Operation Section

Before Operation

i04021647

Mounting and Dismounting

SMCS Code: 7000

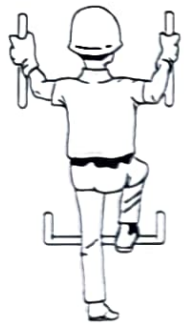


Illustration 29 g00037860

Typical example

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

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

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

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

Do not mount a moving machine. Do not dismount a moving machine. Never jump off the machine. Do not carry tools or supplies when you try to mount the machine or when you try to dismount the machine. Use a hand line to pull equipment onto the platform. Do not use any controls as handholds when you enter the operator compartment or when you exit the operator compartment.

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.

Alternate Exit

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

i04394910

Daily Inspection

SMCS Code: 1000; 7000

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

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

Inspect the area around the machine and under the machine. Inspect the machine components and lines for defects. Look for loose bolts, trash buildup, oil, coolant, fuel, or exhaust leakage, broken parts, or worn parts.

Note: Watch closely for leaks. If you observe a leak, find the source of the leak and correct the leak. If you suspect a leak or you observe a leak, check the fluid levels more frequently.

Inspect the condition of the equipment and of the hydraulic components.

Check all of the oil levels, all of the coolant levels, and all of the fuel levels.

Remove any trash buildup and debris. Make all necessary repairs before you operate the machine.

Make sure that all covers and guards are securely attached.

Adjust the mirrors for the correct rear view of the machine.

Grease the work tool on a daily basis.

Daily, perform the procedures that are applicable to your machine. Refer to the Operation and Maintenance Manual, "Maintenance Interval Schedule" "Every 10 Service Hours or Daily" category for the list of procedures.

Machine Operation

i03879235

Alternate Exit

SMCS Code: 7000

Primary Exit

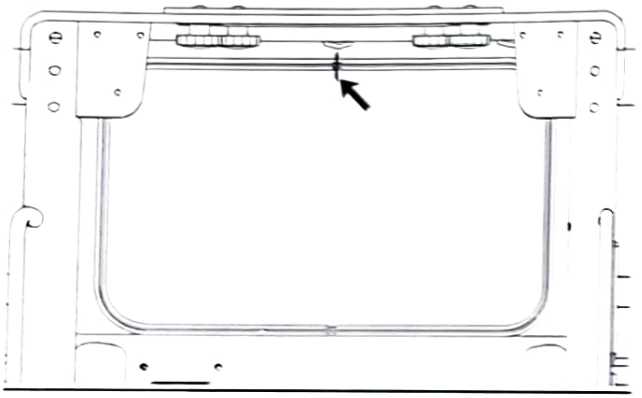


Illustration 30 g00829616

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

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

Secondary Exit

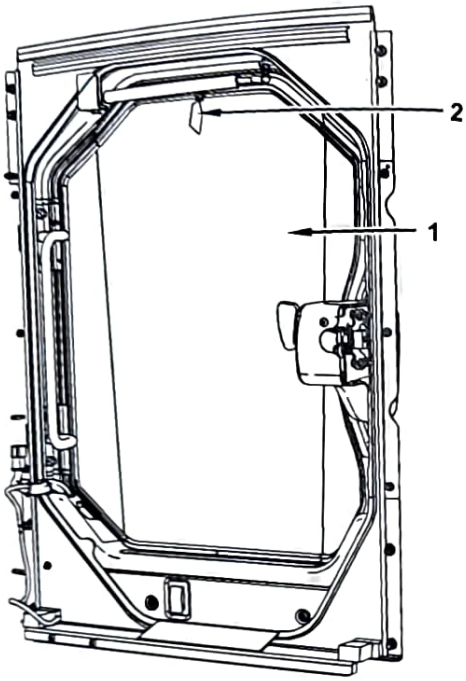


Illustration 31 g01398188

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

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

i04200349

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 Non-Retractable Seat Belts

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

Lengthening the Seat Belt

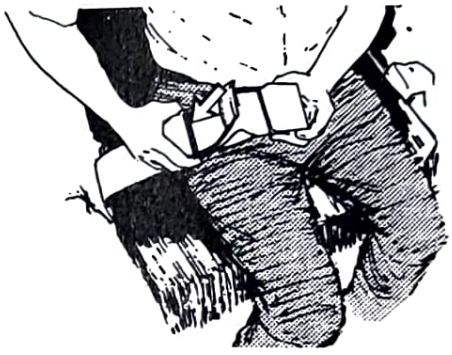


Illustration 32 g00100709

1. Unfasten the seat belt.

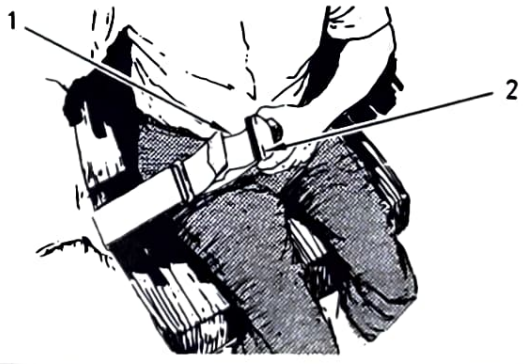


Illustration 33 g00932817

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

Shortening the Seat Belt

Illustration 34 g00100713

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

Fastening The Seat Belt

Illustration 35 g00932818

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

Releasing The Seat Belt

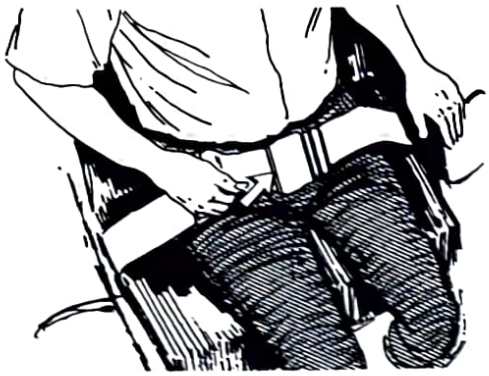


Illustration 36 g00100717

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

Seat Belt Adjustment for Retractable Seat Belts

Fastening The Seat Belt

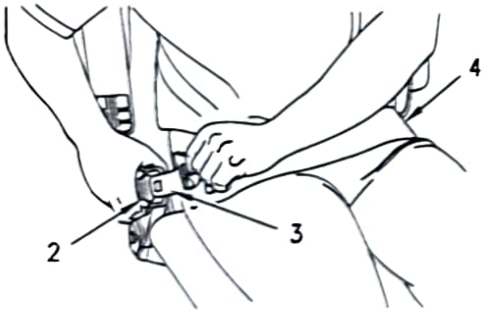


Illustration 37 g00867598

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

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

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

Releasing The Seat Belt

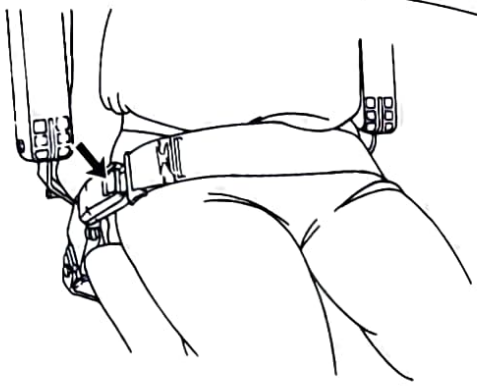


Illustration 38 g00039113

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

Extension of the Seat Belt

⚠ WARNING

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

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

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

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

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

i04399599

Operator Controls

SMCS Code: 7300; 7451

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

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

Illustrations guide the operator through correct procedures of checking, starting, operating, and stopping the machine. Operating techniques that are outlined in this publication are basic. Skill and techniques develop as the operator gains knowledge of the machine and the capabilities of the machine.

The following information briefly identifies the components of the cab. More information on the operation of each item is covered separately in this manual.

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

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

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

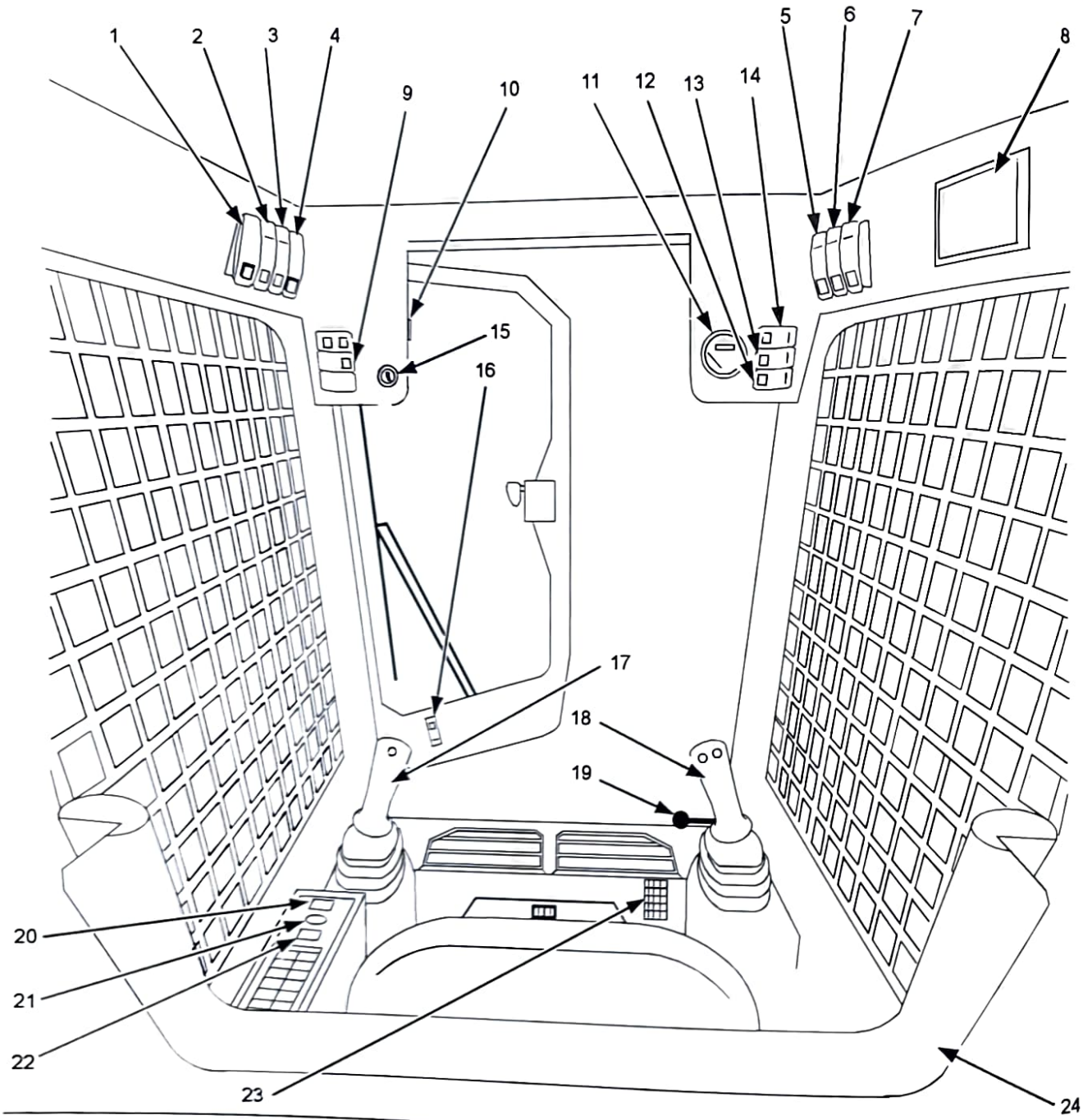


Illustration 39 g02386861

(1) Auxiliary Hydraulic Pressure Release
(2) Automatic Level Control
(3) Auxiliary Electrical Control
(4) Work Tool Coupler Control
(5) Roading Lights
(6) Hazard Flashers
(7) Hydraulic Lockout and Interlock Override
(8) Cab Light
(9) Parking Brake
(10) Service Hour Meter
(11) Fuel Level Gauge
(12) Rear Work Lights
(13) Front Work Lights
(14) Turn Signals
(15) Engine Start Switch
(16) Window Wiper and Window Washer
(17) Joystick Control
(18) Joystick Control
(19) Governor Control
(20) Air Conditioning Control
(21) Temperature Control
(22) Fan Speed Control
(23) Accelerator Control
(24) Interlock Control

Auxiliary Hydraulic Pressure Release (1)

⚠ WARNING

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

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

Auxiliary Hydraulic Pressure Release – Turn the ignition switch to the OFF position. Turn the ignition switch to the ON position. Release the parking brake. Push up on the locking tab. Press the bottom of the switch in order to release the pressure in the Standard Flow Auxiliary Circuit and the High Flow Auxiliary Circuit. Hold the switch for 4 to 5 seconds and release the switch.

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

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

Automatic Level Control (2)

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

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

Auxiliary Electrical Control (3)

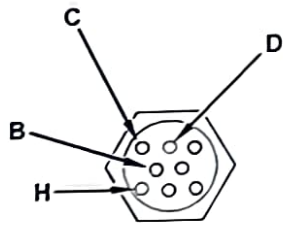


Illustration 40 g01107114

Typical electrical connection on the loading arm (Early models)

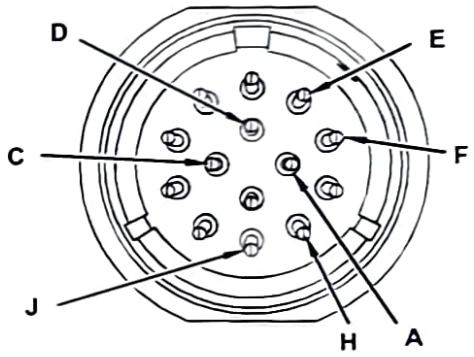


Illustration 41 g02580530

Typical electrical connection on the loading arm (Later models)

(A) Right Hand Trigger Control
(C) C- Control
(D) C+ Control
(E) C2 Control
(F) C1 Control
(J) Control

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

Work Tool Coupler Control (4)

⚠ WARNING

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

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

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

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

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

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

Roading Lights (5)

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

Hazard Flashers (6)

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

Hydraulic Lockout and Interlock Override (7)

Hydraulic Lockout – Press the top of the switch in order to disable the hydraulic functions. Press the top of the switch again in order to activate the hydraulic functions.

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

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

⚠ WARNING

Inadvertent movement of the work tool may occur if the interlock override function is used with work tools. This may result in personal injury or death. Only use interlock override function for hand-held work tools.

Note: The alert indicator for the parking brake will light when the interlock override is activated. When the interlock override is deactivated, press the parking brake switch in order to disengage the parking brake and activate the hydraulic functions.

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

A switch is provided on the cab door that prevents implement operations when the cab door is open. If there is no cab door, install a jumper wire between Terminal 4 and Terminal 5 in the wiring harness connector for the Window Wiper. Refer to Special Instruction, REHS1738, "Installing the Cab Door and Mounting Group" for more information about the cab door.

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

Cab Dome Light (8)

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

Parking Brake Control (9)

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

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

Service Hour Meter (10)

Service Hour Meter – The service hour meter should be used to determine service hour maintenance intervals.

Fuel Level Gauge (11)

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

Rear Work Lights (12)

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

Front Work Lights (13)

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

Turn Signals (14)

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

Engine Start Switch (15)

OFF – Insert the engine start switch key only from the OFF position and remove the engine start switch key only from the OFF position. Turn the engine start switch key to the OFF position in order to stop the engine. In the OFF position, there is no power to most electrical circuits on the machine. The cab lights, panel lights, tail lights, working lights (if equipped), and fuel gauge light are operational even when the engine start switch is in the OFF position.

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

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

Note: For more information on engine starting, refer to Operation and Maintenance Manual, "Engine Starting".

Note: If the engine fails to start, turn the engine start switch key to the OFF position. Attempt to start the engine again.

Window Wiper and Window Washer (16)

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

Joystick Control (17)

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

Joystick Control (18)

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

Governor Control (19)

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

High Idle

Low Idle

Air Conditioner Control (20)

Air Conditioner Control – Press the left side of the switch in order to turn on the air conditioning. Press the right side of the switch in order to turn off the air conditioning.

Temperature Control (21)

Temperature Control – The temperature control knob is a rotary switch. Turn the knob clockwise for warmer air. Turn the knob counterclockwise for cooler air.

Fan Speed Control (22)

Fan Speed Control – Press the left side of the switch for high fan speed. Press the right side of the switch for low fan speed. Move the switch to the middle position in order to turn off the fan.

Accelerator Control (23)

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

Interlock Control (24)

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

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

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

Seat

Standard Seat

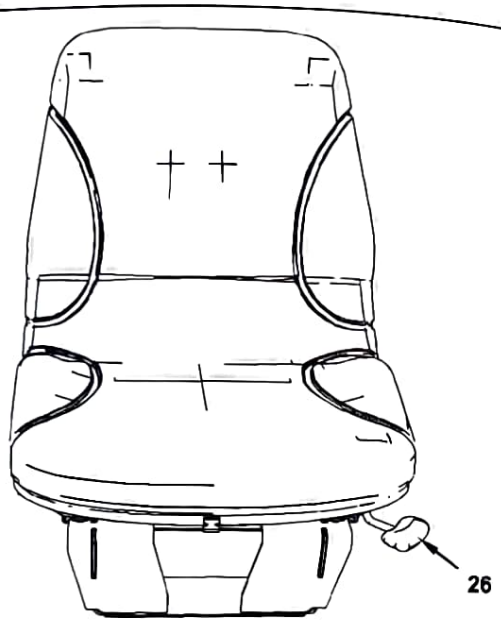


Illustration 42 g02155176

(26) Fore/Aft Adjustment

Standard Seat

Suspension Seat

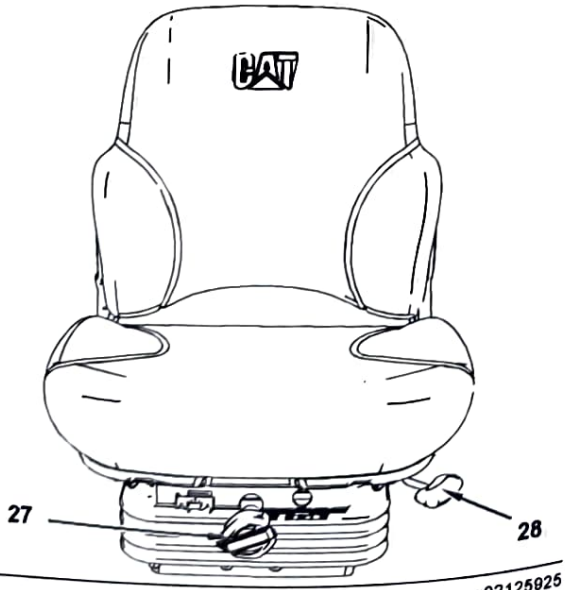


Illustration 43 g02125925

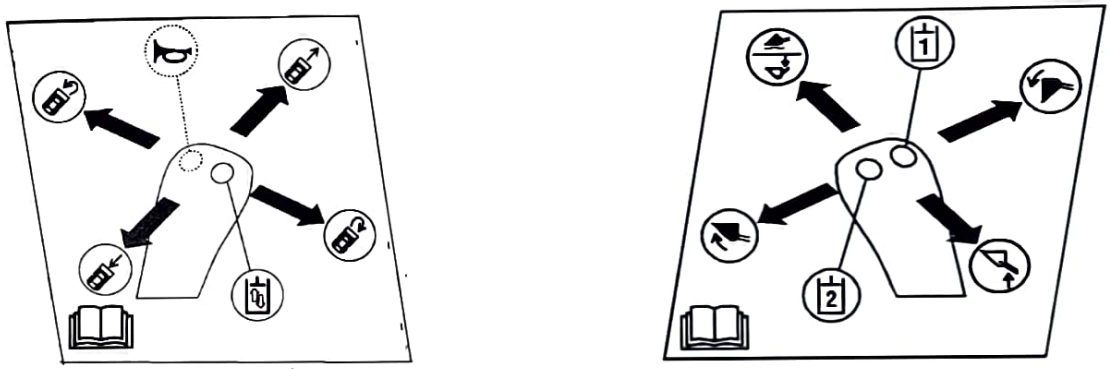
(27) Height Adjustment
(28) Fore/Aft Adjustment

Height Adjustment (27) – Turn the knob in order to adjust the suspension of the seat. Turn the knob clockwise for a heavier person. Turn the knob counterclockwise for a lighter person.

Fore/Aft lever (28) – Move the lever in order to adjust the seat.

Joystick and Auxiliary Hydraulic Controls

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



g01112346

Illustration 44

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

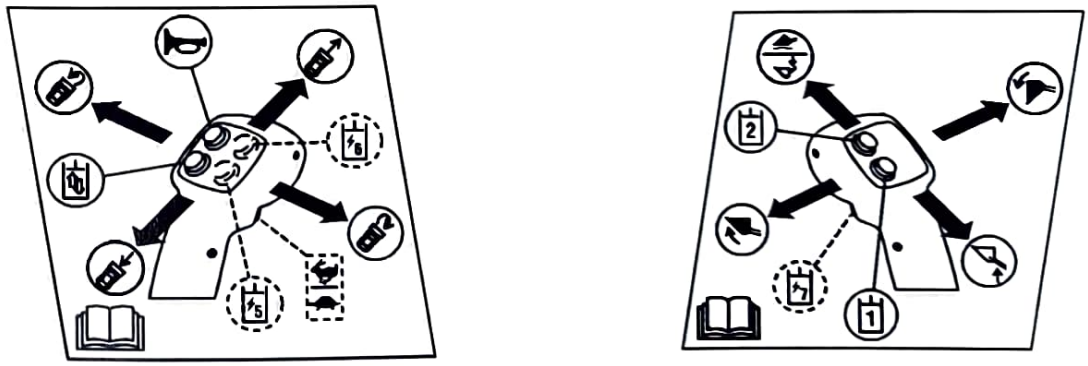


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Illustration 45

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

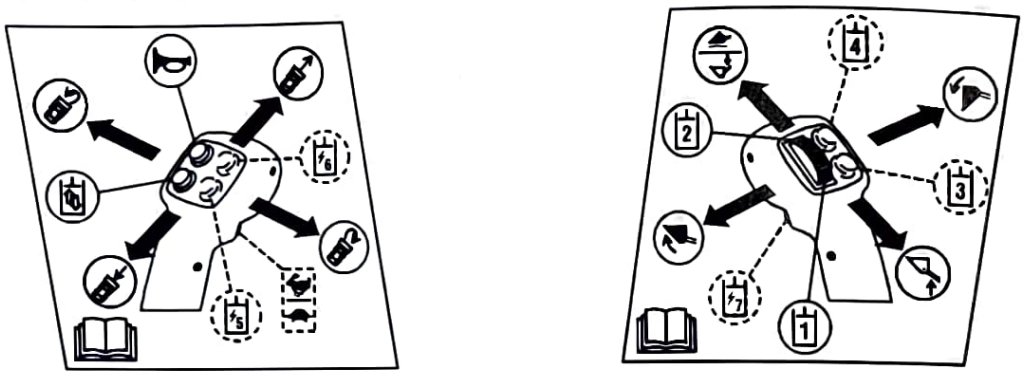

Illustration 46 g01112442

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

Forward

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

Backward

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

Right Turn

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

Left Turn

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

Dump

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

Raise

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

Tilt Back

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

Lower

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

Float

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

Horn

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

Two Speed Control

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

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

Note: Keep the work tool close to the ground when you travel in rabbit mode. The machine will be more stable.

Auxiliary Work Tool Controls

Early Models

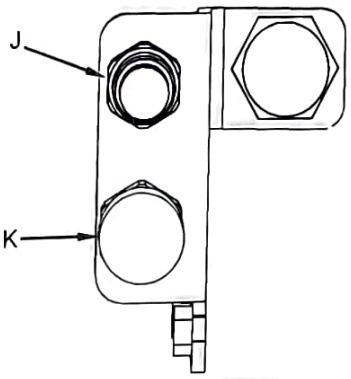

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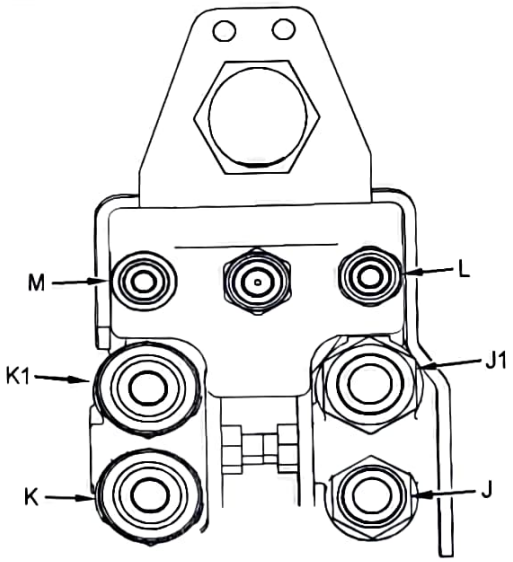
Illustration 47

Standard Auxiliary Connections



g01106740

Illustration 48

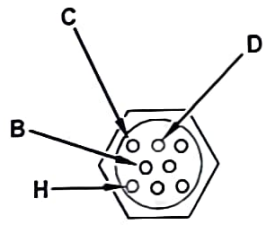
Early Model High Flow

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

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

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

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



g01107114

Illustration 49

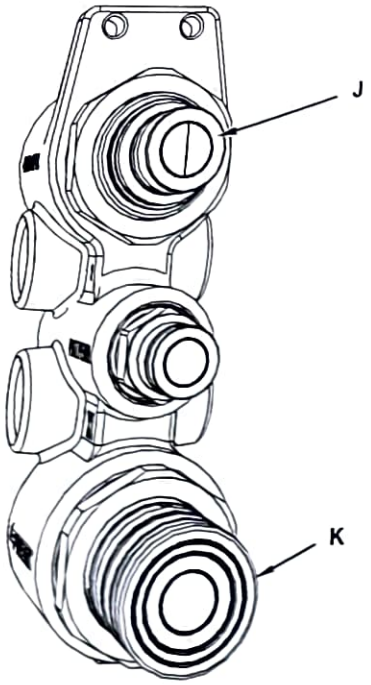
Typical electrical connection on the loading arm

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

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

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

Later Models



g02555596

Illustration 50

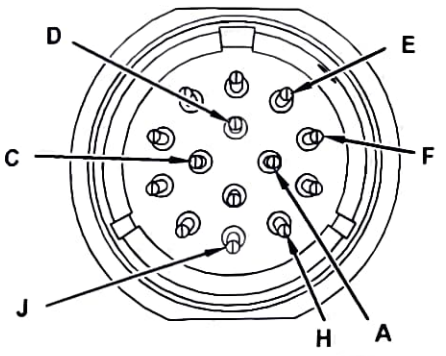
Later Model High Flow

Auxiliary Hydraulic Control (A1) – This control provides hydraulic oil flow to the auxiliary connections on the loader arm. Engage the control in order to provide hydraulic oil flow to the connector (K).

Auxiliary Hydraulic Control (A2) – This control provides hydraulic oil flow to the auxiliary connections on the loader arm. Engage the control in order to provide hydraulic oil flow to the connector (J).

Secondary Auxiliary Hydraulic Control (C-) – This control provides electrical power in order to activate additional work tool functions using a three-position diverter valve that is located on some work tools. Press the switch and hold the switch in order to send power to the pin (C) this will activate the required Work Tool function. Release the switch in order to deactivate the control. If the auxiliary hydraulic controls (1), (2), and continuous flow are inactive and a work tool featuring auto reverse functionality (such as cold planers) is connected, pressing the switch will send power to pin (C) and provide hydraulic flow to connector (K).

Secondary Auxiliary Hydraulic Control (C+) – This control provides electrical power in order to activate additional work tool functions using a three-position diverter valve that is located on some work tools. Press the switch and hold the switch in order to send power to the pin (D) this will activate the required Work Tool function. Release the switch in order to deactivate the control. If the auxiliary hydraulic controls (1), (2), and continuous flow are inactive and a work tool featuring auto reverse functionality (such as cold planers) is connected, pressing the switch will send power to pin (D) and provide hydraulic flow to connector (K).



g02580530

Illustration 51

Typical electrical connection on the loading arm (Later models)

(A) Right Hand Trigger Control
(C) C- Control
(D) C+ Control
(E) C2 Control
(F) C1 Control
(J) Control

Auxiliary Electrical Control (C2) – This control provides electrical power in order to activate additional work tool functions using a three-position diverter valve that is located on some work tools. Press the switch and hold the switch in order to send power to the pin (E) this will activate the required Work Tool function. Release the switch in order to deactivate the control. If the auxiliary hydraulic controls (1), (2), and continuous flow are inactive and a work tool featuring auto reverse functionality (such as cold planers) is connected, pressing the switch will send power to pin (E) and provide hydraulic flow to connector (K).

Auxiliary Electrical Control (C1) – This control provides electrical power in order to activate additional work tool functions using a three-position diverter valve that is located on some work tools. Press the switch and hold the switch in order to send power to pin (F) this will activate the required Work Tool function. Release the switch in order to deactivate the control. If the auxiliary hydraulic controls (1), (2), and continuous flow are inactive and a work tool featuring auto reverse functionality (such as cold planers) is connected, pressing the switch will send power to pin (F) and provide hydraulic flow to connector (K).

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

Note: These controls need to be used in conjunction with individual Work Tool Operation and Maintenance Manual to understand fully the functions of each control.

Continuous Flow Control

Continuous Flow – The continuous flow control supplies continuous flow of hydraulic fluid to the auxiliary hydraulic circuit without continuously holding the auxiliary hydraulic control. Press one of the two auxiliary hydraulic switches that are located on the right side joystick. Press the continuous flow switch on the left hand joystick and release the continuous flow switch. Immediately release the auxiliary hydraulic switch after you release the continuous flow switch. The continuous flow function will be activated if the operator releases the auxiliary hydraulic switch within one second of releasing the continuous flow switch. Press on either the auxiliary hydraulic control or the continuous flow switch in order to stop the flow to the auxiliary circuit.

Dedicated Dual Direction Control Kit

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

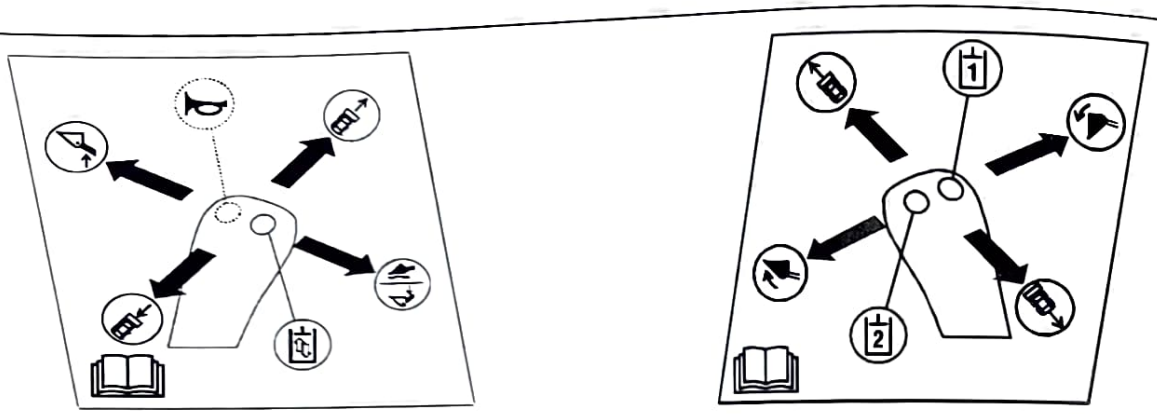


Illustration 52 g01112348

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

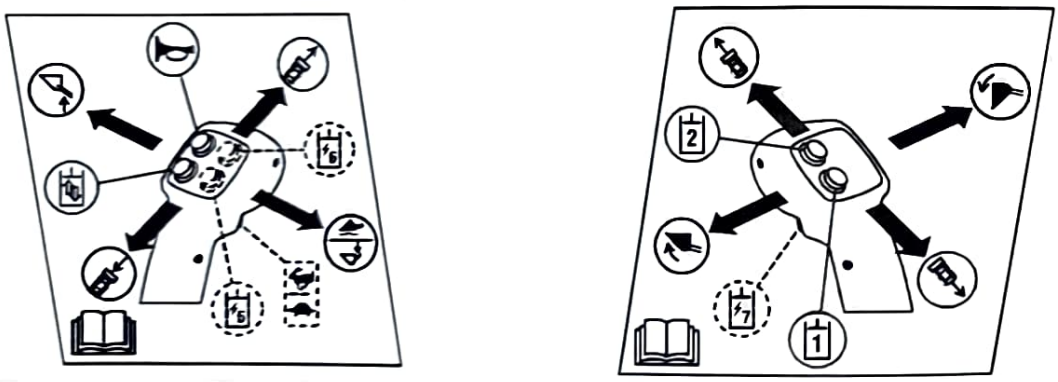


Illustration 53 g01112448

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

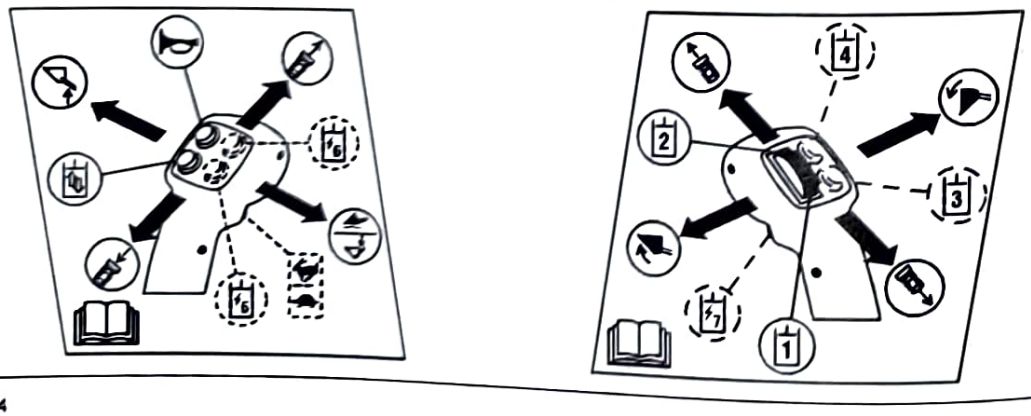


Illustration 54 g01112451

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

Forward

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

Reverse

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

Right Turn

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

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

Left Turn

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

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

Float

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

Lower

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

Raise

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

Dump

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

Tilt Back

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

i03879447

Alert Indicators

SMCS Code: 7450; 7451

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

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

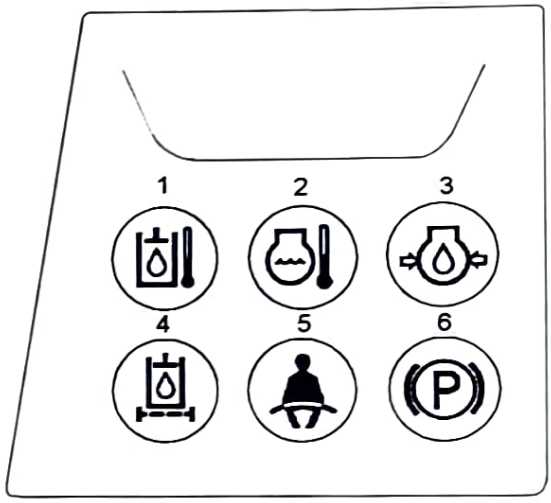


Illustration 55 g01015590

Left side

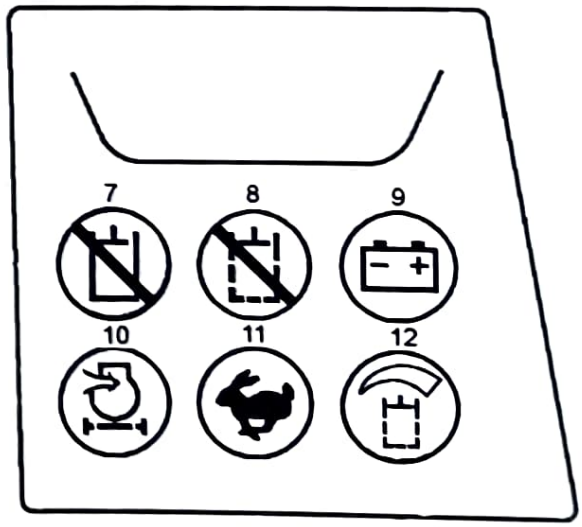


Illustration 56 g02125723

Right Side

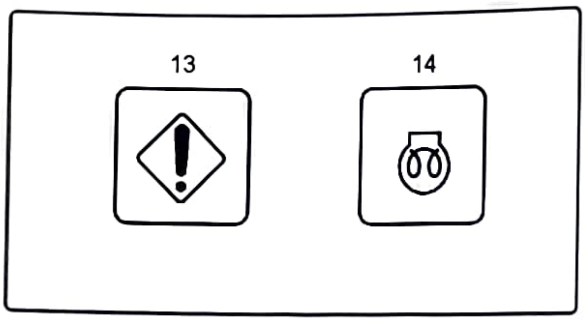


Illustration 57 g02125769

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

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

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

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

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

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

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

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

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

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

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

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

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

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

Note: High flow will not operate if rabbit mode has been selected with the two speed control.

Hydraulic High Flow (12) – This alert indicator will light when the high flow hydraulic system is activated.

Note: High Flow should not be operated in continuous flow mode.

Note: High flow will not operate if rabbit mode has been selected with the two speed control.

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

Note: High flow mode requires an electrical connection that is located on the loader arm. Refer to Operation and Maintenance Manual, "Work Tool Coupler Operation" or Operation and Maintenance Manual, "Work Tool Operation" for additional details.

Driver Alert (13) – This alert indicator will activate when there is a problem which requires the operator's attention.

Note: Other alert indicators that light or the gauges may help investigate the cause of any problems.

There are three levels of severity for the indicator:

- Level 1 - If the alert indicator is on continuously, stop the machine at the earliest convenience. Investigate the cause. If no additional alert indicators are illuminated, contact your Caterpillar dealer or refer to the service manual.
- Level 2 - If the alert indicator is flashing and there is no audible alarm, severe component damage could occur. Change your operation or perform the indicated maintenance.
- Level 3 - If the alert indicator is flashing and there is an audible alarm, injury to the operator or severe component damage could occur. Stop the machine immediately and stop the engine.

Glow Plug Starting Aid (14) – With the engine start switch in the ON position, this alert indicator will light when the glow plugs are activated. The operator should wait until this light is no longer illuminated before starting the machine. Refer to Operation and Maintenance Manual, "Engine Starting" for more information about the glow plug starting aid.

i04648130

Product Link

SMCS Code: 7606

Note: Your machine may be equipped with the Product Link system.

The Product Link 121SR system utilizes satellite technology to communicate machine information. The Product Link 420/421 and 522/523 are cellular based communication devices that transmit machine information. This information is communicated to Caterpillar, Cat dealers, and Caterpillar customers. Product Link systems contain Global Positioning System (GPS) satellite receivers.

The capability of two-way communication between the machine and a remote user is available with the Product Link 121SR, 420/421, and 522/523 system. The remote user can be a dealer or a customer. At any time, a user can request updated information from a machine such as hours of use or the location of the machine. Also, the system parameters for Product Link 121SR, 420/421, and 522/523 systems can be changed.

Data Broadcasts

Data concerning this machine, the condition of the machine, and the operation of the machine is being transmitted by Product Link to Caterpillar and/or Cat dealers. The data is used to serve the customer better and to improve upon Caterpillar 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 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 Caterpillar 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 of 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

The Product Link radio transmitter must be disabled by the minimum distance mandated under all applicable legal requirements, or the following Caterpillar recommended distance from the site, whichever is greater: 12 m (40 ft) for Product Link 121SR and 321SR and 3 m (10 ft) for Product Link 420/421 and 522/523.

The following are suggested methods to disable the Product Link 121SR system or the Product Link 522/523 system: (a) Install a Product Link disconnect switch in the machine cab that will allow the Product Link 121SR system or the Product Link 522/523 system module to be shut off. Refer to Special Instruction, REHS2365, "An Installation Guide for the Product Link PL121SR and for the PL300" and Special Instruction, REHS2368, "Installation Procedure For Product Link PL522/523 (Cellular)" for more details and installation instructions. Or, (b) Disconnect the Product Link 121SR system or the Product Link 522/523 module from the main power source by disconnecting the wiring harness at the Product Link module.

For Product Link devices with an internal battery back-up without a radio disable feature including the PL420 system: it is not recommended to operate an asset with this type of device within a blast site, nor should it be operated within the minimum mandated or recommended distance from a blast site perimeter.

The following Product Link system specifications are provided in order to aid in conducting any related hazard assessment and to ensure compliance with all local regulations:

- The transmit power rating for the Product Link 121SR transmitter is 5 to 10 W.
- The operating frequency range for the Product Link 121SR system is 148 to 150 MHz
- The transmit power rating for the Product Link 522/523 transmitter is approximately 1 W.
- The operating frequency range for the Product Link 522/523 system is 824 to 849 MHz, 880 to 915 MHz, 1710 to 1785 MHz, and 1850 to 1910 MHz.
- The transmit power rating for the Product Link 420/421 system is 2 w for 850 MHz and 900 MHz and 1 w for 1800 MHz and 1900 MHz.

Consult your Cat dealer if there are any questions.

Information for the initial installation of the Product Link 121SR system is available in Special Instruction, REHS2365, "An Installation Guide for the Product Link PL121SR and for the PL300". Information for the initial installation of the Product Link 522/523 system is available in Special Instruction, REHS2368, "Installation Procedure For Product Link PL522/523 (Cellular)".

Operation, configuration, and troubleshooting information for the Product Link 121SR system can be found in the Systems Operation, Troubleshooting, Testing and Adjusting, RENR7911, "Product Link 121/321".

Operation, configuration, and troubleshooting information for the Product Link 522/523 system can be found in the Systems Operation, Troubleshooting, Testing and Adjusting, RENR8143, "Product Link - PL522/523".

Information for the initial installation of the Product Link 420 system is available in Special Instruction, REHS5595, "Installation Procedure for Product Link PL420 Retrofit".

Information for the initial installation of the Product Link 421 system is available in Special Instruction, REHS5596, "Installation Procedure for Product Link PL421 Retrofit".

Machine Security

Machine Lock Icon

De-rate – Some machines can have the machine engine de-rated remotely by the owner of the machine. The action causes the machine to operate much slower than normal.

A warning is given before this action occurs on the display with the machine lock icon and "Security Pending". When engine de-rate has happened, the machine display shows the machine lock icon and "Security Enabled". The operator should move the machine to a safe location, apply the parking brake, power the machine down, notify the site supervisor, and contact your local Cat dealer.

Disable – Some machines can be prevented from starting remotely by the owner of the machine. When disabling has happened, the machine display shows the machine lock icon and "Security Enabled". Before the machine is disabled, the machine display shows the machine lock icon and "Security Pending". The operator should notify the site supervisor.

Tampering – Tampering with the Product Link system to disable the Product Link can also result in engine de-rating of the machine. To avoid de-rating, prevent tampering with the Product Link. If, machine diagnostics occur due to Product Link notify your site supervisor immediately to prevent derating. An example of this situation is an antenna becoming damaged.

Note: Leaving the blast site switch in the OFF position for more than 48 machine hours can cause the machine to derate.

Regulatory Compliance

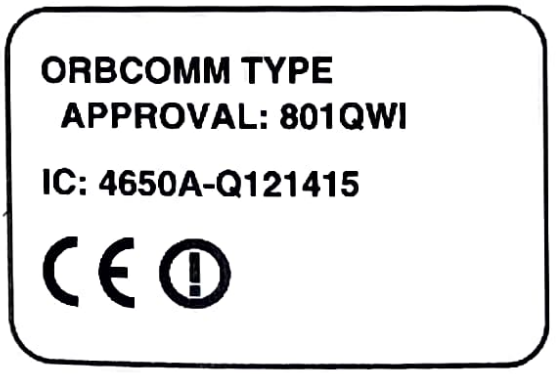


Illustration 58 g01131982

NOTICE

Transmission of information using Product Link is subject to legal requirements that may vary from location to location, including, but not limited to, radio frequency use authorization. The use of Product Link must be limited to those locations where all legal requirements for the use of the Product Link communication network have been satisfied.

If a machine outfitted with Product Link is located in or relocated to a location where (i) legal requirements are not satisfied or (ii) transmitting or processing of such information across multiple locations would not be legal, Caterpillar disclaims any liability related to such failure to comply and Caterpillar may discontinue the transmission of information from that machine.

Consult your Cat dealer with any questions that concern the operation of the Product Link in a specific country.

Engine Starting

i03879237

Engine Starting

SMCS Code: 1000; 7000

⚠ WARNING

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

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

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

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

NOTICE
If the engine does not start within 30 seconds, disengage the starter. Wait for 2 minutes and repeat the procedure.

NOTICE
If you fail to follow the steps described below, damage to the engine or damage to the hydraulic system may occur.

1. Fasten the seat belt.
2. Pull the armrests downward.
3. Before the engine is started, check for the presence of bystanders or maintenance personnel. Ensure that all personnel are clear of the machine. Briefly sound the forward horn before you start the engine.
4. Move the governor control lever or the accelerator pedal to low idle.
5. Turn the engine start switch key to the ON position. If the glow plug indicator light is ON, wait until the light goes out. Then turn the key to the START position. After the engine starts, the glow plugs may continue to operate briefly, even though the light is off. Release the key after the engine has started.
6. Disengage the parking brake.
7. Run the engine for 5 minutes before performing the following procedure. Run the engine at half throttle. Hold the work tool joystick control in the TILT BACK position for thirty seconds. Release the control for thirty seconds. Hold the work tool joystick control in the DUMP position for thirty seconds. Release the control for thirty seconds. Perform the procedure for three minutes.

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

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

8. Keep all personnel away from the machine. Move the machine very slowly to an open area. Repeat Step 7 as you move the machine back and forth for 3 m (10 ft).

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

Operation

i03879242

Operation Information

SMCS Code: 7000

General Information

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

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

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

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

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

NOTICE

The use of this machine in certain applications can cause premature wear and/or failure of the tracks. Applications that may cause premature wear and/or failure of the tracks include: use in rocky terrain, use in gravel, use in concrete demolition, and use in terrain where metal debris is present.

Damage to the tracks that is caused from using the machine in these conditions is not covered under warranty.

Avoid any situation that causes the tracks of the machine to spin on the ground. Avoid spinning the tracks. This will extend the life of the track.

Operating on a Slope

When it is necessary to travel across a slope, never exceed a slope that is greater than 3 to 1 (18.4°).

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

NOTICE

When it is necessary to operate the machine on a slope, keep bucket loads light in order to decrease the possibility of derailing the tracks.

NOTICE

If the correct method for turning is not followed, the tracks may derail.

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

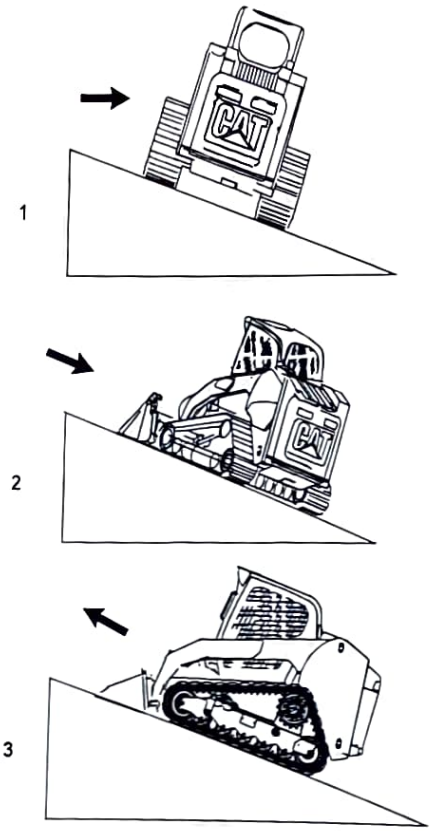


Illustration 66 g01451273

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

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

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

Operating on a Transition

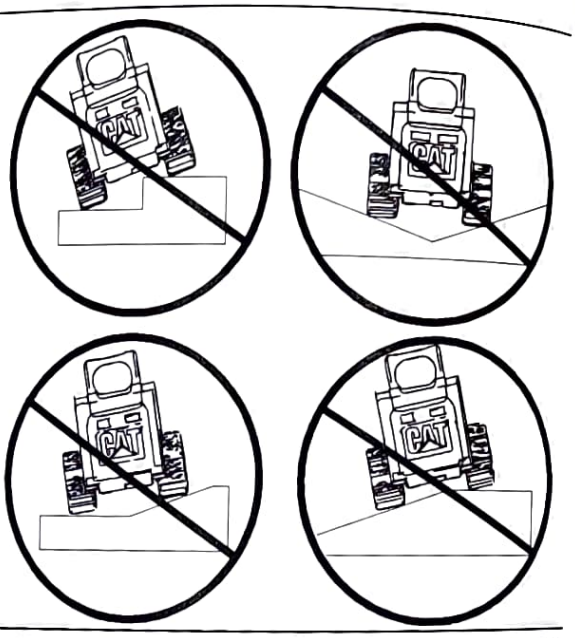


Illustration 67 g01296038

NOTICE
Avoid operating this machine on transitions. Operating this machine on transitions may cause the tracks to derail.

When the machine is operated on a transition, the tracks may not be supported fully.

When the tracks are not supported fully, the wheels may ride on top of the drive lugs of the tracks. The track will derail if you continue to travel on the transition.

If you must travel on a transition, travel the machine at 90° to the transition. Do not perform hard turns or fast turns when you are operating the machine on the transition.

Counterrotate turn

For maximum life of the undercarriage, use more gradual turns while you slowly move forward or reverse. Gradual turns will help minimize wear on the track and wear on the wheels. Only use counterrotate turns, if necessary. Sharp turns will increase the wear on the components of the undercarriage.

i04399611

Work Tool Coupler Operation

SMCS Code: 6129; 7000

⚠ WARNING

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

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

Attaching the Work Tool

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

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

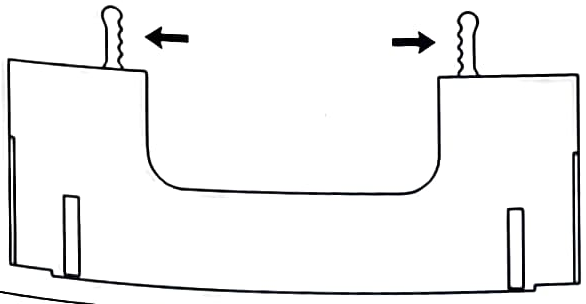


Illustration 68 g00929776

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

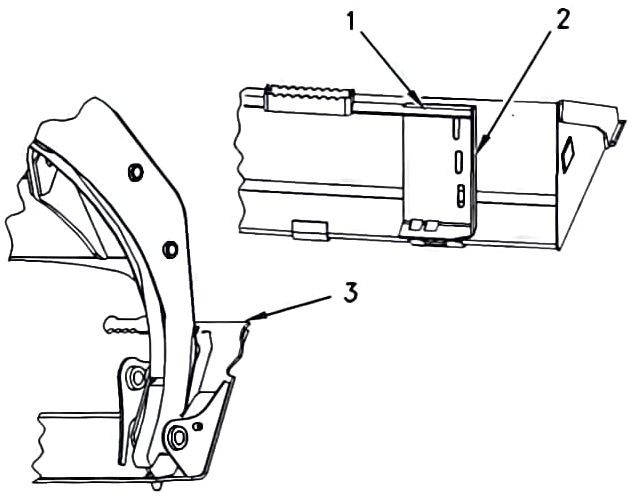


Illustration 69 g00929878

8. Align the quick coupler assembly (3) between the outer plates (2) of the mounting bracket. Move the quick coupler assembly under the angled plate (1) of the mounting bracket and rack back the work tool.
9. Fully lower the loader arms.

⚠ WARNING

Improper attachment of the work tool could result in injury or death. If the work tool touches the ground, the work tool may move away from the coupler. Do not allow the work tool to touch the ground until the coupler pins are fully engaged.

10. Turn the engine start switch key to the OFF position in order to stop the engine.
11. If the work tool requires hydraulics, the hydraulic system pressure must be released before you connect the work tool. Refer to the section "Auxiliary Hydraulic Pressure Release".
12. Exit the machine.

Note: If you are installing a material handling arm that is not equipped with the optional center step, do not exit the machine. A second person needs to perform steps 13 through step 15.

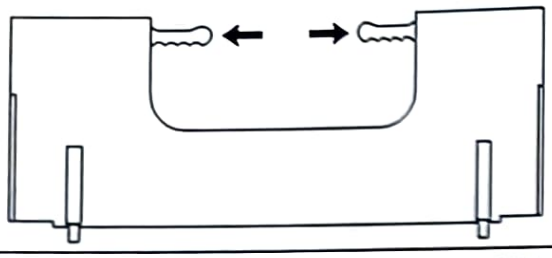


Illustration 70 g00929831

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

14. If the work tool requires hydraulics, refer to the following procedure in order to connect the hydraulic hoses.

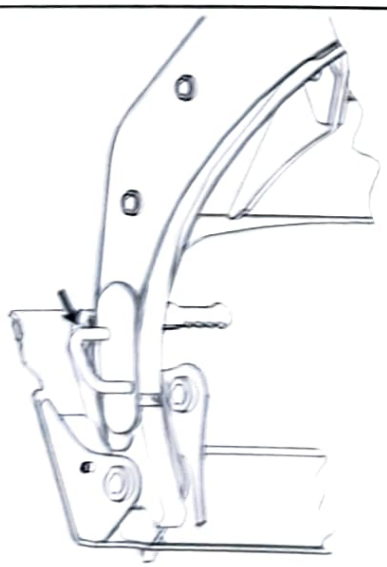


Illustration 71 g00829874

a. Route the hydraulic hoses through the hose guide on the machine in order to prevent damage to the hoses. Not all work tools require the hydraulic hoses to be routed through the hose guide. The work tool Operation and Maintenance Manual will inform you if the hydraulic hoses need to be routed through the hose guide. Caterpillar work tools require the hoses to be routed through the hose guide.

b. Ensure that the quick connect couplers are clean.

c. Connect the auxiliary hydraulic hoses for the work tool to the machine. Twist the collar of the quick connect coupler for one quarter of a turn in order to secure the hydraulic connections. If the work tool uses High Flow hydraulics, refer to Operation and Maintenance Manual, "Joystick and Auxiliary Hydraulic Controls" for operating details.

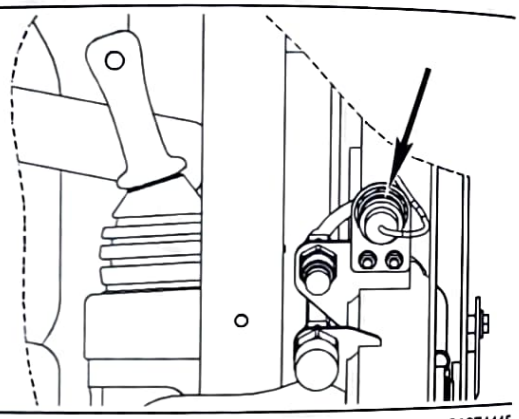


Illustration 72 g01074445
Standard Auxiliary Connection

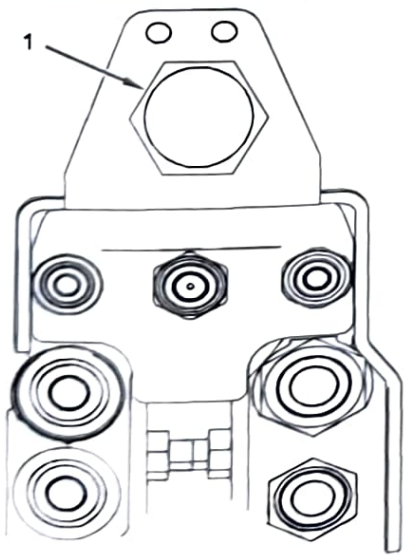


Illustration 73 g01109579
High Flow option (Early model 226B3)

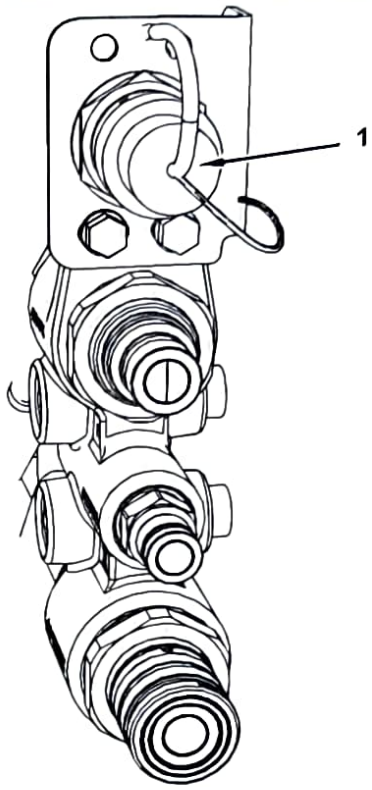


Illustration 74 g02571199

High Flow option (Later models)

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

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

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

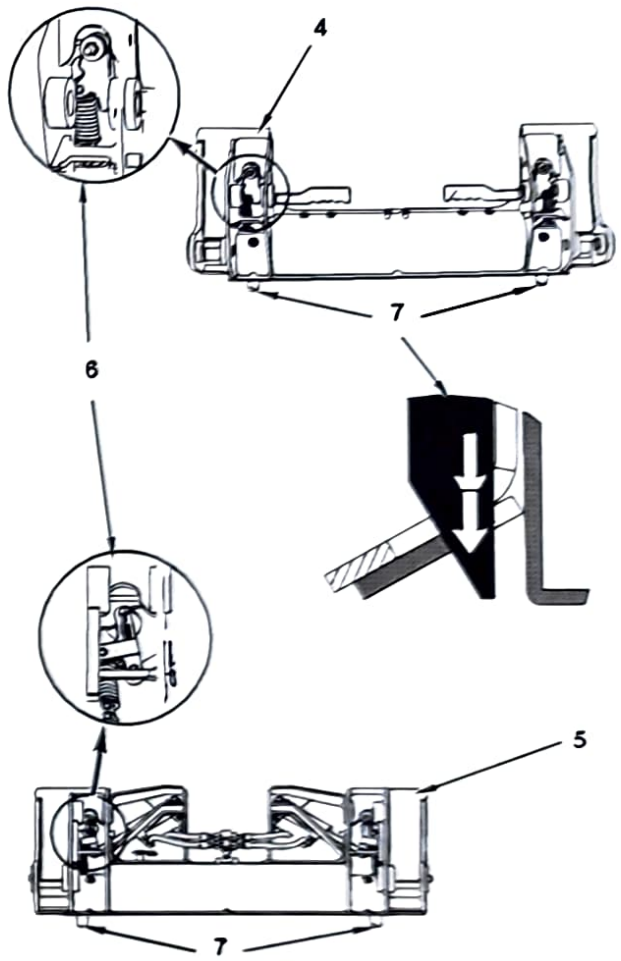


Illustration 75 g01352344

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

15. Visually ensure that both coupler pins (7) are extending out of the holes in the work tool mounting bracket.

16. Use the following procedure to verify engagement of the coupler pins.

a. Enter the machine.

b. Fasten the seat belt and lower the armrests.

c. Start the engine.

d. Disengage the parking brake.

e. Raise the work tool off the ground.

f. Visually inspect the coupler pins (7) in order to ensure that the pins are fully extended through the work tool.

g. Visually inspect the lever (6) that holds the coupler pins in order to ensure that the lever is in the proper position.

h. Activate the tilt control in order to tilt the work tool downward.

i. Apply down pressure on the work tool.

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

j. Move the machine backward. Ensure that the coupler pins do not disengage from the work tool.

17. Test the work tool for leaks and for proper operation.

Removing the Work Tool

⚠ WARNING

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

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

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

⚠ WARNING

Inadvertent movement of the work tool may occur if the coupler pins are disengaged before the auxiliary hose lines are disconnected.

Serious injury or death may result from disengaging the coupler pins before the auxiliary hose lines are disconnected.

Place the work tool in a safe position and disconnect the auxiliary hose lines before disengaging the coupler pins.

NOTICE

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

1. Position the machine on level ground.

2. Lower the work tool to the ground.

3. Rack back the work tool until the work tool is slightly off the ground.

4. Turn the engine start switch key to the OFF position in order to stop the engine.

5. If the work tool requires hydraulics, the hydraulic system pressure must be released. Refer to the section "Releasing the Auxiliary Hydraulic System Pressure".

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

7. Disconnect the auxiliary hydraulic hoses from the machine.

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

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

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

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

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

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

12. Exit the machine.

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

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

14. Enter the machine.

15. Fasten the seat belt and lower the armrest.

16. Start the engine.

17. Disengage the parking brake.

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

19. Back away from the work tool.

Releasing the Auxiliary Hydraulic System Pressure

NOTICE

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

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

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

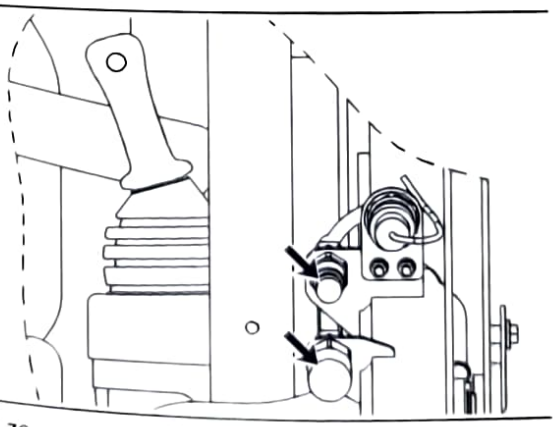


Illustration 76 g00902862

Auxiliary quick connectors

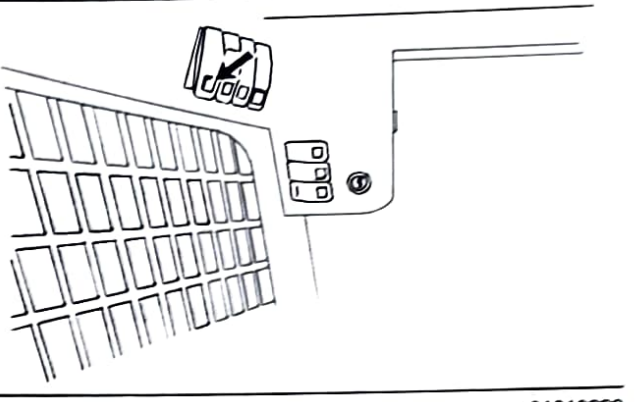


Illustration 77 g01016223

Auxiliary Hydraulic Pressure Release

1. Stop the engine.

2. Move the engine start switch to the ON position and release the parking brake.

3. Push up on the locking tab and press the bottom of the switch in order to release the pressure in the Standard Flow Auxiliary Circuit and the High Flow Auxiliary Circuit (if equipped). Hold the switch for 4 seconds and release the switch.

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

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

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

Secondary Auxiliary Circuit

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

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

1. Fasten the seat belt. Lower the armrest.

2. Turn the engine start switch key to the ON position.

3. Release the parking brake.

4. Activate the controls for the secondary auxiliary function. Activate the controls several times in order to release all the pressure. Refer to Operation and Maintenance Manual, "Auxiliary Hydraulic Controls" for information about the controls.

If the pressure is not released, the accumulator is not charged. Recharge the accumulator by running the engine or cranking the engine for 15 seconds.

Connecting under pressure 226B3, 242B3, 257B3, and 259B3 Later Models

Push the attaching Quick Disconnects together and hold for 5 seconds. Any pressure in the lines will be released, and the couplers can be connected.

Disconnecting under pressure 226B3, 242B3, 257B3, and 259B3 Later Models

Push the attached Quick Disconnects together and hold for 5 seconds. Any pressure in the lines will be released, and the couplers can be separated.

i01954204

Material Handling Arm Operation

SMCS Code: 6542; 6700; 7000

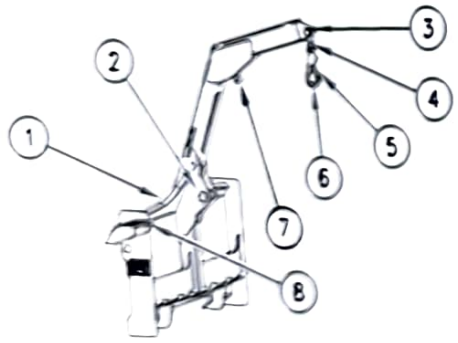


Illustration 78 g00674640

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

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

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

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

⚠ WARNING

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

Two Person Operation

Attaching A Load

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

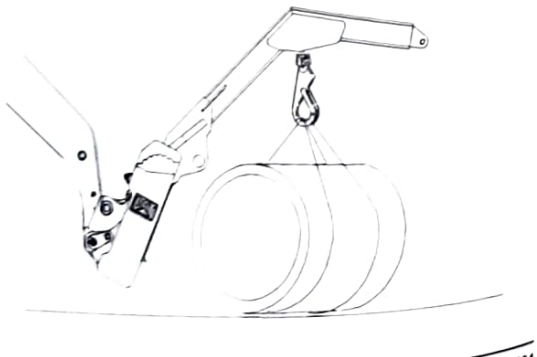


Illustration 79 g01020534

5. Keep the loader arms in the fully lowered position. Slowly position the material handling arm until either lifting point 1 or the lifting point 2 is directly above the load.
6. Tilt the material handling arm forward until the hook is slightly higher than the load in order to minimize swinging of the load.
7. Stop the engine.

8. Wait as the second person attaches the load securely to the hook. The second person needs to ensure that the hook clasp is in the locked position.

9. Ensure that ALL personnel have left the work area.

10. Start the engine.

11. Disengage the parking brake.

12. Slowly tilt back the material handling arm until the material handling arm is fully tilted back.

13. Stop the engine.

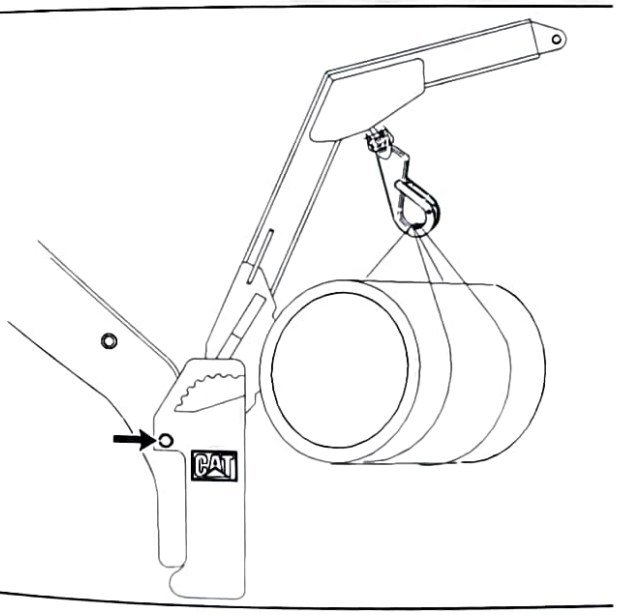


Illustration 80 g01020535

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

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

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

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

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

Removing a Load

1. Slowly tilt back the material handling arm until the material handling arm is fully tilted back. Lower the loader arms fully.

2. Stop the engine.

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

4. Wait as the second person removes the line that secures the load to the tie-down points.

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

6. Remove all personnel from the work area.

7. Start the engine.

8. Disengage the parking brake.

9. Lower the load to the ground.

10. Stop the engine.

11. Wait as the second person removes the load from the hook.

12. Remove all personnel from the work area.

13. Start the engine.

14. Disengage the parking brake.

15. Slowly tilt back the material handling arm until the material handling arm is fully tilted back.

16. Back away from the load.

One Person Operation

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

Attaching the Load

1. Verify that the load does not exceed the weight limit. Refer to the Operation and Maintenance Manual, "Material Handling Arm Rated Load" for the rated load capacities.

2. Keep all personnel out of the work area at all times, except when you are attaching or removing a load.

3. Enter the machine. Start the engine.

4. Disengage the parking brake.

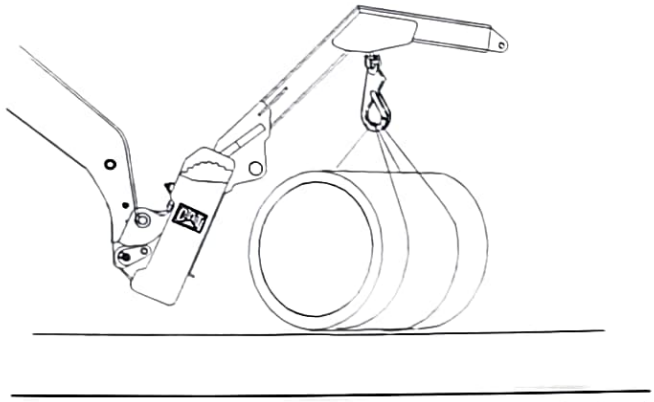


Illustration 81 g01020534

5. Keep the loader arms in the fully lowered position. Slowly position the material handling arm until either lifting point 1 or lifting point 2 is directly above the load.

6. Tilt the material handling arm forward until the hook is slightly higher than the load in order to minimize swinging of the load.

7. Stop the engine. Exit the machine.

8. Attach the load securely to the hook. Ensure that the hook clasp is in the LOCKED position.

9. Keep all personnel out of the work area.

10. Enter the machine. Start the engine.

11. Disengage the parking brake.

12. Slowly tilt back the material handling arm until the material handling arm is fully tilted back.

13. Stop the engine. Exit the machine.

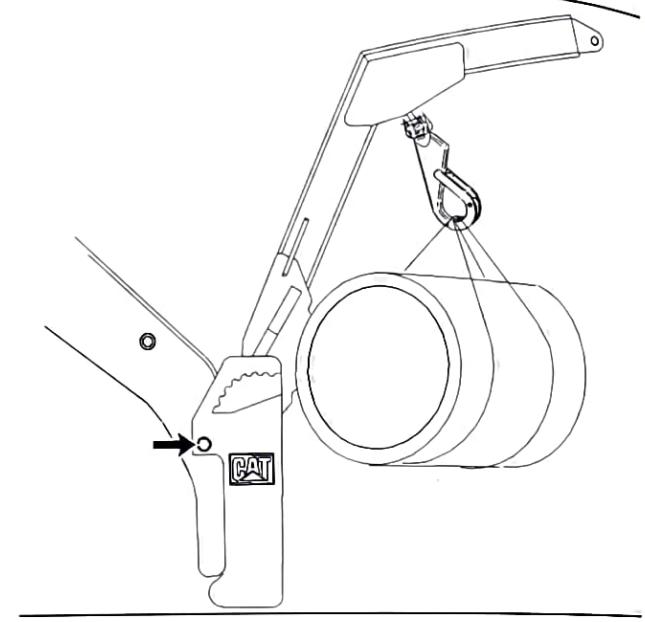


Illustration 82 g01020535

14. Install the position lock pin through the hole in the material handling arm and the hole in the loader arm of the machine.

15. Secure the load to the tie-down points with a suitable line in order to minimize load swing.

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

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

Removing a Load

1. Fully tilt back the material handling arm. Fully lower the loader arms.

2. Stop the engine. Exit the machine.

3. Install the position lock pin through the hole in the loader arm of the machine.

4. Remove the line that secures the load to the tie-down points .

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

6. Keep all personnel out of the work area.

7. Enter the machine. Start the engine.

8. Disengage the parking brake.

9. Lower the load to the ground.
10. Stop the engine. Exit the machine.

Note: Make sure that the load is stable.

11. Remove the load from the hook.
12. Keep all personnel out of the work area.
13. Enter the machine. Start the engine.
14. Disengage the parking brake.
15. Slowly tilt back the material handling arm until the material handling arm is fully tilted back.
16. Back away from the load.

Traveling with a Load

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

i01878348

Pallet Forks Operation

SMCS Code: 6700; 7000

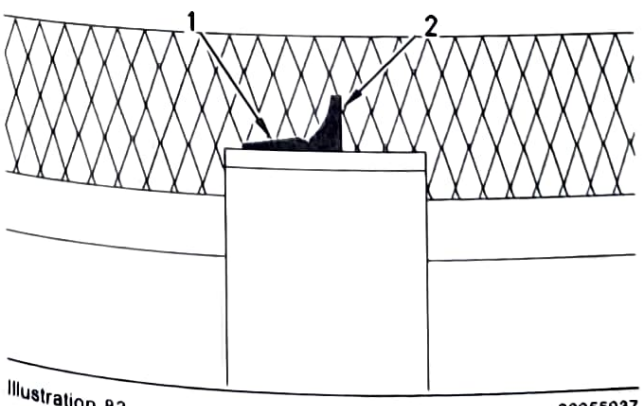


Illustration 83 g00955937

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

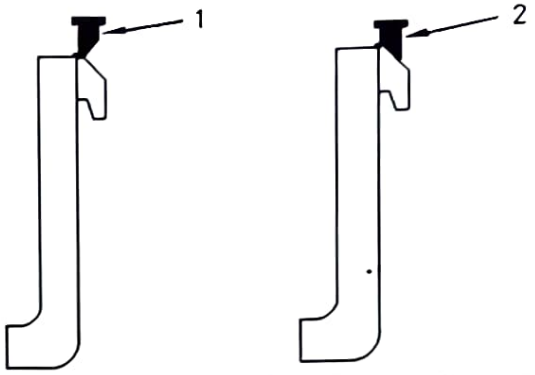


Illustration 84 g00955964

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

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

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

Travel with the load uphill on upgrades and on downgrades.

i04399615

Work Tool Operation

SMCS Code: 6700; 7000

S/N: MWD1-Up

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

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

Note: All of the work tool functions that are described below are viewed as the operator seated in the machine.

Operate the machine and the work tool slowly in an open area. Check for proper operation of all controls and all protective devices on the machine and the work tool.

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

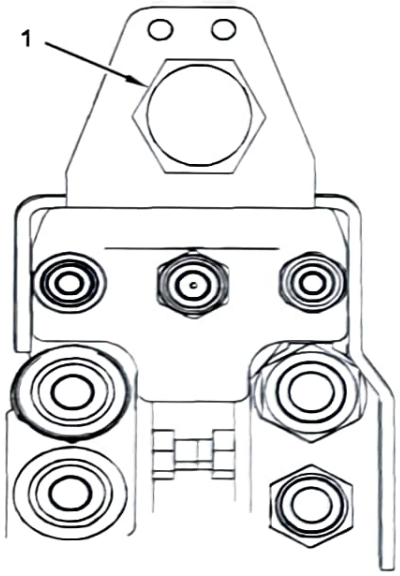


Illustration 85 g01109579

High Flow Connections (Early models)

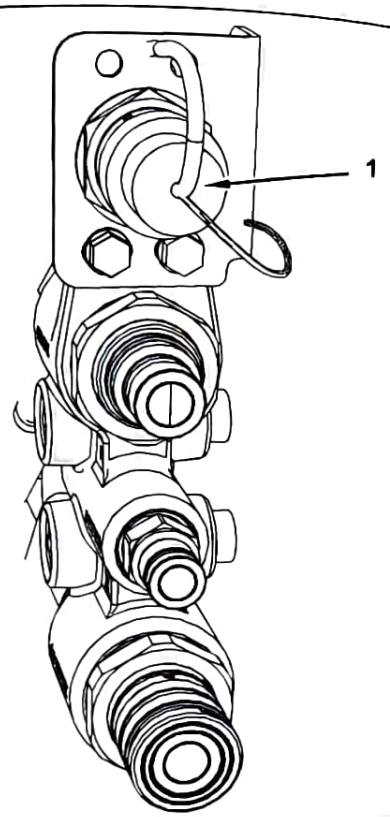


Illustration 86 g02571199

High Flow Connections (Later models)

For all High Flow work tools, refer to Operation and Maintenance Manual, "Joystick and Auxiliary Hydraulic Controls". Connect the wiring harness to the electrical plug (1).

Note: If your High Flow work tool does not have a wiring harness, a Jumper Plug should be installed on the electrical plug (1) for the work tool control. Without this Jumper Plug, the machine will not provide High Flow to the work tool. Consult your Cat for the correct part number for your machine.

Simple Hydromechanical Work Tools

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

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

Table 25

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

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

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

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

Complex Hydromechanical Work Tools

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

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

Parking

i02582658

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.

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

1. Operate the engine for five minutes at low idle with no load.

Note: This allows hot areas in the engine to cool gradually. This will extend the engine life.

2. Move the joysticks to the NEUTRAL position.
3. Turn the engine start switch key to the OFF position.
4. Relieve the pressure in the auxiliary hydraulic system. Refer to Operation and Maintenance Manual, "Work Tool Coupler Operation" for details.
5. Ensure that the engine start switch key is in the OFF position after the pressure in the auxiliary hydraulic system has been relieved.
6. Cover the exhaust opening after the machine has cooled down.

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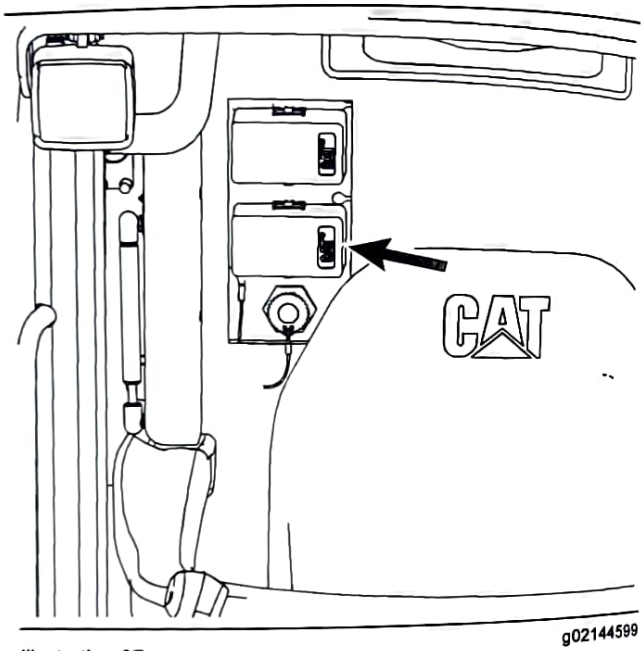
Stopping the Engine if an Electrical Malfunction Occurs

SMCS Code: 1000; 7000

Inside Cab

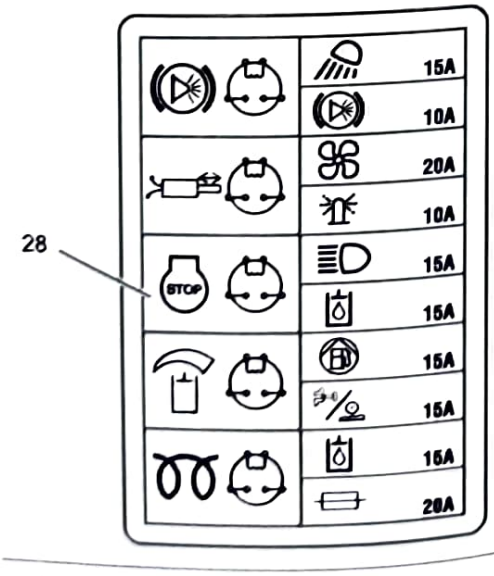


g02144599

Illustration 87

The fuse panel is located behind the seat on the right side.

Remove the cover in order to access the fuse panel.



g02142662

Illustration 88

Remove the relay for the fuel shutoff solenoid (28) in order to shut off the fuel supply to the engine.

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

Outside Cab

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

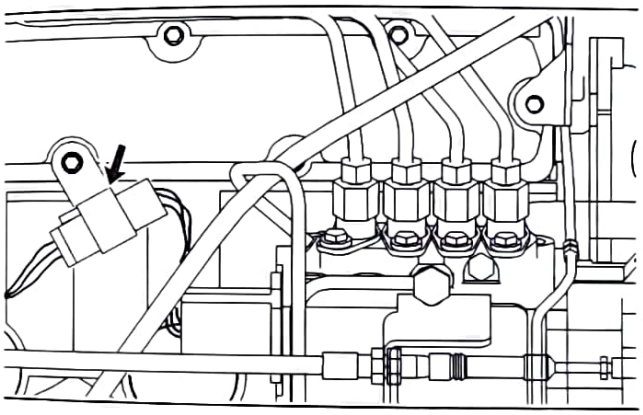


Illustration 89 g00953400

216B3, 226B3, and 247B3 Engine

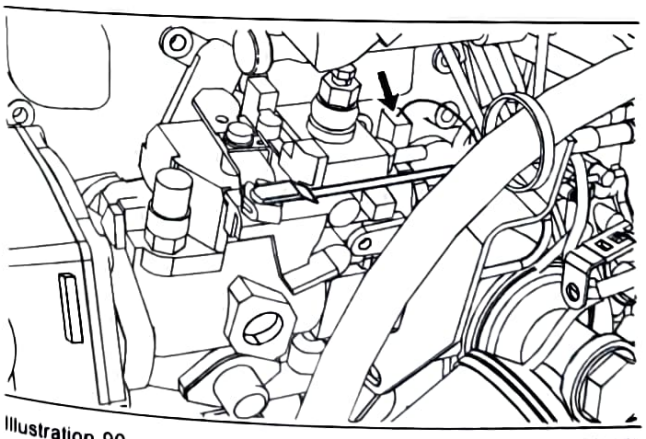


Illustration 90 g01017850

236B3, 242B3, 252B3, 257B3, and 259B3 Engine

4. Unplug the connector for the fuel shutoff solenoid.

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

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Equipment Lowering with Engine Stopped

SMCS Code: 6700; 7000

⚠ WARNING

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

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

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

Lowering the Equipment with the Accumulator Charged

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

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

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

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

Alternate Lowering the Equipment

⚠ WARNING

Personal injury can result from oil under high pressure.

DO NOT allow high pressure oil to contact skin.

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

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

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

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

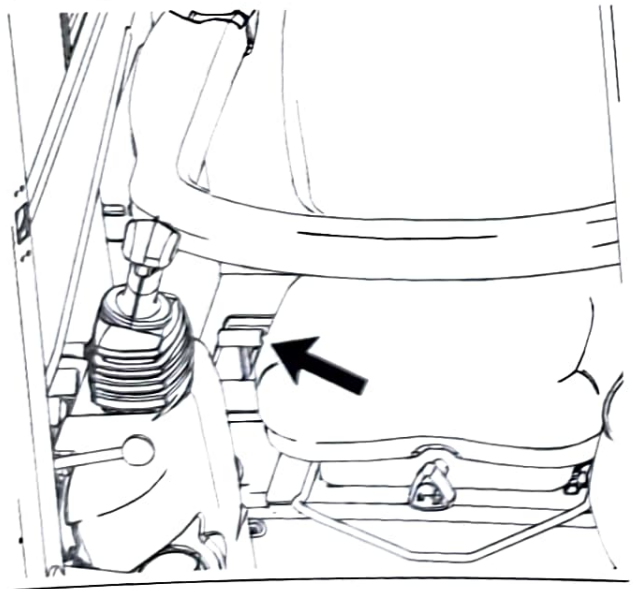

Illustration 91 g02141938

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

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Leaving the Machine

SMCS Code: 7000

Refer to Operation and Maintenance Manual, "Parking" for details about stopping the engine and lowering the equipment.

The use of a wheel chock may be required when you leave the machine at the side of the road in Germany. The wheel chock is located next to the storage box in the cab.

The use of warning triangles may be required when you leave the machine at the side of the road in Germany.

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Machine Storage Procedure

SMCS Code: 7000

NOTICE

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

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

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

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

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

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

Use the following steps to maintain the fuel system.

1. Drain the fuel tank. Follow the procedure that is described in Operation and Maintenance Manual, "Fuel Tank Water and Sediment - Drain".

2. Drain the water separator and replace the element. Follow the procedure that is described in Operation and Maintenance Manual, "Fuel System Water Separator Element - Replace".

3. Fill the fuel tank so that the fuel tank is at least 20% full with Calibration Fluid.

4. Prime the fuel system. Follow the procedure that is described in Operation and Maintenance Manual, "Fuel System Prime".

5. Start the engine and run at low idle for approximately 15 minutes in order to allow the calibration fluid to flush the diesel fuel from the system.

6. Turn off the engine.

7. Add .15 mL (0.02 oz) of commercial biocide for every 1 L (0.3 US gal) of calibration fluid to the fuel tank. Seal all openings to the fuel tank in order to prevent evaporation of the preservative.