

Product: EXCAVATOR

Model: 235 EXCAVATOR 32K

Configuration: 235 EXCAVATOR 32K01301-02678 (MACHINE) POWERED BY 3306 ENGINE

## **Operation and Maintenance Manual 235 EXCAVATOR REPLACES GEG05073-03**

Media Number -SEBU6464-00

Publication Date -01/11/1979

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.

Most accidents, no matter where they occur, are caused by someone's failure to observe and follow simple and fundamental rules or precautions. For this reason most accidents can be avoided by recognizing hazards and taking steps to avoid them before an accident occurs.

Regardless of the care used in the design and construction of any type of equipment, there are conditions that cannot be completely safeguarded against without interfering with reasonable accessibility and efficient operation.

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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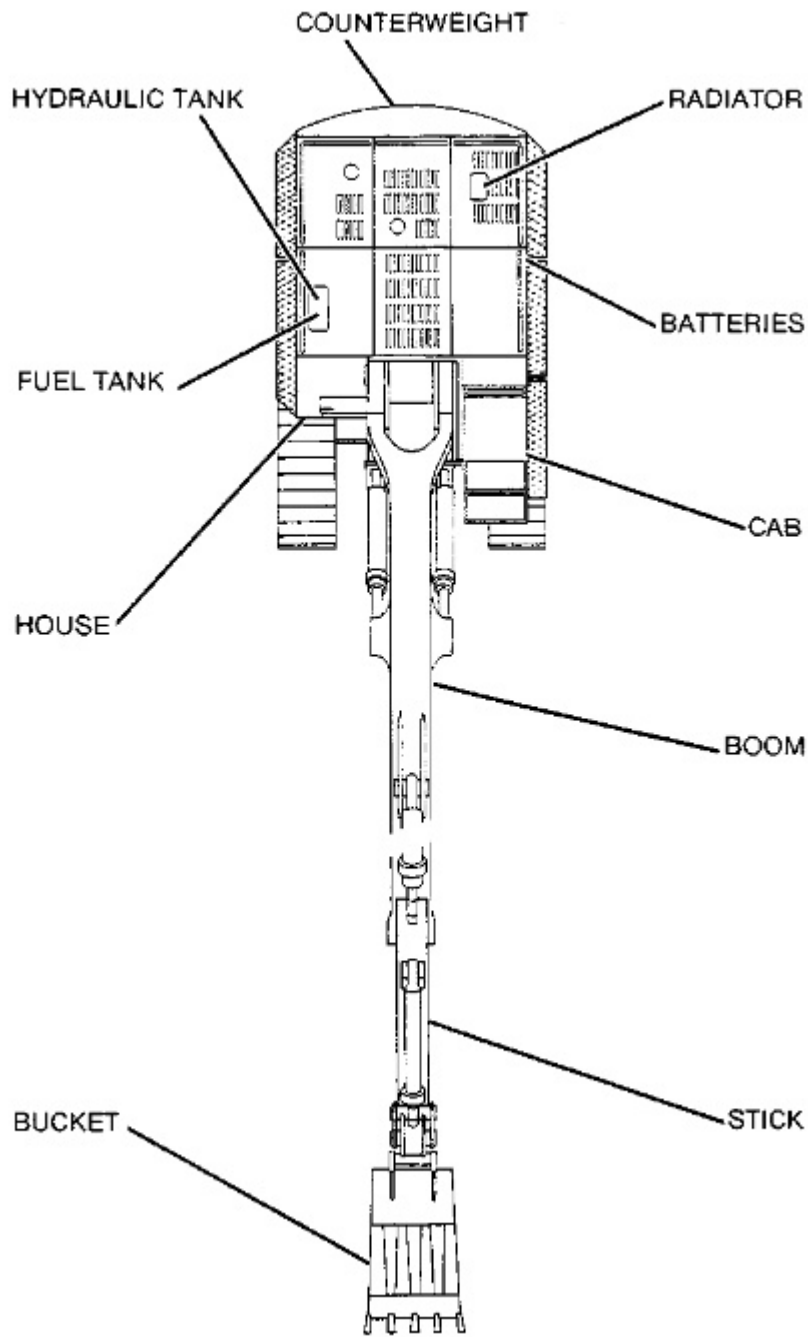
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## **Model View**

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## **Safety**

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### **General**

Wear a hard hat, safety glasses and respirator as required by job conditions.

Do not wear loose clothing or jewelry that could catch on controls or other objects.

Lower equipment, engage safety control lever and stop engine before making any adjustments, servicing or leaving machine.

Do not smoke while fueling.

### **Preparing to Operate**

Report needed repairs.

Make certain all safety guards and covers are securely in place.

Clear personnel from machine and area.

Maintain good vision by keeping cab and windshield clean.

Always have a fire extinguisher on hand and know how to use it. Check regularly ... at least monthly ... to be sure it is in working order.

Be particularly careful on machines you do not usually operate.

Clear obstacles from path of machine ... note hazards such as wires and ditches.

Be sure to check for tail swing clearance before operating machine.

Start engine only in well ventilated area.

Become thoroughly familiar with all controls.

### **Checking Controls**

Test all controls at start of shift to be sure they are properly adjusted before beginning operation.

Listen for unusual noises.

Test engine governor control.

Test right and left steering while moving slowly.

Adjust seat for comfortable working conditions.

Check function of safety devices such as lights, horns, etc.

## **Operating**

No riders.

Stay clear of overhangs, electric wires, slide areas or other danger areas.

Use extra caution in crossing side hills, ridges, ditches and other obstructions.

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

Stay safe distance from edge of cliff or overhang.

Know traffic pattern of the job and obey flagmen, road signals and signals.

Keep machine under control - do not try to work machine over capacity.

For long moves, position boom in direction of travel.

Know the exact location of buried utility lines ... mark them clearly.

Use extreme care to avoid tipping when working on hills, banks or slopes.

If possible load trucks from the rear. Never swing over the truck cab ... and make sure the driver remains out of the truck during loading.

Look behind machine before and while backing.

Observe all gauges frequently - investigate improper readings.

Watch your boom clearance when traveling ... uneven ground may cause boom to weave or bob into power lines.

If it is necessary to work near power lines, check local or state codes.

If you hit a power line: Stay inside the cab until line is cleared or power is shut off.

Warn people not to come close to machine if in contact with power lines.

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

Never exceed manufacturer's rating. Remember that many machines have some ratings limited by factors other than machine stability.

If machine begins to malfunction, shut down machine immediately.

Keep near-capacity loads as close to the ground as possible.

Check loads before moving them. First, determine the load weight and check against the capacity chart. Be sure lifting devices are of sufficient capacity. Before you start to lift be sure the lifting line is vertical. When lifting, avoid sudden starts and stops.

When loading a truck with an Excavator, raise the boom at the same time you extend the stick.

Be aware of reduced stability when swinging over side of track.

Do not handle large, heavy loads in strong winds. The wind can catch the load and create an unstable condition.

Avoid fast swings, hoists or sudden braking ... these can cause overloads.

When working in pit or high banks -

Keep check on pit men ... be quick to alert them if a cave-in appears imminent.

Beware of caving edges and overhanging banks.

Always position machine to let you get away quickly when digging high banks ... a slide may start.

Pull machine away from high banks or edges before shutting down.

Use caution on slopes ... tipping can occur if you travel with load beyond safe operating radius.

Do not swing load or equipment over workmen.

### **Mounting and Dismounting**

Always lower all equipment before dismounting.

Do not jump off machine. Use grab irons.

Lower attachments, engage safety control, shut off engine, and remove key.

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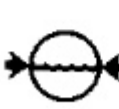
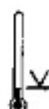




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



## **Symbol Identification**

**SMCS - 7606**

THESE PAGES EXPLAIN THE MEANING OF SYMBOLS THAT MAY APPEAR ON YOUR MACHINE.

|                              |   |                        |   |                         |   |                           |   |
|------------------------------|---|------------------------|---|-------------------------|---|---------------------------|---|
| ENGINE - HEAT                |    | FUEL TANK              |    | INSIDE AIR CIRCULATION  |    | OFF                       |    |
| ENGINE OIL                   |    | FUEL FILTER            |    | OUTSIDE AIR CIRCULATION |    | ON                        |    |
| ENGINE OIL FILTER            |    | FUEL LEVEL             |    | AIR FILTER              |    | HYDRAULIC OIL FILTER      |    |
| ENGINE OIL LEVEL             |    | FUEL PRESSURE          |    | AIR PRESSURE            |    | HYDRAULIC OIL LEVEL       |    |
| ENGINE OIL PRESSURE          |    | FUEL SHUTOFF           |    | COOLANT FLOW            |    | HYDRAULIC OIL TEMPERATURE |    |
| ENGINE - START OR RUNNING    |   | VOLUME - FULL          |   | COOLANT LEVEL           |   | AMMETER OR ALTERNATOR     |   |
| ENGINE - STOP OR NOT RUNNING |  | VOLUME - ONE HALF FULL |  | COOLANT PRESSURE        |  | COOLER CONTROL            |  |
| OIL PRESSURE                 |  | VOLUME - EMPTY         |  | COOLANT TEMPERATURE     |  | HEATER CONTROL            |  |



|  |  |   |   |
|--|--|---|---|
| <p>DISENGAGE</p>            | <p>BACKHOE - DIG</p>              | <p>LIGHT - ALL</p>                     | <p>PRESSURIZED COMPARTMENT</p>  |
| <p>ENGAGE</p>               | <p>BACKHOE - DUMP</p>             | <p>LIGHT - BRIGHT</p>                  | <p>LEVER - MOVEMENT</p>         |
| <p>MAXIMUM</p>              | <p>BACKHOE - STICK - IN</p>       | <p>LIGHT - DIM</p>                     | <p>BRAKE - PARK</p>             |
| <p>MINIMUM</p>              | <p>BACKHOE - STICK - OUT</p>      | <p>LIGHT - FLOOD</p>                   | <p>BRAKE</p>                    |
| <p>STEERING</p>             | <p>BACKHOE - BOOM - LOWER</p>     | <p>LIGHT - INSTRUMENT</p>              | <p>CONTINUOUSLY VARIABLE</p>    |
| <p>TURN - LEFT</p>          | <p>BACKHOE - BOOM - RAISE</p>     | <p>LIGHT - PARK</p>                    | <p>LOCK</p>                     |
| <p>TURN - RIGHT</p>       | <p>BACKHOE - SWING - LEFT</p>   | <p>WINDSHIELD DEFROSTER CONTROL</p>  | <p>UNLOCK</p>                 |
| <p>TRACTOR - FORWARD</p>  | <p>BACKHOE - SWING - RIGHT</p>  | <p>WINDSHIELD WASHER CONTROL</p>     | <p>HORN CONTROL</p>           |
| <p>TRACTOR - REVERSE</p>  | <p>LIFT POINT</p>               | <p>WINDSHIELD WIPER CONTROL</p>      | <p>HOURS</p>                  |

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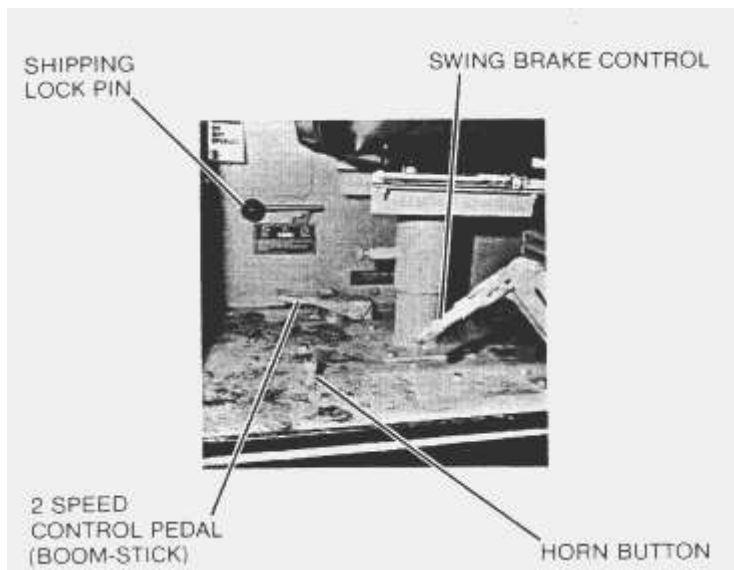
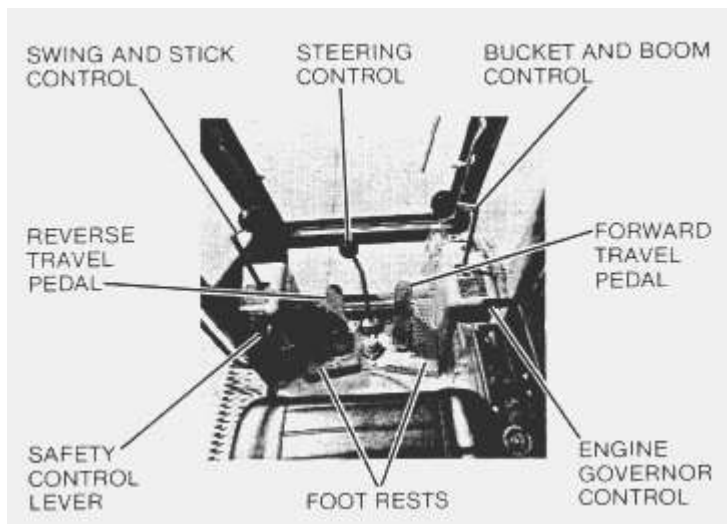
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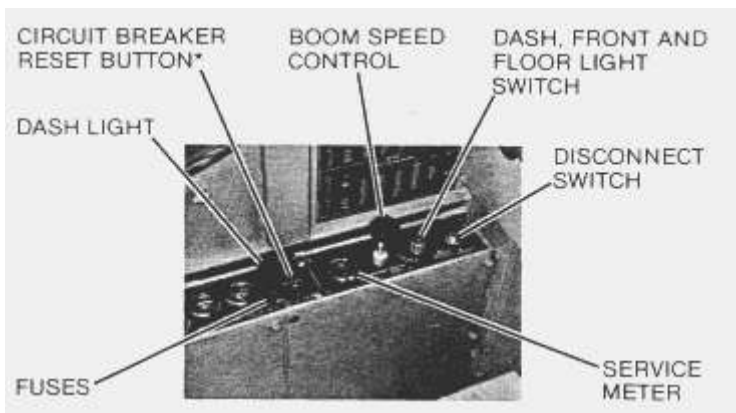
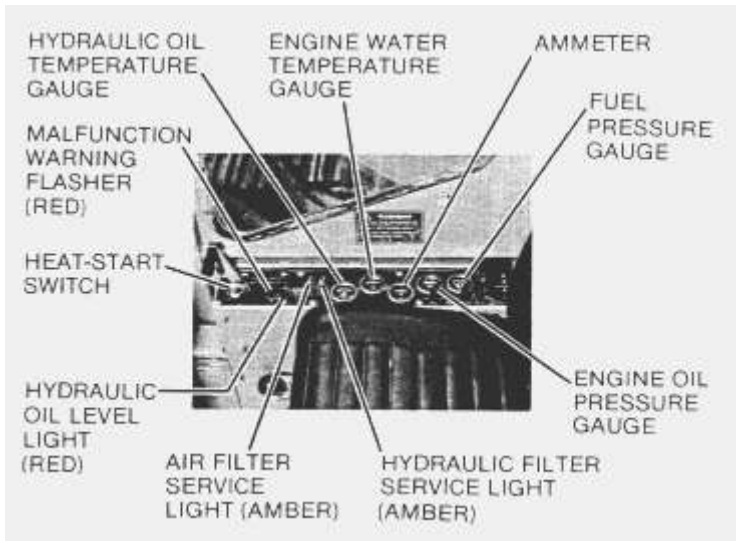
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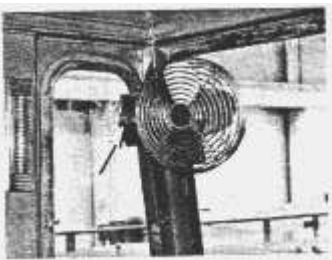
### Operator's Compartment

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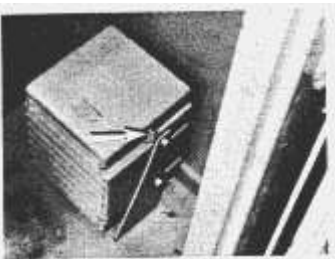




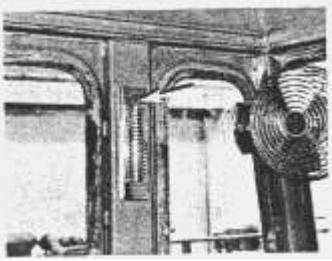
\*Push down on button to reset open circuit breaker. Stop Excavator and check for electrical problem if circuit breaker opens again.



VENTILATION FAN SWITCH <sup>1</sup>



HEATER SWITCH <sup>1</sup>



DOMELIGHT SWITCH



DEFROSTER SWITCH <sup>1</sup>



WINDSHIELD WIPER SWITCH <sup>1</sup>



WINDSHIELD WASHER BUTTON <sup>1</sup>

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<sup>1</sup>ATTACHMENT

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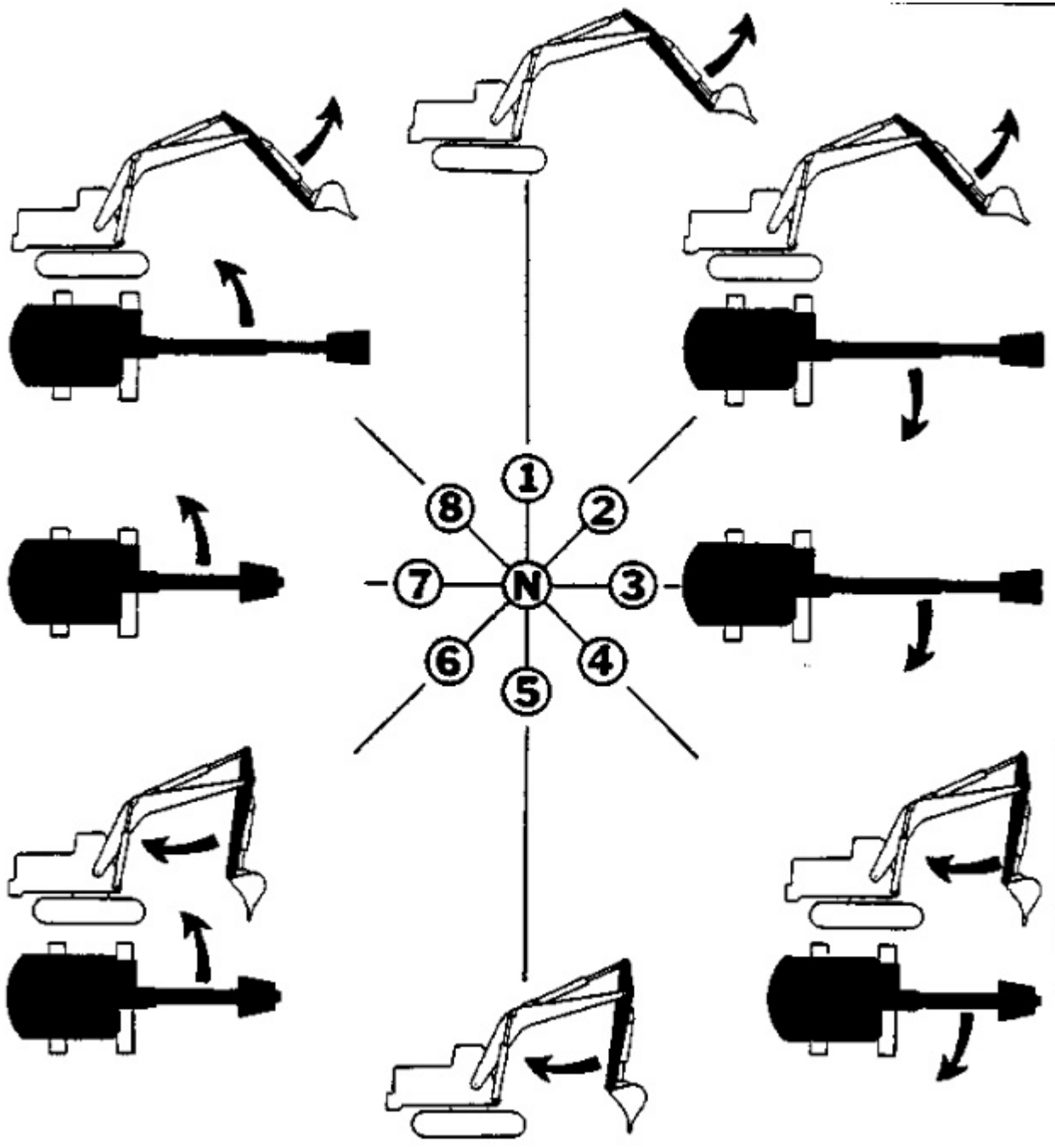
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## **Controls**

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### **Swing and Stick Control**

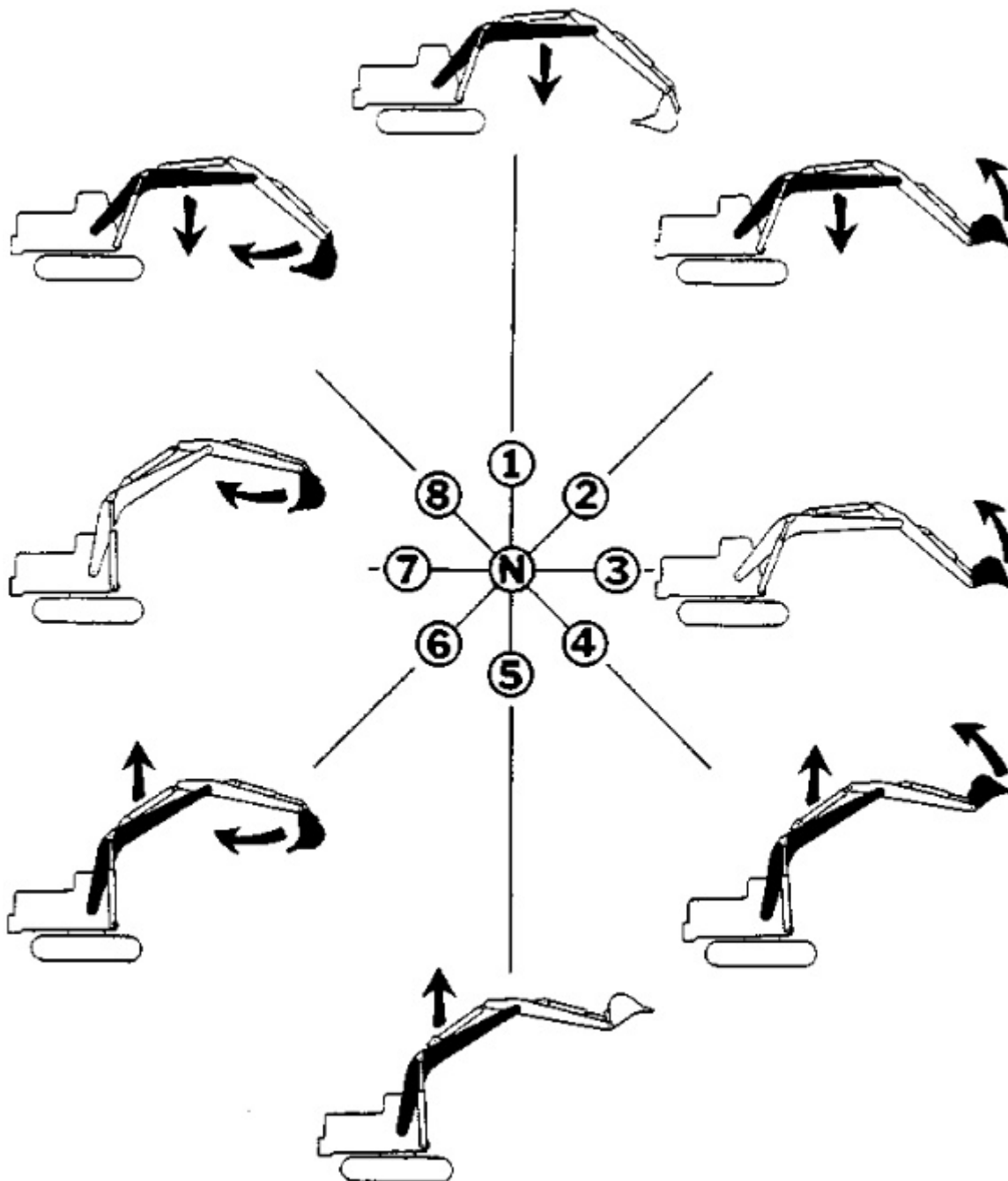


(N) NEUTRAL

- (1) Stick moves out.
- (2) Stick moves out and upper house swings to the right.
- (3) Upper house swings to the right.
- (4) Upper house swings to right and stick moves in.
- (5) Stick moves in.
- (6) Stick moves in and upper house swings to left.
- (7) Upper house swings to the left.
- (8) Upper house swings to the left and stick moves out.

**NOTE:** The control will function in any position of a full circle movement. Swing control functions are independent of all other functions.

### **Bucket and Boom Control**



(N) NEUTRAL

(1) Boom lowers.

(2) Boom lowers and bucket opens.

(3) Bucket opens.

(4) Bucket opens and boom raises.

(5) Boom raises.

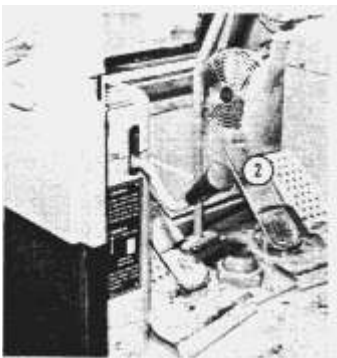
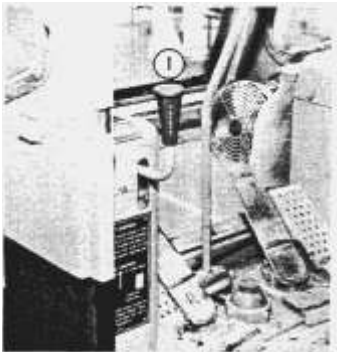
(6) Boom raises and bucket closes.

(7) Bucket closes.

(8) Bucket closes and boom lowers.

**NOTE:** The control will function in any position of a full circle movement.

### **Safety Control**



(1) Up position of handle - all hydraulic controls inside the cab are inoperable.

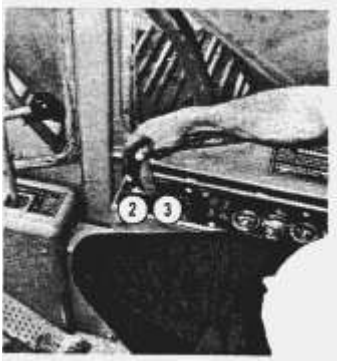
(2) Down position of handle - all hydraulic controls inside the cab are operable.

**NOTE:** Place lever in UP position before leaving operator's station.

### **Engine Governor Control**



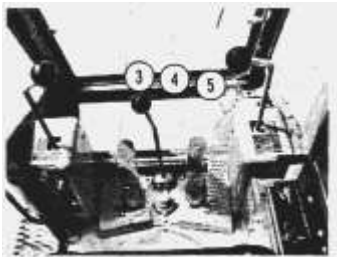
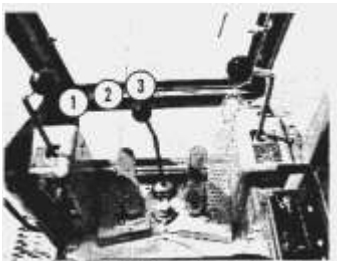




- (1) FORWARD - Governor off.
- (2) CENTERED - Low idle position.
- (3) REARWARD - High idle position.

## **Steering Control**

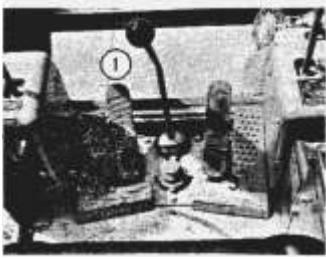
**NOTE:** Steering control will not function unless operated in conjunction with track control pedals.



- (1) Spot left turn - Right track forward and left track reverse.
- (2) Pivot left turn - Right track forward and left track locked.
- (3) NEUTRAL
- (4) Pivot right turn - Left track forward and right track locked.
- (5) Spot right turn - Left track forward and right track reverse.

## **Track Control Pedals**

**NOTE:** With either track control pedal fully depressed; boom raise, stick and bucket controls will not function. With either track control pedal partially depressed; boom raise, stick and bucket controls will function at reduced speed.

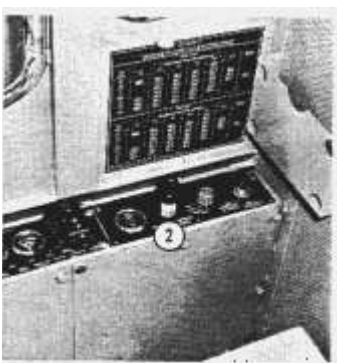


(1) LEFT PEDAL - Depress left track pedal for reverse.

(2) RIGHT PEDAL - Depress right track pedal for forward.

**NOTE:** The farther the pedals are depressed the faster the speed.

### **Boom Speed Control**



Controls boom lowering speed.

(1) Push button in center of knob and pull knob up to increase boom down speed.

(2) Push button in center of knob and push knob down to decrease boom down speed.

**NOTE:** Rotation of control knob will provide boom down speed fine adjustment.



**WARNING**

**Gradually engage control to regulate speed at which boom lowers.**

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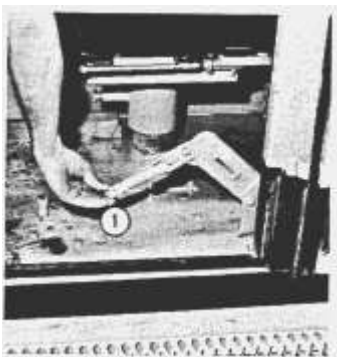
### **Two Speed Control**

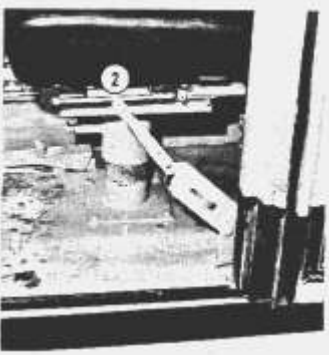


- (1) Fully depress pedal to increase boom raise and stick out speed.
- (2) Release pedal to resume normal boom raise and stick out speed.

**NOTE:** Pedal may be secured in the depressed position by rotating knob in center of pedal.

### **Swing Brake Control**





Used to restrain upper house from swinging motion caused by external loads.

(1) DOWN - Brake OFF.

(2) UP - Brake ON.

**NOTE:** Swing brake is not a service brake. Brake is used while digging, working on a side slope or as a parking brake.

DO NOT use swing brake when roading machine.

### **Swing Lock Pin**



(1) ENGAGED - Upper house is locked.

(2) DISENGAGED - Upper house is unlocked.

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