DOOSAN

950106-01051NA-1
January 2015

EXCAVATOR

Operation & Maintenance Manual

DX210W-5

Serial Number 1001 and Up

Product Identification Number (PIN)

A PIN number is stamped on upper frame under boom foot (Figure 1). It is also stamped on a product identification plate (Figure 2) on outside of cabin on right-hand side.

NOTE: *Record these numbers and their locations. These will be required whenever warranty or service work is requested. Keep these numbers on file in case machine is stolen.*

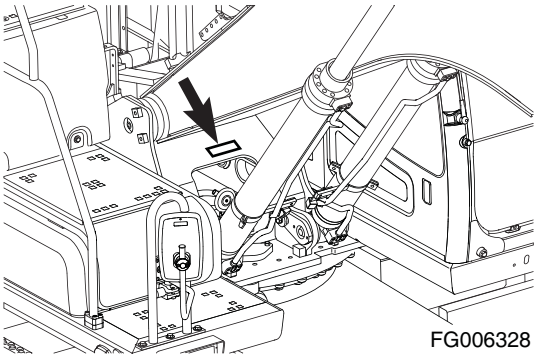


Figure 1

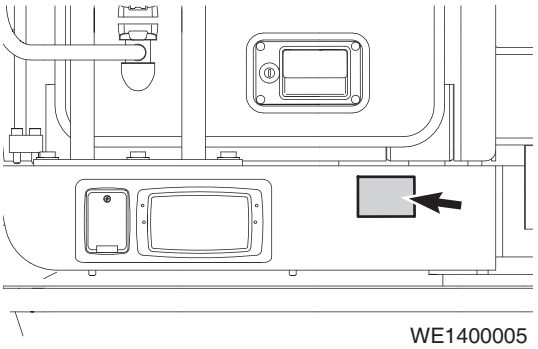


Figure 2

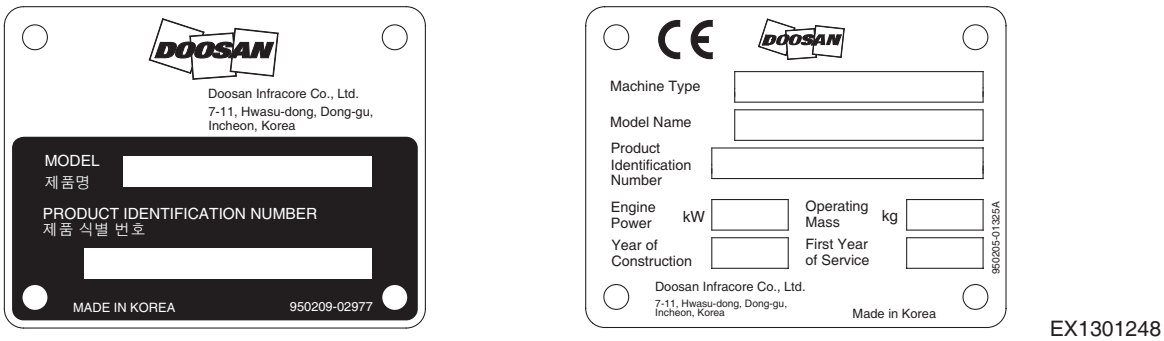


Figure 3

Component Serial Numbers

There are many serial numbers on each traceable component of the machine. Record these numbers and their locations. These will be required whenever warranty service work is requested.

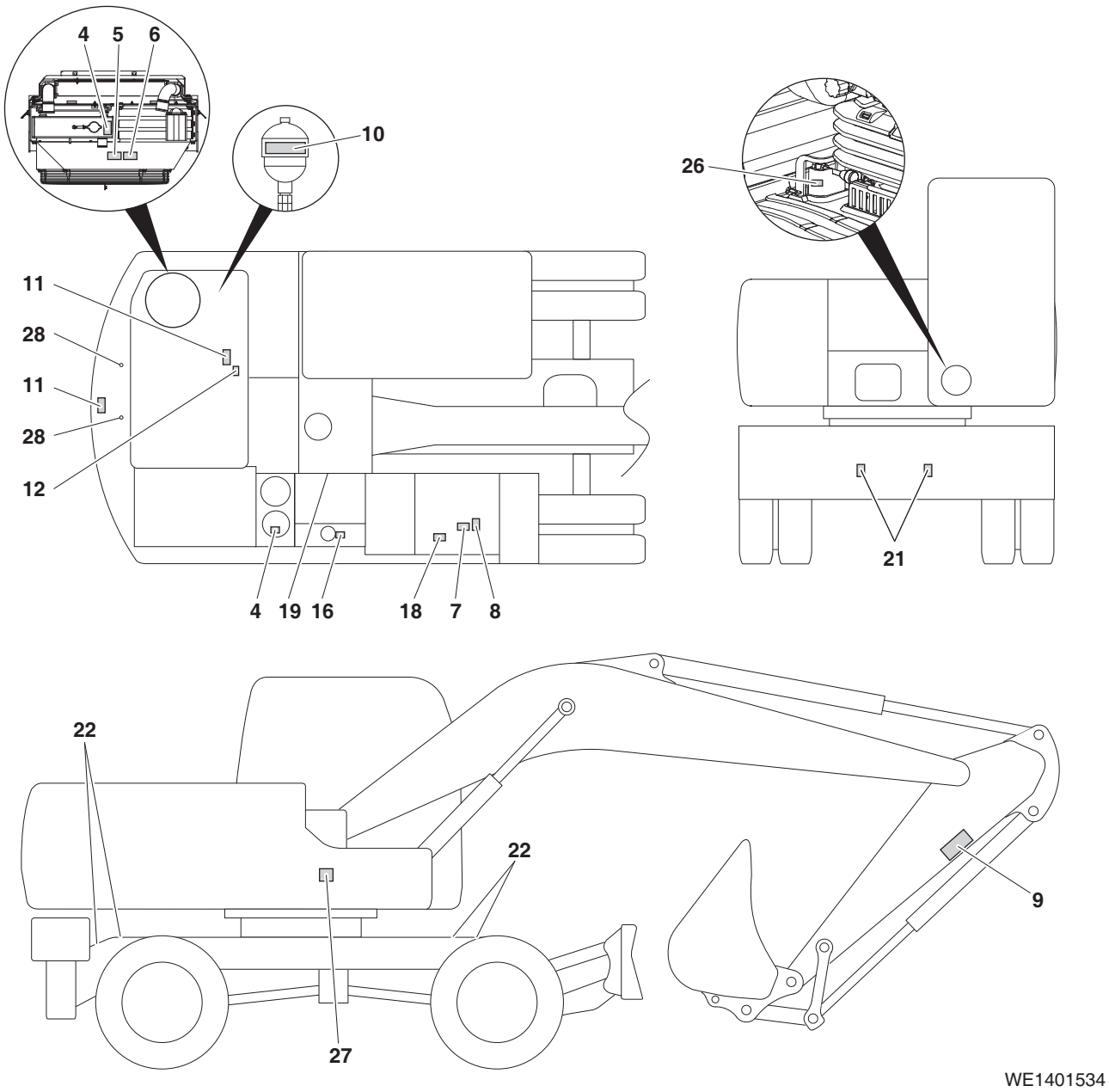


Figure 3

27. DEF (AdBlue) (950205-01489A)

IMPORTANT

- **Use only the specified diesel exhaust fluid.**
- **See the Operation & Maintenance Manual for more information.**

WL1300370

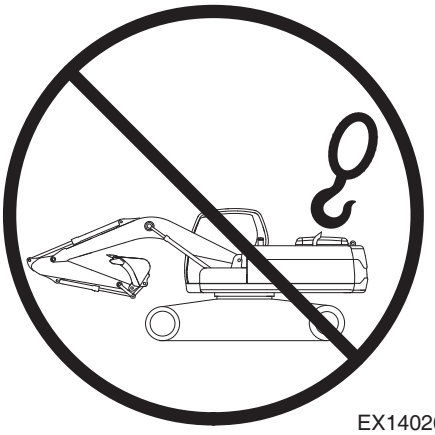
28. Do Not Lift (950205-03570)

WARNING

AVOID DEATH OR SERIOUS INJURY

Not a lift point for machine.

Refer to "Lifting Machine" section of this manual for detail regarding the lifting point.



EX1402619

Electrical System and Electrical Shock

Never short across starter terminals or across batteries. Shorting could damage electrical system and engine neutral start system.

When engine is running or immediately after it has stopped, high voltage is generated at injector terminal and inside engine controller, so there is a potential for an electrical shock. Never touch injector terminal or inside of engine controller.

NOTE: *If it is necessary to touch injector terminal or inside engine controller, contact your DOOSAN distributor.*

Rollover Protective Structure (ROPS)

The operator's cabin is a ROPS certified structure for protecting the seat-belted operator. It absorbs the impact energy of a rollover impact. Do not allow machine weight (mass) to exceed certified value on certification plate. If weight is exceeded, the ROPS structure will not be able to fulfill its safety function.

Do not increase machine weight beyond certified value by modifying machine or by installing attachments on machine. If weight limit of protective equipment is exceeded, protective equipment will not be able to protect operator, and this can result in death or serious injury. Always observe the following:

- This machine is equipped with a protective structure. Do not remove protective structure and perform operations without it.
- Never modify the operator's cabin by welding, grinding, drilling holes or adding attachments unless instructed by DOOSAN in writing. Changes to the cabin can cause loss of operator protection from rollover and falling objects, and result in death or serious injury.
- When protective structure is damaged or deformed by falling objects or by rolling over, its strength will be reduced and it will not be able to adequately protect the operator. Contact your DOOSAN distributor if you have any questions about the ROPS. Never repair a damaged ROPS cabin.
- Always wear your seat belt when operating machine.

Seat Belt

Check seat belt daily for correct function.

Inspect seat belt system more often if machine is exposed to severe environmental conditions or applications. Conduct the following inspections and replace seat belt system as necessary:

1. Check webbing. If system is equipped with a retractor, pull webbing completely out and inspect full length of webbing. Look for cuts, wear, fraying, dirt and stiffness.
2. Check buckle and latch for correct operation.
3. Make sure latch plate is not excessively worn, deformed or buckle is not damaged or casing is broken.
4. Check retractor web storage device (if equipped) by extending webbing and checking that it spools out and retracts correctly.
5. Check webbing in areas exposed to ultraviolet (UV) rays from sun or extreme dust or dirt. If original color of webbing in these areas is extremely faded and/or webbing is packed with dirt, webbing strength may be reduced.

NOTE: *Contact your DOOSAN distributor for seat belt system replacement parts.*

WARNING

AVOID DEATH OR SERIOUS INJURY

Failure to properly inspect and maintain seat belt and seat belt system can cause lack of operator restraint and can result in death or serious injury.

Before fastening seat belt, check that there is no problem in belt mounting bracket. If it is worn or damaged, replace seat belt. Fasten seat belt so it is not twisted.

Always wear seat belt when operating machine.

Parking Machine

Avoid making sudden stops, or parking machine wherever it happens to be at end of workday. Park machine on firm and level ground away from traffic and away from high walls, drop-offs and any area of potential water accumulation or runoff. If parking on inclines is unavoidable, block tires tracks to prevent movement. Lower bucket or other working attachment completely to ground, or to an overnight support saddle to prevent unintended or accidental movement. Lower dozer blade to ground, if equipped.

NOTE: *Do not lower outriggers when parking. Make sure that outriggers are "LOCKED" in place.*

When parking on public roads, provide fences, signs, flags, or lights, and put up any other necessary signs to ensure that passing traffic can see machine clearly. Park machine so machine, flags, signs and fences do not obstruct traffic.

After front attachment has been lowered to an overnight storage position and all switches and operating controls are in "OFF" position, safety lock lever must be moved to "LOCK" position. This will disable all pilot control functions.

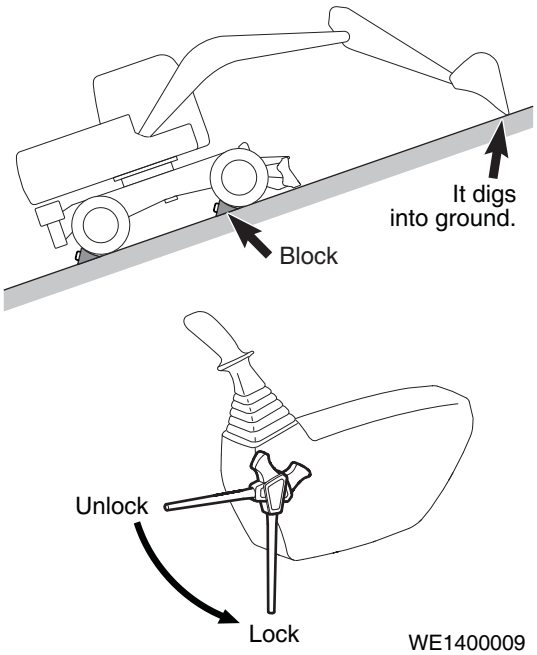


Figure 35

Always close door of operator's cabin and lock all equipment to prevent any unauthorized person from operating the machine.

The hydraulic system remains pressurized, provided accumulator, is charged even when engine is not running. Accumulator pressure should decrease in a short time (approximately one minute). While hydraulic system maintains a charge, hydraulic work tools and machine controls remain functional.

Machine movement will occur if any controls are moved. This can result in death or serious injury.

Always move hydraulic lockout control to "LOCK" position before stopping off engine or immediately after engine stops running.

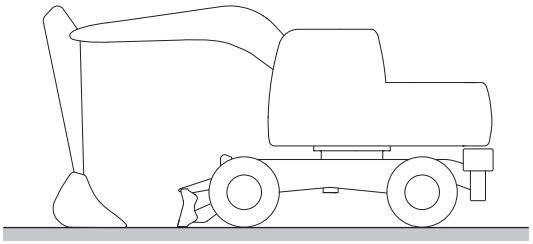


Figure 36

Rubber That Contains Fluorides

Observe extra great care when it is suspected that you may have to handle rubber that contains fluorides.

Certain seals which have to withstand high operating temperatures (e.g. in engines, transmissions, axles, hydraulic motors and pumps) may be made from rubber that contains fluorides, which, when exposed to high heat (fire), forms hydrogen fluoride and hydrofluoric acid. This acid is very corrosive and cannot be rinsed or washed off from the skin. It causes very severe burns which take a long time to heal.

It usually means that damaged tissue must be surgically removed. Several hours may pass after contact with the acid, before any symptoms appear and therefore one is not given any immediate warning. The acid may remain on the machine parts for several years after a fire.

If swelling, redness or a stinging feeling appears and one suspects that cause may be contact with heated rubber that contains fluorides, contact a medical doctor immediately. If a machine, or part of a machine, has been exposed to fire or severe heat, it must be handled by specially trained personnel. In all handling of machines after a fire, thick rubber gloves and protective goggles must be used.

The area around a part which has been very hot and which may be made of rubber that contains fluorides must be decontaminated by thorough and ample washing with limewater (a solution or suspension of calcium hydroxide, i.e. slaked lime in water). After the work has been completed, the gloves must be washed in limewater and then discarded.

Drop-off or Edge

When working at edge of an excavation or near a drop-off, the machine could tip over, which can result in death or serious injury. Always fasten your seat belt. Check ground conditions of work site before operating to prevent the machine from falling or rollover, and to prevent ground, stockpiles, or banks from collapsing.

Do not travel too close to edge of a drop-off.

Poor Visibility

For good visibility, always do the following:

- When working in dark areas, attach working lights and front lights to the machine. If necessary, set up additional lighting at work site.
- Stop operations when visibility is poor, such as in fog, mist, snow, and rain. Wait for visibility to improve before starting operation.

To avoid hitting work equipment and damaging other property, always do the following:

- When working in tunnels, on bridges, under electrical wires, or when parking the machine or performing other operations in places with limited height, be careful not to hit and damage other equipment or property.
- To prevent hitting objects, operate machine at a slow speed when working in confined spaces, indoors, or in crowded areas.
- Do not swing bucket over the top of personnel or over operator's cabin of dump truck.

Loose or Soft Ground

Do not operate on soft ground or near edge of drop-offs, overhangs, and deep ditches. The ground can collapse because of the weight of the machine causing the machine to fall or rollover.

Check ground conditions before beginning work with the machine. If ground is soft, reposition the machine before operating.

The excavated material must not be dumped too close to edge. How far away from edge of trench excavated material must be dumped depends on soil type and moisture content. If loose clay is being excavated, place it at least 5 m (16 ft) away from edge.

If excavated material is dumped too close to edge, its weight can cause a landslide.

Thawing of frozen ground, rain, traffic, piling and blasting are other factors which increase risk of landslide. The risk also increases on sloping ground. If it is not possible to dig a trench and adequately slope its sides, always install shoring equipment.

Loose ground may easily give way under weight of the machine.

Vibration Information

NOTE: *The level of vibration is influenced by many different parameters such as operator training, job site organization, weather, material, environment, machine type, machine and seat suspension system, attachments, and condition of the machine.*

Measurements are obtained on a representative machine, using measuring procedures as described in the following standards: ISO 2631/1, ISO 5349, and SAE J1166.

Vibration levels were given consideration in accordance with uncertainty (K) determined to manufacturer.

Hand/Arm Vibration Level

The vibration total value to which the hand-arm system is subjected, is less than 2.5 m/s^2.

Whole Body Vibration Level

The highest root mean square value of weighted acceleration to which the whole body is subjected, is less than 0.5 m/s^2.

Guidelines for Use and Working Conditions of Earth-moving Machinery to Reduce Vibration Levels (ISO/TR 25398 Annex E)

Properly adjusting and maintaining machines, operating machines smoothly, and maintaining the terrain conditions can reduce whole-body vibrations. The following can help the users of earth-moving machinery reduce whole-body vibration levels.

1. Use the right type and size of machine, equipment, and attachments.
2. Maintain machines according to the manufacturer's recommendations:
   - Tire pressure;
   - Brake and steering systems;
   - Controls, hydraulic system and linkages.
3. Keep the terrain where the machine is working and travelling in good condition:
   - Remove any large rocks or obstacles;
   - Fill any ditches and holes;
   - Provide machines and schedule time to maintain terrain conditions.
4. Use a seat in conformance with ISO 7096 and keep the seat maintained and adjusted:
   - Adjust the seat and suspension for the weight and size of the operator;
   - Inspect and maintain the seat suspension and adjustment mechanisms.

Reference Number	Description
1	Starter Switch
2	Engine Speed Control Dial
3	Quick Coupler Switch (Optional)
4	Auxiliary Mode Switch
5	Smart Power Control Switch
6	Audio Control Panel
7	Ram Lock Switch
8	Light Switch
9	Work Light Switch
10	Intelligent Floating Boom Switch (Optional)
11	Parking Brake Switch
12	Cabin Work Light Switch (Optional)
13	Travel Alarm Selector Switch
14	Heater and Air Conditioner Control Panel
15	Cigarette Lighter
16	Power Socket for 12V
17	Warning Light Switch (Optional)
18	Overload Warning Switch (Optional)
19	Lower Wiper Switch (Optional)
20	Dozer/Outrigger Selector Switch (Independent Optional)
21	Steering Console

Reference Number	Description
22	Horn Button
23	Rotating Switch
24	Breaker/Booster Switch
25	Shear Switch
26	Display Monitor
27	Safety Lever
28	Power Socket for 12V (Optional)
29	Photo Sensor
30	DeSOx Switch
31	One Touch Deceleration Button
32	Intelligent Floating Boom Temporary Reset Button
33	Jog Switch Control Panel
34	Jack Assembly
35	Hour Meter
36	Micro Phone (Optional)
37	Travel Speed Selector Switch
38	Cruise Control Switch
39	FNR Selector Switch
40	Auxiliary Travel Selector Switch
41	Auxiliary FNR Switch
42	Air Compressor Switch (Optional)

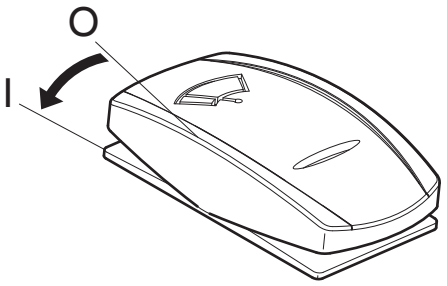
19. Lower Wiper Switch (Optional)

This switch is used to control the lower front window wiper.

O. In this position, lower windshield wiper is "OFF".

I. In this position, lower windshield wiper runs at a constant speed.

NOTE: *Operating wiper without washer fluid or when there is sand or dirt present will damage the window and wiper.*



FG016021

Figure 29

20. Dozer/Outrigger Selector Switch (Independent Optional)

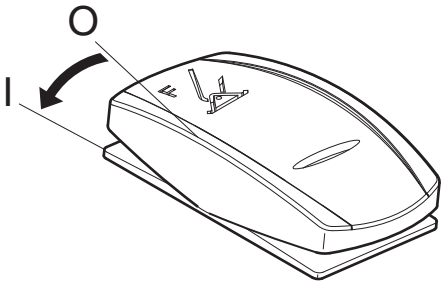
This switch is used to select the operational mode of front and rear work equipment. (If equipped)

The front two switches are for front equipment and rear two switches are for rear equipment.

Each equipment is individually operated or simultaneously as selected.

O. In this position, equipment is not selected.

I. In this position, equipment is selected.

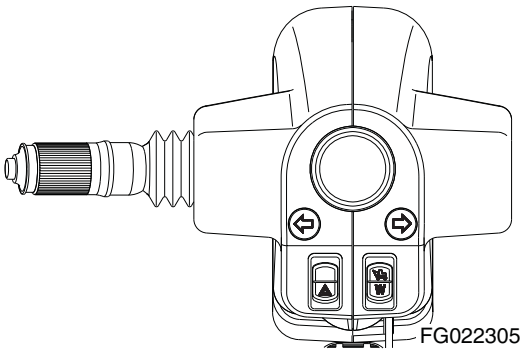


FG016164

Figure 30

21. Steering Console

See “Steering Console” on page 2-29.



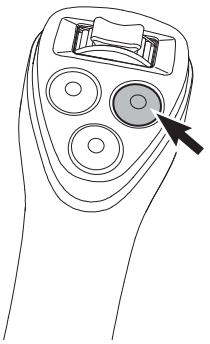
FG022305

Figure 31

22. Horn Button (Left-hand Work Lever)

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

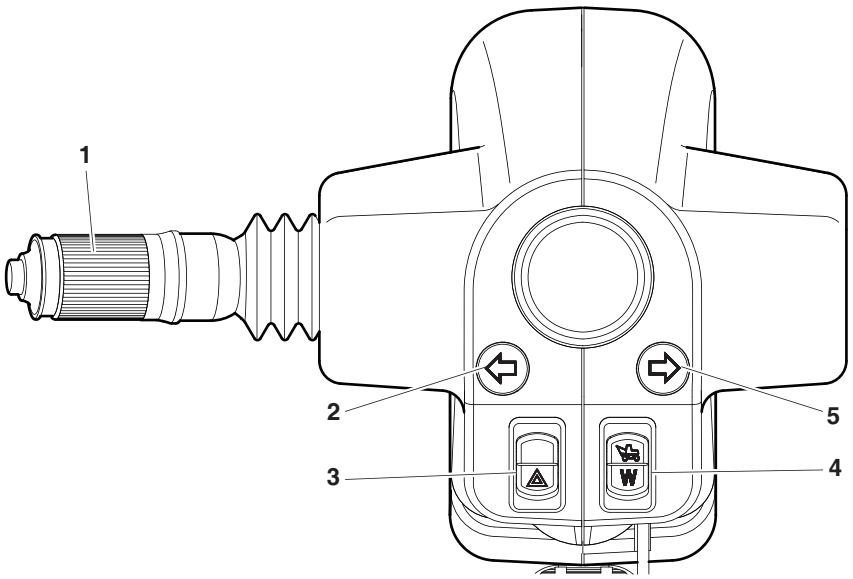
NOTE: *The starter switch must be "ON".*



EX1403213

Figure 32

Steering Console



FG022317

Figure 59

Reference Number	Description
1	Combination Switch
2	Left Turn Signal Light and Hazard Warning Light
3	Hazard Warning Light Switch

Reference Number	Description
4	Work/Travel Selector Switch
5	Right Turn Signal Light and Hazard Warning Light

1. Combination Switch (LH)

A. Wiper Switch

Activates the windshield wiper when the outside area of the lever is rotated.

ON: In this position, windshield wiper runs at a constant speed.

O : In this position, windshield wiper is turned "OFF"

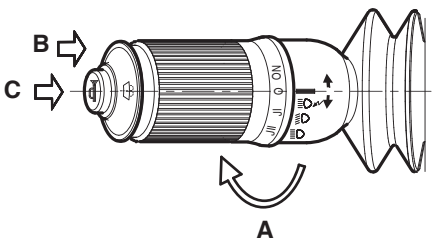
JI : In this position, windshield wiper runs at approximately a three second intermittent cycle.

JII : In this position, windshield wiper runs at approximately a six second intermittent cycle.

B. Window Washer Switch

When the outside area of the lever is pressed, it activates the washer pump and sprays fluid onto the windshield. (Only while being pressed.)

NOTE: *Do not operate the windshield washer without any fluid. If operated without any fluid, the washer motor may be damaged. Check level in washer tank, and add fluid as required.*



FG007018

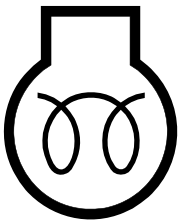
Figure 60

will be automatically reduced. Allow the engine to run at "LOW IDLE" until temperature gauge registers in the white zone again. When the white zone is reached, allow the engine to idle for an additional three - five minutes before stopping the engine. If not allowed to idle, heat surge may develop which will damage the engine. Allowing the engine to idle will dissipate heat. Check the coolant level, look for a loose fan belt, inspect for debris around radiator, etc. When the temperature reaches the normal range, the engine speed will automatically recover.

4. Preheating Indicator Symbol

In cold weather this symbol indicates that engine preheat function is operating.

When this indicator symbol turns "OFF", it means that engine preheat cycle has been completed.



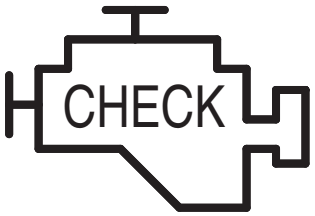
HAAE2000

Figure 85

5. Engine Check Warning Symbol

This symbol indicates when the engine needs to be check.

NOTE: *If this symbol turns "ON" stop the machine and repair the cause of the fault.*

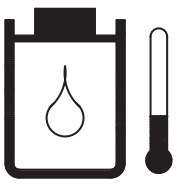


FG000045

Figure 86

6. Hydraulic Oil Overheat Warning Symbol

If the hydraulic oil temperature is too high, this symbol appears on the screen.



FG000056

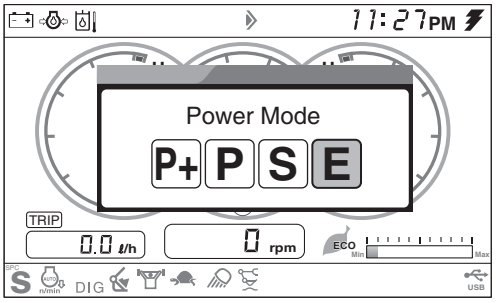
Figure 87

1B. Power Mode Selector Button

When the SPC switch (Figure 112) is pressed again, it turns "OFF" the SPC function, power plus mode, power mode, standard mode, or economy mode can be used.

Pressing power mode selector button will display available modes on main window.

Scroll through selection bar by turning jog switch and select mode by pressing jog switch.



EX1301028

Figure 114

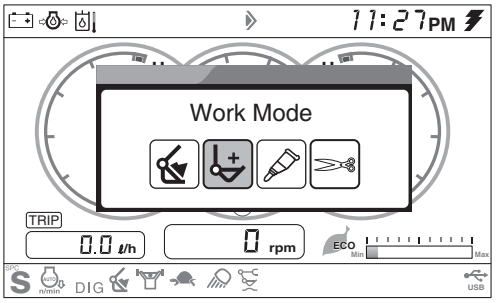
2. Work Mode Selector Button

Used to select the digging, lifting, or attachment mode.

Pressing the "Work Mode" selector button will display the available modes in the main window.

Scroll through selection bar by turning the jog switch and select the mode by pressing the jog switch.

Changing the starter switch from the "O" to "I" position will automatically reset the work mode to "Digging Mode".



EX1301027

Figure 115

3. Auto Idle Selector Button

When the auto idle system is activated, the engine will automatically reduce speed to "IDLE" approximately four seconds after all the control levers are in "NEUTRAL" position. This system is designed to reduce fuel consumption and noise.

When the auto idle selector button is pushed to "ON" position, an auto idle symbol will be displayed on the display monitor.

When the auto idle selector button is pushed again, it is turned "OFF" and the engine speed will return to the setting of the engine speed dial and will remain at this speed despite control lever position, until engine speed dial is moved.

FG018106

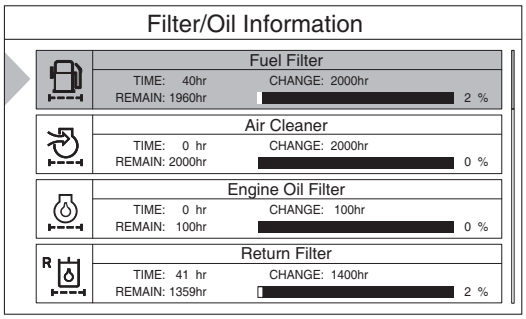
Figure 116

Reset Method/Replacement Period Change Method

Move the cursor over the filter/oil item you wish to change using the jog switch or the ◀ and ▶ buttons on the front of the dashboard and click the jog switch or press the 'Enter' button on the front of the dashboard. A window for resetting/changing the filter/oil time will pop-up.
To reset the use time, move the cursor over 'clear' and click the jog switch or press the 'Enter' button on the front of the dashboard.

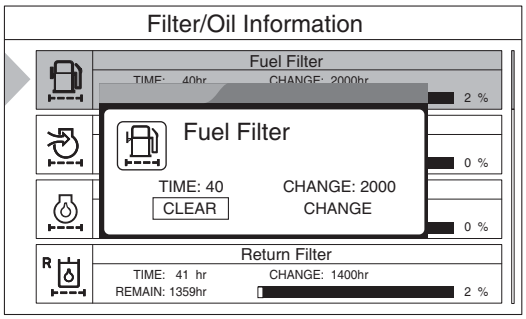
Turn the jog switch to locate it at YES. Then, click on the jog switch to reset the operation hour.

Turn the jog switch to locate it at NO. Then, click on the jog switch to allow the pop-up window to disappear without resetting the operation hour.



EX1301406

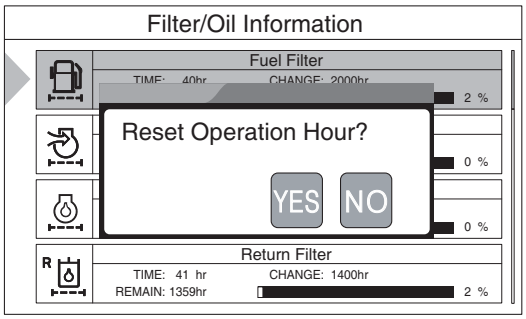
Figure 139



EX1301407

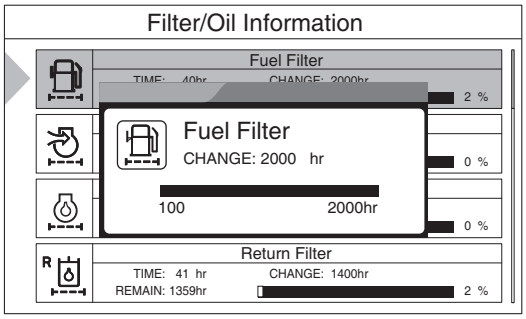
Figure 140

– The filter/oil use time shows the hours of operation after initializing the engine. It begins again with 0 hr after initialization the following the replacement of filter/oil.



EX1301408

Figure 141



EX1301409

Figure 142

Button Type ← Max Pressure ← User Setting Max Flow ← Max Pressure ← User Setting Max Flow

However, when the cursor is on the max pressure, it does not move further.

When turning the jog switch clockwise or pressing the Key 3 (▶), the cursor moves in the follows:

Button Type ← Max Pressure ← User Setting Max Flow ← Max Pressure ← User Setting Max Flow

When the cursor is on the user setting flow, it does not move further.

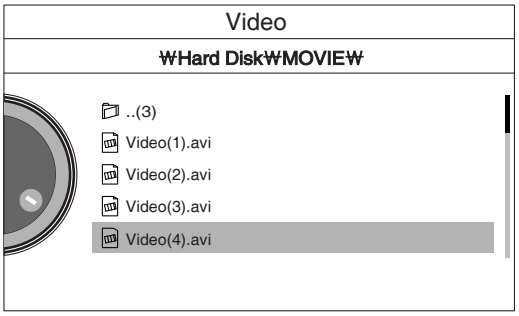
- Breaker Setting

	Max. Limit	Min. Limit
Max. E/G Limit	1,700 rpm	-
Max. Press. (ATT)	280 bar	140 bar

- Two-way Setting

	Max. Limit	Min. Limit
Max. E/G Limit	1,700 rpm	-
Max. Press. (ATT)	340 bar	140 bar

Select and replay a video.

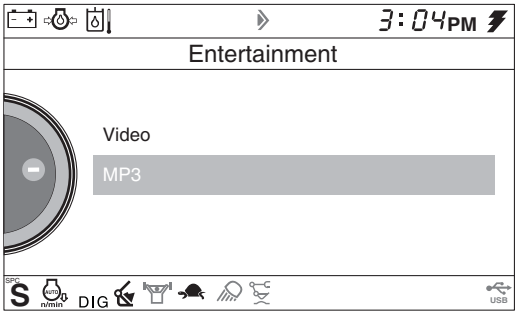


FG018557

Figure 196

B. MP3

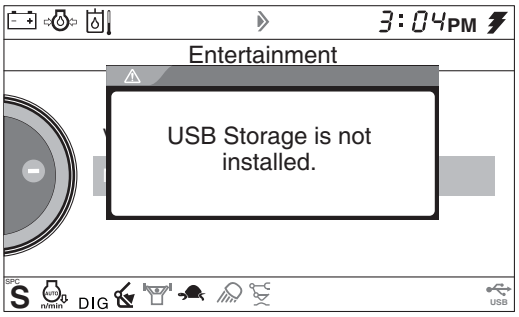
From the entertainment screen, select MP3 to access it.



EX1301053

Figure 197

If there is no USB storage system, a pop-up window is displayed for 3 seconds, saying "USB Storage is not installed". and the MP3 player is not run.

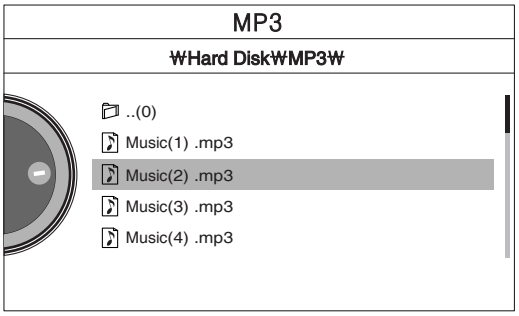


EX1301054

Figure 198

When initially accessing the MP3 player, the file tree screen of USB storage system is displayed. Operate the jog switch clockwise/counterclockwise to select and play an MP3 file.

If there is an MP3 file played last, the file will automatically be played.

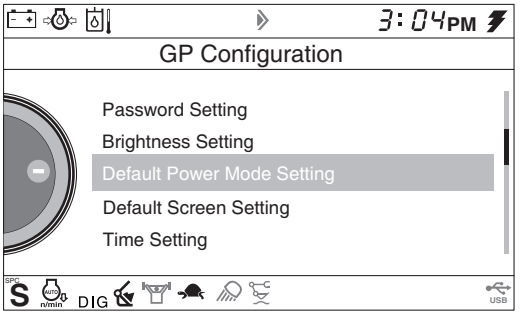


FG018560

Figure 199

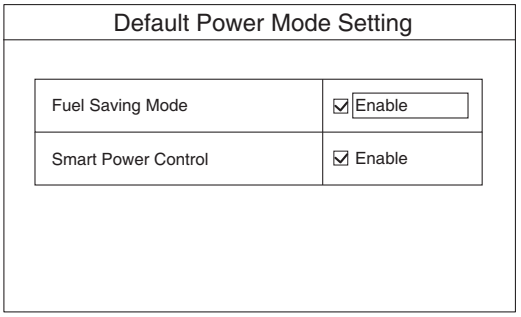
C. Default Power Mode Setting

On the GP configuration screen, when cursor is placed on default power mode setting, click on the jog switch to access the default power mode setting.



EX1402180

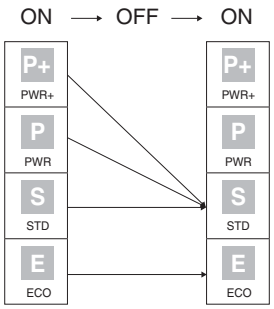
Figure 231



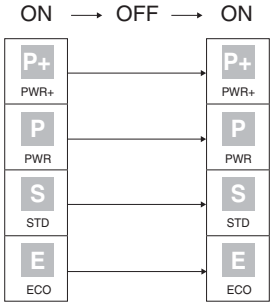
EX1301446

Figure 232

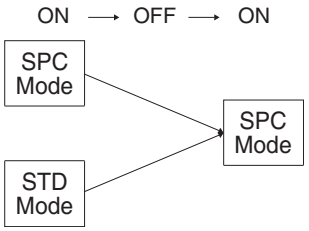
Fuel Saving Mode is Enable



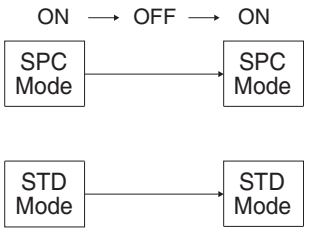
Fuel Saving Mode is Disable



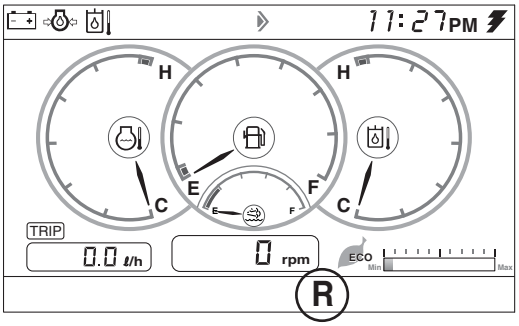
Smart Power Control is Enable



Smart Power Control is Disable



16. Reverse Travel Selection (Wheel Machine Only)



WE1400098

Figure 265

Fuse Boxes

There are two fuse boxes (Figure 292) on the left side of the heater box. The fuses prevent electrical devices from overloading or shorting.

A decal attached inside the fuse box access cover indicates the function and amperage of each fuse.

NOTE: *For a further explanation see “Fuse Boxes” on page 4-103.*

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

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

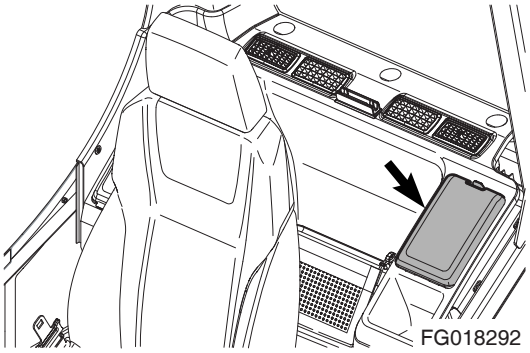


Figure 292

WARNING

AVOID DEATH OR SERIOUS INJURY

Always replace fuses with the same type and capacity fuse that was removed. Improper fuses can cause electrical damage and result in a fire, death or serious injury.

Cabin Storage Compartments

There are three storage compartments behind the operator's seat.

The large compartment (1, Figure 312) is for storing nonperishable items.

The covered other one (2, Figure 312) is interconnected with the air conditioner. It can be supplied with either warm or cool air when air conditioner is turned "ON". The small compartment (3, Figure 312) is for storing small items. A net storage bag (4, Figure 312) is added.

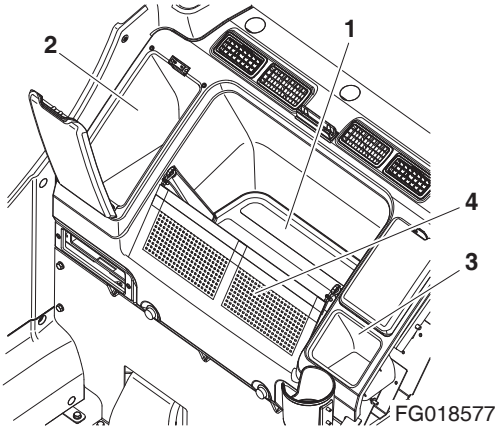


Figure 312

There is a separate small tray on right side (5, Figure 313) of operator's seat.

A document storage case (6, Figure 313) which can store up to A4-size documents is prepared.

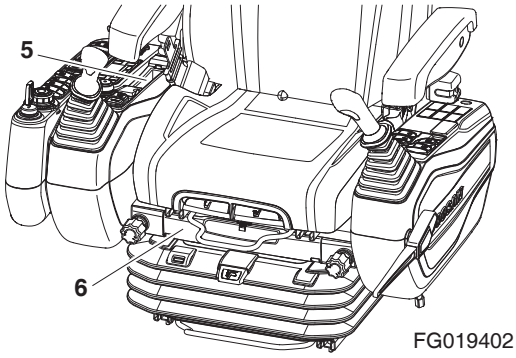


Figure 313

Sunglasses Case

The sunglass storage case (1, Figure 314) is on the center top of the rear wall of the operator cabin.

Keep this case lid closed before and after use.

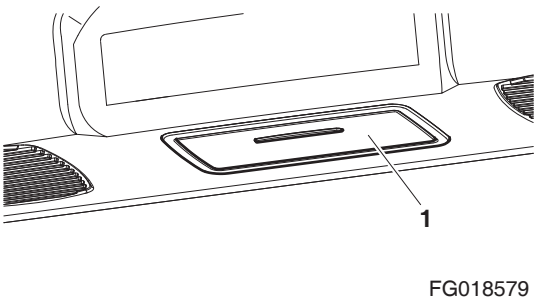


Figure 314

Operation

TO OPERATE A NEW EXCAVATOR

All DOOSAN excavators are inspected before leaving the factory. However, it is required that operator follow these steps during the initial break-in period. Failure to follow these steps can result in damage to the equipment or reduced performance.

Hour	Load
For first 50 hours of operation	Maintain about 80% load of full capacity (Engine rpm: 80% of rated rpm)
After first 50 hours of operation	Full load

If machine is used at full load before it is broken in, it could affect the overall performance and service life of the machine.

NOTE:

1. *Check daily for leakage of coolant, fuel, engine oil and hydraulic oil.*
2. *Inspect all lubricants daily and add appropriate lubricants as required.*
3. *During operation, monitor all instruments and gauges from time to time.*
4. *Avoid an extreme engine load.*
5. *Operate unit at 80% load until engine and all other components are at operating temperatures.*
6. *Check that work equipment is operating normally.*
7. *Check machine for loose parts or for damage that may have occurred during shipping.*
8. *Check for loose wiring or terminals, check gauge operation and battery electrolyte level.*

Plug Heater (Optional)

1. Mounting the plug heater

   A. Drain the cooling system.

   B. Remove existing plug. Keep the bolts and lock washers.

   C. Apply teflon tape or thread sealant to heater threads.

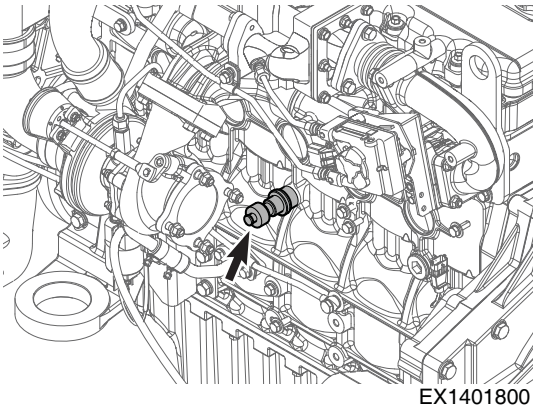

EX1401800

Figure 16

IMPORTANT

The element should not touch any cavity walls. Contact with the walls can cause the element to fail during operation.

NOTE: *The plug heater element is formed to fit the water passage without touching the walls.*

   D. Thread the heater into the engine opening and tighten securely.

2. Attaching the cord

   A. Align the cord and element pins on the heater. Press the cord onto the heater using even pressure across the cord cap. Place the clamp around bottom of cord cap and squeeze closed with pliers.

   B. Route the cord to any convenient point and tie cord down to prevent damage and strain. Keep cord away from hot surfaces and moving objects.

3. Testing the plug heater

   A. Refill the coolant system. Run engine until internal thermostat opens and continue running engine for 15 to 20 minutes to eliminate air pockets. Allow engine to cool. Check for leaks and proper coolant level.

CAUTION

AVOID INJURY

Do not connect plug heater to power supply before installation.

Handling the plug heater while connected to a power supply could cause burns.

   B. Connect plug heater to power supply and test for proper operation. The block near the heater should get hot.

NOTE: *Do not test plug heater before installation. This will cause the heater to fail and void the warranty.*

Over the Road Traveling Procedures

1. Make sure that brake oil pressure warning light is "OFF".
2. After making sure that front attachment is facing forward, "RELEASE" the parking brake.
3. Using the right-hand work lever (joystick), select either "FORWARD" or "REVERSE" travel direction and step on the accelerator pedal.

   NOTE: *The accelerator pedal functions in two ways. If the manual engine speed control dial is at the lowest setting, the accelerator pedal controls both engine speed and a hydraulic proportioning valve that controls the actual travel speed. If the manual engine speed control dial has been set to a higher rpm, the accelerator pedal functions only as a hydraulic proportioning valve control, enabling control of only travel speed and not engine rpm.*

4. Test the brakes before beginning over-the-road travel.
5. During forward travel the travel speed selector switch can be turned from low speed range II to high-speed range III.

   NOTE: *Downshifting from speed range III to speed range II should not be done if the machine is traveling at a high rate of speed. Damage to the transmission could result.*

IMPORTANT

Do not change to creep speed during running in low or high-speed. It can cause serious damage to equipment. Only select, creep speed after stopping machine. When normally traveling, drive in low or high-speed.

6. To stop the machine, slowly release the accelerator pedal. The dynamic braking action of the machine's momentum against the engine's back pressure will begin to slow the machine. Step on the brake to bring the machine to a full and controlled stop.

IMPORTANT

If the engine speed is controlled by the engine speed control dial, when the machine comes to a stop, the engine will continue to run at the preset rpm. If the engine speed is being controlled by the accelerator pedal, it will decrease and the machine will slow down as the pedal is released.

DeSOx

Sulfur contained in fuel and oil degrades NOx reduction performance of SCR (Selective Catalytic Reduction) catalyst after combustion. Therefore, to ensure high efficiency for NOx reduction, the temperature of exhaust gas needs to be increased periodically to eliminate sulfur content, and this process is called as DeSOx.

The DeSOx process is automatically performed by the ECU periodically based on the operating time of the machine. If the process is not successfully performed according to the operating condition, the corresponding "Warning Light" comes on.

In this case, park the vehicle in a safe place and perform the DeSOx process manually according to the following procedure. If the process is successfully performed, the warning light goes off.

WARNING

AVOID DEATH OR SERIOUS INJURY

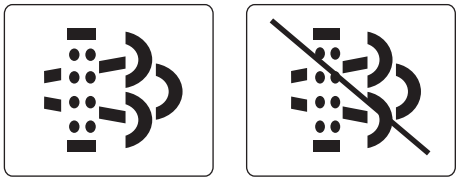
Exhaust gas temperature and exhaust system components are very hot during DeSOx. This can cause a fire or burn hazard and result in death or serious injury or property damage. Keep flammable material and explosive gases away from exhaust system during DeSOx.

WARNING

AVOID DEATH OR SERIOUS INJURY

The engine power can be degraded unless performing the DeSOx process manually after the warning light is turned on.

1. DeSOx light: light turns "ON" when DeSOx is required, or during the DeSOx process. When the operator inhibits DeSOx, the symbol will be displayed as shown in the right-hand view of Figure 51.

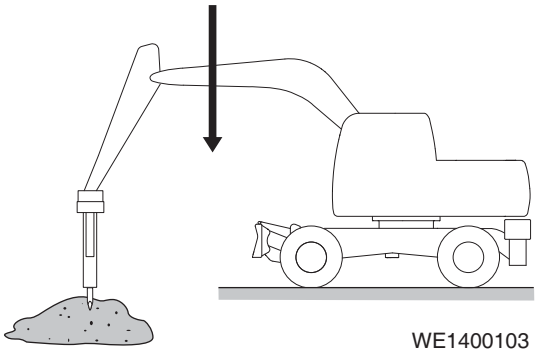


FG018399

Figure 51

Operating a Breaker

The boom can freely move "DOWN". The breaker can be operated with only the weight of the work group on the front without additional force, resulting in less shock and vibration, and extended service life of the breaker. The breaker will remain in constant contact with the object.

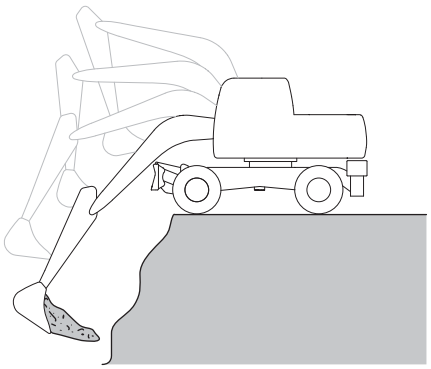


WE1400103

Figure 72

Truck Loading

Boom lowering can be controlled without hydraulic pump flow discharge, increasing productivity and fuel efficiency.



WE1400104

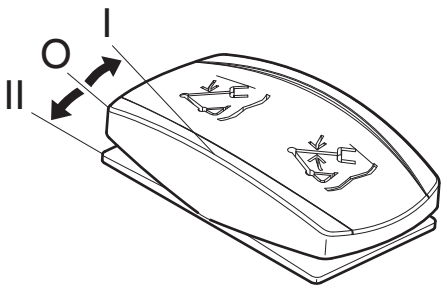
Figure 73

1. Intelligent Floating Boom Mode

   To select the Intelligent Floating Boom mode, set the Intelligent Floating Boom selector switch from "O" (NORMAL MODE) to "I" (INTELLIGENT FLOATING BOOM MODE).

   Moving joystick in boom-down direction after selecting Intelligent Floating Boom mode will lower boom by using its own weight, and the boom will move upwards naturally by external load forces.

   NOTE: *When the Intelligent Floating Boom selector switch is in "O" (NORMAL MODE) position, the Intelligent Floating Boom will not operate.*



FG018272

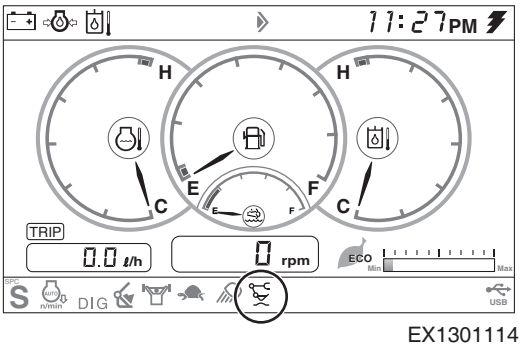
Figure 74

2. Breaker Mode

   To select the breaker mode, set the Intelligent Floating Boom selector switch from "O" (NORMAL MODE) to "II" (BREAKER MODE).
   Moving joystick in boom-down direction, the boom will be lowered by its own weight.

   However, the boom upward movement is not smooth in breaker mode where the operator must move the joystick in boom rising direction.

   NOTE: *When the Intelligent Floating Boom selector switch is in "O" (NORMAL MODE) position, the Intelligent Floating Boom will not operate.*



EX1301114

Figure 75

TOWING PROCEDURE

WARNING

AVOID DEATH OR SERIOUS INJURY

Make sure that towing machine can handle the weight of the machine being towed and that it has adequate braking capacity.

Never use a damaged wire rope or chain. They could break and cause a serious accident.

Always wear gloves when handling a wire rope or chain.

When towing excavator use a wire rope or chain capable of handling the load.

Always have one person in cabin at all times.

IMPORTANT

Parking brake is automatically "APPLIED" when engine is stopped. If engine is operational, "RELEASED" parking brake before towing machine.

If engine will not start, the parking brake will have to be "MANUALLY RELEASED" before towing machine. See “Releasing Parking Brake Manually” on page 3-52.

1. Secure equipment with wheel chocks so equipment will not move.
2. Attach wire rope to equipment and remove slack with towing machine.
3. If engine is operational, "RELEASE" the parking brake.

   NOTE: *Always have one person in cabin at all times.*

   NOTE: *If parking brake will not "RELEASE" when engine is running, parking break will have to be "MANUALLY RELEASED" before towing machine. See “Releasing Parking Brake Manually” on page 3-52.*
4. Remove wheel chocks and tow equipment.

CAUTION

AVOID INJURY

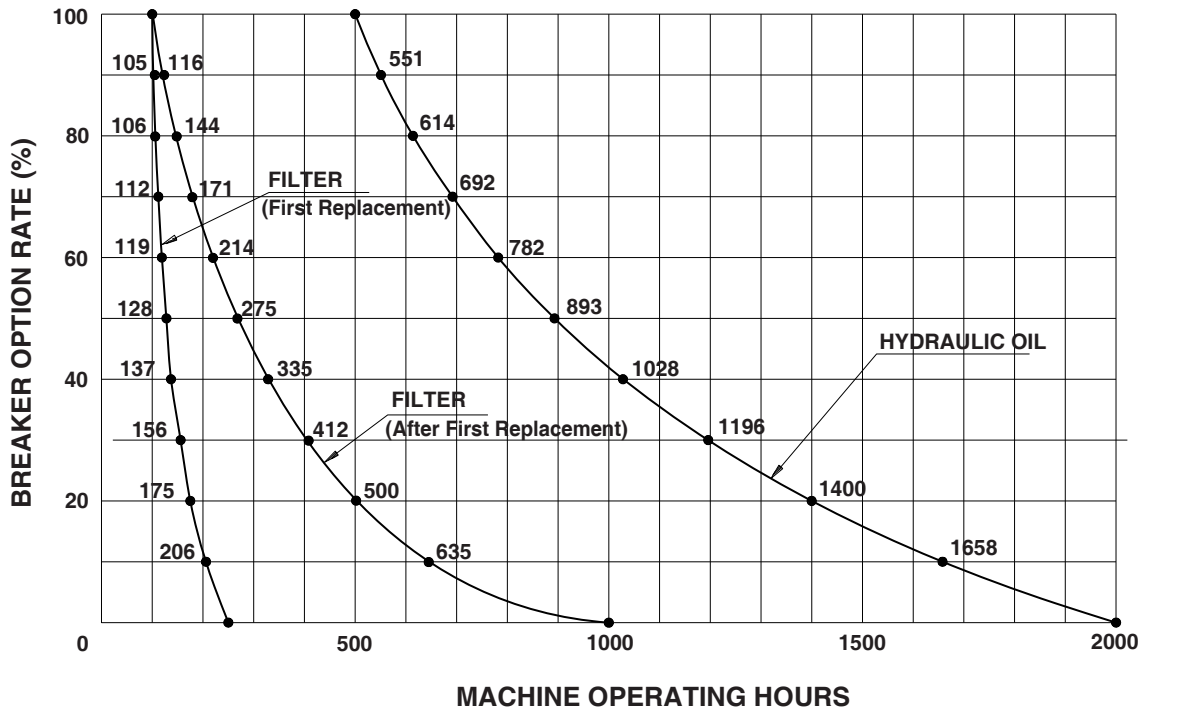
When towing machine, speed must be less than 10 km/h (6.2 MPH). Travel distance must be less than 5 km (3.1 miles). Use trailer if machine is moved over 5 km (3.1 miles).

Always have one person in cabin at all times.

Hydraulic Oil and Filter Service Intervals

When using a hydraulic breaker, the viscosity breakdown and contamination of hydraulic oil is faster because the work condition is more severe than during normal digging work. To prevent the hydraulic components (especially pump) from having a shortened life cycle, replace the hydraulic oil and main hydraulic oil return filter using the following schedule.

Attachment	Operation Rate	Hydraulic Oil	Filter
Bucket Work	100%	2,000 Hours	250 Hours (First Replacement) 1,000 Hours (After First Replacement)
Hydraulic Breaker Work	100%	500 Hours	100 Hours
* These service intervals only apply, when genuine DOOSAN hydraulic oil and filter are used. If any other brands are used, the guaranteed change interval must be reduced in half.			



FG000767

Figure 122

NOTE: *The replacement intervals of hydraulic oil and filter depend upon amount of time hydraulic breaker is being used. These service intervals must be followed as opposed to regularly scheduled maintenance.*

9. Visually check that quick coupler is fully engaged and locked before operating the machine and attachment.

WARNING

AVOID DEATH OR SERIOUS INJURY

Failure to visually check that quick coupler is "FULLY ENGAGED AND LOCKED" before operating can allow the attachment to fall off causing death or serious injury.

WARNING

AVOID DEATH OR SERIOUS INJURY

The attachment swing radius is increased when the quick coupler is installed.

Operate quick coupler and attachment through its full range of motion to check for interference between attachment and machine that could damage the cabin, boom, coupler or attachment.

WARNING

AVOID DEATH OR SERIOUS INJURY

Never use quick coupler or attachment to transport or lift persons. Always use quick coupler and attachment according to the instructions provided by the manufacturer.

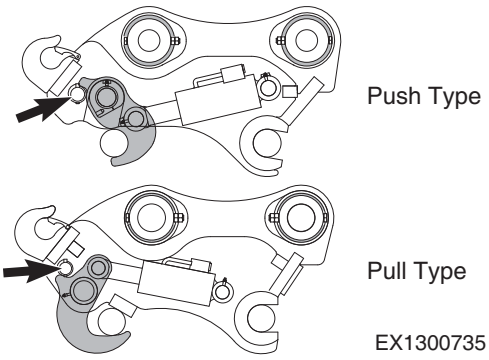


Figure 139

Operation in Saltwater Areas

Saltwater and saltwater spray is very corrosive. When operating in or around saltwater areas, or in or around snow, observe the following precautions:

1. When exposed to saltwater, dry machine thoroughly and rinse with freshwater as soon as possible.
2. Keep all exposed surfaces coated with preservative lubricating oil. Pay attention to damaged paint surfaces.
3. Keep all painted surfaces in good repair.
4. Lubricate machine as prescribed on lubrication chart on machine or Periodic Service Table and Chart, Section 4, in this manual. Shorten lubricating intervals for parts exposed to salt water.
5. Check operating controls to ensure proper functionality and that they return to "NEUTRAL" when released.

Operation at High Altitudes

Operation instructions at high altitudes are the same as those provided for extreme cold. Before operating at high altitudes, engine fuel and air mixture may have to be adjusted according to appropriate engine manual.

1. Check engine operating temperature for evidence of overheating. The radiator cap must make a perfect seal to maintain coolant pressure in cooling system.
    - Perform warming-up operation thoroughly. If machine is not thoroughly warmed up before control levers or control pedals are operated, reaction of machine will be slow.
    - If battery electrolyte is frozen, do not charge battery or start engine with a different power source. There is a potential hazard that could cause a battery explosion or fire.
    - Before charging or starting engine with a different power source, thaw battery electrolyte and check for any leakage of electrolyte before starting.

Operation During Electrical Storms

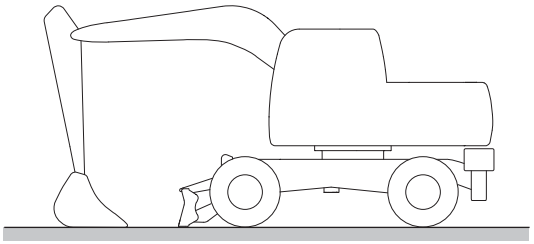
During electrical storms, do not enter or exit machine.

- If you are off machine, keep away from machine until storm passes.
- If you are in cabin, remain seated with machine stationary until storm passes. Do not touch controls or anything metal.

MACHINE SETUP POSITION FOR MAINTENANCE

Before beginning any service work, park the machine using the following procedure (except for service work requiring the machine to be positioned differently).

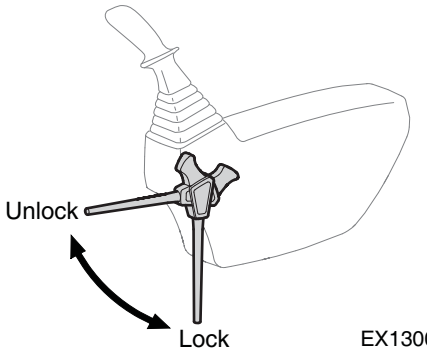
1. Park machine on firm and level ground. Lower bucket or attachment to ground.
2. "LOWER" dozer blade to ground, if equipped.
3. Set parking brake switch to "I" (APPLIED) position.



WE1400010

Figure 1

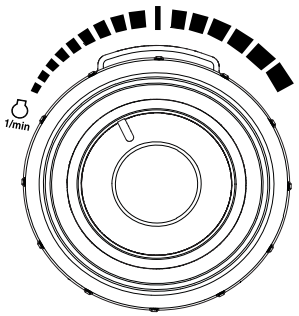
4. Move safety lever to "LOCK" position.



EX1300566

Figure 2

5. Allow engine to run at "LOW IDLE" for a minimum of five minutes to allow engine to cool. If this is not done, heat surge can occur.



FG018148

Figure 3

RECOMMEND FUEL, COOLANT, AND LUBRICANT

- Lubrication is an important part of preventive maintenance. To keep your machine in the best condition for long periods of time, it is essential to follow the instructions given in this manual.
- Failure to follow these recommendations can result in shortened life or excess wear of the engine, power train, cooling system, and/or other components.
- Commercially available lubricant may be good for the machine, but it can also cause harm. DOOSAN does not recommend any commercially available lubricant additive.
- When starting the engine in temperatures below 0°C (32°F), be sure to use recommended multigrade oil, even if the ambient temperature may become higher during the course of the day.
- If the machine is operated at temperatures below -20°C (-4°F), a separate device is needed, so discuss with DOOSAN distributor.
- Only use Ultra Low Sulfur Diesel (ULSD) fuel and API-CJ-4/ACEA-E9 grade engine oil.

Lubrication

Lubrication is an important part of preventive maintenance. If the machine is lubricated in a specified way, the life of equipment and components can be considerably extended. The “Lubrication and Service Chart” on page 4-17 makes lubrication work much easier and reduces the risk of forgetting lubrication intervals.

IMPORTANT

Wipe off grease fittings and grease gun before greasing to prevent sand and dirt particles from penetrating into components.

Clean Dust Net in Front of Oil Cooler and Radiator

IMPORTANT

If running excavator in dusty area, check dust net everyday and clean it if dirty.

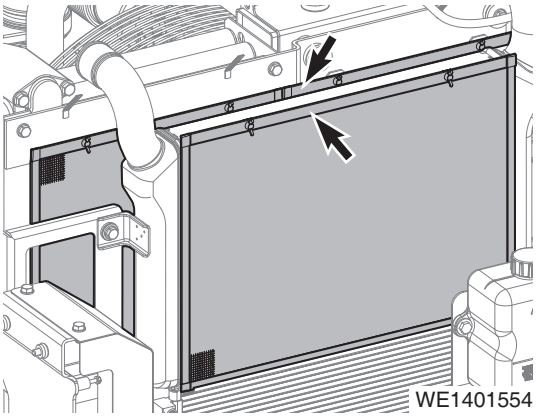


Figure 29

WARNING

AVOID DEATH OR SERIOUS INJURY

If using compressed air or water to clean the dust net, wear safety goggles for proper eye protection.

1. Loosen wing bolt(s) and remove dust net.
2. Clean with compressed air or water.

Check Cooling System and Refill As Required

WARNING

AVOID DEATH OR SERIOUS INJURY

Allow the engine to cool before releasing the radiator cap. Loosen the cap slowly to release any remaining pressure.

Radiator cleaning is performed while the engine is running. Lock out and tag the controls alerting personnel that service work is being performed. Do not remove radiator cap unless it is required. Check the coolant level in the coolant recovery tank.

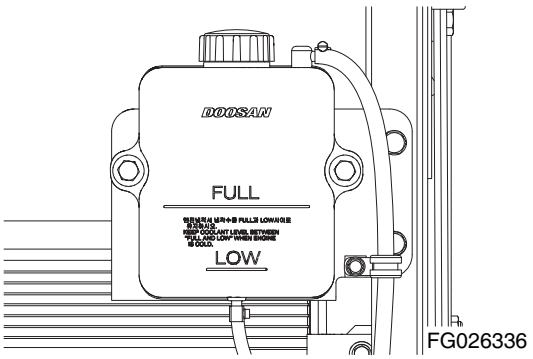


Figure 30

NOTE: *Do not mix ethylene glycol and propylene glycol antifreeze together.*

1. When the engine is cold, remove radiator cap and check the coolant level inside the radiator. Do not rely on the level of coolant in the coolant recovery tank. Refill radiator as required. Refer to coolant concentration table. (See page 4-107)
2. Check to make sure that coolant transfer line from the coolant recovery tank to the radiator is free and clear of obstructions, or is not pinched.
3. Check the level of coolant in the coolant recovery tank. The normal cold engine fluid level must be between "FULL" and "LOW" marks on tank.
4. If the coolant is below the "LOW" mark, add genuine part of 50% concentration coolant to the tank.

Check Air Compressor and Drain Water as Required

1. Set air compressor operating switch to "I" (OFF) position.
2. Using air gun in the cabin, completely release all air in compressor tank.
3. The air compressor drain valve (1, Figure 46) is on the bottom of the battery box, on right side of the machine.
4. Put a pan under the drain valve, push valve handle sideways to drain water.

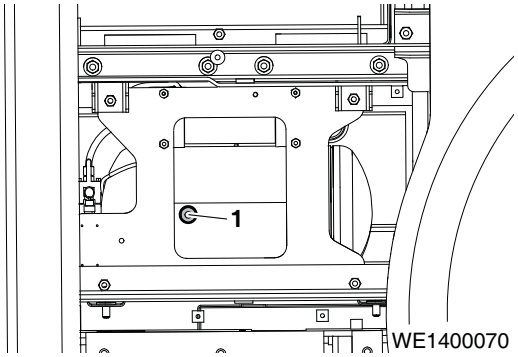


Figure 46

WARNING

AVOID DEATH OR SERIOUS INJURY

The drain valve does not work when the pressure in the air compressor tank is 1.0 bar (14 psi) or above. Compressed air inside tank must be released first.

Wear safety goggles to protect your eyes from water and/or flying objects from drain valve.

Check Engine Fan Belt for Cracks, Wear and Correct Tension (After First 50 Hours)

1. Inspect after first 50 hours of operation and every 250 hours thereafter. For details, See “Check Engine Fan and Alternator Belts Tension” on page 4-48.

Inspect for Any Loose or Missing Nuts and Bolts

1. All nuts and bolts must be inspected after first 50 hours of operation. There after every 250 hours.

Change Engine Oil and Filter (After First 50 Hours)

1. Change engine oil and filter after first 50 hours of operation or rebuild, then every 500 hours thereafter. For details, See “Change Engine Oil and Filter” on page 4-53

Check and Clean Air-conditioning Inner Filter

WARNING

AVOID DEATH OR SERIOUS INJURY

All service and inspection of air-conditioning system must be performed with the starter switch in the "O" (OFF) position.

WARNING

AVOID DEATH OR SERIOUS INJURY

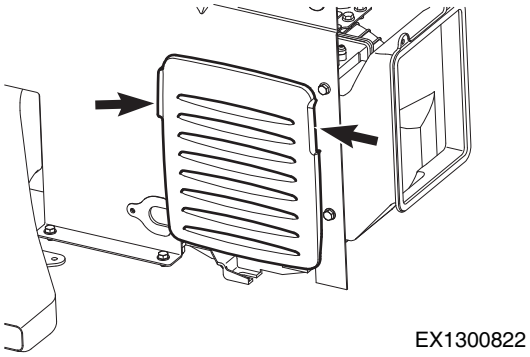
If using compressed air to clean the element, make sure that proper eye protection is worn.

1. Remove cover by pulling knob outward on top of the left and right of the filter which is inside the left rear part of the cabin.
2. Remove inner filter by pulling knob outward while pressing the upperpart and lower part of the filter handle.
3. Use compressed air to clean filter. If the filter is damaged, replace with a new one.

   If the filter is very dirty, use a mild soap or detergent and water to clean it.

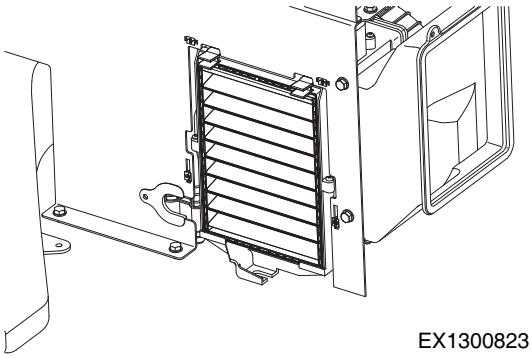
IMPORTANT

If water was used to clean filter, be certain that filter is completely dry before installing.



EX1300822

Figure 64



EX1300823

Figure 65

1,000 HOUR / 6 MONTH SERVICE

Perform All Daily, 50, 250 and 500 Hour Service Checks

Grease Swing Reduction Device

1. Park machine on firm and level ground. Lower the front attachment to the ground and stop engine.
2. Remove air vent plug (1, Figure 87) from swing reduction device.

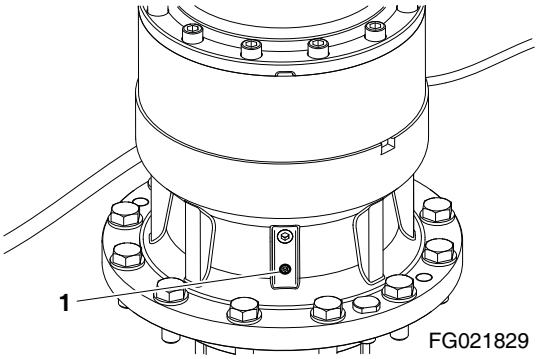


Figure 87

3. Press grease fitting and inject grease with the grease gun on the marked point (2, Figure 88).
4. Install air vent plug (1, Figure 87) in swing reduction device.

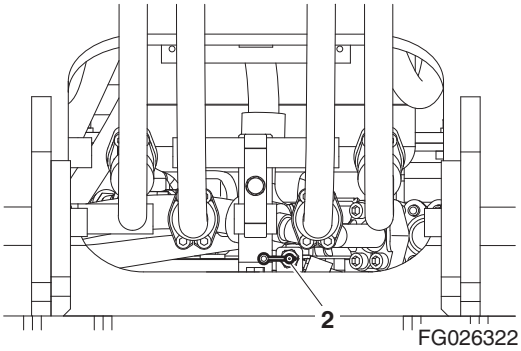


Figure 88

Change Hydraulic Oil Tank Breather Filter

1. Park machine on firm and level ground. Lower the front attachment to the ground and stop engine.
2. Tip breather cap up (2. Figure 89) slightly to release the internal pressure.
3. Unscrew the bolt (1, Figure 89) and take off the breather cap (2).
4. Change a filter cartridge (3, Figure 89) and assemble the breather cap by tightening the bolt.

   NOTE: *Used filter should always be disposed of according to local regulations.*

   NOTE: *When the machine is operated under dusty work sites, the air breather filter needs to be cleaned or replaced regularly even before the expected replacement date.*

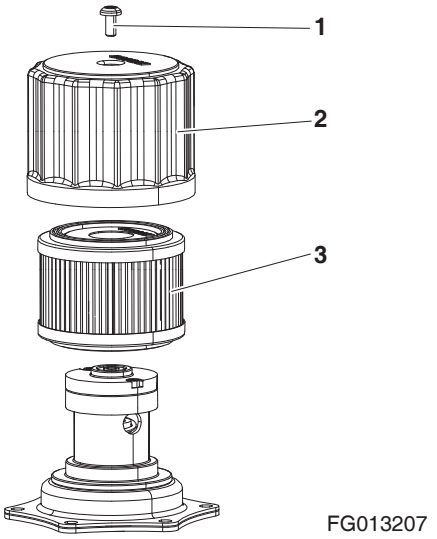


Figure 89

2,000 HOUR / YEARLY SERVICE

Perform All Daily, 50, 250, 500 and 1,000 Hour Service Checks

Replace Outer and Inner Air Cleaner Filters

WARNING

AVOID DEATH OR SERIOUS INJURY

Never clean or attempt to remove air cleaner filter if the engine is running.

NOTE: *Replace outer element after cleaning 5 times or every 2,000 hours of service.*

NOTE: *Replace inner element whenever a new outer element is installed.*

1. Open the side door of the machine, remove 6 latches (3, Figure 113), then remove cover.
2. Remove evacuator valve (1, Figure 113) from the air cleaner cover (2).

   NOTE: *Inspect evacuator valve seal lips for wear or damage. Replace valve if necessary. Install evacuator valve with lips parallel to the cover.*
3. Hold the outer element (4, Figure 114), rock it lightly up and downward, and swing the element to pull it out. Remove inner element (5) after doing this.
4. Wipe off the dirt stuck to the air cleaner cover and the inside of the air cleaner housing.

   NOTE: *When replacing the outer element, replace the inner element simultaneously. Do not reuse the inner element.*

   NOTE: *If the inner element is not installed properly and the outer element and cover are installed, the outer element will be damaged.*

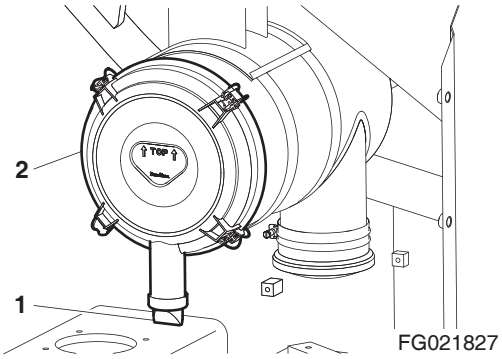


Figure 112

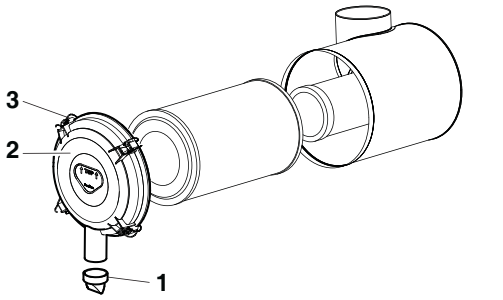


Figure 113

4,500 HOUR / BIENNIAL SERVICE

Change DEF (AdBlue) Filter

IMPORTANT

The replacement interval of the DEF (urea solution) filter is different by the amount of foreign materials in DEF.

Make sure to use only the specified DEF and container and keep the surrounding area of the tank clean to prevent possible foreign materials.

1. Remove filter cover.

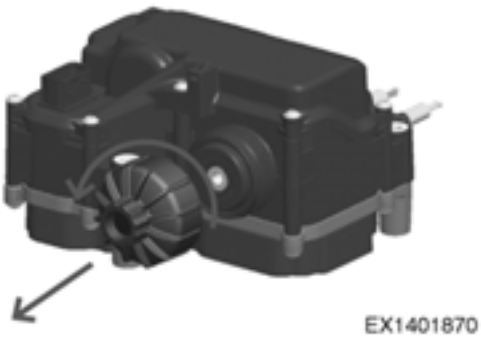


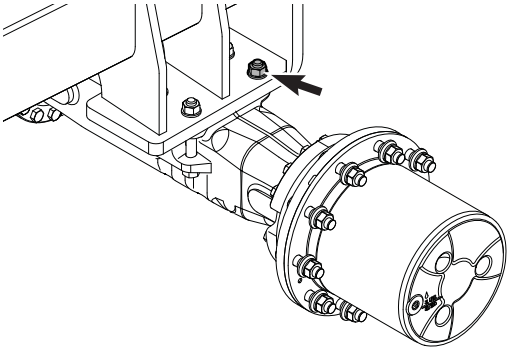
Figure 131

2. Remove equalizing element.

Figure 132

13. Mounting nut for rear axle.

    - Tool: 36 mm ( )
    - Torque: 931 N.m (95 kg.m, 687 ft lb)

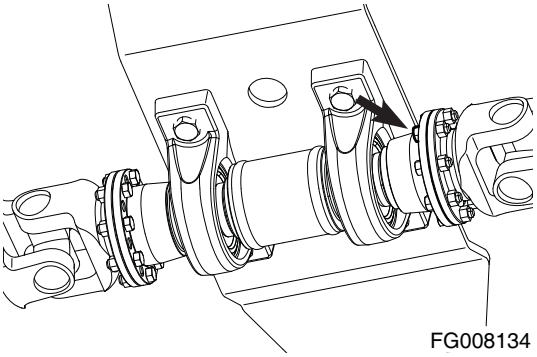


WE1400085

Figure 157

14. Mounting bolt with nut for driveshaft.

    - Tool: 14 mm ( )
    - Torque: 69 N.m (7 kg.m, 51 ft lb)

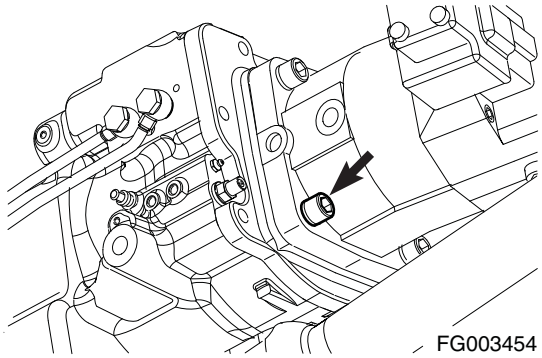


FG008134

Figure 158

15. Mounting bolt for travel motor.

    - Tool: 14 mm ( )
    - Torque: 265 N.m (27 kg.m, 195 ft lb)

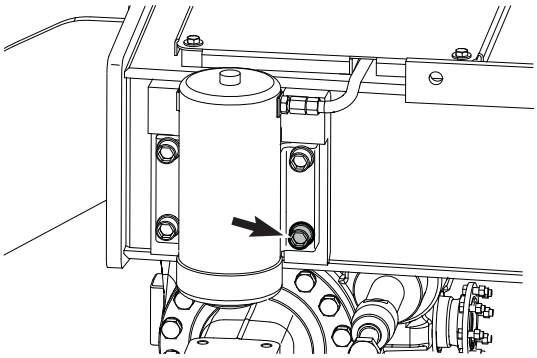


FG003454

Figure 159

16. Mounting bolt for ram cylinder.

    - Tool: 20 mm ( )
    - Torque: 931 N.m (95 kg.m, 687 ft lb)



WE1400084

Figure 160

ENGINE COOLING SYSTEM

General

Keeping an engine's cooling system in peak operating condition can have many benefits in keeping a machine in good operating condition. A properly functioning cooling system will improve fuel efficiency, reduce engine wear, and extend component life.

Always use distilled water in the radiator. Contaminants in tap water neutralize the corrosion inhibitor components. If tap water must be used, Refer to “Table of Standards for Allowed Tap Water” on page 4-107. Water that has been treated with a water softener also contains salt that will cause corrosion of components. Water from creeks and stagnant pools usually contain dirt, minerals and/or organic material that are deposited in the cooling system and impair cooling efficiency. As such, the use of distilled water is recommended.

Engine coolant shall be mixed with antifreeze solution and water in ratio of 50 : 50.

Coolant shall be checked every 500 hours of operation for ensuring adequate concentration of antifreeze solution and additives.

Engine overheating is often caused by bent or clogged radiator fins. The spaces between the fins can be cleaned by use of air or water under pressure. When straightening bent fins, use care not to damage the tubes or break the bonding joint between the fins and the tubes.

WARNING

AVOID DEATH OR SERIOUS INJURY

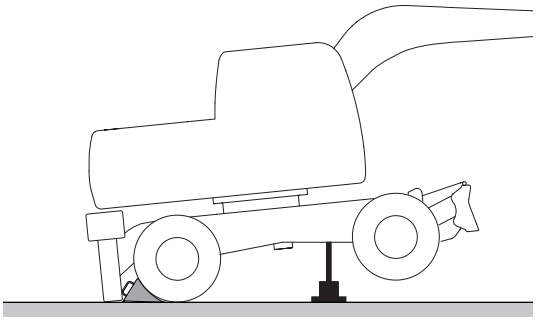
Pressure at air nozzle must not exceed 2 kg/cm^2 (28 psi). Always wear goggles when using compressed air.

Do not pour cold water into radiator when engine is hot and water level is below the top of the tubes. Such action could result in damage to engine cylinder heads.

Heavy-duty diesel engines require a balanced mixture of water and antifreeze. Drain and replace the mixture 1 year or 2,000 hours of operation, whichever comes first. This will eliminate buildup of harmful chemicals.

Antifreeze is essential in any climate. It broadens the operating temperature range by lowering the coolant's freezing point and by raising its boiling point. Do not use more than 50% antifreeze in the mixture unless additional antifreeze protection is required. Never use more than 60% antifreeze under any condition.

1. Park machine on firm and level ground.
2. "LOWER" dozer blade, if equipped.
3. Set parking brake switch to "I" (APPLIED) position.
4. Move safety lever to "LOCK" position.
5. Using a jack rated for weight of machine, raise machine to a height so tires have enough clearance. Place appropriate stands under frame to support machine.
6. Lower bucket or work tool to ground.
7. Stop engine.



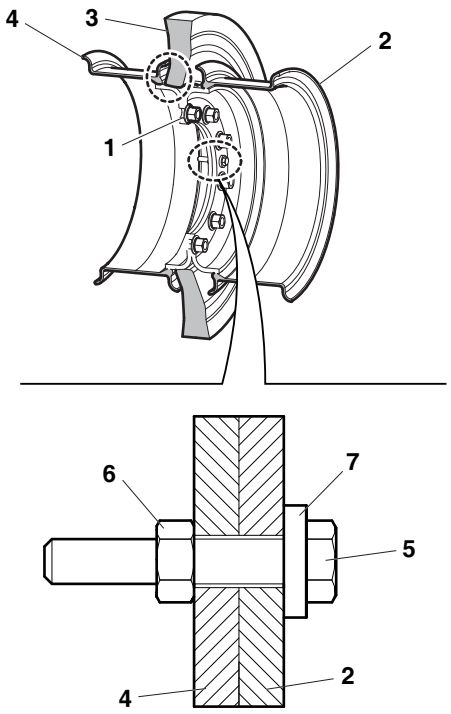
WE1401215

Figure 192

8. This is a cross-sectional view tire assembly

   NOTE: *Rubber spacer protrusion must face inner tire rim.*

Reference Number	Description
1	Wheel Nut
2	Outer Tire Rim
3	Rubber Spacer
4	Inner Tire Rim
5	Outer and Inner Tire Assembly Bolt
6	Outer and Inner Tire Assembly Nut
7	Outer and Inner Tire Assembly Washer

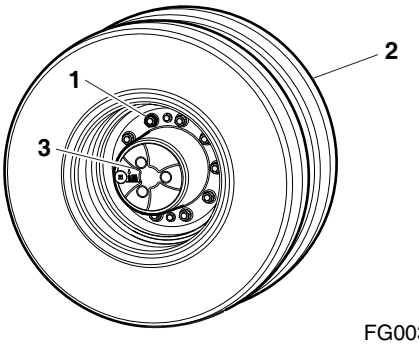


FG003431

Figure 193

9. Remove wheel nuts (1), and tire assembly (2) from axle hub (3).

   NOTE: *Examine wheel nuts for wear and damage. Replace all necessary parts.*



FG003432

Figure 194

Removal

1. Park on firm and level ground.
2. Lower front attachment (bucket) to ground.
3. Stop engine.
4. Move safety lever to "UNLOCK" position.
5. Turn starter switch to "I" (ON) position.

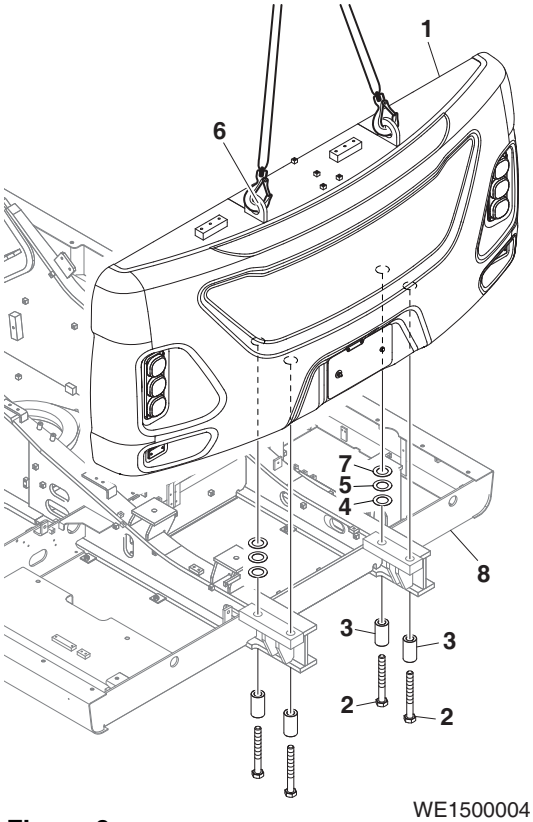
WARNING

AVOID DEATH OR SERIOUS INJURY

If engine must be running while performing maintenance, use extreme care. Always have one person in the cabin at all times. Never leave the cabin with the engine running.

6. Fully stroke work levers (joysticks) in all directions to relieve any pressure from accumulators.
7. Move safety lever to "LOCK" position.
8. Turn key to "O" (OFF) position and remove from starter switch.
9. Attach maintenance warning tag on controls.
10. Turn battery disconnect switch to "OFF" position.
11. Make sure all electrical lines and other items are disconnected.
12. Using a suitable lifting device capable of handling a heavy load, partially support counterweight from lifting holes (6, Figure 3), counterweight (1) before loosening four bolts (2). Stop lifting with assist crane as soon as lifting slings are taut.
13. Remove four bolts (2, Figure 3), spacers (3) and washers (4, 5 and 7) from counterweight (1).
    - Tool: 46 mm
    - Weight:
      - 3,200 kg (7,055 lb)
      - 4,000 kg (8,820 lb)

    NOTE: *Heat bolts, if necessary, to free them.*
14. When bolts (2, Figure 3), spacers (3) and washers (4, 5 and 7) have been removed, lift counterweight (1) a very short distance above support frame (8) and stop. Check slings and make sure counterweight is being supported evenly.



WE1500004

Figure 3

Problem	Cause	Correction
Engine knocks, runs unevenly or surges.	Low engine oil.	Refill.
	Plugged air intake system.	Clean system and replace filter.
	Injection pump out of adjustment.	Contact your DOOSAN dealer.
	Plugged fuel filter.	Replace fuel filter.
	Water or dirt in fuel system.	Clean system and add new fuel.
	Clogged or dirty fuel injectors.	Clean injectors.
Engine has poor power.	Plugged air intake system.	Clean system and replace filter.
	Clogged or dirty fuel injectors.	Clean injectors.
	Fuel filters plugged.	Replace filters.
	Engine speed control cable out of adjustment.	Readjust.
	Injection pump out of adjustment.	Contact your DOOSAN dealer.
	Valve backlash faulty.	Adjust backlash.
Engine runs hot.	Low coolant level.	Add coolant.
	Thermostat faulty.	Replace thermostat.
	Radiator cap faulty.	Replace radiator cap.
	Radiator core plugged.	Clean radiator.
	Oil cooler core plugged.	Clean oil cooler.
	Fan belt loose or damaged.	Tighten or replace as required.
	Temperature sensor faulty.	Replace sensor.
Starting difficult.		
Starting motor trouble.	Refer to diagnostics.	
Fuel system trouble.	Refer to diagnostics.	
Lack of compression pressure	Valve's poor shut, stem distortion.	Repair or replace.
	Valve spring damage.	Replace valve spring.
	Cylinder head gasket's leak.	Replace gasket.
	Wear of piston, piston ring or liner.	Adjust.
Idle operation abnormal.	Injection timing incorrect.	Check by SCAN-200.
	Air mixing at high-pressure pump.	Remove air.
Engine output insufficient.		
Continuous output insufficient.	Valve clearance incorrect.	Adjust.
	Valve tightness poor.	Repair.
	Cylinder head gasket's leak.	Replace gasket.

Specification

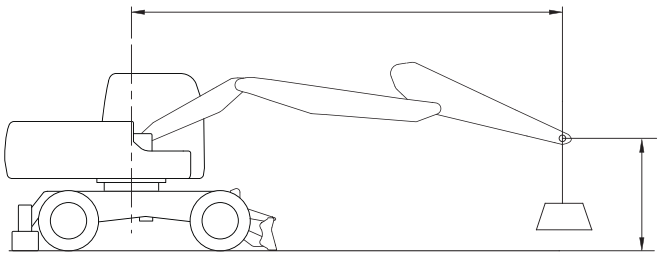
SPECIFICATION

One-Piece Boom (Front Outrigger and Rear Dozer, 5.6 m Boom and 2.75 m Arm)

Component				Specification	
				Metric	English
Operating Weight				20.9 metric tons	23.0 tons
Bucket	CECE			0.76 m^3	0.99 yd^3
	SAE (PCSA)			0.86 m^3	1.12 yd^3
Engine	Model			DL06P	
	Type			4-cycle Water Cooled, Turbocharge, Direct Injection, Exhaust Gas Recirculation	
	Rated Output (Gross)			141.2 kW @ 1,900 rpm	189 HP (192 PS) @ 1,900 rpm
	Rated Output (Net)			139 kW @ 1,900 rpm	186 HP (189 PS) @ 1,900 rpm
	Maximum Torque			82 kg.m @ 1,400 rpm	434 ft lb @ 1,400 rpm
	Fuel Tank Capacity			292 L	77.1 U.S. gal.
Hydraulic Pump	Type			Axial Piston	
	Discharging Pressure			357 kg/cm^2	5,076 psi
	Maximum Discharge Quantity			2 x 224 L/min	2 x 44.1 U.S. gpm
	Hydraulic Oil Capacity	Tank Level		128 L	33.8 U.S. gal.
		Full		207 L	54.7 U.S. gal.
		System		290 L	76.6 U.S. gal.
Performance	Travel Speed	Forward	Creep	0 ~ 4 km/h	0 ~ 2.5 MPH
			Low	0 ~ 9 km/h	0 ~ 5.6 MPH
			High	0 ~ 35 km/h	0 ~ 22 MPH
		Reverse	Creep	0 ~ 4 km/h	0 ~ 2.5 MPH
			Low	0 ~ 9 km/h	0 ~ 5.6 MPH
			High	0 ~ 35 km/h	0 ~ 22 MPH
	Digging Capability (SAE)	Bucket		13.4/*14.2 metric tons	14.77/*15.65 tons
		Arm		10.3/*10.9 metric tons	11.35/*12.01 tons
	Digging Capability (ISO)	Bucket		15.2/*16.0 metric tons	16.75/*17.63 tons
		Arm		10.6/*11.2 metric tons	11.68/*12.34 tons
	Swing Speed			9.8 rpm	
	Gradeability			33° (65% Slope)	
	Minimum Swing Radius			3,300 mm	10' 10"
Travel System	Drive System			Hydraulic Drive/Forward, Reverse 3 Speed	
	Tire Size			10.00 - 20 - 14PR	
	Brake Type			Full Hydraulic Wet Disk Brake Type	

* Power Boost

DIM.	Boom Type	5.6 m (18' 4")		
	Arm Type	**2.75 m (9' 0")**	**3.0 m (9' 10")**	**2.4 m (7' 10")**
	Bucket Type (PCSA)	**0.86 m^3 (1.12 yd^3)**	**0.86 m^3 (1.12 yd^3)**	**0.86 m^3 (1.12 yd^3)**
A	Max. Digging Reach	9,705 mm (31' 10")	9,980 mm (32' 9")	9,410 mm (30' 10")
B	Max. Digging Reach (Ground)	9,505 mm (31' 2")	9,785 mm (32' 1")	9,200 mm (30' 2")
C	Max. Digging Depth	5,905 mm (19' 4")	6,160 mm (20' 3")	5,555 mm (18' 3")
D	Max. Loading Height	7,115 mm (23' 4")	7,350 mm (24' 1")	6,985 mm (22' 11")
E	Min. Loading Height	2,840 mm (9' 4")	2,630 mm (8' 8")	3,230 mm (10' 7")
F	Max. Digging Height	9,870 mm (32' 5")	10,140 mm (33' 3")	9,770 mm (32' 1")
G	Max. Bucket Pin Height	8,570 mm (28' 1")	8,805 mm (28 11")	8,440 mm (27' 8")
H	Max. Vertical Wall Depth	5,280 mm (17' 4")	5,715 mm (18' 9")	5,120 mm (16' 10")
I	Max. Radius Vertical	6,365 mm (20' 11")	6,260 mm (20' 6")	6,090 mm (20' 0")
J	Max. Depth to 2.5 m Line	5,715 mm (18' 9")	5,980 mm (19' 7")	5,345 mm (17' 6")
K	Min Radius 2.5 m Line	3,180 mm (10' 5")	3,180 mm (10' 5")	3,180 mm (10' 5")
L	Min. Digging Reach	850 mm (2' 9")	1,040 mm (3' 5")	1,690 mm (5' 7")
M	Min Swing Radius	3,300 mm (10' 10")	3,445 mm (11' 4")	3,340 mm (10' 11")
d	Bucket Angle	178°	177°	177°



Boom (Lower) : 1.92 m (6' 4")
Boom (Upper) : 3.84 m (12' 7")
Arm : 2.4 m (7' 10")
Bucket : Without Bucket
Counterweight : 3,200 kg (7,060 lb)
: Rating Over Front
: Rating Over Side or 360 degree
Unit : 1,000 kg (1,000 lb)

WE1401549

Figure 15

METRIC 1,000 kg

A (m) / B (m)	3		4.5		6		7.5		MAX. REACH		
											A (m)
7.5			* 5.17	* 5.17					* 4.66	* 4.66	5.60
6			* 5.33	* 5.33	* 5.34	* 5.34			* 4.01	* 4.01	6.80
4.5			* 6.55	* 6.55	* 5.77	5.59	* 3.75	* 3.75	* 3.75	* 3.75	7.50
3			* 8.47	8.31	* 6.61	5.36	* 5.92	3.81	* 3.68	3.53	7.86
1.5			* 10.27	7.83	* 7.54	5.14	* 6.34	3.72	* 3.78	3.44	7.92
0			* 11.31	7.62	* 8.24	5.00	* 6.67	3.68	* 4.06	3.57	7.68
-1.5	* 12.50	* 12.50	* 11.53	7.61	* 8.48	4.99			* 4.63	3.99	7.12

FEET 1,000 lb

A (m) / B (m)	10		15		20		25		MAX. REACH		
											A (m)
25			* 11.57	* 11.57					* 10.46	* 10.46	17.96
20			* 11.64	* 11.64	* 11.82	* 11.82			* 8.89	* 8.89	22.09
15			* 14.16	* 14.16	* 12.59	12.04			* 8.27	* 8.27	24.53
10			* 18.23	17.91	* 14.36	11.55	* 13.00	8.19	* 8.12	7.79	25.77
5			* 22.16	16.88	* 16.34	11.08	* 13.85	8.02	* 8.33	7.58	25.98
0			* 24.48	16.40	* 17.87	10.79	* 11.90	7.94	* 8.95	7.87	25.20
-5	* 28.58	* 28.58	* 24.98	16.37	* 18.37	10.75			* 10.23	8.82	23.32

1. Load point is the end of the arm.
2. Capacities marked with an asterisk (*) are limited by hydraulic capacities.
3. Lift capacities shown do not exceed 75% of minimum tipping loads or 87% of hydraulic capacities.
4. The least stable position is over the side.
5. Lift capacities apply only to the machine as originally manufactured and normally equipped by the manufacturer.
6. The total weight of machine is 20,700 kg (45,636 lb). Included are the; lower boom 1.92 m (6' 4"), upper boom 3.84 m (12' 7"), arm 2.4 m (7' 10"), 3,200 kg (7,060 lb) counterweight, all operating fluids and a 75 kg (165 lb) operator.
7. Lift capacities are in compliance with ISO 10567.