Doosan Infracore

DX350LC

Serial Number 6113 and Up

Operation & Maintenance Manual

K1046035BE
(Equipped with ROPS)
November 2010

Learn Signal Words Used with Safety Alert Symbol

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

CAUTION

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

WARNING

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

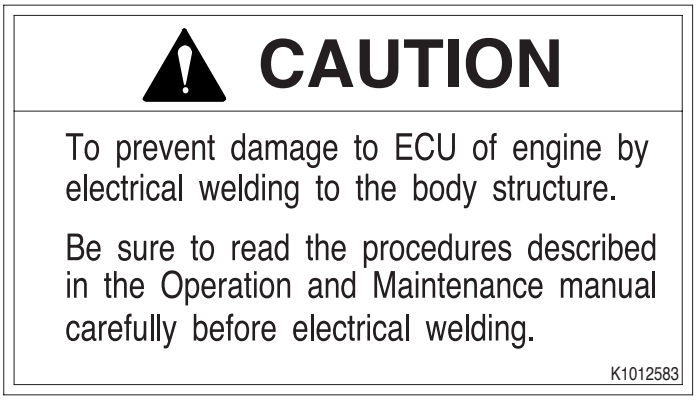
DANGER

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

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

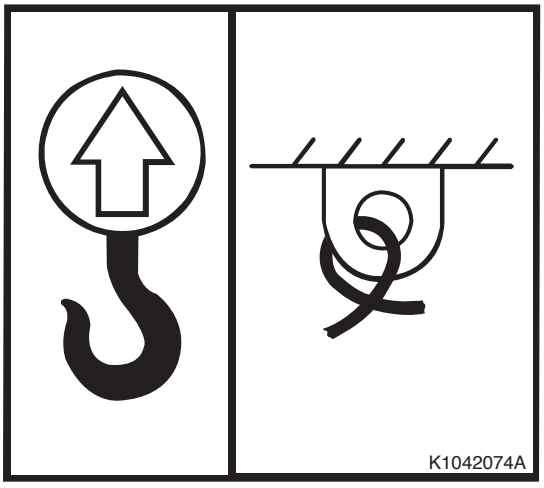
DOOSAN cannot predict every circumstance that might involve a potential hazard in operation and maintenance. Therefore the safety messages in this manual and on the machine may not include all possible safety precautions. If any procedures or actions not specifically recommended or allowed in this manual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

17. Warning for Engine ECU (K1012583)



FG014331

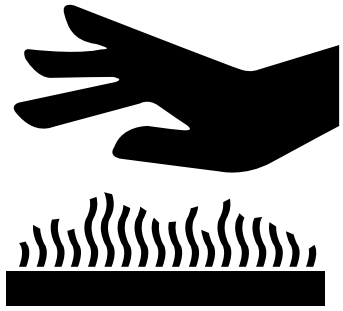
18. Warning for Lifting, Tie Down (K1042074A)



FG014828

Precautions When Handling Fluids at High Temperature

Immediately after operations are stopped, the coolant, engine oil, and hydraulic oil are at highest temperatures and the radiator and hydraulic tank are still under pressure. Attempting to remove cap, drain the oil or coolant, or replacing the filters may lead to serious burns. Always wait for the temperature to go down, and follow the specified procedures when carrying out these operations.



HAOA050L

Figure 6

To prevent hot coolant from spurting out, shut down engine, wait for the coolant to cool, then loosen the cap slowly to relieve the pressure.

To prevent hot oil from spurting out, shut down engine, wait for the oil to cool, then loosen the cap slowly to relieve the pressure.

HAOA060L

Figure 7

Asbestos Dust Hazard Prevention

Asbestos dust can be HAZARDOUS to your health if it is inhaled. Materials containing asbestos fiber can be present on work site. Breathing air that contains asbestos fiber can ultimately cause serious or fatal lung damage. To prevent lung damage from asbestos fiber, observe following precautions:

- Use a respirator that is approved for use in an asbestos-laden atmosphere.
- Never use compressed air for cleaning.
- Use water for cleaning to keep down the dust.
- Work on the machine or component with the wind at your back whenever possible.
- Always observe any regulations related to the work site and working environment.

ARO1770L

Figure 8

Always keep to the permissible water depth. Permissible water depth is to the centerline of the upper track rollers.

When traveling over bridges or structures on private land, check first that bridge or structure can withstand the weight of the machine. When traveling on public roads, check with the local authorities and follow their instructions.

Traveling on Slopes

Never jump onto a machine that is running away to stop it. There is a danger of serious injury.

Traveling on slopes could result in the machine tipping over or slipping.

On hills, banks or slopes, carry the bucket approximately 20 - 30 cm (8 - 12 in) above the ground. In case of an emergency, quickly lower the bucket to the ground to help stop the machine.

Do not travel on grass, fallen leaves, or wet steel plates. Even slight slopes may cause the machine to slip to the side, so travel at low speed and make sure that machine is always traveling directly up or down the slope.

Avoid changing travel direction on a slope. This could result in tipping or sideslipping of the machine.

When possible, operate the machine up slopes and downslopes. Avoid operating the machine across the slope, when possible.

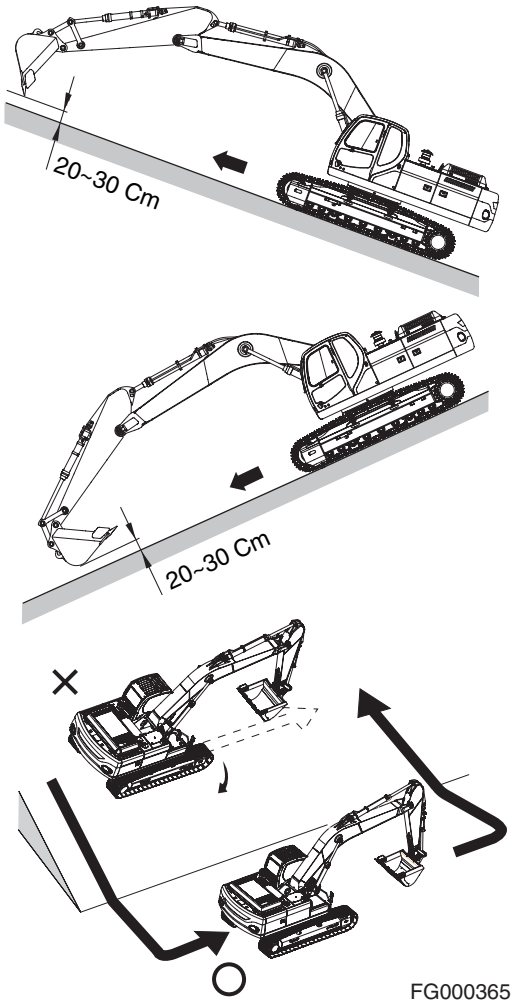
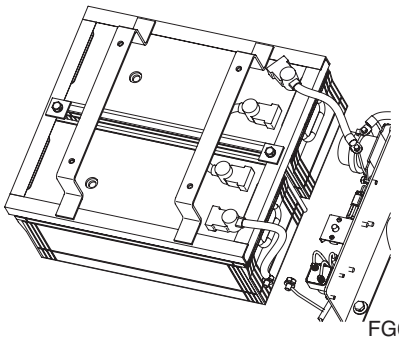


Figure 20

Preparation for Electrical Welding on Body Structure

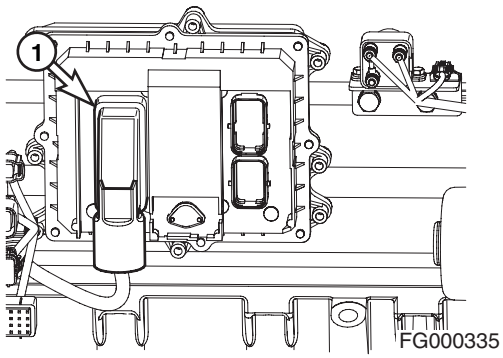
To prevent damage to ECU by electrical welding, please observe the following procedures:

1. Open the door of the battery cover.
2. Detach the cover after loosening the bolts on the battery.
3. Detach the positive and negative terminal cables from the battery.
4. Detach the undercover, and after that detach the connector (1) from the ECU that are installed at the engine.
5. Proceed with welding.
6. After welding, carefully reassemble the connector(1).
7. Connect the battery terminal cables.
8. Reassemble the undercover under the engine.
9. Reassemble the cover over the battery.
10. Close the cover of the battery.



FG000312

Figure 38



FG000335

Figure 39

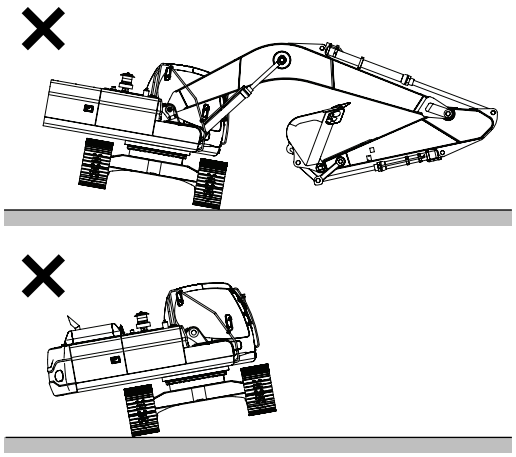
Warning for Counterweight and Front Attachment Removal

DANGER

DOOSAN **warns any user, that 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.**

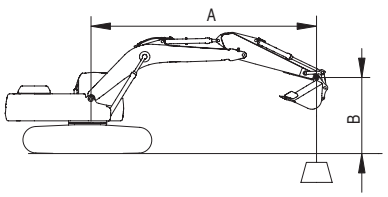
Never remove counterweight or front attachment unless the upper structure is in-line with the lower structure.

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



FG000371

Figure 40



TRACK WIDTH	: 3.28 m (10' 9") STD TRACK
BOOM	: 6.5 m (21' 4")
ARM	: 3.2 m (10' 6")
BUCKET	: SAE 1.49 m^3 HEAPED (CECE 1.3 m^3)
SHOE	: 800 mm (32")
	: RATING OVER FRONT
	: RATING OVER SIDE OR 360 degree
UNIT	: 1,000 kg (1,000 lb)

METRIC

A(m) / B(m)	2		3		4		5		6		7		8		9		MAX. REACH		
																			A(m)
8																	* 6.05	* 6.05	7.48
7													* 6.61	6.28			* 6.07	6.01	8.19
6											* 6.91	* 6.91	* 6.75	6.22			* 6.18	5.31	8.73
5											* 7.45	* 7.45	* 7.06	6.12	* 6.82	4.96	* 6.39	4.84	9.12
4							* 10.50	* 10.50	* 9.07	* 9.07	* 8.13	7.47	* 7.50	5.99	* 7.06	4.89	* 6.69	4.53	9.39
3			* 9.78	* 9.78	* 16.01	* 16.01	* 12.29	12.28	* 10.20	9.24	* 8.88	7.25	* 7.98	5.84	* 7.36	4.79	6.67	4.32	9.55
2					* 18.56	16.66	* 13.91	11.77	* 11.27	8.92	* 9.60	7.04	* 8.47	5.70	7.26	4.70	6.54	4.22	9.59
1			* 6.05	* 6.05	* 17.11	16.13	* 15.11	11.39	* 12.14	8.65	* 10.22	6.85	8.64	5.57	7.17	4.62	6.54	4.20	9.53
0 (GROUND)			* 8.88	* 8.88	* 17.23	15.88	* 15.80	11.14	* 12.73	8.46	10.53	6.71	8.53	5.47	7.10	4.55	6.67	4.27	9.37
-1	* 8.82	* 8.82	* 12.08	* 12.08	* 19.46	15.79	* 16.00	11.01	* 12.99	8.34	10.42	6.61	8.46	5.40	7.06	4.51	6.96	4.45	9.08
-2	* 12.26	* 12.26	* 15.66	* 15.66	* 19.78	15.80	* 15.76	10.97	* 12.91	8.29	10.37	6.57	8.43	5.38			7.45	4.76	8.68
-3	* 15.86	* 15.86	* 19.78	* 19.78	* 18.69	15.89	* 15.10	11.01	* 12.45	8.30	10.38	6.58	8.45	5.40			8.26	5.28	8.12
-4	* 19.89	* 19.89	* 21.45	* 21.45	* 17.07	16.06	* 13.93	11.11	* 11.52	8.37	* 9.54	6.65					* 8.81	6.14	7.39
-5	* 23.71	* 23.71	* 18.23	* 18.23	* 14.74	* 14.74	* 12.10	11.29	* 9.90	8.53							* 9.03	7.71	6.42
-6					* 11.29	* 11.29	* 9.12	* 9.12									* 8.98	* 8.98	5.07

FEET

A (ft) / B (ft)	10'		15'		20'		25'		30'		MAX. REACH		
													A (ft)
25'							* 14.49	* 14.49			* 13.32	* 13.32	25' 6"
20'							* 14.92	* 14.92			* 13.60	11.83	28' 6"
15'					* 18.44	* 18.44	* 16.32	14.53	* 15.17	10.57	* 14.34	10.34	30' 4"
10'	* 25.56	* 25.56	* 29.74	29.74	* 22.03	19.90	* 18.21	13.97	15.82	10.29	14.73	9.55	31' 4"
5'	* 12.05	* 12.05	* 35.89	29.25	* 25.37	18.90	* 20.06	13.42	15.51	10.00	14.39	9.26	31' 5"
0 (GROUND)	* 20.19	* 20.18	* 38.74	28.22	* 27.54	18.20	20.30	13.00	15.27	9.78	14.71	9.42	30' 9"
-5'	* 31.18	* 31.18	* 38.67	27.90	* 28.13	17.87	20.06	12.77			15.85	10.13	29' 2"
-10'	* 44.69	* 44.69	* 36.25	28.03	* 26.90	17.86	20.07	12.79			18.33	11.71	26' 7"
-15'	* 43.01	* 43.01	* 31.12	28.53	* 23.17	18.18					* 19.73	15.23	22' 6"
-20'			* 21.27	* 21.27							* 19.70	* 19.70	16' 1"

1. LOAD POINT IS THE END OF THE ARM.
2. CAPACITIES MARKED WITH AN ASTERISK (*) ARE LIMITED BY HYDRAULIC CAPACITES.
3. LIFT CAPACITIES SHOWN DO NOT EXCEED 75 % OF MINIMUN TIPPING LOAD OR 87 % OF HYDRAULIC CAPACITIES.
4. THE LEAST STABLE POSITION IS OVER THE SIDE.
5. THE TOTAL MASS OF MACHINE IS 32,800 kg INCLUDED IN THIS MASS BOOM 6.50 m, ARM 3.20 m, 7,100 kg COUNTERWEIGHT, BUCKET WEIGHT 0 kg, ALL OPERATING FLUIDS A 75 kg OPERATOR.
6. LIFT CAPACITIES ARE IN COMPLIANCE WITH ISO 10567.

FG014636

Reference Number	Description
1	Starter Switch
2	Heater and Air Conditional Control Panel
3	Power Socket for 12v
4	Cigarette Lighter
5	Engine Emergency Stop Switch
6	Engine Speed Control Dial
7	Travel Speed Selector Switch
8	Light Switch
9	Breaker / Booster / Shear Selector Switch
10	Cabin Work Light Switch (Optional)
11	Audio Control Panel
12	Wiper Control Panel
13	Warning Light Switch (Optional)
14	Lower Wiper Switch (Optional)
15	Quick Clamp Switch (Optional)

Reference Number	Description
16	Travel / Swing Alarm Switch (Optional)
17	Fuel Heater Switch (Optional)
18	Reverse Fan Switch (Only use for DX420, 480LC)
19	Overload Warning Switch (Optional)
20	2-Pump Flow Control Switch (Optional)
21	Power Socket For 12v (Optional)
22	Horn Button
23	Rotating Buttons
24	Shear Buttos
25	Breaker Button
26	Instrument Panel
27	Photo Sensor
28	Safety Lever
29	Auxiliary Mode Switch

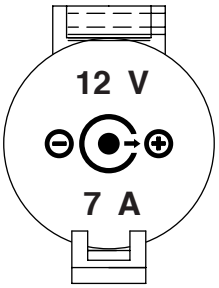
21. Power Socket for 12 Volt (Optional)

This is a power socket for only 12V DC devices.

This socket can be used for charging a cellular phone or powering a small 12V DC electrical device.

Open the cap when using it.

NOTE: *This socket is designed for small electrical capacity devices. Do not use this socket for large electrical capacity devices. Thus, damage can be avoided.*



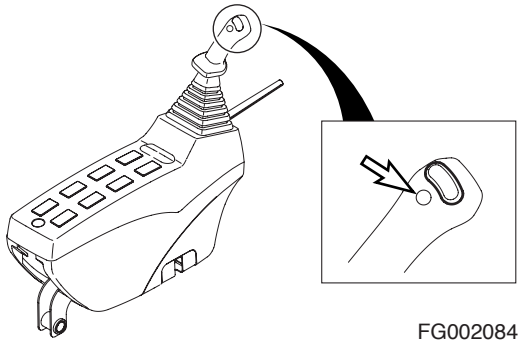
FG017015

Figure 31

22. Horn Button (Left-hand Work Lever)

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

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



FG002084

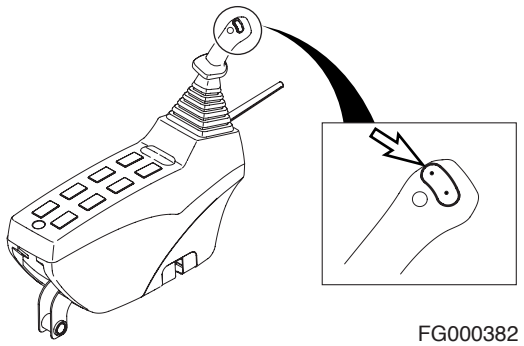
Figure 32

23. Rotating Buttons

For a machine equipped with an attachment that rotates, press the upper two buttons on the top of the left-hand work lever (joystick) to rotate the attachment clockwise or counterclockwise. Left button is for counterclockwise and the right one is for clockwise.

WARNING

Before using any attachment in a work application, be sure to check its functional control. Make sure that desired movement or action is being activated by the control. e.g. opening/closing, CW/CCW, crowd/dump, etc.



FG000382

Figure 33

MULTIFUNCTION GAUGE AND GRAPHIC INFORMATION

When the engine starter switch is turned to the "I" (ON) position, a LOGO will appear on the display screen for about two seconds.

When the LOGO disappears, the multifunction gauge and graphic information screen will appear.

The engine rpm is normally displayed at the bottom of the screen when the starter switch is first turned "ON." Each time the display selector button (19, Figure 40) is pressed, the digital readout changes in the following sequence; Engine speed (rpm) -> Battery voltage (VOLT) -> Front pump pressure (BAR) -> Rear pump pressure (BAR).

NOTE: *See Figure 57 thru Figure 60.*

A digital clock is located at the top of the display.

By using a combination of the mode selector buttons, information for filters and oils can also be displayed.

The display can also be set for the desired language.

Refer to the “Setting Main Menu” on page 2-35 for the language selection and information display sequences.

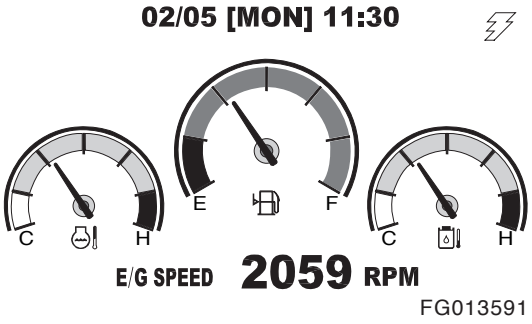


Figure 54

Communication Indicator

Indicates the condition of communication between main controller and instrument panel.

1. Normal Condition:

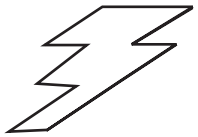
   The symbol will sequentially move like lightening.

   NOTE: *See Figure 57 thru Figure 60.*

2. Abnormal Condition:

   If the symbol is not displayed, it means there is a communication error.

   NOTE: *See Figure 56.*



FG000047

Figure 55

Display Selection and Escaping

Display Selection

When the display button (Figure 82) is pressed for more than three seconds, the main menu screen (Figure 84) is displayed.

In the normal display screen, the engine speed (rpm), battery voltage (volt), front pump pressure (bar), and rear pump pressure (bar) can be displayed.

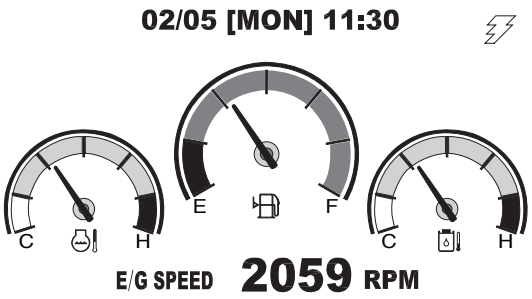
FG000070

Figure 82

ESC Button

The screen will return from the main menu to the normal display screen, by again pressing the "ESC" ( ) button.

NOTE: *If more than twenty seconds are spent in any menu, without changing the screen, it will return to the normal display screen.*



FG013591

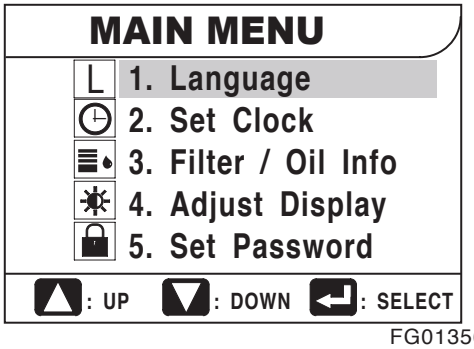
Figure 83

Main Menu

The menu selection can be changed by pressing the "UP" (▲) or "DOWN" (▼) buttons. The selected menu item will be highlighted, and a cursor will appear by the menu item.

When the selected menu item is highlighted, press the "SELECT" (↵) button to enter the next submenu.

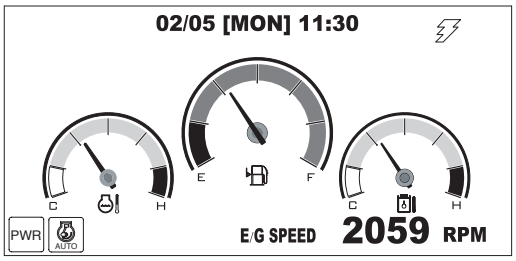
1. “Language” on page 2-38.
2. “Set Clock” on page 2-38.
3. “Filter / Oil Info” on page 2-39.
4. “Adjust Display” on page 2-41
5. “Set Password (Lock and Unlock)” on page 2-42



FG013563

Figure 84

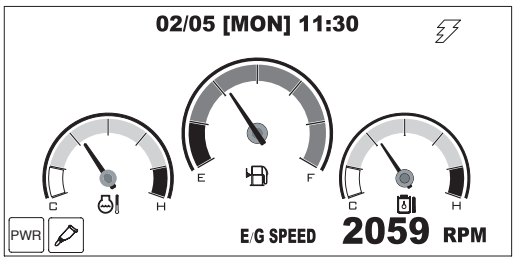
Auto Idle Selection



FG013723

Figure 109

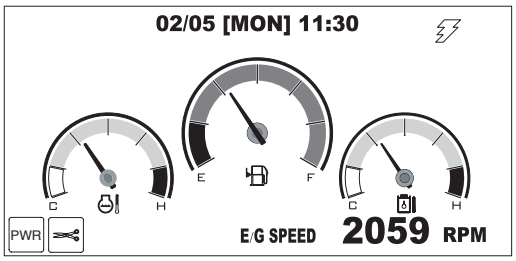
Breaker Selection



FG013725

Figure 110

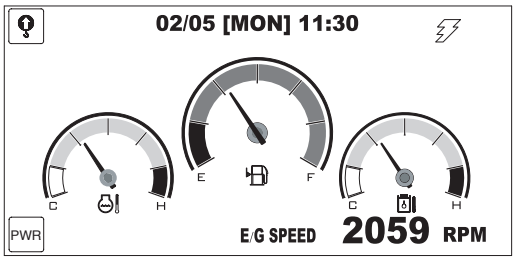
Shear Selection



FG013726

Figure 111

Overload Alarm Selection (Optional)



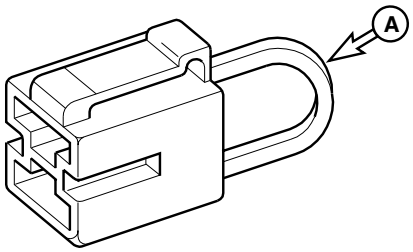
FG013727

Figure 112

Fusible Link

A fusible link is in the battery box.

If the engine does not crank, first check that starter switch is turned "ON" and that no power is available (No indicator lights will light.). Check that "A" portion (Figure 137) of the fusible link is not broken or burned through. Replace the fusible link if damage and investigate cause.



HAAE2120

Figure 137

WARNING

When changing the fusible link, replace the fusible link with the same capacity part. Otherwise, a fire could break out in the wiring harness and/or other components of the circuit. Always use original *DOOSAN* parts.

Fuse Boxes

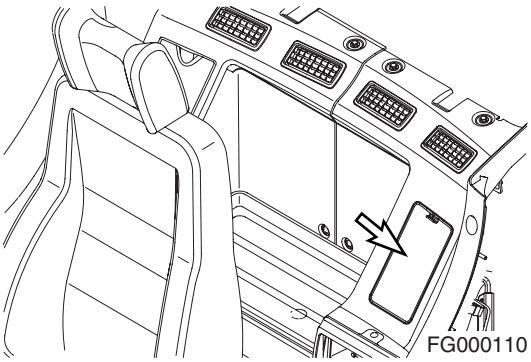
There are two fuse boxes (Figure 138) on the left side of the heater box. The fuses prevent electrical devices from overloading or shorting.

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 4-75.*

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.



FG000110

Figure 138

CAUTION

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

SUN VISOR

The excavator has two sun visors

Front Window Visor

The sun visor can be used to reduce the amount of sunlight coming through the front window and ceiling.

When wanting to reduce the amount of sunlight coming in the front window, pull bar (1, Figure 158) down.

When not wanting protection, hold bar with left-hand and push release button (2, Figure 158) with right-hand. This will allow visor to retract.

NOTE: *Do not allow visor to roll backup without holding it. Not holding it may result in damage to visor and retract mechanism.*

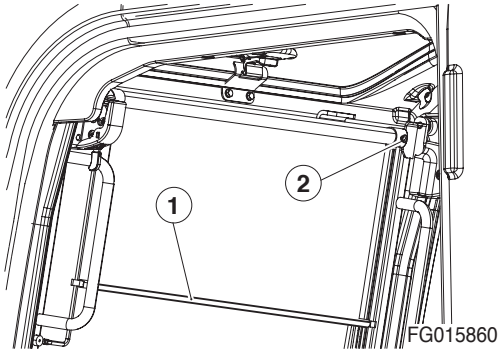


Figure 158

Ceiling Window Visor

When you wish to use visor, pull handle on bar (1, Figure 159) to middle holders (2, Figure 159) or the end holders (3, Figure 159). Hook bar on holders to secure visor in place.

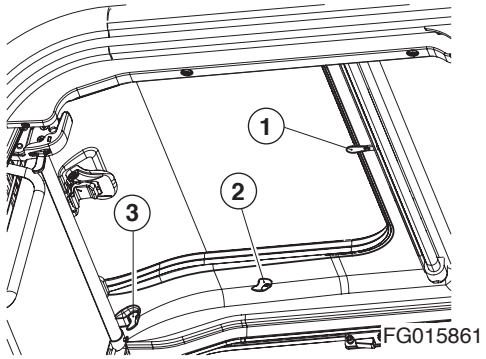


Figure 159

Pull visor to release it. It will return to its original position.

NOTE: *Do not allow visor to roll backup without holding it. Not holding it may result in damage to visor and retract mechanism.*

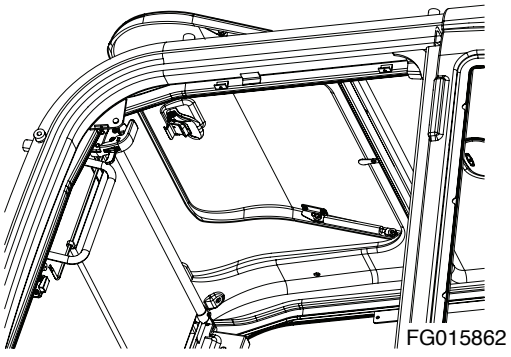


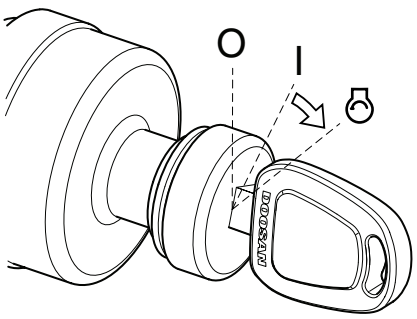
Figure 160

5. After the preheat completion, immediately turn starter switch to "⏻" (START) position (Figure 10). Engine should start in approximately five seconds.

⚠ WARNING

If the engine does not start after approximately fifteen seconds of cranking, release the starter switch. Wait about five minutes and repeat above step.

6. After engine has started, release key. Key will return to the "I" (ON) position (Figure 10).
7. After the engine starts, 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.
8. Follow "Hydraulic System Warm-up" procedures in this section. (See page 3-10)

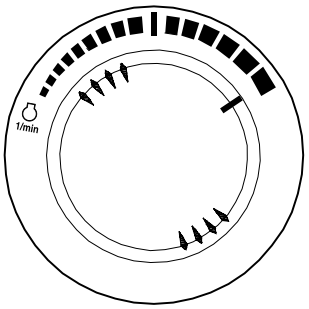


FG000085

Figure 10

General Travel Instructions

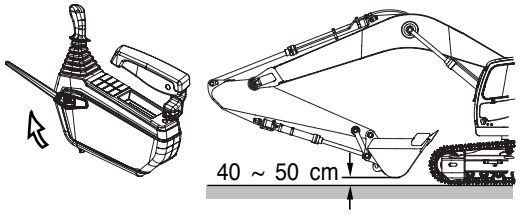
1. Set engine speed control dial (Figure 31) on desired speed.



HAOB550L

Figure 31

2. Set safety lever on "UNLOCK" position, and folding the front, raise it 40 - 50 cm (16 - 20 in) above ground. See Figure 32.



FG015868

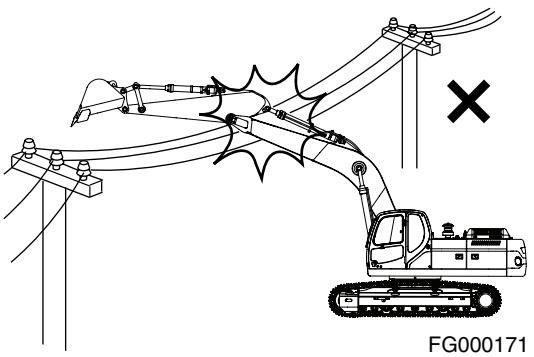
Figure 32

3. When possible, travel on firm, level ground. Avoid sudden movements and sharp turns.
4. When traveling on rough ground, travel at a slow speed [1.0 - 1.5 km/h (0.62 - 0.93 MPH)]. Reduced engine speed, to avoid shock loading the equipment. Be careful that an excessive force is not added to equipment by touching or climbing on rocks.

FG000423

Figure 33

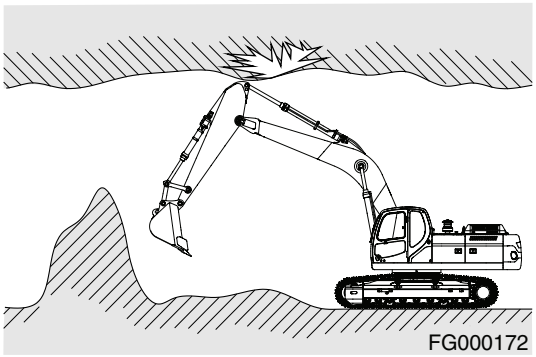
11. Make sure there is adequate clearance from overhead electrical supply lines. See Figure 59.



FG000171

Figure 59

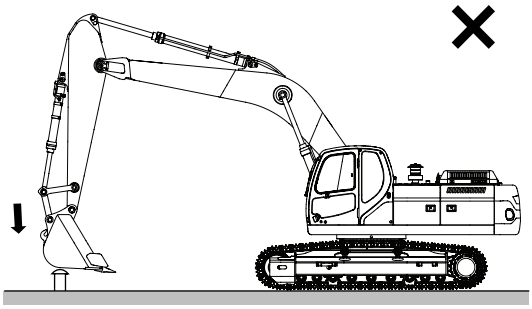
12. If the excavation is in an underground location or in a building, make sure there is adequate overhead clearance and there is adequate ventilation. See Figure 60.



FG000172

Figure 60

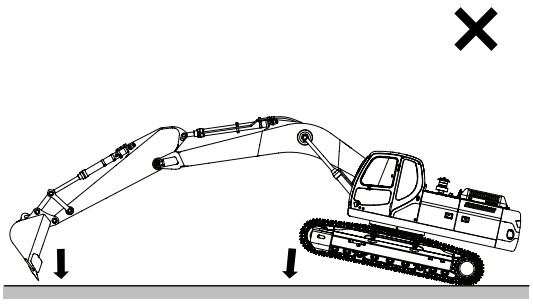
13. Do not use the bucket as a hammer or ramming device. This is dangerous and causes damage to the front attachment. See Figure 61.



FG000173

Figure 61

14. Do not dig with the excavator tracks raised. This can result in structural and mechanical failures.



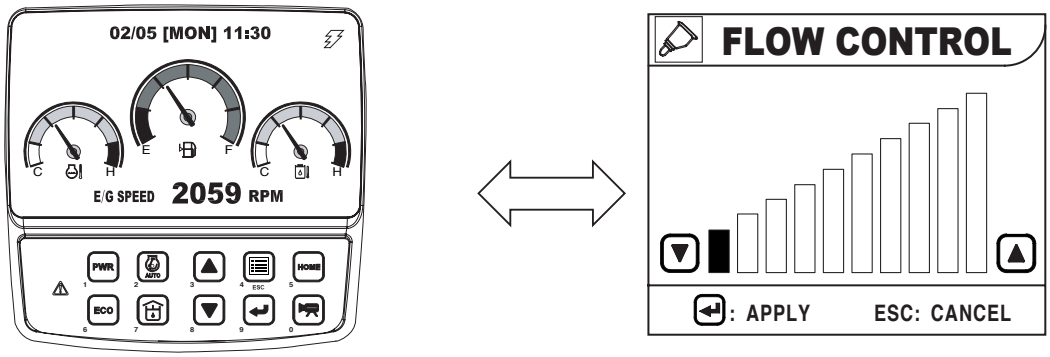
FG000174

Figure 62

ADJUSTING THE PUMP FLOW

NOTE: *For further information, see "Flow Control" on page 2-44.*

1. On the instrument panel, press the flow control button , the flow control screen (Figure 81) will be displayed.
2. Use "UP" (▲) or "DOWN" (▼) buttons to adjust flow rate.
3. Press "SELECT" (↵) button, to return to normal display screen and save the flow rate setting.



<Normal Display> <Flow Control Display>

FG013831

Figure 81

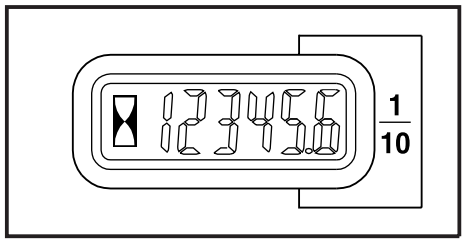
Flow Control Step	Pump Flow Setting (l/min)
0	50
1	80
2	110
3	130
4	150
5	170
6	190
7	210
8	230
9	250
10	264

Inspection, Maintenance and Adjustment

PREVENTIVE MAINTENANCE

Routine maintenance and inspections are required to keep your machine in the correct operating condition. The following pages list the inspection intervals, the system or component checks, and location references.

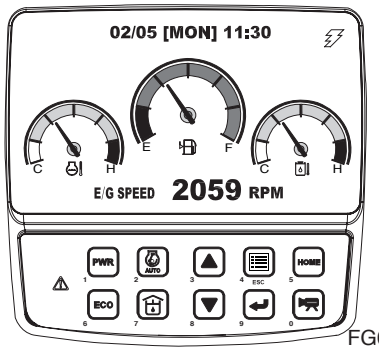
NOTE: *The following pages list the service checks and their required intervals. The service cycles may need to be shortened depending on the working conditions. Extremely hot or dusty conditions will require more frequent service. Operational hours are determined by the amount of time accumulated on the engine hour meter on the control console in the cabin.*



HAOA601L

Figure 1

NOTE: *Besides the normal hour meter, the multifunction gauge can be used to keep track of the hours on individual filters. See “Filter / Oil Info” on page 2-39.*



FG013662

Figure 2

SERVICE DATA									
No.	Items to Check	Service	Qty.	DX350LC					
				Service Interval					
				10	50	250	500	1000	2000
1	Arm, Bucket Joint Pin	Grease	5	F100	W10				
2	Boom, Arm Joint Pin	Grease	12	F100		W10			
3	Swing Bearing	Grease	3		W10				
4	Swing Gear	Grease	1						
5	Swing Reduction Gear	Grease	1					W10	
6	Swing Device	Gear Oil (80W90)	6 ℓ	V		F			
7	Track Spring	Grease	2				W10		
8	Travel Reduction Device	Gear Oil (80W90)	2X5.5 ℓ			F, V			
9	Engine Oil	Engine Oil (10W40)	36 ℓ	V	F				
10	Hydraulic Oil Tank	Hydraulic Oil	460 ℓ	V					
11	Fuel Tank	Diesel	550 ℓ	V					
12	Fuel Prefilter	Cartridge	1	V					
13	Radiator	Coolant (Antifreeze)	34 ℓ	V					
14	Hydraulic Oil Return Filter	Element	2			F			
15	Pilot Filter	Element	1			F			
16	Hydraulic Oil Suction Strainer	Strainer	1						C
17	Engine Oil Filter	Cartridge	1		F				
18	Fuel Filter	Cartridge	1						
19	Air Cleaner (Outer)	Element	1				C		
	Air Cleaner (Inner)	Element	1						
20	Air Conditioner Filter (Outer)	Cartridge	1				C		
	Air Conditioner Filter (Inner)	Cartridge	1				C		
21	Air Breather Filter	Element	1						
22	Fuel Cap Filter	Element	1						

V: Maintenance and Refill.

C: Cleaning.

F: First Time Exchange Only.

F100: Every 10 Hours For First 100 Hours.

W10: Every 10 Hours If Operating In Water.

EG: Ethylene Glycol - Doosan Genuine Antifreeze Solution (Drain and replace using this interval.) See "Engine Cooling System" on page 4-77, for further explanation.

PG: Propylene Glycol - Extended Life Antifreeze (Drain and replace using this interval.) See "Engine Cooling System" on page 4-77, for further explanation.

: Replacement On Every Interval.

NOTE: *For additional service items see list of "Maintenance Intervals" on page 4-12.*

4. If the coolant is below the "LOW" mark, add coolant to this tank.

Check Level of Window Washer Liquid

1. Open left front access door and check fluid level in windshield washer tank.
2. Open fill cap and add fluid.

   NOTE: *Use a washer liquid that is rated for all seasons. This will prevent freezing during cold weather operation.*

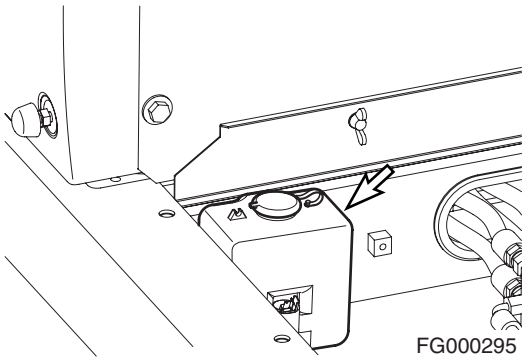


Figure 30

Inspect the Bucket Teeth and Side Cutters for Signs of Wear

1. On a daily basis, inspect the bucket teeth to make sure that tooth wear or breakage has not developed.
2. Do not allow the replaceable bucket teeth to wear down to the point that the bucket adapter is exposed. See Figure 31.

   NOTE: *These instructions are only for DOOSAN OEM buckets. If you are using other manufacturers' buckets, refer to their specific instructions.*

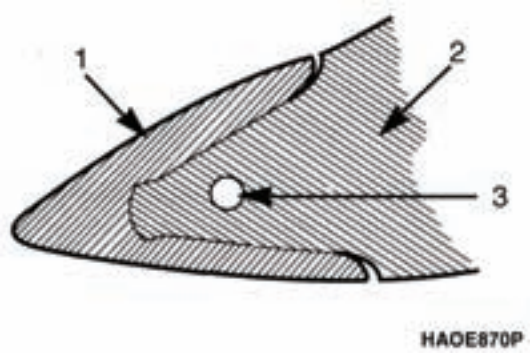


Figure 31 1. POINT, 2. ADAPTER and 3. PIN

Inspect Engine Fan Blade

⚠ WARNING

Personal injury can result from a fan blade failure. Never pull or pry on the fan. This can damage the fan blade(s) and cause fan failure.

NOTE: *Manually rotate the crankshaft by using a wrench on the accessory drive pulley nut.*

1. An inspection of the cooling fan is required daily. Check for cracks, loose bolts, bent or loose blades, and for contact between the blade tips and the fan shroud. Check the fan to make sure it is securely mounted. Tighten the bolts if necessary. Replace any fan that is damaged

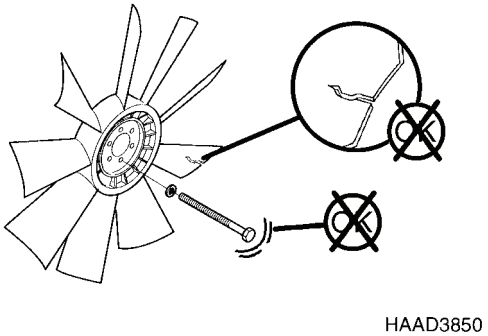


Figure 32

Check Engine Fan Belt Wear

WARNING

Keep clear of engine fan and fan drive belts when the engine is running. Rotating fan and belt contact can cause injury.

WARNING

When checking, adjusting or replacing drive belts, care must be taken to prevent accidental cranking of the engine. Be sure the starter switch is in the "OFF" position and the controls are tagged.

1. Replace badly worn, greasy or severely cracked belts immediately. These conditions prevent proper belt function. Visually inspect the belt. Check the belt for intersecting cracks. Transverse (across the belt width) cracks are acceptable. Longitudinal (direction of belt length) cracks that intersect with transverse cracks are not acceptable. Replace the belt if it is frayed or has pieces of material missing.
2. Before installing new belts, make sure all pulley grooves are clean and not worn. Replace pulley, if damaged, or if the grooves are worn.
3. All pulley support bearings, shafts, and brackets must be in working order.
4. When replacing belts and pulleys, pulley alignment must be checked with belts tensioned and brackets securely clamped. A misalignment that can be detected by the naked eye is detrimental to belt performance.
5. Do not force the belts into the pulley grooves by prying with a screwdriver or pry bar. This will damage the belt side cords which will cause the belts to turn and result in complete destruction of the belts in operation.
6. Belts on new machines and replacement belts lose their tension as they seat into the pulley grooves. Check the tension of new belts at 50 hour intervals until tension is stabilized and thereafter, every 250 hours. If the tension falls below the required minimum, the belt slips damaging the belts and pulley grooves.

   NOTE: *When operating in abrasive conditions, check tension every 100 hours.*

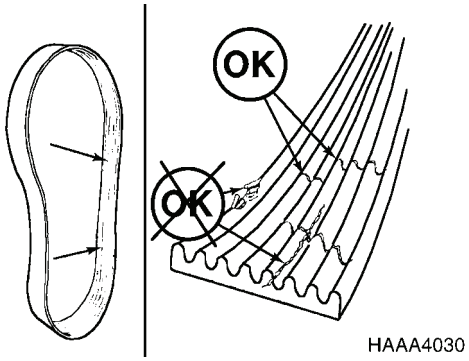
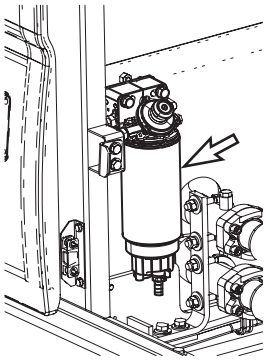


Figure 46

Change of Fuel Prefilter

1. Open the left rear side door to access fuel prefilter.
2. Position a small container under prefilter. Drain fuel by opening drain valve on bottom of filter.

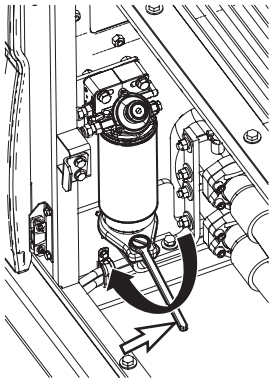
   NOTE: *Dispose of drained fluids according to local regulations.*



FG002133

Figure 65

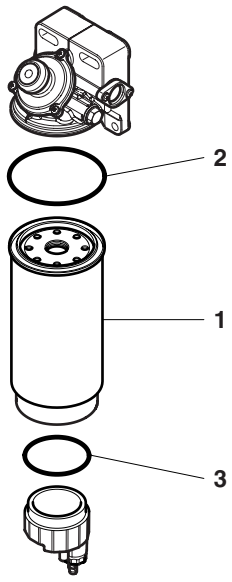
3. Remove the bowl using supplied tool.
4. Remove the cartridge.



FG002140

Figure 66

5. Coat surface of packing (2, Figure 67) with fuel on new cartridge (1).
6. Tighten the cartridge by hand until the packing comes into contact with the surface of the filter housing head.
7. When it reach the surface, tighten the cartridge about 3/4 of a turn more.
8. Coat surface of seal (3, Figure 67) with fuel, and tighten the bowl with tool.



FG000428

Figure 67

2,000 HOUR / YEARLY SERVICE

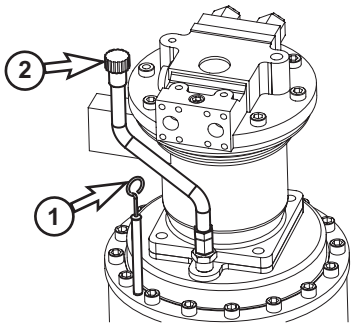
Perform All Daily, 50, 250, 500 and 1,000 Hour Service Checks

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.

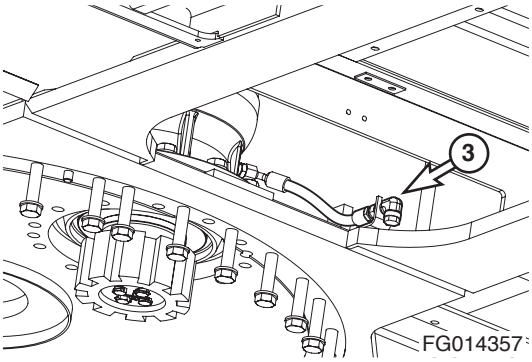


FG002083

Figure 90

1. Set a container under excavator.
2. Release the drain plug (3, Figure 91) and drain the swing reduction device oil into a container.

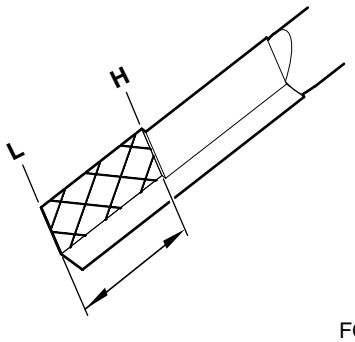
   NOTE: *Dispose of drained fluids according to local regulations.*
3. After draining oil, tighten the drain plug.



FG014357

Figure 91

4. Remove breather/fill cap (2, Figure 90) and add oil to "H" mark on dipstick (1).



FG000419

Figure 92

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	16	8	24	24.5	240	177
		fan side	12	8	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	20	2	30	46	451	333
3	Radiator mounting bolt		16	4	24	27	265	195
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		10	12	17	6.5	64	47
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		16	4	24	24.5	240	177
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	40	36	95	931	687
13	Tightening bolt for travel device		20	52	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 (OPT)		-	1	30	27	265	195
20	Track adjuster grease valve		PF1/2	2	27	14	137	101
21	Mounting bolt for the ROPS		39X3 (Thin Screw)	1	60	250	2450	1807

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.

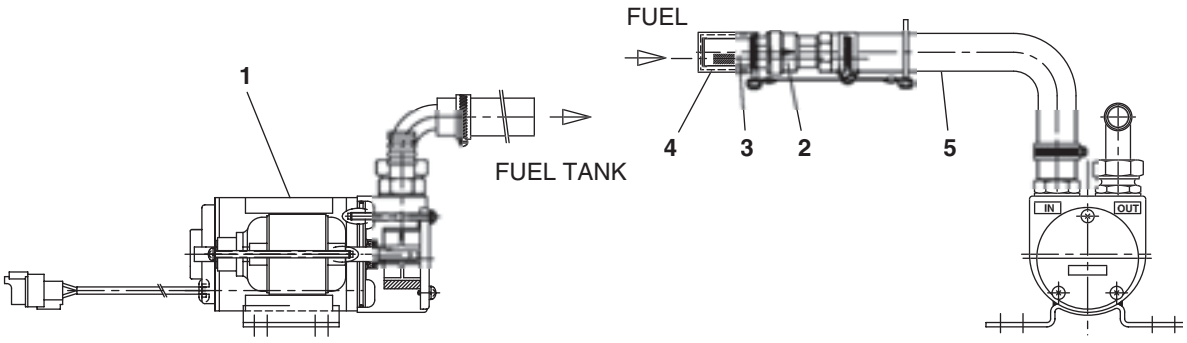
IMPORTANT

If there are any sign of leakage while operating transfer pump, inspect the following components to prevent any fires or hazardous fuel spills.

- **Check all hoses leading to and from the transfer pump.**
- **Check all hose clamps.**
- **Check transfer pump inlet port.**

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.



F(

Figure 142

Reference Number	Description
1	Body
2	Check Valve
3	Strainer

Reference Number	Description
4	Strainer Cap
5	Inlet Hose

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

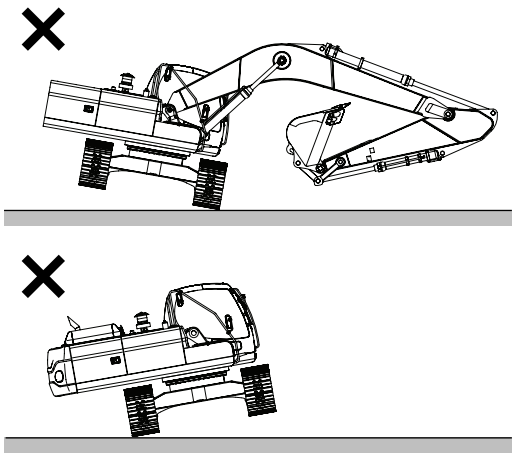
Warning for Counterweight and Front Attachment Removal

DANGER

DOOSAN **warns any user, that 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 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.