Mega 200-V
Mega 200-VTC

Operation and Maintenance Manual

022-00028AE

S/N 1001 and Up (Tier I & II)

February 2003

Daewoo reserves the right to improve our products in a continuing process to provide the best possible product to the market place. These improvements can be implemented at any time with no obligation to change materials on previously sold products. It is recommended that consumers periodically contact their distributors for recent documentation on purchased equipment.

This documentation may include attachments and optional equipment that is not available in your machine's package. Please call your distributor for additional items that you may require.

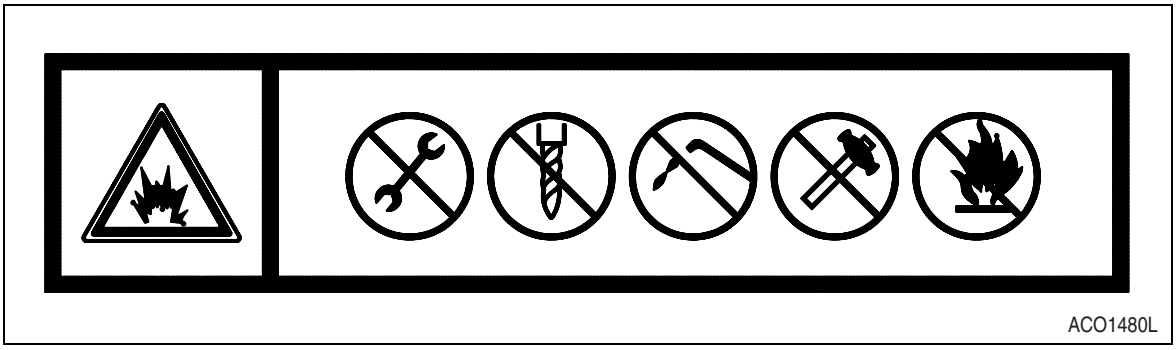
Illustrations used throughout this manual are used only as a representation of the actual piece of equipment, and may vary from the actual item.

3. WARNING FOR HANDLING ACCUMULATOR (2190-2528, 190-00099)

⚠ WARNING!

Explosion hazard:

- **Keep away from flame.**
- **Do not weld or drill.**



ACO1480L

Accumulator

Wheel loader pilot control system is equipped with an accumulator. Accumulator will store a pressure charge that may enable hydraulic controls to be activated for a brief period of time after engine has been shut down. Activation of any controls may enable selected function to operate under force of gravity.

⚠ CAUTION!

Any raised attachment will lower to ground if accumulator holds a charge.

When shutting machine down, lower front attachment to ground. After engine has been shut down, turn key to "ON" position and move joystick controls to release pressure in accumulator. Remove key.

IMPORTANT

Refer to Shop Manual for service procedures. Do not release any pilot lines until pressure within accumulator has been released.

TAKE TIME TO PROVIDE GOOD VISIBILITY

Halt work if visibility is poor. Strong rains, snow, fog and extremely dusty conditions can all obscure visibility so badly that it is best to wait for weather to change or dust to settle before continuing operation.

Night work in areas of limited visibility should be halted if installation of extra work lights on machine (or work area) is necessary.

Keep dirt and dust off of windows and off lens surfaces of work lights. Stop working if lights, windows or mirrors need cleaning or adjustment.

FUEL, OIL AND HYDRAULIC FLUID FIRE HAZARDS

Add fuel, oil, antifreeze and hydraulic fluid to machine only in a well-ventilated area. Machine must be parked with controls, lights and switches turned "OFF." Engine must be "OFF" and any flames, glowing embers, auxiliary heating units or spark-causing equipment must be doused, turned "OFF" and/or kept well clear of machine.

Static electricity can produce dangerous sparks at fuel filling nozzle. In very cold, dry weather or other conditions that could produce static discharge, keep tip of fuel nozzle in constant contact with neck of fuel filling nozzle, to provide a ground.

Keep fuel and other fluid reservoir caps tight and do not start engine until caps have been secured.

Figure 10

BOOST STARTING OR CHARGING ENGINE BATTERIES

Turn "OFF" all electrical equipment before connecting leads to battery. This includes electrical switches on battery charger or boost starting equipment.

When boost-starting from another machine or vehicle do not allow two machines to touch. Wear safety glasses or goggles while required parallel battery connections – positive to positive and negative to negative – are made.

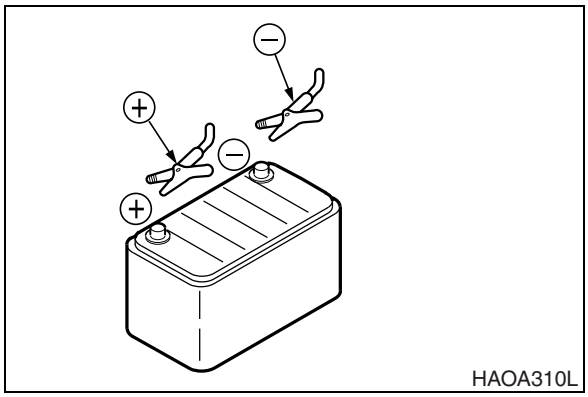


Figure 11

24 volt battery units consisting of two series-connected twelve volt batteries have a cable connecting one positive terminal on one of the 12 volt batteries to a negative terminal on the other battery. Booster or charger cable connections must be made between nonseries-connected positive terminals and between negative terminal of booster battery and metal frame of machine being boosted or charged. Refer to procedure and illustration in “Starting with Auxiliary Batteries” on page 3-8.

Connect positive cable first when installing cables and disconnect negative cable first when removing them. Final cable connection, at metal frame of machine being charged or boost-started, should be as far away from batteries as possible.

OPERATING CONTROLS

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

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 gauges on instrument panel. Operators should monitor machine pressure on instrument panel along with indicator lights. These lights will only give operators an indication that there is a problem.

WARNING!

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

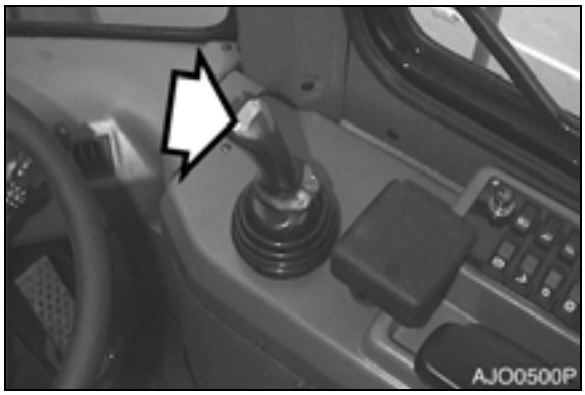


Figure 8

3. COMBINATION SWITCH

A. Left Side Directional Switch - Pushing lever forward, activates left outside directional lights and directional indicator light on instrument panel.

B. Right Side Directional Switch - Pulling lever back, activates right outside directional lights and directional indicator light on instrument panel.

NOTE: *When turn is completed the lever automatically returns to the "NEUTRAL" position. Should it not, it can be manually returned by hand.*

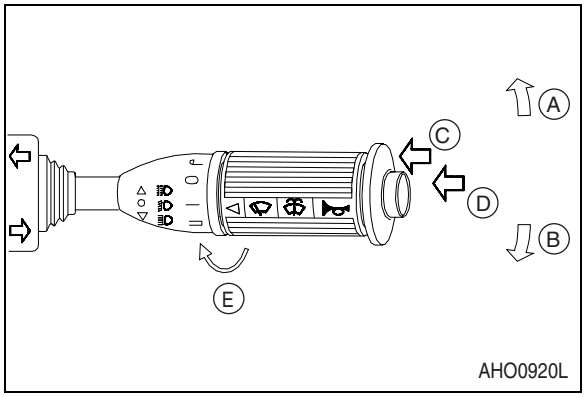


Figure 9

NOTE: *Turn signals will function with starter switch in "OFF" position.*

C. Window Washer Switch - When the outside area of the lever is pressed, it activates the washer pump and sprays fluid on the windshield. (Only while being pressed.)

> **CAUTION!**
>
> **The washer pump can be damaged if it is activated while there is no fluid in the tank. The fluid level should be checked regularly and refilled if necessary.**
>
> **Using soap or other solvents instead of the recommended washer fluid may damage the wiper blades and the paint finish.**
>
> **Only use recommended washer fluid or equivalent.**

D. Horn Button - The center button on end of lever activates horn. (Only while being pressed.)

E. Wiper Switch - Activates wipers when outside area of lever is rotated.

J: Intermittent Mode - wipes every 5 seconds.

0: Stop (Off).

I: Normal Speed Mode.

II: High Speed Mode.

5. COOLANT TEMPERATURE GAUGE

This gauge displays temperature of engine coolant.

CAUTION!

When the pointer indicates "H" mark (red zone), it means the engine is overheated. Stop the operation, let the engine run at low rpm and wait for it to cool down.

Do not shut down engine. If engine is shut down heat surge may occur.

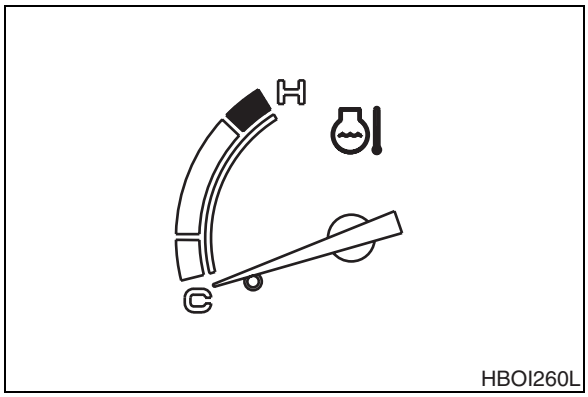


Figure 29

6. TRANSMISSION OIL TEMPERATURE GAUGE

This gauge displays temperature of oil in transmission converter and transmission circuit.

CAUTION!

When the pointer indicates "H" mark (red zone), it means the transmission is overheated. Stop the operation, let the engine run at low rpm and wait for transmission to cool down.

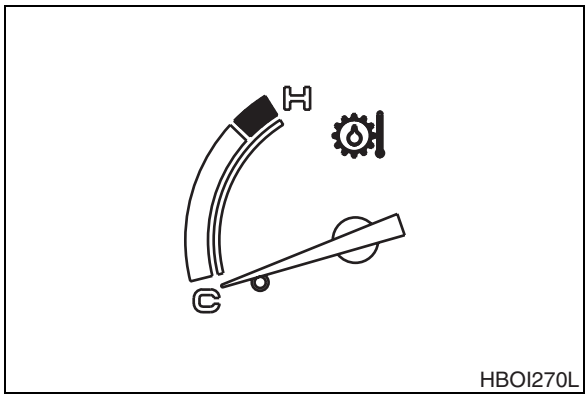


Figure 30

7. PREHEAT CYCLE INDICATOR LIGHT

When this light turns "ON" it means that engine preheat cycle is complete. When radiator temperature is below 10°C (-12°F), this light will turn "ON" approximately 3.5 seconds after starter switch is turned to preheat position.

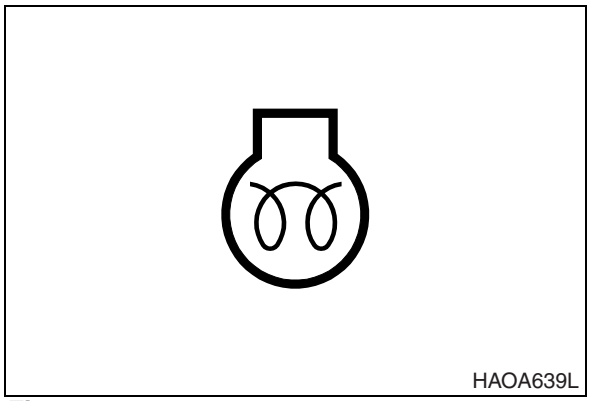


Figure 31

3. HORN BUTTON (TWO PLACES)

Pressing the left button at the tip of the pilot control valve lever (joystick) (Figure 53) or the button at the end of the combination switch (Figure 54) will sound the horn.

NOTE: *Starter switch must be "ON."*

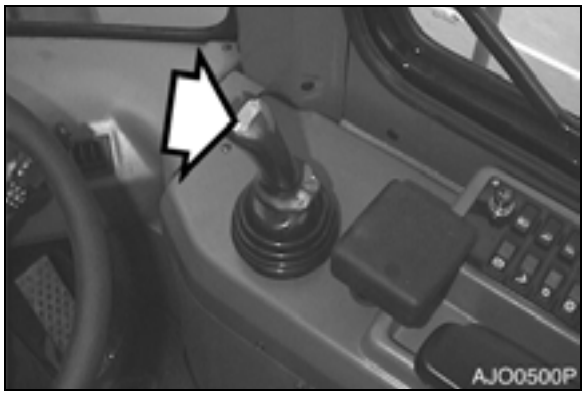


Figure 53

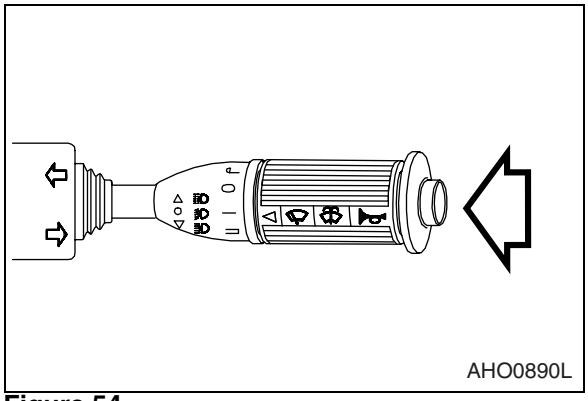


Figure 54

4. CIGAR LIGHTER

Push the lighter all the way into the socket and release your hand. After pushing it in, it will be ejected when it is heated. If it does not eject after a short time, pull it out and have it serviced.

IMPORTANT

The cigar lighter is powered by a 24 volt circuit. Never plug any 12 volt device into the cigar lighter.

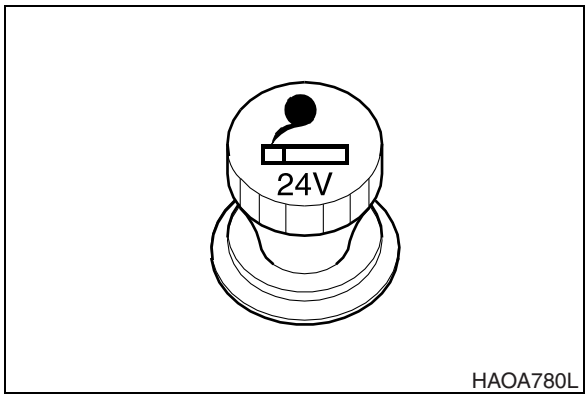


Figure 55

9. FUSE BOX TWO

Fuse box two is just above the windshield washer fluid tank. For a detailed explanation of fuses see “Fuse Box/Relay” on page 2-55.

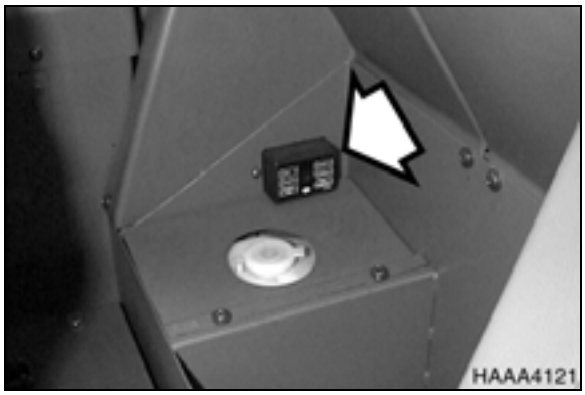


Figure 76

10. FUSE BOX ONE

The fuse box one is at the rear side of right control stand. For a detailed explanation of fuses “Fuse Box/Relay” on page 2-55

Figure 77

SEAT ADJUSTMENT

⚠ WARNING!

Whenever operator or operating condition has changed, check to see that seating position is suitable for the condition at hand. Always fasten your seat belt while operating vehicle. Adjust backrest so that the operator can fully reach and operate pedals.

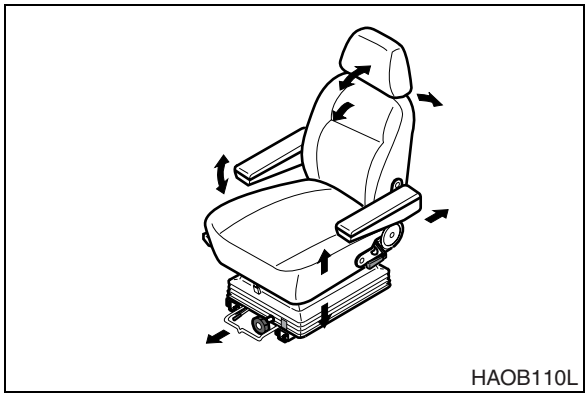


Figure 95

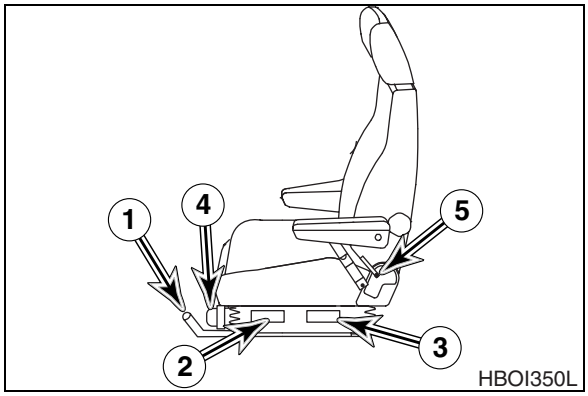


Figure 96

1. ADJUSTING SEAT FORWARD/ BACKWARD LEVER

Holding lever (3, Figure 96), raise it up, while pushing or pulling seat to desired position. Release lever once desired position is reached. Adjustment range is 160 mm (6.3 in).

2 & 3. ADJUSTING SEAT'S ANGLE AND HEIGHT LEVER

Pulling left lever (3, Figure 96) up allows rear part of seat to be moved up or down. Pulling lever (2) up allows front part of seat to be moved up or down. Adjust seat according to operator's size and work conditions. Adjustment range is 60 mm (2.36 in) for both front and rear.

4. WEIGHT ADJUSTMENT KNOB

Turning knob (4, Figure 96) to right makes suspension harder. Turning knob to left makes suspension softer. Adjust according to operator's weight by checking weight indicator dial. Adjustment range is from 50 - 120 kg (110 - 265 lb).

5. BACKREST ADJUSTMENT LEVER

Pulling up right lever (5, Figure 96) allows seat backrest to be moved forward or backward.

4. Set pilot cutoff switch to "O" (LOCK) position. This will "LOCK" pilot control valve lever (joystick).

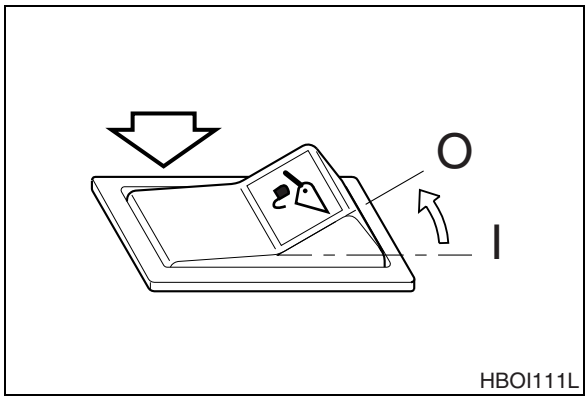


Figure 4

5. Rotate starter key to "I" (ON) position. All indicator lights should turn "ON."

   NOTE: *If unit is equipped with and emergency steering system. Test system before starting engine. If system does not function properly, do not start unit. Follow test procedure given with test switch.*

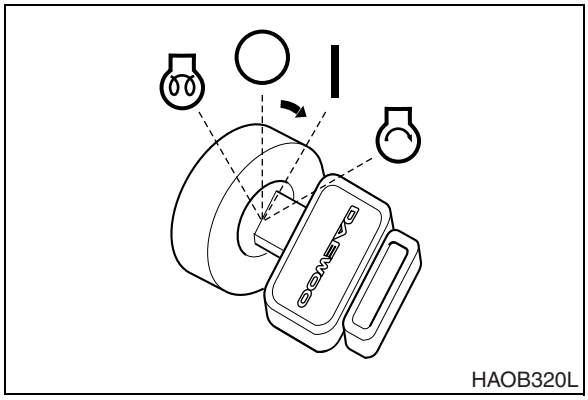


Figure 5

6. Rotate starter key to "START" position. Starter motor should crank immediately, and engine should start within a few seconds.

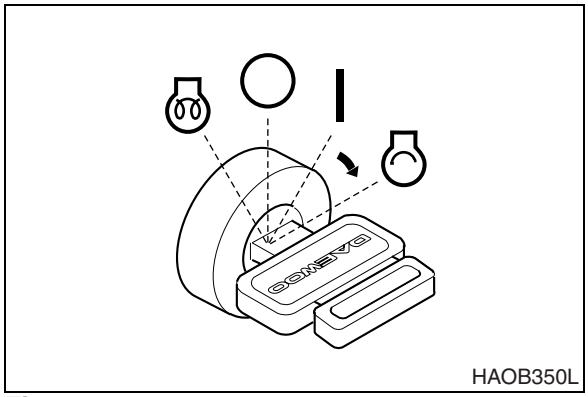


Figure 6

7. Release starter key when engine starts. Key will return to "I" (ON) position.

IMPORTANT
If engine does not start after approximately 15 seconds of cranking, release Starter Key. Wait 5 minutes for starter motor to cool down. Repeat step 6.

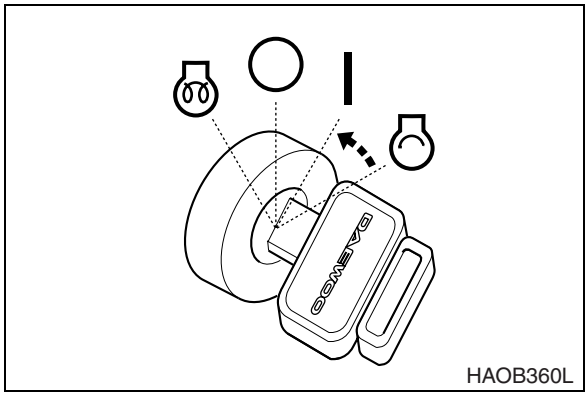


Figure 7

8. After engine starts, check all indicator lights and gauges to be certain that all

7. Place transmission lever in desired gear. Shift gears one by one. Do not skip from 1st to 3rd, for example.
8. Shift transmission lever to "FORWARD" position.

Figure 28

9. Release the brake pedal while slowly pressing the accelerator pedal.

> **WARNING!**
>
> **When traveling at high speed or on a steep hill, do not make sharp changes in direction. This could cause vehicle to overturn.**
>
> **When traveling or changing direction, always look carefully to be certain that no one is in path of vehicle.**

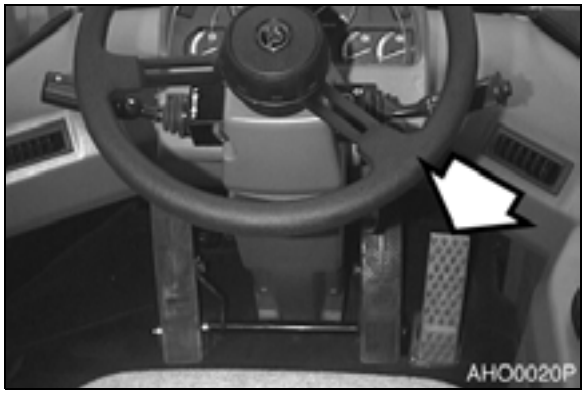


Figure 29

MACHINE SHUT DOWN

1. Ease off throttle and apply travel brakes.

Figure 30

TABLE OF RECOMMENDED LUBRICANTS

IMPORTANT

Do not use lubricants other than those recommended, without prior written approval from Daewoo.

NOTE: *Refer to Maintenance Intervals Table for application points.*

LUBRICANT MANUFACTURER	HYDRAULIC OIL	ENGINE OIL	LUBRICANT GREASE	AXLE GEAR OIL
CALTEX	CALTEX HD32	CALTEX RPM or DELO 300	MULTIFAC EP	MULTIPURPOSE EP90
EXXON/ESSO	NUTO (ANTI-WEAR) HD 32 (BELOW 0°C (32°F)) or HD 46 (ABOVE 0°C (32°F)) or TERESSTIC (ANTI-RUST)	EXXON XD-3 STRAIGHT WEIGHT or 15W40	RONEX MP #2 or RONEX MP #1 (COLD TEMPS)	SPARTAN EP220 or EXXON GX 80W90
MOBIL	MOBIL DTE 13M (ALL-TEMP) or DTE 24 (SUMMER)	DELVAC 1300 or SUPER 15W40 or DELVAC 1 or STRAIGHT WEIGHT	MOBIL FAW #2 or MOBIL FAW #1 (COLD TEMPS)	MOBILUBE LS 80W90
SHELL	TELLUS 32	ROTELLA T15W40 or T30 (WINTER) or T40 (SUMMER)	ALVANIA EP #2	SPIRAX HD 80W90
PENNZOIL	PENNZBELL AW 32 (BELOW 0°C (32°F)) or AW 46 (ABOVE 0°C (32°F))	LONGLIFE SAE30 or SAE40 or SAE15W40	PENNZOIL 705 EP #2	PENZOIL MULTIPUPOSE 4092 or 80W90
DRYDEN	PARADENE AW 32 (BELOW 0°C (32°F)) or AW 46 (ABOVE 0°C (32°F))	DIESELALL PLUS or 30W or 40W or 15W40	EP #2 (RED)	AP80W90

DRAIN FUEL CONDENSATION

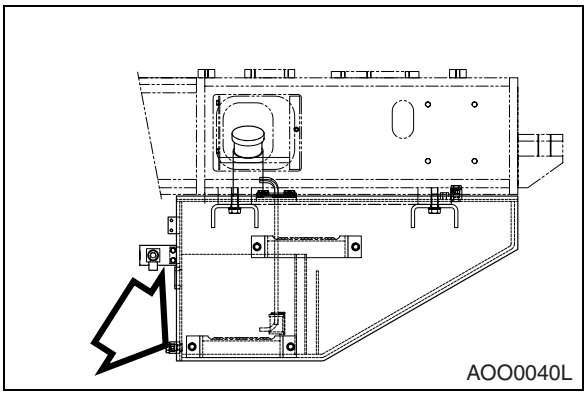


Figure 16

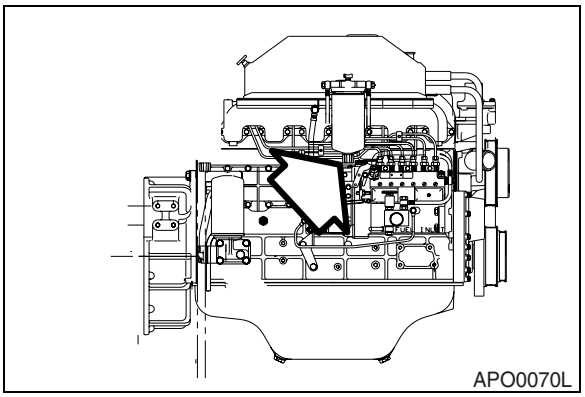


Figure 17

1. Open fuel tank drain valve (Figure 16). Allow any condensed water or sediment to drain out of tank. Also open drain on fuel filter and drain out any water or sediment (Figure 17). Catch drained material in a container. Properly dispose of drained material.

CHECK COOLANT LEVEL

⚠ WARNING!

Never open radiator when it is hot. Scalding liquid inside a hot radiator is under pressure. Removing cap from a hot radiator could cause a person to be sprayed and burned from liquid inside. Wait for radiator temperature to cool down before removing cap.

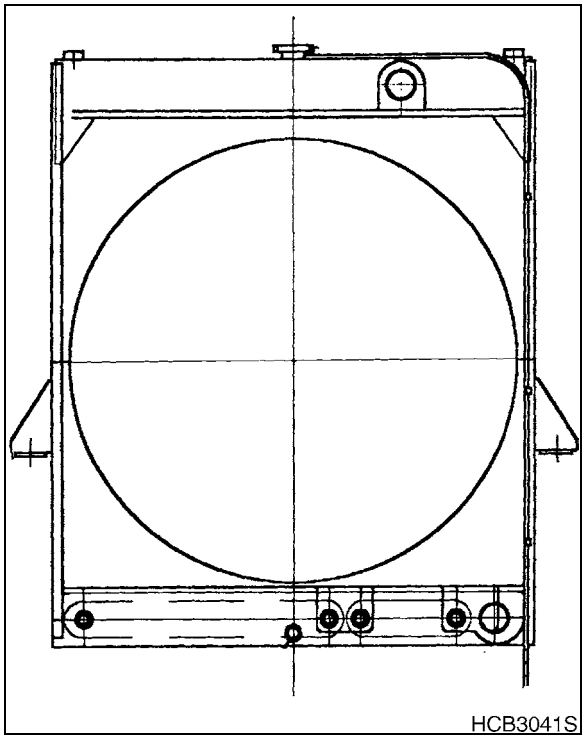


Figure 18

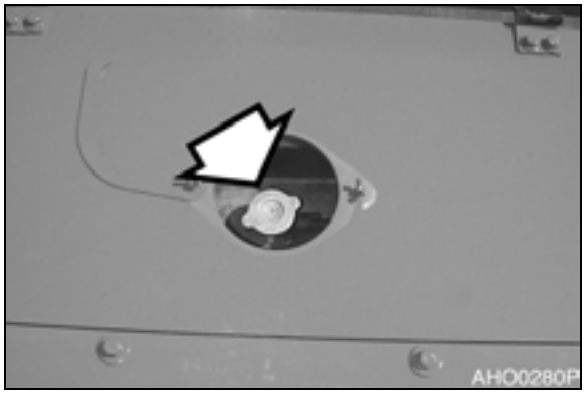


Figure 19

1. Following fittings are greased daily, or every 10 hours, for first 100 hours of operation to comply with new machine break-in requirements. After that, greasing should be done every 50 hours. If bucket is being used in water, grease fittings immediately after machine is removed from water.

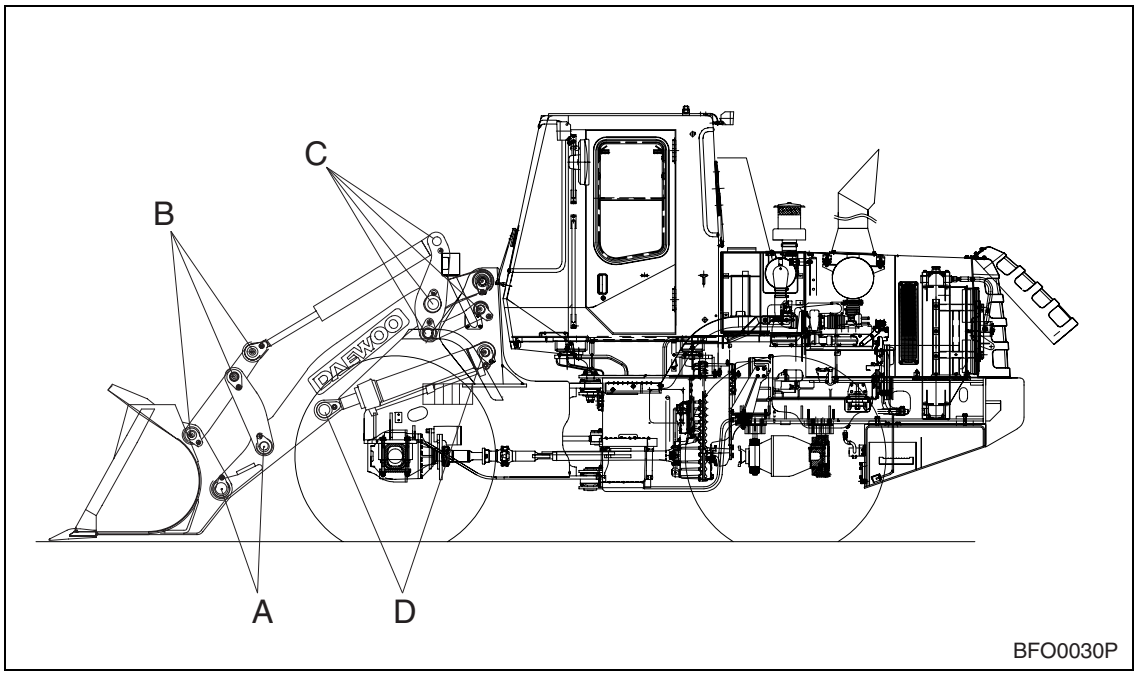


Figure 40

A: Bucket hinge pins, 2 locations on each side of bucket. Arm link connecting pins, 2 locations. (Figure 41)

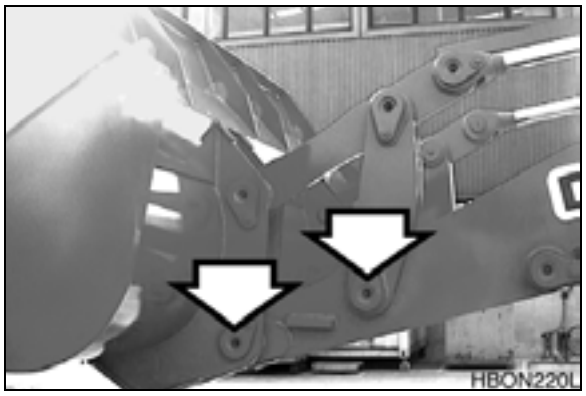


Figure 41

GREASE DRIVE SHAFTS

1. Grease fitting for center bearing, 1 location. Use remote grease fitting mounted on frame (3, Figure 61).

Reference Number	Remote Grease Fittings
1 and 2 50 Hours	Steering Cylinder Head Ends
3 250 Hours	Drive Shaft Center Bearing

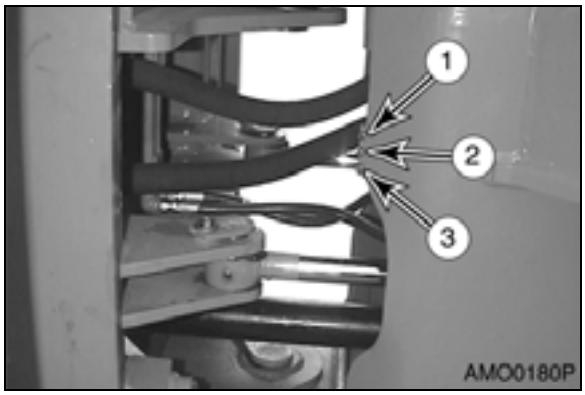


Figure 61

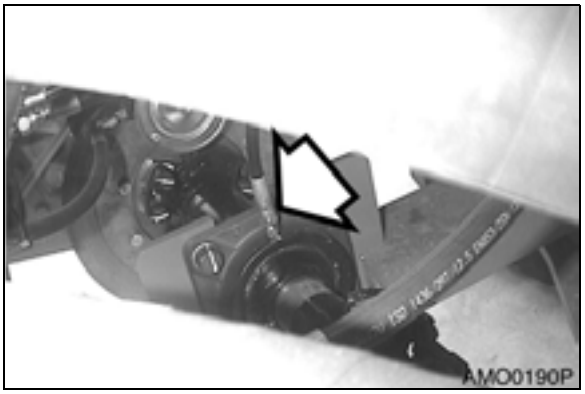


Figure 62

AXLE DIFFERENTIAL AND PLANETARIES OIL REPLACEMENT (AFTER FIRST 250 HOURS)

NOTE: *The differential and planetaries oil should be drained and refilled after first 250 hours of operation. There after every 1,500 hours of operation. (See page 4-43)*

REPLACEMENT OF TRANSMISSION OIL AND FILTER (AFTER FIRST 250 HOURS)

NOTE: *Transmission oil and filter must be changed after first 250 hours of operation to comply with new machine break-in requirements.*

NOTE: *After first change, oil and filter should be changed every 1,000 hours. Follow procedure under 1,000 hour maintenance interval. (See page 4-39)*

1,500 HOUR / 9 MONTH SERVICE

PERFORM ALL 10, 50, 250, AND 500 HOUR SERVICE CHECKS

REPLACE OUTER AND INNER AIR CLEANER ELEMENTS

> **⚠ CAUTION!**
>
> **Never remove air cleaner element while engine is running. This will allow dirt to be sucked into engine and cause serious engine damage. Always turn engine "OFF" before servicing air cleaner.**

1. Replace inner element when outer element is replaced.
2. After removing outer element, remove wing nut and inner element.
3. Clean out inside of air cleaner housing. DO NOT use compressed air to blow out housing.
4. Install new inner element, and secure it into position with wing nut. DO NOT clean and re-use inner element.
5. Install new outer element, and secure it into position with wing nut.
6. Install air cleaner cover.

   NOTE: *Make sure that all gaskets on wing nuts and cover are properly installed and seated.*

AXLE DIFFERENTIAL AND PLANETARIES OIL REPLACEMENT

NOTE: *Oil in both front and rear axle must be replaced after first 250 hours of operation to comply with new machine break-in requirements. After that, axle oil check should be done every 250 hours of operation and replacement should be done every 1,500 hours.*

Each axle contains a center differential, and a planetary in each end. The same oil lubricates center differential and planetaries in axle ends, but oil flows very slowly between these points. When checked, oil must be checked and refilled at all three places at the same time. To drain and replace oil in an axle, perform the following steps:

1. Drive machine onto a level surface. Position wheels on axle being drained so that axle end level plugs (1, Figure 79) are in the lowest position. Apply parking brake. Block wheels.
2. Clean area around level plugs on both ends of axle. Remove plugs.

   NOTE: *See "Fluid Capacities" on page 4-5 for capacity.*

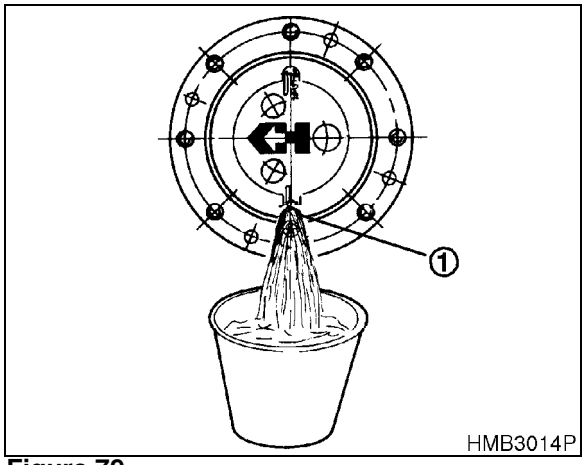


Figure 79

CHECK HYDRAULIC PRESSURES

Hydraulic pressure for most systems can be check by using the remote test ports shown in (Figure 93).

Reference Number	Description
1	Main Pump Pressure
2	Control Lever Activation Pressure
3	Steering Pump Pressure
4	Transmission Clutch Pressure
5	Brake Charge Pressure

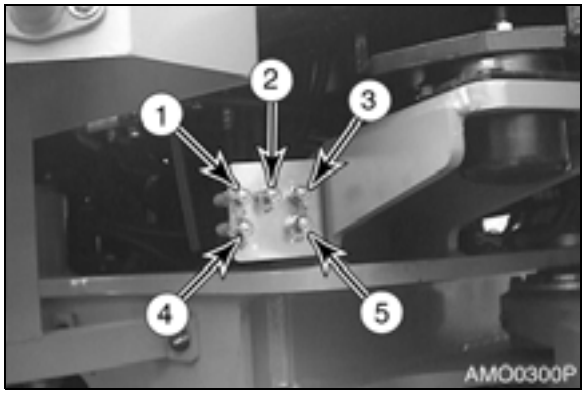


Figure 93

MAIN PUMP PRESSURE

1. Attach gauge to port (1, Figure 93).
2. Relief cartridge for main pump must open at $205^{\pm5}$ kg/cm^2 ($2{,}915^{\pm70}$ psi).
3. Adjust screw on relief valve cartridge (Figure 94). Loosen lock nut and turn screw clockwise to raise relief pressure. Turn screw counterclockwise to lower relief pressure.
4. Tighten lock nut after pressure has been adjusted.

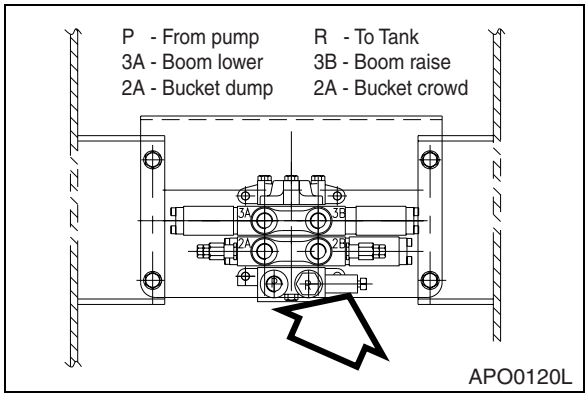


Figure 94

CONTROL LEVER ACTIVATION PRESSURE

(S/N 1001 thru 2000)

1. Attach gauge to port (2, Figure 93).
2. Adjust relief cartridge (3, Figure 95) on brake and pilot supply valve (1, Figure 95).

   Relief pressure should be set at 28^{+3}_{-2} kg/cm^2 (398^{+43}_{-30} psi).
3. Loosen lock nut on adjusting screw. Turn adjusting screw clockwise to raise relief pressure. Turn adjusting screw counterclockwise to lower relief pressure.
4. Tighten lock nut after adjustment has been made.

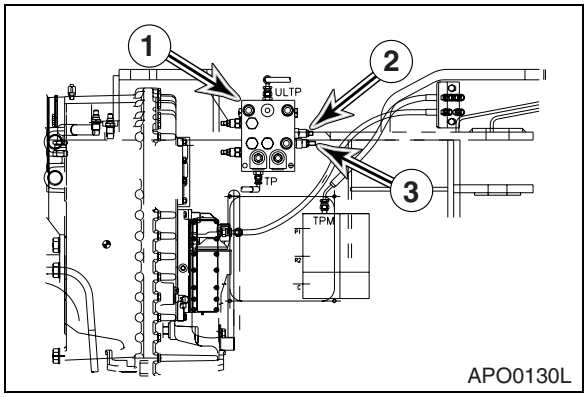


Figure 95

LOADING MACHINE ON A TRAILER

When transporting the machine observe the various road rules, road transportation vehicle laws and vehicle limit ordinances, etc.

It is a good idea to obtain special platform for loading and unloading the machine.

1. Park the trailer on a flat firm roadbed. Keep a fairly long distance between the road shoulder and the machine.
2. Properly apply the brakes of the trailer and place wheel chocks in front of and behind the tires to ensure that the trailer does not move.
3. Fix the ramp in line with the centers of the trailer and the machine.
4. Determine the position of the ramp, then slowly load the machine onto to the specified part of the trailer.

   NOTE: *Have someone in clear view and in a safe position provide directions while loading.*

5. Lower the bucket and lock each control lever using the pilot cutoff switch.
6. Apply the parking brake and set the articulation stopper in the "LOCKED" position.
7. Tape over the exhaust stack outlet to prevent turbo "Wind-milling" damage.
8. Place blocks in front of and behind the tires to prevent the machine from moving.
9. Fasten the machine to the trailer with chains or cables at lower part of the rear chassis. Additional chains or cables may be used but do not damage brake lines or cylinder rods.

IMPORTANT
Brake pipe runs on axle housing.
Do not fasten axle housing.

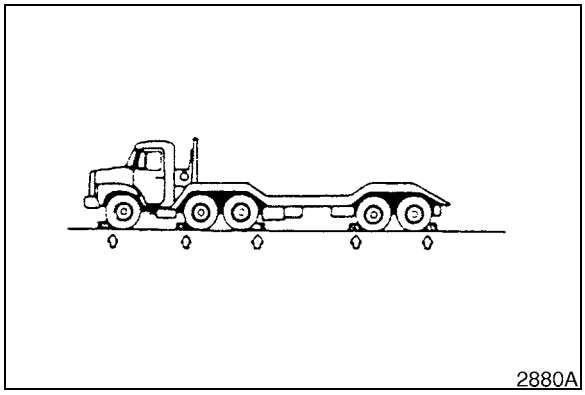


Figure 1

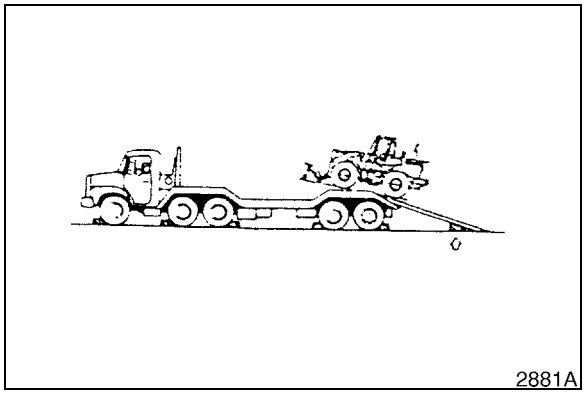


Figure 2

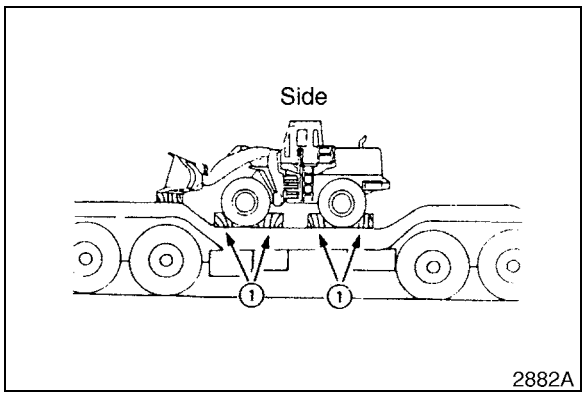


Figure 3

Error Code Number	Meaning Of Error Code	Remarks
38	Short circuit to ground or open circuit at internal speed input.	
39	Logical error at internal speed input.	
3A	Short circuit to battery voltage at output speed input.	
3B	Short circuit to ground or open circuit at output speed input.	
3C	Logical error at output speed input.	
71	Short circuit to battery voltage at clutch K1.	
72	Short circuit to ground at clutch K1.	
73	Open circuit at clutch K1.	
74	Short circuit to battery voltage at clutch K2.	
75	Short circuit to ground at clutch K2.	
76	Open circuit at clutch K2.	
77	Short circuit to battery voltage at clutch K3.	
78	Short circuit to ground at clutch K3.	
79	Open circuit at clutch K3.	
7A	Short circuit to battery voltage at converter clutch.	Not used.
7B	Short circuit to ground at converter clutch.	Not used.
7C	Open circuit at converter clutch.	Not used.
81	Short circuit to battery voltage at clutch K4.	
82	Short circuit to ground at clutch K4.	
83	Open circuit at clutch K4.	
84	Short circuit to battery voltage at clutch KV.	
85	Short circuit to ground at clutch KV.	
86	Open circuit at clutch KV.	
87	Short circuit to battery voltage at clutch KR.	
88	Short circuit to ground at clutch KR.	
89	Open circuit at clutch KR.	
91	Short circuit to battery voltage at relay reverse warning alarm.	
82	Short circuit to ground at relay reverse warning alarm.	

WORKING CAPACITIES

BUCKET CAPACITY

Standard toothed bucket has a capacity of 1.8 m^3 (2.4 yd^3).

TIPPING LOAD

Static Tipping Load with bucket in Over Front position is 8,500 kg (18,740 lb). With bucket in Fully Turned position, Static Tipping Load is 7,400 kg (16,315 lb).

MATERIAL WEIGHT

The data below describes weight of a cubic meter (cubic yard) of many types of workload materials.

APPROXIMATE WEIGHT OF WORKLOAD MATERIALS

MATERIAL	LOW WEIGHT OR DENSITY 1,100 KG/M^3 (1,850 LB/YD^3), OR LESS	MEDIUM WEIGHT OR DENSITY 1,600 KG/M^3 (2,700 LB/YD^3), OR LESS	HIGH WEIGHT OR DENSITY 2,000 KG/M^3 (3,370 LB/YD^3), OR LESS
Charcoal	401 kg/m^3 (695 lb/yd^3)	----------	----------
Coke, blast furnace size	433 kg/m^3 (729 lb/yd^3)	----------	----------
Coke, foundry size	449 kg/m^3 (756 lb/yd^3)	----------	----------
Coal, bituminous slack, piled	801 kg/m^3 (1,350 lb/yd^3)	----------	----------
Coal, bituminous r. of m., piled	881 kg/m^3 (1,485 lb/yd^3)	----------	----------
Coal, anthracite	897 kg/m^3 (1,512 lb/yd^3)	----------	----------
Clay, DRY, in broken lumps	1,009 kg/m^3 (1,701 lb/yd^3)	----------	----------
Clay, DAMP, natural bed	----------	1,746 kg/m^3 (2,943 lb/yd^3)	----------
Cement, Portland, DRY granular	----------	1,506 kg/m^3 (2,583 lb/yd^3)	----------