

# Operation Section

## Before Operation

i02601969

### Mounting and Dismounting

SMCS Code: 7000



Illustration 24  
Typical example

g00037850

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.

## Daily Inspection

i03921321

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. 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. 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. Inspect the area between lift cylinder and lower plate of the lift tower for debris and clean as necessary. Inspect the rear portion of the right side lift cylinder tower for debris and clean as necessary.

Perform all necessary repairs before you operate the machine.

Ensure that all covers and guards are securely attached.

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

Grease all of the fittings that are scheduled 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

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### Alternate Exit

SMCS Code: 7000

### Primary Exit

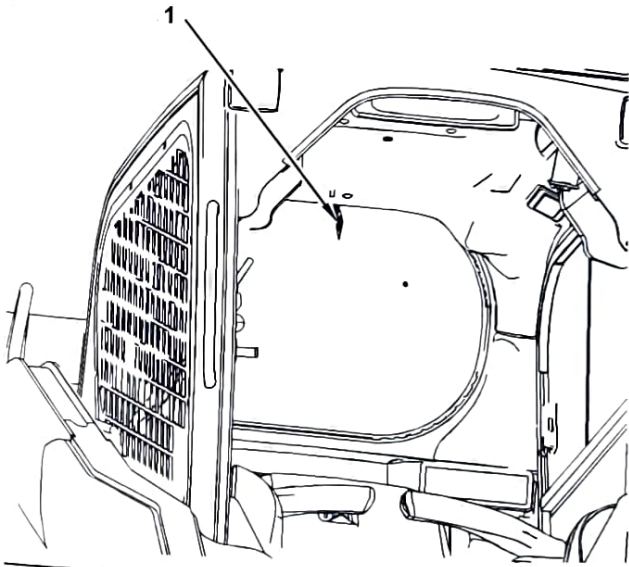


Illustration 25

g01260321

(1) Latch pin

The rear window in the machine serves as the primary alternate exit. The window will need to be removed in order to use the primary alternate exit. Pull on the ring at the top of the window in order to remove 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

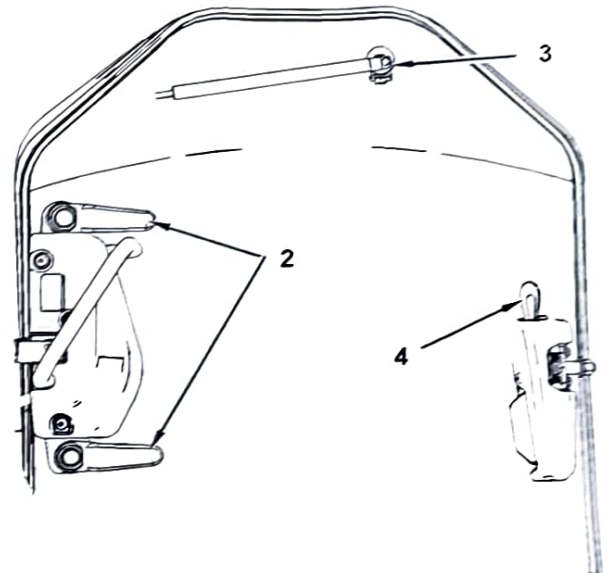


Illustration 26

g01250322

- (2) Release levers for the hinge
- (3) Quick release for the strut
- (4) Door Latch



Illustration 27

g01250324

If necessary, the cab door may be removed from the hinges from the inside of the machine. Use the following procedure:

1. Release the door from the striker (4)
2. Use the two levers (2) in order to release the hinge. Move the upper lever counterclockwise. Move the lower lever clockwise.



3. Locate the quick release (3) on the end of the support strut. Move the quick release to the left and hold the quick release.
4. Push up on the strut in order to release the strut from the mount.
5. Push the door away from the cab.

i03415082

## 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. See your Caterpillar 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

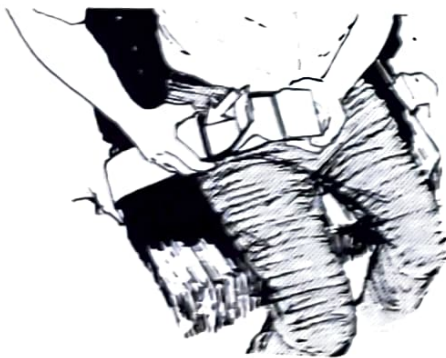


Illustration 28

900100709

1. Unfasten the seat belt.

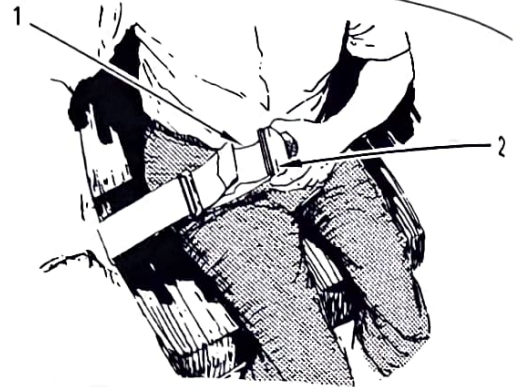


Illustration 29

900932817

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

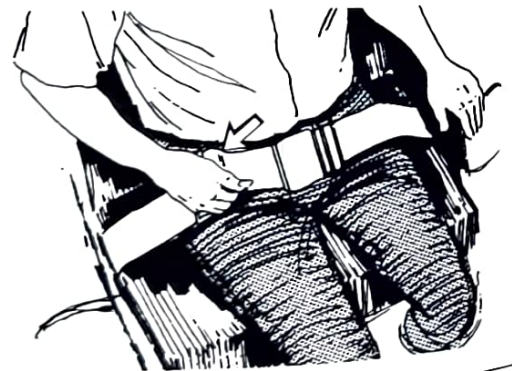


Illustration 30

900100713

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

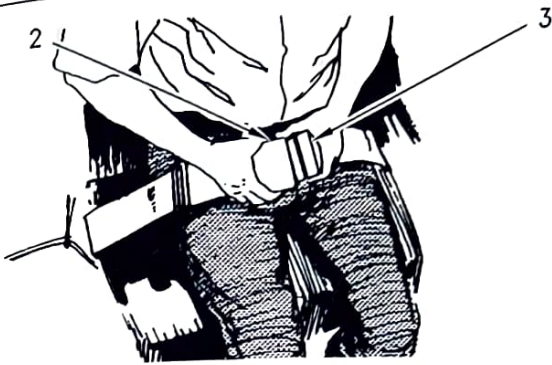


Illustration 31

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

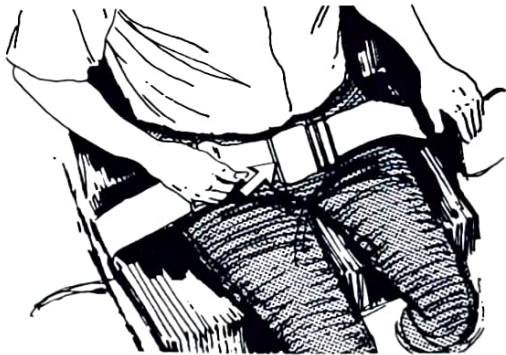


Illustration 32

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

## Seat Belt Adjustment for Retractable Seat Belts

### Fastening The Seat Belt

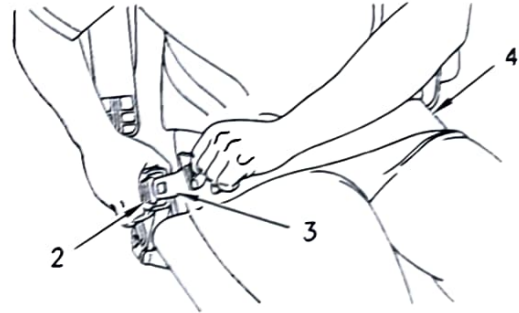


Illustration 33

g00067590

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

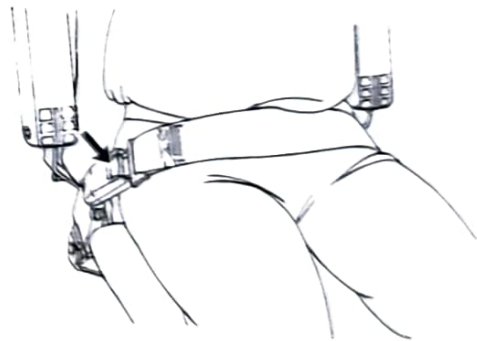


Illustration 34

g00008113

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 Caterpillar dealer for longer seat belts and for information on extending the seat belts.

i04077189

## 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.

**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.

# Left Side Controls

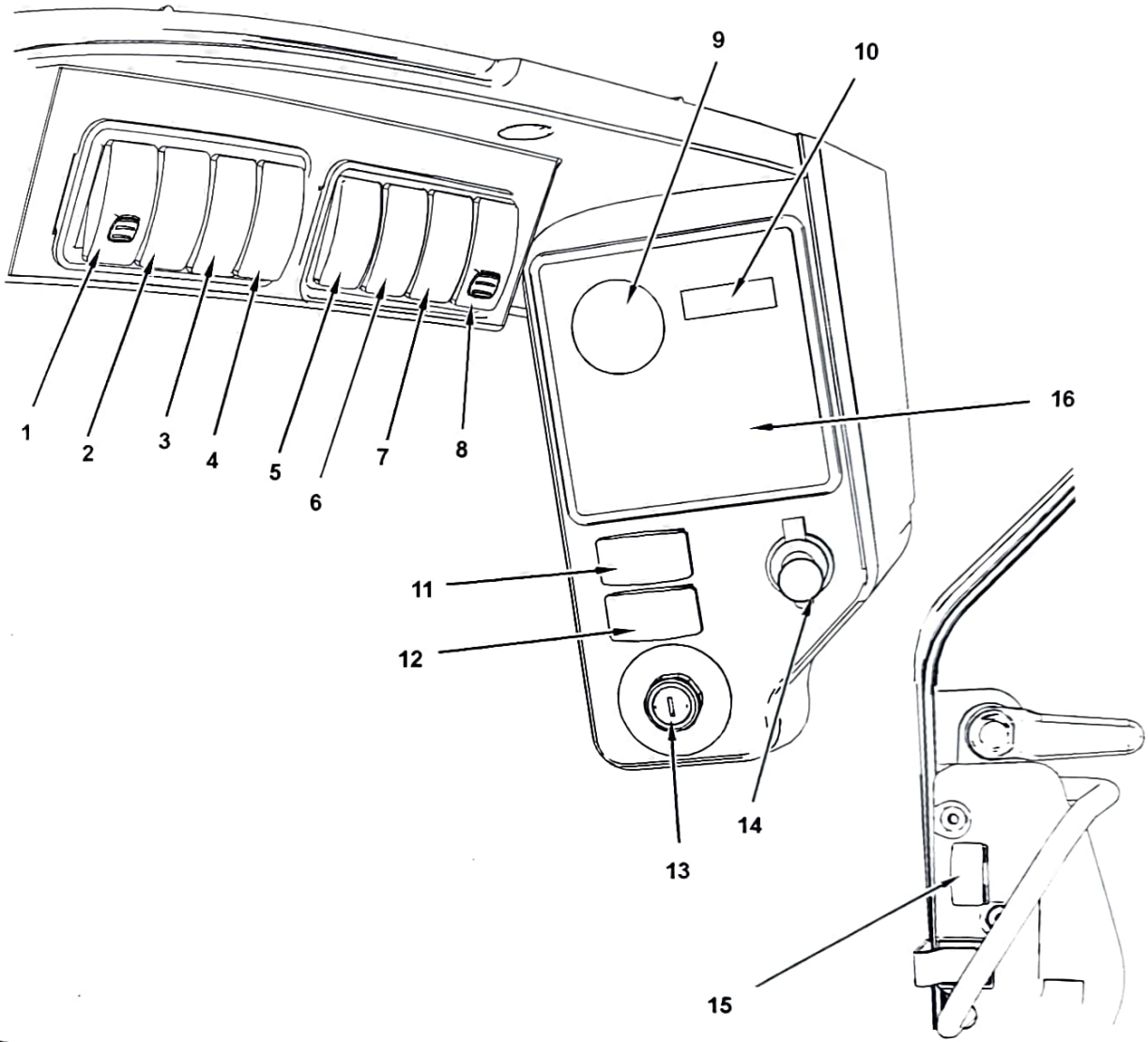


Illustration 35

g01210307

- (1) Auxiliary Hydraulic Pressure Release
- (2) Hydraulic Lockout and Interlock Override
- (3) Rear Work Lights
- (4) Front Work Lights
- (5) Multifunction Switch for the Left Hand Trigger

- (6) Auxiliary Electrical Control
- (7) Automatic Level Control
- (8) Work Tool Coupler Control
- (9) Fuel Level Gauge
- (10) Service Hour Meter
- (11) Joystick Control Pattern

- (12) Parking Brake
- (13) Engine Start Switch
- (14) 12 volt Plug
- (15) Window Wiper and Window Washer
- (16) Alert Indicator Panel

## 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** – After the engine has run in order to charge the accumulator, 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 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. 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. If equipped, the front door must be closed.

**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.

## Hydraulic Lockout and Interlock Override (2)



**Hydraulic Lockout** – Press the top of the switch in order to disable the hydraulic functions. Return the switch to the middle position 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 armrests in the RAISED position. First bring the machine to a complete stop. Activate the continuous flow control that is located on the left side joystick. Refer to the section "Joystick Controls" for detailed information. Press the bottom of the interlock override switch and release the 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 and release 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.

## Switch on the Cab Door

A switch is provided on the cab door that prevents the work tool from operating when the cab door is open. If the cab door is not installed, install a jumper wire between Terminal 2 and Terminal 4 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.

## Rear Work Lights (3)



**Rear Work Lights** – Press the bottom of the switch in order to turn on the lights. Press the top of the switch in order to turn off the lights.

## Front Work Lights (4)



**Front Work Lights** – Press the bottom of the switch in order to turn on the lights. Press the top of the switch in order to turn off the lights.

## Multifunction Switch for the Left Hand Trigger (5)

This switch is used to toggle the function of the trigger on the left-hand joystick between Two Speed and the Auxiliary Electrical Function "AUX 7".

### Two Speed



**Two Speed** – Push the top of the switch in order to use the trigger for the two speed control. Press the trigger and release the trigger on the front of the left-hand joystick in order to activate rabbit mode. In order to return to single speed, press the trigger and release the trigger again.

**Note:** Keep the work tool close to the ground when you travel in rabbit mode. This method will maximize the stability of the machine.

**Note:** Do not move the multifunction switch while the Two Speed function is active. Ensure that the machine is in single speed mode before the Auxiliary Electrical Function "AUX 7" is activated.

**Note:** The creeper must be turned off in order to shift the machine into two speed. If you activate the creeper, the machine will return to single speed. If you set the parking brake, the machine will return to low speed.

### Auxiliary Electrical Function "AUX 7"

**Note:** If the switch is not present, the trigger on the left-hand joystick only provides this auxiliary function.



**Auxiliary Electrical Function "AUX 7"** – Push the bottom of the switch in order to activate the seventh auxiliary electrical function. Pull the trigger and hold the trigger on the left-hand joystick in order to provide electrical power to pin (B) on the work tool connector on the loader arm. Release the trigger in order to deactivate the control.

### Auxiliary Electrical Control "AUX 8"

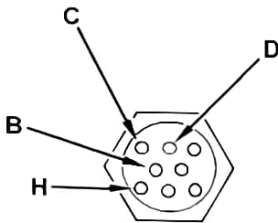


Illustration 36

g01107114

Typical electrical connection on the loading arm



**Auxiliary Electrical Control "AUX 8" (6)** – The auxiliary electrical control supplies continuous electrical power to pin (H) on the connector for the work tool 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.

### Automatic Level Control (7)



**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.

**Note:** If Automatic Level Control and Ride Control are selected, Ride Control will be activated at the Activation Speed and the Automatic Level Control will be deactivated. When the machine reaches the Deactivation speed, the Ride Control will be deactivated and the Automatic Level Control will be activated. Refer to the section on "Ride Control" for more details.

### Work Tool Coupler Control (8)

**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** – Push the red button upward 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.

### Fuel Level Gauge (9)



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

### Service Hour Meter (10)



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



## Joystick Control Pattern (11)

The switch for the Joystick Control Pattern has a number "1" on one side and a number "2" on the other side. When you start the machine, choose "1 - Caterpillar" or "2 - Alternate" in order to release the parking brake. The numbers on the Alert Indicator panel will blink until a pattern is selected. Once a pattern has been selected, activating the parking brake will not affect the selection of the pattern. Refer to the section "Joystick Controls" for detailed information.

## Parking Brake Control (12)



**Parking Brake Control** – Press on the right side of the switch and release the switch in order to engage the parking brake.

The same operation will disengage the parking brake.

**Note:** The parking brake will engage when the engine is stopped. The parking brake will engage when the armrests are moved to the RAISED position. The parking brake will engage when the operator leaves the operator seat for a time. The parking brake will engage when the interlock override is activated.

**Note:** If the switch for the Joystick Control Pattern is installed, select a pattern in order to release the parking brake.

## Engine Start Switch (13)



**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 dome light is 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:** If the engine fails to start, the turn the engine start switch key to the OFF position in order to attempt to start the engine again. Refer to the Operation and Maintenance Manual, "Engine Starting" for more details about starting the engine.

## 12 volt plug (14)

12 volt plug

## Window Wiper and Window Washer (15)



**Window Wiper and Window Washer** – Move the switch to the middle position in order to turn on the wiper. Press on the top of the switch in order to operate the washer. Press on the bottom of the switch in order to turn off the wipers.

## Alert Indicator Panel (16)

Refer to the section Operator and Maintenance Manual, "Alert Indicators" for a description about the indicators.

## Right Side Controls

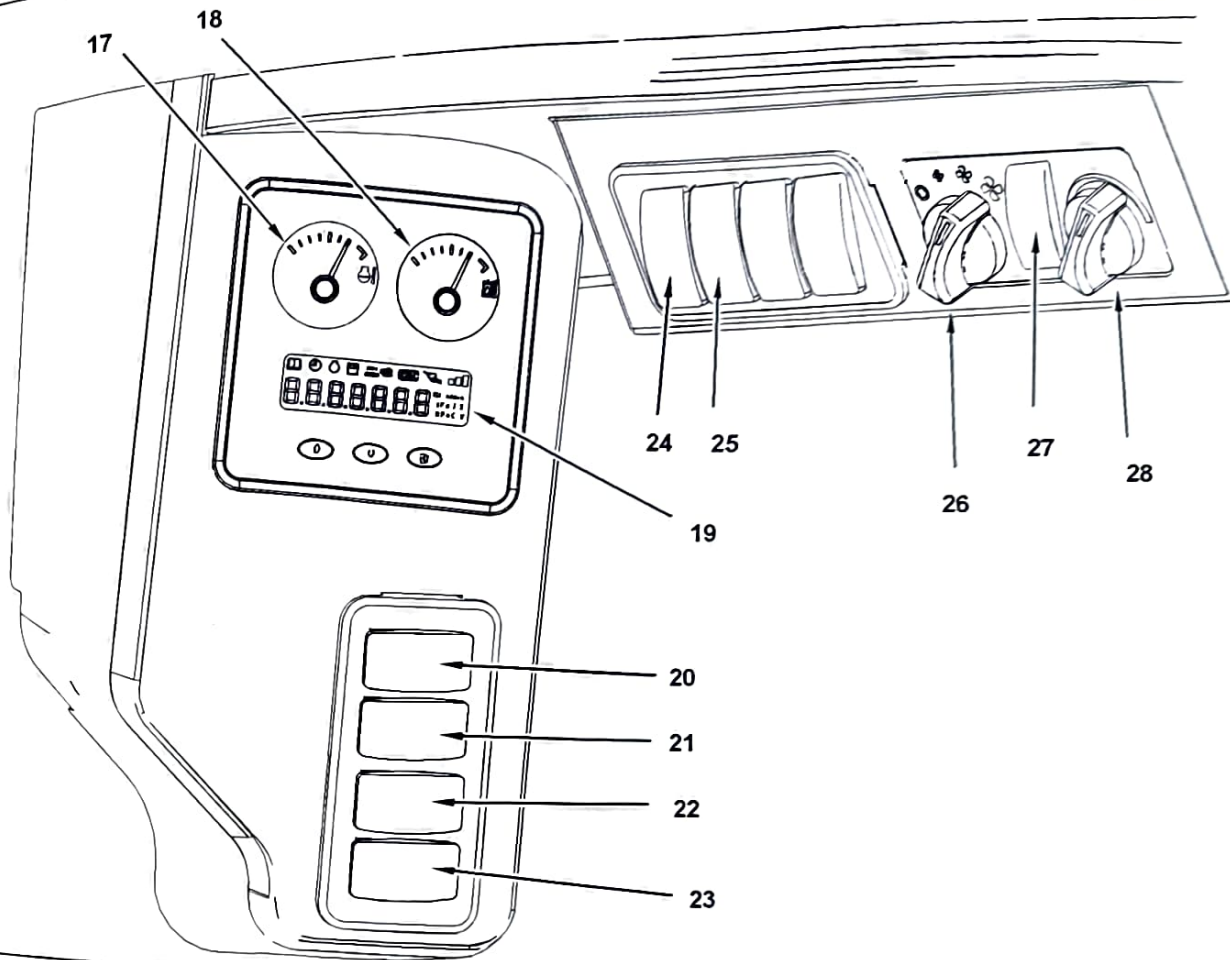


Illustration 37

g01210277

- (17) Coolant Temperature
- (18) Hydraulic Oil Temperature
- (19) Digital Display Window
- (20) Beacon Switch

- (21) Hazard Flashers
- (22) Roading Lights
- (23) Turn Signals
- (24) Creeper Control

- (25) Ride Control
- (26) Fan Speed Control
- (27) Air Conditioning Control
- (28) Temperature Control

### Coolant Temperature (17)

Coolant Temperature gauge

### Hydraulic Oil Temperature (18)

Hydraulic Oil Temperature gauge

### Digital Display Window (19)

Refer to the section "Digital Display Window" for detailed information.

### Beacon Switch (20)



**Beacon** – Press on the left side of the switch in order to turn on the beacon. Press the right side of the switch in order to turn off the beacon. The receptacle for the beacon is located on the upper left corner on the rear of the cab

### Hazard Flashers (21)



**Hazard Flasher Control** – Press on the left side of the switch in order to activate the hazard flashers. Press on the right side of the switch in order to deactivate the hazard flashers.



## Rooding Lights (22)



**Rooding Lights** – Move the switch to the middle position in order to turn on the control panel lights and position lights.

Press on the left side of the switch in order to turn on the front low beams. Press on the right side of the switch in order to turn off the lights.

## Turn Signals (23)



**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.

## Creep Control (24)

The Creep Control allows the operator to select a maximum machine travel speed at full joystick movement. Use creep control for operations that require slow, constant speed.



**Creep Control** – In order to activate the creep control, stop the machine and return the joysticks to the neutral position.

Press the bottom of the switch in order to turn on the creep control. In order to deactivate the creep control, stop the machine and return the joysticks to the neutral position. Press the top of the switch in order to turn off the creep control.

Refer to "Digital Display Window" for detailed information about the creep speed control.

## Ride Control (25)

Ride Control assists in smoothing the ride of the machine. Travel over rough terrain causes bucket movement. The ride control system uses the lift cylinders as shock absorbers. The lift cylinders dampen the forces from the bucket.



**Ride Control** – Press the bottom of the switch in order to turn on the ride control. Ride control will activate and the alert

indicator will illuminate at the appropriate speed. Press the top of the switch in order to turn off the ride control.

**Note:** The ride control will deactivate and the indicator will not be illuminated at the appropriate speed. The ride control will also deactivate if the lift function for the work tool is operated.

The following approximate speeds apply

- Activation speed - 8 km/h (5.0 mph) for Ride Control
- Deactivation speed - 6 km/h (3.7 mph) for Ride Control.

**Note:** If Automatic Level Control and Ride Control is selected, Ride Control will be activated at the Activation Speed and the Automatic Level Control will be deactivated. When the machine reaches the Deactivation speed, the Ride Control will be deactivated and the Automatic Level Control will be activated.

## Fan Speed Control (26)



Fan Speed Control

## Air Conditioner Control (27)



Air Conditioner Control

## Temperature Control (28)



Temperature Control

## Digital Display Window

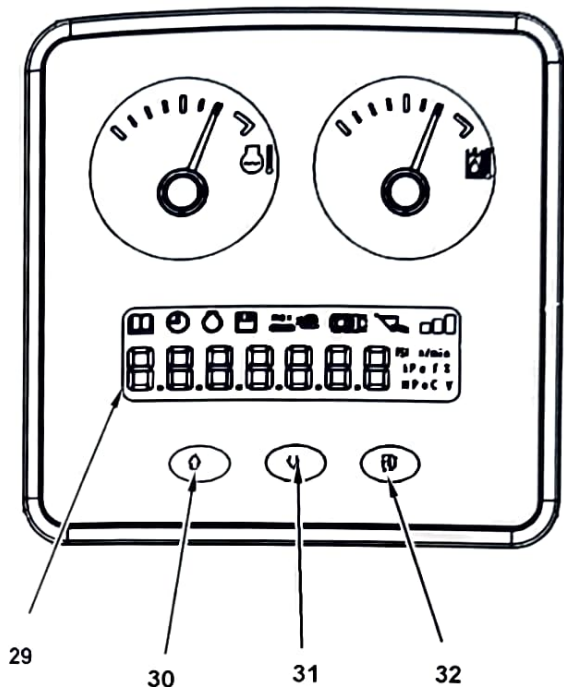


Illustration 38  
(29) Digital Display Window  
(30) Scroll Up Key  
(31) Scroll Down Key  
(32) Function Selector

g01227636

### General Description

The digital display window (29) shows some basic information about the machine. The Engine Speed, System Voltage, Job Clock, Work tool Control, "Drive Mode Control", and Creeper Control are displayed. The digital display window is used to set the work tool control. The digital display window is used to set the Creeper Control. The Function Selector (32) is used to toggle between modes that are available:

- Operator Mode 1 - Display Screen
- Operator Mode 2 - Work Tool Control
- Operator Mode 3 - Drive Mode Control
- Operator Mode 4 - Creeper Control

The scroll up key (30) and the scroll down key (31) are used to toggle between screens or settings in a mode

In order to display the AccuGrade menu, press the scroll down key (31) and press the function key (32) at the same time. Refer to the AccuGrade section below.

### Operator Mode 1 - Display Screen

Three displays are available in this mode: Digital Tachometer, System Voltage, and Job Clock.



Illustration 39  
Representation of the Digital Tachometer (default start-up mode)

g01242569



Illustration 40  
Representation of the System Voltage

g01242600



Illustration 41  
Representation of the Job Clock

g01242640



The default start-up mode is the Digital Tachometer. Use the "Scroll Up" button and the "Scroll Down" button in order to change the screen. The Job Clock can be reset by holding the "Scroll Up" and the "Scroll Down" buttons for 3 seconds.

## Operator Mode 2 - Work Tool Control

In Operator Mode 1, push the "Function Selector" button 1 time. The "Work Tool Control" screen is used in order to display the current setting for the response of the lift and tilt functions of the machine. Use the "Scroll Up" button and the "Scroll Down" button in order to change to a different setting.

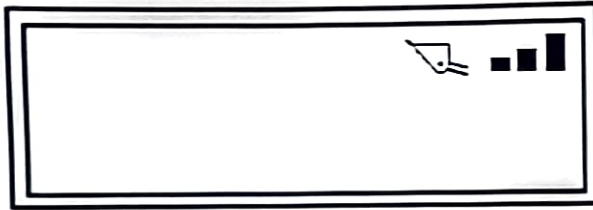


Illustration 42

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Representation of the Work Tool Control

The Work Tool Control mode has three settings:

- Fine Control - 1 Bar
- Medium Control - 2 Bars
- Coarse Control - 3 Bars

**Note:** The Work Tool Control setting will not change when the ignition switch is turned off.

## Operator Mode 3 - Drive

In Operator Mode 1, push the "Function Selector" button 2 times. The "Drive Mode Control" screen is used in order to display the current setting of the "Drive Mode Control" functions. Use the "Scroll Up" button and the "Scroll Down" button in order to change to a different setting.

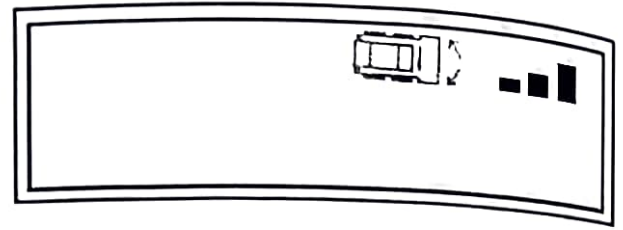


Illustration 43

g01892289

Representation of the "Drive Mode Control"

The "Drive Mode Control" has three settings:

- Standard Mode - 1 Bar
- Intermediate Mode - 2 Bars
- Maximum Mode - 3 Bars

**Note:** The "Drive Mode Control" setting will not change when the ignition switch is turned off.

**Note:** The machine will start, stop, and steer more aggressively with each progressive drive control mode. Test drive the machine in an open area in order to test the operating characteristics of the machine.

## Operator Mode 4 - Creeper Control

In Operator Mode 1, push the "Function Selector" button 3 times. The "Creeper Control" screen is used in order to display the current setting for the creeper control. Use the "Scroll Up" button and the "Scroll Down" button in order to change to a different setting for the Creeper Control.

**Note:** The "Creeper Control" setting will not change when the ignition switch is turned off. Refer to the section "Creeper Control" for operation of the switch.



Illustration 44  
Representation of the Creeper Control

g01242658

The Creeper Control has the following ten settings:

Table 22

Setting	Approximate Percent of Full Speed
1	5%
2	7%
3	10%
4	13%
5	17%
6	24%
7	37%
8	57%
9	80%
10	100%

**max** Setting 10 – The "MAX" icon will appear at the maximum setting.

### AccuGrade (If Equipped)


The following instructions are a quick reference for the AccuGrade. For detailed instructions for the AccuGrade, refer to the Operation and Maintenance Manual, SEBU8278.

1. Ensure that the Laser Receiver is attached to the work tool and attached to the machine properly.
2. In order to display the AccuGrade menu, press the scroll down key (31) and press function key (32) at the same time.

3. In order to set the benchmark, press the scroll up key (30) and press the scroll down key (31) at the same time. Hold the keys until the value is set in the computer (approximately 3 seconds). The screen will display a "0" and the screen will flash once.
4. Press the trigger and release the trigger on the right-hand joystick in order to enable the AccuGrade automatic controls. Operate the implement joystick or operate the thumb wheel in order to override the automatic controls temporarily.
5. Press the trigger and release the trigger on the right-hand joystick in order to disable the AccuGrade automatic controls.
6. Press the scroll up key (30) and hold the scroll up key in order to exit AccuGrade.

## Other Features in the Cab

### Cab Dome Light

 **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.

### Interlock Control

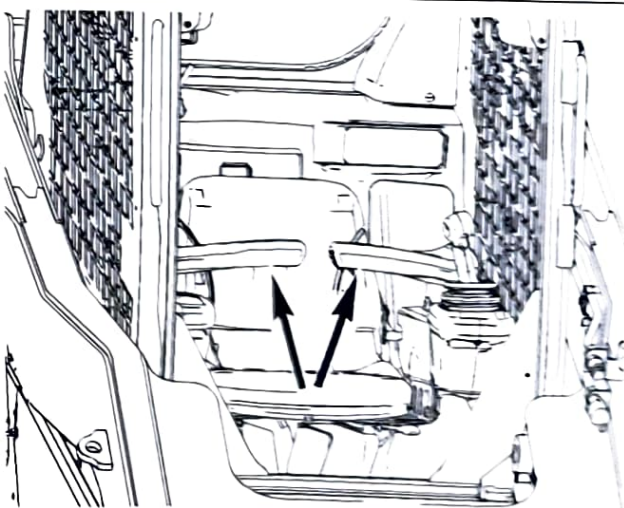


Illustration 45

g01231722

Armrests

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



**Note:** When the armrests are moved to the RAISED position, the parking brake will engage. Move the armrests 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 armrests are raised and lowered during operation, disengage the parking brake in order for the hydraulic controls to be activated.

### Accelerator Control

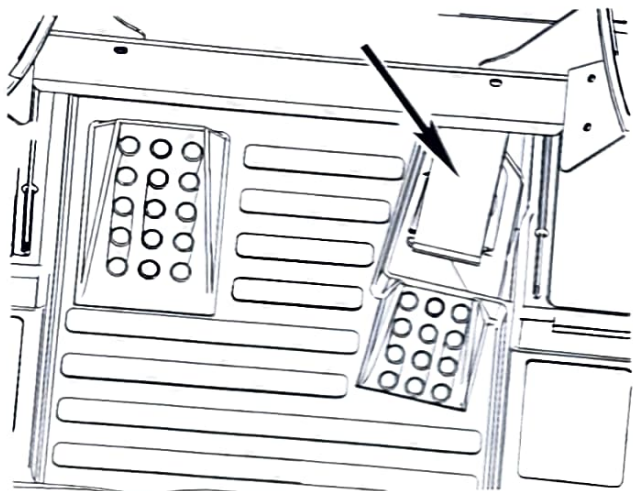


Illustration 46

g01231723



**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.

### Standard Seat

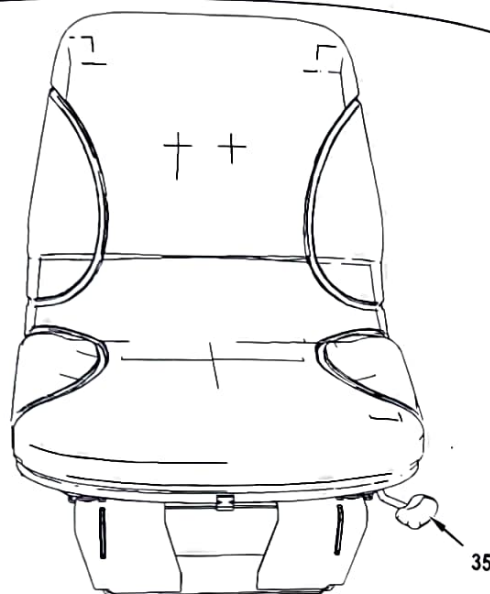


Illustration 47

g01231724

(35) Fore/Aft Adjustment



### Standard Seat

### Suspension Seat

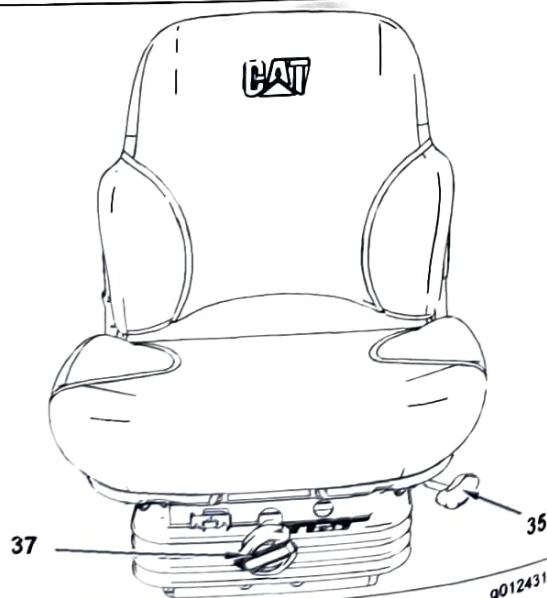


Illustration 48

g01243184

(35) Fore/Aft Adjustment  
(37) Adjustment for the suspension

**Fore/Aft lever (35)** – Move the lever in order to adjust the seat.

**Height (37)** – 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.

## Air Suspension Seat

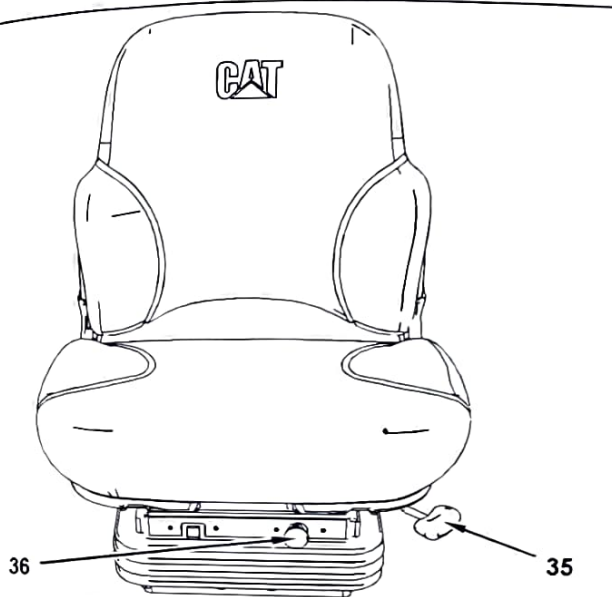


Illustration 49

g01231726

- (35) Fore/Aft Adjustment
- (36) Adjustment for the suspension



## Seat Adjustment

Push in the knob (36) in order to increase the stiffness of the suspension. Pull the knob in order to decrease the stiffness of the suspension.

**Note:** The engine start switch key must be in the ON position in order to increase the stiffness of the seat.

## Governor Control

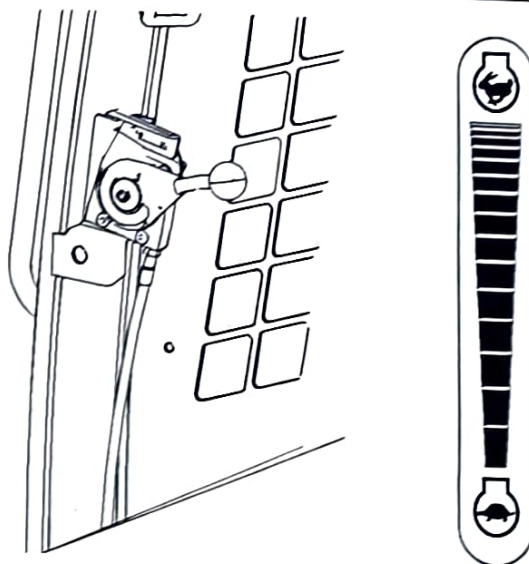


Illustration 50

g01231729

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

## Joystick Controls

The joystick control that is described in this section is for the Caterpillar Joystick Control Pattern. This pattern is the default for machines that are NOT equipped with the option for the Selectable Control Pattern or the Dedicated Control Pattern.

Refer to the section "Selectable Control Pattern and Dedicated Control Pattern" below for instructions about the Alternate Joystick Control pattern and the Dedicated Control Pattern.

Refer to the section "Auxiliary Hydraulic Controls" below for instructions about the Auxiliary Hydraulic Controls .

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



## Left Hand Joystick

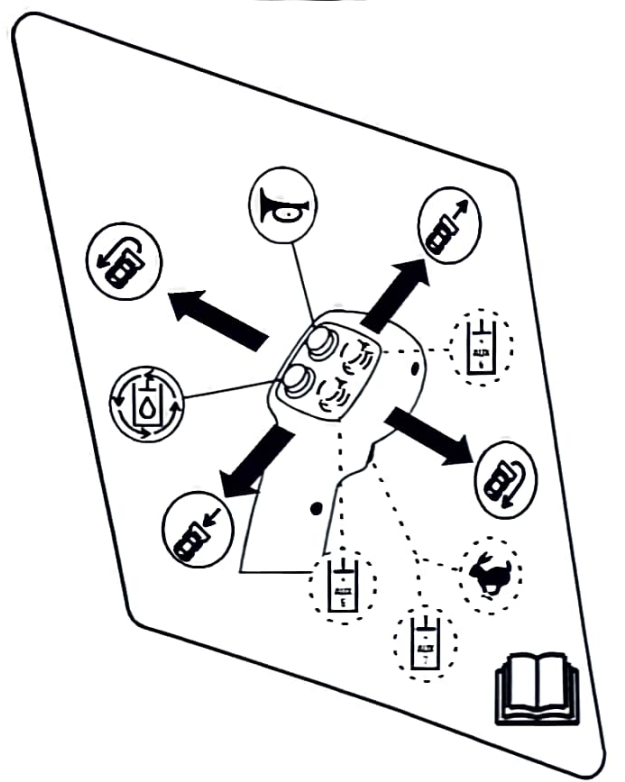




Illustration 51  
Instruction Decal for the Left Hand Joystick  
g01259300


### 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.

### Horn


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

### Two Speed Control

 **Two Speed** – Press the trigger and release the trigger on the front of the left-hand joystick in order to activate rabbit mode. In order to activate rabbit mode, the Multifunction Switch must also be in the Two Speed position. Refer to "Multifunction Switch for the Left Hand Trigger (5)" above for instructions about the switch.

**Note:** Keep the work tool close to the ground when you travel in rabbit mode. This method will maximize the stability of the machine.

### 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 either one of the two auxiliary hydraulic switches (1) or (2) that are located on the right side joystick and hold that switch. If equipped, you may also move the thumb wheel on the right side joystick and hold the thumb wheel. Press the continuous flow switch on the left-hand joystick and release the continuous flow switch. Immediately release the auxiliary hydraulic switch or the thumb wheel 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 pressing 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.

## Right Hand Joystick

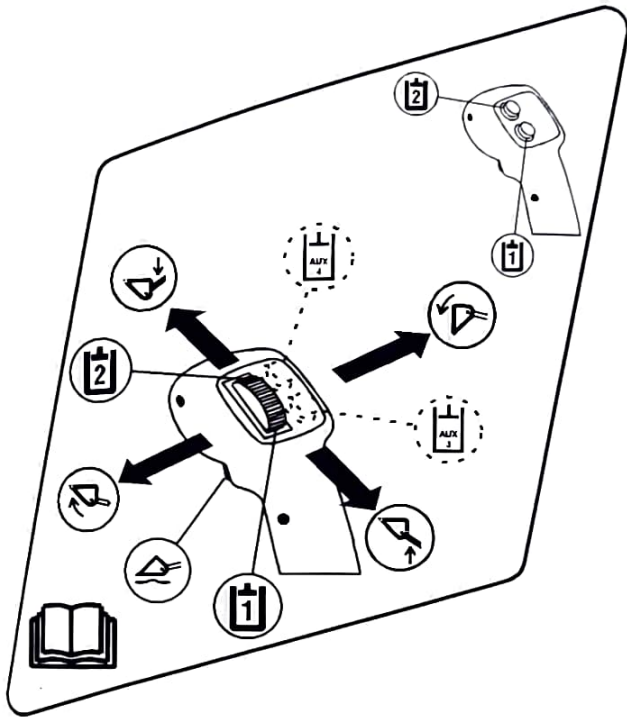


Illustration 52

g01259303

Instruction Decal for the Right Hand Joystick

### Lower



**Lower** – Push the joystick forward in order to lower the work tool.

### Dump



**Dump** – Move the joystick to the right in order to tilt the work tool downward.

### Raise



**Raise** – Pull the joystick backward in order to raise the work tool.

### Tilt Back



**Tilt Back** – Move the joystick to the left in order to tilt the work tool upward.

## Float



**Float** – Float allows the work tool to follow the contour of the ground.

The following conditions will activate the float function on the machine.

Move the joystick to the lower position and press the trigger. Float is activated. You may now release the trigger.

For an earlier machine that is not updated, move the joystick to the lower position. Press the trigger and release the trigger. Float is activated.

Once the float function is engaged, the joystick can be returned to the neutral position without affecting the float function. Float will remain engaged until the trigger on the right-hand joystick is pressed again. The float function will disengage also when the bucket is raised or when the bucket is lowered.

**Note:** These changes affect the following serial numbers: (S/N: JAY3086-UP), (S/N: DWS1377-UP), (S/N: MST2570-UP), (S/N: RED1669-UP), (S/N: JWF2014-UP), (S/N: MAS1735-UP), (S/N: GCP1475-UP), (S/N: MBT326-UP), (S/N: JSP289-UP), and (S/N: JMP309-UP). Serial numbers earlier than the listed will be affected if the software for the machine control has been updated.

**Note:** If the float function is enabled, the AccuGrade option is disabled.

## Auxiliary Shake Out Mode

Auxiliary Shake Out mode is an aggressive movement of the work tool in order to dislodge effectively wet material or sticky material.

Move the thumb wheel over the NEUTRAL position three times within a 2 second period in order to activate Auxiliary Shake Out mode. Auxiliary Shake Out mode will remain engaged while the thumb wheel is moved back and forth over the NEUTRAL position. Normal auxiliary control mode will return when the movement of the thumb wheel is discontinued.

## Selectable Control Pattern and Dedicated Control Pattern

If your machine is equipped with a Selectable Control Pattern or the Dedicated Control Pattern, there are two options for the joystick control.



- The alert indicator "1" will light when the Caterpillar Joystick Control Pattern is activated. Refer to the section "Joystick Controls" above for instructions about the Caterpillar Joystick Control Pattern in illustration 53 and in illustration 54 with the label "1".
- The alert indicator "2" will light when the Alternate Joystick Control Pattern is activated.

The following instructions reflect the operation of the joysticks when the Alternate Joystick Control Pattern is selected. The Alternate Joystick Control Pattern changes the control of the work tool and the movement of the machine. The changes in the control are indicated in illustration 53 and in illustration 54 with the label "2".

Refer to the section "Auxiliary Hydraulic Controls" below for instructions about the Auxiliary Hydraulic Controls .

### Left Hand Joystick

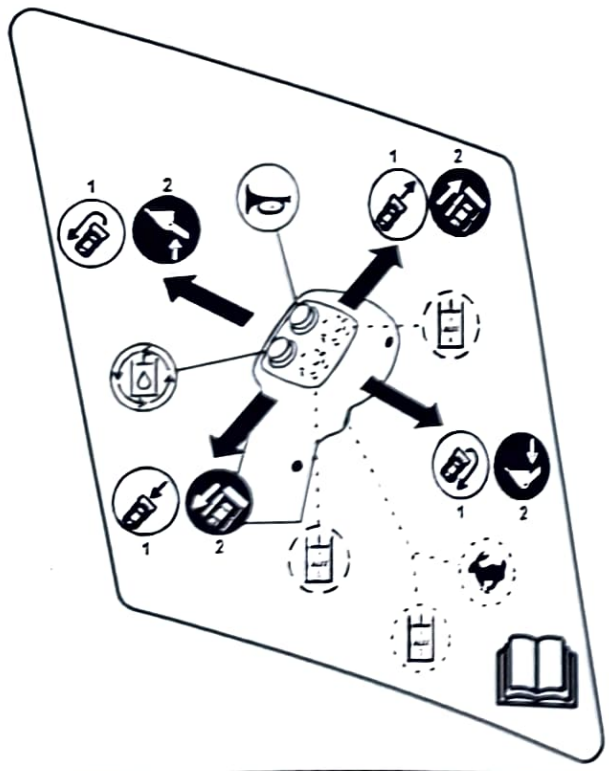




Illustration 53  
 Instruction Decal for the Left Hand Joystick  
 01259305

### Forward Drive

 **Forward** – Push the left-hand joystick forward in order to move the left side of the machine forward.

Push both joysticks forward equally in order to move the machine in a straight line.

### Reverse Drive

 **Reverse** – Pull the left-hand joystick backward in order to move the left side of the machine backward.


Pull both joysticks backward equally in order to move the machine backward in a straight line.

### 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.

### Horn


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

### Two Speed Control


 **Two Speed** – Press the trigger and release the trigger on the front of the left-hand joystick in order to activate rabbit mode. In order to activate rabbit mode, the Multifunction Switch must also be in the Two Speed position. Refer to "Multifunction Switch for the Left Hand Trigger (5)" above for instructions about the switch.

**Note:** Keep the work tool close to the ground when you travel in rabbit mode. This method will maximize the stability of the machine.

### Lower

 **Lower** – Move the joystick to the right in order to lower the work tool.

### Raise

 **Raise** – Move the joystick to the left in order to raise the work tool.

## 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 either one of the two auxiliary hydraulic switches (1) or (2) that are located on the right side joystick and hold that switch. If equipped, you may also move the thumb wheel on the right side joystick and hold the thumb wheel. Press the continuous flow switch on the left-hand joystick and release the continuous flow switch. Immediately release the auxiliary hydraulic switch or the thumb wheel 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 pressing 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.

## Right Hand Joystick

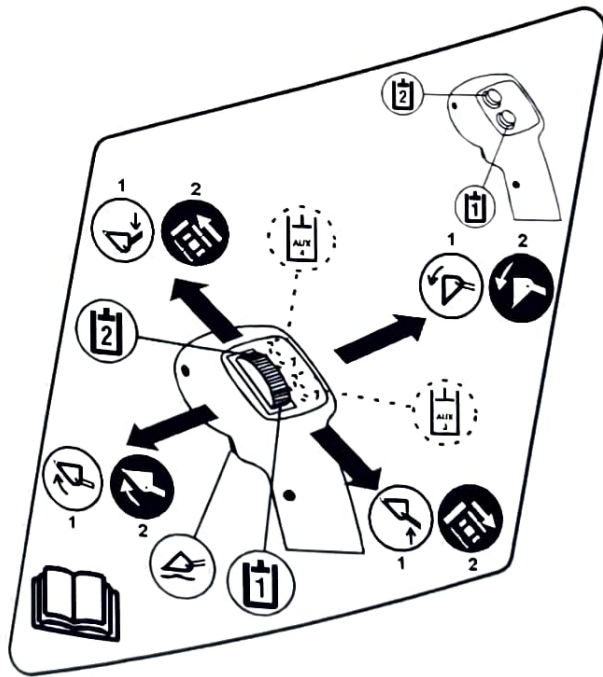


Illustration 54

g01259306

Instruction Decal for the Right Hand Joystick

## Forward Drive



**Forward** – Push the right-hand joystick forward in order to move the right side of the machine forward.

Push both joysticks forward equally in order to move the machine forward in a straight line.

## Reverse Drive



**Reverse** – Pull the right-hand joystick backward in order to move the right side of the machine backward.

Pull both joysticks backward equally in order to move the machine backward in a straight line.

## 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.

## Dump



**Dump** – Move the joystick to the right in order to tilt the work tool downward.

## Tilt Back



**Tilt Back** – Move the joystick to the left in order to tilt the work tool upward.

## Float



**Float** – Float allows the work tool to follow the contour of the ground.

The following conditions will activate the float function on the machine.

Move the joystick to the lower position and press the trigger on the right-hand joystick. Float is activated. You may now release the trigger.

For an earlier machine that is not updated, move the joystick to the lower position. Press the trigger and release the trigger. Float is activated.

Once the float function is engaged, the joystick can be returned to the neutral position without affecting the float function. Float will remain engaged until the trigger on the right-hand joystick is pressed again. The float function will disengage also when the bucket is raised or when the bucket is lowered.



**Note:** These changes affect the following serial numbers: (S/N: JAY3086-UP), (S/N: DWS1377-UP), (S/N: MST2570-UP), (S/N: RED1669-UP), (S/N: JWF2014-UP), (S/N: MAS1735-UP), (S/N: GCP1475-UP), (S/N: MBT326-UP), (S/N: JSP289-UP), and (S/N: JMP309-UP). Serial numbers earlier than the listed will be affected if the software for the machine control has been updated.

**Note:** If the float function is enabled, the AccuGrade option is disabled.

## Auxiliary Hydraulic Controls

If the work tool has a wiring harness, connect the work tool harness to the electrical plug on the loader arm. If your High Flow work tool does not have a wiring harness, a Jumper Plug should 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. 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.

**Note:** If the high flow work tool does not have a wiring harness, consult the Operation and Maintenance Manual for the work tool for the proper instructions for attaching the work tool.

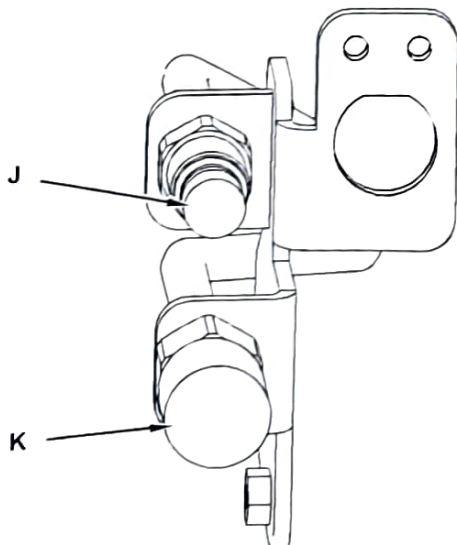


Illustration 55  
Standard Auxiliary Connections

g01291620

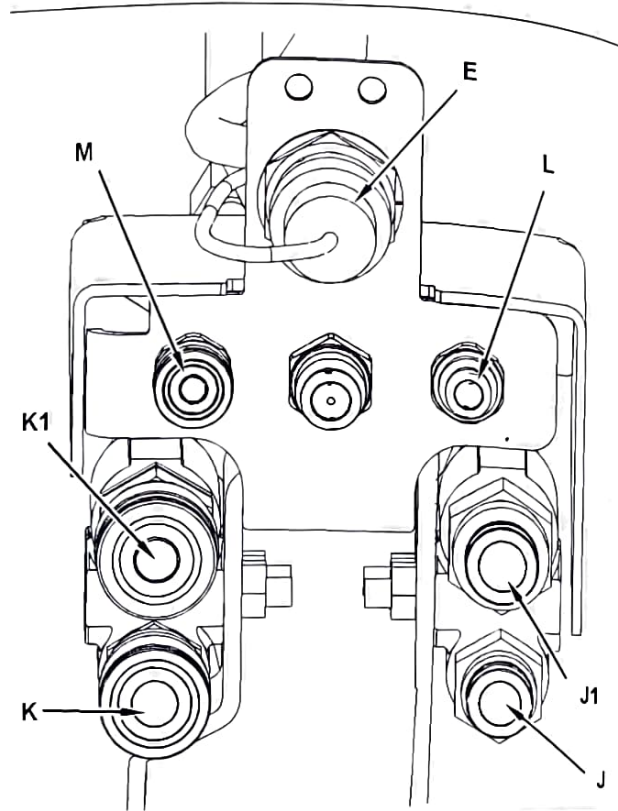


Illustration 56  
High Flow Connections

g01210266

**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).

**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).

**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).

**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).



## Auxiliary Electrical Control (E)

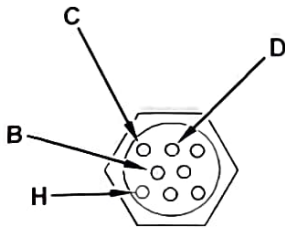


Illustration 57

g01107114

Typical electrical connection on the loading arm



### Auxiliary Electrical Control "AUX 5"

**(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 on the left-hand joystick in order to provide electrical power to the pin (D). Release the switch in order to deactivate the control.



### Auxiliary Electrical Control "AUX 6"

**(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 on the left-hand joystick in order to provide electrical power to the pin (C). Release the switch in order to deactivate the control.



### Auxiliary Electrical Control "AUX 7" –

Press the left hand trigger and hold the trigger in order to provide electrical power to the pin (B). Release the trigger in order to deactivate the control. Refer to "Multifunction Switch for the Left Hand Trigger (5)" above for instructions about the switch.

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## Alert Indicators

SMCS Code: 7450; 7451

The alert indicators are located on the left side overhead console.

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

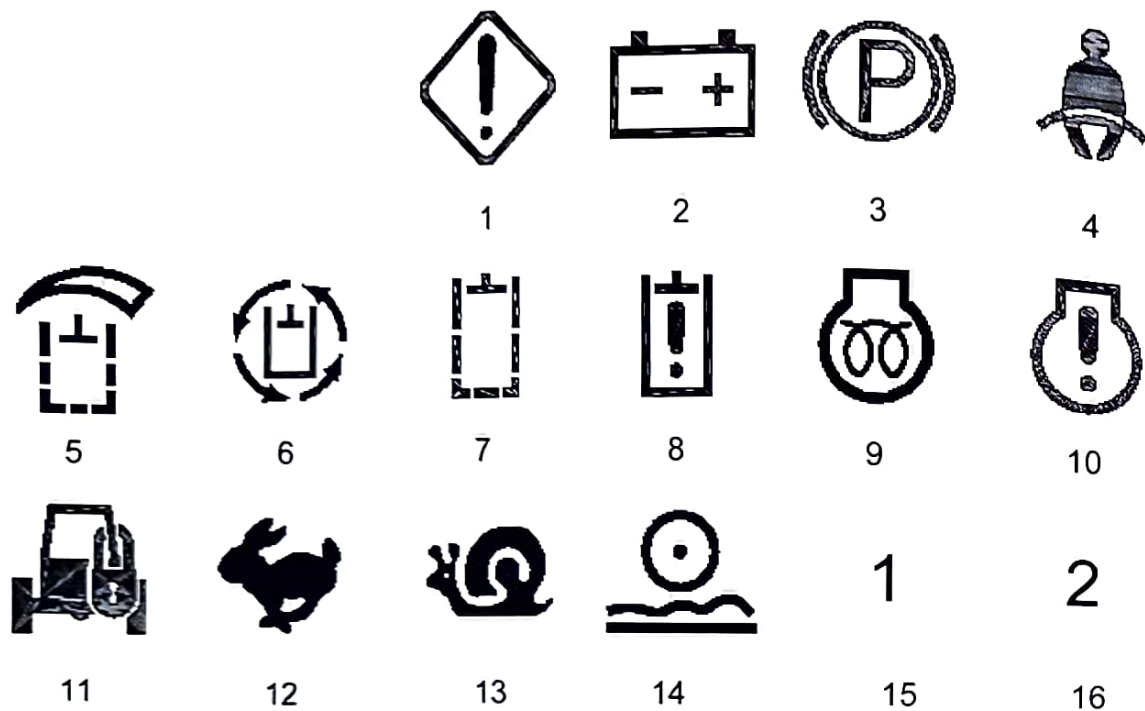


Illustration 58  
 Left Side

g01218926

- 1 – Driver Alert
  - 2 – Alternator Output
  - 3 – Parking Brake
  - 4 – Seat Belt
  - 5 – High Flow
  - 6 – Continuous Flow
  - 7 – Work Tool System
    - RED Work Tool Lockout
    - AMBER Interlock Override
  - 8 – Hydraulics
    - RED Hydraulic Temperature
    - AMBER Hydraulic Filter Bypass
  - 9 – Glow Plug Starting Aid
  - 10 – Engine Condition Indicator
    - RED Coolant Temperature
  - 11 – MSS Indicator
  - 12 – Two Speed Control
  - 13 – Creeper Control
  - 14 – Ride Control
  - 15 – Caterpillar Joystick Control Pattern
  - 16 – Alternate Joystick Control Pattern
- 1 - Driver Alert** 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.

**2 - Alternator Output** 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).

**3 - Parking Brake** 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.

**4 - Seat Belt and Armrests** This alert indicator will light when the armrests are 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 armrests are in the LOWERED position.

**5 - Hydraulic High Flow** This alert indicator will light when the high flow hydraulic system is activated.

**Note:** The thumb wheel on the joystick must be fully displaced in order to activate the high flow hydraulic system.

**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.

**6 - Continuous Flow** This alert indicator will light when the continuous flow is activated.

## 7 - Work Tool System

- This alert indicator will light red when the work tool lockout control is activated.
- This alert indicator will light amber when the interlock override is activated.

## 8 - Hydraulics

- This alert indicator will light red 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.
- This indicator will light amber 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.

**9 - Glow Plug Starting Aid** 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.

## 10 - Engine

- This alert indicator will light red 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.
- This alert indicator will light red 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.
- This alert indicator will light amber when the air cleaner indicator is activated. Stop the machine and service the air cleaner.

**11 - Machine Security System** This alert indicator will light when the Machine Security System is activated. Refer to "Machine Security System" for more details about the security system.

**12 - Two-Speed Control** This alert indicator will light when rabbit mode is selected with the two speed control.

**13 - Creeper Control** This alert indicator will light when creeper mode is selected.



**14 - Ride Control** This alert indicator will light when the Ride Control switch is "ON" and the necessary ground speed is reached for Ride Control activation.

**15 - Joystick Control Pattern 1** If your machine is equipped with a Selectable Control Pattern, this alert indicator will light when the Caterpillar Joystick Control Pattern is activated.

**Note:** Refer to Operation and Maintenance Manual, "Operator Controls - Joystick Controls" for information about the joystick control patterns. If your machine does not have the Dedicated Control Pattern, the light will flash until a selection is made.

**16 - Alternate Joystick Control Pattern 2** If your machine is equipped with a Selectable Control Pattern, this alert indicator will light when the Alternate Joystick Control Pattern is activated.

**Note:** Refer to Operation and Maintenance Manual, "Operator Controls - Joystick Controls" for information about the joystick control patterns. If your machine does not have the Dedicated Control Pattern, the light will flash until a selection is made.

## Machine Security System (If Equipped)

### NOTICE

This machine is equipped with a Caterpillar Machine Security System (MSS) and may not start under certain conditions. Read the following information and know your machine's settings. Your Caterpillar Dealer can identify your machine settings.



**Machine Security System (MSS) –** Machines that are equipped with a Caterpillar Machine Security System (MSS)

can be identified by a decal in the operator station. MSS is designed to prevent theft of the machine or unauthorized operation.

### Basic Operation

MSS may be programmed to read a standard Caterpillar key or an electronic key. The electronic key contains an electronic chip within the plastic housing of the key. Each key emits a unique signal to the MSS. The keys can be identified by a gray housing or a yellow housing. MSS can have programmed settings to require an electronic key or a standard Caterpillar key for starting during certain periods of time.

When the key start switch of the machine is turned to the ON position, the ECM will read the unique ID that is stored in the electronic key. The ECM will then compare this ID to the list of authorized keys. The status light is located on the alert indicator panel. If the light is on, the key is not authorized.

**Note:** MSS will not shut down the machine after the machine has started.

## Security Management

The MSS has the capability to allow you to program the system to automatically activate at different time periods with different keys. The MSS can also be programmed to reject a specific electronic key after a selected date and time. When you turn the key to the OFF position and the MSS is active, you have a 30 second interval in order to restart the machine with an unauthorized key. Also if the machine stalls, there is a 30 second interval for restarting the machine. This 30 second interval is counted from the time of turning the key to the OFF position.

**Note:** Know your machine's settings because the use of an electronic key is no guarantee that the machine can be restarted.

An expiration date can be set for each electronic key that is contained in the list of keys for the machine. The key will no longer start the machine when the internal clock in the security system passes the expiration date. Each entry in the list of keys can have a different expiration date.

Spare keys are available from your dealer. Before a key can operate the machine, the MSS must be set to accept that particular key. Contact your Caterpillar dealer for information on additional features of the MSS.

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## Product Link (If Equipped)

**SMCS Code:** 7606

The Product Link PL121SR is a satellite communication device that transmits information regarding the machine to Caterpillar, Caterpillar dealers, and Caterpillar customers. The unit contains a Global Positioning System receiver (GPS receiver) and a satellite transceiver.



The Product Link PL121SR is two-way communication between the machine and a remote user. 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 PL121SR can be changed. Data is transmitted from the machine to a satellite. Next, the data is transmitted to a ground station. The receiving station transmits the data to Caterpillar Inc. The data can then be sent to a Caterpillar dealer and to the customer.

### Data Broadcasts

Machine data about the machine condition and operation is being transmitted by Product Link. This data is transmitted to Caterpillar and/or Cat dealers in order to serve the customer better. Also, this machine data will improve Caterpillar products and services. The information that is transmitted may include the following data: machine serial number, location of the machine, fault codes, emissions data, fuel usage, service meter hours, version numbers for software and hardware, and installed attachments.

Caterpillar and/or Caterpillar dealers may use this information for various purposes: providing services to the customer and/or the machine, checking or maintaining Product Link equipment, monitoring the machine health or performance, helping to maintain the machine, improving the machine efficiency, evaluating or improving Caterpillar products and services, complying with legal requirements and valid court orders, performing market research, and 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 Caterpillar dealer.

### Operation in a Blast Site

If the machine is required to work within 12 m (40 ft) of a blast site, then Product Link PL121SR must be disabled. In order to disable the Product Link PL121SR install a Product Link Disconnect Switch in the machine cab. This disconnect switch will allow the Product Link PL121SR module to be shut off. Refer to Special Instruction, REHS2365, "An Installation Guide for the Product Link PL121SR and for the PL300" for more details and installation instructions. You may also disconnect the Product Link PL121SR module from the main power source by disconnecting the wiring harness at the Product Link module.

This blast site warning does not supersede the published requirements or regulations found in "Title 30 of the Code of Federal Regulations (CFR)". This warning does not allow deviation from the published requirements or regulations found in "Title 30 of the Code of Federal Regulations (CFR)". A hazard assessment should be conducted by each customer. Every customer should meet all of the requirements of "Title 30 of the Code of Federal Regulations (CFR)" in order to ensure the safe storage, transportation, loading, and blasting of any explosive.

The following Product Link PL121SR specifications are provided in order to aid in conducting any related hazard assessment. These specifications help to ensure compliance with all local regulations:

- The transmit power rating for the Product Link PL121SR transmitter is 5 to 10 w
- The operating frequency range for the Product Link PL121SR module is 148 MHz to 150 MHz.

Consult your Caterpillar dealer if there are any questions.

Information for the initial installation of the Product Link PL121SR is available in Special Instruction, REHS2365, "Installation Guide for the Product Link PL121SR".

Operation, configuration, and troubleshooting information for the Product Link PL121SR can be found in System Operation Troubleshooting Testing and Adjusting, RENR7911.

### Regulatory Compliance

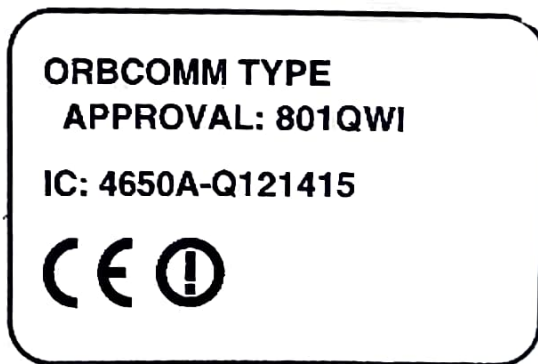


Illustration 59

# Engine Starting

i03741443

## 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.

**Note:** If you are starting the engine in cold conditions, 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.

5. Turn the engine start switch key to the START position in order to start the engine. Release the key after the engine has started.

**Note:** If the machine is equipped with "Pattern Changer", you must select a pattern before you disengage the parking brake.

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

i03708380

## 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 control 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.

**Note:** While you use steel tracks that go over the tires, the work tools may not engage the work tool coupler properly. Work tools may not properly engage the ground. **Steel tracks that go over the tires should only be used with pneumatic tires.** The loader arms may contact the steel tracks which will cause damage to the machine. When you use steel tracks that go over the tires, the interval for checking the drive chains should be reduced to every 100 Service Hours. Refer to Operation and Maintenance Manual, "Drive Chain Tension - Check/Adjust" for proper service of the drive chain. The use of rubber tracks that go over the tires is not recommended.

### Operating on a Slope

When it is possible, avoid operating the machine across a slope that is greater than 18 degrees. 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 3044 engine has an intermittent rating of 2 minutes. Do not turn the machine while you are operating on a slope.

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

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.

i03708381

### 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 - Clean/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.

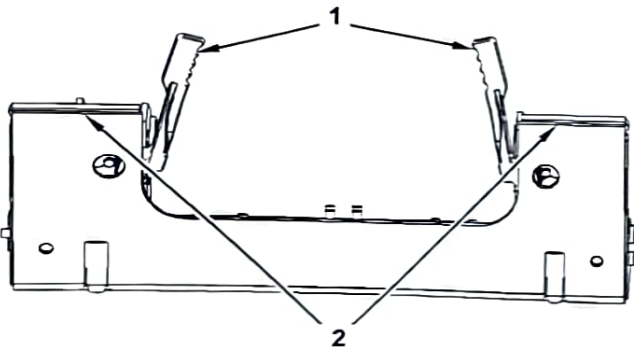


Illustration 61

g01263431

2. If the machine is equipped with a manual coupler, ensure that the levers(1) 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 armrests.
5. Start the engine.
6. Disengage the parking brake.
7. Tilt the quick coupler assembly forward.

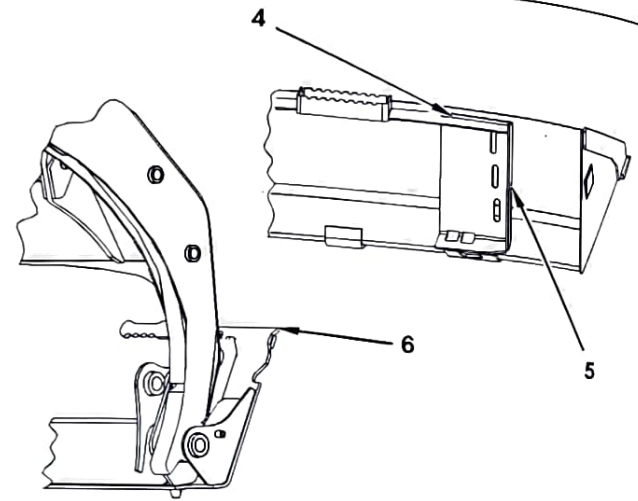


Illustration 62

g01278223

8. Align the quick coupler assembly (6) between the outer plates (5) of the mounting bracket. Move the quick coupler assembly under the angled plate (4) 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.



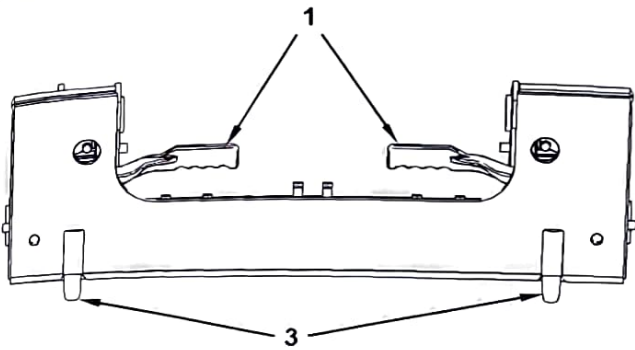


Illustration 63

g01263432

13. Engage the coupler pins(3). If the machine is equipped with a manual coupler, ensure that the levers(1) 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.

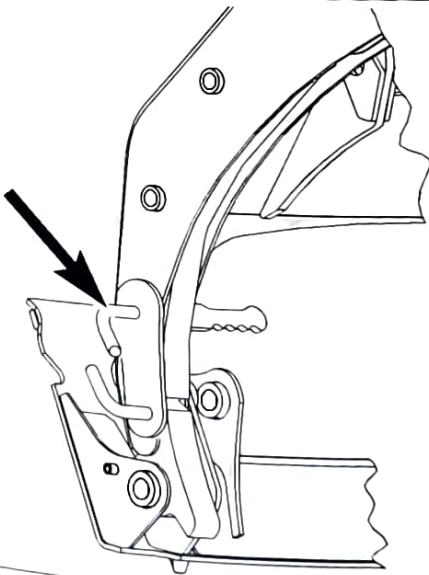


Illustration 64

g02020639

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, "Operator Controls - Auxiliary Hydraulic Controls" for operating details.

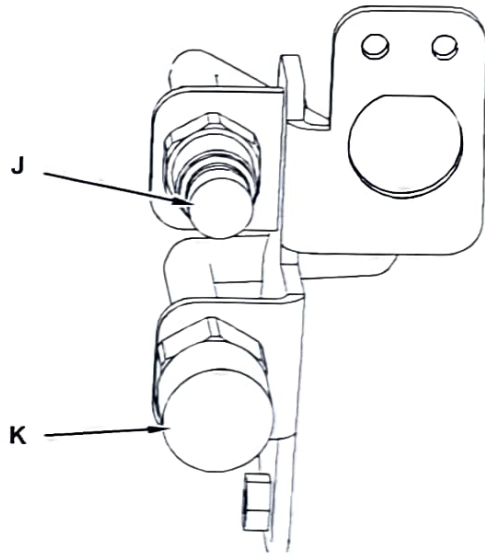


Illustration 65

g01291520

Standard Auxiliary Connection



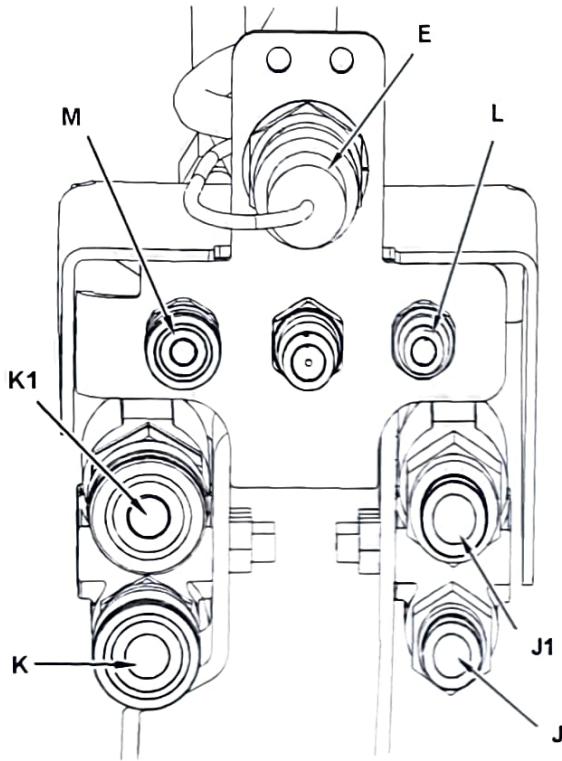


Illustration 66  
 High Flow Auxiliary Connection  
 g01210266

- 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 (E) 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 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.

- 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.

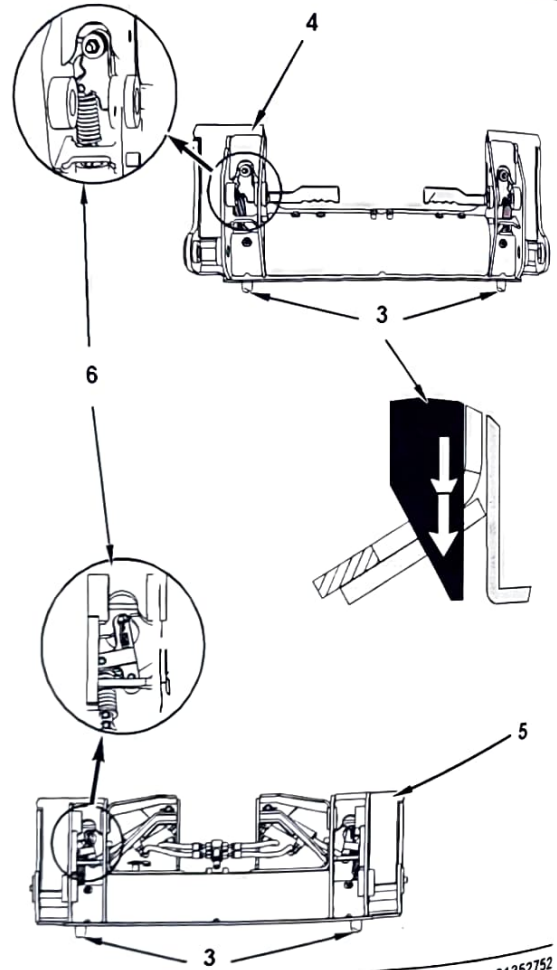


Illustration 67  
 (3) Coupler Pins  
 (4) Manual Work Tool Coupler  
 (5) Hydraulic Work Tool Coupler  
 (6) Lever for the Coupler Pin  
 g01352752

- 15. Visually ensure that both coupler pins (3) 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 (3) 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.

### NOTICE

Auxiliary hoses for work tools must be disconnected before the quick coupler is disengaged.

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

1. 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 armrests.

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)

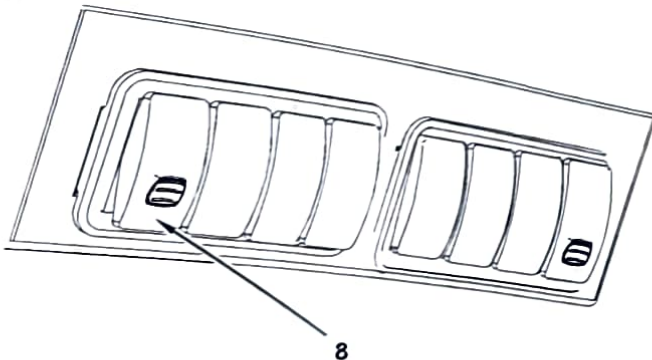


Illustration 68

901274820

(8) Auxiliary Hydraulic Pressure Release

1. After the engine has run in order to charge the accumulator, turn the ignition switch to the OFF position. Turn the ignition switch to the ON position. Press the parking brake switch and release the parking brake switch.

**Note:** The parking brake indicator will remain illuminated since the engine is not running. When the indicator for the work tool is no longer illuminated, the pressure can be released.

2. 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 four 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 armrests in the LOWERED position in order for the control to function. If equipped, the front door must be closed.

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

**Note:** The parking brake indicator will remain illuminated since the engine is not running. When the indicator for the work tool is no longer illuminated, the pressure can be released.

3. 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, "Operator Controls - Auxiliary Hydraulic Controls" for information about the controls.

If the pressure is not released, the accumulator is not charged. It is possible to recharge the accumulator by running the engine or cranking the engine for a period of fifteen seconds. Repeat steps 2 and 3 in order to release the pressure.

## Material Handling Arm Operation

SMCS Code: 6542; 6700; 7000

i01964204

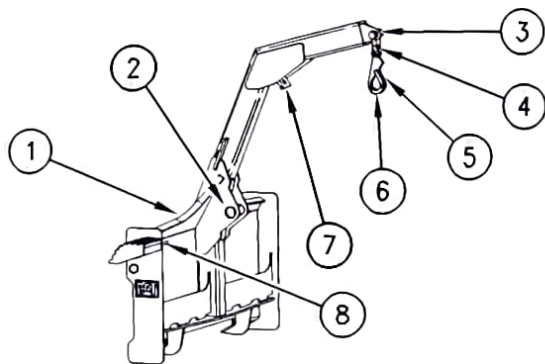


Illustration 69

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.

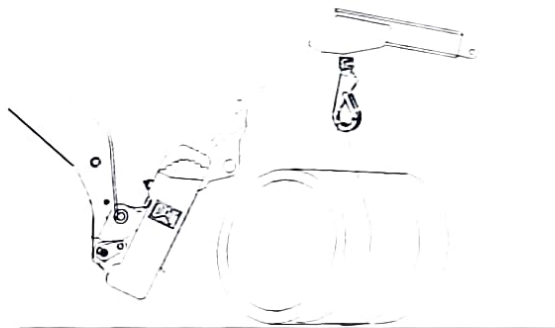


Illustration 70

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.



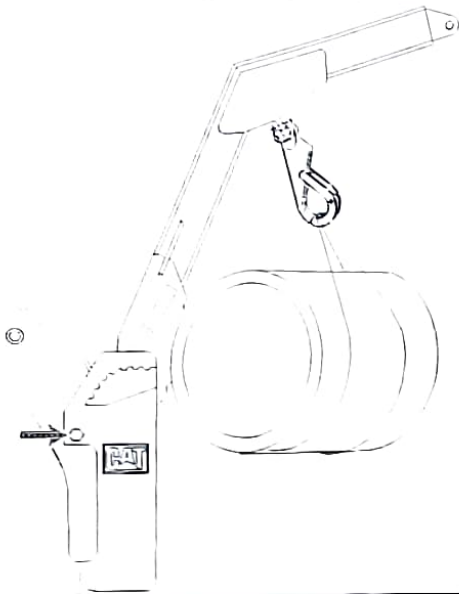


Illustration 71

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.

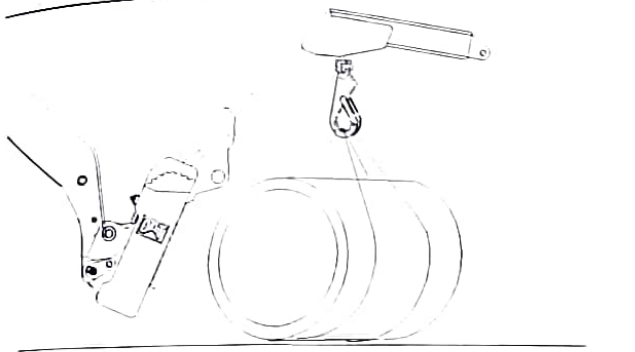


Illustration 72

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.

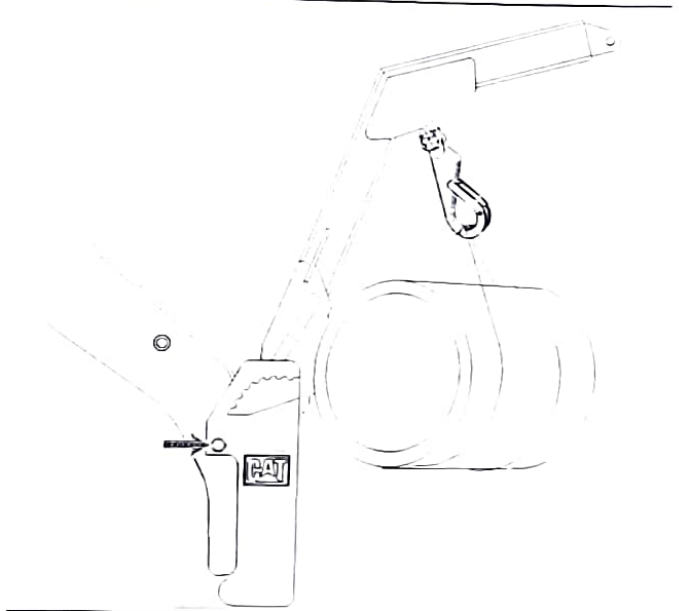


Illustration 73

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

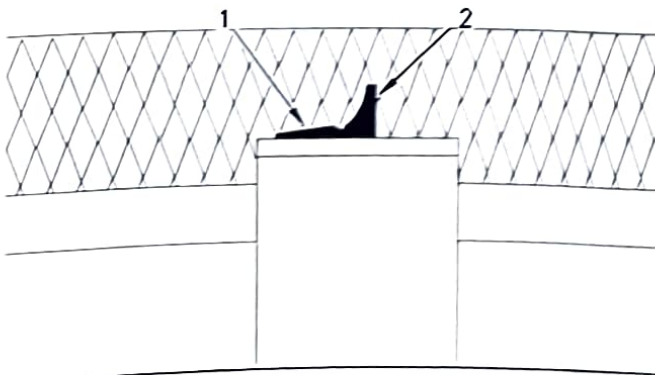


Illustration 74

g00955937

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

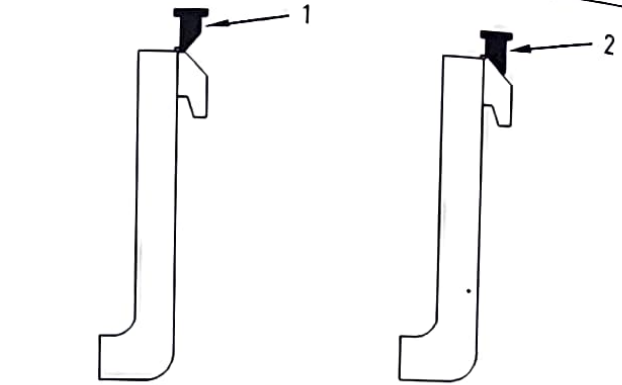


Illustration 75

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.

i04000738

## Work Tool Operation

SMCS Code: 6700; 7000

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

Refer to Operation and Maintenance Manual, "Operator Controls - Joystick Controls" and Operation and Maintenance Manual, "Operator Controls - 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 from the left side of 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.

## Simple Hydromechanical Work Tools

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

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

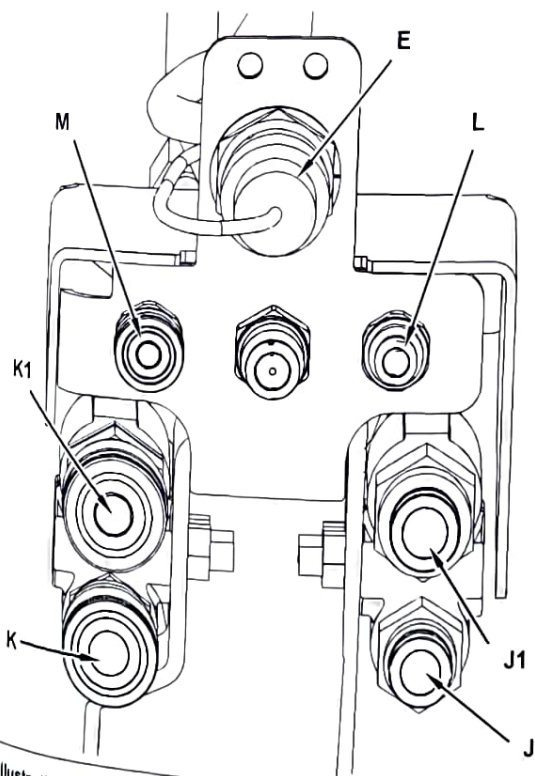


Illustration 76

g01210266

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

**Note:** If your High Flow work tool does not have a wiring harness, a Jumper Plug (241 - 3763 Plug As) 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. The affected machines are in the following list:



Table 25

Operation of Caterpillar Simple Hydromechanical Work Tools									
Work Tool	Left Hand Joystick				Right Hand Joystick				Actions
	8	5	6	7	1	2	3	4	
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.

## Complex Hydromechanical Work Tools

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

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

# Parking

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## 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

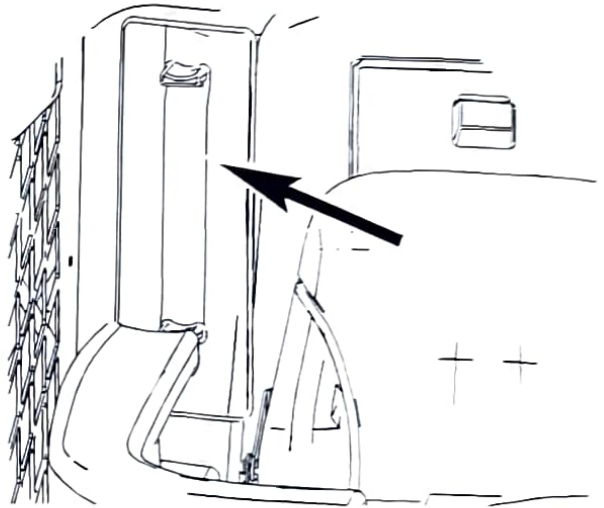


Illustration 77

g01287527

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

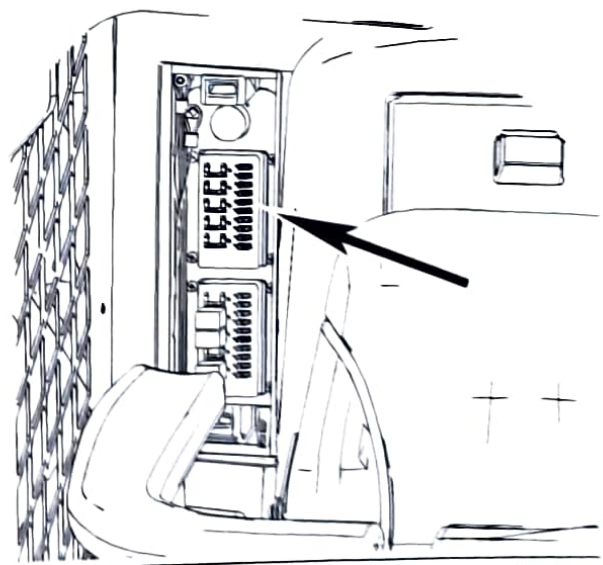


Illustration 78

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Remove the cover in order to access the fuse panel



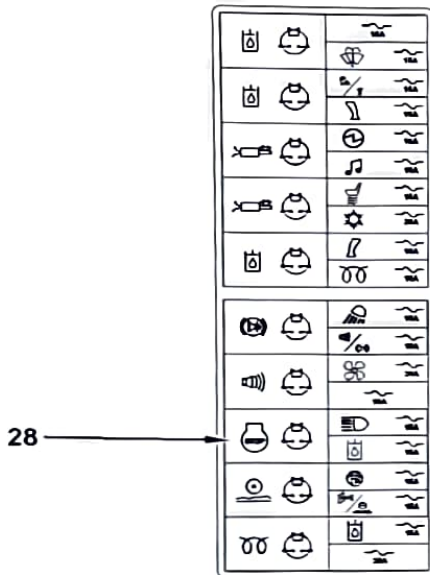


Illustration 79

g01330924

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 armrests. Unfasten the seat belt. Exit the machine.
3. Open the engine access door. Refer to Operation and Maintenance Manual, "Access Doors and Covers".

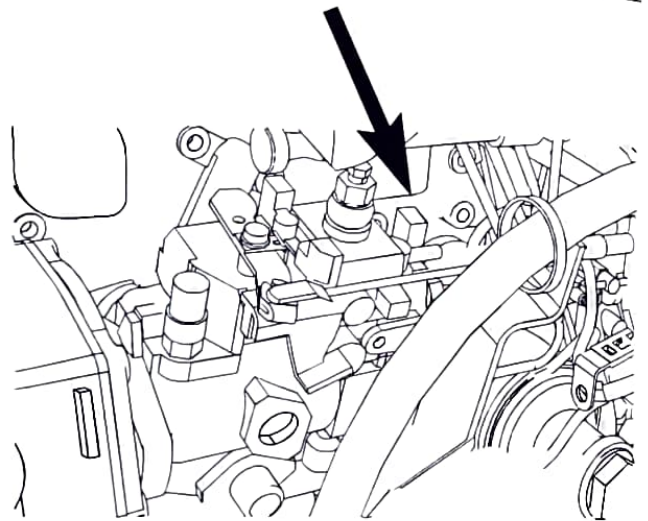


Illustration 80

g01289102

The connector for the fuel shutoff solenoid is located on the back of the fuel pump.

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 protective equipment and follow the established procedure in the Operation and Maintenance Manual, "Equipment Lowering with Engine Stopped" in the Operation Section of the manual.

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

**Note:** The parking brake indicator will remain illuminated since the engine is not running. When the indicator for the work tool is no longer illuminated, the pressure can be released.

3. 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 2 and 3.

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.

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

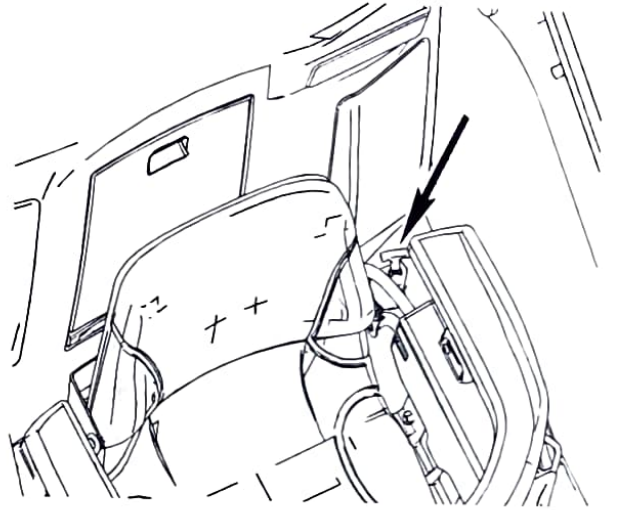


Illustration 81

g01400888

The bypass valve is located on the left side next to the seat in the cab.

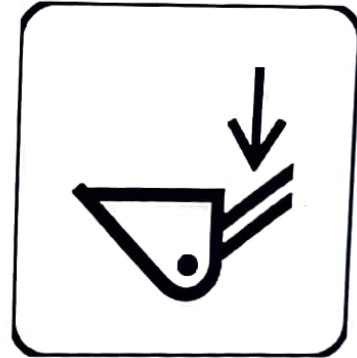


Illustration 82

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Film next to the red knob

1. Slide the seat forward. Slide the left hand armrest forward.
2. Pull up on the red handle. Push the handle in order to stop the loader arms, if necessary.
3. Allow the loader arms to lower until the work tool is on the ground.
4. Push the red handle to the original position.
5. Make the necessary repairs before you operate the machine.