

The auto idle control feature allows the operator to reduce the rpm without touching the engine speed dial. Auto idle control is useful when operator wants to reduce the engine speed to talk to someone or while operator is waiting for truck.

Location (4D)



(4D) Security System Immobilizer – This indicator will cover the smart code icon if a security system immobilizer request has been received from product link.



(4D) Smart Mode – This indicator shows that the machine is set to operate in Power On Demand (POD).

Location (4E)



(4E) Thumbwheel Mode – This indicator will illuminate when this feature is ACTIVE.



(4E) Hammer – This indicator will illuminate when this work tool is chosen.



(4E) User Defined – This indicator will illuminate when this work tool is chosen.



(4E) Tilt Bucket – This indicator will illuminate when this work tool is chosen.



(4E) Auger – This indicator will illuminate when this work tool is chosen.



(4E) Thumb – This indicator will illuminate when this work tool is chosen.

Location (4F)



(4F) – In Call



(4F) – Bluetooth Connected



(4F) – Bluetooth Enabled

Location (4G)



(4G) – Boom Swing – This icon appears if this function is controlled with the left thumbwheel.



(4G) – Swing Valve – This icon appears if this function is controlled with the left thumbwheel.



(4G) – Auxiliary Valve 2 – This icon appears if this function is controlled with the left thumbwheel.

Location (4H)



(4H) Joystick Pattern – This icon position combines Pattern Changer and Joystick Steering Pattern. The number on the upper left represents the Pattern Changer. The number in the upper left portion of the icon indicates if an alternate control pattern is selected. The letter in the upper right corner reflects the joystick steer control pattern for the right joystick. Refer to “Joystick Controls” and “Joystick Controls Alternate Patterns” sections for more information.

Cabin Status (5)

Depending upon installed features various information is available in this area. Use of the jog dial can also scroll information between the various available screens.



Illustration 265

g06390246

View of status area

With and without Radio and HVAC installed

Radio Volume (5A)

Radio Volume (5A) – The radio volume function displays the current volume.

Air Conditioning Fan Speed (5B)

Air Conditioning Fan Speed (5B) – The air conditioning fan speed function displays the current fan speed.

Radio Display (5C)

Radio Display (5C) – The radio display area will display radio station, Bluetooth audio, Aux audio input, or DAB information.

Air Temperature (5D)

Air Temperature (5D) – The air temperature function controls the temperature of the air coming out of the vents.

Hydraulic Temperature (5E)

Hydraulic Temperature (5E) – The current temperature of the machine hydraulic oil.

Battery Voltage (5F)

Note: The hydraulic temperature gauge and battery voltage are accessible on the machines with a radio and heat / air conditioning. To access, either highlight the heat / air conditioning on the cabin status screen and use the jog dial to jog to the right. Highlight the radio on the cabin status screen and use the jog dial to jog to the left.

Battery Voltage (5F) – The current voltage of the machine battery.

Clock (5G)

Clock (5G) – If equipped, will display the time of day.

Note: A product link elite system with network manager must be installed on the machine for the clock to be available.

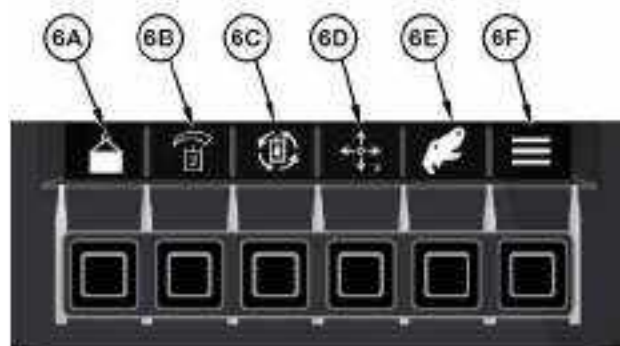
Navigation Buttons (6)

Illustration 266

g06330261

Navigation buttons (6A) through (6E) are programmable shortcuts. The shortcuts will be automatically populated based on how the machine is configured. To view the complete list or change a shortcut, navigate to the “Shortcut Settings” under the “Display Settings” menu on the monitor. Button (6F) accesses the main menu options available in the Monitoring System. The following sections detail the available options.

Main Menu

The following sections detail available options within the menu structure of the display.

Machine Settings

Machine settings adjust various options which control machine functions. Certain settings may require the engine to be OFF for adjustment.

Included in machine settings are the following:

- Control Mode
- Aux/Work Tool
- Auto Idle Control
- Machine Lighting
- Factory Defaults
- Job Clock

Control Mode

Control mode contains several settings that affect machine operation.

Included in this subsection is descriptions of Pattern Changer, Joystick Steering Pattern, Engine Idle Shutdown (if equipped), Implement Speed, Joystick Response, Cruise Control, Forward Travel Trim, and Reverse Travel Trim.

Pattern Changer

The pattern changer allows the selection of various control patterns for the left and right joystick. Refer to “Joystick Controls Alternate Patterns” for details of available patterns.

Joystick Steering Pattern

Joysticks steering Pattern allows for the selection of desired function of the right joystick lever while in Stick-Steer mode. Refer to “Joystick Controls” for more details.

Implement Speed

Implement speed allows the operator to adjust the joystick sensitivity and function maximum speeds. This parameter is adjusting both the joystick sensitivity and speed of the boom, stick, bucket, and swing together. The Advanced settings menu allows for individual adjustment.

To access the Implement Speed options, press the “Menu” button, select “Machine Settings”, “Control Mode”, then “Implement Speed” .

Select the desired option using the up and down arrows, then press “OK” .

Advanced

To access the Advanced options, press the “Menu” button, select “Machine Settings”, “Control Mode”, “Implement Speed”, then “Advanced” .



Illustration 267

g06333802

Select the desired option using the up and down arrows, then press “OK” .

The following are the options within each:

- Normal
- Fast
- Slow

Joystick Response

Joystick response allows the operator to adjust the implement response to the joystick inputs. This parameter is adjusting the joystick response of the boom, stick, bucket, and swing together. The Advanced settings menu allows for individual adjustment.

Adjusting the implement response rate will change how abrupt the implements start and stop, affecting the smoothness of operation of the machine.

To access the Joystick Response options, press the “Menu” button, select “Machine Settings”, “Control Mode”, then “Joystick Response” .

Select the desired option using the up and down arrows, then press “OK” .

Advanced

To access the Advanced options, press the “Menu” button, select “Machine Settings”, “Control Mode”, “Joystick Response”, then “Advanced” .



Illustration 268

g06333802

Select the desired option using the up and down arrows, then press “OK” .

The following are the options within each:

- Normal
- Slow
- Fast

Cruise Control

To enable the cruise control feature in the monitor press “Menu” button, select “Machine settings”, “Control mode”, “Cruise control”, then press “OK”. Once enabled, cruise control can be activated as indicated in the “Joystick controls” section.

The cruise control can be added to the shortcut menu in the monitor if desired. Each time the machine is powered ON, the cruise control feature must be enabled.

WARNING

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

Do not mount a moving machine. Do not dismount a moving machine. Never jump off the machine. Do not carry tools or supplies when you try to mount the machine or when you try to dismount the machine. Use a hand line to pull equipment onto the platform. Do not use any controls as handholds when you enter the operator compartment or when you exit the operator compartment.

Forward Travel Trim

Forward travel trim allows operator to make fine adjustments between left and right track speed in FORWARD direction to correct any drift or wandering.

To access the Forward Travel Trim options, press the “Menu” button, select “Machine Settings”, “Control Mode”, then “Forward Travel Trim”.



Illustration 269

g06333952

To adjust the forward travel trim, use the right and left arrows.

If your machine drifts RIGHT, then move the arrow to the LEFT.

Reverse Travel Trim

Reverse travel trim allows operator to make fine adjustments between left and right track speed in REVERSE direction to correct any drift or wandering.

To access the Reverse Travel Trim options, press the “Menu” button, select “Machine Settings”, “Control Mode”, then “Reverse Travel Trim”.

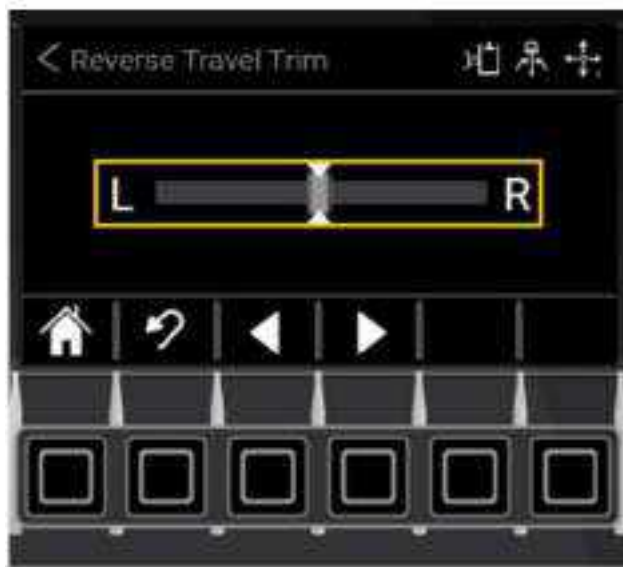


Illustration 270

g06333956

To adjust the reverse travel trim, use the right and left arrows.

If your machine drifts RIGHT, then move the arrow to the LEFT.

Engine Idle Shutdown (If Equipped)

Engine Idle Shutdown feature automatically shuts off the engine when the following conditions are met for 3 to 15 minutes :

- Arm bar is raised
- Coolant temperature is above 50° C (122° F)
- Work lights are OFF
- Auto idle control feature is enabled
- Throttle dial position is less than seven

The engine idle shutdown feature must be enabled for the function to be active. To enable, press the "Menu" button, select "Service Mode", "Machine", "Engine Idle Shutdown", then press OK.

Once enabled, the timer can be adjusted by pressing the "Menu" button, "Machine Settings", "Control Mode", then "Engine Idle Shutdown". The idle time is adjustable from 3 to 15 minutes in increment of 1 minute. Press OK to confirm the selection.

Aux/Work Tool

The Aux/Work Tool submenu allows for configuration of the auxiliary hydraulics of the machine.

Included in this subsection is descriptions of Continuous Flow, Quick Coupler, Aux Flow 1 (if equipped), Aux Flow 1 Balance (if equipped), Aux Flow 1 Direction (if equipped), Aux Flow 2 (if equipped), Aux Flow 2 Balance (if equipped), Tiltrotator(if equipped) and Work Tool Select.

Continuous Flow

To enable the continuous flow feature in the monitor press the "Menu" button, select "Machine Settings", "Aux / Work Tool", "Continuous Flow" then "OK". Once enabled, continuous flow can be activated as indicated in the "Continuous Flow" section.

The continuous flow enable can be added to the shortcut menu in the monitor if desired. Each time the machine is powered on, the continuous flow feature must be enabled.

Quick Coupler (If Equipped)

This menu allows for activation of a hydraulic quick coupler. Two types of couplers are supported including dual lock and single lock couplers. Dual lock couplers will show two screens indicating the status of each individual locking mechanism. Single lock couplers have only a single screen allowing for lock and unlock functions of the coupler.

To access the Hydraulic Quick Coupler in the monitor press the "Menu" button, "Machine Settings", "Aux / Work Tool", then "Quick Coupler". The Single Lock or Dual Lock quick coupler screen will be selected automatically based on which quick coupler the machine is configured with.

The quick coupler control screen can be added to the shortcut menu in the monitor if desired.

Tilt rotator (If Equipped)

The Tilt rotator is a specialized worktool that can be purchased for the machine. Refer to the Tiltrotator Operation and Maintenance Manual for more details or contact your dealer for information.

Aux Flow 1 (If Equipped)

Aux 1 Flow allows for metering the flow provided to the auxiliary 1 circuit. To adjust the aux 1 flow press the "Menu" button, select "Machine settings", "Aux / Work Tool", "Aux flow 1" then adjust the flow rate. The flow is adjustable from 10% to 100% in increments of 10 percent.

The aux flow 1 can be added to the shortcut menu in the monitor if desired.

Aux Flow 1 Balance (If Equipped)

Aux Flow 1 Balance allows for reducing flow to aux 1 A port or aux 1 B port. Flow is reduced for work tools that require different flow rates in each direction.

To adjust the aux flow 1 balance press the "Menu" button, select "Machine settings", "Aux / Work Tool", "Aux Flow 1 Balance" then adjust the balance as desired. When the slider is in the middle position, the supply flow rate is in the same for both ports.

Adjusting the slider to the LEFT will reduce the flow rate to the right (aux 1 A) port but maintain same flow rate to the left (aux 1 B) port. Adjusting the slider to the RIGHT will reduce the flow rate to the left (aux 1 B) port but maintain the same flow rate to the right (aux 1 A) port.

Aux Flow 1 Direction (If Equipped)

Certain machines may not have one-way flow valves to limit aux flow to one direction. On these machines, Aux 1 Flow Direction is used to allow flow commands to only the B port of the machine.

To access the Aux Flow 1 Direction options, press the "Menu" button, select "Machine Settings", "Aux / Work Tool", then "Aux Flow 1 Direction". To adjust the Aux Flow 1 Direction, use the up and down arrows. Press "OK" to confirm the selection.

Note: Depending upon the work tool one way flow or two way flow can be selected. One way would be selected for a Hammer type work tool.

Aux Flow 2 (If Equipped)

Aux 2 Flow allows for metering the flow provided to the auxiliary 2 circuit. To adjust the aux 2 flow press the "Menu" button, select "Machine settings", "Aux / Work Tool", "Aux Flow 2" then adjust the flow rate. The flow is adjustable from 10 percentage to 100 percentage in increments of 10 percent.

The Aux flow 2 can be added to the shortcut menu in the monitor if desired.

Aux Flow 2 Balance (If Equipped)

Aux Flow 2 balance allows for reducing the flow to the aux 2 A port or aux 2 B port. Flow is reduced for work tools that require different flow rates in each direction.

To adjust the aux flow 2 balance press the "Menu" button, select "Machine settings", "Aux / Work Tool", "Aux Flow 2 balance" then adjust the balance as desired. When the slider is in the middle position, the supply flow rate is in the same to both ports. Adjusting the slider to the LEFT will reduce the flow rate to the right (aux 2 A) port but maintain same flow rate to the left (aux 2 B) port. Adjusting the slider to the RIGHT will reduce the flow rate to the left (aux 2 B) port but maintain the same flow rate to the right (aux 2 A) port.

Work Tool Select

Toggling the work tool select, various work tools are available. Selecting the work tool attached to the machine will pick default settings for Aux 1 Flow metering.

To select the work tool press the "Menu" button, select "Machine Settings", "Aux / Work Tool", "Work Tool Select" then select the desired tool.

The work tool select can be added to the shortcut menu in the monitor if desired.

Auto Idle Control

Auto idle control automatically reduces engine speed to low idle after no implement commands have been issued for 3 seconds. To enable, press the "Menu" button, select "Machine settings", "Auto idle control", then press "OK". Auto idle control can be added to the shortcut menu in the monitor if desired.

Machine Lighting

Courtesy Light – Courtesy light allows the machine lighting to stay ON after turning the key switch OFF. Courtesy lights illuminate if the work lights were ON when the key was switched OFF. Press the "Menu" button, select "Machine Settings", "Machine Lighting", "Courtesy Light". The timer is adjustable from 0 to 100 seconds in increment of 5 seconds. Press OK to confirm the selection.

Job Clock

The job clock displays the number of engine running hours that have been accumulated since the last reset. To reset the job clock back to zero, press the "Menu" button, "Machine Settings", "Job Clock", press the RESET button (icon with two parallel lines at a 45 degree angle).

Job Clock can be added to the shortcut menu in the monitor if desired.

Reset Factory Default

Restores factory default settings for the parameters such as joystick response, implement speed, auxiliary flow 1, auxiliary flow 1 balance, auxiliary flow 2, auxiliary flow 2 balance, courtesy light timer, work tool select, automatic engine idle control, cruise control, joystick steering pattern. To reset, press the "Menu" button, select "Machine settings", "Reset factory default", then "OK".

Display Settings

Display settings configure the monitoring system on the machine. To access the display settings press the “Menu” button, select “Display Settings”, then select the desired display setting to be adjusted. Available settings include Show Camera (if equipped), Brightness, Clock Adjust (if equipped), Language, Units, Clock Format (if equipped), and Shortcut Settings

Shortcut Settings – Shortcut settings are configurable allowing for direct access to submenu options on the monitoring system using the Navigation Buttons. The following shortcut settings such as pattern changer, quick coupler, performance, camera, auto idle, continuous flow, work tool select, aux flow 1, aux flow 2, HVAC, radio, audio source, bluetooth, tilt rotator, cruise control, joystick steering pattern, job clock can be selected.

To access the display settings, press the “Menu” button, select “Display settings”, then select the desired display setting to be adjusted.

HVAC (If Equipped)

Accesses the cab climate control system. Refer to the Air Conditioning and Heating Control section for more information.

Radio (If Equipped)

Accesses the radio controls of the machine. Refer to the Radio section for more details on how to operate.

Information

Accesses the performance and ECM summary submenus.

Performance – Displays sensor parameters available on the machine such as engine speed and pump pressure.

ECM Summary – To access the ECM summary press the “Menu” button, select “Information”, then “ECM summary”

Service

Includes submenus showing diagnostics and service mode.

Contact your dealer for more information about menu items not disclosed in this manual.

Diagnostics

Reports fault code information used for troubleshooting.

Maintenance Intervals

The Maintenance feature allows the tracking of machine running hours on various routine service items on the machine. The number of machine running hours since the last reset is accumulated individually for each service item.



Illustration 271

g06711006

To access the Maintenance options, press the “Menu” button, select “Service”, then “Maintenance”.



Illustration 272

g06711007

The Maintenance menu shows the various service items along with the total machine running hours accumulated since last reset on the left and the recommended service interval on the right.

When any of maintenance items are within 20 hours of being due, there will be a "Maintenance Due" popup alerting the operator. The pop up will appear every time the key is turned on. Once cleared, it will not appear again until the key is turned on again.

When any of the maintenance items are past due, there will be a "Maintenance Past Due" popup alerting the operator. The pop up will appear every time the key is turned on. Once cleared, it will not appear again until the key is turned on again.



Illustration 273

g06711008

To reset a maintenance item, highlight the desired item in the menu and press "OK". Within the screen for that item is a reset option (button with two parallel lines). Select the reset button.



Illustration 274 g06711012

Press “OK” to confirm the reset. After pressing “OK” , the number of machine running for that item will be set to 0.

Note: If machine security is enabled, you must be logged in as a Master user to reset a maintenance item. If logged in as a Standard user, a Master Level Access Required message will appear when pressing “OK” and the value will not be reset.

Service Mode

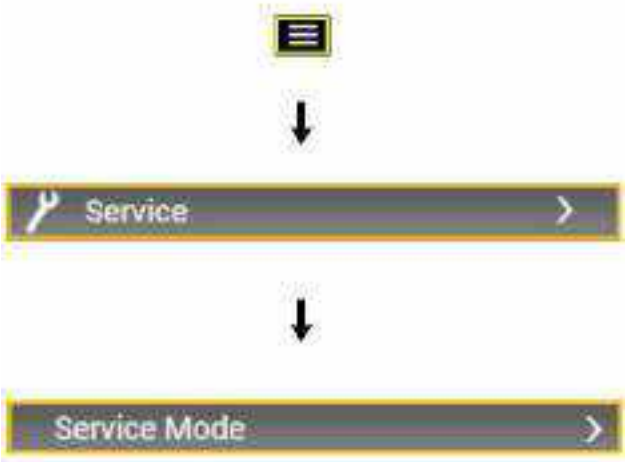


Illustration 275 g06334877

To access the Service Mode Menu options, press the “Menu” button, select “Service” , then “Service Mode” .

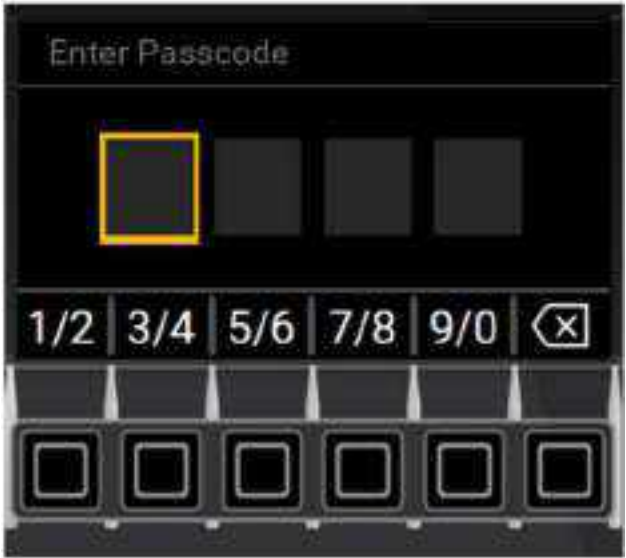


Illustration 276 g06334880

Enter the four-digit service entry password.

Note: Factory set default code is 1234 or 1925.

Thumbwheel Mode

Thumbwheel Mode allows stick to toggle to right thumb roller when in sticks steer mode. Refer to Operation and Maintenance Manual, “Joystick Controls” for more information.

This parameter must be ENABLED for the joystick thumbwheel controls to be used.

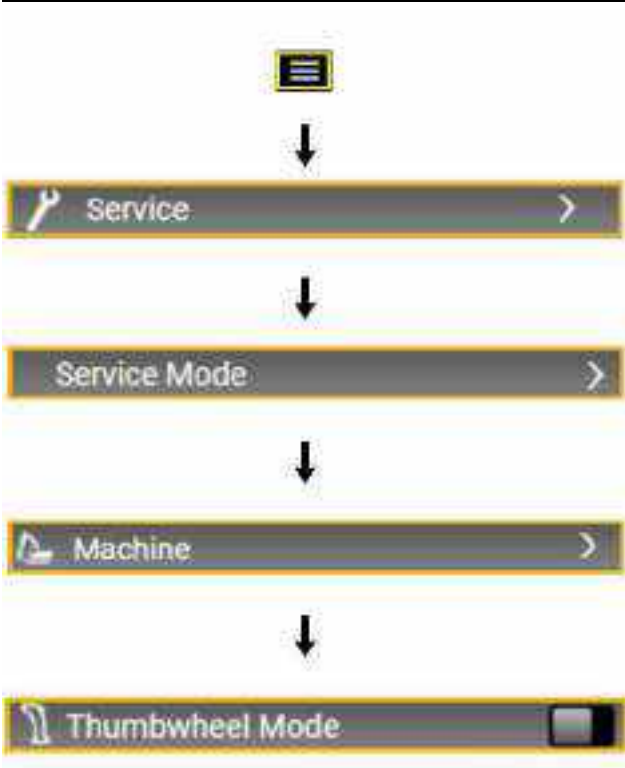


Illustration 277 g06334888

To access the Thumbwheel Mode options, press the “Menu” button, select “Service”, “Service Mode”, “Machine”, then “Thumbwheel Mode” .



Illustration 278 g06334998

To enable the Thumbwheel Mode function, select “Thumbwheel Mode” and press “OK” .

Note: When the indicator is green and the slide is to the right, the feature is activated.

Auxiliary Flow Command Direction Inversion

Auxiliary Invert allows the Aux 1 and Aux 2 commands to be inverted so that rolling the thumbweel up will send flow to the A port (right side of stick) and rolling to the thumbwheel down will send flow to the B port (left side of stick).

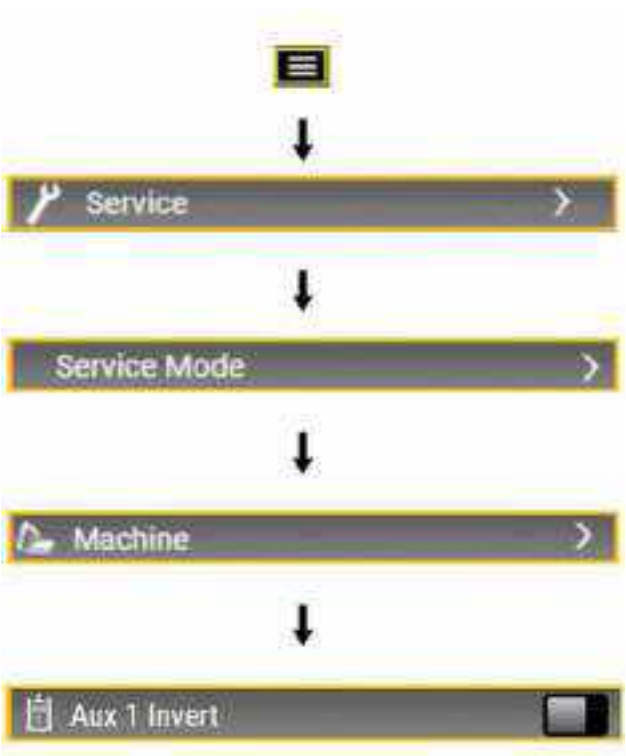


Illustration 279 g06711017

To access the Auxiliary Invert options, press the “Menu” button, select “Service”, “Service Mode”, “Machine”, then “Aux 1 Invert” or “Aux 2 Invert” .



Illustration 280 g06711019

To enable the Auxiliary Inversion, select “Aux 1 Invert” or “Aux 2 Invert” and press “OK” .

Note: When the indicator is green and the slide is to the right, the feature is activated.

Security

Machine security can be configured to prevent unregistered access to your machine. Additional security features can be configured using the Monitoring System. Press the “Menu” button, select “service” , “service mode” , then “security” . If security is disabled or a standard security level passcode or bluetooth key was used to access the machine, you will be prompted to enter a master security level passcode when accessing the security screens. The default master passcode from the factory is “1 1 1” . 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

Toggleing this setting will turn the security system ON or OFF.

Grace Period

This setting is used to set the duration after key off that the registered user stays logged on to the machine. If the machine is turned ON within this time range, the machine will bypass security access without the use of a Bluetooth key or passcode.

Users / Keys

The Users / Keys category from the Security Menu allows the owner / technician to enter unique passcodes (PINs) and/or Bluetooth keys (each with a unique ID) which allow those authorized users to start and operate the machine. Also, the owner or authorized technician can delete passcode PINs and Bluetooth key IDs of authorized keys and users.



Illustration 281 g06334983

To access the User / Keys options, press the “Menu” button, select “Service” , “Service Mode” , “Security” , then “Users / Keys” .



Illustration 282

g06390456

Add PIN



Illustration 283

g06345288

To add new 4-digit PIN to the passcode list of authorized users, select “Add PIN” from the “Users / Keys” menu.



Illustration 284

g06345290

Only a user with a “Master” passcode can enter new “Standard” passcodes.

Note: Standard passcodes are for operators and technicians - Master passcodes are intended for owners or authorized personnel

Multiple Master passcodes can be added to the Master Passcode list. The default master passcode from the factory is “1 1 1 1” . This default passcode can be removed after creating a new master passcode.

This same strategy applies to the Bluetooth system, with a Master Bluetooth key used to add or remove Bluetooth keys from respective lists.

Passcode PINs and Bluetooth key IDs can also be added or removed from respective lists using Cat ET.

Note: A maximum total of 25 passcodes and keys can be added to the machine.



Illustration 285 g06345300

From the Add PIN entry screen, use the number buttons to enter a unique 4-digit passcode number.

Note: Each button can enter two numbers. To enter the number two (2), press the left-most “1/2” button twice, then the highlight will move to the next entry field to the right.

Each time a number is entered, the highlight will automatically move to the next space to the right.

Once all four numbers have been entered, the new passcode will be added to the list of authorized PINs. The display will then return to the Keys/Users Menu.

In the example above, when the operator turns the key start switch to ON, the monitor will display the startup passcode entry screen. When the operator enters “1111” , the MSS will allow the engine to be started.

Remove PIN



Illustration 286 g06345316

To remove a 4-digit PIN to the passcode list of authorized users, select “Remove PIN” from the “Users / Keys” menu.

From the “Remove PIN” entry screen, use the number buttons to enter the 4-digit passcode number that you wish to remove if equipped with the Performance display or select the 4-digit passcode number you wish to remove if equipped with the Premium display.

Press the “OK” button or tap the center of the Jog Dial (if equipped) to remove the 4-digit passcode number from the list of authorized passcodes.

Add Bluetooth Key



Illustration 287 g06345355

To add new Bluetooth key ID to the list of authorized Bluetooth keys, select “Add Bluetooth Key” from the “Users / Keys” menu.

From the “Users / Keys” menu, use the arrow buttons to highlight the “Add Bluetooth Key” option, then press the “OK” button. The “Add Bluetooth Key” confirmation screen will appear.



Illustration 288 g06345356

Use the arrow buttons to highlight the “Standard” or “Master” option, then press the “OK” button. The “Add Bluetooth Key” screen will be displayed.



Illustration 289 g06345359

Use a combination of number buttons and Jog Dial Module (if equipped) to enter the unique 12-digit alpha-numeric ID assigned to Bluetooth key chip.

The “Add Bluetooth Key” screen is first displayed with all 12 ID spaces blank and the left-most space highlighted. Use the arrow buttons scroll up and down through the numbers 0-9, then alpha characters A-F, which are displayed in the space. When the desired character is displayed in the highlighted space, move to the next space.

Note: The highlight can also be moved left to change a number previously entered.

Repeat this process for all 12 spaces. When all 12 spaces have been filled with the unique 12-digit Bluetooth key ID, press the “OK” button or tap the center of the Jog Dial (if equipped) to enter the Bluetooth key ID to the list of authorized Bluetooth IDs.

The display will return to the “Users / Keys” Menu.

Remove Bluetooth Key



Illustration 290

g06345381

To remove a 12-digit Bluetooth key ID from the list of authorized Bluetooth key IDs, select "Remove Bluetooth Key" from the "Users / Keys" menu.

Enter the unique 12-digit alpha-numeric ID assigned to the Bluetooth key ID that you wish to remove if equipped with the Performance display or select the Bluetooth Key ID that you wish to remove if equipped with the Premium display.

Press the "OK" button or tap the center of the Jog Dial (if equipped) to remove the Bluetooth key ID from the list of authorized Bluetooth IDs.

The display will return to the "Users / Keys" Menu.

Display System Mode

The Display System Mode can be changed between Normal and Simplified. When the mode is set to Normal, all available display settings are shown and available for adjustment. When the mode is set to Simplified, the display settings below are hidden and not available for adjustment:

- All joystick response settings
- Advanced implement speed settings (overall setting still available)
- Forward travel trim
- Reverse travel trim
- Auxiliary 1 flow balance
- Auxiliary 2 flow balance

- Job clock
- ECM summary
- Machine configurations within service mode

The Simplified Display System Mode is intended for customers who want to limit the adjustability of the machine.

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

Seat Belt Reminder System (If Equipped)

If the machine is fitted with the operator presence seat belt assembly and the "Operator Seat Belt Monitor Installation Status" configuration is set to "Installed" in Cat® ET, the seat belt reminder system will be active on the machine.

The red seat belt warning symbol is always present on the top status bar when the seat belt is not fastened. Once the seat belt is fastened, the red seat belt warning symbol disappears and there will be no other seat belt notifications while the seat belt remains fastened.



Illustration 291

g06751792

Seat Belt Indicator in Monitor

If the belt is not fastened while the engine is running and the arm bar is lowered, there will be a pulsing audible tone for 10 seconds every minute and a pop-up message stating "Seat Belt Unfastened – Fasten Belt". The audible tone can be configured to be snoozed after 5 minutes by setting the "Operator Seat Belt Audible Alarm Snooze Enable Status" to ENABLED in Cat® ET. If DISABLED, the tone will continue for 10 seconds every minute while the engine is running, arm bar is lowered and seat belt is not fastened.



Illustration 292

g06721427

If the operator seat belt unfastened while machine is not idle event enable status is configured as ENABLED in Cat® ET, the operator seat belt unfastened while machine is not idle event will be logged if the seat belt is not fastened while the engine is running and the arm bar is lowered for 5 minutes. If Disabled, there will not be an event logged.

Monitor Wake-up Feature

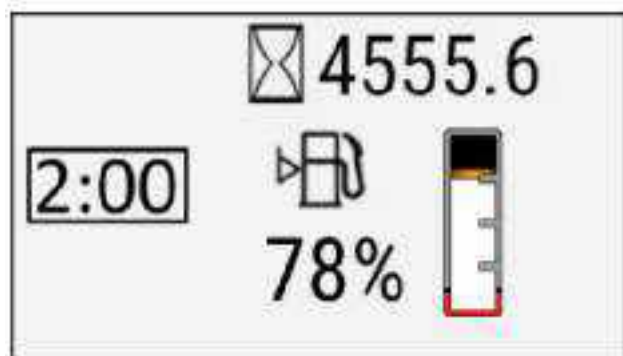


Illustration 293

g06366070

Monitor wake-up screen example

Pressing any navigation button on the monitor will display the service hours of the machine and actual fuel level for 2 minutes. This feature will function when the key is in the OFF position and the battery disconnect switch is in the ON position.

Note: This feature can also be activated by pressing the monitor wake-up button located below the cup holder in the cab (if equipped).

i07256347

Storage and Literature Compartment

SMCS Code: 7268



Illustration 294

g06267099

The compartment on the rear of the operator seat is used to store the literature for the machine.

i07287781

Mirror (If Equipped)

SMCS Code: 7319

WARNING

Adjust all mirrors as specified in the Operation and Maintenance Manual. Failure to heed this warning can lead to personal injury or death.

Note: Your machine may not be equipped with all the mirrors that are described in this topic.



Illustration 295

g06275389

- (1) Right Side Mirror
(2) Left Side Mirror

Mirrors provide additional visibility around your machine. Make sure that the mirrors are in proper working condition and that the mirrors are clean. Adjust all mirrors at the beginning of each work period and adjust the mirrors when you change operators.

The appropriate job site organization is also recommended to minimize visibility hazards. For more information refer to this Operation and Maintenance Manual, "Visibility Information".

Modified machines or machines that have additional equipment or attachments may influence your visibility.

Mirror Adjustment

- Park the machine on a level surface.
- Lower the work tool to the ground.
- Move the hydraulic lockout lever to the LOCKED position. For further details on this procedure, refer to Operation and Maintenance Manual, "Operator Controls"
- Stop the engine.
- Adjust rear view mirrors to provide visibility behind the machine at a maximum distance of 30 m (98 ft) from the rear corners of the machine.

Note: You may need to use hand tools to adjust certain types of mirrors.

Right Side Rear View Mirror (1)



Illustration 296

g06275391

If equipped, adjust the right side rear view mirror (1) so that an area of at least 1 m (3.3 ft) from the side of the machine can be seen from the operator seat. Also, provide as much visibility to the rear as possible.

Left Side Rear View Mirror (2)



Illustration 297

g06275390

If equipped, adjust the left side rear view mirror (2) so that an area of at least 1 m (3.3 ft) from the side of the machine can be seen from the operator seat. Also, provide as much visibility to the rear as possible.

i07255572

Window (Front)

SMCS Code: 7310-FR

Canopy Machines

WARNING

When installing or removing the polycarbonate shield, be extra careful to prevent any personal injury. Also, the hydraulic lockout control must be in the RAISED position to prevent any possibility of sudden movement of the machine due to inadvertent contact with the hydraulic controls.

Do not install/remove the polycarbonate shield until the following items have been done:

- Park the machine on a level surface.
- Lower the work tools and the blade to the ground.
- Cycle the joystick controls. Move the hydraulic lockout control to the RAISED position.
- Remove the engine start switch key.

Perform the following procedure to install the polycarbonate shield.

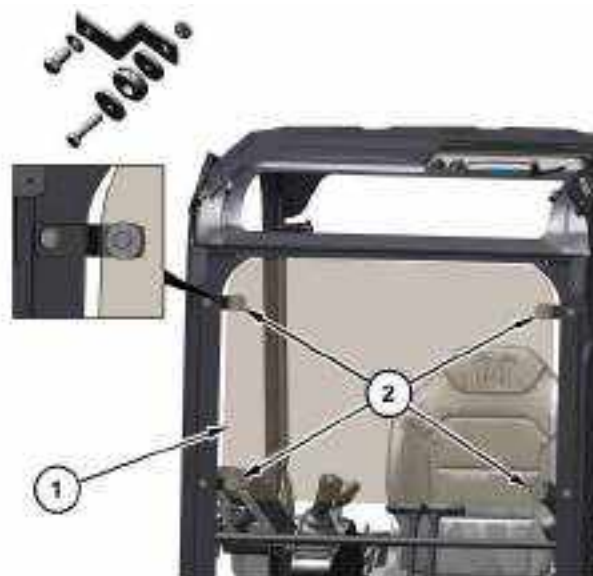


Illustration 298

g06267035

1. Put polycarbonate shield (1) with the help of another person into position.
2. Secure the polycarbonate shield with the four fasteners attached (2).

Perform the following procedure to remove the polycarbonate shield.

1. Remove four fasteners (2).
2. Remove polycarbonate shield (1) with the help of another person.

Note: Protect the polycarbonate shield from damage while in storage.

Cab Machines

To provide full ventilation inside the cab, the upper window and the lower window can be fully opened.

WARNING

Crushing Hazard! Stay clear (extremities, clothing) of the window run and of the window. Always open and close the front window using both handles. Always make sure the window locks into the recesses as the window is open and closed. Be careful not to hit the front window with your head as the front window is opened and closed.

Stop the engine before opening or closing the front window in order to avoid any unintentional operation or movement of the machine.

Operation Section
Window (Front)

Do not change the position of the front window until the following items have been done:

- Park the machine on a level surface.
- Lower the work tools and the blade to the ground.
- Move the hydraulic lockout control to the RAISED position.

Perform the following procedure to vent the upper window.

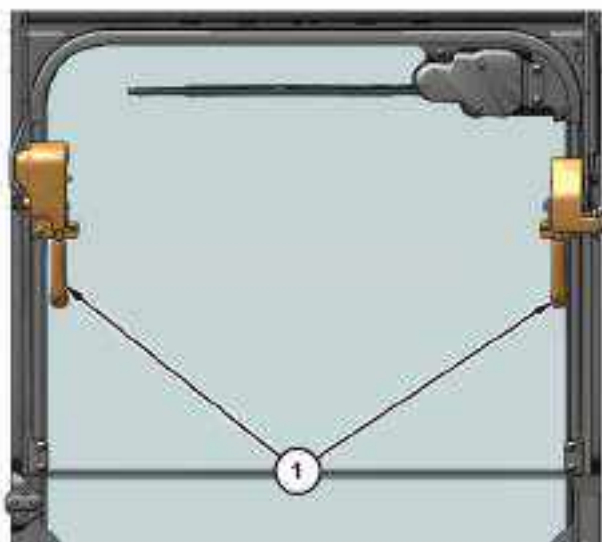


Illustration 299

g06267076

1. Release the auto-lock latches by pulling release levers (1) on the window handles.
2. Holding both handles on the window frame, pull the window upward.
3. Hold both handles and move the window into the storage position until the auto-lock latches near the ceiling are engaged.

Perform the following procedure to close the upper window.

1. Release the auto-lock latches by pulling release levers (1) on the window handles.
2. Holding both handles on the window frame, pull the window downward.
3. Hold both handles and move the window into the closed position until the auto-lock latches near the front of the machine engage.

Perform the following procedure to vent the lower window.

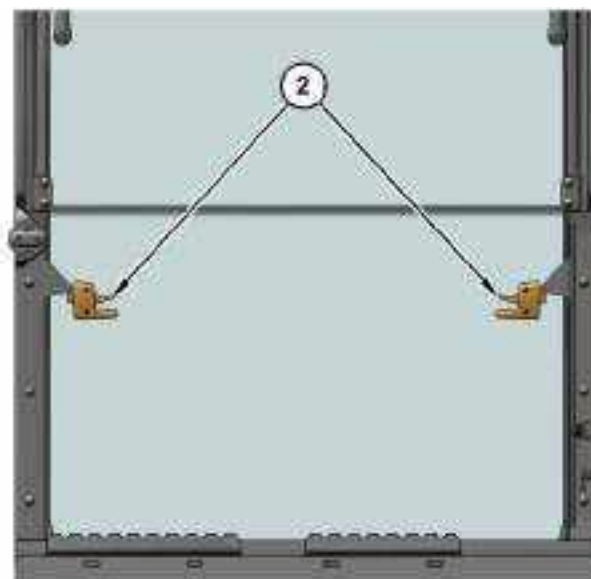


Illustration 300

g06267083

1. Release the auto-lock latches by pushing release levers (2) on the window handles.
2. Holding both handles on the window frame, pull the window upward.
3. Hold both handles and move the window into the storage position until the auto-lock latches near the top window are engaged.

Perform the following procedure to close the upper window.

1. Release the auto-lock latches by pulling release levers (2) on the window handles.
2. Holding both handles on the window frame, pull the window downward.

3. Hold both handles and move the window into the closed position until the auto-lock latches near the front of the machine engage.

i07686363

Joystick Controls

SMCS Code: 5705

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

The machine control pattern is initially set at the factory to the SAE system, as shown. The pattern on the left pertains to the left joystick and the pattern on the right pertains to the right joystick.

The machine control pattern can be varied. Refer to Operation and Maintenance Manual, "Joystick Controls Alternate Patterns" for more information.

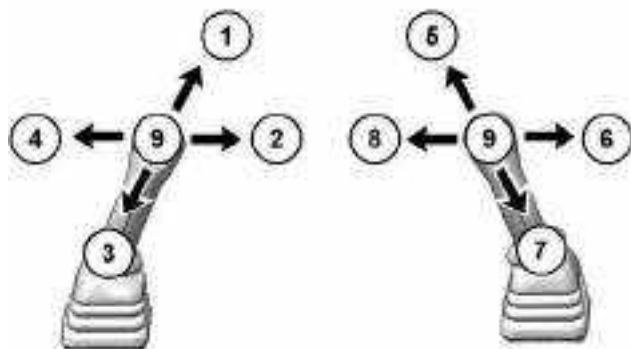


Illustration 301

g06275408



STICK OUT (1) – Move the left joystick to this position to move the stick outward.



SWING RIGHT (2) – Move the left joystick to this position to swing the upper structure to the right.



STICK IN (3) – Move the left joystick to this position to move the stick inward.



SWING LEFT (4) – Move the left joystick to this position to swing the upper structure to the left.



BOOM LOWER (5) – Move the right joystick to this position to lower the boom.



BUCKET DUMP (6) – Move the right joystick to this position to dump the bucket or the work tool.



BOOM RAISE (7) – Move the right joystick to this position to raise the boom.



BUCKET CLOSE (8) – Move the right joystick to this position to close the bucket or the work tool.

HOLD (9) – When you release a joystick from any position, the joystick will return to the HOLD position. Movement of the structure will stop.

Joystick Configurations

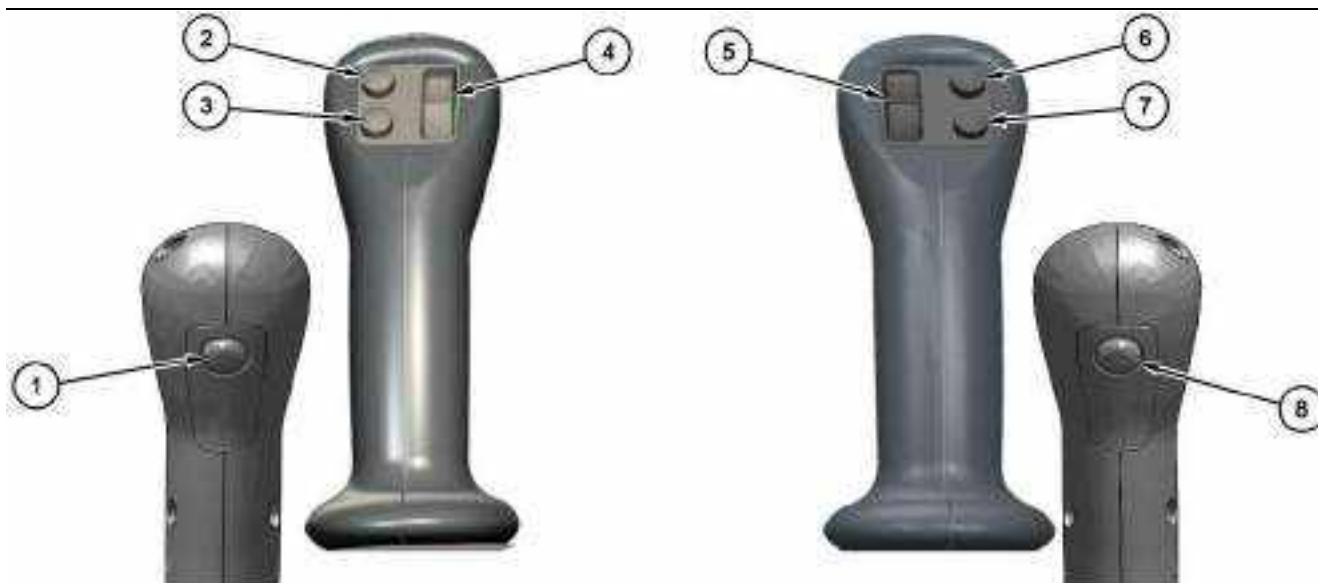


Illustration 302

g06285624

Vertical Slider Joystick Controls

(1) Left joystick trigger switch
(2) Left joystick switch 1
(3) Left joystick switch 2

(4) Left joystick thumbwheel
(5) Right joystick thumbwheel
(6) Right joystick switch 1

(7) Right joystick switch 2
(8) Right joystick trigger switch

Table 24

Joystick Configurations		
Switch Location	Machine Configuration	
	Joystick Steering Mode OFF	Joystick Steering Mode ON
1	Inactive	Cruise Control
2	Boom Swing / Aux 2 Select	House Swing / Aux 2 Select
3	Joystick Steer Mode On/Off	Joystick Steer Mode On/Off
4	Boom Swing / Aux 2 Flow Control	House Swing / Aux 2 Flow Control
5	Aux 1 Flow Control	Aux 1 Flow Control / Stick Control (Configurable)
6	Horn	Horn
7	Travel Speed	Travel Speed
8	Inactive	Inactive / Blade Float / Thumbwheel (5) toggle
Left Joystick	Stick / Swing	Travel
Right Joystick	Boom / Bucket	Boom / Bucket / Blade (Configurable)

Left Joystick Controls

Trigger Switch (1)

Button (1) will only function in joystick steer mode. When in joystick steer mode this button activates cruise control. Cruise control maintains forward or reverse ground speed when the joystick is in the hold position.

Cruise control is available using the Monitor (see "Monitoring System" for details). Cruise control can be enabled using the monitoring system.



WARNING

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

Do not mount a moving machine. Do not dismount a moving machine. Never jump off the machine. Do not carry tools or supplies when you try to mount the machine or when you try to dismount the machine. Use a hand line to pull equipment onto the platform. Do not use any controls as handholds when you enter the operator compartment or when you exit the operator compartment.

Cruise control is disabled by any of the following:

- moving the left joystick forward or reverse after placing the joystick in the hold position.
- pressing button (1).
- moving the travel pedals.
- pressing button (3).
- hydraulic lockout control lever is raised to the lockout position.

Boom Swing / 2nd Auxiliary Button (2)

Button (2) will determine which function thumb wheel (4) controls.

The default setting of thumb wheel (4) is boom swing function.

Joystick Steer Mode Button (3)

Push button (3) to activate joystick steer mode, then press the confirmation button on the monitoring system using the jog dial or touch screen (if equipped). The confirmation process must be completed after every key cycle of the machine.

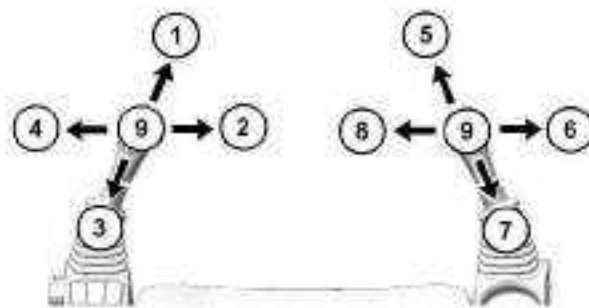


Illustration 303

g06180324

Joystick Steer Pattern A

- (1) TRAVEL FORWARD
- (2) COUNTER-ROTATE CLOCKWISE
- (3) TRAVEL REVERSE
- (4) COUNTER-ROTATE COUNTERCLOCKWISE
- (5) BOOM LOWER
- (6) BUCKET DUMP
- (7) BOOM RAISE
- (8) BUCKET CLOSE
- (9) HOLD

Once activated, the joystick steer light will illuminate as defined in the "Monitor System" section. The left joystick functionality is modified as shown in Illustration 303. This control pattern is identified as joystick steer pattern A.

Note: Refer to Table 24 for additional control changes.

In joystick steer mode, machine swing is available on the left thumb roller in place of boom swing (if equipped). Machine swing and aux 2 (if equipped) can toggle function control on the left thumbwheel while in joystick steer mode.

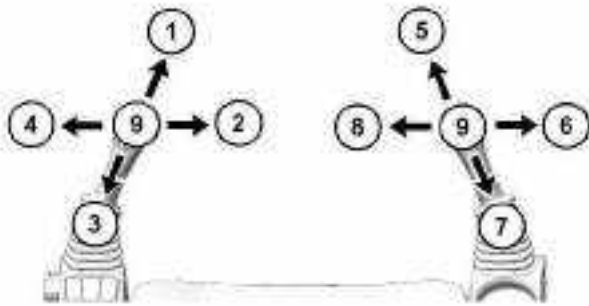


Illustration 304

g06180324

Joystick Steer Pattern B

- (1) TRAVEL FORWARD
- (2) COUNTER-ROTATE CLOCKWISE
- (3) TRAVEL REVERSE
- (4) COUNTER-ROTATE COUNTERCLOCKWISE
- (5) BLADE LOWER
- (6) BLADE TILT CLOCKWISE
- (7) BLADE RAISE
- (8) BLADE TILT COUNTERCLOCKWISE
- (9) HOLD

While in joystick steer mode, changing an alternate control pattern for the right joystick is possible. This pattern is identified as joystick steer pattern B. See the "Monitoring System" section for more details on how to modify the control pattern. The following image details the control of the machine using blade control on the right joystick lever.

Advanced Joystick Steer Mode: An advanced control pattern is available in joystick steer mode using the service mode of the display (see "Monitoring System – Thumbwheel Mode" for setup details). When Thumbwheel Mode is set to enabled and Joystick Steer Pattern A is selected, the trigger on the right joystick can allow for toggling between aux 1 and stick function on the right joystick thumbwheel.

Boom Swing / 2nd Auxiliary Flow Control (4)

If thumb wheel (4) is changed to second auxiliary control, the thumb wheel is used to operate work tools such as a grapple. Refer to Operation and Maintenance Manual, "Work Tool Control" for more information.

If thumb wheel (4) is changed to boom swing function, refer to the information below.

The boom swing control is used to swing the boom to the right or to the left.



Swing Left – Pull downward on the left thumbwheel to swing the boom to the LEFT.



Swing Right – Push upward on the left thumbwheel to swing the boom to the RIGHT.

Note: Operate the boom swing thumbwheel carefully until you become familiar with how boom swing reacts to the controls.

Right Joystick Controls**Primary Auxiliary Control (5)**

The primary auxiliary control thumb wheel is used to control the work tools. For more information on the auxiliary controls, refer to Operation and Maintenance Manual, "Work Tool Control".

This thumbwheel can be toggled to activate the stick using button (8) while in joystick steer mode if right joystick is configured to Boom/Bucket by using advanced settings in the monitoring system.

Horn (6)

Horn (6) – The horn button is on the right side joystick. Depress the horn button to sound the horn. Use the horn before starting the engine, or for alerting or signaling personnel.

Travel Speed Control (7)

Depress the button to change the travel speed.

Depress the button to the high-speed position to make the machine travel in high speed. The indicator light on the monitor is active when the machine is in the high-speed mode.

Depress the button again to return to low speed.

Always travel at slow speeds on slopes and rough ground.

i08301436

Work Tool Control

SMCS Code: 6700

 WARNING

Unexpected operation of the auxiliary control circuit can cause injury or death.

A RAISED hydraulic lock lever does not mean that the auxiliary control function is locked out.

In order to prevent unexpected operation of the auxiliary control circuit, make sure that the foot is not placed on or near the work tool control pedal.

⚠ WARNING

Unexpected operation of the secondary auxiliary control circuit can cause injury or death.

In order to prevent unexpected operation of the secondary auxiliary control circuit, make sure that the thumb is not placed on or near the switch on the left joystick.

⚠ WARNING

Unintended operation of the Auxiliary Control pedal can cause injury or death. A RAISED hydraulic lock lever does not mean that the auxiliary line is locked out.

To Prevent unintended activation of the Auxiliary Control pedal while traveling or whenever the auxiliary line is not being used, make sure the foot is not placed on or near the Auxiliary Control pedal.

⚠ WARNING

Unintended operation of the switch for the Auxiliary Control can cause injury or death.

To prevent unintended activation of the switch for the Auxiliary Control while traveling or whenever the auxiliary line is not being used, make sure that the thumb is not placed on or near the switch for the Auxiliary Control.

Auxiliary lines are equipped with coupler assemblies. Wipe all coupler assemblies before you connect the work tools. The auxiliary lines must be relieved of pressure to connect the coupler assemblies to the work tool. Relieve the pressure in the auxiliary hydraulic lines by performing the following steps:

1. Operate the machine to charge the accumulator.
2. Lower implements to the ground.
3. Turn off the engine and turn the key switch to ON position without starting the engine.
4. Ensure that the Hydraulic Lockout control is in the UNLOCKED position to provide function to the hydraulic circuits.
5. Actuate the auxiliary circuit in both directions several times.

Note: Pressure can build up in the auxiliary lines if the attachment is not coupled/uncoupled immediately after the pressure has been released.

Primary Auxiliary Hydraulic Circuit (AUX I)

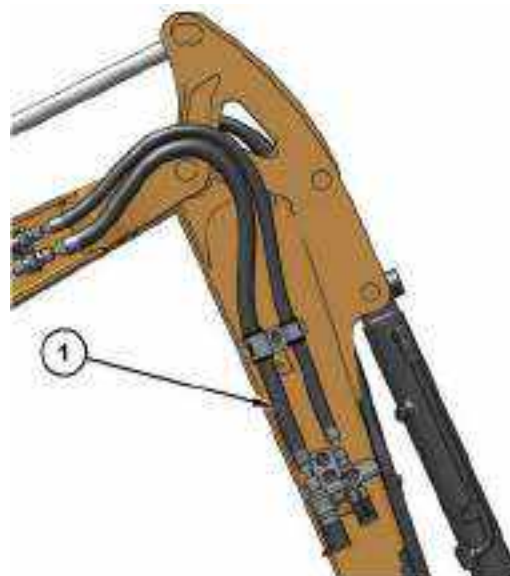


Illustration 305

g06267476

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

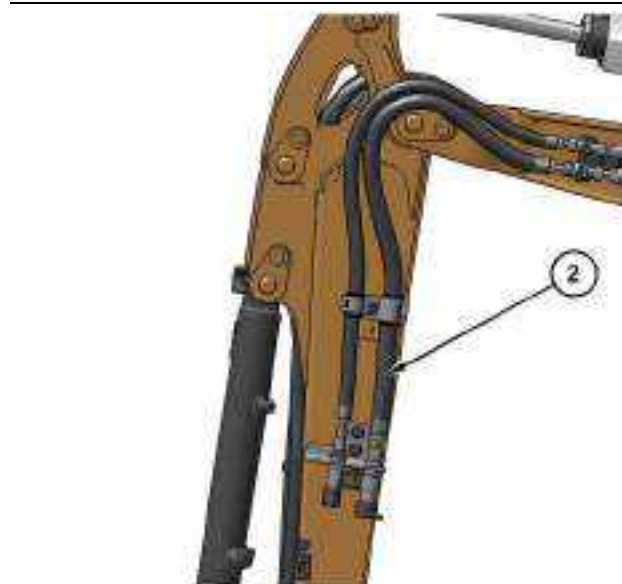


Illustration 306

g06267480

(2) Primary oil feed / return line on left side of stick

There are two primary auxiliary lines that are routed to the stick.

Primary oil feed / return line on right side of stick (1).
Primary oil feed / return line on left side of stick (2).

The primary auxiliary lines can be equipped with coupler assemblies. Wipe all coupler assemblies before you connect the work tools.

The primary auxiliary lines must be relieved of pressure to connect the coupler assemblies to the work tool. Relieve the pressure in the primary auxiliary hydraulic lines by performing the following steps:

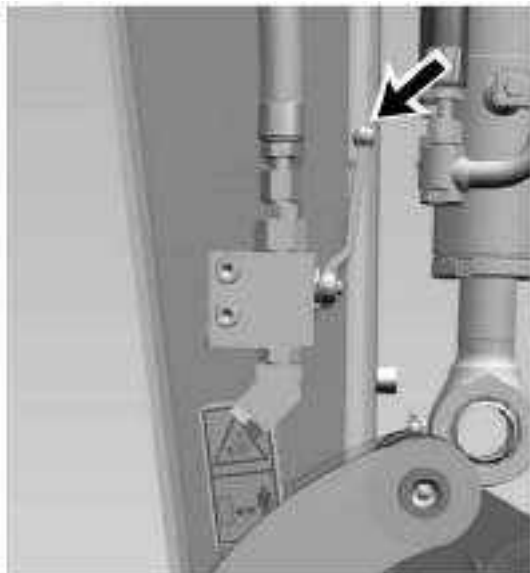


Illustration 307

g06639214

Aux stop valve in ON position

Rotate the aux stop valve to 90 degrees to turn OFF the aux stop valve.

1. Turn the engine start switch key to the ON position with the engine OFF.
2. Lower the hydraulic lockout control lever.
3. Move the control levers and thumb wheels in both directions repeatedly.

Note: The hydraulic accumulator must have pressure to relieve a circuit. If needed, start engine and engage the hydraulic lockout control lever for 5 seconds to charge the accumulator. After the accumulator has been pressurized, repeat Step 1 through Step 3.

4. Uncouple the attachment immediately after the pressure has been released.

Note: Pressure can build up in the primary auxiliary lines if the attachment is not uncoupled immediately after the pressure has been released.

Secondary Auxiliary Hydraulic Circuit (AUX II) (If Equipped)

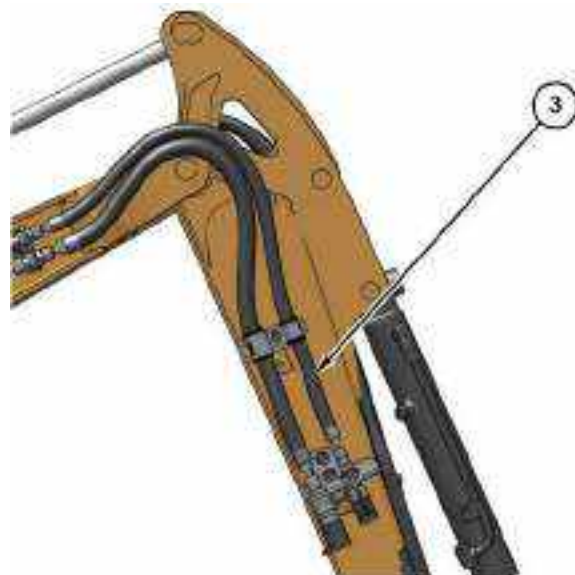


Illustration 308

g06267483

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

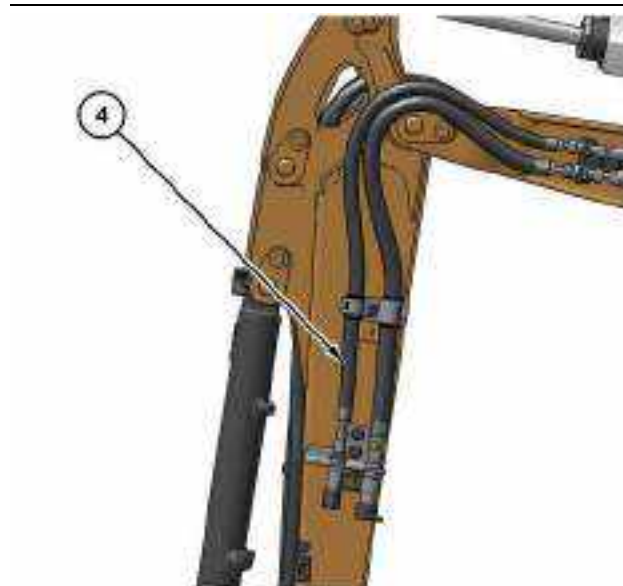


Illustration 309

g06267484

(4) Secondary oil feed / return line on left side of stick

There are two secondary auxiliary lines that are routed to the stick.

Secondary oil feed / return line on right side of stick (3). Secondary oil feed / return line on left side of stick (4).

The secondary auxiliary lines are equipped with coupler assemblies. Wipe all coupler assemblies before you connect the work tools.

The secondary auxiliary lines must be relieved of pressure to connect the coupler assemblies to the work tool. Relieve the pressure in the secondary auxiliary hydraulic lines by performing the following steps:

1. Turn the engine start switch key to the ON position with the engine OFF.
2. Lower the hydraulic lockout control lever.
3. Move the control levers and thumb wheels in both directions repeatedly.

Note: The hydraulic accumulator must have pressure to relieve a circuit. If needed, start engine and engage the hydraulic lockout control lever for 5 seconds to charge the accumulator. After the accumulator has been pressurized, repeat Step 1 through Step 3.

4. Uncouple the attachment immediately after the pressure has been released.

Note: Pressure can build up in the primary auxiliary lines if the attachment is not uncoupled immediately after the pressure has been released.

Auxiliary Bucket Cylinder Diverter Circuit (AUX V) (If Equipped)

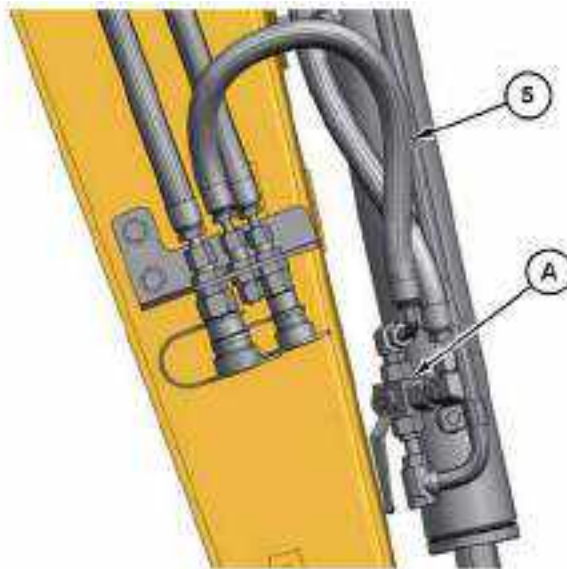


Illustration 310

g06643027

(A) Diverter Valve

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

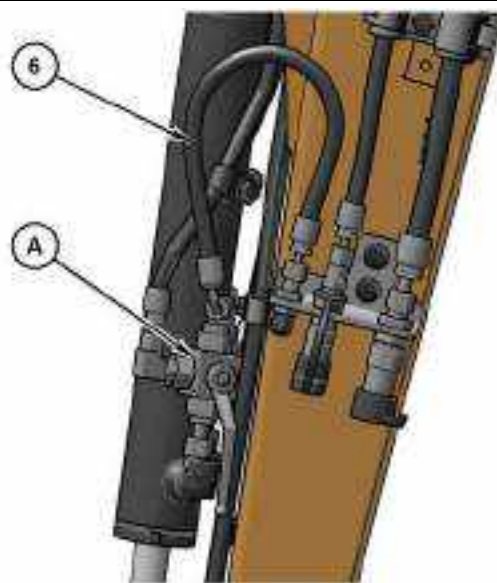


Illustration 311

g06274437

(A) Diverter Valve

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

Diverter valves are used to divert oil from the bucket cylinder to the auxiliary lines. These valves (A) are attached on the left and right side of the stick. The bucket auxiliary circuit is open when the right ball valve handle has been turned counter-clockwise as far as it will go and the left ball valve handle has been turned clockwise as far as it will go. The bucket auxiliary circuit is closed when the right ball valve handle has been turned clockwise as far as it will go and the left ball valve handle has been turned counter-clockwise as far as it will go.

Auxiliary oil feed/ return line on right side of stick (5).
Auxiliary oil feed/ return line on left side of stick (6).

The bucket auxiliary circuit lines are equipped with coupler assemblies. Wipe all coupler assemblies before you connect the work tools.

The bucket auxiliary circuit lines must be relieved of pressure to connect the coupler assemblies to the work tool. Relieve the pressure in the auxiliary hydraulic lines by performing the following steps:

1. Turn the engine start switch key to the ON position with the engine OFF.
2. Lower the hydraulic lockout control lever.
3. Move the control levers and thumb wheels in both directions repeatedly.

Note: The hydraulic accumulator must have pressure to relieve a circuit. If needed, start engine and engage the hydraulic lockout control lever for 5 seconds to charge the accumulator. After the accumulator has been pressurized, repeat Step 1 through Step 3.

4. Uncouple the attachment immediately after the pressure has been released.

Note: Pressure can build up in the primary auxiliary lines if the attachment is not uncoupled immediately after the pressure has been released.

Continuous Flow

Note: The continuous flow feature must first be enabled in the monitor. Refer to Operation and Maintenance Manual, "Monitoring System" for additional information.



Illustration 312

g06287030

The operator controls the hydraulic flow rate with the thumbwheel on the right-hand joystick. To set continuous flow, first set the continuous flow feature to ON in the monitor. Then use the right thumb wheel to command Aux 1 until the desired hydraulic flow rate is achieved. Hold the thumb wheel at the desired command for 2.5 seconds. After 2.5 seconds, the continuous flow indicator on the monitor will turn green indicating that continuous flow is ACTIVE. Once the continuous flow begins, release the switch. Continuous flow will stop operating when the switch is moved or the hydraulic lockout is lifted or when the machine is turned off.

Work Tool Flow Mode Control



One-Way Flow – Move work tool flow control lever to this position when one-way flow is required.



Two-Way Flow – Move work tool flow control lever to this position when two-way flow is required.

One-Way Flow



Illustration 313

g06643039

Valve position for one-way flow

The flow control manual valve is located next to the main control valve and can be accessed using the access cover near the cab door.

Two-Way Flow

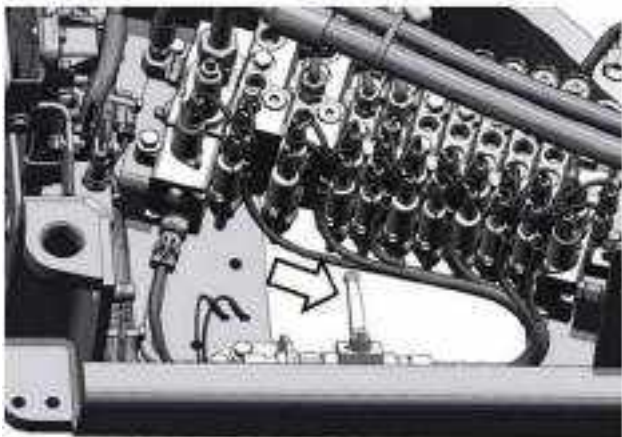


Illustration 314

g06643041

Valve position for two-way flow

The flow control manual valve is located next to the main control valve and can be accessed using the access cover near the cab door.

Auxiliary Control Pedal (AUX 1) (If Equipped)

Note: Operate the Auxiliary Control pedal carefully until you become familiar with how AUX 1 reacts to the controls.

The right Auxiliary Control pedal controls the two-way flow auxiliary line circuit (AUX 1).



Illustration 315

g06274468

(7) Pedal

To pressurize the line that is connected to the left-hand side of the stick, apply pressure to the front of the pedal (7).

To pressurize the line that is connected to the right-hand side of the stick, apply pressure to the back of the pedal (7).

Secondary Auxiliary Control (AUX II) via the Switch on the Joystick (Two-way flow) and Boom Swing Control (If Equipped)

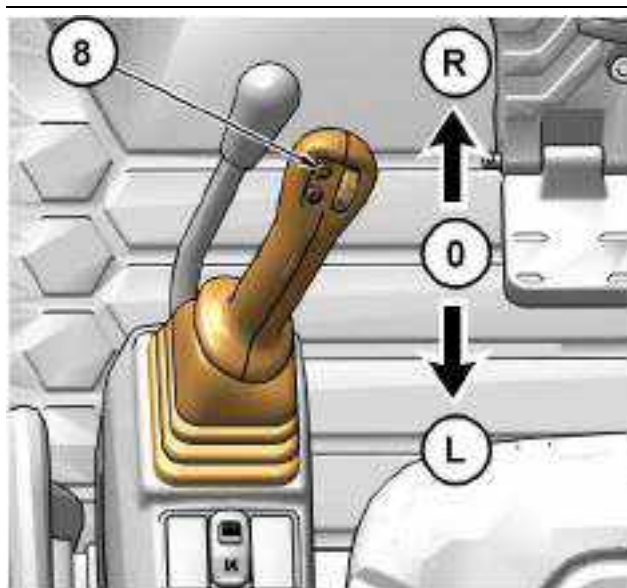


Illustration 316

g06274472

(8) Switch

The switch (8) on the left joystick activates the secondary auxiliary control (AUX II) and the swing boom control. The monitor will display which function is activated

To swing the boom to the right, slide thumb wheel switch forward.

To swing the boom to the left, slide thumb wheel switch backward.

Note: Operate the switch for the Secondary Auxiliary/ Boom Swing Control carefully until you become familiar with how the AUX II and swing boom react to the controls.

Auxiliary Bucket Cylinder Diverter Circuit Control (If Equipped)

If the diverter valves on the boom are open, the bucket auxiliary circuit can be operated via the right joystick when in excavator pattern.

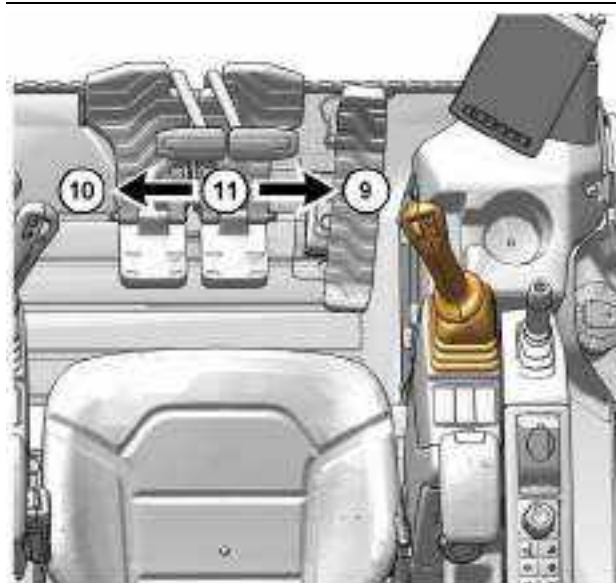


Illustration 317

g06638825

Move the right joystick to position (9) to send flow to left side of stick.

Move the right joystick to position (10) to send flow to the right side of stick.

When you release the joystick from any position, the joystick will return to the HOLD position (11). The functions will stop.

Two functions (bucket auxiliary circuit and boom) may be performed at the same time by moving the joystick diagonally.

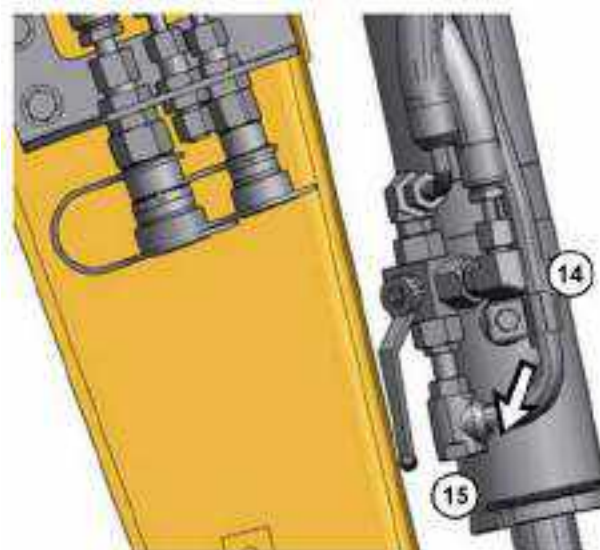


Illustration 318

g06643038

Right Side Diverter Valve

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

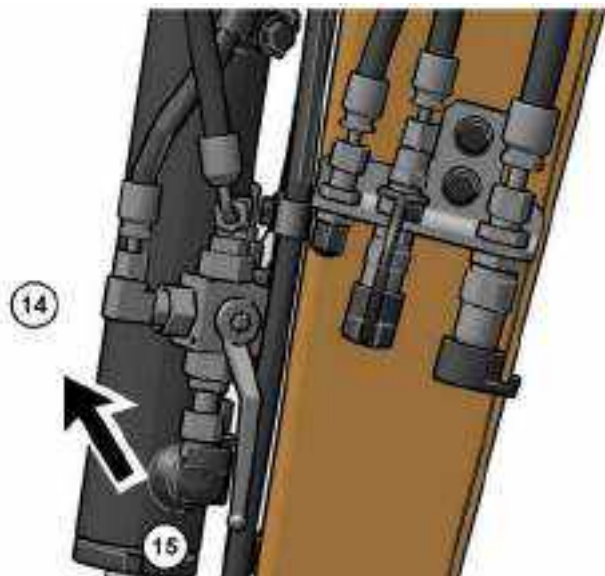


Illustration 319

g06274491

Left Side Diverter Valve

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

Adjustable Primary Auxiliary Valves

This feature enables the ability to adjust pressure allowing for customized and improved performance of work tools.

Standard Auxiliary



Illustration 320

g06622091

Cab door

1. Open the cab door

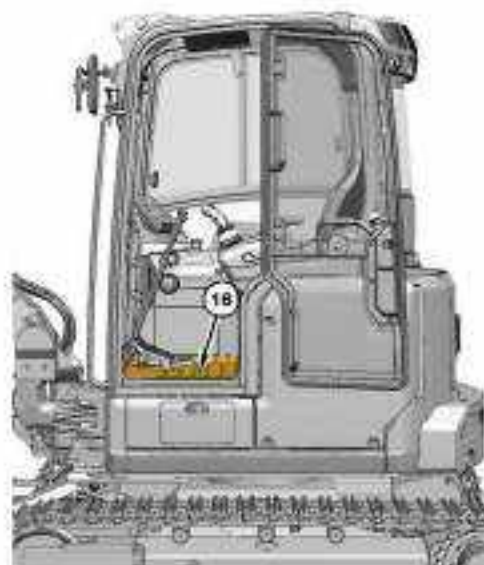


Illustration 321

g06622117

(16) Floor mat

2. Remove the floor mat (16).

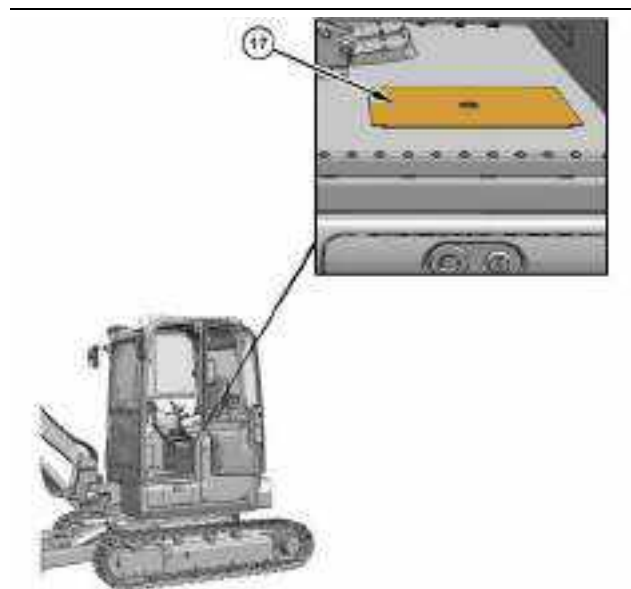


Illustration 322

g06622144

(17) Panel

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

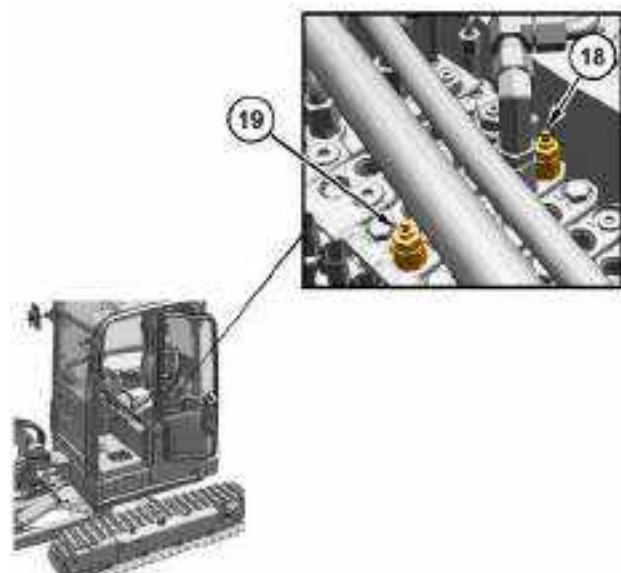


Illustration 323

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

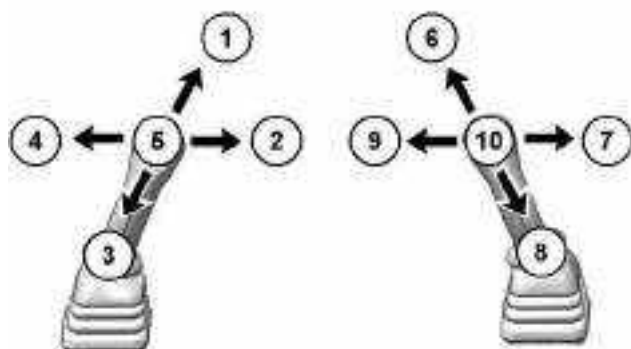


Illustration 324

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

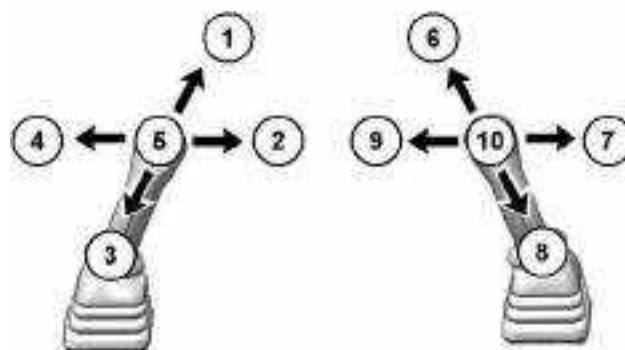


Illustration 325

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.

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

Mitsubishi Joystick Pattern

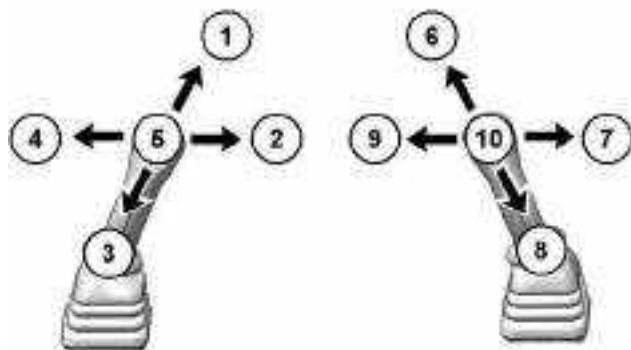


Illustration 326

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

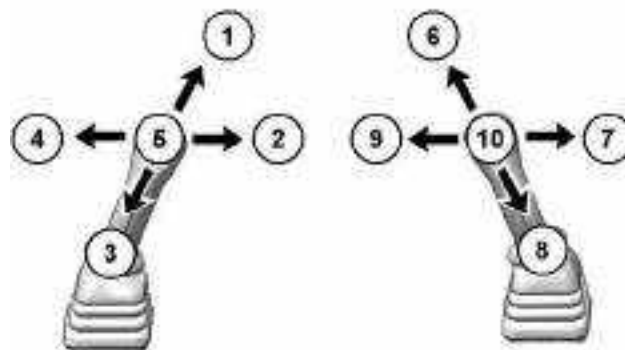


Illustration 327

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.

⚠ 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.



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.

Operation

i08484409

Operation Information

SMCS Code: 7000

Make sure that no personnel are on the machine or near the machine in order to prevent any personal injury. Keep the machine under control at all times in order to prevent injury.

If the boom is in the raised position and if the engine is stopped, refer to Operation and Maintenance Manual, "Equipment Lowering with Engine Stopped" for the procedure to lower the boom.

Reduce the engine speed when you maneuver the machine in tight quarters and when you drive over an incline.

Select the necessary travel speed range before you drive downgrade. Do not change the speed range while you drive downhill.

Use the same travel speed on a downgrade and on an upgrade.

When you travel for any distance, keep the stick inward and carry the boom in a low position. A machine that is equipped with a blade should travel with the blade in the highest position.

When you travel on a steep grade, keep the work tool as close to the ground as possible on the downhill side of the machine.

When you travel on moderate uphill grades, keep the boom on the uphill side of the machine.

Operating Procedure

1. Adjust the operator seat.
2. Fasten the seat belt.
3. Start the machine and refer to Operation and Maintenance Manual, "Engine and Machine Warm-Up" for information about warming the engine and warming the hydraulic oil.
4. Raise the boom enough in order to provide sufficient ground clearance.
5. Make sure that the position of the upper structure and of the undercarriage is known before you move the machine. The dozer blade should be in front of the machine.

Note: The travel levers will operate normally if the dozer blade is in front of the machine. The travel levers will operate backward if the dozer blade is behind the machine.

6. Rotate the engine speed dial clockwise in order to increase the engine speed to the desired speed.
7. Push both travel levers forward at the same time in order to travel forward. If both travel levers are pushed farther, the travel speed at the selected engine speed will be faster.

Note: If the machine does not operate or if the machine does not travel in a straight line, consult your Caterpillar dealer.

8. See Operation and Maintenance Manual, "Operator Controls" for information on "Travel Control". This instruction is about spot turning and about pivot turns.
9. When you make turns in soft material, travel in a forward direction occasionally in order to clear the tracks.
10. Slowly move both of the travel levers to the center position in order to stop the machine.

Lifting Objects

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

The overload warning device (if equipped) must be adjusted for the bucket linkage and bucket size that is installed on the machine. Adjust the overload warning device for proper operation.

The setting for the overload warning device (if equipped) should be checked by an authorized dealer.

Contact your Cat dealer for additional information.

i07287854

Frozen Ground Conditions

SMCS Code: 7000

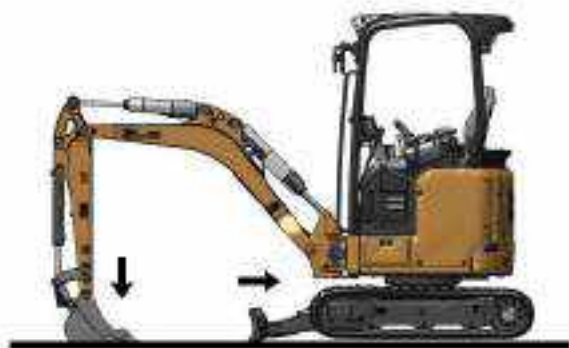


Illustration 329

g06275430

To free the tracks from frozen ground, swing the boom to the front of the machine. Use boom down pressure to free the idler end of the machine.

Swing the boom to the rear of the machine. Use boom down pressure to free the sprocket end of the machine.

i07245364

Equipment Lowering with Engine Stopped

SMCS Code: 7000

To lower the boom, place the hydraulic activation control lever in the UNLOCKED position. Move the joystick to the BOOM LOWER position. If the accumulator is still charged, the boom will lower.

If the boom does not lower, the accumulator is empty. Use the following method to lower the boom.

WARNING

Be sure no one is under or near the work tools before manually lowering the boom. Keep all personnel away from the boom drop area when lowering the boom with the engine stopped in order to avoid possible personal injury.

WARNING

Personal injury can result from oil under high pressure.

DO NOT allow high pressure oil to contact skin.

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

Note: Refer to Operation and Maintenance Manual, "General Hazard Information" for information on Containing Fluid Spillage.

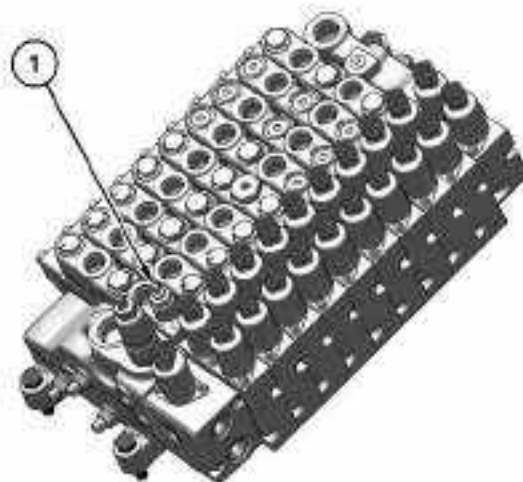


Illustration 330

g06264442

1. Remove plug (1) on end of valve with 5 mm hex wrench.
2. Turn screw clockwise with 4 mm hex wrench until the relief is forced open and the boom begins to lower.
3. Make sure that the work tool has lowered all the way to the ground. Reset the valve by turning the screw counter clockwise until the valve returns to the original position.
4. Replace the plug.
5. Make the necessary repairs before you operate the machine.
6. Check the level of the hydraulic fluid. Refer to Operation and Maintenance Manual, "Hydraulic System Oil Level-Check".

Blade (If Equipped)

To lower the blade, place the hydraulic lockout control in the UNLOCKED position. Move the blade control lever to the BLADE LOWER position. If the accumulator is still charged, the blade will lower.

If the blade does not lower, the accumulator is empty. The blade will need to be blocked in the raised position until the engine can be started again.

Additional instructions can be found in the service manual and/or consult your Cat dealer.

Operating Techniques

i07929204

Operating Technique Information

SMCS Code: 7000

 WARNING

Know the maximum height and reach of your machine. Serious injury or death by electrocution can occur if machine, work tools, or attachments are not kept a safe distance from electrical power lines. Keep distance at least 3 m (10 ft) Plus additional 10 mm (.4 inch) for each 1,000 volts over 50,000 volts.

For safety, the local codes, the state codes, or the requirements of the job site may require a greater distance.

NOTICE

When swinging into a ditch, do not use the ditch to stop the swinging motion. Inspect the machine for damage if the boom is swung into a bank or an object.

Repeated stopping by an object can cause structural damage if the boom is swung into a bank or an object.

Always swing as slowly as possible. Sudden swing start/stop motion can cause machine instability.

With certain work tool combinations, the work tool can hit the canopy or the front of the machine. Always check for interference when first operating a new work tool.

Whenever the tracks of the machine raise off the ground while digging, lower the machine back to the ground smoothly. Do not drop or catch the machine with the hydraulics. Damage to the machine can result.

Do not move hydraulic cylinders to the end of the stroke. This could cause structural damage to the cylinders.

When digging, do not allow the stick cylinder or the bucket cylinder to contact the edge of the excavation.

Do not dig or excavate while the machine is traveling. This could cause damage to the work tool or to the machine.

Do not use the bucket as a pile driver or a hydraulic hammer.

With certain combinations of work tools, the auxiliary hydraulic pedal can have different functions. Always check the function of the auxiliary hydraulic pedal before you use the pedal.

Know the location of any buried cables. Mark the locations clearly before you dig.

Consult your Cat dealer for special bucket tips that are available for use in severe applications.

Move the machine whenever the position for digging is not efficient. The machine can be moved forward or backward at any time during the operating cycle.

When you perform work in close places, utilize the bucket or other work tools in order to perform the following functions:

- Pushing the machine
- Pulling the machine
- Lifting the tracks

Use consistent, comfortable speeds while you operate the machine.

For efficient operation, use more than one control at a time, when possible.

Never swing the bucket or a load over a truck cab or any personnel.

Position a truck so that the machine can load material into the truck from the rear or from the side. Load the truck evenly so that the rear axles are not overloaded.

Do not use oversize buckets or oversize work tools, as this could make the machine unstable.

Machines which are equipped with a canopy, a polycarbonate shield must be installed when a work tool that may create flying objects is used. Always remember to wear your safety glasses even when the polycarbonate shield is in place. Consult your work tool Operation and Maintenance Manual in order to determine if using a work tool will require the polycarbonate shield.

Digging

1. Lower the blade to the ground in order to ensure better machine stability while you are digging.
2. Position the stick at a 90 degree angle to the boom.
3. Position the bucket cutting edge at a 120 degree angle to the ground. Maximum breakout force can now be exerted with the bucket.

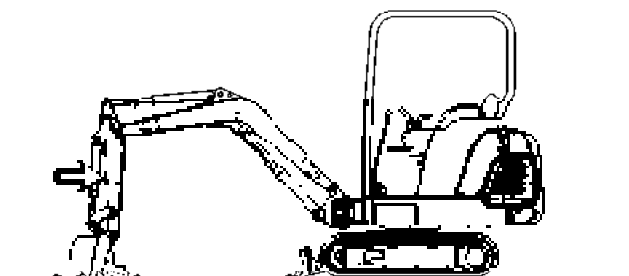


Illustration 331

g00394783

4. Move the stick toward the canopy and keep the bucket parallel to the ground.
5. If the stick stops due to the load, raise the boom and/or perform a curl in order to adjust the depth of the cut.
6. To apply the greatest force at the cutting edge, decrease the down pressure as you move the stick toward the canopy.
7. Maintain a bucket attitude that ensures a continuous flow of material into the bucket.
8. Continue the pass in a horizontal direction so that material peels into the bucket.

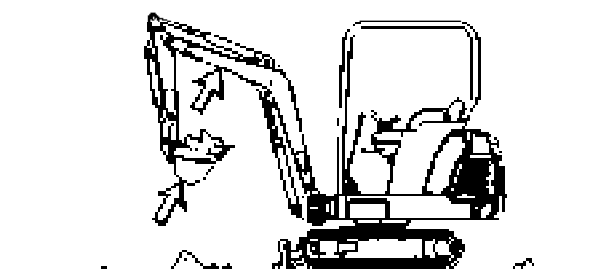


Illustration 332

g00394917

9. Close the bucket and raise the boom when the pass has been completed.
10. Engage the swing control when the bucket is clear of the excavation.

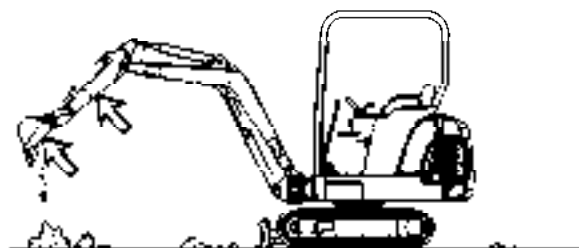


Illustration 333

g00394937

11. To dump a load, move the stick outward and open the bucket in a smooth motion.

Lifting Objects

Obey the local regulations and/or government regulations that govern the use of excavators which lift objects.

Obey the local regulations and/or government regulations that govern the lifting of loads.

Japan regulations require a shovel crane configuration to lift certain objects. Contact your Caterpillar® dealer for more information.

DANGER

Crushing hazard. The excavator may be used for applications with lifting gear only if the prescribed safety devices are in place and functional.

Failure to follow this precautionary measure will lead to serious injury or death.

- Acoustic and optical warning device
- Boom lowering control device
- Suitable equipment for fastening and securing loads
- The lift capacity table must be observed
- Approved bucket linkage with lifting point

WARNING

To prevent injury, do not exceed the rated object handling capacity of the machine. If the machine is not on level ground, the rated object handling capacities will vary.

⚠ WARNING

When lifting a load with the blade on the ground, do not raise the blade once the load has been lifted. This action may cause instability and sudden movement of the machine and of the object that is being lifted.

Sudden movement of the machine or the lifted object can cause personal injury.

NOTICE

Damage to bucket cylinder, bucket or linkage could result if slings are placed incorrectly.

Secure the load to prevent the load from falling.

Short slings will prevent excessive load swing. In order to avoid oscillating movements:

- Carry out smooth, slow movements with the machine
- Bear in mind the weather conditions (e.g. wind force, etc.)

Only use the approved lifting point on the Cat bucket linkage in order to lift objects. Lifting capacities are calculated from this point. Adjust to this capacity accordingly. Refer to Operation and Maintenance Manual, "Lifting Capacities" for more information on lifting objects with the machine.

The connection must be made with a sling or with a chain, so that it is not possible to unhook the sling or chain unintentionally.

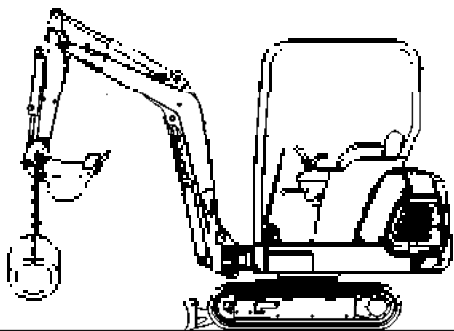


Illustration 334

g00394957

An unstable condition can exist if a load exceeds the machine load rating or if a heavy load is swung over an end or over a side. Lower the blade to the ground in order to increase the stability of the machine.

The most stable lifting position is over a corner of the machine.

For the best stability, carry a load close to the machine and to the ground.

Lift capacity decreases as the distance from the swing centerline is increased. Obey the load charts that are given in Operation and Maintenance Manual, "Boom/Stick/Bucket Combinations".

Position the lifting gear ensuring the sling is not deflected by other parts.

Do not use any lifting gear and slings that are damaged or not sufficiently dimensioned.

The lifting gear must be designed to withstand the loads that can arise in the different positions of the work equipment or parts of the boom. Lateral loads and diagonal tensile forces must also be taken into account.

The sling must be checked regularly by a qualified technician, at least once a year. Replace damaged slings immediately.

Fasten lifting gear and slings to avoid risk, such as rotating parts and crushing or shearing. Furthermore, neither must the work equipment be affected by the lifting gear, nor must the functions of the lifting gear be affected by external influences, such as dirt that cannot be removed by simply cleaning.

Do not place slings over sharp edges.

The persons attaching or securing loads may approach the boom from the side only, and only after the machine operator has given permission. The machine operator may give permission only after the machine is at a standstill and the work attachment no longer moves.

Staying under the suspended loads, in the danger area or under the machine attachment, is forbidden.

Have loads fastened and operators instructed by a qualified person competent in ranging operation and standard hand signals. The person giving instructions to the operator must be in sight of the operator during load attachment and disconnection.

The machine operator must guide the load near the ground and avoid any oscillating or swinging movements.

Machine travel with a raised load must be done carefully on a level surface. Move slowly to avoid sudden motion that can cause swinging or oscillation of the load.

The machine operator must not raise loads over persons.

The machine operator may not leave the seat or stop the engine as long as the load is raised.

i07287891

Travel in Water and Mud

SMCS Code: 7000-V6

NOTICE

When working in or around any body of water, around a stream or river, or in conditions of heavy mud, be careful that the swing bearing, the swing drive gear, and the swivel joint do not dip into water, mud, sand, or gravel. If the swing bearing dips into water, mud, sand, or gravel, immediately grease the swing bearing until the used grease leaks from the outer circle of the swing bearing. Failure to carry out this procedure may cause premature wear in the swing bearing.



Illustration 335

g06275447

Maximum depth of water to the top edge of the idler wheel.

The following guidelines pertain to travel across water and through mud, sand, or gravel.

The machine can travel across a river only under the following conditions:

- The bed of the river is flat.
- The flow of the river is slow.
- The machine dips into the water only to the center of the track carrier roller (dimension A).

While you cross the river, carefully confirm the depth of the water with the bucket. Do not move the machine into an area that has a water depth that is greater than Dimension A.

The machine may sink gradually on soft ground. Therefore, frequently check the height of the undercarriage from ground level and the depth of water on the ground.

If you have any doubts that the water might have been too deep, contact your Cat dealer for the required check.

After you travel through water, carefully clean the machine to remove any salt, sand, or other foreign matter.

Procedure for Removing the Machine from Water or Mud

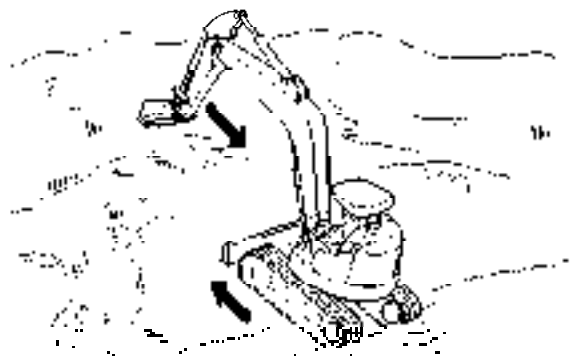


Illustration 336

g00818886

1. You may not be able to move the machine by using the travel controls only. In this case use both the travel control levers/pedals and the stick to pull the machine out of the water or ground.

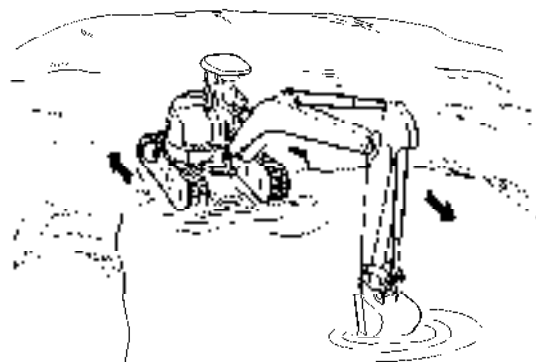


Illustration 337

g00818890

2. The machine may slip because of a steep slope. The procedure in Step 1 may not work. In this case, first rotate the upper structure by 180°. Then use both the travel control levers/pedals and the stick to move the machine up the slope.



Illustration 338

g06275725

3. It may be impossible to travel because the bottom of the frame comes into contact with the ground or the undercarriage is clogged with mud or gravel. In this case, operate the boom and the stick together. Raise the track and rotate the track forward and backward to remove the mud and the gravel.

i05374164

Quick Coupler Operation (Manual Pin Grabber Quick Coupler (If Equipped))

SMCS Code: 6129; 6522; 7000

NOTICE

The vibration caused by extensive use of a hydraulic hammer as well as the added weight of certain demolition tools such as shears, crushers, and pulverizers may cause premature wear and decreased service life of the coupler.

Be sure to inspect the coupler daily for cracks, bent components, or wear when operating with any of the above work tools.

Coupling the Work Tool

WARNING

Improper attachment of work tools could result in injury or death.

Do not operate this machine until you have positive indication that the coupler pins are fully engaged. Check for engagement by:

1. Position the work tool on the ground.
2. Apply slight down pressure on the work tool.
3. Retract and extend the stick cylinder in order to push the work tool against the ground. Visually confirm that there is no movement between the coupler and the work tool.

WARNING

Place the work tool or bucket in a safe position before engaging the quick coupler. Ensure that the work tool or bucket is not carrying a load.

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

WARNING

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

NOTICE

With certain work tool combinations, including quick couplers, the work tool can hit the canopy or the front of the machine. Always check for interference when first operating a new work tool.

1. Start the engine. Position the work tool on a level surface.

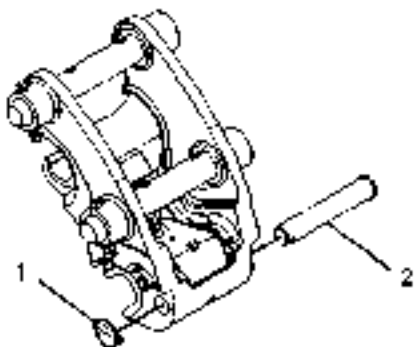


Illustration 339

g02165934

2. Remove lynch pin (1) and the safety pin (2).
3. Retract the work tool cylinder. Position the open hook on the quick coupler over the top pin of the work tool.

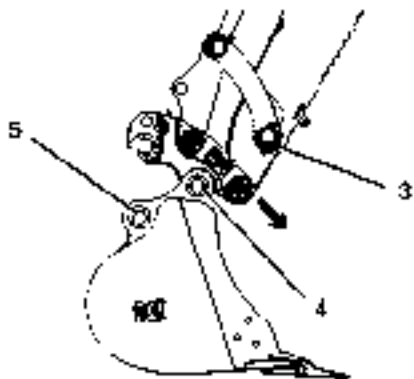


Illustration 340

g02165936

4. Move stick (3) inward and lower the stick until the hook engages the top pivot pin (4) of the work tool.
5. Rotate the quick coupler toward the machine and lift the bucket from the ground.
6. With increased engine speed, extend the work tool cylinder in order to rotate the quick coupler and the bucket toward the stick. When the cylinder is almost at the end of the stroke, reverse the direction of the cylinder. This will cause the bucket to swing. The bucket will drop into the quick coupler and the lower pin (5) of the bucket will engage. Stop the engine.

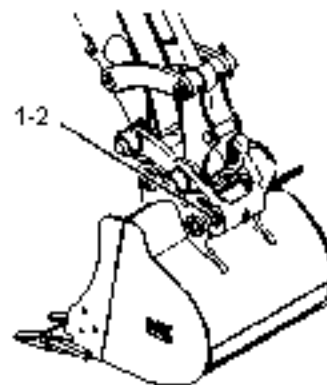


Illustration 341

g02193894

7. Fully insert the safety pin (2) into the bore of the quick coupler. Install the lynch pin (1) in order to secure the safety pin.
8. In order to verify the engagement of the work tool, perform the following procedure.
 - a. Start the engine. Retract and extend the stick cylinder in order to push the work tool against the ground.
 - b. Ensure that there is no movement between the work tool and the quick coupler.
 - c. Visually confirm the engagement of the work tool.

Uncoupling the Work Tool

WARNING

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

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

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

NOTICE

Auxiliary hoses for work tools must be disconnected before the Hydraulic Quick Coupler is disengaged.

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

Operation Section
Manual Pin Grabber Quick Coupler (If Equipped)

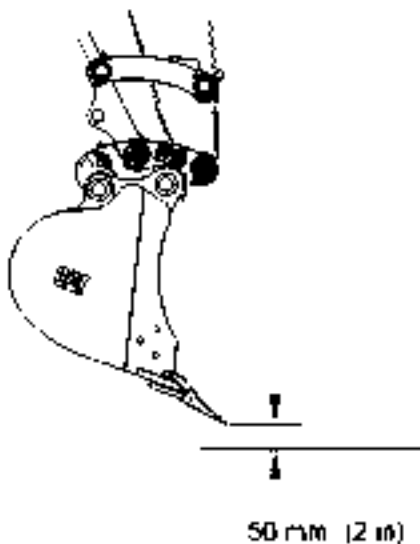


Illustration 342

g01502436

1. Lower the bucket to approximately 50 mm (2 inch) above the ground. The cutting edge should be slightly lower than the rear of the bucket. Other work tools may need to be lowered to the ground.

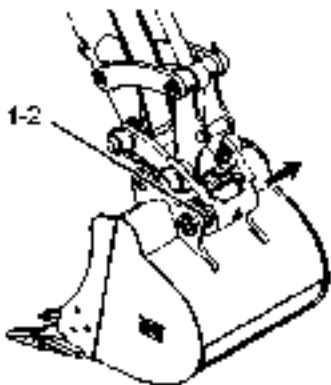


Illustration 343

g02165954

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

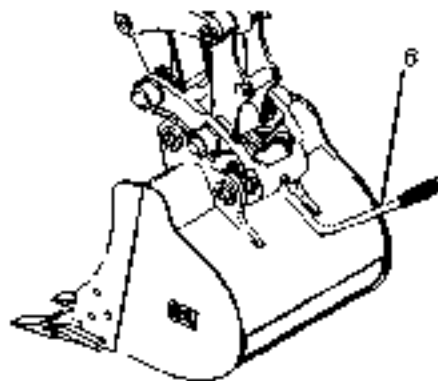


Illustration 344

g02165973

3. Insert the release lever (6). Push down on the release lever (6) in order to open the hook. The work tool will swing away from the coupler.

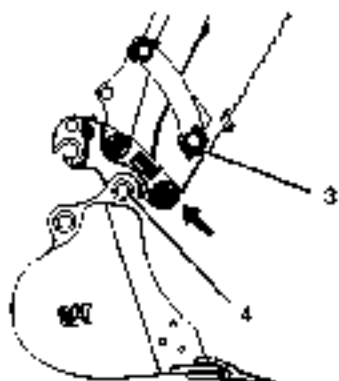


Illustration 345

g02193895

4. Raise stick (3) and move stick (3) away from the work tool in order to release the quick coupler from pivot pin (4) of the work tool.

i05505856

Quick Coupler Operation (Mechanical Pin Grabber Quick Coupler (If Equipped))

SMCS Code: 6129; 6522; 7000

NOTICE

The vibration caused by extensive use of a hydraulic hammer as well as the added weight of certain demolition tools such as shears, crushers, and pulverizers may cause premature wear and decreased service life of the coupler.

Be sure to inspect the coupler daily for cracks, bent components, or wear when operating with any of the above work tools.

General Operation

The quick coupler is used to change work tools, with minimal effort on the operators part. The quick coupler can be used with a broad range of buckets and work tools. Each work tool must have a set of pins in order for the quick coupler to work properly.

The work tools are held onto the quick coupler by two independent locking mechanisms. The work tool rear pin locking mechanism consists of a wedge that is actuated by a mechanical threaded actuator. This actuator provides a positive lock and is adjustable to ensure a rigid, tight interface between the work tool and the quick coupler. Additionally, a fully independent locking system exists on the front pin of the work tool. This system is spring applied, ensuring that the work tool is locked immediately after the front pin of the work tool is seated. Always ensure that both locking mechanisms are working properly before using the quick coupler.

Installation

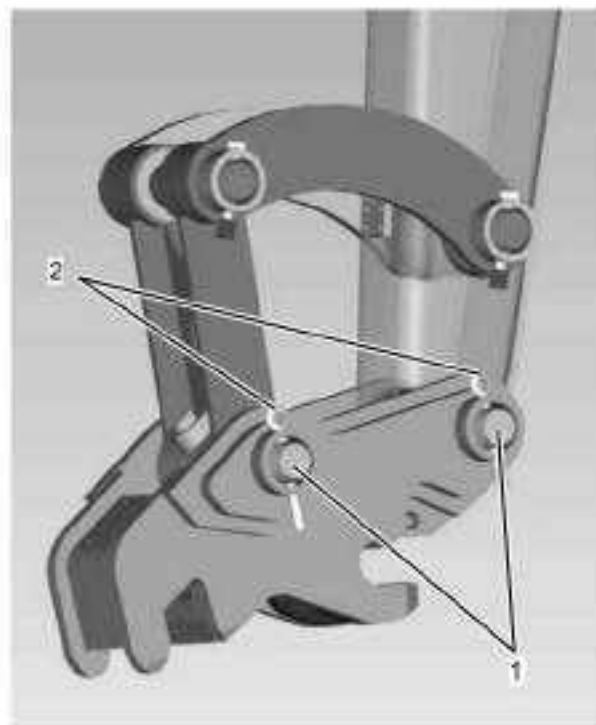


Illustration 346

g02869245

1. The quick coupler comes with two linkage pins (1) for installation on the machine. Lubricate the linkage pins (1) and pin bores before assembly on the machine.
2. Install the coupler and the linkage pins (1).

3. Install the cotter pins (2).

Coupling the Work Tool

WARNING

Improper attachment of work tools could result in serious injury or death.

Do not operate this machine until you have positive indication that the locking mechanisms are fully engaged. Check for engagement by:

1. Visually confirm the engagement of the work tool. Ensure that both the front and rear pin locking mechanisms for the work tool are locked and secure the work tool to the quick coupler.
2. Retract the bucket cylinder and drag the work tool on the ground.
3. Visually confirm that there is no movement between the work tool and the quick coupler.

WARNING

Place the work tool or bucket in a safe position before engaging the quick coupler. Ensure that the work tool or bucket is not carrying a load.

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

WARNING

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

NOTICE

With certain work tool combinations, including quick couplers, the work tool can hit the cab or the front of the machine. Always check for interference when first operating a new work tool.

1. Start the engine. Retract the bucket cylinder, positioning the quick coupler front locking mechanism over the front pin of the work tool.

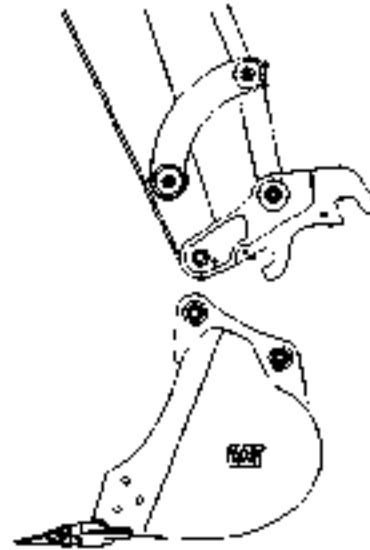


Illustration 347

g02163290

2. Align the quick coupler front locking mechanism over the front pin of the work tool. Extend the stick cylinder until the automatic front locking mechanism of the quick coupler engages and secures the front pin of the work tool.

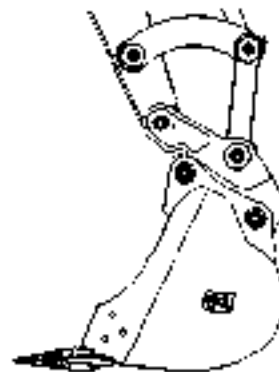


Illustration 348

g02163292

3. Extend the bucket cylinder in order to rotate the quick coupler toward the work tool until the quick coupler contacts the rear pin of the work tool. Position the work tool so that the work tool is slightly above the ground, with the front pin of the work tool higher than the rear pin of the work tool. If the work tool is a bucket, verify that the cutting edge is slightly higher than the bottom of the bucket. Stop the engine.

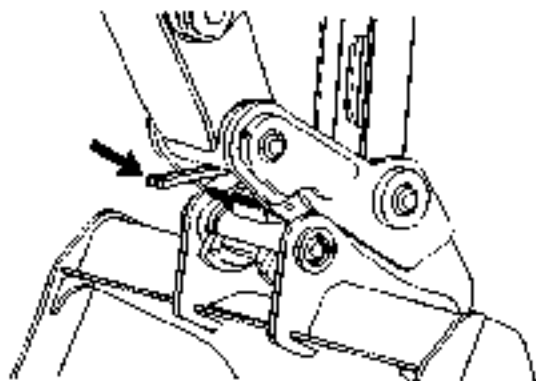


Illustration 349

g02165065

4. Using the supplied wrench, if equipped, and insert the ratcheting end onto the hex drive mechanism. Turn the ratchet in a clockwise direction in order to tighten the rear locking mechanism.
5. In order to verify the engagement of the work tool, perform the following procedure:
 - a. Visually confirm the engagement of the work tool. Ensure that both the work tool front and rear pin locking mechanisms are locked and securing the work tool to the coupler.
 - b. Retract the bucket cylinder and drag the work tool on the ground.
 - c. Visually confirm that there is no movement between the work tool and the quick coupler.

Uncoupling the Work Tool

WARNING

Place the work tool or bucket in a safe position before disengaging the coupler. Disengaging the coupler will release the work tool or bucket from control of the operator.

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

NOTICE

Auxiliary hoses for work tools must be disconnected before the Hydraulic Quick Coupler is disengaged.

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

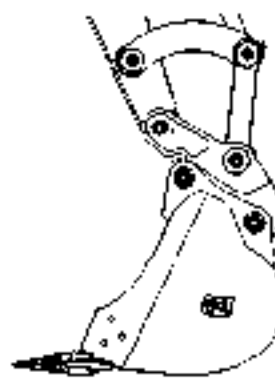


Illustration 350

g02163292

1. In order to unlock the coupler, position the work tool so that the work tool is slightly above the ground, with the front pin of the work tool higher than the rear pin of the work tool. If the work tool is a bucket, verify that the cutting edge is slightly higher than the bottom of the bucket. Other work tools may need to be lowered to the ground. Stop the engine.

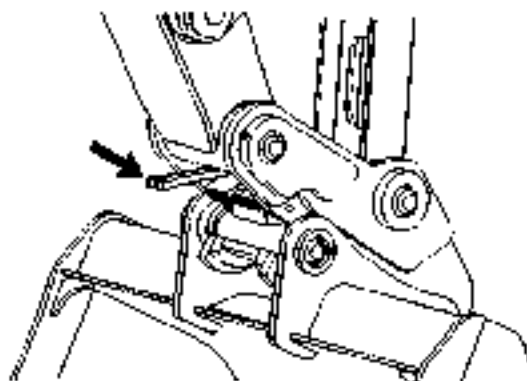


Illustration 351

g02165065

2. Using the supplied wrench, if equipped, and insert the ratcheting end onto the hex drive mechanism. Turn the wrench in a counterclockwise direction in order to release the rear locking mechanism.

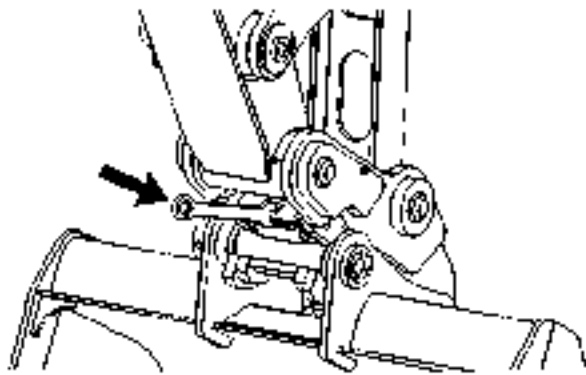


Illustration 352

g02165068

3. Using the supplied wrench, if equipped, and insert the open wrench end onto the front lock actuator. Push down on the wrench to rotate the front lock into an unlocked, detent position.
4. Start the engine. Lower the work tool to the ground.
5. Retract the bucket cylinder in order to rotate the quick coupler away from the work tool until the quick coupler disengages the rear pin of the work tool.
6. Move the stick away from the work tool in order to release the quick coupler from the front pin of the work tool. The front locking mechanism will automatically reset. The quick coupler is now ready to engage the next work tool.

Quick Coupler use with a Bucket that is Reversed

NOTICE

When some Cat buckets are used in the reverse position, it can be more difficult to couple the bucket and uncouple the bucket than in the normal position.

Care must be taken to ensure that the position of the boom, stick, and bucket are aligned to ensure smooth coupling. The coupler must be in position between the bucket bosses.

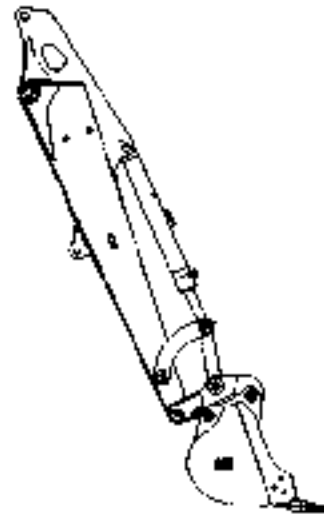


Illustration 353

g02163425

1. Follow the same steps for coupling and uncoupling the work tool in order to operate the coupler with a bucket that is reversed. Refer to "Coupling the Work Tool" and "Uncoupling the Work Tool" for the proper procedure.

i07423159

Quick Coupler Operation (If Equipped)

SMCS Code: 6129; 6522; 7000

Quick Coupler Ready (If Equipped)

Quick Coupler Ready is the definition for the installation of an additional hydraulic control circuit, which is routed to the end of the stick.

If a Hydraulic Quick Coupler is installed, ensure that the machine is equipped with the Quick Coupler Ready System and that the Hydraulic Quick Coupler and the matching work tools are approved for that machine. Caterpillar will not be liable for personal injury and/or damage to property caused by failure to observe the following:

Obey the instructions described in the Operation and Maintenance Manual of the Hydraulic Quick Coupler.

Store the Operation and Maintenance Manual of the Hydraulic Quick Coupler in the machines literature compartment.

The installation of a non-approved Hydraulic Quick Coupler may change the machines original operating functions and its description in the machines Operator and Maintenance Manual.

Furthermore, the following points have to be considered:

- If necessary, modifications and/or supplements have to be carried out at the machine (for example, safety decals), and/or its manuals (for example, changes to the described functionality).
- The Intended Use of the machine might have to be limited.
- The machines EC or EU-Declaration of Conformity might be compromised by fitting a Hydraulic Quick Coupler that does not match with the machine and its interface (for example, provided pressures).
- The Hydraulic Quick Couplers EC or EU-Declaration of Conformity might be compromised by installing the Hydraulic Quick Coupler on a host machine that does not match with the Hydraulic Quick Coupler and its interface (for example, required pressures).

General Operation

The hydraulic quick coupler is used to change work tools while the operator remains in the operator station.

As for how the work tools are held onto the hydraulic quick coupler and how the hydraulic quick coupler is operated, refer to the Hydraulic Quick Coupler Operation and Maintenance Manual. Always ensure that the hydraulic system and the locking mechanisms are working properly before using the hydraulic quick coupler.

If a lifting eye is included on the Hydraulic Quick Coupler, release the work tool from the Hydraulic Quick Coupler to use the lifting eye to pick up loads. To lift a load with the lifting eye, extend the bucket cylinder until the Hydraulic Quick Coupler is in a vertical position. Do not exceed the rated load for the machine.

Obey the local regulations and/or government regulations that govern the use of excavators which lift objects.

Obey the local regulations and/or government regulations that govern the lifting of loads.

Refer to Operation and Maintenance Manual, “Lifting Objects”, for more information on lifting objects with the machine.

Installation

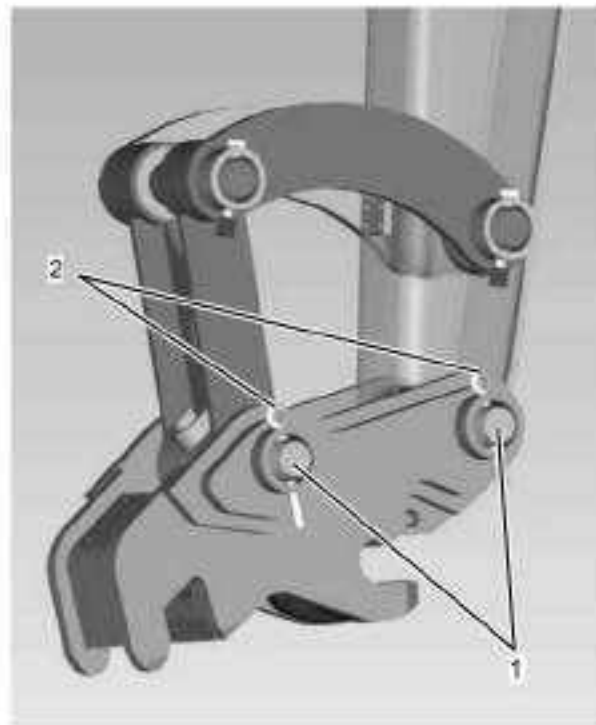


Illustration 354

g02869245

Note: The selection and installation of a Hydraulic Quick Coupler is subject to Cat dealers only.

1. Make sure that the linkage pins (1) fit the machine. Lubricate the linkage pins (1) and pin bores before assembly on the machine.

Note: If the machine is filled with biodegradable oil, make sure that the Hydraulic Quick Coupler is approved for that type of hydraulic oil. Flush the Hydraulic Quick Couplers hydraulic system with the same biodegradable oil as used in the machine.

2. Install the Hydraulic Quick Coupler and the linkage pins (1).
3. Secure the retaining pins (2) properly.
4. Connect the hydraulic lines following the instructions in the Hydraulic Quick Coupler Operation and Maintenance Manual.
5. Purge the system.

6. Perform a functional test and make sure that everything works properly as described in the Operation and Maintenance Manual of the machine and the Hydraulic Quick Coupler.
7. Check the Hydraulic Quick Coupler and its lines/connectors for any leakage.

Quick Coupler Operation

Coupling the Work Tool

WARNING

Improper attachment of work tools could result in serious injury or death.

Do not operate this machine until you have positive indication that the locking mechanisms are fully engaged. Check for engagement by:

1. Visually confirm the engagement of the work tool. Ensure that all locking mechanisms for the work tool are locked and secure the work tool to the quick coupler.
2. Retract the bucket cylinder and drag the work tool on the ground.
3. Visually confirm that there is no movement between the work tool and the quick coupler.

WARNING

Place the work tool or bucket in a safe position before engaging the quick coupler. Ensure that the work tool or bucket is not carrying a load.

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

WARNING

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

NOTICE

The buzzer will not sound when the switch is in the lock position. The position of the switch does not confirm the Hydraulic Quick Coupler is engaged. A physical test is required by dragging the work tool on the ground to confirm the Hydraulic Quick Coupler is engaged.

NOTICE

Always confirm that the buzzer sounds when the switch is in the unlock position. If no sound is heard while in this condition, ensure that the work tool is placed in a stable and safe position. Turn off the engine. Consult your Cat dealer.

NOTICE

With certain work tool combinations, including quick couplers, the work tool can hit the cab/canopy or the front of the machine. Always check for interference when first operating a new work tool.

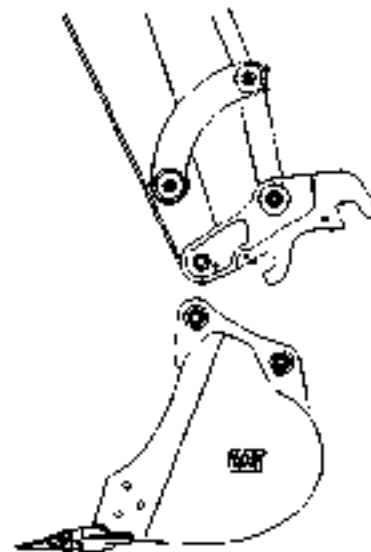


Illustration 355

g02163290

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

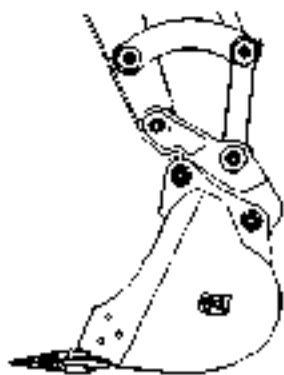


Illustration 356

g02163292

2. Unlock and press the quick coupler option on the monitor. The buzzer will sound and the Quick Coupler Ready System will be enabled and can be operated.

Note: If no sound is heard while in this condition, ensure that the work tool is placed in a stable and safe position. Turn off the engine. Consult your Cat dealer.

3. Press and hold the foot-operated switch (13). Pull the dozer blade lever (17) backwards as far as the lever will go, hold the lever in this position. The Quick Coupler Ready System provides the adjusted pressure to the Hydraulic Quick Coupler. The dozer blade lever can be released once the Hydraulic Quick Coupler is open.
4. Attach the Hydraulic Quick Coupler to the work tool as described in the Hydraulic Quick Coupler Operation and Maintenance Manual.

WARNING

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

NOTICE

For system-specific reasons, the Quick Coupler Ready System opens and closes with the dozer blade function, the swing function and the AUX II function (if equipped). For practical reasons, only use the described function "Dozer Blade" to operate the Quick Coupler Ready System.

5. Release the foot-operated switch (13). Pull the dozer blade lever (17) backwards as far as the lever will go, hold the lever in this position. The dozer blade lever can be released once the Hydraulic Quick Coupler is closed. Press the quick coupler option on the monitor again, the buzzer will stop.
6. To verify the engagement of the work tool, perform the following procedure:
 - a. Visually confirm the engagement of the work tool. Ensure that the locking mechanisms of the work tool are locked and securing the work tool to the Hydraulic Quick Coupler.
 - b. Retract the bucket cylinder and drag the work tool on the ground.
 - c. Visually confirm that there is no movement between the work tool and the Hydraulic Quick Coupler.

NOTICE

Back drag the work tool on the ground to ensure the Hydraulic Quick Coupler is properly locked.

Do not strike the work tool on the ground to ensure the Hydraulic Quick Coupler is properly locked. Striking the work tool on the ground may result in damage to the Hydraulic Quick Coupler and the host machine.

Uncoupling the Work Tool

WARNING

Place the work tool or bucket in a safe position before disengaging the coupler. Disengaging the coupler will release the work tool or bucket from control of the operator.

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

NOTICE

Auxiliary hoses for work tools must be disconnected before the Hydraulic Quick Coupler is disengaged.

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

NOTICE

Always confirm that the buzzer sounds when the switch is in the unlock position. If no sound is heard while in this condition, ensure that the work tool is placed in a stable and safe position. Turn off the engine. Consult your Cat dealer.

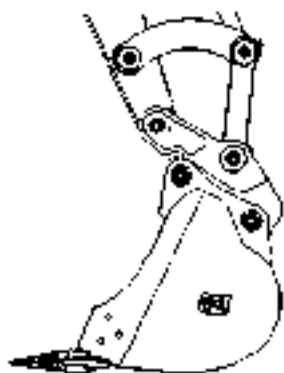


Illustration 357

g02163292

1. To unlock the Hydraulic Quick Coupler, position the work tool as described in the Hydraulic Quick Coupler Operation and Maintenance Manual .

NOTICE

For system-specific reasons, the Quick Coupler Ready System opens and closes with the dozer blade function, the swing function and the AUX II function (if equipped). For practical reasons, only use the described function "Dozer Blade" to operate the Quick Coupler Ready System.

2. Unlock and press the quick coupler option on the monitor. The buzzer will sound and the Quick Coupler Ready System will be enabled and can be operated.

Note: If no sound is heard while in this condition, ensure that the work tool is placed in a stable and safe position. Turn off the engine. Consult your Cat dealer.

3. Press and hold the foot-operated switch (13). Pull the dozer blade lever (17) backwards as far as the lever will go, hold the lever in this position. The dozer blade lever can be released once the Hydraulic Quick Coupler is open.

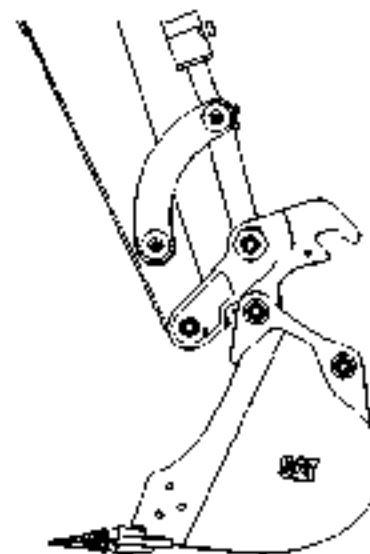


Illustration 358

g02163415

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

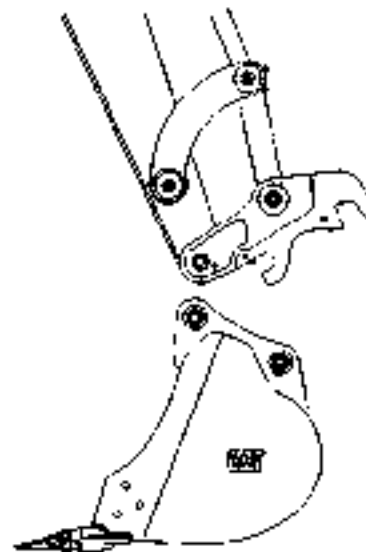


Illustration 359

g02163290

5. Ensure that the work tool is in a stable and safe storage position on the ground.

6. Release the foot-operated switch (13). Pull the dozer blade lever (17) backwards as far as the lever will go, hold the lever in this position. The dozer blade lever can be released once the Hydraulic Quick Coupler is closed. Press the quick coupler option on the monitor again, the buzzer will stop.

Coupling a Bucket that is Reversed

NOTICE

When some buckets are used in the reverse position, it can be more difficult to couple the bucket and uncouple the bucket than in the normal position.

Care must be taken to ensure that the position of the boom, stick, and bucket are aligned to ensure smooth coupling.

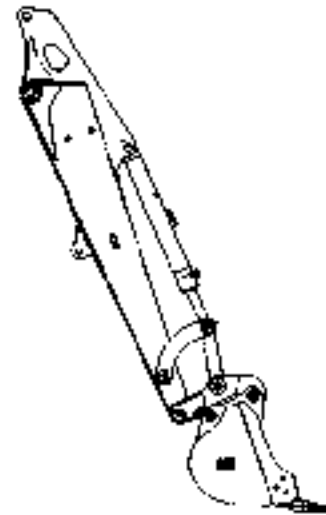


Illustration 360

g02163425

Follow the same steps for coupling and uncoupling the work tool to operate the Hydraulic Quick Coupler with a bucket that is reversed. Refer to “Coupling the Work Tool” and “Uncoupling the Work Tool” for the proper procedure.

i08503640

Quick Coupler Operation (CW (Single Lock) Quick Coupler (If Equipped))

SMCS Code: 6129; 6522; 7000

NOTICE

The vibration caused by extensive use of a hydraulic hammer and the added weight of certain demolition tools such as shears, crushers, and pulverizers may cause premature wear and decreased service life of the coupler.

Be sure to inspect the coupler daily for cracks, bent components, or wear when operating with any work tools.

General Operation

The CW coupler is used to change work tools quickly. The quick coupler can be used with a broad range of buckets and work tools.

Installation Procedure

WARNING

Personal injury or death can result from improperly checking for a leak.

Always use a board or cardboard when checking for a leak. Escaping air or fluid under pressure, even a pin-hole size leak, can penetrate body tissue causing serious injury, and possible death.

If fluid is injected into your skin, it must be treated immediately by a doctor familiar with this type of injury.

Note: Hydraulic oil may be trapped in the lines if the hydraulic lines are plugged or if the hydraulic lines are connected. The trapped oil may be under pressure. Use care when you open the hydraulic lines.

Note: The quick coupler must be controlled by the excavator's hydraulic system.

Perform this procedure as described in the following steps:

Ensure that the quick coupler is compatible with the host machine. For more information, consult your Caterpillar dealer.

To provide a stable operating condition, the host machine must be on flat, level ground. The host machine must be blocked to prevent inadvertent movement.

The quick coupler must be supported to prevent inadvertent movement. Position the quick coupler to prevent unnecessary climbing and unnecessary bending.

Optimum alignment of the bores will prevent the use of unnecessary force when you install the pins. Never check the alignment of the bores with your fingers. Use the proper tools to check the alignment of the bores.

A retaining pin can fly out when the retaining pin is struck with force. The area must be clear of people when you drive retaining pins.

When you strike objects, chips and other debris can fly. Before you strike any object, make sure that no one can be injured by the flying debris. Always wear appropriate PPE, including safety glasses.

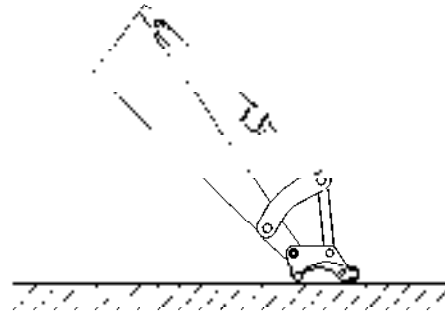


Illustration 361

g00741430

1. Position the quick coupler on the ground in front of the host machine. Make sure that the wedge faces away from the host machine.
2. Install the mounting pins.
3. Lubricate all the mounting points.
4. Connect the hydraulic lines to the quick coupler (if equipped).
5. After mounting the quick coupler on the excavator, or after working on the quick coupler hydraulic system, it is necessary to purge all the air from the cylinder and the control system. Refer to the "Hydraulic System Air Purge" for additional information.

Quick Coupler Removal Procedure

1. Lay the quick coupler flat on the ground.
2. Release the pressure from the hydraulic lines (if equipped).
 - a. Extend the wedge to the UNLOCKED position.
 - b. Stop the engine on the host machine. Turn the ignition to OFF.
 - c. Turn the ignition to the ON position without starting the engine.
 - d. Move the hydraulic control levers repeatedly through the full range of motion. This will release any pressure that may be present in the hydraulic system. Actuate the quick coupler using the machine control monitor. Cycle through locking and unlocking the quick coupler several times to release trapped hydraulic pressure within the quick coupler circuit.
 - e. The wedge should begin to move inward due to the spring force.

- f. Turn the ignition to the OFF position.
- g. Release the pressure in the host machine's hydraulic tank.

WARNING

Personal injury or death can result from improperly checking for a leak.

Always use a board or cardboard when checking for a leak. Escaping air or fluid under pressure, even a pin-hole size leak, can penetrate body tissue causing serious injury, and possible death.

If fluid is injected into your skin, it must be treated immediately by a doctor familiar with this type of injury.

NOTICE

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

Refer to Special Publication, PERJ1017, "Dealer Service Tool Catalog" for tools and supplies suitable to collect and contain fluids on Cat® products.

Dispose of all fluids according to local regulations and mandates.

3. Place a suitable container below the hydraulic fittings to catch any hydraulic oil that may escape. Slowly disconnect the hydraulic lines. Plug the ends of the hydraulic lines or connect the hydraulic lines.
4. Dispose of the hydraulic oil in a suitable manner.
5. Remove the pins from the quick coupler.

Daily Inspection

WARNING

Personal injury or death can result from improperly checking for a leak.

Always use a board or cardboard when checking for a leak. Escaping air or fluid under pressure, even a pin-hole size leak, can penetrate body tissue causing serious injury, and possible death.

If fluid is injected into your skin, it must be treated immediately by a doctor familiar with this type of injury.

NOTICE

Accumulated grease and oil on a work tool is a fire hazard.

Remove debris with steam cleaning or high pressure water at any time a significant quantity of oil is spilled on the work tool.

Note: If major repairs to the quick coupler are required, consult your Caterpillar dealer.

1. For the maximum service life of the work tool, make a thorough daily inspection before you mount a work tool to the host machine.
2. Inspect the quick coupler for the following conditions: loose bolts, oil leaks, broken parts, missing parts and cracked components. Check the overall condition of the quick coupler. Check the overall condition of the hydraulic system.
3. Inspect the warning signs and labels. Replace warning signs or labels that are missing. Replace warning signs or labels when you cannot read the warning signs or labels.
4. If equipped, inspect the condition of the hydraulic lines and the hydraulic fittings.
5. Check the mounting pins for the quick coupler.
6. Inspect the bolts for the wedge when you remove the wedge.
7. Check the lifting device, if equipped. If damage is present, do not use the lifting device. Contact your Caterpillar dealer for repairs.
8. Perform all repairs before you put the quick coupler into service.
9. Perform an UNLOCK and LOCK cycle of the wedge to provide a smooth operation of the wedge. This procedure is for the quick coupler with hydraulic coupling only.

Operation

Coupling the Work Tool

WARNING

Place the work tool or bucket in a safe position before engaging the quick coupler. Ensure that the work tool or bucket is not carrying a load.

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

WARNING

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

Reference: For more information on connecting the quick coupler to the host machine, contact your dealer for special instructions.

Quick Coupler with Hydraulic Coupling

WARNING

Place the work tool or bucket in a safe position before engaging the quick coupler. Ensure that the work tool or bucket is not carrying a load.

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

NOTICE

The buzzer will not sound when the switch is in the lock position. The position of the switch does not confirm that the quick coupler locking system is properly engaged with the attachment pins. Visually confirm positive engagement of the locking system. A physical test is required by dragging the work tool on the ground to confirm that the coupler is properly engaged with the work tool.

NOTICE

Always confirm that the buzzer sounds when the switch is in the unlock position. If no sound is heard while in this condition, ensure that the work tool is placed in a stable and safe position. Turn off the engine. Consult your Cat dealer.

NOTICE

With certain work tool combinations, including quick couplers, the work tool can hit the cab or the front of the machine. Always check for interference when first operating a new work tool.

1. Verify that the wedge is in the unlocked position. If the wedge is not extended, extend the bucket cylinder. Then, extend the wedge.

WARNING

Ensure that the wedge is extended before coupling the work tool. Severe damage may occur. Failing to extend the wedge before coupling the work tool could result in a poorly coupled work tool or an uncoupled work tool.

Serious injury or death may result from an improperly coupled work tool.

2. Ensure that the mounting bracket of the work tool is in line with the host machine. The work tool must be facing the host machine. The mounting bracket must be at the top of the work tool.

Coupling a Bucket

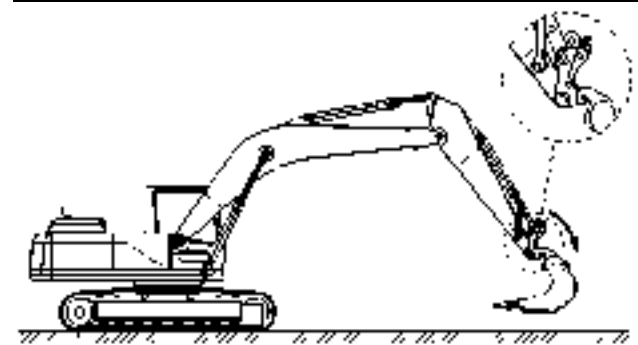


Illustration 362

g01285027

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

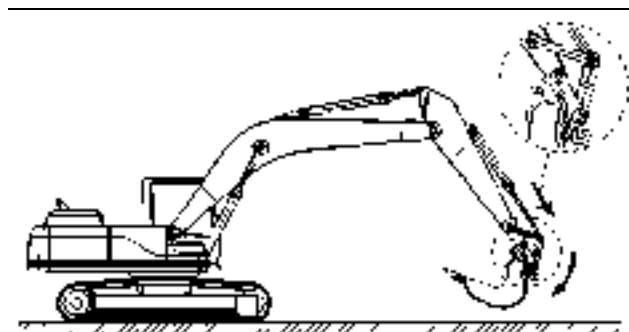


Illustration 363

g01285038

2. Select "UNLOCK" on the monitor display and confirm that the buzzer is sounding with an intermittent pattern of one beep per second. If no sound is heard while in this condition, ensure that the work tool is placed in a stable and safe position. Turn off the engine. Consult your Cat dealer. Extend the bucket cylinder until the coupler contacts the work tool.
3. Tilt the quick coupler against the work tool by extending the bucket cylinder.
4. Select "LOCK" on the monitor display and the beep will stop and the rear lock (wedge) will slide back into place. The monitor will return to the home screen.
5. Visually confirm that the wedge has engaged the work tool hook and is properly locked. If this visual confirmation cannot be performed from the machine cab due to obstruction, lighting, etc., place the machine in a safe state, exit the cab, and visually confirm proper engagement at the quick coupler.

WARNING

Inspect the quick coupler engagement before operating the machine.

Serious injury or death may result from improperly engaged coupler.

NOTICE

Visually confirm that the quick coupler engagement system is properly locked to the work tool. Confirm that the wedge has engaged the work tool hook and is properly locked.

6. Verify the engagement of the quick coupler and the work tool.

- a. Place the work tool on the ground.
- b. Apply pressure to the work tool against the ground.
- c. Drag the work tool forward and backward.

Quick Coupler with Mechanical Coupling

WARNING

Place the work tool or bucket in a safe position before engaging the quick coupler. Ensure that the work tool or bucket is not carrying a load.

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

1. Ensure that the work tool mounting bracket is in line with the host machine. The work tool must be facing the host machine. The mounting bracket must be at the top of the work tool.

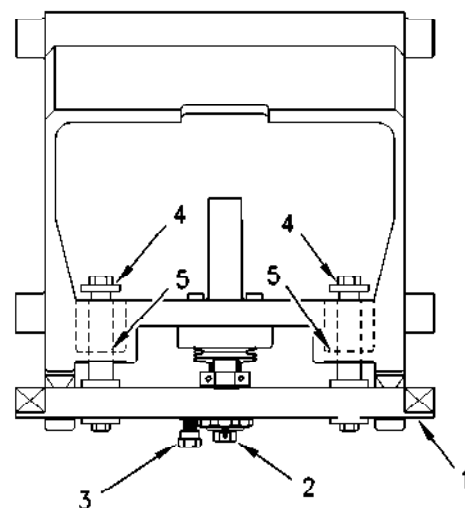


Illustration 364

g00928845

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

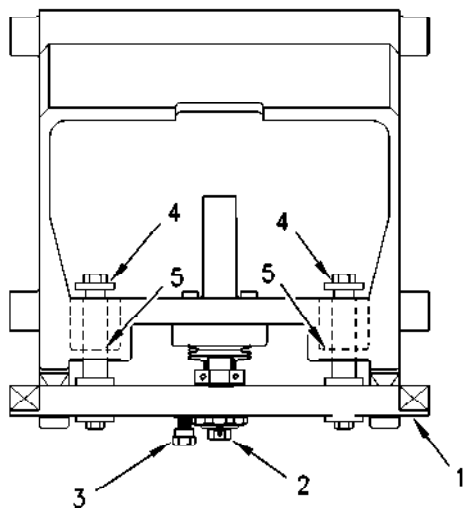


Illustration 365

g00928845

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

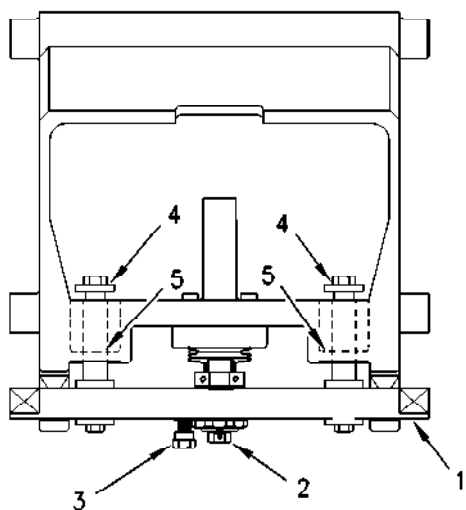


Illustration 366

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

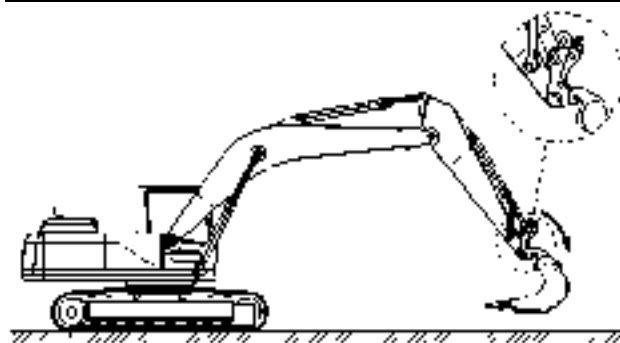


Illustration 367

g01285027

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

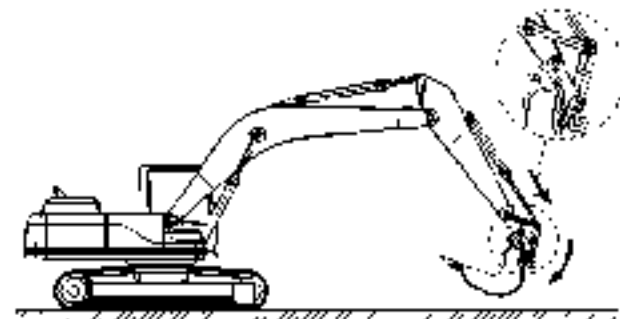


Illustration 368

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.

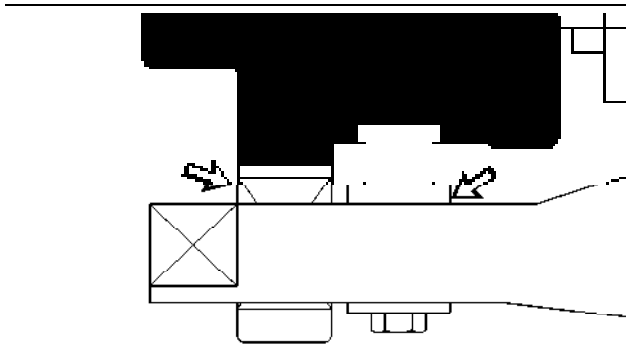


Illustration 369

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 placed in a stable and safe position. Turn off the engine. Consult your Cat dealer.
3. Retract the bucket cylinder until the coupler is no longer in contact with the work tool. The work tool is now suspended by the front pivot.
4. Place the work tool on the ground.
5. Unhook the quick coupler from the mounting bracket.

Quick Coupler with Mechanical Coupling

WARNING

Place the work tool or bucket in a safe position before disengaging the coupler. Disengaging the coupler will release the work tool or bucket from control of the operator.

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

1. Stop the engine of the host machine.
2. Loosen the locking bolt until you can turn the spindle.
3. Turn the spindle outward. If necessary, strike the wedge with a hammer to release the wedge.
4. Retract the bucket cylinder. The work tool will be suspended by the front pivot.
5. Place the work tool on the ground.
6. Unhook the quick coupler from the mounting bracket.

Lifting Loads

WARNING

Lifting loads with the quick coupler is only permitted when there is no work tool attached. Lifting loads when there is a work tool attached may result in serious injury or death.

NOTICE

If used to lift loads, then the excavator must comply with the requirements for lifting machinery. These are given in standard EN 474-5. For more information, consult your Caterpillar dealer.

Note: When you lift loads with the lifting yoke or the lifting hook, the wedge must be retracted or the wedge must be removed from the coupler.

Lifting Hook (If Equipped)

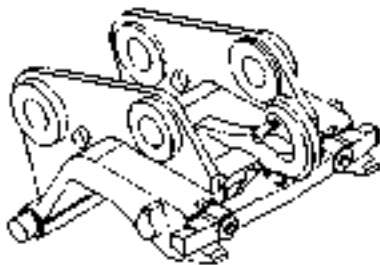


Illustration 370

g03219216

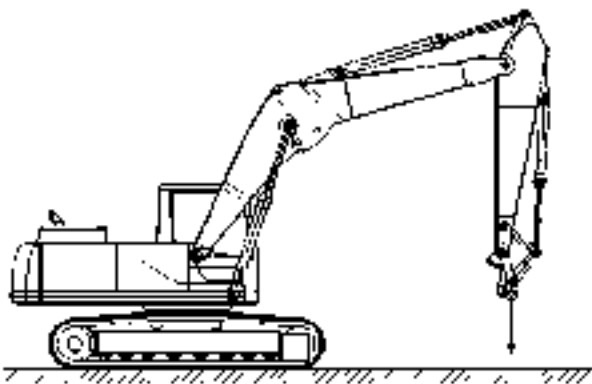


Illustration 371

g01285467

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

WARNING

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

3. Fasten an appropriate chain, cable, or a lifting strap to the lifting hook. Do not perform any lifting operations if the safety latch is missing. Do not perform any lifting operations if the safety latch is damaged. Contact your supplier.

Lifting Objects

WARNING

To prevent injury, do not exceed the rated load capacity of the machine. If the machine is not on level ground, load capacities will vary.

The quick coupler and attached lifting hook have unique rated load capacities. Each capacity is marked on the corresponding component. Do not exceed the maximum capacity of any component used in a lifting operation. Quick coupler capacities are listed in the table below:

Table 25

Quick Coupler Rated Capacities ⁽¹⁾	
Quick Coupler Model	Rated Capacity
CW05	600 kg (1322 lb)
CW10	1400 kg (3086 lb)

⁽¹⁾ Capacities rated in accordance with EN 474-1:2006+A4:2013 Annex E and ASS 1418.8-2008 standards

Refer to the load charts in the Operation and Maintenance Manual of the host machine. Use the load charts and account for the mass of the work tool. Calculate the load capacity relative to the location of the lifting point on your specific host machine.

Use a sling or a shackle to attach to the lifting point and lift the object. The sling or the shackle must have a rated capacity that is greater than the mass of the load.

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

Contact your Cat dealer for additional information.

The setting for the overload warning device should be checked by an authorized dealer.

i07290597

Bucket - Remove and Install

SMCS Code: 6001; 6001-012; 6001-011; 6101; 6102; 6523

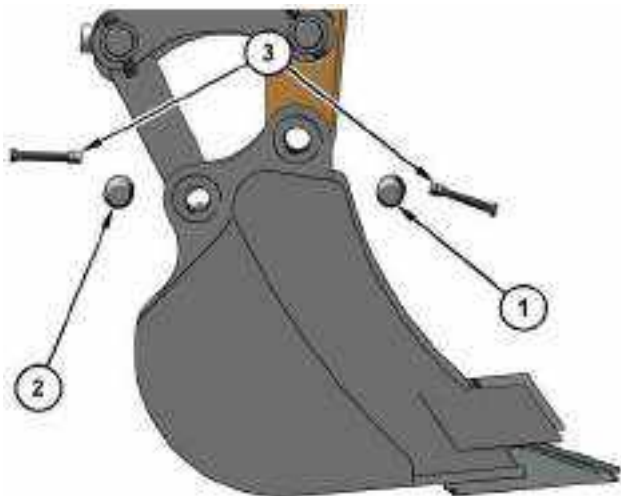


Illustration 372

g06275756

- (1) Pin
- (2) Pin
- (3) Locking Pin

Removal Procedure

WARNING

Driving in linkage pins with a hammer can cause the pins to splinter, which can cause severe personal injury.

Always use personal protective equipment (protective goggles, helmets, gloves, and other protective equipment) when installing linkage pins.

WARNING

When the pin assembly is removed, the linkage assembly may swing out of the bucket. To prevent possible personal injury, do not stand in front of, or do not stand behind the linkage assembly when the pin assembly is being removed. Do not place any part of the body (hands, feet, etc.) beneath the bucket.

1. Start the engine. Park the machine on a hard, level surface and lower the bucket to the ground. Shut off the engine.

Note: Make sure that the bottom side of the bucket is facing downward.

2. Remove locking pin (3) from support pin (2) and remove the pin that connects the connecting link to the bucket.
3. Remove locking pin (3) from support pin (1) and remove the pin that connects the stick to the bucket.
4. Start the engine and raise the stick out of the bucket.

Note: After the support pins have been removed, make sure that the support pins do not become contaminated with sand or dirt. Make sure that the stick and the linkage do not become damaged.

Installation Procedure

WARNING

Failure to follow the instruction below for the installation of a work tool may result in personal injury or death. Special care must be taken if more than one person is installing the work tool.

- Confirm the verbal communication and the hand signals that will be used during the installation.
- Be alert for sudden movement of the front linkage and the work tool.
- Do not insert fingers into the bores of the support pins when the support pins and the bores are being aligned.

WARNING

Driving in linkage pins with a hammer can cause the pins to splinter, which can cause severe personal injury.

Always use personal protective equipment (protective goggles, helmets, gloves, and other protective equipment) when installing linkage pins.

⚠ WARNING

When the pin assembly is removed, the linkage assembly may swing out of the bucket. To prevent possible personal injury, do not stand in front of, or do not stand behind the linkage assembly when the pin assembly is being removed. Do not place any part of the body (hands, feet, etc.) beneath the bucket.

1. Start the engine. Park the machine on a hard, level surface. Position the bucket on a hard, level surface with the bottom side facing downward.
2. Clean each pin and each pin bore. Lubricate each pin bore with molybdenum grease.
3. Start the engine and lower the stick into the bucket until the pin bores are in alignment with each other. Stop the engine and put the hydraulic lockout control in the RAISED position.
4. Install support pin (1) to connect the stick to the bucket. Secure the pin with locking pin (3).
5. Install support pin (2) to connect the connecting link to the bucket. Secure the pin with locking pin (3).
6. To verify a proper work tool installation, perform the following procedure:
 - a. Start the engine. Position the work tool on the ground.
 - b. Apply a slight down pressure on the work tool.
 - c. Retract and extend the stick cylinder to push the work tool against the ground. Visually confirm that there is no movement between the

linkage and the work tool and the locking pins are properly fixed.

i07290678

Hammer Operation (If Equipped)

SMCS Code: 5705-WTL

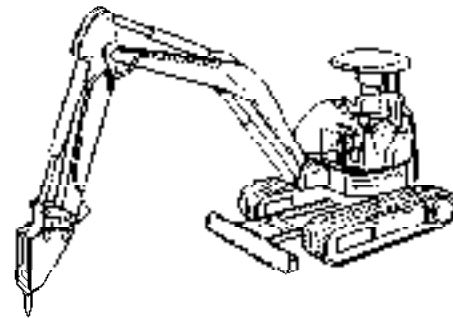


Illustration 373

g00821410

NOTICE

Selection of a hydraulic hammer must be done with extra care. Use of a hydraulic hammer not recommended by Caterpillar could result in structural damage to the machine. Consult your Caterpillar dealer for hydraulic hammer information.

Only use the hydraulic hammer to break rocks, concrete, and other hard objects. Before you start hydraulic hammer operation, place the machine on a level, stable surface. If the machine must be placed on a slope or on a rough surface, be careful during operation.

If the machine is equipped with a canopy, make sure that the machine is equipped with a polycarbonate shield. However, the limited operating range has to be observed, see illustrations 374 and 375. When visibility is restricted due to rain, snowfall, dust etc., the work has to be stopped. Resume work only if visibility is no longer restricted. Wear protective equipment such as a hard hat and protective goggles before you start hydraulic hammer operation.

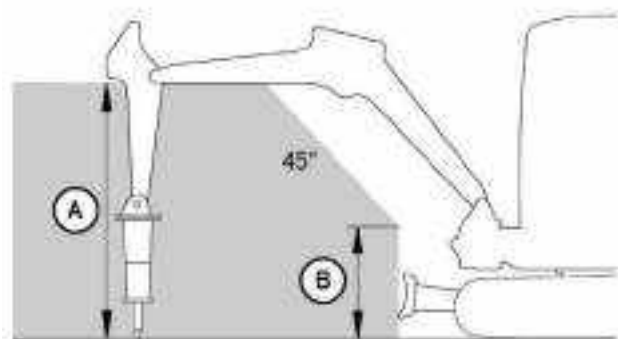


Illustration 374

g03392773

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



Illustration 375

g06276140

NOTICE

In order to avoid structural damage to the host machine or the hydraulic hammer, comply with the following:

Do not attempt to break rocks or concrete by burying the hammer tool completely into the rocks or concrete.

Do not apply a prying force to the hammer tool in order to remove the hammer tool from the material.

NOTICE

Frequent idle strokes (blank firing) have a deteriorating effect on the hammer. Do not operate the hammer without proper down pressure against the object.

Do not allow the hydraulic hammer to continuously operate at one location and for more than 1 minute. Change the location of the machine and repeat the procedure. Failure to change the location of the machine could cause the hydraulic oil to overheat. Overheated hydraulic oil could damage the accumulator or the cylinder seals.

Stop hydraulic hammer operation immediately if any of the hydraulic hoses are twisting rapidly. This indicates that the accumulator is punctured. Consult your Cat dealer for the necessary repairs.

NOTICE

Do not use the dropping force of the hydraulic hammer to break rocks or other hard objects. This could cause structural damage to the machine.

Do not use the sides or back of the hydraulic hammer to move rocks or other hard objects. Doing this could cause damage not only to the hammer but to stick or boom cylinder.

Do not operate the hydraulic hammer with any of the cylinders fully retracted or extended. Doing this could cause structural damage to the machine, resulting in reduced machine life.

Do not use the hydraulic hammer to lift an object.

Do not operate the hydraulic hammer while the stick is vertical to the ground. This type of operation could allow the stick cylinder to vibrate excessively.

Do not operate the hydraulic hammer on objects in water. This type of operation could cause the chisel to rust and the seal on the sliding section to be damaged.

Operate the attachment control levers carefully to keep the hydraulic hammer's chisel from hitting the boom.

Do not operate the hydraulic hammer with the upper structure sideways to the undercarriage. Before you start hydraulic hammer operation, place the upper structure in the recommended position that is shown in the following illustration. Any other operating positions could make the machine unstable. Any other operating positions could place excessive loads on the undercarriage.

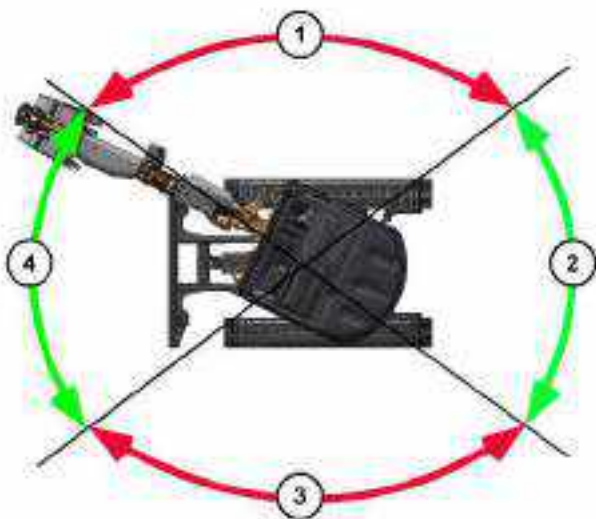


Illustration 376

g06275800

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

i07285207

Blade Operation

SMCS Code: 6060

NOTICE

The machine can be damaged if the adjustable gauge undercarriage and the blade are set to different widths (for instance when driving through a door).

Reducing the Width of the Blade

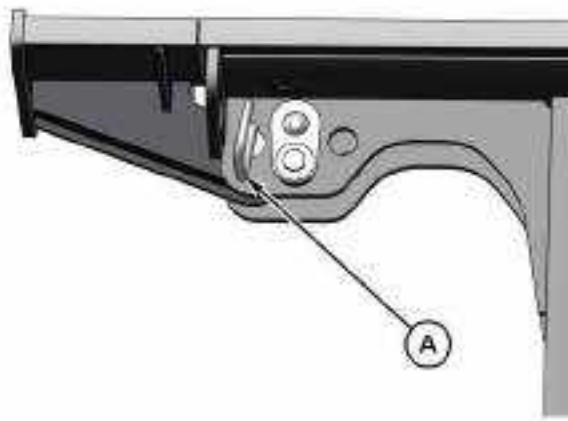


Illustration 377

g06262829

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

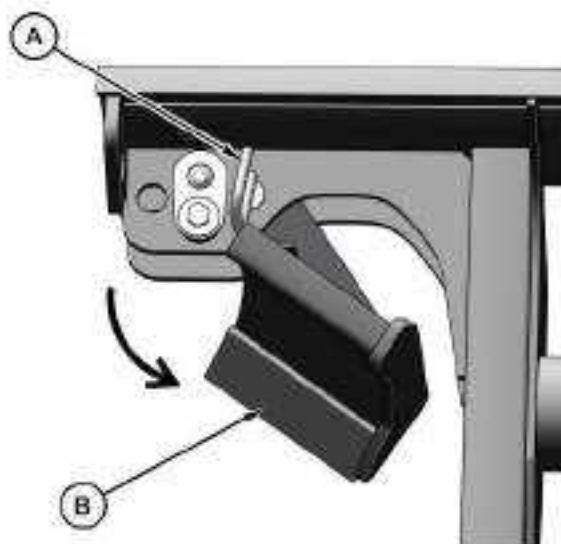


Illustration 378

g06262835

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

4. Insert pins (A) on either side.

Increasing the Width of the Blade

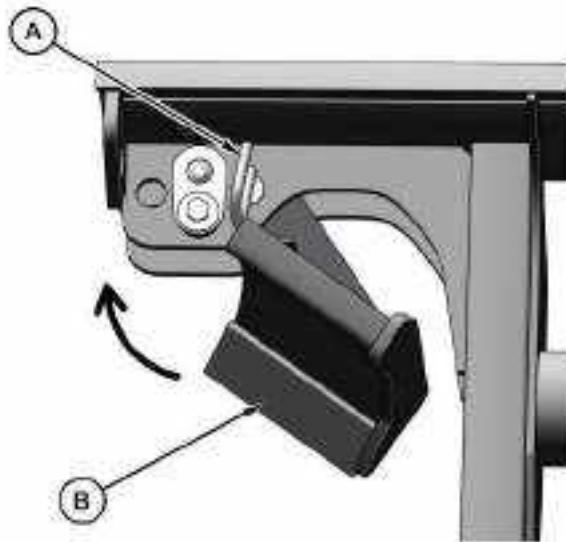


Illustration 379

g06262836

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

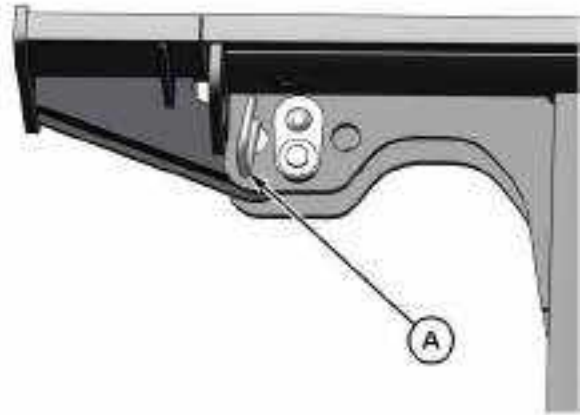


Illustration 380

g06262829

4. Insert pins (A) on either side.

i05334780

Rubber Belt Track Operation

SMCS Code: 4198

The rubber part of the track assembly can easily be damaged during operation. Operate the machine with the rubber belt only if damage to the rubber belt is shallow and the damage is not harmful. However, any harmful damage to the rubber can cause the following serious problems to the entire track assembly:

- Early wear of iron core.
- Early wear of track grousers.
- Fracture of iron core.
- Fracture of track grousers.
- Cuts of steel cords
- Rubber flaking off
- Disengagement of sprocket

Such a failed track assembly needs to be replaced as a unit. In order to minimize the replacement of the track, observe the following items. In order to maximize the performance of the track, observe the following items:

- Avoid Traveling at sites for demolition.

Operation Section
Rubber Belt Track Operation

- Traveling at these sites should be avoided particularly when the machine is being swung at the same time.
- Avoid operation under salty conditions.
- Avoid combined operation of travel and swing with excessive load at rough terrain.
- Avoid operation at rocky sites.
- Avoid suddenly swinging the machine when the machine is Traveling on pavement.
- Use the rubber belt tracks at temperatures within -15°C (5°F) to 45°C (113°F). Avoid operation on hot surfaces.
- Rubber belt tracks are less stable than steel tracks. Side-to-side movement of the machine should be done carefully.
- If the sprockets are badly worn, use a new sprocket for replacement.
- Be sure that the tracks are free of oily materials such as fuel, hydraulic oil, grease, etc.
- Avoid going over sharp obstacles. Decreased life of the track, fracture of the track grousers and cut steel cords can occur.
- Track Tension must be correctly maintained and checked regularly.
- Disengagement of the track could occur if the track gets clear of the track roller. This could happen while the machine travels over an obstacle.

Parking

i07240905

Stopping the Machine

SMCS Code: 7000

WARNING

Deactivation of the controls and drive levers does not prevent the blade, boom swing, or auxiliary circuit functions from moving if the blade lever or a foot pedal is moved.

Personal injury or death may occur from sudden machine movement.

Note: There may be regulations that define the requirements for the operator and/or support personnel to be present when the engine is running.

Park on a level surface. If the machine must be parked on a grade, chock the tracks securely.



Illustration 381

g06268228

1. Turn the engine speed dial counterclockwise to reduce engine speed.



Illustration 382

g06262810

2. Move the left and right travel levers slowly to the STOP position to stop the machine.

Note: Avoid sudden stops. Sudden stops can damage the machine. Slow down and bring the machine to a smooth stop.

3. Lower the work tool and the blade to the ground. Apply a slight downward pressure.



Illustration 383

g06262819

4. Raise the hydraulic lockout control to the RAISED position to deactivate the controls and drive levers.

i07290689

i07291002

Freezing Conditions

SMCS Code: 7000

If freezing temperatures are expected, remove the mud and the dirt from each track roller frame. Park the machine on wood planks. Use the following procedure to clean each track roller frame.

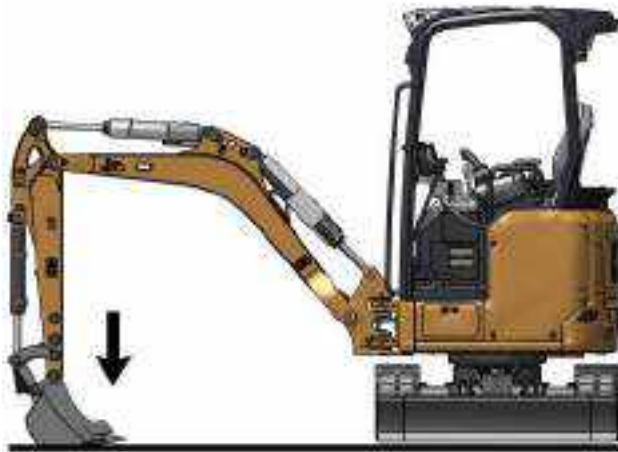


Illustration 384

g06275814

1. Position the boom over one side of the machine.
2. Use boom down pressure to lift the track on one side off the ground. Operate the track in the forward direction. Then operate the track in reverse. Continue this procedure until the maximum amount of material is thrown off the track.
3. Lower the track onto the wood planks.
4. Repeat the procedure for the other track.
5. Clean the area around the skid plate that is on top of the track roller frame and around the track rollers.
6. Lower the attachment onto a wood plank.

Stopping the Engine

SMCS Code: 1000; 7000

NOTICE

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

1. Stop the machine and lower all work tools to the ground.
2. Turn off all auxiliary electrical equipment.
3. Run the engine at low idle for 2 minutes.

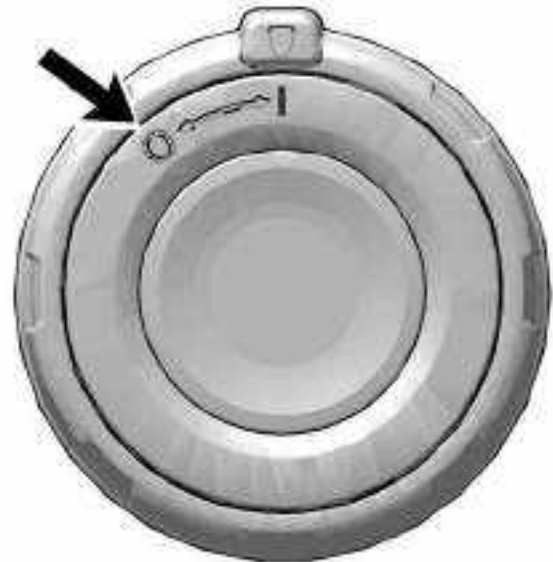


Illustration 385

g06275824

4. Turn the engine start switch key to the OFF position and remove the engine start switch key.



Off – The engine is stopped with the key in this position.

Stop the Engine if an Electrical Malfunction Occurs

Lower all attachments and the blade to the ground. Turn the engine start switch key to the OFF position. If the engine does not stop, perform the following procedure.



Illustration 386

g06268234

1. Remove the cover under the operator seat.

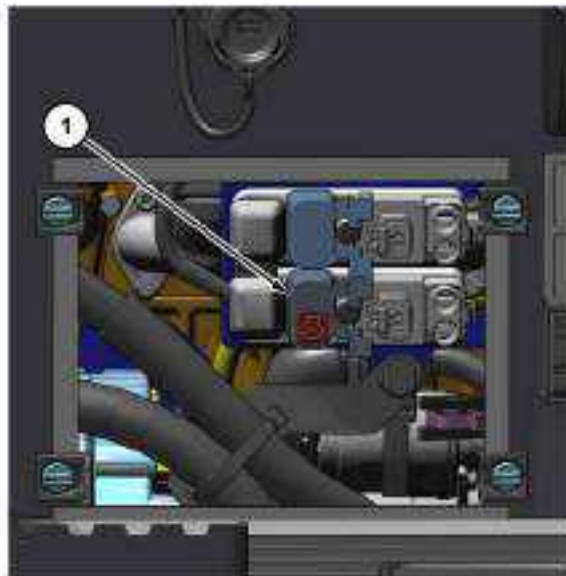


Illustration 387

g06268242

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

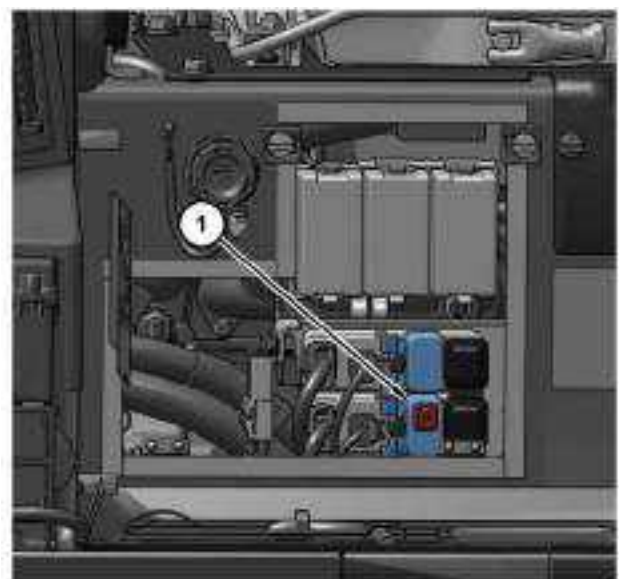


Illustration 388

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.

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.

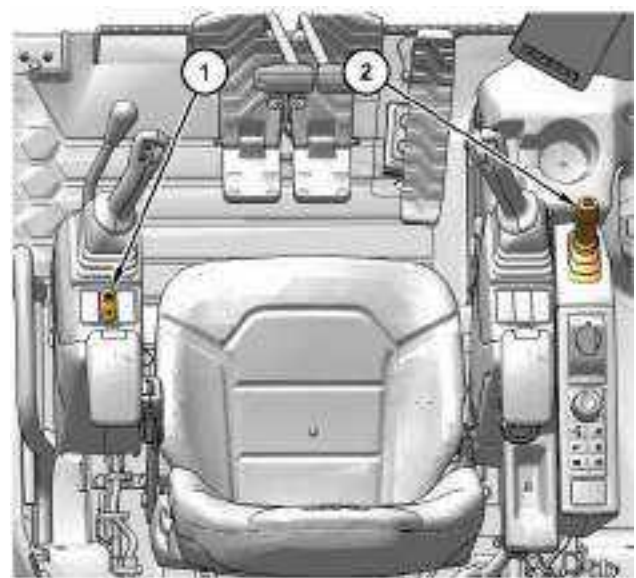


Illustration 391

g06268268

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

4. Move control lever (2) forward to expand the undercarriage. Move control lever (2) backward to retract the undercarriage. Release control lever (2).

Note: While expanding and retracting the undercarriage, the dozer blade may lift slightly and cause the rear of the machine to lift or lower.

5. Release switch (1) to control the blade.
6. Simultaneously hold the joystick controls in the BOOM RAISE position and the STICK IN position to lower the front of the machine to the ground. Carefully lower the rear of the machine to the ground by using the dozer blade control.
7. Swing the upper structure to place the dozer blade in the front of the machine.

i07285192

Lifting and Tying Down the Machine

SMCS Code: 7000; 7500

NOTICE

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

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

Use proper rated cables and slings for lifting. The crane should be positioned so that the machine is lifted parallel to the ground.

Positioning the Machine for Lifting

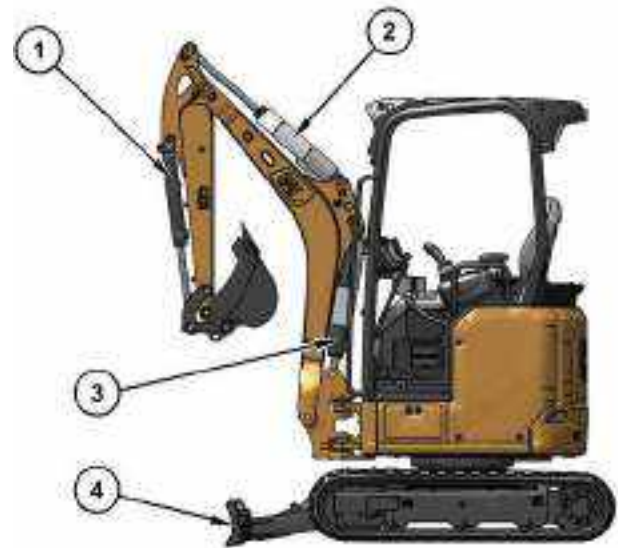


Illustration 392

g06274782

1. Raise blade (4).
2. Position the boom in a straight ahead position.
3. Retract boom cylinder (3), extend stick cylinder (2), and extend work tool cylinder (1) to the end of the stroke.
4. Stop the engine. Raise the hydraulic lockout control and dismount the machine. Lock the door.



Illustration 393

g06274789

5. To obtain the position for the second lifting option, swing the upper structure so blade (4) is to the rear of the machine.

Lifting the Machine

Note: Ensure that the undercarriage is fully expanded before you lift the machine. Ensure that an empty standard bucket is installed on the machine.

Option 1



Illustration 394

g06274811

1. Attach shackles to the lifting eyes on the top of the canopy and fasten slings to the shackles.
2. Use lifting gears that match the required lengths.
3. Raise the machine slowly to make sure that the machine stays in a horizontal position.

Option 2

Illustration 395

g06274836



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.

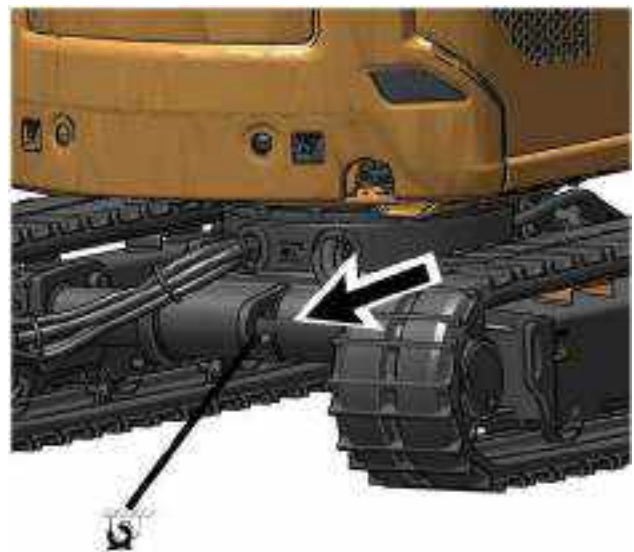


Illustration 397

g06274899

9. Install tie-downs on the rear eye on the lower frame to prevent shifting in transit.



Illustration 398

g06274914

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

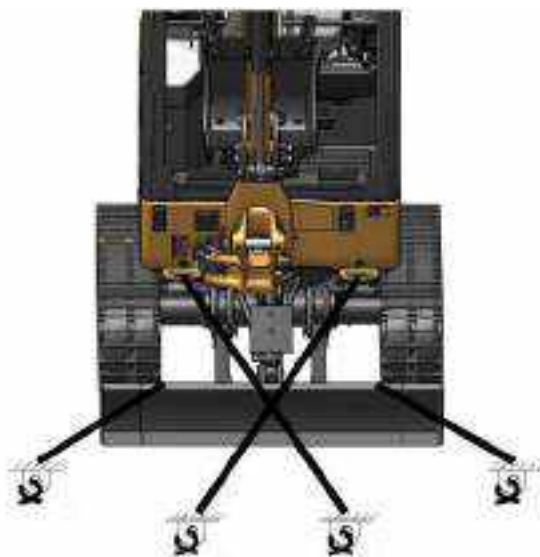


Illustration 399

g06274906

Front of the Machine



Illustration 400

g06274909

Rear of the Machine

11. Install tie-downs on the lower portion of the machine by referring to either Illustration 399 or 400 .

Note: Use protectors between the machine and tie-downs.

Note: To utilize the tie-down points on the rear of the machine, install M30x2 eye bolts. Thread depth is 30 mm (1.2 inch).

12. Separately tie down all work tools that will accompany the machine. Refer to the operation manual for the work tools for instructions on tying down the individual work tools.

Towing Information

i07291036

Towing the Machine

SMCS Code: 7000

Towing the machine:

- Ensure that the excavator can be towed safely
- Use the towing bracket for towing the machine.
- Use the towing bracket only for towing the machine
- Use a shackle pin with a lock pin
- Take off slowly!
- Ensure that there are no persons close to the towing equipment (towing bar, cable)!

WARNING

Personal injury or death could result when towing a disabled machine incorrectly. Keep all personnel clear of the disabled machine until the machine has been towed to a safe place. Follow the towing procedure.

The maximum admissible load of the towing bracket is one and a half times the machine weight.

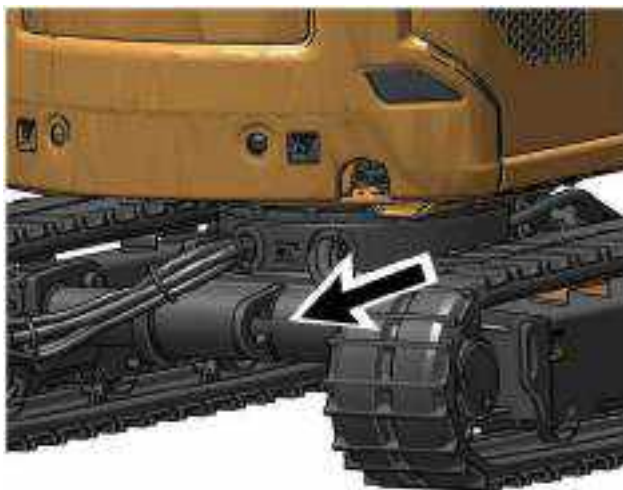


Illustration 401

g06275844

Use the towing bracket on the undercarriage.

Use a shackle and secure the shackle with the shackle pin and a lock pin.

Mount a towing bar or cable of adequate size to the towing eye.

Pull the machine slowly.

NOTICE

Follow the following instructions under all circumstances:

Do not tow the machine if the machine is at a stand-still or broken down, otherwise the final drives of the machine can be damaged.

The manufacturer's warranty shall not apply to accidents or damage caused by towing the excavator.

Do not tow other things (for example, machines, trailers, etc.) with the towing bracket.

Engine Starting (Alternate Methods)

i02016499

Engine Starting with Jump Start Cables

SMCS Code: 1000; 7000

 WARNING

Failure to properly service the batteries may cause personal injury.

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

Do not smoke when checking battery electrolyte levels.

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

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

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

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

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

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

NOTICE

When jump starting the engine with another machine, make sure that the machines do not touch. This could prevent damage to engine bearings and electrical circuits.

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

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

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

1. Lower the equipment to the ground. Move all controls to the HOLD position. Move the hydraulic lockout control (lever) to the LOCKED position.
2. Turn the start switch on the stalled machine to the OFF position. Turn off all accessories.
3. Move the machine that is being used as an electrical source near the stalled machine so that the jump start cables reach the stalled machine.
Do not allow the machines to contact each other.
4. Stop the engine of the machine that is being used as an electrical source. If you are using an auxiliary power source, turn off the charging system.
5. Ensure that battery caps on both machines are tight and correctly placed. Ensure that batteries in the stalled machine are not frozen. Make sure that the batteries have enough electrolyte.

Note: The positive terminal of the 12 volt system of the source and the negative terminal of the 12 volt system of the source must be identified correctly before the jumper cables are connected. The positive terminal of the 12 volt system of the discharged battery must be identified correctly before the jumper cables are connected.

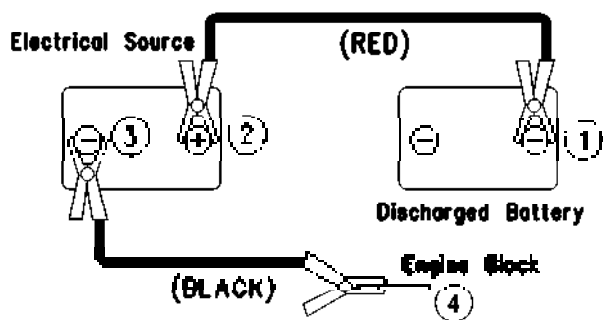


Illustration 402

g00818210

6. The positive ends of the jump start cable are red. Connect one positive end of the jump start cable to positive cable terminal (1) of the discharged battery.

Do not allow the positive cable clamps to contact any metal except for the battery terminals.
7. Connect the other positive end of the jump start cable to positive cable terminal (2) of the electrical source.
8. Connect one negative end of the jump start cable to negative cable terminal (3) of the electrical source.
9. Finally, connect the other negative end of the jump start cable to engine block (4) of the stalled machine. Do not connect the jump start cable to the battery post. Do not allow the jump start cables to contact the battery cables, the fuel lines, the hydraulic lines, or any moving parts.
10. Start the engine of the machine that is being used as an electrical source or energize the charging system on the auxiliary power source.
11. Wait at least two minutes before you attempt to start the stalled machine. This will allow the batteries in the stalled machine to partially charge.
12. Attempt to start the stalled engine. See Operation and Maintenance Manual, "Engine Starting" for the correct starting procedure.
13. Immediately after you start the stalled engine, disconnect the jump start cables in reverse order.

Maintenance Section

Maintenance Access

i08723449

Access Door and Cover Locations

SMCS Code: 726A-CH

Engine Door

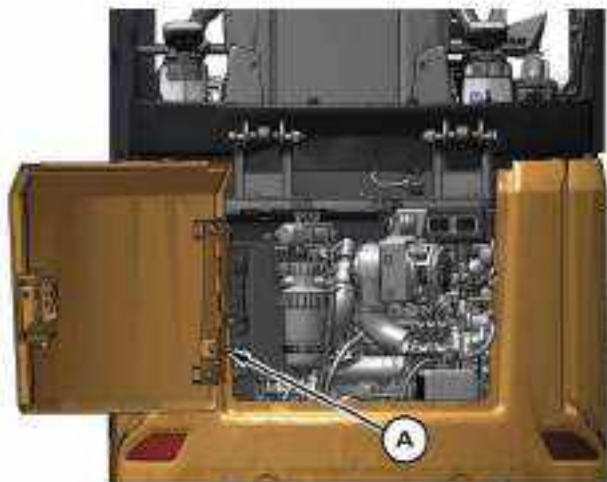


Illustration 403

g06268512

1. Open the engine door by pulling the lever and opening the door towards you. Place lock bar (A) into the bracket to prevent the engine door from closing.

2. To close the engine door, raise lock bar (A) on the left side, close the engine door, and firmly press the door towards the machine.

Left Side Cover



Illustration 404

g06268527

1. To open the left side door, remove three screws (B).



Illustration 405

g06268520

2. Open the left side door towards you, place lock bar (A) into the bracket to prevent the door from closing.

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.

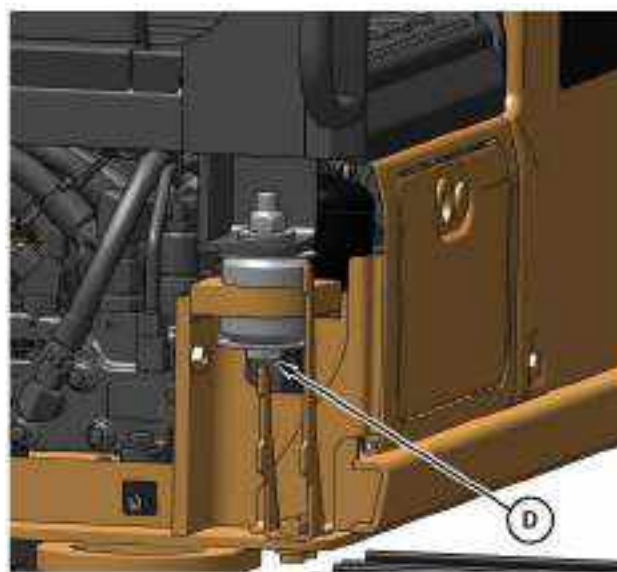


Illustration 408

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.

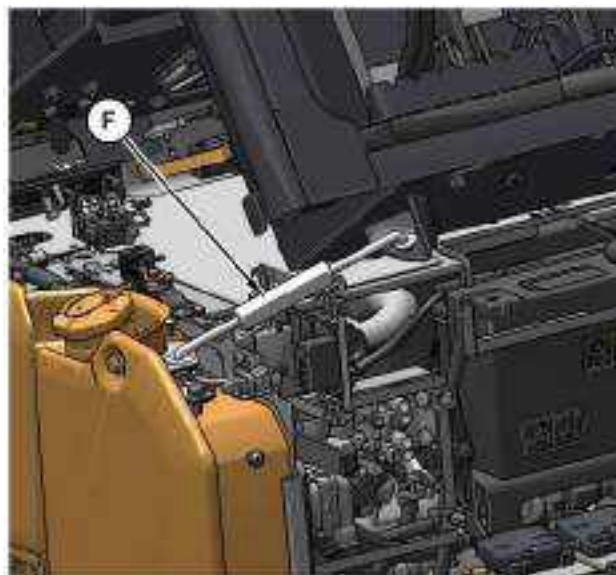


Illustration 411

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)

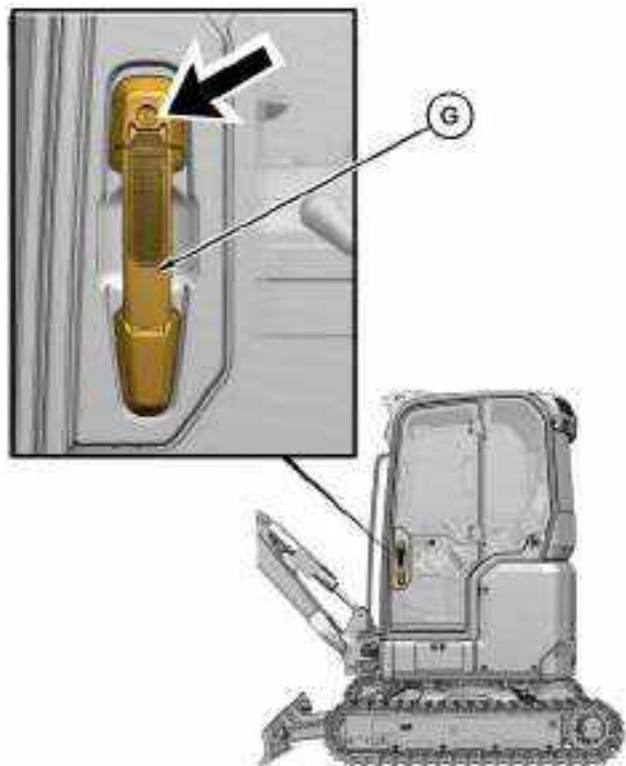


Illustration 412

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 the 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.

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	SAE 30	-20	25	-4	77
	Cat ECF-1-a Cat ECF-2 Cat ECF-3 API CF	SAE 5W-40	-35	40	-31	104

Table 29

Excavators, Front Shovels, Mass Excavators, Demolition Excavators, and Track Material Handlers Lubricant Viscosities for Ambient Temperatures						
Compartment or System	Oil Type and Performance Requirements	Oil Viscosity Grade	°C		°F	
			Min	Max	Min	Max
Variable Pitch Flexxaire Fan (If Equipped)	Cat Full Synthetic Multi-grade DEO commercial Full Synthetic Multigrade Diesel Engine Oil meeting either Cat ECF-1 or API CG-4	SAE 0W40 ⁽¹⁾	-40	50	-40	122
		SAE 5W40 ⁽¹⁾	-40	50	-40	122
	Caterpillar Non-Synthetic TO-4	SAE 30 ⁽²⁾	-15	25	-5	77
		SAE 50 ⁽²⁾	-10	50	14	122

(1) This is the first choice. Full synthetic oils are recommended. Synthetic oils may provide longer service life for the fan. Synthetic oils allow for increased service intervals over non-synthetic oils.

(2) This is the second choice. Caterpillar TDTO is acceptable. Commercial oils that meet the TO-4 specification are also acceptable. TDTO is non-synthetic. Commercial TO-4 oils are typically non-synthetic.

Special Lubricants

Grease

To use a non-Cat grease, the supplier must certify that the lubricant is compatible with Cat grease.

Each pin joint should be flushed with the new grease. Ensure that all old grease is removed. Failure to meet this requirement may lead to failure of a pin joint.

Table 30

Recommended Grease						
Compartment or System	Grease Type	NLGI Grade	°C		°F	
			Min	Max	Min	Max
External Lubrication Points	Cat Prime Application Grease	NLGI Grade 2	-20	140	-4	284
	Cat Extreme Application Grease	NLGI Grade 1	-20	140	-4	284
		NLGI Grade 2	-15	140	+5	284

(continued)

(Table 30, contd)

Recommended Grease						
Compartment or System	Grease Type	NLGI Grade	°C		°F	
			Min	Max	Min	Max
	Cat Extreme Application Grease-Artic	NLGI Grade 0.5	-50	130	-58	266
	Cat Extreme Application Grease-Desert	NLGI Grade 2	-10	140	+14	284
	Cat Utility Grease	NLGI Grade 2	-20	140	-4	284
	Cat Ball Bearing Grease	NLGI Grade 2	-20	160	-4	320

Grease for the Autolube System (if Equipped)

The grease used with the automatic lubrication system must not contain any graphite or PTFE.

Note: Pumpability is based on “US Steel Mobility and Lincoln Ventmeter Tests”. Performance may vary depending on lubrication equipment and the length of the lines.

Refer to Special Publication, SEBU6250, “Caterpillar Machine Fluids Recommendations” for additional information about grease. This manual may be found on the following website:

safety.cat.com

Table 31

Recommended Grease for the Autolube System						
Compartment or System	Grease Type	NLGI Grade	°C		°F	
			Min	Max	Min	Max
Cat Autolube System	Cat Extreme Application Grease	NLGI Grade 1	-35	40	-31	104
		NLGI Grade 2	-30	50	-22	122

Diesel Fuel Recommendations

Diesel fuel must meet “Caterpillar Specification for Distillate Fuel” and the latest versions of “ASTM D975” or “EN 590” to ensure optimum engine performance. Refer to Special Publication, SEBU6250, “Caterpillar Machine Fluids Recommendations” for the latest fuel information and for Cat fuel specification. This manual may be found on the following website:

safety.cat.com

The preferred fuels are distillate fuels. These fuels are commonly called diesel fuel, furnace oil, gas oil, or kerosene. These fuels must meet the “Caterpillar Specification for Distillate Diesel Fuel for Off-Highway Diesel Engines”. Diesel Fuels that meet the Caterpillar specification will help provide maximum engine service life and performance.

Misfueling with fuels of high sulfur level can have the following negative effects:

- Reduce engine efficiency and durability
- Increase the wear
- Increase the corrosion
- Increase the deposits
- Lower fuel economy
- Shorten the time period between oil drain intervals (more frequent oil drain intervals)
- Increase overall operating costs
- Negatively impact engine emissions

Failures that result from the use of improper fuels are not Caterpillar factory defects. Therefore the cost of repairs would not be covered by a Caterpillar warranty.

Caterpillar does not require the use of ULSD in off road and machine applications that are not Tier 4/ Stage IIIB certified engines. ULSD is not required in engines that are not equipped with after treatment devices.

Follow operating instructions and fuel tank inlet labels, if available, to ensure that the correct fuels are used.

Refer to Special Publication, SEBU6250, "Caterpillar Machine Fluids Recommendations" for more details about fuels and lubricants. This manual may be found on the following website:

safety.cat.com

Fuel Additives

Cat Diesel Fuel Conditioner and Cat Fuel System Cleaner are available for use when needed. These products are applicable to diesel and biodiesel fuels. Consult your Cat dealer for availability.

Biodiesel Fuel Recommendations

NOTICE

Never use raw vegetable or plant-based oils in place of esterified biodiesel.

The use of oils that are not esterified can lead to engine damage, up to and including engine failure.

Biodiesel is a fuel that can be made from various renewable resources that include vegetable oils, animal fat, and waste cooking oil. These oils and fats are chemically processed (esterified), and filtered to remove water and contaminants.

For biodiesel storage requirements, consult your fuel supplier.

Note: In some regions, biodiesel blends are known as Fatty Acid Methyl Ester (FAME).

Use biodiesel blends that meet national, regional, and local standards.

For more information on biodiesel standards, and to reduce the risks associated with biodiesel usage, refer to Special Publication, SEBU6250, "Caterpillar Machine Fluids Recommendations".

Biodiesel Blend Limits

NOTICE

The use of biofuel blends above the acceptable limit can lead to higher engine downtime.

Biodiesel blend levels up to B20 are acceptable to use in this product.

The use of higher biodiesel blend levels are acceptable in regions where mandated. Consult your Cat dealer.

Note: The energy density of biodiesel blends above B20 are noticeably lower than diesel fuel.

Note: For engines equipped with emission aftertreatment devices, biodiesel blends must be blended with U.S. Ultra Low Sulfur Diesel, or European Sulfur Free Diesel.

Coolant Information

The information provided in this "Coolant Recommendation" section should be used with the "Lubricants Information" provided in the latest revision of Special Publication, SEBU6250, "Caterpillar Machine Fluids Recommendations". This manual may be found on the web on the following website:

safety.cat.com

The following two types of coolants may be used in Cat diesel engines:

Preferred – Cat ELC (Extended Life Coolant)

Acceptable – Cat DEAC (Diesel Engine Antifreeze/Coolant)

NOTICE

Never use water alone as a coolant. Water alone is corrosive at engine operating temperatures. In addition, water alone does not provide adequate protection against boiling or freezing.

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Capacities (Refill)

SMCS Code: 1000; 7000

Table 32

Approximate Refill Capacities				
Component or System		Liters	US gal	Recommended Type
Fuel Tank	S/N: MNH1–Up; JH71–Up	22	5.80	Diesel Fuel
	S/N: H8X1–Up; RHM1–Up; MY61–Up	26	6.87	
Cooling System		3.5	0.90	"ASTM D4985"
				Caterpillar Extended Life Coolant (ELC)
Engine Crankcase with Filter		3.5	0.90	Refer to Operation and Maintenance Manual, "Lubricant Viscosities".
Final Drive		0.6	0.16	
Hydraulic System ⁽¹⁾		18	4.76	
		kg	lbs	
Refrigerant ⁽²⁾		0.8	1.8	R-134a

(1) The amount of hydraulic fluid that is needed to refill the hydraulic system after performing Operation and Maintenance Manual, "Hydraulic System Oil - Change"

(2) Refer to Service Manual, "Air Conditioning and Heating R-134a for All Caterpillar Machines" for additional information

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S·O·S Information

SMCS Code: 1000; 1348; 3080; 4050; 5050; 7000; 7542-008

S·O·S Services is a highly recommended process for Cat customers to use in order to minimize owning and operating cost. Customers provide oil samples, coolant samples, and other machine information. The dealer uses the data in order to provide the customer with recommendations for management of the equipment. In addition, S·O·S Services can help determine the cause of an existing product problem.

Refer to Special Publication, SEBU6250, "Caterpillar Machine Fluid Recommendations" for detailed information concerning S·O·S Services.

The effectiveness of S·O·S Services is dependent on timely submission of the sample to the laboratory at recommended intervals.

Refer to the Operation and Maintenance Manual, "Maintenance Interval Schedule" for a specific sampling location and a service hour maintenance interval.

Consult your Cat dealer for complete information and assistance in establishing an S·O·S program for your equipment.

Maintenance Support

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Prepare the Machine for Maintenance

SMCS Code: 1000; 7000

Refer to the following procedure before you perform any maintenance to the machine.

WARNING

Personal injury can result from hydraulic oil pressure and hot oil.

Hydraulic oil pressure can remain in the hydraulic system after the engine has been stopped. Serious injury can be caused if this pressure is not released before any service is done on the hydraulic system.

Make sure all of the attachments have been lowered, oil is cool before removing any components or lines. Remove the oil filler cap only when the engine is stopped, and the filler cap is cool enough to touch with your bare hand.

NOTICE

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

Refer to Special Publication, PERJ1017, "Dealer Service Tool Catalog" for tools and supplies suitable to collect and contain fluids on Cat® products.

Dispose of all fluids according to local regulations and mandates.

Note: Permit only one operator on the machine. Keep all other personnel away from the machine or in view of the operator.

1. Park the machine on a dry, level, solid surface that is free of any debris.

Note: The surface must be solid enough to support the weight of the machine and any tooling that is used to support the machine.

2. Engage the parking brake. Place wheel blocks in front and behind the wheels or tracks.
3. Lower all work tools to the ground.
4. Stop the engine.

5. Release the pressure in the hydraulic system. Refer to Operation and Maintenance Manual, "System Pressure Release" for more information.

Perform a visual inspection first. If the visual checks are completed but the problem has not been identified, perform operational checks. If the problem has not been identified, perform instrument tests. This procedure will help to identify system problems.

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Service Interval Chart

SMCS Code: 7000

The service interval chart is on the roof.

Refer to this Operation and Maintenance Manual, "Maintenance Interval Schedule" for the correct maintenance intervals and procedures that are specific to your machine.

Maintenance Section
Service Interval Chart

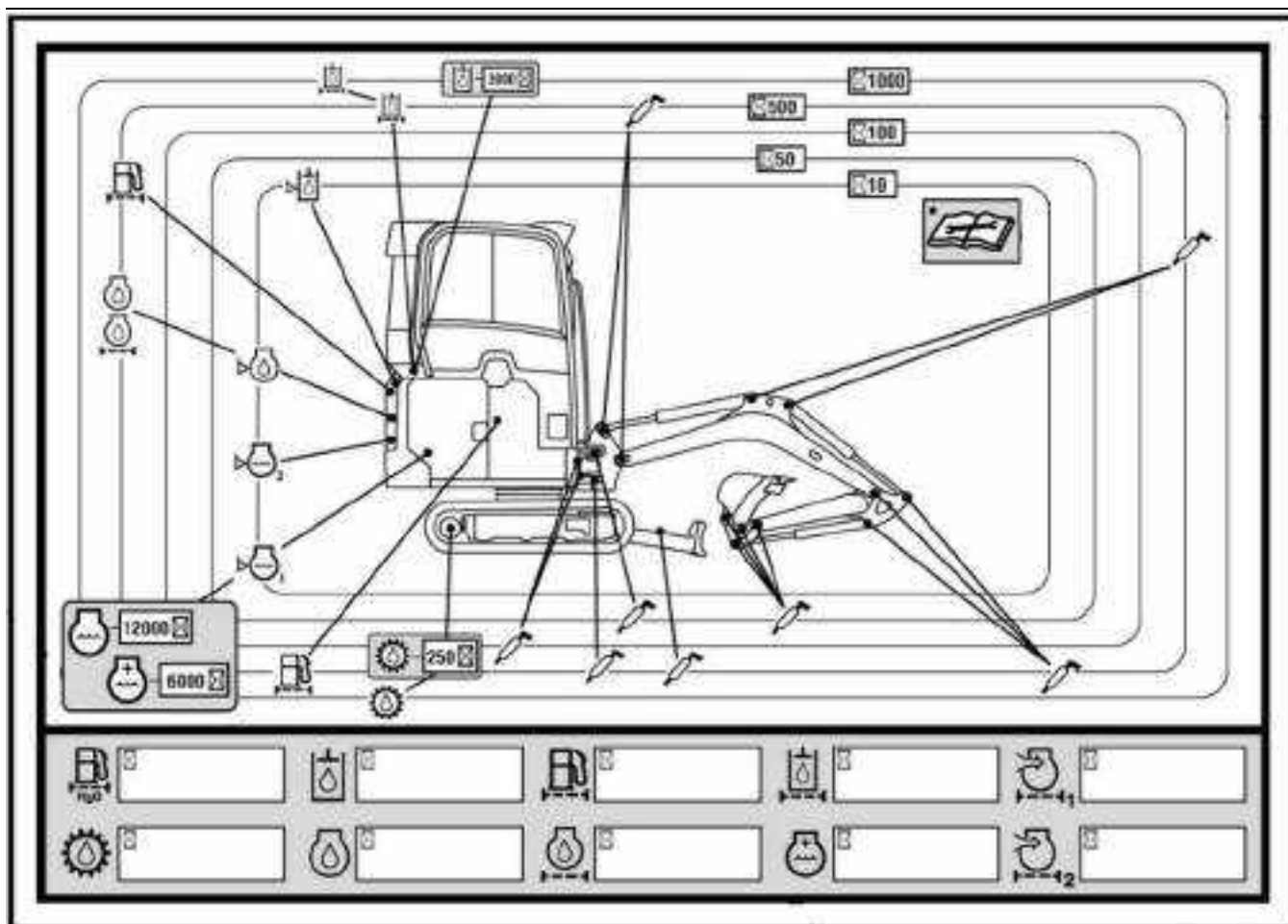


Illustration 414

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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.

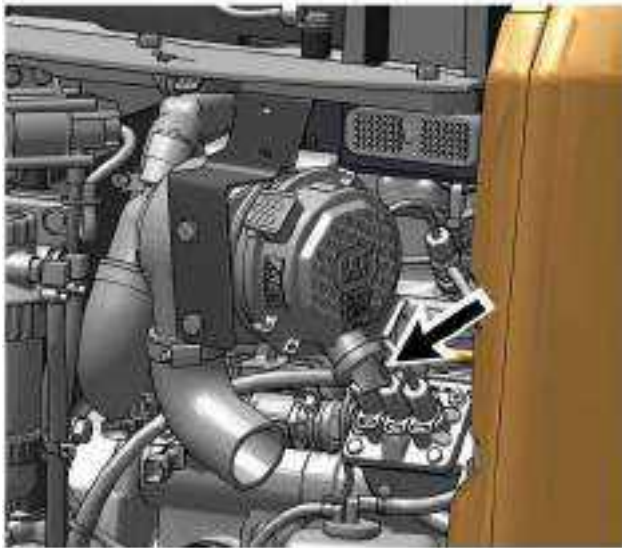


Illustration 415

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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

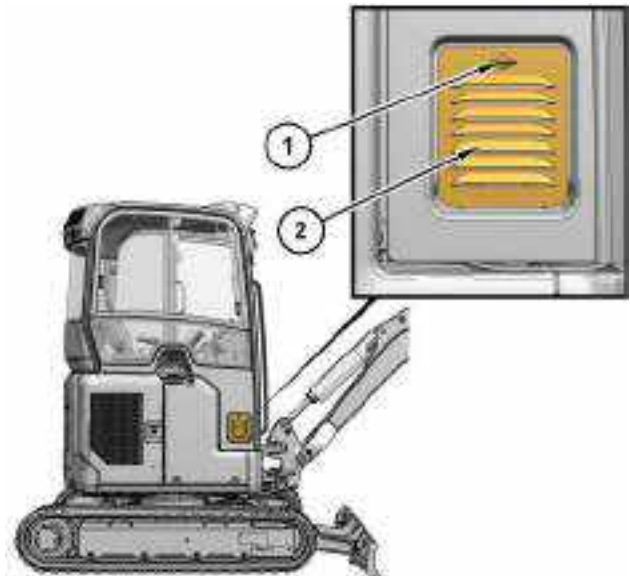


Illustration 416

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

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

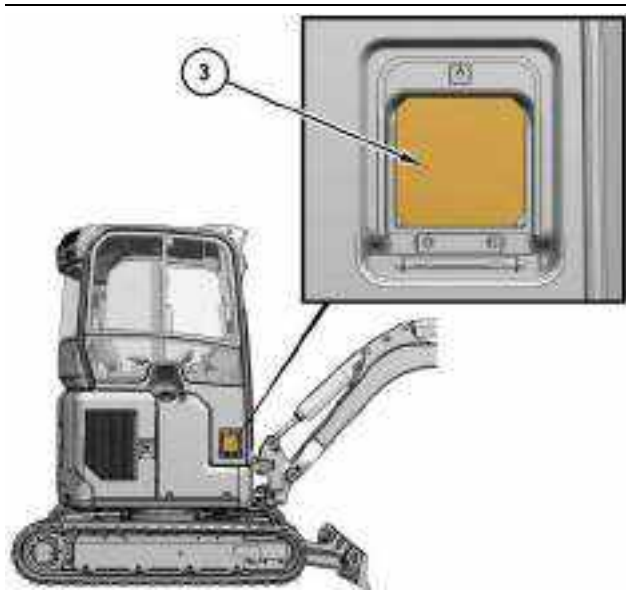


Illustration 417

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(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

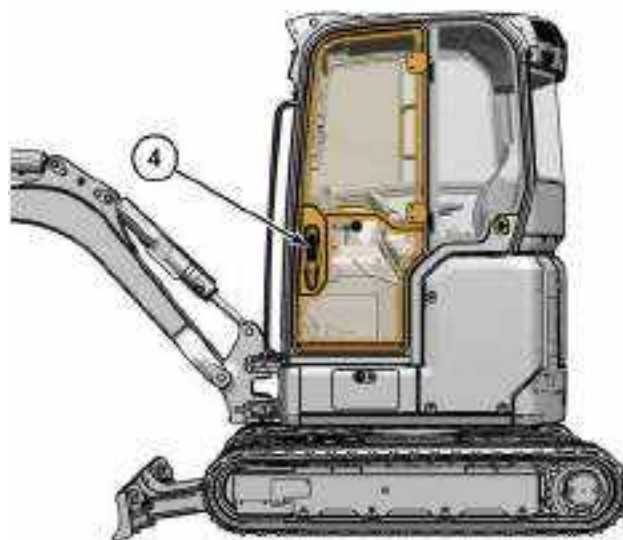


Illustration 418

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(4) Cab door

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

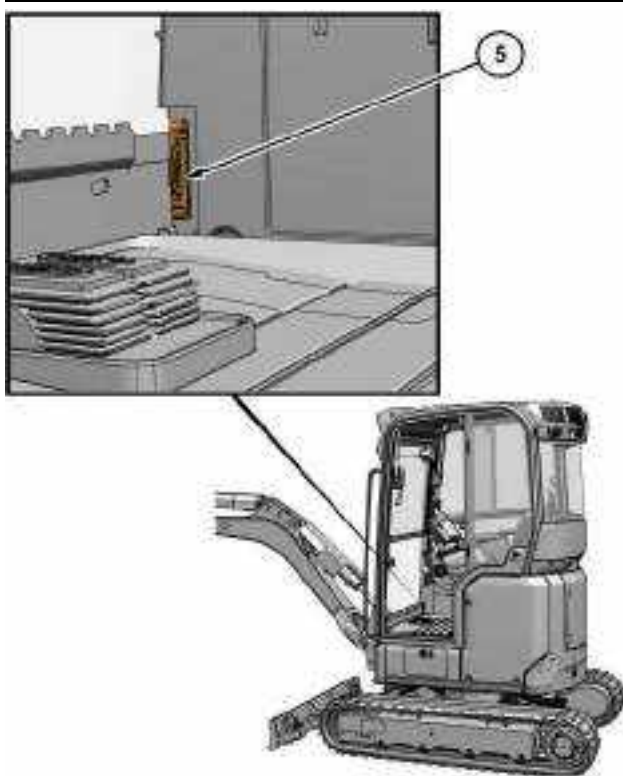


Illustration 419

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Some components removed for better clarity
Location of air conditioner filter element
(5) Air conditioner filter element

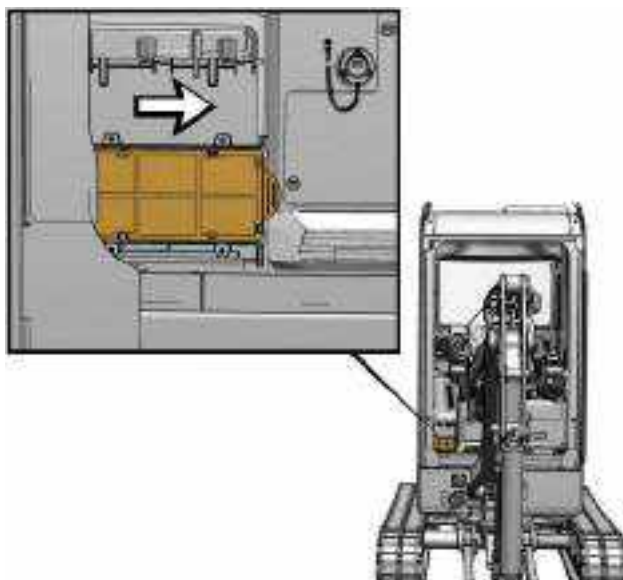


Illustration 420

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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.

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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.

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Battery or Battery Cable - Inspect/Replace

SMCS Code: 1401-040; 1401-510; 1401-561; 1401; 1402-510; 1402-040

WARNING

Personal injury may occur from failure to properly service the batteries.

Batteries give off flammable fumes that can explode. Electrolyte is an acid and can cause personal injury if it contacts the skin or eyes.

Prevent sparks near the batteries. Sparks could cause vapors to explode. Do not allow jumper cable ends to contact each other or the engine. Improper jumper cable connections can cause an explosion.

Always wear protective glasses when working with batteries.

1. Turn the engine start switch to the OFF position. Remove the engine start switch key from the switch. Turn all switches to the OFF position.
2. To access the battery, tilt the canopy up. Refer to Operation and Maintenance Manual, "Access Door and Cover Locations" for more information on how to tilt the canopy up.
3. Disconnect the negative battery cable at the battery.
4. Disconnect the positive battery cable at the battery.
5. For necessary repairs, consult your Cat dealer. Replace the cable or the battery, as needed.
6. Connect the positive battery cable at the battery.
7. Connect the negative battery cable at the battery.
8. Install the engine start switch key.

Battery Recycle

Always recycle a battery. Never discard a battery.

Always return used batteries to one of the following locations:

- A battery supplier
- An authorized battery collection facility

- Recycling facility

i08130170

Belt - Inspect/Adjust/Replace

SMCS Code: 1357-025; 1357-040; 1357-510; 1397-025; 1397-040; 1397-510

NOTICE

The V-belt must be tensioned correctly. Failure to tension the belt properly could cause damage to the belt and/or to the air conditioner compressor.

For maximum engine performance and maximum utilization of your engine, inspect the belts for wear and for cracking. Check the belt tension. Adjust the belt tension to minimize belt slippage. Belt slippage will decrease the belt life. Belt slippage will also cause poor performance of the alternator and of any driven equipment.

If new belts are installed, recheck the belt adjustment after 30 minutes of operation.

Water Pump Belt, Fan Drive Belt, and Alternator Belt



Illustration 421

g06558770

- (1) Bracket bolt
- (2) Alternator mounting bolt
- (3) Alternator mounting bolt

1. Open the engine access door.
2. Remove the fan guard.
3. Check the belt tension.

Table 33

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

⁽¹⁾ Initial Belt Tension refers to a new belt.

⁽²⁾ Used Belt Tension refers to a belt that has been in operation for 30 minutes or more at the rated speed.

Note: Use a 144 - 0235 Belt Tension Gauge to measure belt tension. Refer to Table 33 for proper belt tension adjustment.

4. If the tension is not correct, loosen bolt (1), and alternator mounting bolts (2) and (3). Adjust alternator position.
5. When the adjustment is correct, tighten bolt (1), and alternator mounting bolts (2) and (3) securely.
6. Check the tension of the belt again.
7. Close the engine access door.

Air Conditioner Belt (If Equipped)

NOTICE

The V-belt must be tensioned correctly. Failure to tension the belt properly could cause damage to the belt and/or to the air conditioner compressor.

1. Open the engine access door.
2. Remove the bottom access guard.
3. Remove the fan guard.

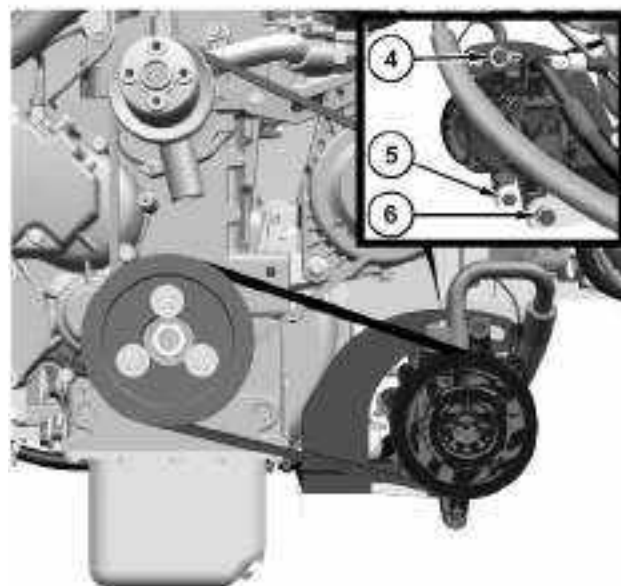


Illustration 422

g06558782

- (4) Compressor mounting bolt
(5) Compressor mounting bolt
(6) Compressor mounting bolt

4. Check the belt tension.

Table 34

Belt Tension Chart	
Gauge Reading	
Initial Belt Tension ⁽¹⁾	Used Belt Tension ⁽²⁾
423 to 467 N (95 to 105 lb)	378 to 422 N (85 to 95 lb)

⁽¹⁾ Initial Belt Tension refers to a new belt.

⁽²⁾ Used Belt Tension refers to a belt that has been in operation for 30 minutes or more at the rated speed.

Note: Use a 144 - 0235 Belt Tension Gauge to measure belt tension. Refer to Table 34 for proper belt tension adjustment.

5. If the tension is not correct, loosen bolts (4), (5), and (6). Adjust compressor position.
6. When the adjustment is correct, tighten bolts (4), (5), and (6).
7. Check the tension again.

8. Close the engine access door.

i07291617

Blade Linkage - Lubricate

SMCS Code: 6060-086

Dozer

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

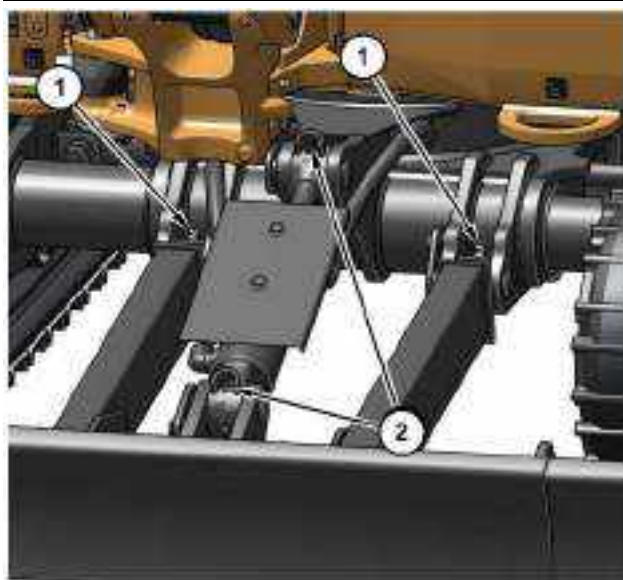


Illustration 423

g06276254

Wipe all fittings before lubricating.

1. Apply lubricant to the fittings for the arms (1) that support the blade.
2. Apply lubricant to the fittings of the blade cylinder (2).

i07284739

Boom and Stick Linkage - Lubricate

SMCS Code: 6501-086; 6502-086

Note: Caterpillar recommends the use of 5% molybdenum grease for lubricating the boom and stick linkage. Refer to Special Publication, SEBU6250, "Caterpillar Machine Fluids Recommendations" for more information on grease.

1. Position the machine into the service position.
2. Wipe all fittings before you apply lubricant.



Illustration 424

g06273896

3. Apply lubricant to grease fittings (1) at each cylinder end.

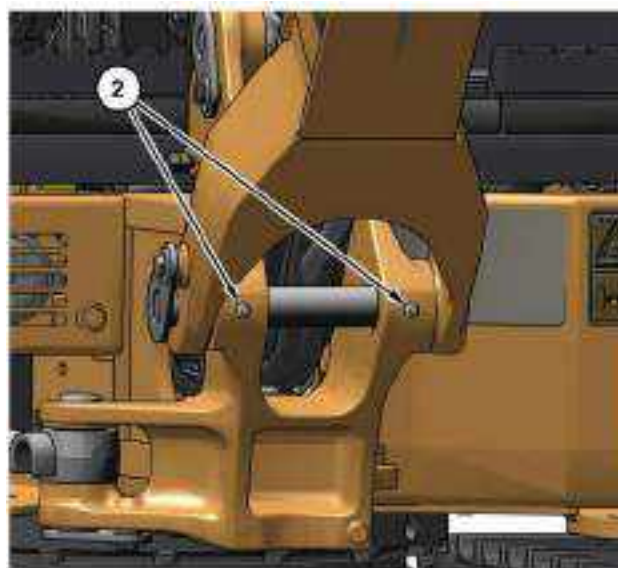


Illustration 425

g06273754

4. Apply lubricant to grease fittings (2) at the boom cylinder pin joint.

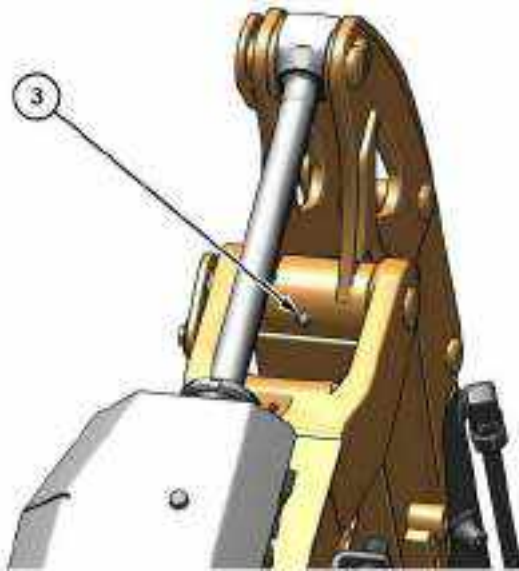


Illustration 426

g06273898

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

i07291711

Boom, Stick, and Frame - Inspect

SMCS Code: 6501; 6502; 6506

All earthmoving equipment is prone to a high degree of wear. Regular inspections for structural damage are necessary.

The interval between these inspections depends on the factors that follow.

- The age of the machine
- The severity of the application
- The loads that have been carried on the machine
- The amount of routine servicing that has been carried out

If the machine has been involved in any accident, the machine must be inspected thoroughly. Inspect the machine regardless of the date of the last inspection.

The machine must be clean before the machine is inspected.

Proper repair of frames and structures requires specific knowledge of the following subjects.

- Materials that have been used to manufacture the frame members
- Frame member construction

- Repair techniques that are recommended by the manufacturer.

Consult your Cat dealer if repairs are necessary. Your Cat dealer is qualified to carry out repairs on your behalf.

All repairs should be carried out by a Cat dealer. If you carry out your own repairs, contact your Cat dealer for advice about proper repair techniques.

Particular attention should be given to all welded structures. Inspect the following items thoroughly for cracks and for defects:

- Boom
- Stick
- Blade
- Lifting points
- Upper frame
- Lower frame

NOTICE

The areas highlighted are of particular importance but other areas must not be neglected. The entire structure must be carefully examined.

Boom

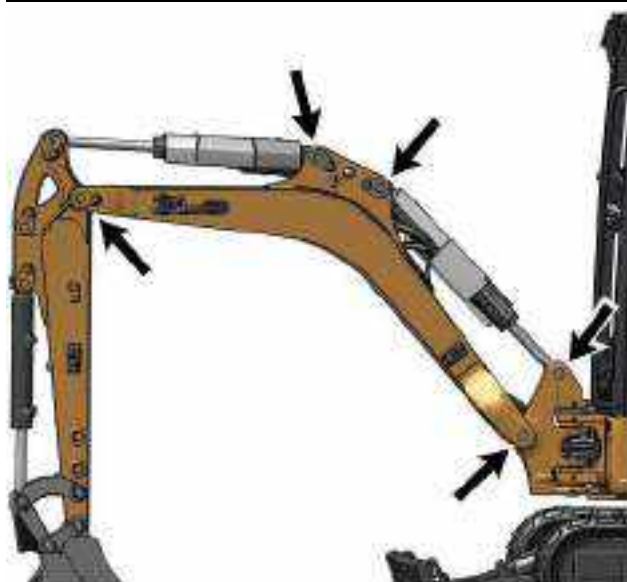


Illustration 427

g06276285

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

Blade

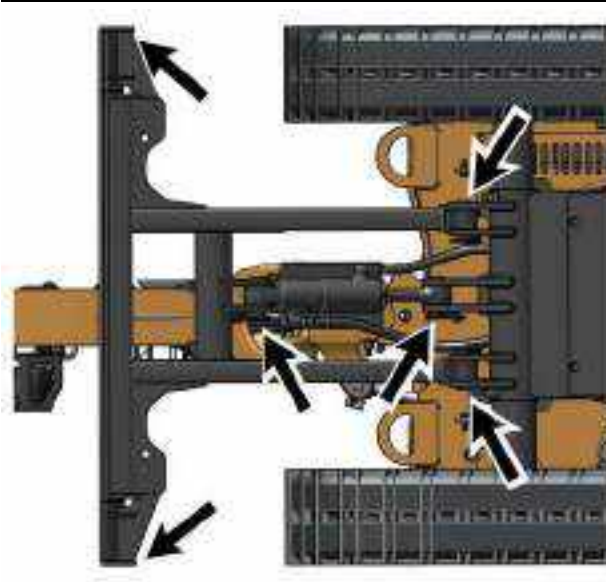


Illustration 429

g06276301

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

Stick

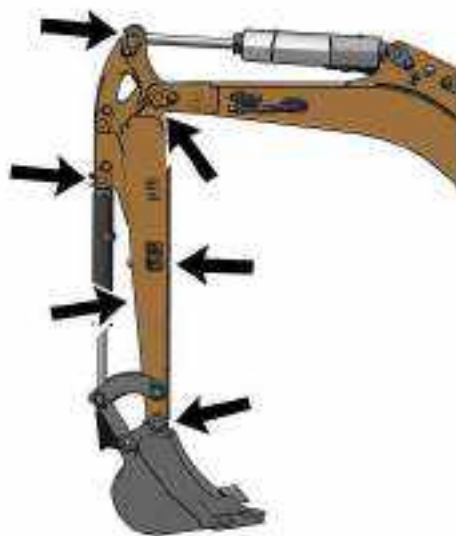


Illustration 428

g06276291

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

Lifting Points



Illustration 430

g06276305

Check the approved lifting points carefully. Check the welds. Check that the plates are not excessively bent. Check that the lifting holes are not deformed.

Upper Frame



Illustration 431

g06276321

Check for damaged panels. Specifically look for any damage to the canopy that might invalidate the certification. The canopy is a safety device that must be maintained in good condition. Check for loose hardware or missing hardware.

Note: Replace any hardware that is loose, damaged, or missing with original replacement parts only.

Lower Frame



Illustration 432

g06276531

Check the weld joints in the lower structure. Check for loose hardware or missing hardware. Check the ring of bolts that secure the swing gear.

i07293069

Bucket Linkage - Lubricate

SMCS Code: 6513-086

Note: Caterpillar recommends the use of 5% molybdenum grease for lubricating the bucket linkage. Refer to Special Publication, SEBU6250, "Caterpillar Machine Fluids Recommendations" for more information on molybdenum grease.

Apply lubricant through all fittings after operation under water.

Wipe all fittings before you apply lubricant.

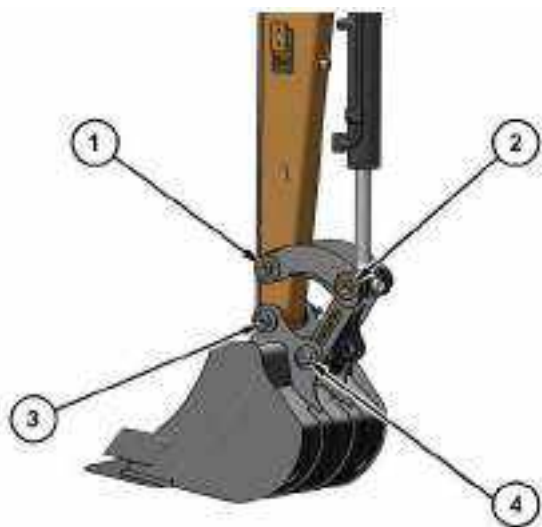


Illustration 433

g06276574

Note: Completely fill all cavities of the bucket control linkage with grease when you initially install a bucket.

1. Apply lubricant through fittings for the linkages (1) and (2).
2. Apply lubricant through fittings for the bucket (3) and (4).

Note: Service the above fittings after you operate the bucket under water.

i07294704

Bucket Tips - Inspect/Replace

SMCS Code: 6805-510; 6805-040

WARNING

Personal injury or death can result from bucket falling.

Block the bucket before changing bucket tips or side cutters.

Bucket Tips

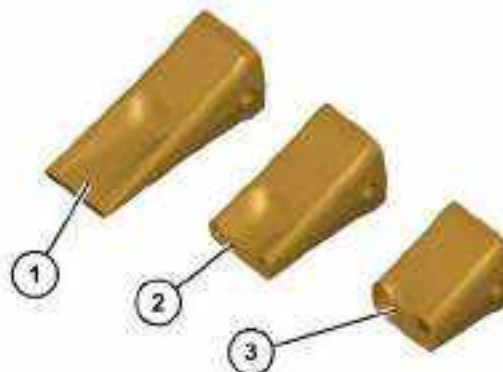


Illustration 434

g06214790

- (1) Usable
(2) Replace this bucket tip.
(3) Overworn

Check the bucket tips for wear. Consult your Cat dealer if the bucket tips need to be replaced. Your Cat dealer is qualified to carry out repairs on your behalf.

i07295040

Condenser (Refrigerant) - Clean

SMCS Code: 1805-070

NOTICE

If excessively dirty, clean condenser with a brush. To prevent damage or bending of the fins, do not use a stiff brush.

Repair the fins if found defective.

1. Remove the right side console inside the cab.

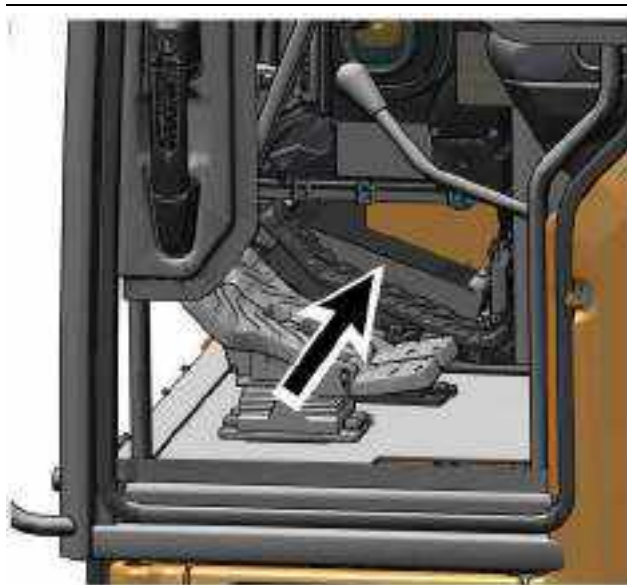


Illustration 435

g06276629

2. Inspect the condenser for debris. Clean the condenser, if necessary.
3. You can use compressed air, high-pressure water, or steam to remove dust and other debris from the condenser. However, the use of compressed air is preferred.
4. Reinstall the right side console.

i07279114

Cooling System Coolant (ELC) - Change

SMCS Code: 1350-044

NOTICE

Do not change the coolant until you read and understand the cooling system information in Special Publication, SEBU6250, "Caterpillar Machine Fluids Recommendations".

Failure to do so could result in damage to the cooling system components.

NOTICE

Mixing ELC with other products will reduce the effectiveness of the coolant.

This could result in damage to cooling system components.

If Caterpillar products are not available and commercial products must be used, make sure they have passed the Caterpillar EC-1 specification for pre-mixed or concentrate coolants and Caterpillar Extender.

Note: If cooling system samples Level 1 and Level 2 are not performed, and ELC not added, The coolant should be changed every 2 years.

Note: This machine was filled at the factory with Caterpillar Extended Life Coolant.

If the coolant in the machine is changed to Extended Life Coolant from another type of coolant, see Special Publication, SEBU6250, "Caterpillar Machine Fluids Recommendations".

1. Open the right side access door.

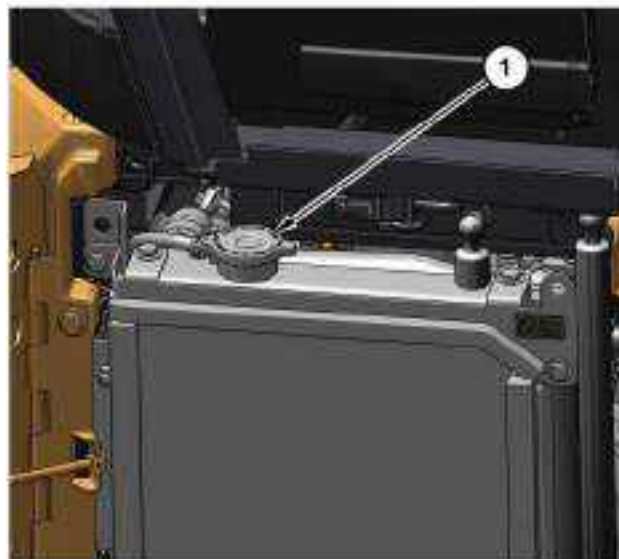


Illustration 436

g06268850

2. Loosen radiator cap (1) slowly to release pressure. Remove the radiator cap.

Note: Refer to Operation and Maintenance Manual, "General Hazard Information" for information on Containing Fluid Spillage.

Maintenance Section
Cooling System Coolant (ELC) - Change



Illustration 437

g06268860

3. Remove guard (2) under the fuel tank to access the coolant drain hose.

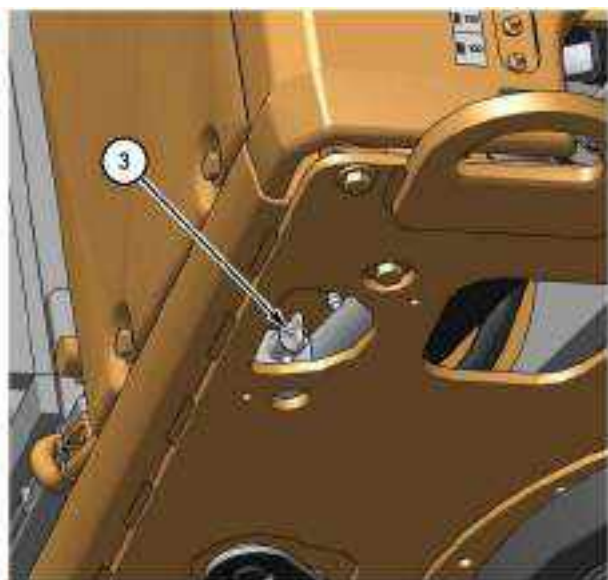


Illustration 438

g06268866

4. Remove coolant drain hose cap (3) and allow the coolant to drain into a suitable container.

Note: Dispose of drained fluids according to local regulations.

5. Flush the cooling system with water until the draining water is transparent.
6. Install coolant drain hose cap (3).

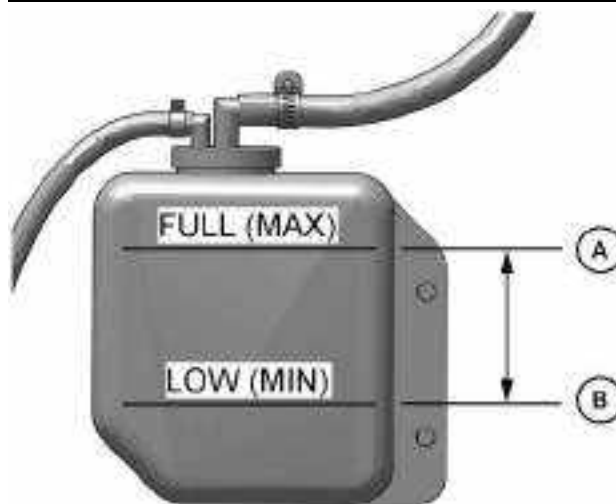


Illustration 439

g06268911

7. Add the Extended Life Coolant to the proper level as shown on the coolant reservoir. Refer to the following topics:

- Special Publication, SEBU6250, "Caterpillar Machine Fluids Recommendations"
- Operation and Maintenance Manual, "Capacities (Refill)"

8. Start the engine. Leave the radiator cap off. Run the engine to expel any air from the system.
9. Maintain the coolant level within 13 mm (0.5 inch) of the bottom of the filler pipe.
10. Install the cooling system pressure cap after the thermostat and the coolant level stabilizes.
11. Stop the engine.
12. If more coolant is necessary, add the appropriate coolant solution.
13. Install guard (2).
14. Install radiator cap (1).
15. Close the right side access door.

Note: Dispose of drained fluids according to local regulations.

i03967772

Cooling System Coolant Extender (ELC) - Add

SMCS Code: 1352; 1353; 1395

WARNING

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

When a Caterpillar Extended Life Coolant is used, an extender must be added to the cooling system. See the Operation and Maintenance Manual, "Maintenance Interval Schedule" for the proper service interval. The amount of extender is determined by the cooling system capacity.

Table 35

RECOMMENDED AMOUNT OF EXTENDER BY COOLING SYSTEM CAPACITY	
Cooling System Capacity	Recommended Amount of Extender
6 to 11 L (1.6 to 3 US gal)	.2 L (0.21 qt)

For additional information on the addition of extender, see Operation and Maintenance Manual, SEBU6250, "Caterpillar Coolant Recommendations" or consult your Caterpillar dealer.

i07305734

Cooling System Coolant Level - Check

SMCS Code: 1350-040; 1350-535-FLV; 1395-535-FLV

WARNING

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

1. Open the rear access door.

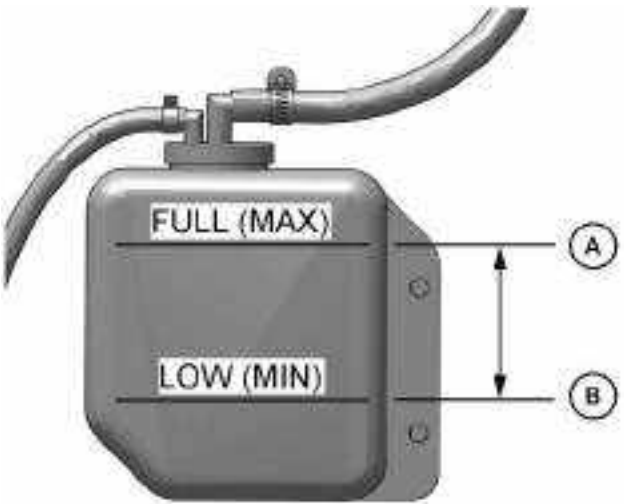


Illustration 440

g06268911

2. Maintain the coolant level between "FULL" mark (A) on the coolant reservoir and "LOW" mark (B) on the coolant reservoir.

Note: Refer to Operation and Maintenance Manual, "General Hazard Information" for information on containing fluid spillage.

3. If additional coolant is necessary, remove the filler cap for the coolant reservoir and add the appropriate coolant mixture. Install the filler cap.

i07296023

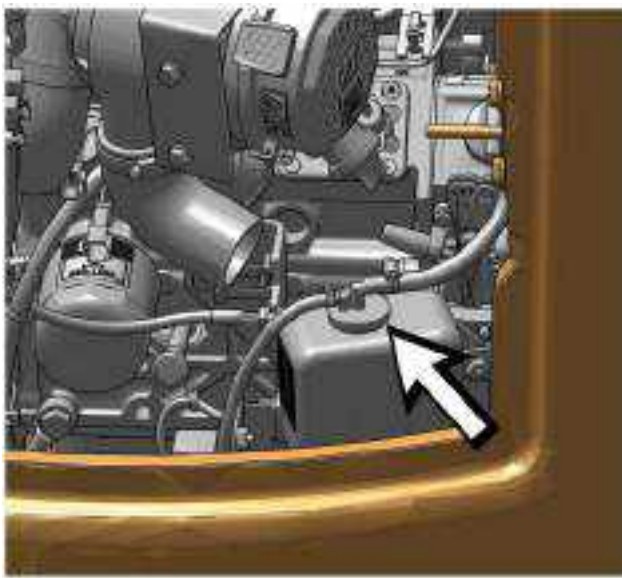


Illustration 441

g06268892

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

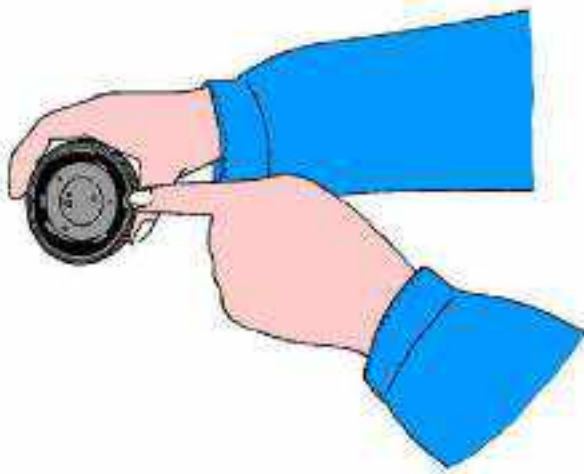


Illustration 442

g06277320

5. Inspect the condition of the cap gasket. If necessary, replace the cap.
6. Install the cooling system pressure cap.
7. Close the rear access door.

Cooling System Coolant Sample (Level 1) - Obtain

SMCS Code: 1395-554; 1395-008; 7542

Note: It is not necessary to obtain a Coolant Sample (Level 1) if the cooling system is filled with Cat ELC (Extended Life Coolant). Cooling systems that are filled with Cat ELC should have a Coolant Sample (Level 2) that is obtained at the recommended interval that is stated in the Maintenance Interval Schedule.

Note: Obtain a Coolant Sample (Level 1) if the cooling system is filled with any other coolant instead of Cat ELC. This includes the following types of coolants.

- Commercial long life coolants that meet the Caterpillar Engine Coolant Specification -1 (Caterpillar EC-1)
- Cat Diesel Engine Antifreeze/Coolant (DEAC)
- Commercial heavy-duty antifreeze/coolant solution

NOTICE

Always use a designated pump for oil sampling, and use a separate designated pump for coolant sampling. Using the same pump for both types of samples may contaminate the samples that are being drawn. This contaminate may cause a false analysis and an incorrect interpretation that could lead to concerns by both dealers and customers.

Note: Level 1 results may indicate a need for Level 2 Analysis.

NOTICE

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

Refer to Special Publication, PERJ1017, "Dealer Service Tool Catalog" for tools and supplies suitable to collect and contain fluids on Cat® products.

Dispose of all fluids according to local regulations and mandates.

Obtain the sample of the coolant as close as possible to the recommended sampling interval. The recommended sampling interval for Level 1 Coolant Analysis is every 250 service hours. To receive the full effect of S·O·S analysis, you must establish a consistent trend of data. To establish a pertinent history of data, perform consistent samplings that are evenly spaced. Supplies for collecting samples can be obtained from your Caterpillar dealer.

Use the following guidelines for proper sampling of the coolant:

- Complete the information on the label for the sampling bottle before you begin to take the samples.
- Keep the unused sampling bottles stored in plastic bags.
- Keep the lids on empty sampling bottles until you are ready to collect the sample.
- Place the sample in the mailing tube immediately after obtaining the sample to avoid contamination.
- Never collect samples from expansion bottles.
- Never collect samples from the drain for a system.

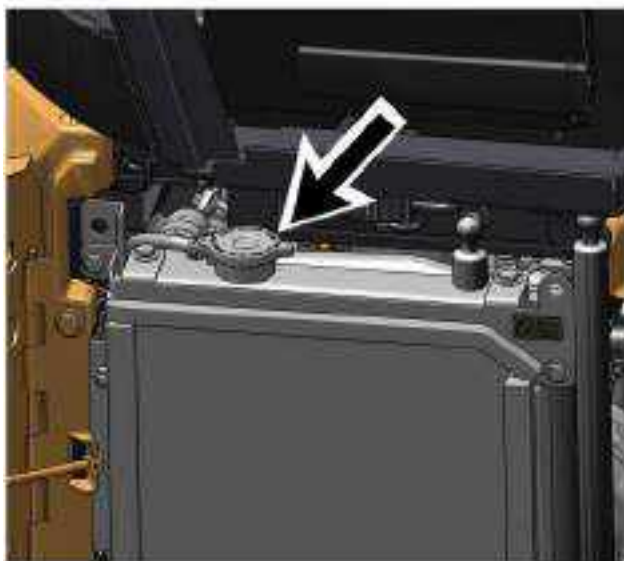


Illustration 443

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).

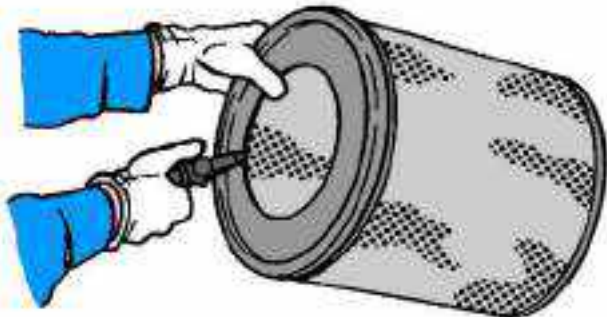


Illustration 444

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.

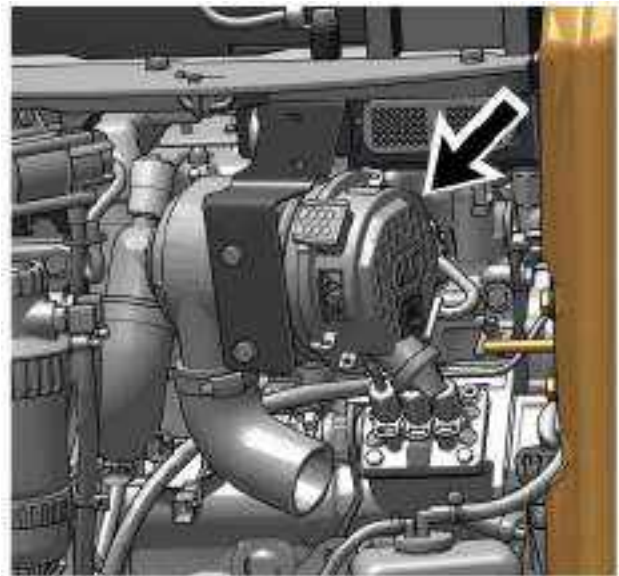


Illustration 447

g06276763

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

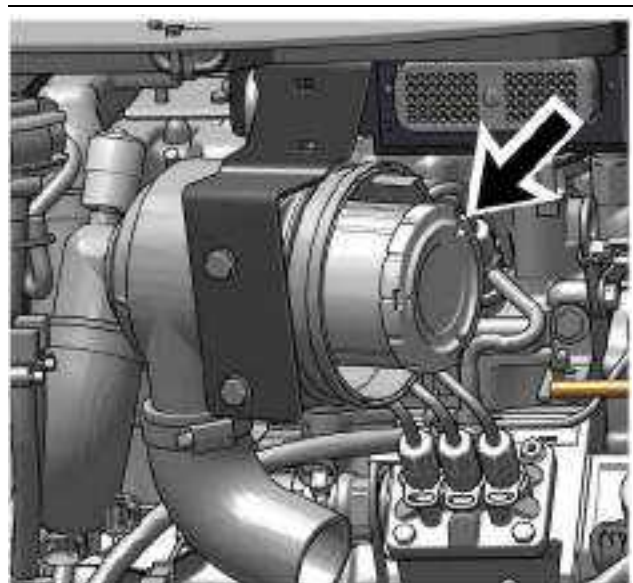


Illustration 448

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.

5. Wipe dust from the interior of the air cleaner housing. Remove the cover from the air inlet port. Leave the secondary filter element in place while you clean the air cleaner housing.
6. Put the clean air filter element into the air cleaner housing and push the air filter element into position.
7. Install the access cover.
8. Close the rear access door.

i07297257

Engine Air Filter Secondary Element - Replace

SMCS Code: 1054-510

NOTICE

Always replace the secondary filter element. Never attempt to reuse the element by cleaning.

The secondary filter element should be replaced at the time the primary element is serviced for the third time.

NOTICE

The filter should be kept in service for no longer than one year.

NOTICE

Always leave the secondary filter element in place while you clean the air cleaner housing.

1. Open the rear access door.
2. Remove the air cleaner housing cover.
3. Remove the primary filter element. Refer to Operation and Maintenance Manual, "Engine Air Filter Primary Element - Clean/Replace".

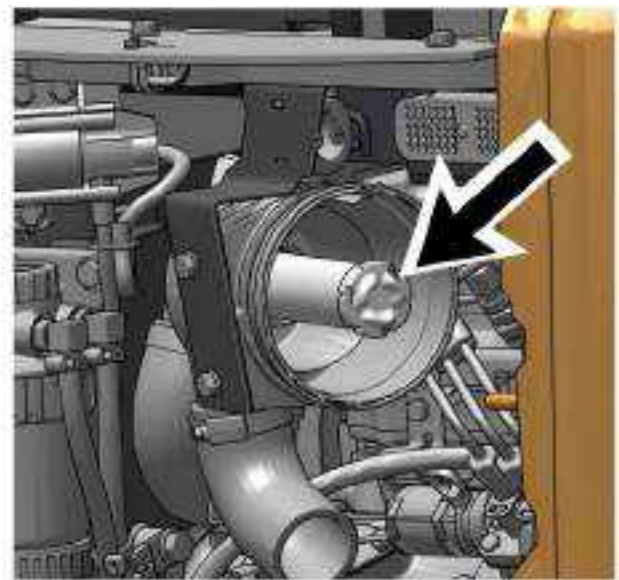


Illustration 449

g06276771

4. Remove the secondary filter element. Pull out to remove the element.
5. Cover the air inlet opening. Clean the inside of the air cleaner housing.
6. Install a new secondary filter element. Push the element firmly to properly seat the element. Write the date on the element.
7. Install the primary filter element and the air cleaner housing cover.
8. Close the rear access door.

i07280036

Engine Air Filter Service Indicator - Inspect

SMCS Code: 7452-040-DJ

NOTICE

Service the air cleaner only with the engine stopped. Engine damage could result if the air cleaner is serviced while the engine is running.

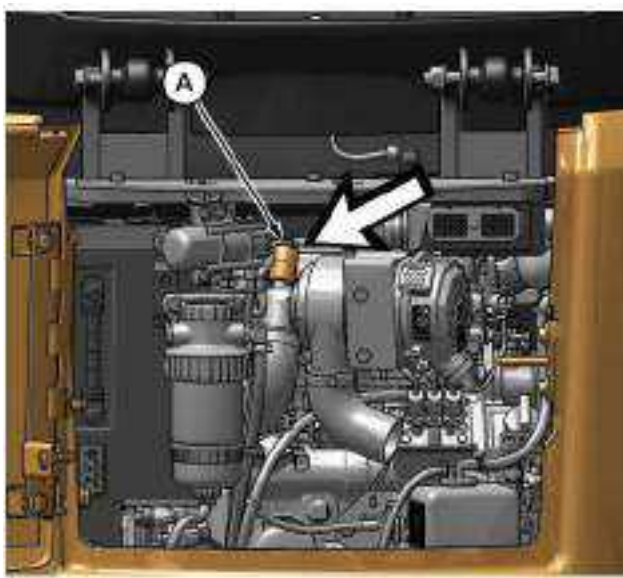


Illustration 450

g06272398

1. Open the rear access door.
2. If the piston in the engine air filter service indicator is in the red zone, push button (A) to reset. Service the air cleaner.

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

3. Close the rear access door.

i07281033

Engine Oil Level - Check

SMCS Code: 1000-535

WARNING

Hot oil and hot components can cause personal injury. Do not allow hot oil or hot components to contact skin.

NOTICE

Do not overfill the crankcase. Engine damage can result.

1. Open the rear access door.

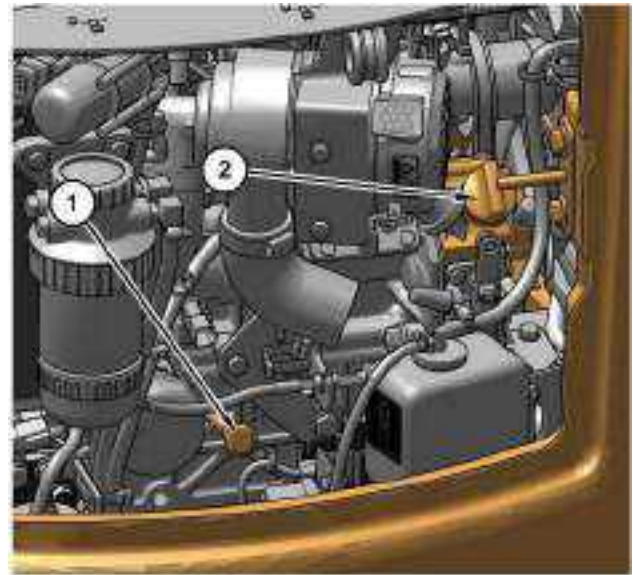


Illustration 451

g06272736

2. While the engine is stopped, maintain the oil level in the crosshatched area on the dipstick (1).
3. If necessary, remove the oil filler cap (2) and add oil. Allow the oil to drain into the crankcase before you check the oil level.
4. Close the rear access door.

i07297308

Engine Oil Sample - Obtain

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

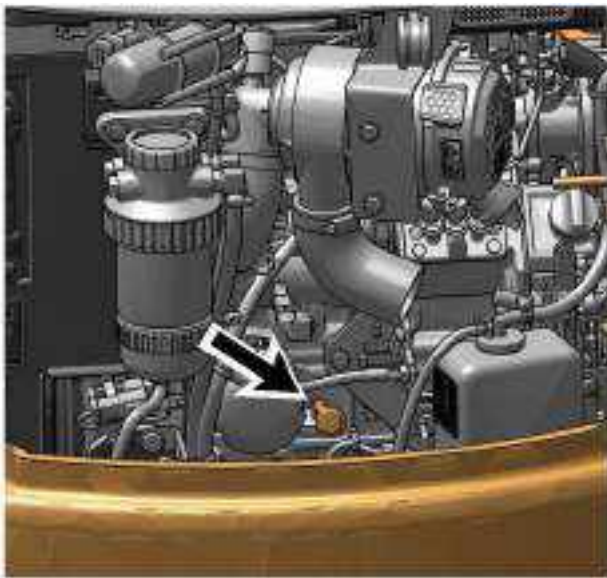


Illustration 452

g06276791

Obtain a sample of the engine oil through the dipstick tube. Refer to Special Publication, SEBU6250, "Caterpillar Machine Fluids Recommendations" "S·O·S Oil Analysis" for information that pertains to obtaining a sample of the engine oil. Refer to Special Publication, PEHP6001, "How To Take A Good Oil Sample" for more information about obtaining a sample of the engine oil.

i08424452

Engine Oil and Filter - Change

SMCS Code: 1318-510

Selection of the Oil and Filter Change Interval



WARNING

Hot oil and hot components can cause personal injury. Do not allow hot oil or hot components to contact skin.

NOTICE

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

Dispose of all fluids according to local regulations and mandates.

NOTICE

Keep all parts clean from contaminants.

Contaminants may cause rapid wear and shortened component life.

NOTICE

The engine oil and filter change interval for standard service application is every 500 hours or every year when the following requirements are met:

- Utilize Cat Recommended Fluids
- Utilize Cat Filters
- Utilize S·O·S Services at recommended interval
- Altitude does not exceed 2300 m (7545 ft)

When these requirements are not met, the oil and filter change interval should be every 250 hours, or use S·O·S Services oil sampling and analysis program to determine an acceptable oil change interval.

If you select an interval for oil and filter change that is too long, you may damage the engine.

NOTICE

When operating in any of the conditions or environments outlined in this Operation and Maintenance Manual, Severe Service Application, use S·O·S Services oil analysis to determine the best oil and filter change interval.

When S·O·S Services are not used in severe service applications, the oil and filter change interval should be every 250 hours..

If you select an interval for oil and filter change that is too long, you may damage the engine.

Note: If the sulfur content in the fuel is greater than 1.5% by weight, use an oil that has a TBN of 30 and reduce the oil change interval by one-half.

Note: Drain the crankcase while the oil is warm. This allows waste particles that are suspended in the oil to drain. As the oil cools, the waste particles will settle to the bottom of the crankcase. The particles will not be removed by draining the oil and the particles will recirculate in the engine lubrication system with the new oil.

Reference: “Lubricant Viscosities”

Reference: Operation and Maintenance Manual, “Maintenance Interval Schedule”

Reference: Operation and Maintenance Manual, “S·O·S Information”

Use the table below to determine the appropriate oil and filter change interval.

Table 36

Selection of Oil and Filter Change Interval					
	Altitude Exceeds 2300 m (7545 ft)	Conditions			Interval
		Cat Recommended Fluids	Cat Filters	S·O·S Services	
Standard Service Application	NO	YES	YES	YES	500 hours or every year
		YES	YES	NO	500 hours or every year
		YES	NO	YES	500 hours or every year
		NO	YES	YES	500 hours or every year
		NO	NO	NO	250 hours
Severe Service Application	YES	NO	NO	NO	250 hours
		YES	YES	NO	250 hours
		YES	YES	YES	Use S·O·S ⁽¹⁾
		YES	NO	YES	Use S·O·S ⁽¹⁾
		NO	YES	YES	Use S·O·S ⁽¹⁾

⁽¹⁾ If operating in any of the conditions or environments outlined in the Severe Service Application, use S·O·S Services oil analysis to determine the best oil change interval.

Engine Oil and Filter Change

1. Park the machine on a level surface. Prepare the machine for maintenance. Refer to “Prepare the Machine for Maintenance”.

Maintenance Section
Engine Oil and Filter - Change



Illustration 453

g06660612

2. Open the access door at the rear of the machine.
Refer to "Access Door and Cover Locations".

Note: Refer to "General Hazard Information" for information on Containing Fluid Spillage.

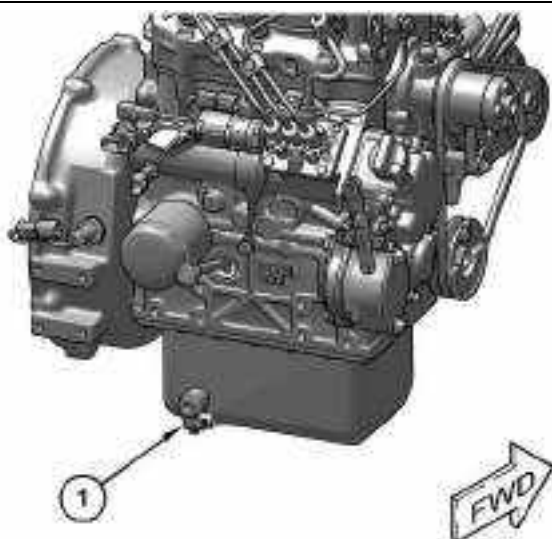


Illustration 454

g06660613

Some components removed for better clarity

(1) Crankcase drain plug

3. Remove crankcase drain plug (1) and allow the oil to drain into a suitable container.

Note: Discard any drained fluids according to local regulations.

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

5. Install crankcase drain plug (1).

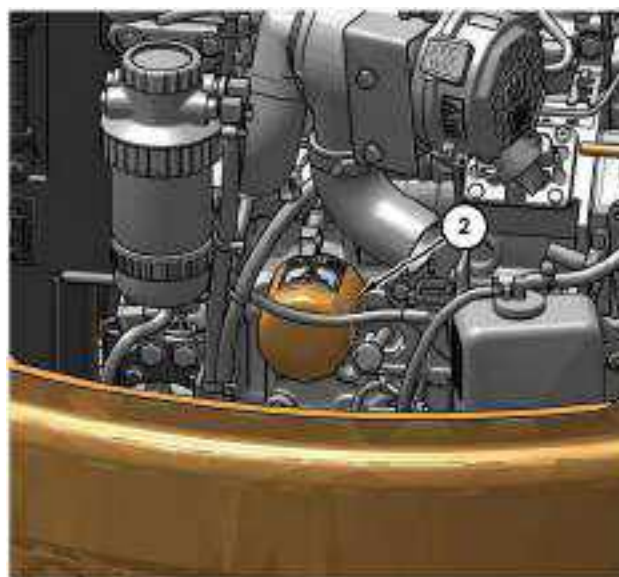


Illustration 455

g06660605

(2) Filter

6. Remove filter (2) with a filter wrench. Discard filter (2).

Note: Used filters should always be disposed according to local regulations.

7. Install new filter (2) by hand. When the gasket contacts the filter base, tighten the filter for an additional three quarters of a turn.

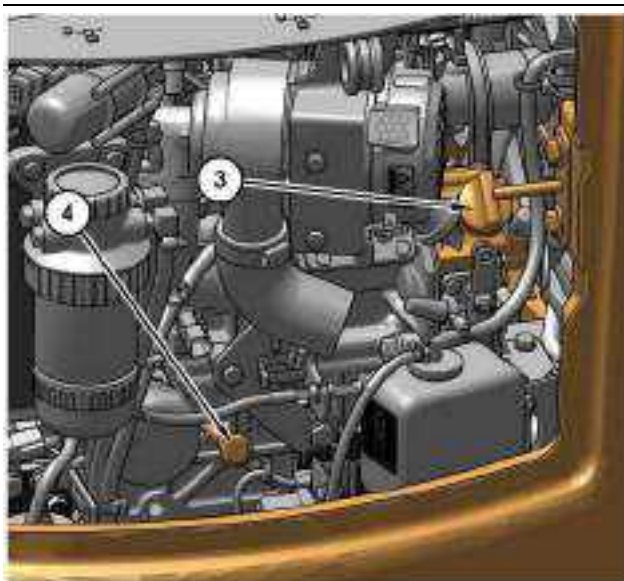


Illustration 456

g06660606

- (3) Oil filler cap
(4) Oil level gauge

8. Remove oil filler cap (3). Fill the crankcase with new oil. Refer to "Capacities (Refill)". Clean oil filler cap (3) and install oil filler cap (3).

NOTICE

Do not under fill or overfill engine crankcase with oil. Either condition can cause engine damage.

9. Start the engine and allow the oil to warm. Refer to "Engine Starting". Check the engine for leaks.
10. Stop the engine. Refer to "Stopping the Engine".



Illustration 457

g06183475

11. Wait for 30 minutes to allow the oil to drain back into the crankcase. Check the oil level with oil level gauge (4). Maintain the oil between the "L" and "H" marks on the oil level gauge (4).

If necessary, add oil. Refer to "Lubricant Viscosities".

12. Start the engine and operate the engine at low idle for several minutes. Refer to "Engine Starting". While the engine is running, check the filter base for oil leaks.
13. Stop the engine and allow the oil to drain back into the crankcase. Refer to "Stopping the Engine".
14. Close the access door at the rear of the machine. Refer to "Access Door and Cover Locations".

i08423522

Engine Valve Lash - Check/Adjust

SMCS Code: 1105-535; 1105-025

WARNING

Ensure that the engine cannot be started while this maintenance is being performed. To help prevent possible injury, do not use the starting motor to turn the flywheel.

Hot engine components can cause burns. Allow additional time for the engine to cool before measuring/adjusting valve lash clearance.

NOTICE

Only qualified service personnel should perform this maintenance. Refer to the Systems Operation/Testing and Adjusting Manual, "Valve Lash and Valve Bridge Adjustment" article or consult your Caterpillar dealer for the complete valve lash adjustment procedure.

Operation of Caterpillar engines with improper valve adjustments can reduce engine efficiency. This reduced efficiency could result in excessive fuel usage and/or shortened engine component life.

Note: For procedures on adjusting the valve lash and adjusting the valve bridge, refer to Systems Operation/Testing and Adjusting, "Valve Lash and Valve Bridge Adjustment". Consult your Cat® dealer for assistance.

i07284921

Film (Product Identification) - Clean

SMCS Code: 7405-070; 7557-070

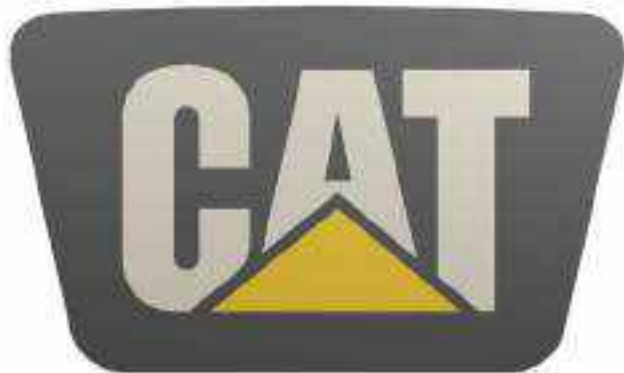


Illustration 458

g06184074



Illustration 459

g06274059

Typical example of the Product Identification Films.

Cleaning of the Films

Make sure that all the product identification films are legible. Make sure that the recommended procedures are used to clean the product identification films. Ensure that all the product identification films are not damaged or missing. Clean the product identification films or replace the films.

Hand Washing

Use a wet solution with no abrasive material that contains no solvents and no alcohol. Use a wet solution with a "pH" value between 3 and 11. Use a soft brush, a rag, or a sponge to clean the product identification films. Avoid wearing down the surface of the product identification films with unnecessary scrubbing. Ensure that the surface of the product identification films is flushed with clean water and allow the product identification films to air dry.

Power Washing

Power washing or washing with pressure may be used to clean product identification films. However, aggressive washing can damage the product identification films.

Excessive pressure during power washing can damage the product identification films by forcing water underneath the product identification films. Water lessens the adhesion of the product identification film to the product, allowing the product identification film to lift or curl. These problems are magnified by wind. These problems are critical for the perforated film on windows.

To avoid lifting of the edge or other damage to the product identification films, follow these important steps:

- Use a spray nozzle with a wide spray pattern.
- A maximum pressure of 83 bar (1200 psi)
- A maximum water temperature of 50° C (120° F)
- Hold the nozzle perpendicular to the product identification film at a minimum distance of 305 mm (12 inch).
- Do not direct a stream of water at a sharp angle to the edge of the product identification film.

i07281445

Final Drive Oil - Change

SMCS Code: 4050-044-FLV

Note: At the time of changing oil, observe the oil for presence of metallic particles or other foreign matters. If you find something that needs attention, consult your Cat dealer.

1. Warm up the oil by roading the tracks. Draining the oil should be done when the oil is hot. Draining the oil when hot will help to prevent sludge.
2. Move the machine to level ground.

i07281532



Illustration 460

g06272783

3. Position one of the final drives as shown in illustration 460 .

Note: Refer to Operation and Maintenance Manual, “General Hazard Information” for information on Containing Fluid Spillage.

4. Remove the oil level plug (1).
5. Remove the oil drain plug (2). Allow the oil to drain into a suitable container.
6. Clean the drain plug (2). Apply pipe sealant to the threads of the drain plug to prevent leakage. Reinstall the drain plug.
7. Add oil to the final drive through the opening for the oil level plug (1) until the oil is level with the plug threads (1). See Operation and Maintenance Manual, “Lubricant Viscosities” and Operation and Maintenance Manual, “Capacities (Refill)”.
8. Clean the oil level plug (1). Apply pipe sealant to the threads of the oil level plug to prevent leakage. Reinstall the oil level plug.
9. Repeat the procedure for the other final drive.
10. Start the engine and allow the final drives to run through several cycles.
11. Stop the engine. Check the oil level in both final drives.
12. Apply pipe sealant on the threads of the oil level plug. Reinstall the oil level plug.
13. Properly dispose of the drained material. Obey local regulations for the disposal of the material.

Final Drive Oil Sample - Obtain

SMCS Code: 4011-008; 4050-008; 4050-SM; 7542-008



Illustration 461

g06272797

1. Position the final drive as shown in illustration 461 .
2. Remove oil level plug (1).
3. Obtain a sample of the final drive oil through the hole for the oil level plug.
4. Clean the oil level plug. Apply pipe sealant on the threads to prevent leakage. Reinstall the plug.

Refer to Special Publication, SEBU6250, “S·O·S Oil Analysis” for more information on obtaining a sample of the final drive oil. For additional information about taking an oil sample, refer to Special Publication, PEGJ0047, “How To Take A Good Oil Sample”.

i07297388

Fuel Lift Pump Strainer - Replace

(If equipped)

SMCS Code: 1256-510-STR; 1256

WARNING

Personal injury or death may result from failure to adhere to the following procedures.

Fuel leaked or spilled onto hot surfaces or electrical components can cause a fire.

Clean up all leaked or spilled fuel. Do not smoke while working on the fuel system.

Turn the disconnect switch OFF or disconnect the battery when changing fuel filters.

NOTICE

Do not fill the fuel filters with fuel before installing the fuel filters. The fuel will not be filtered and could be contaminated. Contaminated fuel will cause accelerated wear to fuel system parts.

The fuel lift pump strainer is located below the fuel system primary filter.



Illustration 462

g06276835

1. Open the rear access door.
2. Disconnect clamps (2) from both the side of the strainer (1) and remove the strainer.
3. Replace the strainer.

4. Reconnect the hoses.

5. Close the rear access door.

i05372885

Fuel System - Prime

SMCS Code: 1250-548

WARNING

Fuel leaked or spilled onto hot surfaces or electrical components can cause a fire. To help prevent possible injury, turn off the start switch and let the engine cool down when changing fuel filters or water separator elements. Clean up fuel spills immediately.

NOTICE

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

Refer to Special Publication, PERJ1017, "Dealer Service Tool Catalog" for tools and supplies suitable to collect and contain fluids on Cat® products.

Dispose of all fluids according to local regulations and mandates.

NOTICE

Do not loosen the fuel lines at the fuel manifold. The fittings may be damaged and/or a loss of priming pressure may occur when the fuel lines are loosened.

Prime the fuel system in order to fill the fuel filter, and prime the fuel system in order to purge trapped air. The fuel system should be primed under the following conditions:

- The fuel tank is running low.
- The machine has been stored.
- The fuel filter is being replaced.
- The fuel lines have been replaced.

1. Fill the fuel tank. Move the hydraulic lockout lever to the RAISED position. Turn the ignition key to the first position.

2. Wait 5 minutes while the fuel system primes automatically.

NOTICE

Do not crank the engine continuously for more than 10 seconds. Allow the starting motor to cool for two minutes before cranking the engine again.

3. Start the engine.
4. Check the fuel system for leaks.
5. Run the engine at low idle for 5 minutes.

Note: If the engine runs smoothly, and then stops, or the engine runs rough, more priming may be necessary.

6. If more priming is necessary, turn off the engine.
7. Move the hydraulic lockout lever to the RAISED position.
8. Turn the engine start switch key to the first position.
9. Prime the fuel system again.

Note: If the fuel system does not prime correctly, consult your Cat dealer.

i07281585

Fuel System Primary Filter (Water Separator) Element - Replace

SMCS Code: 1263-510-FQ

WARNING

Personal injury or death may result from failure to adhere to the following procedures.

Fuel leaked or spilled onto hot surfaces or electrical components can cause a fire.

Clean up all leaked or spilled fuel. Do not smoke while working on the fuel system.

Turn the disconnect switch OFF or disconnect the battery when changing fuel filters.

NOTICE

Do not fill the fuel filters with fuel before installing the fuel filters. The fuel will not be filtered and could be contaminated. Contaminated fuel will cause accelerated wear to fuel system parts.

1. Open the rear access door.

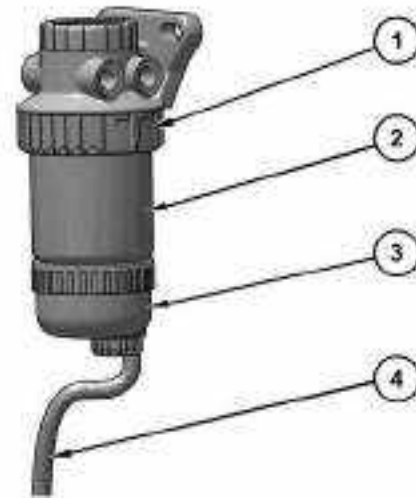


Illustration 463

g06272834

- (1) Locking ring
- (2) Primary fuel filter/water separator element
- (3) Water separator bowl
- (4) Drain hose

2. Open the drain on the water separator bowl (3). Allow the water and fuel to drain into a suitable container.
 3. Support the fuel filter/water separator element (2) and rotate the locking ring (1) counterclockwise. Remove the locking ring.
 4. Remove the water separator bowl (3) from the bottom of the fuel filter/water separator element (2).
- Note:** The water separator bowl is reusable. Do not discard the water separator bowl.
5. Inspect the O-ring seal of the water separator bowl (3) for damage. Replace the O-ring seal, if necessary.
 6. Lubricate the O-ring seal with clean diesel fuel or lubricate the O-ring seal with motor oil. Place the seal in the water separator bowl.
 7. Spin the water separator bowl (3) onto the new fuel filter/water separator element (2) by hand until the fuel filter/water separator is snug. Do not use tools to tighten the fuel filter/water separator element to the bowl.
 8. Clean the filter mounting base.
 9. Install the new element. Rotate the locking ring (1) clockwise to fasten the filter to the mounting base.

10. Prime the fuel system. See Operation and Maintenance Manual, "Fuel System - Prime" for instructions.

11. Close the access door.

i07281590

Fuel System Water Separator - Drain

SMCS Code: 1263

1. Open the rear access door.



Illustration 464

g06272847

2. Turn the drain valve counterclockwise to open the drain valve.

Note: Refer to Operation and Maintenance Manual, "General Hazard Information" for information on containing fluid spillage.

3. Drain the water and drain the sediment into a suitable container.

Note: Dispose of drained fluids according to local regulations.

4. Close the drain valve.

5. Close the rear access door.

i07305678

Fuel Tank Cap - Clean

SMCS Code: 1273-070-Z2; 1273



Illustration 465

g06277309

1. Remove fuel cap (1).

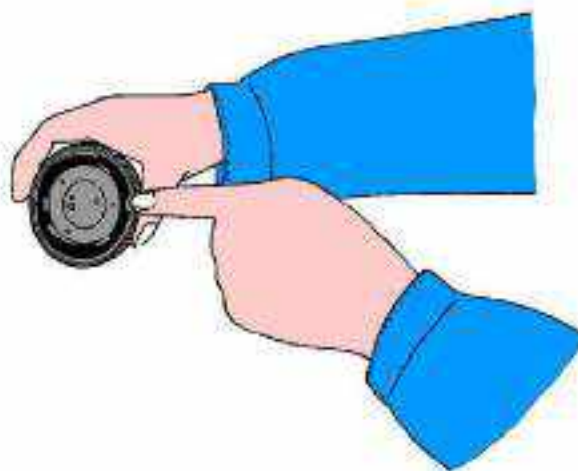


Illustration 466

g06277320

2. Inspect the cap and gasket for damage. Replace the fuel tank cap if the cap is damaged.

3. Use a clean, nonflammable solvent to wash the fuel tank cap.

4. Put a light coating of fuel oil on the cap gasket.

5. Install the fuel cap.

i07282145

Fuel Tank Water and Sediment - Drain

SMCS Code: 1273-543

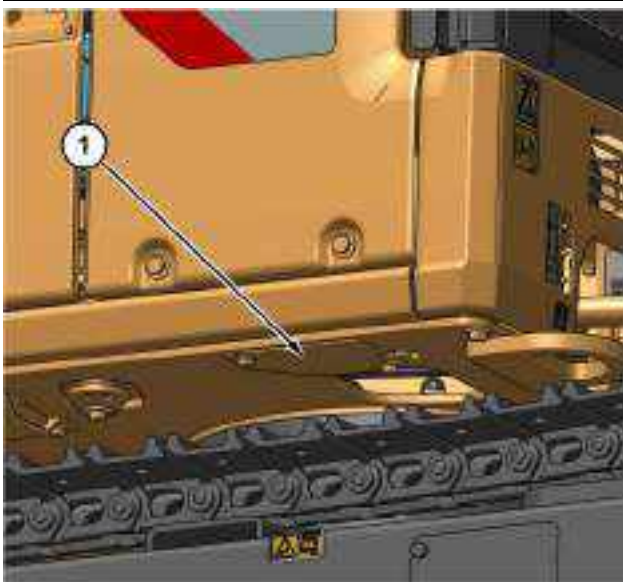


Illustration 467

g06317865

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

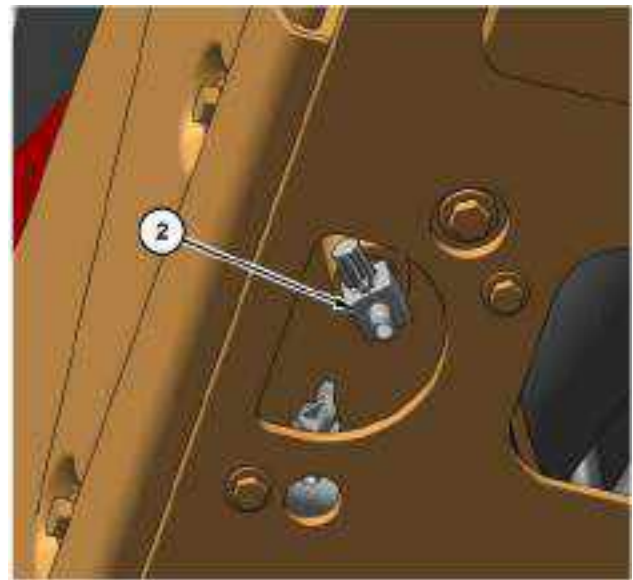


Illustration 468

g06317875

2. Open fuel tank valve (2). Allow the water and sediment to drain into a suitable container.

Note: Refer to Operation and Maintenance Manual, "General Hazard Information" for information on Containing Fluid Spillage.

3. Close fuel tank valve (2).

Note: Discard the drained fluids according to local regulations.

4. Reinstall guard (1).

i07282454

Fuses - Replace

SMCS Code: 1417-510

Fuses – Fuses protect the electrical system from damage that is caused by overloaded circuits. Replace the fuse if the element separates. If the element of a new fuse separates, check the circuit. If necessary, consult your Cat dealer.

NOTICE

Always replace fuses with the same type and capacity fuse that was removed. Otherwise, electrical damage could result.

NOTICE

If it is necessary to replace fuses frequently, an electrical problem may exist.

Contact your Cat dealer.

Maintenance Section

Fuses - Replace

The fuses are located below the seat or on the lower right console.

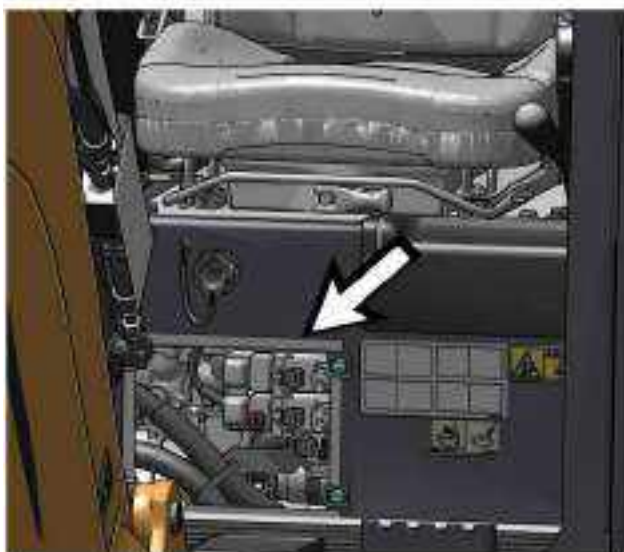


Illustration 469

g06273207

Fuse and relay locations for 301.5 and 301.7 CR

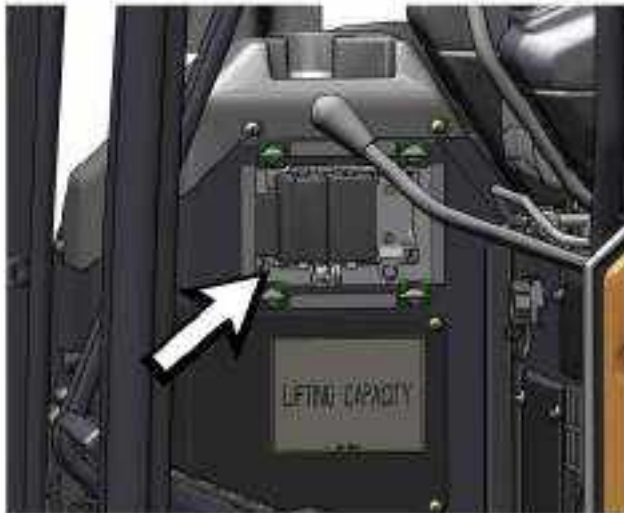


Illustration 470

g06273205

Fuse and relay locations for 301.5 and 301.7 CR

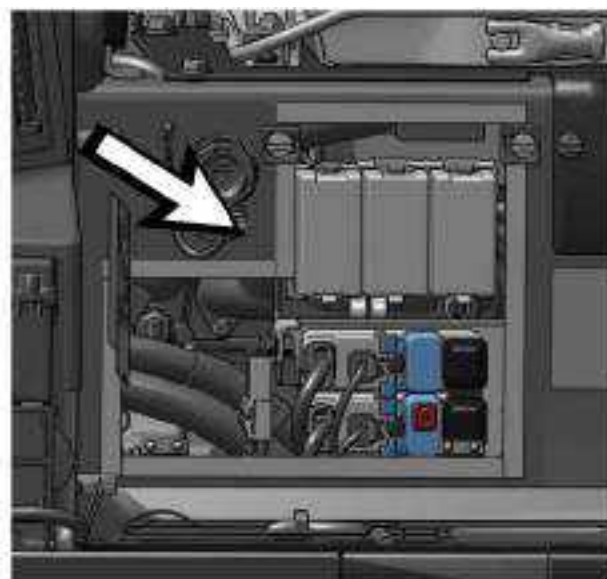


Illustration 471

g06318395

Fuse and relay locations for 301.6, 301.8, and 302 CR

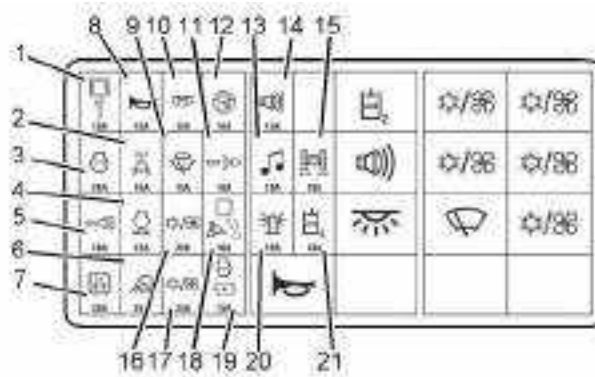


Illustration 472

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

i02054663

Relays

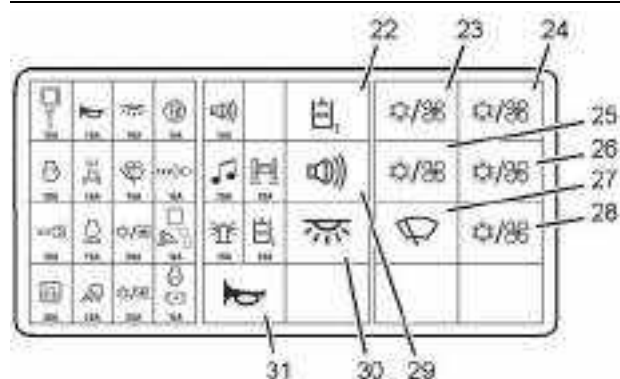


Illustration 473

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

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".



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).

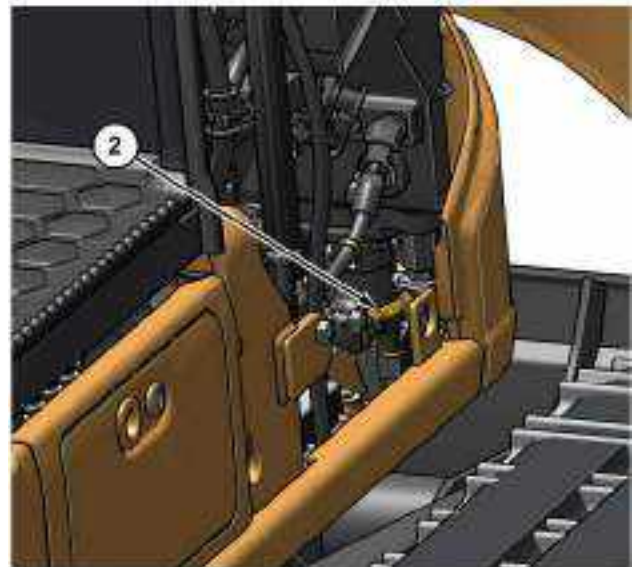


Illustration 476

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".

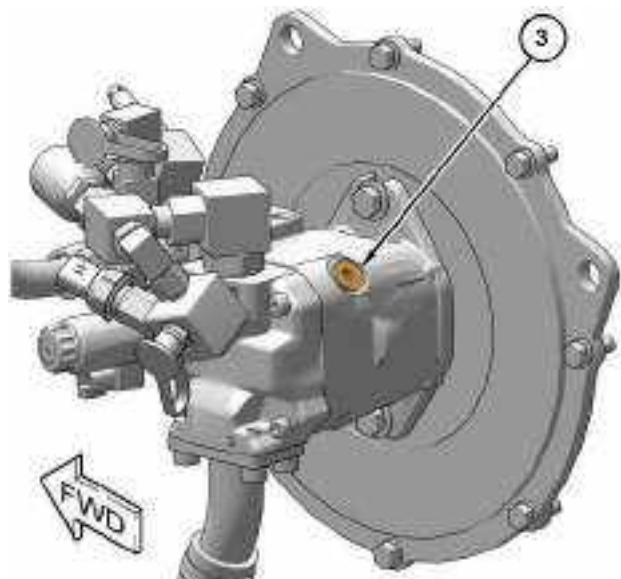


Illustration 477

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".

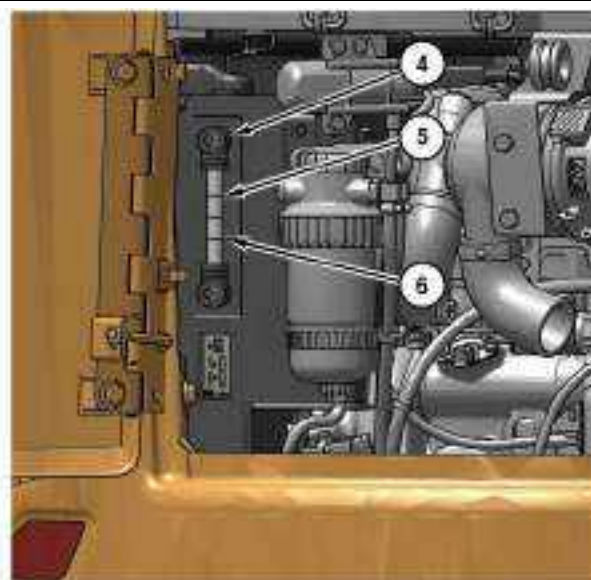


Illustration 478

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".

i08423603

Hydraulic System Oil Filter (Return) - Replace

SMCS Code: 5068-510-RJ

WARNING

Hot oil and hot components can cause personal injury. Do not allow hot oil or hot components to contact skin.

NOTICE

Never remove the fill/vent plug from the hydraulic tank if the oil is hot.

Air can enter the system and cause pump damage.

1. Prepare the machine for maintenance. Refer to "Prepare the Machine for Maintenance".
2. Open the access door on the left side of the machine. Refer to "Access Door and Cover Locations".

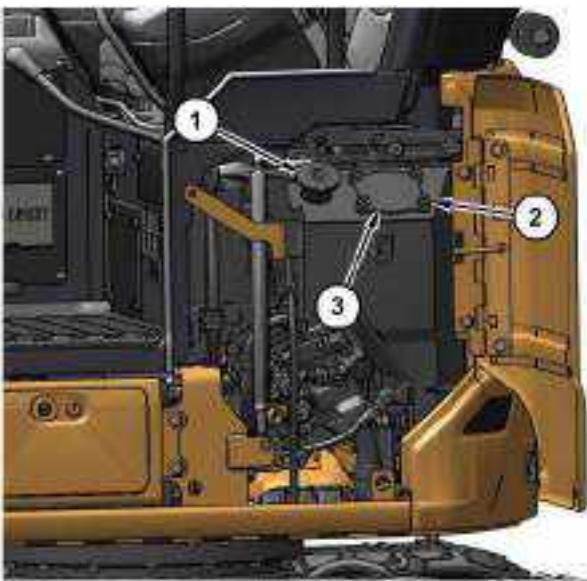


Illustration 479

g06660588

- (1) Oil filler cap
(2) Bolt
(3) Cover

WARNING

Pressurized system!

The hydraulic tank contains hot oil under pressure. To prevent burns from the sudden release of hot oil, relieve the tank pressure with the engine off. Relieve pressure by slowly turning the cap until the cap reaches the secondary stop.

3. Clean the area around oil filler cap (1) and cover (3).
4. Slowly loosen oil filler cap (1) to relieve the pressure in the hydraulic oil tank. Refer to "System Pressure Release". Clean oil filler cap (1).
5. Place a suitable container under the filter.

Note: Refer to "General Hazard Information" for information on Containing Fluid Spillage.

6. Remove four bolts (2). Remove cover (3) and collect the hydraulic oil as the oil drains.

Note: Discard any drained fluids according to local regulations.

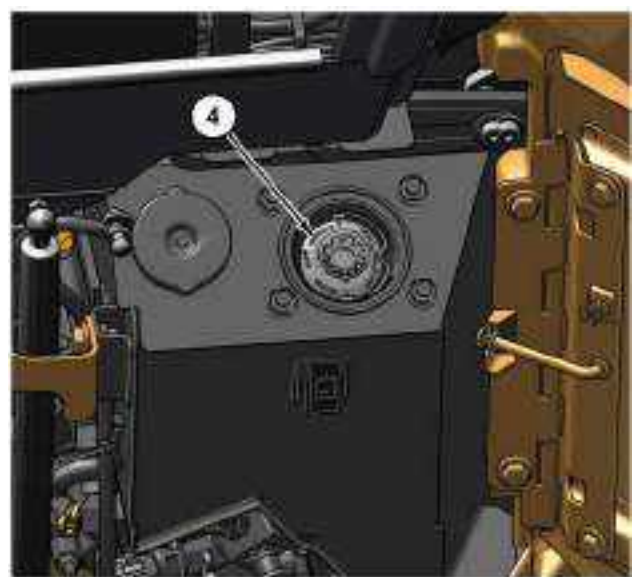


Illustration 480

g06660589

Hydraulic tank

- (4) Filter element

7. Remove and discard filter element (4).

Note: Used filters should always be disposed according to local regulations.

8. Remove any dirt from the housing and the sealing surface of cover (3). Check the surface of the removed filter element (4) for dirt residue and coarse particles. If dirt residue and/or coarse particles are found, consult your Cat[®] dealer.
9. Install new filter element (4).
10. Position cover (3) in place on top of the hydraulic tank. Tighten four bolts (2).
Refer to Specifications, SENR3130, "Torque Specifications" for the recommended torque.
11. Install oil filler cap (1).
12. Close the access door on the left side of the machine. Refer to "Access Door and Cover Locations".

i07475362

Hydraulic System Oil Level - Check

SMCS Code: 5050-535

WARNING

Hot oil and hot components can cause personal injury. Do not allow hot oil or hot components to contact skin.

Note: Check the hydraulic system oil level with the machine on a level surface.



Illustration 481

g06273670

1. Park the machine on level ground. Lower the work tool to the ground with the stick in the vertical position.

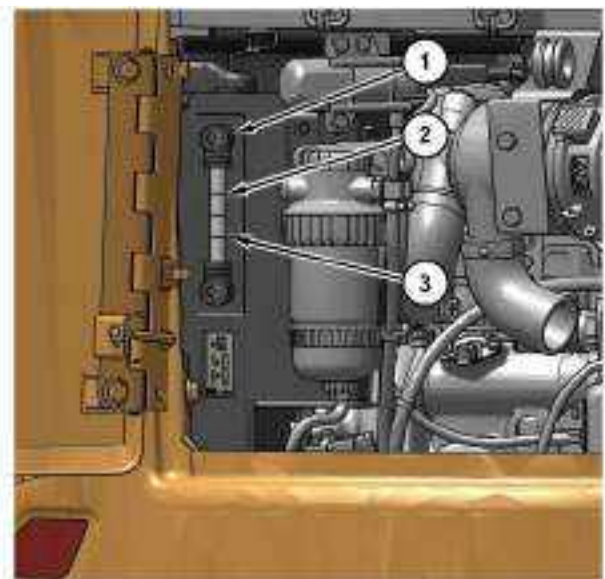


Illustration 482

g06273684

- (2) High
(3) Low

2. The sight gauge (1) is behind the rear access door.
3. Maintain the hydraulic system oil level in the middle of the sight gauge.
4. Open left side access door.

i07284652



Illustration 483

g06273689

5. Slowly loosen hydraulic oil tank cap (4) to relieve any pressure and add hydraulic oil, if necessary.
6. Close left side access door.

Hydraulic System Oil Sample - Obtain

SMCS Code: 5050-008-OC; 5095-SM; 5095-008; 7542-008; 7542



Illustration 484

g06273696

Obtain a sample of the hydraulic oil by removing the floor mat and cover to expose SOS sampling port (1) under the cab floor.

Refer to Special Publication, SEBU6250, "S·O·S Oil Analysis" for information that pertains to obtaining a sample of the hydraulic oil. Refer to Special Publication, PEGJ0047, "How To Take A Good Oil Sample" for more information about obtaining a sample of the hydraulic oil.

i07203750

Lifting Hook - Inspect

SMCS Code: 6459-040

Note: Designate a person to inspect the hook frequently. The designated person should inspect the hook prior to operation and during operation. The designated person will determine if the conditions that are found are a hazard. The designated person will determine if a more detailed inspection is required.

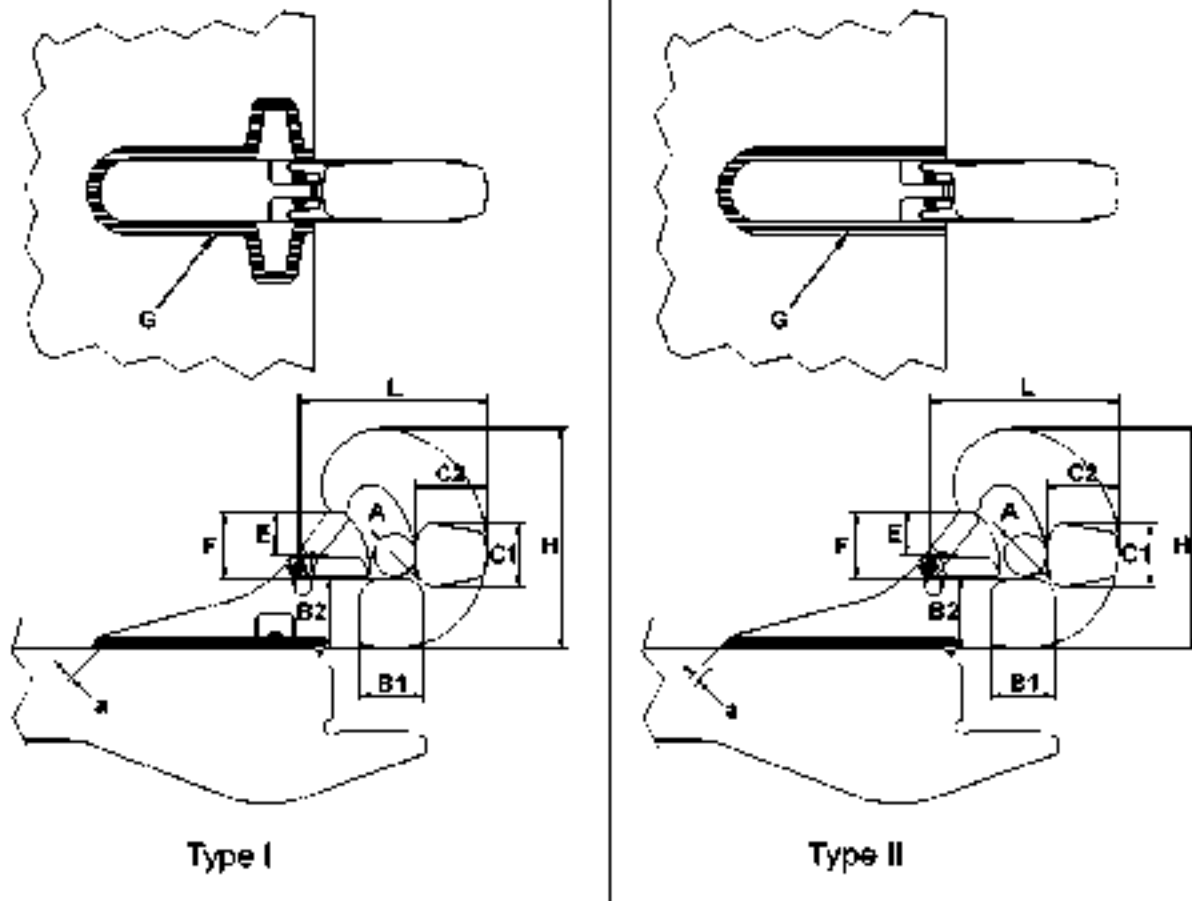


Illustration 485

g01540013

(A) Maximum diameter of bar
(B1) Nominal width of bottom
(B2) Nominal height of bottom
(C1) Nominal width of front

(C2) Nominal height of front
(E) Actual throat clearance
(F) Full throat clearance
(G) Required height of weld (a)

(H) Nominal height of hook
(L) Nominal length of hook

1. Inspect the hook for any distortion such as bends in the hook or twists in the hook.
2. Inspect the dimensions of the throat (E) and (F). An increase in the dimensions of the throat must not exceed 5% of the original dimensions of the throat. Refer to Illustration 485 for the dimensions of the throat.
3. Inspect the hook for wear. An increase in the nominal dimensions (B1), (B2), (C1), (C2), (H), and (L) of the hook must not exceed 10% of the original nominal dimensions of the hook. Refer to Illustration 485 for the nominal dimensions of the hook.
4. Inspect the hook for cracks, nicks, or gouges.
5. Ensure that the latch properly engages. Inspect the latch for any damage. Ensure that the latch is not malfunctioning.

Note: Before continuing to operate the hook, the hook must be repaired or replaced if any of the above conditions exist. Refer to Special Instruction, REHS3357, "Procedure for Installation or Replacement of a Lifting Hook or a Lifting Yoke on Certain Quick Couplers" for additional information.

i04432083

Light - Test

SMCS Code: 1429-081

Turn on the switch. Observe the lights and replace any that are not working.

i07349186

Oil Filter - Inspect

SMCS Code: 1308-507; 5068-507

Inspect a Used Filter for Debris



Illustration 486

g06224663

The element is shown with debris.

Use a filter cutter to cut the filter element open. Spread apart the pleats and inspect the element for metal and for other debris. An excessive amount of debris in the filter element can indicate a possible failure.

If metals are found in the filter element, a magnet can be used to differentiate between ferrous metals and nonferrous metals.

Ferrous metals can indicate wear from steel parts and on cast iron parts.

Nonferrous metals can indicate wear from the aluminum parts of the engine such as main bearings, rod bearings, or turbocharger bearings.

Small amounts of debris may be found in the filter element. This debris could be caused by friction and by normal wear. Consult your Cat dealer to arrange for further analysis if an excessive amount of debris is found.

Using an oil filter element that is not recommended by Caterpillar can result in severe engine damage to engine bearings, to the crankshaft, and to other parts. This can result in larger particles in unfiltered oil. The particles could enter the lubricating system and the particles could cause damage.

i01819738

Quick Coupler - Check

SMCS Code: 6129-535; 6700-535

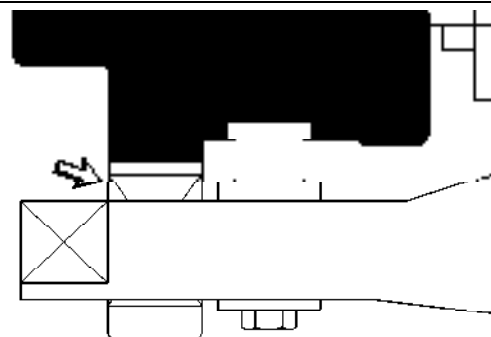


Illustration 487

g00584367

1. Ensure that there is a visible space between the wedge and the quick coupler frame. If there is no space, the mounting bracket or the quick coupler may be damaged or worn. Contact your Caterpillar dealer.

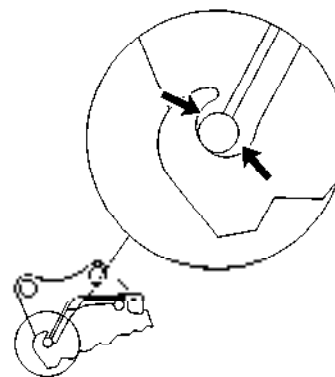


Illustration 488

g00584389

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

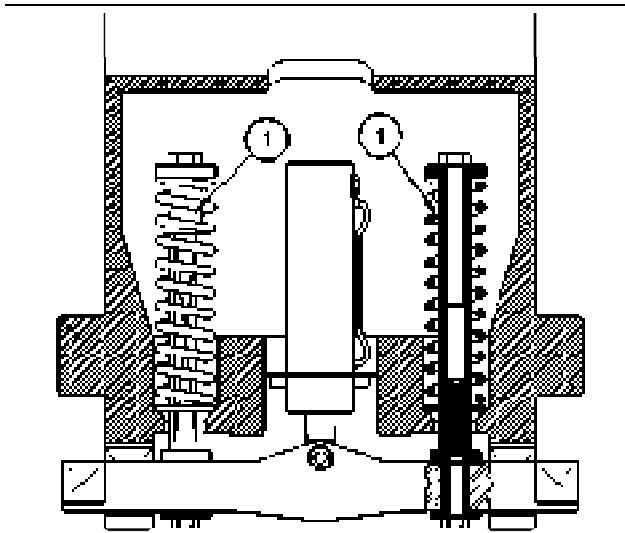


Illustration 489

g00584390

3. Visually inspect the shafts (1). The shafts (1) must be straight. Replace the shafts (1) if the shafts are bent.

i04673589

Quick Coupler - Clean

SMCS Code: 6129-070

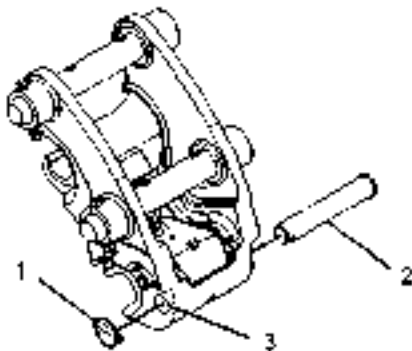


Illustration 490

g01155173

Typical example

1. Remove pin (1).
2. Remove safety pin (2) from the quick coupler. The pin may be located on the right side or located on the rear of the quick coupler.
3. Clean safety pin (2).
4. Clean out bore (3) on either side of the coupler.

5. Remove any trash or buildup from the quick coupler.

6. Apply grease to safety pin (2).

Refer to Special Publication, SEBU6250, "Caterpillar Machine Fluid Recommendations" for more information about the selection of grease.

7. Insert safety pin (2) into bore (3) on the right side.

8. Insert pin (1) into safety pin (2) on the left side of the quick coupler.

i02166325

Quick Coupler - Clean/Inspect

SMCS Code: 6129-040; 6129-070

WARNING

Personal injury or death can result from improperly checking for a leak.

Always use a board or cardboard when checking for a leak. Escaping air or fluid under pressure, even a pin-hole size leak, can penetrate body tissue causing serious injury, and possible death.

If fluid is injected into your skin, it must be treated immediately by a doctor familiar with this type of injury.

Note: Do not weld on the quick coupler without consulting your Caterpillar dealer.

Note: Clean the quick coupler prior to inspection in order to properly inspect the quick coupler.

Note: Refer to Operation and Maintenance Manual, "Daily Inspection" for additional information.

1. Inspect the hydraulic lines and the hydraulic fittings for damage or for wear. Repair any worn components or replace any worn components. Repair any leaking components.
2. Inspect the locking pins that secure the quick coupler to the host machine.
3. Inspect the steel material of the quick coupler for cracks.
4. Inspect the warning signs and labels. Replace warning signs or labels that are missing. Replace warning signs or labels when you cannot read the warning signs or labels. Refer to Operation and Maintenance Manual, "Safety Messages" for additional information.

i02973110

i05815772

Quick Coupler - Lubricate (If Equipped)

SMCS Code: 6129-086

1. Lower all work tools to the ground.
2. Wipe off the fittings before you lubricate the fitting.

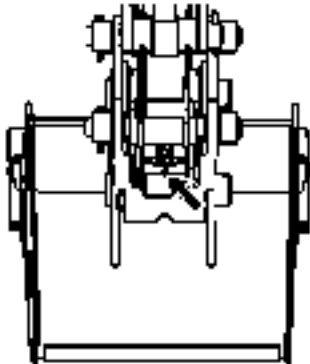


Illustration 491

g01167510

Typical example

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

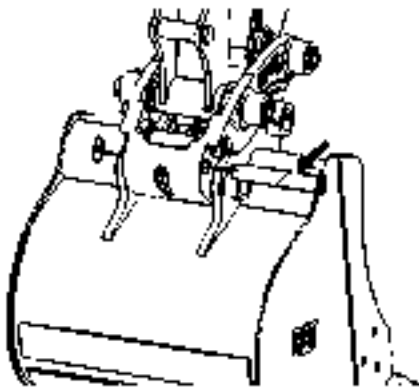


Illustration 492

g01167518

Typical example

4. Apply grease to the external surface of the pin in the lock assembly.

Note: The lock assembly may be located on the side of the coupler or located on the rear of the coupler.

5. Check the overall condition of the quick coupler. Look for the following conditions: loose bolts, worn parts, broken parts, missing parts and damaged parts. Make any necessary repairs.

Quick Coupler - Lubricate (Mechanical Pin Grabber Quick Coupler (If Equipped))

SMCS Code: 6129-086

1. Release the work tool from the quick coupler. Ensure that the work tool is in a stable and safe storage position on the ground. Refer to Operation and Maintenance Manual, "Quick Coupler Operation - Mechanical Pin Grabber Quick Coupler" for the proper procedure.

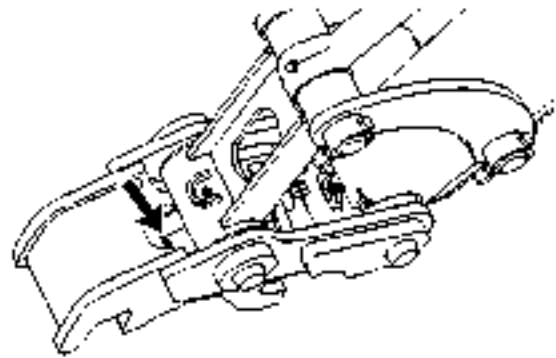


Illustration 493

g03681390

2. Wipe off the fitting before you lubricate the fitting.
3. Apply grease to the fitting of the quick coupler.
4. Check that all pin retainers are in place and that all bolts and nuts are tight.
5. Check the full operation of all the moving parts within the quick coupler. Repair or replace immediately if required.
6. Check that there is no material buildup around the rear locking mechanism, threaded actuator, or wedge plate. Check that there is no material buildup around the front locking mechanism.
7. Check the quick coupler for cracks, bent components, or wear.

i06514107

Quick Coupler - Lubricate

SMCS Code: 6129-086

Spindle Lubricate

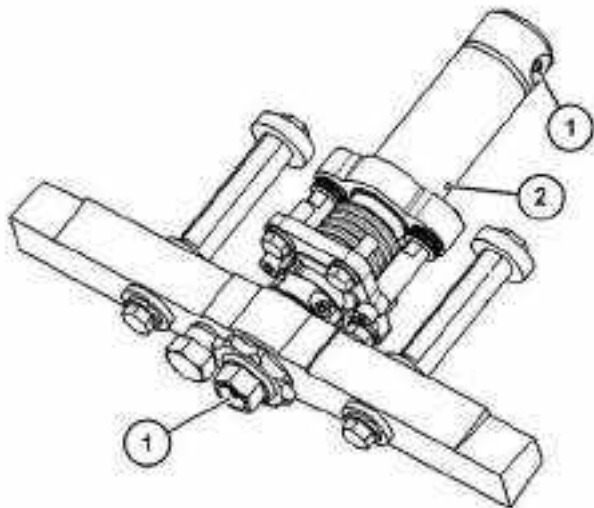


Illustration 494

g06005591

Note: On quick couplers with spindle coupling, the spindle must be lubricated.

1. Uncouple the work tool to lubricate the spindle housing. Refer to Uncoupling the Work Tool - Quick Coupler with Spindle Coupling for information.
2. Turn the spindle inward completely, in a CLOCKWISE direction. Grease the spindle at both grease points (1) until the grease becomes visible at the grease release hole (2).
3. Turn the spindle outward completely, in a COUNTER-CLOCKWISE direction. Remove any excess grease from the spindle.
4. Couple the work tool.

i07284663

Radiator Core - Clean

SMCS Code: 1353-070

1. Open the right side access door.



Illustration 495

g06273709

2. You can use compressed air or water to remove dust and other debris from the radiator fins. The compressed air should be oil free and 200 kPa (29 psi) maximum.
3. Close the right side access door.

i07285015

Seat Belt - Inspect

SMCS Code: 7327-040

Always check the condition of the seat belt and the condition of the seat belt mounting hardware before you operate the machine. Replace any parts that are damaged or worn before you operate the machine.



Illustration 496

g06224278

Typical example

Check the seat belt mounting hardware for wear or for damage. Replace any mounting hardware that is worn or damaged. Make sure that the mounting bolts are tight.

Check buckle (2) for wear or for damage. If the buckle is worn or damaged, replace the seat belt.

Inspect seat belt (1) for webbing that is worn or frayed. Replace the seat belt if the seat belt is worn or frayed.

Consult your Cat dealer for the replacement of the seat belt and the mounting hardware.

i06970675

Seat Belt - Replace

SMCS Code: 7327-510

The seat belt should be replaced within 3 years of the date of installation. A date of installation label is attached to the seat belt retractor and buckle. If the date of installation label is missing, replace the belt within 3 years from the year of manufacture as indicated on the belt webbing label, buckle housing, or installation tags (non-retractable belts).

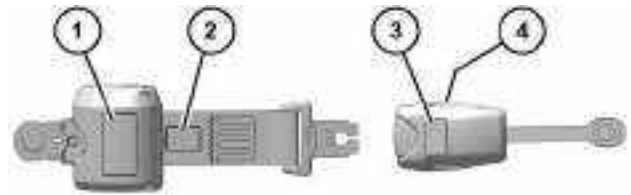


Illustration 497

g06183390

- (1) Date of installation (retractor)
- (2) Year of manufacture (tag) (fully extended web)
- (3) Date of installation (buckle)
- (4) Year of manufacture (underside) (buckle)

Consult your Cat dealer for the replacement of the seat belt and the mounting hardware.

Determine the age of a new seat belt before installing on seat. A manufacture label is on the belt webbing and imprinted on the belt buckle. Do not exceed the install by date on the label.

A complete seat belt system should be installed with new mounting hardware.

Date of installation labels should be marked and affixed to the seat belt retractor and buckle.

Note: Date of installation labels should be permanently marked by punch (retractable belt) or stamp (non-retractable belt).

If your machine is equipped with a seat belt extension, also perform this replacement procedure for the seat belt extension.

i07284881

Swing Frame Pin - Lubricate

SMCS Code: 6506-086; 6507-086

1. Lower all work tools to the ground.
2. Wipe all grease fittings before you lubricate the grease fittings.

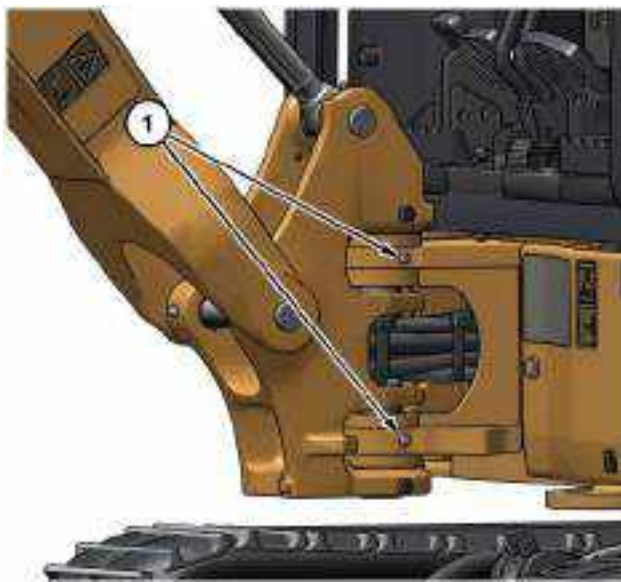


Illustration 498

g06273916

3. Apply lubricant to grease fittings (1) for the swing frame.

i07284699

Swing Gear and Bearing - Lubricate

SMCS Code: 7063-086

WARNING

Do not rotate the machine during lubrication. Danger of severe crushing that can cause severe injury or death.

1. Park the machine on a level surface. Lower all work tools to the ground. Place the hydraulic lockout control in the RAISED position.

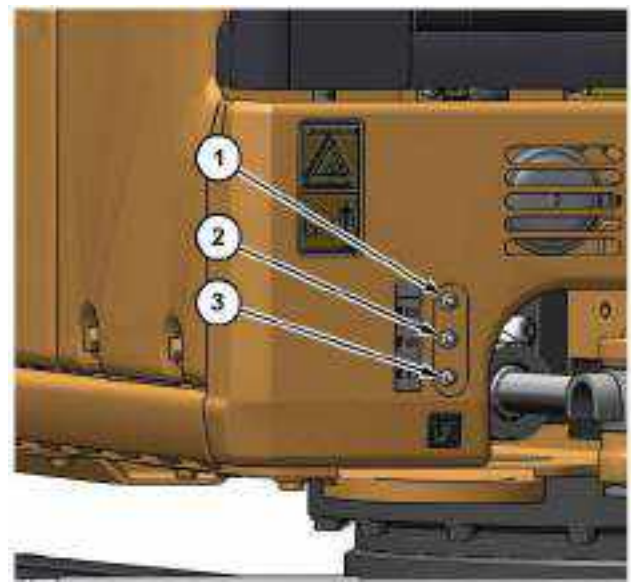


Illustration 499

g06273727

- (1) Swing cylinder (head)
- (2) Swing bearing (inner)
- (3) Swing gear (outer)

2. Fittings (1), (2), and (3) for the swing cylinder, bearing, and gear are on the right side of the machine on the upper carriage.

3. Wipe the fittings and lubricate.



Illustration 500

g06273733

4. Rotate the upper structure for 90°.
5. Apply grease to the fitting for the swing bearing.
6. Repeat Step 4 and Step 5 until the upper structure has rotated 360°.

7. Rotate the upper structure 360° twice.

i07284885

Track Adjustment - Adjust

SMCS Code: 4170-025

Tightening the Tracks



Illustration 501

g06273924

1. Remove cover (1).



Illustration 502

g06273930

2. Wipe fitting (2) before you add grease.

3. Add grease through fitting (2) until the correct tension is reached.
4. Operate the track back and forth to equalize the pressure.
5. Check the amount of sag. Adjust the track, as needed. Refer to Operation and Maintenance, "Track Adjustment - Inspect".
6. Repeat the same procedure for the other track.

Loosening the Track

WARNING

Personal injury or death can result from grease under pressure.

Grease coming out of the relief valve under pressure can penetrate the body causing injury or death.

Do not watch the relief valve to see if grease is escaping. Watch the track or track adjustment cylinder to see if the track is being loosened.

Loosen the relief valve one turn only.

If track does not loosen, close the relief valve and contact your Caterpillar dealer.



Illustration 503

g06273930

1. Loosen fitting (2) carefully until the track begins to loosen. One turn should be the maximum.
2. Tighten fitting (2) when the desired track tension is reached.

3. Operate the track back and forth to equalize pressure.
4. Check the amount of sag in the track. Adjust the track, as needed. Refer to Operation and Maintenance, "Track Adjustment - Inspect".
5. Repeat the same procedure for the other track.

If the correct adjustment cannot be achieved, consult your Cat dealer.

i07284912

Track Adjustment - Inspect

SMCS Code: 4170-040

Note: Keeping the track properly adjusted will increase the service life of the track components and the drive components.

Check the rubber tracks for the following conditions:

- Steel cords that are cut
- Core irons that are fractured
- Rubber flaking off to the point of showing steel cords or core irons
- Loss of traction or grousers are worn down to approximately 5 mm (0.2 inch) in height.

If any of the above conditions or a combination of the above conditions are observed, replace the belt.

Measuring Rubber Track Tension

1. Park the machine on a level surface.



Illustration 504

g06273981

2. Position the upper frame over the tracks at a 90° angle.
3. Lower the bucket to the ground with the stick in a vertical position.
4. Chock the track that is not being lifted off the ground.
5. Apply boom down pressure until the track that is on the same side as the bucket has cleared the ground.
6. Chock the lower frame of the machine in this position.
7. Clean the track rollers and the area around the skid plate.

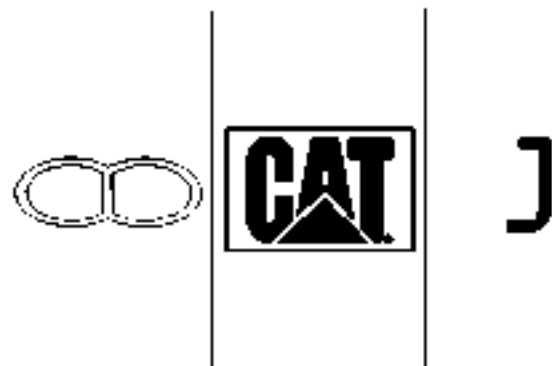


Illustration 505

g03731778

Various track joint marks

8. For a machine that is equipped with the rubber tracks, locate the track joint mark on the inside flat of the track.

Note: The track joint mark varies by supplier.

9. Position the track joint mark under the center track roller.

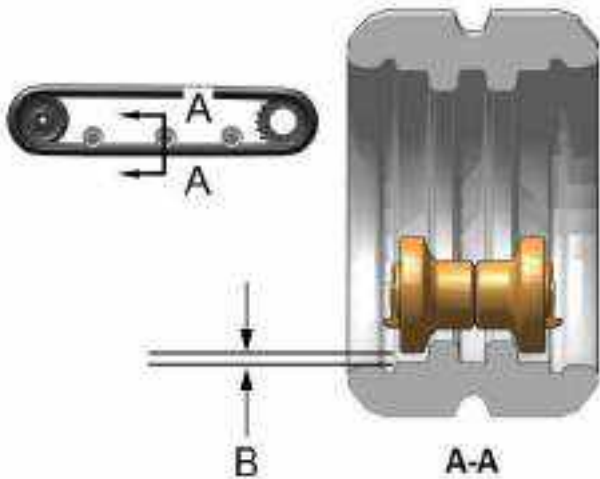


Illustration 506 g06274031
The distance (B) is the amount of track sag.

10. Measure the sag in the track. The sag is measured from the bottom of the center roller to the surface on the top of the track.

Measuring Steel Track Tension

Note: The track tension must be set according to the current operating conditions. Keep the track as slack as possible if the soil is heavy.

Follow the same procedures for measuring rubber track tension. There is not an “omega” mark on the steel tracks. You do not need to align the steel tracks.

If the correct adjustment cannot be achieved, consult your Cat dealer.

Table 37

Track Sag	
Rubber Tracks	5 to 10 mm (0.20 to 0.40 inch)
Steel Tracks	10 to 20 mm (0.40 to 0.80 inch)

i07285023

Travel Alarm - Test

SMCS Code: 7429-081

Move the machine to test the travel alarm.

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

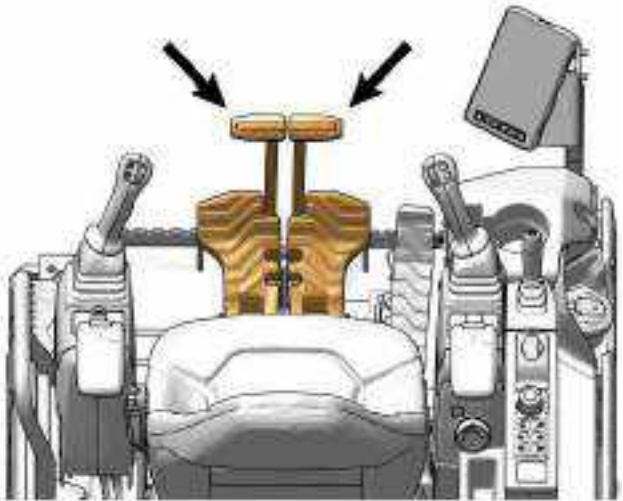


Illustration 507 g06274089

3. Use the travel levers to move the machine forward. The travel alarm should sound.
4. Release the travel levers to stop the machine.
5. Use the travel levers to move the machine backward. The travel alarm should sound.
6. Release the travel levers to stop the machine. Lower the work tool to the ground. Deactivate the hydraulic control and drive levers by placing the hydraulic lockout control in the RAISED position. Stop the engine.

i04288151

Undercarriage - Check

SMCS Code: 4150-535

1. Check the track rollers and the idler wheels for possible leakage.
2. Check the surface of the track, the track rollers, the idler wheels, and the drive sprockets. Look for signs of wear and loose mounting bolts.
3. Listen for any abnormal noises while you are moving slowly in an open area.
4. If abnormal wear exists or abnormal noises or leaks are found, consult your Cat dealer.

i07305486

Window Washer Reservoir - Fill

SMCS Code: 7306-544-KE

NOTICE

When operating in freezing temperatures, use Caterpillar or any commercially available nonfreezing window washer solvent.

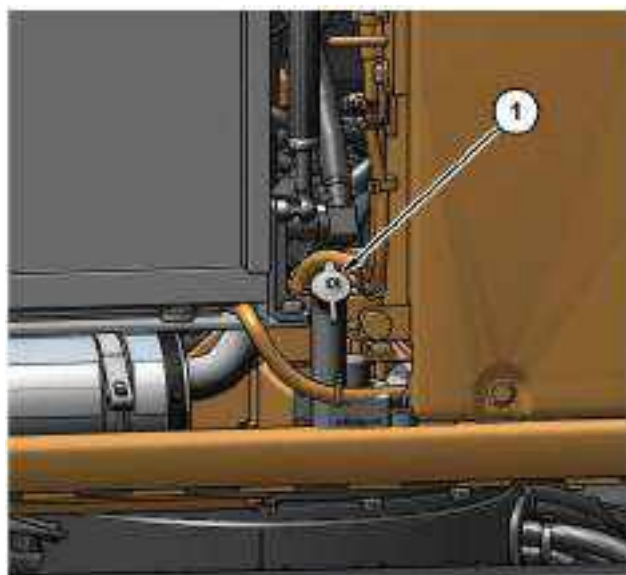


Illustration 508

g06277138

The washer fluid bottle is inside the right side access door.

1. Remove the filler cap (1).
2. Fill the washer fluid bottle with washer fluid through the filler opening.

3. Close the filler cap (1).

i01048717

Window Wiper - Inspect/Replace

SMCS Code: 7305-510; 7305-040

Inspect the wiper blade on the front window. Replace the window wiper blade if the window wiper blade is worn or damaged. Replace the front window wiper blade if the front window is streaked after use.

i07305526

Windows - Clean

SMCS Code: 7310-070; 7340-070

Clean the outside of the windows from the ground, unless handholds are available.



Illustration 509

g06277176

Typical example

Cleaning Methods

Aircraft Window Cleaner

Apply the cleaner with a soft cloth. Rub the window with moderate pressure until all the dirt is removed. Allow the cleaner to dry. Wipe off the cleaner with a clean soft cloth.

Soap and Water

Use a clean sponge or a soft cloth. Wash the windows with a mild soap or with a mild detergent. Also use plenty of lukewarm water. Rinse the windows thoroughly. Dry the windows with a moist chamois or with a moist cellulose sponge.

Stubborn Dirt and Grease

Wash the windows with a good grade of naphtha, of isopropyl alcohol, or of Butyl Cellosolve. Then, wash the windows with soap and with water.

Polycarbonate Windows (If equipped)

Special care is needed to clean polycarbonate windows.

Wash polycarbonate windows with mild soap and warm water that does not exceed 50° C (122° F). Use a soft sponge, or damp cloth. Never use a dry cloth or paper towels on polycarbonate windows. Rinse the windows with a sufficient amount of clean cold water.

Note: Naphtha or kerosene can be used to remove labels, films, paint, or marking pen from polycarbonate windows.

Note: Do not use abrasive, or highly alkaline cleaners. Do not use sharp instruments, such as squeegees or razor blades on polycarbonate windows. Do not clean polycarbonate windows in the hot sun or at elevated temperatures.

Warranty Section

Warranty Information

i08375716

Emissions Warranty Information

SMCS Code: 1000

The certifying engine manufacturer warrants to the ultimate purchaser and each subsequent purchaser that:

1. New non-road diesel engines and stationary diesel engines less than 10 liters per cylinder (including Tier 1 and Tier 2 marine engines < 37 kW, but excluding locomotive and other marine engines) operated and serviced in the United States and Canada, including all parts of their emission control systems ("emission related components"), are:

- a. Designed, built, and equipped so as to conform, at the time of sale, with applicable emission standards prescribed by the United States Environmental Protection Agency (EPA) by way of regulation.
- b. Free from defects in materials and workmanship in emission-related components that can cause the engine to fail to conform to applicable emission standards for the warranty period.

2. New non-road diesel engines (including Tier 1 and Tier 2 marine propulsion engines < 37 kW and Tier 1 through Tier 4 marine auxiliary engines < 37 kW, but excluding locomotive and other marine engines) operated and serviced in the state of California, including all parts of their emission control systems ("emission related components"), are:

- a. Designed, built, and equipped so as to conform, at the time of sale, to all applicable regulations adopted by the California Air Resources Board (ARB).
- b. Free from defects in materials and workmanship which cause the failure of an emission-related component to be identical in all material respects to the component as described in the engine manufacturer's application for certification for the warranty period.

3. New non-road diesel engines installed in construction machines conforming to the South Korean regulations for construction machines manufactured after January 1, 2015, and operated and serviced in South Korea, including all parts of their emission control systems ("emission related components"), are:

- a. Designed, built, and equipped so as to conform, at the time of sale, with applicable emission standards prescribed in the Enforcement Rule of the Clean Air Conservation Act promulgated by South Korea MOE.
- b. Free from defects in materials and workmanship in emission-related components that can cause the engine to fail to conform to applicable emission standards for the warranty period.

The aftertreatment system can be expected to function properly for the lifetime of the engine (emissions durability period) subject to prescribed maintenance and operating environment requirements being followed.

A detailed explanation of the Emission Control Warranty that is applicable to new non-road and stationary diesel engines, including the components covered and the warranty period, is found in a supplemental Special Publication. Consult your authorized Cat dealer to determine if your engine is subject to an Emission Control Warranty and to obtain a copy of the applicable Special Publication.

Reference Information Section

Reference Materials

i08292374

Reference Material

SMCS Code: 1000; 7000

Additional literature regarding your product may be purchased from your local Cat dealer or by visiting publications.cat.com. Use the product name, sales model, and serial number to obtain the correct information for your product.

publications.cat.com

i08292382

Decommissioning and Disposal

SMCS Code: 1000; 7000

When the product is removed from service, local regulations for the product decommissioning will vary. Disposal of the product will vary with local regulations.

Improperly disposing of waste can threaten the environment. Obey all local regulations for the decommissioning and disposal of materials.

Utilize appropriate personal protective equipment when decommissioning and disposing product.

Consult the nearest Cat dealer for additional information. Including information for component remanufacturing and recycling options.

i08467615

Caterpillar Approved Work Tools

SMCS Code: 6700; 7007

NOTICE

Use only work tools that are recommended by Caterpillar. The use of work tools that are not recommended by Caterpillar could damage your machine. Consult your Cat dealer for information on recommended work tools.

The following work tools have been approved by Caterpillar. Refer to Operation and Maintenance Manual for each work tool for proper operation, maintenance, and servicing of the work tools.

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

Always compare the weight of the work tool and maximum payload of work tool with the indications in the lift capacity table. Never exceed the maximum payload stated in the lift capacity table.

Table 38

Caterpillar Approved Work Tools for Mini Hydraulic Excavators					
Work Tool	Machine Model				
	301.5	301.6	301.7 CR	301.8	302 CR
Quick Coupler	Manual Pin Grabber Quick Coupler				
	ManualCW05Quick Coupler				
	ManualCW05Hook Quick Coupler				
	HydraulicCW05Quick Coupler				
	HydraulicCW05Hook Quick Coupler				
Thumb	Hydraulic Thumb				
Hammer	H45DHammer				
	B1Hammer	B1Hammer	B1Hammer	B1Hammer	-
	-	-	B2Hammer	B2Hammer	B2Hammer
Mud Bucket	Mud Bucket with cubic capacity of 8.5 m ³ (11.12 yd ³)				
General Purpose Bucket	General Purpose Bucket with cubic capacity of 0.02 m ³ (0.034 yd ³)				
Ditch Cleaning Bucket	-				Ditch Cleaning Bucket with cubic capacity of 0.03 m ³ (0.046 yd ³)
Compaction Wheel	DC-12 SKHCompaction Wheel				
	DC-18 SKHCompaction Wheel				
	DC-24 SKHCompaction Wheel				
Other Buckets	(1)				

(1) Refer to "Boom/Stick/Bucket Combinations" for more information.

Refer to Operation and Maintenance Manual, "Maintenance Interval Schedule" for more information.

This list was completed at the time of publication. There may be additional work tools that have been approved since that time. Consult your Cat[®] dealer for an updated list of approved work tools.

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Product and Dealer Information

Note: For product identification plate locations, see the section “Product Identification Information” in the Operation and Maintenance Manual.

Delivery Date: _____

Product Information

Model: _____

Product Identification Number: _____

Engine Serial Number: _____

Transmission Serial Number: _____

Generator Serial Number: _____

Attachment Serial Numbers: _____

Attachment Information: _____

Customer Equipment Number: _____

Dealer Equipment Number: _____

Dealer Information

Name: _____ Branch: _____

Address: _____

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

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