DOOSAN

022-00042BE
July 2014

EXCAVATOR

Operation & Maintenance Manual

Solar 180W-V

Serial Number 1001 and Up

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SAFETY ALERT SYMBOL

Be Prepared - Get To Know All Operating and Safety Instructions.

This is the Safety Alert Symbol. Wherever it appears in this manual or on safety signs on the machine you should be alert to the potential for personal injury or accidents. Always observe safety precautions and follow recommended procedures.

LEARN THE SIGNAL WORDS USED WITH THE SAFETY ALERT SYMBOL

The words **"CAUTION," "WARNING,"** and **"DANGER"** used throughout this manual and on decals on the machine indicate degree of risk of hazards or unsafe practices. All three degrees of risk indicate that safety is involved. Observe precautions indicated whenever you see the Safety Alert "Triangle," no matter which signal word appears next to the "Exclamation Point" symbol.

CAUTION!

This word is used on safety messages and safety labels and indicates potential of a hazardous situation that, if not avoided, could result in minor or moderate injury. It may also be used to alert against a generally unsafe practice.

WARNING!

This word is used on safety messages and safety labels and indicates potential of a hazardous situation that, if not avoided, could result in serious injury or death. It may also be used to alert against a highly unsafe practice.

DANGER!

This word is used on safety messages and safety labels and indicates an imminent hazard of a situation that, if not avoided, is very likely to cause death or extremely serious injury. It may also be used to alert against equipment that may explode or detonate if handled or treated carelessly.

Safety precautions are described in SAFETY from page 1-4 on.

DOOSAN cannot predict every circumstance that might involve a potential hazard in operation and maintenance. Therefore the safety messages in this manual and on the machine may not include all possible safety precautions. If any procedures or actions not specifically recommended or allowed in this manual are used, you must be sure that you and others can do such procedures and actions safely and without damaging the machine. If you are unsure about the safety of some procedures, contact a *DOOSAN* distributor.

INSIDE OPERATOR'S COMPARTMENT

When entering the operator's compartment, always remove all mud and oil from the soles of your shoes. If you operate the travel pedal with mud or oil stuck to your shoes, your foot may slip and this may cause a serious accident.

After using the ashtray, make sure that any matches or cigarettes are properly extinguished, and be sure to close the ashtray. If the ashtray is left open, there is danger of fire.

Do not stick suction pads to the window glass. Suction pads act as a lens and may cause fire.

Do not leave lighters laying around the operator's compartment. If the temperature inside the operator's compartment becomes high, there is danger that the lighter may explode.

Do not use cellular telephones inside the operator's compartment when driving or operating the machine. There is danger that this may lead to an unexpected accident.

Never bring any dangerous objects such as flammable or explosive items into the operator's cab.

To ensure safety, do not use the radio or music headphones when operating the machine. There is danger that this may lead to a serious accident.

When operating the machine, do not put your hands or head out of the window.

When standing up from the operator's seat, always place safety lock lever securely in the "LOCK" position. If you accidentally touch the work equipment levers when they are not locked, the machine may suddenly move and cause serous injury or damage.

When leaving the machine, lower the work equipment completely to the ground, set safety lock lever to the "LOCK" position and shut down engine. Use the key to lock all the equipment. Always remove the key and take it with you.

ENGINE STARTING

Walk around your machine before getting in the operator's cab. Look for evidence of leaking fluid, loose fasteners, misaligned assemblies or any other indications of possible equipment hazard.

All equipment covers and machinery safety guards must be in place, to protect against injury while the machine is being operated.

Look around the work site area for potential hazards, people or properly that could be at risk while operation is in progress.

NEVER start the engine if there is any indication that maintenance or service work is in progress, or if a warning tag is attached to controls in the cab.

A machine that has not been used recently, or is being operated in extremely cold temperatures, could require a warm-up or maintenance service before start-up.

Check gauges and monitor displays for normal operation before starting the engine. Listen for unusual noises and remain alert for other potentially hazardous conditions at the start of the work cycle.

Do not short circuit the starting motor to start the engine. This is not only dangerous, but may also damage the machine.

When starting the engine, sound the horn as an alert.

Start and operate the machine only while seated.

BEFORE OPERATING MACHINE

If checks are not carried out properly after starting the engine, it may result in a delay in discovering abnormalities in the machine, and this may lead to personal injury or damage to the machine.

Carry out the checks in an open area where there are no obstructions. Do not let anyone near the machine when carrying out the checks.

- Check the operating condition of the equipment, and the actuation of the bucket, arm, boom, travel, and swing systems.
- Check the machine for any abnormal noise, vibration, heat, smell, or abnormality with the gauges. Check also for leakage of air, oil, and fuel.
- If any abnormality is found, repair the problem immediately. If the machine is used without repairing the problems, it may lead to unexpected injury or failure.
- Clear all personnel from directly around machine and from the area.
- Clear all obstacles from the machine's path. Beware of hazards.
- Be sure that all windows are clean. Secure the doors and the windows in the open position or in the shut position.
- Adjust the rear view mirrors for best visibility close to the machine. Make sure that the horn, the travel alarm (if equipped), and all other warning devices are working properly.
- Fasten the seat belt securely.
- Warm up the engine and hydraulic oil before operating machine.
- Before moving the machine, check the position of undercarriage. The normal travel position is with the steering axle to the front under the cab and the rigid axle to the rear. When the undercarriage is in the reversed position, the travel controls must be operated in opposite directions.

PRECAUTIONS FOR REMOVAL, INSTALLATION, AND STORAGE OF ATTACHMENTS

Before starting removal and installation of attachments, decide the team leader.

Do not allow anyone except the authorized workers close to the machine or attachment.

Place attachments that have been removed from the machine in a safe place so that they do not fall. Put up a fence around the attachments and take other measures to prevent unauthorized persons from entering.

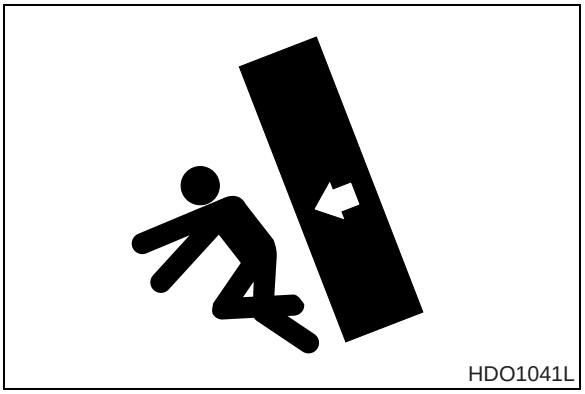


Figure 33

PRECAUTIONS WHEN WORKING ON MACHINE

When carrying out maintenance operations on the machine, keep the area around your feet clean and tidy to prevent you from falling. Always do the following;

- Do not spill oil or grease.
- Do not leave tools laying about.
- Watch your step when walking.

Never jump down from the machine. When getting on or off the machine, use the steps and handrails, and maintain a three-point contact (both feet and one hand or both hands and one foot) to support yourself securely.

If the job requires it, wear protective clothing.

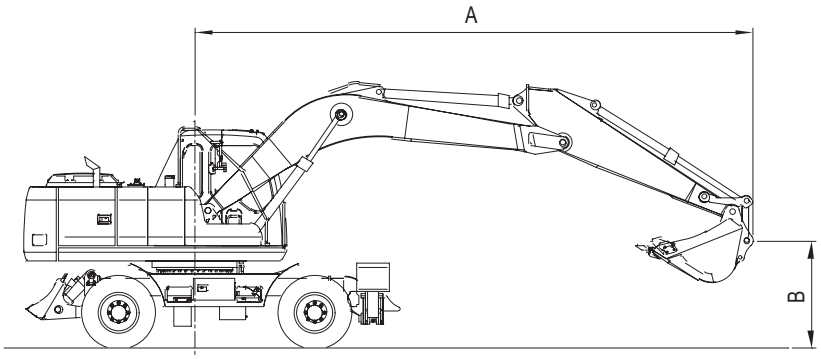
To prevent injury from slipping or falling, when working on the hood or covers, never use any part except the inspection passage fitted with nonslip pads.

Figure 34

LOCK INSPECTION COVERS

When carrying out maintenance with the inspection cover open, lock the cover securely in position with the lock bar.

If maintenance work is carried out with the inspection cover open but not locked, there is danger that it may suddenly close and cause injury if there is a gust of wind.



A : Load radius from centerline of rotation
B : Load point height
S : Rated lift capacity - over side
(Free on wheel (Outrigger on ground))
F : Rated lift capacity - over front
(Free on wheel (Outrigger on ground))
BUCKET : SAE 0.76 m^3
CECE 0.66 m^3

METRIC (5.15 m Mono Boom, 2.6m Arm)

Unit : 1,000Kg

A / B	2m		3m		4m		5m		6m		7m		Max. Reach		
	F	S	F	S	F	S	F	S	F	S	F	S	F	S	A(m)
6m									*3.50 / *3.52	2.51 / *3.52			*2.58 / *2.57	2.09 / *2.57	6.67
5m									*3.69 / *3.69	2.46 / *3.69	*2.74 / *2.77	1.84 / *2.77	*2.63 / *2.62	1.78 / *2.62	7.19
4m							*4.34 / *4.33	3.24 / *4.33	*3.99 / *3.99	2.39 / *3.99	3.56 / *3.78	1.81 / *3.78	*2.74 / *2.73	1.60 / *2.73	7.53
3m			*8.26 / *8.23	6.70 / *8.23	*6.09 / *6.08	4.35 / *6.08	*5.01 / *5.01	3.09 / *5.01	*4.39 / *4.39	2.30 / *4.39	3.50 / *4.00	1.76 / 3.78	*2.91 / *2.90	1.48 / *2.90	7.73
2m			*7.71 / *7.77	6.21 / *7.77	*7.27 / *7.26	4.10 / *7.26	*5.71 / *5.71	2.95 / *5.71	4.44 / *4.80	2.21 / 4.77	3.45 / *4.25	1.71 / 3.72	2.92 / *3.14	1.43 / *3.14	7.79
1m			*6.19 / *6.19	5.88 / *6.19	*8.14 / *8.11	3.89 / *8.11	5.80 / *6.28	2.80 / *6.26	4.33 / *5.17	2.13 / 4.67	3.39 / *4.46	1.66 / 3.66	2.92 / *3.42	1.42 / 3.17	7.74
0 (Ground)	*3.60 / *3.59	*3.60 / *3.59	*7.07 / *7.07	5.79 / *7.07	8.36 / *8.59	3.77 / *8.59	5.71 / *6.63	2.72 / *6.14	4.26 / *5.42	2.07 / 4.60	3.34 / *4.59	1.62 / 3.62	3.01 / *3.89	1.45 / 3.26	7.56
-1m	*5.73 / *5.73	*5.73 / *5.73	*8.91 / *8.94	5.76 / *8.94	8.27 / *8.63	3.72 / *8.63	5.66 / *6.75	2.68 / 6.09	4.23 / *5.48	2.04 / 4.57	3.32 / *4.54	1.60 / 3.60	3.21 / *4.42	1.55 / 3.48	7.23
-2m	*7.98 / *7.99	*7.98 / *7.99	*10.88 / *10.88	5.80 / *10.88	8.28 / *8.31	3.72 / *8.31	5.64 / *6.54	2.67 / 6.10	4.22 / *5.28	2.03 / 4.56			3.59 / *4.61	1.74 / 3.88	6.74
-3m	*10.63 / *10.62	*10.63 / *10.62	*9.73 / *9.73	5.93 / *9.73	*7.53 / *7.52	3.77 / *7.52	5.68 / *5.93	2.70 / *5.93	4.32 / *4.80	2.10 / 4.66			*4.30 / *4.79	2.09 / *4.64	6.03
-4m	*10.45 / *10.45	*10.45 / *10.45	*7.89 / *7.88	6.05 / *7.88	*6.09 / *6.12	3.89 / *6.12	*4.94 / *4.93	2.84 / *4.93					*4.94 / *4.93	2.82 / *4.93	5.03
-5m			*5.27 / *5.26	*5.27 / *5.26									*4.77 / *4.77	*4.77 / *4.77	3.48

1. RATINGS ARE BASED ON SAE J 1097.
2. LOAD POINT IS THE HOOK ON THE BACK OF THE BUCKET.
3. * RATED LOADS ARE BASED ON HYDRAULIC CAPACITY.
4. RATED LOADS DO NOT EXCEED 87% OF HYD. CAPACITY OR 75% OF TIPPING CAPACITY.

BLO0010L

OPERATING CONTROLS

The "Operating Controls" section presented here consists of the following groups:

1. “Component Locations” on page 2-2
2. “Operator’s Area” on page 2-4
3. “Operational Controls and Panels” on page 2-5
4. “Steering Console” on page 2-14
5. “Instrument Panel” on page 2-21
6. “Multifunction Gauge and Graphic Information” on page 2-27
7. “Mode Selection Buttons” on page 2-32
8. “Setting Method for Main Menu” on page 2-35
9. “Heater and Air Conditioner Control Panel” on page 2-39
10. “Stereo” on page 2-44
11. “Fuse Boxes” on page 2-51
12. “Miscellaneous Electrical Devices” on page 2-52
13. “Seat Adjustment” on page 2-54
14. “Seat Belt” on page 2-56
15. “Ceiling Cover” on page 2-57
16. “Front Windows” on page 2-58
17. “Door Side Latch” on page 2-61
18. “Miscellaneous Access Covers and Doors” on page 2-62
19. “Swing Lock Pin and Mechanism” on page 2-63
20. “Wheel Chocks” on page 2-63
21. “Cab Storage Compartments” on page 2-64
22. “Ashtray” on page 2-64
23. “Emergency Glass Breaking Tool” on page 2-65

Each group is explained with a point location drawing or photo and a brief description of each control, switch, gauge or valve.

Indicator lights work in addition to the gauges on the instrument panel. The operator should monitor machine pressure on the instrument panel along with pilot lights. These lights will only give the operator an indication that there is a problem.

⚠ WARNING!

Warning lights. When any one or more of the warning lights on the control console come "ON," immediately stop operation and shut down unit. Investigate and correct the problem before proceeding with operation.

14. BOOSTER SWITCH (RIGHT HAND WORK LEVER (JOYSTICK))

Press the right side button on the top of the right hand work lever (joystick) to boost the hydraulic pressure. Refer to the “Boost Mode” on page 3-27.

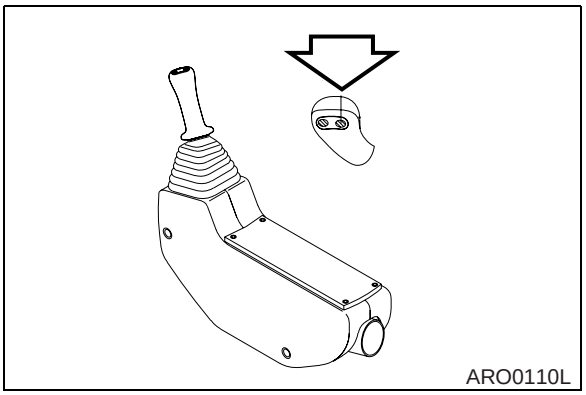


Figure 17

15. HORN SWITCH (LEFT HAND WORK LEVER (JOYSTICK))

Press the left side button on the top of the left hand work lever (joystick) to sound horn.

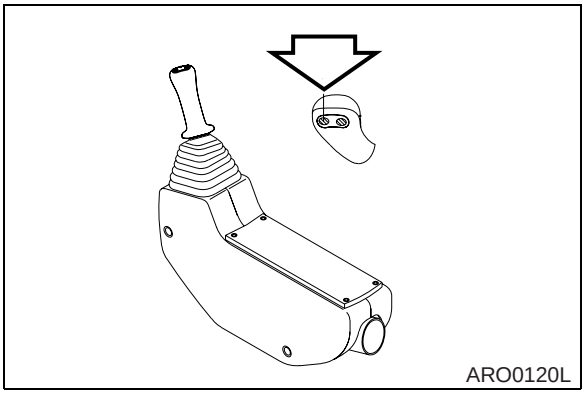


Figure 18

16. CAB WORK LIGHT SWITCH (OPTIONAL)

This switch is used to control the cab work lights, if unit is equipped with them.

O. In this position, all cab work lights are turned "OFF."

I. In this position, the front cab work lights on the front top of cab will turn "ON."

II. In this position, the front cab work lights on the front top of cab and rear cab work lights on rear top of cab will turn "ON."

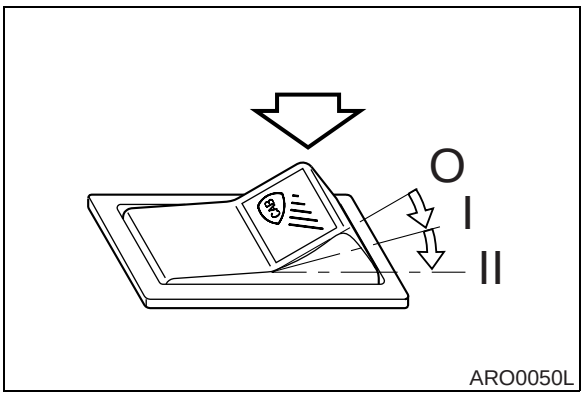


Figure 19

INSTRUMENT PANEL

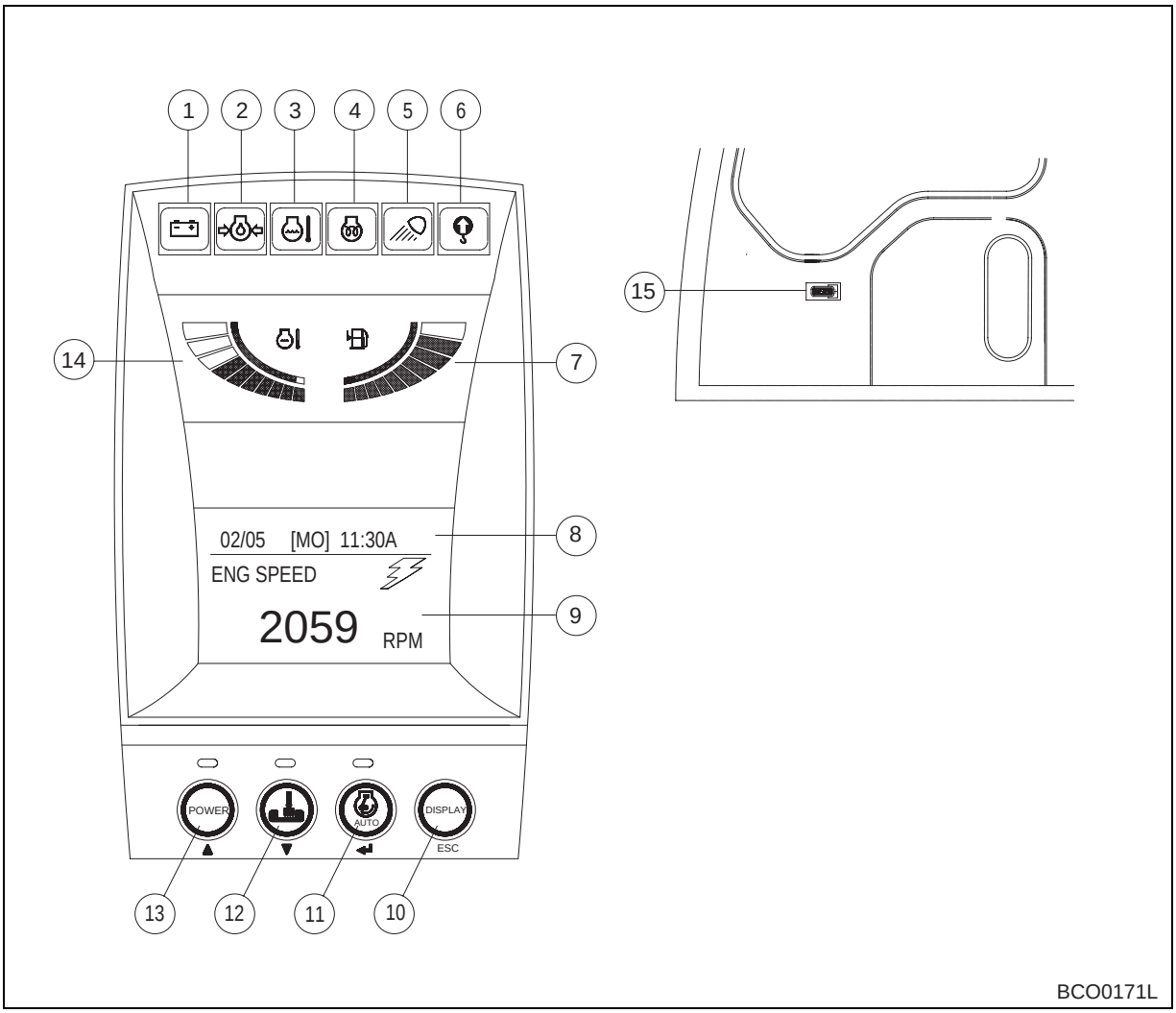


Figure 40

1. CHARGE WARNING LIGHT
2. ENGINE OIL PRESSURE WARNING LIGHT
3. COOLANT TEMPERATURE WARNING LIGHT
4. PREHEATING COMPLETION LIGHT
5. WORK LIGHT INDICATOR LIGHT
6. OVERLOAD WARNING LIGHT (OPTION)
7. FUEL GAUGE
8. DIGITAL CLOCK
9. MULTIFUNCTION GAUGE & GRAPHIC INFORMATION AREA
10. DISPLAY SELECTION BUTTON (See page 2-34)
11. AUTO IDLE SELECTION BUTTON (See page 2-33)
12. WORK MODE SELECTION BUTTON (See page 2-33)
13. POWER MODE SELECTION BUTTON (See page 2-32)
14. ENGINE COOLANT TEMP. GAUGE
15. HOUR METER

C. Pilot Filter Clogged Warning

This screen indicates when the pilot filter clogged. When this screen appears, the pilot filter symbol on the screen will start to blink.

If this screen is displayed, immediately stop operation and replace the pilot filter element.

After the pilot filter has been serviced, the engine speed and a symbol of communicative state will be displayed again.

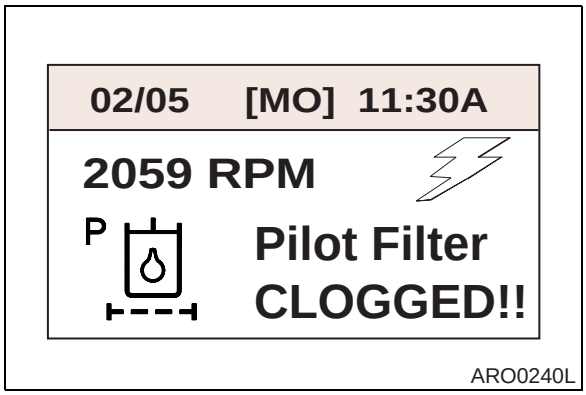


Figure 62

2. FAN SPEED SELECTION SWITCHES

These switches are used to control the speed of the blower fan.

A. "LO" Switch - Used for low speed.

B. "MID" Switch - Used for intermediate speed.

C. "HI" Switch - Used for high speed.

NOTE: *If you do not select a blower speed the heater and air conditioner will not work.*

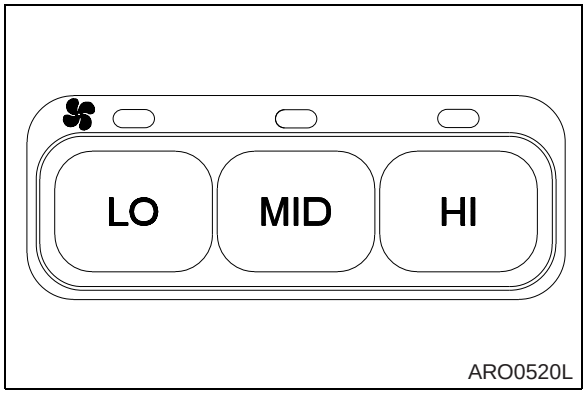


Figure 80

3. TEMPERATURE CONTROL SWITCH

The temperature control consists of 24 stages. An LED is turned "ON" for every three stages. Whenever pushing it, it changes in stages. Pushing it continuously, it changes continuously.

A. "COOL" Switch - Lowers the temperature.

B. "WARM" Switch - Raises the temperature.

LED COLOR STATUS

Green LED - Air conditioner. Full green, maximum operation of air-conditioner.

Red LED - Heater. Full red, maximum operation of heater.

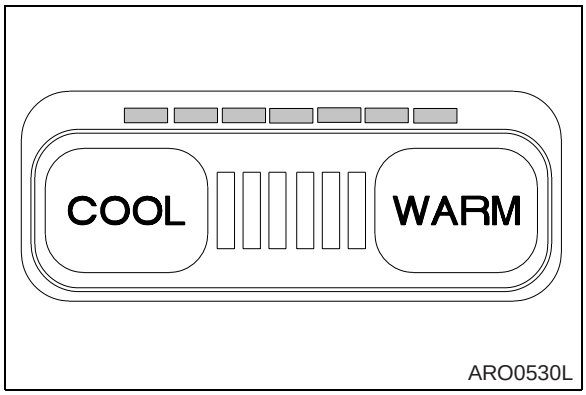


Figure 81

When the unit is used only for air conditioning, push the "A/C" switch and make all the LEDs fully green by pressing the "COOL" switch.

When the unit is used only for heat, make the LEDs fully red by pressing the "WARM" switch. The "A/C" switch has to be turned "OFF."

To set the desired temperature of air coming out of the air outlets, turn the "A/C" switch "ON" and combine red LEDs with green LEDs by pressing the temperature selection switch. The more LEDs in the green range that turn "ON," the cooler the temperature will become. The more LEDs in the red range that turn "ON," the warmer the temperature will become.

FUSE BOXES

There are two fuse boxes (1 and 2, Figure 94) on the left side of the heater box. Fuses prevent electrical devices from overloading or shorting.

A decal attached to the inside of the fuse box's cover indicates the function and amperage of each fuse.

NOTE: *For a further explanation see "Fuse Boxes" on page 4-67.*

Spare fuses are mounted on the inside of fuse box's cover.

Change a fuse if the element separates. If the element of a new fuse separates, check the circuit and repair the circuit.

CAUTION!

Always replace fuses with the same type and capacity fuse that was removed. Otherwise, electrical damage could result.

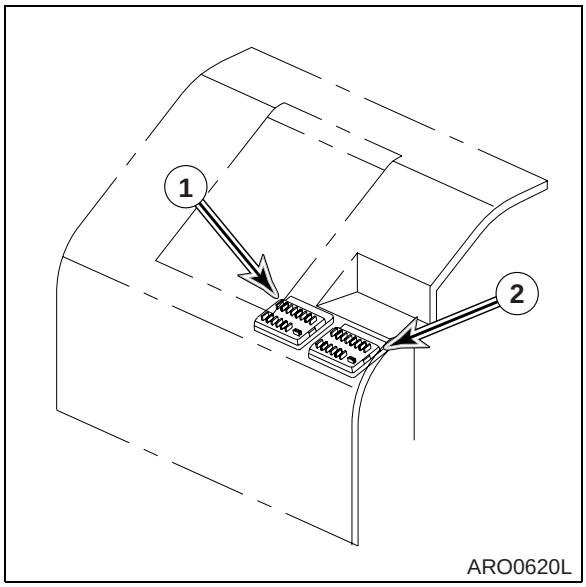


Figure 94

2. Set bottom window in rubber holders (1, Figure 116) behind operator's seat. Secure window to cab with left and right knobs (2).

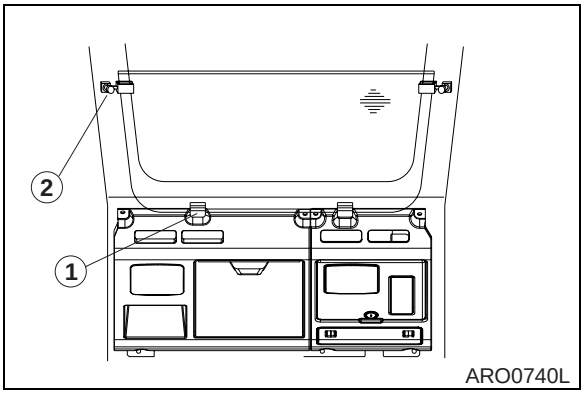


Figure 116

DOOR SIDE LATCH

1. The door side latch (1, Figure 117) is used to secured the door to the side of the cab when it is opened.

   NOTE: *Keep the door closed and locked when machine is not in use.*

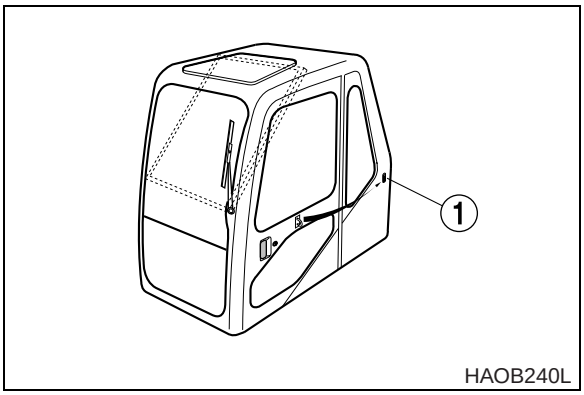


Figure 117

2. To release door from side of cab, push the latch lever (Figure 118) down. The latch lever is to the left of the operator’s seat.

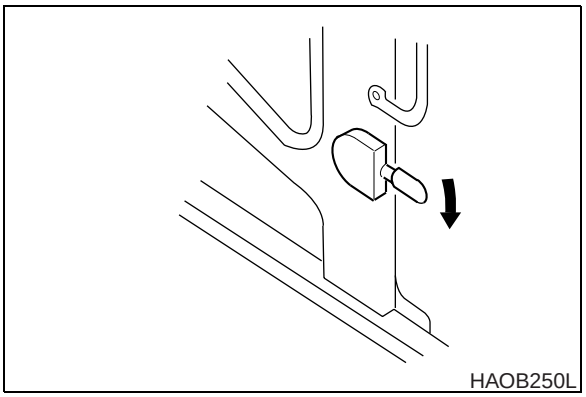


Figure 118

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, shut down engine. Normal indicators are:

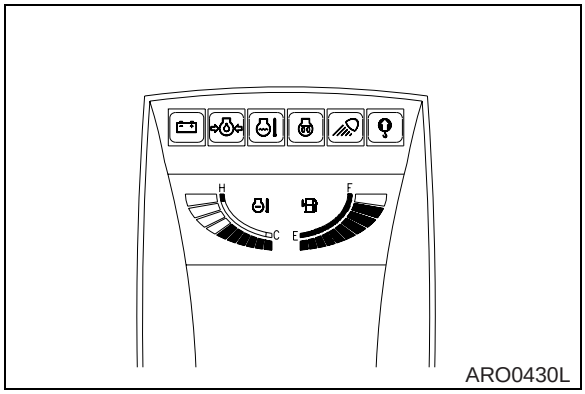


Figure 8

Instrument Panel Light Or Gauge	Indicator Reading
Engine Coolant Temperature Gauge	GREEN RANGE
Fuel Gauge	GREEN RANGE
Charging Warning Light	OFF
Engine Oil Pressure Warning Light	OFF
Preheating Completion Light	OFF
Pilot Filter Clogged Warning Light	OFF
Return Filter Clogged Warning Light	OFF
Air Cleaner Filter Clogged Warning Light	OFF

8. Check color of exhaust smoke.
   - No color or light blue - Engine is running in good condition.
   - Black - Incomplete combustion. Check cause.
   - White or dark blue - Engine is burning engine oil. Check cause.
9. Check for usual engine vibration and noises. If any are heard or felt, investigate cause.

   NOTE: *If engine coolant temperature gauge shows red while running, take the following action; Discontinue work and allow engine to run at low idle. Open engine compartment cover for good ventilation. Once engine temperature gauge returns to the green zone, shut down engine. After engine has cooled, check coolant level, look for leaks, clogged or dirty radiator fins (radiator core), and fan belt tension.*

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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 all outriggers and the dozer blade.
4. Make sure that the upper section is facing forwards.
5. Store the front attachment in the "TRANSPORT" position and set the Function Lock in the "TRAVEL" position. (See Figure 31 on page 3-16)
6. Set the Ram Cylinder toggle switch in the "UNLOCK" position.
7. Before moving the excavator, make sure that the swing lock pin has been engaged. (See "Swing Lock Pin and Mechanism" on page 2-63.) This will prevent the excavator from accidentally rotating during traveling.

MODE SELECTION

More efficient work can be done by choosing a proper power and work mode combination, suitable to type of work and conditions. Use the mode selection according to following guide.

Power Mode

1. When the starter switch is turned "ON" the power mode is automatically defaulted to the last setting.
2. Select a proper power mode using buttons (Figure 50) before starting work.
3. When the power mode button (1, Figure 50) is pressed, a signal sounds. Changing the power mode to either "ON" or "OFF." When the power mode is turned "ON," the LED indicator (5, Figure 50) turns "ON."

   Deactivate the power mode by pressing it a second time. When the power mode is turned "OFF," the LED indicator (5, Figure 50) turns "OFF" and the power mode returns to the standard mode.

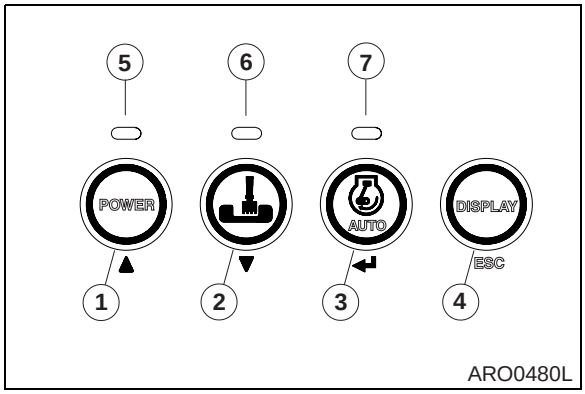

Figure 50

Mode	Selection Point
STANDARD MODE	General work. Minimize fuel consumption.
POWER MODE	Required to heavy work in a short time. Fast speed loading. Fast speed travel.

WORKING IN WATER

1. Do not operate equipment when the front and rear axles, and transmission are under water.
2. It is possible to work and travel in shallow water if the ground is stable. If the terrain is rough or if the water is flowing heavy it is unsafe to operate the equipment.
3. When working in wet soil, the equipment can sink into the soft ground. Select solid ground to secure the equipment before starting work.

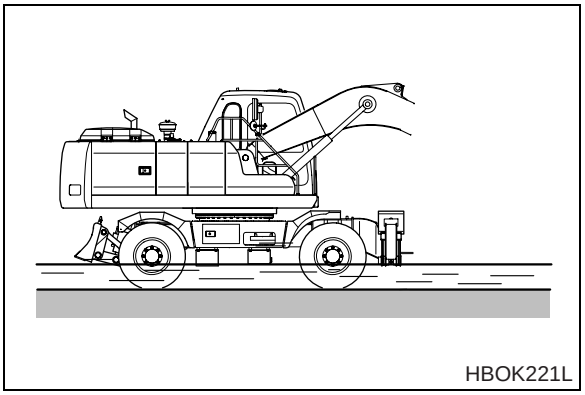

Figure 67

OPERATION UNDER UNUSUAL CONDITIONS

NOTE: *See “Maintenance in Special Conditions” on page 4-79 for other recommendations.*

OPERATION IN EXTREME COLD

If machine is to be operated in extreme cold weather temperatures, certain precautions must be taken to assure continued normal operation. The following paragraphs detail checks to be made to be certain the machine is capable of operating at these temperatures.

1. Check the cooling system for correct antifreeze solution for lowest temperature expected. Carefully inspect cooling system and correct or report any leaks.
2. Keep batteries fully charged to prevent freezing. If water is added to batteries, run engine at least one hour to mix electrolyte solution.
3. Keep engine in best possible mechanical condition to assure easy starting and good performance during adverse weather conditions.
4. Use engine oil of the proper specifications for the expected temperatures. Refer to the "Lubrication Specifications" of the engine manual for details.
5. Keep fuel tank full at all times. Drain condensation from tank before and after operation. Drain and service fuel filter. To eliminate clogging of fuel filters due to wax crystal formation in the fuel, be sure that the fuel used has a cloud point specification below the lowest expected temperature.
6. Lubricate entire machine according to "Periodic Service Table and Chart" Section 4, in this manual or lubrication chart on machine.
7. Start engine and allow it to reach normal operating temperature before applying load.
    A. If mud and ice collects and freezes on any of the moving parts while machine is idle, apply heat to thaw the frozen material before attempting to operate machine.
    B. Operate hydraulic units with care until they have reached a temperature to enable them to operate normally.
    C. Check all machine controls and/or functions to be sure they are operating correctly.
8. An extra outer air filter element should be kept in the operator's cab to replace element that could become iced and cause restricted air flow to engine.
9. If cold weather starting aid must be used, see "Engine Starting" COLD WEATHER START portion of this manual.
10. Clean off all mud, snow and ice to prevent freezing. Cover machine with tarpaulin if possible, keep ends of tarpaulin from freezing to ground.

OPERATION IN EXTREME HEAT

Continuous operation of the machine in high temperatures may cause the machine to overheat. Monitor engine and transmission temperatures and stop machine for a cooling-off period whenever necessary.

1. Make frequent inspections and services of the fan and radiator. Check coolant level in radiator. Check grills and radiator fins for accumulation of dust, sand and insects which could block the cooling passages.
    A. Formation of scale and rust in cooling system occurs more rapidly in extremely high temperatures. Change antifreeze each year to keep corrosion inhibitor at full strength.
    B. If necessary, flush cooling system periodically to keep passage clear. Avoid use of water with a high alkali content which increases scale and rust formation.

FLUID CAPACITIES

Component		Capacity
Engine	Oil Pan with Filter	20.5 liters (5.4 U.S. gal.)
	Cooling System	49 liters (13 U.S. gal.)
Fuel Tank		280 liters (74 U.S. gal.)
Hydraulic Oil	Tank Level	132 liters (34.9 U.S. gal.)
	System	300 liters (79.3 U.S. gal.)
Transmission		3.8 liters (1.0 U.S. gal.)
Swing Device		5 liters (1.3 U.S. gal.)
Axle	Front Differential	8.5 liters (? U.S. gal.)
	Front Hub Reduction Gear	2 x 2 liters (2 x 0.53 U.S. gal.)
	Rear Differential	11 liters (2.9 U.S. gal.)
	Rear Hub Reduction Gear	2 x 2 liters (4 x 0.53 U.S. gal.)

LUBRICATION AND SERVICE CHART

Lubrication and service chart is on the inside of tool box cover. The symbols shown here are used in the lubrication and service chart on the next page.

Symbol	Description
	Lubrication
	Gear Oil (Swing Device, Travel Device)
	Engine Oil
	Engine Oil Filter
	Hydraulic Oil
	Hydraulic Oil Filter
	Coolant

Symbol	Description
	Air Cleaner Element
	Fuel Filter
	Air-conditioner Filter
	Drain Water
	Fuel Cap Filter
	Hydraulic Oil Tank Breather

CHECK FUEL LEVEL

WARNING!

Use extreme safety precautions while refueling to prevent explosions or fire.

Immediately clean up any spilt fuel.

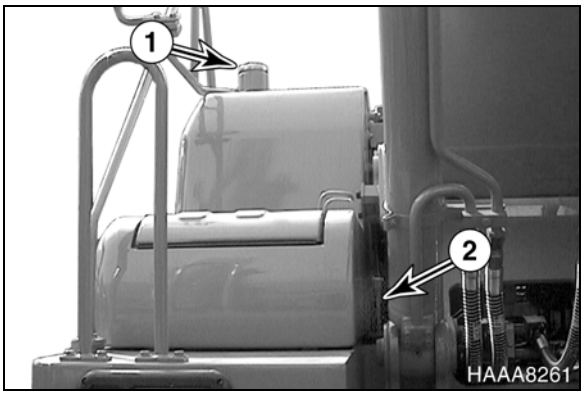

Figure 17

1. At end of each work day, fill fuel tank. Add fuel through fuel filler tube (1, Figure 17). When working at a temperature of 0°C (32°F) or higher, use ASTM No. 2-D or its equivalent. At temperatures below 0°C (32°F) use ASTM No. 1-D or its equivalent.
2. Make sure that the fuel fill hose is grounded to the excavator before fueling begins.
3. Check the amount of fuel in the tank by observing the fuel tank sight gauge (2, Figure 17) and fuel gauge in monitor panel. Fill the tank using the fill tube with the proper fuel for the operating conditions.

   NOTE: *See "Fluid Capacities" on page 4-7, for capacity.*
4. The excavator may be equipped with the optional battery operated fuel fill pump. The pump assembly is located in the battery box. Put the suction hose of the pump into the fuel resupply tank. Turn the switch in the battery box "ON," and the fuel will be pumped into the excavator fuel tank.
5. Do not overfill the tank.
6. Securely tighten cap after fueling.

   NOTE: *If breather holes in cap are clogged, a vacuum may form in the tank preventing proper fuel flow to engine. Keep holes in fuel cap clean.*

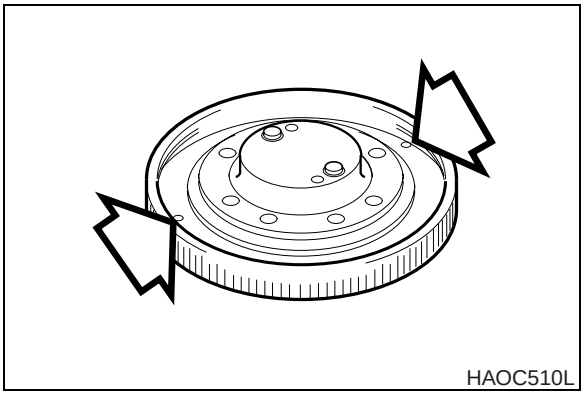

Figure 18

CHECK FOR LEAKS IN THE FUEL SYSTEM

1. Perform an inspection of the engine compartment to verify that the fuel system is not leaking. If any is noted, determine the source of the leak and repair.

GREASE DOZER BLADE PINS

NOTE: *Grease every 10 hours for first 100 hours and every 50 hours thereafter.*

NOTE: *If the unit has been running or working in water the front attachment should be greased on a 10 hour / Daily basis.*

1. There are a total of 6 grease points, 3 on each cylinder of the blade.

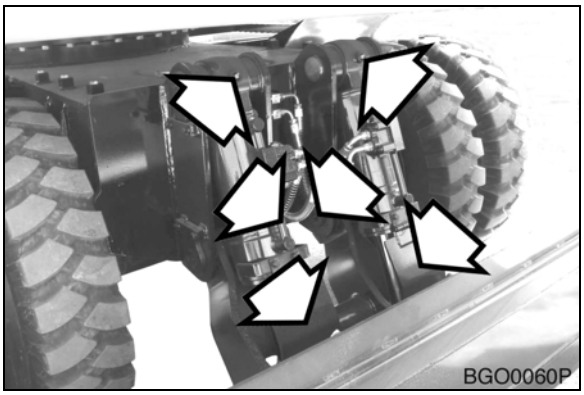

Figure 38

GREASE OUTRIGGER STABILIZER PINS

NOTE: *Grease every 10 hours for first 100 hours and every 50 hours thereafter.*

NOTE: *If the unit been run working in water the front attachment should be greased on a 10 hour / Daily basis.*

1. There are a total of 8 grease points, 4 on each side.

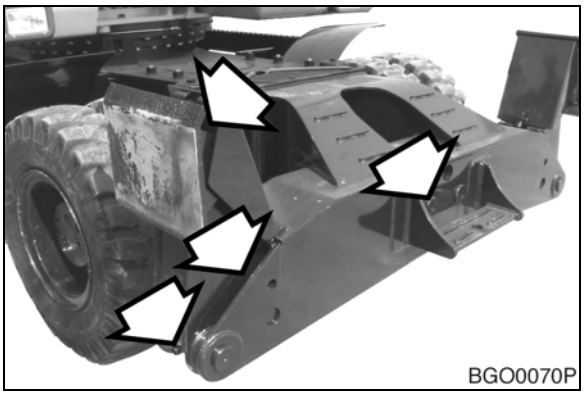

Figure 39

GREASE FRONT AXLE PIN

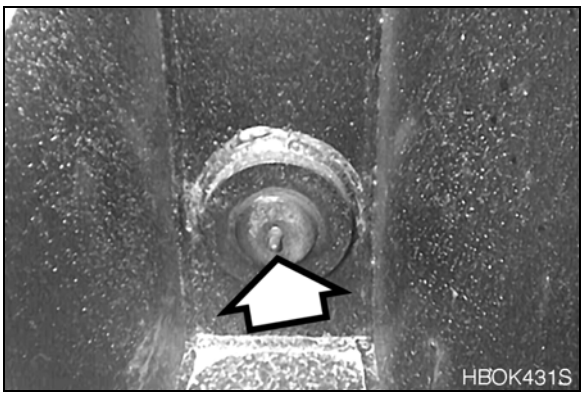

Figure 40

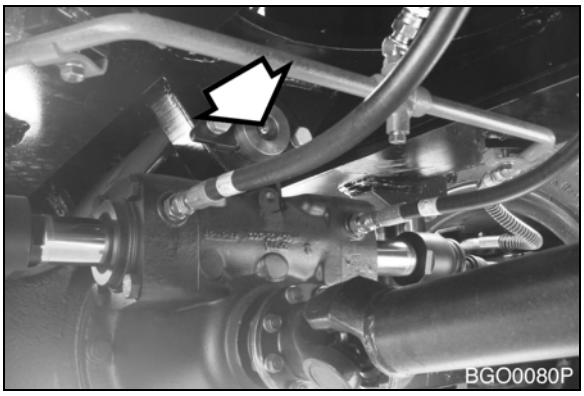

Figure 41

4. Rear Shaft Center U-joint (1 point)
5. Rear Spinet (1 point)

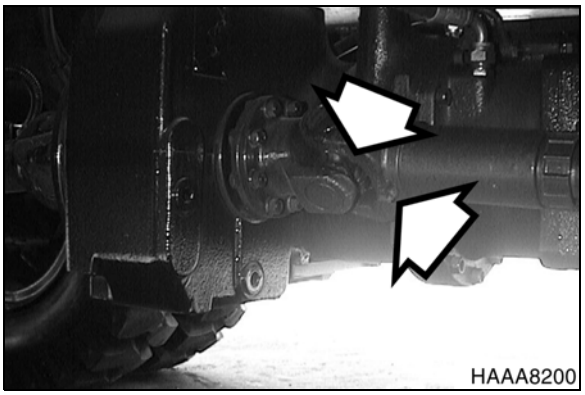

Figure 61

6. Rear U-joint (1 point)

Figure 62

GREASE FRONT AXLE STEERING KNUCKLE (2 X 2 POINTS, 4 POINTS)

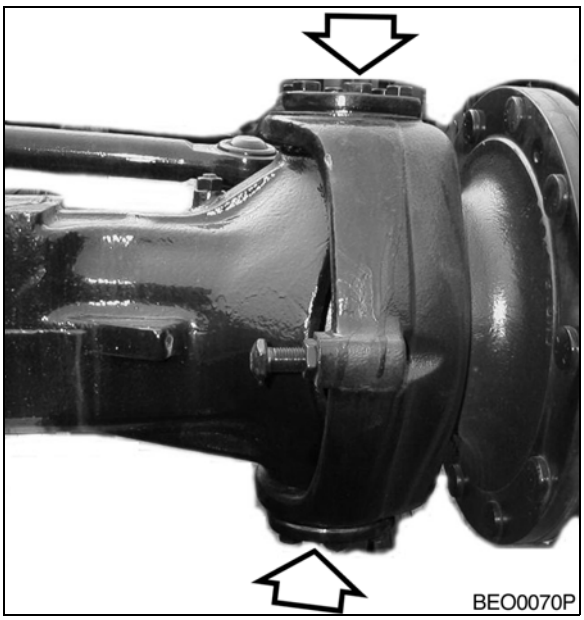

Figure 63

DRAIN AND REFILL TRANSMISSION FLUID

NOTE: *The transmission fluid should be drained and refilled after first 50 hours of operation. There after every 1000 hours of operation.*

NOTE: *The oil level must be checked on level ground. When replacing fluid, only use approved grade transmission fluid.*

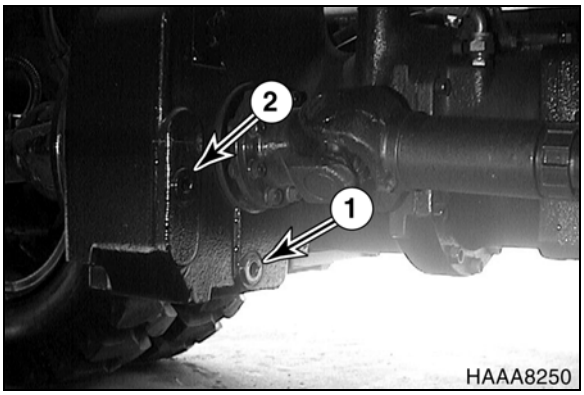

Figure 84

1. The gear oil drain and fill holes are located on the front lower section of the transmission.
2. Clean off any dirt, grease and other foreign materials from area surrounding the drain (1, Figure 84) and fill (2) holes of the transmission.
3. Place a drain pan under the drain plug and remove the drain plug.
4. Clean the drain plug. Inspect the O-ring for deterioration or damage and replace if necessary. Reinstall drain plug.
5. Remove the fill plug (2, Figure 84) and fill to the bottom of the fill hole with approved transmission fluid.

   NOTE: *See "Fluid Capacities" on page 4-7, for capacity.*
6. Clean the fill plug. Inspect the fill plug O-ring for deterioration or damage and replace if necessary. Reinstall the fill plug.

DRAIN AND REFILL FRONT AXLE CASE OIL

NOTE: *The front axle case oil should be drained and refilled after the first 250 hours of operation and at every 1000 hours there after.*

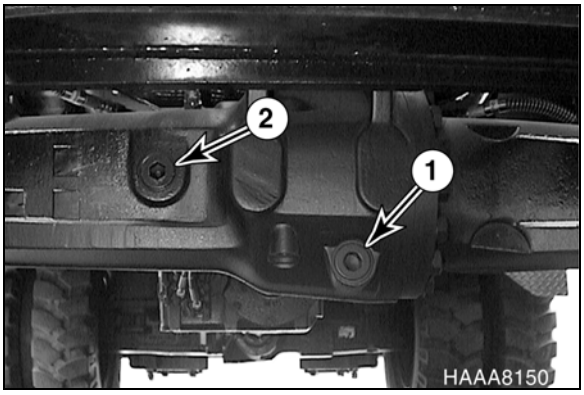

Figure 85

1. The oil drain (1, Figure 85) and fill (2) holes are located in the front section of the axle case.
2. Clean off any dirt, grease and other foreign materials from area surrounding the drain (1, Figure 85) and fill (2) holes of the axle case.
3. Place a drain pan under the drain plug and remove the drain plug.
4. Clean the drain plug. Inspect the O-ring for deterioration or damage and replace if necessary. Reinstall drain plug.
5. Remove the fill plug (2, Figure 85) and fill to the bottom of the fill hole with approved gear oil.

   NOTE: *See "Fluid Capacities" on page 4-7, for capacity.*
6. Clean the fill plug. Inspect the fill plug O-ring for deterioration or damage and replace if necessary. Reinstall the fill plug.

CHECK ALTERNATOR AND STARTER**

**These checks need to be completed by an authorized *DOOSAN* Dealer.

CHECK ALL RUBBER ANTI-VIBRATION SHOCK MOUNTS

PERFORM AND RECORD THE RESULTS OF THE CYCLE TIME TESTS

INSPECT MACHINE TO CHECK FOR CRACKED OR BROKEN WELDS OR OTHER STRUCTURAL DAMAGE

CHECK, ADJUST VALVE CLEARANCE

CHECK HEAD BOLT TORQUES

FUSES

1. The fuses in the fuse box are used to protect the various electrical circuits and their components from damage. See Figure 106. The fuses used are standard automotive type fuses.
2. The section on “Fuse Identification” on page 4-68, lists the circuits and the fuse amperage required for each circuit. If a fuse blows, determine the cause and repair any faults or failures.
3. DO NOT insert a higher amperage fuse into a lower amperage slot. Serious damage to the electrical components or fire can result.

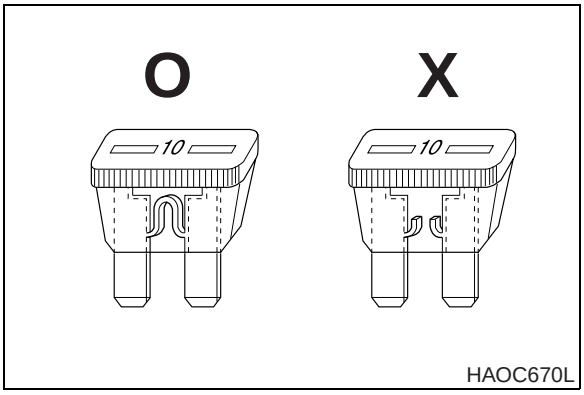

Figure 106

CAUTION!

Before replacing a fuse, be sure to turn starter switch to "O" (OFF) position.

Fuse Boxes

There are two fuse boxes (1 and 2, Figure 107) on the left side of the heater box. Fuses prevent electrical devices from overloading or shorting.

A decal attached to the inside of the fuse box's cover indicates the function and amperage of each fuse.

Spare fuses are mounted on the inside of fuse box's cover.

Change a fuse if the element separates. If the element of a new fuse separates, check the circuit and repair the circuit.

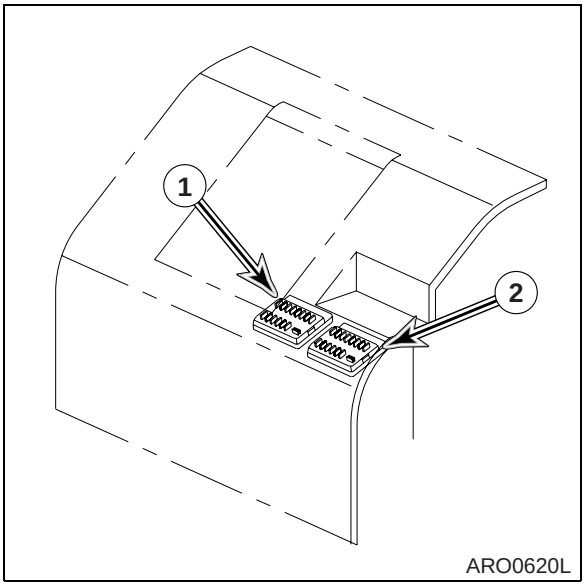

Figure 107

CAUTION!

Always replace fuses with the same type and capacity fuse that was removed. Otherwise, electrical damage could result.

6. Remove rubber spacer (1, Figure 123) and inner tire assembly (2) from hub (3). Examine rubber spacer assembly for wear and damage. Replace if necessary.

7. Examine all parts for excessive wear and damage. Replace all necessary parts.

8. Reassemble parts in following order; inner tire, rubber spacer, outer tire and wheel nut.

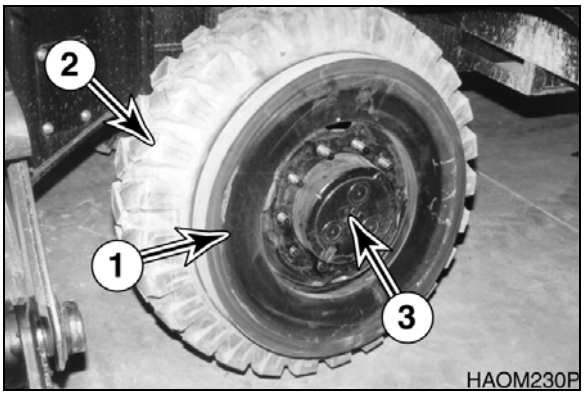

Figure 123

9. Follow tightening pattern (Figure 124) when tightening wheel nuts. Tighten to specified torque. (Tightening torque 400 - 434 ft lb / 55 - 60 kg•m.)

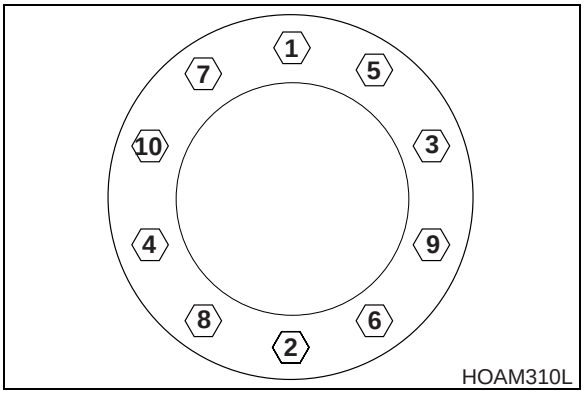

Figure 124

10. Run machine forward and backward several times to ensure proper assembly and seating of the washers. Retighten wheel nuts to ensure proper torque.

Figure 125

Problem	Cause	Remedy
All actuators have low power	Low hydraulic oil level.	Add hydraulic oil as required.
	Suction filter clogged.	Clean filter.
	Hydraulic pumps faulty.	Contact your *DOOSAN* dealer.
	Main relief pressure too low.	Contact your *DOOSAN* dealer.
	Hydraulic pumps excavating.	Bleed air from hydraulic pumps.
Only one or two actions have little or no power	Overload relief pressure too low.	Reset pressure.
	Make-up check valve leaking.	Clean or replace as required.
	Control valve spool faulty.	Replace valve spool.
	Dirt in valve spool.	Clean or replace as required.
	Actuator failure.	Repair or replace as required.
	Cylinder seal failure.	Repair or replace as required.
	Cylinder rod damaged.	Repair or replace as required.
	Remote control valve failure.	Replace control valve.
	Wrong pilot line connection.	Reconnect pilot lines.
Oil temperature too high	Oil cooler faulty.	Contact your *DOOSAN* dealer.
	Fan belt loose.	Tighten fan belting as required.

SWING SYSTEM

Problem	Cause	Remedy
No swinging motion	Swing brake valve faulty.	Replace brake valve.
	Hydraulic timer faulty.	Replace timer.
	Low brake release pressure.	Adjust pressures.
	Swing motor failed.	Replace swing motor.
	Remote control valve failed.	Replace control valve.
	Wrong pilot line connection.	Reconnect pilot lines.
Swing motion jerky	Swing gear worn.	Replace swing gear.
	Swing bearing damaged.	Replace bearing.
	Improper lubrication.	Add grease.

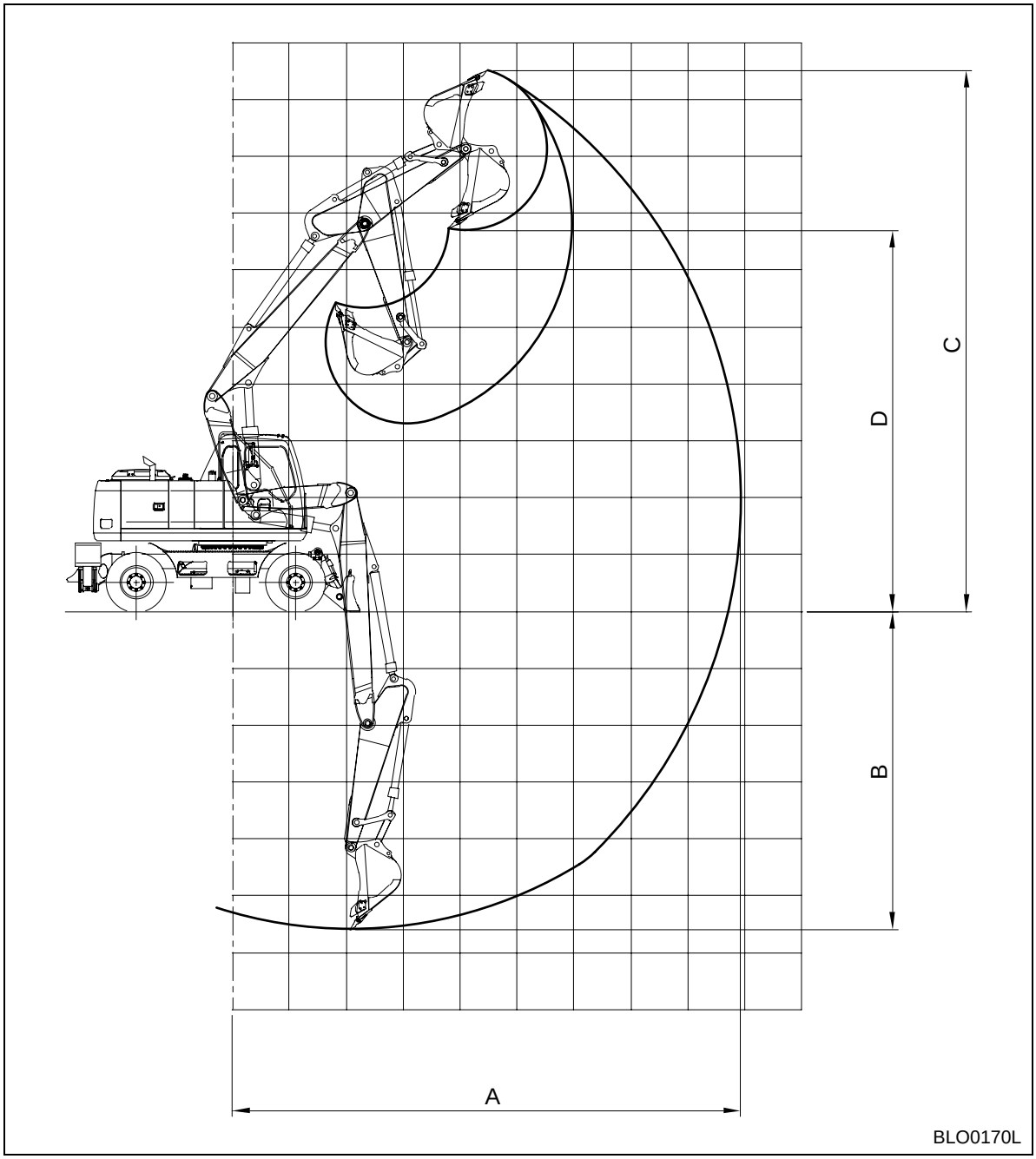

Figure 8

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