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SAFETY

TO THE OPERATOR OF A YANMAR EXCAVATOR

⚠ DANGER!

Unsafe use of the excavator could lead to serious injury or death. Operating procedures, maintenance and equipment practices or traveling or shipping methods that do not follow the safety guidelines on the following pages could cause serious, potentially fatal injuries or extensive damage to the machine or nearby property.

Please respect the importance of taking responsibility for your own safety, and that of other people who may be affected by your actions.

The safety information on the following pages is organized into the following sections:

1. “General Safety Essentials” on page 1-3
2. “Locations of Safety Labels” on page 1-4
3. “Work-site Precautions” on page 1-12
4. “Operation” on page 1-15
5. “Equipment” on page 1-20
6. “Maintenance” on page 1-24
7. “Shipping and Transportation” on page 1-27
8. “Excavator Rated Lift Capacity Tables” on page 1-28

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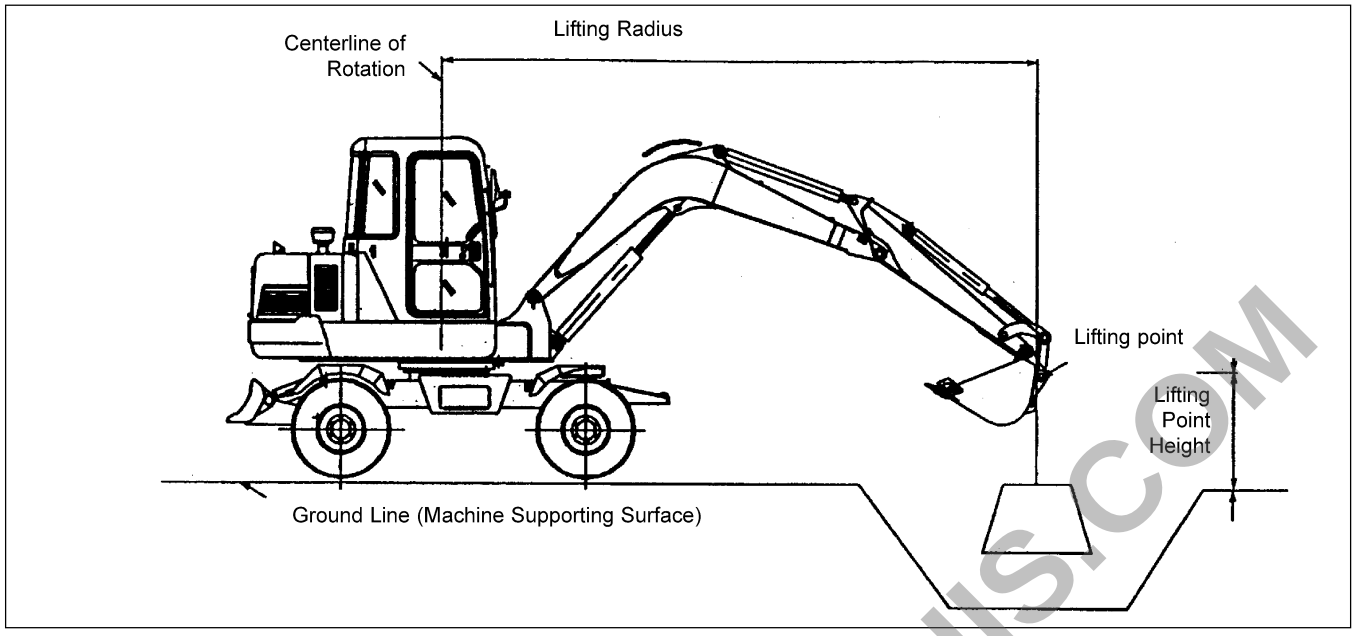


Figure 25

The weight of slings and any auxiliary lifting device (and/or the weight difference of any attachment heavier than standard configuration) must be deducted from the rated lift capacity to determine allowable net lifting load. The lift point should be located on the back of the bucket, as shown in Figure 25.

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HEATING AND AIR-CONDITIONING

SYSTEM SYSTEM SELECT LEVER

The heater and air-conditioner are built into one housing. Moving the lever to the "A" position provides heat, while moving the lever to the "B" position activates the air-conditioner.

When the lever in the "A" (heat) position, air is drawn into the unit from the rear and lower left-hand side. It is exhausted (blown out) from the lower right-hand side.

If the lever is moved to the "B" position, the air is drawn into the unit from the rear and lower left-hand side. It is exhausted (blown out) up the right side of the cab.

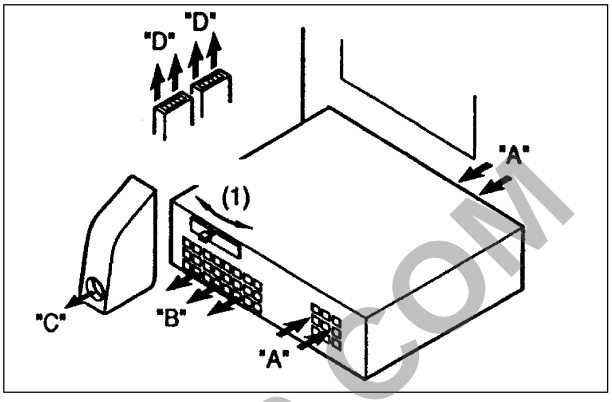


Figure 54

NOTE: When you do not use the air-conditioning system, or when you operate your machine in a dusty environment, use the air flow direction control lever to stop up the drain port of the system. If you have not used the system for an extended period of time with this port open, dust may settle within the system and reduce the system performance.

FAN CONTROL SWITCH

Use this control to regulate the amount of air forced through the system in order to maintain a proper interior temperature.

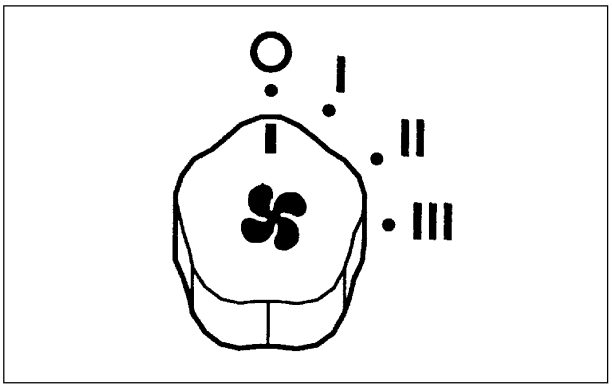


Figure 55

AIR-CONDITIONING SYSTEM SWITCH

When using the air-conditioning system, placing this switch (Figure 56) in the "I" position activates the air-conditioning compressor and refrigerant begins circulating.

Even if the fan control switch (Figure 55) is turned to the "O" position, the fan automatically operates as if the switch were in the "I" position.

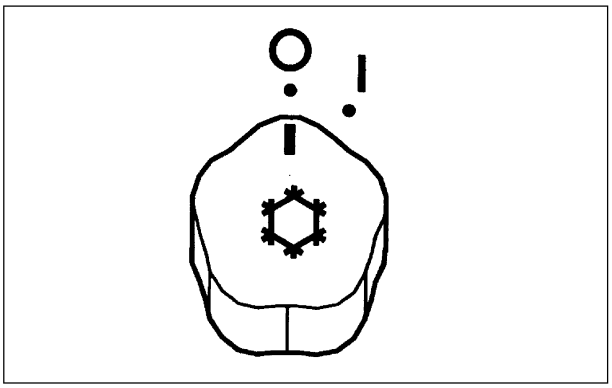


Figure 56

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12. METAL SELECTION

If the tape being listened to is either a metal or chromium type of tape, press the preset selector button 2 to select the "MTL" setting. "MTL" will appear on the display. Press this control a second time to turn this setting off.

13. LCD DISPLAY PANEL

A. Tape Reverse Direction Indicator
B. Tape Reverse Direction Indicator
C. Preset Radio Memory Channel Indicator
D. Radio Station Frequency
E. AM/FM Band Indicator
F. Stereo Radio Signal
G. Dolby Noise Reduction Indicator
H. Metal Tape Indicator

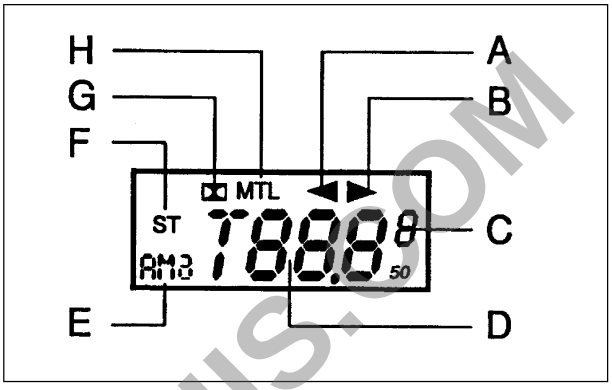


Figure 59

CARE OF STEREO

Do not use a tape which has a longer playing time than C-90 (90 minutes). Avoid use of C-120 tapes because the tapes are made of a thinner material that may break and get tangled inside the stereo.

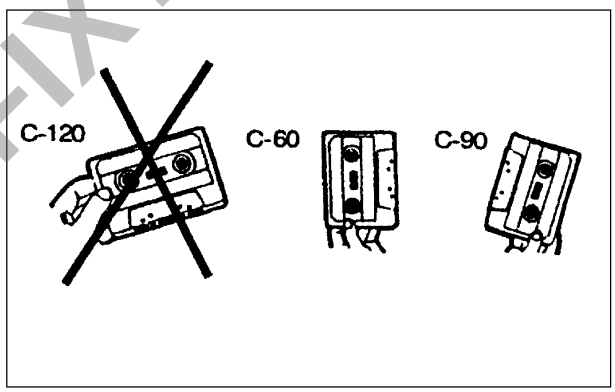


Figure 60

Make sure tapes are wound type. If you use a loose tape, it may cause a problem in the deck.
If they are loose, use a pencil or similar device to wind up the slack.

Do not use poor quality tapes.

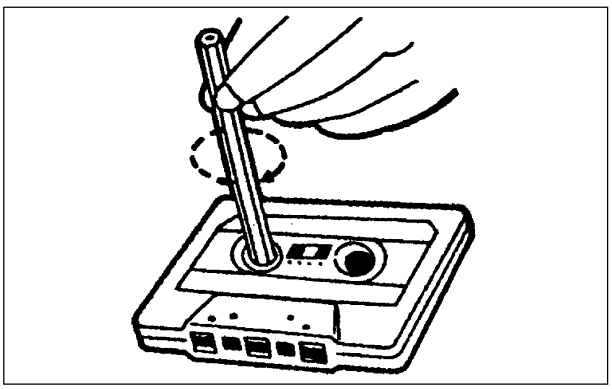


Figure 61

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TRAVEL

⚠ WARNING!

1. Make sure to read and understand all operating controls, Cautions, and Warnings before traveling.

2. Obey all traffic rules and regulations.

3. Do not travel faster than conditions allow.

4. Make sure to follow all local and state rules and regulations regarding over the road travel of construction equipment.

5. Before putting the machine into gear, make sure in which direction the machine is facing. Locate the front section of the excavator and select the appropriate gear for the direction of travel desired.

6. Before moving, make sure that there are no personnel in the way or on the machine. Sound the horn to alert workers that you are about to move the machine.

7. Be sure the path is clear during travel, especially when traveling in reverse gear.

8. If an alarm buzzer sounds or a warning light turns "ON," stop immediately and determine the cause of the problem.

9. If an unusual sound or smell is noticed, immediately stop the machine and determine the cause of the problem.

10. Avoid sudden stops or turns.

11. Remain in the slowest travel lane possible.

12. The machine is top heavy. Make sure to make turns at a slow speed.

13. Take extreme caution when traveling on road shoulders or narrow streets.

14. Never jump off the machine while it is moving.

15. Before leaving the operator's seat, make sure to lock out all control systems and shut down the engine to avoid accidental activation.

BEFORE TRAVELING

1. Check all tires to make sure that they are properly inflated and are not damaged.
2. Make sure that all excess mud, stone, etc. has been removed from the tires.
3. Fully raise and secure the dozer blade.
4. Make sure that the upper structure is facing forwards.
5. Store the front attachment in the "TRANSPORT" position and set the travel/work/park select switch in the "TRAVEL" position.
6. Set the ram cylinder switch in the "UNLOCK" position.
7. Before moving the excavator, make sure that the swing lock pin has been engaged. (See "Upper Structure Swing Lock Pin" on page 2-38.) This will prevent the excavator's upper structure from accidentally rotating while travelling.
8. Make sure that the boom swing lock is installed. (See "Upper Structure Swing Lock Pin" on page 2-38.)

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WORK LEVER (JOYSTICKS) (ISO STYLE)

⚠ WARNING!

Check surrounding area before swinging. When operating a ever while in auto idle, do it carefully, because the engine speed will increase rapidly

NOTE: When starting work, move joysticks slowly and check movement of swing and front attachment.

This equipment is manufactured using the lever configuration described in ISO standards. Do not change valving, hoses, etc. that would change this standard.

A plate on the right side of the driver's seat shows how to operate the work levers. See Figure 35.

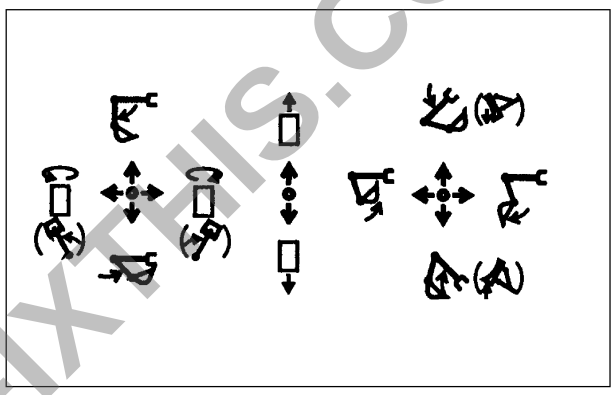


Figure 35

The boom, arm and bucket movements as well as swing direction of work levers are as follows:

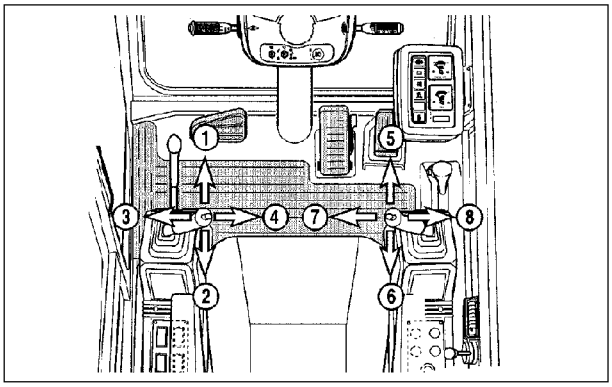


Figure 36

Left work lever (Figure 36 and Figure 37)

1. Arm dump
2. Arm crowd
3. Left swing
4. Right swing

NOTE: The swing brake is spring applied and hydraulically released. It is always engaged when the work lever is in "NEUTRAL" or the engine is shutdown.

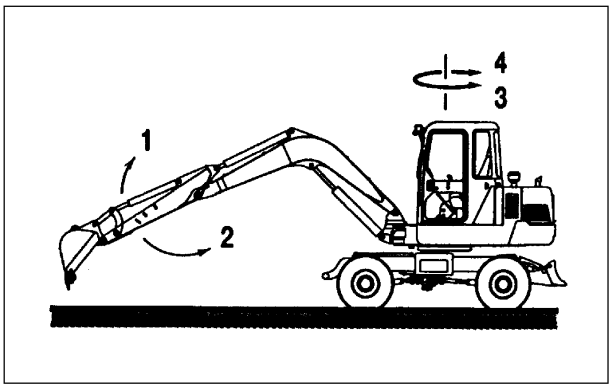


Figure 37

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EXCAVATOR RATED LIFT CAPACITY TABLES

⚠ WARNING!

All rated lift capacities are based on the machine and the load both remaining level at all times. DO NOT EXCEED THE RATED LIFT CAPACITY. Lifting loads greater than those shown in the rated capacity tables can cause catastrophic equipment failure and/or structural collapse of the machine.

To operate safely the excavator should be on a firm, level and uniformly supporting surface. The operator is expected to make due allowance for all specific work site and lift-related conditions, and respond to changes in those conditions that could pose a hazard. The following could all cause hazardous conditions and accidents or injuries:

- Soft or uneven ground
- Off-level terrain
- Side loads
- Modifications or poor maintenance of the excavator
- Failure to lift squarely over the end or over the side of the machine

When a load is in the air, the operator must remain alert.

- Avoid side loads that may be caused by uneven slings, traveling with the load or swinging too quickly.
- The load can become unbalanced if the hookline is twisted and starts to rotate. If the surface area of the load is large enough, wind gusts can create side loads.
- Keep the bucket hook point directly over the load. Taglines on opposite sides of the load can help maintain greater stability against side loads and wind gusts.

Avoid traveling with a suspended load. Before swinging (or if required, traveling), bring the load in to an arm position (radius and height) that has a safer weight capacity rating and adequate movement clearance. The operator and all work-site personnel should be thoroughly familiar with safety instructions and procedures within this Operation and Maintenance Manual.

The following weight loads are in compliance with SAE (J1097) and ISO applicable, recommended standards for hydraulic excavators performing lifting operation on a firm supporting surface. An asterisk (*) next to the lift rating indicates rated load does not exceed 87% of hydraulic capacity. All other ratings have been determined not to exceed 75% of tipping capacity.

DO NOT attempt to lift or hold any load that exceeds rated load capacity at the specified distances (from the machine's rotation centerline and height - see "lift radius" and "lift height" in the reference drawing, Figure 25).

⚠ WARNING!

Lower the dozer blade to the ground to unload the chassis frame from weight of blade. By no way lift the chassis frame with the dozer blade which is not designed to increase the stability when performing a lifting task.

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1. Perform all steps in “Operational Checks Before Starting Engine” on page 3-2.

2. Set engine accelerator lever slightly above "LOW IDLE" (Figure 5).

3. Sound horn.

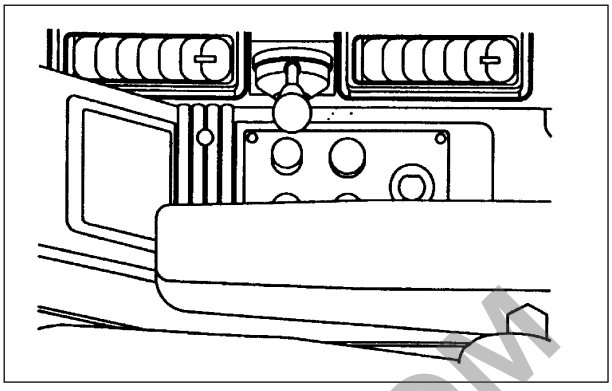


Figure 5

4. Turn start switch to "START" position (Figure 6). Engine should start in approximately 5 seconds.

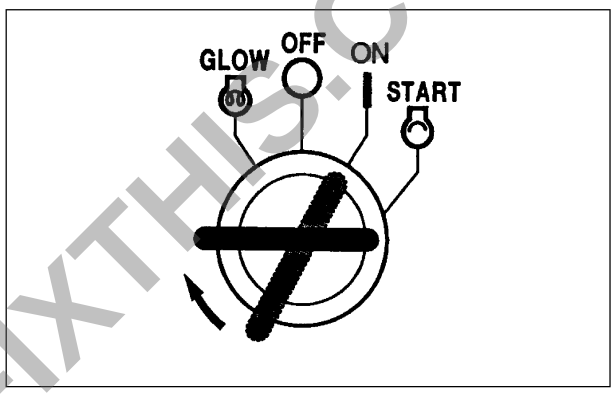


Figure 6

> **⚠ WARNING!**
>
> **If the engine does not start after approximately 10 seconds of cranking, release the starter control. Wait about 30 sec and repeat above step**.

5. After engine has started, release key. Key will return to "I" - "ON" position (Figure 7).

6. Follow “Hydraulic System Warm-up” on page 3-8.

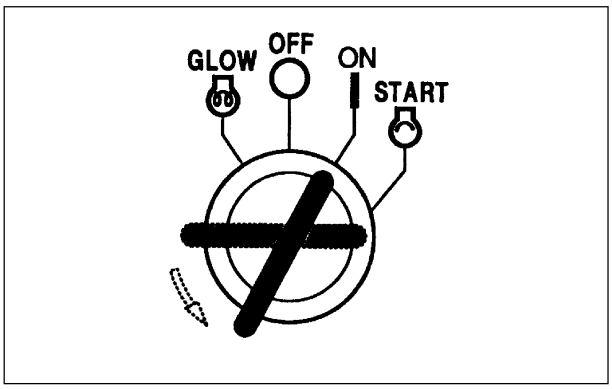


Figure 7

7. After warming unit, check all operating indicators to make sure that all engine systems (oil pressure, coolant, etc.) are in the normal operating range. If any problems are noticed, stop the engine.

   Normal indicators are shown in the following table.

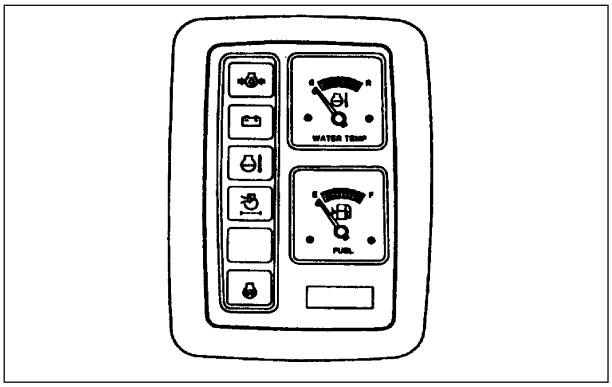


Figure 8

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5. AIR-CONDITIONING SYSTEM SWITCH

If the air-conditioning system switch is turned to the "I" position with the engine running, the air-conditioning compressor starts operation.

Even if the fan control switch is turned to the "O" position, the fan automatically operates at low speed as if the fan control switch (Figure 21) were in the "I" position.

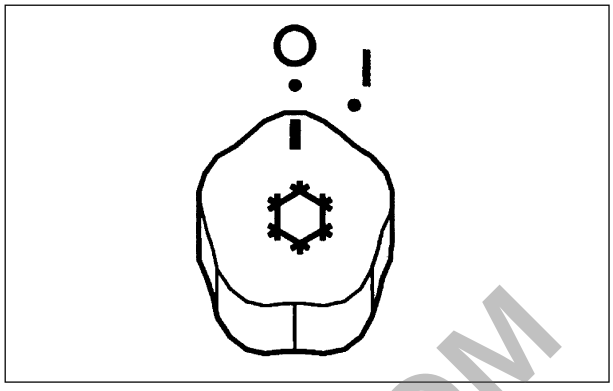


Figure 6

6. DOZER SELECTOR SWITCH

With the dozer select switch pressed, the the right hand work lever can be used as the dozer operation. Also, the lamp of dozer symbol is lit up and this shows the dozer selection.

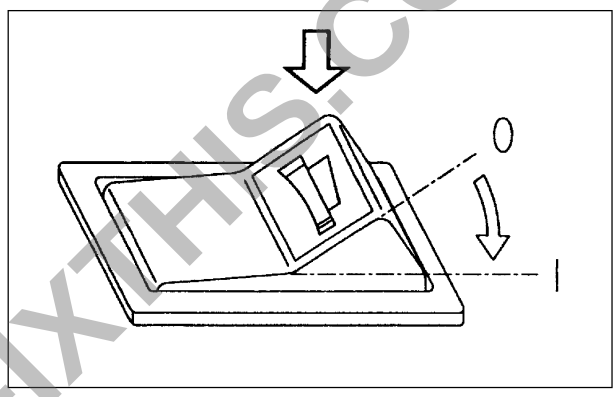


Figure 7

7. RIGHT HAND WORK LEVER (JOYSTICK) WITH DOZER

This lever controls boom and bucket movements. For a more detailed explanation see “Work Lever (Joysticks) (ISO Style)” on page 3-20.

Press the dozer selector switch (Figure 7) and operate work lever to front or to left, the dozer operates.

- Push the work lever to front, then dozer is down.
- Pull the work lever to rear, then dozer is up.

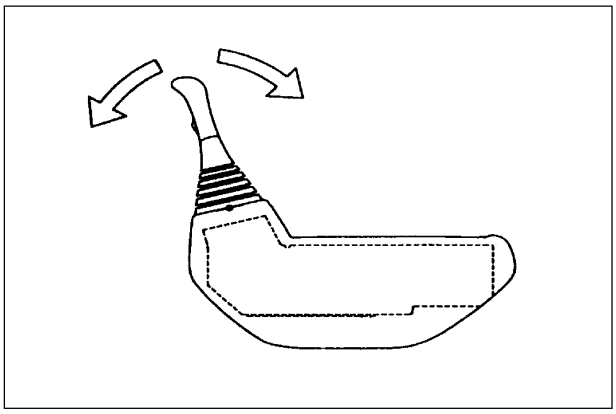


Figure 8

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1. INSTRUMENT PANEL

See “Instrument Panel” on page 2-16.

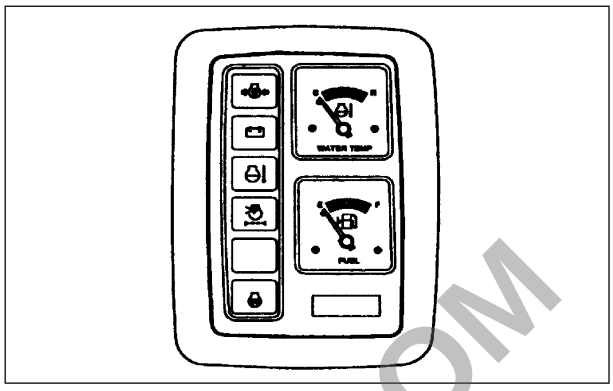


Figure 3

2. START SWITCH

To start or stop the engine for equipment operation.

A. "I" Position (On) - Turning the switch to this position turns the engine electrical system on. The charge indicator light and the oil pressure indicator light should be on at this time.

NOTE: When the switch is in this position the preheating system operates automatically in cold weather. It performs he same function as position "D."

B. "O" Position (Off) - Turning switch to this position turns the engine "OFF" along with its electrical system. In this position the engine is "OFF" but the interior cab light and fuel tank transfer pump (if equipped) are functional.

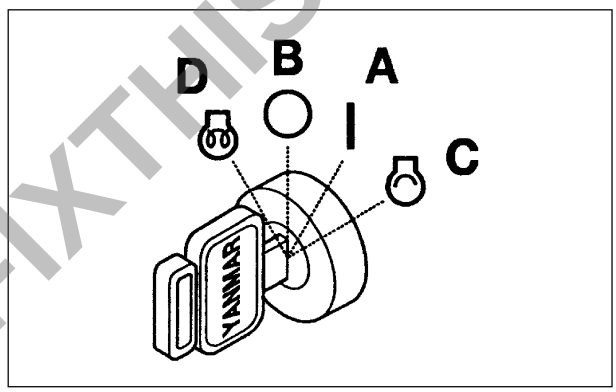


Figure 4

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3. Set safety lever (1, Figure 21) on "UNLOCK" position

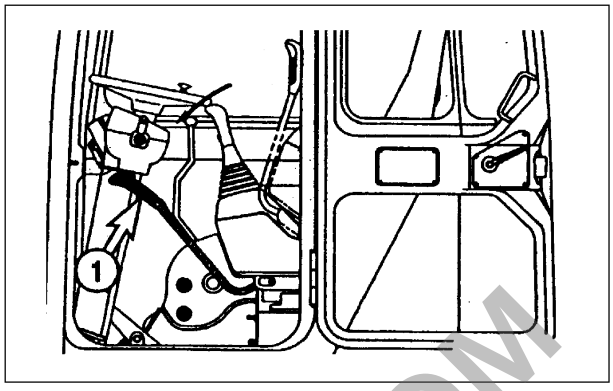


Figure 21

4. Slowly cycle boom, arm and bucket cylinders about five times without a load to circulate the oil through the system. Do this for 5 minutes.

NOTE: Do not allow cylinders to pass hydraulic oil over relief valve for more than twenty seconds at a time.

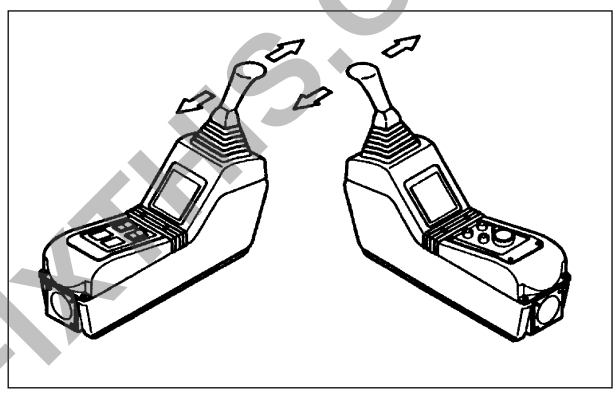


Figure 22

5. Set engine accelerator lever to "HIGH IDLE" (Figure 23).

6. Repeat Step 4 for 5 minutes. If working speeds continue to be slow, continue to operate, but use extreme caution because the machine function may be erratic.

7. Check for clearance and fully raise the front attachment. Slowly swing clockwise three revolutions. Slowly swing counterclockwise three revolutions.

8. Lower front attachment to approximately 300 mm (12 in.) above the ground. Slowly move the unit forward and backwards to warm transmission oil.

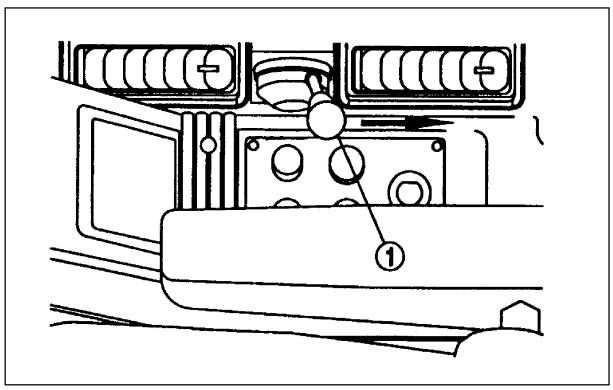


Figure 23

ENGINE SHUTDOWN

NOTE: Allow engine to idle for 3 - 5 minutes before shutting down the engine. If not allowed to idle, heat surge may develop which will damage the engine. Allowing the engine to idle will dissipate heat.

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