



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.

Table of Contents

Foreword	4	Operator Station	43
Safety Section		Guards (Operator Protection)	43
Safety Messages	6	Product Information Section	
Additional Messages	15	General Information	46
General Hazard Information	21	Identification Information	226
Crushing Prevention and Cutting Prevention ..	23	Operation Section	
Burn Prevention	24	Before Operation	231
Fire Prevention and Explosion Prevention	25	Machine Operation	233
Fire Extinguisher Location	28	Engine Starting	285
Track Information	29	Operation	287
Electrical Storm Injury Prevention	29	Operating Techniques	290
Before Starting Engine	29	Parking	319
Visibility Information	29	Transportation Information	323
Restricted Visibility	30	Towing Information	329
Engine Starting	33	Engine Starting (Alternate Methods)	330
Before Operation	33	Maintenance Section	
Work Tools	34	Maintenance Access	332
Operation	34	Lubricant Viscosities and Refill Capacities ...	336
Engine Stopping	38	Maintenance Support	343
Lifting Objects	38	Maintenance Interval Schedule	347
Demolition	38	Warranty Section	
Parking	39	Warranty Information	397
Slope Operation	39	Reference Information Section	
Equipment Lowering with Engine Stopped	40	Reference Materials	398
Sound Information and Vibration Information .	40	Index Section	
		Index	400

Foreword

California Proposition 65 Warning

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



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

www.P65Warnings.ca.gov

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



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

www.P65Warnings.ca.gov

Wash hands after handling components that may contain lead.

Literature Information

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

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

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

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

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

Safety

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

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

Operation

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

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

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

Maintenance

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

Maintenance Intervals

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

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

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

Certified Engine Maintenance

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

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

Machine Capacity

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

Product Identification Number

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

XXX 0789BG 6SL12345

Illustration 1

g03891925

Where:

1. World Manufacturing Code (characters 1-3)

2. Machine Descriptor (characters 4-8)

3. Check Character (character 9)

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

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

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

Safety Section

i07929081

Safety Messages

SMCS Code: 7000; 7405

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

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

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

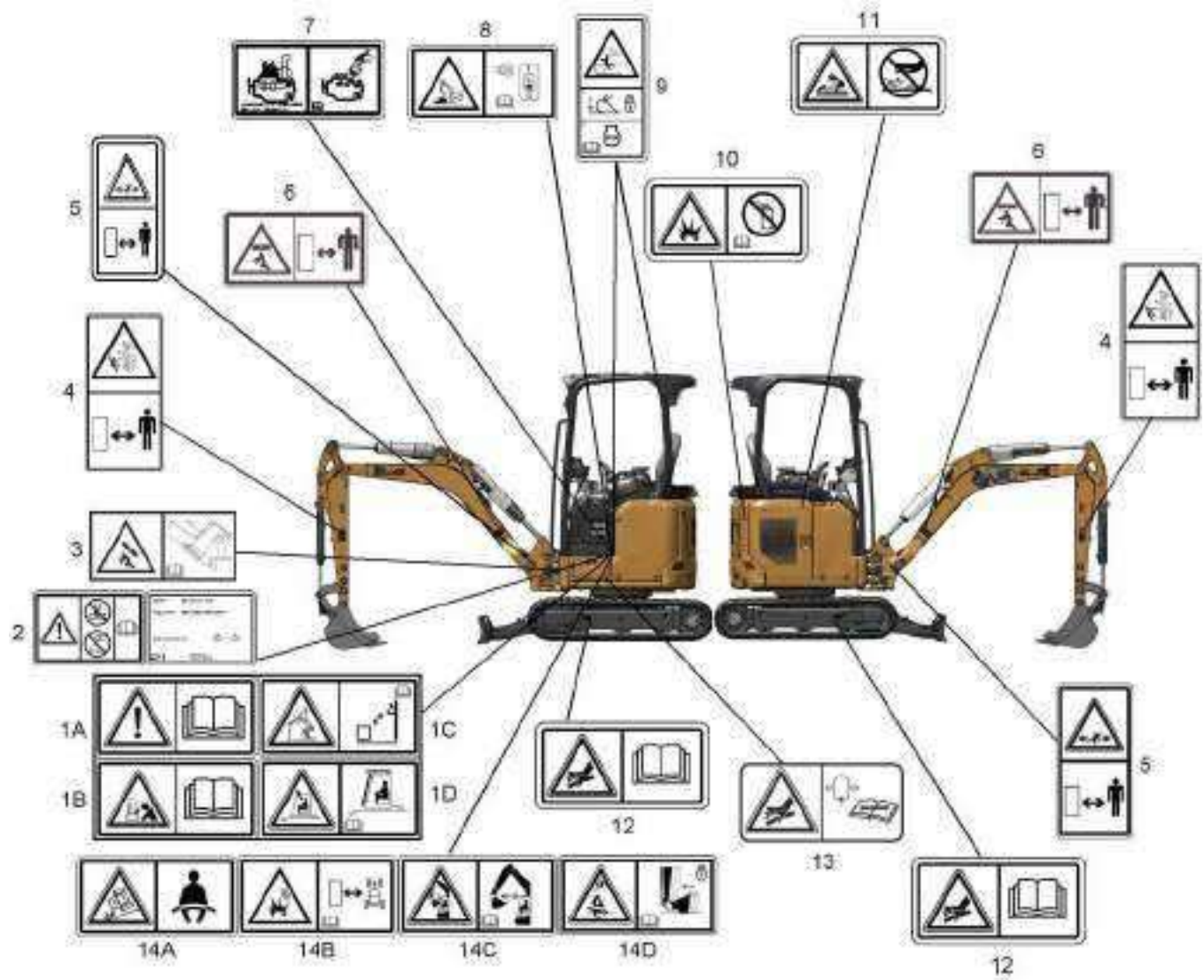


Illustration 2
Warnings for canopy and cab machines

g06275043

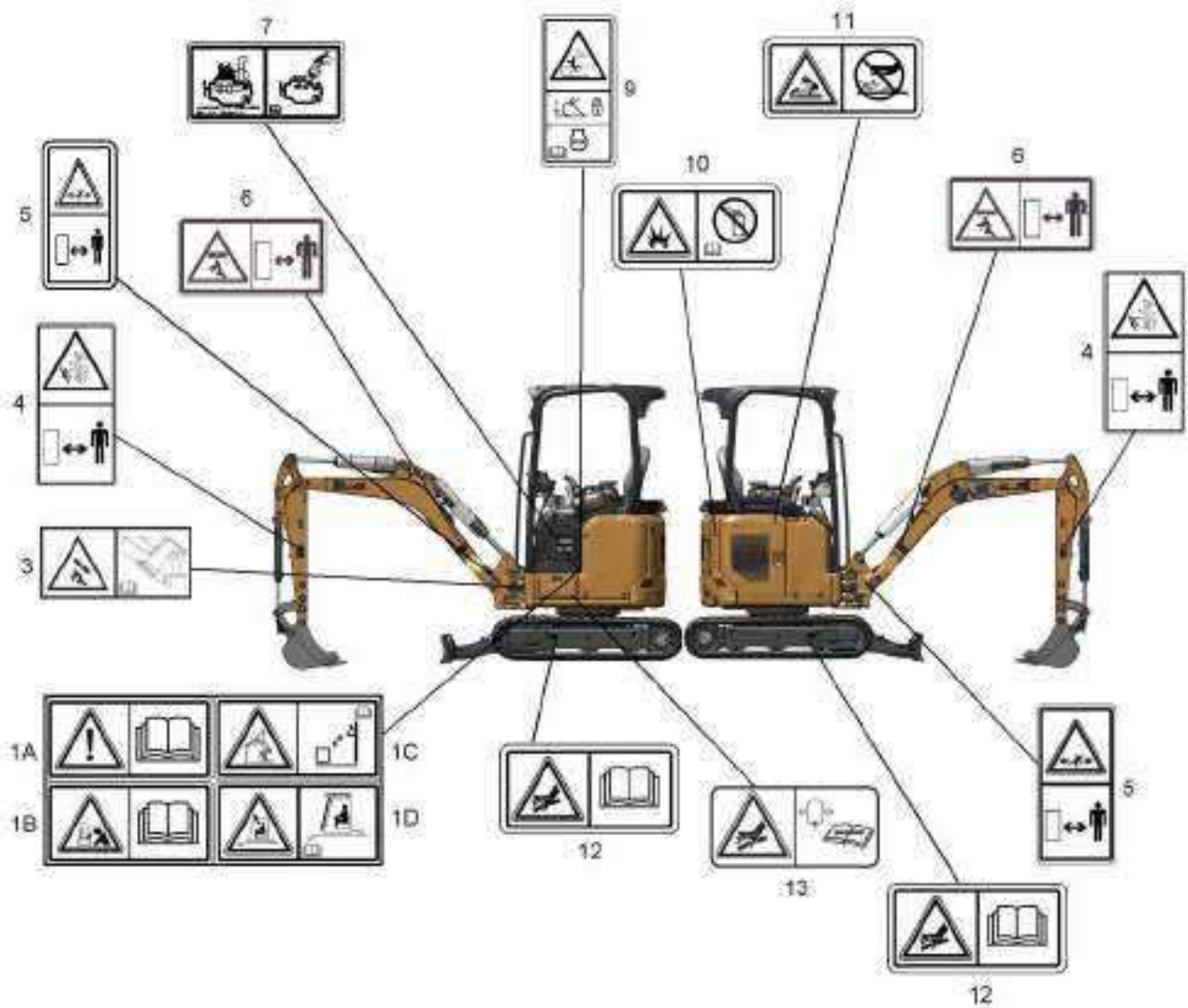


Illustration 3

Japan machines

Warnings for canopy and cab machines

Do Not Operate (1A)

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

g06482844



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.

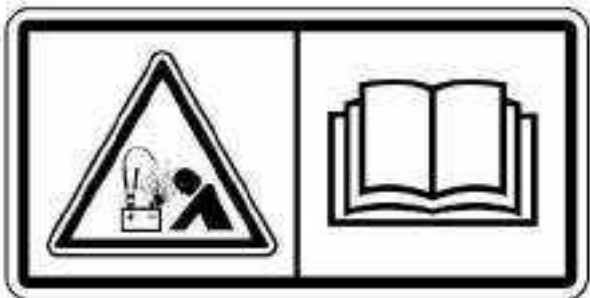


Illustration 5

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.

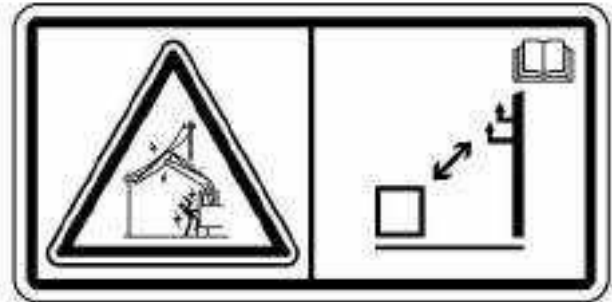


Illustration 6

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.

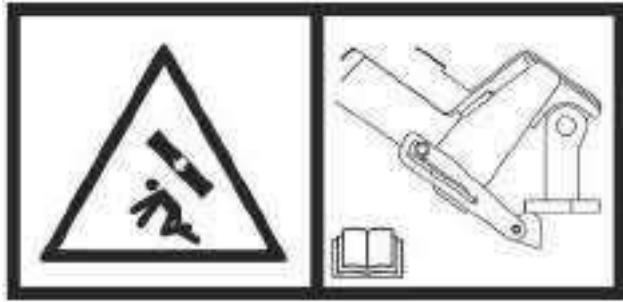


Illustration 9

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.

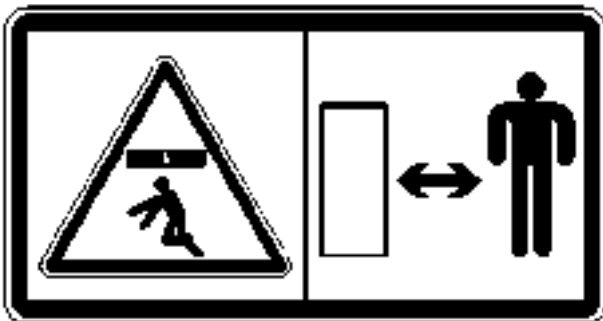


Illustration 12

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.

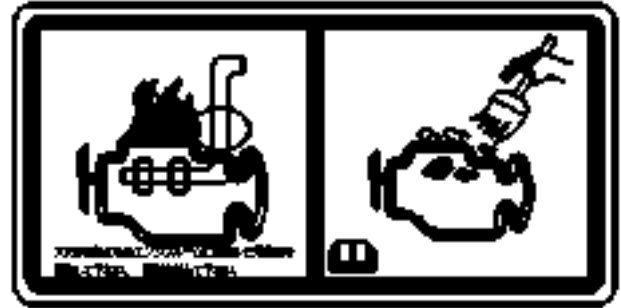


Illustration 13

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



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



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



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

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

High-Pressure Cylinder (12)

This safety message is positioned on the track adjusters.



Illustration 18

g06266697

WARNING

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

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

High-Pressure Gas (13)

This safety message is on the accumulator.

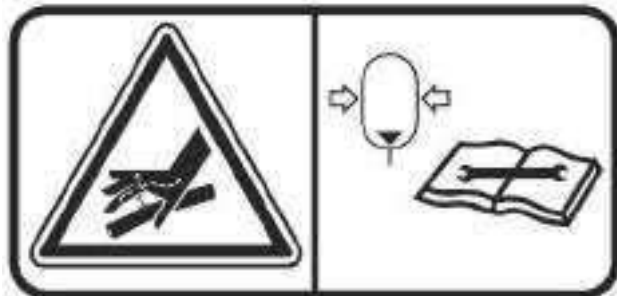


Illustration 19

g06275274

Seat Belt (14a)

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



Illustration 20

g01370908

WARNING

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

Product Link (14b)

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

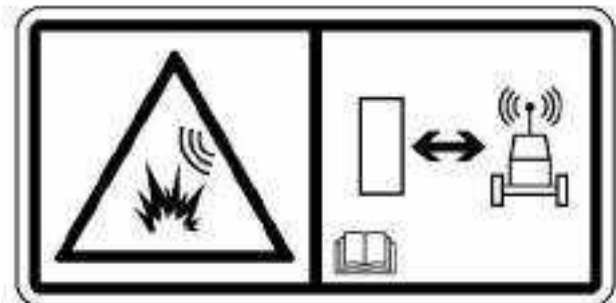


Illustration 21

g01370917

Crushing Hazard (14c)

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



Illustration 22

g01373971

WARNING

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

Crushing Injury (14d)

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



Illustration 23

g01374035

WARNING

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

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

i08644737

Additional Messages

SMCS Code: 7000; 7405

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

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

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

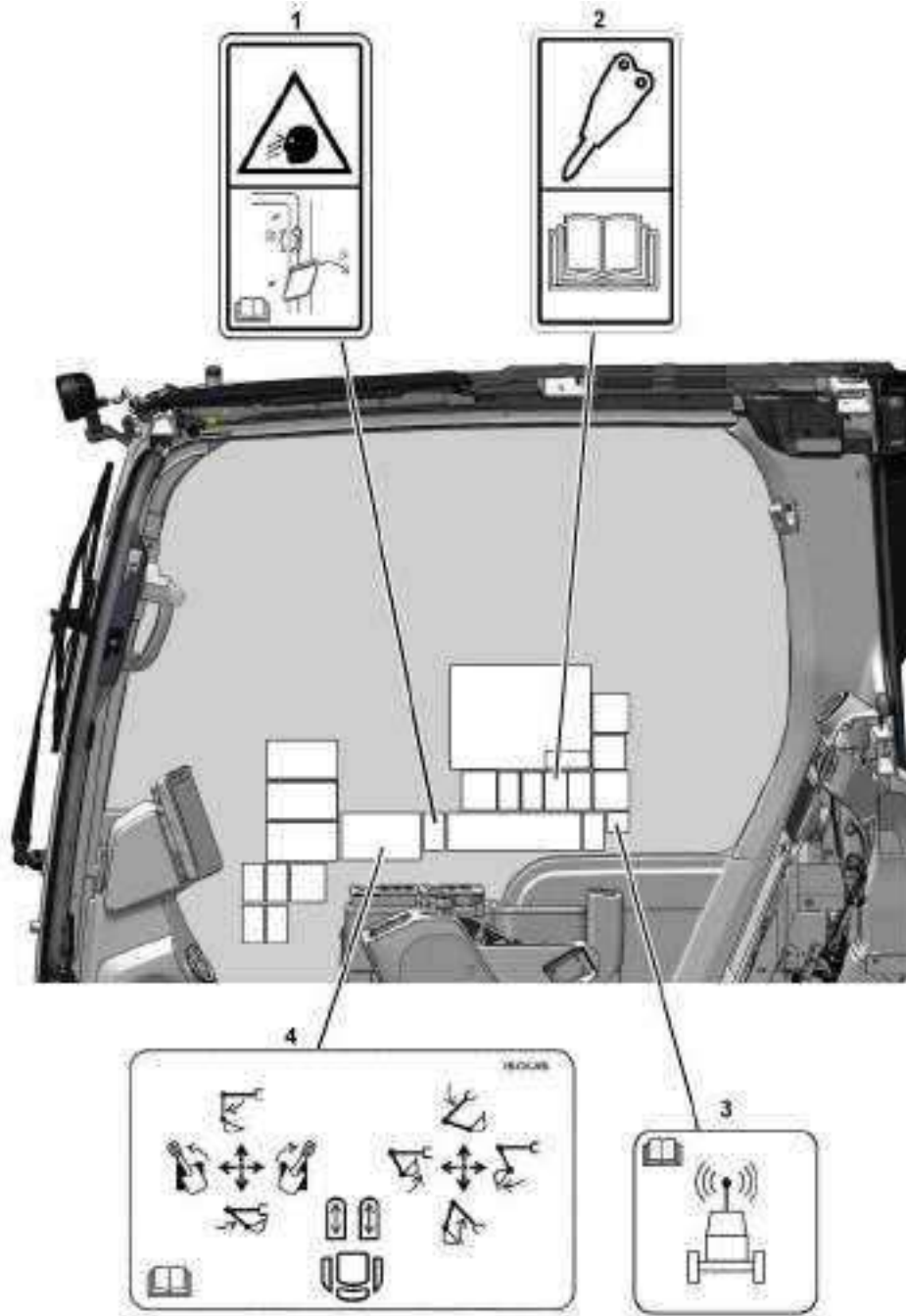


Illustration 24

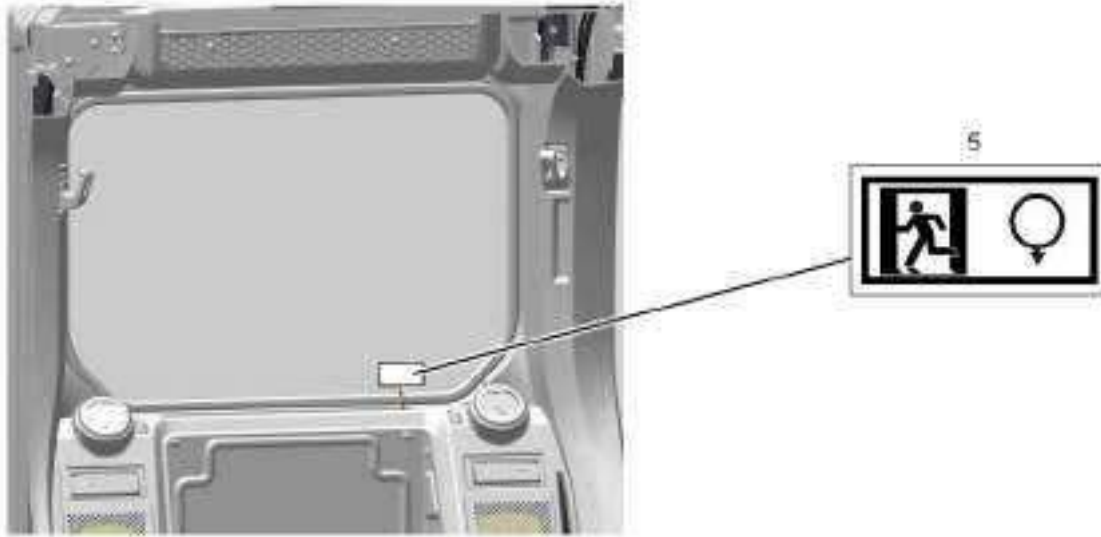


Illustration 25

g06696954

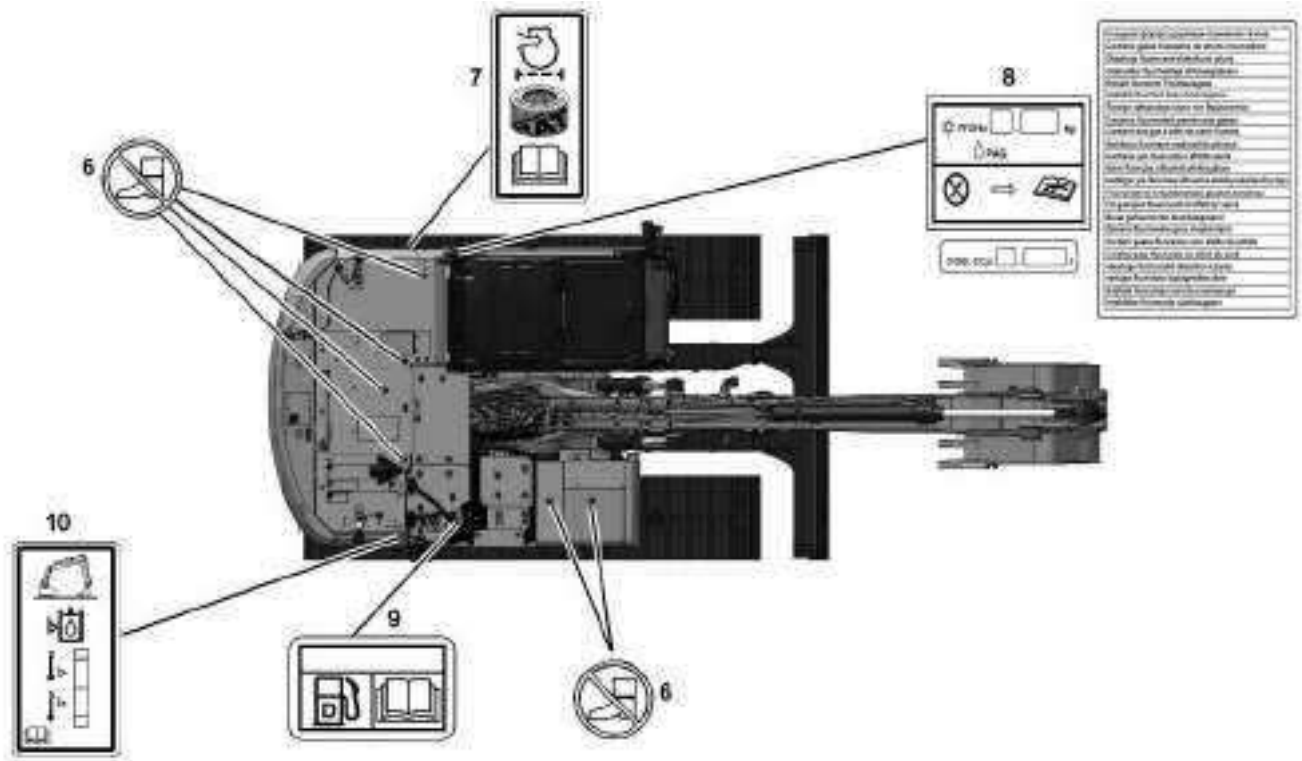


Illustration 26

g06696955

Front Window Usage (1)



Illustration 27

g06214810

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

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

Hammer Operation (2)

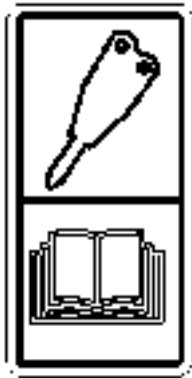


Illustration 28

g06189240

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

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

Cat[®]Product Link[™] (3)



Illustration 29

g01418953

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

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

Refer to “Product Link” for more information.

Joystick Controls Alternate Patterns (4)

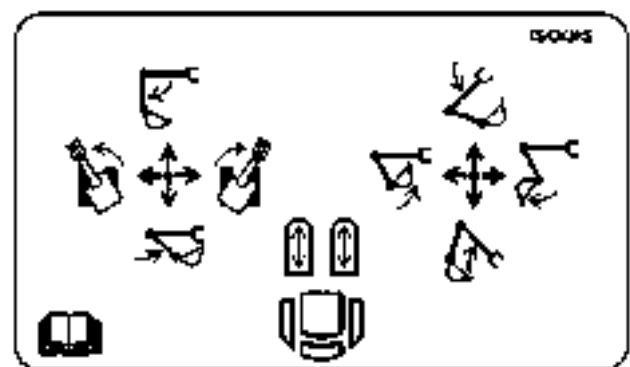


Illustration 30

g06214805

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

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

Alternate Exit (5)



Illustration 31 g06189112

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

Refer to “Alternate Exit” for more information.

No Step (6)

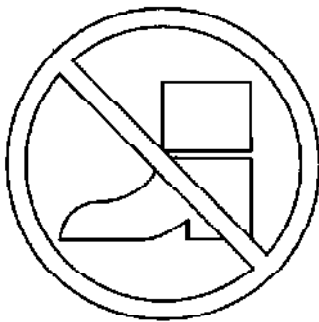


Illustration 32 g00911158

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

Do not step in this area.

Radial Seal Air Filters (7)



Illustration 33 g01134494

This message is located on the air cleaner.

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

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

Air Conditioner (8)

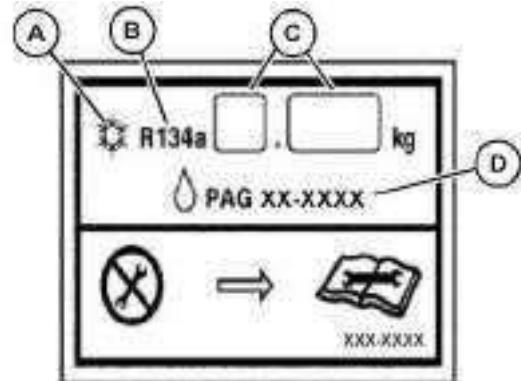


Illustration 34 g06650123

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

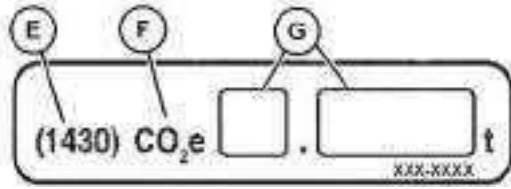


Illustration 35 g06650124

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

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



Illustration 36 g06685232

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

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

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

Diesel Fuel Requirements (9)

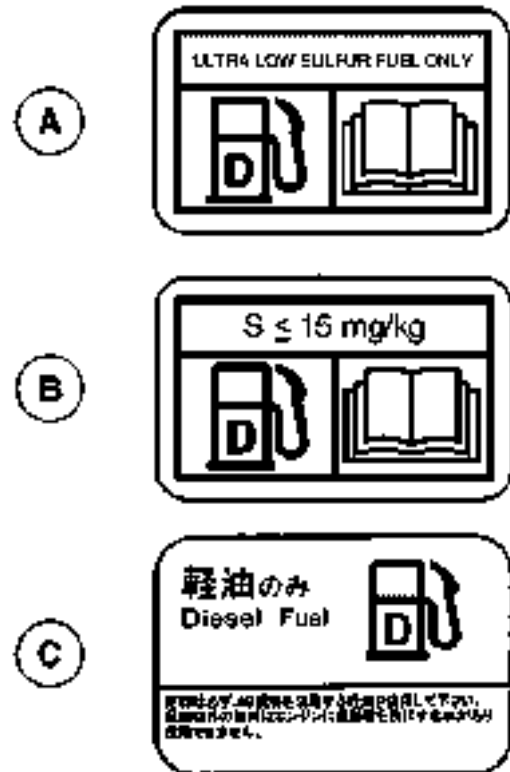


Illustration 37 g03218956

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

This message is located by the fuel tank.

Hydraulic Oil Level Check (10)

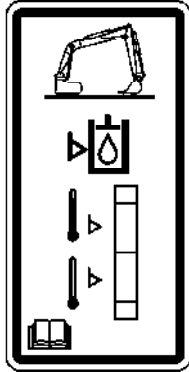


Illustration 38

g01069075

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

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

i07920557

General Hazard Information

SMCS Code: 7000

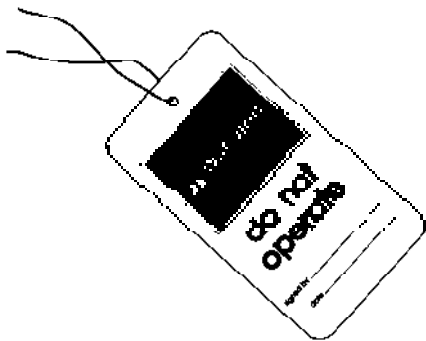


Illustration 39

g00104545

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

WARNING

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

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

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



Illustration 40

g00702020

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

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

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

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

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

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

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

Obey all local regulations for the disposal of liquids.

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

Do not allow unauthorized personnel on the equipment.

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

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

Pressurized Air and Water

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

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

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

Trapped Pressure

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

Fluid Penetration

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

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

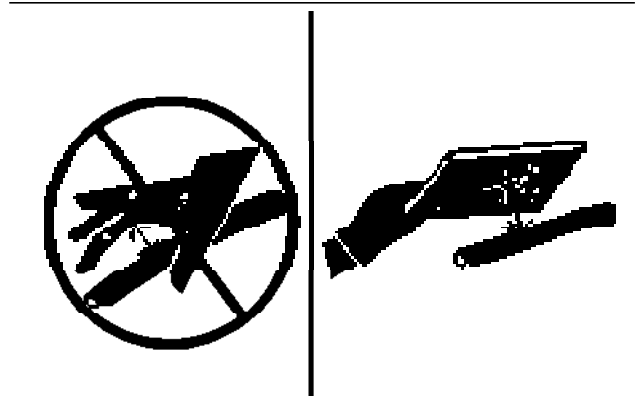


Illustration 41

g00687600

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

Containing Fluid Spillage

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

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

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

Obey all local regulations for the disposal of liquids.

Inhalation



Illustration 42

g02159053

Exhaust

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

Asbestos Information

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

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

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

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

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

Dispose of Waste Properly

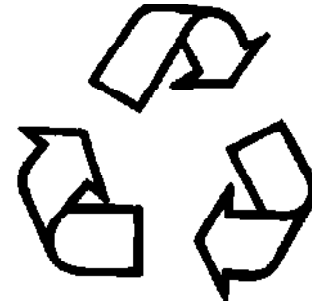


Illustration 43

g00706404

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

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

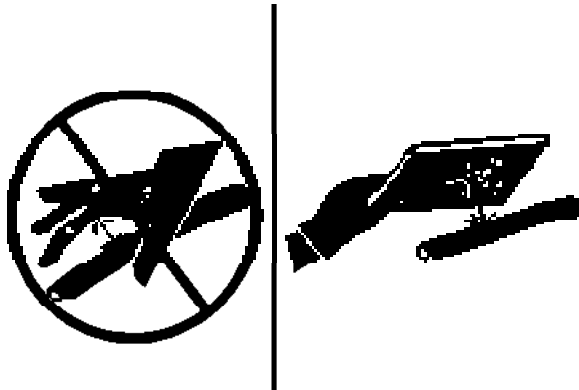


Illustration 47

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.

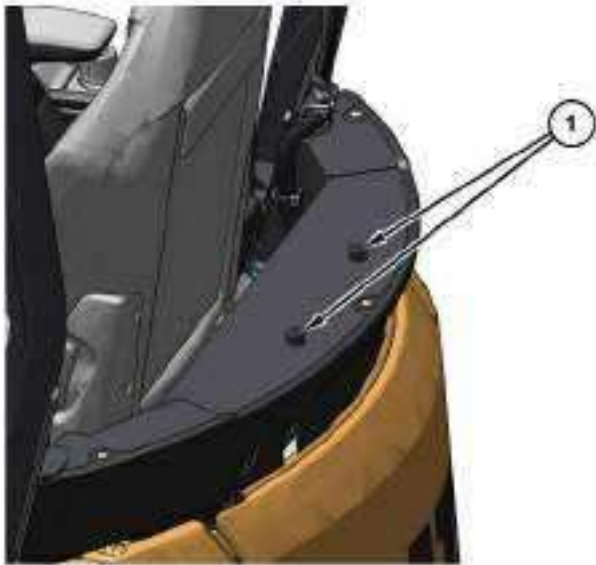


Illustration 48

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.

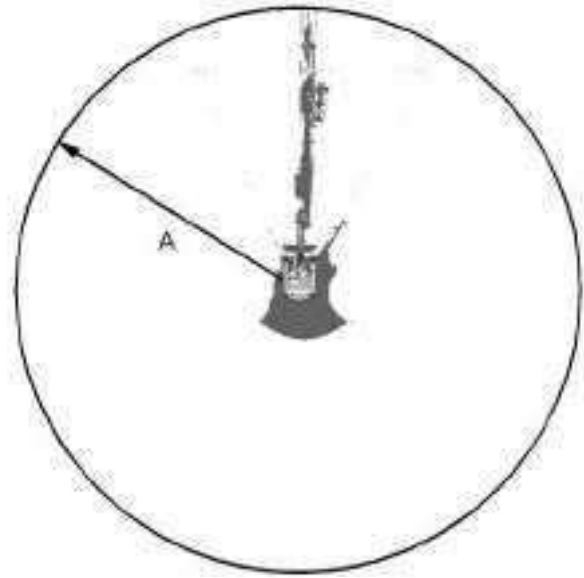


Illustration 55 g06321908
Top view of the machine, ground level visibility, with available left side mirror and right side mirror
(A) 12 m (39 ft)

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).

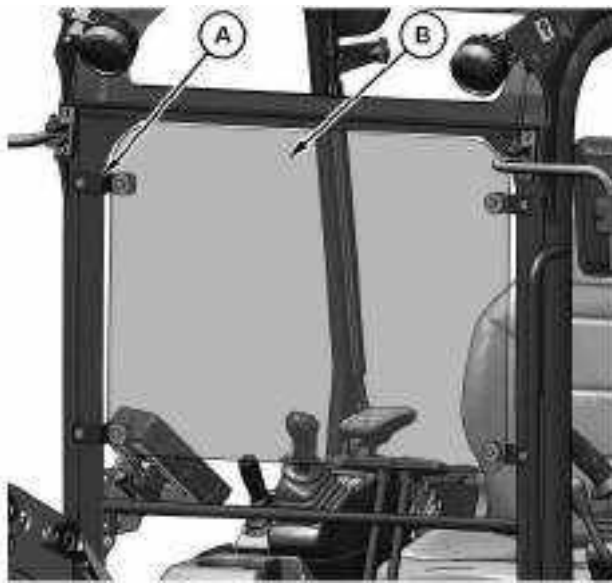


Illustration 58

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 $-18\text{ }^{\circ}\text{C}$ ($0\text{ }^{\circ}\text{F}$) to $43\text{ }^{\circ}\text{C}$ ($109\text{ }^{\circ}\text{F}$). Special configurations for different ambient temperatures may be available. Consult your Cat dealer for additional information on special configurations of your machine.

Limiting Conditions and Criteria

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

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

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

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

Critical Failures

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

Safety Section
Operation

Table 1

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

(continued)

(Table 1, contd)

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

Machine Operation

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

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

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

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

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

Never use the work tool for a work platform.

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

Know the maximum dimensions of your machine.

Watch the load at all times.

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

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

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

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

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Machine Operation when the Machine is not Completely Assembled

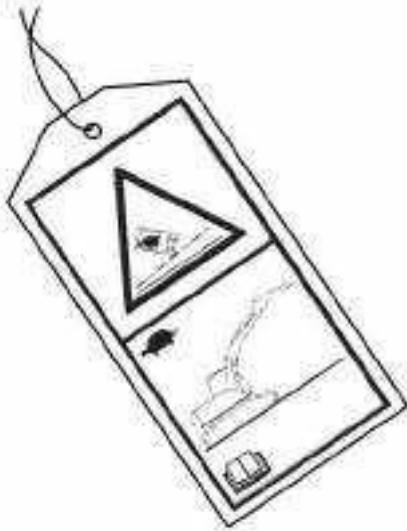


Illustration 59

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

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

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Engine Stopping

SMCS Code: 1000; 7000

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

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

Lifting Objects

SMCS Code: 7000

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

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

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

Contact your Cat dealer for additional information.

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Demolition

SMCS Code: 6700

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

Note: Obey all local and government regulations.

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

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

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

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

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

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Parking

SMCS Code: 7000

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

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

WARNING

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

Personal injury or death may occur from sudden machine movement.

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

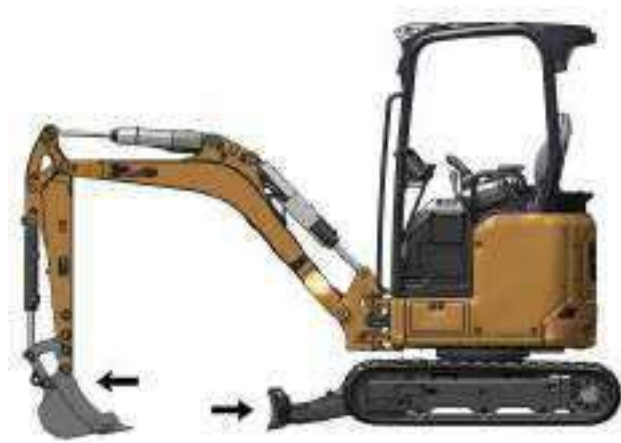


Illustration 60

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

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



Illustration 61

g06263724

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

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Slope Operation

SMCS Code: 7000

WARNING

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

WARNING

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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Equipment Lowering with Engine Stopped

SMCS Code: 7000-II

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

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Sound Information and Vibration Information

SMCS Code: 7000

Sound Level Information

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

Table 2

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

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

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

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

Sound Level Information for Machines Required by the Applicable Regional Regulations

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

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

Table 3

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

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

Table 4

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

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

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

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

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

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

Vibration Information Applicable to Regional Regulations

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

Vibration Data for Track Type Excavator

Information Concerning Hand/Arm Vibration Level

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

Information Concerning Whole Body Vibration Level

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

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

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

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

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

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

Table 5

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

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

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

Guidelines for Reducing Vibration Levels on Earthmoving Equipment

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

1. Use the right type and size of machine, equipment, and attachments.
2. Maintain machines according to the manufacturer recommendations.
 - a. Tire pressures
 - b. Brake and steering systems
 - c. Controls, hydraulic system, and linkages
3. Keep the terrain in good condition.
 - a. Remove any large rocks or obstacles.
 - b. Fill any ditches and holes.
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.
9. 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.

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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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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:

Guards (Operator Protection)

SMCS Code: 7000; 7150

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

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

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

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

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

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

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

Other Guards (If Equipped)

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

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

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

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

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

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

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

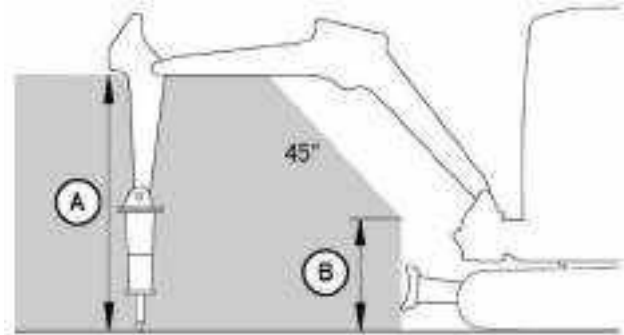


Illustration 62

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



Illustration 63

g06276140

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

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

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

Product Information Section

General Information

i07105852

Regulatory Information (Japan)

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

Qualifications for Machine Operation

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

Excavation and Loading

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

Demolition

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

Mining Jobs

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

Crane Slings for the Bucket with a Hook

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

Trailer Transportation

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

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

Load

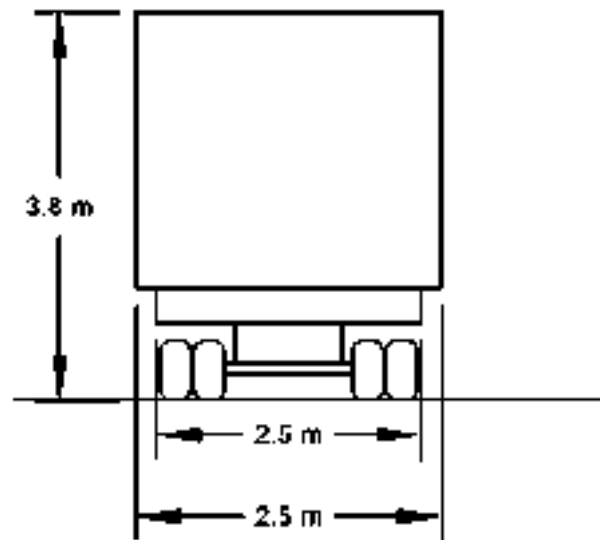


Illustration 64

g02698738

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

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

Table 6

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

(continued)

(Table 6, contd)

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

Operation of Construction Equipment and the Governing Laws and Regulations

NOTICE

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

NOTICE

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

Qualification of Operators

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

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

- One who completed an operating skill course for vehicle-type construction equipment at a registered training institution.
- One who passed the construction equipment and technologies license examination (Type 1-3) defined by the Construction Industry Law.
- One who completed an operating training course for construction equipment defined by the Vocational Training Law.
- One who took a special training (rules and skills) at a registered training institution to operate equipment weighing less than 3 tons.
- With an auto-drivers license, an operator does not need to complete an operating skill course for construction equipment to operate equipment on the roads that apply to the rules of the Road Traffic Act. However, the operator needs to complete the course to engage in snow clearing or excavating on the roads.
- The operator must be qualified under the Mine Safety Act to operate construction equipment in a mine.

Acquisition of the Qualifications

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

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

Subsidy System

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

Operation of Construction Equipment and the Governing Laws and Regulations

NOTICE

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

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

Request for Periodical Self-Inspection

Rules of Periodical Self-Inspection

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

Ordinance on Industrial Safety and Hygiene

Periodical self-inspections Article 167

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

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

Periodical self-inspections Article 168

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

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

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

Record of Periodical Self-Inspections Article 169

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

Specified Self-Inspection Article 169-2

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

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

Checkup before Commencing the Work Article 170

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

Other Rules

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

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

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

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

Construction Equipment and Environmental Laws

Prohibition of Emissions and Obligations to Recover Fluorocarbons

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

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

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

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

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

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

Standard Certificate of Transfer

Dear Customers

Japan Construction Equipment Manufacturers Association

Standard Certificate of Transfer

Issued by the Japan Construction Equipment Manufacturers Association

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

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

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

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

1. About the standard certificate of transfer

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

2. Purpose of issuance

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

3. Issuer

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

4. Eligibility

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

5. Issuance

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

6. Prohibition of reissuance

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

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

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

Industrial Safety and Health Act

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

Article 164

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

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

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

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

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

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

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

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

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

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

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

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Specifications

SMCS Code: 7000

Intended Use

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

Expected Life

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

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

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

Carbon Dioxide (CO₂) Emissions Statement

Table 7

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

(continued)

(Table 7, contd)

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

Specification Data

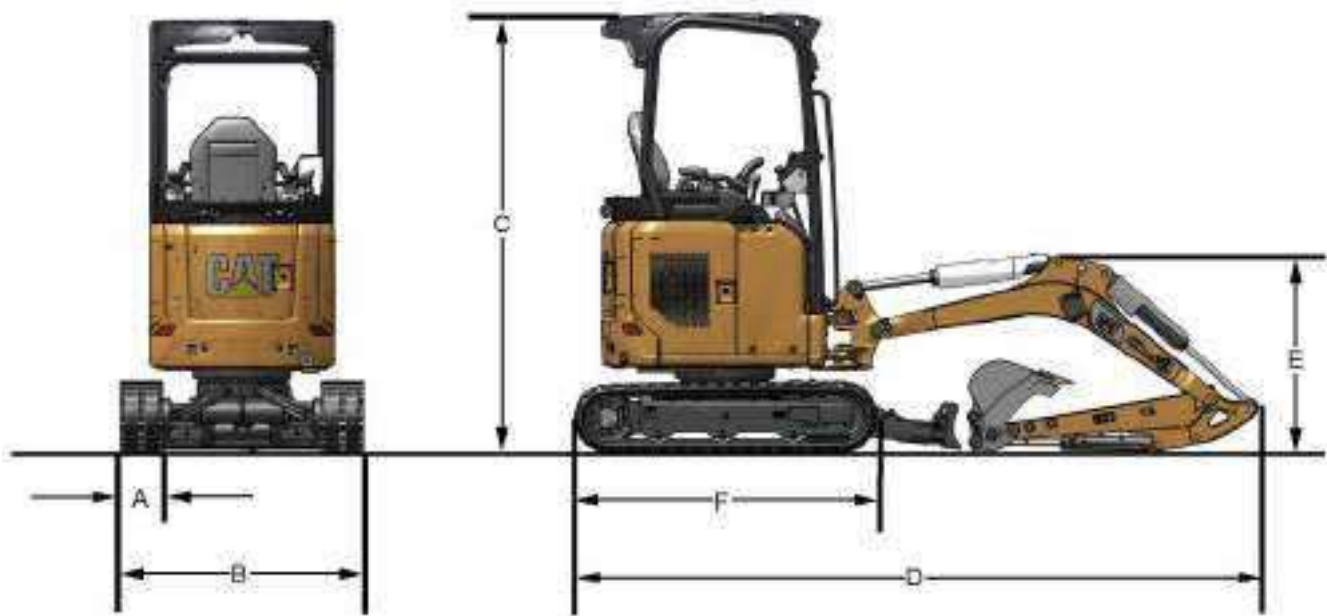


Illustration 65

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Table 8

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

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

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

(3) Undercarriage retracted

(4) Undercarriage expanded

Product Information Section
Specifications

301.6

Table 9

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

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

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

⁽³⁾ Undercarriage retracted

⁽⁴⁾ Undercarriage expanded

301.7 CR

Table 10

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

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

Product Information Section
Specifications

301.8

Table 11

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

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

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

(3) Undercarriage retracted

(4) Undercarriage expanded

302 CR

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

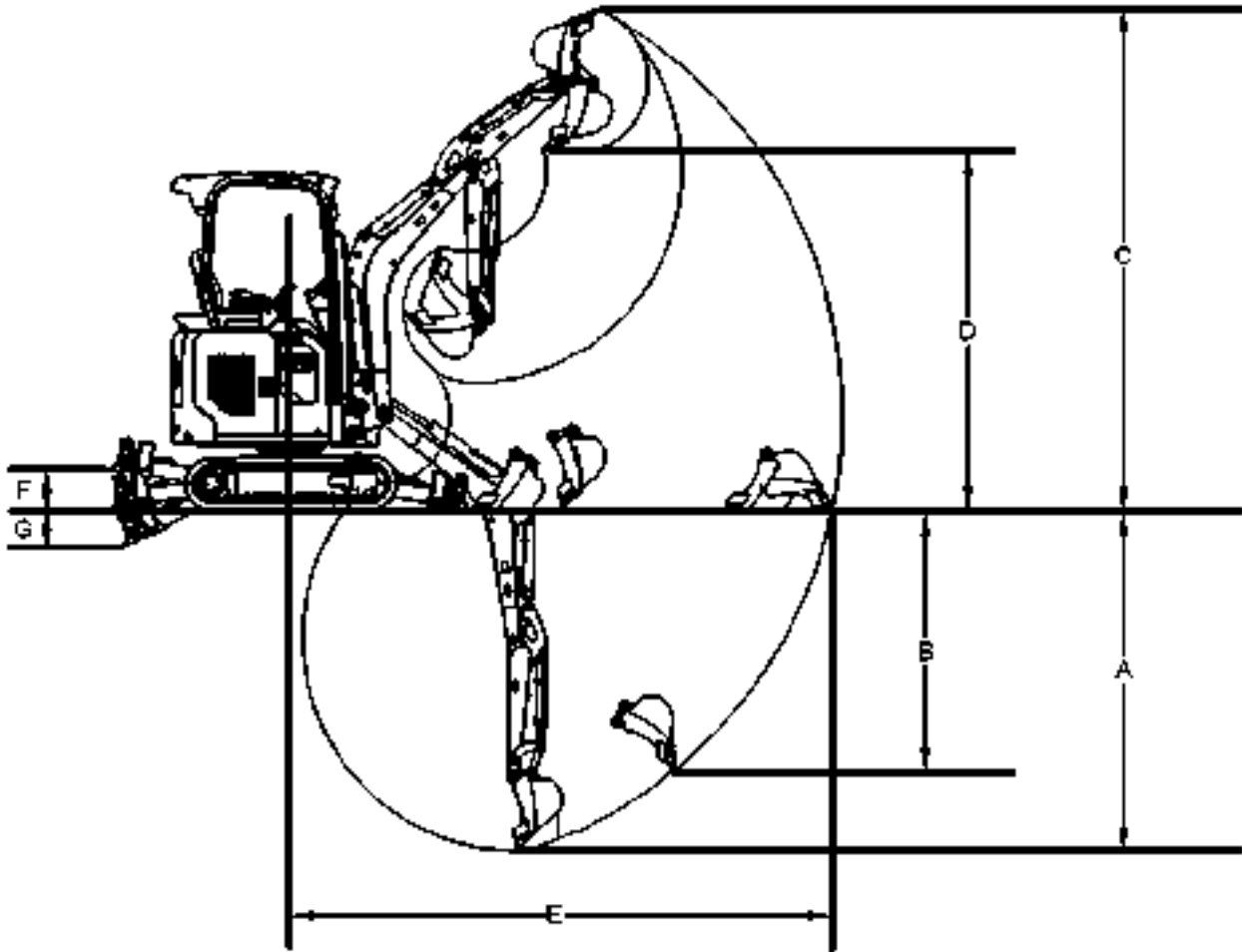


Illustration 66

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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)	

Product Information Section
Specifications

301.6

Table 14

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

301.7 CR

Table 15

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

⁽¹⁾ Japan machines

Product Information Section
Specifications

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)	

302 CR

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) Measurements are provided in millimeters
(inch) Measurements are provided in inches



Lift Capacities are provided in kilograms and pounds



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



Lift point radius



Lift point height



Lifting capacity over the front of the machine



Lifting capacity over the side of the machine



Heavy Lift ON

With Bucket















[mm] [inch]	1000 40		1500 60		2000 80		2500 100		3000 120				[mm] [inch]	
													[mm] [inch]	
120												* 499	* 499	90
2500 100							* 244	* 244				* 225	* 225	2750
2000 80							* 559	* 559				* 493	* 493	110
1500 60							* 256	* 256	227	263		* 217	* 219	3000
1000 40							* 573	* 573				* 483	* 493	120
500 20						* 299	* 299	307	* 320	225	260	191	* 221	3280
0 0						* 643	* 643	660	* 693	462	550	424	* 497	130
1000 40						419	482	295	341	219	255	176	207	1400
500 20						303	339	635	733	471	547	385	456	740
0 0						395	458	283	328	210	248	171	201	1420
500 20						852	987	609	707	457	534	379	443	740
0 0						383	446	274	320	206	243	175	206	1350
500 20						825	960	591	688	447	524	368	453	740
1000 40	* 802	* 802	611	713	389	443	271	316	266	241	189	222	190	1380
500 20	* 1349	* 1349	1010	1128	618	693	583	680	443	523	345	431	130	130
1000 40			617	719	383	446	272	317			222	260	2600	
500 20			1224	1542	824	959	586	684			494	577	120	120
1000 40			* 604	* 684	392	* 411					* 293	* 298	2380	
500 20			* 1284	* 1524	845	* 867					* 600	* 660	100	100

Illustration 67

g06363837

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












[mm] [inch]	1000 40	1500 60	2000 80	2500 100	3000 120		(mm) (inch)
320							30
2500 300				* 244 * 244 * 559 * 559			2760 100
2000 80				* 256 * 256 * 573 * 573	* 309 309		2080 120
1500 60			* 299 * 299 * 643 * 643	* 320 * 320 * 699 * 699	* 320 260 * 703 569		3280 130
1000 40			* 534 482 * 1036 1038	* 490 341 * 806 733	* 349 255 * 757 547		3400 140
500 20			* 679 459 * 1438 997	* 472 328 * 1017 707	* 369 248 * 797 534		3820 140
0			* 673 446 * 1451 960	* 484 320 * 1041 688	* 368 243 * 787 524		3750 140
-500 -20	* 602 * 402 * 1349 * 1349	* 698 710 * 1874 1828	* 617 443 * 1339 863	* 452 316 * 972 680	* 334 241 * 792 530		3180 130
-1000 -40		* 759 718 * 1633 1542	* 533 446 * 1344 893	* 387 317 * 826 684			2880 120
-1500 -60		* 604 * 604 * 1294 * 1294	* 481 * 481 * 867 * 867				2380 100

Illustration 68

g06363840

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

Product Information Section
Lifting Capacities















(mm) (inch)	1000 40		1500 60		2000 80		2500 100		3000 120				(mm) (inch)
													
120													90
2500													2760
100													110
2000													3000
80													100
1500													3200
60													130
1000													3400
40													140
500													3420
20													140
0													3350
0													140
-800													3100
-20													130
-1000													2800
-40													120
-1500													2100
-80													100

Illustration 69

g06363842

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



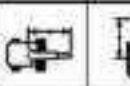
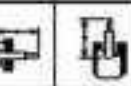

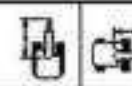
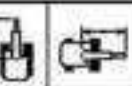

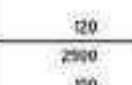
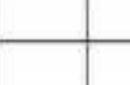
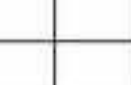
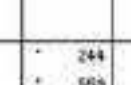


[mm] [inch]	1800 60		1500 60		2000 80		2500 100		3000 120				[mm] [inch]		
															
120													499	439	99
2500 100							244	238					225	198	2700
							559	509					489	448	119
2000 80							266	235	308	181			219	150	1080
							573	505					483	386	120
1500 60					299	299	320	228	320	165			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	717	343			496	280	740
500 20					671	284	472	205	369	154			229	122	1420
					1439	603	1017	443	737	331			526	270	740
0 0					673	273	484	88	346	149			265	125	1500
					1451	568	1041	425	787	323			504	275	740
500 20	602	602	958	432	617	270	452	194	334	147			292	135	1680
	1349	1349	1974	987	1338	582	872	419	702	317			646	299	130
1000 40			759	428	533	273	387	165					291	160	1600
			1633	920	1844	587	1026	421					642	355	120
1500 60			684	439	411	281							298	220	1380
			1284	945	867	607							680	435	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

Stroke (inch)	1000 40	1500 60	2000 80	2500 100	3000 120	3500 140	
							
2000							190 190 2470
2500							176 173 2960
100				388 388			284 284 120
2000				412 412	228 259		174 174 3290
80					284 260		264 264 120
500				354 354	324 260		178 175 3450
60				553 553	461 556		283 285 140
3000		674 674	425 431	295 341	208 257	165 194	160 179 3060
40		1390 1390	914 919	636 714	467 544		253 295 140
500			297 460	292 337	200 245	161 190	165 183 3590
20			895 890	606 704	452 528	340 400	241 304 150
0		563 563	380 442	271 316	204 239	159 168	157 186 3520
0		1262 1307	817 862	583 680	438 508		347 411 140
500	578 578	697 698	373 436	265 310	200 238		168 189 3360
20	1293 1293	1499 1499	903 938	578 668	431 507		273 440 140
1000	891 891	693 704	374 437	264 310	201 238		184 229 3080
40	2000 2000	1293 1511	804 833	563 667	434 510		431 507 120
1000		848 881	380 443	270 315			251 285 3630
60		1310 1450	875 954	593 680			314 431 110
2000		460 460					332 332 1830
80		945 945					251 281 70

Illustration 71

g06364040

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

[mm] [inch]	1500 60		1501 60		2000 80		2500 100		3000 120		3500 140				[mm] [inch]		
																	
3000															156	156	2470
2500															178	178	2560
300								386	386						234	234	120
2000								181	181	258	258				174	174	3200
00								412	412	582	584				284	284	120
1500								254	254	201	200				175	175	2480
60								553	553	618	550				285	285	140
1000			674	674	431	431	360	341	321	253	268	194			179	179	3580
40			1300	1300	370	369	778	724	650	544					235	235	140
500					626	490	445	327	354	245	231	150			192	183	3090
20					1120	890	953	704	760	520	520	400			410	410	150
0			563	563	675	442	470	38	364	233	244	188			210	185	3520
0			1307	1307	1451	952	1028	680	784	585					471	411	140
500	578	578	861	699	638	436	462	310	346	238				251	189	3360	
20	1230	1233	1963	1489	1375	938	932	668	740	567				555	440	140	
1000	891	691	828	704	568	437	410	310	294	236				276	229	3090	
40	2000	2000	1778	1511	1213	923	877	667	618	530				610	507	120	
1500			681	681	460	442	320	35						285	285	2630	
60			1450	1450	370	354	688	668						621	621	110	
2000			460	460										332	332	1830	
80			945	945										761	761	70	

Illustration 72

g06364041

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

Product Information Section
Lifting Capacities

(mm) (inch)	1500 60		1501 60		2000 80		2500 100		3000 120		3500 140				(mm) (inch)	
																
3000														155	155	2470
2500														178	174	2560
300								385	385					234	232	120
2000								181	181	228	168			174	143	3200
00								412	412	457	358			264	238	120
1500								254	218	324	185			179	124	2480
60								553	492	461	352			282	275	140
1000			674	480	425	380	295	207	218	158	105	107		160	113	3580
40			1288	1029	914	883	636	467	467	329				252	250	140
500						397	295	232	204	210	161	114		155	109	3090
20						656	614	606	439	452	324	240	244	241	240	150
0			562	408	380	253	271	194	204	145	109	111		157	110	3520
0			1282	880	817	580	583	407	428	312				247	243	140
500	578	578	597	408	373	283	285	118	200	142				168	118	3260
20	1293	1293	1292	880	803	567	570	465	421	265				273	262	140
1000	891	837	603	414	374	284	284	118	201	142				164	117	3080
40	2000	1791	1293	890	804	593	593	464	434	287				421	385	120
1500			614	424	380	270	270	110						251	180	2630
60			1318	113	889	542	593	407						364	416	110
2000			490	444										332	328	1630
80			945	945										261	251	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)		
															(mm) (inch)		
3800															191	191	2470
2500															178	174	2160
100							388	388							334	332	420
2000							191	191	299	199					174	143	3250
80							412	412	592	358					384	381	130
1500							354	219	291	165					175	124	3160
60							559	432	618	352					395	275	340
1800			674	488	421	390	350	207	321	158	266	107			179	113	3560
40			1290	908	819	699	776	467	638	339					335	250	140
500					626	395	445	284	354	151	291	114			192	169	3590
25					1339	614	959	419	766	324	520	244			422	240	150
1			563	488	675	299	478	34	364	145	244	11			210	180	3520
1			1307	888	1451	590	1028	417	784	310					471	243	340
100	578	578	981	488	639	283	462	169	346	142					251	189	3360
20	1293	1293	1969	888	1375	667	992	465	748	305					655	262	140
1000	496	337	628	474	668	364	430	38	394	142					278	137	3080
40	2066	1791	1778	888	1213	568	877	464	618	307					649	395	120
1500			681	424	488	270	320	193							285	180	2630
60			1450	303	978	592	668	417							631	404	110
2000			460	444											332	328	1830
80			945	945											251	251	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												* 499	* 499	90	
2500 90							* 244	227				* 225	183	2760 100	
2000 80							* 559	486				* 490	427		
1500 60							* 258	325	290	159		201	152	3080 120	
1000 40							* 573	482				447	338		
500 20							* 299	* 298	285	218	207	157	176	131	3280 130
0							* 641	* 643	613	468	444	325	390	291	3600 140
-500 20							399	292	273	206	202	151	151	119	3820 140
-1000 40							849	630	588	444	433	325	356	264	
-1500 60							368	270	261	195	185	145	156	115	3820 140
-2000 80							789	583	562	420	420	312	345	254	
-2500 100							354	258	253	187	181	141	160	117	3350 140
-3000 120							782	568	544	402	400	302	352	258	
-3500 140	* 602	* 402	598	402	351	257	249	184	189	139	139	173	127	3180 130	
-4000 160	* 1249	* 1349	1214	864	795	652	628	396	406	299		383	283		
-4500 180			673	407	354	259	250	185				204	151	2880 120	
-5000 200			1228	876	761	657	639	398				453	335		
-5500 220			588	418	363	267						280	209	2380 100	
-6000 240			1257	901	782	677						632	470		

Illustration 75

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.

g06364052




[mm] [inch]	1000 40	1500 60	2000 80	2500 100	3000 120		(mm) (inch)	
320							30	
2500 300				* 244 * 359	227 400		2760 100	
2000 80				* 256 * 573	328 482	* 399 * 559	152 120	
1500 60			* 299 * 643	* 299 * 699	* 320 * 468	* 357 * 703	131 130	
1000 40			* 534 * 1035	292 630	* 490 * 895	* 349 * 757	119 140	
500 20			* 679 * 1438	270 593	* 472 * 1017	* 369 * 797	105 140	
0			* 673 * 1451	259 598	* 484 * 1041	* 368 * 787	117 140	
-500 -20	* 602 * 1049	* 402 * 1349	* 698 * 1874	402 864	* 617 * 1339	257 562	* 452 * 972	184 395
-1000 -40		* 759 * 1633	407 876	* 533 * 1144	259 557	* 387 * 826	185 398	
-1500 -60		* 604 * 1294	419 911	* 411 * 867	267 577			* 293 * 660

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								156 186 2470
2500								170 165 2960
3000				388 388				284 370 120
3500				412 412	211 359			174 105 3290
4000				454 398	450 240			264 300 130
4500				553 468	507 354			150 97 3450
5000		633 460	385 295	274 206	200 150	150 110		145 188 3560
5500		1366 695	651 639	535 444	430 321			321 235 140
6000			767 271	269 193	190 142	147 107		345 162 3590
6500			791 594	593 410	414 346	318 220		300 225 150
7000		553 389	350 255	243 183	167 117	144 104		145 180 3520
7500		1186 837	754 550	536 394	401 293			265 220 140
8000	578 578	653 388	344 219	243 178	163 113			154 81 3360
8500	1293 1293	1196 837	740 537	523 382	292 216			328 245 140
9000	891 799	698 394	345 250	243 177	164 114			177 129 3080
9500	2000 1711	1197 847	741 538	522 381	296 218			330 247 130
10000		668 404	351 256	248 183				201 170 3630
10500		1222 863	756 552	536 394				536 381 110
11000		460 424						332 312 1830
11500		945 836						350 242 70

Illustration 77

g06364061

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

(mm) (inch)	1500 60		1501 60		2000 80		2500 100		3000 120		3500 140				(mm) (inch)	
																
3000														156	156	2470
2500														176	168	2560
300								386	386					234	272	120
2000								181	181	258	199			174	135	3200
00								412	412	582	340			264	300	120
1500								254	288	201	166			176	117	2480
60								553	468	618	324			285	283	140
1000			674	460	431	296	360	206	321	150	266	110		279	166	3560
40			1288	906	939	639	776	444	658	321				235	225	140
500					626	271	445	150	354	143	231	107		192	162	3090
20					1129	584	953	416	766	360	623	229		410	225	150
0			562	389	675	255	478	110	364	127	244	104		210	163	3520
0			1307	837	1451	550	1028	394	784	253				471	229	140
500	578	578	861	389	638	249	462	178	346	133				251	11	3260
20	1293	1233	1963	837	1375	537	932	382	740	265				555	245	140
1000	691	733	828	394	568	250	410	177	294	134				276	129	3090
40	2000	1711	1778	947	1213	533	877	381	618	283				618	287	120
1500			611	404	460	256	320	110						265	170	2630
60			1450	853	979	552	688	394						621	351	110
2000			460	424										332	382	1830
80			945	816										761	742	70

Illustration 78

g06364065

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

Product Information Section
Lifting Capacities

Without Bucket














(mm) (inch)	1000 40		1500 60		2000 80		2500 100		3000 120				(mm) (inch)		
															
2500 100													* 316 * 703	* 316 * 703	2540 100
2000 80													* 329 722	* 329 * 733	2930 120
1500 60					* 384 * 828	* 384 * 828	329 709	375 807	248 533	283 610	229 507	262 580	262 580	3150 130	
1000 40					441 951	504 1087	318 687	364 785	243 524	279 601	213 471	245 541	245 541	3270 130	
500 20					420 906	493 1041	308 654	363 761	238 513	273 589	205 460	240 529	240 529	3290 130	
0 0			* 625 1352	* 625 * 1446	409 881	471 1016	300 647	345 746	234 505	269 581	213 470	246 542	246 542	3210 130	
-500 -20	* 677 * 1510	* 677 * 1510	631 1366	733 1673	406 873	468 1008	297 640	342 738	233 508	268 586	230 508	265 586	265 586	3130 120	
-1000 -40			638 1370	739 1667	406 879	471 1014	299 645	344 743			269 596	309 606	309 606	2720 110	
-1500 -60			* 639 * 1366	* 639 * 1366	418 * 896	* 426 * 896					* 359 * 796	* 359 * 796	2200 90		

Illustration 79

g06364078

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

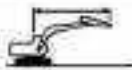










[mm] [inch]	1000 40		1500 60		2000 80		2500 100		3000 120				[mm] [inch]
													
2500 100							* 348	* 348			* 315	* 315	2540 100
2000 80							* 329	* 329			* 290	* 290	2030 80
1500 60					* 384	* 384	* 383	375	* 371	283	* 283	262	3150 130
1000 40					* 584	504	* 457	364	* 390	279	* 289	245	3270 130
500 20					* 700	483	* 507	353	* 482	273	* 308	240	3290 130
0 0			* 825	* 625	* 704	471	* 512	345	* 392	269	* 343	246	3210 130
-500 -20	* 577	* 577	* 938	733	* 656	466	* 478	342	* 351	268	* 343	265	3030 120
-1000 -40	* 1510	* 1510	* 2023	1573	* 1400	1008	* 1028	738			* 755	595	2720 110
-1500 -60			* 812	739	* 662	471	* 406	344			* 344	309	2200 90
			* 1745	1087	* 1205	1014	* 864	743			* 758	605	
			* 639	* 639	* 426	* 426					* 359	* 359	
			* 1356	* 1356	* 896	* 896					* 795	* 795	

Illustration 80

g06364085

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

Product Information Section
Lifting Capacities














[mm] [inch]	1000 40		1500 60		2000 80		2500 100		3000 120				[mm] [inch]
													
2500 100							336	266			* 316	249	2540 100
2000 80							* 329	257			260	198	2030 80
1500 60					* 384	349	329	251	248	188	229	174	3150 60
1000 40					* 828	754	709	540	533	406	507	385	130 40
500 20					441	328	318	241	243	184	213	161	3270 20
0					951	710	687	519	524	397	471	356	130 0
0					420	308	308	230	238	179	209	157	3290 0
-500 -20					906	668	664	498	513	387	460	347	130 -20
0			* 625	442	409	299	300	223	234	175	213	160	3210 0
-500 -20	* 577	* 577	631	443	405	296	297	220	233	175	230	173	3030 -20
-1000 -40	* 1510	* 1510	1356	955	873	638	640	476			508	381	120 -40
-1500 -60			638	445	408	298	299	222			369	201	2720 -60
			1370	958	879	644	645	481			596	446	110
			* 639	461	418	308					* 369	273	2200
			* 1366	995	* 895	668					* 795	617	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]
													
2500 100							* 340	266			* 315	249	2540 100
2000 80							* 329	257			* 296	198	2030 80
1500 60					* 384	349	* 383	251	* 371	188	* 283	174	3150 60
1000 40					* 828	754	* 836	540	* 813	406	* 625	385	3270 40
500 20					* 584	328	* 457	241	* 390	184	* 289	161	3290 20
0					* 1249	710	* 988	519	* 847	397	* 637	356	3290 0
0					* 700	309	* 507	230	* 482	179	* 308	157	3290 0
-500 -20					* 1503	668	* 1394	498	* 868	387	* 678	347	3210 -20
-1000 -40					* 625	442	* 704	299	* 512	223	* 392	175	3210 -40
-1500 -60					* 1446	952	* 1518	645	* 1106	492	* 843	379	3210 -60
2500 100	* 577	* 877	* 938	443	* 666	296	* 478	220	* 351	175	* 343	173	3030 100
2000 80	* 1510	* 2023	955	* 1400	638	* 1128	476				* 756	381	3030 80
1500 60			* 812	449	* 582	298	* 406	222			* 344	201	2720 60
1000 40			* 1745	958	* 1206	564	* 864	481			* 758	446	2720 40
500 20			* 639	461	* 426	308					* 359	273	2200 20
0			* 1356	995	* 895	668					* 795	617	2200 0

Illustration 82

g06364088

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

Product Information Section
Lifting Capacities

[mm] [inch]	500 20	1000 40	1500 60	2000 80	2500 100	3000 120			[mm] [inch]
2000									260 300 290
2500					255 255				245 245 270
300					583 583				545 545 180
2000					258 258	299 286			210 230 310
80					579 579	536 503			508 508 130
2500					322 322	247 249			209 227 320
60					787 787	532 608			483 561 130
3000			626 743	445 485	288 384	242 277			186 225 2430
40			1480 1546	993 1059	686 754	520 557			432 456 180
500			626 696	420 462	286 361	235 270			191 221 2650
20			1075 1133	906 1042	659 757	506 560			421 466 180
0			621 713	404 467	256 341	223 265			184 225 3390
0			1034 1111	872 1007	638 736	495 571			429 456 180
500	618 618	619 623	623 623	618 720	398 461	291 336	227 262		208 249 3210
20	1384 1384	1392 1392	1392 1392	1329 1649	897 992	627 725	493 566		456 530 130
1000	766 795	890 890	623 726	398 461	291 336				237 273 2900
40	1745 1745	1897 1897	1020 1156	858 930	627 725				525 606 120
1500			605 717	406 468					305 341 2460
60			1365 1526	875 1010					684 755 130
2000			466 466						425 425 3390
80									882 882 80

Illustration 83

g06364094

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











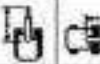



[mm] [inch]	588 20		1001 40		1560 60		2100 80		2500 100		3000 120				[mm] [inch]
															
3000													260	260	2190
2500									255	255			245	245	2760
2000									553	553			545	545	180
1500									208	209	320	206	230	230	3110
1000									579	579	635	610	566	566	130
500									322	322	335	260	227	227	3320
0									767	767	735	609	501	541	130
9000					743	743	435	485	412	364	368	277	234	225	3430
40					1546	1546	1059	1059	894	784	796	597	504	488	180
500					696	696	889	455	493	351	390	270	245	221	3450
20					1601	1593	1417	1042	1042	757	844	593	540	466	180
0					713	713	703	467	506	341	333	285	277	225	3380
0					1646	1551	1514	1007	1055	736	847	571	611	486	180
-500	618	618	623	623	947	720	689	461	468	336	369	262	323	240	3210
-20	1264	1264	1292	1292	2148	1545	1440	1062	1051	725	789	564	710	630	130
-1000	788	798	990	800	670	728	594	401	450	308			327	273	2920
-40	1745	1745	1997	1997	1678	1556	1275	993	926	725			721	606	120
-1500					717	717	482	468					341	341	2460
-60					1526	1526	1123	1110					755	755	100
-2000					468	468							425	425	1990
-80													882	882	60

Illustration 84

g06364099

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

Product Information Section
Lifting Capacities


(mm) (inch)	500 20	800 40	1500 60	2000 80	2500 100	3000 120		(mm) (inch)
3800								200 280 260
2500					255 295			245 218 2760
100					593 696			545 491 180
2000					298 298	250 29		239 179 3180
88					579 565	508 408		508 298 130
1500					322 291	247 88		209 189 2020
88					787 541	552 404		463 290 120
1800			895 499	445 331	318 240	242 82		196 147 3430
48			1438 1079	859 715	696 507	520 303		432 324 140
500			638 449	420 269	396 228	235 116		181 143 2450
25			1075 571	806 647	658 492	506 379		421 285 140
8			621 433	404 254	296 219	229 111		194 145 2080
8			1324 834	872 625	638 472	495 268		429 318 140
500	618 519	623 623	818 432	298 218	298 214	227 98		208 154 3210
25	1364 1304	1592 1382	1328 830	857 622	627 462	469 362		488 341 120
1000	785 795	890 818	823 438	398 288	291 214			217 176 2820
48	1745 1745	2097 1803	1338 838	856 623	627 462			525 390 120
1500			835 448	408 295				305 228 2460
62			1385 962	875 638				684 507 100
2000			488 448					425 425 1580
48								932 932 60

Illustration 85

g06364100

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





[mm] [inch]	500 20		1000 40		1500 60		2000 80		1500 100		2000 120				[mm] [inch]
															
3000													260	260	260
2500									255	295			245	245	2760
2000									533	596			545	431	180
1500									258	298	300	390	230	178	3180
1000									579	595	635	408	593	298	130
500									322	251	205	88	227	150	3200
0									737	541	725	404	581	290	100
1800					743	499	455	311	412	240	266	82	234	187	3430
1400					1546	1079	1059	715	834	517	796	303	514	324	140
900					494	449	640	369	493	238	290	114	249	143	3450
400					1001	571	1017	647	1043	492	844	278	549	285	140
0					713	453	700	294	598	218	593	111	277	145	3580
0					1046	624	754	625	1036	472	847	268	611	319	140
1500	618	518	623	623	947	432	669	288	498	214	369	98	323	154	320
1100	1284	1304	1332	1332	2148	950	1440	622	1050	462	789	363	713	341	130
600	785	706	890	846	978	436	684	288	433	214			327	178	2900
200	1745	1745	2297	203	1073	439	1275	623	924	460			721	390	100
0					717	448	482	295					341	228	2460
0					1526	962	1023	628					755	517	100
0					488	448							425	425	1900
0													382	382	60

Illustration 86

g06364101

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

Product Information Section
Lifting Capacities














[mm] [inch]	1000 40		1500 60		2000 80		2500 100		3000 120				
													[mm] [inch]
2500 100							313	245			304	230	2540 100
2000 80							314	248			247	190	2030 80
1500 60					* 384	335	307	240	231	188	212	166	3150 120
1000 40					* 828	724	662	617	456	387	471	367	130
500 20					412	354	297	230	226	175	198	154	3270 130
0					886	680	640	496	487	379	437	339	130
0					391	295	266	220	221	171	193	150	3290 130
-500 -20			585	422	843	638	617	475	475	368	426	330	130
-1000 -40			1256	908	379	265	278	213	217	167	197	152	3210 130
-1500 -60	* 577	* 877	887	423	818	615	600	459	447	360	435	336	130
-2000 -80	* 1510	* 1510	1260	911	376	282	276	210	216	166	213	164	3030 120
-2500 -100			593	429	810	608	593	453			471	363	120
-3000 -120			1274	924	375	284	277	212			245	191	2720 110
-3500 -140			807	441	816	614	598	458			563	425	110
-4000 -160			1366	952	389	294					347	261	2200 90
					840	636					773	680	90

Illustration 87

g06364102

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














(mm) (inch)	1000 40		1500 60		2000 80		2500 100		3000 120				
 (mm) (inch)												(mm) (inch)	
2500 100							* 348	245			* 315	238	2540
											* 703	538	100
2000 80							* 329	248			* 290	190	2030
							* 733	530			* 641	423	120
1500 60					* 384	335	* 383	240	* 371	180	* 283	166	3150
					* 828	724	* 835	517	* 813	387	* 625	367	130
1000 40					* 584	314	* 457	230	* 390	175	* 289	154	3270
					* 1249	600	* 368	496	* 847	379	* 637	339	130
500 20					* 706	295	* 507	220	* 482	171	* 308	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	608	* 1028	453			* 755	363	120
-1000 -40			* 812	425	* 562	284	* 406	212			* 344	191	2720
			* 1745	924	* 1205	614	* 864	456			* 756	425	110
-1500 -60			* 639	441	* 425	294					* 359	261	2200
			* 1356	952	* 895	636					* 795	589	50

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]		
																[mm] [inch]	
3000 88															290	290	290
2500 80									255	249					245	209	2760
2000 88									553	520					545	470	180
1500 82									258	247	230	82			218	170	3180
1000 82									579	502	459	300			487	380	120
500 49					850	478	475	37	398	229	224	174			181	140	3430
250 28					1602	1025	896	685	628	495	460	374			299	200	140
125 8					594	429	391	285	284	228	218	168			171	138	3450
62 8					1079	827	640	607	412	470	469	361			299	209	140
31 8					576	413	375	288	274	208	212	162			173	137	3380
15 25					1038	691	608	665	581	490	457	358			295	200	140
7.5 25		618	838	623	623	574	411	369	275	269	204	209	98		182	146	3210
3.75 43		1364	1364	1292	1292	1233	890	794	592	589	440	452	245		423	323	130
1.875 43		788	708	690	688	578	48	369	278	269	204				219	167	2920
0.9375 43		1745	1745	1697	1733	1243	895	795	583	598	440				495	371	120
0.46875 43					598	426	376	281							203	15	2460
0.234375 88					1269	88	812	668							535	493	100
0.1171875 88					499	449									429	415	1090
															992	982	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		800 40		1500 60		2000 80		2500 100		3000 120				[mm] [inch]		
																[mm] [inch]	
3000															260	260	260
2500																	
2000																	
1500																	
1000																	
500																	
0																	
-500																	
-1000																	
-1500																	
-2000																	
-2500																	
-3000																	

Illustration 90

g06364114

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

301.6

With Bucket















(mm) (inch)	1090 43		1550 60		2000 80		2500 100		3000 120				(mm) (inch)	
														
120												* 608	* 500	90
2500 100							* 244	* 244				* 225	* 225	2700
2000 80							* 256	* 256	282	* 359		* 219	* 219	3080
1500 60					* 308	* 300	* 321	* 321	279	317		* 221	* 221	3280
1000 40					* 644	* 644	* 700	* 700	608	681		* 487	* 487	130
500 20					511	* 534	364	* 410	274	311		224	* 225	3400
0 0					1162	* 1137	784	* 886	589	669		494	* 496	140
500 20					488	554	352	399	268	305		218	* 209	3420
0 0					1051	1194	758	867	576	656		481	* 506	140
500 -20					471	542	343	391	263	300		223	265	3350
-1000 -40					1024	1167	739	842	565	646		491	562	140
500 -20	* 962	* 802	752	880	473	539	330	387	261	298		261	275	3180
-1000 -40	* 1345	* 1345	1812	1843	1017	1160	731	834	562	642		531	607	130
-1500 -60			758	* 760	475	* 533	341	* 398				288	* 291	2880
-1500 -60			1626	* 1633	1023	* 1144	734	* 826				621	* 643	120
-1500 -60			* 504	* 634	* 411	* 411						* 299	* 299	2380
-1500 -60			* 1284	* 1284	* 867	* 867						* 668	* 660	100

Illustration 91

g06364121

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















[mm] [inch]	1000 40		1500 60		2000 80		2500 100		3000 120				(mm) (inch)
													
100												* 500 * 500	90
2500 90							* 244 * 244	* 244 * 244				* 225 * 225	2760 100
2000 80							* 258 * 258	* 258 * 258	* 309 * 309	* 309 * 309		* 219 * 219	3060 120
1500 60					* 309 * 309	* 309 * 309	* 321 * 321	* 321 * 321	* 321 * 321	* 307 * 307		* 221 * 221	3280 130
1000 40					* 534 * 534	* 534 * 534	* 410 * 410	* 410 * 410	* 349 * 349	* 311 * 311		* 225 * 225	3400 140
500 20					* 872 * 872	* 554 * 554	* 473 * 473	* 399 * 399	* 370 * 370	* 305 * 305		* 239 * 239	3420 140
0 0					* 1439 * 1439	* 1094 * 1094	* 1018 * 1018	* 861 * 861	* 797 * 797	* 656 * 656		* 526 * 526	3550 140
-500 -20	* 602 * 602	* 402 * 402	* 607 * 607	* 800 * 800	* 617 * 617	* 838 * 838	* 453 * 453	* 387 * 387	* 335 * 335	* 299 * 299		* 293 * 293	3180 130
-1000 -40	* 1249 * 1249	* 1349 * 1349	* 1878 * 1878	* 1843 * 1843	* 1331 * 1331	* 1060 * 1060	* 973 * 973	* 834 * 834	* 712 * 712	* 642 * 642		* 644 * 644	2880 120
-1500 -60			* 799 * 799	* 760 * 760	* 533 * 533	* 533 * 533	* 388 * 388	* 388 * 388				* 291 * 291	2380 100
-2000 -80			* 1633 * 1633	* 1633 * 1633	* 1044 * 1044	* 1044 * 1044	* 826 * 826	* 826 * 826				* 643 * 643	2380 100
-2500 -100			* 604 * 604	* 604 * 604	* 411 * 411	* 411 * 411						* 299 * 299	2380 100
-3000 -120			* 1284 * 1284	* 1284 * 1284	* 887 * 887	* 887 * 887						* 680 * 680	100

Illustration 92

g06364124

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

Product Information Section
Lifting Capacities














(mm) (inch)	100E 40		1500 60		2000 80		2500 100		3000 120				(mm) (inch)
													
120													500 20
2500 100							244 9.6	244 9.6					225 8.9
2000 80							286 11.3	286 11.3	262 10.3	212 8.3			219 8.6
1500 60					308 12.1	308 12.1	321 12.6	284 11.2	279 10.9	210 8.3			221 8.7
1000 40					58 2.3	379 14.9	354 13.9	273 10.7	274 10.8	205 8.1			224 8.8
500 20					102 4.0	818 32.2	794 31.2	587 23.1	539 21.2	440 17.3			494 19.4
0 0					488 19.2	357 14.0	352 13.8	261 10.3	268 10.5	199 7.8			218 8.6
-500 -20					1053 41.6	771 30.3	758 29.8	563 22.2	576 22.7	428 16.8			481 18.9
-1000 -40					476 18.7	346 13.6	343 13.5	253 9.9	263 10.3	194 7.6			223 8.8
-1500 -60					1024 40.3	747 29.5	739 29.1	546 21.5	565 22.3	418 16.4			491 19.3
-2000 -80					602 23.7	602 23.7	752 29.6	529 20.8	475 18.7	344 13.5			241 9.5
-2500 -100					1349 53.2	1049 41.3	962 37.8	1137 44.9	1017 39.8	740 29.1			531 20.9
-3000 -120					758 29.8	534 21.0	475 18.7	346 13.6	341 13.4	251 9.9			280 11.0
-3500 -140					1625 64.0	1180 46.4	1023 40.1	748 29.4	734 28.9	541 21.3			621 24.4
-4000 -160					604 23.8	545 21.5	48 1.9	354 13.9					298 11.7
-4500 -180					1284 50.5	1175 46.2	887 34.7	765 30.1					680 26.8

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)	1500 60		1500 60		2000 80		2500 100		3000 120				(mm) (inch)	
														
120												* 500 * 500	90	
2500 100							* 244 * 244	* 244 * 244				* 225 * 225	2760	
							* 559 * 559	* 559 * 559				* 493 * 493	119	
2000 80							* 256 * 256	* 256 * 256	** 369 210			* 219 204	3000	
							* 574 * 574	* 574 * 574				* 483 453	120	
1500 60					* 309 * 309	* 300 * 300	* 321 284	* 321 284	* 321 210	* 210		* 221 190	3200	
					* 644 * 644	* 644 * 644	* 700 611	* 700 611	* 764 651	* 651		* 487 398	130	
1000 40					* 534 * 379	* 379 * 300	* 410 273	* 410 273	* 349 205	* 205		* 225 156	3400	
					* 1037 * 830	* 830 * 605	* 805 587	* 805 587	* 750 443	* 443		* 436 366	140	
500 20					* 672 * 357	* 357 * 246	* 473 261	* 473 261	** 370 199	* 199		* 239 161	3420	
					* 1439 * 771	* 771 * 508	* 508 318	* 508 318	* 757 421	* 421		* 526 395	140	
0 0					* 674 * 346	* 346 * 246	* 484 253	* 484 253	* 367 194	* 194		* 265 164	3350	
					* 1452 * 747	* 747 * 546	* 546 342	* 546 342	* 788 418	* 418		* 504 362	140	
-800 -20	* 602 * 1349	* 602 * 1349	* 867 * 1925	629 * 1137	* 617 * 1331	344 * 740	* 453 * 973	250 * 558	* 335 * 712	192 * 415		* 293 * 646	177 * 392	3180 * 138
-1000 -40			* 750 * 1633	534 * 1150	* 533 * 1164	346 * 745	* 388 * 825	251 * 541				* 291 * 643	207 * 450	2880 * 120
-1500 -80			* 804 * 1284	545 * 1175	* 411 * 867	354 * 765						* 299 * 660	279 * 628	2380 * 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 60		1900 60		2000 80		2500 100		3000 120		3500 140				(mm) (inch)	
																
3000														186	186	2470
2500														170	170	2900
100							398	398						264	264	120
2000							181	181	259	259				174	174	3250
00							412	412	582	582				384	384	130
3000							295	295	270	291				175	175	3490
60							560	560	586	659				385	385	160
3000			674	674	432	432	360	360	272	300	210	241		179	179	3960
40			1381	1381	920	920	778	778	566	668				395	395	160
500					469	556	390	390	285	382	207	237		182	182	3590
20					964	997	754	857	670	659	444	510		422	422	150
0			563	563	472	578	349	387	259	298	204	234		202	202	3520
0			1307	1307	908	959	731	824	557	637				447	447	160
500	570	570	730	846	466	532	324	381	255	252				207	249	3260
20	1293	1293	1094	816	902	984	719	821	549	629				478	549	160
3000	091	091	740	020	400	532	332	391	256	292				247	277	3090
40	2000	2000	1595	1779	1003	1045	719	820	552	619				545	610	120
3000			681	881	460	460	320	320						285	285	2630
60			1951	1951	978	978	688	688						631	631	110
3000			460	460										332	332	3030
60			945	945										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.

(mm) (inch)	1900 40		1500 60		2000 80		2500 100		3000 120		3500 140				(mm) (inch)	
															(mm) (inch)	
3000														156	156	2470
2500														178	170	2960
2000							386	388						394	384	320
1500							601	601	259	259				174	174	3150
1000							413	413	592	592				384	384	130
500							255	255	201	201				175	175	3150
0							560	560	619	619				395	395	140
500			674	674	432	432	360	360	321	330	266	241		179	179	3660
1000			1381	1381	929	929	779	779	899	886				395	395	140
1500					627	596	446	398	355	302	291	237		182	182	3990
2000					1348	1197	860	667	784	650	520	518		422	422	150
2500					563	563	475	387	364	236	244	234		213	213	3520
3000			1307	1307	1452	1199	1028	834	784	637				471	471	140
3500	578	578	861	846	639	532	462	381	346	232				251	249	3360
4000	1293	1293	1969	1804	1376	1114	953	823	790	628				555	549	140
4500	891	891	829	828	568	532	490	381	344	295				377	377	3080
5000	2080	2080	1773	1773	1214	1145	870	828	618	618				618	618	120
5500			631	631	468	468	320	328						285	285	2530
6000			1451	1451	979	979	663	663						631	631	110
6500														332	332	1030
7000			945	945										251	251	70

Illustration 96

g06364155

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

Product Information Section
Lifting Capacities



[mm] [inch]	1880 40		1500 30		1000 60		750 30		500 120		250 140				[mm] [inch]		
																	
3000															195	195	2470
2500															173	173	2060
2000								266	385						234	234	120
1800								181	181	259	213				174	174	3200
1500								413	413	582	456				234	234	120
1000								266	266	279	209				175	182	2460
800								560	568	599	490				285	290	140
600			674	587	432	383	360	273	272	203	210	25			179	150	3560
400			1381	1269	920	827	779	597	586	437					235	232	140
200					488	399	350	258	265	195	207	92			182	145	3580
100					1054	773	764	589	578	421	444	225			422	321	150
50			583	528	472	362	340	249	259	190	204	93			203	145	3520
25			1207	1111	1046	739	731	527	527	409					447	326	140
10	578	578	738	598	486	336	334	244	255	187				217	158	3360	
5	1293	1230	1094	100	1002	725	719	526	549	402				479	349	140	
2	480	391	343	521	468	337	333	243	258	183				247	181	3060	
1	2050	2000	1595	1120	1093	728	718	525	552	404				560	402	120	
0.5			691	531	469	363	320	249						285	232	2830	
0.25			1451	1122	979	729	668	527						421	321	180	
0.1			460	460										332	332	1500	
0.05			945	945										761	761	70	

Illustration 97

g06364156

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

[mm] [inch]	1000 40		1500 60		2000 80		2500 100		3000 120		3500 140				[mm] [inch]		
																	
3000															190	190	2470
2500															178	178	2160
2000								388	388						334	334	120
1500								101	101	259	210				174	174	3250
1000								413	413	582	456				384	384	130
500								255	255	261	209				175	162	3160
0								560	560	618	450				335	360	340
1800			674	507	432	383	360	273	321	209	266	175			179	150	3560
1400			1331	1218	928	827	779	587	639	437					335	332	140
900					627	350	446	259	355	196	291	152			192	146	3590
400					1348	770	868	589	766	421	520	325			422	321	150
0			563	516	675	342	478	249	364	190	244	143			210	148	3520
0			1307	118	1452	738	1029	537	784	409					471	326	140
100	578	578	981	716	639	336	462	244	346	157				251	158	3560	
25	1293	1293	1969	188	1376	725	993	526	748	402				955	349	140	
1000	890	891	628	625	968	337	490	243	384	167				277	181	3080	
40	2066	2000	1779	109	1314	736	878	505	638	404				649	402	120	
1500			681	538	488	343	320	248						285	232	2630	
60			1451	1142	978	739	668	537						631	521	180	
2000			460	448										332	332	1800	
80			945	945										761	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



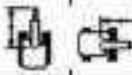
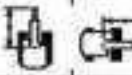


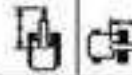
[mm] [inch]	1000 40	1500 60	2000 80	2500 100	3000 120		(mm) (inch)							
														
100						* 500 * 500	90							
2500				* 244 * 244		* 225 * 225	2760							
300				* 559 * 559		* 490 * 490	130							
2000				* 258 * 258	295 204	* 219 195	3060							
80				* 574 * 574		* 483 435	120							
1500			* 309 * 309	* 321 273	262 202	* 221 172	3280							
50			* 644 * 644	* 700 588	563 433	* 487 381	130							
1000			482 1940	365 788	342 737	262 565	257 552	186 422	203 461	153 350	3400			
40			458 889	343 741	330 711	251 540	250 538	180 409	203 443	154 333	3420			
20			447 861	332 717	322 692	243 523	245 528	166 400	203 458	157 346	3350			
0			602 1249	402 817	707 1404	509 1008	444 888	338 676	338 676	243 486	184 368	224 448	170 340	3180
-20			713 1426	518 1036	817 1634	589 1178	444 888	332 664	338 676	243 486	184 368	224 448	170 340	3180
-1000			713 1426	518 1036	817 1634	589 1178	444 888	332 664	338 676	243 486	184 368	224 448	170 340	3180
-40			604 1208	505 1011	817 1634	589 1178	444 888	332 664	338 676	243 486	184 368	224 448	170 340	3180
-1500			604 1208	505 1011	817 1634	589 1178	444 888	332 664	338 676	243 486	184 368	224 448	170 340	3180
-80			604 1208	505 1011	817 1634	589 1178	444 888	332 664	338 676	243 486	184 368	224 448	170 340	3180

Illustration 99

g06364160

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








[mm] [inch]	1000 40	1500 60	2000 80	2500 100	3000 120		(mm) (inch)
							
100						* 500 * 500	90
2500 90				* 244 * 244 * 559 * 559		* 225 * 225 * 490 * 490	2760 110
2000 80				* 258 * 258 * 574 * 574	* 309 204	* 219 195 * 483 435	3080 120
1500 60			* 309 * 309 * 644 * 644	* 321 273 * 700 588	* 321 202 * 704 433	* 221 172 * 487 381	3280 130
1000 40			* 534 365 * 1037 788	* 410 262 * 885 565	* 349 196 * 758 422	* 225 159 * 496 350	3600 140
500 20			* 672 343 * 1439 741	* 473 251 * 1018 540	* 370 190 * 797 409	* 239 154 * 526 339	3820 140
0 0			* 674 332 * 1452 717	* 484 243 * 1042 523	* 367 166 * 788 400	* 265 157 * 584 346	3350 140
-500 20	* 602 * 402 * 1249 * 1349	* 667 509 * 1875 1084	* 617 330 * 1321 710	* 453 239 * 973 516	* 335 164 * 712 386	* 293 170 * 646 374	3180 130
-1000 40		* 760 514 * 1633 906	* 533 332 * 1144 716	* 388 240 * 826 519		* 291 180 * 643 440	2880 120
-1500 60		* 604 505 * 1284 1121	* 411 340 * 887 735			* 299 268 * 660 603	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								190 190 2470
3500								178 178 2160
3000				388 388				234 234 320
2800				413 413	259 204			174 174 3250
2500				413 413	262 204			284 284 130
2300				560 560	262 204			175 195 3160
2000				560 560	262 204			285 344 140
1800		674 567	432 370	343 262	255 195	196 148		179 182 3560
1600		1391 1226	928 797	728 564	548 418			295 338 140
1500			468 344	329 248	248 190	193 145		185 139 3590
1400			391 242	208 136	133 80	83 38		409 206 150
1300			563 436	443 328	338 239	241 182	150 112	188 141 3520
1200			1307 1067	953 700	664 505	519 330		415 310 140
1100	578 578	694 488	436 323	312 213	228 178			281 181 3560
1000	1293 1293	1408 1067	928 695	672 503	512 304			445 337 140
900	890 391	699 501	437 323	311 213	228 179			238 173 3580
800	2060 2000	1500 1077	943 696	671 502	514 306			50 283 320
700		681 501	443 328	317 218				285 222 2630
600		1451 1085	935 710	660 505				631 495 130
500		460 460						332 332 1830
400		945 945						251 251 70

Illustration 101

g06364163

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

[mm] [inch]	1000 40		1500 60		2000 80		2500 100		3000 120		3500 140				[mm] [inch]
															
3800															2470
2500															2160
100							388	388							120
2000							101	101	259	204					3250
80							413	413	582	637					130
1500							295	295	261	291					1160
60							560	560	638	421					140
1800			674	567	432	370	360	262	321	195	266	148			3560
40			1391	1226	928	797	779	564	639	418					140
500					627	344	446	249	355	190	291	145			3590
25					1348	747	800	536	766	607	523	378			150
1			563	496	675	328	476	239	364	192	244	142			3520
1			1307	1067	1452	700	1029	525	784	330					140
500	578	578	981	496	639	323	462	213	346	178					3560
25	1293	1293	1969	1067	1375	695	1003	543	749	304					140
1000	890	391	628	508	668	323	490	213	334	179					3080
40	2060	2000	1779	1077	1314	636	1070	562	638	336					120
1500			681	590	688	329	520	238							2630
60			1451	1089	1578	710	1060	555							110
2000			460	460											1800
80			945	945											70

Illustration 102

g06364165

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

Without Bucket















[mm] [inch]	1000 40		1500 60		2000 80		2500 100		3000 120				[mm] [inch]
													[mm] [inch]
2500 100							* 349	* 349			* 315	* 315	2540 100
2000 80							* 329	* 329			* 290	* 290	2500 100
1500 60					* 384	* 384	* 387	* 387	343	343	280	* 283	3160 120
1000 40					* 829	* 829	* 806	* 806	451	732	621	* 625	3270 130
500 20					1151	* 1250	835	838	642	723	580	* 637	3280 130
0 0					512	579	376	424	283	338	258	291	3280 130
500 20					1105	1240	812	915	631	71	563	641	3210 130
0 0			* 625	* 625	501	567	369	416	289	329	264	298	3210 130
500 20	* 677	* 677	772	878	499	664	365	412	288	325	284	321	3000 120
1000 40	* 1510	* 1510	1658	1888	1073	1235	789	891			428	709	3200 130
1500 60			778	* 813	508	562	367	* 407			330	* 344	2700 110
2000 80			1672	* 1745	1079	* 1206	794	* 865			733	* 758	2200 90
2500 100			* 638	* 638	* 428	* 428					* 358	* 358	2200 90
3000 120			* 1356	* 1356	* 885	* 885					* 795	* 795	2200 90

Illustration 103

g06364168

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








[mm] [inch]	1000 40	1500 60	2000 80	2500 100	3000 120		(mm) (inch)
2500 100							2540 100
2000 80				* 348 * 348		* 315 * 315	2500 100
1500 60				* 329 * 329		* 290 * 290	2500 100
1000 40			* 384 * 384	* 383 * 383	* 371 * 371	* 283 * 283	3270 130
500 20			* 929 * 929	* 836 * 836	* 894 * 894	* 625 * 625	3290 130
0 0			* 584 * 584	* 457 * 457	* 340 * 340	* 289 * 289	3210 120
-500 -20			* 1250 * 1250	* 989 * 989	* 847 * 847	* 637 * 637	3290 130
-1000 -40			* 701 * 701	* 579 * 579	* 507 * 507	* 424 * 424	3290 130
-1500 -60			* 1504 * 1504	* 1248 * 1248	* 1094 * 1094	* 905 * 905	3210 120
-2000 -80	* 677 * 677	* 625 * 625	* 878 * 878	* 705 * 705	* 567 * 567	* 430 * 430	3000 120
-2500 -100	* 1510 * 1510	* 1446 * 1446	* 1988 * 1988	* 1619 * 1619	* 1322 * 1322	* 1005 * 1005	3000 120
-3000 -120		* 813 * 813	* 639 * 639	* 562 * 562	* 407 * 407	* 351 * 351	2720 110
-3500 -140		* 1745 * 1745	* 1358 * 1358	* 1205 * 1205	* 865 * 865	* 750 * 750	2200 90
-4000 -160		* 639 * 639	* 426 * 426			* 359 * 359	89
-4500 -180		* 1358 * 1358	* 895 * 895			* 795 * 795	

Illustration 104

g06364170

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

Product Information Section
Lifting Capacities








[mm] [inch]	1000 40	1500 60	2000 80	2500 100	3000 120		(mm) (inch)
2500 100							315 303 2540
2000 80							703 685 2500
1500 60							290 245 2500
1000 40							641 545 120
500 20							384 384 383 308 363 234 280 216 358
0 0							929 829 836 661 651 503 621 479 138
-500 -20							533 402 387 286 298 229 263 202 3270
-1000 -40							1151 868 835 640 642 495 500 446 130
-1500 -60							512 382 376 288 293 224 259 198 3290
-2000 -80							1105 827 812 618 631 484 563 436 139
-2500 -100							625 549 501 372 369 279 289 229 264 202 3219
-3000 -120							1446 1182 1080 803 796 603 623 476 582 445 130
-3500 -140							677 677 772 558 499 369 385 276 280 219 204 257 3000
-4000 -160							1510 1658 1185 1073 798 789 598
-4500 -180							628 479 120
-5000 -200							778 595 509 371 367 278
-5500 -220							1672 1198 1073 802 794 601
-6000 -240							330 251 2720
-6500 -260							733 558 110
-7000 -280							639 339 2200
-7500 -300							795 763 89

Illustration 105

g06364171

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




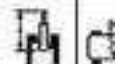


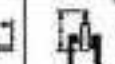

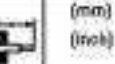

(mm) (inch)	3000 40		1900 60		2090 80		2500 100		3000 120				(mm) (inch)
												(mm) (inch)	
2500 100							* 349	311			* 315	300	2540 100
2000 80							* 329	313			* 290	245	2030 80
1500 60					* 384	* 384	* 383	306	* 371	234	* 283	218	1150 45
1000 40					* 929	* 829	* 836	661	* 834	503	* 625	479	130
500 20					* 594	402	* 457	286	* 380	229	* 289	202	3270 130
0 0					* 1253	863	* 989	640	* 847	485	* 637	448	3290 130
-500 -20					* 701	382	* 507	286	* 402	224	* 308	188	3290 130
-1000 -40					* 1504	827	* 1094	618	* 889	484	* 679	436	2720 107
-1500 -60					* 625	549	* 705	372	* 513	279	* 383	220	2200 87
-2000 -80					* 1448	1082	* 1519	803	* 1105	603	* 843	476	1600 63
-2500 -100	* 677	* 677	* 308	550	* 459	368	* 478	276	* 351	218	* 343	217	1030 41
-3000 -120	* 1510	* 1510	* 3024	1885	* 1401	796	* 1028	596			* 756	479	120
-3500 -140			* 813	886	* 562	375	* 467	278			* 344	261	2720 107
-4000 -160			* 1745	1088	* 1206	802	* 865	601			* 753	558	100
-4500 -180			* 639	568	* 428	311					* 353	338	2200 87
-5000 -200			* 1058	1225	* 895	823					* 795	763	80

Illustration 106

g06364172

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

Product Information Section
Lifting Capacities

Lift (mm) (inch)	590 20		1000 40		1500 60		2000 80		2500 100		3000 120				Lift (mm) (inch)
															
2000													261	281	290
2500									255	255			245	245	270
3000									580	580			545	545	180
3500									250	250	305	321	250	230	310
4000									580	580	635	635	568	568	130
4500									320	320	392	395	327	317	320
5000									707	787	650	721	501	581	130
5500					744	744	835	855	387	413	298	330	234	234	240
6000					1547	1547	1050	1060	824	894	639	719	514	514	160
6500					696	696	512	519	374	422	290	327	237	249	340
7000					1070	1081	1105	1248	607	663	626	706	523	549	160
7500					730	713	637	663	365	412	284	321	242	274	330
8000					1637	1646	1671	1710	787	863	613	693	530	600	140
8500	618	618	623	623	759	857	898	956	359	467	291	318	258	252	320
9000	1264	1264	1292	1292	1631	1661	1696	1809	775	879	607	697	570	646	130
9500	768	795	890	890	764	871	881	957	359	467			280	327	280
10000	1745	1745	1897	1897	1641	1672	1697	1800	775	879			650	721	130
10500					717	717	832	882					341	341	240
11000					1527	1527	1624	1624					755	755	100
11500					468	468							425	425	330
12000													982	982	80

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)	
 														(mm) (inch)	
3000													267	241	2600
2500									255	295			245	245	2760
2000									593	593			545	545	180
1500									258	259	321	321	239	230	3180
1000									590	590	655	655	598	598	130
500									323	329	295	305	227	227	3280
40									787	787	726	731	581	581	120
3000					744	744	455	455	413	413	266	263	234	234	3430
2500					1547	1547	3060	3060	924	924	796	79	514	514	340
2000					636	636	661	579	484	422	290	297	249	249	3450
1500					1681	1681	3130	3248	1944	930	845	705	549	549	340
1000					713	713	704	563	598	412	394	321	277	274	3580
500					1646	1646	2575	323	1935	919	840	683	618	603	340
3000	608	608	623	623	347	357	668	556	488	497	369	38	323	292	3230
2500	1364	1364	1392	1392	2159	1861	1441	1088	1050	876	790	667	713	645	130
2000	785	795	890	898	378	371	694	557	433	407			327	327	2820
1500	1745	1745	2097	2097	1099	1072	1275	1260	927	870			721	721	120
1000					717	717	452	452					341	341	2460
500					1527	1527	3024	3024					795	795	300
3000					488	488							425	425	1590
2000													932	932	60

Illustration 108

g06364175

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

Product Information Section
Lifting Capacities

(mm) (inch)	500 20	1000 40	1500 60	2000 80	2500 100	3000 120		(mm) (inch)
3000								291 291 290
2500					255 255			245 245 260
2000					583 530			545 545 190
1500					258 258	305 235		238 222 310
1000					588 580	635 505		599 494 130
500					323 307	302 273		227 190 3020
40					787 551	650 561		561 438 130
300			744 695	435 464	387 236	286 227		234 185 3430
20			1547 1393	1060 874	834 638	638 458		514 408 140
10			636 556	512 382	374 284	290 221		237 181 3450
5			1678 1291	1006 828	887 615	626 437		521 389 140
3			713 540	437 347	365 275	284 216		242 184 3080
2			1837 1365	1071 784	787 633	610 468		533 408 140
100	638 438	623 623	759 538	490 342	359 270	281 210		258 186 3230
25	1364 1364	1382 1382	1638 1360	1006 788	775 665	607 461		578 433 130
1000	785 705	690 698	764 542	491 362	358 270			293 222 3920
40	1745 1745	1697 1697	1841 1369	1057 781	725 580			659 493 120
1500			717 553	482 368				341 283 2460
60			1527 151	1024 796				755 634 100
2000			468 468					425 425 1590
80								382 382 60

Illustration 109

g06364176

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

(mm) (inch)	500 20		800 40		1500 60		2000 80		2500 100		3000 120				(mm) (inch)	
																
3000														241	241	2600
2500									255	255				245	245	2760
2000									593	593				545	545	180
1500									258	259	321	225		239	222	3180
1000									590	590	655	505		598	494	130
500									323	397	295	209		227	189	3200
0									787	640	736	561		591	430	100
1800					744	695	455	464	413	296	266	227		234	185	3430
1400					1547	1399	3000	274	324	626	796	458		514	405	340
900					636	556	661	382	484	284	290	221		249	181	3450
400					1681	1291	1130	825	1044	613	645	477		549	399	140
0					713	540	704	347	598	275	384	26		277	184	3580
0					1646	1025	755	794	1055	530	640	465		611	406	340
1500	618	518	623	623	347	528	668	362	488	270	369	20		323	196	3200
1100	1364	1304	1592	1382	2159	1860	1441	788	1050	585	790	461		713	433	100
600	785	795	890	888	378	512	694	342	433	270				327	222	2800
200	1745	1745	2097	2097	1099	1059	1275	761	927	582				721	492	100
0					717	553	452	388						341	288	2460
0					1527	101	824	795						795	624	300
0					488	488								425	425	1960
0														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
												* 703	662	700
2000 80							* 329	300				* 290	236	2930
							* 734	650				* 641	626	120
1500 60					* 384	* 384	376	296	285	225		264	208	3150
					* 829	* 829	811	638	614	495		585	461	130
1000 40					504	388	365	286	281	221		247	194	3270
					1086	838	788	617	605	475		546	429	130
500 20					483	369	356	276	275	216		242	190	3290
					1043	797	765	596	594	466		534	419	130
0 0			* 825	528	472	368	347	269	271	212		248	194	3210
			* 1446	1139	1017	774	749	580	586	458		547	428	130
-500 -20	* 577	* 677	727	530	465	355	344	266	270	211		267	209	3030
	* 1510	* 1510	1562	1142	1016	767	742	574				590	461	120
-1000 -40			734	638	471	367	346	267				311	242	2720
			1577	1154	1016	772	747	578				686	537	110
-1500 -60			* 639	548	* 426	367						* 359	326	2200
			* 1356	1182	* 896	794						* 795	736	80

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.



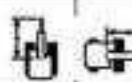
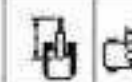

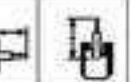
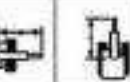
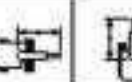
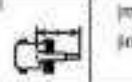

[mm] [inch]	1000 40		1500 60		2000 80		2500 100		3000 120				[mm] [inch]		
															
2100 100							* 349	301				* 316	293	2640 100	
2000 80							* 329	300				* 290	236	2830 120	
1500 60					* 384	* 384	* 383	266	* 371	225	* 283	208	* 283	208	3150 130
1000 40					* 829	* 829	* 836	638	* 814	485	* 625	461	* 625	461	3270 130
500 20					* 701	369	* 307	276	* 462	216	* 308	190	* 308	190	3290 130
0 0			* 626	528	* 705	358	* 513	268	* 393	212	* 343	194	* 343	194	3210 130
-500 -20	* 677	* 677	* 938	530	* 650	355	* 478	268	* 351	211	* 343	209	* 343	209	3830 120
-1000 -40	* 1510	* 1510	* 2024	1142	* 1401	767	* 1028	574			* 756	461	* 756	461	2720 110
-1500 -60			* 813	536	* 562	357	* 407	257			* 344	242	* 344	242	2300 90
			* 1745	1154	* 1206	772	* 865	578			* 758	537	* 758	537	
			* 639	548	* 426	367					* 359	325	* 359	325	
			* 1356	1182	* 895	794					* 795	735	* 795	735	

Illustration 112

g06364187

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

Product Information Section
Lifting Capacities



(mm) (inch)	500 20	1000 40	1500 60	2000 80	2500 100	3000 120		(mm) (inch)
3800								261 241 260
2500 100					255 295 593 593			245 245 2760 545 545 180
2000 80					258 299 590 590	280 227		239 214 3180 998 476 130
1500 60					323 290 787 636	295 224		227 190 3280 591 421 120
1000 40			744 595 1547 1298	455 381 1060 844	345 285 787 615	278 219		228 178 3430 902 333 140
500 20			636 536 1503 1350	483 389 1043 785	353 273 761 580	272 210		223 174 3450 491 283 140
0 0			713 520 1541 1321	468 384 1000 764	343 264 748 571	267 207		227 177 3580 500 330 140
500 -20	608 498 1364 1304	623 492 1392 1382	715 386 1535 1335	461 384 1004 758	338 259 723 560	264 205		242 188 3250 534 415 130
1000 -40	785 795 1745 1745	890 888 1997 1997	719 522 1546 1325	462 388 1005 753	338 259 723 560			274 214 3800 481 473 120
1500 -60			717 522 1527 1340	469 385 1011 756				341 272 3460 795 610 100
2000 -80			488 488					425 425 1590 932 932 60

Illustration 113

g06364189

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


[mm] [inch]	500 20		1000 40		1500 60		2000 80		2500 100		3000 120				[mm] [inch]		
																	
3000															267	241	2500
2500									255	295					245	245	2760
2000									593	693					545	545	180
1500									258	299	321	227			239	214	3180
1000									690	690	695	457			998	476	130
500									323	346	395	224			227	190	3280
0									787	638	736	463			591	421	100
1800					744	585	455	385	413	285	266	219			234	178	3430
1500					1547	1298	1060	844	924	66	796	472			514	353	340
1000					636	536	461	388	484	273	290	211			249	174	3450
500					1681	1350	1130	785	1044	580	645	458			549	283	140
0					713	520	404	364	598	264	394	207			277	177	3580
0					1646	1321	1075	764	1035	571	640	447			611	390	340
1500	618	518	423	323	347	248	168	149	488	209	369	205			323	188	3210
1000	1364	1304	1252	1202	2158	186	141	128	1050	560	790	442			713	48	130
500	785	705	690	688	978	522	694	348	433	269					327	214	2820
0	1745	1745	1697	1697	1699	1625	1275	781	927	560					721	473	100
1500					717	522	452	385							341	272	3460
1000					1527	1149	824	766							795	610	300
500					488	488									425	425	1890
0															932	932	60

Illustration 114

g06364190

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

301.7

With Bucket
















(mm) (inch)	1000 40		1500 60		2000 80		2500 100		3000 120		3500 140				(mm) (inch)	
																
3000 129														* 991	* 561	100
2500 103							* 245	* 283						260	* 365	2000
2000 80							* 563	* 563						586	* 587	120
1500 60							* 268	* 268	247	261				215	226	3250
1000 40							* 604	* 604	528	559				475	564	130
500 20							333	350	243	267				188	291	3440
0 0							716	703	521	552				417	445	140
-500 -20					454	476	318	306	258	250	100	192		174	184	3570
-1000 -40					970	1027	686	723	606	637				384	410	140
-1500 -60					425	447	304	321	226	242	176	189		169	181	3560
-2000 -80					915	964	654	692	460	521				372	346	150
-2500 -100					414	437	294	312	222	236				172	164	3520
-3000 -120					891	940	633	671	475	509				360	456	140
-3500 -140					557	713	413	436	290	308	219	234		196	190	3550
-4000 -160	* 1631	* 1661	1469	1530	850	907	624	663	472	503				411	438	140
-4500 -180	* 1174	* 1174	605	723	417	439	302	309						217	231	3050
-5000 -200	* 2638	* 2638	1482	1549	806	945	626	666						482	513	120
-5500 -220			706	737	426	449	300	318						202	310	2550
-6000 -240			1512	1579	917	965								658	687	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 41		1500 60		2000 80		2500 106		3000 120		3500 140				(mm) (inch)		
																	
3000 120																	
2500 100								* 245	* 243						* 285	* 285	2930
2000 80								* 563	* 563						* 587	* 587	120
1500 60								* 268	* 268	* 353	261				* 209	235	3250
1000 40								* 604	* 604	* 792	659				* 570	604	150
500 20								* 375	350	* 383	297				* 261	207	3440
0 0								* 816	753	* 838	552				* 576	445	140
-500 -20					* 724	478	* 620	330	* 430	298	* 379	302			* 298	188	3870
-1000 -40					* 1526	1027	* 1117	725	* 941	537					* 686	450	140
-1500 -60					* 825	447	* 619	321	* 473	242	* 381	309			* 282	181	3890
-2000 -80					* 1975	964	* 1325	680	* 1021	521					* 528	369	150
-2500 -100					* 900	457	* 636	312	* 478	236					* 311	184	3820
-3000 -120					* 1938	940	* 1364	671	* 1027	509					* 687	406	140
-3500 -140					* 875	716	* 817	436	* 596	308	* 444	234			* 352	199	3350
-4000 -160	* 1891	* 1681	* 2800	1636	* 1781	957	* 1281	683	* 961	609					* 778	439	140
-4500 -180	* 1174	* 1174	* 1929	725	* 708	438	* 516	308							* 351	231	3050
-5000 -200	* 2636	* 2636	* 2247	1549	* 1520	845	* 1103	666							* 774	513	120
-5500 -220			* 845	737	* 558	449	* 378	318							* 360	310	2500
-6000 -240			* 1703	1579	* 1182	966									* 796	607	100

Illustration 116

g06615561

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

Product Information Section
Lifting Capacities
















(mm) (inch)	1000 40		1500 60		2000 80		2500 100		3000 120		3500 140				(mm) (inch)		
																	
3000 120															601	648	100
2500 100								245	327						260	368	2000
								563	486						586	378	120
2000 80								358	224	247	158				213	134	3250
								604	481	528	337				475	299	100
1500 60								333	318	243	154				188	315	3440
								716	463	521	331				417	257	140
1000 40					454	298	318	302	238	148	180	109			174	356	3670
					979	617	688	436	505	317					384	230	140
500 20					425	259	304	188	228	140	176	106			169	301	3580
					915	551	654	406	490	301					372	222	100
0 0					414	250	294	180	222	135					172	306	3520
					891	539	633	387	473	290					380	226	140
-500 20	* 1681	* 1681	1489	800	888	536	624	279	472	295					166	311	3350
															411	246	140
-1000 40	* 1174	837	692	466	417	252	290	178							217	332	3050
	* 2636	1831	1482	871	895	543	626	382							482	295	120
-1500 60			706	417	425	251	320	196							292	181	2550
			1512	897	917	552									658	407	100

Illustration 117

g06615565

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
















(mm) (inch)	1000 40		1500 60		2000 80		2500 100		3000 120		3500 140				(mm) (inch)	
																
3000 120														* 291	543	100
2500 100							* 248	227						* 266	168	2930
2000 80							* 565	486						* 587	378	120
1500 60							* 268	224	* 353	158				* 258	134	3290
1000 40							* 604	481	* 792	397				* 670	299	130
500 20							* 375	215	* 363	154				* 361	175	3440
0 0							* 898	853	* 838	331				* 876	257	140
-500 -20					* 729	268	* 608	302	* 436	148	* 379	100		* 360	105	3670
-1000 -40					* 1025	817	* 1117	435	* 941	317				* 886	232	140
-1500 -60					* 925	259	* 819	339	* 474	140	* 381	106		* 282	101	3590
-2000 -80					* 1975	561	* 1328	406	* 1021	301				* 420	222	150
-2500 -100					* 900	200	* 806	180	* 478	130				* 311	103	3620
-3000 -120					* 1938	539	* 1368	387	* 1027	290				* 687	225	140
-3500 -140					* 875	401	* 817	249	* 595	178	* 444	132		* 362	111	3390
-4000 -160	* 1001	* 1681	* 2900	864	* 1761	530	* 1281	379	* 961	265				* 776	245	140
-4500 -180	* 1174	857	* 1949	406	* 708	252	* 518	175						* 351	132	3050
-5000 -200	* 2638	1831	* 2247	871	* 1820	543	* 1103	382						* 774	293	120
-5500 -220			* 846	417	* 358	261	* 378	186						* 360	181	2550
-6000 -240			* 1793	897	* 1182	362								* 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)	
																
3000 120														* 233	* 233	2540
2500 100									249 832	263 863				* 212	* 212	3130 130
2000 80									248 530	262 661				193	205	3420 140
1500 60								* 282 * 920	* 282 * 920	243 521	257 552	182 388	194 414	178	182	3620 150
1000 40					452 998	485 1044	320 687	337 725	235 504	249 538	178 381	199 407	158 348	158	169	3730 150
500 20					428 922	453 971	303 652	300 660	226 485	240 516	173 372	185 398	153	154	164	3760 150
0 0			* 488 * 1076	* 488 * 1076	418 882	433 931	290 625	308 665	218 469	233 500	189 364	182 390	155	167	167	3800 150
-500 -20	* 851 * 1447	* 851 * 1447	889 1431	700 1493	405 878	423 918	284 611	300 650	214 460	228 491	188	330	164	178	164	3830 140
-1000 -40	* 984 * 2199	* 984 * 2199	876 1445	707 1513	307 672	329 723	284 610	301 649	214 460	228 492			198	203	198	3260 130
-1500 -60	* 1341 * 3018	* 1341 * 3018	688 1473	719 1541	414 890	438 939	289 623	307 661					244	259	244	2810 110
-2000 -80			* 663 * 1395	* 663 * 1395	* 402 * 402	* 402 * 402							* 408	* 408	* 408	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)	1500 49		1500 50		2000 60		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
										* 545	551			* 455	455	140
1500 60								* 282	* 282	* 329	257	* 341	194	* 209	182	3620
								* 620	* 620	* 725	552	* 523	414	* 450	403	150
1000 49					* 551	485	* 448	337	* 397	249	* 359	190	* 214	169	3730	
					* 1183	1044	* 865	726	* 851	535	* 793	407	* 472	373	150	
500 20					* 888	458	* 581	300	* 453	240	* 374	185	* 228	164	3780	
					* 1645	971	* 1248	600	* 977	516	* 808	398	* 500	362	150	
0 0			* 498	* 468	* 317	433	* 630	308	* 474	233	* 371	182	* 253	167	3890	
			* 1078	* 1073	* 1568	931	* 1354	663	* 1019	500	* 794	390	* 558	367	150	
-500 -20	* 851	* 851	* 834	700	* 856	428	* 610	302	* 456	229	* 339	180	* 207	178	3530	
	* 1447	* 1447	* 1392	1493	* 1841	918	* 1310	620	* 977	491			* 656	393	140	
-1000 -40	* 864	* 834	* 1181	707	* 787	626	* 645	301	* 400	228			* 334	203	3250	
	* 2199	* 2199	* 2483	1513	* 1623	923	* 1167	648	* 850	492			* 736	451	130	
-1500 -60	* 1341	* 1341	* 857	718	* 622	436	* 438	307					* 348	209	2810	
	* 3018	* 3018	* 2943	1541	* 1323	938	* 824	661					* 750	581	110	
-2000 -80			* 603	* 563	* 492	* 492							* 406	* 406	2010	
			* 1286	* 1388									* 806	* 806	80	

Illustration 120

g06615590

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

Product Information Section
Lifting Capacities

















(mm) (inch)	1000 40		1500 60		2000 80		2500 100		3000 120		3500 140				(mm) (inch)	
																
3000 120														* 213	205	2640
2500 100									248	160				* 212	147	3120
2000 80									503	346				* 470	330	138
1500 60									248	158				103	119	3420
1000 40									530	330				429	385	148
500 20									* 282	217	243	154	182	111	170	3600
0 0									* 620	465	521	329	388	235	378	153
-500 -20					467	292	320	203	235	146	178	107	158	93	158	3730
-1000 -40					995	621	667	426	504	312	391	229	348	205	152	152
-1500 -60					428	262	303	187	225	138	173	103	153	89	153	3760
-2000 -80					922	566	652	403	485	290	372	220	337	196	153	153
-2500 -100			* 466	383	410	245	280	178	218	131	169	98	155	80	155	3800
-3000 -120			* 1078	822	882	529	625	375	469	281	364	212	342	198	155	155
-3500 -140	* 651	* 551	669	385	405	241	284	179	214	127	168	98	156	85	156	3850
-4000 -160	* 1447	* 1447	1431	826	879	518	611	388	480	272	361	213	367	213	158	158
-4500 -180	* 984	828	875	390	407	243	284	179	214	127	169	98	156	85	156	3900
-5000 -200	* 2180	1764	1446	838	873	521	610	385	480	273	362	214	368	214	159	159
-5500 -220	* 1341	842	888	401	414	249	289	175								2810
-6000 -240	* 3018	1830	1473	862	893	536	623	377								110
-6500 -260			* 882	421	* 402	295										2010
-7000 -280			* 1395	906										* 306	625	80

Illustration 121

g06615593

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
















(mm) (inch)	1000 40		1500 60		2000 80		2500 100		3000 120		3500 140				(mm) (inch)	
																
3000 120														* 213	205	2640
2500 100									* 283	160				* 212	147	3120
2000 80									* 303	340				* 470	330	133
1500 60									* 286	158				* 208	119	3420
1000 40									* 545	338				* 458	265	145
500 20								* 282	217	* 329	154	* 341	111	* 209	102	3620
0 0							* 520	485	* 725	329	* 623	235	* 400	227	151	151
-500 -20					* 551	292	* 448	203	* 397	146	* 359	107	* 214	83	3730	
-1000 -40					* 1183	631	* 365	438	* 861	313	* 780	229	* 472	205	154	154
-1500 -60					* 988	282	* 581	187	* 453	118	* 374	103	* 328	89	3760	
-2000 -80					* 1045	565	* 1248	403	* 877	296	* 806	220	* 502	186	153	153
-2500 -100			* 488	383	* 917	245	* 830	175	* 474	131	* 371	99	* 251	90	3800	
-3000 -120			* 1078	622	* 1968	629	* 1354	378	* 1019	261	* 794	212	* 559	188	150	150
-3500 -140	* 651	* 857	* 834	385	* 858	241	* 810	170	* 495	127	* 330	98	* 297	86	3530	
-4000 -160	* 1447	* 1447	* 1892	825	* 1841	519	* 1310	365	* 677	272			* 605	213	148	148
-4500 -180	* 984	826	* 1161	390	* 757	243	* 545	170	* 400	127			* 384	112	3260	
-5000 -200	* 2199	1754	* 2483	838	* 1523	521	* 1167	385	* 569	273			* 738	249	138	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	118
-6500 -260			* 553	421	* 402	205							* 400	254	2910	
-7000 -280			* 1368	938									* 805	825	80	80

Illustration 122

g06615598

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

Without Bucket














(mm) (inch)	1000 40		1500 60		2000 80		2500 100		3000 120				(mm) (inch)
													
2500 100							* 367 780	* 357 816			317 716	333 752	2730 110
2000 80							* 357 781	* 357 797	269 576	283 607	255 569	269 599	3090 120
1500 60					* 442 946	* 442 946	354 763	372 801	266 572	280 603	225 499	238 527	3320 130
1000 40					476 1027	499 1076	341 736	359 774	260 560	274 591	211 465	223 492	3440 140
500 20					451 973	474 1022	328 708	346 746	253 546	267 577	206 454	218 481	3460 140
0 0					448 947	463 997	320 689	337 726	248 535	262 586	210 464	223 491	3380 140
-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 130
-1000 -40	* 1121 * 2510	* 1121 * 2510	711 1524	742 1591	441 956	464 999	318 686	336 724			262 582	277 615	2890 120
-1500 -60	* 1567 * 3535	* 1567 * 3535	726 1557	757 1624	451 973	474 1022					354 798	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							* 367 * 830	* 357 * 818				* 366 * 815	333 752	2710 110
2000 80							* 357 * 797	* 357 * 797	* 423 * 854	283 607		* 336 * 744	269 599	3090 126
1500 60					* 442 * 946	* 442 * 946	* 450 * 979	* 372 * 801	* 441 * 965	280 603		* 329 * 726	238 527	3320 130
1000 40					* 775 * 1844	499 1076	* 572 * 1232	359 774	* 481 * 1043	274 591		* 336 * 748	223 492	3440 140
500 20					* 948 * 2029	474 1022	* 653 * 1406	346 746	* 508 * 1097	267 577		* 357 * 787	218 481	3400 140
0 0					* 938 * 2018	463 997	* 665 * 1432	337 728	* 505 * 1088	262 566		* 398 * 877	225 491	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	464 999	* 537 * 1147	336 724				* 407 * 898	277 615	2890 120
-1500 -60	* 1567 * 3535	* 1567 * 3535	* 896 * 1894	757 1624	* 578 * 1229	474 1022						* 426 * 943	373 840	2170 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	2730 110
2000 80							* 367 781	246 528	269 576	181 386		266 569	171 381	3090 120
1500 60					* 442 * 946	336 722	354 763	238 512	266 572	178 383		225 499	149 331	3320 130
1000 40					476 1027	309 668	341 736	226 487	260 560	172 371		211 465	138 306	3440 140
500 20					451 973	286 619	328 708	214 462	253 546	166 358		206 454	134 296	3460 140
0 0					440 947	276 590	320 689	206 444	248 536	161 348		210 464	137 302	3380 140
-600 -20	* 766 * 1699	* 766 * 1699	704 1507	420 903	438 942	274 592	316 682	203 437	246 531	169 344		226 499	147 324	3200 130
-1000 -40	* 1121 * 2510	862 1843	711 1524	426 917	441 950	277 598	318 686	204 441				262 582	170 378	2890 120
-1500 -60	* 1567 * 3535	881 1886	726 1557	439 945	451 973	286 619						354 798	229 516	2370 100

Illustration 125

g06615552

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















(mm) (inch)	1000 40		1500 60		2000 80		2500 100		3000 120				(mm) (inch)	
													(mm) (inch)	
2500 100							* 357 * 836	246 528				* 366 * 815	214 483	2710 110'
2000 80							* 357 * 797	246 528	* 423 * 864	181 386		* 336 * 744	171 381	3090 120
1500 60					* 442 * 946	335 722	* 450 * 979	238 512	* 441 * 965	178 383		* 329 * 726	149 331	3320 130
1000 40					* 775 * 1644	309 660	* 572 * 1232	226 487	* 485 * 1043	172 371		* 336 * 746	138 306	3440 140
500 20					* 948 * 2020	286 610	* 653 * 1408	214 462	* 508 * 1097	166 358		* 357 * 787	134 296	3460 140
0 0					* 936 * 2018	276 606	* 685 * 1432	206 444	* 505 * 1086	161 348		* 398 * 877	137 302	3380 140
-500 -20	* 766 * 1699	* 766 * 1699	* 852 * 2163	420 903	* 858 * 1847	274 592	* 622 * 1338	203 437	* 465 * 993	159 344		* 405 * 893	147 324	3200 130
-1000 -40	* 1121 * 2510	862 1843	* 1128 * 2412	426 917	* 744 * 1596	277 598	* 537 * 1147	204 441				* 407 * 898	170 378	2850 120
-1500 -60	* 1567 * 3535	881 1886	* 896 * 1894	438 945	* 578 * 1220	286 615						* 426 * 943	229 516	2370 100

Illustration 126

g06615556

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

Product Information Section
Lifting Capacities

















(mm) (inch)	1200 48		1500 60		2000 80		2500 100		3000 120		3500 140				(mm) (inch)	
																
3000 120														* 305	* 305	2300
2500 100							* 577	* 577						280 630	* 284 * 635	2030 120
2000 80							* 692	* 692	270	264				321 515	244 544	3200 130
1500 60							356 767	* 355 * 795	296 571	280 502				206 457	218 463	3490 140
1000 40			1650	1710	1000	1080	737	342 774	288 556	273 507	255 435	215 461	183 427	259 453	2600 100	
500 20					452	475	327	344	250	265	189	211	189	200	200	3520
0			* 613	* 613	435	458	316	330	244	258	186	208	192	204	204	3550
0			* 1484	* 1404	937	988	680	719	525	557			423	449	449	140
-500	* 696	* 686	638	119	429	452	310	326	240	255			204	217	217	3380
-20	* 1526	* 1526	1474	1542	924	974	668	706	518	549			451	479	479	140
1000	* 990	* 980	694	726	431	453	310	327	241	256			232	246	246	3090
-40	* 2147	* 2147	1488	1556	927	976	668	706	521	552			514	545	545	130
-1000	* 1276	* 1276	737	730	438	461	310	334					296	312	312	2630
-60	* 2868	* 2868	1517	1584	944	993	683	721					562	598	598	110
-2000			* 677	* 677										* 505	* 505	1770
-80														* 1165	* 1165	70

Illustration 127

g06615573

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

















(mm) (inch)	1000 40		1500 60		2000 80		2500 100		3000 120		3500 140				(mm) (inch)	
																
3000 120														* 305	* 305	2300
2500 100								* 677	* 677					* 286	* 286	2000
2000 80										* 358	294			* 268	344	3200
1500 60								* 365	* 365	* 392	280			* 265	218	3000
1000 40								* 799	* 799	* 850	602			* 685	483	140
500 20																
0 0																
-500 -20	* 696	* 686	* 904	710	* 891	452	* 637	308	* 480	255				* 381	217	3300
-1000 -40	* 1526	* 1526	* 2063	1542	* 1815	874	* 1369	708	* 1029	548				* 842	479	140
-1500 -60	* 2147	* 2147	* 2828	1566	* 1994	976	* 1218	706	* 877	552				* 695	545	170
-2000 -80	* 2868	* 2868	* 2146	1584	* 1375	983	* 945	721						* 406	312	2600
-2500 -100			* 677	* 677										* 898	689	110
														* 605	* 685	1770
														* 1166	* 1365	70

Illustration 128

g06615578

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

Product Information Section
Lifting Capacities


















(mm) (inch)	1000 40		1500 60		2000 80		2500 100		3000 120		3500 140				(mm) (inch)	
																
3000 125														* 305	268	2368
2500 100								* 577	534					280	188	2930
2000 80								* 592	531	270	181			231	154	3288
1500 60								366	238	266	177			205	135	3488
1000 40								767	514	571	381			467	300	3440
500 20					482	313	342	226	258	178	283	192		199	126	3688
0 0			1653	1021	1059	677	737	486	656	367	435	263		427	277	3520
-500 20					452	285	327	212	250	163	195	128		189	122	3628
-1000 40					975	619	705	457	538	351	428	275		416	268	3550
-1500 60			* 613	484	435	271	316	202	244	157	186	125		150	123	3558
-2000 80			* 1404	871	937	595	680	455	525	338				423	271	3440
-2500 100	* 685	* 695	693	498	423	266	310	195	240	153				204	131	3388
-3000 120	* 1528	* 1526	1474	872	924	574	668	424	518	331				451	289	3440
-3500 140	* 860	831	891	411	631	267	310	166	241	154				230	149	3088
-4000 160	* 2147	1778	1465	834	527	576	668	423	521	331				514	329	3130
-4500 180	* 1275	850	737	422	438	274	316	202						295	150	2638
-5000 200	* 2868	1821	1517	905	944	592	683	437						662	425	3110
-5500 220			* 677	644										* 505	348	3770
-6000 240														* 1168	635	78

Illustration 129

g06615579

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
















(mm) (inch)	1000 40		1500 60		2000 80		2500 100		3000 120		3500 140				(mm) (inch)	
																
3000 120														* 305	260	2360
2500 100								* 677	634					* 285	188	2930
2000 80								* 602	531	* 358	181			* 635	423	120
1500 60								* 365	239	* 801	388			* 263	154	3280
1000 40								* 799	614	* 382	177			* 593	342	120
500 20								* 447	226	* 860	381			* 265	135	3490
0 0								* 400	132	* 909	367			* 585	300	140
-500 -20			* 2322	1021	* 1351	677	* 1000	406	* 871	367	* 480	132		* 273	126	3660
0 0								* 895	285	* 621	212	* 491	163	* 780	283	160
-500 -20								* 1912	619	* 1336	457	* 1051	351	* 485	128	3620
0 0			* 813	404	* 346	271	* 860	202	* 584	157	* 385	125		* 643	268	150
-500 -20			* 1404	871	* 2031	585	* 1421	435	* 1085	338				* 323	123	3550
-1000 -40	* 666	* 586	* 384	406	* 891	285	* 637	196	* 480	153				* 712	271	140
-1500 -60	* 1526	* 1526	* 2053	872	* 1915	574	* 1369	424	* 1029	331				* 381	131	3380
-2000 -80	* 360	831	* 1231	411	* 796	267	* 169	196	* 416	114				* 842	289	140
-2500 -100	* 2147	1776	* 2628	884	* 1694	575	* 1218	423	* 877	333				* 393	149	3080
-3000 -120	* 1275	850	* 1512	422	* 647	274	* 451	202						* 855	329	130
-3500 -140	* 2868	1821	* 2148	939	* 1375	592	* 945	437						* 405	150	2630
-4000 -160			* 677	444										* 898	425	110
-4500 -180														* 665	348	1770
-5000 -200														* 1160	635	70

Illustration 130

g06615581

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

301.8

With Bucket














[mm] [inch]	1500 60		1500 60		2000 80		2500 100		3000 120				[mm] [inch]	
														
3000 120												* 305 * 305	2320	
												* 647 * 647	93	
2500 100								* 305 * 305				* 663 * 663	2840	
								* 691 * 691				* 683 * 683	119	
2000 80								* 325 * 325	304	329		* 645 * 645	3250	
								* 723 * 723	674	705		* 649 * 649	100	
1500 60					* 415 * 415			* 404 * 404	311	325		* 571 * 571	3350	
					* 891 * 891			* 878 * 878	668	690		* 539 * 539	140	
1000 40					574	585		405	422	344	311	240	252	3470
					1238	1283		873	910	654	605	530	557	140
500 20					547	569		392	409	297	31	234	246	3490
					1179	1226		844	881	639	679	517	543	140
0 0					535	557		383	400	292	306	233	252	3420
					1152	1199		824	861	628	659	520	555	140
900 36	* 844 * 844	* 844 * 844	871	980	531	555	379	386	289	303	250	271	3280	
	* 1723 * 1723	* 1723 * 1723	1865	1927	1146	1194	815	853	623	654	569	597	130	
1000 40			* 845 * 845		535	558	380	387				293	312	2570
			* 1820 * 1820		1153	1200	818	856				660	692	120
1500 60			* 880 * 880		476	476						* 324 * 324	2490	
			* 1449 * 1449		1303	1309						* 716 * 716	100	

Illustration 131

g06364222

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








[mm] [inch]	1800 40	1500 60	2000 80	2500 100	3000 120		[mm] [inch]
3000 120							* 305 * 305 2320
2500 100				* 306 * 306			* 647 * 647 90
2000 80				* 691 * 691			* 300 * 300 2840
1500 60				* 325 * 325	* 319 321		* 863 * 863 110
1000 40			* 416 * 416	* 404 * 404	* 385 325		* 295 * 295 3150
500 20			* 891 * 891	* 878 * 878	* 842 698		* 649 * 649 130
0 0			* 672 595	* 502 422	* 418 318		* 297 * 271 3350
			* 1432 1283	* 1081 900	* 865 685		* 655 * 599 140
			* 798 569	* 563 409	* 438 31		* 321 * 246 3490
			* 1712 1228	* 1212 881	* 945 679		* 706 * 543 140
			* 777 557	* 567 400	* 431 304		* 339 * 252 3420
			* 1677 1189	* 1220 881	* 928 659		* 746 * 555 140
500 20	* 844 * 844	* 954 990	* 705 555	* 624 396	* 394 300		* 330 * 271 3280
1000 40	* 1723 * 1723	* 2070 1927	* 1521 1194	* 1030 653	* 642 454		* 727 * 597 130
1500 60		* 945 * 945	* 809 558	* 451 397			* 324 * 312 2970
2000 80		* 1820 * 1820	* 1307 1000	* 864 656			* 715 * 632 120
2500 100		* 680 * 680	* 476 * 476				* 324 * 324 2480
3000 120		* 1449 * 1449	* 1009 * 1009				* 716 * 716 100

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)	1500 60	1500 60	2000 80	2500 100	3000 120		(mm) (inch)
3000 120							* 305 * 305 2320 * 647 * 647 99
2500 100				* 305 * 305 * 634 653			* 305 246 2840 * 663 553 119
2000 80				* 325 304 * 723 653	304 222	222	309 200 3260 643 453 100
1500 60			* 418 * 418 * 891 * 891	* 404 295 * 878 636	311 219	219	258 180 3350 571 338 90
1000 40			574 383 1238 850	405 283 873 609	344 212	212	240 156 3470 530 387 90
500 20			547 370 1179 799	292 270 844 583	297 206	206	234 161 3490 517 355 90
0 0			535 359 1152 775	303 262 824 564	292 204	204	233 164 3420 520 362 90
-500 -20	* 844 * 844 * 1723 * 1723	671 557 1565 1158	533 357 1146 789	379 258 815 557	289 199	199	258 177 3280 589 390 70
-1000 -40		* 945 583 * 1920 1210	535 360 1153 775	380 250 816 550			298 205 2570 660 454 120
-1500 -60		* 680 574 * 1449 1238	* 476 360 * 1003 794				* 324 270 2490 * 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.



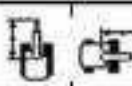
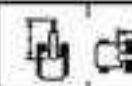

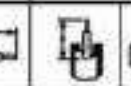
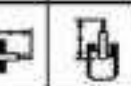
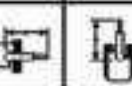
[mm] [inch]	100 40	150 60	200 80	250 100	300 120			
							[mm] [inch]	
3000 120						* 305 * 305	2320 90	
2500 100				* 306 * 306		* 300 * 246	2040 110	
2000 80				* 681 * 659	* 369 * 322	* 895 * 475	* 295 * 200	1750 100
1500 60			* 415 * 416	* 404 * 295	* 385 * 219	* 297 * 237	* 190 * 150	1350 70
1000 40			* 891 * 891	* 878 * 636	* 842 * 463	* 655 * 398	* 303 * 166	1170 70
500 20			* 798 * 370	* 563 * 270	* 438 * 205	* 321 * 161	* 161 * 161	3490 70
0 0			* 1712 * 799	* 1212 * 580	* 945 * 443	* 708 * 355	* 355 * 164	3420 70
500 20	* 844 * 844	* 954 * 557	* 705 * 357	* 628 * 288	* 394 * 199	* 330 * 177	* 177 * 130	3280 130
1000 40	* 1723 * 1723	* 2070 * 1138	* 1521 * 769	* 1039 * 557	* 842 * 421	* 727 * 390	* 390 * 205	2970 100
1500 40		* 1449 * 1236	* 1103 * 794				* 324 * 270	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 108								3040 120
2000 83								3300 130
1500 63								3500 140
1000 40								3600 150
500 25								3650 150
0 0								3600 150
-500 -25								3400 140
-1000 -40								3300 130
-1500 -63								2740 110
-2000 -80								2000 80

Illustration 135

g06364227

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

[mm] [inch]	1000 40		1500 60		2000 80		2500 100		3000 120		3500 140				[mm] [inch]
															
3800 129							251	251					247	241	2500 800
2500 108							222	222	280	280			242	242	3040 120
2000 83							246	246	315	315			239	239	3300 130
1500 63							254	254	345	325	204	249	239	239	3520 140
1000 41			1862	1962	987	987	451	433	380	317	243	245	246	232	3630 150
500 25					798	571	538	468	434	309	247	242	262	226	3650 150
0 0					626	1230	1850	678	916	604	746	628	976	699	3500 150
500 20			682	682	788	553	564	385	431	302	235	228	239	230	3500 150
1000 40	762	762			1591	1581	1638	1091	1214	653	828	690	714	514	3430 140
1500 60	1792	1703			735	617	638	388	467	298			313	245	3130 130
2000 80			829	888	847	649	477	388	361	218			310	277	2800 110
2500 100			896	1068	1281	1119	1022	638	742	640			604	625	2740 110
3000 120			767	767	538	530	378	378					314	314	2740 110
3500 140			627	637	1129	1129	736	736					633	633	2000 80
4000 160			536	538	342	342							342	342	2000 80
4500 180			112	112									764	764	2000 80

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								250 98.5
2500 82								242 95.3
2000 67								246 97.2
1500 49								254 100.0
1000 39								258 101.6
500 19								262 103.1
0 0								266 104.7
-500 -16								270 106.3
-1000 -33								274 107.9
-1500 -49								278 109.5
-2000 -66								282 111.1
-2500 -82								286 112.7

Illustration 137

g06364230

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

[mm] [inch]	1850 40		1901 50		2000 90		2500 105		3000 120		3500 140				[mm] [inch]
															
3000 120							251	200					251	261	2500 100
2500 100							222	222	280	224			242	219	3040 120
2000 80							188	190					175	191	3200 120
1500 60							146	146	305	222			138	184	3300 120
1000 40							104	107	340	218	284	184	108	163	3500 140
500 20					567	393	451	283	380	28	343	161	246	150	3600 140
0 0			1962	1320	1207	880	873	610	846	483	743	345	541	332	3600 150
-500 20					760	521	538	288	424	293	347	157	252	145	3600 150
-1000 40					1620	981	1028	578	998	436	746	327	576	322	3600 150
-1500 60					632	542	788	355	594	258	431	195	305	154	2800 110
-2000 80					1581	1165	1638	766	1214	556	928	423	718	330	2800 110
-2500 100	782	782			735	350	538	253	407	193			303	158	3600 140
-3000 120	1702	1703			1804	750	1058	544	872	415			688	349	3600 140
-3500 140			828	548	647	381	677	282	581	190			310	180	3100 120
-4000 160			1396	1179	1391	755	1022	543	742	408			584	288	3300 130
-4500 180					767	558	520	257	378	257			314	227	2740 110
-5000 200					1637	1202	1028	789	738	555			640	308	3300 130
-5500 220					536	336	342	342					342	342	3300 130
-6000 240					812	512							764	764	3000 120

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]	100 40	150 60	200 80	250 100	300 120		[mm] [inch]										
3000 120																(mm) (inch)	
2500 100																	
2000 80																	
1500 60																	
1000 40																	
500 20																	
0 0																	
500 20	* 844 * 1723	* 844 * 1723	920 1756	518 1112	501 1077	330 711	355 764	338 513	271 583	192 392	241 531	162 357	162 357	3260 139			
1000 40			827 1771	523 1124	504 1083	333 717	356 767	339 536						279 618	188 417	2970 120	
1500 60			* 688 * 1449	534 1150	* 476 * 1003	341 736								* 324 * 716	249 560	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)	1500 60		1500 60		2000 80		2500 100		3000 120				(mm) (inch)		
															
3000 120													* 305 * 647	* 305 * 847	2320 90
2500 100								* 305 * 634	287 685				* 305 * 663	228 564	2840 110
2000 80							* 325 * 723	284 669	* 369 * 815	205 448			* 335 * 645	190 410	3250 120
1500 60					* 415 * 891	380 848	* 404 * 878	375 852	* 385 * 842	202 434			* 297 * 655	165 366	3350 140
1000 40					* 672 * 1432	367 792	* 502 * 1081	262 565	* 418 * 915	196 421			* 303 * 668	152 336	3470 140
500 20					* 799 * 1712	343 741	* 583 * 1212	250 539	* 438 * 945	189 407			* 321 * 705	147 325	3490 140
0 0					* 777 * 1677	332 717	* 567 * 1220	242 520	* 431 * 928	184 396			* 338 * 746	150 331	3420 140
-500 -20	* 844 * 1723	* 844 * 1723	* 954 * 2070	518 1121	* 705 * 1521	330 711	* 526 * 1100	230 513	* 394 * 842	182 392			* 330 * 727	162 357	3280 120
-1000 -40			* 845 * 1820	523 1124	* 609 * 1307	323 717	* 451 * 964	229 516					* 324 * 715	158 417	2570 120
-1500 -80			* 680 * 1449	534 1159	* 476 * 1003	341 736							* 324 * 715	249 560	2490 100

Illustration 140

g06364234

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

Product Information Section
Lifting Capacities


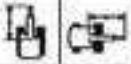
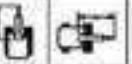
(mm) (inch)	1500 60	1501 60	2000 80	2500 100	3000 120	3500 140		(mm) (inch)
3000 120								2500 100
2500 100								3040 120
2000 80								3320 130
1500 60								3520 140
1000 40		1904	1225	548	372	283	263	3830 150
500 20				507	344	267	246	3860 150
0 0				1104	742	530	525	3920 150
-500 -20	762	762	805	804	833	848	855	3930 150
-1000 -40	1702	1702	1723	1662	1660	1665	1670	3960 150
-1500 -60			1737	1690	1662	1637	1622	3970 150
-2000 -80			1677	1610	1601	1574	1557	3980 150
			1637	1590	1579	1551	1534	3990 150

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.







Stroke (inch)	1000 40		1500 60		2000 80		2500 100		3000 120		3500 140				(mm) (inch)
															
2000 80							251	251					267	281	2500 100
2500 100							222	222	260	267			242	260	3040 120
2000 80							246	246	305	308			238	269	3220 130
1500 60							552	552	703	441			526	378	3500 140
1000 40							324	376	345	262	204	250	229	144	3600 140
500 20					567	372	451	263	390	84	343	147	246	127	3630 150
0 0			1862	1225	1207	892	373	666	846	428	743	378	541	363	3650 150
500 20					760	344	528	249	424	187	347	143	262	120	3650 150
0 0					626	762	1158	838	606	481	746	307	676	290	3650 150
500 20	762	762			769	328	564	226	401	98	335	140	288	135	3690 150
0 0	1702	1702			1561	1000	1636	793	1214	512	928	387	627	257	3690 150
1000 40					735	323	539	222	467	126			382	144	3430 140
500 20					1524	695	1155	560	872	280			689	257	3430 140
1000 40					829	609	847	324	472	232	350	177	310	164	3160 130
500 20					1336	1092	1391	697	1022	498	742	381	634	384	3160 130
1000 40					767	519	530	330	378	237			394	209	2740 110
500 20					1627	110	1029	711	798	511			653	467	2740 110
2000 80					536	536	342	242					342	342	2010 80
					112	112							764	764	2010 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 * 647 * 647 2320 90
2500 100				* 308 * 308 * 691 * 691		 	* 300 * 300 * 663 * 663 2840 100
2000 80				* 325 * 325 * 723 * 723	349 362 750 778	 	* 295 * 295 * 649 * 649 3150 130
1500 60			* 415 * 415 * 891 * 891	* 404 * 404 * 878 * 878	346 359 744 772	 	289 * 287 633 * 605 3350 140
1000 40			534 554 1366 1409	450 466 969 1003	339 353 730 759	 	270 281 595 620 3670 140
500 20			608 628 1309 1352	438 452 940 974	332 345 715 744	 	284 275 581 606 3690 140
0 0			596 616 1282 1326	427 443 920 955	327 340 704 733	 	269 281 594 619 3620 140
-500 -20	* 844 * 844 * 1723 * 1723	* 854 * 854 * 2069 * 2070	594 614 1276 1320	423 439 911 946	324 338 699 728	 	289 302 639 666 3260 130
-1000 -40		* 845 * 845 * 1820 * 1820	597 608 1283 * 1307	424 441 914 949		 	* 324 * 324 * 715 * 715 2870 120
-1500 -60		* 680 * 680 * 1449 * 1449	* 479 * 479 * 1009 * 1009			 	* 324 * 324 * 718 * 718 2690 100

Illustration 143

g06364250

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








[mm] [inch]	1000 40	1500 60	2000 80	2500 100	3000 120		(mm) (inch)	
3000 120							* 305 * 305 * 647 * 647	2320 90
2500 90				* 308 * 308 * 691 * 691			* 300 * 300 * 663 * 663	2840 100
2000 80				* 325 * 325 * 723 * 723	* 389 362 * 895 778		* 295 * 295 * 643 * 643	3150 130
1500 60			* 415 * 415 * 931 * 931	* 404 * 404 * 878 * 878	* 385 359 * 842 772		* 297 * 297 * 655 * 655	3350 140
1000 40			* 572 * 572 * 1432 * 1432	* 554 528 * 1409 1353	* 502 466 * 1081 1003		* 498 453 * 505 459	3670 140
500 20			* 799 * 799 * 1712 * 1712	* 628 615 * 1353 1326	* 563 528 * 1212 1120		* 498 453 * 545 499	3990 140
0 0			* 777 * 777 * 1677 * 1677	* 615 608 * 1326 1286	* 567 528 * 1220 1130		* 431 403 * 308 278	3620 140
-500 -20	* 844 * 844 * 1723 * 1723	* 844 * 844 * 2070 * 2070	* 854 * 854 * 2070 * 2070	* 705 * 705 * 1521 * 1521	* 614 528 * 1320 1130	* 439 346 * 942 728	* 330 302 * 727 668	3250 130
-1000 -40		* 845 * 845 * 1820 * 1820	* 845 * 845 * 1820 * 1820	* 608 * 608 * 1307 * 1307	* 451 364 * 441 343		* 324 * 324 * 715 * 715	2870 120
-1500 -60		* 680 * 680 * 1443 * 1443	* 680 * 680 * 1443 * 1443	* 473 * 473 * 1003 * 1003			* 324 * 324 * 718 * 718	2690 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]	100 40	150 60	200 80	250 100	300 120		[mm] [inch]
3000 120							* 305 * 305 2320 * 647 * 647 90
2500 100						* 306 * 306 * 681 * 681	* 300 * 274 2040 * 663 * 645 110
2000 80						* 325 * 325 * 723 * 723	349 247 * 295 * 228 1750 * 643 * 607 100
1500 60			* 415 * 415 * 891 * 891	* 436 * 436 * 911 * 911	* 459 * 459 * 978 * 978	327 346 244 * 285 * 202 1350 705 744 525 * 633 * 448 70	
1000 40			634 1366	436 941	459 989	315 679	339 730 231 512 * 270 * 188 1470 * 595 * 415 70
500 20			609 1309	412 890	436 940	302 652	332 715 231 498 * 264 * 183 1400 * 501 * 403 70
0 0			595 1282	402 866	427 920	294 634	327 704 225 488 * 263 * 186 1400 * 504 * 411 70
500 20	* 844 * 1723	* 844 * 1723	* 954 2068	620 1332	594 1276	400 861	423 911 290 628 324 689 224 483 * 289 * 180 1300 * 633 * 442 100
1000 40			* 845 1820	625 1345	597 1283	402 867	424 914 282 629 * 324 * 231 1370 * 715 * 512 100
1500 60			* 680 1449	637 1370	* 476 1003	430 886	* 324 * 302 2480 * 716 * 678 100

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]	100 40	150 60	200 80	250 100	300 120			[mm] [inch]					
3000 120													2320 90
2500 100													2040 110
2000 80													1760 130
1500 60													1480 140
1000 40													1200 140
500 20													920 140
0 0													640 140
500 20													360 130
1000 40													80 100
1500 60													0 100

Illustration 146

g06364260

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

Product Information Section
Lifting Capacities

(mm) (inch)	1500 60		1501 60		2000 80		2500 100		3000 120		3500 140				(mm) (inch)	
																
3000 120							281	301						261	261	2500 100
2500 100							222	232	260	280				242	242	3040 120
2000 80							248	248	305	305				238	238	3320 130
1500 60							324	334	345	345	284	284		230	230	3520 140
1000 40			1962	1962	567	567	451	451	538	551	263	275		246	246	3830 150
500 20					630	630	635	651	720	743	565	590		541	541	3850 150
0 0					1094	1057	937	970	790	739	597	562		534	534	3590 140
-500 -20	762	762	950	976	586	636	417	410	378	332				262	274	3830 150
-1000 -40	1703	1703	2035	2091	1260	1384	839	834	687	716				579	605	340 140
-1500 -60			1996	1996	1262	1386	827	822	688	717				656	686	130 130
-2000 -80			1637	1637	1029	1029	738	738						314	314	2740 110
-2500 -100			1102	1102	542	542								342	342	2010 80

Illustration 147

g06364481

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

[mm] [inch]	1000 40		1500 60		2000 80		2500 100		3000 120		3500 140				[mm] [inch]
															
3000 120							251	251					247	241	2500 100
2500 100							222	222	280	280			242	242	3040 120
2000 80							246	246	315	315			239	239	3200 130
1500 60							254	254	345	345	204	204	239	239	3200 140
1000 40			1862	1962	987	987	451	451	380	351	243	275	248	248	3600 150
500 20					798	630	520	481	424	343	247	211	262	253	3650 150
0 0			692	682	789	612	564	440	431	338	235	267	239	258	3500 150
-500 -20	762	762			735	606	539	433	487	332			313	274	3430 140
-1000 -40	1792	1703			1584	1394	1059	804	872	736			659	605	3800 130
-1500 -60			829	828	847	697	477	423	380	330			318	309	3740 130
-2000 -80			767	767	538	530	378	378					314	314	2740 130
-2500 -100			627	637	429	429	296	296					332	342	3040 100
-3000 -120			412	412	342	342							264	264	2500 100

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 108					280 248			3040 120
2000 83					246 246	315 248		3320 130
1500 63					204 209	245 244	204 88	3520 140
1000 40		1862 3455	987 441	451 305	338 237	283 207	263 303	3630 150
500 25			618 414	435 301	338 239	259 179	242 166	3650 150
0 0		692 591	684 1388	582 1274	398 857	423 312	256 625	3560 150
-500 -23	762 1792	762 1703	950 2005	688 1382	588 1268	392 845	417 899	3430 140
-1000 -43			828 1836	630 1382	587 1262	393 846	417 897	3360 130
-1500 -63			787 1727	625 1336	538 1129	389 860	378 796	3240 130
-2000 -83			636 1412	518 1192	342 312			3040 120

Illustration 149

g06364489

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

Lift Height (mm) (inch)	1000 40		1500 60		2000 80		2500 100		3000 120		3500 140				Lift Capacity (mm) (inch)		
																	
3000 120							251	251					267	281	2500 100		
2500 100							222	222	260	249			242	242	2040 80		
2000 80							188	246	305	248			238	287	1320 50		
1500 60							152	252	303	302			228	459	130 5		
1000 40							124	319	345	244	204	85	229	184	3520 140		
500 20							73	288	356	324			228	488	180 7		
0 0			1352	1455	567	441	451	305	390	237	343	182	246	271	2630 105		
500 20					760	414	528	301	424	229	347	179	262	185	3050 120		
0 0					626	393	198	648	606	482	240	304	576	367	155 6		
500 20					692	604	769	399	564	290	401	222	335	175	289	169	3590 143
0 0			1561	1300	636	857	1214	625	928	478	714	377	627	372	250 10		
500 20	762	752			735	392	539	285	467	29			382	180	3430 135		
0 0	1702	1703			1524	848	1155	603	872	471			689	357	140 5		
1000 40					829	611	847	393	472	304	390	239	310	284	2160 85		
0 0					1336	1313	1391	846	1022	603	742	472	684	452	130 5		
1000 40					767	621	500	399	378	288			394	258	2740 108		
0 0					1627	1326	1029	860	798	624			653	572	110 4		
2000 80					536	606	342	342					342	342	2010 80		
0 0					1113	1112							764	764	30 1		

Illustration 150

g06364496

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

Product Information Section
Lifting Capacities














[mm] [inch]	1000 40	1500 60	2000 80	2500 100	3000 120		[mm] [inch]
3000 120	 	 	 	 	 	 	305 120
2500 100				305 120	306 121		300 118
2000 80				325 128	336 132	330 130	295 116
1500 60			418 164	436 171	404 159	327 129	272 107
1000 40			402 158	409 161	428 168	294 116	321 126
500 20			578 228	385 151	412 162	362 142	215 85
0 0			584 230	375 147	403 158	274 108	219 86
500 20	844 332	844 332	885 348	580 228	561 220	399 156	270 106
1000 40		845 333	586 230	564 221	375 147	401 158	271 107
1500 60		880 347	597 235	478 188	384 151		282 111

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 2840 110
2000 80							326 723 3150 130
1500 60							418 891 3350 140
1000 40							672 1432 3470 140
500 20							799 1712 3630 140
0 0							777 1677 3820 140
-500 -20							844 1723 3260 130
-1000 -40							845 1820 2970 120
-1500 -60							690 1449 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



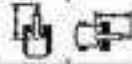


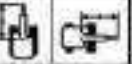

(mm) (inch)	1900 40	1500 60	2000 80	2500 100	3000 120	3500 140		(mm) (inch)
3000 120								2500 100
2500 100				222 88	222 88	288 113		3040 120
2000 80				246 97	246 97	315 124		3000 120
1500 60				552 217	552 217	763 300	261 102	3500 140
1000 40		1862 733	1988 781	367 144	414 163	427 168	389 153	3200 125
500 20			1244 493	878 344	397 156	411 161	38 15	3500 140
1 0		592 233	565 223	560 221	371 146	400 157	384 151	3500 140
500 20	762 300	762 300	699 275	586 231	395 155	394 155	244 96	3500 140
1000 40	1793 702	1703 668	1826 718	1237 487	886 348	847 333	648 255	3500 140
1500 60		805 316	871 341	858 336	366 144	393 155	388 152	3500 140
2000 80		1940 762	1228 481	1193 469	730 287	846 333	648 255	3500 140
2500 100		767 300	681 268	538 211	372 146	378 149		2740 108
3000 120		837 329	1251 491	1129 441	892 349	798 313		3000 120
3500 140		1112 434	1192 468	1042 408	342 134			3000 120

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.

Height (mm) (inch)	1000 40		1500 60		2000 80		2500 100		3000 120		3500 140				Height (mm) (inch)
															
2000 80							251	251					267	281	2500 100
2500 100							222	222	260	220			242	228	3040 120
2000 80							246	246	305	232			238	182	3200 130
1500 60							552	552	703	437			526	427	
1000 40							324	309	345	227	204	172	229	170	3500 140
500 20					567	414	451	295	390	220	343	169	246	158	3600 150
0 0			1862	1369	1207	894	873	625	846	474	740	362	541	343	3650 155
500 20					760	397	528	381	424	232	347	165	262	152	3690 155
0 0					626	335	498	368	306	157	240	114	176	100	
500 20					692	365	564	270	401	205	335	162	239	155	3790 150
0 0					1561	1214	1036	733	1214	581	928	443	714	347	
500 20	762	752			735	385	539	364	467	262			302	168	3400 140
0 0	1702	1703			1524	1117	1155	569	872	425			689	365	
1000 40					829	371	647	398	472	264	350	162	310	188	3800 150
0 0					1036	1210	1091	799	1022	568	740	437	684	418	430
1000 40					767	381	530	372	378	208			304	237	2740 110
0 0					1627	1251	1029	832	798	510			653	521	
2000 80					536	336	342	242					342	342	2010 80
0 0					1112	812							764	764	

Illustration 154

g06364512

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

Without Bucket



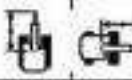
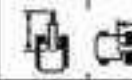


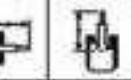
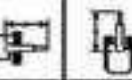
[mm] [inch]	1500 60	1500 60	2000 80	2500 100	3000 120		
							[mm] [inch]
3000 120			* 391 * 391			* 395 * 395	2010 80
2500 100				* 404 * 404 * 302 * 302		* 406 * 406 * 303 * 303	2640 110
2000 80				* 401 * 401 * 387 * 387		338 360 749 779	3000 120
1500 60		* 568 * 568	* 502 * 502 * 1073 * 1073	441 459 850 866	334 343 719 743	299 312 661 680	3230 130
1000 40			596 617 1284 1331	428 446 924 961	328 342 768 791	280 283 619 647	3240 140
500 20			573 594 1234 1281	416 434 898 935	322 336 635 725	270 287 606 634	3360 140
0 0		* 726 * 726 * 1705 * 1705	561 563 1203 1255	408 429 888 919	318 332 665 718	281 284 620 648	3290 130
500 20	* 878 * 878 * 1957 * 1957	889 888 1906 1969	559 580 1201 1248	405 422 873 910	318 334 683 710	302 318 667 698	3110 130
1000 40		836 * 888 1822 * 1953	561 583 1207 1255	406 424 877 915		343 354 774 808	2910 110
1500 60		* 722 * 722 * 1535 * 1535	* 495 * 495 * 1046 * 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							2000 80
2500 100							2040 100
2000 80							3000 120
1500 60							3200 130
1000 40							3340 140
500 20							3060 140
0 0							3280 130
-500 -20							3100 130
-1000 -40							2800 110
-1500 -60							2300 90

Illustration 156

g06364533

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

Product Information Section
Lifting Capacities






















[mm] [inch]	1000 40	1500 60	2000 80	2500 100	3000 120		(mm) (inch)	
3000 120			* 391 * 390			 	* 395 * 395 * 847 * 847	2000 80
2500 100				* 404 328 * 822 859		 	* 406 393 * 900 875	2040 100
2000 80				* 401 325 * 887 701		 	398 244 748 543	3000 120
1500 60		* 566 * 566	* 502 440 * 1078 950	441 398 950 885	334 242	 	299 296 661 479	3230 130
1000 40			596 416 1294 900	428 306 924 662	328 237 708 501	 	280 202 619 447	3340 140
500 20			573 396 1234 855	48 295 898 638	322 231 595 439	 	275 199 606 436	3060 140
0 0		* 736 575 * 1705 1238	561 385 1209 832	408 288 900 621	398 227 685 490	 	281 202 620 444	3290 130
-500 -20	* 878 * 878 * 1857 * 1857	699 577 1906 1243	559 392 1201 826	406 286 873 616	396 226 683 487	 	302 296 667 477	3190 130
-1000 -40		896 584 1922 1256	561 385 1207 831	406 286 877 619		 	349 248 774 551	2830 110
-1500 -60		* 722 596 * 1535 1284	* 495 394 * 1045 852			 	* 384 327 * 849 734	2390 90

Illustration 157

g06364534

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
















[mm] [inch]	1000 40		1500 60		2000 80		2500 100		3000 120				[mm] [inch]		
 													[mm] [inch]		
3000 120					* 391	* 391						* 395	* 395	2010 80	
2500 100							* 404	326				* 406	* 389	2640 110	
2000 80							* 401	325				* 377	244	3000 120	
1500 60			* 568	* 596	* 502	440	* 466	318	* 436	242	* 370	216	* 370	216	3230 130
1000 40					* 719	436	* 547	306	* 458	237	* 379	202	* 379	202	3240 140
500 20					* 825	386	* 596	295	* 470	231	* 398	198	* 398	198	3360 140
0 0			* 726	575	* 811	365	* 595	288	* 457	227	* 383	202	* 383	202	3290 130
500 20	* 878	* 879			* 741	362	* 561	285	* 442	225	* 381	216	* 381	216	3110 130
1000 40	* 1857	* 1857			* 1598	825	* 1085	615	* 876	487	* 840	477	* 840	477	2910 110
1500 60			* 930	594	* 649	385	* 471	286			* 378	248	* 378	248	2910 110
2000 80			* 1953	1256	* 1374	831	* 1005	619			* 832	551	* 832	551	2310 90
2500 100			* 722	536	* 495	394					* 384	327	* 384	327	2310 90
3000 120			* 1535	1214	* 1046	852					* 843	734	* 843	734	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]
															
3800 129													348	345	2700 90
2500 108							311	308					319	319	2000 180
2000 83							326	326	337	351			302	302	1800 150
1500 63					379	379	403	403	434	448			275	287	1400 140
1000 40			853	865	888	922	928	948	1024	1041			259	271	1000 140
500 25			783	793	813	835	845	872	918	933	255	267	254	246	500 140
0 0			868	888	908	938	944	971	1028	1043			268	271	1450 140
500 -23	888	918	876	888	908	932	938	965	1011	1026			275	288	1200 130
1000 -43	1020	1030	981	988	1008	1032	1038	1065	1111	1126			301	325	1000 120
1500 -63			808	808	853	853	880	880					370	370	850 100
2000 -83			1125	1125	1170	1170							421	421	650 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															348 746	345 748	2700 90
2500 108								311 712	308 702						319 708	319 708	2600 180
2000 83								326 728	326 728	328 838	351 795				302 667	302 667	2400 130
1500 63					379 828	379 828		403 881	403 881	388 874	348 748				309 689	387 825	2100 140
1000 41					827 1342	822 1340		502 1087	448 981	434 943	341 735				308 678	271 598	2000 140
500 25					753 1675	753 1675	791 1698	995 1292	574 1259	432 931	458 933	332 718	202 267		328 723	246 540	2520 140
1 1					868 1900	888 1942	818 1782	578 1246	580 1279	421 968	460 1006	327 706			364 802	271 596	2150 140
500 25	818 1828	818 1828			767 1693	872 1232		565 1236	418 897	438 922	324 700				382 798	288 625	2280 130
1000 41					895 1914	888 1951	878 1857	873 1233	600 1072	418 896	383 838	308			382 797	325 721	2010 120
1500 63					809 1725	888 1925	953 1178	953 1178	380 888						378 818	370 818	2570 100
2000 83					951 1126	960 1104									421 951	421 951	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]	1850 40		2500 80		3000 60		2500 80		3000 120		3500				[mm] [inch]		
																	
3000 120															365	365	2310
															740	740	90
2500 100								311	30						319	285	2650
								712	767						708	557	180
2000 80								326	304	337	245				302	221	2190
								726	764	725	526				687	433	120
1500 60					379	379	400	38	334	241					275	189	2100
				828	820	691	685	718	59						509	435	140
1000 40			853	638	861	420	429	388	327	235					259	188	2500
			2052	1363	1294	997	924	668	794	906					571	410	140
500 20			753	678	573	395	495	287	388	228	205	83			254	181	2620
			1285	1248	1235	854	694	610	688	492					559	490	140
0 0			866	565	956	391	404	283	313	222					258	184	2150
			1879	1217	1198	821	871	612	675	480					563	495	140
-500 -20	68	216	875	664	559	375	389	278	388	219					275	195	2290
	1826	1820	1876	1215	1184	809	659	601	669	470					607	431	130
-1000 -40			881	589	581	378	398	278	38	221					311	230	2010
			1899	1225	1198	810	659	601							609	488	120
-1500 -60			803	588	553	382	390	284							370	270	2570
			1725	1218	1179	825									618	457	100
-2000 -80			551	581											421	421	1790
			1190	1184											461	461	70

Illustration 161

g06364543

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

[mm] [inch]	1850 40		1500 30		1000 60		750 30		500 120		250				[mm] [inch]		
																	
3000 120															365	365	2310
															746	746	90
2500 100								311	30						319	288	2650
								712	767						708	557	180
2000 80								326	324	378	245				302	221	2190
								726	764	839	526				687	433	120
1500 60					379	379	400	38	389	241					308	180	2100
					829	820	691	686	874	59					560	438	140
1000 40					627	420	502	388	434	235					308	188	2500
					1342	997	1067	668	943	906					678	410	140
500 20					750	678	791	395	574	287	499	228	372	83	328	181	3520
					1315	1248	1038	854	1229	610	983	492			723	490	140
1 1					866	565	818	391	580	283	498	222			384	184	3150
					1890	1217	1762	821	1779	612	898	480			802	495	140
500 20	616	316			767	375	565	278	438	219				382	195	3290	
	1826	1820			1653	899	1216	601	922	470				798	431	130	
1000 40					806	589	678	378	500	278	383	221			362	230	3010
					2118	1225	1457	810	1072	601					797	488	120
1500 60					803	588	653	382	390	284					378	278	2570
					1725	1218	1178	825							818	617	100
2000 80					951	581									421	421	1790
					1120	104									461	461	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]	1800 40	1500 60	2000 80	2500 100	3000 120		[mm] [inch]	
3000 120								395 15.5
2500 100								391 15.4
2000 80								317 12.5
1500 60		588 23.1	502 19.8	410 16.1	417 16.4	297 11.7	224 8.8	281 11.1
1000 40			584 23.0	389 15.3	405 15.9	288 11.3	310 12.2	284 11.2
500 20			540 21.3	369 14.5	393 15.5	275 10.8	343 13.5	259 10.2
0 0		736 28.9	538 21.2	529 20.8	358 14.1	287 11.3	299 11.7	210 8.3
-500 -20	878 34.5	878 34.5	1730 67.7	1131 44.5	1131 44.5	767 30.2	822 32.4	571 22.5
-1000 -40		946 37.3	544 21.4	523 20.6	358 14.1	303 11.9	286 11.3	329 12.9
-1500 -60		722 28.4	596 23.5	485 19.1	367 14.4			384 15.1

Illustration 163

g06364552

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








[mm] [inch]	1000 40	1500 60	2000 80	2500 100	3000 120		(mm) (inch)
3000 120							2000 80
2500 100				404 160	306 122		2640 100
2000 80				401 160	308 123		2000 80
1500 60		568 22	508 20	502 20	415 16	438 17	3230 120
1000 40			718 28	385 15	547 21	488 19	3340 130
500 20			825 33	368 14	598 23	470 18	3060 120
0 0		738 29	508 20	311 12	358 14	595 23	3290 129
-500 -20	878 34	878 34		741 29	358 14	551 21	300 12
-1000 -40		808 31	544 21	649 25	358 14	471 18	2890 110
-1500 -60		722 28	566 22	495 19	367 14		2390 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								345 746	345 746	2700 90
2500 100								311 712	305 683	2600 180
2000 80								326 728	316 688	2100 130
1500 60				379 828	379 828	400 881	248 642	316 678	315 694	1400 40
1000 40		803 1943	588 1278	558 1225	393 849	405 873	286 68	388 864	219 471	3000 140
500 20		783 1907	538 1183	541 1196	369 796	391 842	273 589	308 648	212 456	240 60
0 0		825 1770	525 1162	524 1129	354 763	360 820	263 568	254 638	206 444	2150 40
-500 -20	816 1826	918 1920	824 1768	525 1168	518 1115	348 751	275 608	268 587	208 430	2000 130
-1000 -40		630 1390	538 1190	538 1190	348 752	348 757	276 608	268 587	208 430	1900 120
-1500 -60		808 1725	540 1184	526 1133	355 767	381 844				1570 300
-2000 -80		651 1126	560 1246							1190 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)
3000 120								340 134
2500 100								310 122
2000 80								325 128
1500 60								379 149
1000 40								427 168
500 20								753 296
300 12								868 341
150 6								1000 394
100 4								1020 401
50 2								1020 401
30 1								1020 401
15 0.6								1020 401
10 0.4								1020 401
5 0.2								1020 401
3 0.1								1020 401
1 0.04								1020 401

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]	100 40	1500 60	2000 80	2500 100	3000 120		[mm] [inch]	
3000 120								2010 80
2500 100								2640 110
2000 80								3000 120
1500 60								3230 130
1000 40								3240 140
500 20								3360 140
0 0								3290 130
500 20								3110 130
1000 40								2910 110
1500 60								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							2000 80
2500 100							2040 100
2000 80							3000 120
1500 60							3200 130
1000 40							3340 140
500 20							3060 140
0 0							3280 130
-500 -20							3100 130
-1000 -40							2800 110
-1500 -60							2300 90

Illustration 168

g06364588

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

Product Information Section
Lifting Capacities








[mm] [inch]	100 40	150 60	200 80	250 100	300 120		[mm] [inch]
3000 120							2010 80
2500 100							2640 110
2000 80							3000 120
1500 60							3230 130
1000 40							3240 140
500 20							3360 140
0 0							3290 130
500 20							3110 130
1000 40							2910 110
1500 60							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]	1500 60		1500 60		2000 80		2500 100		3000 120				[mm] [inch]
													
3000 120					* 391	* 391					* 395	* 395	2010 80
2500 100							* 404	358			* 406	300	2640 110
2000 80							* 822	783			* 803	743	3000 120
1500 60			* 586	* 586	* 502	482	* 466	350	* 436	288	* 370	240	3220 130
1000 40					* 718	459	* 647	309	* 458	253	* 073	225	3340 140
500 20					* 1538	391	* 1803	731	* 384	567	* 834	497	3360 140
0 0			* 736	638	* 1774	947	* 1286	707	* 1085	554	* 399	220	3290 130
0 0			* 1795	1373	* 1750	923	* 1263	691	* 1057	545	* 383	225	3290 130
900 36	* 878	* 878			* 741	428	* 651	317	* 492	251	* 391	241	3110 125
200 8	* 1957	* 1957			* 1598	907	* 1886	684	* 876	541	* 840	532	2980 120
1000 40			* 938	646	* 649	427	* 471	318			* 378	276	2810 115
1500 60			* 1953	1385	* 1374	923	* 1005	688			* 832	610	2710 110
1500 60			* 722	658	* 495	436					* 384	362	2710 110
800 32			* 1535	1418	* 1348	944					* 848	813	2610 105

Illustration 170

g06364606

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

Product Information Section
Lifting Capacities

[mm] [inch]	1500 40		1501 50		2000 90		2500 135		3000 120		3500				[mm] [inch]		
																[mm] [inch]	
3000 120														345 745	345 745	370 30	
2500 100							39 712	31 712							308 768	308 768	3550 150
2000 80							128 726	106 735	172 801	178 823					362 867	362 867	3890 130
1500 60					378 820	379 820	403 881	400 881	368 794	369 823					390 860	390 860	3800 160
1000 40					627 1342	627 1342	473 1019	468 1014	362 780	375 869					288 835	289 860	3500 140
500 20				753 1615	753 1615	624 1365	614 1369	459 999	415 925	354 784	349 793	284 298			292 620	294 649	3520 140
0 0				895 1983	886 1980	637 1328	637 1372	448 967	465 1002	348 751	362 780				288 635	299 660	3450 140
-500 -20	818 1820	118 1820	969 2079	955 2115	690 1314	631 1358	443 955	458 989	345 745	358 774					366 676	358 760	3290 130
-1000 -40			979 2091	955 2114	611 1316	631 1360	443 955	458 990	347 767	360					346 765	360 785	3010 120
-1500 -60			803 1725	800 1725	553 1078	553 1078	390 878	390							370 818	370 868	2570 100
-2000 -80			551 1198	551 1198											421 950	421 951	1790 70

Illustration 171

g06364612

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

(mm) (inch)	1000 40	1500 60	2000 80	2500 100	3000 120	3500		(mm) (inch)				
3800 129								348 746	345 748	2700 90		
2500 108					311 712	308 702				319 708	2600 180	
2000 83					326 728	326 728	378 828			302 667	2400 130	
1500 63			379 828	379 820	403 881	403 881	388 823			309 680	2100 140	
1000 40			827 1342	827 1342	502 1087	488 1054	434 943	375 808		308 678	2000 140	
500 25		753 1675	753 1685	791 1698	854 1909	854 1925	478 1025	458 993	360 795	202 640	200 140	
0 0		868 1900	868 1900	818 1762	837 1772	580 1279	465 1002	460 998	362 790		364 802	2150 140
500 20	818 1825	818 1820		767 1693	631 1398	565 1236	478 1058	438 922	358 774		362 798	2200 130
1000 40		895 1914	895 1914	878 1937	831 1860	600 1372	458 1022	363 790	360		362 797	2000 120
1500 63		809 1725	809 1725	888 1978	888 1978	553 1219	553 1219				378 818	2570 100
2000 80		691 1526	691 1526								421 951	1700 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]	1500 60		1501 60		2000 80		2500 100		3000 120		3500				[mm] [inch]
															
3000 120													346	346	3700 150
2500 100							38	31					308	293	3550 140
2000 80							712	712					268	245	3600 140
1500 60							128	106	172	271			262	245	3650 140
1000 40							726	726	801	562			267	245	3700 150
500 20							378	378	403	360	369	267	260	239	3800 160
0 0							820	820	881	766	754	575	260	239	3850 160
-500 -20							627	462	473	318	362	281	268	237	3900 160
-1000 -40							1042	999	1019	720	780	562	235	235	3950 160
-1500 -60							753	640	624	439	459	325	254	254	4000 160
-2000 -80							1215	1302	1065	846	999	760	264	264	4050 160
-2500 -100							896	627	617	423	448	318	248	248	4100 160
-3000 -120							1983	1362	1329	843	967	681	251	235	4150 160
-3500 -140							818	627	610	417	443	310	245	245	4200 160
-4000 -160							1820	1320	1314	880	955	670	245	223	4250 160
-4500 -180							379	632	611	418	443	310	247	246	4300 160
-5000 -200							2091	1360	1316	892	955	670	246	246	4350 160
-5500 -220							803	642	653	424	438	318	270	267	4400 160
-6000 -240							1725	1394	1379	917	917	670	267	267	4450 160
-6500 -260							551	551					421	421	4500 160
-7000 -280							1106	1106					261	261	4550 160

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								345 746	345 746	2700 90	
2500 108					311 712	308 702				319 708	2400 180
2000 68					326 728	326 728	378 839	371 832		302 667	2100 130
1500 48			379 828	379 828	403 881	368 796	388 874	367 795		309 689	1800 140
1000 40			427 942	492 998	502 987	388 728	434 943	351 782		308 678	1500 110
500 25		753 1975	649 1663	791 1698	430 946	574 1259	325 762	459 933	204 547	328 723	1200 110
0 0		868 1900	627 1582	818 1762	423 913	590 1279	385 841	460 935		364 802	900 140
-500 -23	896 1826	918 1820		767 1693	417 930	565 1236	380 818	438 922		382 798	600 130
-1000 -43			895 1914	632 1388	878 1457	488 992	600 1072	388 878		382 797	300 120
-1500 -62			809 1725	642 1384	553 1178	424 917	388 888			378 818	0 0
-2000 -80			591 1126	566 1046						421 951	1190 70

Illustration 174

g06364618

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

Product Information Section
Lifting Capacities

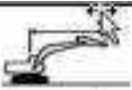


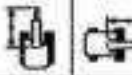
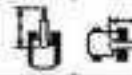
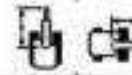
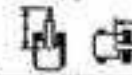
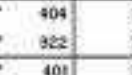
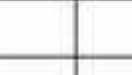
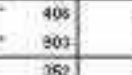
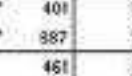
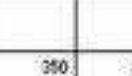
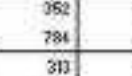
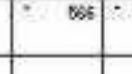
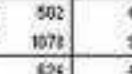
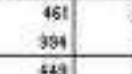
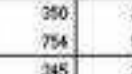
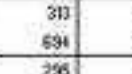
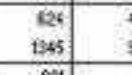
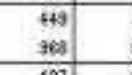
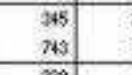
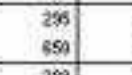

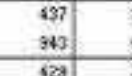







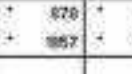
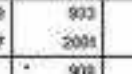

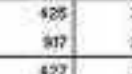
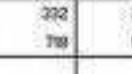
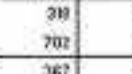
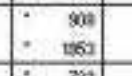
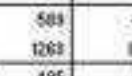
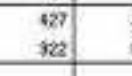
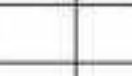
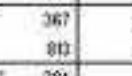

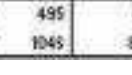
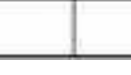
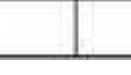
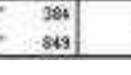
[mm] [inch]	1000 40	1500 60	2000 80	2500 100	3000 120		(mm) (inch)
3000 120							2000 80
2500 100							2040 100
2000 80							3000 120
1500 60							3200 130
1000 40							3340 140
500 20							3360 140
0 0							3280 130
-500 -20							3100 120
-1000 -40							2800 110
-1500 -60							2300 90

Illustration 175

g06364639

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














[mm] [inch]	1500 60		1500 60		2000 80		2500 100		3000 120				[mm] [inch]		
															
3000 120					* 391	* 391							* 395	* 395	2010
2500 100							* 404	538					* 847	* 847	89
2000 80							* 408	327					* 377	253	3000
1500 60			* 586	* 586	* 502	455	* 466	329	* 436	252	* 370	225	* 820	584	128
1000 40					* 1873	983	* 1015	711	* 952	542	* 616	498	* 379	211	3240
500 20					* 718	432	* 547	319	* 458	245	* 373	211	* 834	465	340
0 0					* 325	411	* 596	307	* 470	241	* 393	206	* 820	584	128
0 0			* 736	538	* 1774	888	* 1286	663	* 1085	519	* 379	206	* 820	584	128
0 0			* 1795	1288	* 1750	865	* 1263	647	* 1085	519	* 379	206	* 820	584	128
0 0					* 811	401	* 595	300	* 457	234	* 383	200	* 820	584	128
0 0					* 741	398	* 551	286	* 412	235	* 391	225	* 820	584	128
0 0					* 1598	859	* 1886	640	* 876	508	* 340	225	* 820	584	128
0 0					* 938	686	* 649	401	* 471	288	* 378	259	* 820	584	128
0 0			* 1953	1386	* 1374	865	* 1005	644			* 832	573	* 820	584	128
0 0			* 722	819	* 495	410					* 384	339	* 820	584	128
0 0			* 1535	1074	* 1348	885					* 848	763	* 820	584	128

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								348 746	345 748	2700 90
2500 108								311 712	308 712	2600 180
2000 68								326 728	326 728	2400 130
1500 63				379 828	379 828	403 881	398 712	368 752	351 540	2100 140
1000 41		897 2098	653 1612	827 1342	495 910	449 860	318 686	343 739	244 527	3000 160
500 25		753 1975	601 1538	601 1538	411 990	435 908	365 688	336 724	257 512	2600 160
1 1		868 1973	588 1567	585 1559	396 855	425 936	295 637	338 718	232 500	2450 140
500 -23	898 1828	918 1820	919 1971	517 1364	579 1245	390 842	419 804	298 628	326 704	2280 130
1000 -43		809 1863	582 1275	679 1246	391 844	419 804	298 628	328 704	230 500	2010 120
1500 -63		809 1725	683 1539	553 1179	398 859	390 859	298 628			2570 100
2000 -83		591 1126	590 1104							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]		
																	
2000 80															240 240	230 30	
2500 100							38 712	31 72							208 208	275 69	2050 10
2000 80							328 728	326 726	278 628	254 548					262 667	230 52	2190 130
1500 60					278 620	279 620	403 881	320 70	389 874	261 540					360 660	200 45	2400 140
1000 40					627 1342	435 940	502 1097	318 696	434 943	244 527					268 676	184 427	2000 140
500 20			753 1318	401 1296	791 1690	411 888	574 1238	365 798	459 990	237 512	372 100				328 723	189 41	2520 140
0 0			894 1933	568 1267	818 1762	395 858	593 1278	295 637	460 990	232 503					364 802	192 423	2450 140
500 -20	816 1820	418 1820			767 1653	380 842	565 1216	290 626	430 922	229 494					362 796	204 459	2290 130
1000 -40			895 1215	592 1275	878 1457	381 844	609 1072	290 626	363 726	229					362 797	230 509	2010 120
1500 -60			808 1725	803 1290	853 1070	393 853	390 286								270 616	207 843	2570 100
2000 -80			591 1136	591 1136											421 951	421 951	1790 70

Illustration 178

g06364674

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

302

With Bucket















[mm] [inch]	1500 60		2000 80		2500 100		3000 120		3500 140				(mm) (inch)	
														
3000 120												* 305 * 305	2560	
2500 100												* 647 * 647	100	
2000 80					* 566 * 566							* 300 * 300	3080	
1500 60					* 284 * 284	* 633 * 633	* 362 * 362	* 336 * 336				* 295 * 295	270	
1000 40					* 418 * 418	* 888 * 888	* 418 * 418	* 389 * 389	* 323 * 323	300	254	* 287 * 287	243	
500 20					* 882 * 882	* 988 * 988	* 888 * 888	* 838 * 838	* 708 * 708			* 638 * 638	537	
0 0					725 1062	598 929	507 1082	426 917	380 817	323 690	298 636	250 537	* 269 * 269	227
-500 -20							499 1055	409 882	371 797	312 671	292 627	246 528	* 263 * 263	221
-1000 -40					695 1476	561 1206	483 1032	409 861	364 793	309 657	289 600	242 521	* 261 * 261	226
-1500 -60	* 678 * 678	* 1595 * 1595	696 1471	562 1207	476 1024	396 853	361 776	302 651					* 269 * 269	242
-2000 -80			699 1481	566 1216	478 1029	398 856	362 780	304 654					* 324 * 324	276
-2500 -100	* 657 * 657	* 1815 * 1815	* 562 * 562	* 1094 * 1094	* 399 * 399	* 832 * 832							* 324 * 324	2740
-3000 -120													* 718 * 718	100

Illustration 179

g06364681

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















(mm) (feet)	1630 63		2000 80		2500 100		3000 120		3500 140				(mm) (feet)	
													(mm) (feet)	
3000 120												* 305 * 617	* 305 * 617	2500 100
2500 100						* 506 * 506						* 300 * 603	* 300 * 603	3000 120
2000 80						* 284 * 633	* 284 * 633	* 352 * 783	335 718			* 295 * 649	* 270 * 691	3400 140
1500 60			* 419 * 882	* 419 * 882	* 411 * 888	* 411 * 888	* 411 * 888	* 395 * 861	329 738	* 374 * 754	254	* 297 * 655	* 243 * 537	3500 140
1000 40			* 858 * 1794	588 1291	* 567 * 1213	426 917	* 454 * 880	321 690	* 386 * 834	250 537		* 303 * 606	227 500	3710 150
500 20					* 657 * 1408	409 892	* 491 * 1059	312 671	* 393 * 841	246 528		* 321 * 706	221 488	3740 150
0 0			* 108 * 1364	561 1200	* 658 * 1414	409 861	* 491 * 1055	385 857	* 378 * 803	242 521		* 339 * 745	226 498	3870 150
500 -20	* 878 * 1999	* 878 * 1999	* 818 * 1784	582 1287	* 606 * 1300	398 853	* 468 * 974	382 851				* 330 * 727	242 534	3500 140
-1000 -40			* 708 * 1520	566 1216	* 523 * 1118	398 856	* 383 * 809	384 854				* 324 * 715	275 613	3210 130
-1500 -60	* 857 * 1815	* 857 * 1815	* 562 * 1194	* 552 * 1194	* 398 * 832	* 398 * 832						* 324 * 715	* 324 * 715	2740 110

Illustration 180

g06364693

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

Product Information Section
Lifting Capacities



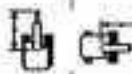


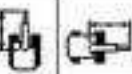
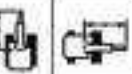
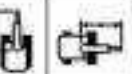



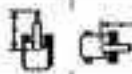

(mm) (inch)	1590 63	2050 82		2500 100		3000 120		3500 140				(mm) (inch)	
												(mm) (inch)	
3000 120											* 305 * 647	208 647	2080 100
2500 100					* 556 * 566						* 308 * 663	207 466	3090 120
2000 80					* 284 * 633	* 284 * 633	* 352 * 783	217 465			* 295 * 649	172 382	3400 140
1500 60			* 419 * 382	413 * 382	* 411 * 888	288 619	369 836	212 455	300	160	287 635	152 335	3590 140
1000 40			725 1562	376 813	507 1092	272 586	380 817	204 438	296 636	156 336	289 593	140 309	3710 150
500 20					498 1055	267 553	371 797	195 420	252 627	152 326	263 589	130 290	3740 150
0 0			486 1470	342 737	484 1032	248 533	364 783	189 407	288 628	149 319	288 582	133 306	3870 150
500 -20	* 878 * 1966	554 1187	386 1471	343 737	476 1024	244 526	361 776	188 401			288 635	148 327	3500 140
-1000 -40			590 1481	346 745	471 1029	246 529	362 780	188 405			* 324 * 715	171 379	3210 130
-1500 -60	* 857 * 1815	566 1217	* 562 1194	355 764	* 398 * 832	253 546					* 324 * 716	223 500	2740 110

Illustration 181

g06364694

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




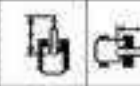

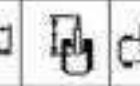
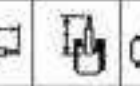



(mm) (inch)	1590 60		2050 80		2500 100		3000 120		3500 140				(mm) (inch)	
														
3000 120												* 305 * 647	209 100	2560
2500 100					* 594 * 566							* 300 * 663	207 466	3090 120
2000 80					* 284 * 633	* 264 * 633	* 362 * 783	217 465				* 295 * 649	172 382	3400 140
1500 60			* 419 * 882	413 * 812	* 411 * 888	288 619	* 395 * 851	212 455	* 374 160			* 297 * 655	152 336	3590 140
1000 40			* 858 * 1794	376 813	* 587 * 1213	272 586	* 454 * 880	204 438	* 386 * 834	156 335		* 303 * 668	142 309	3710 150
500 20					* 657 * 1408	257 553	* 491 * 1056	195 420	* 393 * 841	152 326		* 301 * 706	136 299	3740 150
0 0			* 300 * 1964	342 737	* 658 * 1414	246 533	* 491 * 1056	189 407	* 378 * 802	149 319		* 338 * 745	130 304	3670 150
400 20	* 878 * 1966	554 1187	* 810 * 1761	343 737	* 696 * 1502	244 526	* 455 * 874	196 401				* 338 * 727	140 307	3500 140
-1000 -40			* 768 * 1520	345 745	* 623 * 1118	245 529	* 393 * 809	188 405				* 324 * 715	171 379	3210 130
-1500 -60	* 857 * 1815	566 1217	* 562 * 1194	355 764	* 398 * 832	253 546						* 304 * 715	223 500	2740 110

Illustration 182

g06364696

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

Product Information Section
Lifting Capacities

(mm) (inch)	1000 40	1500 60	2000 80	2500 100	3000 120	3500 140		(mm) (inch)							
3800 129								2020 190							
2500 100					277 638	277 630		2050 130							
2000 80					288 698	288 698	301 285	2070 140							
1500 60				398 680	398 680	343 750	329 709	2090 150							
1000 40			888 1438	890 1014	456 1062	438 921	378 815	320 697	284 632	248 503	246 541	208 480	2880 160		
500 20			696 1697	571 1230	490 1054	469 960	369 792	309 666	269 620	242 521	242 521	207 440	2860 160		
0 0			879 1458	595 1094	476 1024	385 852	360 774	301 648	284 630	238 511	246 543	206 455	2820 150		
-500 -20	762 1884	762 1924	877 1964	877 1998	676 1498	552 1236	470 1011	388 838	355 784	297 670	281 605	235 507	282 578	2800 150	
-1000 -40					679 1456	555 1232	470 1030	388 838	358 782	296 670			284 652	248 540	2480 140
-1500 -60		898 2007	904 2066	627 1335	562 1239	448 946	385 856						314 693	305 682	2880 120
-2000 -80				428 877	408 877								342 764	342 764	2150 90

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		1500 30		1000 60		750 30		500 120		250 140				[mm] [inch]		
																	
3000 120															261 10.3	281 11.0	2620 100
2500 100									277 10.9	277 10.9					242 9.5	242 9.5	3280 130
2000 80									288 11.3	288 11.3	316 12.4	255 10.0			238 9.4	238 9.4	3670 140
1500 60								318 12.5	318 12.5	343 13.5	318 12.5	342 13.5	283 11.1		239 9.4	222 8.7	3760 150
1000 40				886 34.9	830 32.7	456 17.9	438 17.2	416 16.4	320 12.6	310 12.2	268 10.5	248 9.8	248 9.8	248 9.8	248 9.8	288 11.3	3880 150
500 20				995 39.2	971 38.2	625 24.6	609 23.9	589 23.1	472 18.6	398 15.7	380 14.9	242 9.5	262 10.3	262 10.3	262 10.3	262 10.3	3800 150
1 0				995 39.2	995 39.2	658 25.9	652 25.7	649 25.5	489 19.2	391 15.4	380 14.9	238 9.4	263 10.3	263 10.3	263 10.3	263 10.3	3800 150
-500 -20	762 30.0	762 30.0	877 34.5	877 34.5	871 34.3	852 33.5	824 32.4	798 31.4	488 19.2	257 10.1	352 13.8	235 9.3	313 12.3	313 12.3	313 12.3	219 8.6	3680 150
-1000 -40	1604 63.1	1604 63.1	1604 63.1	1608 63.3	1673 65.8	1636 64.4	1540 60.6	1518 59.7	939 37.0	670 26.4	747 29.4	507 19.9	688 27.1	688 27.1	688 27.1	494 19.4	3500 150
-1500 -60			906 35.7	904 35.6	827 32.5	802 31.5	744 29.3	708 27.8					314 12.3	305 12.0	305 12.0	260 10.2	3260 120
-2000 -80			2087 82.1	2086 82.1	1335 52.7	1299 51.1	948 37.3	888 34.9					342 13.5	342 13.5	342 13.5	242 9.5	2250 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


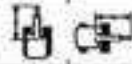
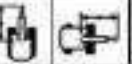
(mm) (inch)	1850 40	1500 30	1000 60	750 30	500 120	250 140								
							(mm) (inch)							
3000 120							* 261 245 2020 * 563 541 180							
2500 100					* 277 218		* 242 184 3280 * 535 414 130							
2000 80					* 288 217	301 80	* 239 195 3070 * 528 344 140							
1500 60				* 318 288	* 343 311	289 98	* 239 137 3760 * 528 303 150							
1000 40			* 686 395	* 496 273	379 202	254 74	* 248 126 3880 * 541 279 80							
500 20			* 636 350	* 450 255	268 155	289 145	* 242 122 3800 * 534 289 90							
1 1			* 579 336	* 476 243	368 195	284 144	* 248 123 3630 * 543 272 150							
-500 -20	* 762 1804	* 762 1804	* 877 195	* 676 1450	333 717	470 811	218 512	355 744	181 380	281 605	142 305	262 579	131 280	3680 80
-1000 -40				* 679 1456	336 722	470 810	218 512	355 743	181 388			284 652	149 331	3430 140
-1500 -60		* 806 2087	* 548 180	* 627 1335	343 738	* 448 848	242 523					* 314 693	187 418	2360 120
-2000 -80				* 428 877	357 772							* 342 764	200 636	2250 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.

Lift (mm) (inch)	1000 40		1500 60		2000 80		2500 100		3000 120		3500 140				(mm) (inch)		
																	
2000 80															260	245	2020
2500 100									277	29					242	165	2280
2000 80									630	469					535	416	1720
1500 60									388	27	316	110			238	185	2570
1000 40									646	465					526	344	1600
500 20								316	240	343	39	340	258		229	157	2700
0 0								688	624	750	454	750	328		528	380	1500
500 20					666	385	496	273	496	262	368	154			246	126	2680
0 0					1128	832	1062	568	901	435	793	330			541	279	1600
500 20					945	390	625	285	472	313	393	148			262	122	2900
0 0					2060	756	1338	660	1017	414	826	316			676	269	1600
500 20					855	326	658	240	499	365	380	144			288	120	2820
0 0					2060	724	1410	524	1650	388	815	309			637	272	1500
500 20	762	752	877	534	871	393	624	238	466	31	352	142			382	131	2680
0 0	1604	1604	1804	1145	1673	717	1348	502	1398	288	747	305			688	250	1500
500 20					763	326	663	238	490	360					310	149	2480
0 0					1626	722	1180	502	1370	288					684	231	1400
500 20			888	548	627	380	448	242							394	167	2680
0 0			2007	1180	1335	738	948	523							653	418	1200
2000 80					428	357									242	189	2250
					677	373									764	636	900

Illustration 186

g06364704

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

Product Information Section
Lifting Capacities









[mm] [inch]	1000 40	1500 60	2000 80	2500 100	3000 120	3500 140		[mm] [inch]
3000 126								311 122
2500 100				553 218	565 222	347 137		289 113
2000 80				643 253	645 254	795 312		285 112
1500 60			445 175	495 195	620 244	689 270	204 80	237 93
1000 40			587 231	582 229	681 268	750 295	608 239	608 239
600 24			980 386	1013 395	1025 399	1061 414	1001 394	1002 395
0 0			650 256	527 207	454 179	374 147	285 112	272 107
-500 -20	1524 60	1524 60	2090 820	2090 820	2096 824	2099 823	2094 820	2094 820
-1000 -40			655 256	532 207	453 178	373 146	284 111	284 111
-1500 -60		842 33	842 33	552 217	542 213	397 156		325 128

Illustration 187

g06364709

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









(mm) (inch)	1000 40	1500 60	2000 80	2500 100	3000 120	3500 140		(mm) (inch)					
3000 120								30 30 360 300					
2500 100					347 307			239 238 230 210					
2000 80					568 568 642 642			295 295 292 282 280 240					
1500 60			445 445 334 334	445 445 307 307	420 420 807 807	420 420 858 858	374 374 817 817	227 227 509 509	297 297 225 225 250 250 3600 3600				
1000 40			373 373 1223 1223	362 362 1213 1213	575 575 1230 1230	468 468 861 861	457 457 385 385	330 330 502 502	386 386 234 234 663 663 495 495 290 290 3740 3740				
500 20					659 659 1413 1413	384 384 927 927	492 492 1066 1066	292 292 828 828	301 301 450 450	229 229 790 790 405 405 200 200 2740 2740			
1 1			932 932 1353 1353	527 527 1333 1333	656 656 1430 1430	374 374 866 866	436 436 1052 1052	285 285 634 634	375 375 465 465	228 228 745 745	211 211 685 685 360 360		
500 20	1586 1586	1836 1836	915 915 2090 2090	884 884 2080 2080	1251 1251 1751 1751	1324 1324 1791 1791	1293 1293 1799 1799	988 988 608 608				330 330 227 227 3490 3490	
1000 40			793 793 1504 1504	532 532 1344 1344	617 617 1305 1305	373 373 863 863	377 377 788 788	294 294 410 410				324 324 261 261 580 580 330 330	
1500 60			842 842 1781 1781	842 842 1761 1761	852 852 1770 1770	542 542 1365 1365	367 367 808 808	301 301				325 325 717 717	325 325 2700 2700

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	1500 60	2000 80	2500 100	3000 120	3500 140		(mm) (inch)
3000 120								2000 80
2500 100					277 11	277 11		3000 120
2000 80					638 25	630 25	285 11	259 10
1500 60				326 13	308 12	347 14	309 12	290 11
1000 40			708 28	573 23	483 19	462 18	358 14	298 12
500 20			659 26	535 21	464 18	383 15	348 14	272 11
1 0			643 25	521 21	450 18	378 15	340 13	267 11
-500 -20	1728 68	1726 68	904 36	863 34	841 33	818 32	795 31	775 30
-1000 -40		2041 80	1378 54	1179 46	1006 39	888 35	781 31	671 27
-1500 -60			971 38	882 35	818 32	759 30		
-2000 -80			2096 83	1314 52	1037 41	800 31		

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.

Stroke (inch)	1000 40		1500 60		2000 80		2500 100		3000 120		3500 140				Stroke (mm) (inch)		
																	
2000 80															250 10	299 12	3900 150
2500 100									277 11	277 11					241 10	241 10	3000 120
2000 80									291 12	291 12	332 13	229 9			239 9	239 9	3900 150
1500 60								326 13	316 12	347 14	369 15	343 14	237 9		240 10	266 11	3700 140
3000 120					710 28	573 23	696 28	462 18	421 17	389 15	367 15	232 9			247 10	150 6	3900 150
500 20					970 38	535 21	629 25	362 14	474 19	289 11	393 16	226 9			263 10	189 7	3900 150
0 0					2665 105	1349 53	1349 53	1022 40	1022 40	632 25	626 25	406 16			579 23	410 16	160
500 20					951 37	521 21	657 26	370 15	488 19	281 11	379 15	221 9			281 11	182 7	3900 150
1000 40					2644 104	1320 52	1412 55	797 31	850 33	665 26	613 24	476 19			642 25	424 17	250
1500 60		1726 68		1726 68	304 12	363 14	1860 73	1123 44	795 31	334 13	596 23	741 29	472 19		382 15	285 11	3600 140
1000 40															310 12	332 13	3300 130
1500 60															334 13	334 13	340
1000 40															335 13	280 11	2950
2000 80															335 13	350 14	120
2000 80															346 14	346 14	2150
															375 15	375 15	90

Illustration 190

g06364713

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

Product Information Section
Lifting Capacities









[mm] [inch]	1500 60	2000 80	2500 100	3000 120	3500 140			[mm] [inch]
3000 120								* 305 * 305 2560
2500 100								* 647 * 647 3080
2000 80				* 566 * 566				* 300 * 300 3080 * 683 * 683 320
1500 60				* 294 * 294 * 352 * 352 * 833 * 833 * 783 783				* 295 299 3400 * 645 640 140
1000 40		* 419 * 419 * 882 * 882	* 419 * 419 * 882 * 882	* 411 * 411 * 889 * 889	* 395 350 * 861 753	320 271		* 297 299 3590 * 655 574 140
500 20		770 635 1658 1085	635 509 1085 1085	509 452 1161 974	405 341 871 735	307 267 681 574		289 243 635 538 3710 250
0 0			522 324 1024 824	436 339 939 739	395 332 851 716	302 261 671 565		282 237 621 523 3740 150
500 20	* 878 * 878 * 1988 * 1988	730 598 1586 1285	598 508 1381 1085	420 366 893 800	396 323 830 686			308 259 680 572 3500 140
1000 40		* 708 682 * 1520 1234	682 519 1234 1097	424 383 913 805	324 324 689 689			* 324 286 689 689 3210 * 715 655 130
1500 60	* 857 * 857 * 1915 * 1915	* 662 * 662 * 1194 * 1194	* 662 * 662 * 1194 * 1194	* 398 * 398 * 832 * 832				* 324 * 324 2740 * 716 * 716 110

Illustration 191

g06364791

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



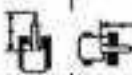
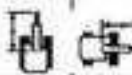
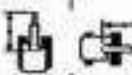
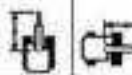
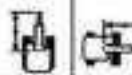

[mm] [inch]	1500 60	2000 80	2500 100	3000 120	3500 140		[mm] [inch]			
										
3000 120							* 305 * 305 2560 * 647 * 647 100			
2500 100			* 566 * 566				* 300 * 300 2080 * 663 * 663 120			
2000 80			* 204 * 204 * 833 * 833	* 352 * 352 * 783 * 783			* 295 * 295 1400 * 645 * 645 140			
1500 60		* 419 * 419 * 832 * 832	* 411 * 411 * 883 * 883	* 395 * 395 * 851 * 851	* 350 * 350 * 753 * 753	* 374 * 374 * 655 * 655	* 297 * 297 3590 * 655 * 655 140			
1000 40		* 858 * 858 * 1794 * 1794	* 635 * 635 * 1213 * 1213	* 567 * 567 * 974 * 974	* 454 * 454 * 880 * 880	* 341 * 341 * 735 * 735	* 316 * 316 * 668 * 668 * 267 * 267 * 574 * 574	* 303 * 303 3710 * 668 * 668 150		
500 20			* 657 * 657 * 1409 * 1409	* 436 * 436 * 939 * 939	* 430 * 430 * 1058 * 1058	* 332 * 332 * 736 * 736	* 391 * 391 * 841 * 841	* 321 * 321 * 565 * 565 * 237 * 237 * 523 * 523	* 3740 * 150	
0 0		* 908 * 908 * 1824 * 1824	* 537 * 537 * 1034 * 1034	* 455 * 455 * 898 * 898	* 426 * 426 * 838 * 838	* 430 * 430 * 865 * 865	* 326 * 326 * 702 * 702	* 376 * 376 * 558 * 558	* 339 * 339 * 748 * 748 * 242 * 242 * 533 * 533	* 3670 * 150
500 20	* 878 * 878 * 1898 * 1898	* 878 * 878 * 1764 * 1764	* 598 * 598 * 1285 * 1285	* 608 * 608 * 1302 * 1302	* 423 * 423 * 890 * 890	* 455 * 455 * 974 * 974	* 323 * 323 * 686 * 686		* 330 * 330 * 727 * 727 * 259 * 259 * 572 * 572	* 3500 * 140
1000 40		* 708 * 708 * 1520 * 1520	* 682 * 682 * 1234 * 1234	* 523 * 523 * 1119 * 1119	* 424 * 424 * 913 * 913	* 383 * 383 * 805 * 805	* 324 * 324 * 689 * 689		* 324 * 324 * 715 * 715 * 236 * 236 * 655 * 655	* 3210 * 130
1500 40	* 857 * 857 * 1815 * 1815	* 857 * 857 * 1675 * 1675	* 562 * 562 * 1194 * 1194	* 562 * 562 * 1134 * 1134	* 398 * 398 * 832 * 832				* 324 * 324 * 716 * 716 * 324 * 324 * 716 * 716	* 2740 * 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 3390 663 490 120
2000 80							294 294 352 352 633 633 783 497 295 184 3400 649 490 140
1500 60							415 415 415 305 395 226 320 172 892 892 893 699 861 487 297 184 3590 655 362 140
1000 40							770 400 539 290 405 218 317 168 1659 866 1181 625 871 470 681 351 289 151 3790 635 324 150
500 20							522 275 395 210 312 164 1124 593 851 452 671 352 282 147 3740 621 324 150
0 0							730 387 512 266 389 204 309 161 1566 788 1101 573 837 438 664 346 289 150 3670 634 320 150
-500 -20							876 590 730 367 509 263 388 201 1899 1285 1667 790 1093 664 830 433 309 160 3500 680 354 140
-1000 -40							708 371 519 264 383 202 1520 788 1087 569 809 436 324 184 3290 715 403 130
-1500 -60							857 603 562 379 398 271 1915 1296 1194 817 832 585 324 229 2740 718 537 80

Illustration 193

g06364796

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














(mm) (inch)	1500 60	2000 80	2500 100	3000 120	3500 140		(mm) (inch)
3000 120	 	 	 	 	 	 	2500 100
2500 100			* 594 * 566				3050 120
2000 80			* 294 * 294 * 352 232 * 633 * 633 * 783 497				2400 95
1500 60		* 419 * 419 * 419 * 419 * 832 * 832 * 832 * 832	* 419 * 419 * 419 * 419 * 832 * 832 * 832 * 832	* 308 * 308 * 308 * 308 * 616 * 616 * 616 * 616	* 338 * 338 * 338 * 338 * 676 * 676 * 676 * 676	* 374 * 374 * 374 * 374 * 748 * 748 * 748 * 748	3590 140
1000 40		* 858 400 * 587 290 * 1716 800 * 1174 580	* 587 290 * 290 145 * 1174 580 * 580 290	* 454 218 * 218 109 * 908 436 * 436 218	* 388 188 * 188 94 * 776 376 * 376 188	* 388 188 * 188 94 * 776 376 * 376 188	3730 150
500 20			* 857 275 * 275 137 * 1714 550 * 550 275	* 491 210 * 210 105 * 982 420 * 420 210	* 381 164 * 164 82 * 762 328 * 328 164	* 381 164 * 164 82 * 762 328 * 328 164	3740 150
0 0		* 908 367 * 367 183 * 1816 734 * 734 367	* 659 268 * 268 134 * 1318 536 * 536 268	* 491 204 * 204 102 * 982 408 * 408 204	* 376 161 * 161 80 * 752 322 * 322 161	* 376 161 * 161 80 * 752 322 * 322 161	3670 150
-500 -20	* 678 590 * 590 295 * 1356 1180	* 818 367 * 367 183 * 1636 734	* 609 283 * 283 141 * 1218 566	* 455 201 * 201 100 * 910 402			3500 140
-1000 -40		* 708 371 * 371 185 * 1416 742	* 523 264 * 264 132 * 1046 528	* 383 202 * 202 101 * 766 404			3230 130
-1500 -60	* 857 603 * 603 301 * 1714 1206	* 562 379 * 379 189 * 1124 758	* 399 271 * 271 135 * 798 542				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		1500 30		1000 60		750 30		500 120		250 140				[mm] [inch]		
																	
3000 120															261 103	281 110	2020 80
2500 100									277 109	277 109					242 95	242 95	3280 130
2000 80									288 113	288 113	316 124	272 107			238 94	238 94	3670 145
1500 60								318 125	318 125	343 135	343 135	320 126	278 109		239 94	239 94	3760 150
1000 40					886 349	848 333	458 180	454 179	484 190	340 134	340 134	375 147	265 104		248 97	223 88	3880 155
500 20					740 291	697 275	522 205	435 171	393 154	330 130	330 130	309 121	268 105		267 105	218 86	3900 155
0 0					724 285	591 233	500 197	432 169	385 151	322 126	304 120	295 116			265 104	222 87	3930 155
-500 -20	762 300	762 300	877 345	877 345	721 284	598 236	502 197	416 163	388 152	317 124	317 124	302 119	252 99		281 110	235 93	3980 155
-1000 -40					723 284	591 233	502 197	416 163	379 149	317 124	317 124				310 122	264 103	3430 135
-1500 -60			906 357	886 347	627 247	530 208	440 173	421 165							314 123	314 123	2360 93
-2000 -80					428 168	428 168									342 134	342 134	2250 90

Illustration 195

g06364801

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


Height (mm) (inch)	1000 40		1500 60		2000 80		2500 100		3000 120		3500 140		 (mm) (inch)		
															
2000 80													261	281	3020
2500 100									277	277			242	242	3280
2000 80									630	630			535	535	320
1500 60									288	288	316	272	238	238	3570
1000 40									646	646			526	526	360
500 20									316	316	343	343	299	299	3700
0 0									688	688	751	751	590	527	350
3000 120					606	646	695	754	813	872	931	990	1049	1108	3880
2500 100					928	1091	1254	1417	1580	1743	1906	2069	2232	2395	390
2000 80					945	997	1050	1103	1156	1209	1262	1315	1368	1421	3900
1500 60					1060	1197	1334	1471	1608	1745	1882	2019	2156	2293	400
1000 40					955	991	1028	1064	1101	1137	1174	1210	1247	1283	3920
500 20					1053	1072	1091	1110	1129	1148	1167	1186	1205	1224	390
0 0					1063	1072	1081	1090	1099	1108	1117	1126	1135	1144	390
500 20	762	752	877	877	871	889	907	924	941	958	975	992	1009	1026	3880
1000 40	1504	1604	1704	1804	1873	1954	2034	2114	2194	2274	2354	2434	2514	2594	390
1500 60			988	986	627	589	549	509	469	429			394	384	3880
2000 80			2087	2087	1335	1287	1239	1191	1143	1095			653	630	320
2500 100					428	408							342	342	2050
3000 120					677	677							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								261 103
2500 100					277 109	234 92		242 95
2000 80					288 113	232 91	316 124	238 94
1500 60				318 125	300 118	243 96	320 126	229 90
1000 40			666 262	410 161	496 195	281 110	404 159	217 86
500 20			740 291	374 147	522 205	274 108	383 150	207 82
0 0			850 334	433 170	627 247	310 122	446 176	181 71
-500 -20	762 300	752 296	877 343	570 224	721 284	388 152	502 197	195 77
-1000 -40	1884 742	1884 742	1884 742	1224 481	1546 609	770 303	1090 425	552 217
-1500 -60		388 152	586 230	827 325	367 144	448 176	281 110	191 75
-2000 -80			428 168	362 142	448 176	281 110	191 75	142 56

Illustration 197

g06364804

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

[mm] [inch]	1000 40		1500 60		2000 80		2500 100		3000 120		3500 140				[mm] [inch]
															
3000 120															2020 80
2500 100									277	234					2260 90
2000 80									288	232	316	173			2070 82
1500 60									348	288	342	171			1760 70
1000 40					888	410	456	281	416	217	266	88			1580 62
500 20					965	374	625	274	472	297	380	81			1360 54
0 0					2053	699	1000	580	1017	646	628	245			1160 46
-500 -20	762	762	877	570	971	358	624	266	466	195	352	84			960 38
-1000 -40	1884	1884	1904	1224	1973	710	1240	582	899	420	747	211			760 30
-1500 -60			808	588	627	357	448	263							580 23
-2000 -80			2007	1259	1335	790	946	562							420 17

Illustration 198

g06364806

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

Product Information Section
Lifting Capacities
















(mm) (inch)	1500 60		1500 60		2000 80		2500 100		3000 120		3500 140				(mm) (inch)		
																	
2000 120															311 664	311 664	2000 100
2500 100							558 668	668	347 338						259 661	289 661	2100 130
2000 80							283 643	289 643	354 788	376 721					255 649	269 689	2400 140
1500 60					445 824	445 824	429 907	420 907	354 846	330 719	304 652	295 548			250 641	242 538	2600 150
1000 40					722 1576	598 1291	510 1104	426 938	385 827	301 691	300 645	251 539			272 601	227 561	2720 159
500 20							436 1066	400 884	375 806	302 670	296 636	240 530			267 586	222 480	2740 150
0 0					694 1491	563 1211	486 1048	401 883	359 794	286 659	292 629	242 523			273 603	227 561	2660 159
-500 -20		1506 1896	918 2090	918 2032	695 1492	564 1232	492 1079	398 886	366 780	283 653				294 646	244 533	2490 140	
-1000 -40					700 1502	593 1272	495 1043	400 860	368 790	295 659					324 714	241 622	2190 130
-1500 -60			862 1781	812 1781	552 1170	552 1170	397 895	397 808							326 717	325 717	2700 180

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.



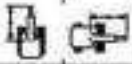
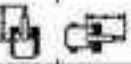

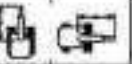


(mm) (inch)	1300 40	1500 48	2000 80	2500 100	3000 128	3500 140		(mm) (inch)
3000 125								311 311
2500 98				568 568	347 330			293 299
2000 89				289 283	254 236			235 263
1500 63			445 445	420 420	388 330	274 255		237 242
1000 48			334 334	307 307	268 210	217 208		155 158
500 29			1638 1231	1230 988	891 891	635 538		369 381
1 1			982 1853	583 1211	438 1630	308 1052	275 799	243 523
500 25	1500 1500	2090 2092	910 1751	888 1232	601 1293	398 886	302 650	
1000 48			788 1534	588 1222	517 1805	488 868	377 658	395
1500 63		842 1781	842 1781	552 1178	552 1170	387 808	347 868	

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 80		3000 60		2500 80		3000 120		2500 140				[mm] [inch]	
																
3000 120													255	259	2660	
													379	370	180	
2500 100									277	277			241	241	3000	
									638	620			524	524	130	
2000 80									291	291	306	259	239	239	3780	
									649	649			526	526	140	
1500 60								328	328	347	320	300	269	240	222	2770
								709	719	759	708	651	544	525	481	150
1000 40					710	699		506	438	384	320	298	249	247	209	3880
					1483	1313		1003	922	825	689	641	524	543	460	160
500 20					793	571		496	489	373	340	250	243	245	204	3800
					1593	1221		1060	962	803	667	629	523	543	450	160
1 1					688	557		482	397	365	302	266	229	251	200	3600
					1477	1198		1038	854	785	650	609	503	553	458	150
-500 -25		1726		1726	304	304		685	554	477	391	368	298	285	226	3660
					2041	1867		1471	1191	1025	842	775	641	605	509	150
-1000 -40					688	557		477	391	368	297			302	250	3200
					1677	1197		1025	842	775	641			569	551	140
-1500 -60					371	503		418	565	440	397			315	312	2650
					2056	2019		1314	1215	930	855			595	695	120
-2000 -80					410	411								348	345	2100
					834	836								775	775	90

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		2500 80		3000 120		3500 140				(mm) (inch)		
																	
3000 120															259 10	259 10	2000 80
2500 100									277 10	277 10					241 10	241 10	3000 120
2500 80									638 10	630 10					534 10	534 10	3500 140
1500 60									291 10	291 10	302 10	256 10			239 10	239 10	3500 140
1500 40								306 10	306 10	347 10	330 10	343 10	254 10		249 10	222 10	3770 150
1000 40					713 10	693 10	506 10	428 10	421 10	320 10	367 10	248 10			247 10	208 10	3800 150
500 20					1693 10	1331 10	3063 10	3022 10	918 10	689 10	798 10	534 10			543 10	460 10	3500 140
500 8					378 10	371 10	629 10	465 10	474 10	330 10	383 10	243 10			263 10	204 10	3500 140
500 8					2044 10	1888 10	1412 10	854 10	1958 10	1850 10	813 10	513 10			642 10	458 10	3500 140
500 25	1726 10	1726 10	504 10	584 10	1045 10	954 10	621 10	391 10	464 10	290 10	349 10	238 10			312 10	221 10	3000 120
1000 40					758 10	657 10	547 10	391 10	496 10	297 10					319 10	280 10	3000 120
1500 60					1628 10	1197 10	1372 10	842 10	843 10	641 10					684 10	554 10	140
1500 60					971 10	508 10	418 10	565 10	440 10	387 10					315 10	312 10	2850 120
2500 80					2056 10	2019 10	1314 10	1215 10	930 10	855 10					635 10	635 10	120
2500 80							418 10	411 10							346 10	346 10	2190 90
							836 10	836 10							775 10	775 10	90

Illustration 202

g06364816

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

Without Bucket















[mm] [inch]	1500 60		2000 80		2500 100		3000 120		3500 140				[mm] [inch]		
															
3000 120												* 395 * 847	* 395 * 847	2268 90	
2500 100					- 346 - 794	- 346 - 794							* 406 * 903	380 956	2689 106
2000 80					* 372 * 823	* 372 * 823	417 896	357 768					666 845	314 700	3259 129
1500 60			* 528 * 1194	* 528 * 1194	* 482 * 1044	* 465 * 1001	412 887	352 759					328 727	282 623	3478 140
1000 40			749 1612	622 1343	530 1143	449 969	404 870	345 743	321 691	275 592			310 684	265 586	3599 140
500 20			719 1549	595 1283	515 1119	435 938	396 853	337 727	307 683	271 585			304 671	261 574	3609 140
0 0			710 1526	596 1282	506 1089	426 918	390 840	331 714	304 674	269			311 688	266 586	3599 140
500 20			709 1524	596 1280	502 1082	422 910	387 835	329 710					311 706	264 626	3289 140
1000 40			714 1533	590 1289	504 1086	424 914	390 831	331					* 378 * 832	324 719	3059 120
1500 60	* 921 * 1945	* 921 * 1945	* 591 * 1251	* 591 * 1251	* 405 * 405	* 405 * 405							* 384 * 848	* 384 * 848	2589 100

Illustration 203

g06364886

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



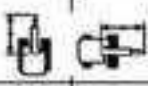
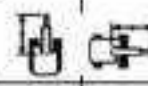
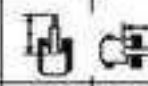
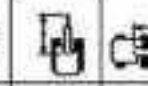
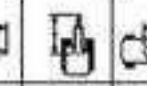
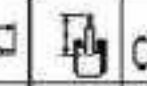
[mm] [inch]	1500 60	2000 80	2500 100	3000 120	3500 140		(mm) (inch)
							
3000 120							* 395 * 395 2260 * 847 * 847 90
2500 90			* 346 * 346 * 794 * 794				* 406 * 406 2850 * 900 * 900 120
2000 80			* 372 * 372 * 823 * 823	* 419 357 * 928 768			* 377 * 377 3250 * 833 * 833 130
1500 60		* 526 * 526 * 1114 * 1114	* 482 * 482 * 1044 * 1044	* 465 * 465 * 1001 * 1001	* 451 * 451 * 963 * 963		* 379 * 379 3470 * 816 * 816 140
1000 40		* 890 * 890 * 1990 * 1990	* 822 * 822 * 1843 * 1843	* 614 * 614 * 1318 * 1318	* 443 * 443 * 969 * 969	* 422 * 422 * 922 * 922	* 275 * 275 3580 * 592 * 592 140
500 20			* 689 * 689 * 1479 * 1479	* 435 * 435 * 938 * 938	* 525 * 525 * 1131 * 1131	* 337 * 337 * 727 * 727	* 420 * 420 3900 * 271 * 271 150
0 0		* 964 * 964 * 2079 * 2079	* 596 * 596 * 1262 * 1262	* 687 * 687 * 1478 * 1478	* 426 * 426 * 918 * 918	* 519 * 519 * 1115 * 1115	* 301 * 301 3530 * 269 * 269 140
-500 -20		* 870 * 870 * 1873 * 1873	* 666 * 666 * 1260 * 1260	* 634 * 634 * 1364 * 1364	* 422 * 422 * 910 * 910	* 478 * 478 * 1022 * 1022	* 329 * 329 3350 * 710 * 710 140
-1000 -40		* 751 * 751 * 1610 * 1610	* 500 * 500 * 1069 * 1069	* 547 * 547 * 1171 * 1171	* 424 * 424 * 914 * 914	* 394 * 394 * 831 * 831	* 324 * 324 3050 * 719 * 719 120
-1500 -60	* 921 * 921 * 1845 * 1845	* 591 * 591 * 1251 * 1251	* 531 * 531 * 1151 * 1151	* 405 * 405 * 851 * 851			* 384 * 384 2560 * 843 * 843 100

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


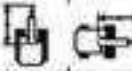


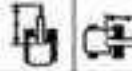
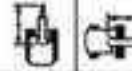
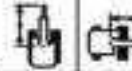
[mm] [inch]	1500 60	2000 80	2500 100	3000 120	3500 140		(mm) (inch)
3000 120							2250 90
2500 100			346 13.6	323 12.7			2880 113
2000 80			372 14.6	320 12.6	417 16.4	240 9.4	3250 128
1500 60		526 20.7	432 16.9	482 18.9	310 12.2	412 16.2	3250 128
1000 40		743 29.2	400 15.7	539 21.2	296 11.6	404 15.9	3590 141
500 20		719 28.3	376 14.8	515 20.3	282 11.1	398 15.6	3600 142
0		1549 61.0	810 31.9	1119 43.7	605 23.8	476 18.7	460 18.1
0		710 27.9	388 15.3	508 19.9	274 10.7	390 15.3	215 8.5
-500 -20		1528 59.9	734 28.9	1083 42.6	590 23.2	440 17.3	360 14.2
-1000 -40		708 27.8	367 14.4	502 19.7	271 10.6	387 15.2	213 8.3
-1500 -60	921 36.3	507 19.9	598 23.5	380 14.9			378 14.9
-1500 -60	945 37.2	523 20.6	605 23.8	380 14.9			378 14.9

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 * 647	373 847	2260 90		
2500 100			* 346 * 794	323 690				* 406 * 803	255 575	2080 80		
2000 80			* 372 * 823	320 689	* 419 * 928	240 545		* 377 * 833	290 467	3250 130		
1500 60		* 528 * 1194	432 973	* 482 * 1044	330 668	* 451 * 883	235 507		* 370 * 816	187 410	3470 140	
1000 40		* 890 * 1980	490 866	* 614 * 1318	296 638	* 497 * 1075	228 492	* 432 * 912	183 399	* 379 * 834	175 398	3580 140
500 20				* 689 * 1479	282 609	* 525 * 1131	221 476	* 420 * 860	179 383	* 398 * 879	171 376	3600 150
0 0		* 964 * 2078	368 784	* 867 * 1870	274 591	* 518 * 1118	205 465	* 386 * 775	175	* 383 * 857	174 383	3590 140
500 20		* 870 * 1873	387 792	* 634 * 1364	271 584	* 478 * 1022	202 460			* 381 * 840	165 408	3380 140
1000 40			* 751 * 1630	371 809	* 547 * 1171	272 588	* 394 * 205			* 378 * 832	211 469	3050 120
1500 60	* 821 * 1845	587 1263	* 591 * 1251	380 820	* 405 * 280					* 384 * 843	273 610	2760 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								2550 800							
2500 108					365 742	358 742		3100 120							
2000 83					620 757	620 769		3130 140							
1500 63					397 664	347 664	320 694	270 585	3640 150						
1000 41			749 1532	620 1358	522 1145	488 1078	493 1140	319 686	270 587	3750 150					
500 25			721 1882	996 1296	514 1007	423 904	393 847	334 720	214 676	268 617	3770 150				
1 1		567 1328	587 1328	794 1844	590 1290	501 1060	421 908	385 838	327 705	310 668	264 549	287 633	245 540	3700 150	
500 -23	793 1755	793 1755	938 2124	812 1896	709 1593	576 1240	495 1067	418 896	361 822	323 696	308 696	262 696	305 673	280 573	3530 140
1000 -43				782 1908	679 1345	495 1067	418 896	381 823	323 697				342 753	211 645	3250 130
1500 -63				958 1393	586 1262	468 985	421 883						378 818	380 884	2810 110
2000 -83				433 433									421 451	421 451	2100 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							326	304					342	345	2850 900
2500 108									365	358			319	319	3000 120
2000 83									742	742			708	708	3130 140
1500 63							820	820	398	398			302	293	3040 140
1000 41							397	347	403	352	391	277	309	300	3040 150
500 25					749	620	552	488	464	343	408	273	308	246	3150 150
25					1532	1358	1186	978	1036	740	891	587	678	542	3170 150
8					996	996	660	423	589	334	430	268	328	241	3770 150
8					2102	1296	1130	924	1097	720	806	617	723	671	3700 150
500 -23	793	793	938	802	910	576	672	418	491	323	369	262	382	280	3530 140
1000 -43	1755	1755	2124	1896	1862	1240	1401	896	1054	696			798	573	3250 130
1500 -63					892	679	678	418	438	323			382	281	2810 130
2000 -83					1718	1245	1239	896	913	697			797	645	2810 130
2500 -103					958	596	466	421					378	280	2100 130
3000 -123					1393	1252	965	869					818	604	2100 130
3500 -143					433	433							421	421	2100 130
													451	451	2100 130

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

Lift Height (mm) (inch)	1000 40		1500 60		2000 80		2500 100		3000 120		3500 140				Lift Capacity (mm) (inch)		
																	
2000 80							326	30					246	303	2000		
2500 100									365	240			208	227	2000		
2000 80									742	503			208	50	120		
2000 80									358	240			302	81	2400		
2500 100									750	505			302	824	160		
2500 100									397	211	403	205	302	80	3040		
3000 120									804	671	882	585	694	230	150		
3000 120					748	497	532	296	403	208	319	178	287	160	3700		
3500 140					1562	879	1145	618	867	488	692	394	634	353	150		
3500 140					721	376	514	280	390	211	314	174	282	166	3770		
4000 160					1562	814	1107	608	847	469	670	378	622	244	150		
4000 160					597	350	704	362	501	269	385	211	310	170	3700		
4500 180					1238	1011	1534	781	1080	581	830	458	668	367	150		
4500 180					790	790	939	552	700	359	495	264	381	217	308	89	
5000 200					1755	1755	2124	1106	1503	772	1067	570	822	447	308	89	
5000 200									702	380	495	264	381	217	308	89	
5500 220									1508	777	1067	570	822	448	308	89	
5500 220									658	367	498	268			370	232	2880
6000 240									1380	732	995	592			618	508	180
6000 240									433	394					421	377	2030
6000 240															961	882	30

Illustration 209

g06364921

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

[mm] [inch]	1000 40		1500 60		2000 80		2500 100		3000 120		3500 140				[mm] [inch]
															
3800 129							320	320					340	309	2550
2500 100									365	240			319	227	3000
2000 80									742	505			708	50	320
1500 60							620	620	358	240			302	191	3130
1000 40							397	397	403	235	391	80	309	171	3040
500 20							664	671	882	505	855	200	660	370	250
1800 70					749	497	552	288	454	235	408	179	308	180	3150
1500 60					1582	879	1186	638	1886	498	891	264	678	353	250
1000 40					996	376	660	258	599	230	430	114	328	156	3170
500 20					2102	814	1130	665	1997	600	806	275	723	244	250
1800 70					567	350	992	362	687	269	510	211	406	179	3100
1500 60					1338	181	2129	701	1476	581	1025	455	871	267	250
1000 40					780	793	938	552	910	358	652	264	491	207	369
500 20					1755	1755	2124	1185	1862	772	1401	578	1954	447	369
1800 70							892	360	679	264	438	207	362	188	3150
1500 60							1718	777	1239	578	813	440	797	435	250
1000 40							958	357	466	269			378	232	3080
500 20							1399	792	965	582			818	515	250
1800 70							433	384					421	277	3100
1500 60													451	302	250

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													2018 80		
2500 100					344 708	344 708							403 898	2918 120	
2000 80					376 832	376 832	397 853	397 725					346 763	294 854	3270 130
1500 60			549 1161	549 1161	491 1061	439 946	392 843	333 716					311 687	264 594	3488 140
1000 40			711 1532	596 1285	504 1088	423 913	384 827	325 700	365 855	258 566			293 648	249 550	3588 150
500 20			683 1471	560 1238	489 1054	409 883	376 818	317 684	301 640	255 549			289 637	245 540	3608 150
0 0			675 1450	552 1188	483 1034	400 863	370 797	311 672	311 672	258 562			296 653	251 553	3528 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 1187	479 1032	399 862	370 812						366 812	309 685	3038 120
1500 60	903 1907	803 1807	579 1224	567 1220	392 862	392							386 852	386 852	2528 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 2010 * 862 * 862 90
2500 100			* 344 * 344 * 709 * 709				* 403 * 354 2010 * 898 * 797 100
2000 80			* 376 * 376 * 832 * 832	* 420 397 * 929 725			* 370 * 294 2070 * 831 * 654 100
1500 60		* 549 * 549 * 1161 * 1161	* 491 439 * 1051 946	* 453 333 * 988 715			* 370 * 264 3480 * 817 * 594 140
1000 40		* 906 596 * 1915 1285	* 820 420 * 1332 903	* 499 325 * 1080 700	* 432 258 * 912 556		* 300 * 249 3500 * 808 * 550 100
500 20		* 1037 560 * 2180 1208	* 691 409 * 1403 883	* 525 317 * 1032 684	* 418 251 * 838 549		* 308 * 245 3600 * 877 * 540 100
0 0		* 959 592 * 2067 1189	* 885 480 * 1474 863	* 517 311 * 1112 672	* 383 252		* 388 * 251 3500 * 858 * 553 140
500 20		* 983 582 * 1959 1187	* 839 437 * 1395 857	* 474 309 * 1014 667			* 381 * 249 3340 * 839 * 534 140
1000 40		* 743 556 * 1592 1137	* 541 389 * 1058 862	* 387 302			* 378 * 309 3030 * 832 * 685 100
1500 60	* 903 * 903 * 1907 * 1907	* 579 587 * 1224 1220	* 392 * 392				* 386 * 386 2520 * 852 * 852 100

Illustration 212

g06364926

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

Product Information Section
Lifting Capacities

[mm] [inch]	1850 40		1501 60		2000 80		2500 100		3000 120		3500 140				[mm] [inch]
															
2000 80							315	35					250	250	2000
2500 100									362	39			267	267	2120
2000 80							281	38	360	38			301	289	2490
4500 60							406	40	400	30	307	260	267	242	2650
3000 40				720	594	505	434	382	323	302	296	272	230	230	2750
500 20				849	723	638	564	525	466	451	452	460	510	510	250
0 0			608	600	668	548	478	396	365	387	293	248	273	230	3530
100 20	808	808	951	879	865	742	671	591	561	563	522	524	662	580	650
1000 40	1730	1730	2172	1881	1428	1157	1012	842	779	854	684	641	641	541	140
1500 40					667	545	479	395	362	384			328	276	1230
1500 60					920	772	683	610	540	605			727	601	130
2000 60					648	553	487	397					371	345	2280
2000 80					1078	931	805	657					623	571	180
													431	431	1860
													877	877	30

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 80		3000 60		2500 80		3000 120		2500 140				[mm] [inch]
															
3000 120							375	385					350	350	2600 100
2500 100									382	338			317	317	3100 120
2000 80									326	725			704	704	3100 140
1500 60							281	281	368	338			301	288	3100 160
1000 40							630	630	890	727			665	593	3100 180
1000 40							406	466	487	332	391	268	308	240	3650 150
1000 40					771	594	560	424	468	323	407	258	309	230	3150 150
500 20					1628	1280	1004	384	1003	836	683	552	693	593	3150 180
500 20					381	561	584	467	518	314	416	251	330	226	3160 150
500 20					2185	1630	1426	678	801	677	690	542	726	499	3160 180
500 20			608	688	388	546	626	396	517	307	405	248	386	230	3690 150
500 20			1383	1383	2123	1876	1475	654	884	662	668	524	805	588	3690 180
500 20	808	908	961	878	387	512	648	391	488	303	366	246	362	245	3620 140
1000 40	1796	1796	2172	1881	1958	1667	1283	842	1048	654			787	541	3620 160
1000 40					798	848	670	391	428	304			362	276	3230 130
1500 60					1793	1672	1227	843	982	695			798	611	2780 110
1500 60					848	853	457	387					371	345	2780 130
2000 80					1376	891	865	657					821	771	1860 80
2000 80													437	437	1860 80

Illustration 214

g06364934

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

Product Information Section
Lifting Capacities









(mm) (inch)	1503 60	2100 80	2500 100	3000 120	3500 140		(mm) (inch)	
3000 120								* 395 * 395 2268 * 847 * 847 99
2500 100			* 346 * 346 * 794 * 794					* 406 * 406 2580 * 903 * 903 129
2000 80			* 372 * 372 * 823 * 823	* 419 378 * 928 813				* 377 333 3250 * 823 741 108
1500 60		* 526 * 526 * 1184 * 1184	* 482 * 482 * 1044 * 1044	437 373 840 804				349 289 3470 772 662 90
1000 40		733 638 1708 1421	562 476 1212 1026	429 365 824 708	341 292 735 623			030 282 3580 727 623 90
500 20		784 635 1644 1361	547 461 1179 995	421 358 807 772	337 299 727 622			324 277 3600 714 611 79
0 0		754 622 1622 1340	538 452 1159 975	415 352 804 759	335 296			301 283 3530 731 624 90
-500 -20		784 622 1619 1338	534 449 1159 967	412 350 809 755				358 302 3350 783 668 90
-1000 -40		* 751 * 626 * 1610 * 1347	538 450 1159 971	* 394 352				* 378 345 3050 * 832 755 129
-1500 -80	* 921 * 921 * 1945 * 1945	* 591 * 591 * 1251 * 1251	* 405 * 405					* 304 * 304 2560 * 848 * 848 100

Illustration 215

g06364822

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








[mm] [inch]	1500 60	2000 80	2500 100	3000 120	3500 140		[mm] [inch]
3000 120							* 395 * 395 2260
2500 100			- 346 - 346				* 647 * 847 2080
2000 80			- 794 - 794				* 406 * 402 2000
1500 60			* 372 * 372	* 419 370			* 803 * 900 120
1000 40		* 526 * 526	* 482 * 482	* 451 373			* 377 370 3250
500 20		* 104 * 104	* 1044 * 1044	* 883 804			* 833 741 100
0 0		* 890 658	* 614 476	* 497 368	* 432 292		* 370 239 3470
		* 1880 1421	* 1318 926	* 1075 788	* 912 623		* 816 662 140
			* 689 461	* 525 358	* 420 281		* 379 282 3580
			* 1479 995	* 1131 772	* 960 622		* 804 623 140
		* 964 622	* 867 492	* 518 352	* 386 284		* 398 277 3600
		* 2078 1340	* 1470 876	* 1118 759			* 879 611 150
500 20		* 870 622	* 631 449	* 478 380			* 381 302 3380
1000 40		* 1873 1338	* 1364 967	* 1022 755			* 840 668 140
1500 60		* 751 626	* 547 450	* 394 352			* 378 345 3050
2000 80		* 1600 1247	* 1171 871				* 832 765 120
2500 100	* 821 * 821	* 591 * 591	* 405 * 405				* 384 * 334 2760
3000 120	* 1945 * 1945	* 1251 * 1251					* 843 * 843 100

Illustration 216

g06364823

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

Product Information Section
Lifting Capacities








[mm] [inch]	1500 60	2000 80	2500 100	3000 120	3500 140		(mm) (inch)					
3000 120							2250 90					
2500 100			346 794	341 733			2880 120					
2000 80			372 823	338 729	419 929	254 547	3250 130					
1500 60		526 1114	457 986	482 1044	326 708	437 940	250 539	3470 140				
1000 40		793 1708	425 938	562 1212	314 678	429 924	240 526	341 735	193 436	339 727	187 412	3590 140
500 20		794 1644	400 866	547 1179	300 649	421 907	236 508	307 727	180 410	324 714	182 402	3600 150
0 0		754 1622	392 847	538 1159	292 631	415 894	230 487	305 688	168 368	331 731	168 403	3530 140
-500 -20		754 1619	392 845	534 1159	285 624	412 889	228 482			365 780	168 437	3350 140
-1000 -40		751 1610	385 833	538 1155	281 628	394 862	230			378 832	226 500	3050 120
-1500 -60	921 245	623 1341	598 1251	404 873	405 873	298				384 849	291 653	2560 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)	1503 60		2100 80		2500 100		3000 120		3500 140				(mm) (inch)		
 	 	 	 	 	 	 	 					(mm) (inch)			
3000 120												* 395 * 847	394 847	2260 90	
2500 100					* 346 * 794	341 733							* 406 * 903	271 690	2580 100
2000 80					* 372 * 823	339 729	* 419 * 928	254 547					* 377 * 820	223 497	3050 100
1500 60			* 526 * 754	457 395	* 482 * 1044	329 708	* 451 * 983	250 539					* 370 * 815	199 440	3470 140
1000 40			* 830 * 1080	425 319	* 614 * 1310	394 678	* 497 * 1075	243 524	* 422 * 902	193 416			* 373 * 834	187 412	3590 140
500 20			* 1608 * 2179	490 366	* 689 * 1479	380 649	* 525 * 1131	236 508	* 420 * 940	199 419			* 399 * 879	182 402	3600 150
0 0			* 954 * 2070	352 847	* 687 * 1478	292 631	* 519 * 1115	230 497	* 396 * 868	188			* 389 * 857	186 409	3530 140
-500 -20			* 870 * 1873	352 845	* 634 * 1384	289 624	* 478 * 1022	228 492					* 391 * 846	189 437	3350 140
-1000 -40			* 751 * 1610	335 853	* 547 * 1171	291 628	* 394 * 868	230					* 378 * 832	226 500	3050 120
-1500 -60	* 921 * 1945	623 1341	* 591 * 1251	484 873	* 405 * 873	299							* 384 * 848	291 653	2560 100

Illustration 218

g06364829

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

Product Information Section
Lifting Capacities





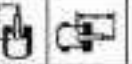
(mm) (inch)	1000 40	1500 60	2000 80	2500 100	3000 120	3500 140		(mm) (inch)						
3800 129								2550 800						
2500 108					365 742	365 742		3100 120						
2000 83					398 797	398 797		3130 140						
1500 63					397 864	379 892	342 738	294 632	3040 150					
1000 40			749 1582	696 1426	552 1188	476 1027	427 921	364 795	329 730	289 624	308 675	282 577	3150 150	
500 25			796 1648	633 1364	546 1176	459 1001	418 888	355 765	294 630	265 618	261 662	257 566	3170 150	
0 0		567 1328	567 1328	749 1618	617 1328	530 1149	448 985	416 904	348 750	300 662	281 618	281 576	3700 150	
-500 -23	792 1755	792 1755	938 2124	808 208	744 1593	612 1380	527 1156	442 975	396 875	344 741	328 718	279 611	3530 140	
-1000 -43				747 1694	616 1323	527 1136	442 963	398 876	364 742			362 797	310 698	3250 130
-1500 -63				958 1393	822 1340	666 1466	448 985					378 818	370 818	2810 130
-2000 -83				433 933								421 951	421 951	2100 80

Illustration 219

g06364831

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

Height (mm) (inch)	1000 40		1500 60		2000 80		2500 100		3000 120		3500 140		 (mm) (inch)		
															(mm) (inch)
2000 80							326	316					246	246	2000 80
2500 100									365	365			268	268	2000 100
2000 80									742	742			268	268	120
2000 80									356	356			362	362	2400 80
2000 80							620	620					667	667	160
2500 100							397	397	403	393	391	394	360	379	2040 100
2500 100							864	864	882	882	855	832	660	691	150
3000 120				748	686	652	476	464	364	408	290	368	262	262	3700 120
3000 120				1562	1436	1196	1027	1006	785	891	624	876	577	577	150
3000 120				866	632	669	489	509	355	446	295	329	257	257	3770 120
3000 120				2002	1384	1416	991	1097	765	896	614	723	666	666	150
3000 120			597	687	662	617	637	448	508	348	406	261	364	241	3700 120
3000 120			1338	1338	2029	1029	1476	965	1185	750	871	606	662	676	150
3000 120	790	790	939	939	910	682	652	442	491	344	369	279	362	277	3530 120
3000 120	1755	1755	2124	218	1062	108	1488	953	1054	741			736	61	140
3000 120					800	685	679	442	439	344			362	39	3290 120
3000 120					1719	1223	1239	953	910	742			737	680	130
3000 120					658	622	498	448					370	370	2880 120
3000 120					1350	1340	995	946					696	696	180
3000 120					433	433							421	421	2030 120
3000 120													961	961	90

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






Lift Height (mm) (inch)	1000 40		1500 60		2000 80		2500 100		3000 120		3500 140				Lift Capacity (mm) (inch)
															
2000 80							324	316					244	327	2000
2500 100									365	295			268	241	2000
2000 80									742	545			268	542	120
2000 80									358	255			302	280	2400
2500 100									750	547			357	452	160
2500 100									397	320			403	249	2400
3000 120									894	710			882	527	150
3000 120					748	401	552	314	427	241	339	191	286	171	2700
3500 140					1582	932	1196	818	921	520	730	411	675	378	150
3500 140					766	481	546	290	430	232	334	190	301	167	2770
4000 160					1640	898	1176	645	900	591	720	402	683	360	150
4000 160					597	306	333	206	430	228	330	193	306	170	2700
4500 180					1338	760	834	443	623	384	467	294	675	374	150
4500 180					790	490	527	292	406	222	328	191	320	179	2530
5000 200					1755	1005	1224	669	875	473			738	385	140
5000 200					747	466	527	292	406	222			362	201	2650
5500 220					1604	823	1136	600	876	480			737	445	130
5500 220					658	382	406	238					370	248	2810
6000 240					1350	645	695	422					618	354	110
6000 240					433	488							421	441	2030
													951	932	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 60		2500 80		3000 120		2500 140				[mm] [inch]
															
3000 120							326	305					365	327	2550 100
2500 100									365	295			319	241	2100 80
2000 80									742	545			708	542	120
1500 60							620	620	358	275			302	203	3130 140
1000 40							397	318	493	248	391	198	308	182	3040 150
500 20					748	431	652	314	484	241	408	181	308	171	3150 150
1500 60					1582	932	1806	678	1036	510	881	43	678	378	250
1000 40					398	401	660	288	599	232	436	88	328	187	3170 150
500 20					2132	940	1848	645	1097	591	690	462	723	389	150
1500 60			567	586	932	396	687	288	508	226	406	163	384	170	3100 150
1000 40			1328	1268	2128	834	1476	621	985	487	871	264	802	374	150
500 20	793	793	939	988	913	393	652	282	491	222	368	181	382	179	3530 140
1000 40	1755	1755	2024	1285	1862	825	1401	689	1054	479			798	396	140
1500 60					992	395	679	282	478	222			362	241	3280 130
1000 40					1719	829	1239	669	883	400			797	445	130
500 20					658	332	406	288					378	248	2810 110
1500 60					1399	645	985	622					818	554	110
2000 80					433	498							421	481	2030 80

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

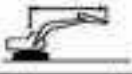












[mm] [inch]	1500 60		2000 80		2500 100		3000 120		3500 140				[mm] [inch]	
3000 120													2018 80	
2500 100					- 344 - 708	- 344 - 708							* 400 * 862 * 403 * 858	2018 80
2000 80					- 376 - 832	- 376 - 832	* 420 * 807	* 350 * 770					368 815	3270 129
1500 60			* 549 * 1161	* 549 * 1161	- 491 - 1061	- 465 - 1003	417 897	353 761					331 733	3489 140
1000 40			758 1628	622 1343	536 1155	450 970	409 880	346 745	325 740	274 594	274 594		313 691	3589 140
500 20			728 1587	596 1286	521 1123	436 940	400 863	338 729	321 692	272 597	272 597		309 689	3609 140
0 0			719 1546	588 1267	512 1103	427 820	395 859	332 717	309 688	270 596	270 596		316 697	3529 140
500 20			719 1544	588 1265	509 1098	424 894	392 846	330 712					340 750	3340 140
1000 40			723 1554	592 1275	511 1101	426 899	* 387 833	333					* 378 * 832	3039 120
1500 60	* 903 * 1907	* 803 * 1807	* 579 * 1224	* 579 * 1224	- 392 - 852	* 392 * 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 2210 * 862 * 862 90
2500 100			* 344 * 344 * 788 * 788					* 403 * 403 2910 * 896 * 896 120
2000 80			* 376 * 376 * 832 * 832	* 420 * 420 * 929 * 929	358 770			* 376 * 376 3270 * 831 * 831 130
1500 60		* 549 * 549 * 1261 * 1261	* 491 * 491 * 1061 * 1061	* 465 * 465 * 1003 * 1003	* 453 * 453 * 988 * 988	353 761		* 370 * 370 3480 * 817 * 817 140
1000 40		* 306 * 306 * 1315 * 1315	* 622 * 622 * 1332 * 1332	* 620 * 620 * 970 * 970	* 498 * 498 * 1080 * 1080	346 745	* 422 * 422 * 902 * 902	276 * 276 3580 594 * 594 150
500 20			* 691 * 691 * 1483 * 1483	* 438 * 438 * 940 * 940	* 525 * 525 * 1132 * 1132	339 729	* 419 * 419 * 898 * 898	272 * 272 3600 587 * 587 150
0 0		* 359 * 359 * 2067 * 2067	* 588 * 588 * 1267 * 1267	* 685 * 685 * 1474 * 1474	* 427 * 427 * 920 * 920	* 517 * 517 * 1112 * 1112	332 * 332 717	* 393 * 393 3520 * 856 * 856 140
-500 -20		* 963 * 963 * 1859 * 1859	* 688 * 688 * 1285 * 1285	* 639 * 639 * 1355 * 1355	* 424 * 424 * 914 * 914	* 474 * 474 * 1014 * 1014	330 712	* 391 * 391 3340 * 859 * 859 140
-1000 -40		* 743 * 743 * 1532 * 1532	* 592 * 592 * 1275 * 1275	* 541 * 541 * 1156 * 1156	* 428 * 428 * 919 * 919	* 387 * 387 833		* 378 * 378 3030 * 832 * 832 120
-1500 -60	* 903 * 903 * 1907 * 1907	* 803 * 803 * 1807 * 1807	* 579 * 579 * 1224 * 1224	* 579 * 579 * 1224 * 1224	* 392 * 392 * 832 * 832			* 386 * 386 2520 * 852 * 852 100

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								350 752
2500 108					362 528	358 770		317 764
2000 68				281 630	281 630	348 772		301 685
1500 63				406 882	466 882	497 885	327 760	278 703
1000 40			784 1628	620 1358	537 1157	458 971	407 877	344 741
500 25			728 1569	597 1290	520 1120	434 935	388 857	375 722
0 0		608 1383	688 1383	713 1533	582 1254	508 1093	422 908	390 841
-500 -25	868 1736	908 1790	961 2172	806 2084	709 1523	579 1245	502 1081	417 889
-1000 -40				712 1528	591 1290	502 1082	417 900	317 700
-1500 -60				848 1376	598 1269	457 985	423 94	
-2000 -80								371 821
								431 877
								2600 100
								3100 120
								3450 140
								3600 160
								3750 180
								3900 200
								4050 220
								4200 240
								4350 260
								4500 280
								4650 300
								4800 320
								4950 340
								5100 360
								5250 380
								5400 400
								5550 420
								5700 440
								5850 460
								6000 480
								6150 500
								6300 520
								6450 540
								6600 560
								6750 580
								6900 600
								7050 620
								7200 640
								7350 660
								7500 680
								7650 700
								7800 720
								7950 740
								8100 760
								8250 780
								8400 800
								8550 820
								8700 840
								8850 860
								9000 880
								9150 900
								9300 920
								9450 940
								9600 960
								9750 980
								9900 1000

Illustration 225

g06364862

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



(mm) (inch)	1000 40	1500 60	2000 80	2500 100	3000 120	3500 140		(mm) (inch)		
3800 129								350 767	350 767	3500 100
2500 108								362 794	358 794	3200 100
2000 83								281 620	281 620	3150 100
1500 63								406 892	466 1023	3000 100
1000 41								771 1623	620 1358	2750 100
500 25								391 205	397 1290	2600 100
1 1								608 1383	688 1503	2450 100
500 23								868 1736	808 1730	2300 100
1000 41								798 1783	891 1950	2100 100
1500 63								848 1876	893 1959	1900 100
2000 83								965 2127	934 2050	1700 100

Illustration 226

g06364879

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

Identification Information

i08714229

Plate Locations and Film Locations

SMCS Code: 1000; 7000

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

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

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

Product Identification Number (PIN) Plate



Illustration 227

g06276619

PIN plate location

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

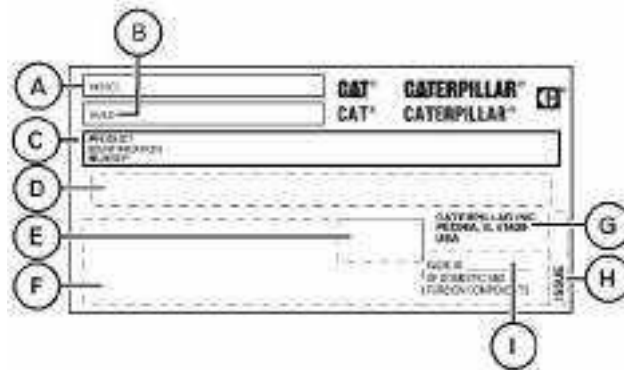


Illustration 228

g06201159

PIN plate

Model (A) _____

Build (B) _____

Product Identification Number (C) _____

Bar Code (D) _____

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

Regional Certification Plate (If Required) (F) _____

Address of Manufacturer (G) _____

Issue (H) _____

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

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

Regional Product Marking (If Equipped)

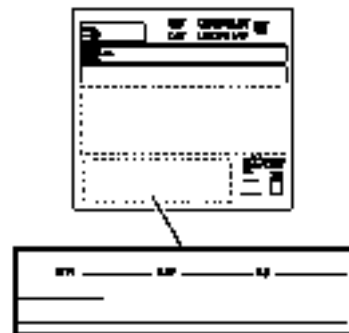


Illustration 229

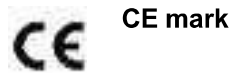
g06650998

Regional marking plate

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

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

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



CE mark



UKCA mark



EAC mark



Gulf Standardization Organization (GSO) mark



Ukraine mark

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

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

Eurasian Economic Union

Manufacturer Information

Manufacturer:

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

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

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

Machine Specification Film

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

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

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



Illustration 230

g06178867

Typical example

Electromagnetic Emissions

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



Illustration 231

g06063443

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

Engine Serial Number

This label is on the engine.

Engine Serial Number _____

Sound Certification

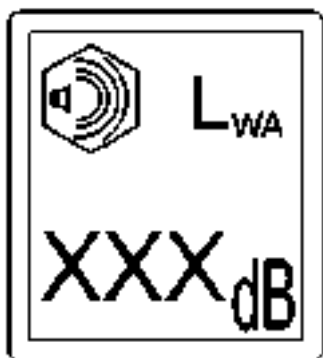


Illustration 232

g06675270

Sound certification film

A typical example of this film is shown.

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

- "ISO 6395:1988"

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



Illustration 233

g03105800

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

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

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

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

i08085827

Emissions Certification Film

SMCS Code: 1000; 7000; 7405

Consult your Cat dealer for an Emission Control Warranty Statement.

The emission certification film is on the engine.

Declaration of Conformity (European Union)

SMCS Code: 1000; 7000

Table 22

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

ORIGINAL EU DECLARATION OF CONFORMITY

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

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

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

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

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

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.

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.

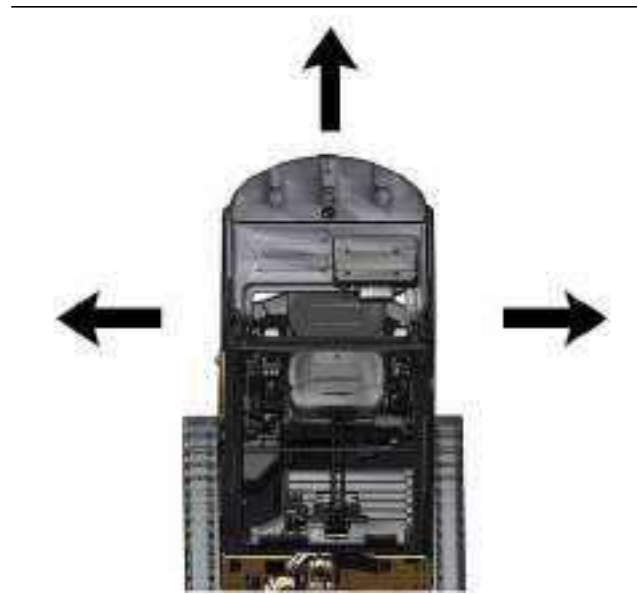


Illustration 236

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.

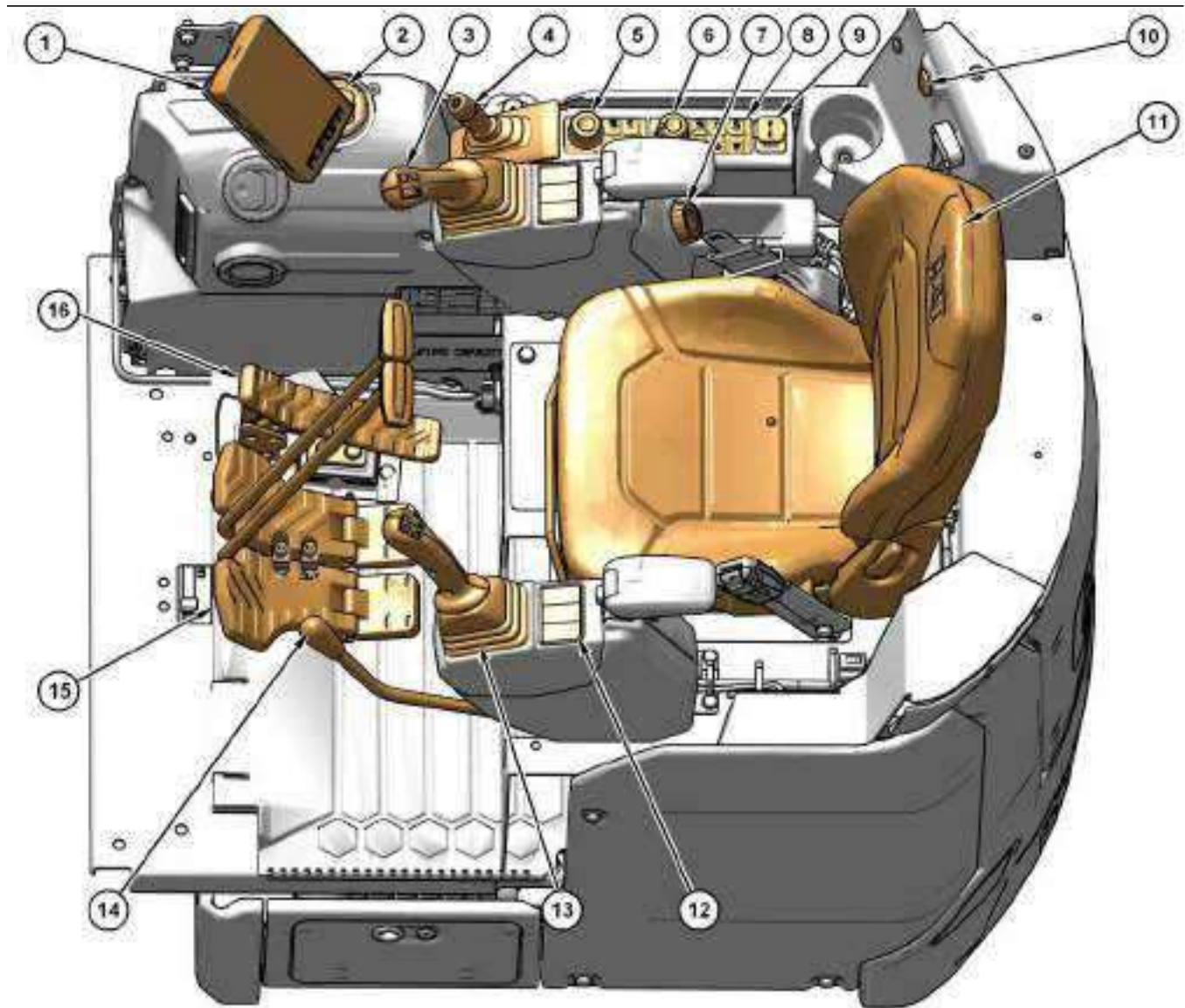


Illustration 242

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)

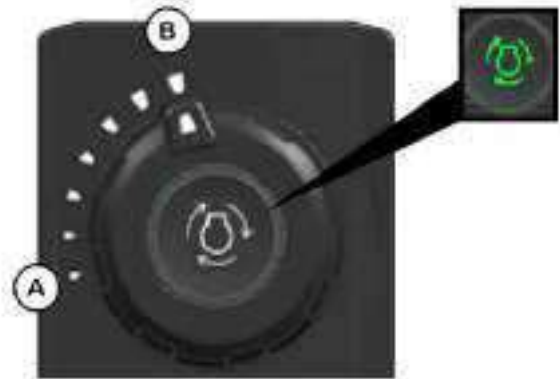


Illustration 244

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)

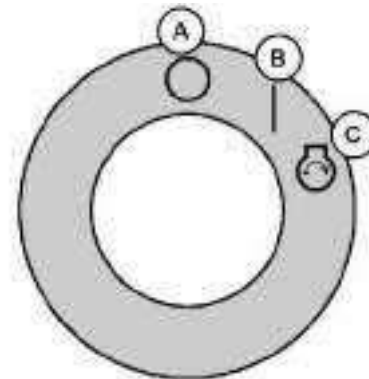


Illustration 245

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)

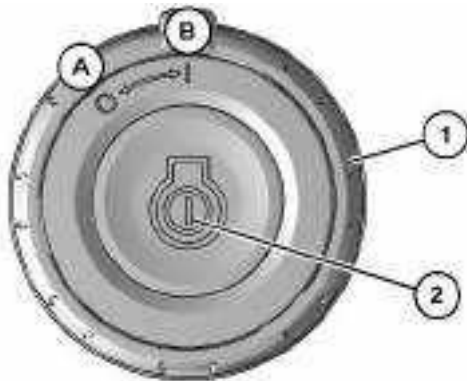


Illustration 246

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

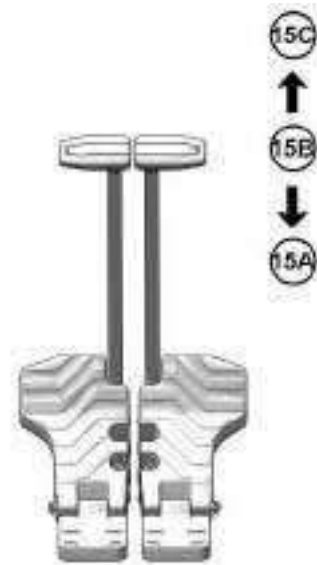


Illustration 249

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.

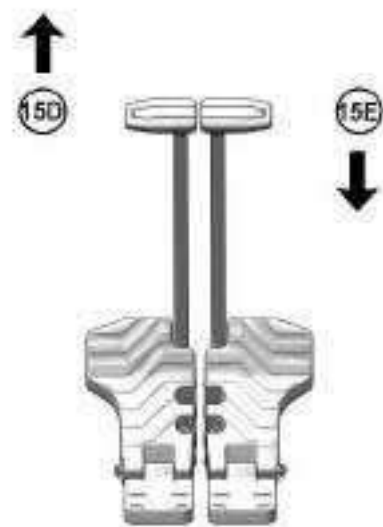


Illustration 250

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

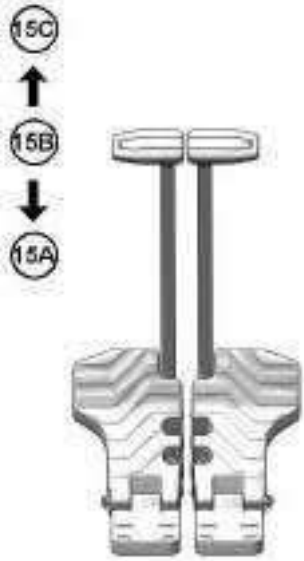


Illustration 251

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.

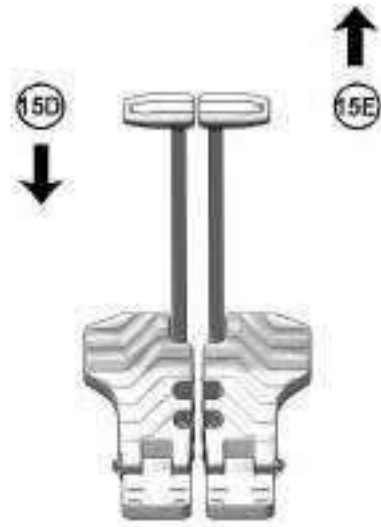


Illustration 252

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.

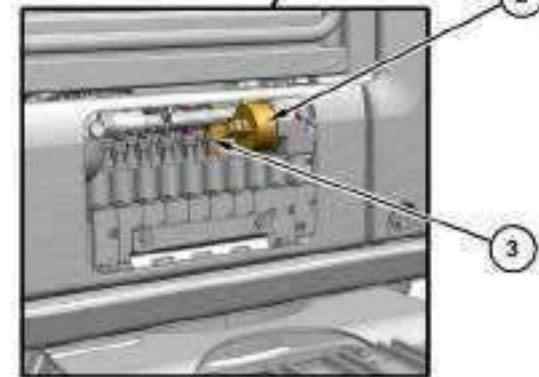



Illustration 257 g06756722


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)

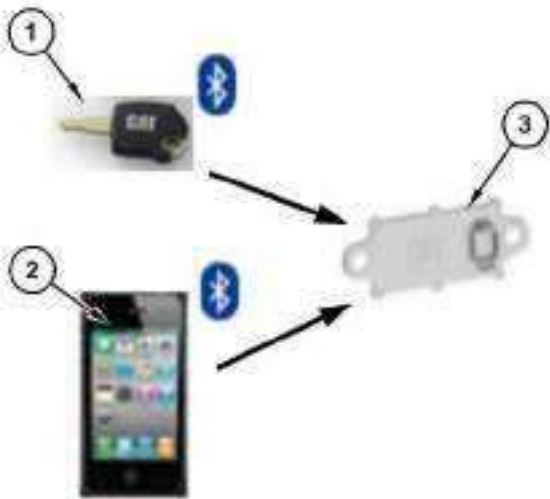


Illustration 259

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

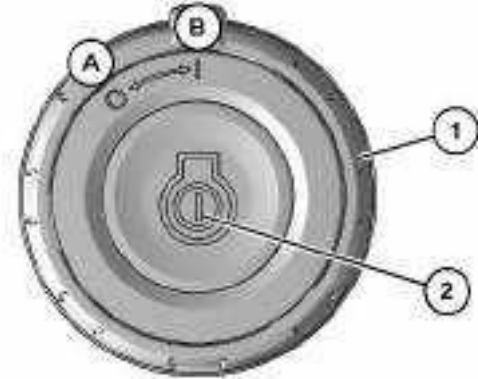


Illustration 260

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)

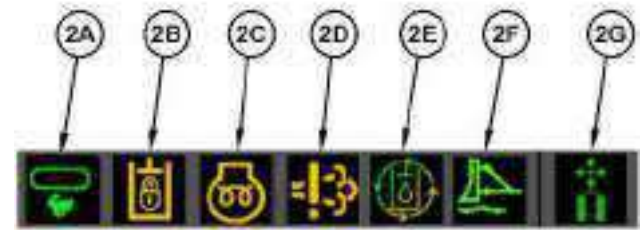


Illustration 262

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.

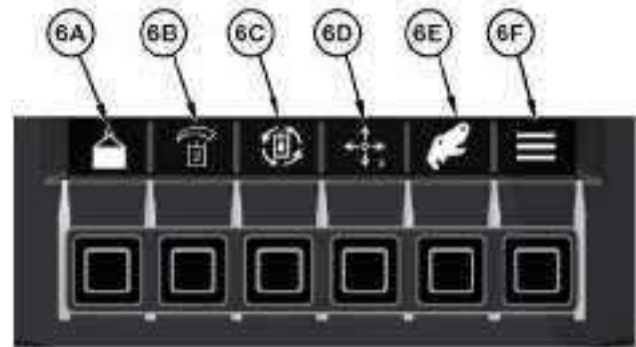
Navigation Buttons (6)

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”.

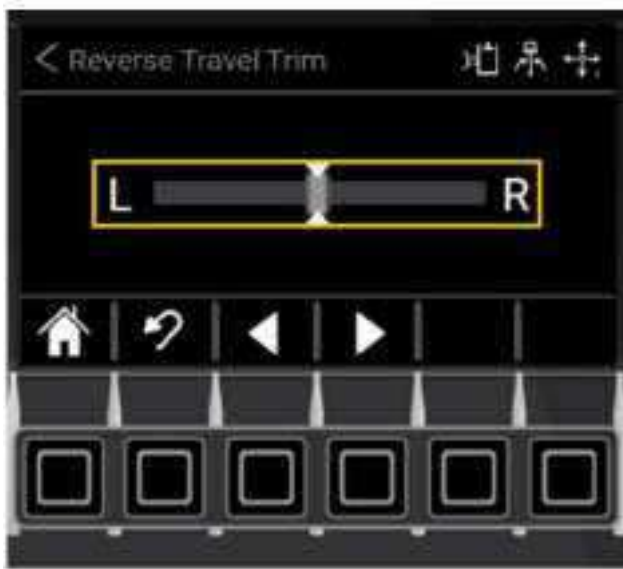


Illustration 270

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

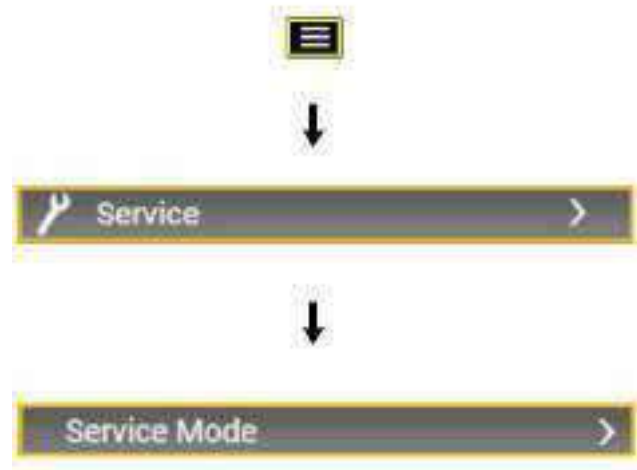


Illustration 275

g06334877

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

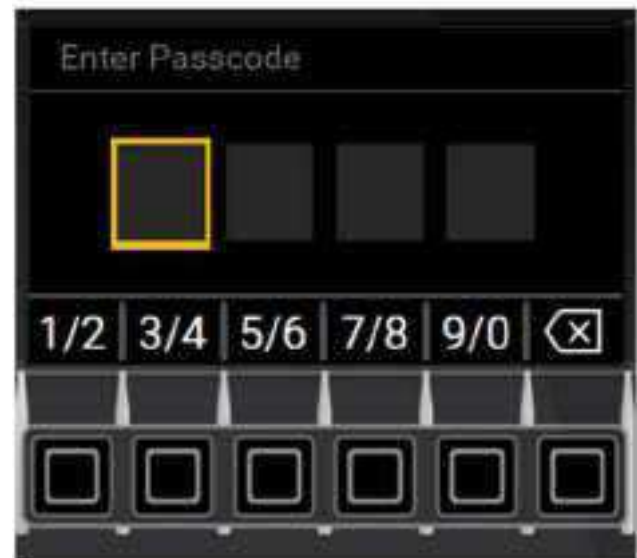


Illustration 276

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.

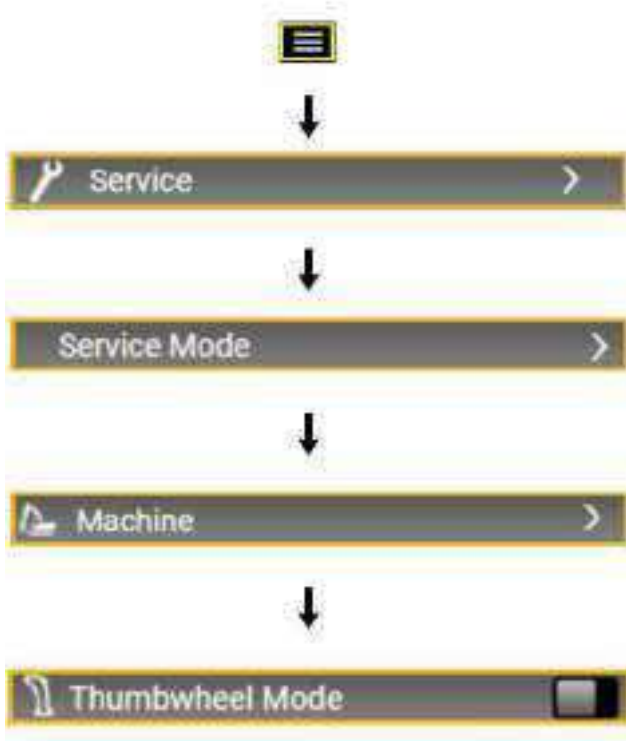


Illustration 277 g06334888

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).

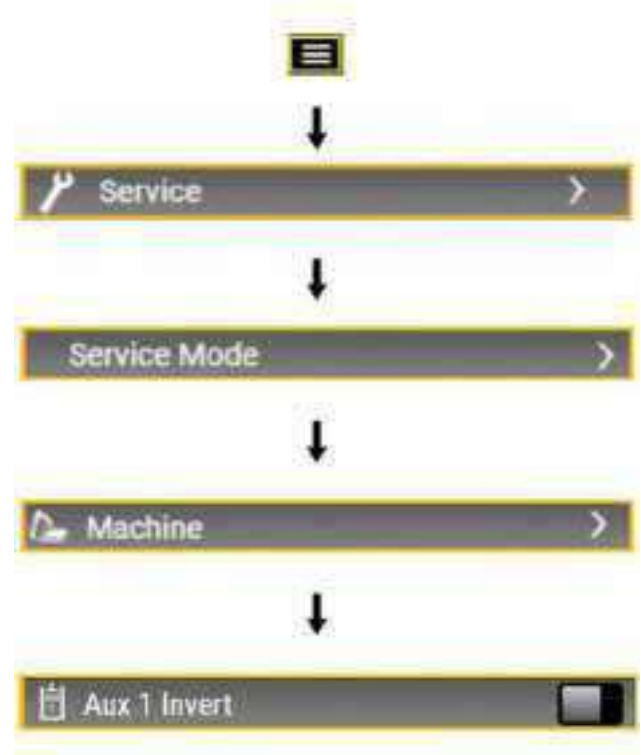


Illustration 279 g06711017

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

toggling this setting will turn the security system ON or OFF.

Grace Period

This setting is used to set the duration after key off that the registered user stays logged on to the machine. If the machine is turned ON within this time range, the machine will bypass security access without the use of a Bluetooth key or passcode.

Users / Keys

The Users / Keys category from the Security Menu allows the owner / technician to enter unique passcodes (PINs) and/or Bluetooth keys (each with a unique ID) which allow those authorized users to start and operate the machine. Also, the owner or authorized technician can delete passcode PINs and Bluetooth key IDs of authorized keys and users.



Illustration 281

g06334983

To access the User / Keys options, press the “Menu” button, select “Service”, “Service Mode”, “Security”, then “Users / Keys” .



Illustration 282

g06390456

Add PIN



Illustration 283

g06345288

To add new 4-digit PIN to the passcode list of authorized users, select "Add PIN" from the "Users / Keys" menu.



Illustration 284

g06345290

Only a user with a "Master" passcode can enter new "Standard" passcodes.

Note: Standard passcodes are for operators and technicians - Master passcodes are intended for owners or authorized personnel

Multiple Master passcodes can be added to the Master Passcode list. The default master passcode from the factory is "1 1 1 1". This default passcode can be removed after creating a new master passcode.

This same strategy applies to the Bluetooth system, with a Master Bluetooth key used to add or remove Bluetooth keys from respective lists.

Passcode PINs and Bluetooth key IDs can also be added or removed from respective lists using Cat ET.

Note: A maximum total of 25 passcodes and keys can be added to the machine.



Illustration 285

g06345300

From the Add PIN entry screen, use the number buttons to enter a unique 4-digit passcode number.

Note: Each button can enter two numbers. To enter the number two (2), press the left-most “1/2” button twice, then the highlight will move to the next entry field to the right.

Each time a number is entered, the highlight will automatically move to the next space to the right.

Once all four numbers have been entered, the new passcode will be added to the list of authorized PINs. The display will then return to the Keys/Users Menu.

In the example above, when the operator turns the key start switch to ON, the monitor will display the startup passcode entry screen. When the operator enters “1111”, the MSS will allow the engine to be started.

Remove PIN



Illustration 286

g06345316

To remove a 4-digit PIN to the passcode list of authorized users, select “Remove PIN” from the “Users / Keys” menu.

From the “Remove PIN” entry screen, use the number buttons to enter the 4-digit passcode number that you wish to remove if equipped with the Performance display or select the 4-digit passcode number you wish to remove if equipped with the Premium display.

Press the “OK” button or tap the center of the Jog Dial (if equipped) to remove the 4-digit passcode number from the list of authorized passcodes.

Add Bluetooth Key

Illustration 287

g06345355

To add new Bluetooth key ID to the list of authorized Bluetooth keys, select “Add Bluetooth Key” from the “Users / Keys” menu.

From the “Users / Keys” menu, use the arrow buttons to highlight the “Add Bluetooth Key” option, then press the “OK” button. The “Add Bluetooth Key” confirmation screen will appear.



Illustration 288

g06345356

Use the arrow buttons to highlight the “Standard” or “Master” option, then press the “OK” button. The “Add Bluetooth Key” screen will be displayed.



Illustration 289

g06345359

Use a combination of number buttons and Jog Dial Module (if equipped) to enter the unique 12-digit alpha-numeric ID assigned to Bluetooth key chip.

The “Add Bluetooth Key” screen is first displayed with all 12 ID spaces blank and the left-most space highlighted. Use the arrow buttons scroll up and down through the numbers 0-9, then alpha characters A-F, which are displayed in the space. When the desired character is displayed in the highlighted space, move to the next space.

Note: The highlight can also be moved left to change a number previously entered.

Repeat this process for all 12 spaces. When all 12 spaces have been filled with the unique 12-digit Bluetooth key ID, press the “OK” button or tap the center of the Jog Dial (if equipped) to enter the Bluetooth key ID to the list of authorized Bluetooth IDs.

The display will return to the “Users / Keys” Menu.

Remove Bluetooth Key



Illustration 290

g06345381

To remove a 12-digit Bluetooth key ID from the list of authorized Bluetooth key IDs, select "Remove Bluetooth Key" from the "Users / Keys" menu.

Enter the unique 12-digit alpha-numeric ID assigned to the Bluetooth key ID that you wish to remove if equipped with the Performance display or select the Bluetooth Key ID that you wish to remove if equipped with the Premium display.

Press the "OK" button or tap the center of the Jog Dial (if equipped) to remove the Bluetooth key ID from the list of authorized Bluetooth IDs.

The display will return to the "Users / Keys" Menu.

Display System Mode

The Display System Mode can be changed between Normal and Simplified. When the mode is set to Normal, all available display settings are shown and available for adjustment. When the mode is set to Simplified, the display settings below are hidden and not available for adjustment:

- All joystick response settings
- Advanced implement speed settings (overall setting still available)
- Forward travel trim
- Reverse travel trim
- Auxiliary 1 flow balance
- Auxiliary 2 flow balance

- Job clock
- ECM summary
- Machine configurations within service mode

The Simplified Display System Mode is intended for customers who want to limit the adjustability of the machine.

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

Seat Belt Reminder System (If Equipped)

If the machine is fitted with the operator presence seat belt assembly and the "Operator Seat Belt Monitor Installation Status" configuration is set to "Installed" in Cat® ET, the seat belt reminder system will be active on the machine.

The red seat belt warning symbol is always present on the top status bar when the seat belt is not fastened. Once the seat belt is fastened, the red seat belt warning symbol disappears and there will be no other seat belt notifications while the seat belt remains fastened.



Illustration 291

g06751792

Seat Belt Indicator in Monitor

If the belt is not fastened while the engine is running and the arm bar is lowered, there will be a pulsing audible tone for 10 seconds every minute and a pop-up message stating “Seat Belt Unfastened – Fasten Belt”. The audible tone can be configured to be snoozed after 5 minutes by setting the “Operator Seat Belt Audible Alarm Snooze Enable Status” to ENABLED in Cat® ET. If DISABLED, the tone will continue for 10 seconds every minute while the engine is running, arm bar is lowered and seat belt is not fastened.



Illustration 292

g06721427

If the operator seat belt unfastened while machine is not idle event enable status is configured as ENABLED in Cat® ET, the operator seat belt unfastened while machine is not idle event will be logged if the seat belt is not fastened while the engine is running and the arm bar is lowered for 5 minutes. If Disabled, there will not be an event logged.

Monitor Wake-up Feature

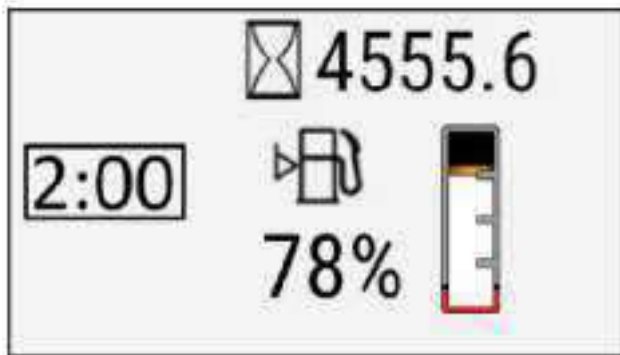


Illustration 293

g06366070

Monitor wake-up screen example

Pressing any navigation button on the monitor will display the service hours of the machine and actual fuel level for 2 minutes. This feature will function when the key is in the OFF position and the battery disconnect switch is in the ON position.

Note: This feature can also be activated by pressing the monitor wake-up button located below the cup holder in the cab (if equipped).

i07256347

Storage and Literature Compartment

SMCS Code: 7268



Illustration 294

g06267099

The compartment on the rear of the operator seat is used to store the literature for the machine.

i07287781

Mirror (If Equipped)

SMCS Code: 7319



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.

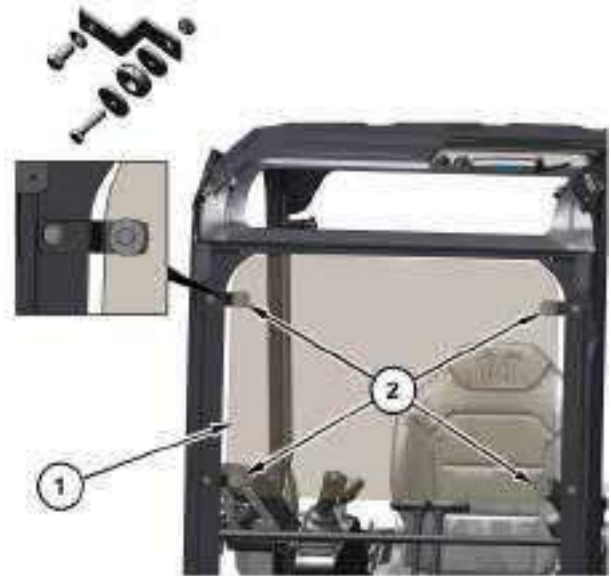


Illustration 298

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.

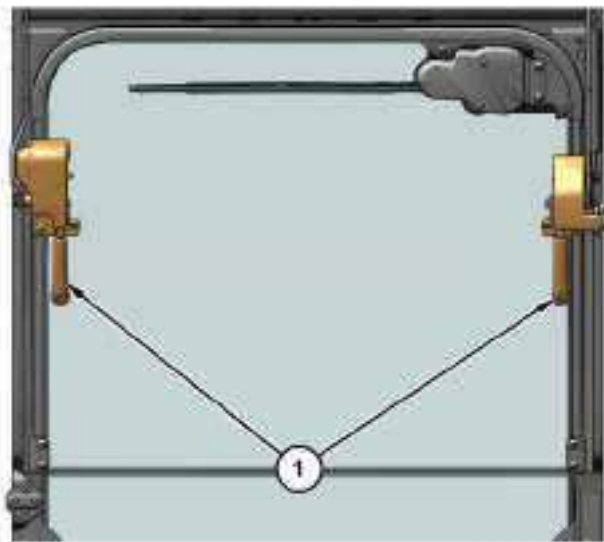


Illustration 299

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.

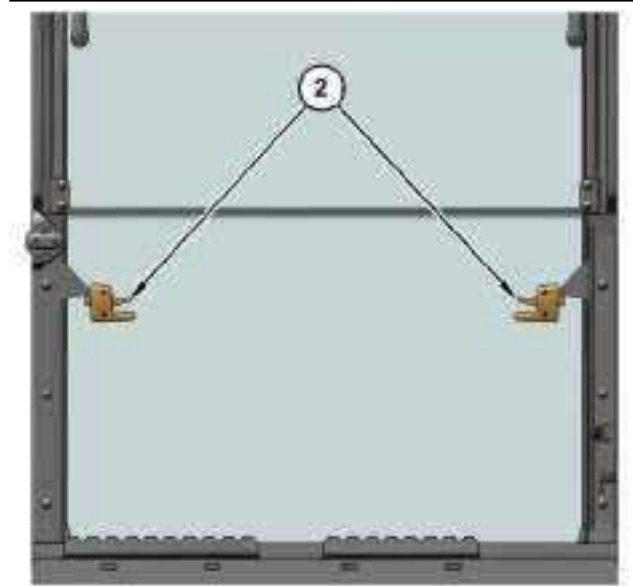


Illustration 300

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 pushing 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.

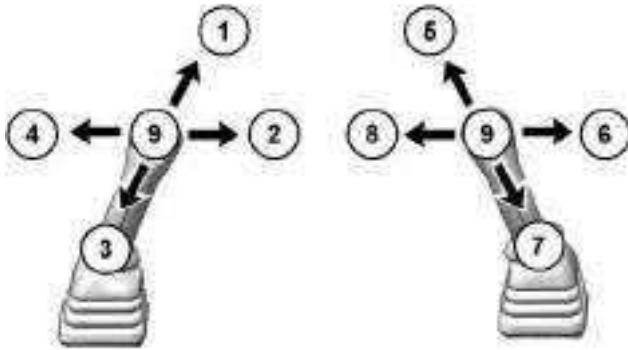


Illustration 301

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

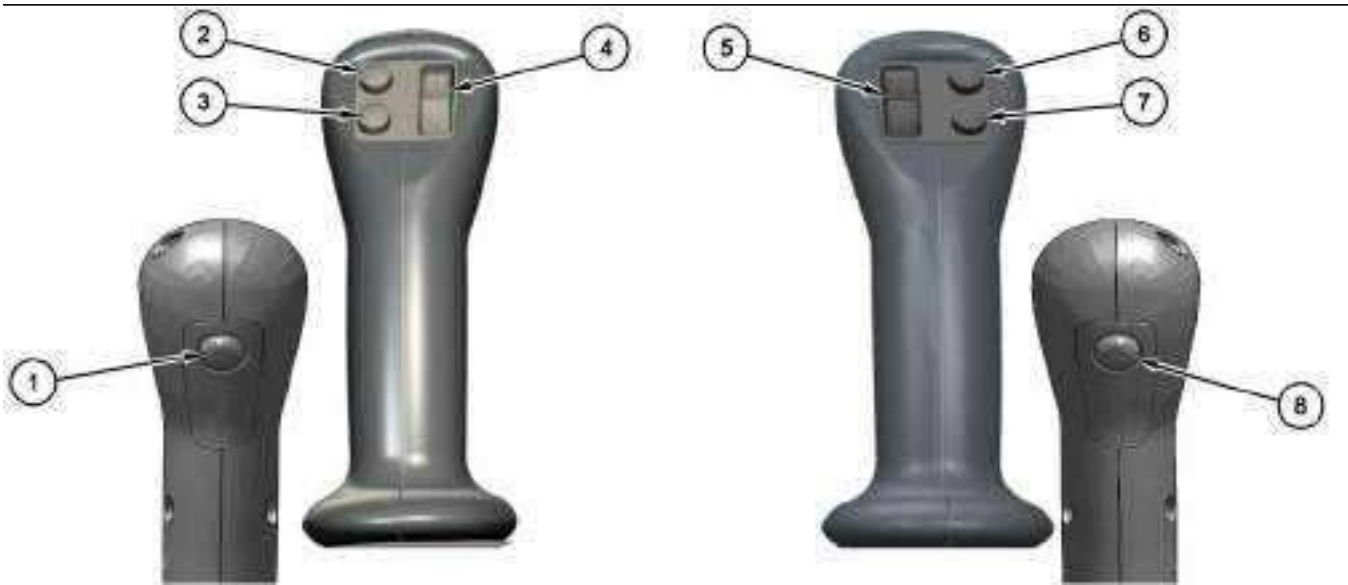


Illustration 302

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.

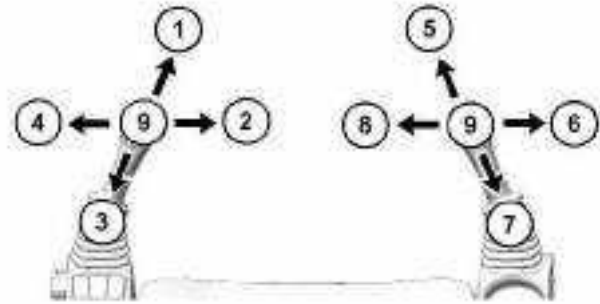


Illustration 303

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.

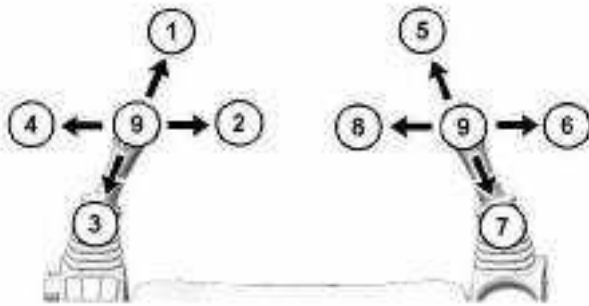


Illustration 304

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 the 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)

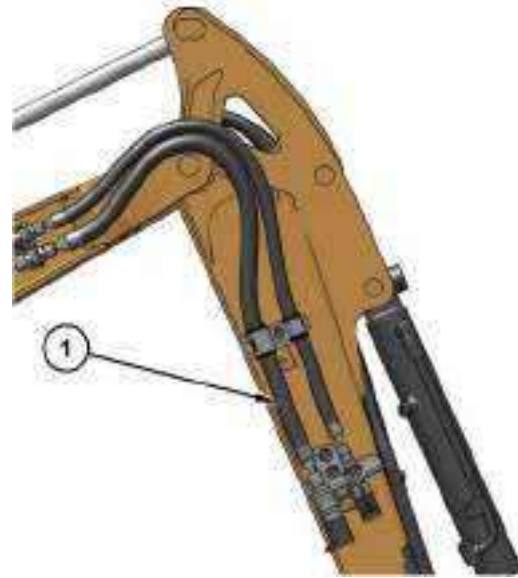


Illustration 305

g06267476

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

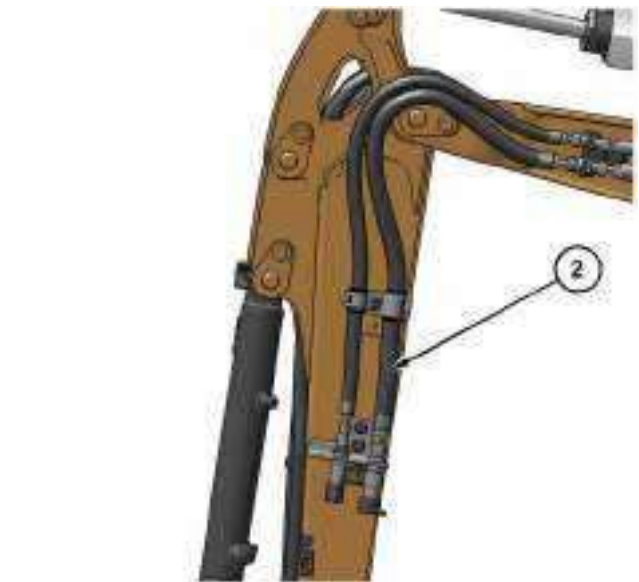


Illustration 306

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:

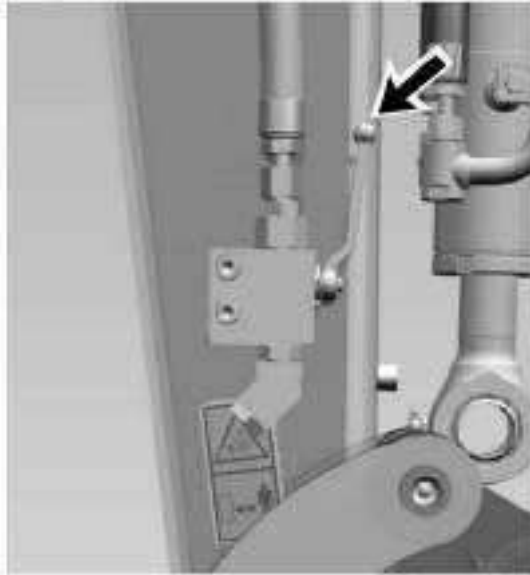


Illustration 307

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)

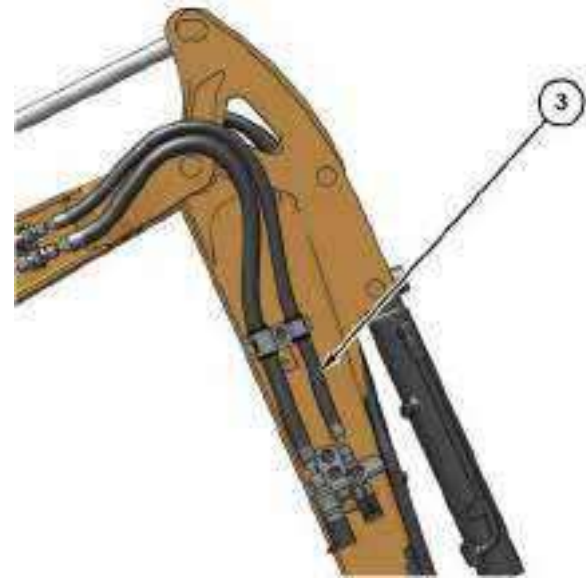


Illustration 308

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)

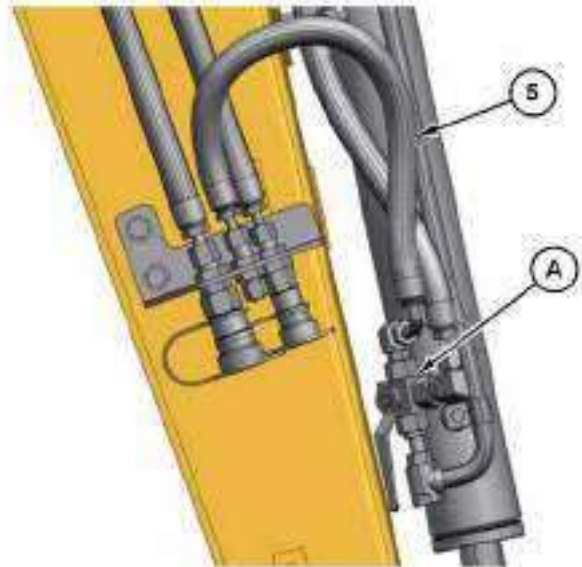


Illustration 310

g06643027

(A) Diverter Valve

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

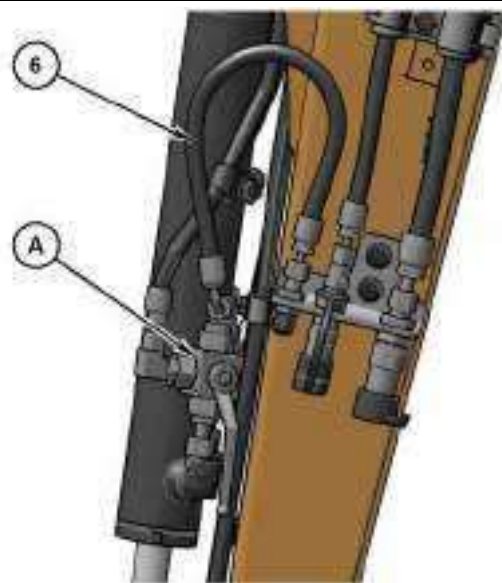


Illustration 311

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

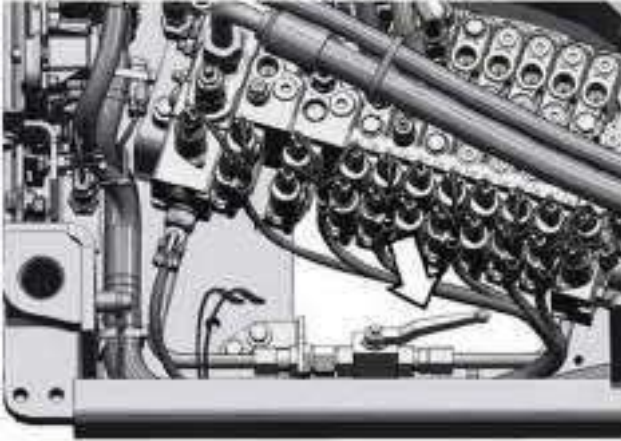


Illustration 313

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

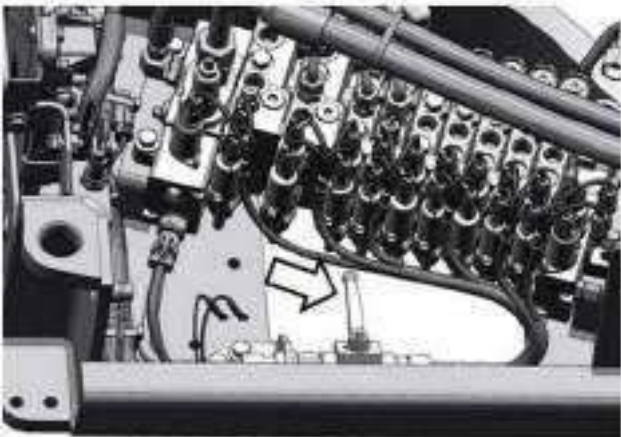


Illustration 314

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)

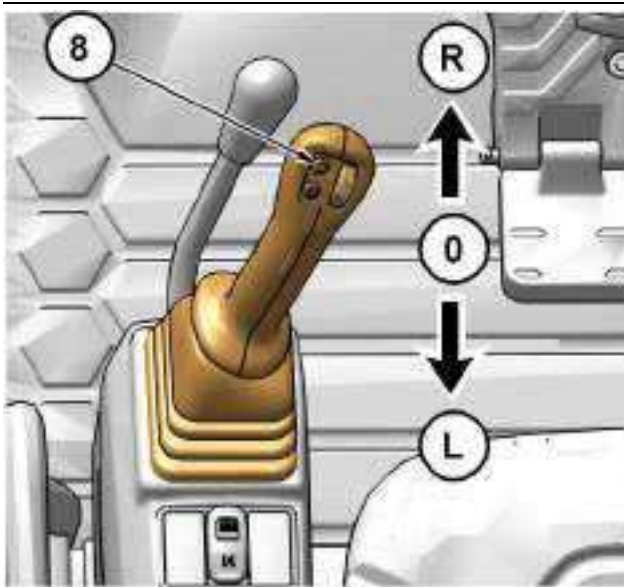


Illustration 316

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.

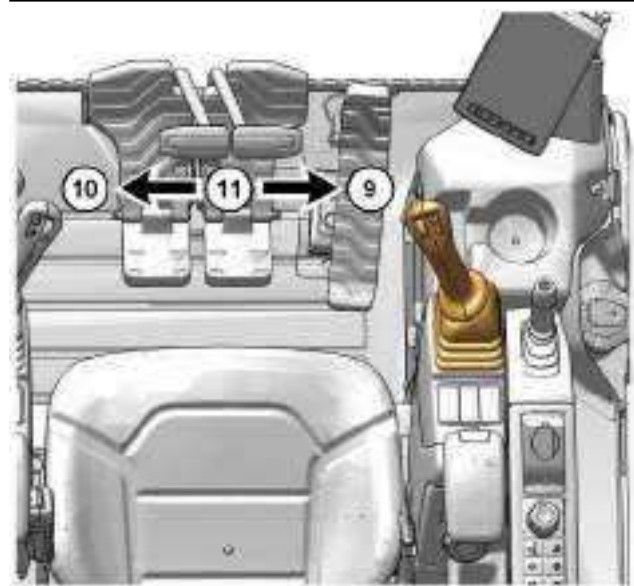


Illustration 317

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.

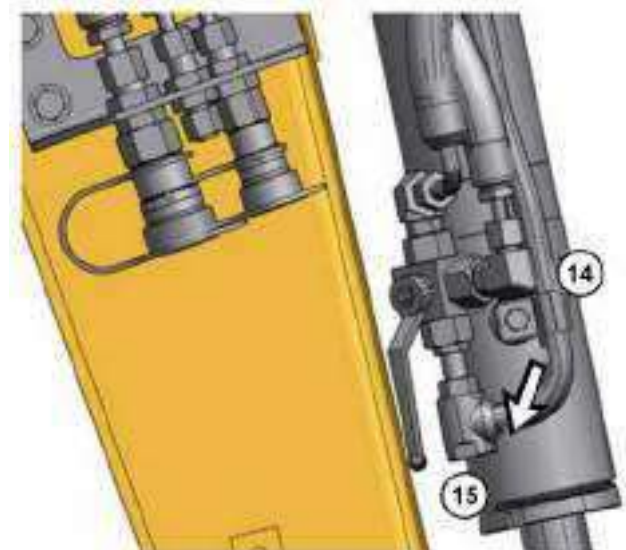


Illustration 318

g06643038

Right Side Diverter Valve

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

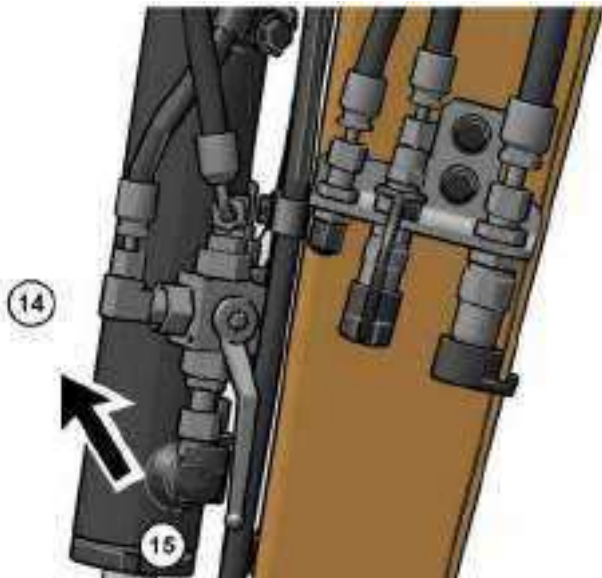


Illustration 319

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

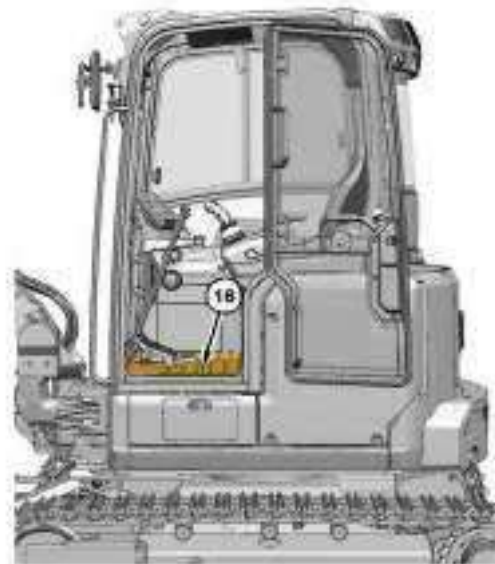


Illustration 321

g06622117

(16) Floor mat

2. Remove the floor mat (16).

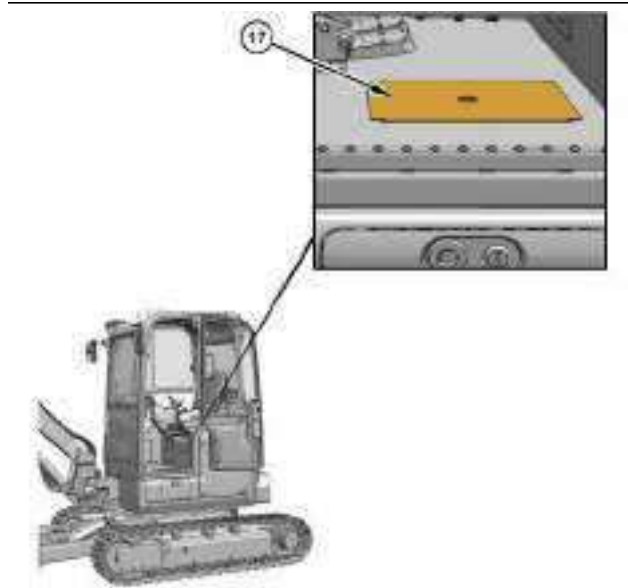


Illustration 322

g06622144

(17) Panel

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

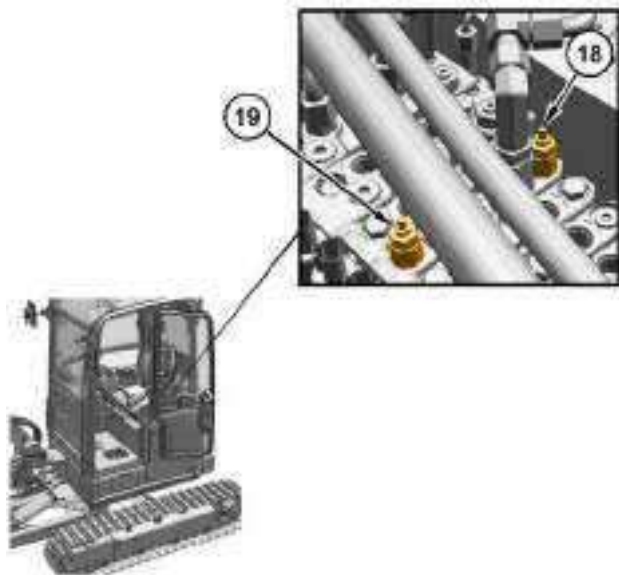


Illustration 323

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

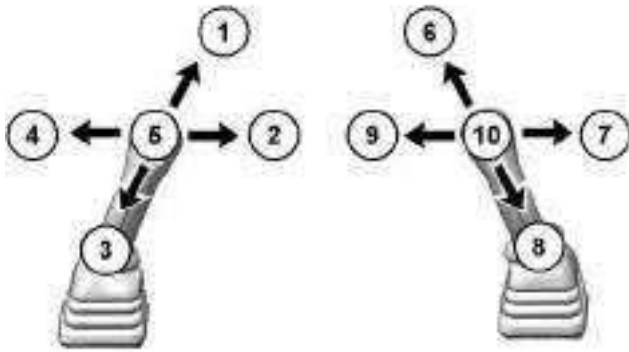


Illustration 324

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

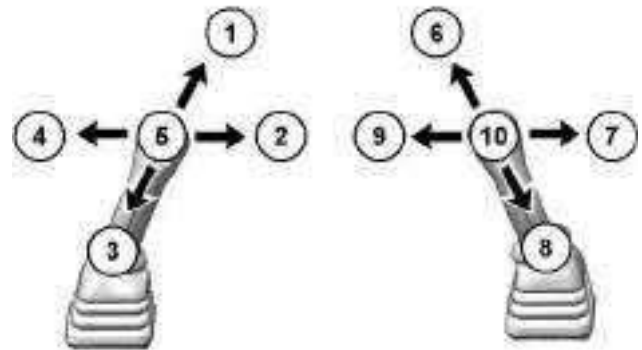


Illustration 325

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

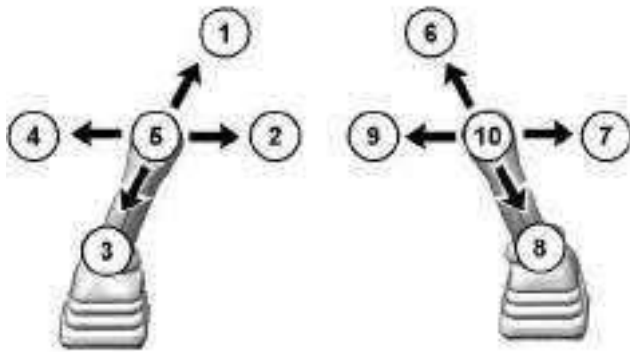










Illustration 326

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

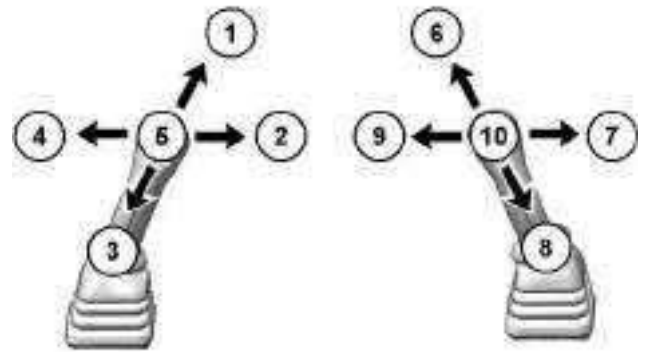










Illustration 327

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.



Illustration 328

g06319355

- (1) 40° C (104° F)
(2) 80° C (176° F)

4. Allow the engine to warm up until the coolant temperature dial reaches 40° C (104° F) (1) or, if at higher altitude or cold conditions, 80° C (176° F) (2).
5. Cycle all controls to circulate warm oil through all hydraulic cylinders and through all hydraulic lines.

⚠ WARNING

When you cycle the machine controls, the machine can move suddenly. Contact between the machine and external objects or ground personnel can result in serious injury or death. Before you cycle the machine controls, the machine should be located in an unobstructed, hazard-free work area that is away from external objects and ground personnel.

6. Observe the gauges and the indicators frequently during the operation.

Operation

i08484409

Operation Information

SMCS Code: 7000

Make sure that no personnel are on the machine or near the machine in order to prevent any personal injury. Keep the machine under control at all times in order to prevent injury.

If the boom is in the raised position and if the engine is stopped, refer to Operation and Maintenance Manual, "Equipment Lowering with Engine Stopped" for the procedure to lower the boom.

Reduce the engine speed when you maneuver the machine in tight quarters and when you drive over an incline.

Select the necessary travel speed range before you drive downgrade. Do not change the speed range while you drive downhill.

Use the same travel speed on a downgrade and on an upgrade.

When you travel for any distance, keep the stick inward and carry the boom in a low position. A machine that is equipped with a blade should travel with the blade in the highest position.

When you travel on a steep grade, keep the work tool as close to the ground as possible on the downhill side of the machine.

When you travel on moderate uphill grades, keep the boom on the uphill side of the machine.

Operating Procedure

1. Adjust the operator seat.
2. Fasten the seat belt.
3. Start the machine and refer to Operation and Maintenance Manual, "Engine and Machine Warm-Up" for information about warming the engine and warming the hydraulic oil.
4. Raise the boom enough in order to provide sufficient ground clearance.
5. Make sure that the position of the upper structure and of the undercarriage is known before you move the machine. The dozer blade should be in front of the machine.

Note: The travel levers will operate normally if the dozer blade is in front of the machine. The travel levers will operate backward if the dozer blade is behind the machine.

6. Rotate the engine speed dial clockwise in order to increase the engine speed to the desired speed.
7. Push both travel levers forward at the same time in order to travel forward. If both travel levers are pushed farther, the travel speed at the selected engine speed will be faster.

Note: If the machine does not operate or if the machine does not travel in a straight line, consult your Caterpillar dealer.

8. See Operation and Maintenance Manual, "Operator Controls" for information on "Travel Control". This instruction is about spot turning and about pivot turns.
9. When you make turns in soft material, travel in a forward direction occasionally in order to clear the tracks.
10. Slowly move both of the travel levers to the center position in order to stop the machine.

Lifting Objects

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

The overload warning device (if equipped) must be adjusted for the bucket linkage and bucket size that is installed on the machine. Adjust the overload warning device for proper operation.

The setting for the overload warning device (if equipped) should be checked by an authorized dealer.

Contact your Cat dealer for additional information.

i07287854

Frozen Ground Conditions

SMCS Code: 7000

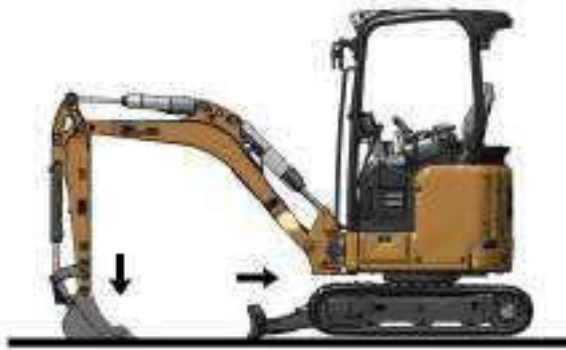


Illustration 329

g06275430

To free the tracks from frozen ground, swing the boom to the front of the machine. Use boom down pressure to free the idler end of the machine.

Swing the boom to the rear of the machine. Use boom down pressure to free the sprocket end of the machine.

i07245364

Equipment Lowering with Engine Stopped

SMCS Code: 7000

To lower the boom, place the hydraulic activation control lever in the UNLOCKED position. Move the joystick to the BOOM LOWER position. If the accumulator is still charged, the boom will lower.

If the boom does not lower, the accumulator is empty. Use the following method to lower the boom.

WARNING

Be sure no one is under or near the work tools before manually lowering the boom. Keep all personnel away from the boom drop area when lowering the boom with the engine stopped in order to avoid possible personal injury.

WARNING

Personal injury can result from oil under high pressure.

DO NOT allow high pressure oil to contact skin.

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

Note: Refer to Operation and Maintenance Manual, "General Hazard Information" for information on Containing Fluid Spillage.

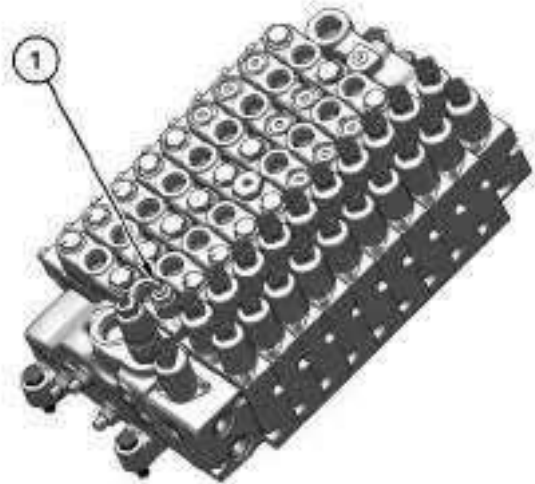


Illustration 330

g06264442

1. Remove plug (1) on end of valve with 5 mm hex wrench.
2. Turn screw clockwise with 4 mm hex wrench until the relief is forced open and the boom begins to lower.
3. Make sure that the work tool has lowered all the way to the ground. Reset the valve by turning the screw counter clockwise until the valve returns to the original position.
4. Replace the plug.
5. Make the necessary repairs before you operate the machine.
6. Check the level of the hydraulic fluid. Refer to Operation and Maintenance Manual, "Hydraulic System Oil Level-Check".

Blade (If Equipped)

To lower the blade, place the hydraulic lockout control in the UNLOCKED position. Move the blade control lever to the BLADE LOWER position. If the accumulator is still charged, the blade will lower.

If the blade does not lower, the accumulator is empty. The blade will need to be blocked in the raised position until the engine can be started again.

Additional instructions can be found in the service manual and/or consult your Cat dealer.

Operating Techniques

i07929204

Operating Technique Information

SMCS Code: 7000

WARNING

Know the maximum height and reach of your machine. Serious injury or death by electrocution can occur if machine, work tools, or attachments are not kept a safe distance from electrical power lines. Keep distance at least 3 m (10 ft) Plus additional 10 mm (.4 inch) for each 1,000 volts over 50,000 volts.

For safety, the local codes, the state codes, or the requirements of the job site may require a greater distance.

NOTICE

When swinging into a ditch, do not use the ditch to stop the swinging motion. Inspect the machine for damage if the boom is swung into a bank or an object.

Repeated stopping by an object can cause structural damage if the boom is swung into a bank or an object.

Always swing as slowly as possible. Sudden swing start/stop motion can cause machine instability.

With certain work tool combinations, the work tool can hit the canopy or the front of the machine. Always check for interference when first operating a new work tool.

Whenever the tracks of the machine raise off the ground while digging, lower the machine back to the ground smoothly. Do not drop or catch the machine with the hydraulics. Damage to the machine can result.

Do not move hydraulic cylinders to the end of the stroke. This could cause structural damage to the cylinders.

When digging, do not allow the stick cylinder or the bucket cylinder to contact the edge of the excavation.

Do not dig or excavate while the machine is traveling. This could cause damage to the work tool or to the machine.

Do not use the bucket as a pile driver or a hydraulic hammer.

With certain combinations of work tools, the auxiliary hydraulic pedal can have different functions. Always check the function of the auxiliary hydraulic pedal before you use the pedal.

Know the location of any buried cables. Mark the locations clearly before you dig.

Consult your Cat dealer for special bucket tips that are available for use in severe applications.

Move the machine whenever the position for digging is not efficient. The machine can be moved forward or backward at any time during the operating cycle.

When you perform work in close places, utilize the bucket or other work tools in order to perform the following functions:

- Pushing the machine
- Pulling the machine
- Lifting the tracks

Use consistent, comfortable speeds while you operate the machine.

For efficient operation, use more than one control at a time, when possible.

Never swing the bucket or a load over a truck cab or any personnel.

Position a truck so that the machine can load material into the truck from the rear or from the side. Load the truck evenly so that the rear axles are not overloaded.

Do not use oversize buckets or oversize work tools, as this could make the machine unstable.

Machines which are equipped with a canopy, a polycarbonate shield must be installed when a work tool that may create flying objects is used. Always remember to wear your safety glasses even when the polycarbonate shield is in place. Consult your work tool Operation and Maintenance Manual in order to determine if using a work tool will require the polycarbonate shield.

Digging

1. Lower the blade to the ground in order to ensure better machine stability while you are digging.
2. Position the stick at a 90 degree angle to the boom.
3. Position the bucket cutting edge at a 120 degree angle to the ground. Maximum breakout force can now be exerted with the bucket.

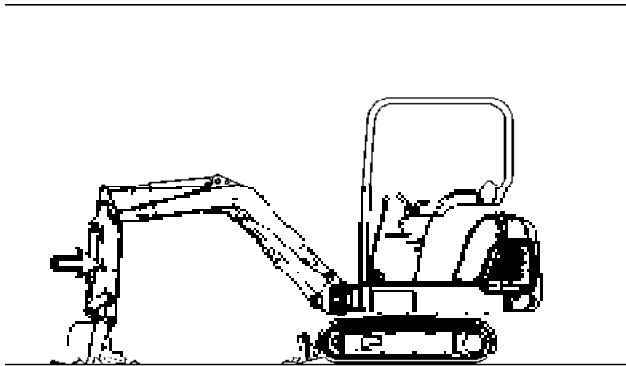


Illustration 331

g00394783

4. Move the stick toward the canopy and keep the bucket parallel to the ground.
5. If the stick stops due to the load, raise the boom and/or perform a curl in order to adjust the depth of the cut.
6. To apply the greatest force at the cutting edge, decrease the down pressure as you move the stick toward the canopy.
7. Maintain a bucket attitude that ensures a continuous flow of material into the bucket.
8. Continue the pass in a horizontal direction so that material peels into the bucket.

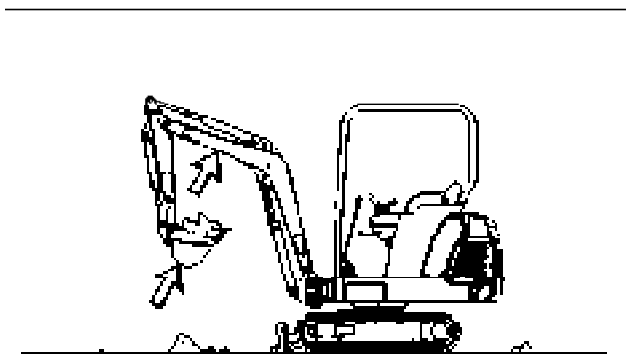


Illustration 332

g00394917

9. Close the bucket and raise the boom when the pass has been completed.
10. Engage the swing control when the bucket is clear of the excavation.

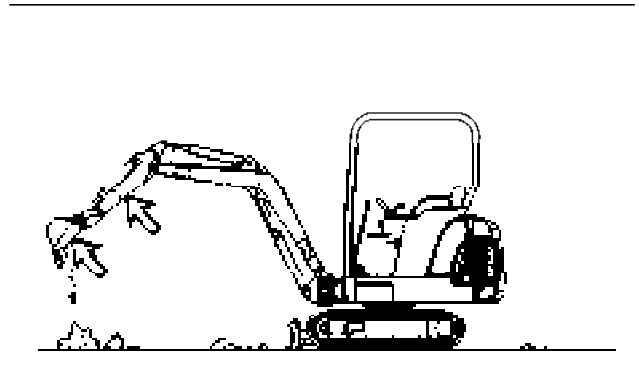


Illustration 333

g00394937

11. To dump a load, move the stick outward and open the bucket in a smooth motion.

Lifting Objects

Obey the local regulations and/or government regulations that govern the use of excavators which lift objects.

Obey the local regulations and/or government regulations that govern the lifting of loads.

Japan regulations require a shovel crane configuration to lift certain objects. Contact your Caterpillar® dealer for more information.

DANGER

Crushing hazard. The excavator may be used for applications with lifting gear only if the prescribed safety devices are in place and functional.

Failure to follow this precautionary measure will lead to serious injury or death.

- Acoustic and optical warning device
- Boom lowering control device
- Suitable equipment for fastening and securing loads
- The lift capacity table must be observed
- Approved bucket linkage with lifting point

WARNING

To prevent injury, do not exceed the rated object handling capacity of the machine. If the machine is not on level ground, the rated object handling capacities will vary.

⚠ WARNING

When lifting a load with the blade on the ground, do not raise the blade once the load has been lifted. This action may cause instability and sudden movement of the machine and of the object that is being lifted.

Sudden movement of the machine or the lifted object can cause personal injury.

NOTICE

Damage to bucket cylinder, bucket or linkage could result if slings are placed incorrectly.

Secure the load to prevent the load from falling.

Short slings will prevent excessive load swing. In order to avoid oscillating movements:

- Carry out smooth, slow movements with the machine
- Bear in mind the weather conditions (e.g. wind force, etc.)

Only use the approved lifting point on the Cat bucket linkage in order to lift objects. Lifting capacities are calculated from this point. Adjust to this capacity accordingly. Refer to Operation and Maintenance Manual, "Lifting Capacities" for more information on lifting objects with the machine.

The connection must be made with a sling or with a chain, so that it is not possible to unhook the sling or chain unintentionally.

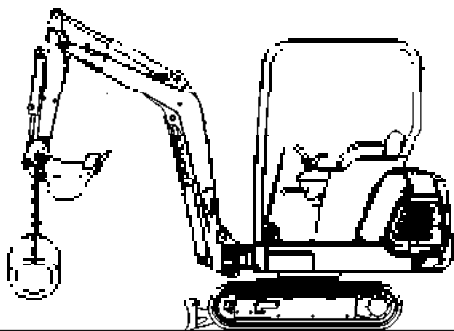


Illustration 334

g00394957

An unstable condition can exist if a load exceeds the machine load rating or if a heavy load is swung over an end or over a side. Lower the blade to the ground in order to increase the stability of the machine.

The most stable lifting position is over a corner of the machine.

For the best stability, carry a load close to the machine and to the ground.

Lift capacity decreases as the distance from the swing centerline is increased. Obey the load charts that are given in Operation and Maintenance Manual, "Boom/Stick/Bucket Combinations".

Position the lifting gear ensuring the sling is not deflected by other parts.

Do not use any lifting gear and slings that are damaged or not sufficiently dimensioned.

The lifting gear must be designed to withstand the loads that can arise in the different positions of the work equipment or parts of the boom. Lateral loads and diagonal tensile forces must also be taken into account.

The sling must be checked regularly by a qualified technician, at least once a year. Replace damaged slings immediately.

Fasten lifting gear and slings to avoid risk, such as rotating parts and crushing or shearing. Furthermore, neither must the work equipment be affected by the lifting gear, nor must the functions of the lifting gear be affected by external influences, such as dirt that cannot be removed by simply cleaning.

Do not place slings over sharp edges.

The persons attaching or securing loads may approach the boom from the side only, and only after the machine operator has given permission. The machine operator may give permission only after the machine is at a standstill and the work attachment no longer moves.

Staying under the suspended loads, in the danger area or under the machine attachment, is forbidden.

Have loads fastened and operators instructed by a qualified person competent in ranging operation and standard hand signals. The person giving instructions to the operator must be in sight of the operator during load attachment and disconnection.

The machine operator must guide the load near the ground and avoid any oscillating or swinging movements.

Machine travel with a raised load must be done carefully on a level surface. Move slowly to avoid sudden motion that can cause swinging or oscillation of the load.

The machine operator must not raise loads over persons.

The machine operator may not leave the seat or stop the engine as long as the load is raised.

i07287891

Travel in Water and Mud

SMCS Code: 7000-V6

NOTICE

When working in or around any body of water, around a stream or river, or in conditions of heavy mud, be careful that the swing bearing, the swing drive gear, and the swivel joint do not dip into water, mud, sand, or gravel. If the swing bearing dips into water, mud, sand, or gravel, immediately grease the swing bearing until the used grease leaks from the outer circle of the swing bearing. Failure to carry out this procedure may cause premature wear in the swing bearing.



Illustration 335

g06275447

Maximum depth of water to the top edge of the idler wheel.

The following guidelines pertain to travel across water and through mud, sand, or gravel.

The machine can travel across a river only under the following conditions:

- The bed of the river is flat.
- The flow of the river is slow.
- The machine dips into the water only to the center of the track carrier roller (dimension A).

While you cross the river, carefully confirm the depth of the water with the bucket. Do not move the machine into an area that has a water depth that is greater than Dimension A.

The machine may sink gradually on soft ground. Therefore, frequently check the height of the undercarriage from ground level and the depth of water on the ground.

If you have any doubts that the water might have been too deep, contact your Cat dealer for the required check.

After you travel through water, carefully clean the machine to remove any salt, sand, or other foreign matter.

Procedure for Removing the Machine from Water or Mud

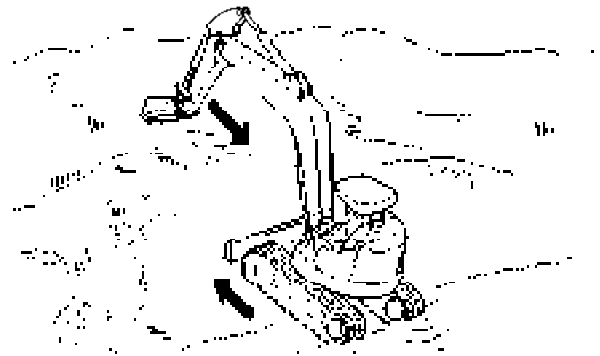


Illustration 336

g00818886

1. You may not be able to move the machine by using the travel controls only. In this case use both the travel control levers/pedals and the stick to pull the machine out of the water or ground.

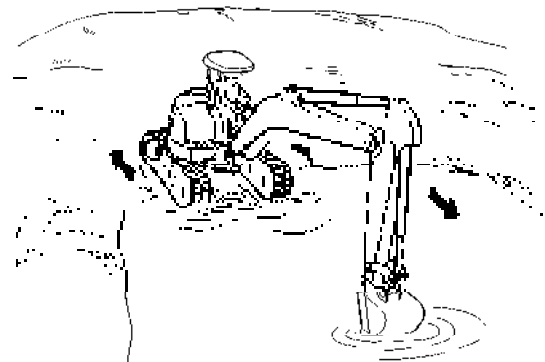


Illustration 337

g00818890

2. The machine may slip because of a steep slope. The procedure in Step 1 may not work. In this case, first rotate the upper structure by 180°. Then use both the travel control levers/pedals and the stick to move the machine up the slope.



Illustration 338

g06275725

3. It may be impossible to travel because the bottom of the frame comes into contact with the ground or the undercarriage is clogged with mud or gravel. In this case, operate the boom and the stick together. Raise the track and rotate the track forward and backward to remove the mud and the gravel.

i05374164

Quick Coupler Operation (Manual Pin Grabber Quick Coupler (If Equipped))

SMCS Code: 6129; 6522; 7000

NOTICE

The vibration caused by extensive use of a hydraulic hammer as well as the added weight of certain demolition tools such as shears, crushers, and pulverizers may cause premature wear and decreased service life of the coupler.

Be sure to inspect the coupler daily for cracks, bent components, or wear when operating with any of the above work tools.

Coupling the Work Tool

WARNING

Improper attachment of work tools could result in injury or death.

Do not operate this machine until you have positive indication that the coupler pins are fully engaged. Check for engagement by:

1. Position the work tool on the ground.
2. Apply slight down pressure on the work tool.
3. Retract and extend the stick cylinder in order to push the work tool against the ground. Visually confirm that there is no movement between the coupler and the work tool.

WARNING

Place the work tool or bucket in a safe position before engaging the quick coupler. Ensure that the work tool or bucket is not carrying a load.

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

WARNING

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

NOTICE

With certain work tool combinations, including quick couplers, the work tool can hit the canopy or the front of the machine. Always check for interference when first operating a new work tool.

1. Start the engine. Position the work tool on a level surface.

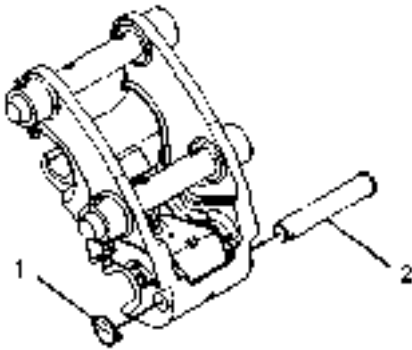


Illustration 339

g02165934

2. Remove lynch pin (1) and the safety pin (2).
3. Retract the work tool cylinder. Position the open hook on the quick coupler over the top pin of the work tool.

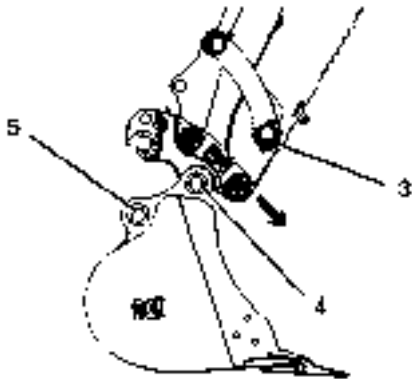


Illustration 340

g02165936

4. Move stick (3) inward and lower the stick until the hook engages the top pivot pin (4) of the work tool.
5. Rotate the quick coupler toward the machine and lift the bucket from the ground.
6. With increased engine speed, extend the work tool cylinder in order to rotate the quick coupler and the bucket toward the stick. When the cylinder is almost at the end of the stroke, reverse the direction of the cylinder. This will cause the bucket to swing. The bucket will drop into the quick coupler and the lower pin (5) of the bucket will engage. Stop the engine.

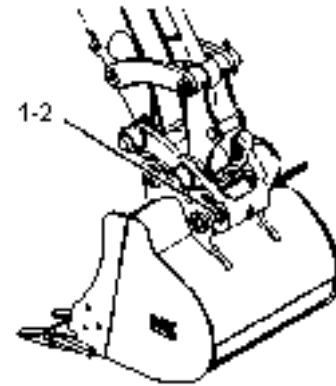


Illustration 341

g02193894

7. Fully insert the safety pin (2) into the bore of the quick coupler. Install the lynch pin (1) in order to secure the safety pin.
8. In order to verify the engagement of the work tool, perform the following procedure.
 - a. Start the engine. Retract and extend the stick cylinder in order to push the work tool against the ground.
 - b. Ensure that there is no movement between the work tool and the quick coupler.
 - c. Visually confirm the engagement of the work tool.

Uncoupling the Work Tool

⚠ WARNING

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

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

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

NOTICE

Auxiliary hoses for work tools must be disconnected before the Hydraulic Quick Coupler is disengaged.

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

Operation Section
Manual Pin Grabber Quick Coupler (If Equipped)

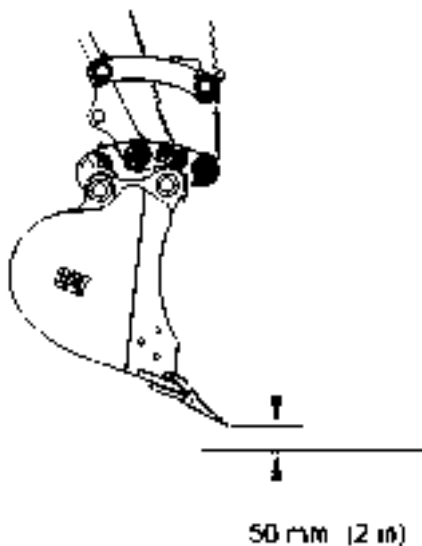


Illustration 342

g01502436

1. Lower the bucket to approximately 50 mm (2 inch) above the ground. The cutting edge should be slightly lower than the rear of the bucket. Other work tools may need to be lowered to the ground.

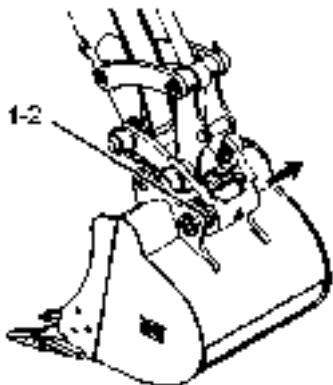


Illustration 343

g02165954

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

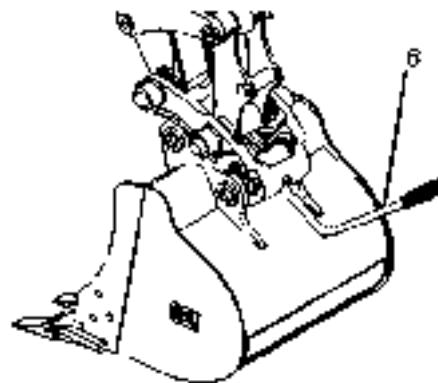


Illustration 344

g02165973

3. Insert the release lever (6). Push down on the release lever (6) in order to open the hook. The work tool will swing away from the coupler.

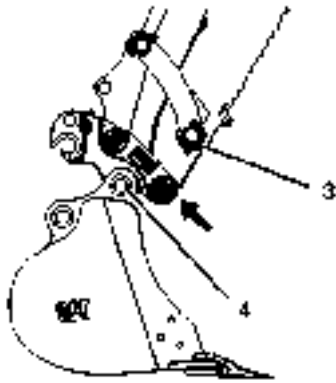


Illustration 345

g02193895

4. Raise stick (3) and move stick (3) away from the work tool in order to release the quick coupler from pivot pin (4) of the work tool.

i05505856

Quick Coupler Operation (Mechanical Pin Grabber Quick Coupler (If Equipped))

SMCS Code: 6129; 6522; 7000

NOTICE

The vibration caused by extensive use of a hydraulic hammer as well as the added weight of certain demolition tools such as shears, crushers, and pulverizers may cause premature wear and decreased service life of the coupler.

Be sure to inspect the coupler daily for cracks, bent components, or wear when operating with any of the above work tools.

General Operation

The quick coupler is used to change work tools, with minimal effort on the operators part. The quick coupler can be used with a broad range of buckets and work tools. Each work tool must have a set of pins in order for the quick coupler to work properly.

The work tools are held onto the quick coupler by two independent locking mechanisms. The work tool rear pin locking mechanism consists of a wedge that is actuated by a mechanical threaded actuator. This actuator provides a positive lock and is adjustable to ensure a rigid, tight interface between the work tool and the quick coupler. Additionally, a fully independent locking system exists on the front pin of the work tool. This system is spring applied, ensuring that the work tool is locked immediately after the front pin of the work tool is seated. Always ensure that both locking mechanisms are working properly before using the quick coupler.

Installation

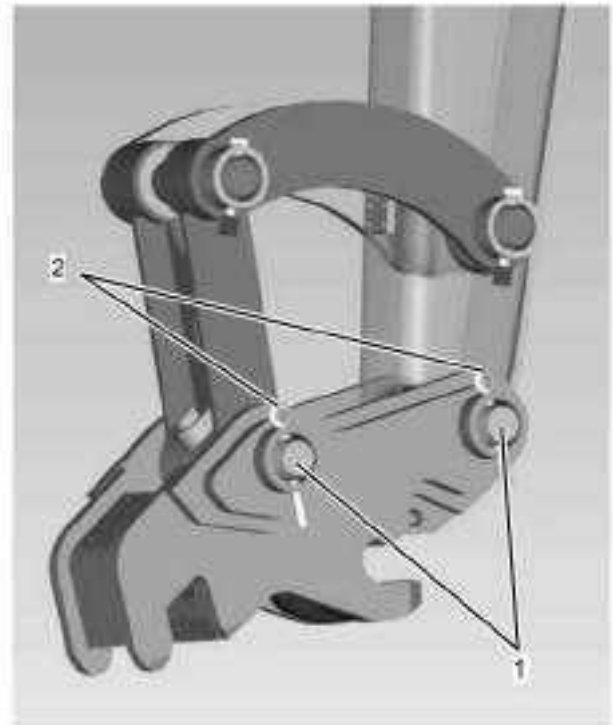


Illustration 346

g02869245

1. The quick coupler comes with two linkage pins (1) for installation on the machine. Lubricate the linkage pins (1) and pin bores before assembly on the machine.
2. Install the coupler and the linkage pins (1).

3. Install the cotter pins (2).

Coupling the Work Tool

WARNING

Improper attachment of work tools could result in serious injury or death.

Do not operate this machine until you have positive indication that the locking mechanisms are fully engaged. Check for engagement by:

1. Visually confirm the engagement of the work tool. Ensure that both the front and rear pin locking mechanisms for the work tool are locked and secure the work tool to the quick coupler.
2. Retract the bucket cylinder and drag the work tool on the ground.
3. Visually confirm that there is no movement between the work tool and the quick coupler.

WARNING

Place the work tool or bucket in a safe position before engaging the quick coupler. Ensure that the work tool or bucket is not carrying a load.

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

WARNING

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

NOTICE

With certain work tool combinations, including quick couplers, the work tool can hit the cab or the front of the machine. Always check for interference when first operating a new work tool.

1. Start the engine. Retract the bucket cylinder, positioning the quick coupler front locking mechanism over the front pin of the work tool.

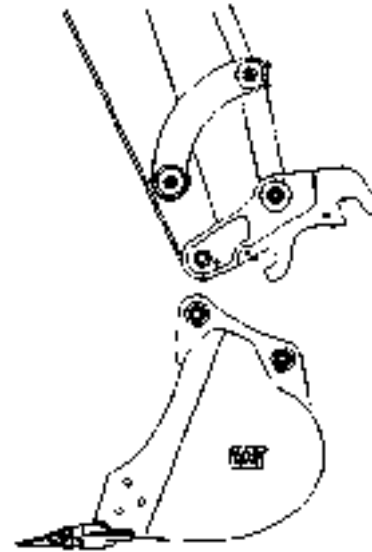


Illustration 347

g02163290

2. Align the quick coupler front locking mechanism over the front pin of the work tool. Extend the stick cylinder until the automatic front locking mechanism of the quick coupler engages and secures the front pin of the work tool.

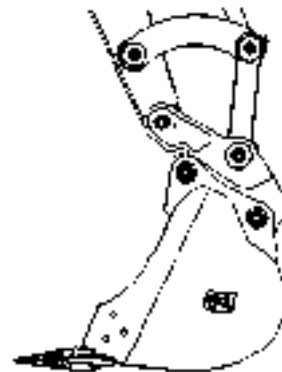


Illustration 348

g02163292

3. Extend the bucket cylinder in order to rotate the quick coupler toward the work tool until the quick coupler contacts the rear pin of the work tool. Position the work tool so that the work tool is slightly above the ground, with the front pin of the work tool higher than the rear pin of the work tool. If the work tool is a bucket, verify that the cutting edge is slightly higher than the bottom of the bucket. Stop the engine.

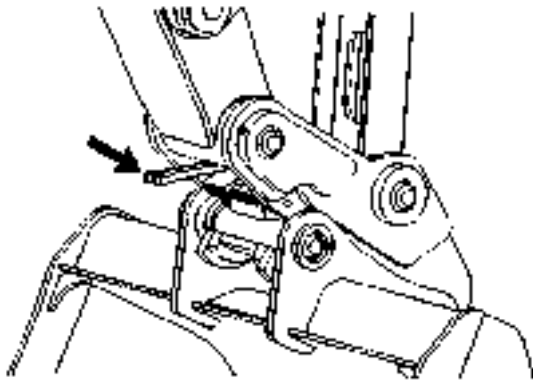


Illustration 349

g02165065

4. Using the supplied wrench, if equipped, and insert the ratcheting end onto the hex drive mechanism. Turn the ratchet in a clockwise direction in order to tighten the rear locking mechanism.
5. In order to verify the engagement of the work tool, perform the following procedure:
 - a. Visually confirm the engagement of the work tool. Ensure that both the work tool front and rear pin locking mechanisms are locked and securing the work tool to the coupler.
 - b. Retract the bucket cylinder and drag the work tool on the ground.
 - c. Visually confirm that there is no movement between the work tool and the quick coupler.

Uncoupling the Work Tool

WARNING

Place the work tool or bucket in a safe position before disengaging the coupler. Disengaging the coupler will release the work tool or bucket from control of the operator.

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

NOTICE

Auxiliary hoses for work tools must be disconnected before the Hydraulic Quick Coupler is disengaged.

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

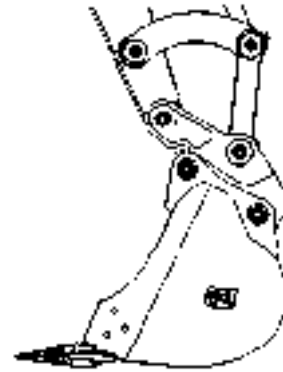


Illustration 350

g02163292

1. In order to unlock the coupler, position the work tool so that the work tool is slightly above the ground, with the front pin of the work tool higher than the rear pin of the work tool. If the work tool is a bucket, verify that the cutting edge is slightly higher than the bottom of the bucket. Other work tools may need to be lowered to the ground. Stop the engine.

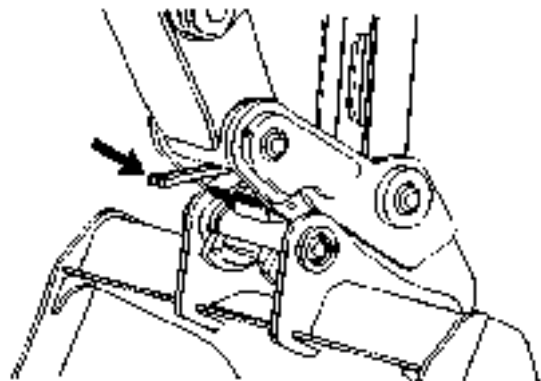


Illustration 351

g02165065

2. Using the supplied wrench, if equipped, and insert the ratcheting end onto the hex drive mechanism. Turn the wrench in a counterclockwise direction in order to release the rear locking mechanism.

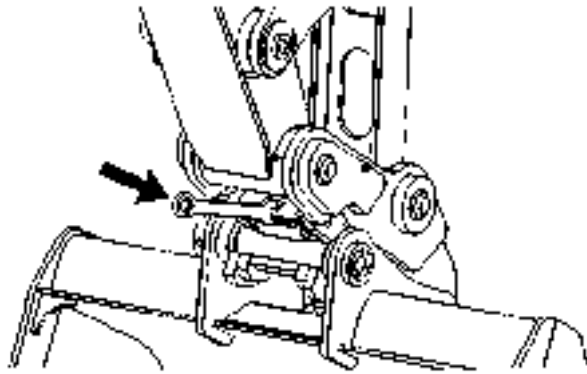


Illustration 352

g02165068

3. Using the supplied wrench, if equipped, and insert the open wrench end onto the front lock actuator. Push down on the wrench to rotate the front lock into an unlocked, detent position.
4. Start the engine. Lower the work tool to the ground.
5. Retract the bucket cylinder in order to rotate the quick coupler away from the work tool until the quick coupler disengages the rear pin of the work tool.
6. Move the stick away from the work tool in order to release the quick coupler from the front pin of the work tool. The front locking mechanism will automatically reset. The quick coupler is now ready to engage the next work tool.

Quick Coupler use with a Bucket that is Reversed

NOTICE

When some Cat buckets are used in the reverse position, it can be more difficult to couple the bucket and uncouple the bucket than in the normal position.

Care must be taken to ensure that the position of the boom, stick, and bucket are aligned to ensure smooth coupling. The coupler must be in position between the bucket bosses.

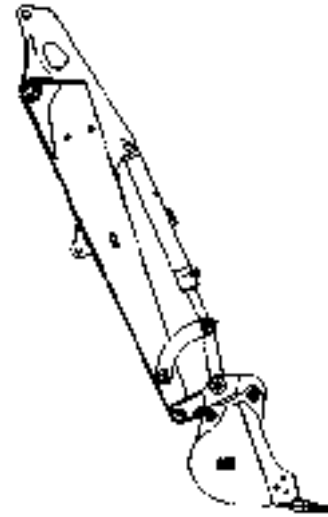


Illustration 353

g02163425

1. Follow the same steps for coupling and uncoupling the work tool in order to operate the coupler with a bucket that is reversed. Refer to "Coupling the Work Tool" and "Uncoupling the Work Tool" for the proper procedure.

i07423159

Quick Coupler Operation (If Equipped)

SMCS Code: 6129; 6522; 7000

Quick Coupler Ready (If Equipped)

Quick Coupler Ready is the definition for the installation of an additional hydraulic control circuit, which is routed to the end of the stick.

If a Hydraulic Quick Coupler is installed, ensure that the machine is equipped with the Quick Coupler Ready System and that the Hydraulic Quick Coupler and the matching work tools are approved for that machine. Caterpillar will not be liable for personal injury and/or damage to property caused by failure to observe the following:

Obey the instructions described in the Operation and Maintenance Manual of the Hydraulic Quick Coupler.

Store the Operation and Maintenance Manual of the Hydraulic Quick Coupler in the machines literature compartment.

The installation of a non-approved Hydraulic Quick Coupler may change the machines original operating functions and its description in the machines Operator and Maintenance Manual.

Furthermore, the following points have to be considered:

- If necessary, modifications and/or supplements have to be carried out at the machine (for example, safety decals), and/or its manuals (for example, changes to the described functionality).
- The Intended Use of the machine might have to be limited.
- The machines EC or EU-Declaration of Conformity might be compromised by fitting a Hydraulic Quick Coupler that does not match with the machine and its interface (for example, provided pressures).
- The Hydraulic Quick Couplers EC or EU-Declaration of Conformity might be compromised by installing the Hydraulic Quick Coupler on a host machine that does not match with the Hydraulic Quick Coupler and its interface (for example, required pressures).

General Operation

The hydraulic quick coupler is used to change work tools while the operator remains in the operator station.

As for how the work tools are held onto the hydraulic quick coupler and how the hydraulic quick coupler is operated, refer to the Hydraulic Quick Coupler Operation and Maintenance Manual. Always ensure that the hydraulic system and the locking mechanisms are working properly before using the hydraulic quick coupler.

If a lifting eye is included on the Hydraulic Quick Coupler, release the work tool from the Hydraulic Quick Coupler to use the lifting eye to pick up loads. To lift a load with the lifting eye, extend the bucket cylinder until the Hydraulic Quick Coupler is in a vertical position. Do not exceed the rated load for the machine.

Obey the local regulations and/or government regulations that govern the use of excavators which lift objects.

Obey the local regulations and/or government regulations that govern the lifting of loads.

Refer to Operation and Maintenance Manual, “Lifting Objects”, for more information on lifting objects with the machine.

Installation

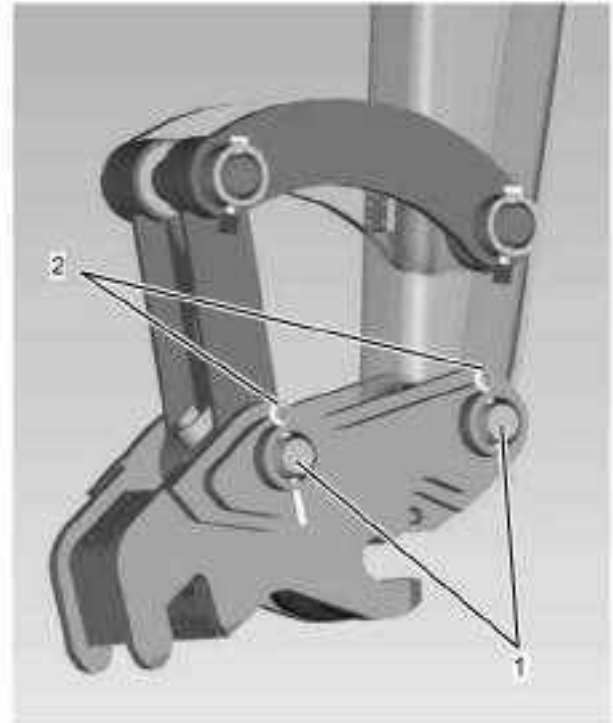


Illustration 354

g02869245

Note: The selection and installation of a Hydraulic Quick Coupler is subject to Cat dealers only.

1. Make sure that the linkage pins (1) fit the machine. Lubricate the linkage pins (1) and pin bores before assembly on the machine.

Note: If the machine is filled with biodegradable oil, make sure that the Hydraulic Quick Coupler is approved for that type of hydraulic oil. Flush the Hydraulic Quick Couplers hydraulic system with the same biodegradable oil as used in the machine.

2. Install the Hydraulic Quick Coupler and the linkage pins (1).
3. Secure the retaining pins (2) properly.
4. Connect the hydraulic lines following the instructions in the Hydraulic Quick Coupler Operation and Maintenance Manual.
5. Purge the system.

6. Perform a functional test and make sure that everything works properly as described in the Operation and Maintenance Manual of the machine and the Hydraulic Quick Coupler.
7. Check the Hydraulic Quick Coupler and its lines/connectors for any leakage.

Quick Coupler Operation

Coupling the Work Tool

WARNING

Improper attachment of work tools could result in serious injury or death.

Do not operate this machine until you have positive indication that the locking mechanisms are fully engaged. Check for engagement by:

1. Visually confirm the engagement of the work tool. Ensure that all locking mechanisms for the work tool are locked and secure the work tool to the quick coupler.
2. Retract the bucket cylinder and drag the work tool on the ground.
3. Visually confirm that there is no movement between the work tool and the quick coupler.

WARNING

Place the work tool or bucket in a safe position before engaging the quick coupler. Ensure that the work tool or bucket is not carrying a load.

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

WARNING

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

NOTICE

The buzzer will not sound when the switch is in the lock position. The position of the switch does not confirm the Hydraulic Quick Coupler is engaged. A physical test is required by dragging the work tool on the ground to confirm the Hydraulic Quick Coupler is engaged.

NOTICE

Always confirm that the buzzer sounds when the switch is in the unlock position. If no sound is heard while in this condition, ensure that the work tool is placed in a stable and safe position. Turn off the engine. Consult your Cat dealer.

NOTICE

With certain work tool combinations, including quick couplers, the work tool can hit the cab/canopy or the front of the machine. Always check for interference when first operating a new work tool.

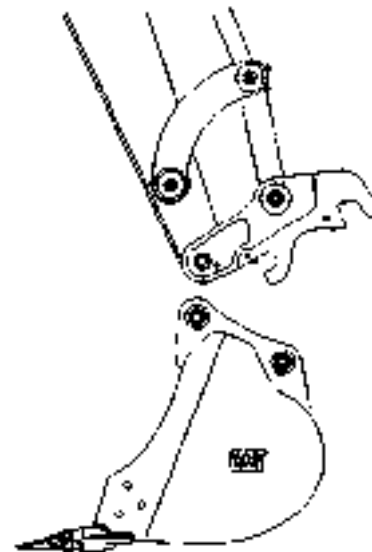


Illustration 355

g02163290

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

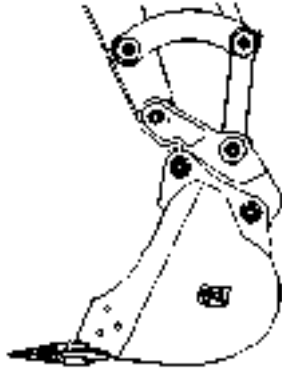


Illustration 356

g02163292

2. Unlock and press the quick coupler option on the monitor. The buzzer will sound and the Quick Coupler Ready System will be enabled and can be operated.

Note: If no sound is heard while in this condition, ensure that the work tool is placed in a stable and safe position. Turn off the engine. Consult your Cat dealer.

3. Press and hold the foot-operated switch (13). Pull the dozer blade lever (17) backwards as far as the lever will go, hold the lever in this position. The Quick Coupler Ready System provides the adjusted pressure to the Hydraulic Quick Coupler. The dozer blade lever can be released once the Hydraulic Quick Coupler is open.
4. Attach the Hydraulic Quick Coupler to the work tool as described in the Hydraulic Quick Coupler Operation and Maintenance Manual.

WARNING

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

NOTICE

For system-specific reasons, the Quick Coupler Ready System opens and closes with the dozer blade function, the swing function and the AUX II function (if equipped). For practical reasons, only use the described function "Dozer Blade" to operate the Quick Coupler Ready System.

5. Release the foot-operated switch (13). Pull the dozer blade lever (17) backwards as far as the lever will go, hold the lever in this position. The dozer blade lever can be released once the Hydraulic Quick Coupler is closed. Press the quick coupler option on the monitor again, the buzzer will stop.
6. To verify the engagement of the work tool, perform the following procedure:
 - a. Visually confirm the engagement of the work tool. Ensure that the locking mechanisms of the work tool are locked and securing the work tool to the Hydraulic Quick Coupler.
 - b. Retract the bucket cylinder and drag the work tool on the ground.
 - c. Visually confirm that there is no movement between the work tool and the Hydraulic Quick Coupler.

NOTICE

Back drag the work tool on the ground to ensure the Hydraulic Quick Coupler is properly locked.

Do not strike the work tool on the ground to ensure the Hydraulic Quick Coupler is properly locked. Striking the work tool on the ground may result in damage to the Hydraulic Quick Coupler and the host machine.

Uncoupling the Work Tool

WARNING

Place the work tool or bucket in a safe position before disengaging the coupler. Disengaging the coupler will release the work tool or bucket from control of the operator.

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

NOTICE

Auxiliary hoses for work tools must be disconnected before the Hydraulic Quick Coupler is disengaged.

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

NOTICE

Always confirm that the buzzer sounds when the switch is in the unlock position. If no sound is heard while in this condition, ensure that the work tool is placed in a stable and safe position. Turn off the engine. Consult your Cat dealer.

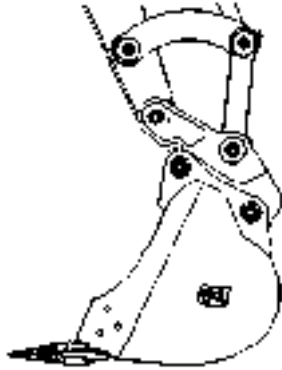


Illustration 357

g02163292

1. To unlock the Hydraulic Quick Coupler, position the work tool as described in the Hydraulic Quick Coupler Operation and Maintenance Manual .

NOTICE

For system-specific reasons, the Quick Coupler Ready System opens and closes with the dozer blade function, the swing function and the AUX II function (if equipped). For practical reasons, only use the described function "Dozer Blade" to operate the Quick Coupler Ready System.

2. Unlock and press the quick coupler option on the monitor. The buzzer will sound and the Quick Coupler Ready System will be enabled and can be operated.

Note: If no sound is heard while in this condition, ensure that the work tool is placed in a stable and safe position. Turn off the engine. Consult your Cat dealer.

3. Press and hold the foot-operated switch (13). Pull the dozer blade lever (17) backwards as far as the lever will go, hold the lever in this position. The dozer blade lever can be released once the Hydraulic Quick Coupler is open.

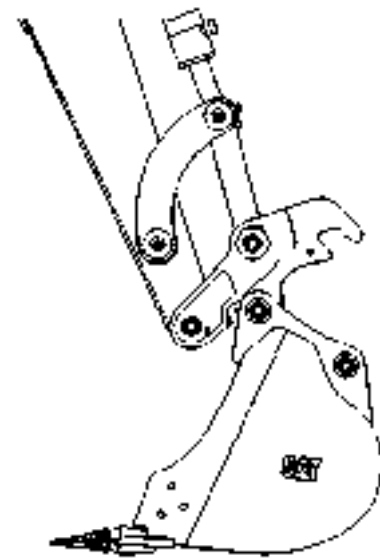


Illustration 358

g02163415

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

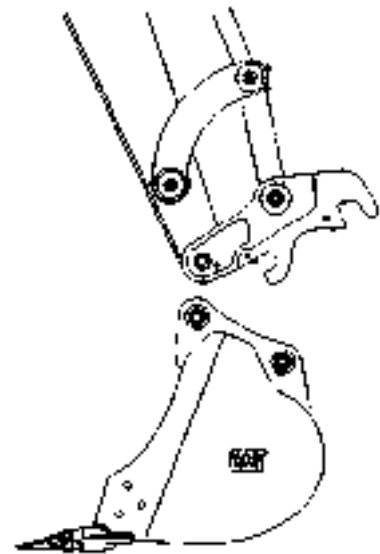


Illustration 359

g02163290

5. Ensure that the work tool is in a stable and safe storage position on the ground.

6. Release the foot-operated switch (13). Pull the dozer blade lever (17) backwards as far as the lever will go, hold the lever in this position. The dozer blade lever can be released once the Hydraulic Quick Coupler is closed. Press the quick coupler option on the monitor again, the buzzer will stop.

Coupling a Bucket that is Reversed

NOTICE

When some buckets are used in the reverse position, it can be more difficult to couple the bucket and uncouple the bucket than in the normal position.

Care must be taken to ensure that the position of the boom, stick, and bucket are aligned to ensure smooth coupling.

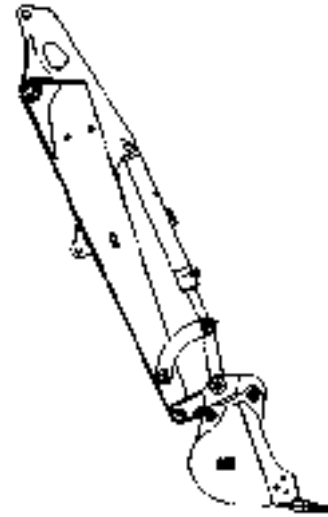


Illustration 360

g02163425

Follow the same steps for coupling and uncoupling the work tool to operate the Hydraulic Quick Coupler with a bucket that is reversed. Refer to “Coupling the Work Tool” and “Uncoupling the Work Tool” for the proper procedure.

i08503640

Quick Coupler Operation (CW (Single Lock) Quick Coupler (If Equipped))

SMCS Code: 6129; 6522; 7000

NOTICE

The vibration caused by extensive use of a hydraulic hammer and the added weight of certain demolition tools such as shears, crushers, and pulverizers may cause premature wear and decreased service life of the coupler.

Be sure to inspect the coupler daily for cracks, bent components, or wear when operating with any work tools.

General Operation

The CW coupler is used to change work tools quickly. The quick coupler can be used with a broad range of buckets and work tools.

Installation Procedure

WARNING

Personal injury or death can result from improperly checking for a leak.

Always use a board or cardboard when checking for a leak. Escaping air or fluid under pressure, even a pin-hole size leak, can penetrate body tissue causing serious injury, and possible death.

If fluid is injected into your skin, it must be treated immediately by a doctor familiar with this type of injury.

Note: Hydraulic oil may be trapped in the lines if the hydraulic lines are plugged or if the hydraulic lines are connected. The trapped oil may be under pressure. Use care when you open the hydraulic lines.

Note: The quick coupler must be controlled by the excavator's hydraulic system.

Perform this procedure as described in the following steps:

Ensure that the quick coupler is compatible with the host machine. For more information, consult your Caterpillar dealer.

To provide a stable operating condition, the host machine must be on flat, level ground. The host machine must be blocked to prevent inadvertent movement.

The quick coupler must be supported to prevent inadvertent movement. Position the quick coupler to prevent unnecessary climbing and unnecessary bending.

Optimum alignment of the bores will prevent the use of unnecessary force when you install the pins. Never check the alignment of the bores with your fingers. Use the proper tools to check the alignment of the bores.

A retaining pin can fly out when the retaining pin is struck with force. The area must be clear of people when you drive retaining pins.

When you strike objects, chips and other debris can fly. Before you strike any object, make sure that no one can be injured by the flying debris. Always wear appropriate PPE, including safety glasses.

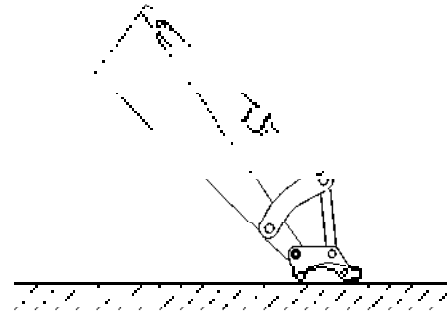


Illustration 361

g00741430

1. Position the quick coupler on the ground in front of the host machine. Make sure that the wedge faces away from the host machine.
2. Install the mounting pins.
3. Lubricate all the mounting points.
4. Connect the hydraulic lines to the quick coupler (if equipped).
5. After mounting the quick coupler on the excavator, or after working on the quick coupler hydraulic system, it is necessary to purge all the air from the cylinder and the control system. Refer to the "Hydraulic System Air Purge" for additional information.

Quick Coupler Removal Procedure

1. Lay the quick coupler flat on the ground.
2. Release the pressure from the hydraulic lines (if equipped).
 - a. Extend the wedge to the UNLOCKED position.
 - b. Stop the engine on the host machine. Turn the ignition to OFF.
 - c. Turn the ignition to the ON position without starting the engine.
 - d. Move the hydraulic control levers repeatedly through the full range of motion. This will release any pressure that may be present in the hydraulic system. Actuate the quick coupler using the machine control monitor. Cycle through locking and unlocking the quick coupler several times to release trapped hydraulic pressure within the quick coupler circuit.
 - e. The wedge should begin to move inward due to the spring force.

- f. Turn the ignition to the OFF position.
- g. Release the pressure in the host machine's hydraulic tank.

WARNING

Personal injury or death can result from improperly checking for a leak.

Always use a board or cardboard when checking for a leak. Escaping air or fluid under pressure, even a pin-hole size leak, can penetrate body tissue causing serious injury, and possible death.

If fluid is injected into your skin, it must be treated immediately by a doctor familiar with this type of injury.

NOTICE

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

Refer to Special Publication, PERJ1017, "Dealer Service Tool Catalog" for tools and supplies suitable to collect and contain fluids on Cat® products.

Dispose of all fluids according to local regulations and mandates.

3. Place a suitable container below the hydraulic fittings to catch any hydraulic oil that may escape. Slowly disconnect the hydraulic lines. Plug the ends of the hydraulic lines or connect the hydraulic lines.
4. Dispose of the hydraulic oil in a suitable manner.
5. Remove the pins from the quick coupler.

Daily Inspection

WARNING

Personal injury or death can result from improperly checking for a leak.

Always use a board or cardboard when checking for a leak. Escaping air or fluid under pressure, even a pin-hole size leak, can penetrate body tissue causing serious injury, and possible death.

If fluid is injected into your skin, it must be treated immediately by a doctor familiar with this type of injury.

NOTICE

Accumulated grease and oil on a work tool is a fire hazard.

Remove debris with steam cleaning or high pressure water at any time a significant quantity of oil is spilled on the work tool.

Note: If major repairs to the quick coupler are required, consult your Caterpillar dealer.

1. For the maximum service life of the work tool, make a thorough daily inspection before you mount a work tool to the host machine.
2. Inspect the quick coupler for the following conditions: loose bolts, oil leaks, broken parts, missing parts and cracked components. Check the overall condition of the quick coupler. Check the overall condition of the hydraulic system.
3. Inspect the warning signs and labels. Replace warning signs or labels that are missing. Replace warning signs or labels when you cannot read the warning signs or labels.
4. If equipped, inspect the condition of the hydraulic lines and the hydraulic fittings.
5. Check the mounting pins for the quick coupler.
6. Inspect the bolts for the wedge when you remove the wedge.
7. Check the lifting device, if equipped. If damage is present, do not use the lifting device. Contact your Caterpillar dealer for repairs.
8. Perform all repairs before you put the quick coupler into service.
9. Perform an UNLOCK and LOCK cycle of the wedge to provide a smooth operation of the wedge. This procedure is for the quick coupler with hydraulic coupling only.

Operation

Coupling the Work Tool

WARNING

Place the work tool or bucket in a safe position before engaging the quick coupler. Ensure that the work tool or bucket is not carrying a load.

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

⚠ WARNING

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

Reference: For more information on connecting the quick coupler to the host machine, contact your dealer for special instructions.

Quick Coupler with Hydraulic Coupling

⚠ WARNING

Place the work tool or bucket in a safe position before engaging the quick coupler. Ensure that the work tool or bucket is not carrying a load.

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

NOTICE

The buzzer will not sound when the lock position. The position of the switch does not confirm that the quick coupler locking system is properly engaged with the attachment pins. Visually confirm positive engagement of the locking system. A physical test is required by dragging the work tool on the ground to confirm that the coupler is properly engaged with the work tool.

NOTICE

Always confirm that the buzzer sounds when the switch is in the unlock position. If no sound is heard while in this condition, ensure that the work tool is placed in a stable and safe position. Turn off the engine. Consult your Cat dealer.

NOTICE

With certain work tool combinations, including quick couplers, the work tool can hit the cab or the front of the machine. Always check for interference when first operating a new work tool.

1. Verify that the wedge is in the unlocked position. If the wedge is not extended, extend the bucket cylinder. Then, extend the wedge.

⚠ WARNING

Ensure that the wedge is extended before coupling the work tool. Severe damage may occur. Failing to extend the wedge before coupling the work tool could result in a poorly coupled work tool or an uncoupled work tool.

Serious injury or death may result from an improperly coupled work tool.

2. Ensure that the mounting bracket of the work tool is in line with the host machine. The work tool must be facing the host machine. The mounting bracket must be at the top of the work tool.

Coupling a Bucket

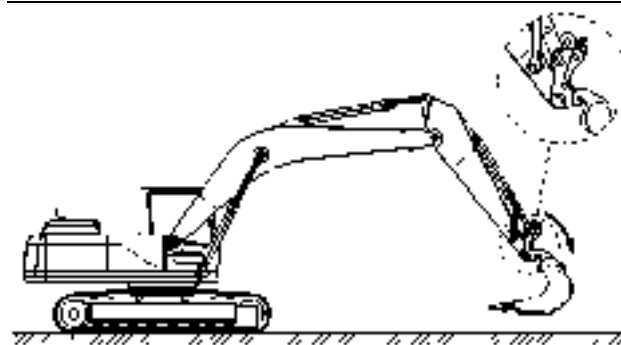


Illustration 362

g01285027

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

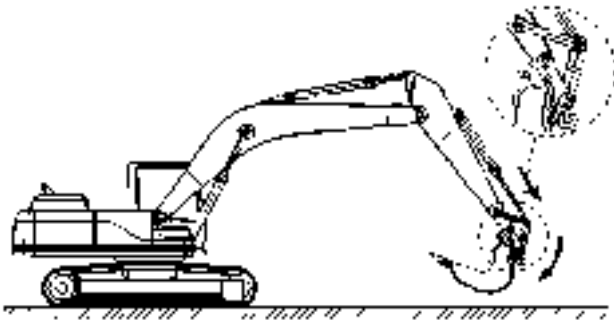


Illustration 363

g01285038

2. Select "UNLOCK" on the monitor display and confirm that the buzzer is sounding with an intermittent pattern of one beep per second. If no sound is heard while in this condition, ensure that the work tool is placed in a stable and safe position. Turn off the engine. Consult your Cat dealer. Extend the bucket cylinder until the coupler contacts the work tool.
3. Tilt the quick coupler against the work tool by extending the bucket cylinder.
4. Select "LOCK" on the monitor display and the beep will stop and the rear lock (wedge) will slide back into place. The monitor will return to the home screen.
5. Visually confirm that the wedge has engaged the work tool hook and is properly locked. If this visual confirmation cannot be performed from the machine cab due to obstruction, lighting, etc., place the machine in a safe state, exit the cab, and visually confirm proper engagement at the quick coupler.

WARNING

Inspect the quick coupler engagement before operating the machine.

Serious injury or death may result from improperly engaged coupler.

NOTICE

Visually confirm that the quick coupler engagement system is properly locked to the work tool. Confirm that the wedge has engaged the work tool hook and is properly locked.

6. Verify the engagement of the quick coupler and the work tool.

- a. Place the work tool on the ground.
- b. Apply pressure to the work tool against the ground.
- c. Drag the work tool forward and backward.

Quick Coupler with Mechanical Coupling

WARNING

Place the work tool or bucket in a safe position before engaging the quick coupler. Ensure that the work tool or bucket is not carrying a load.

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

1. Ensure that the work tool mounting bracket is in line with the host machine. The work tool must be facing the host machine. The mounting bracket must be at the top of the work tool.

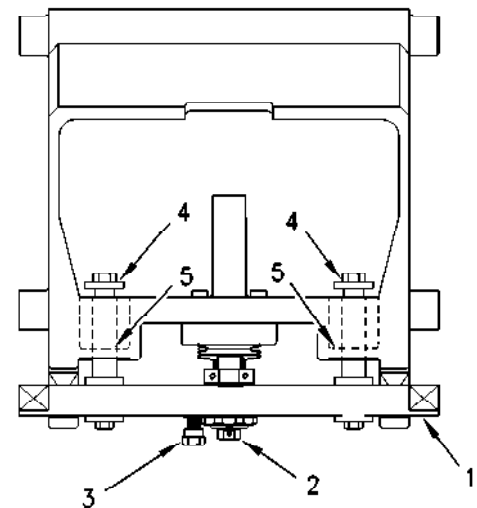


Illustration 364

g00928845

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

Operation Section
CW (Single Lock) Quick Coupler (If Equipped)

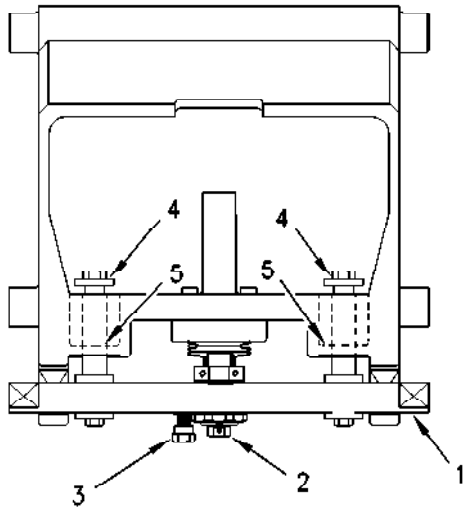


Illustration 365

g00928845

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

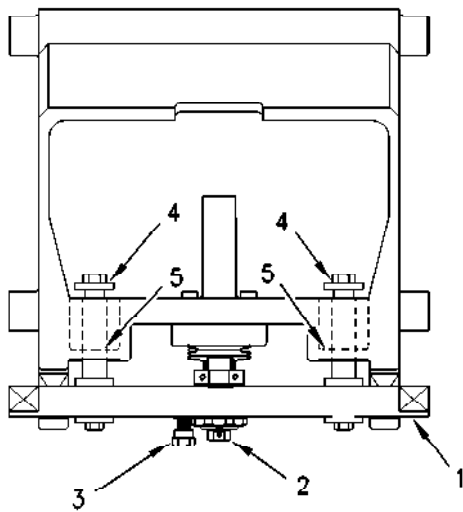


Illustration 366

g00928845

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

Coupling a Bucket

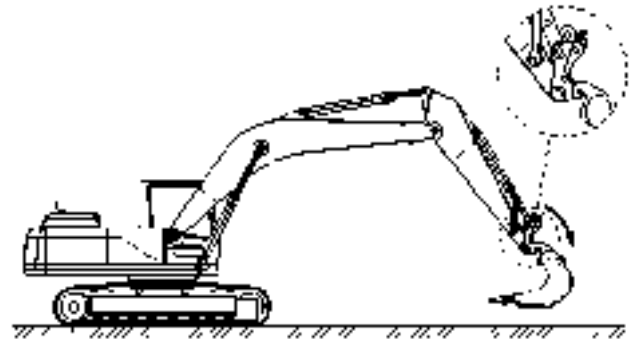


Illustration 367

g01285027

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

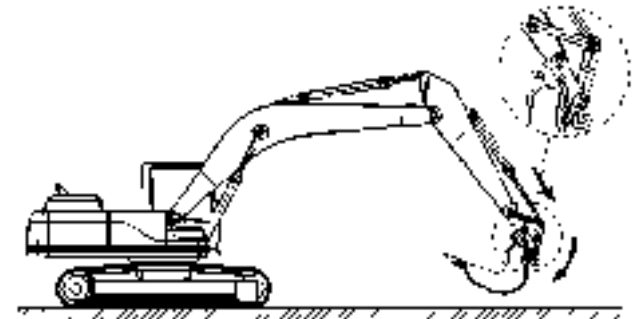


Illustration 368

g01285038

- Tilt the quick coupler against the work tool by extending the bucket cylinder. Stop the engine of the host machine.
 - Turn the spindle inward. Tighten the spindle.
- Note:** If necessary, tighten the spindle until the next notch is aligned with the locking bolt.
- Tighten the locking bolt.

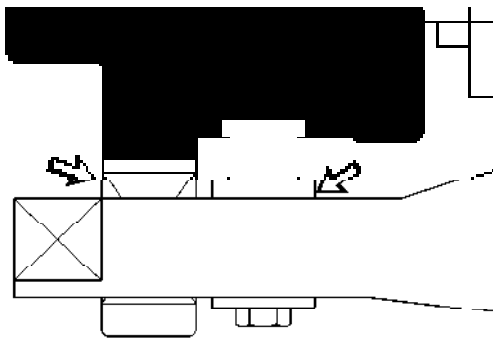


Illustration 369

g00583309

5. Ensure that there is a visible space between the wedge and the quick coupler frame. If there is not a space, the mounting bracket or the quick coupler may be damaged.

WARNING

Inspect the quick coupler engagement before operating the machine.

Serious injury or death may result from improperly engaged coupler.

6. Verify the engagement of the quick coupler and the work tool.
 - a. Place the work tool on the ground.
 - b. Apply pressure to the work tool against the ground.
 - c. Drag the work tool forward and backward.

Uncoupling the Work Tool

Use the following steps to prepare the quick coupler for uncoupling.

NOTICE

Auxiliary hoses for work tools must be disconnected before the Hydraulic Quick Coupler is disengaged.

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

1. Disconnect any auxiliary hoses from the work tool (if equipped).
2. Ensure that the work tool is clear of the ground.
3. Fully extend the bucket cylinder. Extend the stick cylinder until the wedge is pointing downward. The load is now released from the wedge.

Quick Coupler with Hydraulic Coupling

WARNING

Place the work tool or bucket in a safe position before disengaging the coupler. Disengaging the coupler will release the work tool or bucket from control of the operator.

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

1. Extend the wedge cylinder.
2. Select UNLOCK on the monitor display and confirm that the buzzer is sounding with an intermittent pattern of one beep per second. If no sound is heard while in this condition, ensure that the work tool is placed in a stable and safe position. Turn off the engine. Consult your Cat dealer.
3. Retract the bucket cylinder until the coupler is no longer in contact with the work tool. The work tool is now suspended by the front pivot.
4. Place the work tool on the ground.
5. Unhook the quick coupler from the mounting bracket.

Quick Coupler with Mechanical Coupling

WARNING

Place the work tool or bucket in a safe position before disengaging the coupler. Disengaging the coupler will release the work tool or bucket from control of the operator.

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

1. Stop the engine of the host machine.
2. Loosen the locking bolt until you can turn the spindle.
3. Turn the spindle outward. If necessary, strike the wedge with a hammer to release the wedge.
4. Retract the bucket cylinder. The work tool will be suspended by the front pivot.
5. Place the work tool on the ground.
6. Unhook the quick coupler from the mounting bracket.

Lifting Loads

WARNING

Lifting loads with the quick coupler is only permitted when there is no work tool attached. Lifting loads when there is a work tool attached may result in serious injury or death.

NOTICE

If used to lift loads, then the excavator must comply with the requirements for lifting machinery. These are given in standard EN 474-5. For more information, consult your Caterpillar dealer.

Note: When you lift loads with the lifting yoke or the lifting hook, the wedge must be retracted or the wedge must be removed from the coupler.

Lifting Hook (If Equipped)

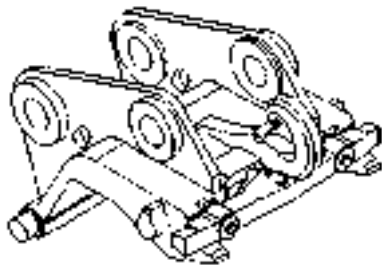


Illustration 370

g03219216

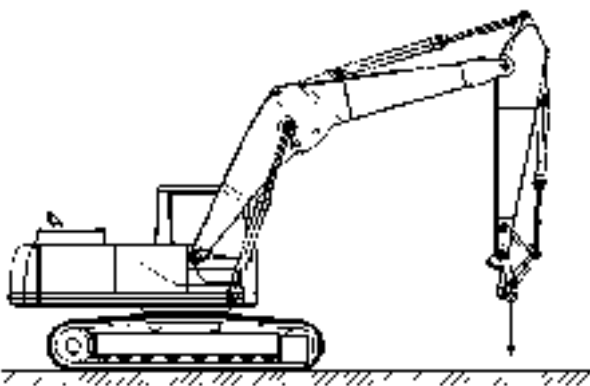


Illustration 371

g01285467

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

WARNING

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

3. Fasten an appropriate chain, cable, or a lifting strap to the lifting hook. Do not perform any lifting operations if the safety latch is missing. Do not perform any lifting operations if the safety latch is damaged. Contact your supplier.

Lifting Objects

WARNING

To prevent injury, do not exceed the rated load capacity of the machine. If the machine is not on level ground, load capacities will vary.

The quick coupler and attached lifting hook have unique rated load capacities. Each capacity is marked on the corresponding component. Do not exceed the maximum capacity of any component used in a lifting operation. Quick coupler capacities are listed in the table below:

Table 25

Quick Coupler Rated Capacities ⁽¹⁾	
Quick Coupler Model	Rated Capacity
CW05	600 kg (1322 lb)
CW10	1400 kg (3086 lb)

⁽¹⁾ Capacities rated in accordance with EN 474-1:2006+A4:2013 Annex E and ASS 1418.8-2008 standards

Refer to the load charts in the Operation and Maintenance Manual of the host machine. Use the load charts and account for the mass of the work tool. Calculate the load capacity relative to the location of the lifting point on your specific host machine.

Use a sling or a shackle to attach to the lifting point and lift the object. The sling or the shackle must have a rated capacity that is greater than the mass of the load.

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

Contact your Cat dealer for additional information.

The setting for the overload warning device should be checked by an authorized dealer.

i07290597

Bucket - Remove and Install

SMCS Code: 6001; 6001-012; 6001-011; 6101; 6102; 6523

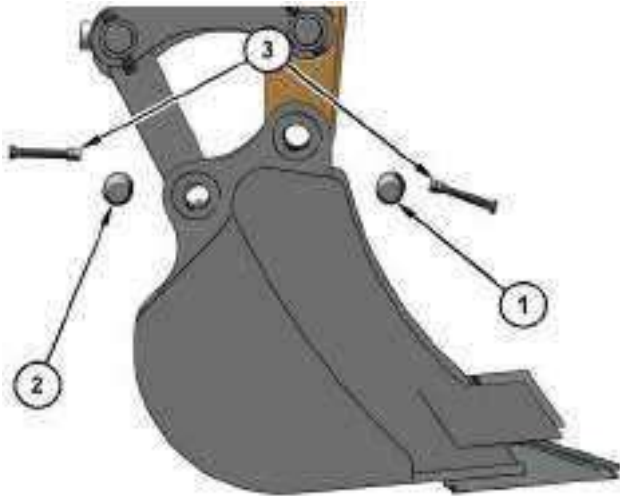


Illustration 372

g06275756

- (1) Pin
- (2) Pin
- (3) Locking Pin

Removal Procedure

WARNING

Driving in linkage pins with a hammer can cause the pins to splinter, which can cause severe personal injury.

Always use personal protective equipment (protective goggles, helmets, gloves, and other protective equipment) when installing linkage pins.

WARNING

When the pin assembly is removed, the linkage assembly may swing out of the bucket. To prevent possible personal injury, do not stand in front of, or do not stand behind the linkage assembly when the pin assembly is being removed. Do not place any part of the body (hands, feet, etc.) beneath the bucket.

1. Start the engine. Park the machine on a hard, level surface and lower the bucket to the ground. Shut off the engine.

Note: Make sure that the bottom side of the bucket is facing downward.

2. Remove locking pin (3) from support pin (2) and remove the pin that connects the connecting link to the bucket.
3. Remove locking pin (3) from support pin (1) and remove the pin that connects the stick to the bucket.
4. Start the engine and raise the stick out of the bucket.

Note: After the support pins have been removed, make sure that the support pins do not become contaminated with sand or dirt. Make sure that the stick and the linkage do not become damaged.

Installation Procedure

WARNING

Failure to follow the instruction below for the installation of a work tool may result in personal injury or death. Special care must be taken if more than one person is installing the work tool.

- Confirm the verbal communication and the hand signals that will be used during the installation.
- Be alert for sudden movement of the front linkage and the work tool.
- Do not insert fingers into the bores of the support pins when the support pins and the bores are being aligned.

WARNING

Driving in linkage pins with a hammer can cause the pins to splinter, which can cause severe personal injury.

Always use personal protective equipment (protective goggles, helmets, gloves, and other protective equipment) when installing linkage pins.

WARNING

When the pin assembly is removed, the linkage assembly may swing out of the bucket. To prevent possible personal injury, do not stand in front of, or do not stand behind the linkage assembly when the pin assembly is being removed. Do not place any part of the body (hands, feet, etc.) beneath the bucket.

1. Start the engine. Park the machine on a hard, level surface. Position the bucket on a hard, level surface with the bottom side facing downward.
2. Clean each pin and each pin bore. Lubricate each pin bore with molybdenum grease.
3. Start the engine and lower the stick into the bucket until the pin bores are in alignment with each other. Stop the engine and put the hydraulic lockout control in the RAISED position.
4. Install support pin (1) to connect the stick to the bucket. Secure the pin with locking pin (3).
5. Install support pin (2) to connect the connecting link to the bucket. Secure the pin with locking pin (3).
6. To verify a proper work tool installation, perform the following procedure:
 - a. Start the engine. Position the work tool on the ground.
 - b. Apply a slight down pressure on the work tool.
 - c. Retract and extend the stick cylinder to push the work tool against the ground. Visually confirm that there is no movement between the

linkage and the work tool and the locking pins are properly fixed.

i07290678

Hammer Operation (If Equipped)

SMCS Code: 5705-WTL

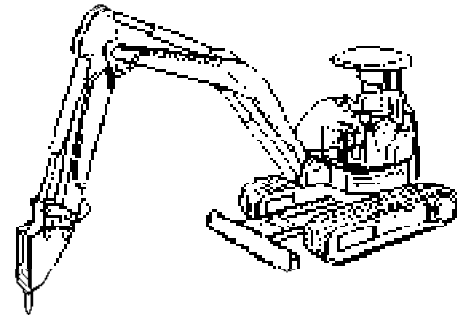


Illustration 373

g00821410

NOTICE

Selection of a hydraulic hammer must be done with extra care. Use of a hydraulic hammer not recommended by Caterpillar could result in structural damage to the machine. Consult your Caterpillar dealer for hydraulic hammer information.

Only use the hydraulic hammer to break rocks, concrete, and other hard objects. Before you start hydraulic hammer operation, place the machine on a level, stable surface. If the machine must be placed on a slope or on a rough surface, be careful during operation.

If the machine is equipped with a canopy, make sure that the machine is equipped with a polycarbonate shield. However, the limited operating range has to be observed, see illustrations 374 and 375. When visibility is restricted due to rain, snowfall, dust etc., the work has to be stopped. Resume work only if visibility is no longer restricted. Wear protective equipment such as a hard hat and protective goggles before you start hydraulic hammer operation.

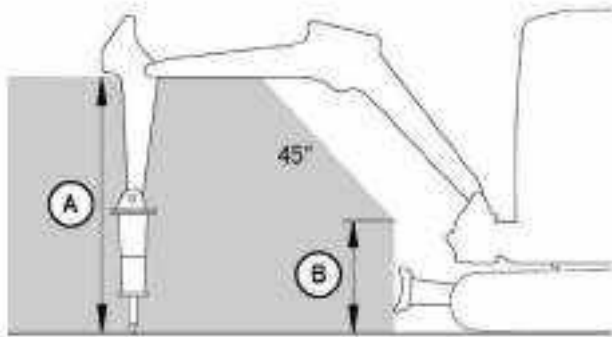


Illustration 374

g03392773

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



Illustration 375

g06276140

NOTICE

In order to avoid structural damage to the host machine or the hydraulic hammer, comply with the following:

Do not attempt to break rocks or concrete by burying the hammer tool completely into the rocks or concrete.

Do not apply a prying force to the hammer tool in order to remove the hammer tool from the material.

NOTICE

Frequent idle strokes (blank firing) have a deteriorating effect on the hammer. Do not operate the hammer without proper down pressure against the object.

Do not allow the hydraulic hammer to continuously operate at one location and for more than 1 minute. Change the location of the machine and repeat the procedure. Failure to change the location of the machine could cause the hydraulic oil to overheat. Overheated hydraulic oil could damage the accumulator or the cylinder seals.

Stop hydraulic hammer operation immediately if any of the hydraulic hoses are twisting rapidly. This indicates that the accumulator is punctured. Consult your Cat dealer for the necessary repairs.

NOTICE

Do not use the dropping force of the hydraulic hammer to break rocks or other hard objects. This could cause structural damage to the machine.

Do not use the sides or back of the hydraulic hammer to move rocks or other hard objects. Doing this could cause damage not only to the hammer but to stick or boom cylinder.

Do not operate the hydraulic hammer with any of the cylinders fully retracted or extended. Doing this could cause structural damage to the machine, resulting in reduced machine life.

Do not use the hydraulic hammer to lift an object.

Do not operate the hydraulic hammer while the stick is vertical to the ground. This type of operation could allow the stick cylinder to vibrate excessively.

Do not operate the hydraulic hammer on objects in water. This type of operation could cause the chisel to rust and the seal on the sliding section to be damaged.

Operate the attachment control levers carefully to keep the hydraulic hammer's chisel from hitting the boom.

Do not operate the hydraulic hammer with the upper structure sideways to the undercarriage. Before you start hydraulic hammer operation, place the upper structure in the recommended position that is shown in the following illustration. Any other operating positions could make the machine unstable. Any other operating positions could place excessive loads on the undercarriage.

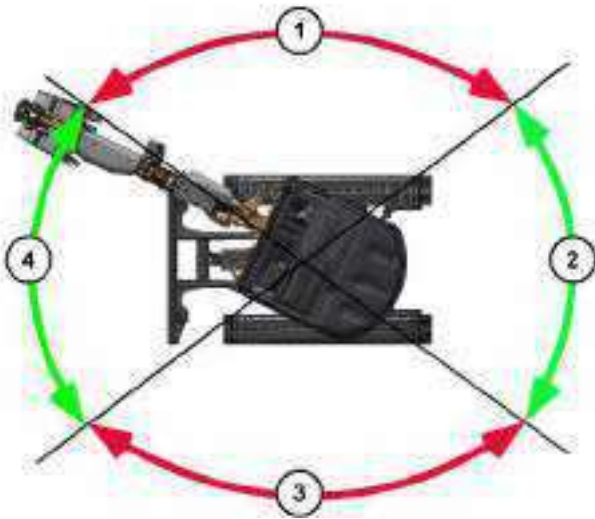


Illustration 376

g06275800

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

i07285207

Blade Operation

SMCS Code: 6060

NOTICE

The machine can be damaged if the adjustable gauge undercarriage and the blade are set to different widths (for instance when driving through a door).

Reducing the Width of the Blade

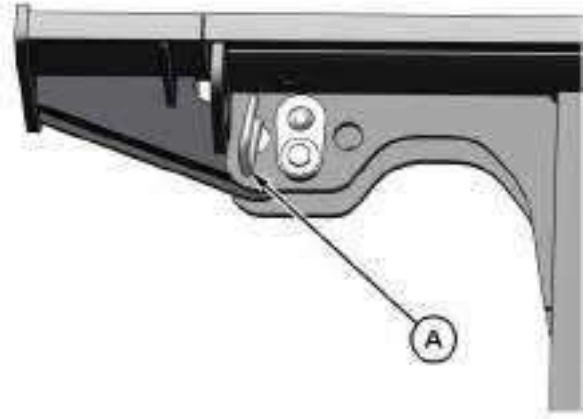


Illustration 377

g06262829

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

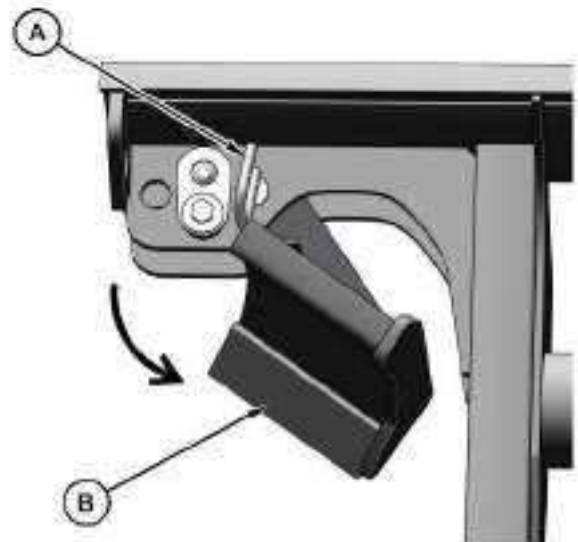


Illustration 378

g06262835

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

4. Insert pins (A) on either side.

Increasing the Width of the Blade

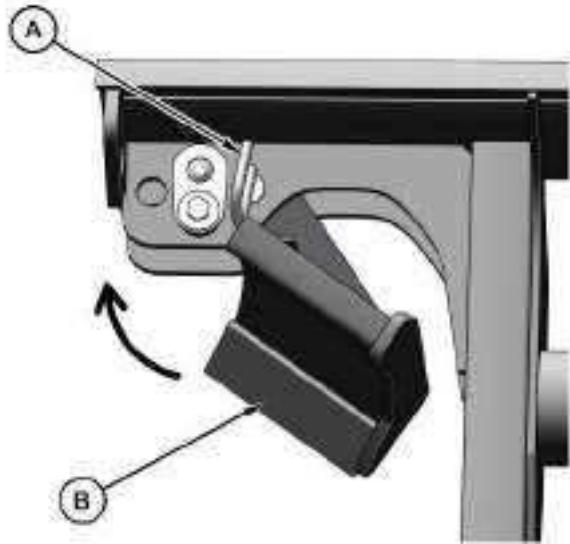


Illustration 379

g06262836

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

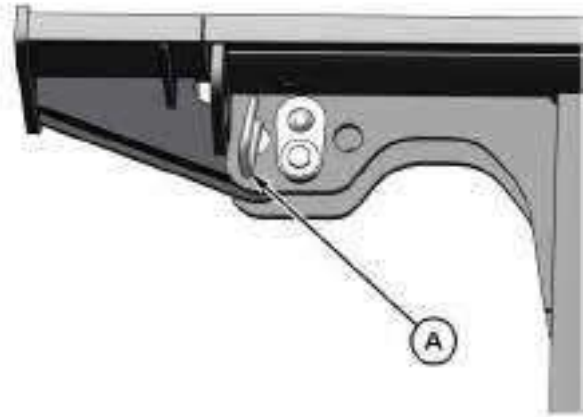


Illustration 380

g06262829

4. Insert pins (A) on either side.

i05334780

Rubber Belt Track Operation

SMCS Code: 4198

The rubber part of the track assembly can easily be damaged during operation. Operate the machine with the rubber belt only if damage to the rubber belt is shallow and the damage is not harmful. However, any harmful damage to the rubber can cause the following serious problems to the entire track assembly:

- Early wear of iron core.
- Early wear of track grousers.
- Fracture of iron core.
- Fracture of track grousers.
- Cuts of steel cords
- Rubber flaking off
- Disengagement of sprocket

Such a failed track assembly needs to be replaced as a unit. In order to minimize the replacement of the track, observe the following items. In order to maximize the performance of the track, observe the following items:

- Avoid Traveling at sites for demolition.

Operation Section
Rubber Belt Track Operation

- Traveling at these sites should be avoided particularly when the machine is being swung at the same time.
- Avoid operation under salty conditions.
- Avoid combined operation of travel and swing with excessive load at rough terrain.
- Avoid operation at rocky sites.
- Avoid suddenly swinging the machine when the machine is Traveling on pavement.
- Use the rubber belt tracks at temperatures within -15°C (5°F) to 45°C (113°F). Avoid operation on hot surfaces.
- Rubber belt tracks are less stable than steel tracks. Side-to-side movement of the machine should be done carefully.
- If the sprockets are badly worn, use a new sprocket for replacement.
- Be sure that the tracks are free of oily materials such as fuel, hydraulic oil, grease, etc.
- Avoid going over sharp obstacles. Decreased life of the track, fracture of the track grousers and cut steel cords can occur.
- Track Tension must be correctly maintained and checked regularly.
- Disengagement of the track could occur if the track gets clear of the track roller. This could happen while the machine travels over an obstacle.

Parking

i07240905

Stopping the Machine

SMCS Code: 7000

WARNING

Deactivation of the controls and drive levers does not prevent the blade, boom swing, or auxiliary circuit functions from moving if the blade lever or a foot pedal is moved.

Personal injury or death may occur from sudden machine movement.

Note: There may be regulations that define the requirements for the operator and/or support personnel to be present when the engine is running.

Park on a level surface. If the machine must be parked on a grade, chock the tracks securely.



Illustration 381

g06268228

1. Turn the engine speed dial counterclockwise to reduce engine speed.



Illustration 382

g06262810

2. Move the left and right travel levers slowly to the STOP position to stop the machine.

Note: Avoid sudden stops. Sudden stops can damage the machine. Slow down and bring the machine to a smooth stop.

3. Lower the work tool and the blade to the ground. Apply a slight downward pressure.



Illustration 383

g06262819

4. Raise the hydraulic lockout control to the RAISED position to deactivate the controls and drive levers.

i07290689

i07291002

Freezing Conditions

SMCS Code: 7000

If freezing temperatures are expected, remove the mud and the dirt from each track roller frame. Park the machine on wood planks. Use the following procedure to clean each track roller frame.

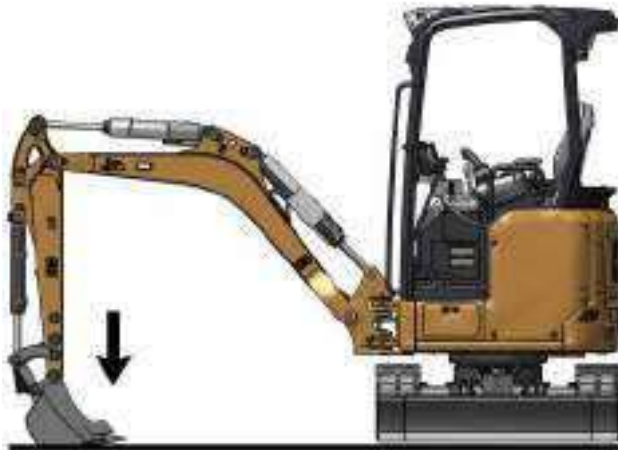


Illustration 384

g06275814

1. Position the boom over one side of the machine.
2. Use boom down pressure to lift the track on one side off the ground. Operate the track in the forward direction. Then operate the track in reverse. Continue this procedure until the maximum amount of material is thrown off the track.
3. Lower the track onto the wood planks.
4. Repeat the procedure for the other track.
5. Clean the area around the skid plate that is on top of the track roller frame and around the track rollers.
6. Lower the attachment onto a wood plank.

Stopping the Engine

SMCS Code: 1000; 7000

NOTICE

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

1. Stop the machine and lower all work tools to the ground.
2. Turn off all auxiliary electrical equipment.
3. Run the engine at low idle for 2 minutes.



Illustration 385

g06275824

4. Turn the engine start switch key to the OFF position and remove the engine start switch key.



Off – The engine is stopped with the key in this position.

Stop the Engine if an Electrical Malfunction Occurs

Lower all attachments and the blade to the ground. Turn the engine start switch key to the OFF position. If the engine does not stop, perform the following procedure.



Illustration 386

g06268234

1. Remove the cover under the operator seat.

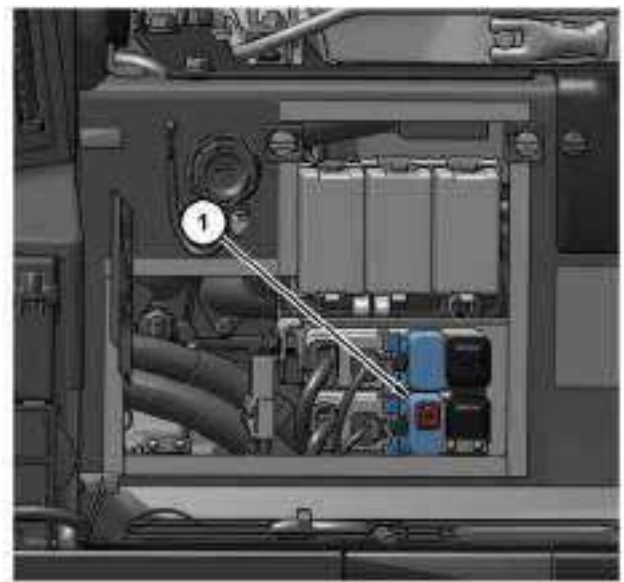


Illustration 388

g06318381

Relay location for sales models 301.6, 301.8, and 302 CR

- (1) Engine stop relay

2. Remove relay (1) marked with the red stop engine film.

Note: Do not operate the machine again until the malfunction has been corrected, and the relay reconnected.

i07508043

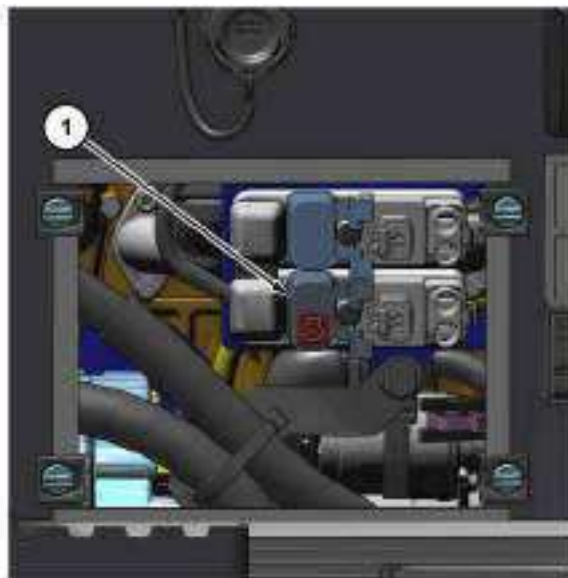


Illustration 387

g06268242

Relay location for sales models 301.5 and 301.7 CR

- (1) Engine stop relay

Leaving the Machine

SMCS Code: 7000

1. Remove the engine start switch key.

Removing the key will prevent unauthorized persons from starting the engine or from turning on the lights.

2. Use the handholds when you exit the machine. Face the machine and use both hands. Step from the operator stand to the ground. Make sure that the rubber mat is clear of debris before you dismount.

3. Inspect the engine compartment for debris. Clean out any debris and any paper to avoid a fire.

4. Lock the engine cover.

The machine is equipped with a courtesy light function. The courtesy light function enables a delay shut down of the lights after the machine has been turned off to allow the operator to exit the machine safely.

i07735116

Machine Storage and Specified Storage Period

SMCS Code: 7000

Machine Storage

The Safety Section of this Operation and Maintenance Manual contains storage information for fuels, lubricants, and ether (if equipped).

The Operation Section of this Operation and Maintenance Manual contains information for short-term storage of this machine, including engine shutdown, parking, and instructions for leaving the machine.

For detailed steps on long-term storage refer to Special Instruction, SEHS9031, "Storage Procedure for Caterpillar Products".

Specified Storage Period

The specified storage period of this machine is 1 year.

After the specified storage period has expired, consult your Cat dealer for inspect, repair, rebuild, install remanufactured, or install new components, and disposal options, and to establish a new specified storage period.

If a decision is made to remove the machine from service, refer to Decommissioning and Disposal for further information.

Transportation Information

i02005176

Shipping the Machine

SMCS Code: 7000; 7500

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

Before you load the machine onto the trailer, remove ice, snow, or other slippery material from the loading dock and from the truck bed. Removal of ice, snow, or other slippery material will prevent the slipping of the machine as you load the machine. Removing ice, snow, or other slippery material will prevent the machine from moving in transit.

NOTICE

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

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

Observe all regulations governing wide loads.

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

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

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

Loading The Machine

1. Position the machine so that the machine can drive straight up the loading ramps. Position the machine so that the front linkage and the dozer blade will be the first machine components to travel up the loading ramps. Make sure that the dozer blade is raised up.
2. Extend the front linkage forward over the trailer bed in order to help maintain balance.
3. Use caution when you travel over the areas around the loading ramp joints. Maintain the balance point of the machine.
4. After you load the machine onto the trailer be sure that the machine is properly positioned on the trailer bed.
5. Slowly, swing the upper structure for 180° and carefully move the machine toward the front of the trailer or the rail car.
6. Refer to the Operation and Maintenance Manual, "Lifting and Tying Down the Machine" for information on tying down the machine.

Unloading The Machine

1. Position the machine so that the machine can drive straight down the loading ramps. Position the machine so that the front linkage will be the first machine component to travel down the loading ramps. Position the machine so that the dozer blade will be the last machine component to travel down the loading ramps. Make sure that the dozer blade is raised up.
2. Extend the front linkage forward over the ramps. While you travel down the loading ramps, adjust the front linkage in order to allow the work tool to remain close to the ground. This will prevent the machine from tipping forward.

- Use caution when you travel over the areas around the loading ramp joints in order to maintain the balance point of the machine.

i07423174

Adjustable Gauge Undercarriage Frame

SMCS Code: 4150-VAR

The undercarriage will not expand evenly. When you are expanding the undercarriage, be sure to expand the undercarriage completely. If the undercarriage is not fully expanded, the upper structure can slide when the machine is operated. The machine can overturn if the upper structure slides.

The undercarriage will not retract evenly. When you are retracting the undercarriage, be sure to retract the undercarriage completely. If the undercarriage is not fully retracted, the upper structure can slide when the machine is operated. The machine can overturn if the upper structure slides.

Expand the undercarriage in an open area on flat, solid ground. The undercarriage should always be expanded except when you travel through narrow passages.

Expanding the Undercarriage and Retracting the Undercarriage



Illustration 389

g06268257

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



Illustration 390

g06268265

- Apply down pressure with the dozer blade to lift the rear of the machine off the ground. Simultaneously hold the joystick controls in the BOOM LOWER position and the STICK OUT position until the tracks are off the ground.

Note: While operating the adjustable undercarriage, be sure not to put the blade in the FLOAT position otherwise a sudden drop may occur.

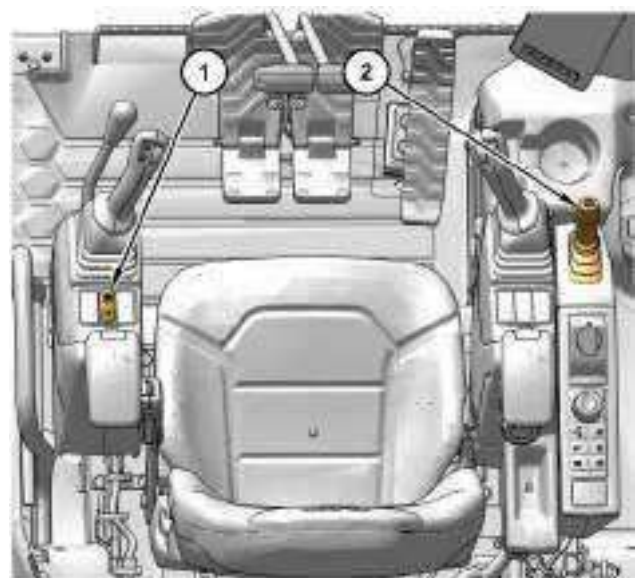


Illustration 391

g06268268

- Lift and hold switch (1) to control the adjustable gauge undercarriage.

4. Move control lever (2) forward to expand the undercarriage. Move control lever (2) backward to retract the undercarriage. Release control lever (2).

Note: While expanding and retracting the undercarriage, the dozer blade may lift slightly and cause the rear of the machine to lift or lower.

5. Release switch (1) to control the blade.
6. Simultaneously hold the joystick controls in the BOOM RAISE position and the STICK IN position to lower the front of the machine to the ground. Carefully lower the rear of the machine to the ground by using the dozer blade control.
7. Swing the upper structure to place the dozer blade in the front of the machine.

i07285192

Lifting and Tying Down the Machine

SMCS Code: 7000; 7500

NOTICE

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

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

Use proper rated cables and slings for lifting. The crane should be positioned so that the machine is lifted parallel to the ground.

Positioning the Machine for Lifting

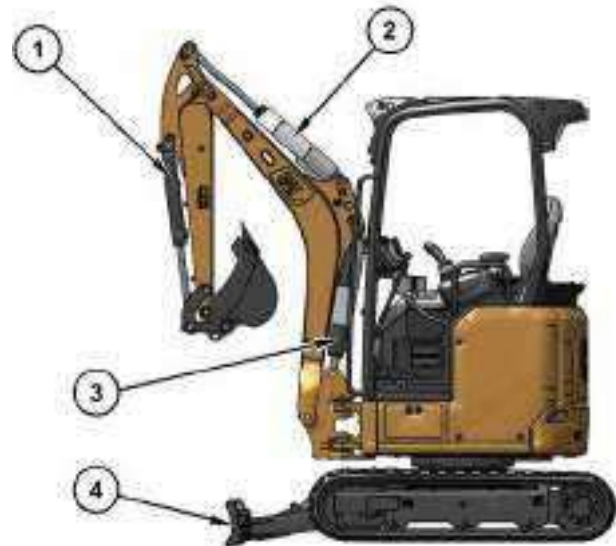


Illustration 392

g06274782

1. Raise blade (4).
2. Position the boom in a straight ahead position.
3. Retract boom cylinder (3), extend stick cylinder (2), and extend work tool cylinder (1) to the end of the stroke.
4. Stop the engine. Raise the hydraulic lockout control and dismount the machine. Lock the door.



Illustration 393

g06274789

5. To obtain the position for the second lifting option, swing the upper structure so blade (4) is to the rear of the machine.

Lifting the Machine

Note: Ensure that the undercarriage is fully expanded before you lift the machine. Ensure that an empty standard bucket is installed on the machine.

Option 1



Illustration 394

g06274811

1. Attach shackles to the lifting eyes on the top of the canopy and fasten slings to the shackles.
2. Use lifting gears that match the required lengths.
3. Raise the machine slowly to make sure that the machine stays in a horizontal position.

Option 2

Illustration 395

g06274836

2. Raise the machine slowly to make sure that the machine stays in a horizontal position.

Tying Down the Machine

Note: Do not allow anyone in the machine during the transport of the machine.

1. Lower the blade to the trailer.
2. Extend the bucket and stick cylinders to the end of the stroke.
3. Lower the boom slowly to rest the bucket control linkage on a block of wood.
4. Stop the engine.
5. Move the hydraulic lockout control to the RAISED position.
6. Ensure that all service doors are closed.
7. Chock the tracks.
8. Install tie-downs on the bucket control linkage to prevent the boom from shifting.



Illustration 396

g06274841

1. Attach shackles to the two lifting eyes on the blade and the two lifting eyes on the middle bracket of the boom. Fasten slings to each shackle.

Note: The shackles should be long enough so that the slings do not contact the cab or canopy.

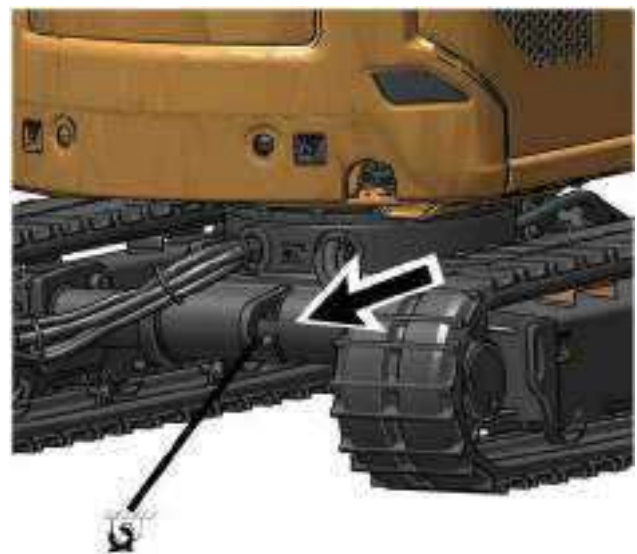


Illustration 397

g06274899

9. Install tie-downs on the rear eye on the lower frame to prevent shifting in transit.

Operation Section
Lifting and Tying Down the Machine



Illustration 398

g06274914

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

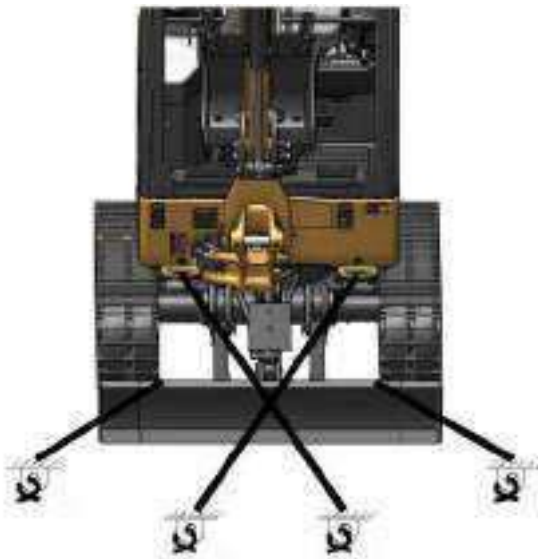


Illustration 399

g06274906

Front of the Machine



Illustration 400

g06274909

Rear of the Machine

11. Install tie-downs on the lower portion of the machine by referring to either Illustration 399 or 400 .

Note: Use protectors between the machine and tie-downs.

Note: To utilize the tie-down points on the rear of the machine, install M30x2 eye bolts. Thread depth is 30 mm (1.2 inch).

12. Separately tie down all work tools that will accompany the machine. Refer to the operation manual for the work tools for instructions on tying down the individual work tools.

Towing Information

i07291036

Towing the Machine

SMCS Code: 7000

Towing the machine:

- Ensure that the excavator can be towed safely
- Use the towing bracket for towing the machine.
- Use the towing bracket only for towing the machine
- Use a shackle pin with a lock pin
- Take off slowly!
- Ensure that there are no persons close to the towing equipment (towing bar, cable)!

WARNING

Personal injury or death could result when towing a disabled machine incorrectly. Keep all personnel clear of the disabled machine until the machine has been towed to a safe place. Follow the towing procedure.

The maximum admissible load of the towing bracket is one and a half times the machine weight.

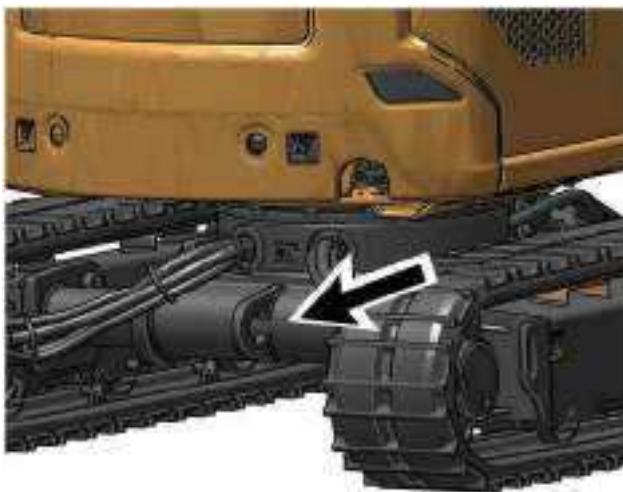


Illustration 401

g06275844

Use the towing bracket on the undercarriage.

Use a shackle and secure the shackle with the shackle pin and a lock pin.

Mount a towing bar or cable of adequate size to the towing eye.

Pull the machine slowly.

NOTICE

Follow the following instructions under all circumstances:

Do not tow the machine if the machine is at a standstill or broken down, otherwise the final drives of the machine can be damaged.

The manufacturer's warranty shall not apply to accidents or damage caused by towing the excavator.

Do not tow other things (for example, machines, trailers, etc.) with the towing bracket.

Engine Starting (Alternate Methods)

i02016499

Engine Starting with Jump Start Cables

SMCS Code: 1000; 7000

WARNING

Failure to properly service the batteries may cause personal injury.

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

Do not smoke when checking battery electrolyte levels.

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

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

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

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

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

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

NOTICE

When jump starting the engine with another machine, make sure that the machines do not touch. This could prevent damage to engine bearings and electrical circuits.

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

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

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

1. Lower the equipment to the ground. Move all controls to the HOLD position. Move the hydraulic lockout control (lever) to the LOCKED position.
2. Turn the start switch on the stalled machine to the OFF position. Turn off all accessories.
3. Move the machine that is being used as an electrical source near the stalled machine so that the jump start cables reach the stalled machine.
Do not allow the machines to contact each other.
4. Stop the engine of the machine that is being used as an electrical source. If you are using an auxiliary power source, turn off the charging system.
5. Ensure that battery caps on both machines are tight and correctly placed. Ensure that batteries in the stalled machine are not frozen. Make sure that the batteries have enough electrolyte.

Note: The positive terminal of the 12 volt system of the source and the negative terminal of the 12 volt system of the source must be identified correctly before the jumper cables are connected. The positive terminal of the 12 volt system of the discharged battery must be identified correctly before the jumper cables are connected.

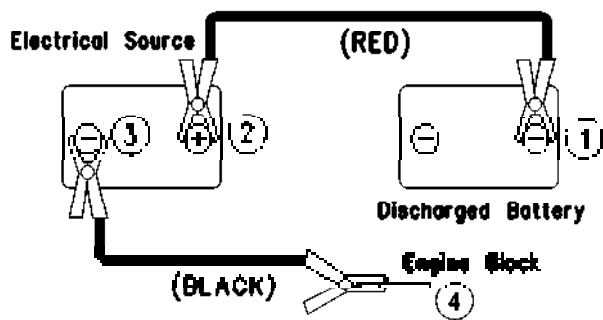


Illustration 402

g00818210

6. The positive ends of the jump start cable are red. Connect one positive end of the jump start cable to positive cable terminal (1) of the discharged battery.
Do not allow the positive cable clamps to contact any metal except for the battery terminals.
7. Connect the other positive end of the jump start cable to positive cable terminal (2) of the electrical source.
8. Connect one negative end of the jump start cable to negative cable terminal (3) of the electrical source.
9. Finally, connect the other negative end of the jump start cable to engine block (4) of the stalled machine. Do not connect the jump start cable to the battery post. Do not allow the jump start cables to contact the battery cables, the fuel lines, the hydraulic lines, or any moving parts.
10. Start the engine of the machine that is being used as an electrical source or energize the charging system on the auxiliary power source.
11. Wait at least two minutes before you attempt to start the stalled machine. This will allow the batteries in the stalled machine to partially charge.
12. Attempt to start the stalled engine. See Operation and Maintenance Manual, "Engine Starting" for the correct starting procedure.
13. Immediately after you start the stalled engine, disconnect the jump start cables in reverse order.

Maintenance Section

Maintenance Access

i08723449

Access Door and Cover Locations

SMCS Code: 726A-CH

Engine Door



Illustration 403

g06268512

1. Open the engine door by pulling the lever and opening the door towards you. Place lock bar (A) into the bracket to prevent the engine door from closing.

2. To close the engine door, raise lock bar (A) on the left side, close the engine door, and firmly press the door towards the machine.

Left Side Cover



Illustration 404

g06268527

1. To open the left side door, remove three screws (B).



Illustration 405

g06268520

2. Open the left side door towards you, place lock bar (A) into the bracket to prevent the door from closing.

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

Right Side Cover



Illustration 406

g06268535

- Open the right side door by pulling the lever and opening the door towards you. Place lock bar (A) into the bracket to prevent the door from closing.
- To close the right side door, raise lock bar (A) on the left side, close the door, and firmly press the door towards the machine.

Access Beneath Canopy/Cab

- Park the machine on level ground and lower the implements



Illustration 407

g06268577

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

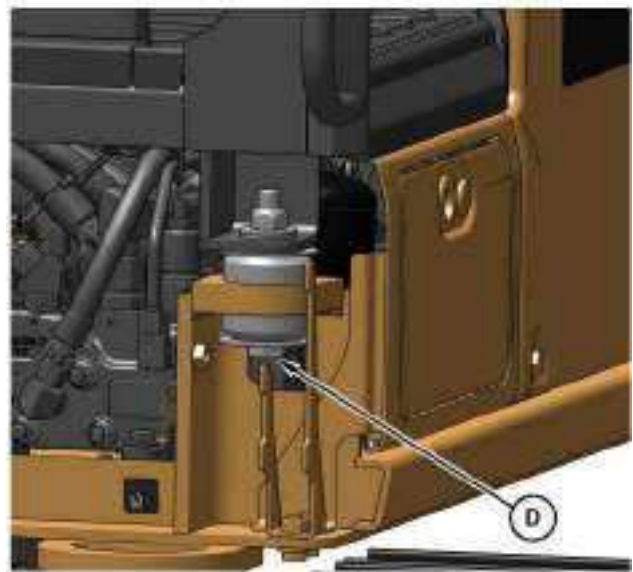


Illustration 408

g06317801

- Remove bolts (D) at the left and right corners of the canopy.



Illustration 409

g06268597

4. Lift the canopy.



Illustration 410

g06268607

5. Secure locks (E) on the left and right side of the canopy.



Illustration 411

g06274240

6. Secure cab brace bar (F). Place one end in the bracket on the cab and other end in the bracket on top of the fuel tank. Adjust bar (F) to the necessary length by turning the center along the threads.

Note: The cab brace bar is stored in front of the fuel tank when not in use.

7. To lower the canopy back into place, perform Steps 2 through 6 in reverse.

Removable Canopy Mounting Area Inspection

Before operation, confirm no loosening or damages to the canopy mounting bolts. If any problems are present, retighten or replace the bolts.

Do not remove the removable canopy. If removal of the canopy is necessary, reinstall the bolts into the mounting brackets. Tighten the bolts to a torque of $100 \pm 20 \text{ N}\cdot\text{m}$ ($74 \pm 15 \text{ lb ft}$).

Note: The removable canopy is designed as a Tip-Over Protective Structure (TOPS) canopy for 302 CR only. The removable canopy for the 301.7 CR is **NOT** a TOPS.

Cab Door Lock (If Equipped)

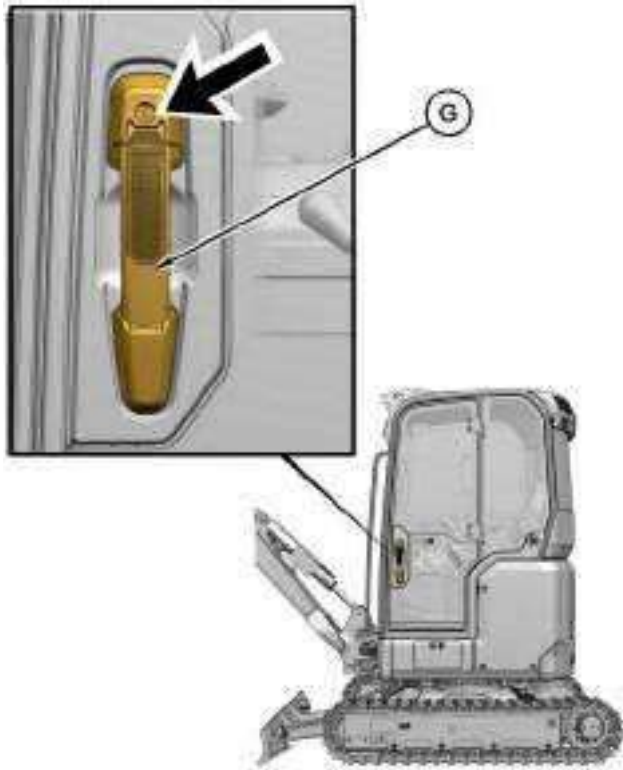


Illustration 412 g06757509
Vertical position of key cylinder on door handle (G).
(G) Cab door



Illustration 413 g06757514
Horizontal position of key cylinder on door handle (G).

When the key cylinder on door handle (G) is in the vertical position as shown in the Illustration 412, the door is locked. To lock the door, insert the key into the cylinder, rotate to the vertical position, and remove the key.

If the door is closed with the key cylinder in the vertical position, the door will remain locked. A key will be required to unlock the door before it can be opened from the outside. The door can always be opened from inside the cab, even if locked. If opened from the inside while locked, the door will remain locked.

When the key cylinder on the door handle is in the horizontal position as shown in the Illustration 413, the door is unlocked. To unlock the door, insert the key into the cylinder, rotate to the horizontal position, and remove the key.

Lubricant Viscosities and Refill Capacities

i08704805

Lubricant Viscosities (Fluids Recommendations)

SMCS Code: 7581

General Information for Lubricants

When you are operating the machine in temperatures below -20°C (-4°F), refer to Special Publication, SEBU5898, "Cold Weather Recommendations". This publication is available from your Cat dealer.

Refer to the "Lubricant Information" section in the latest revision of the Special Publication, SEBU6250, "Caterpillar Machine Fluids Recommendations" for a list of Cat[®] engine oils and for detailed information. This manual may be found on the following website:

safety.cat.com

The footnotes are a key part of the tables. Read ALL footnotes that pertain to the machine compartment in question.

Selecting the Viscosity

To select the proper oil for each machine compartment, refer to the "Lubricant Viscosity for Ambient Temperature" table. Use the oil type AND oil viscosity for the specific compartment at the proper ambient temperature.

The proper oil viscosity grade is determined by the minimum ambient temperature (the air in the immediate vicinity of the machine). Measure the temperature when the machine is started and while the machine is operated. To determine the proper oil viscosity grade, refer to the "Min" column in the table. This information reflects the coldest ambient temperature condition for starting a cold machine and for operating a cold machine. Refer to the "Max" column in the table for operating the machine at the highest temperature that is anticipated. Unless specified otherwise in the "Lubricant Viscosities for Ambient Temperatures" tables, use the highest oil viscosity that is allowed for the ambient temperature.

Machines that are operated continuously should use oils that have the higher oil viscosity. The oils that have the higher oil viscosity will maintain the highest possible oil film thickness. Refer to "General Information for Lubricants" article, "Lubricant Viscosities" tables, and any associated footnotes. Consult your Cat dealer if additional information is needed.

NOTICE

Not following the recommendations found in this manual can lead to reduced performance and compartment failure.

Engine Oil

Cat oils have been developed and tested in order to provide the full performance and life that has been designed and built into Cat engines.

Cat DEO-ULS multigrade and Cat DEO multigrade oils are formulated with the correct amounts of detergents, dispersants, and alkalinity in order to provide superior performance in Cat diesel engines where recommended for use.

Note: SAE 10W-30 is the preferred viscosity grade for the 3116, 3126, C7, C-9, and C9 diesel engines when the ambient temperature is between -18°C (0°F) and 40°C (104°F).

Table 26

Lubricant Viscosities for Ambient Temperatures						
Compartment or System	Oil Type and Performance Requirements	Oil Viscosities	°C		°F	
			Min	Max	Min	Max
Engine Crankcase	Cat DEO-ULS Cold Weather	SAE 0W-40	-40	40	-40	104
	Cat DEO-ULS SYN Cat DEO SYN	SAE 5W-40	-30	50	-22	122
	Cat DEO-ULS Cat DEO	SAE 10W-30	-18	40	0	104
	Cat DEO-ULS Cat DEO	SAE 15W-40	-9.5	50	15	122
Pump Coupling (If Equipped)	Cat DEO-ULS Cat DEO	SAE 10W-30	-18	40	0	104

Note: API engine oil categories are backwards compatible. Cat DEO-ULS (API CK-4) oil can be used in all engines with some restrictions related to fuel sulfur level. Cat DEO (API CI-4/API CI-4 PLUS) can be used in engines that are Tier 3 emissions certified and prior, and in engines that do not use aftertreatment devices.

Hydraulic Systems

Refer to the “Lubricant Information” section in the latest revision of the Special Publication, SEBU6250, “Caterpillar Machine Fluids Recommendations” for detailed information. This manual may be found on the web on the following website:

safety.cat.com

The following are the preferred oils for use in most Cat machine hydraulic systems:

- Cat HYDO Advanced 10 SAE 10W
- Cat HYDO Advanced 30 SAE 30W
- Cat BIO HYDO Advanced

Cat HYDO Advanced oils allow 6000 hours or higher oil drain intervals for most applications. S·O·S Services oil analysis is recommended when the oil drain interval is increased to 6000 hours or higher. In comparison, non-Cat commercial hydraulic oils (second choice oils) allow 2000 hours oil drain interval. It is recommended to follow the maintenance interval schedule for oil filter changes and for oil sampling that is stated in the Operation and Maintenance Manual for your particular machine. Consult your Cat dealer for details. When switching to Cat HYDO Advanced fluids, cross contamination with the previous oil should be kept to less than 10%.

Second choice oils are listed below.

- Cat MTO
- Cat DEO

- Cat DEO-ULS
- Cat TDTO
- Cat TDTO Cold Weather
- Cat TDTO-TMS
- Cat DEO-ULS SYN
- Cat DEO SYN
- Cat DEO-ULS Cold Weather

Note: Oil drain intervals of the oils listed above are less than those of Cat HYDO Advanced oils. The oil drain interval of these oils is typically 2000 hours and up to a maximum of 4000 hours. An exception is Cat TDTO Cold Weather oil which allows 6000 hours or higher oil drain interval. S·O·S Services oil analysis is required when the oils listed above are used in Cat hydraulic system components and hydrostatic transmissions.

Maintenance Section
Fluids Recommendations

Table 27

Lubricant Viscosities for Ambient Temperatures						
Compartment or System	Oil Type and Performance Requirements	Oil Viscosities	°C		°F	
			Min	Max	Min	Max
Hydraulic System	Cat HYDO Advanced 10 Cat TDTO	SAE 10W	-20	40	-4	104
	Cat HYDO Advanced 30 Cat TDTO	SAE 30	10	50	50	122
	Cat BIO HYDO Advanced	"ISO 46" Multi-Grade	-30	50	-22	122
	Cat MTO Cat DEO-ULS Cat DEO	SAE10W-30	-20	40	-4	104
	Cat DEO-ULS Cat DEO	SAE15W-40	-15	50	5	122
	Cat TDTO-TMS	Multi-Grade	-15	50	5	122
	Cat DEO-ULS SYN Cat DEO SYN	SAE 5W-40	-30	40	-22	104
	Cat DEO-ULS Cold Weather	SAE0W-40	-40	40	-40	104
	Cat TDTO Cold Weather	SAE 0W-20	-40	40	-40	104

Other Fluid Applications

Table 28

Excavators, Front Shovels, Mass Excavators, Demolition Excavators, and Track Material Handlers Lubricant Viscosities for Ambient Temperatures						
Compartment or System	Oil Type and Performance Requirements	Oil Viscosity Grade	°C		°F	
			Min	Max	Min	Max
Final Drives and Swing Drives	Cat TDTO Cat TDTO-TMS Cat TDTO SYN Cold Weather commercial TO-4	SAE 0W-20	-40	0	-40	32
		SAE 0W-30	-40	10	-40	50
		SAE 5W-30	-30	10	-22	50
		SAE 10W	-30	0	-22	32
		SAE 30	-25	25	-13	77
		SAE 50	-15	50	5	122
		Cat TDTO-TMS	-30	25	-22	77
Track Roller Frame Recoil Spring and Pivot Shaft Bearings	Cat TDTO Cat TDTO-TMS Cat TDTO SYN Cold Weather commercial TO-4	SAE 0W-20	-40	0	-40	32
		SAE 0W-30	-40	10	-40	50
		SAE 5W-30	-35	0	-31	32
		SAE 10W	-30	0	-22	32
		SAE 30	-20	25	-4	77
		SAE 40	-10	40	14	104
		SAE 50	0	50	32	122
		Cat TDTO-TMS	-25	25	-13	77

(continued)

(Table 28, contd)

Excavators, Front Shovels, Mass Excavators, Demolition Excavators, and Track Material Handlers Lubricant Viscosities for Ambient Temperatures						
Compartment or System	Oil Type and Performance Requirements	Oil Viscosity Grade	°C		°F	
			Min	Max	Min	Max
Track Idlers and Track Rollers	Cat DEO (single grade) Cat DEO SYN	SAE 30	-20	25	-4	77
	Cat DEO-ULS SYN Cat ECF-1-a Cat ECF-2 Cat ECF-3 API CF	SAE 5W-40	-35	40	-31	104

Table 29

Excavators, Front Shovels, Mass Excavators, Demolition Excavators, and Track Material Handlers Lubricant Viscosities for Ambient Temperatures						
Compartment or System	Oil Type and Performance Requirements	Oil Viscosity Grade	°C		°F	
			Min	Max	Min	Max
Variable Pitch Flexxaire Fan (If Equipped)	Cat Full Synthetic Multi-grade DEO commercial Full Synthetic Multigrade Diesel Engine Oil meeting either Cat ECF-1 or API CG-4	SAE 0W40 ⁽¹⁾	-40	50	-40	122
		SAE 5W40 ⁽¹⁾	-40	50	-40	122
	Caterpillar Non-Synthetic TO-4	SAE 30 ⁽²⁾	-15	25	-5	77
		SAE 50 ⁽²⁾	-10	50	14	122

(1) This is the first choice. Full synthetic oils are recommended. Synthetic oils may provide longer service life for the fan. Synthetic oils allow for increased service intervals over non-synthetic oils.

(2) This is the second choice. Caterpillar TDTO is acceptable. Commercial oils that meet the TO-4 specification are also acceptable. TDTO is non-synthetic. Commercial TO-4 oils are typically non-synthetic.

Special Lubricants

Grease

To use a non-Cat grease, the supplier must certify that the lubricant is compatible with Cat grease.

Each pin joint should be flushed with the new grease. Ensure that all old grease is removed. Failure to meet this requirement may lead to failure of a pin joint.

Table 30

Recommended Grease						
Compartment or System	Grease Type	NLGI Grade	°C		°F	
			Min	Max	Min	Max
External Lubrication Points	Cat Prime Application Grease	NLGI Grade 2	-20	140	-4	284
	Cat Extreme Application Grease	NLGI Grade 1	-20	140	-4	284
		NLGI Grade 2	-15	140	+5	284

(continued)

(Table 30, contd)

Recommended Grease						
Compartment or System	Grease Type	NLGI Grade	°C		°F	
			Min	Max	Min	Max
	Cat Extreme Application Grease-Artic	NLGI Grade 0,5	-50	130	-58	266
	Cat Extreme Application Grease-Desert	NLGI Grade 2	-10	140	+14	284
	Cat Utility Grease	NLGI Grade 2	-20	140	-4	284
	Cat Ball Bearing Grease	NLGI Grade 2	-20	160	-4	320

Grease for the Autolube System (if Equipped)

The grease used with the automatic lubrication system must not contain any graphite or PTFE.

Note: Pumpability is based on “US Steel Mobility and Lincoln Ventmeter Tests”. Performance may vary depending on lubrication equipment and the length of the lines.

Refer to Special Publication, SEBU6250, “Caterpillar Machine Fluids Recommendations” for additional information about grease. This manual may be found on the following website:

safety.cat.com

Table 31

Recommended Grease for the Autolube System						
Compartment or System	Grease Type	NLGI Grade	°C		°F	
			Min	Max	Min	Max
Cat Autolube System	Cat Extreme Application Grease	NLGI Grade 1	-35	40	-31	104
		NLGI Grade 2	-30	50	-22	122

Diesel Fuel Recommendations

Diesel fuel must meet “Caterpillar Specification for Distillate Fuel” and the latest versions of “ASTM D975” or “EN 590” to ensure optimum engine performance. Refer to Special Publication, SEBU6250, “Caterpillar Machine Fluids Recommendations” for the latest fuel information and for Cat fuel specification. This manual may be found on the following website:

safety.cat.com

The preferred fuels are distillate fuels. These fuels are commonly called diesel fuel, furnace oil, gas oil, or kerosene. These fuels must meet the “Caterpillar Specification for Distillate Diesel Fuel for Off-Highway Diesel Engines”. Diesel Fuels that meet the Caterpillar specification will help provide maximum engine service life and performance.

Misfueling with fuels of high sulfur level can have the following negative effects:

- Reduce engine efficiency and durability
- Increase the wear
- Increase the corrosion
- Increase the deposits
- Lower fuel economy
- Shorten the time period between oil drain intervals (more frequent oil drain intervals)
- Increase overall operating costs
- Negatively impact engine emissions

Failures that result from the use of improper fuels are not Caterpillar factory defects. Therefore the cost of repairs would not be covered by a Caterpillar warranty.

Caterpillar does not require the use of ULSD in off road and machine applications that are not Tier 4/ Stage IIIB certified engines. ULSD is not required in engines that are not equipped with after treatment devices.

Follow operating instructions and fuel tank inlet labels, if available, to ensure that the correct fuels are used.

Refer to Special Publication, SEBU6250, "Caterpillar Machine Fluids Recommendations" for more details about fuels and lubricants. This manual may be found on the following website:

safety.cat.com

Fuel Additives

Cat Diesel Fuel Conditioner and Cat Fuel System Cleaner are available for use when needed. These products are applicable to diesel and biodiesel fuels. Consult your Cat dealer for availability.

Biodiesel Fuel Recommendations

NOTICE

Never use raw vegetable or plant-based oils in place of esterified biodiesel.

The use of oils that are not esterified can lead to engine damage, up to and including engine failure.

Biodiesel is a fuel that can be made from various renewable resources that include vegetable oils, animal fat, and waste cooking oil. These oils and fats are chemically processed (esterified), and filtered to remove water and contaminants.

For biodiesel storage requirements, consult your fuel supplier.

Note: In some regions, biodiesel blends are known as Fatty Acid Methyl Ester (FAME).

Use biodiesel blends that meet national, regional, and local standards.

For more information on biodiesel standards, and to reduce the risks associated with biodiesel usage, refer to Special Publication, SEBU6250, "Caterpillar Machine Fluids Recommendations".

Biodiesel Blend Limits

NOTICE

The use of biofuel blends above the acceptable limit can lead to higher engine downtime.

Biodiesel blend levels up to B20 are acceptable to use in this product.

The use of higher biodiesel blend levels are acceptable in regions where mandated. Consult your Cat dealer.

Note: The energy density of biodiesel blends above B20 are noticeably lower than diesel fuel.

Note: For engines equipped with emission aftertreatment devices, biodiesel blends must be blended with U.S. Ultra Low Sulfur Diesel, or European Sulfur Free Diesel.

Coolant Information

The information provided in this "Coolant Recommendation" section should be used with the "Lubricants Information" provided in the latest revision of Special Publication, SEBU6250, "Caterpillar Machine Fluids Recommendations". This manual may be found on the web on the following website:

safety.cat.com

The following two types of coolants may be used in Cat diesel engines:

Preferred – Cat ELC (Extended Life Coolant)

Acceptable – Cat DEAC (Diesel Engine Antifreeze/ Coolant)

NOTICE

Never use water alone as a coolant. Water alone is corrosive at engine operating temperatures. In addition, water alone does not provide adequate protection against boiling or freezing.

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Capacities (Refill)**SMCS Code:** 1000; 7000

Table 32

Approximate Refill Capacities				
Component or System		Liters	US gal	Recommended Type
Fuel Tank	S/N: MNH1–Up; JH71–Up	22	5.80	Diesel Fuel
	S/N: H8X1–Up; RHM1–Up; MY61–Up	26	6.87	
Cooling System		3.5	0.90	“ASTM D4985”
				Caterpillar Extended Life Coolant (ELC)
Engine Crankcase with Filter		3.5	0.90	Refer to Operation and Maintenance Manual, “Lubricant Viscosities”.
Final Drive		0.6	0.16	
Hydraulic System ⁽¹⁾		18	4.76	
		kg	lbs	
Refrigerant ⁽²⁾		0.8	1.8	R-134a

(1) The amount of hydraulic fluid that is needed to refill the hydraulic system after performing Operation and Maintenance Manual, “Hydraulic System Oil - Change”

(2) Refer to Service Manual, “Air Conditioning and Heating R-134a for All Caterpillar Machines” for additional information

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S·O·S Information**SMCS Code:** 1000; 1348; 3080; 4050; 5050; 7000; 7542-008

S·O·S Services is a highly recommended process for Cat customers to use in order to minimize owning and operating cost. Customers provide oil samples, coolant samples, and other machine information. The dealer uses the data in order to provide the customer with recommendations for management of the equipment. In addition, S·O·S Services can help determine the cause of an existing product problem.

Refer to Special Publication, SEBU6250, “Caterpillar Machine Fluid Recommendations” for detailed information concerning S·O·S Services.

The effectiveness of S·O·S Services is dependent on timely submission of the sample to the laboratory at recommended intervals.

Refer to the Operation and Maintenance Manual, “Maintenance Interval Schedule” for a specific sampling location and a service hour maintenance interval.

Consult your Cat dealer for complete information and assistance in establishing an S·O·S program for your equipment.

Maintenance Support

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Prepare the Machine for Maintenance

SMCS Code: 1000; 7000

Refer to the following procedure before you perform any maintenance to the machine.

WARNING

Personal injury can result from hydraulic oil pressure and hot oil.

Hydraulic oil pressure can remain in the hydraulic system after the engine has been stopped. Serious injury can be caused if this pressure is not released before any service is done on the hydraulic system.

Make sure all of the attachments have been lowered, oil is cool before removing any components or lines. Remove the oil filler cap only when the engine is stopped, and the filler cap is cool enough to touch with your bare hand.

NOTICE

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

Refer to Special Publication, PERJ1017, "Dealer Service Tool Catalog" for tools and supplies suitable to collect and contain fluids on Cat® products.

Dispose of all fluids according to local regulations and mandates.

Note: Permit only one operator on the machine. Keep all other personnel away from the machine or in view of the operator.

1. Park the machine on a dry, level, solid surface that is free of any debris.

Note: The surface must be solid enough to support the weight of the machine and any tooling that is used to support the machine.

2. Engage the parking brake. Place wheel blocks in front and behind the wheels or tracks.
3. Lower all work tools to the ground.
4. Stop the engine.

5. Release the pressure in the hydraulic system. Refer to Operation and Maintenance Manual, "System Pressure Release" for more information.

Perform a visual inspection first. If the visual checks are completed but the problem has not been identified, perform operational checks. If the problem has not been identified, perform instrument tests. This procedure will help to identify system problems.

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Service Interval Chart

SMCS Code: 7000

The service interval chart is on the roof.

Refer to this Operation and Maintenance Manual, "Maintenance Interval Schedule" for the correct maintenance intervals and procedures that are specific to your machine.

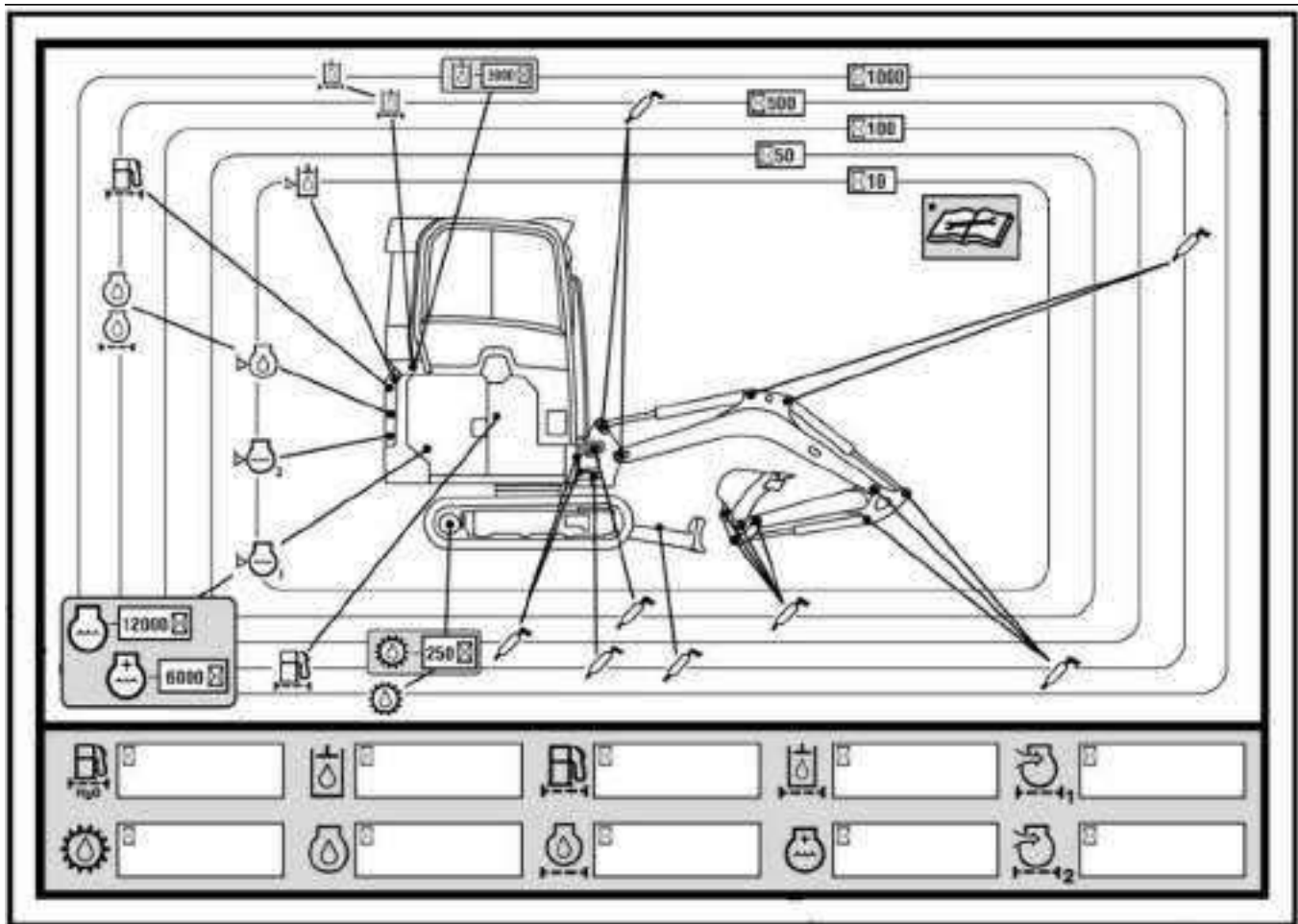















Illustration 414

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-  Service hour interval – Hourly interval in which a maintenance procedure should be performed.
-  Coolant level – Check the coolant level.
-  Cooling system coolant – Add ELC (Extended Left Coolant).
-  Cooling system coolant – Change the ELC (Extended Life Coolant).
-  Engine oil level – Check the engine oil level.
-  Engine oil – Change the engine oil.
-  Engine oil filter – Change the engine oil filter.

-  Final Drive Oil – Change the final drive oil.
-  Fuel system filter – Replace the fuel system filters.
-  Grease zerk – Lubricate the designated locations.
-  Hydraulic oil level – Check the hydraulic oil level.
-  Hydraulic oil – Change the hydraulic oil.
-  Hydraulic oil filter – Change the hydraulic oil filter.

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System Pressure Release

SMCS Code: 1250-553-PX; 1300-553-PX; 1350-553-PX; 5050-553-PX; 6700-553-PX; 7540-553-PX

WARNING

Personal injury or death can result from sudden machine movement.

Sudden movement of the machine can cause injury to persons on or near the machine.

To prevent injury or death, make sure that the area around the machine is clear of personnel and obstructions before operating the machine.

Coolant System

WARNING

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

To relieve the pressure from the coolant system, turn off the machine. Allow the cooling system pressure cap to cool. Remove the cooling system pressure cap slowly to relieve pressure.

Hydraulic System

WARNING

Personal injury can result from hydraulic oil pressure and hot oil.

Hydraulic oil pressure can remain in the hydraulic system after the engine has been stopped. Serious injury can be caused if this pressure is not released before any service is done on the hydraulic system.

Make sure all of the attachments have been lowered, oil is cool before removing any components or lines. Remove the oil filler cap only when the engine is stopped, and the filler cap is cool enough to touch with your bare hand.

1. Position the machine on level ground.
2. Lower the work tools to the ground.
3. Shut off the engine.
4. Turn the key to the ON position before moving the joysticks.

Note: Ensure that the hydraulic activation control lever in the UNLOCKED position.

5. Move the joysticks through the full range of travel. This action will relieve any pressure that may be present in the hydraulic system.
6. Slowly loosen the filler cap to release the pressure in the hydraulic tank.
7. Tighten the filler cap.
8. The pressure in the hydraulic system has been released. Lines and components can be removed.

Release Hydraulic System Pressure in the Auxiliary Circuits

1. Start the engine to charge pilot accumulator.
2. Shut off the engine.

Note: Perform Step 3 through Step 5 immediately after the engine is shut off to insure adequate pilot system pressure is available to release the pressure in the hydraulic circuits.

3. Turn the engine start switch to the ON position without starting the engine.
4. Place the hydraulic activation control lever in the UNLOCKED position.
5. Actuate the auxiliary circuit in both directions several times.
6. Place the hydraulic activation control lever in the LOCKED position.
7. Start the engine to recharge pilot accumulator.

Note: Do not activate any controls when recharging pilot accumulator.

8. Shut off the engine.
9. Repeat Step 3 through Step 6 for each auxiliary circuit.
10. After releasing the hydraulic pressure in each of the desired hydraulic circuits, place the hydraulic activation control lever in the LOCKED position.
11. Turn the engine start switch to the OFF position.
12. Remove the hydraulic oil tank filler cap.
13. The pressure in the multiple hydraulic circuits that require service is now released and lines and components can be disconnected or removed from those hydraulic circuits.

Note: Pressure can build up in the auxiliary lines if the attachment is not coupled/uncoupled immediately after the pressure has been released.

Note: Refer to the Operation and Maintenance Manual, Equipment Lowering with Engine Stopped for information on lowering the work tool with the engine off.

5. Use standard welding procedures to weld the materials together.

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Welding on Machines and Engines with Electronic Controls

SMCS Code: 1000; 7000

Do not weld on any protective structure. If it is necessary to repair a protective structure, contact your Cat dealer.

Proper welding procedures are necessary to avoid damage to the electronic controls and to the bearings. When possible, remove the component that must be welded from the machine or the engine and then weld the component. If you must weld near an electronic control on the machine or the engine, temporarily remove the electronic control to prevent heat related damage. The following steps should be followed to weld on a machine or an engine with electronic controls.

1. Turn off the engine. Place the engine start switch in the OFF position.
2. If equipped, turn the battery disconnect switch to the OFF position. If there is no battery disconnect switch, remove the negative battery cable at the battery.

NOTICE

Do NOT use electrical components (ECM or sensors) or electronic component grounding points for grounding the welder.

3. Clamp the ground cable from the welder to the component that will be welded. Place the clamp as close as possible to the weld. Make sure that the electrical path from the ground cable to the component does not go through any bearing. Use this procedure to reduce the possibility of damage to the following components:
 - Bearings of the drive train
 - Hydraulic components
 - Electrical components
 - Other components of the machine
4. Protect any wiring harnesses and components from the debris and the spatter which is created from welding.

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Maintenance Interval Schedule

SMCS Code: 7000

Ensure that all safety information, warnings, and instructions are read and understood before any operation or any maintenance procedures are performed.

The user is responsible for the performance of maintenance. All adjustments, the use of proper lubricants, fluids, filters, and the replacement of components due to normal wear and aging are included. Failure to adhere to proper maintenance intervals and procedures may result in diminished performance of the product and/or accelerated wear of components.

Use mileage, fuel consumption, service hours, or calendar time, WHICH EVER OCCURS FIRST, to determine the maintenance intervals. Products that operate in severe operating conditions may require more frequent maintenance. Refer to the maintenance procedure for any other exceptions that may change the maintenance intervals.

Note: The aftertreatment system can be expected to function properly for the useful life of the engine (emissions durability period), as defined by regulation. All prescribed maintenance requirements must be followed.

Note: Before each consecutive interval is performed, all maintenance from the previous interval must be performed.

The following guidelines should be followed if the service hours are not met:

Items listed between 10 and 100 service hours should be performed at least every 3 months.

Items listed between 250 and 500 service hours should be performed at least every 6 months.

Items listed between 1000 service hours and 2500 service hours should be performed at least every year.

When Required

- " Air Cleaner Dust Valve - Clean/Inspect" 349
- " Air Conditioner/Cab Heater Filter (Recirculation) - Inspect/Replace" 349
- " Battery - Recycle" 351
- " Battery or Battery Cable - Inspect/Replace" 352
- " Bucket Tips - Inspect/Replace" 358
- " Condenser (Refrigerant) - Clean" 358

- " Engine Air Filter Primary Element - Clean/Replace" 363
- " Engine Air Filter Secondary Element - Replace" 366
- " Film (Product Identification) - Clean" 372
- " Fuel System - Prime" 374
- " Fuel Tank Cap - Clean" 376
- " Fuel Tank Water and Sediment - Drain" 377
- " Fuses - Replace" 377
- " Oil Filter - Inspect" 386
- " Quick Coupler - Clean/Inspect" 387
- " Radiator Core - Clean" 389
- " Track Adjustment - Adjust" 392
- " Window Washer Reservoir - Fill" 395
- " Window Wiper - Inspect/Replace" 395
- " Windows - Clean" 395

Every 10 Service Hours or Daily for First 100 Hours

- " Blade Linkage - Lubricate" 354
- " Boom and Stick Linkage - Lubricate" 354
- " Bucket Linkage - Lubricate" 357
- " Swing Frame Pin - Lubricate" 390
- " Swing Gear and Bearing - Lubricate" 391

Every 10 Service Hours or Daily

- " Cooling System Coolant Level - Check" 361
- " Engine Air Filter Service Indicator - Inspect" 366
- " Engine Oil Level - Check" 367
- " Fuel System Water Separator - Drain" 376
- " Horn - Test" 379
- " Hydraulic System Oil Level - Check" 383
- " Light - Test" 385
- " Quick Coupler - Lubricate" 389
- " Seat Belt - Inspect" 389
- " Travel Alarm - Test" 394

“ Undercarriage - Check” 395

Every 10 Service Hours or Daily for Machines Used in Severe Applications

“ Blade Linkage - Lubricate” 354

Every 50 Service Hours

“ Bucket Linkage - Lubricate” 357

“ Quick Coupler - Clean” 387

“ Swing Frame Pin - Lubricate” 390

“ Track Adjustment - Inspect” 393

Every 100 Service Hours

“ Swing Gear and Bearing - Lubricate” 391

Every 250 Service Hours

“ Belt - Inspect/Adjust/Replace” 352

“ Engine Oil Sample - Obtain” 368

“ Quick Coupler - Check” 386

“ Quick Coupler - Lubricate” 389

Initial 500 Service Hours

“ Final Drive Oil - Change” 372

“ Hydraulic System Oil Filter (Return) - Replace” 382

Every 500 Service Hours

“ Blade Linkage - Lubricate” 354

“ Boom and Stick Linkage - Lubricate” 354

“ Boom, Stick, and Frame - Inspect” 355

“ Cooling System Coolant Sample (Level 1) - Obtain” 362

“ Engine Air Filter Primary Element - Clean/Replace” 363

“ Engine Oil and Filter - Change” 368

“ Final Drive Oil Sample - Obtain” 373

“ Fuel Lift Pump Strainer - Replace” 374

“ Fuel System Primary Filter (Water Separator) Element - Replace” 375

“ Hydraulic System Oil Sample - Obtain” 384

Every 750 Service Hours

“ Lifting Hook - Inspect” 384

Every 1000 Service Hours

“ Battery Hold-Down - Tighten” 351

“ Engine Valve Lash - Check/Adjust” 371

“ Final Drive Oil - Change” 372

“ Hydraulic System Oil Filter (Return) - Replace” 382

Every 3000 Service Hours

“ Hydraulic System Oil - Change” 379

Every 3 Years

“ Seat Belt - Replace” 390

Every 6000 Service Hours

“ Cooling System Coolant Extender (ELC) - Add” 361

Every 12 000 Service Hours

“ Cooling System Coolant (ELC) - Change” 359

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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.

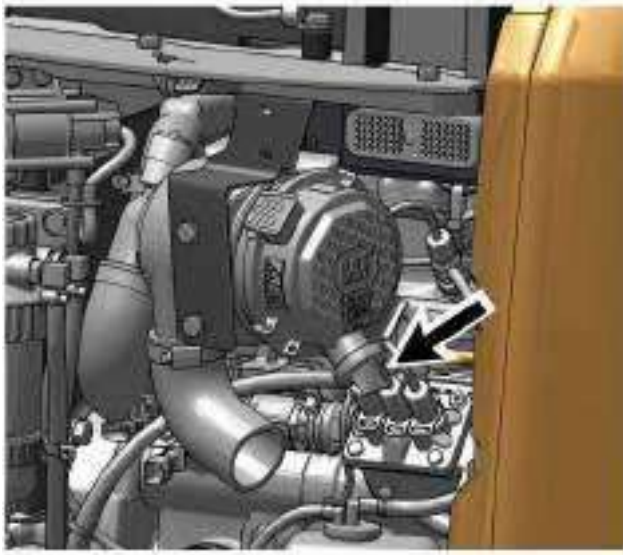


Illustration 415

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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

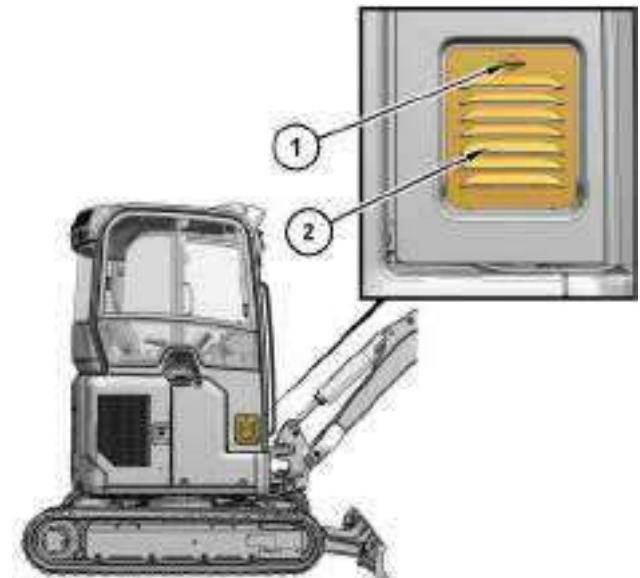


Illustration 416

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

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

Maintenance Section

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

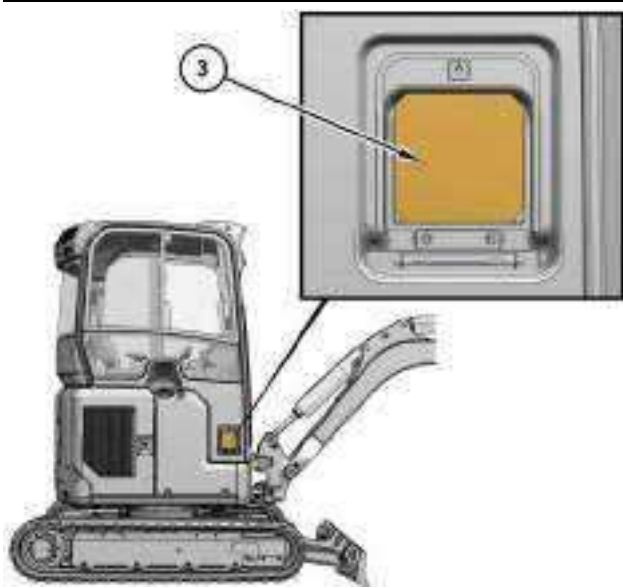


Illustration 417

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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

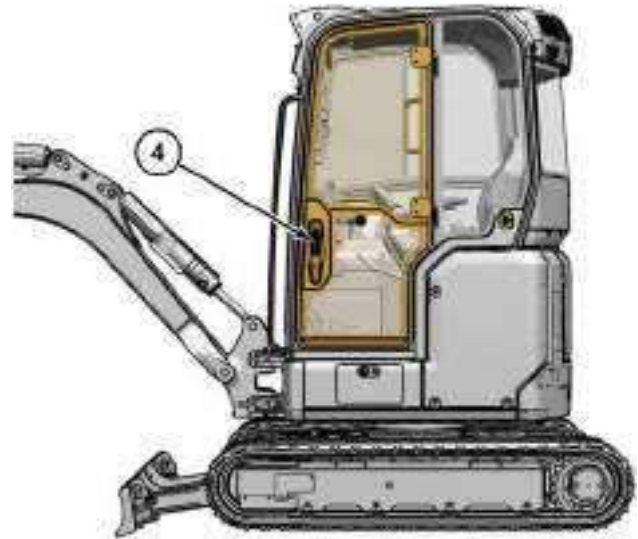


Illustration 418

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(4) Cab door

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

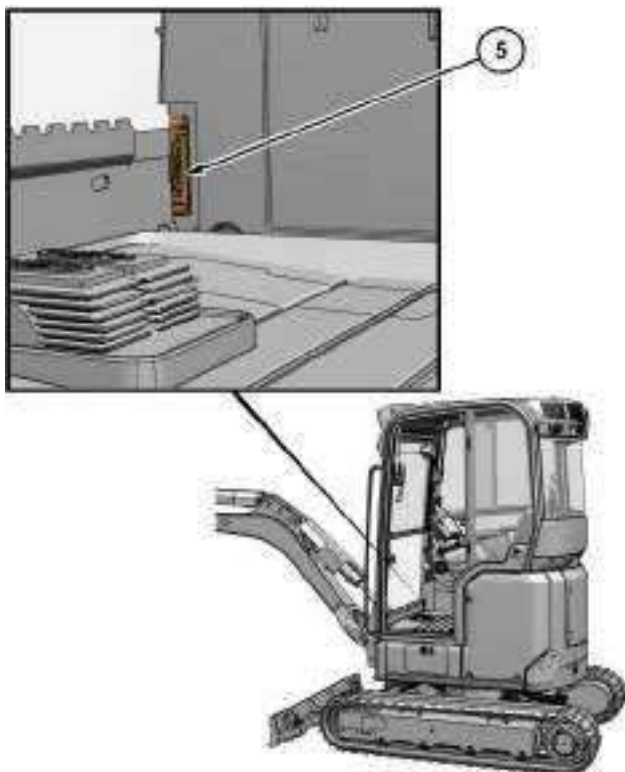


Illustration 419

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Some components removed for better clarity
Location of air conditioner filter element
(5) Air conditioner filter element

2. Air conditioner filter element (5) is on the lower right side of the cab and to the front of Heating Ventilation and Air Conditioning (HVAC) unit.
3. Remove air conditioner filter element (5) by sliding air conditioner filter element (5) outward.
Refer to Illustration 420 for the direction in which air conditioner filter element (5) to be removed.
4. Tap air conditioner filter element (5) to remove the dirt. Do not use compressed air to clean air conditioner filter element (5).
5. After cleaning air conditioner filter element (5), inspect air conditioner filter element (5). If air conditioner filter element (5) is damaged or badly contaminated, use new air conditioner filter element (5). Make sure that air conditioner filter element (5) is dry.
6. Install air conditioner filter element (5).
7. Close cab door (4). Refer to "Access Door and Cover Locations" for more information.

i08316356

Battery - Recycle

SMCS Code: 1401-561

Always recycle a battery. Never discard a battery.

Always return used batteries to one of the following locations:

- A battery supplier
- An authorized battery collection facility
- Recycling facility

i00934872

Battery Hold-Down - Tighten

SMCS Code: 7257

Tighten the hold-downs for the battery in order to prevent the batteries from moving during machine operation.

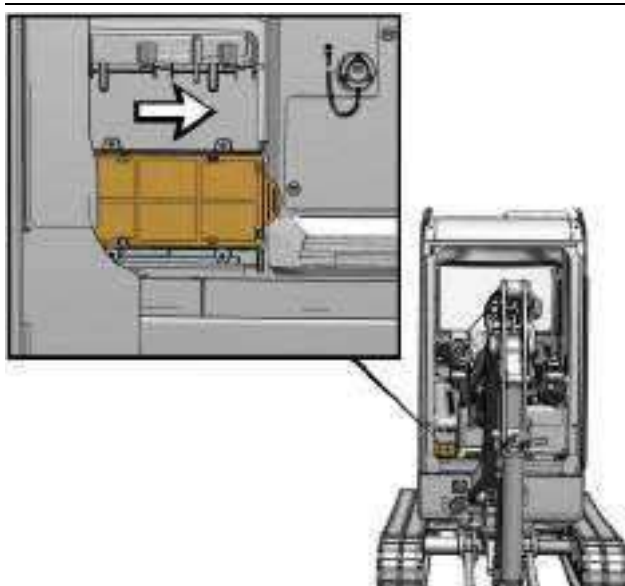


Illustration 420

g06675072

Some components removed for better clarity
Direction to remove air conditioner filter element

i07279888

Battery or Battery Cable - Inspect/Replace

SMCS Code: 1401-040; 1401-510; 1401-561; 1401; 1402-510; 1402-040

WARNING

Personal injury may occur from failure to properly service the batteries.

Batteries give off flammable fumes that can explode. Electrolyte is an acid and can cause personal injury if it contacts the skin or eyes.

Prevent sparks near the batteries. Sparks could cause vapors to explode. Do not allow jumper cable ends to contact each other or the engine. Improper jumper cable connections can cause an explosion.

Always wear protective glasses when working with batteries.

1. Turn the engine start switch to the OFF position. Remove the engine start switch key from the switch. Turn all switches to the OFF position.
2. To access the battery, tilt the canopy up. Refer to Operation and Maintenance Manual, "Access Door and Cover Locations" for more information on how to tilt the canopy up.
3. Disconnect the negative battery cable at the battery.
4. Disconnect the positive battery cable at the battery.
5. For necessary repairs, consult your Cat dealer. Replace the cable or the battery, as needed.
6. Connect the positive battery cable at the battery.
7. Connect the negative battery cable at the battery.
8. Install the engine start switch key.

Battery Recycle

Always recycle a battery. Never discard a battery.

Always return used batteries to one of the following locations:

- A battery supplier
- An authorized battery collection facility

- Recycling facility

i08130170

Belt - Inspect/Adjust/Replace

SMCS Code: 1357-025; 1357-040; 1357-510; 1397-025; 1397-040; 1397-510

NOTICE

The V-belt must be tensioned correctly. Failure to tension the belt properly could cause damage to the belt and/or to the air conditioner compressor.

For maximum engine performance and maximum utilization of your engine, inspect the belts for wear and for cracking. Check the belt tension. Adjust the belt tension to minimize belt slippage. Belt slippage will decrease the belt life. Belt slippage will also cause poor performance of the alternator and of any driven equipment.

If new belts are installed, recheck the belt adjustment after 30 minutes of operation.

Water Pump Belt, Fan Drive Belt, and Alternator Belt

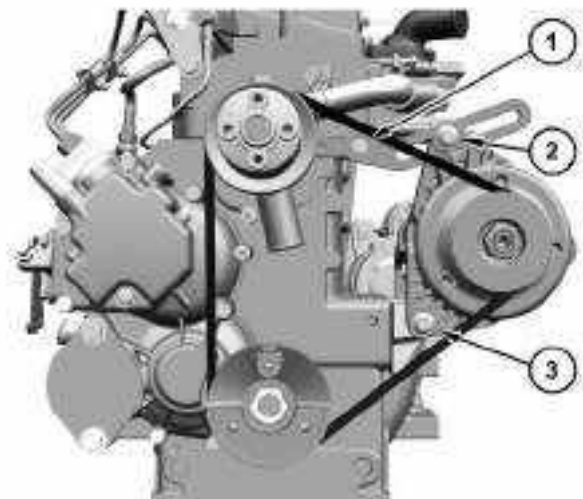


Illustration 421

g06558770

- (1) Bracket bolt
- (2) Alternator mounting bolt
- (3) Alternator mounting bolt

1. Open the engine access door.
2. Remove the fan guard.
3. Check the belt tension.

Table 33

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

- (1) Initial Belt Tension refers to a new belt.
- (2) Used Belt Tension refers to a belt that has been in operation for 30 minutes or more at the rated speed.

Note: Use a 144 - 0235 Belt Tension Gauge to measure belt tension. Refer to Table 33 for proper belt tension adjustment.

4. If the tension is not correct, loosen bolt (1), and alternator mounting bolts (2) and (3). Adjust alternator position.
5. When the adjustment is correct, tighten bolt (1), and alternator mounting bolts (2) and (3) securely.
6. Check the tension of the belt again.
7. Close the engine access door.

Air Conditioner Belt (If Equipped)

NOTICE

The V-belt must be tensioned correctly. Failure to tension the belt properly could cause damage to the belt and/or to the air conditioner compressor.

1. Open the engine access door.
2. Remove the bottom access guard.
3. Remove the fan guard.

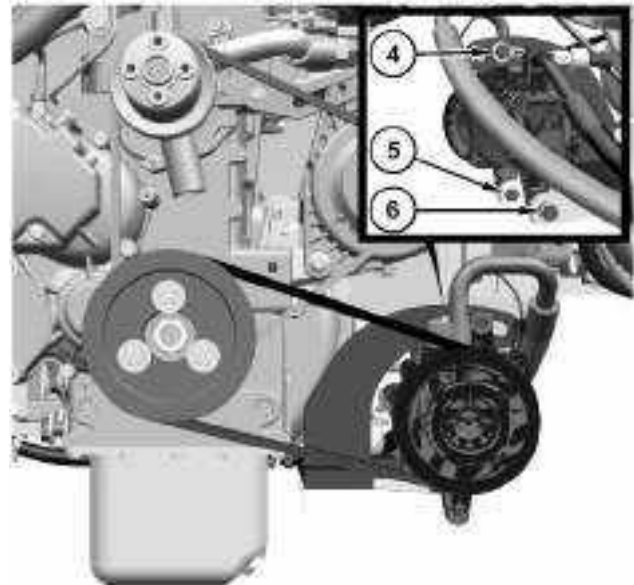


Illustration 422

g06558782

- (4) Compressor mounting bolt
- (5) Compressor mounting bolt
- (6) Compressor mounting bolt

4. Check the belt tension.

Table 34

Belt Tension Chart	
Gauge Reading	
Initial Belt Tension ⁽¹⁾	Used Belt Tension ⁽²⁾
423 to 467 N (95 to 105 lb)	378 to 422 N (85 to 95 lb)

- (1) Initial Belt Tension refers to a new belt.
- (2) Used Belt Tension refers to a belt that has been in operation for 30 minutes or more at the rated speed.

Note: Use a 144 - 0235 Belt Tension Gauge to measure belt tension. Refer to Table 34 for proper belt tension adjustment.

5. If the tension is not correct, loosen bolts (4), (5), and (6). Adjust compressor position.
6. When the adjustment is correct, tighten bolts (4), (5), and (6).
7. Check the tension again.

8. Close the engine access door.

i07291617

Blade Linkage - Lubricate

SMCS Code: 6060-086

Dozer

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

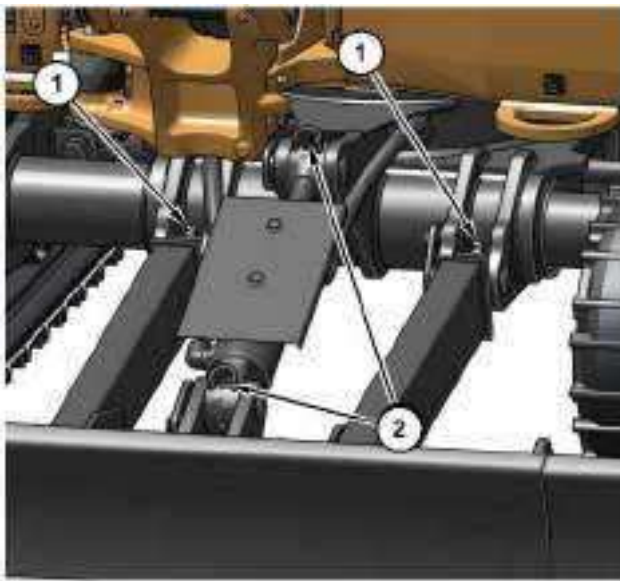


Illustration 423

g06276254

Wipe all fittings before lubricating.

1. Apply lubricant to the fittings for the arms (1) that support the blade.
2. Apply lubricant to the fittings of the blade cylinder (2).

i07284739

Boom and Stick Linkage - Lubricate

SMCS Code: 6501-086; 6502-086

Note: Caterpillar recommends the use of 5% molybdenum grease for lubricating the boom and stick linkage. Refer to Special Publication, SEBU6250, "Caterpillar Machine Fluids Recommendations" for more information on grease.

1. Position the machine into the service position.
2. Wipe all fittings before you apply lubricant.



Illustration 424

g06273896

3. Apply lubricant to grease fittings (1) at each cylinder end.



Illustration 425

g06273754

4. Apply lubricant to grease fittings (2) at the boom cylinder pin joint.

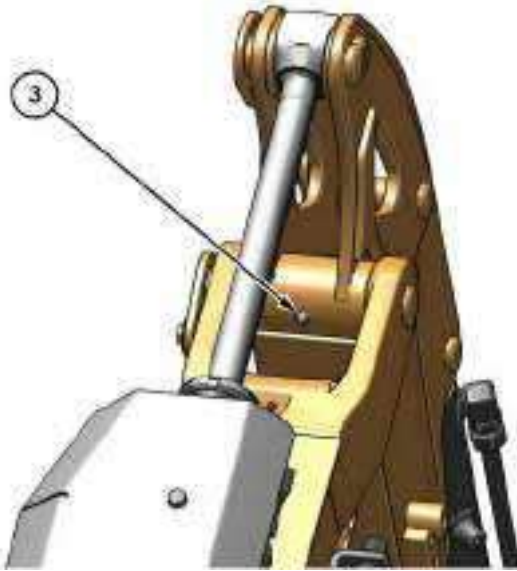


Illustration 426

g06273898

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

i07291711

Boom, Stick, and Frame - Inspect

SMCS Code: 6501; 6502; 6506

All earthmoving equipment is prone to a high degree of wear. Regular inspections for structural damage are necessary.

The interval between these inspections depends on the factors that follow.

- The age of the machine
- The severity of the application
- The loads that have been carried on the machine
- The amount of routine servicing that has been carried out

If the machine has been involved in any accident, the machine must be inspected thoroughly. Inspect the machine regardless of the date of the last inspection.

The machine must be clean before the machine is inspected.

Proper repair of frames and structures requires specific knowledge of the following subjects.

- Materials that have been used to manufacture the frame members
- Frame member construction

- Repair techniques that are recommended by the manufacturer.

Consult your Cat dealer if repairs are necessary. Your Cat dealer is qualified to carry out repairs on your behalf.

All repairs should be carried out by a Cat dealer. If you carry out your own repairs, contact your Cat dealer for advice about proper repair techniques.

Particular attention should be given to all welded structures. Inspect the following items thoroughly for cracks and for defects:

- Boom
- Stick
- Blade
- Lifting points
- Upper frame
- Lower frame

NOTICE

The areas highlighted are of particular importance but other areas must not be neglected. The entire structure must be carefully examined.

Boom

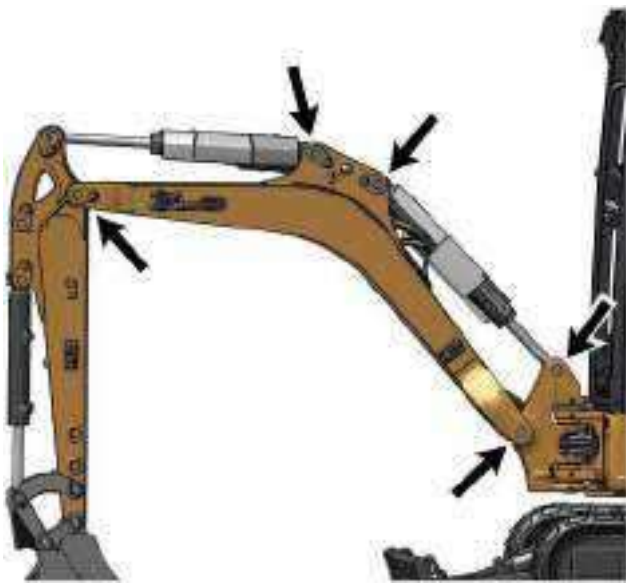


Illustration 427

g06276285

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

Blade

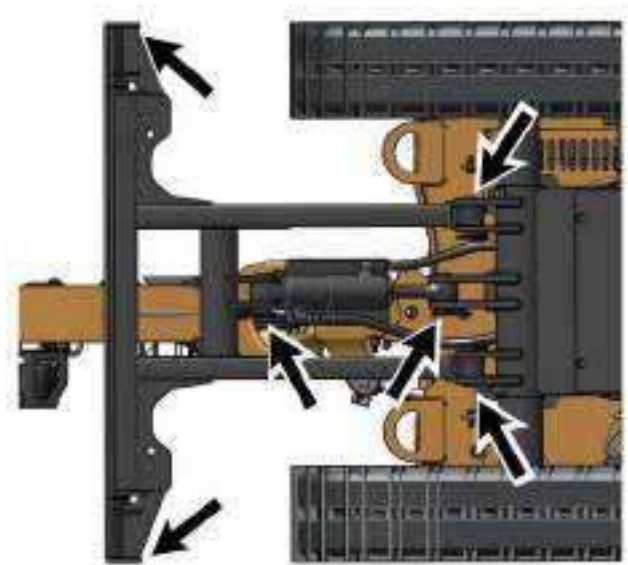


Illustration 429

g06276301

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

Stick

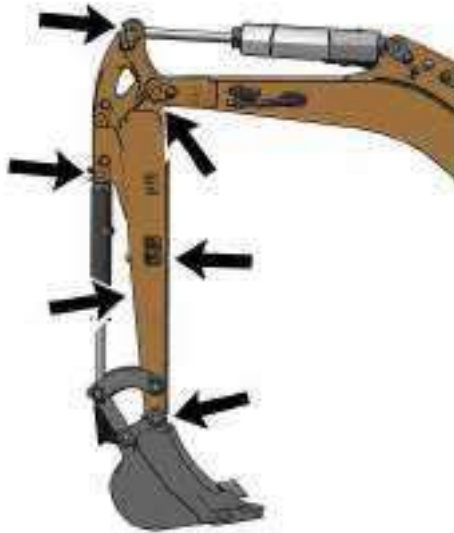


Illustration 428

g06276291

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

Lifting Points



Illustration 430

g06276305

Check the approved lifting points carefully. Check the welds. Check that the plates are not excessively bent. Check that the lifting holes are not deformed.

Upper Frame



Illustration 431

g06276321

Check for damaged panels. Specifically look for any damage to the canopy that might invalidate the certification. The canopy is a safety device that must be maintained in good condition. Check for loose hardware or missing hardware.

Note: Replace any hardware that is loose, damaged, or missing with original replacement parts only.

Lower Frame



Illustration 432

g06276531

Check the weld joints in the lower structure. Check for loose hardware or missing hardware. Check the ring of bolts that secure the swing gear.

i07293069

Bucket Linkage - Lubricate

SMCS Code: 6513-086

Note: Caterpillar recommends the use of 5% molybdenum grease for lubricating the bucket linkage. Refer to Special Publication, SEBU6250, "Caterpillar Machine Fluids Recommendations" for more information on molybdenum grease.

Apply lubricant through all fittings after operation under water.

Wipe all fittings before you apply lubricant.

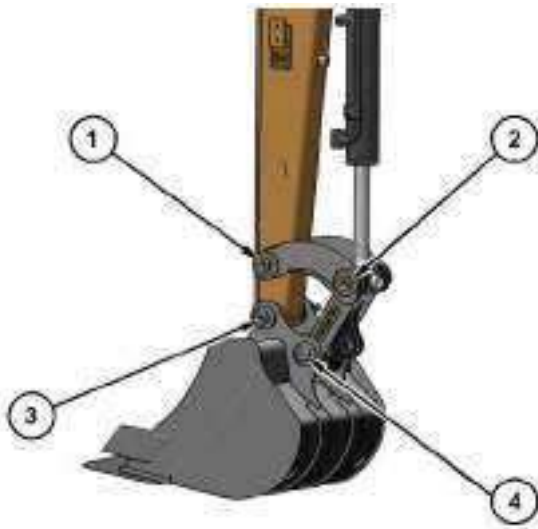


Illustration 433

g06276574

Note: Completely fill all cavities of the bucket control linkage with grease when you initially install a bucket.

1. Apply lubricant through fittings for the linkages (1) and (2).
2. Apply lubricant through fittings for the bucket (3) and (4).

Note: Service the above fittings after you operate the bucket under water.

i07294704

Bucket Tips - Inspect/Replace

SMCS Code: 6805-510; 6805-040

WARNING

Personal injury or death can result from bucket falling.

Block the bucket before changing bucket tips or side cutters.

Bucket Tips

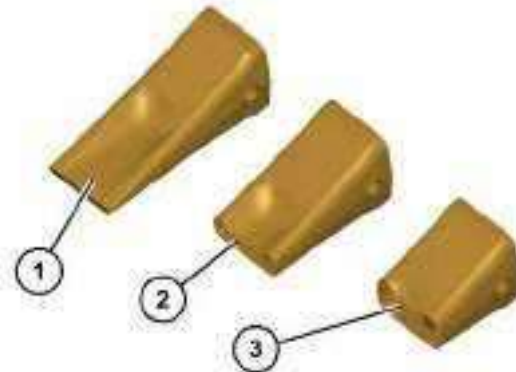


Illustration 434

g06214790

- (1) Usable
(2) Replace this bucket tip.
(3) Overworn

Check the bucket tips for wear. Consult your Cat dealer if the bucket tips need to be replaced. Your Cat dealer is qualified to carry out repairs on your behalf.

i07295040

Condenser (Refrigerant) - Clean

SMCS Code: 1805-070

NOTICE

If excessively dirty, clean condenser with a brush. To prevent damage or bending of the fins, do not use a stiff brush.

Repair the fins if found defective.

1. Remove the right side console inside the cab.



Illustration 435

g06276629

2. Inspect the condenser for debris. Clean the condenser, if necessary.
3. You can use compressed air, high-pressure water, or steam to remove dust and other debris from the condenser. However, the use of compressed air is preferred.
4. Reinstall the right side console.

i07279114

Cooling System Coolant (ELC) - Change

SMCS Code: 1350-044

NOTICE

Do not change the coolant until you read and understand the cooling system information in Special Publication, SEBU6250, "Caterpillar Machine Fluids Recommendations".

Failure to do so could result in damage to the cooling system components.

NOTICE

Mixing ELC with other products will reduce the effectiveness of the coolant.

This could result in damage to cooling system components.

If Caterpillar products are not available and commercial products must be used, make sure they have passed the Caterpillar EC-1 specification for pre-mixed or concentrate coolants and Caterpillar Extender.

Note: If cooling system samples Level 1 and Level 2 are not performed, and ELC not added, The coolant should be changed every 2 years.

Note: This machine was filled at the factory with Caterpillar Extended Life Coolant.

If the coolant in the machine is changed to Extended Life Coolant from another type of coolant, see Special Publication, SEBU6250, "Caterpillar Machine Fluids Recommendations".

1. Open the right side access door.

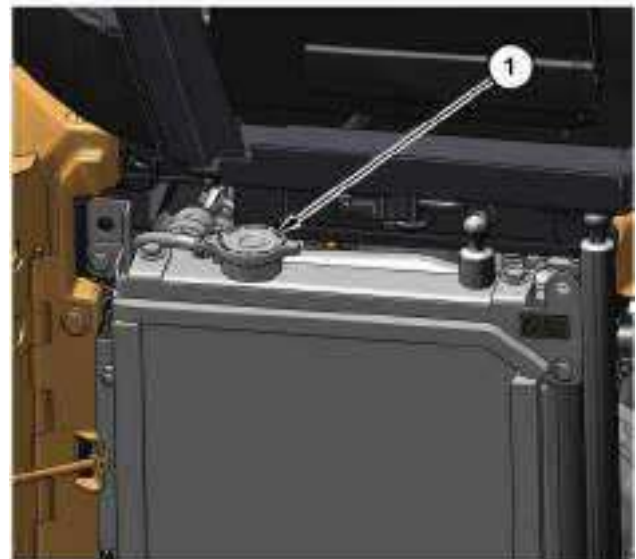


Illustration 436

g06268850

2. Loosen radiator cap (1) slowly to release pressure. Remove the radiator cap.

Note: Refer to Operation and Maintenance Manual, "General Hazard Information" for information on Containing Fluid Spillage.

Maintenance Section
Cooling System Coolant (ELC) - Change



Illustration 437

g06268860

3. Remove guard (2) under the fuel tank to access the coolant drain hose.

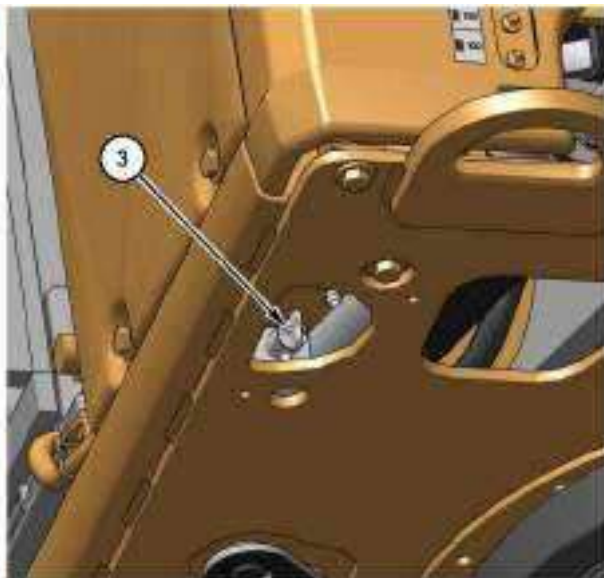


Illustration 438

g06268866

4. Remove coolant drain hose cap (3) and allow the coolant to drain into a suitable container.

Note: Dispose of drained fluids according to local regulations.

5. Flush the cooling system with water until the draining water is transparent.
6. Install coolant drain hose cap (3).

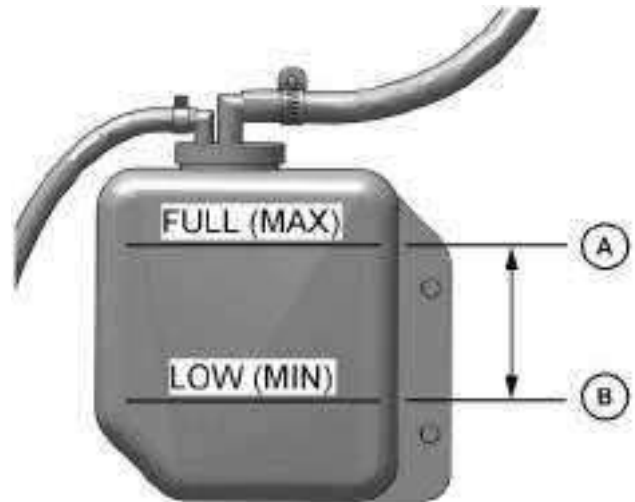


Illustration 439

g06268911

7. Add the Extended Life Coolant to the proper level as shown on the coolant reservoir. Refer to the following topics:

- Special Publication, SEBU6250, "Caterpillar Machine Fluids Recommendations"
- Operation and Maintenance Manual, "Capacities (Refill)"

8. Start the engine. Leave the radiator cap off. Run the engine to expel any air from the system.
9. Maintain the coolant level within 13 mm (0.5 inch) of the bottom of the filler pipe.
10. Install the cooling system pressure cap after the thermostat and the coolant level stabilizes.
11. Stop the engine.
12. If more coolant is necessary, add the appropriate coolant solution.
13. Install guard (2).
14. Install radiator cap (1).
15. Close the right side access door.

Note: Dispose of drained fluids according to local regulations.

i03967772

Cooling System Coolant Extender (ELC) - Add

SMCS Code: 1352; 1353; 1395

WARNING

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

When a Caterpillar Extended Life Coolant is used, an extender must be added to the cooling system. See the Operation and Maintenance Manual, "Maintenance Interval Schedule" for the proper service interval. The amount of extender is determined by the cooling system capacity.

Table 35

RECOMMENDED AMOUNT OF EXTENDER BY COOLING SYSTEM CAPACITY	
Cooling System Capacity	Recommended Amount of Extender
6 to 11 L (1.6 to 3 US gal)	.2 L (0.21 qt)

For additional information on the addition of extender, see Operation and Maintenance Manual, SEBU6250, "Caterpillar Coolant Recommendations" or consult your Caterpillar dealer.

i07305734

Cooling System Coolant Level - Check

SMCS Code: 1350-040; 1350-535-FLV; 1395-535-FLV

WARNING

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

1. Open the rear access door.

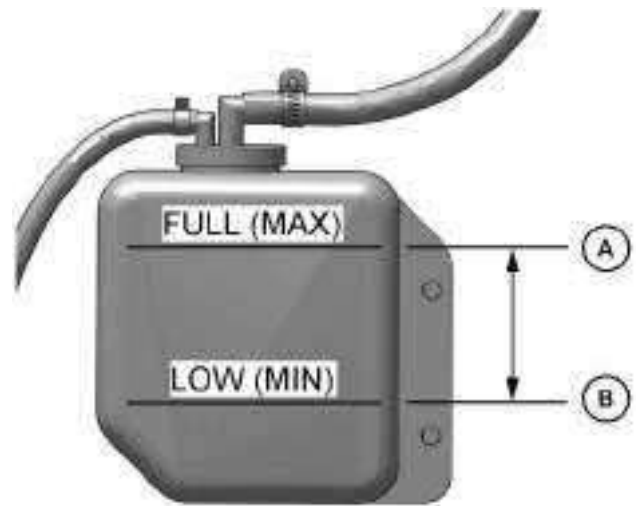


Illustration 440

g06268911

2. Maintain the coolant level between "FULL" mark (A) on the coolant reservoir and "LOW" mark (B) on the coolant reservoir.

Note: Refer to Operation and Maintenance Manual, "General Hazard Information" for information on containing fluid spillage.

3. If additional coolant is necessary, remove the filler cap for the coolant reservoir and add the appropriate coolant mixture. Install the filler cap.

i07296023

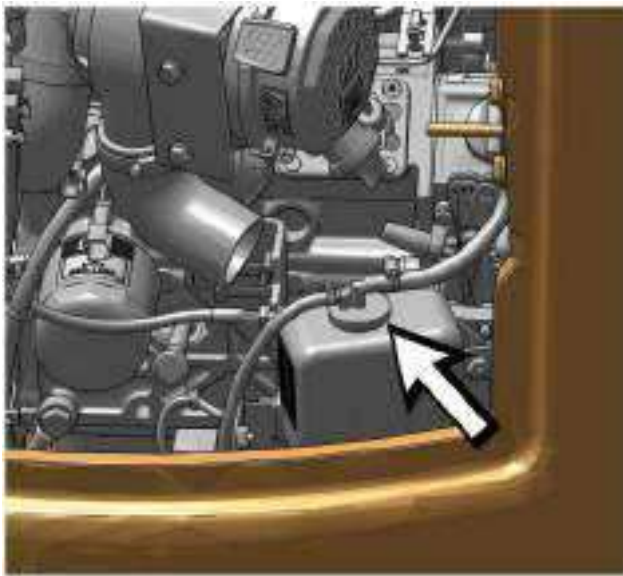


Illustration 441

g06268892

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

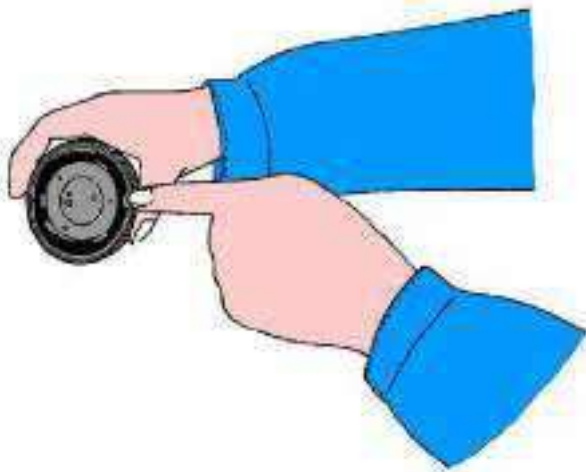


Illustration 442

g06277320

5. Inspect the condition of the cap gasket. If necessary, replace the cap.
6. Install the cooling system pressure cap.
7. Close the rear access door.

Cooling System Coolant Sample (Level 1) - Obtain

SMCS Code: 1395-554; 1395-008; 7542

Note: It is not necessary to obtain a Coolant Sample (Level 1) if the cooling system is filled with Cat ELC (Extended Life Coolant). Cooling systems that are filled with Cat ELC should have a Coolant Sample (Level 2) that is obtained at the recommended interval that is stated in the Maintenance Interval Schedule.

Note: Obtain a Coolant Sample (Level 1) if the cooling system is filled with any other coolant instead of Cat ELC. This includes the following types of coolants.

- Commercial long life coolants that meet the Caterpillar Engine Coolant Specification -1 (Caterpillar EC-1)
- Cat Diesel Engine Antifreeze/Coolant (DEAC)
- Commercial heavy-duty antifreeze/coolant solution

NOTICE

Always use a designated pump for oil sampling, and use a separate designated pump for coolant sampling. Using the same pump for both types of samples may contaminate the samples that are being drawn. This contamination may cause a false analysis and an incorrect interpretation that could lead to concerns by both dealers and customers.

Note: Level 1 results may indicate a need for Level 2 Analysis.

NOTICE

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

Refer to Special Publication, PERJ1017, "Dealer Service Tool Catalog" for tools and supplies suitable to collect and contain fluids on Cat® products.

Dispose of all fluids according to local regulations and mandates.

Obtain the sample of the coolant as close as possible to the recommended sampling interval. The recommended sampling interval for Level 1 Coolant Analysis is every 250 service hours. To receive the full effect of S·O·S analysis, you must establish a consistent trend of data. To establish a pertinent history of data, perform consistent samplings that are evenly spaced. Supplies for collecting samples can be obtained from your Caterpillar dealer.

Use the following guidelines for proper sampling of the coolant:

- Complete the information on the label for the sampling bottle before you begin to take the samples.
- Keep the unused sampling bottles stored in plastic bags.
- Keep the lids on empty sampling bottles until you are ready to collect the sample.
- Place the sample in the mailing tube immediately after obtaining the sample to avoid contamination.
- Never collect samples from expansion bottles.
- Never collect samples from the drain for a system.

1. Operate the machine to circulate the coolant. Collect the sample after a normal workday. Collect the samples from one to two hours after the engine has been shut off.
2. Start the engine momentarily to circulate the coolant again.
3. Shut off the engine.
4. Carefully remove the radiator cap.
5. Use a vacuum pump and draw the sample. Do not allow dirt or other contaminants to enter the sampling bottle. Fill the sampling bottle three-fourths from the top. Do not fill the bottle completely.
6. Place the sampling bottle with the completed label into the mailing tube.
7. Install the radiator cap.

i07296888

Engine Air Filter Primary Element - Clean/Replace

SMCS Code: 1054-070; 1054-510

Cleaning Primary Air Filter Elements

NOTICE

Caterpillar recommends certified air filter cleaning services available at participating Caterpillar dealers. The Caterpillar cleaning process uses proven procedures to assure consistent quality and sufficient filter life.

Observe the following guidelines if you attempt to clean the filter element:

Do not tap or strike the filter element in order to remove dust.

Do not wash the filter element.

Use low pressure compressed air in order to remove the dust from the filter element. Air pressure must not exceed 207 kPa (30 psi). Direct the air flow up the pleats and down the pleats from the inside of the filter element. Take extreme care in order to avoid damage to the pleats.

Do not use air filters with damaged pleats, gaskets, or seals. Dirt entering the engine will cause damage to engine components.

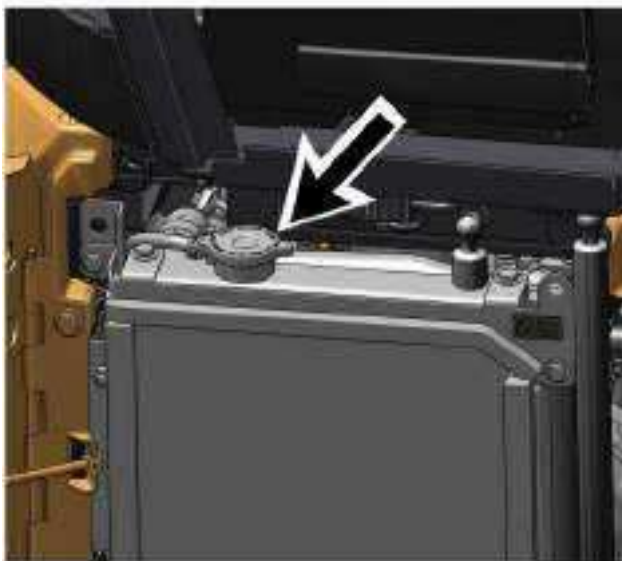


Illustration 443

g06276640

WARNING

Pressurized System: Hot coolant can cause serious burns. To open the cooling system filler cap, stop the engine and wait until the cooling system components are cool. Loosen the cooling system pressure cap slowly in order to relieve the pressure.

The primary air filter element can be used up to six times if the element is properly cleaned and if the element is properly inspected. When the primary air filter element is cleaned, check for rips or tears in the filter material. The primary air filter element should be replaced at least one time per year. This replacement should be performed regardless of the number of cleanings.

NOTICE

Do not clean the air filter elements by bumping or tapping. This could damage the seals. Do not use elements with damaged pleats, gaskets, or seals. Damaged elements will allow dirt to pass through. Engine damage could result.

Visually inspect the primary air filter elements before cleaning. Inspect the air filter elements for damage to the seal, the gaskets, and the outer cover. Discard any damaged air filter elements.

There are two common methods that are used to clean primary air filter elements:

- Pressurized air
- Vacuum cleaning

Pressurized Air

Pressurized air can be used to clean primary air filter elements that have not been cleaned more than two times. Pressurized air will not remove deposits of carbon and oil. Use filtered, dry air with a maximum pressure of 207 kPa (30 psi).



Illustration 444

g06276726

Note: When the primary air filter elements are cleaned, always begin with the clean side (inside) to force dirt particles toward the dirty side (outside).

Aim the hose so that the air flows inside the element along the length of the filter to help prevent damage to the paper pleats. Do not aim the stream of air directly at the primary air filter element. Dirt could be forced further into the pleats.

Vacuum Cleaning

Vacuum cleaning is another method for cleaning primary air filter elements which require daily cleaning because of a dry, dusty environment. Cleaning with pressurized air is recommended prior to vacuum cleaning. Vacuum cleaning will not remove deposits of carbon and oil.

Inspecting the Primary Air Filter Elements



Illustration 445

g06276739

Inspect the clean, dry primary air filter element. Use a 60 watt blue light in a dark room or in a similar facility. Place the blue light in the primary air filter element. Rotate the primary air filter element. Inspect the primary air filter element for tears and/or holes. Inspect the primary air filter element for light that may show through the filter material. If it is necessary to confirm the result, compare the primary air filter element to a new primary air filter element that has the same part number.

Do not use a primary air filter element that has any tears and/or holes in the filter material. Do not use a primary air filter element with damaged pleats, gaskets, or seals. Discard damaged primary air filter elements.

Storing Primary Air Filter Elements

If a primary air filter element that passes inspection will not be used, the primary air filter element can be stored for future use.



Illustration 446

g06276742

Do not use paint, a waterproof cover, or plastic as a protective covering for storage. An airflow restriction may result. To protect against dirt and damage, wrap the primary air filter elements in volatile corrosion inhibitor (VCI) paper.

Place the primary air filter element into a box for storage. For identification, mark the outside of the box and mark the primary air filter element. Include the following information:

- Date of cleaning
- Number of cleanings

Store the box in a dry location.

Replacing the Air Filter Element

The air filter element should be replaced immediately if the element is damaged.

1. Open the rear access door.

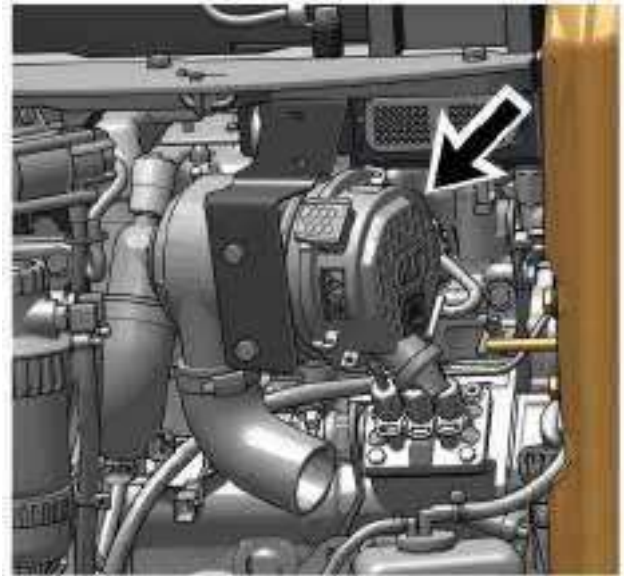


Illustration 447

g06276763

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

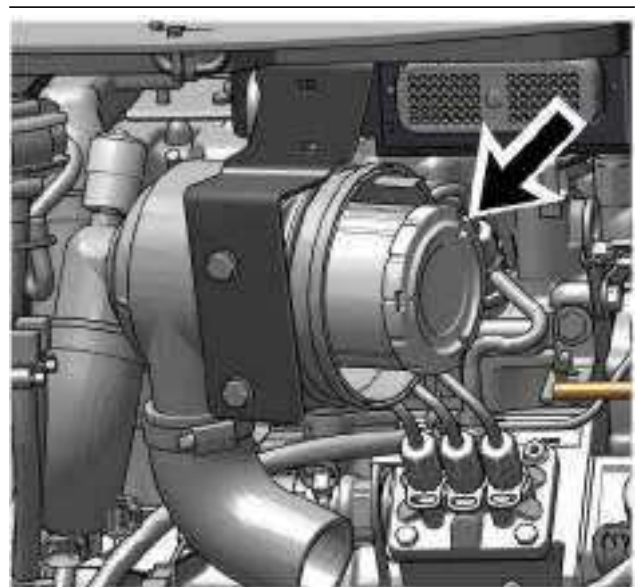


Illustration 448

g06276765

3. Remove the primary filter element from the air cleaner housing.
4. Inspect the filter element. If the pleats, the gaskets or the seals are damaged, discard the filter element. Replace damaged filter elements with new filter elements.

Maintenance Section
Engine Air Filter Secondary Element - Replace

5. Wipe dust from the interior of the air cleaner housing. Remove the cover from the air inlet port. Leave the secondary filter element in place while you clean the air cleaner housing.
6. Put the clean air filter element into the air cleaner housing and push the air filter element into position.
7. Install the access cover.
8. Close the rear access door.

i07297257

Engine Air Filter Secondary Element - Replace

SMCS Code: 1054-510

NOTICE

Always replace the secondary filter element. Never attempt to reuse the element by cleaning.

The secondary filter element should be replaced at the time the primary element is serviced for the third time.

NOTICE

The filter should be kept in service for no longer than one year.

NOTICE

Always leave the secondary filter element in place while you clean the air cleaner housing.

1. Open the rear access door.
2. Remove the air cleaner housing cover.
3. Remove the primary filter element. Refer to Operation and Maintenance Manual, "Engine Air Filter Primary Element - Clean/Replace".

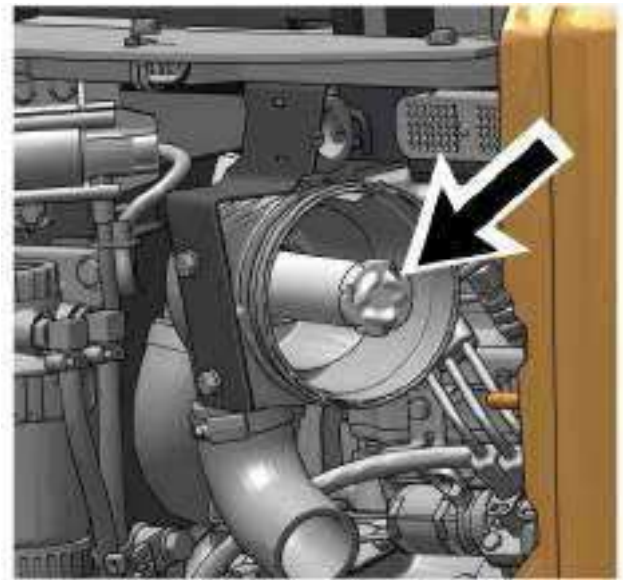


Illustration 449

g06276771

4. Remove the secondary filter element. Pull out to remove the element.
5. Cover the air inlet opening. Clean the inside of the air cleaner housing.
6. Install a new secondary filter element. Push the element firmly to properly seat the element. Write the date on the element.
7. Install the primary filter element and the air cleaner housing cover.
8. Close the rear access door.

i07280036

Engine Air Filter Service Indicator - Inspect

SMCS Code: 7452-040-DJ

NOTICE

Service the air cleaner only with the engine stopped. Engine damage could result if the air cleaner is serviced while the engine is running.

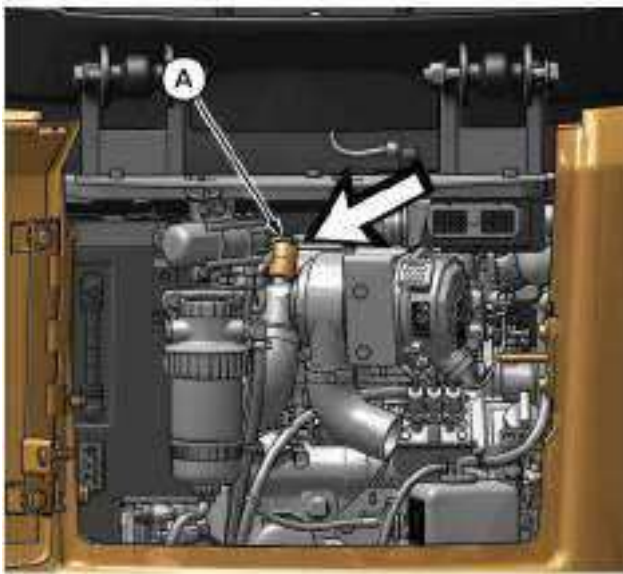


Illustration 450

g06272398

1. Open the rear access door.
2. If the piston in the engine air filter service indicator is in the red zone, push button (A) to reset. Service the air cleaner.

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

3. Close the rear access door.

i07281033

Engine Oil Level - Check

SMCS Code: 1000-535

WARNING

Hot oil and hot components can cause personal injury. Do not allow hot oil or hot components to contact skin.

NOTICE

Do not overfill the crankcase. Engine damage can result.

1. Open the rear access door.

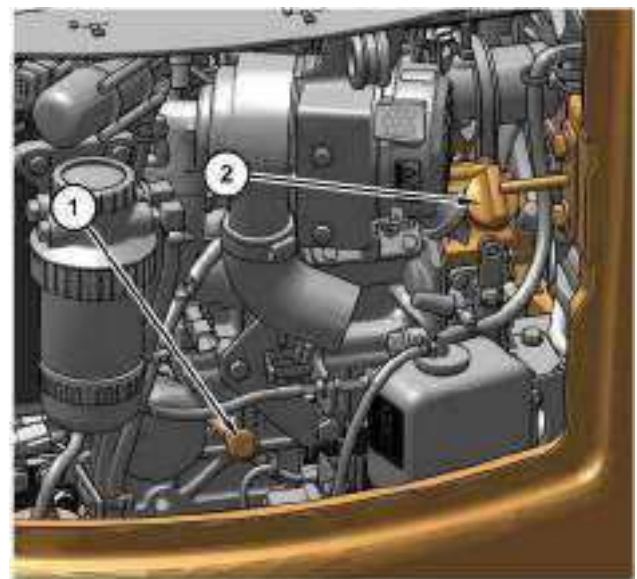


Illustration 451

g06272736

2. While the engine is stopped, maintain the oil level in the crosshatched area on the dipstick (1).
3. If necessary, remove the oil filler cap (2) and add oil. Allow the oil to drain into the crankcase before you check the oil level.
4. Close the rear access door.

i07297308

Engine Oil Sample - Obtain

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

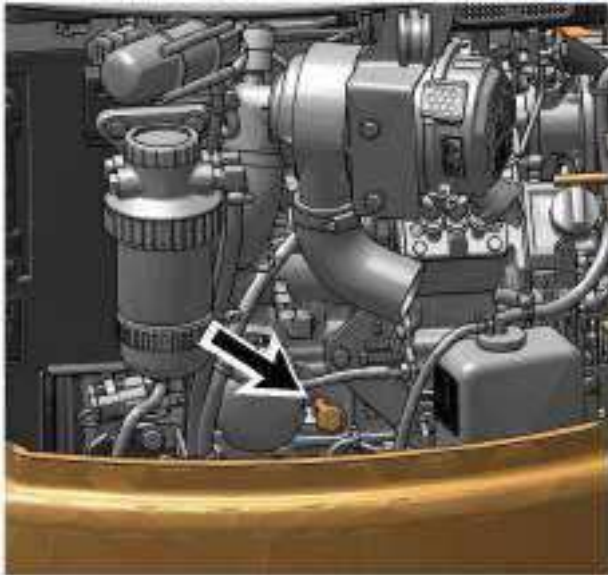


Illustration 452

g06276791

Obtain a sample of the engine oil through the dipstick tube. Refer to Special Publication, SEBU6250, "Caterpillar Machine Fluids Recommendations" "S·O·S Oil Analysis" for information that pertains to obtaining a sample of the engine oil. Refer to Special Publication, PEHP6001, "How To Take A Good Oil Sample" for more information about obtaining a sample of the engine oil.

i08424452

Engine Oil and Filter - Change

SMCS Code: 1318-510

Selection of the Oil and Filter Change Interval

WARNING

Hot oil and hot components can cause personal injury. Do not allow hot oil or hot components to contact skin.

NOTICE

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

Dispose of all fluids according to local regulations and mandates.

NOTICE

Keep all parts clean from contaminants.

Contaminants may cause rapid wear and shortened component life.

NOTICE

The engine oil and filter change interval for standard service application is every 500 hours or every year when the following requirements are met:

- Utilize Cat Recommended Fluids
- Utilize Cat Filters
- Utilize S·O·S Services at recommended interval
- Altitude does not exceed 2300 m (7545 ft)

When these requirements are not met, the oil and filter change interval should be every 250 hours, or use S·O·S Services oil sampling and analysis program to determine an acceptable oil change interval.

If you select an interval for oil and filter change that is too long, you may damage the engine.

NOTICE

When operating in any of the conditions or environments outlined in this Operation and Maintenance Manual, Severe Service Application, use S·O·S Services oil analysis to determine the best oil and filter change interval.

When S·O·S Services are not used in severe service applications, the oil and filter change interval should be every 250 hours..

If you select an interval for oil and filter change that is too long, you may damage the engine.

Note: If the sulfur content in the fuel is greater than 1.5% by weight, use an oil that has a TBN of 30 and reduce the oil change interval by one-half.

Note: Drain the crankcase while the oil is warm. This allows waste particles that are suspended in the oil to drain. As the oil cools, the waste particles will settle to the bottom of the crankcase. The particles will not be removed by draining the oil and the particles will recirculate in the engine lubrication system with the new oil.

Reference: “Lubricant Viscosities“

Reference: Operation and Maintenance Manual, “Maintenance Interval Schedule”

Reference: Operation and Maintenance Manual, “S·O·S Information”

Use the table below to determine the appropriate oil and filter change interval.

Table 36

Selection of Oil and Filter Change Interval					
	Altitude Exceeds 2300 m (7545 ft)	Conditions			Interval
		Cat Recommended Fluids	Cat Filters	S·O·S Services	
Standard Service Application	NO	YES	YES	YES	500 hours or every year
		YES	YES	NO	500 hours or every year
		YES	NO	YES	500 hours or every year
		NO	YES	YES	500 hours or every year
		NO	NO	NO	250 hours
Severe Service Application	YES	NO	NO	NO	250 hours
		YES	YES	NO	250 hours
		YES	YES	YES	Use S·O·S ⁽¹⁾
		YES	NO	YES	Use S·O·S ⁽¹⁾
		NO	YES	YES	Use S·O·S ⁽¹⁾

⁽¹⁾ If operating in any of the conditions or environments outlined in the Severe Service Application, use S·O·S Services oil analysis to determine the best oil change interval.

Engine Oil and Filter Change

1. Park the machine on a level surface. Prepare the machine for maintenance. Refer to “Prepare the Machine for Maintenance“.

Maintenance Section
Engine Oil and Filter - Change



Illustration 453

g06660612

2. Open the access door at the rear of the machine. Refer to "Access Door and Cover Locations".

Note: Refer to "General Hazard Information" for information on Containing Fluid Spillage.

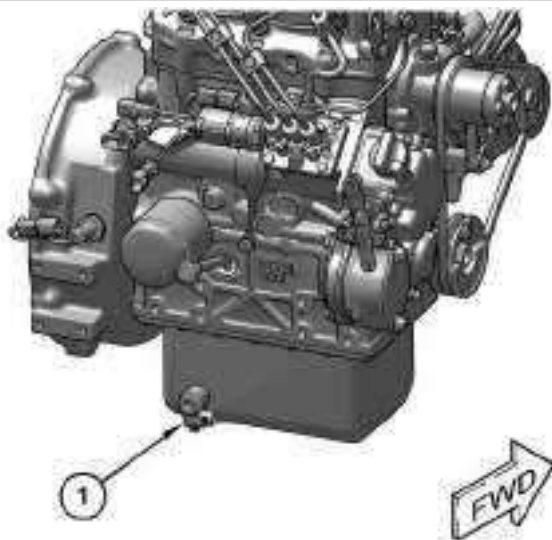


Illustration 454

g06660613

Some components removed for better clarity

(1) Crankcase drain plug

3. Remove crankcase drain plug (1) and allow the oil to drain into a suitable container.

Note: Discard any drained fluids according to local regulations.

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

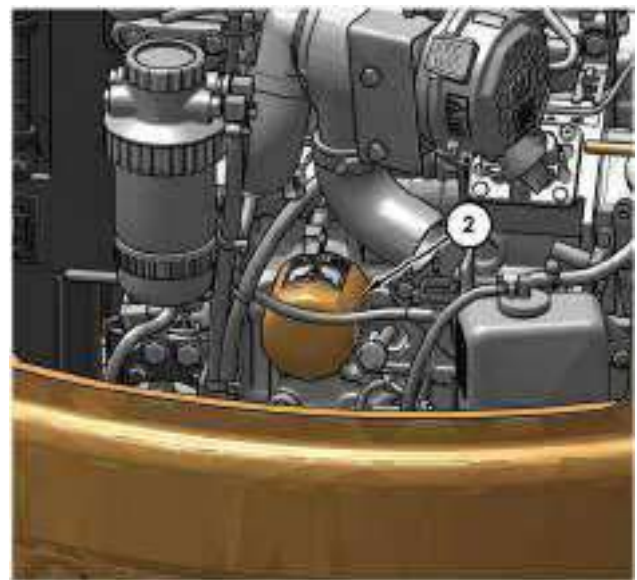


Illustration 455

g06660605

(2) Filter

6. Remove filter (2) with a filter wrench. Discard filter (2).

Note: Used filters should always be disposed according to local regulations.

7. Install new filter (2) by hand. When the gasket contacts the filter base, tighten the filter for an additional three quarters of a turn.

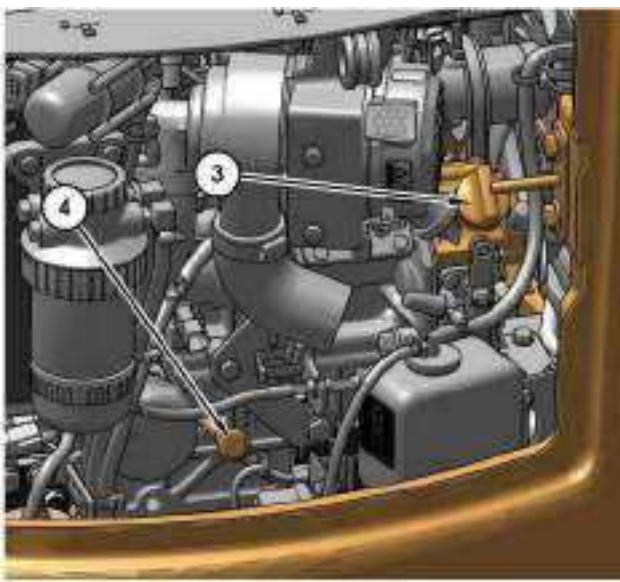


Illustration 456

g06660606

- (3) Oil filler cap
(4) Oil level gauge

8. Remove oil filler cap (3). Fill the crankcase with new oil. Refer to "Capacities (Refill)". Clean oil filler cap (3) and install oil filler cap (3).

NOTICE

Do not under fill or overfill engine crankcase with oil. Either condition can cause engine damage.

9. Start the engine and allow the oil to warm. Refer to "Engine Starting". Check the engine for leaks.
10. Stop the engine. Refer to "Stopping the Engine".



Illustration 457

g06183475

11. Wait for 30 minutes to allow the oil to drain back into the crankcase. Check the oil level with oil level gauge (4). Maintain the oil between the "L" and "H" marks on the oil level gauge (4).

If necessary, add oil. Refer to "Lubricant Viscosities".

12. Start the engine and operate the engine at low idle for several minutes. Refer to "Engine Starting". While the engine is running, check the filter base for oil leaks.
13. Stop the engine and allow the oil to drain back into the crankcase. Refer to "Stopping the Engine".
14. Close the access door at the rear of the machine. Refer to "Access Door and Cover Locations".

i08423522

Engine Valve Lash - Check/Adjust

SMCS Code: 1105-535; 1105-025

WARNING

Ensure that the engine cannot be started while this maintenance is being performed. To help prevent possible injury, do not use the starting motor to turn the flywheel.

Hot engine components can cause burns. Allow additional time for the engine to cool before measuring/adjusting valve lash clearance.

NOTICE

Only qualified service personnel should perform this maintenance. Refer to the Systems Operation/Testing and Adjusting Manual, "Valve Lash and Valve Bridge Adjustment" article or consult your Caterpillar dealer for the complete valve lash adjustment procedure.

Operation of Caterpillar engines with improper valve adjustments can reduce engine efficiency. This reduced efficiency could result in excessive fuel usage and/or shortened engine component life.

Note: For procedures on adjusting the valve lash and adjusting the valve bridge, refer to Systems Operation/Testing and Adjusting, "Valve Lash and Valve Bridge Adjustment". Consult your Cat[®] dealer for assistance.

i07284921

Film (Product Identification) - Clean

SMCS Code: 7405-070; 7557-070



Illustration 458

g06184074



Illustration 459

g06274059

Typical example of the Product Identification Films.

Cleaning of the Films

Make sure that all the product identification films are legible. Make sure that the recommended procedures are used to clean the product identification films. Ensure that all the product identification films are not damaged or missing. Clean the product identification films or replace the films.

Hand Washing

Use a wet solution with no abrasive material that contains no solvents and no alcohol. Use a wet solution with a "pH" value between 3 and 11. Use a soft brush, a rag, or a sponge to clean the product identification films. Avoid wearing down the surface of the product identification films with unnecessary scrubbing. Ensure that the surface of the product identification films is flushed with clean water and allow the product identification films to air dry.

Power Washing

Power washing or washing with pressure may be used to clean product identification films. However, aggressive washing can damage the product identification films.

Excessive pressure during power washing can damage the product identification films by forcing water underneath the product identification films. Water lessens the adhesion of the product identification film to the product, allowing the product identification film to lift or curl. These problems are magnified by wind. These problems are critical for the perforated film on windows.

To avoid lifting of the edge or other damage to the product identification films, follow these important steps:

- Use a spray nozzle with a wide spray pattern.
- A maximum pressure of 83 bar (1200 psi)
- A maximum water temperature of 50° C (120° F)
- Hold the nozzle perpendicular to the product identification film at a minimum distance of 305 mm (12 inch).
- Do not direct a stream of water at a sharp angle to the edge of the product identification film.

i07281445

Final Drive Oil - Change

SMCS Code: 4050-044-FLV

Note: At the time of changing oil, observe the oil for presence of metallic particles or other foreign matters. If you find something that needs attention, consult your Cat dealer.

1. Warm up the oil by roading the tracks. Draining the oil should be done when the oil is hot. Draining the oil when hot will help to prevent sludge.
2. Move the machine to level ground.

i07281532



Illustration 460

g06272783

3. Position one of the final drives as shown in illustration 460 .

Note: Refer to Operation and Maintenance Manual, "General Hazard Information" for information on Containing Fluid Spillage.

4. Remove the oil level plug (1).
5. Remove the oil drain plug (2). Allow the oil to drain into a suitable container.
6. Clean the drain plug (2). Apply pipe sealant to the threads of the drain plug to prevent leakage. Reinstall the drain plug.
7. Add oil to the final drive through the opening for the oil level plug (1) until the oil is level with the plug threads (1). See Operation and Maintenance Manual, "Lubricant Viscosities" and Operation and Maintenance Manual, "Capacities (Refill)".
8. Clean the oil level plug (1). Apply pipe sealant to the threads of the oil level plug to prevent leakage. Reinstall the oil level plug.
9. Repeat the procedure for the other final drive.
10. Start the engine and allow the final drives to run through several cycles.
11. Stop the engine. Check the oil level in both final drives.
12. Apply pipe sealant on the threads of the oil level plug. Reinstall the oil level plug.
13. Properly dispose of the drained material. Obey local regulations for the disposal of the material.

Final Drive Oil Sample - Obtain

SMCS Code: 4011-008; 4050-008; 4050-SM; 7542-008



Illustration 461

g06272797

1. Position the final drive as shown in illustration 461 .
2. Remove oil level plug (1).
3. Obtain a sample of the final drive oil through the hole for the oil level plug.
4. Clean the oil level plug. Apply pipe sealant on the threads to prevent leakage. Reinstall the plug.

Refer to Special Publication, SEBU6250, "S·O·S Oil Analysis" for more information on obtaining a sample of the final drive oil. For additional information about taking an oil sample, refer to Special Publication, PEGJ0047, "How To Take A Good Oil Sample".

i07297388

Fuel Lift Pump Strainer - Replace

(If equipped)

SMCS Code: 1256-510-STR; 1256

WARNING

Personal injury or death may result from failure to adhere to the following procedures.

Fuel leaked or spilled onto hot surfaces or electrical components can cause a fire.

Clean up all leaked or spilled fuel. Do not smoke while working on the fuel system.

Turn the disconnect switch OFF or disconnect the battery when changing fuel filters.

NOTICE

Do not fill the fuel filters with fuel before installing the fuel filters. The fuel will not be filtered and could be contaminated. Contaminated fuel will cause accelerated wear to fuel system parts.

The fuel lift pump strainer is located below the fuel system primary filter.



Illustration 462

g06276835

1. Open the rear access door.
2. Disconnect clamps (2) from both the side of the strainer (1) and remove the strainer.
3. Replace the strainer.

4. Reconnect the hoses.
5. Close the rear access door.

i05372885

Fuel System - Prime

SMCS Code: 1250-548

WARNING

Fuel leaked or spilled onto hot surfaces or electrical components can cause a fire. To help prevent possible injury, turn off the start switch and let the engine cool down when changing fuel filters or water separator elements. Clean up fuel spills immediately.

NOTICE

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

Refer to Special Publication, PERJ1017, "Dealer Service Tool Catalog" for tools and supplies suitable to collect and contain fluids on Cat® products.

Dispose of all fluids according to local regulations and mandates.

NOTICE

Do not loosen the fuel lines at the fuel manifold. The fittings may be damaged and/or a loss of priming pressure may occur when the fuel lines are loosened.

Prime the fuel system in order to fill the fuel filter, and prime the fuel system in order to purge trapped air. The fuel system should be primed under the following conditions:

- The fuel tank is running low.
 - The machine has been stored.
 - The fuel filter is being replaced.
 - The fuel lines have been replaced.
1. Fill the fuel tank. Move the hydraulic lockout lever to the RAISED position. Turn the ignition key to the first position.
 2. Wait 5 minutes while the fuel system primes automatically.

NOTICE

Do not crank the engine continuously for more than 10 seconds. Allow the starting motor to cool for two minutes before cranking the engine again.

3. Start the engine.
4. Check the fuel system for leaks.
5. Run the engine at low idle for 5 minutes.

Note: If the engine runs smoothly, and then stops, or the engine runs rough, more priming may be necessary.

6. If more priming is necessary, turn off the engine.
7. Move the hydraulic lockout lever to the RAISED position.
8. Turn the engine start switch key to the first position.
9. Prime the fuel system again.

Note: If the fuel system does not prime correctly, consult your Cat dealer.

i07281585

Fuel System Primary Filter (Water Separator) Element - Replace

SMCS Code: 1263-510-FQ

WARNING

Personal injury or death may result from failure to adhere to the following procedures.

Fuel leaked or spilled onto hot surfaces or electrical components can cause a fire.

Clean up all leaked or spilled fuel. Do not smoke while working on the fuel system.

Turn the disconnect switch OFF or disconnect the battery when changing fuel filters.

NOTICE

Do not fill the fuel filters with fuel before installing the fuel filters. The fuel will not be filtered and could be contaminated. Contaminated fuel will cause accelerated wear to fuel system parts.

1. Open the rear access door.

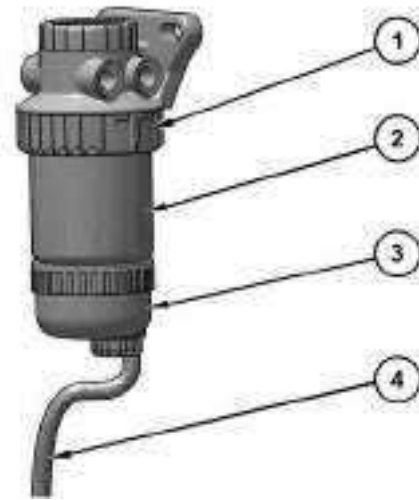


Illustration 463

g06272834

- (1) Locking ring
- (2) Primary fuel filter/water separator element
- (3) Water separator bowl
- (4) Drain hose

2. Open the drain on the water separator bowl (3). Allow the water and fuel to drain into a suitable container.
 3. Support the fuel filter/water separator element (2) and rotate the locking ring (1) counterclockwise. Remove the locking ring.
 4. Remove the water separator bowl (3) from the bottom of the fuel filter/water separator element (2).
- Note:** The water separator bowl is reusable. Do not discard the water separator bowl.
5. Inspect the O-ring seal of the water separator bowl (3) for damage. Replace the O-ring seal, if necessary.
 6. Lubricate the O-ring seal with clean diesel fuel or lubricate the O-ring seal with motor oil. Place the seal in the water separator bowl.
 7. Spin the water separator bowl (3) onto the new fuel filter/water separator element (2) by hand until the fuel filter/water separator is snug. Do not use tools to tighten the fuel filter/water separator element to the bowl.
 8. Clean the filter mounting base.
 9. Install the new element. Rotate the locking ring (1) clockwise to fasten the filter to the mounting base.

10. Prime the fuel system. See Operation and Maintenance Manual, "Fuel System - Prime" for instructions.

11. Close the access door.

i07281590

Fuel System Water Separator - Drain

SMCS Code: 1263

1. Open the rear access door.



Illustration 464

g06272847

2. Turn the drain valve counterclockwise to open the drain valve.

Note: Refer to Operation and Maintenance Manual, "General Hazard Information" for information on containing fluid spillage.

3. Drain the water and drain the sediment into a suitable container.

Note: Dispose of drained fluids according to local regulations.

4. Close the drain valve.

5. Close the rear access door.

Fuel Tank Cap - Clean

SMCS Code: 1273-070-Z2; 1273

i07305678



Illustration 465

g06277309

1. Remove fuel cap (1).

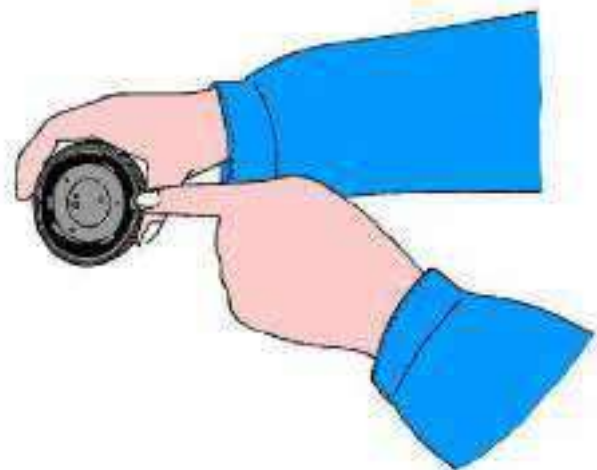


Illustration 466

g06277320

2. Inspect the cap and gasket for damage. Replace the fuel tank cap if the cap is damaged.

3. Use a clean, nonflammable solvent to wash the fuel tank cap.

4. Put a light coating of fuel oil on the cap gasket.

5. Install the fuel cap.

i07282145

Fuel Tank Water and Sediment - Drain

SMCS Code: 1273-543

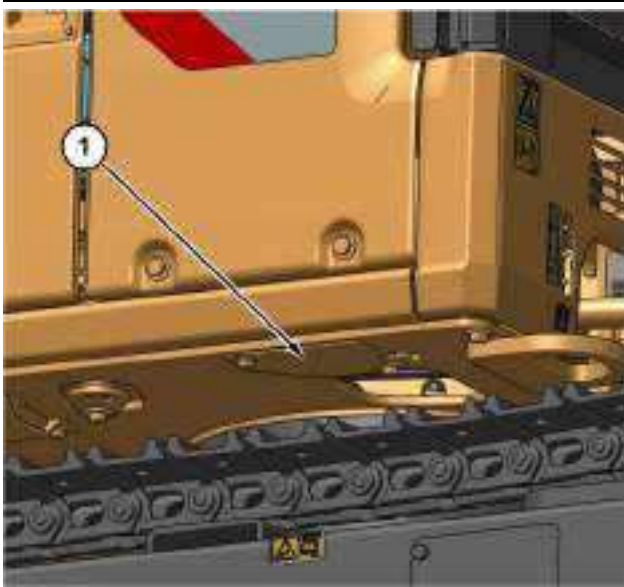


Illustration 467

g06317865

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

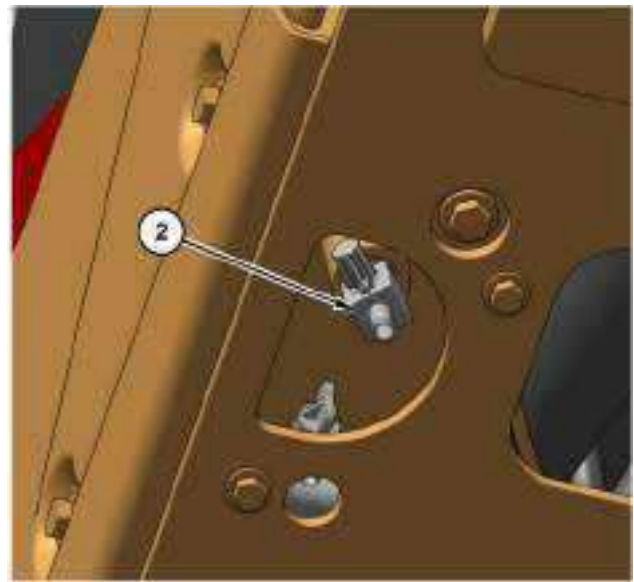


Illustration 468

g06317875

2. Open fuel tank valve (2). Allow the water and sediment to drain into a suitable container.

Note: Refer to Operation and Maintenance Manual, "General Hazard Information" for information on Containing Fluid Spillage.

3. Close fuel tank valve (2).

Note: Discard the drained fluids according to local regulations.

4. Reinstall guard (1).

i07282454

Fuses - Replace

SMCS Code: 1417-510

Fuses – Fuses protect the electrical system from damage that is caused by overloaded circuits. Replace the fuse if the element separates. If the element of a new fuse separates, check the circuit. If necessary, consult your Cat dealer.

NOTICE

Always replace fuses with the same type and capacity fuse that was removed. Otherwise, electrical damage could result.

NOTICE

If it is necessary to replace fuses frequently, an electrical problem may exist.

Contact your Cat dealer.

Maintenance Section
Fuses - Replace

The fuses are located below the seat or on the lower right console.

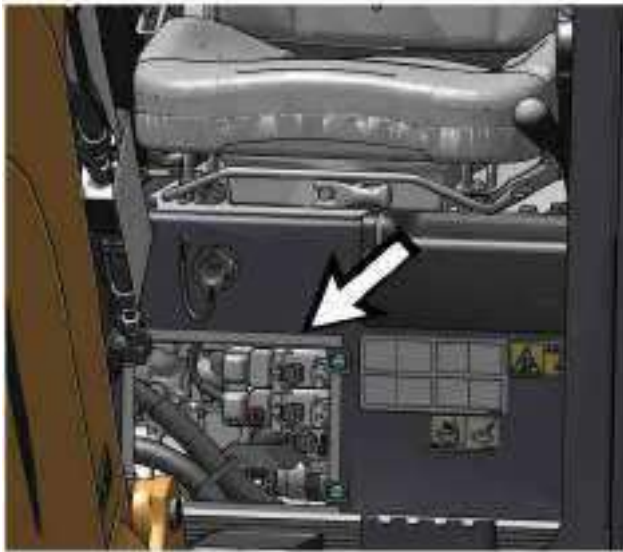


Illustration 469 g06273207
Fuse and relay locations for 301.5 and 301.7 CR

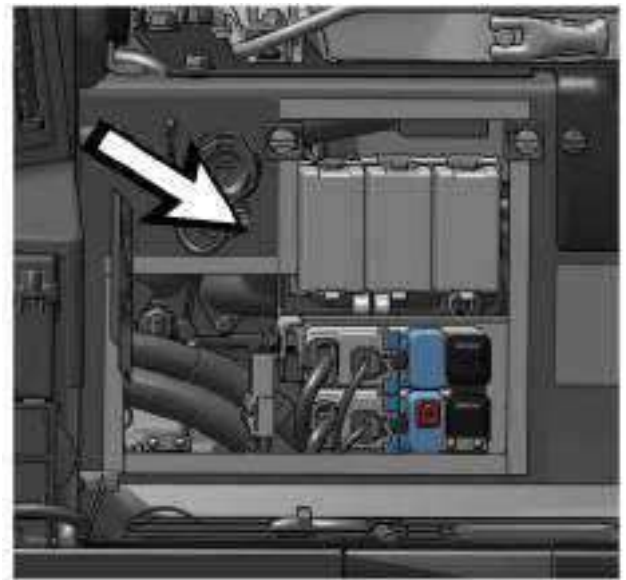


Illustration 471 g06318395
Fuse and relay locations for 301.6, 301.8, and 302 CR

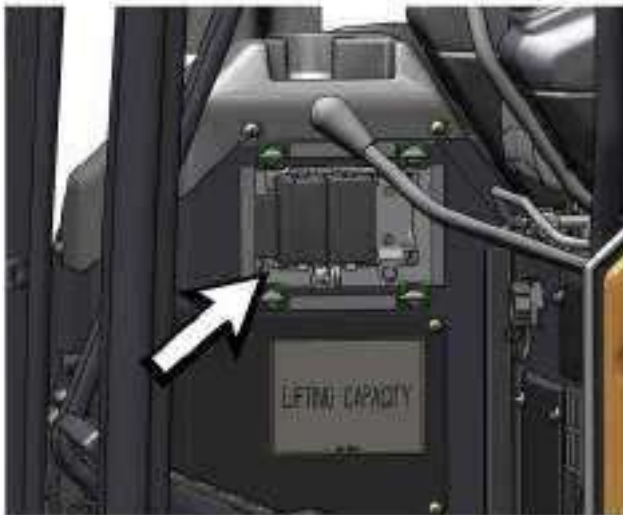


Illustration 470 g06273205
Fuse and relay locations for 301.5 and 301.7 CR

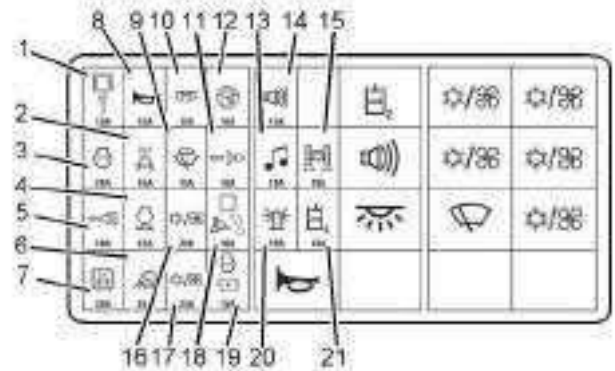


Illustration 472 g06318200

- (1) **Monitor and Service Connector** – 10 amp
- (2) **Product Link** – 15 amp
- (3) **Engine Start** – 20 amp
- (4) **Governor** – 15 amp
- (5) **Key Switch** – 10 amp
- (6) **Working Lamp** – 25 amp
- (7) **Machine ECM** – 30 amp
- (8) **Horn** – 10 amp
- (9) **Wiper Washer** – 15 amp
- (10) **Courtesy Lamp** – 10 amp
- (11) **Power Socket** – 10 amp

- (12) Fuel Pump – 10 amp
- (13) Radio – 10 amp
- (14) Fault Alarm – 10 amp
- (15) Undercarriage Expansion – 10 amp
- (16) Heat Ventilation and Air Conditioner – 20 amp
- (17) Heat Ventilation and Air Conditioner – 25 amp
- (18) Engine ECM and Blade Control – 10 amp
- (19) Engine Stop and Alternator IG Term – 15 amp
- (20) Beacon – 10 amp
- (21) Second Auxiliary – 10 amp

i02054663

Horn - Test

SMCS Code: 7402-081

Test the horn on a daily basis. Press downward on the horn button in order to sound the horn. If the horn does not sound, make the necessary repairs before you operate the machine.

i08423525

Hydraulic System Oil - Change

SMCS Code: 5056-044

WARNING

Hot oil and hot components can cause personal injury. Do not allow hot oil or hot components to contact skin.

NOTICE

If the machine is filled with non-biodegradable hydraulic oil and biodegradable hydraulic oil is wanting to be used, consult a Cat dealer. Biodegradable hydraulic oil can NOT be added to the system by performing an ordinary hydraulic oil change. Damage to the hydraulic system can occur.

NOTICE

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

Refer to Special Publication, PERJ1017, "Dealer Service Tool Catalog" for tools and supplies suitable to collect and contain fluids on Cat® products.

Dispose of all fluids according to local regulations and mandates.

1. Park the machine on level ground. Prepare the machine for maintenance. Refer to "Prepare the Machine for Maintenance".

Relays

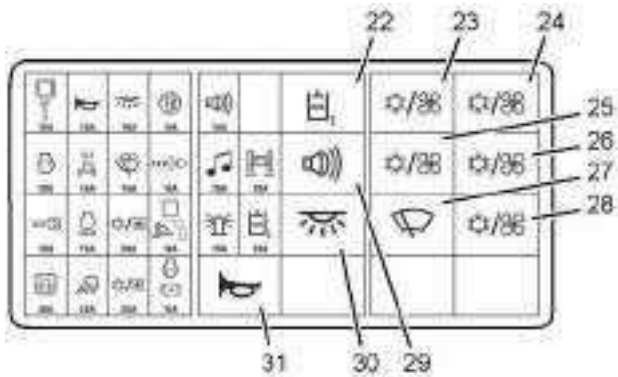


Illustration 473

g06318247

- (22) Second Auxiliary – Relay
- (23) Heat Ventilation and Air Conditioner – Relay
- (24) Heat Ventilation and Air Conditioner – Relay
- (25) Heat Ventilation and Air Conditioner – Relay
- (26) Heat Ventilation and Air Conditioner – Relay
- (26) Heat Ventilation and Air Conditioner – Relay
- (27) Front Wiper – Relay
- (28) Heat Ventilation and Air Conditioner – Relay
- (29) Fault Alarm – Relay
- (30) Courtesy Lamp – Relay
- (31) Horn – Relay



Illustration 474

g06400477

2. Extend the stick and the bucket fully. Lower the boom so that the bucket is rested on the ground. Lower the blade to the ground. Refer to Illustration 474 .
3. Turn the engine switch to the OFF position. Refer to "Engine Starting".
4. Cycle the joysticks to relieve any pressure remaining in the hydraulic lines. Refer to "System Pressure Release".
5. Move the hydraulic lockout control lever to the RAISED position. Refer to "Operator Controls".



Illustration 475

g06273625

(1) Oil filler cap

6. Open left side access door. Refer to "Access Door and Cover Locations".

WARNING

Pressurized system!

The hydraulic tank contains hot oil under pressure. To prevent burns from the sudden release of hot oil, relieve the tank pressure with the engine off. Relieve pressure by slowly turning the cap until the cap reaches the secondary stop.

7. Relieve the internal pressure in the hydraulic tank by slowly loosening oil filler cap (1).



Illustration 476

g06273640

(2) Drain valve

8. Hydraulic oil drain valve (2) is on the bottom side of the hydraulic oil tank.

Note: Refer to "General Hazard Information" for information on Containing Fluid Spillage.

9. Open drain valve (2) and attach a drain hose. Allow the oil to drain into a suitable container.

Note: Discard the drained fluids according to local regulations.

10. Check the hydraulic tank for contamination and clean if necessary.
11. Inspect the hydraulic suction screen and clean with a nonflammable solvent. Replace the screen if the screen is damaged.
12. Close drain valve (2) and remove the drain hose.

13. Open hydraulic oil filler cap (1) and fill the hydraulic system oil tank with the same type of oil that was in it before. Refer to "Lubricant Viscosities" and "Capacities (Refill)".
14. Inspect the O-ring on oil filler cap (1) for damage. Replace the O-ring, if necessary.
15. Tighten oil filler cap (1).

Note: Do not start the machine until all of the following steps have been completed.

16. Ensure that the hydraulic tank has the correct amount of fluid. Refer to Operation and Maintenance Manual, "Hydraulic System Oil Level - Check".

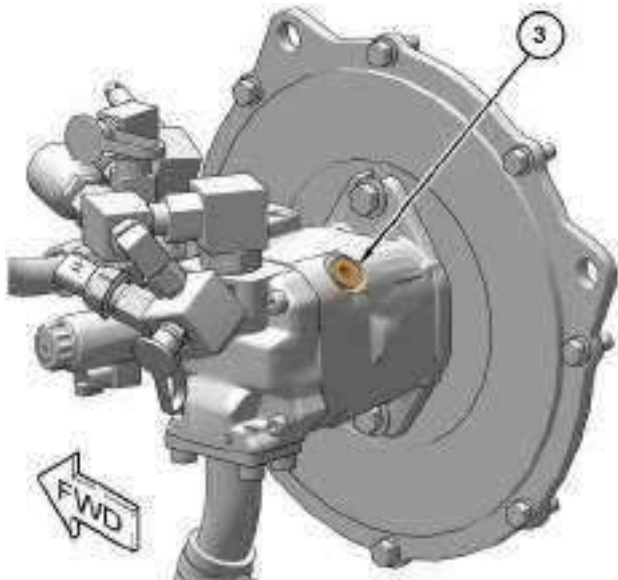


Illustration 477

g06661621

Main hydraulic pump

Some components removed for better clarity

(3) Vent plug

17. Main hydraulic pump is located near the hydraulic tank. Slowly loosen vent plug (3) on the top of the hydraulic pump to allow air to escape from the system.

Note: Cavitation and pump damage can occur if air is trapped in the pump.

18. Once hydraulic oil starts coming out of the vent port, tighten vent plug (3) to a torque of $80 \pm 12 \text{ N}\cdot\text{m}$ ($59 \pm 9 \text{ lb ft}$).
19. Close left side access door. Refer to "Access Door and Cover Locations".

20. Start the engine and run the engine for a few minutes. Refer to "Engine Starting".
21. Operate the joysticks to cause the hydraulic oil to flow through the circuits. Refer to "Joystick Controls".
22. Open the access door on the rear of the machine. Refer to "Access Door and Cover Locations".

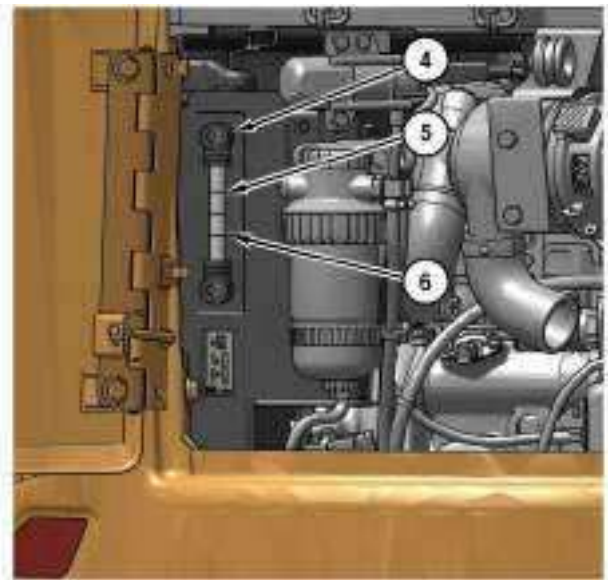


Illustration 478

g06400503

- (4) Sight gauge
- (5) High range
- (6) Low range

23. Maintain the hydraulic oil level in the middle of the sight gauge (4), which is behind the rear access door.

Note: The oil must be free of bubbles. If bubbles are present in the oil, air is entering the hydraulic system. Inspect the suction hoses, the hose clamps, and the hydraulic oil filter.

CAUTION

Bleed the hydraulic pump after performing a hydraulic oil change and using a vacuum pump - otherwise severe damage to the pump can occur.

24. Stop the engine. Refer to "Stopping the Engine".
25. If necessary, tighten any loose clamps and any loose connections. Replace any damaged hoses.
26. Close the rear access door. Refer to "Access Door and Cover Locations".

i08423603

Hydraulic System Oil Filter (Return) - Replace

SMCS Code: 5068-510-RJ

WARNING

Hot oil and hot components can cause personal injury. Do not allow hot oil or hot components to contact skin.

NOTICE

Never remove the fill/vent plug from the hydraulic tank if the oil is hot.

Air can enter the system and cause pump damage.

1. Prepare the machine for maintenance. Refer to "Prepare the Machine for Maintenance".
2. Open the access door on the left side of the machine. Refer to "Access Door and Cover Locations".

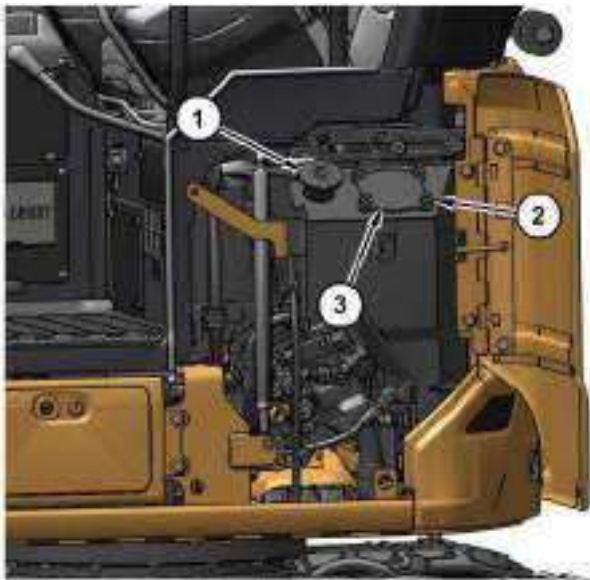


Illustration 479

g06660588

- (1) Oil filler cap
(2) Bolt
(3) Cover

WARNING

Pressurized system!

The hydraulic tank contains hot oil under pressure. To prevent burns from the sudden release of hot oil, relieve the tank pressure with the engine off. Relieve pressure by slowly turning the cap until the cap reaches the secondary stop.

3. Clean the area around oil filler cap (1) and cover (3).
4. Slowly loosen oil filler cap (1) to relieve the pressure in the hydraulic oil tank. Refer to "System Pressure Release". Clean oil filler cap (1).
5. Place a suitable container under the filter.

Note: Refer to "General Hazard Information" for information on Containing Fluid Spillage.

6. Remove four bolts (2). Remove cover (3) and collect the hydraulic oil as the oil drains.

Note: Discard any drained fluids according to local regulations.

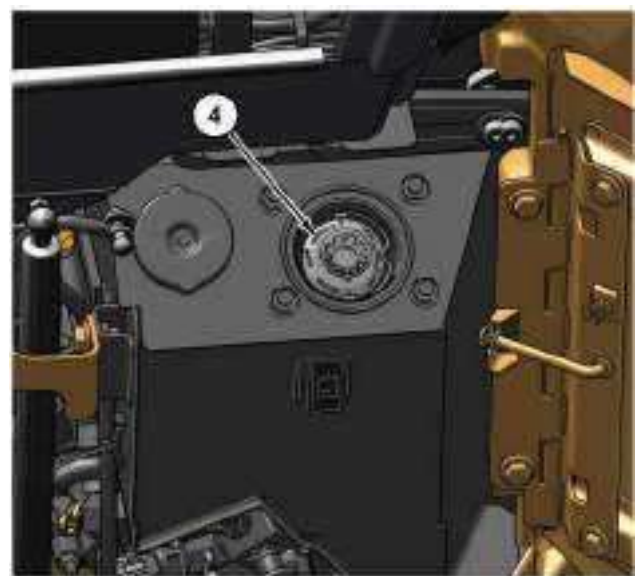


Illustration 480

g06660589

- Hydraulic tank
(4) Filter element

7. Remove and discard filter element (4).

Note: Used filters should always be disposed according to local regulations.

8. Remove any dirt from the housing and the sealing surface of cover (3). Check the surface of the removed filter element (4) for dirt residue and coarse particles. If dirt residue and/or coarse particles are found, consult your Cat[®] dealer.
9. Install new filter element (4).
10. Position cover (3) in place on top of the hydraulic tank. Tighten four bolts (2).
Refer to Specifications, SENR3130, "Torque Specifications" for the recommended torque.
11. Install oil filler cap (1).
12. Close the access door on the left side of the machine. Refer to "Access Door and Cover Locations".

i07475362

Hydraulic System Oil Level - Check

SMCS Code: 5050-535

WARNING

Hot oil and hot components can cause personal injury. Do not allow hot oil or hot components to contact skin.

Note: Check the hydraulic system oil level with the machine on a level surface.



Illustration 481

g06273670

1. Park the machine on level ground. Lower the work tool to the ground with the stick in the vertical position.

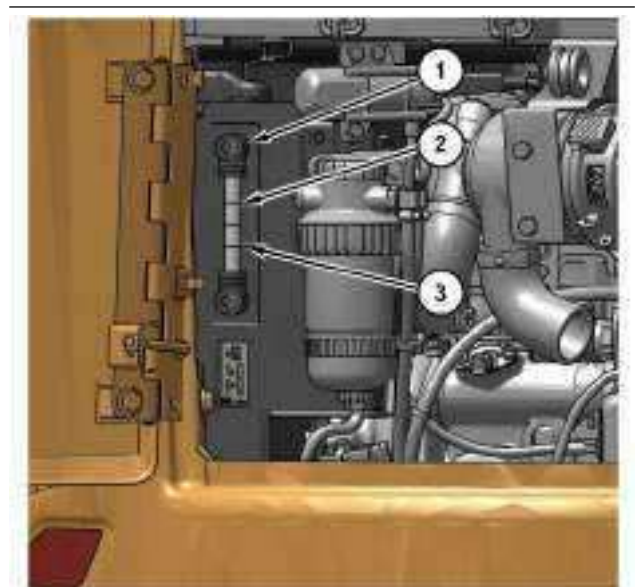


Illustration 482

g06273684

- (2) High
- (3) Low
2. The sight gauge (1) is behind the rear access door.
3. Maintain the hydraulic system oil level in the middle of the sight gauge.
4. Open left side access door.

i07284652



Illustration 483

g06273689

5. Slowly loosen hydraulic oil tank cap (4) to relieve any pressure and add hydraulic oil, if necessary.
6. Close left side access door.

Hydraulic System Oil Sample - Obtain

SMCS Code: 5050-008-OC; 5095-SM; 5095-008; 7542-008; 7542



Illustration 484

g06273696

Obtain a sample of the hydraulic oil by removing the floor mat and cover to expose SOS sampling port (1) under the cab floor.

Refer to Special Publication, SEBU6250, "S·O·S Oil Analysis" for information that pertains to obtaining a sample of the hydraulic oil. Refer to Special Publication, PEGJ0047, "How To Take A Good Oil Sample" for more information about obtaining a sample of the hydraulic oil.

i07203750

Lifting Hook - Inspect

SMCS Code: 6459-040

Note: Designate a person to inspect the hook frequently. The designated person should inspect the hook prior to operation and during operation. The designated person will determine if the conditions that are found are a hazard. The designated person will determine if a more detailed inspection is required.

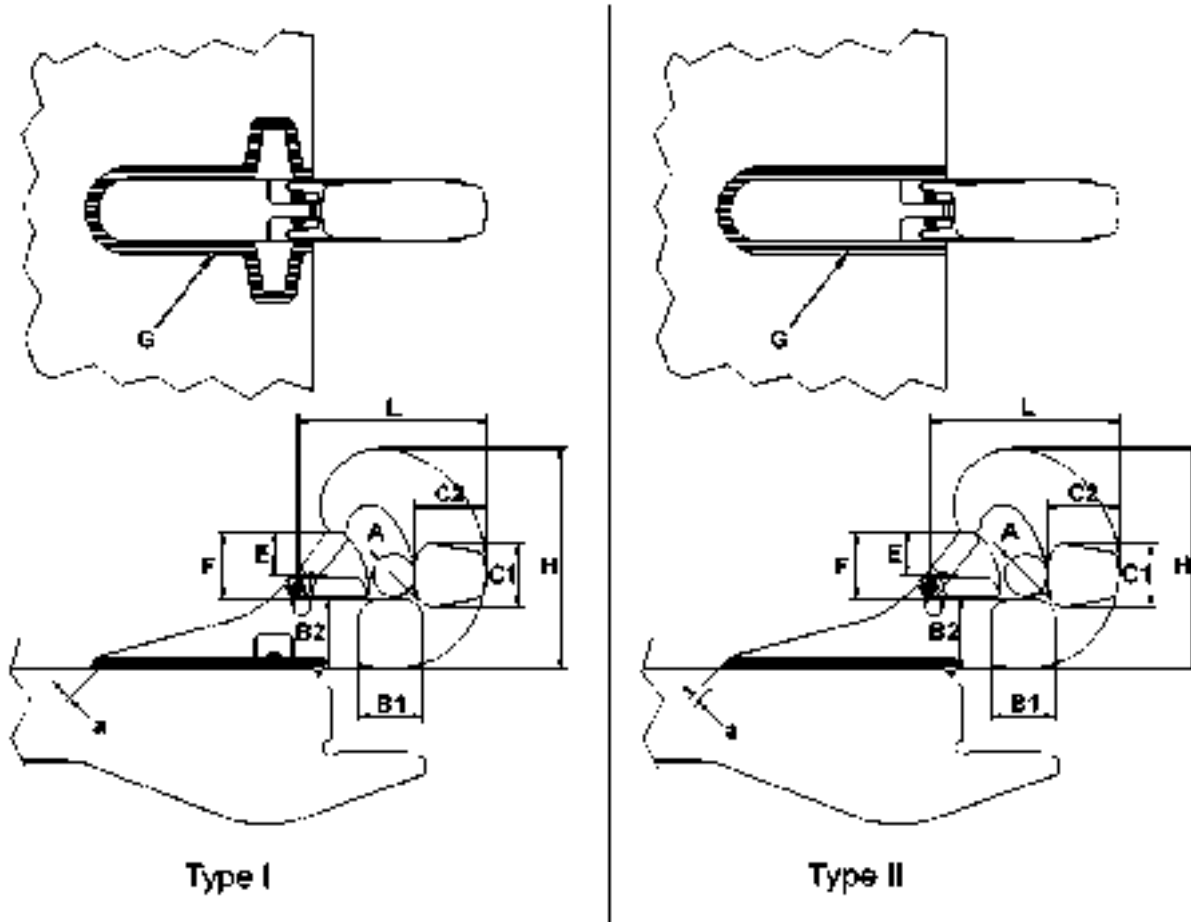


Illustration 485

g01540013

(A) Maximum diameter of bar
(B1) Nominal width of bottom
(B2) Nominal height of bottom
(C1) Nominal width of front

(C2) Nominal height of front
(E) Actual throat clearance
(F) Full throat clearance
(G) Required height of weld (a)

(H) Nominal height of hook
(L) Nominal length of hook

1. Inspect the hook for any distortion such as bends in the hook or twists in the hook.
2. Inspect the dimensions of the throat (E) and (F). An increase in the dimensions of the throat must not exceed 5% of the original dimensions of the throat. Refer to Illustration 485 for the dimensions of the throat.
3. Inspect the hook for wear. An increase in the nominal dimensions (B1), (B2), (C1), (C2), (H), and (L) of the hook must not exceed 10% of the original nominal dimensions of the hook. Refer to Illustration 485 for the nominal dimensions of the hook.
4. Inspect the hook for cracks, nicks, or gouges.
5. Ensure that the latch properly engages. Inspect the latch for any damage. Ensure that the latch is not malfunctioning.

Note: Before continuing to operate the hook, the hook must be repaired or replaced if any of the above conditions exist. Refer to Special Instruction, REHS3357, "Procedure for Installation or Replacement of a Lifting Hook or a Lifting Yoke on Certain Quick Couplers" for additional information.

i04432083

Light - Test

SMCS Code: 1429-081

Turn on the switch. Observe the lights and replace any that are not working.

i07349186

Oil Filter - Inspect

SMCS Code: 1308-507; 5068-507

Inspect a Used Filter for Debris



Illustration 486

g06224663

The element is shown with debris.

Use a filter cutter to cut the filter element open. Spread apart the pleats and inspect the element for metal and for other debris. An excessive amount of debris in the filter element can indicate a possible failure.

If metals are found in the filter element, a magnet can be used to differentiate between ferrous metals and nonferrous metals.

Ferrous metals can indicate wear from steel parts and on cast iron parts.

Nonferrous metals can indicate wear from the aluminum parts of the engine such as main bearings, rod bearings, or turbocharger bearings.

Small amounts of debris may be found in the filter element. This debris could be caused by friction and by normal wear. Consult your Cat dealer to arrange for further analysis if an excessive amount of debris is found.

Using an oil filter element that is not recommended by Caterpillar can result in severe engine damage to engine bearings, to the crankshaft, and to other parts. This can result in larger particles in unfiltered oil. The particles could enter the lubricating system and the particles could cause damage.

i01819738

Quick Coupler - Check

SMCS Code: 6129-535; 6700-535

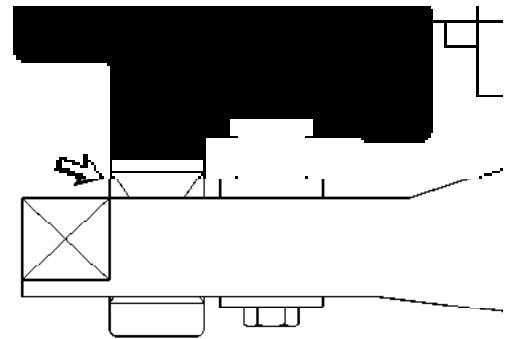


Illustration 487

g00584367

1. Ensure that there is a visible space between the wedge and the quick coupler frame. If there is no space, the mounting bracket or the quick coupler may be damaged or worn. Contact your Caterpillar dealer.

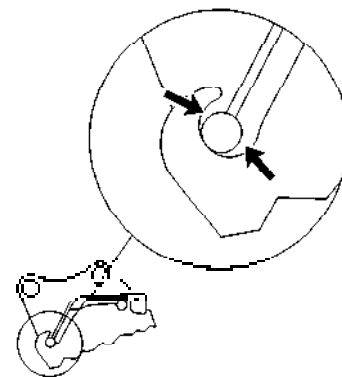


Illustration 488

g00584389

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

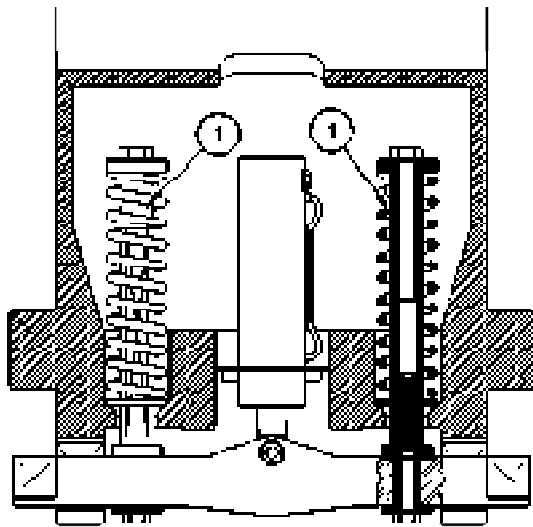


Illustration 489

g00584390

3. Visually inspect the shafts (1). The shafts (1) must be straight. Replace the shafts (1) if the shafts are bent.

i04673589

Quick Coupler - Clean

SMCS Code: 6129-070

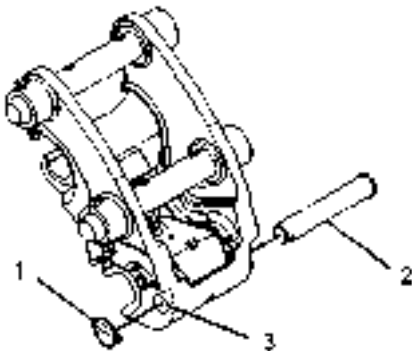


Illustration 490

g01155173

Typical example

1. Remove pin (1).
2. Remove safety pin (2) from the quick coupler. The pin may be located on the right side or located on the rear of the quick coupler.
3. Clean safety pin (2).
4. Clean out bore (3) on either side of the coupler.

5. Remove any trash or buildup from the quick coupler.
6. Apply grease to safety pin (2).
Refer to Special Publication, SEBU6250, "Caterpillar Machine Fluid Recommendations" for more information about the selection of grease.
7. Insert safety pin (2) into bore (3) on the right side.
8. Insert pin (1) into safety pin (2) on the left side of the quick coupler.

i02166325

Quick Coupler - Clean/Inspect

SMCS Code: 6129-040; 6129-070

WARNING

Personal injury or death can result from improperly checking for a leak.

Always use a board or cardboard when checking for a leak. Escaping air or fluid under pressure, even a pin-hole size leak, can penetrate body tissue causing serious injury, and possible death.

If fluid is injected into your skin, it must be treated immediately by a doctor familiar with this type of injury.

Note: Do not weld on the quick coupler without consulting your Caterpillar dealer.

Note: Clean the quick coupler prior to inspection in order to properly inspect the quick coupler.

Note: Refer to Operation and Maintenance Manual, "Daily Inspection" for additional information.

1. Inspect the hydraulic lines and the hydraulic fittings for damage or for wear. Repair any worn components or replace any worn components. Repair any leaking components.
2. Inspect the locking pins that secure the quick coupler to the host machine.
3. Inspect the steel material of the quick coupler for cracks.
4. Inspect the warning signs and labels. Replace warning signs or labels that are missing. Replace warning signs or labels when you cannot read the warning signs or labels. Refer to Operation and Maintenance Manual, "Safety Messages" for additional information.

i02973110

i05815772

Quick Coupler - Lubricate (If Equipped)

SMCS Code: 6129-086

1. Lower all work tools to the ground.
2. Wipe off the fittings before you lubricate the fitting.

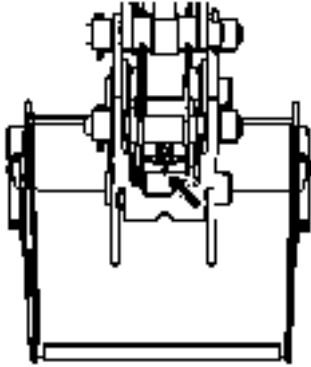


Illustration 491

g01167510

Typical example

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

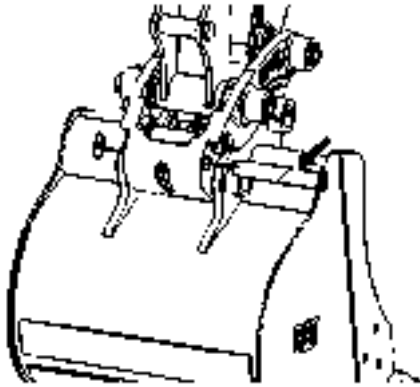


Illustration 492

g01167518

Typical example

4. Apply grease to the external surface of the pin in the lock assembly.

Note: The lock assembly may be located on the side of the coupler or located on the rear of the coupler.

5. Check the overall condition of the quick coupler. Look for the following conditions: loose bolts, worn parts, broken parts, missing parts and damaged parts. Make any necessary repairs.

Quick Coupler - Lubricate (Mechanical Pin Grabber Quick Coupler (If Equipped))

SMCS Code: 6129-086

1. Release the work tool from the quick coupler. Ensure that the work tool is in a stable and safe storage position on the ground. Refer to Operation and Maintenance Manual, "Quick Coupler Operation - Mechanical Pin Grabber Quick Coupler" for the proper procedure.

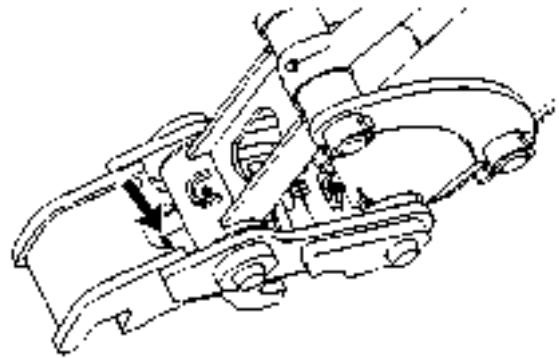


Illustration 493

g03681390

2. Wipe off the fitting before you lubricate the fitting.
3. Apply grease to the fitting of the quick coupler.
4. Check that all pin retainers are in place and that all bolts and nuts are tight.
5. Check the full operation of all the moving parts within the quick coupler. Repair or replace immediately if required.
6. Check that there is no material buildup around the rear locking mechanism, threaded actuator, or wedge plate. Check that there is no material buildup around the front locking mechanism.
7. Check the quick coupler for cracks, bent components, or wear.

i06514107

Quick Coupler - Lubricate

SMCS Code: 6129-086

Spindle Lubricate

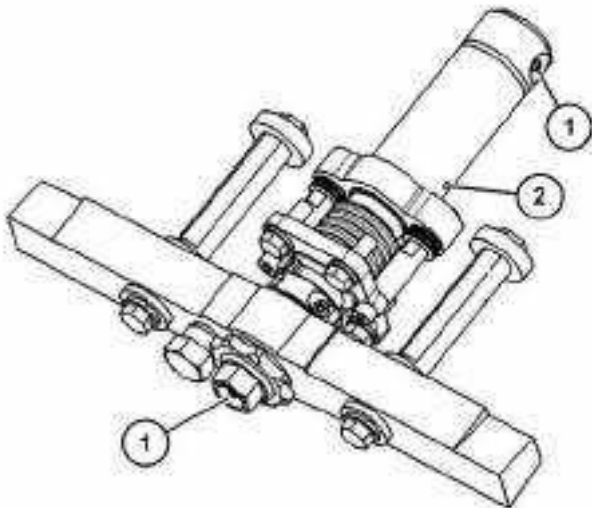


Illustration 494

g06005591

Note: On quick couplers with spindle coupling, the spindle must be lubricated.

1. Uncouple the work tool to lubricate the spindle housing. Refer to Uncoupling the Work Tool - Quick Coupler with Spindle Coupling for information.
2. Turn the spindle inward completely, in a CLOCKWISE direction. Grease the spindle at both grease points (1) until the grease becomes visible at the grease release hole (2).
3. Turn the spindle outward completely, in a COUNTER-CLOCKWISE direction. Remove any excess grease from the spindle.
4. Couple the work tool.

i07284663

Radiator Core - Clean

SMCS Code: 1353-070

1. Open the right side access door.



Illustration 495

g06273709

2. You can use compressed air or water to remove dust and other debris from the radiator fins. The compressed air should be oil free and 200 kPa (29 psi) maximum.
3. Close the right side access door.

i07285015

Seat Belt - Inspect

SMCS Code: 7327-040

Always check the condition of the seat belt and the condition of the seat belt mounting hardware before you operate the machine. Replace any parts that are damaged or worn before you operate the machine.

Maintenance Section

Seat Belt - Replace



Illustration 496

g06224278

Typical example

Check the seat belt mounting hardware for wear or for damage. Replace any mounting hardware that is worn or damaged. Make sure that the mounting bolts are tight.

Check buckle (2) for wear or for damage. If the buckle is worn or damaged, replace the seat belt.

Inspect seat belt (1) for webbing that is worn or frayed. Replace the seat belt if the seat belt is worn or frayed.

Consult your Cat dealer for the replacement of the seat belt and the mounting hardware.

i06970675

Seat Belt - Replace

SMCS Code: 7327-510

The seat belt should be replaced within 3 years of the date of installation. A date of installation label is attached to the seat belt retractor and buckle. If the date of installation label is missing, replace the belt within 3 years from the year of manufacture as indicated on the belt webbing label, buckle housing, or installation tags (non-retractable belts).

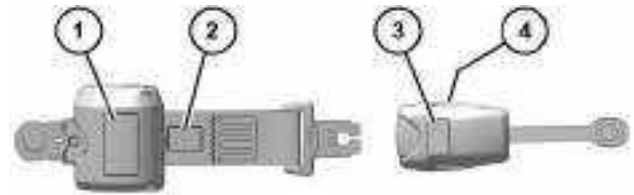


Illustration 497

g06183390

- (1) Date of installation (retractor)
- (2) Year of manufacture (tag) (fully extended web)
- (3) Date of installation (buckle)
- (4) Year of manufacture (underside) (buckle)

Consult your Cat dealer for the replacement of the seat belt and the mounting hardware.

Determine the age of a new seat belt before installing on seat. A manufacture label is on the belt webbing and imprinted on the belt buckle. Do not exceed the install by date on the label.

A complete seat belt system should be installed with new mounting hardware.

Date of installation labels should be marked and affixed to the seat belt retractor and buckle.

Note: Date of installation labels should be permanently marked by punch (retractable belt) or stamp (non-retractable belt).

If your machine is equipped with a seat belt extension, also perform this replacement procedure for the seat belt extension.

i07284881

Swing Frame Pin - Lubricate

SMCS Code: 6506-086; 6507-086

1. Lower all work tools to the ground.
2. Wipe all grease fittings before you lubricate the grease fittings.



Illustration 498

g06273916

3. Apply lubricant to grease fittings (1) for the swing frame.

i07284699

Swing Gear and Bearing - Lubricate

SMCS Code: 7063-086

WARNING

Do not rotate the machine during lubrication. Danger of severe crushing that can cause severe injury or death.

1. Park the machine on a level surface. Lower all work tools to the ground. Place the hydraulic lockout control in the RAISED position.



Illustration 499

g06273727

- (1) Swing cylinder (head)
- (2) Swing bearing (inner)
- (3) Swing gear (outer)

2. Fittings (1), (2), and (3) for the swing cylinder, bearing, and gear are on the right side of the machine on the upper carriage.
3. Wipe the fittings and lubricate.



Illustration 500

g06273733

4. Rotate the upper structure for 90°.
5. Apply grease to the fitting for the swing bearing.
6. Repeat Step 4 and Step 5 until the upper structure has rotated 360°.

7. Rotate the upper structure 360° twice.

i07284885

Track Adjustment - Adjust

SMCS Code: 4170-025

Tightening the Tracks



Illustration 501

g06273924

1. Remove cover (1).



Illustration 502

g06273930

2. Wipe fitting (2) before you add grease.

3. Add grease through fitting (2) until the correct tension is reached.
4. Operate the track back and forth to equalize the pressure.
5. Check the amount of sag. Adjust the track, as needed. Refer to Operation and Maintenance, "Track Adjustment - Inspect".
6. Repeat the same procedure for the other track.

Loosening the Track

⚠ WARNING

Personal injury or death can result from grease under pressure.

Grease coming out of the relief valve under pressure can penetrate the body causing injury or death.

Do not watch the relief valve to see if grease is escaping. Watch the track or track adjustment cylinder to see if the track is being loosened.

Loosen the relief valve one turn only.

If track does not loosen, close the relief valve and contact your Caterpillar dealer.



Illustration 503

g06273930

1. Loosen fitting (2) carefully until the track begins to loosen. One turn should be the maximum.
2. Tighten fitting (2) when the desired track tension is reached.

3. Operate the track back and forth to equalize pressure.
4. Check the amount of sag in the track. Adjust the track, as needed. Refer to Operation and Maintenance, "Track Adjustment - Inspect".
5. Repeat the same procedure for the other track.

If the correct adjustment cannot be achieved, consult your Cat dealer.

i07284912

Track Adjustment - Inspect

SMCS Code: 4170-040

Note: Keeping the track properly adjusted will increase the service life of the track components and the drive components.

Check the rubber tracks for the following conditions:

- Steel cords that are cut
- Core irons that are fractured
- Rubber flaking off to the point of showing steel cords or core irons
- Loss of traction or grousers are worn down to approximately 5 mm (0.2 inch) in height.

If any of the above conditions or a combination of the above conditions are observed, replace the belt.

Measuring Rubber Track Tension

1. Park the machine on a level surface.



Illustration 504

g06273981

2. Position the upper frame over the tracks at a 90° angle.
3. Lower the bucket to the ground with the stick in a vertical position.
4. Chock the track that is not being lifted off the ground.
5. Apply boom down pressure until the track that is on the same side as the bucket has cleared the ground.
6. Chock the lower frame of the machine in this position.
7. Clean the track rollers and the area around the skid plate.

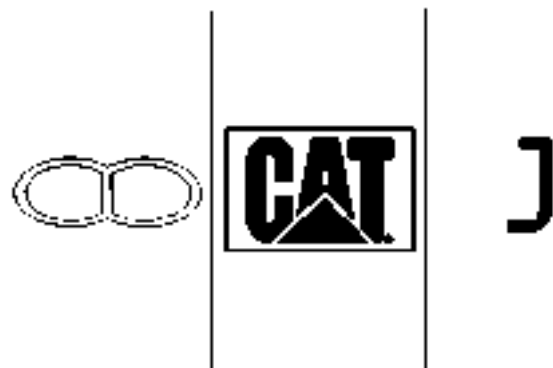


Illustration 505

g03731778

Various track joint marks

8. For a machine that is equipped with the rubber tracks, locate the track joint mark on the inside flat of the track.

Note: The track joint mark varies by supplier.

9. Position the track joint mark under the center track roller.

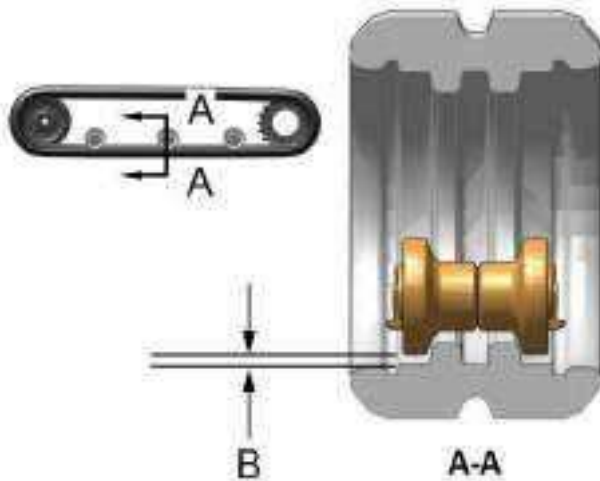


Illustration 506

g06274031

The distance (B) is the amount of track sag.

10. Measure the sag in the track. The sag is measured from the bottom of the center roller to the surface on the top of the track.

Measuring Steel Track Tension

Note: The track tension must be set according to the current operating conditions. Keep the track as slack as possible if the soil is heavy.

Follow the same procedures for measuring rubber track tension. There is not an “omega” mark on the steel tracks. You do not need to align the steel tracks.

If the correct adjustment cannot be achieved, consult your Cat dealer.

Table 37

Track Sag	
Rubber Tracks	5 to 10 mm (0.20 to 0.40 inch)
Steel Tracks	10 to 20 mm (0.40 to 0.80 inch)

i07285023

Travel Alarm - Test

SMCS Code: 7429-081

Move the machine to test the travel alarm.

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

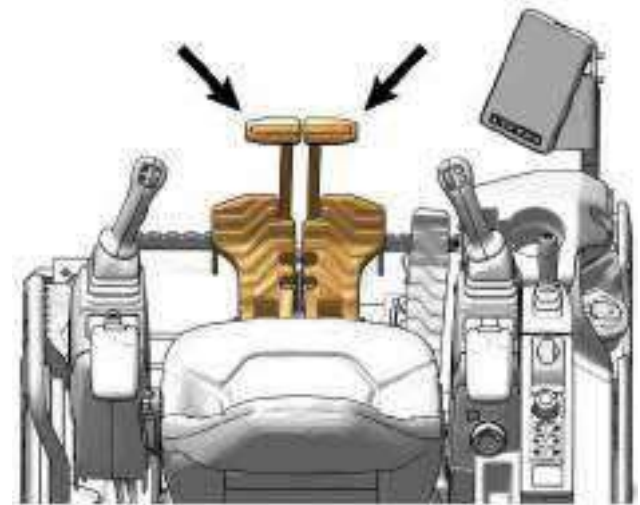


Illustration 507

g06274089

3. Use the travel levers to move the machine forward. The travel alarm should sound.
4. Release the travel levers to stop the machine.
5. Use the travel levers to move the machine backward. The travel alarm should sound.
6. Release the travel levers to stop the machine. Lower the work tool to the ground. Deactivate the hydraulic control and drive levers by placing the hydraulic lockout control in the RAISED position. Stop the engine.

i04288151

Undercarriage - Check

SMCS Code: 4150-535

1. Check the track rollers and the idler wheels for possible leakage.
2. Check the surface of the track, the track rollers, the idler wheels, and the drive sprockets. Look for signs of wear and loose mounting bolts.
3. Listen for any abnormal noises while you are moving slowly in an open area.
4. If abnormal wear exists or abnormal noises or leaks are found, consult your Cat dealer.

i07305486

Window Washer Reservoir - Fill

SMCS Code: 7306-544-KE

NOTICE

When operating in freezing temperatures, use Caterpillar or any commercially available nonfreezing window washer solvent.

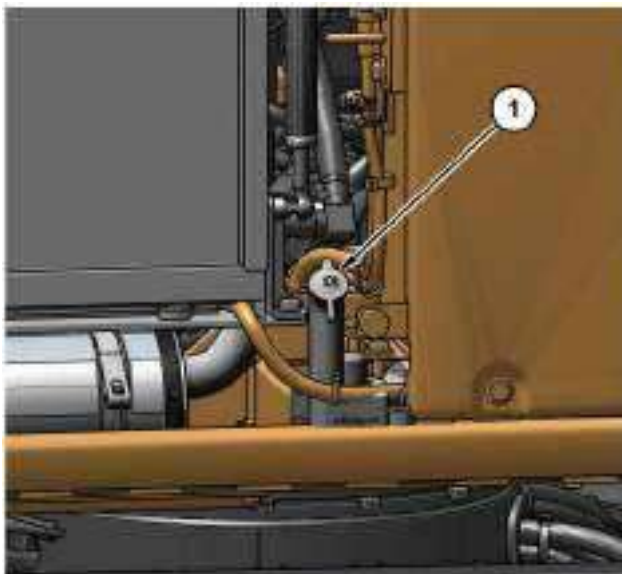


Illustration 508

g06277138

The washer fluid bottle is inside the right side access door.

1. Remove the filler cap (1).
2. Fill the washer fluid bottle with washer fluid through the filler opening.

3. Close the filler cap (1).

i01048717

Window Wiper - Inspect/Replace

SMCS Code: 7305-510; 7305-040

Inspect the wiper blade on the front window. Replace the window wiper blade if the window wiper blade is worn or damaged. Replace the front window wiper blade if the front window is streaked after use.

i07305526

Windows - Clean

SMCS Code: 7310-070; 7340-070

Clean the outside of the windows from the ground, unless handholds are available.



Illustration 509

g06277176

Typical example

Cleaning Methods

Aircraft Window Cleaner

Apply the cleaner with a soft cloth. Rub the window with moderate pressure until all the dirt is removed. Allow the cleaner to dry. Wipe off the cleaner with a clean soft cloth.

Soap and Water

Use a clean sponge or a soft cloth. Wash the windows with a mild soap or with a mild detergent. Also use plenty of lukewarm water. Rinse the windows thoroughly. Dry the windows with a moist chamois or with a moist cellulose sponge.

Stubborn Dirt and Grease

Wash the windows with a good grade of naphtha, of isopropyl alcohol, or of Butyl Cellosolve. Then, wash the windows with soap and with water.

Polycarbonate Windows (If equipped)

Special care is needed to clean polycarbonate windows.

Wash polycarbonate windows with mild soap and warm water that does not exceed 50° C (122° F). Use a soft sponge, or damp cloth. Never use a dry cloth or paper towels on polycarbonate windows. Rinse the windows with a sufficient amount of clean cold water.

Note: Naphtha or kerosene can be used to remove labels, films, paint, or marking pen from polycarbonate windows.

Note: Do not use abrasive, or highly alkaline cleaners. Do not use sharp instruments, such as squeegees or razor blades on polycarbonate windows. Do not clean polycarbonate windows in the hot sun or at elevated temperatures.

Warranty Section

Warranty Information

i08375716

Emissions Warranty Information

SMCS Code: 1000

The certifying engine manufacturer warrants to the ultimate purchaser and each subsequent purchaser that:

1. New non-road diesel engines and stationary diesel engines less than 10 liters per cylinder (including Tier 1 and Tier 2 marine engines < 37 kW, but excluding locomotive and other marine engines) operated and serviced in the United States and Canada, including all parts of their emission control systems (“emission related components”), are:
 - a. Designed, built, and equipped so as to conform, at the time of sale, with applicable emission standards prescribed by the United States Environmental Protection Agency (EPA) by way of regulation.
 - b. Free from defects in materials and workmanship in emission-related components that can cause the engine to fail to conform to applicable emission standards for the warranty period.
2. New non-road diesel engines (including Tier 1 and Tier 2 marine propulsion engines < 37 kW and Tier 1 through Tier 4 marine auxiliary engines < 37 kW, but excluding locomotive and other marine engines) operated and serviced in the state of California, including all parts of their emission control systems (“emission related components”), are:
 - a. Designed, built, and equipped so as to conform, at the time of sale, to all applicable regulations adopted by the California Air Resources Board (ARB).
 - b. Free from defects in materials and workmanship which cause the failure of an emission-related component to be identical in all material respects to the component as described in the engine manufacturer's application for certification for the warranty period.

3. New non-road diesel engines installed in construction machines conforming to the South Korean regulations for construction machines manufactured after January 1, 2015, and operated and serviced in South Korea, including all parts of their emission control systems (“emission related components”), are:
 - a. Designed, built, and equipped so as to conform, at the time of sale, with applicable emission standards prescribed in the Enforcement Rule of the Clean Air Conservation Act promulgated by South Korea MOE.
 - b. Free from defects in materials and workmanship in emission-related components that can cause the engine to fail to conform to applicable emission standards for the warranty period.

The aftertreatment system can be expected to function properly for the lifetime of the engine (emissions durability period) subject to prescribed maintenance and operating environment requirements being followed.

A detailed explanation of the Emission Control Warranty that is applicable to new non-road and stationary diesel engines, including the components covered and the warranty period, is found in a supplemental Special Publication. Consult your authorized Cat dealer to determine if your engine is subject to an Emission Control Warranty and to obtain a copy of the applicable Special Publication.

Reference Information Section

Reference Materials

i08292374

Reference Material

SMCS Code: 1000; 7000

Additional literature regarding your product may be purchased from your local Cat dealer or by visiting publications.cat.com. Use the product name, sales model, and serial number to obtain the correct information for your product.

publications.cat.com

i08292382

Decommissioning and Disposal

SMCS Code: 1000; 7000

When the product is removed from service, local regulations for the product decommissioning will vary. Disposal of the product will vary with local regulations.

Improperly disposing of waste can threaten the environment. Obey all local regulations for the decommissioning and disposal of materials.

Utilize appropriate personal protective equipment when decommissioning and disposing product.

Consult the nearest Cat dealer for additional information. Including information for component remanufacturing and recycling options.

i08467615

Caterpillar Approved Work Tools

SMCS Code: 6700; 7007

NOTICE

Use only work tools that are recommended by Caterpillar. The use of work tools that are not recommended by Caterpillar could damage your machine. Consult your Cat dealer for information on recommended work tools.

The following work tools have been approved by Caterpillar. Refer to Operation and Maintenance Manual for each work tool for proper operation, maintenance, and servicing of the work tools.

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

Always compare the weight of the work tool and maximum payload of work tool with the indications in the lift capacity table. Never exceed the maximum payload stated in the lift capacity table.

Table 38

Caterpillar Approved Work Tools for Mini Hydraulic Excavators					
Work Tool	Machine Model				
	301.5	301.6	301.7 CR	301.8	302 CR
Quick Coupler	Manual Pin Grabber Quick Coupler				
	ManualCW05Quick Coupler				
	ManualCW05Hook Quick Coupler				
	HydraulicCW05Quick Coupler				
	HydraulicCW05Hook Quick Coupler				
Thumb	Hydraulic Thumb				
Hammer	H45DHammer				
	B1Hammer	B1Hammer	B1Hammer	B1Hammer	-
	-	-	B2Hammer	B2Hammer	B2Hammer
Mud Bucket	Mud Bucket with cubic capacity of 8.5 m ³ (11.12 yd ³)				
General Purpose Bucket	General Purpose Bucket with cubic capacity of 0.02 m ³ (0.034 yd ³)				
Ditch Cleaning Bucket	-				Ditch Cleaning Bucket with cubic capacity of 0.03 m ³ (0.046 yd ³)
Compaction Wheel	DC-12 SKHCompaction Wheel				
	DC-18 SKHCompaction Wheel				
	DC-24 SKHCompaction Wheel				
Other Buckets	(1)				

(1) Refer to "Boom/Stick/Bucket Combinations" for more information.

Refer to Operation and Maintenance Manual, "Maintenance Interval Schedule" for more information.

This list was completed at the time of publication. There may be additional work tools that have been approved since that time. Consult your Cat[®] dealer for an updated list of approved work tools.

Index

A

Access Door and Cover Locations.....	332
Access Beneath Canopy/Cab	333
Cab Door Lock (If Equipped)	335
Engine Door.....	332
Left Side Cover	332
Removable Canopy Mounting Area Inspection.....	334
Right Side Cover.....	333
Additional Messages	15
Air Conditioner (8).....	19
Alternate Exit (5).....	19
Cat®Product Link™ (3).....	18
Diesel Fuel Requirements (9).....	20
Front Window Usage (1).....	17
Hammer Operation (2).....	18
Hydraulic Oil Level Check (10).....	21
Joystick Controls Alternate Patterns (4).....	18
No Step (6).....	19
Radial Seal Air Filters (7).....	19
Adjustable Gauge Undercarriage Frame	324
Expanding the Undercarriage and Retracting the Undercarriage	324
Air Cleaner Dust Valve - Clean/Inspect.....	349
Air Conditioner/Cab Heater Filter (Recirculation) - Inspect/Replace	349
Air Conditioner Filter.....	350
Cab Intake Air Filter	349
Alternate Exit.....	233

B

Battery - Recycle	351
Battery Disconnect Switch	244
Battery Hold-Down - Tighten.....	351
Battery or Battery Cable - Inspect/Replace... Battery Recycle.....	352
Before Operation	33, 231
Before Starting Engine	29
Belt - Inspect/Adjust/Replace	352
Air Conditioner Belt (If Equipped).....	353
Water Pump Belt, Fan Drive Belt, and Alternator Belt	352
Blade Linkage - Lubricate	354
Dozer	354
Blade Operation	316
Increasing the Width of the Blade.....	317
Reducing the Width of the Blade	316

Boom and Stick Linkage - Lubricate	354
Boom, Stick, and Frame - Inspect.....	355
Blade.....	356
Boom.....	356
Lifting Points	356
Lower Frame.....	357
Stick	356
Upper Frame.....	357
Boom/Stick/Bucket Combinations.....	63
Bucket - Remove and Install	313
Installation Procedure.....	313
Removal Procedure.....	313
Bucket Linkage - Lubricate.....	357
Bucket Tips - Inspect/Replace	358
Bucket Tips	358
Burn Prevention.....	24
Batteries.....	24
Coolant	24
Oils.....	24

C

Cab Dome Light	244
Capacities (Refill)	342
Caterpillar Approved Work Tools.....	398
Condenser (Refrigerant) - Clean.....	358
Cooling System Coolant (ELC) - Change	359
Cooling System Coolant Extender (ELC) - Add	361
Cooling System Coolant Level - Check.....	361
Cooling System Coolant Sample (Level 1) - Obtain	362
Crushing Prevention and Cutting Prevention..	23

D

Daily Inspection	231
Declaration of Conformity (European Union).....	229
Declaration of Conformity (Great Britain).....	230
Decommissioning and Disposal.....	398
Demolition	38

E

Electrical Storm Injury Prevention	29
Emissions Certification Film	228
Emissions Warranty Information	397

Engine Air Filter Primary Element - Clean/ Replace	363	Fuel Lift Pump Strainer - Replace (If equipped).....	374
Cleaning Primary Air Filter Elements	363	Fuel System - Prime	374
Inspecting the Primary Air Filter Elements	364	Fuel System Primary Filter (Water Separator) Element - Replace	375
Replacing the Air Filter Element	365	Fuel System Water Separator - Drain	376
Engine Air Filter Secondary Element - Replace	366	Fuel Tank Cap - Clean.....	376
Engine Air Filter Service Indicator - Inspect..	366	Fuel Tank Water and Sediment - Drain	377
Engine and Machine Warm-Up	285	Fuses - Replace	377
Engine Oil and Filter - Change	368	Relays	379
Engine Oil and Filter Change	369	G	
Selection of the Oil and Filter Change Interval	368	General Hazard Information.....	21
Engine Oil Level - Check	367	Containing Fluid Spillage.....	22
Engine Oil Sample - Obtain.....	368	Dispose of Waste Properly	23
Engine Starting.....	33, 285	Fluid Penetration	22
Engine Starting (Alternate Methods).....	330	Inhalation	23
Engine Starting with Jump Start Cables	330	Pressurized Air and Water.....	22
Engine Stopping	38	Trapped Pressure	22
Engine Valve Lash - Check/Adjust	371	General Information	46
Equipment Lowering with Engine Stopped	40, 288	Guards.....	43
Blade (If Equipped).....	289	Guards (Operator Protection) Other Guards (If Equipped)	44
F		Roll Over Protective Structure (ROPS), Falling Object Protective Structure (FOPS), and Tip Over Protection Structure (TOPS).....	44
Film (Product Identification) - Clean.....	372	H	
Cleaning of the Films	372	Hammer Operation (If Equipped).....	314
Final Drive Oil - Change	372	Horn - Test.....	379
Final Drive Oil Sample - Obtain.....	373	Hydraulic System Oil - Change	379
Fire Extinguisher Location.....	28	Hydraulic System Oil Filter (Return) - Replace	382
Fire Prevention and Explosion Prevention.....	25	Hydraulic System Oil Level - Check.....	383
Battery and Battery Cables.....	26	Hydraulic System Oil Sample - Obtain.....	384
Ether	27	I	
Fire Extinguisher.....	27	Identification Information	226
General.....	25	Important Safety Information.....	2
Lines, Tubes, and Hoses	27	J	
Wiring.....	26	Joystick Controls	271
Foreword	4	Joystick Configurations.....	272
California Proposition 65 Warning	4	Joystick Controls Alternate Patterns	282
Certified Engine Maintenance	5	Backhoe Joystick Pattern	283
Literature Information	4	Mitsubishi Joystick Pattern	284
Machine Capacity	5	SCM Joystick Pattern	283
Maintenance	4		
Operation	4		
Product Identification Number	5		
Safety.....	4		
Freezing Conditions	320		
Frozen Ground Conditions	288		

Shin-Ko Joystick Pattern	284	Every 10 Service Hours or Daily for First 100 Hours	347
L		Every 10 Service Hours or Daily for Machines Used in Severe Applications.....	348
Leaving the Machine	321	Every 100 Service Hours	348
Lifting and Tying Down the Machine	325	Every 1000 Service Hours.....	348
Lifting the Machine.....	326	Every 12 000 Service Hours.....	348
Positioning the Machine for Lifting	325	Every 250 Service Hours.....	348
Tying Down the Machine	327	Every 3 Years.....	348
Lifting Capacities	64	Every 3000 Service Hours	348
301.5	65	Every 50 Service Hours	348
301.6	89	Every 500 Service Hours	348
301.7	113	Every 6000 Service Hours.....	348
301.8	129	Every 750 Service Hours	348
302	177	Initial 500 Service Hours.....	348
Configuration Identification.....	65	When Required.....	347
Symbols Found in the Lifting Capacity Charts	65	Maintenance Section.....	332
Lifting Hook - Inspect.....	384	Maintenance Support	343
Lifting Objects.....	38	Mirror (If Equipped)	267
Light - Test.....	385	Mirror Adjustment	268
Lubricant Viscosities (Fluids Recommendations)	336	Monitoring System.....	249
Biodiesel Fuel Recommendations.....	341	Display System Mode	266
Coolant Information	341	Main Menu	253
Diesel Fuel Recommendations	340	Monitor Wake-up Feature	267
Engine Oil	336	Performance Display	250
Fuel Additives	341	Seat Belt Reminder System (If Equipped).....	266
General Information for Lubricants.....	336	Mounting and Dismounting	231
Hydraulic Systems.....	337	Machine Access System Specifications....	231
Other Fluid Applications	338	O	
Selecting the Viscosity.....	336	Oil Filter - Inspect	386
Special Lubricants	339	Inspect a Used Filter for Debris	386
Lubricant Viscosities and Refill Capacities ...	336	Operating Technique Information.....	290
M		Digging.....	290
Machine Operation	233	Lifting Objects	291
Machine Security System (MSS)	247	Operating Techniques	290
Armed	249	Operation.....	34, 287
Components	248	Critical Failures	35
Disarmed	249	Limiting Conditions and Criteria	35
General Information.....	247	Machine Operating Temperature Range	35
Push to Start with Bluetooth Key Fob.....	248	Machine Operation	37
Standard Key	248	Machine Operation when the Machine is not Completely Assembled.....	38
Machine Storage and Specified Storage Period	322	Operation Information	287
Machine Storage	322	Lifting Objects	287
Specified Storage Period.....	322	Operating Procedure	287
Maintenance Access	332	Operation Section.....	231
Maintenance Interval Schedule.....	347	Operator Controls.....	235
Every 10 Service Hours or Daily.....	347	Adjustable Undercarriage Switch (12).....	241

Air Outlet (2).....	237	Installation Procedure.....	306
Auxiliary Control Pedal (If Equipped)		Operation	307
(16).....	244	Quick Coupler Removal Procedure.....	306
Dozer Blade Lever / Adjustable Undercarriage		Quick Coupler Operation (If Equipped).....	300
Control (4).....	237	General Operation	301
Engine Speed Dial (6).....	237	Installation.....	301
Engine Start Switch (7).....	238	Quick Coupler Operation	302
Hydraulic Lockout Control (14).....	241	Quick Coupler Ready (If Equipped).....	300
Jog Dial (5).....	237	Quick Coupler Operation (Manual Pin	
Left Joystick Controls (13).....	241	Grabber Quick Coupler (If Equipped))	294
Monitoring System (1)	236	Coupling the Work Tool.....	294
Operators Seat (11)	241	Uncoupling the Work Tool.....	295
Power Outlet (10).....	241	Quick Coupler Operation (Mechanical Pin	
Right Joystick Controls (3).....	237	Grabber Quick Coupler (If Equipped))	297
Right Switch Panel (8)	240	Coupling the Work Tool.....	298
Travel Lever Controls (If Equipped) (15) ...	242	General Operation	297
USB Port (9) (If Equipped).....	241	Installation.....	297
Operator Station	43	Quick Coupler use with a Bucket that is	
		Reversed.....	300
		Uncoupling the Work Tool.....	299
P		R	
Parking	39, 319	Radiator Core - Clean	389
Plate Locations and Film Locations	226	Reference Information Section	398
Electromagnetic Emissions	227	Reference Material	398
Engine Serial Number	228	Reference Materials	398
Eurasian Economic Union	227	Regulatory Information (Japan)	46
Machine Specification Film.....	227	Industrial Safety and Health Act	50
Product Identification Number (PIN)		Operation of Construction Equipment and the	
Plate	226	Governing Laws and Regulations.....	47
Regional Product Marking (If Equipped) ...	226	Qualifications for Machine Operation	46
Sound Certification	228	Standard Certificate of Transfer	49
Prepare the Machine for Maintenance.....	343	Trailer Transportation	46
Product Information Section.....	46	Restricted Visibility	30
Product Link	246	301.5	30
Data Broadcasts	246	301.6	31
Operation in a Blast Site for Product Link		301.7 CR.....	31
Radios.....	247	301.8	32
		302 CR.....	32
Q		Rubber Belt Track Operation.....	317
Quick Coupler - Check	386	S	
Quick Coupler - Clean	387	S·O·S Information	342
Quick Coupler - Clean/Inspect	387	Safety Messages.....	6
Quick Coupler - Lubricate.....	389	Aerosol Starting Aid (10)	13
Spindle Lubricate	389	Crushing Hazard (14c)	14
Quick Coupler - Lubricate (If Equipped).....	388	Crushing Hazard (1D).....	9
Quick Coupler - Lubricate (Mechanical Pin		Crushing Hazard (3)	10
Grabber Quick Coupler (If Equipped))	388	Crushing Hazard (4)	11
Quick Coupler Operation (CW (Single		Crushing Hazard (5)	11
Lock) Quick Coupler (If Equipped)).....	305		
Daily Inspection	307		
General Operation	306		

Crushing Hazard (6)	12	System Pressure Release.....	345
Crushing Hazard (9)	13	Coolant System	345
Crushing Injury (14d)	15	Hydraulic System.....	345
Do Not Operate (1A).....	8	T	
Do Not Weld or Drill (TOPS/FOPS) (2)	10	Table of Contents	3
Electrical Power Lines (1C)	9	Towing Information	329
High-Pressure Cylinder (12).....	14	Towing the Machine.....	329
High-Pressure Gas (13).....	14	Track Adjustment - Adjust	392
Improper Connections For Jump-Start Cables (1B)	9	Loosening the Track	392
Keep Engine Clean (7)	12	Tightening the Tracks	392
Overload Warning Device (8)	12	Track Adjustment - Inspect.....	393
Pressurized System (11)	13	Measuring Rubber Track Tension	393
Product Link (14b)	14	Measuring Steel Track Tension	394
Seat Belt (14a).....	14	Track Information	29
Safety Section	6	Transportation Information	323
Seat	234	Travel Alarm - Test	394
Seat Belt	234	Travel in Water and Mud	293
Extension of the Seat Belt	235	Procedure for Removing the Machine from Water or Mud	293
Seat Belt Adjustment for Retractable Seat Belts	235	U	
Seat Belt - Inspect	389	Undercarriage - Check	395
Seat Belt - Replace	390	V	
Service Interval Chart.....	343	Visibility Information	29
Shipping the Machine.....	323	Restricted Area	30
Loading The Machine	323	W	
Unloading The Machine.....	323	Warranty Information.....	397
Slope Operation	39	Warranty Section	397
Sound Information and Vibration Information.....	40	Welding on Machines and Engines with Electronic Controls	346
Sound Level Information.....	40	Window (Front).....	269
Sound Level Information for Machines Required by the Applicable Regional Regulations	41	Cab Machines.....	269
Sources.....	43	Canopy Machines	269
Vibration Information Applicable to Regional Regulations	41	Window Washer Reservoir - Fill	395
Specifications	51	Window Wiper - Inspect/Replace	395
Carbon Dioxide (CO ₂) Emissions Statement.....	51	Windows - Clean	395
Expected Life	51	Cleaning Methods.....	395
Intended Use	51	Polycarbonate Windows (If equipped)	396
Specification Data.....	52	Work Tool Control.....	274
Working Ranges	58	Adjustable Primary Auxiliary Valves	281
Stopping the Engine	320	Auxiliary Bucket Cylinder Diverter Circuit (AUX V) (If Equipped)	277
Stop the Engine if an Electrical Malfunction Occurs.....	320	Auxiliary Bucket Cylinder Diverter Circuit Control (If Equipped).....	280
Stopping the Machine.....	319		
Storage and Literature Compartment	267		
Swing Frame Pin - Lubricate	390		
Swing Gear and Bearing - Lubricate	391		

Auxiliary Control Pedal (AUX 1) (If Equipped).....	279
Continuous Flow	278
Primary Auxiliary Hydraulic Circuit (AUX I).....	275
Secondary Auxiliary Control (AUX II) via the Switch on the Joystick (Two-way flow) and Boom Swing Control (If Equipped)	280
Secondary Auxiliary Hydraulic Circuit (AUX II) (If Equipped)	276
Work Tool Flow Mode Control	278
Work Tools.....	34

Product and Dealer Information

Note: For product identification plate locations, see the section "Product Identification Information" in the Operation and Maintenance Manual.

Delivery Date: _____

Product Information

Model: _____

Product Identification Number: _____

Engine Serial Number: _____

Transmission Serial Number: _____

Generator Serial Number: _____

Attachment Serial Numbers: _____

Attachment Information: _____

Customer Equipment Number: _____

Dealer Equipment Number: _____

Dealer Information

Name: _____ Branch: _____

Address: _____

Dealer Contact

Phone Number

Hours

Sales: _____

Parts: _____

Service: _____

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