

Product: EXCAVATOR

Model: 215 EXCAVATOR 61Z

Configuration: 215 EXCAVATOR 61Z00139-UP (MACHINE) POWERED BY 3204 ENGINE

## **Operation and Maintenance Manual 215 EXCAVATOR**

**Media Number -SEBU5817-01**

**Publication Date -01/05/1984**

**Date Updated -11/10/2001**

### **Foreword**

#### **SMCS - 7606**

This guide is a reference for the new operator and a refresher for the experienced one. Read-study-and keep it handy.

Illustrations guide the operator through the correct procedures of checking, starting, operating and stopping the vehicle and attachments.

Operating techniques outlined in the guide are basic. Skill and techniques develop as the operator gains knowledge of the vehicle and its capabilities.

Your safety and the safety of others depends upon care and judgment in the operation of this vehicle. A careful operator is good insurance against an accident.

Some photographs in this publication may show details or attachments that may be different from your unit.

Continuing improvement and advancement of product design may cause changes to your machine which may not be included in this publication. Each publication is reviewed and revised, as required, to update and include these changes in later editions.

When a question arises regarding your Caterpillar product, or this publication, please consult your Caterpillar dealer for the latest available information.

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## Safety

SMCS - 7606

### Safety Practices



**WARNING**

**Do not operate this machine unless you have read and understand the instructions in the "Operator's Guide". Improper operation is dangerous and could result in injury or death.**

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**WARNING**

Watch boom clearances when moving the machine. Uneven ground can cause the boom to move from side to side or up and down.

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**! WARNING**

**KNOW THE MAXIMUM HEIGHT AND REACH OF YOUR MACHINE**

Serious injury or death by electrocution can result if the machine or attachments are not kept a safe distance from electrical power lines or electrical equipment.

The distance must be at least 3.05 m (10 feet) plus 10 mm (.4 inch) for each 1,000 volts over 50,000 volts. Local or state codes, or job site operating directives, may require a greater distance for safety.

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**! WARNING**

**CLAMSHELL SWING**

**PERSONAL INJURY MAY RESULT IF CLAMSHELL SWINGS INTO THE CAB OR A PERSON IN THE WORK AREA.**

**CLAMSHELL CAN SWING IN ALL DIRECTIONS.**



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Controls must be operated smoothly to avoid excessive clamshell swing.

## **General**

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

Do not wear loose clothing or rings that can catch on controls or parts of the machine.

Keep the steps and walkways free of foreign material. Secure all loose items such as lunch boxes, tools, etc.

Be alert - always keep your eyes on the moving load. If you cannot see the load, have a signal man in full view.

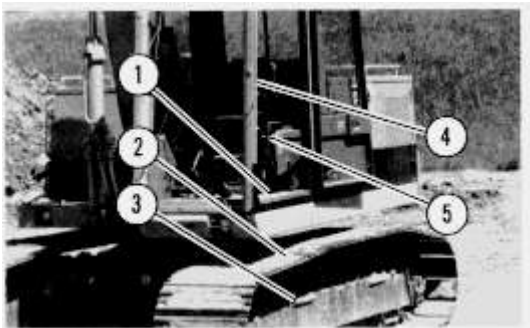
Know hand signals and who gives them. Accept signals from one person only.

Keep the boom away from all overhead lines. Treat all lines as "hot" until you have reliable information to the contrary.

If a power line is hit, stay on the machine until the line is clear or the power is disconnected.

Warn people to stay away from the machine if it is in contact with power lines.

## **Mounting and Dismounting**



Use steps (1), (2), and (3) and grab irons (4) and (5) when entering or leaving the operator's compartment.

Climb on or off the machine only where steps and/or grab irons are provided. Never jump on or off of the machine.

Use both hands and face the machine when mounting or dismounting.

Never get on or off of a moving machine.

Learn the location of the emergency exits.

## **Preparing to Start the Engine**

Inspect the condition of the seat belt. Replace it if it is worn or damaged.

Make certain all protective guards and covers are secured in place.

Inspect the machine for potential fire hazards.

Make sure the machine is equipped with proper lighting as required by job conditions.

## **Starting the Engine**

Do not start the engine or move any of the controls if a DO NOT OPERATE or warning tag is attached to the controls.

Make sure no one is working on, under, or close to the machine before starting the engine.

Move all implement controls to hold or neutral before starting the engine.

Start and operate the engine only in a well ventilated area. In an enclosed area, vent the engine exhaust to an open area.

## **Preparing to Operate**

Fasten the seat belt securely.

Check all controls and protective devices to make sure they are working properly while moving slowly in an open area:

1. Steering
2. All brakes
3. Governor control
4. Hydraulic functions
5. Devices such as lights, travel alarm, horn, etc.

See the "Service Manual" for adjustments, if they are needed.

## **Operating**

Operate the controls only while seated.

Do not allow riders on the machine unless an additional seat, seat belt and rollover protection is provided for each rider.

The operator must satisfy himself that no one will be endangered before moving the machine.

Be careful to avoid tipping when working on hills, banks or slopes and also when crossing ditches, ridges or other obstructions.

Stay a safe distance from the edge of cliffs, overhangs or slide areas.

If the machine begins to slide on a grade, dispose of the load immediately and turn the machine downhill.

Do not exceed the rated load capacity of the machine. If the machine is not on level ground, capacities will vary.

When loading trucks, never swing over the cab. Make sure the driver is out of the truck during loading.

Avoid fast swings and hoists or sudden stops.

Be sure there is adequate space for tail swing before operating.

Beware of reduced stability when swinging over the side of the track.

When working in a pit or near a high bank, alert pit men immediately if a cave-in appears imminent.

Use short slings to prevent excessive load swing.

Use caution on slopes. Tipping can occur if you operate with a load beyond a safe operating radius.

Keep other machines away from the edge of an excavation when you are digging.

Swing the boom to the upper side of a hill to avoid tipping, except when using it as a crutch.

For long moves, position the boom in the direction of travel.

Know the exact location of buried cables and pipes. Mark them clearly.

Move the machine away from the excavation before leaving it.

### **Parking the Machine**

Lower the equipment to the ground with slight down pressure. Engage the hydraulic and anti-travel lock lever. Stop the engine. Turn off the disconnect switch and remove the key.

If the machine must be parked on a steep grade, block both tracks.



Always park the clamshell equipped machine with the clam bucket open on the ground.

### **Fire Prevention**

Do not smoke while refueling or when near batteries.

Always have a fire extinguisher on hand and know how to use it. Inspect and service the extinguisher as recommended on the instruction plate.

Do not start the engine or move any of the controls if there is a warning tag attached to the controls or start switch.

Before starting the engine, inspect for trash or leaks which could cause a fire. See "Before Starting" for the walk-around inspection procedure.

Do not carry flammable fluids such as starting fluid (ether), gasoline or fuel on the machine in loose containers.

Loose or damaged lines, tubes and hoses, which leak, can cause fires.

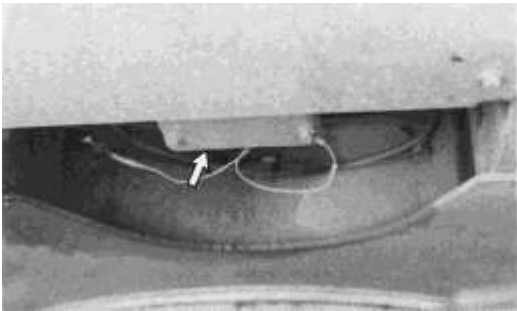
Do not bend or strike high pressure lines. Do not install damaged lines.

Inspect all lines, tubes and hoses carefully. Tighten all connections to the recommended torques.

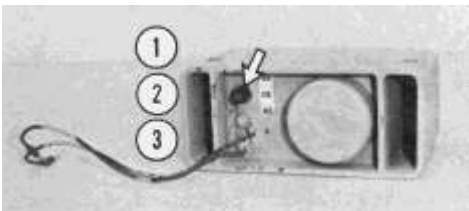
Make sure that all clamps, guards and heat shields are installed correctly. This will help to prevent vibration, rubbing against other parts or excessive heat during operation.

Shields which protect hot exhaust components from oil or fuel spray, must be installed correctly. This will help prevent fires in the event of tube, hose or seal failure.

## **Travel Alarm**



The travel alarm, located under the rear of the upper structure, sounds to warn nearby personnel of machine movement.



The alarm sounds anytime either the forward or reverse travel pedal is depressed.



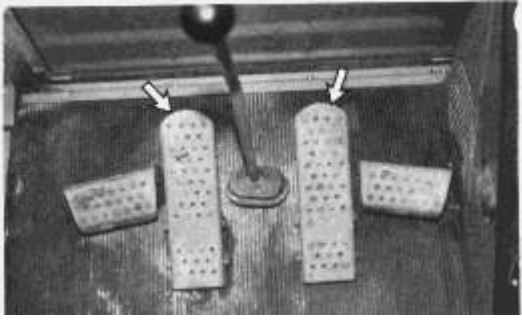
A switch at the back of the alarm adjusts the sound level.

(1) HIGH sound level

(2) LOW sound level

(3) MEDIUM sound level

The alarm is usually set at the HIGH level when shipped from the factory.



Press the button at the top of the steering control lever to stop the alarm when it is not required.

When the button is depressed momentarily while traveling, the alarm will sound for 10 seconds, then it will turn off.

It will remain off until the machine is stopped and travel is resumed in either direction.

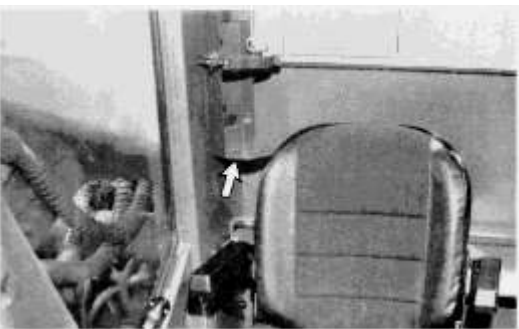
### **Horn**



Push down the button to sound the horn.

Use the horn to signal or warn personnel.

### **Fire Extinguisher**



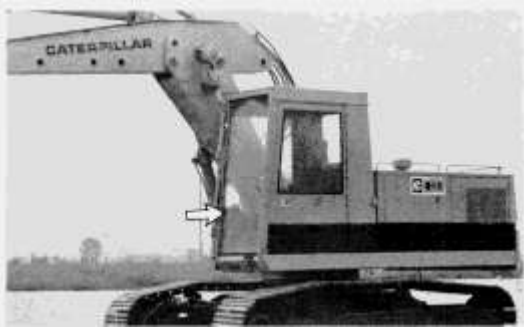
A fire extinguisher mounting bracket is available for mounting in the cab.

Always have a fire extinguisher on the machine and know how to use it.

Have the extinguisher and its charge inspected as recommended on its instruction plate.

### **Emergency Exit**





Use the front windshield as an emergency exit if the door is blocked.

See the "Operator Compartment" Section for windshield opening instructions.

## **Seat Adjustment**



**Adjust the seat at the beginning of each shift or when changing operators.**

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Adjust the seat to allow full travel of the pedals when the operator is seated against the seat back.



Push the front lever down to permit raising or lowering of the seat.



Push the lever located at the left, to the right, to permit moving the seat forward or backward.



To adjust seat back tilt, lift the back and tilt to one of 3 positions. Release the back.

### **Suspension Seat**



The optional suspension seat has a ride adjustment lever located at the right rear corner of the seat cushion. Adjust the seat with the operator seated.



Pull the handle up and twist to the right (clockwise) for a firmer ride or to the left (counterclockwise) for a softer ride. The seat is correctly adjusted when the indicator is even with the seat frame upright.

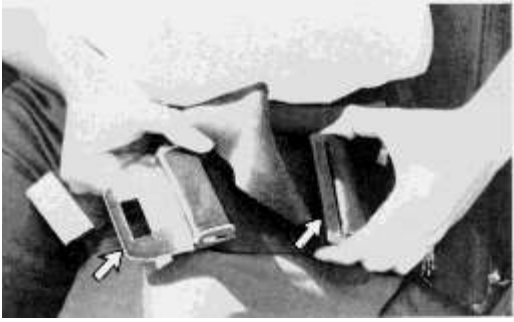
### **Seat Belt**



**Replace the seat belt or mounting hardware if it is damaged. Replace the belt at least every 3 years.**

**Adjust and fasten the seat belt before operating the machine.**

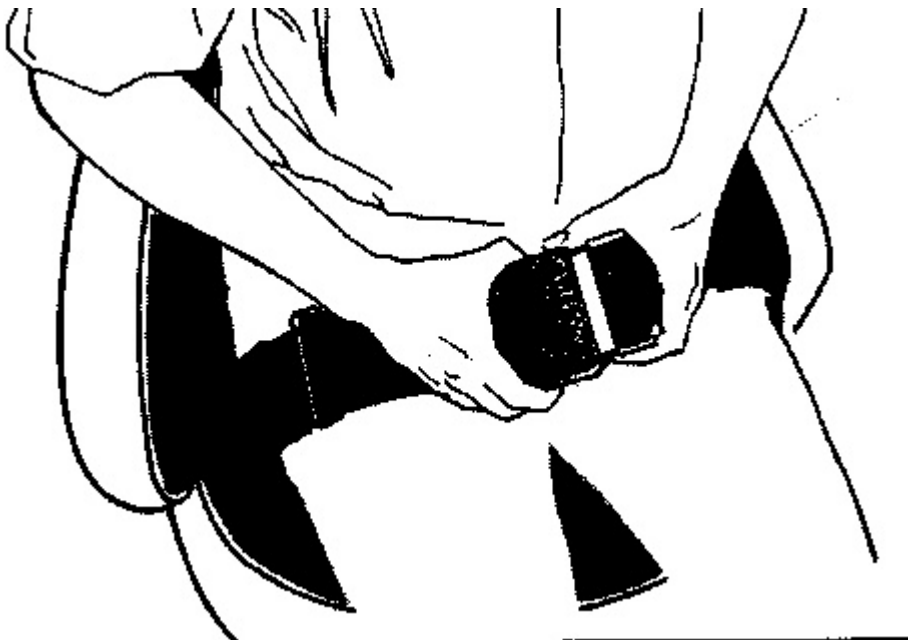
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Inspect for worn or frayed webbing. Check for worn or damaged buckle or anti-creep slide on each half of the belt. Replace the belt, buckle, or slides if they are worn or damaged.

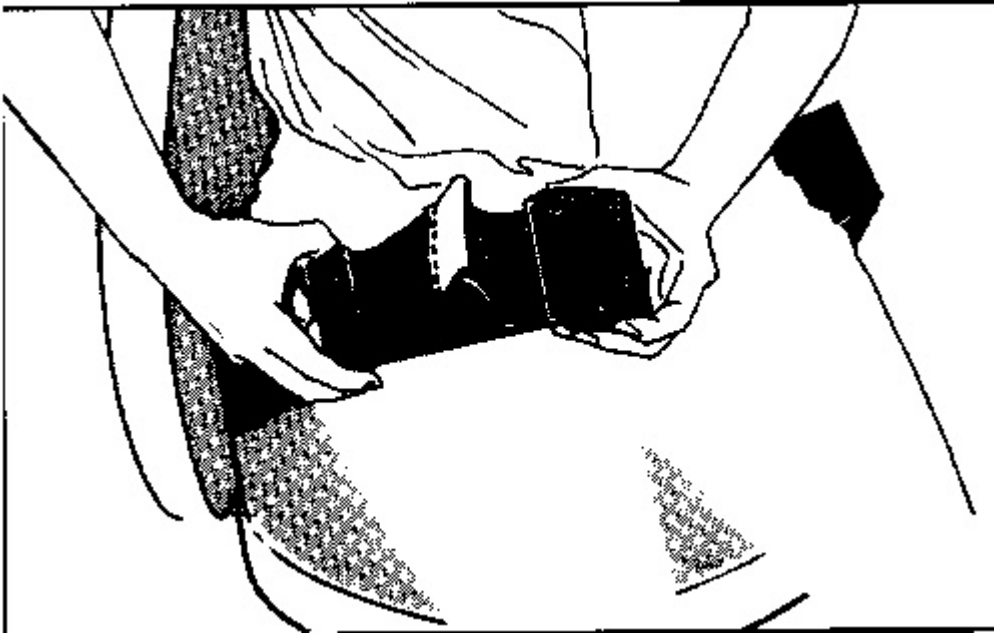


Inspect the belt mounting hardware. Replace any damaged or worn hardware.

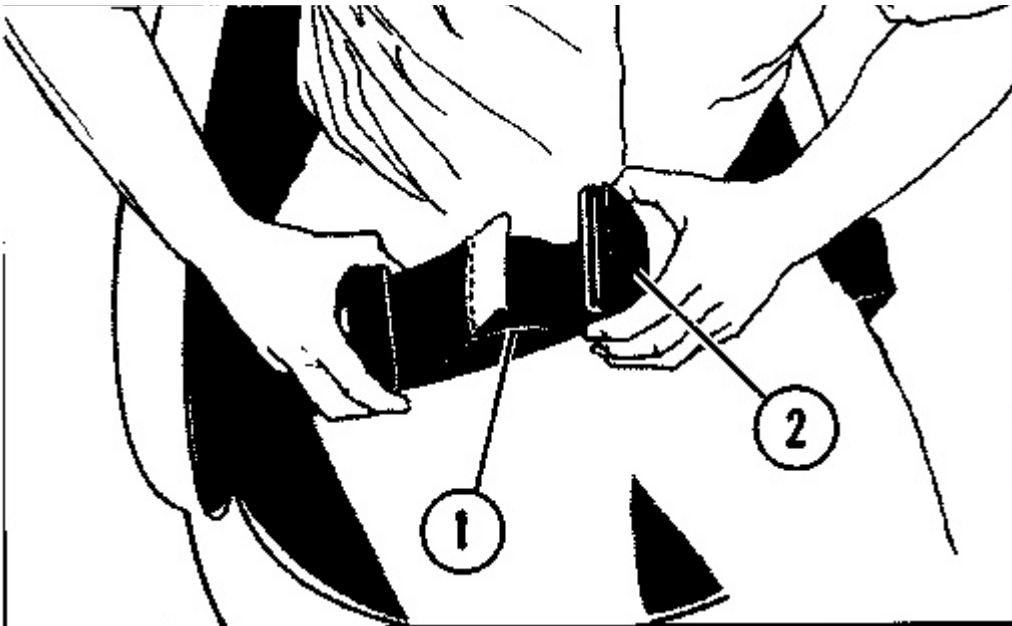


Adjust both ends of the belt. The belt should be snug but comfortable.

### **To Lengthen the Belt**

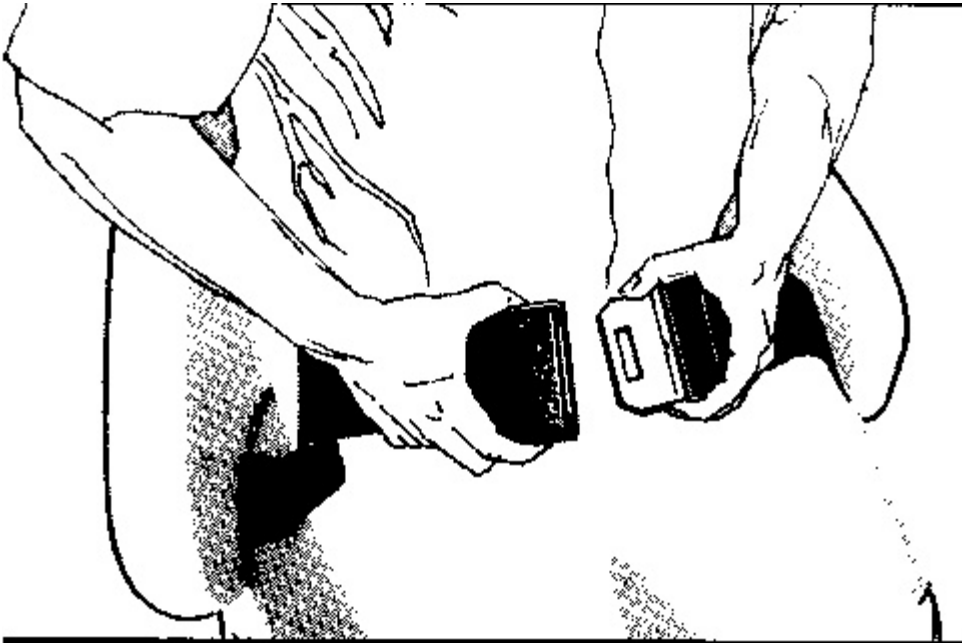


1. With the belt unfastened, move the anti-creep slide toward the buckle.



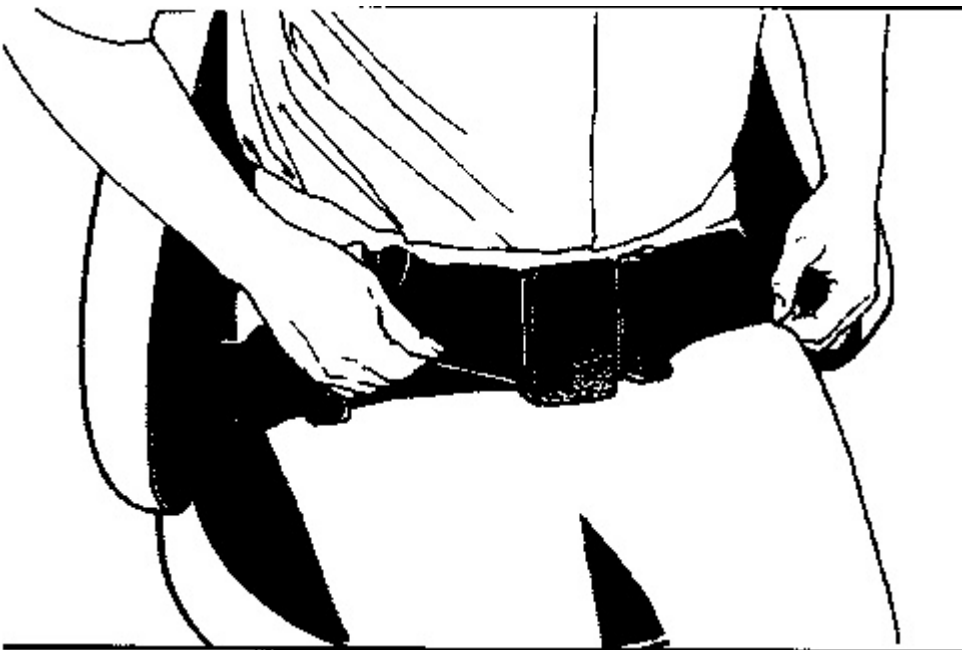
2. Remove the slack in the outer loop (1). Rotate the buckle (2) to free the lock bar.

3. Pull on the buckle until the outer and inner loops are tight.

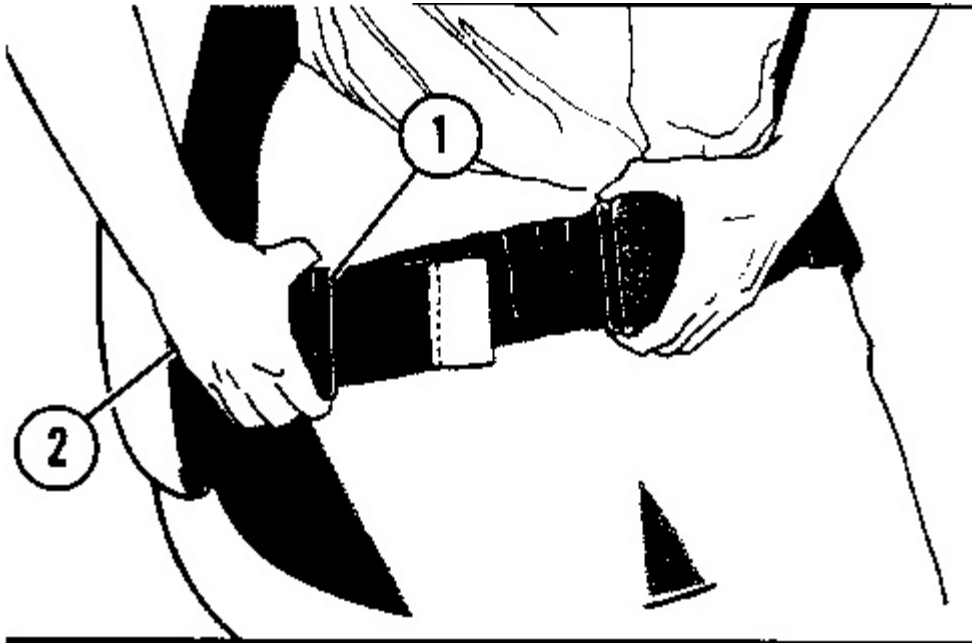


4. Loosen the other half of the belt in the same manner. Readjust the belt if it does not fit properly.

**To Shorten the Belt**



1. With the belt fastened, pull on the outer loop to tighten the belt.



2. Move the anti-creep slide (1) toward the anchor end of the belt (2) to take up the slack in the outer loop.
  3. Adjust the other half of the belt in the same manner.
  4. Readjust the belt if it does not fit properly with the buckle in the center.
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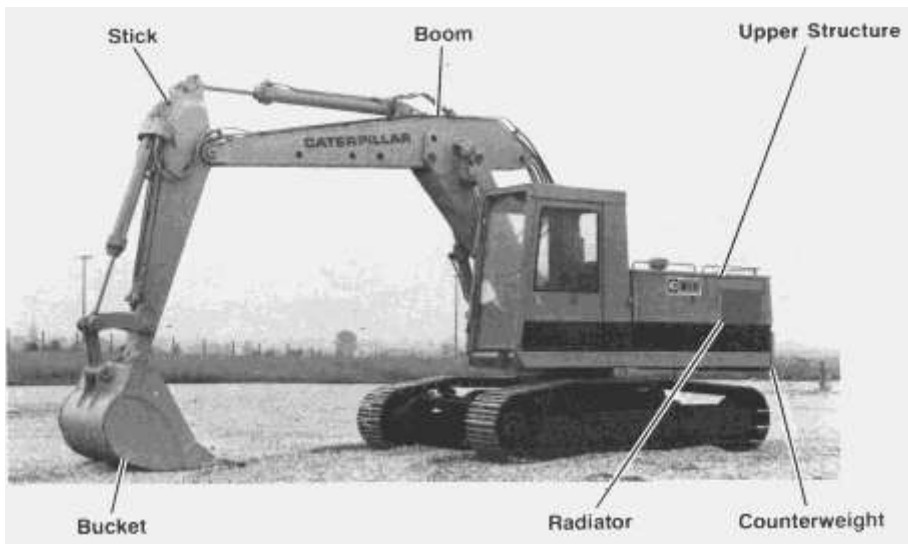
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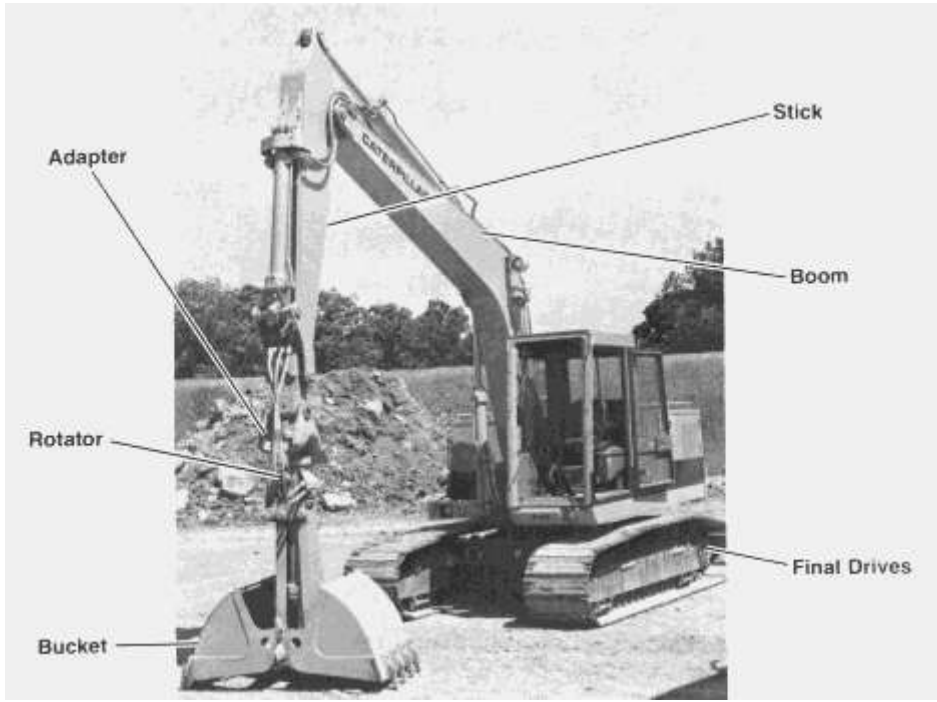
### Model Views

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#### Backhoe Equipped



#### Clamshell Equipped





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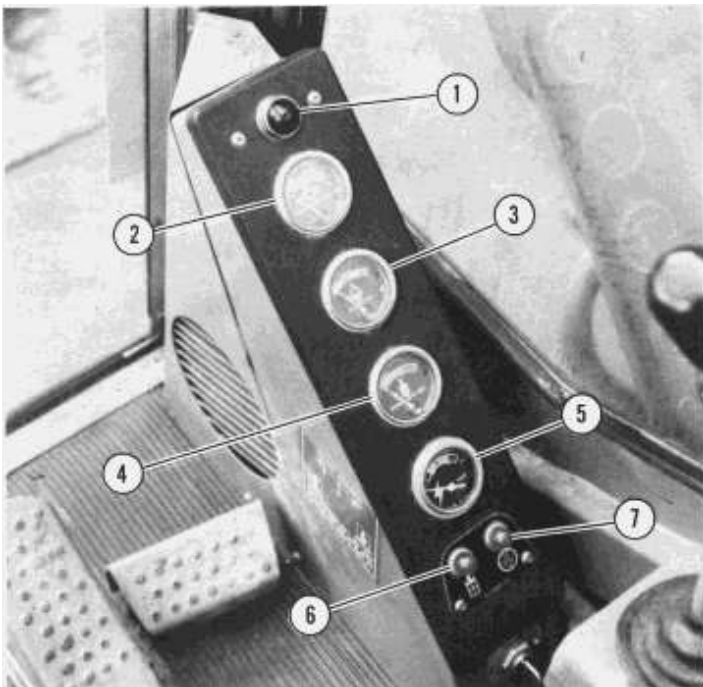
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# Operator's Compartment

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## Indicators



### **(1) Master Warning Light (Red)**

Flashes to warn the operator of a machine malfunction. It operates if engine coolant temperature is high, or the engine oil pressure is low.

**(2) Engine Oil Pressure Gauge** Indicates the engine oil pressure. The GREEN range is normal at engine full load speed. The WHITE range is normal for engine low idle speed.

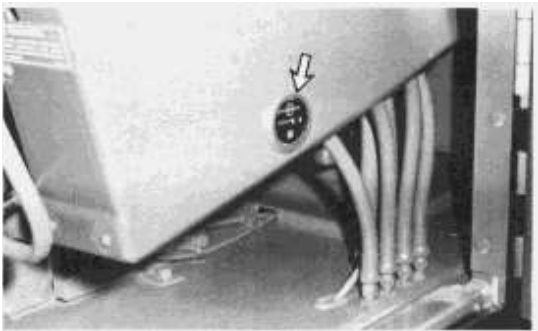
**(3) Coolant Temperature Gauge** Indicates the temperature of the engine coolant. The GREEN range is the normal operating temperature.

**(4) Hydraulic Oil Temperature Gauge** Indicates the hydraulic oil temperature. The GREEN range is the normal operating temperature.

**(5) Voltmeter** Indicates the voltage output of the alternator.

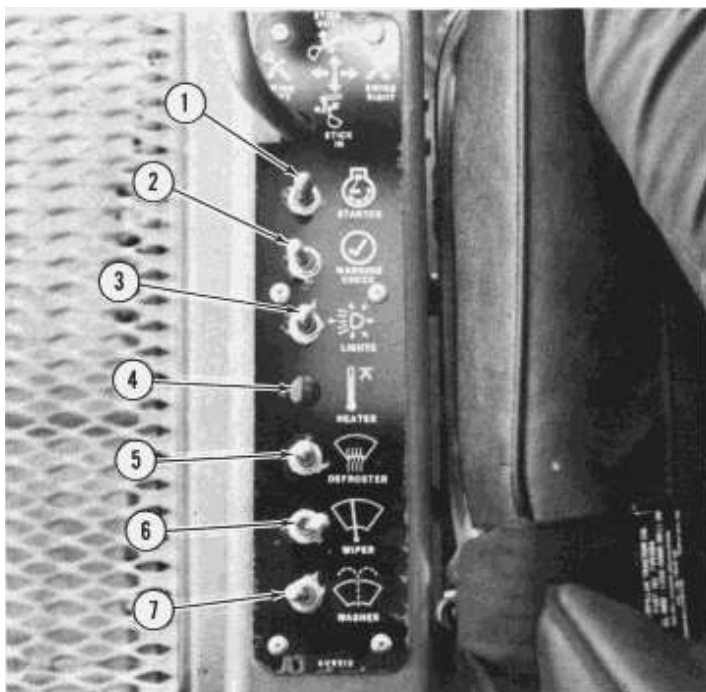
**(6) Hydraulic Oil Filter Indicator (AMBER)** When it lights it indicates plugged hydraulic oil filters.

**(7) Engine Air Filter Indicator (AMBER)** When it lights it indicates that the engine air filter requires service.



**Service Meter** Indicates the total service hours on the engine. It should be used to determine service intervals.

## Electrical Devices



**(1) Start Switch** Pull the switch up and move it to the right to crank the engine.

**(2) Monitoring System Test Switch** With the engine stopped and the disconnect switch on, move the switch to the right. The Master Warning Light and other indicator lights on the gauge panel should light.

**(3) Light Switch** Move the switch to the right to turn the flood and instrument panel lights on.

**(4) Heater Switch** Center the switch for LOW fan speed. Move the switch further to the right for HIGH fan speed.

**(5) Defroster Switch** Center the switch for defroster LOW fan speed. Move the switch farther to the right for HIGH speed.

**(6) Windshield Wiper Switch** Center the switch for SLOW wiper operation. Move the switch to the right for FAST wiper operation.

**(7) Windshield Washer Switch** Move the switch to the right to SPRAY window washing solvent onto the windshield. The switch will return to OFF when released.

All switches on the panel except the START switch are OFF when they are in the far left position. The START switch is OFF when centered.



**Ether Aid Switch** For aid in starting below 0°C (32°F) move the switch to the right to inject a metered amount of ether into the intake manifold. The button must be released and moved again if more ether is required.



### **Battery Disconnect Switch**

To activate the electrical system, insert the key and turn the switch to the RIGHT.

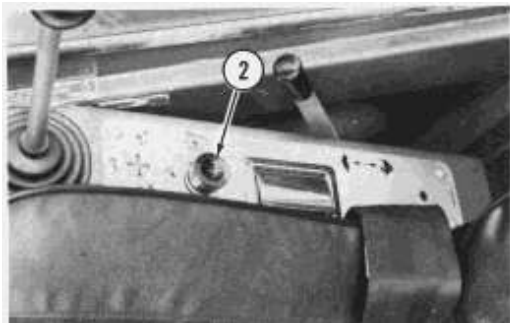
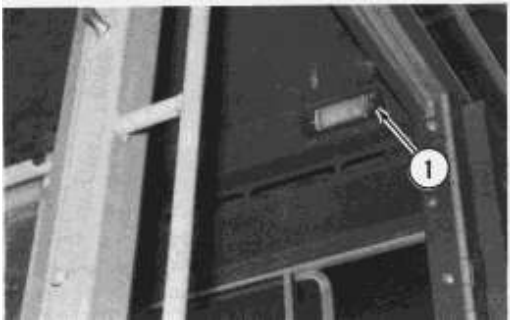
Turn the switch OFF and remove the key when parking the machine. This will prevent battery drain.

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### **NOTICE**

**Do not operate the engine with the disconnect switch off.**

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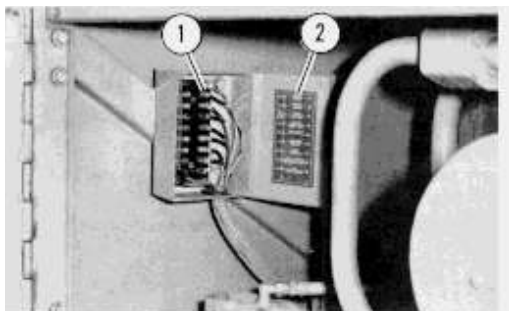
**(1) Interior Light Switch** Move the switch to turn the cab inside light ON or OFF.

**(2) Lighter** Push DOWN the knob. The lighter moves up when it is ready for use.

### **Fuse Box**



The fuse box is located inside the left front access door.



### **(1) Fuses**

Fuses protect the electrical system from damage caused by overloads.

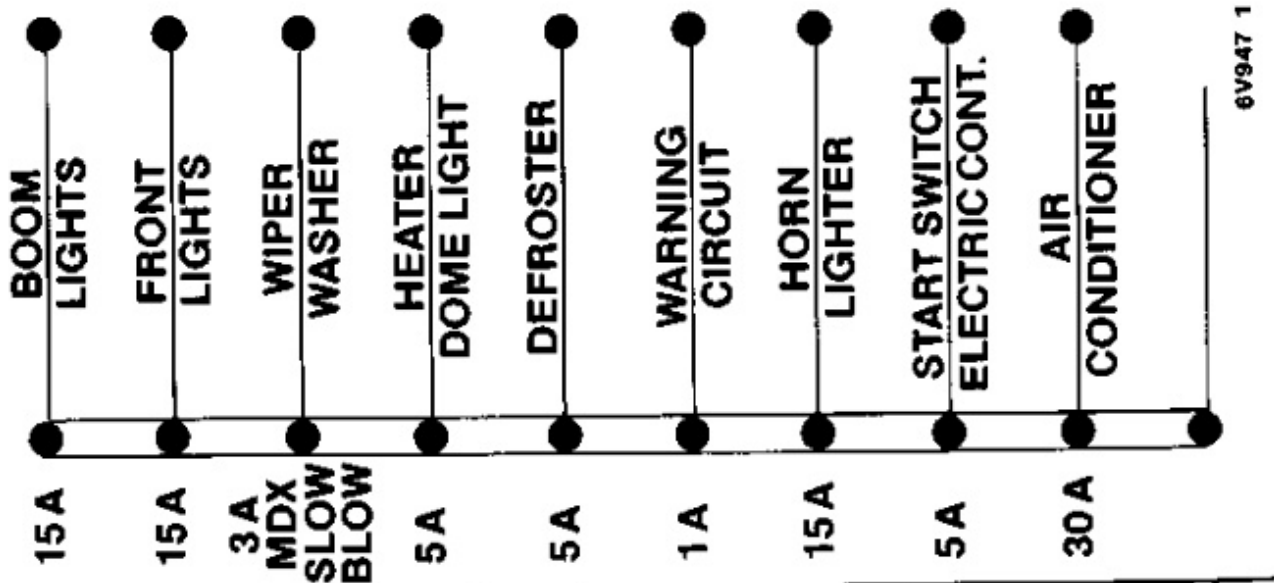
Change a fuse if element separates. If the element of a new fuse separates, have the circuit checked.

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## NOTICE

Replace fuses with the same type and size.

(2) **Fuse Circuit Diagram** The circuit for each fuse is identified on the diagram inside the fuse box door. See below.



Fuse Circuit Diagram

## Windshield

 **WARNING**

To prevent the windows from falling on the operator, be sure the latches at the top of the cab hold the windows securely.



To provide ventilation, the lower window can be opened.

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