DX300LCA

Operation and Maintenance Manual

950106-00077E

Serial Number 5001 and Up

March 2010

DOOSAN 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.

1. Warnings for Operation, Inspection and Maintenance (190-00688)

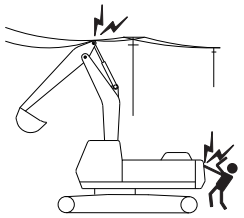
⚠ WARNING

- AVOID DEATH OR SERIOUS INJURY. - READ AND UNDERSTAND OPERATION MANUAL AND SAFETY LABELS prior to operating this machine.
- Never get in under the machine while it is being jacked up with boom and arm.
- Sound the horn to alert the people nearby before operating, and make sure that all persons are clear of area.
- Controls may be changed for attachments or operator preference. Try control pattern before operating.

190-00688

FG015523

2. Warnings for High Voltage (190-00689)



⚠ DANGER

SERIOUS INJURY OR DEATH BY ELECTROCTION can occur if machine or attachments are not a safe distance from electrical power lines.

Line voltage	Safe Distance
6.6 kv	At least 3m(10ft)
66.6 kv	At least 5m(16ft)
275.0 kv	At least 10m(33ft)

190-00689

FG015524

Inside Operator's Cabin

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

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

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

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

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

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

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

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

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

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

Clothing and Personal Protective Items

Secure long hair, and avoid loose clothing and jewelry. These items have the tendency to catch on controls or protrude into parts and cause serious injury or death.

Do not wear oily clothes. They are highly flammable.

Full eye protection, a hard hat, safety shoes and gloves may be required at the work site.

While working on the machine, never use inadequate tools. They could break or slip, causing injury, or they may not adequately perform intended functions.

HAOA020L

Figure 2

Engine Starting

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

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

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

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

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

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

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

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

Start and operate the machine only while seated.

Proper Tools

Use only tools suited to the task. Using damaged, low quality, faulty, or makeshift tools could cause personal injury. There is a danger that pieces from, chisels with crushed heads, or hammers, may get into your eyes and cause blindness.

HDO1037L

Figure 32

Use of Lighting

When checking fuel, oil, battery electrolyte, or window washing fluid, always use lighting with antiexplosion specifications. If such lighting equipment is not used, there is a danger of an explosion.

If work is carried out in dark places without using lighting, it may lead to injury, so always use proper lighting.

Even if the place is dark, never use a lighter or flame instead of lighting. There is a danger of fire. There is also danger that battery gas may catch fire and cause an explosion.

HDO1040L

Figure 33

Fire Prevention and Explosion Prevention

All fuels, most lubricants and some coolant mixtures are flammable. Leaking fuel or fuel that is spilled onto hot surfaces or onto electrical components can cause a fire.

Store all fuels and all lubricants in properly marked containers and away from all unauthorized persons.

Store oily rags and other flammable material in a protective container.

Do not smoke while you refuel the machine or while you are in a refueling area.

Do not smoke in battery charging areas or in areas that contain flammable material.

Clean all electrical connections and tighten all electrical connections. Check the electrical wires daily for wires that are loose or frayed. Tighten all lose electrical wires before you operate the machine. Repair all frayed electrical wires before you operate the machine.

Remove all flammable materials before they accumulate on the machine.

Do not weld on pipes or on tubes that contain flammable fluids. Do not flame cut on pipes or on tubes that contain flammable fluids. Before you weld on pipes or on tubes or before you flame cut on pipes or on tubes, clean the pipes or tubes thoroughly with a nonflammable solvent.

HDO1015I

Figure 34

SHIPPING AND TRANSPORTATION

Obey State and Local Over-the-Road Regulations

Check state and local restrictions regarding weight, width and length of a load before making any other preparation for transport.

The hauling vehicle, trailer and load must all be in compliance with local regulations governing the intended shipping route.

Partial disassembly or teardown of the excavator may be necessary to meet travel restrictions or particular conditions at the work site. See the Shop Manual for information on partial disassembly.

Refer to the Transportation and Shipping section of this Operation and Maintenance Manual for information on loading, unloading and towing.

Reference Number	Description
1	Counterweight
2	Hood
3	Muffler
4	Hydraulic Oil Tank
5	Fuel Tank
6	Engine
7	Fuel Tank Fill Cap
8	Radiator and Oil Cooler
9	Control Valves
10	Swing Motor
11	Precleaner
12	Air Cleaner
13	Swing Bearing
14	Seat
15	Cabin
16	Boom Cylinder
17	Work Lever (Joystick) Controls
18	Arm Cylinder
19	Boom
20	Travel Lever

Reference Number	Description
21	Arm
22	Bucket Cylinder
23	Guide Link
24	Bucket
25	Push Link
26	Tooth Point
27	Side Cutter
28	Idler
29	Track Adjuster
30	Track Guide
31	Battery
32	Lower Roller
33	Center Joint
34	Upper Roller
35	Sprocket
36	Travel Motor
37	Track Link and Shoe
38	Suction Filter
39	Return Filter
40	Pumps

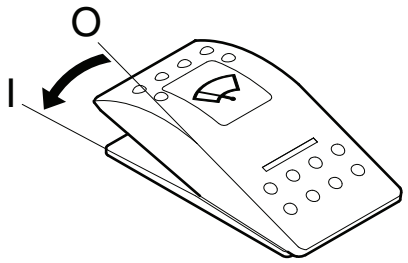
12. Lower Wiper Switch (Optional)

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.*

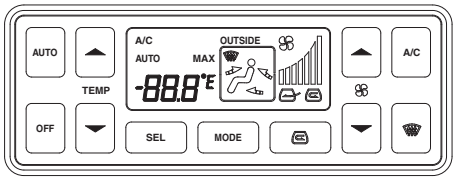


FG000028

Figure 19

13. Heater and Air Conditioner Control Panel

This panel is used to control air conditioner and heater in operator's compartment. Refer to “Heater and Air Conditioner Control Panel” on page 2-48 for more details.



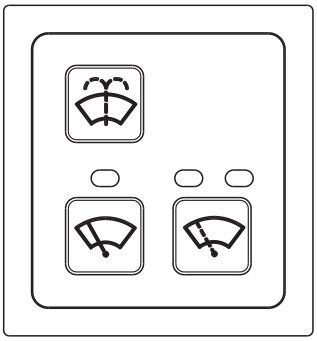
FG000029

Figure 20

14. Wiper Switch Panel

This panel is only for operation of the upper windshield wiper. When the wiper stops running, it moves to right side of the cabin, resting in its support.

NOTE: *When the front window is lifted, the wiper motor will not operate.*



FG000308

Figure 21

3. Hydraulic Oil Temperature Gauge

The colored bands indicate the temperature of the hydraulic oil

WHITE ZONE ( ) - Indicates temperature is lower than the normal operating temperature.

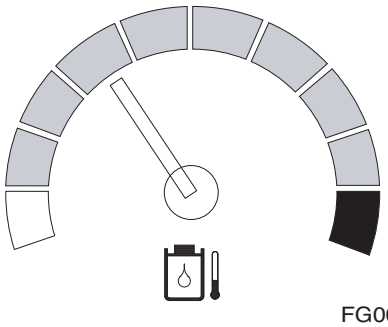
BLUE ZONE ( ) - Indicates temperature is within the normal operating range.

RED ZONE ( ) - Indicates temperature is too high.

During operation, the pointer must be in the blue zone.

If the gauge pointer moves into the red zone, the hydraulic oil temperature symbol will turn "ON," and be display in the screen. Allow the engine to run at low idle speed until the temperature gauge registers in the blue zone again.

NOTE: *See "Abnormal State Warning Symbols" on page 2-29, for location of this warning symbol and others.*

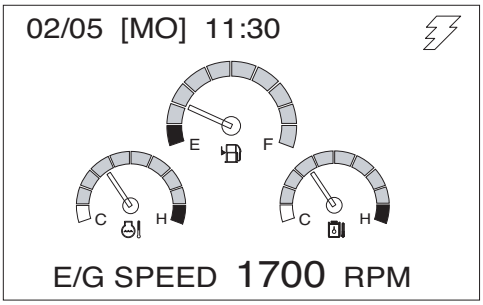


FG000042

Figure 41

4. Multifunction Gauge and Graphic Information Area

See "Multifunction Gauge and Graphic Information" on page 2-27. This section will have a more in-depth explanation of the display area.



FG000043

Figure 42

5. Digital Clock

A digital clock, shows the current time. The displayed contents are as follows.

Display	Description
MM	Month
DD	Date
W	Day
HH	Hour
mm	Minute
A (P)	AM (PM)

Refer to the "Setting Main Menu" on page 2-35 for time setting.

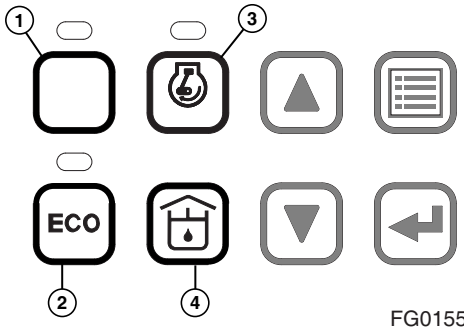
MM/DD [W] HH:mm

FG000044

Figure 43

MODE SELECTOR BUTTONS

1. Power Mode Selector Button
2. Economy Mode Selector Button
3. Auto Idle Selector Button
4. Flow Control Button



FG015507

Figure 66

1. Power Mode Selector Button

This power mode is suitable for heavy-duty work that requires a high operating speed. Push this button to turn power mode "ON" or "OFF."

When the power mode button is pushed to the "ON" position, an indicator light above it turns "ON."

When the power mode button is pushed again, it is turned "OFF" and the power mode is deactivated and returns to the standard operating mode.

When turning the engine starter switch to the "I" (ON) position, the power mode is automatically defaulted to "Standard Mode."

NOTE: *For further details, see ""Mode Selection" on page 3-19.*

FG000063

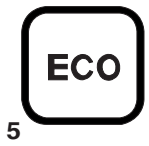
Figure 67

2. Economy Mode Selector Button

Economy mode is used for light loading work, when this mode selected it will reduce noise and fuel consumption with standard mode.

When the economy mode button is pushed to the "ON" position, a symbol appears on the screen.

NOTE: *When the economy mode button is pushed again, it is turned "OFF" and the economy mode is deactivated and returns to the standard operating mode.*



FG015473

Figure 68

Press "ESC" ( ) button (3,Figure 72) for 1 more second, it returns to main menu.

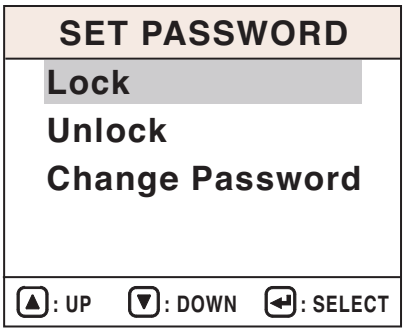
According to the selection of adoption (lock) or nonadoption (unlock), the password function will be in working or nonworking.

When you want to change a password, follow below procedure.

1. Move the cursor to "Change Password."
2. Input desired 4 digits password using selector buttons (at the first column). Input the same password one more time (at the second column)
3. Select adoption (lock) or nonadoption (unlock) at set password menu.

NOTE: *Keep in mind never to forget password.*

NOTE: *Please contact a DOOSAN distributor, if you forget your password.*



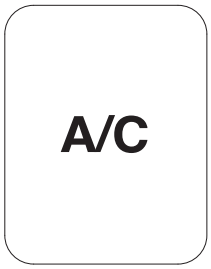
FG000229

Figure 93

8. Air Conditioner Button

This button is used to turn the air conditioner "ON" or "OFF."

When this function is activated, an "A/C" is displayed in the upper left corner of the LCD.

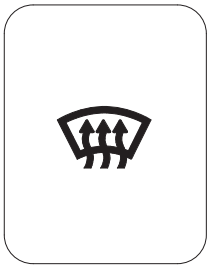


FG000105

Figure 119

9. Defroster Button

Used to direct air flow to front window.



FG000106

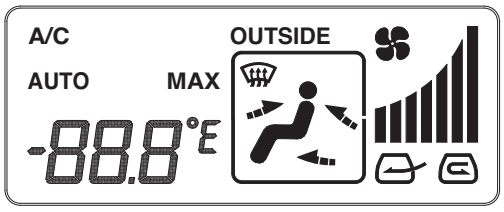
Figure 120

10. LCD Display

This display shows the current setting.

Memory Function

The air conditioner panel has a memory function. When the starter switch is turned "OFF" the settings for the panel, will be stored. When the excavator is started, the last stored setting will be used.



FG000107

Figure 121

Additional Operating Instructions

A proper indoor temperature in summer is 5 - 6°C (10 - 12°F) less than the outdoor temperature.

Operate the air conditioner for twenty - thirty minutes a week to circulate the refrigerant in the system.

NOTE: *The blower button should be on "Three Bars."*

If operating the air conditioner or heater for a long time, operate the air inlet selector button, and when smoking, vent the air to the outside to prevent irritation to eyes.

WARNING

Be careful that your hands are not caught in window frame.

1. Lower bucket to ground.
2. Set safety lever (Figure 138) on "LOCK," and shut down engine.
3. Holding upper handles (1, Figure 140) of front window with left and right-hand, pull lock levers (2, Figure 140) to release the lock.
4. Push window forward, and lower it slowly.
5. When the bottom of the window, reaches the top of the front bottom window, push the front window to engage the lock (2, Figure 139).
6. Check that lock levers are securely latched in the lock position.

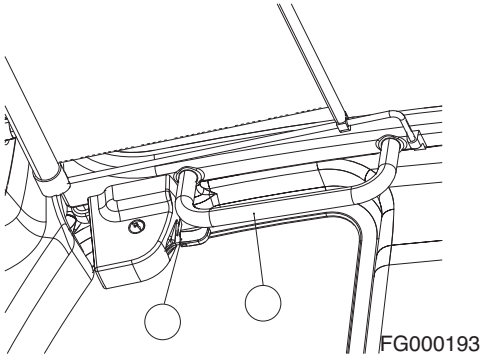


Figure 140

Front Bottom Window

The front bottom window can be removed and stored in the rear of the cabin.

1. After stowing the front upper window in the cabin ceiling, remove bottom window (1, Figure 141) from cabin in direction of the arrow.

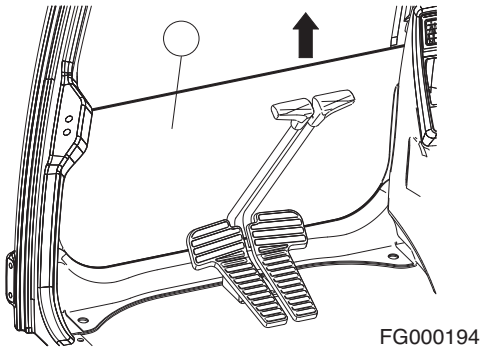


Figure 141

2. Set bottom window in rubber holders (2, Figure 142) behind operator's seat. Secure window with left and right knobs (3) with push button (4).

WARNING

Never have wet hands when handling a window. Never drop window or let it come into contact with other parts of the machine.

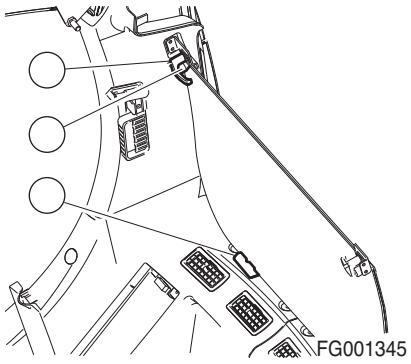
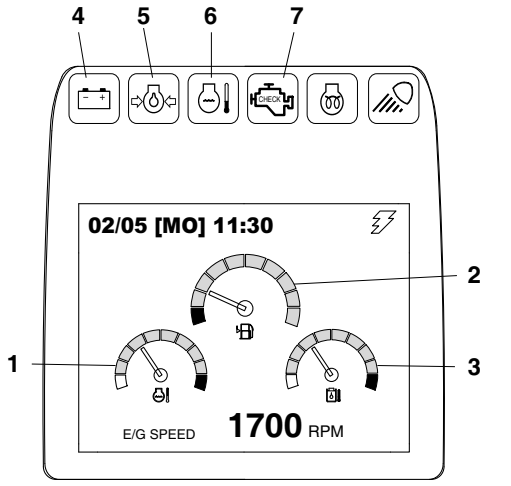


Figure 142

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



FG000092

Figure 6

No.	INSTRUMENT PANEL LIGHT OR GAUGE	INDICATOR READING
1	Engine Coolant Temperature Gauge	Blue Range
2	Fuel Gauge	Blue Range
3	Hydraulic Oil Temperature Gauge	Blue Range
4	Charging Warning Light	OFF
5	Engine Oil Pressure Warning Light	OFF
6	Engine Coolant Temperature Warning Light	OFF
7	Engine Check Warning Light	OFF

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

NOTE: *If engine coolant temperature gauge pointer moves into the red zone, the engine coolant temperature warning light will turn "ON," a warning buzzer will sound, and the engine speed will be automatically reduced. Allow the engine to run at low idle speed until the temperature gauge registers in the blue zone again. When the blue zone is reached, allow the engine to idle for an additional three - five minutes before shutting down the engine. If not allowed to idle, heat surge may develop which will damage the engine. Allowing the engine to idle will dissipate heat. Check the coolant level, look for a loose fan belt, inspect for debris around radiator, and so on.*

Travel Control Lever Operation

1. To travel straight (Figure 27), push both travel control levers/pedals fully forward or backwards. The farther the levers/pedals are pressed, the faster the travel speed.

   NOTE: *"X" is the sprocket end of the track.*

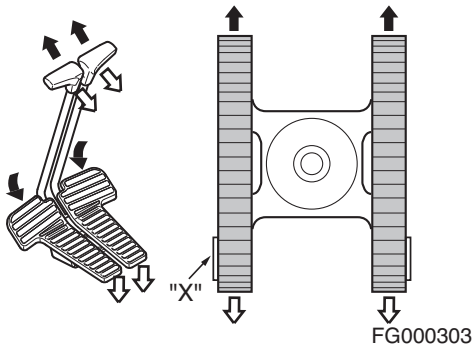


Figure 27

2. Pivot turns (Figure 28) are made by rotating only one track forward or backward. The machine will pivot on the nonmoving track.

   NOTE: *"X" is the sprocket end of the track.*

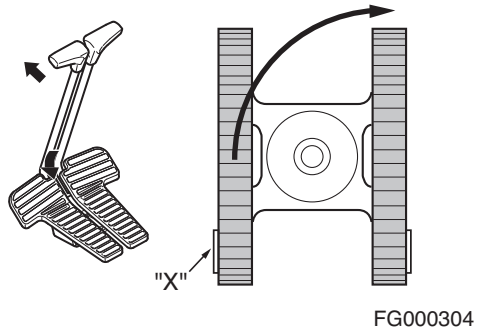


Figure 28

3. Spin turns (Figure 29) are made by rotating one track forward and one track backward. The machine will spin around its center point, thus counterrotating.

   NOTE: *"X" is the sprocket end of the track.*

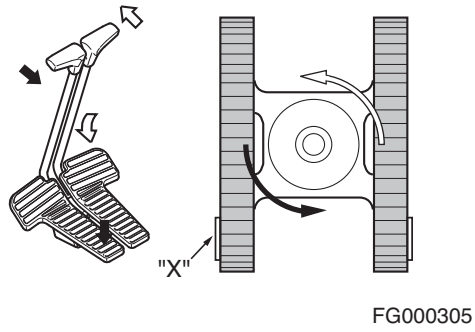


Figure 29

4. Stopping travel (Figure 30) - Returning travel levers to "NEUTRAL" position will automatically apply brakes and stop excavator.

   NOTE: *"X" is the sprocket end of the track.*

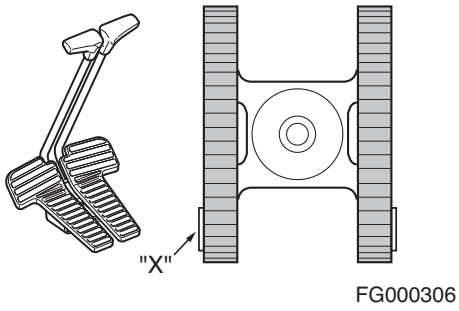


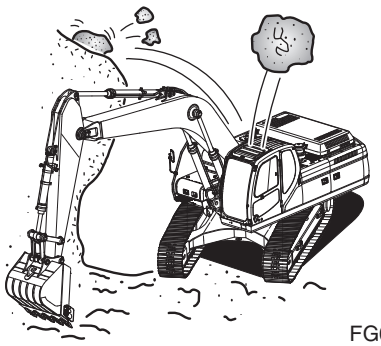
Figure 30

OPERATING PRECAUTIONS

WARNING

Do not rest your feet on the travel pedals during normal machine operation. Unexpected machine travel may occur in this situation.

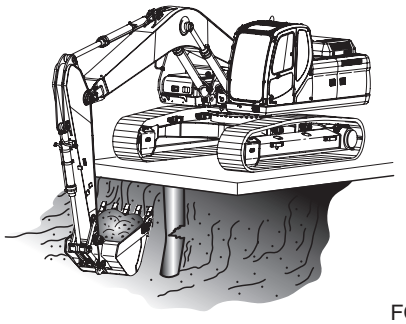
1. Before starting work, investigate terrain and soil condition. Level ground and drain area if necessary.
2. Install window guards when working where there is a possibility of falling rocks or other objects.



FG000374

Figure 53

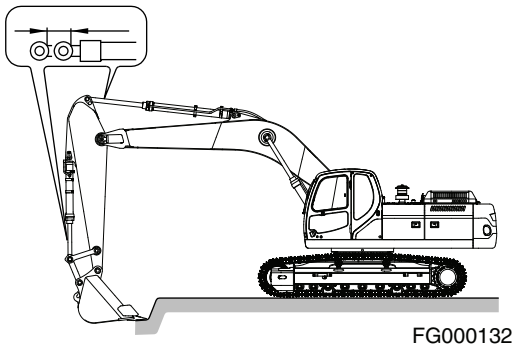
3. Check strength of supported structures in advance before working on them. If insufficient, reinforce it. If any doubt exists about structural strength, refuse to operate unit.
4. It is possible that the boom, arm or bucket may come into contact with the upper or lower structure of the machine. There are digging conditions which could allow this to happen.



FG000375

Figure 54

5. Do not continually "bottom out" the hydraulic cylinders. Machine damage may occur if the cylinders are fully extended or retracted, example: arm cylinder fully retracted and the bucket cylinder is extended to rotate the bucket into the ground.



FG000132

Figure 55

To activate breaker

1. Set breaker selector switch to "II" (BREAKER) position.
2. Press lower button on top of right-hand work lever (joystick) to activate hydraulic breaker.
3. Release lower button on top of right-hand work lever (joystick) to deactivate hydraulic breaker.

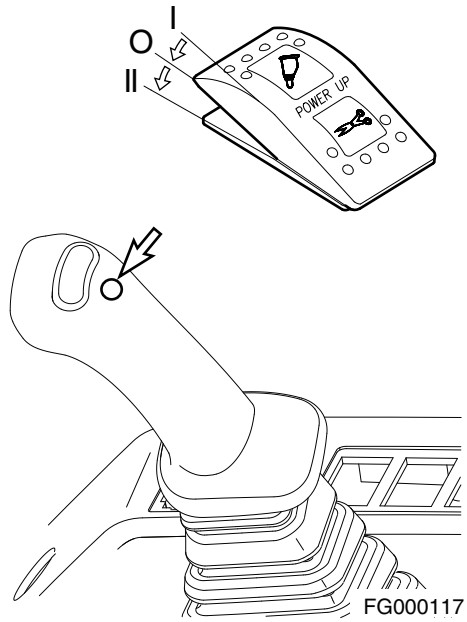


Figure 79 RIGHT-HAND WORK LEVER (JOYSTICK)

Relief Valve Adjustment

1. Cap pipe on arm end, using a cap capable of handling 350.0 kg/cm^2 (5,000 psi) under the condition of disconnecting hose to hydraulic breaker.
2. Adjust pump pressure using activating the breaker, and watching the pressure displayed on the instrument panel. Press the display selector button to show digital pressure reading. (A separate pressure gauge is not required.)
3. Adjust the relief valve pressure by turning the adjustment screw of breaker relief valve. The relief valve is installed on the left side of the upper structure behind the boom. (Do not use the overload relief valve on the lower part of control valve for the breaker relief valve.)

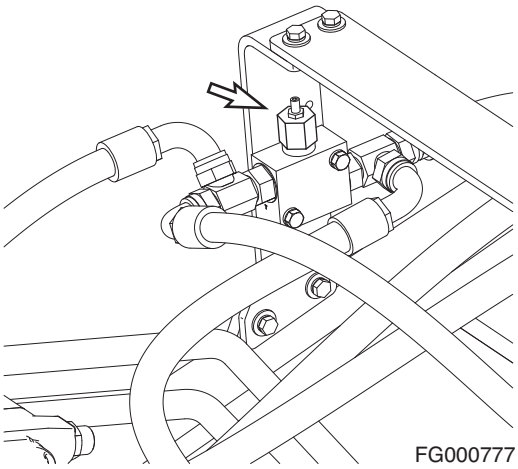


Figure 80

WARNING

If the relief valve pressure is adjusted while the hydraulic breaker is connected, there is possibility that a high-pressure spike or setting could break a hose or pipe. Personal injury or death could result from a hydraulic hose or pipe failure.

Operation at High Altitudes

Normally, operation of machine at high altitudes will be as outlined in 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 pressure cap on radiator must make a perfect seal to maintain coolant pressure in the system.

Check Oil Level of Swing Reduction Device

WARNING

The gear oil is very hot after the machine has been operating. Shut all systems down and allow them to cool. Before fully removing any motor case inspection port plug, etc., loosen the plug slightly to allow pressurized air to escape.

NOTE: *When checking level using a dipstick always remove and wipe it clean before making final level check.*

1. Remove dipstick (1, Figure 24) and wipe the oil from the dipstick with a cloth.
2. Insert dipstick (1, Figure 24) fully into dipstick tube.
3. When dipstick is pulled out, oil level must be between "HIGH" and "LOW" marks on dipstick.

   NOTE: *If oil is above "HIGH" mark on dipstick, some must be drained to proper level.*

4. If the oil does not reach the "L" mark on the dipstick, add oil through fill port (2, Figure 24).

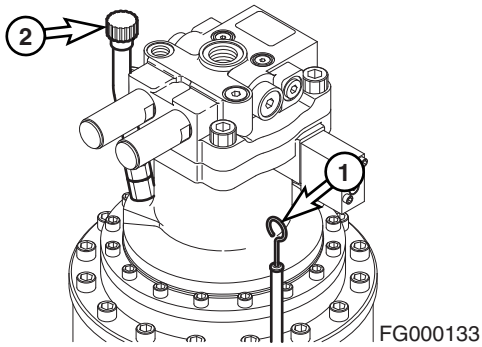


Figure 24

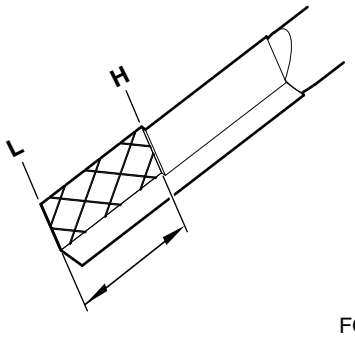


Figure 25

5. If the oil level exceeds the "H" mark on the dipstick, release the drain plug (3, Figure 26). Drain the excessive oil into a suitable container.

   NOTE: *Dispose of drained fluids according to local regulations.*

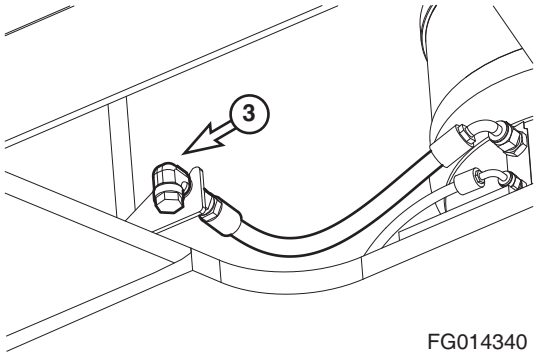


Figure 26

Check Engine Fan Belt Tension

IMPORTANT

A loose fan belt can cause engine overheating, poor charging, and/or premature belt wear. A belt that is too tight can cause damage to the water pump, alternator bearing or belt.

1. Inspect every 250 hours. (Inspect after first 50 hours of operation.)
2. With the engine shut off, check the tension of the fan belt by pressing downwards on the belt, midway between the fan pulley and alternator pulley. The belt should flex approximately 10 mm (0.4 in). See Figure 44. To adjust the belt, loosen the alternator adjustment plate bolts, adjust the belt tension and retighten the bolts.

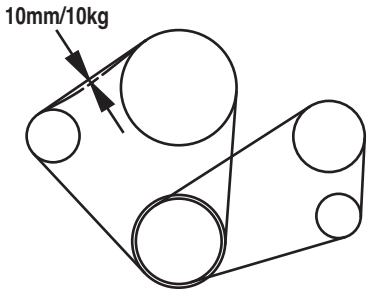


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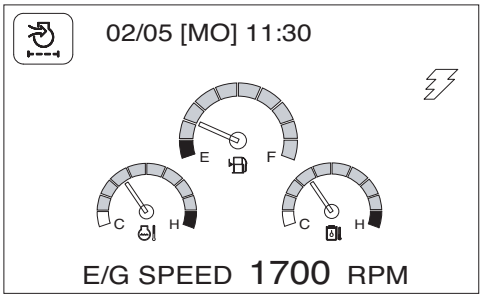
Figure 44

Clean Outer Filter of Air Cleaner

NOTE: *Clean outer filter every 500 hours / 3 months of service.*

NOTE: *If air cleaner clogged warning light (Figure 61) on instrument panel comes "ON" the air cleaner must be serviced.*

NOTE: *When working in severely dusty conditions, the service interval should be shortened.*



FG000264

Figure 61

WARNING

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

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

1. Locate the air cleaner assembly.

   NOTE: *When it reaches every 500 hours or If indicator light (Figure 61) on instrument panel comes "ON" the air cleaner must be serviced.*

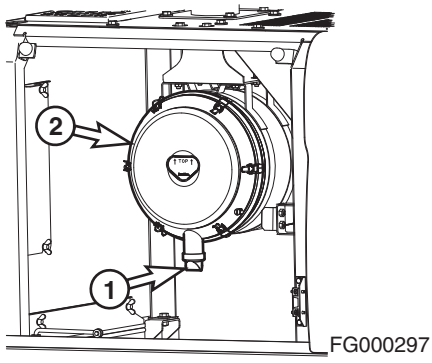
   NOTE: *Replace outer filter after cleaning 5 times or every 2,000 hours / 1 year of service.*

2. Remove and clean rubber evacuator valve (1, Figure 62) from bottom of air cleaner housing cover (2). Inspect seal lips for wear or damage. Replace valve if necessary.

   NOTE: *Install evacuator valve with lips parallel to the cover.*

3. Remove the access cover (2, Figure 63) by loosening the latches (3).

4. Remove the outer filter (4, Figure 63) from the housing. Do not remove inner filter (5).



FG000297

Figure 62

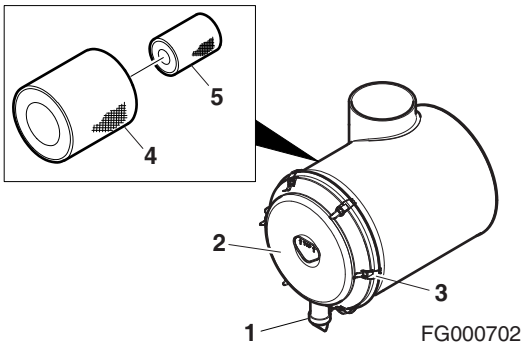


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Figure 63

2,000 HOUR / YEARLY SERVICE

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

Change Swing Reduction Device Oil

NOTE: *Change swing reduction device oil after first 250 hours of operation or rebuild and every 2,000 hours thereafter.*

WARNING

The gear oil is very hot after the machine has been operating. Shut all systems down and allow them to cool.

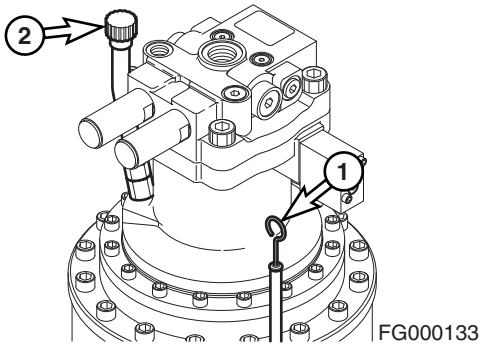


Figure 86

1. Set a container under excavator.
2. Release the drain plug (3, Figure 87) and drain the swing reduction device oil into a container.

   NOTE: *Dispose of drained fluids according to local regulations.*
3. After draining oil, tighten the drain plug.

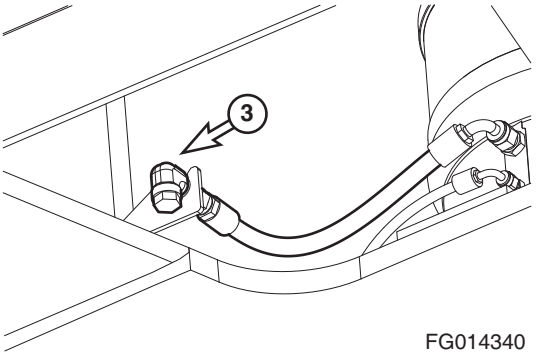


Figure 87

4. Remove breather/fill cap (2, Figure 86) and add oil to "H" mark on dipstick (1).

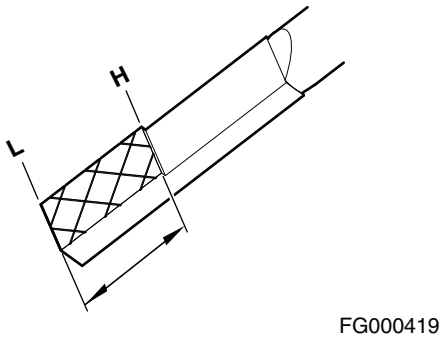


Figure 88

BOLT AND NUT INSPECTION

Inspect ALL fasteners after the first 50 hours of operation and every 250 hours thereafter. If any are loose or are missing tighten them or install new hardware. Always use a calibrated torque wrench.

IMPORTANT

Always clean fasteners before tightening.

If counterweight is loose, contact a *DOOSAN* distributor or sales agent.

NO.	POINT TO BE INSPECTED		BOLT DIA. mm	QTY.	BOLT HEAD SIZE	TORQUE		
						kg•m	Nm	ft lb
1	Joint bolt with engine mounting bracket and engine	pump side	12	8	19	11.2	110	81
		fan side	12	6	19	11.2	110	81
2	Joint bolt and nut between engine mounting bracket and frame	pump side	20	2	30	46	451	333
		fan side	16	2	24	27	265	195
3	Radiator mounting bolt		20	4	30	55	539	398
4	Tightening bolt for hydraulic oil tank		16	6	24	27	265	195
5	Tightening bolt for fuel tank		16	6	24	27	265	195
6	Tightening bolt for pump		20	4	17 (S)	49	480	354
7	Tightening bolt for control valve		16	4	24	27	265	195
8	Tightening bolt for swing reduction device		24	12	36	95	931	687
9	Tightening bolt for swing motor		12	16	10 (S)	11	108	80
10	Tightening bolt for battery		10	2	17	5	49	36
11	Joint bolt with cabin mounting rubber and frame		10	20	17	6.5	64	47
	Joint bolt with cabin mounting rubber and cabin		16	5	24	21	206	152
12	Joint bolt with swing bearing and upper frame		24	35	36	95	931	687
	Joint bolt with swing bearing and bottom frame		24	36	36	95	931	687
13	Tightening bolt for travel device		20	40	30	49	480	354
	Tightening bolt for sprocket		20	48	30	49	480	354
14	Tightening bolt for upper roller		20	4	30	55	539	398
15	Tightening bolt for bottom roller		20	72	30	55	539	398
16	Tightening bolt for track guard		20	16	30	55	539	398
17	Bolt for track shoes		22	384	37	115	1127	832
18	Fixing bolt for front pin		16	10	24	27	265	195
19	Breaker Filter (Optional)			1	30	27	265	195
20	Grease valve for track adjuster		PF 1/2	2	27	14	137	101

BUCKET SHIMMING PROCEDURES

New Bucket Installation

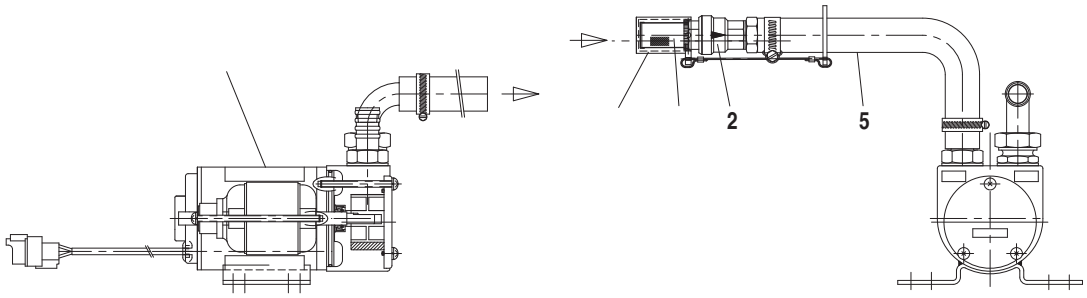
1. If a new bucket is being installed on the excavator, measure the inside dimension between the bucket ears and the outside dimension across the arm mounting boss.
2. Subtract the clearance on both sides from the difference of the two and shim accordingly, before assembly.

WARNING

To check end play (side to side) clearance at bucket attachment point, the bucket must be free to move but at all other times lower it to the ground or use support blocks to immobilize this assembly. Shut off engine and tag and lock out controls to prevent movement during this procedure.

The transfer pump is used to transfer fuel from a refueling source to the fuel tank. A check valve is installed in the inlet hose to prevent fuel from flowing back from fuel tank to source. A strainer is installed in inlet hose to prevent any foreign material from being introduced into transfer pump or fuel tank.

A thermal limiter, built into the motor, will automatically shut off power if motor is overheating to protect it from being damaged.



FG000161

Figure 137

Reference Number	Description
1	Body
2	Check Valve
3	Strainer

Reference Number	Description
4	Strainer Cap
5	Inlet Hose

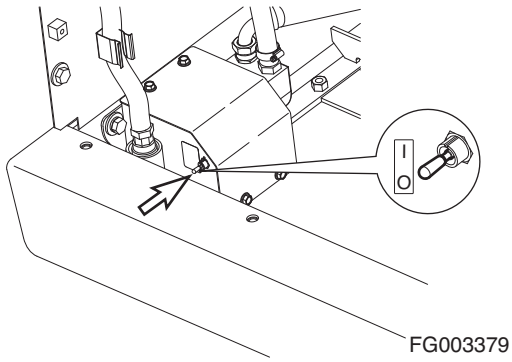
1. Remove strainer cap (4, Figure 137) from strainer (3) on end of inlet hose (5).

   NOTE: *Keep strainer cap (4*, Figure 137*) in a safe location to reseal strainer (3) after refueling is complete.*

2. Insert inlet hose (5, Figure 137) into refueling tank.
3. Turn fuel pump switch (Figure 138) inside of battery box on front side to "I" (ON) position.

   NOTE: *Transfer pump rate of flow is approximately 35 liters/minute (9.24 U.S. gpm). Use extra care not to overfill fuel tank so that fuel does not over flow.*

4. Once fuel transfer is completed, immediately turn switch to "O" (OFF) position to stop pump.
5. Lift inlet hose (5, Figure 137) from fueling source and turn switch to "I" (ON) position for two - three seconds to drain remaining fuel from hose to fuel tank.
6. Install strainer cap (4, Figure 137) on inlet strainer (3) and return hose (5) to storage position.



FG003379

Figure 138

Transportation

Obey all local, state or federal regulations for the transportation of the excavator. If unsure of regulations check with local authorities.

Check the intended route for road width, overhead clearances, weight restrictions, and traffic control regulations. Special approval or permits may be required.

LOADING AND UNLOADING

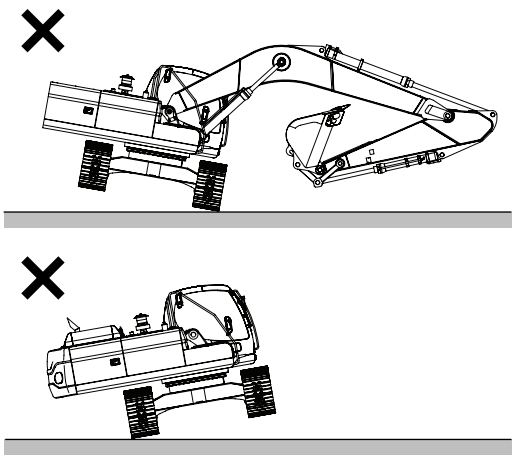
Warning for Counterweight and Front Attachment Removal

DANGER

DOOSAN **warns any user, that the removal of the counterweight from the machine, front attachment or any other part, may affect the stability of the machine. This could cause unexpected movement, resulting in death or serious injuries.** ***DOOSAN*** **is not liable for any misuse.**

Never remove the counterweight or front attachment unless the upper structure is in-line with the lower structure.

Never rotate the upper structure once the counterweight or front attachment has been removed.



FG000371

Figure 1

TRAVEL SYSTEM

Problem	Cause	Remedy
Travel motion does not function.	Center joint leaking.	Repair or replace as required.
	Parking brake will not release.	Repair parking brake.
	Travel motor failed.	Repair or replace as required.
	Remote control valve failed.	Repair or replace as required.
	Wrong pilot line connection.	Reconnect pilot lines.
Travel speed is too low.	Track tension too high or too low.	Adjust tension.
	Damaged rollers or idlers.	Repair or replace as required.
	Track frame damaged.	Repair as required.
	Parking brake will not release.	Repair parking brake.