ORIGINAL INSTRUCTIONS - *according to Directive 2006/42/EC, Annex I 1.7.4.1*

OPERATOR'S MANUAL

E230CSR

Crawler Excavator

Part number 47426586
1st edition English
October 2012

CE

NEW HOLLAND CONSTRUCTION

Vibration to the operator

The vibration level transmitted to the operator depends mainly upon the conditions of the ground on which operations take place, the mode of operation of the machine and its equipment. The exposure to vibrations can be considerably reduced when the following recommendation are complied with:

- use equipment compatible with the machine and the type of work do be done;
- adjust and lock the seat in the correct position; also inspect regularly the suspensions of the seat, performing the adjustments and repairs as required;
- perform regularly the current maintenance operations of the machine at the prescribed intervals;
- operate the equipment in a uniform manner, preventing, as far as possible, sharp movements or excessive loads;
- when travelling, avoid, as far as possible, particularly rough terrain or the impact against possible obstacles.

This machine is equipped with an operator's seat complying with the requisites of standard **ISO 7096:2008**. This ensures that the exposure of the operator's body to vibrations comply with the protection requisites for the protection against vibrations when the machine operates as required by the operational scopes, in accordance with the prescriptions of this Manual. The operator's seat has been tested in accordance with **EM6** input spectral class and has a **SEAT** transmissibility factor < 0.7.

- The weighted average quadratic acceleration value to which the operator's arms are subjected does not exceed **2.5 m/s²**.
- The weighted average quadratic acceleration value to which the operator's body is subjected does not exceed **0.5 m/s²**. These results were obtained using an acceleration gauge while digging ditches.

NOTE: *the Whole-Body exposure value is determined under particular operating and terrain conditions and therefore may not be representative for all the possible operating conditions within the intended use of the machine. Consequently this single Whole-Body vibration emission value is not intended to determine the Whole-Body vibration exposure as required by European Directive* ***2002/44/EC****. For this purpose it is recommended to conduct working conditions measurement. If this is not feasible use of information provided in the table below from* ***ISO/TR 25398:2006*** *(*).*

Working conditions	Basic emissions value			Standard deviation		
	1.4*aw,eqx	**1,4*aw,eqy**	**aw,eqz**	**1.4*sx**	**1.4*sy**	**sz**
	m/s²	**m/s²**	**m/s²**	**m/s²**	**m/s²**	**m/s²**
Excavation	0.44	0.27	0.30	0.24	0.16	0.17
Hydraulic hammer	0.53	0.31	0.55	0.30	0.18	0.28
Mine	0.65	0.42	0.61	0.21	0.15	0.32
Travel	0.48	0.32	0.79	0.19	0.20	0.23

(*) **ISO/TR 25398:2006** Mechanical vibrations – Guidelines for assessment of exposure to whole-body vibration of ride-on machine – Use of harmonized data measured by international institutes, organizations and manufacturers.

2. Working above ground

Located on top of pump cover.

Part Number - **ZL11N02604**

There is a danger of falling when working on areas above ground.

- Do not approach edges.
- Use the appropriate equipment, such as ladders or platform when working above ground. In addition, strap yourself to the proper equipment accordingly.
- Avoid spillage of any oil or grease.
- Do not leave any tools around the working area.
- Use extreme caution to avoid slipping while walking.
- Do not jump on or from the machine. Use the steps and handrails and securely maintain a three point contact while mounting or dismounting at all times.

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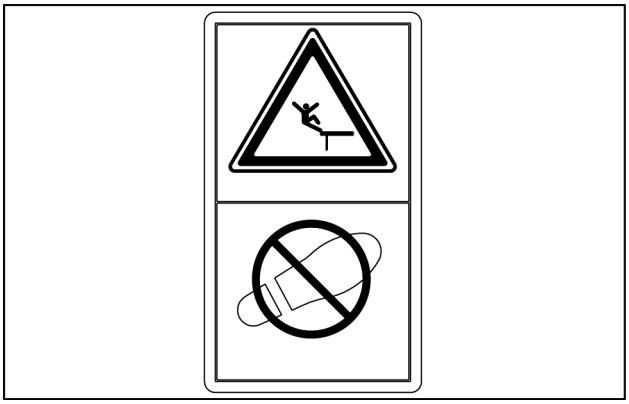
3. Working above ground

Located on top of battery cover

Part Number - **ZL11N02704**

There is a danger of falling when working on areas above ground.

- Do not approach edges.
- Use the appropriate equipment, such as ladders or platform when working above ground. In addition, strap yourself to the proper equipment accordingly.
- Avoid spillage of any oil or grease.
- Do not leave any tools around the working area.
- Use extreme caution to avoid slipping while walking.
- Do not jump on or from the machine. Use the steps and handrails and securely maintain a three point contact while mounting or dismounting at all times.



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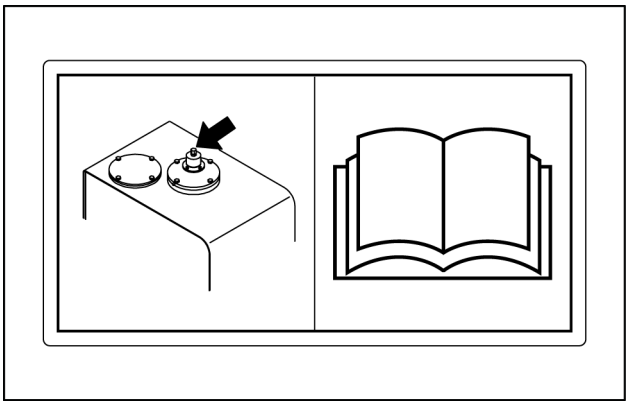
4. Pressurized hot oil

Located on top of hydraulic tank cover and hydraulic tank.

Part Number - **YN20T01355P1** (2REQ'D)

Pressurized hot oil can cause burns.

Depress cap slowly with engine Off to relieve hydraulic tank pressure.



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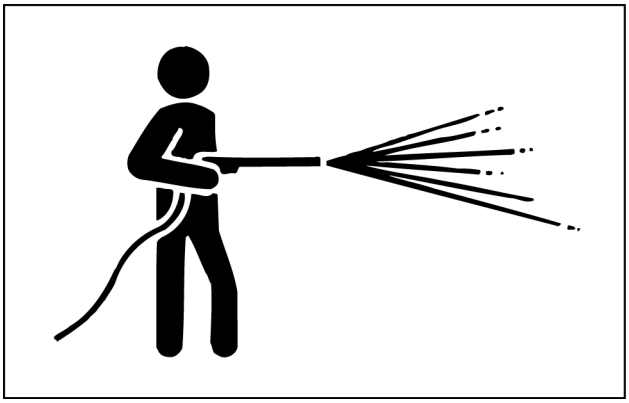
Clean the machine

Keep the machine clean and free of debris, excess or spilled lubricants, fuel and fluids. Use approved solvents, detergents and water to clean the machine and its components on a regular basis.



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NOTICE: *Be careful not to allow water to reach electrical components. Serious damage can occur to the electrical system by allowing water to reach the electrical components. Never clean inside of cab, or electrical components with pressurized water or steam.*

Keep the area around the operator seat clean

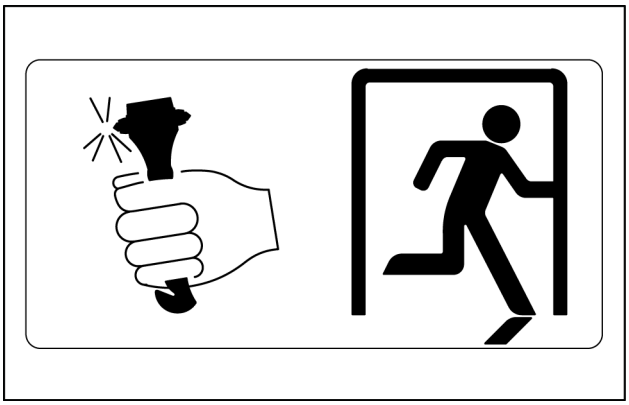
- When taking the operator's seat, do not fail to remove mud, grease and oil, etc. on the sole of shoes. The sole with mud, grease and oil, etc. might slip on the pedal when operating resulting in accident.
  Do not leave parts and tools in the area around the cab.
- Do not leave plastic bottle inside of the cab and put suction cup on the window glass.
  They may do the same job as lenses introducing the possibility of fire.
- Do not take dangerous substances like combustibles and explosive substances into the cab.
- Do not use radio and cellular phone in the cab in traveling operation and working operation.
- After using the ashtray, put out the fire of matches and cigarettes without fail and close the cover.
- Do not leave cigarette lighter inside of the cab. There is a possibility of fire due to high temperature.

How to handle life hammer

A life hammer is provided on the right side of cab. In case of emergency, take the life hammer, break the cab glass, and escape from the cab.

In addition, the life hammer is equipped with a cutter on the lever side to cut the seat belt, etc.

NOTICE: *For the emergency escape way, refer to paragraph headed " **Cab controls - Control identification**".*



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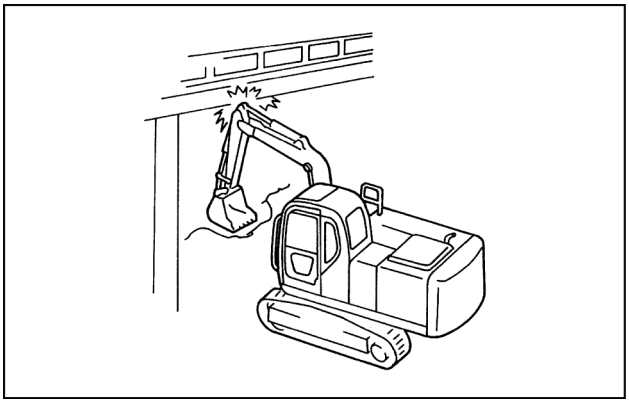
Restricted work areas

In work sites with limited height and swing/traveling areas such as tunnels, bridges, around electrical power lines, other utilities, or inside structures. Use extreme caution on work sites with limited height and swing/traveling areas such as tunnels, bridges, around electrical power lines, other utilities or inside structure.

Keep the machine and its attachment a safe distance to prevent injury, death or damage on equipment or structure.

Use a flagman to guide the operators.



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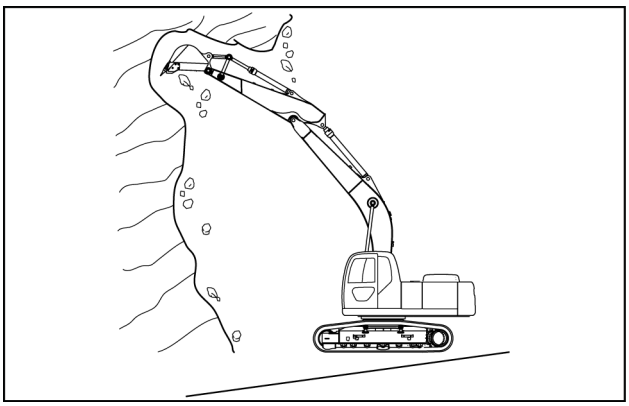
Do not work under precipice / overhang

Do not dig under the precipice. It may cause falling rocks or loosening of the precipice resulting in injury, death or machine damage.



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Check that no person is under the bucket

There is a possibility of accident resulting in injury or death and the damage of machine due to the fall of sand/earth and the direct contact with bucket when the bucket and attachment pass through over the worker and the driver's seat of dump truck. Do not pass the bucket through over person for safety.

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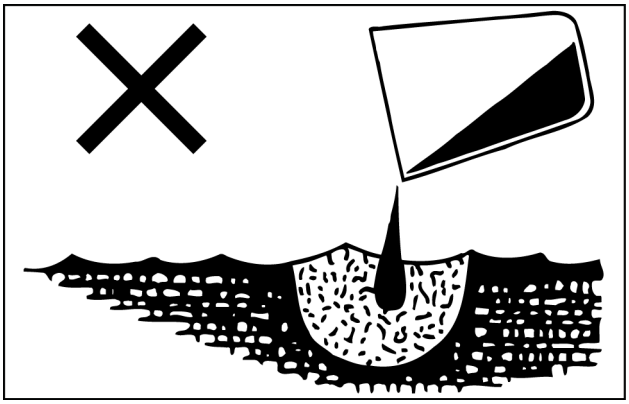
After completion of maintenance work

Check machine for proper functioning when any maintenance is completed:

- After any maintenance work is completed, operate the engine at low idle, and check for leakages and abnormalities.
- Slowly operate each machine function to confirm proper operation.
- Increase the engine speed gradually, and again check for leakages and abnormalities.
- Operate each control lever carefully for smooth operation.

Dispose of waste properly

Dispose of oils, fuel, coolant, solvents, filters, batteries etc. according to federal, state and local codes and regulations regarding hazardous waste disposal. Contact local authorities for proper disposal methods of such materials.



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Opening and closing of engine hood

- Incase that the engine hood is open, do not operate the boom. The attachment collides with the opened hood of engine. As a result, it could cause an accident.
- The opening and closing of the engine hood may be unable to operate depending on the raised boom position. Whenever you need to open the engine hood, place the machine in the parking position.

Battery safety

Burn prevention

Battery acid or battery explosion can cause serious injuries.

Before you service a battery, always wear face protection, protective gloves and protective clothing.

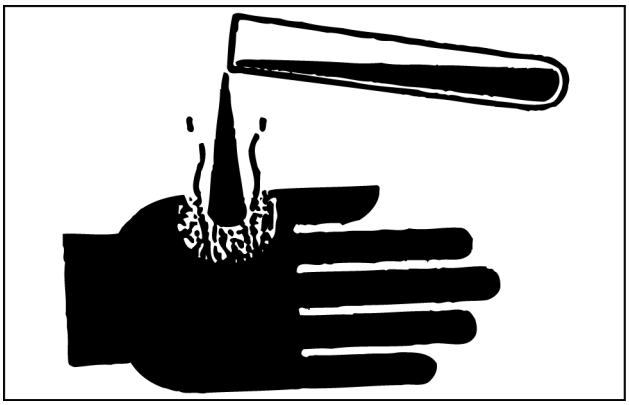
Batteries contain sulfuric acid. Avoid contact with skin, eyes or clothing.

Antidote:

External: Flush with water.

Internal: Drink large quantity of water or milk. Follow with milk of magnesia, beaten egg or vegetable oil. Call physician immediately.

Eyes: Flush with water for **15 min** and get prompt medical attention.



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3 - CONTROLS/INSTRUMENTS

ACCESS TO OPERATOR'S PLATFORM

Cab

ATTENTION: *When necessary to leave from the operator seat, lock the safety lock lever.*
After the control lever is unexpectedly touched without the safety lock lever locked, this may cause serious accident resulting in injury and death.

Cab door lock

This is used to fix door in the condition where the door is open.

1. Push door against catch **(1)** and door is fixed.
2. When necessary to open the door, push down lever **(2)** on the left side of operator seat and the catch is released.
3. When necessary to fix the door, fix door to the catch securely.

⚠ WARNING

Fall hazard!
Always lock the cab doors in the full open or full closed position before using the handrails on the doors.
Failure to comply could result in death or serious injury.

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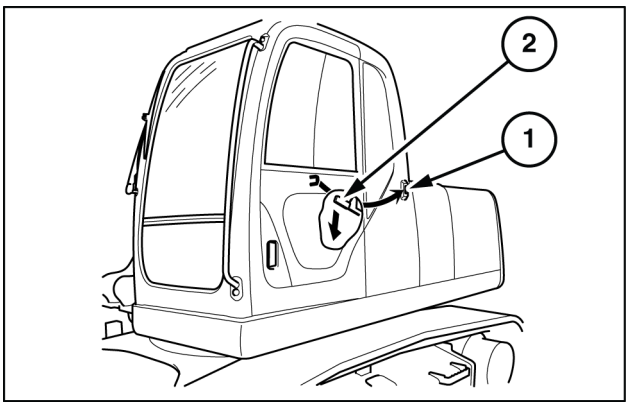

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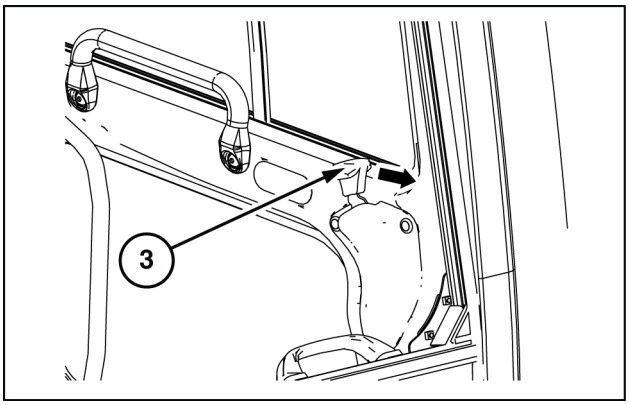
Releasing door lock from Inside of cab

When necessary to open the door from the inside of cab, pull lever **(3)** by hand and the door opens.



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Opening and closing front window

ATTENTION: *The front window should be opened and closed in the condition where the machine is parked in level and locked securely. If the lock is released in the forward tilting position of machine there is a possibility of falling of the front window.*
When closing the front window, the closing speed increases due to the weight of front window. Hold and close it by both hands securely.
When storing the front window in, pull up the safety lever to the ***LOCK*** *position and stop the engine.*

Instrument cluster

Gauge cluster

The gauge cluster is made up of gauges (fuel level, engine coolant temperature), various switch panels and multi-display.

Meters

1. Engine coolant temperature meter
2. Fuel level meter

Switch panels

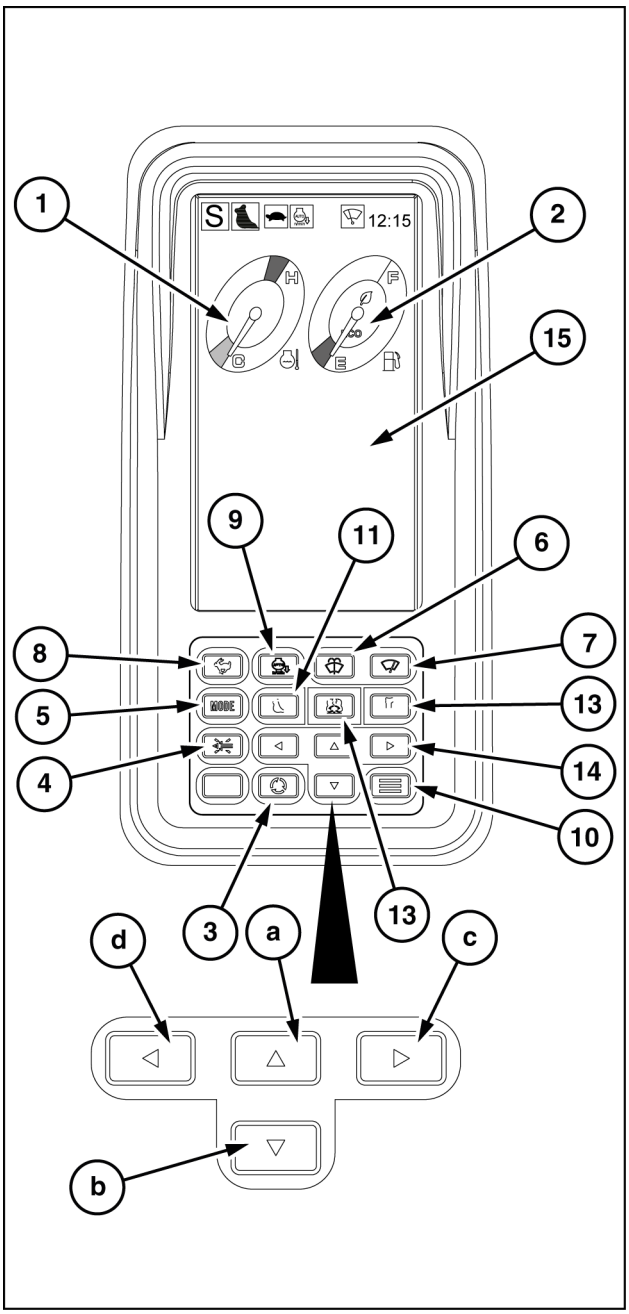
3. Screen change switch
4. Buzzer stop switch
5. KPSS mode select switch
6. Washer switch
7. Wiper switch
8. Travel speed select switch
9. Auto accel switch
10. Menu switch
11. Digging switch
12. Nibbler switch
13. Breaker switch
14. Arrow switch

Detail of arrow switch

a. Up
b. Down
c. Next
d. Back

LCD multi-display

15. LCD display



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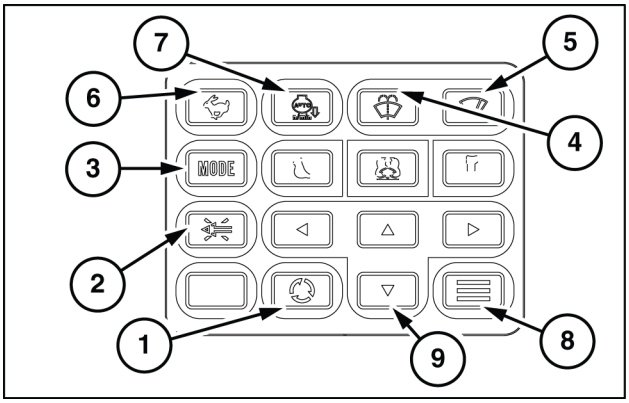
Maintenance Information

1. Screen change switch
2. Buzzer stop switch
3. Work mode select switch
4. Washer switch
5. Wiper switch
6. Travel speed select switch
7. Auto accel switch
8. Menu switch
9. Arrow switch



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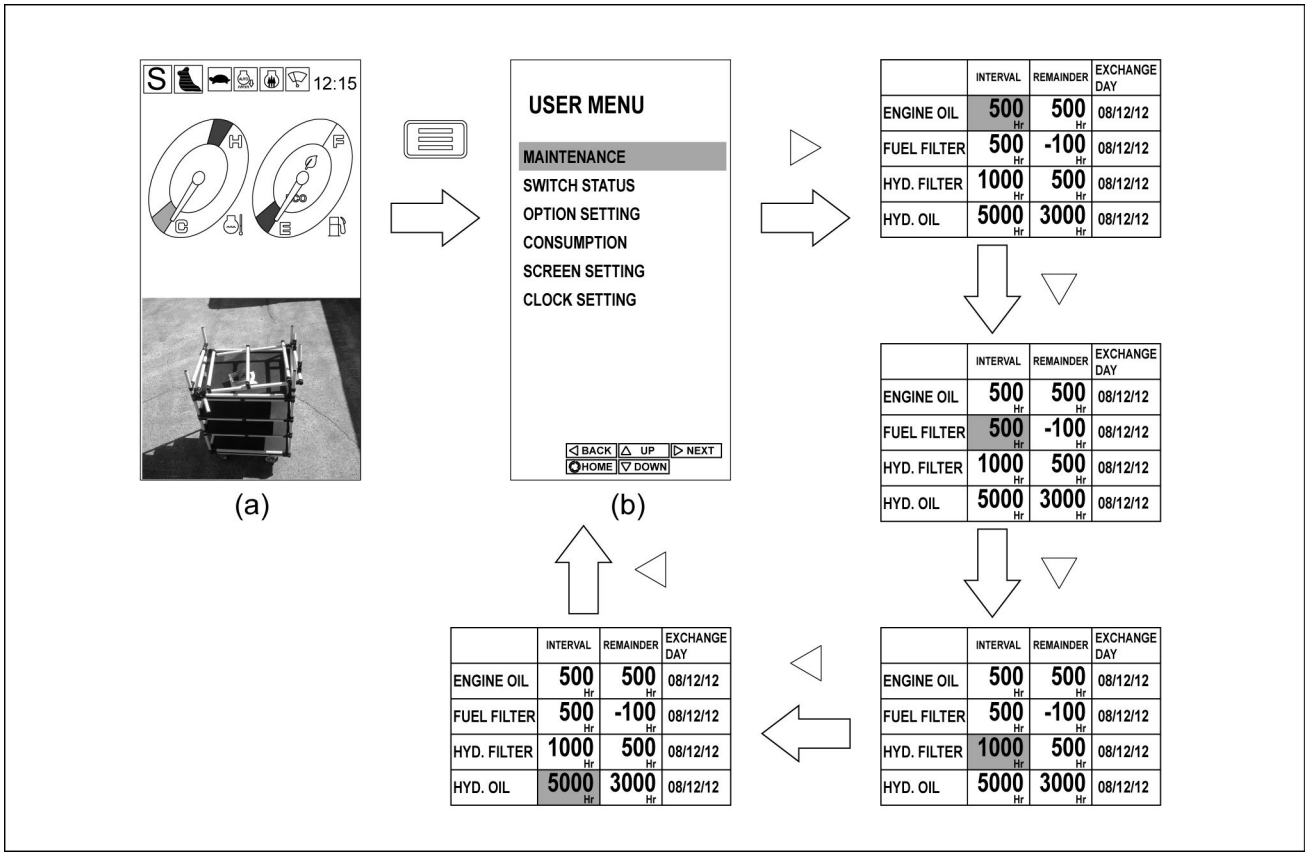

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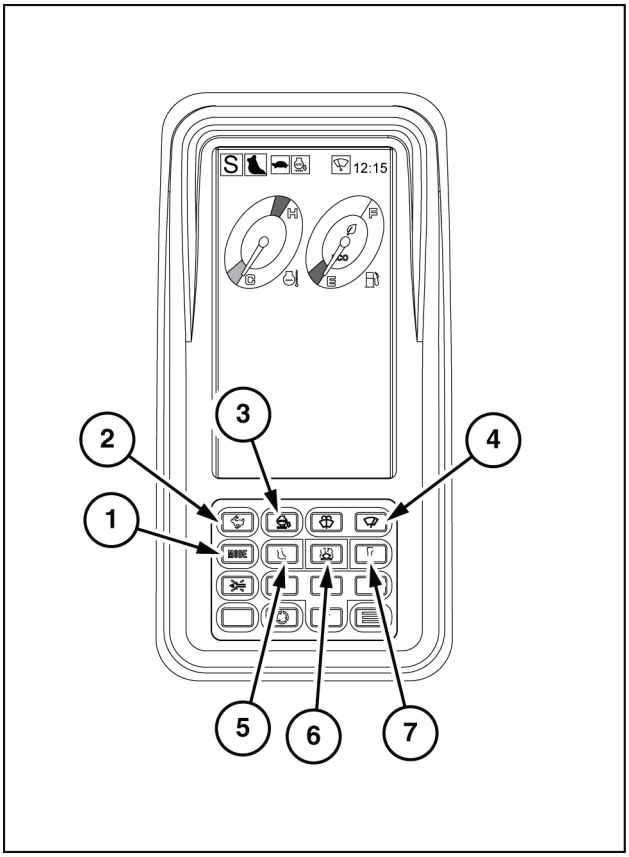
1. After turning starter key switch On, the main screen (a) is appeared. And press “Menu switch” to enter into “USER MENU” display (b).
2. Using switch “DOWN” or “UP”, move cursor to “MAINTENANCE”. Press “NEXT” to select the maintenance information display.
3. Using switch “DOWN” or “UP”, move cursor to one of item from “ENGINE OIL”, “FUEL FILTER”, “HYD. FILTER” or “HYD. OIL” to select desired one. And press “NEXT” to select the item that need to change the value.
4. When “Menu switch” is pressed In this display, remaining time is reset and “EXCHANGE DAY” is renewed.
5. After reset, press “NEXT” switch, and the value is fixed and stored. Press screen change switch, and the display returns to main display.

Display by switch operation

When using it by selecting switch on the switch panel provided on the gauge cluster, the selected mode is displayed on the upper part of multi-display.

1.	Work mode displays (“S”, “E”, “H”)
2.	Travel speed displays (and)
3.	Auto accel display
4.	Wiper displays (intermittent/continuation)
5.	Attachment mode displays (, and)

1. Work mode display
   The mode changes in order of “S” --> “E”--> “H”--> “S” each time the work mode switch **(1)** is pressed and the selected mode is displayed on the lower corner of multi-display.
2. Travel low speed and high speed display
   The display is changed in icons “turtle” --> “rabbit” --> “turtle” in order each time the travel low and high speed change switch is pressed and the selected mode is displayed.
3. Auto accel display
   Press auto accel switch **(3)** and the icon “Auto Accel” is displayed to inform that auto accel is functioning.
4. Wiper display screen
   Press wiper switch **(4)** and the icon “intermittent” is displayed when the wiper motor is running for front window intermittent wiping, and icon “continuous” is displayed when the motor is running for continuous wiping.
5. Attachment mode display
   Press Digging mode switch **(5)** to select Digging mode from attachment modes. And selected Digging mode is indicated. Press Nibbler mode switch **(6)** to select Nibbler mode from attachment modes. And selected Nibbler mode is indicated. Press Breaker mode switch **(7)** to select Breaker mode from attachment modes. And selected Breaker mode is indicated.



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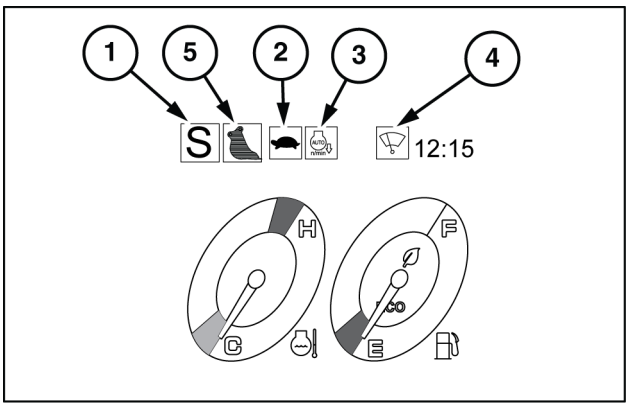

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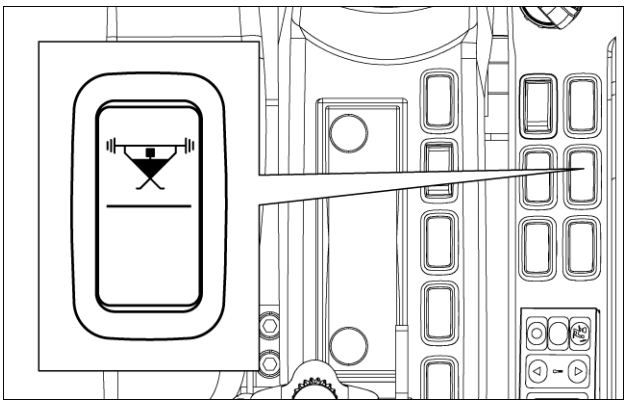
Heavy lift switch

The heavy lift switch is located on the right hand control console. The heavy lift switch has 2 operating positions. The heavy lift function is used when precision control of heavy lifting operations is required.

- ON: Push the symbol side of switch down to turn heavy lift function on
- OFF: Push back of switch down to turn heavy lift function off.



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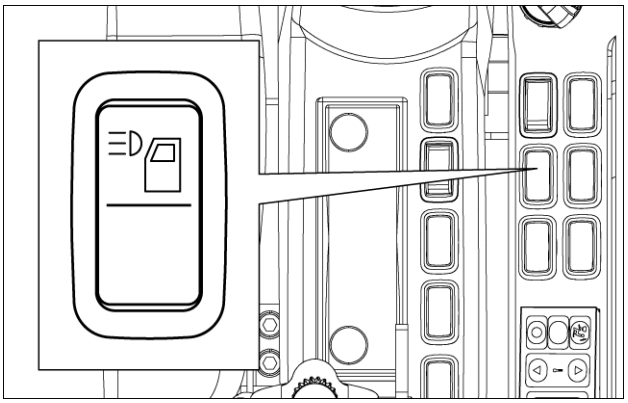
Cab work lights switch (upon request)

The cab work lights switch activates the work lights located on the top of the cab. The switch has the following positions:

OFF (side without symbol pressed) : the three lights are inactive.

ON (side with symbol pressed) : the three lights are on.



NHC0004 7

Pressure release switch

The pressure release switch allows to release the pressure inside the hydraulic system.

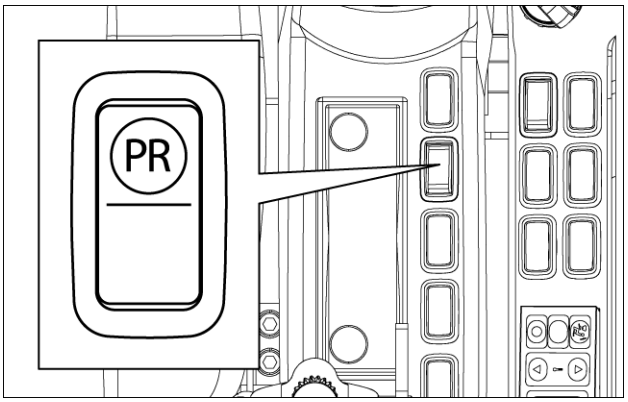
NOTE: *the pressure release operation must be performed with the engine running.*

To release the pressure proceed as follows:

- Keep pressed the pressure release switch for a period between **5 s** and **10 s**.
- Release the switch and wait for a period between **1 s** and **5 s**.
- Keep pressed again the switch for a period between **5 s** and **10 s**.

The display shows the **PR** icon and the buzzer sounds. The engine automatically sets to low idle rpm and the pressure inside the hydraulic system is released at the same time. Then actuate the control levers to release the residual pressure inside the hydraulic cylinders.

NOTE: *if monitor displays **FAIL DRAIN HYD PRES**, the pressure release operation is not correctly occurred. Repeat the operation and should the trouble persist, call a dealer.*



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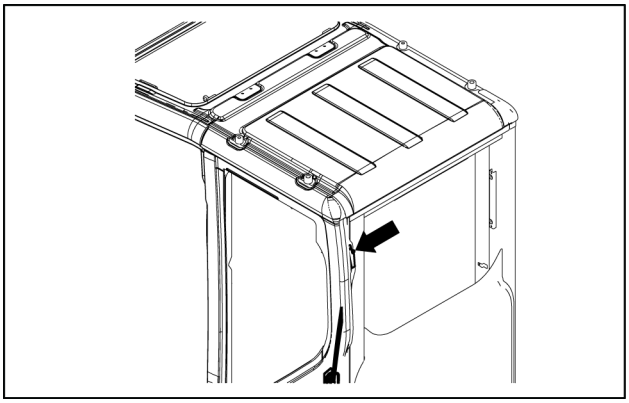
Antenna

To prevent interference, retract the antenna in before transportation and storing.



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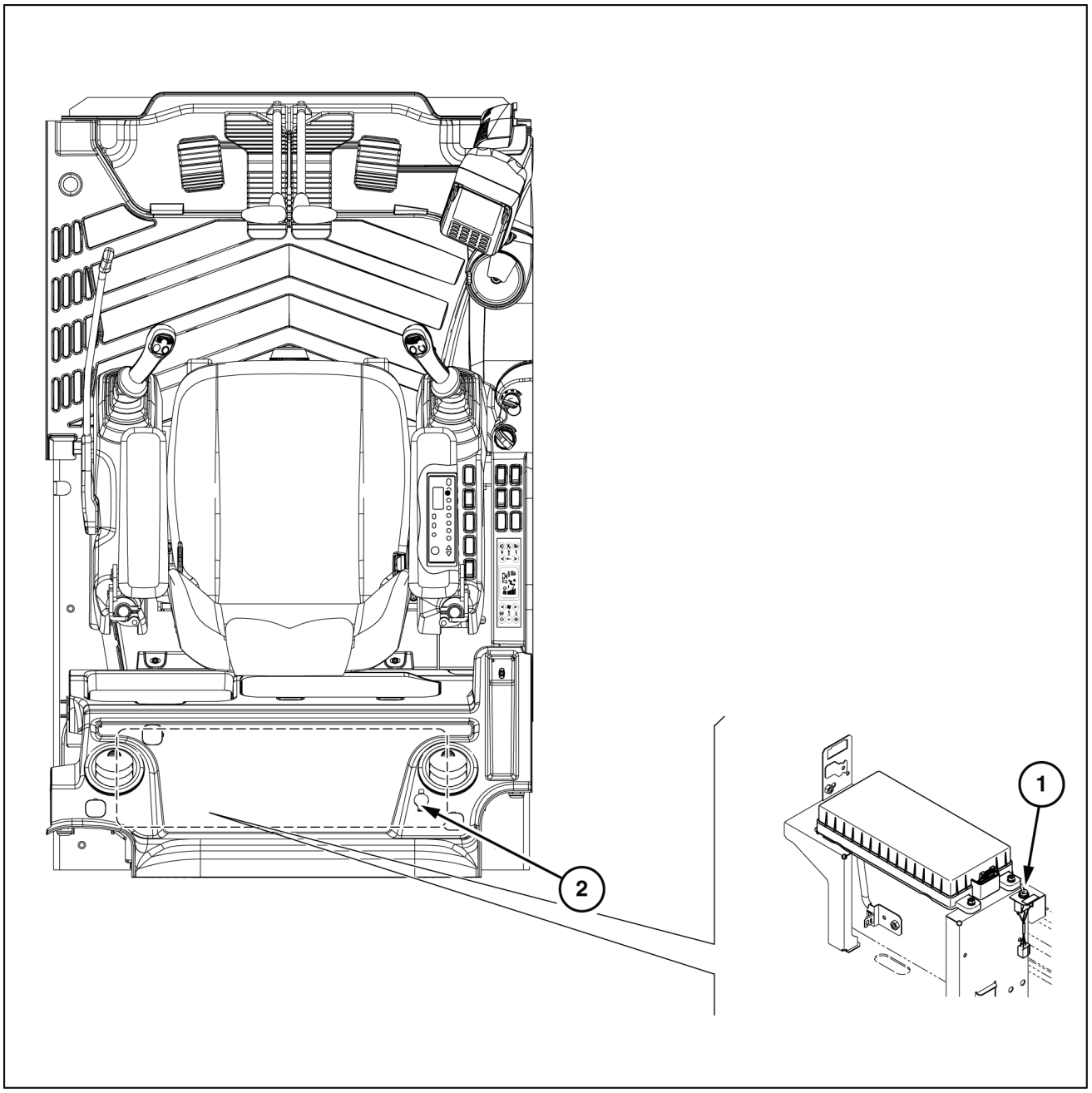
REARWARD CONTROLS

Console - Operating



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1. Parking brake release switch

2. **12 V** socket

Adjusting operator seat

ATTENTION: *Adjust the operator seat before starting operation or at the time when operator was changed.*

Adjust the operator seat position so that the control lever, each control pedal and switch can be easily manipulated in the condition where operator takes seat and has his back fitted to the back seat.

NOTICE: *For adjustment of operator seat, see* ***Pneumatically-adjusted operator seat - Adjust****.*

Be careful not to put hands between handle and seat stand.

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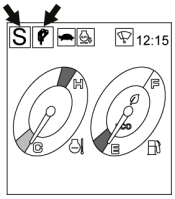
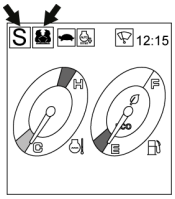
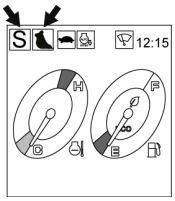
Attachment mode	Switch position	Displays of multi-display	Selection of attachment
Breaker mode		 Breaker Mark is displayed. As fuel consumption mode, “E” or “S” or “H” is displayed on the left lower corner of the multi-display.	Select single flow when the attachment like a breaker requires single flow circuit
Nibbler mode		 Nibbler Mark is displayed. As fuel consumption mode, “E” or “S” or “H” is displayed on the left lower corner of the multi-display.	Select conflux flow when the attachment like a nibbler requires conflux flow circuit
Digging mode		 Normal display is indicated. As fuel consumption mode, “E” or “S” or “H” is displayed on the left lower corner of the multi-display	Select in case of digging

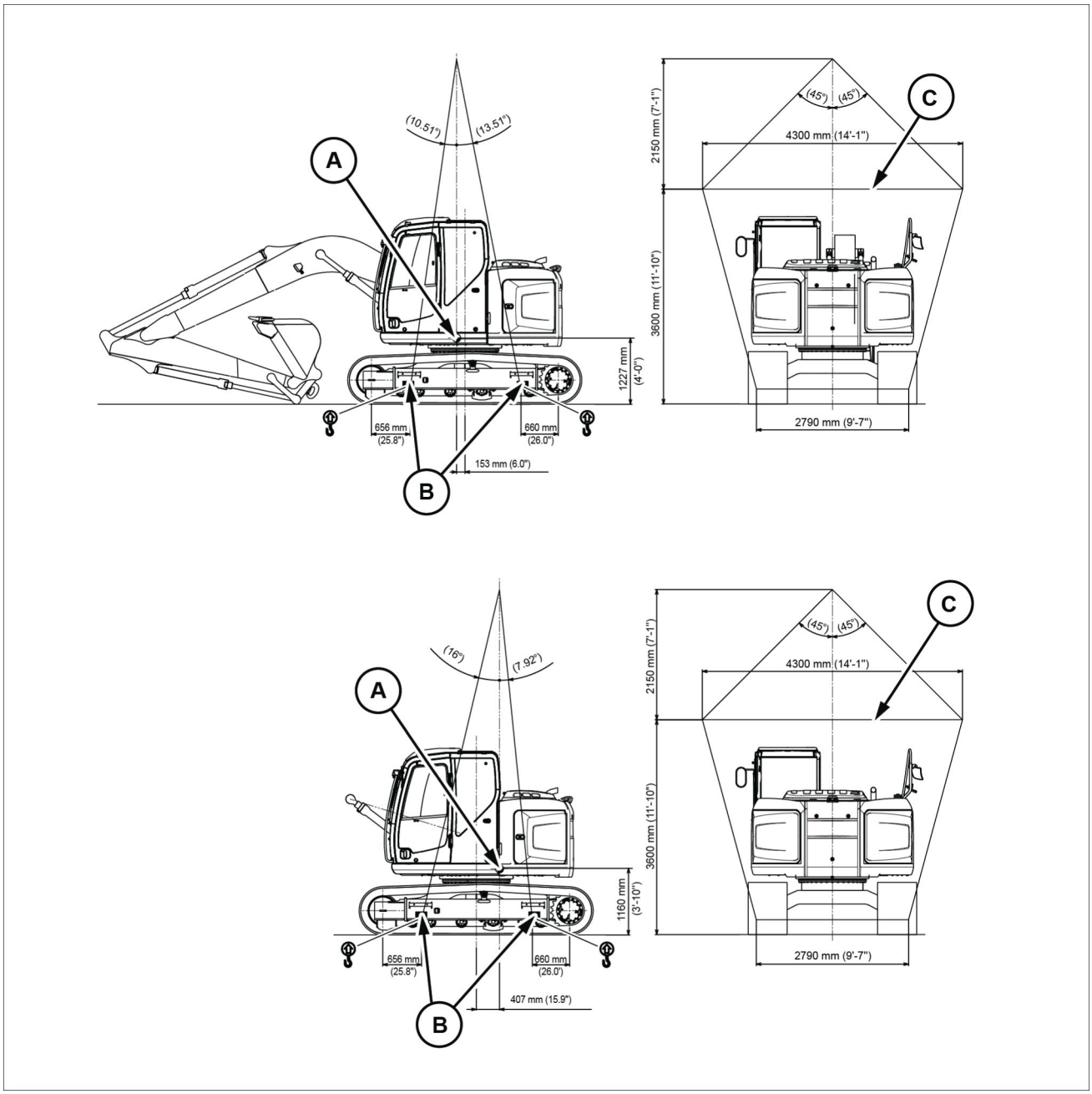
Regarding the explanation for the attachment and hydraulic circuit, refer to **Electrical systems - Operating**.

ATTENTION: *Select the attachment mode appropriately when you use the breaker or nibbler. Confirm the position of attachment mode switch and the screen of multi display closely.*
Switch the attachment mode to the correct position when the switch position is improper.
Select the breaker mode absolutely when you work with breaker. If the machine is operated with mode other than breaker mode, hydraulic component and breaker are damaged.
Lower the attachment to the ground and confirm safety before you change the attachment mode. Especially, the load that is held by the nibbler falls during changing from the nibbler working to the breaker mode, and this is very dangerous.
When the bucket signal of attachment mode is flickering, this shows that the selection of attachment mode is improper.

SHIPPING TRANSPORT

Lifting machine

The following procedures are for lifting the machine, as built by NEW HOLLAND CONSTRUCTION. These procedure do not take into account modifications made to the machine that affect machine weight or center or gravity.



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A. Center of gravity

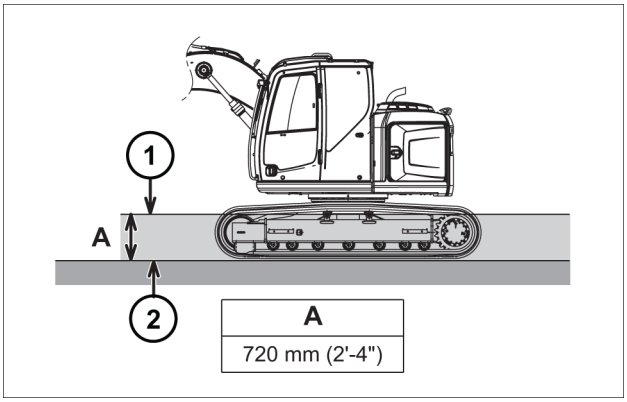
B. Place block between each cable and frame

C. Expander

Machine operation in water

ATTENTION: *Be careful not to immerse the slewing bearing, slewing pinion and swivel joint into the water or mud. If the machine is operated in water or mud, the slewing bearing and others may be worn abnormally.*
If water or mud comes up to the slewing bearing level, put grease in slewing bearing unit the old grease comes out.
If water or mud goes higher than the upper frame level, contact the dealer/distributor for cleaning or repair.

1. Make certain travel motor location is known before performing any travel operation.
2. Travel on firm, level surfaces as much as possible.
3. When traveling on rough terrain, travel in slow speed with engine at a low idle.
4. Travel with the travel motors in back of the machine for long distance travel.
5. When traveling or operating machine on snow or icy surfaces, clean track shoes frequently to prevent clogging. This will help keep the machine from sliding unexpectedly.
6. Keep a safe distance from stationary objects and electrical power lines.
7. Be aware of load capacities of bridges and road shoulders. Reinforce if necessary.
8. Use decking or plating to protect road surfaces as much as possible. Be careful when turning or spinning machine on asphalt pavement.
9. Do not allow large or heavy objects to strike travel motors.
10. Do not travel over large objects such as boulders rocks etc.
11. If necessary to travel or operate machine in a river or other water, the bed must be firm and water current slow. Water must not be deeper than indicated in the chart in.
12. On soft ground or mud the machine can sink. Stay constantly aware of undercarriage position.

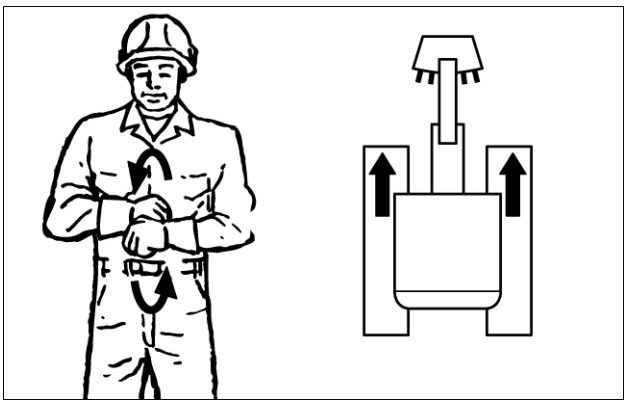


TULT12H2300005A 6

1. Water depth
2. Bed must be firm and stable

Travel forward

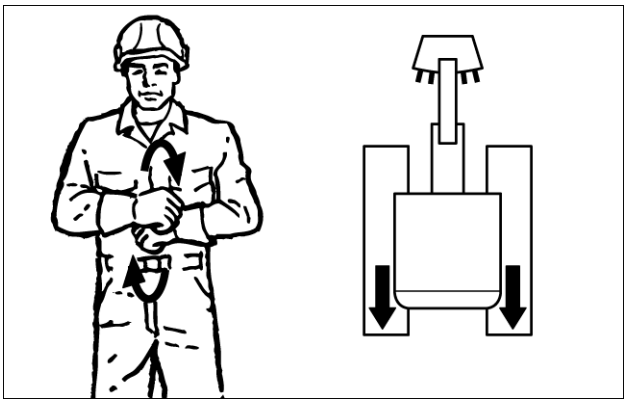
Face machine operator, bend both elbows in, make fists and rotate fists one over the other in a reverse circular motion.



NH0093 13

Travel reverse

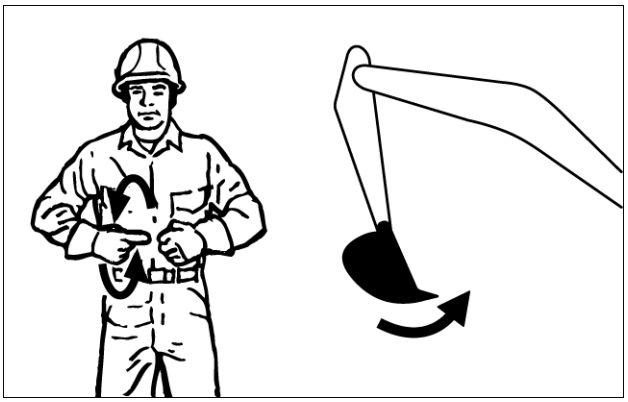
Face machine operator, bend both elbows in, make fists and rotate fists one over the other in a forward circular motion.



NH0094 14

Close bucket

Face machine operator, hold left hand in, closed and stationary, hold right hand in, make a fist with index finger pointing toward left hand and move right hand in a small reverse circular motion.



NH0095 15

Open bucket

Face machine operator, hold left hand in, open and stationary, hold right hand in, make a fist with index finger pointing toward left hand and move right hand in a small forward circular motion.

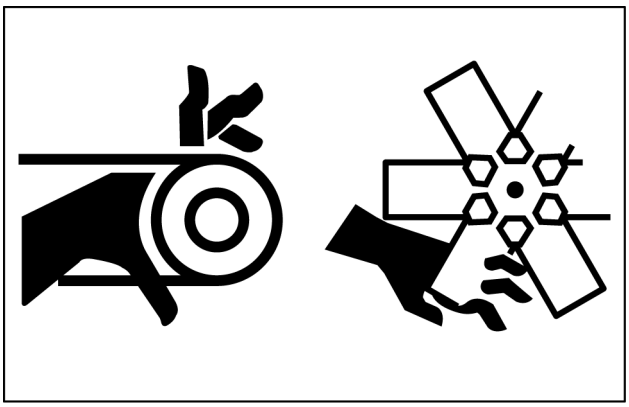
NH0096 16

Stop engine

Do not attempt any MAINTENANCE with engine running. Always stop the engine and allow machine to cool to avoid injury.

Otherwise, there is a possibility of danger that your hand may be caught in the cooling fan or fan belt resulting injury.

If it is unavoidable to operate the engine for inspection or maintenance, carry out the work with two people. The person seated in the operator's seat should be ready to stop the engine at any time while watching for a signal from the other person.



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Tag-out machine

Before beginning any inspection or maintenance procedures, secure a “DANGER” tag (P/N: **YN20T01320P2**) to the operator's console to inform the operator that the machine will be inoperable for inspection and maintenance. This tag will help prevent accidental starting of the machine.

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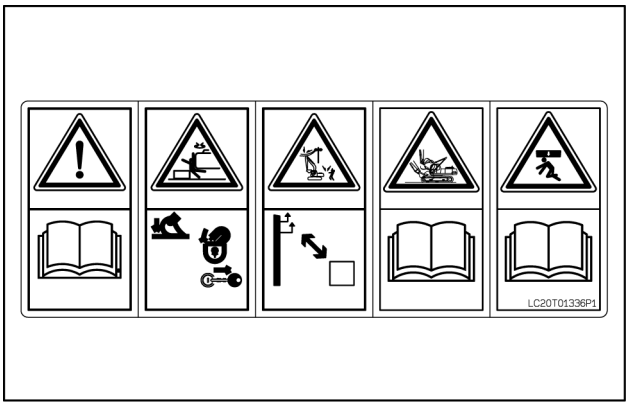
Observe precautions

Start the inspection and maintenance work fully understanding the contents of safety precautions indicated on the machine labels.



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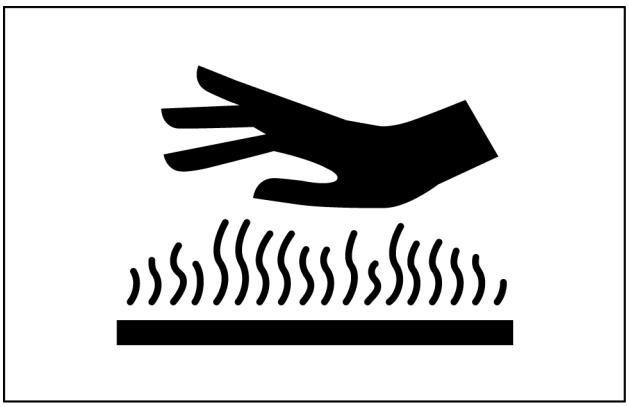
Hot surfaces & fluids

Wear the proper safety equipment when working around hot areas. Do not change oils, engine coolant or filters immediately after machine has been stopped. Allow machine to cool down before performing maintenance procedures.



TUIL12C140296AA 7

Checking procedure (normal condition)

1. Carry into service shop.
2. Connect the service tool and check the error code by service tool.
3. First check in service shop.

- Checking for previous trouble DPF condition is checked by monitor.
- When the previous engine trouble is found, firstly check the engine, and check DPF.

4. Service the forcible regeneration

- To operate a manual forcible regeneration, use a personal computer. Operate forcible regeneration manually.
- If the regeneration had not been completed, and error code “ **20728**” is indicated on the gauge cluster and the temperature in front of DPF is higher than allowable value, then contact our service shop and clean the filter.

5. Measurement of temperature pressure

- Using a personal computer, perform the manual forcible regeneration, and monitor the DOC inlet temperature DPF inlet temperature and DPF outlet temperature.
- If the differential pressure value is beyond the limit of allowable value, and error code “ **P2463**” is indicated on the gauge cluster, then contact our service shop and clean the filter.

MAINTENANCE CHART

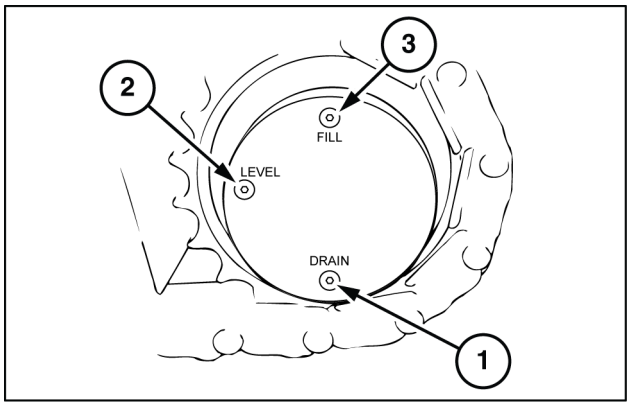
Maintenance Chart

Interval	Page no.	Maintenance action	No. of pts.	Check	Lubricate	Grease	Drain fluid	Adjust	Level make up	Cleaning	Replace	Filling	Bleed
PRE-START (EVERY 8 HOURS)	**7-25**	General check		X									
	7-25	Attachment lubrication				X							
EVERY 50 HOURS (WEEKLY)	**7-28**	Batteries		X									
	7-30	Fuel tank drain					X						
	7-31	Track tension						X					
EVERY 120 HOURS	**7-32**	Swing motor reduction oil							X				
	7-33	Travel reduction unit oil							X				
	7-34	Checking for intake rubber hose		X									
EVERY 250 HOURS	**7-35**	Air cleaner maintenance								X			
	7-37	Checking the radiator hoses								X			
	7-39	Radiator and oil cooler debris screen		X									
	7-41	Fan, Alternator, A/C Belt Wear and tension		X									
	7-43	Air-conditioner filters service								X			
	7-45	Cleaning or replacement of radiator cap								X			
EVERY 500 HOURS	**7-46**	Replacing engine oil									X		
	7-47	Refilling engine oil										X	
	7-48	Replacing the oil filter									X		
	7-49	Replacing the Pre-Filter									X		
	7-50	Replacing the fuel filter									X		
	7-52	Bleeding the fuel system											X
	7-53	Cleaning fuel tank cap and strainer								X			
	7-53	Greasing the slewing ring				X							
	7-54	Checking slewing ring fitting bolts for loosening		X									
	7-55	Lubricating push rod of control lever with grease			X								
	7-56	Checking the air-conditioner refrigerant		X									
EVERY 1000 HOURS (12 MONTHS)	**7-58**	Checking engine mounting bracket for tightening		X									
	7-59	Replacing return filters									X		
	7-61	Replacement of air breather element									X		
	7-62	Checking voltage		X									

Travel reduction unit oil

ATTENTION: *Travel reduction unit could be under pressure. Carefully loosen plug and remove slowly filled air pressure. Where the plug was loosened abruptly, there is the danger of spouting out of plug and oil. Do not face the plug to prevent from flying plug etc.*
Never change oils on a machine that has just finished working. Allow machine to cool first until oils and fluids are warm not hot.

1. Before checking, find level place, stop machine, locating plug **(1)** bottom, and move safety lever to **LOCK** position.
2. Remove level plug **(2)** and check for short of oil level and contamination. If the oil level is to the top side of level plug, it is in proper level. If shorted, remove fill plug **(3)** and make up short of specified gear oil.
3. Clean level plug **(2)** and fill plug **(3)** with light oil, and then attach it in place.
4. Similarly check on the travel reduction unit on the other side.



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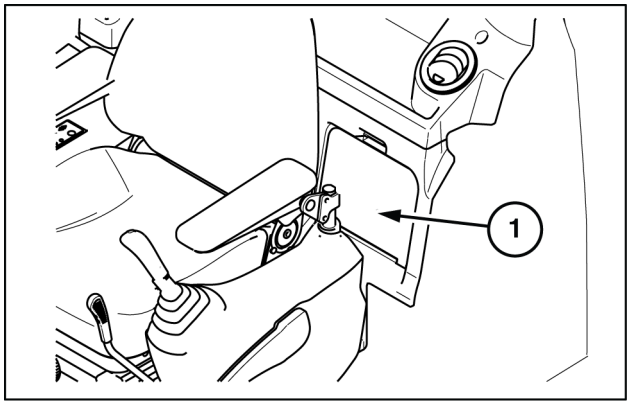
Air-conditioner filters service

ATTENTION: *The flying debris due to compressed air may cause accident resulting in injury or death. Wear safety goggles and respirator when cleaning the filters of air-conditioner.*

Cleaning recirculate and fresh air filters
Recirculate air filter : Every **500 h**
Fresh air filter : Every **250 h**
Replacing inside and outside air filters
Recirculation air filter : After cleaning about 10 times
Fresh air filter : After cleaning about 10 times



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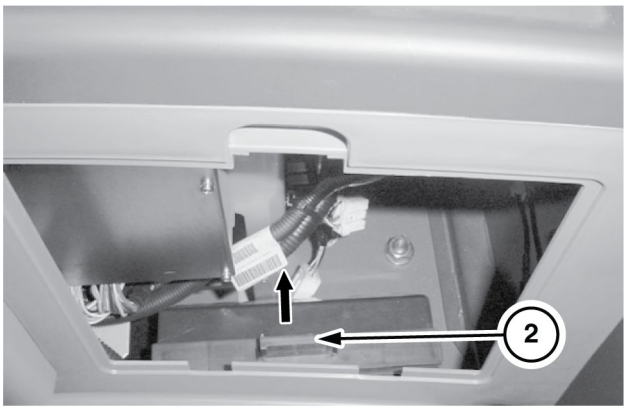
NOTICE: *The maintenance time shows the reference value. Clean them earlier than the specified time in case where being used in dusty area.*

Removing fresh air filter

1. Catch cover **(1)** on the left rear side of operator seat and pull it this side.
2. Catch handle grip of fresh air filter **(2)** through opening from which cover **(1)** is removed and pull it out upward.



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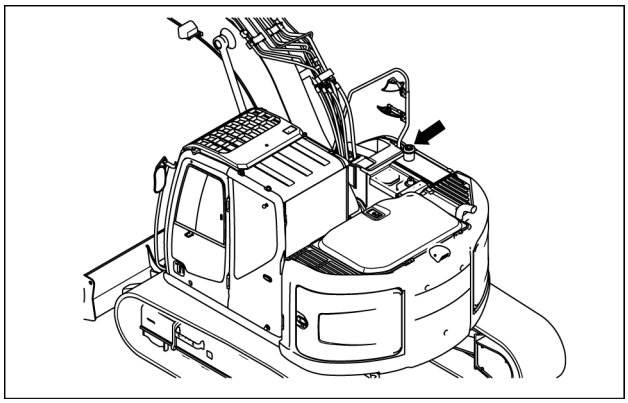
Cleaning fuel tank cap and strainer

1. Remove cap with starter key.
2. Check cap seal for damage, and if damaged replace it with new one.
3. Clean strainer with light oil and attach it in place. If damaged, replace it with new one.
4. Attach cap and lock it with starter key.



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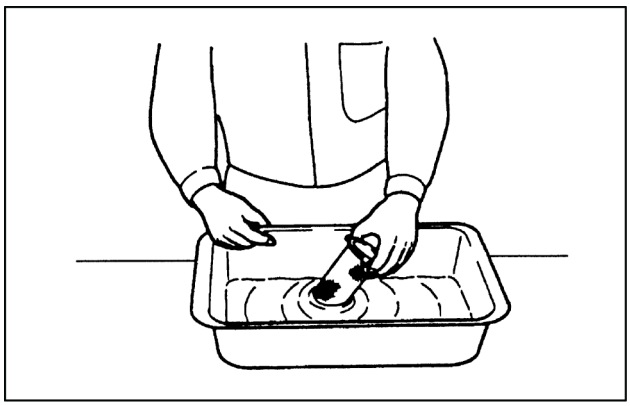

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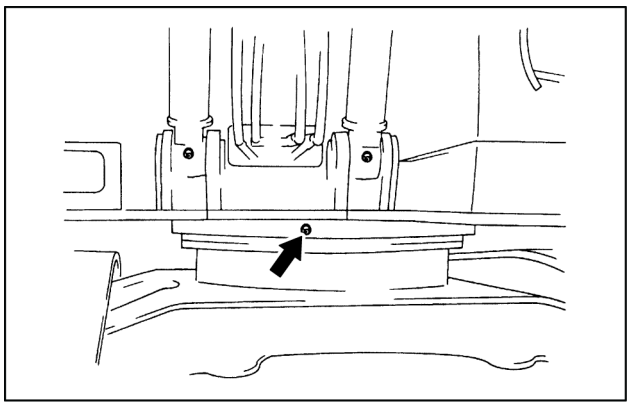
Greasing the slewing ring

1. Locate the grease nipple at the front of the slewing ring.
2. Using grease gun filled with general purpose EP grease (**Fuel injection system - General specification**), lubricate slewing ring with several shots from grease gun.
3. Slew machine 90° right, and repeat **2**. See level on frame.
4. Continue to slew machine at 90° increments and lubricating slewing ring until ring has been completely greased.

NOTICE: *Using grease gun, lubricate through grease nipple until the grease comes out from bearing seal when the direction of the slewing bearing is changed at every 90°. (Grease amount: Max.* ***30 cm³****/1 grease nipple)*



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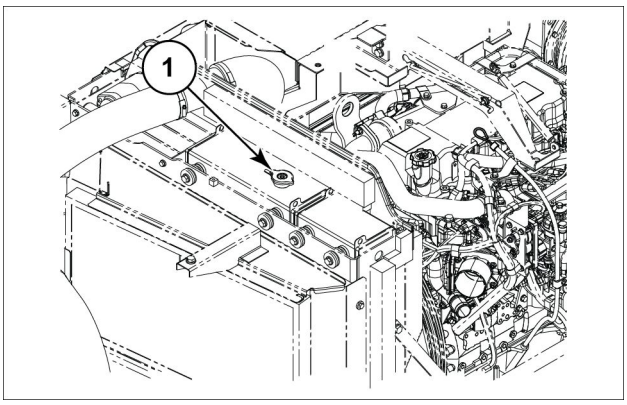
EVERY 2000 HOURS

Changing engine coolant

ATTENTION: *Avoid being burned by hot liquid and steam. Do not loosen the radiator cap when the coolant is hot. The cooling system is under pressure. Stop the engine and allow enough time for system to cool.*
Engine anti-freeze/coolant liquid is flammable and can cause injury.
Keep anti-freeze/coolant liquid away from flames and sparks.
Avoid contact with eyes and skin. If anti-freeze/coolant contacts eyes or skin, immediately wash with clean water for several minutes and seek medical treatment.

NOTICE: *Use clean soft water for coolant in which lime deposit is not produced.*
The water is corrosive in engine operating temperature. The coolant at the time of shipment is mixed with 50% of "Long Life Coolant" to protect the cooling system from rusting and freezing.
Non-amine antifreeze mixture is used for this machine.
Change coolant ahead of the specified period when it was dirty and/or bubbling.

1. Find firm level ground, place bucket on the ground, stop engine, and move safety lever to the **LOCK** position.
2. Using starter key, open engine hood and hold it with stay.
3. Loosen radiator cap **(1)** slowly, check that the pressure is released completely, push cap in, and remove the cap by loosening it further. Prepare hose for pouring water.



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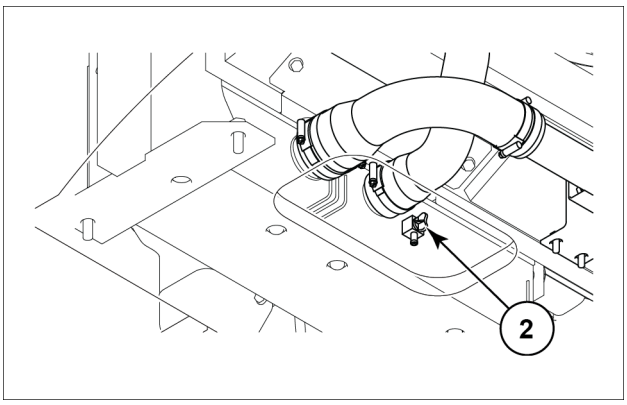
4. Remove undercover under the radiator, and prepare container for coolant under drain plug **(2)** and drain plug **(3)** on the engine side face.
5. After draining, install drain plug **(2)** and close drain plug **(3)** and fill it with clean soft water.



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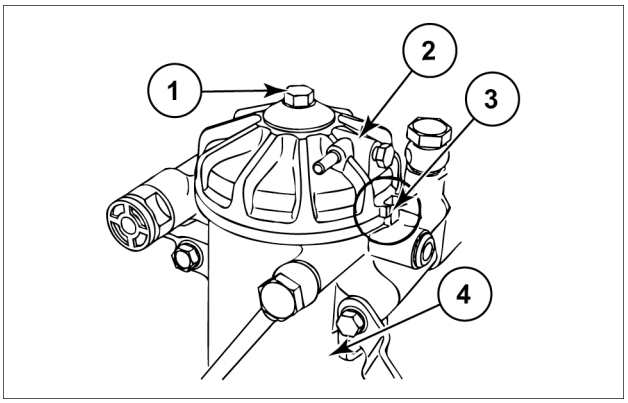
4. Align the match mark **(3)** and set the cap **(2)** to the fuel filter case **(4)** and tighten the center bolt **(1)** .
   Tightening torque : **24.5 - 34.3 N·m** (**18.1 - 25.3 lb ft**)

NOTICE: *Be careful to prevent twisted damage of the O-ring.*
Make sure the O-ring is fitted to the clamp face.
Match the match mark of the fuel filter cap at the fuel filter case.



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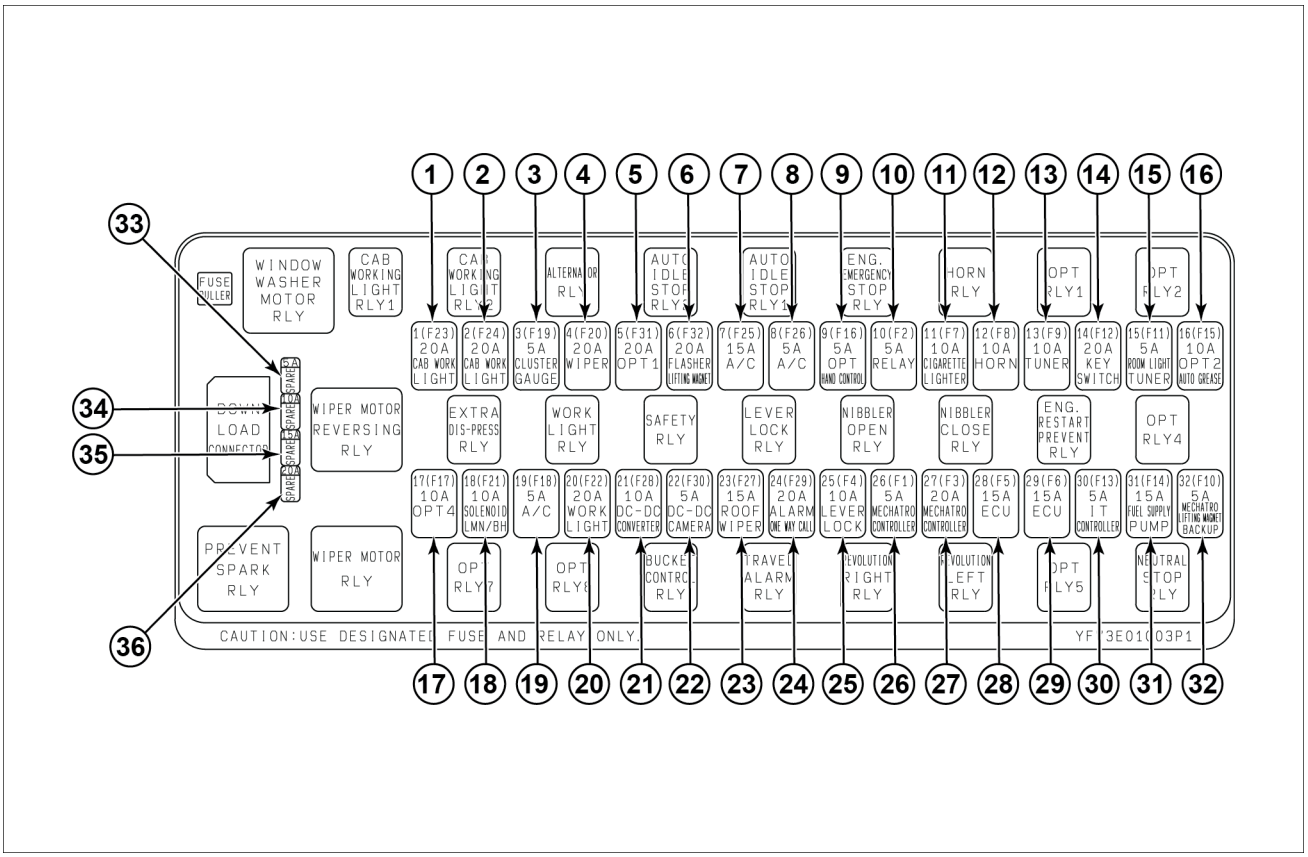
Air-bleeding of the fuel system

1. Refer to page **7-52** and remove air from fuel system.

NOTICE: *Push the priming pump of main filter, and fill the fuel piping with fuel. And the air in the piping is removed.*

Fuses

Follow the procedures below to replace.



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Functions

1	**20 A**	Cab work light
2	**20 A**	Cab work light
3	**5 A**	Gauge cluster
4	**20 A**	Wiper, washer
5	**20 A**	Option 1
6	**20 A**	Flasher relay
7	**15 A**	Air-conditioner
8	**5 A**	Air-conditioner
9	**5 A**	Option (hand control)
10	**5 A**	Relay, hour meter
11	**10 A**	**12 V** power supply
12	**10 A**	Horn, horn relay
13	**10 A**	Tuner
14	**20 A**	Starter key switch
15	**5 A**	Room lamp, tuner
16	**10 A**	Option 2 (auto grease)
17	**10 A**	Option 4
18	**10 A**	Solenoid valve
19	**5 A**	Air-conditioner
20	**20 A**	Work light
21	**10 A**	DC-DC Converter
22	**5 A**	DC-DC Camera
23	**15 A**	Option (roof wiper)
24	**20 A**	Travel alarm
25	**10 A**	Safety lever lock
26	**5 A**	Mechatro controller
27	**20 A**	Mechatro controller
28	**15 A**	Engine controller (ECU)
29	**15 A**	Engine controller (ECU)
30	**5 A**	It controller
31	**15 A**	Fuel supply pump
32	**5 A**	Mechatro controller (back up)
33	**5 A**	Spare
34	**10 A**	Spare
35	**15 A**	Spare
36	**20 A**	Spare

Bucket and arm combinations

Front attachment variation

Outline

- This machine is equipped with attachments in various types in order to comply with various operations.
- When large capacity bucket is used, it should be used in combination of short arms to secure the stability of machine and not to be forced to operate machine, front section and each cylinder.
- When long boom and arm are used, conversely combine with the small capacity bucket.

Type	Bucket		Outside width of bucket		Number of teeth	Can be turned over	Weight	Arm
	SAE (Heaped)	SAE (Struck)	With side cutters	Without side cutters				2.87 m
Hoe Bucket	**0.51 m³ (0.67 yd³)**	**0.39 m³ (0.51 yd³)**	**870 mm**	**770 mm**	3	Yes	520	○
	0.70 m³ (0.92 yd³)	**0.52 m³ (0.68 yd³)**	**1080 mm**	**980 mm**	5	Yes	630	○
	0.80 m³ (1.05 yd³)	**0.59 m³ (0.77 yd³)**	**1160 mm**	**1060 mm**	5	Yes	660	◎
	0.93 m³ (1.22 yd³)	**0.67 m³ (0.88 yd³)**	**1330 mm**	**1230 mm**	5	Yes	710	△
Breaker	-	-	-	-	-	-	-	○
Nibbler	-	-	-	-	-	-	-	○

- If any other bucket except for the backhoe bucket is turned over and used for excavation, damage to the arm and bucket may occur.
- Do not operate the power boost switch when a long arm is installed

◎ Standard combination

○ General operation; Excavation or loading of sand, gravel, and clay

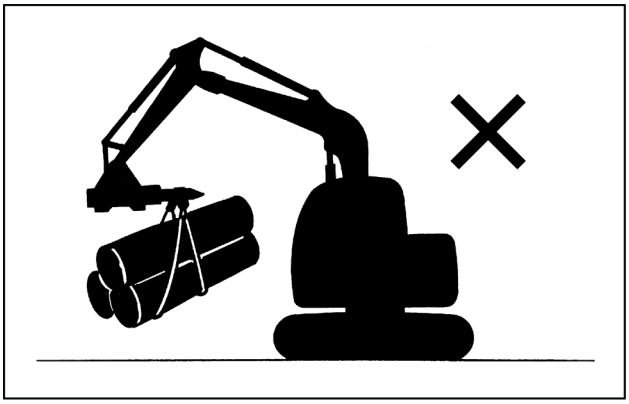
△ Light operation; Mainly loading of loose gravel (e.g., cultivation or loading of sand or gravel)

NOTICE: *Install only genuine attachment recommended by NEW HOLLAND CONSTRUCTION on the machine. NEW HOLLAND CONSTRUCTION is not liable for any damages to the machine or attachment arising from the installment of attachment other than the specified attachments.*

Do not lift

Do not use an optional attachment to lift or transport objects or material.

Doing so can cause extensive damage to the attachment, the machine structures or cause injury or death due to slipping or dropping of load due to improper attachment.



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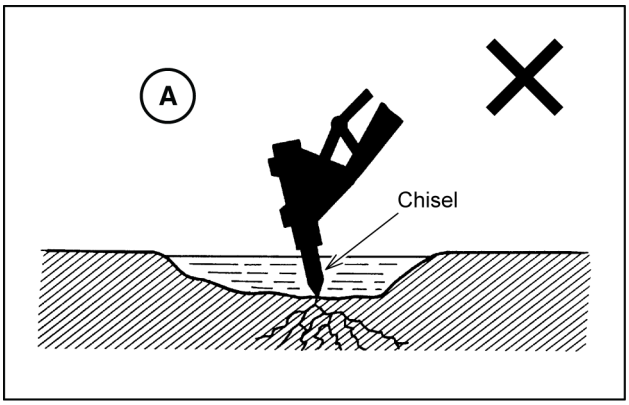
Do not work underwater

The breaker is rusted, and results in damage of sealing. Consequently contamination with rust, dust and water enter into hydraulic oil. This causes damage of hydraulic equipment.

A. Do not work underwater



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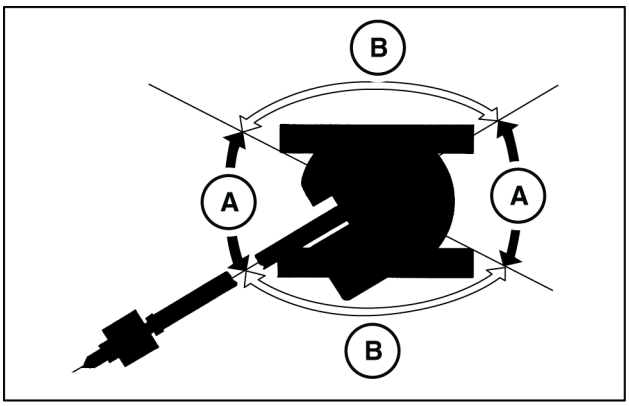
Working ranges

The balance on the machine becomes unstable at the positions shown in the right figure involving a possibility of turning over the machine. Do not carry out breaker work in this position.

A. Acceptable work range

B. Unacceptable work range



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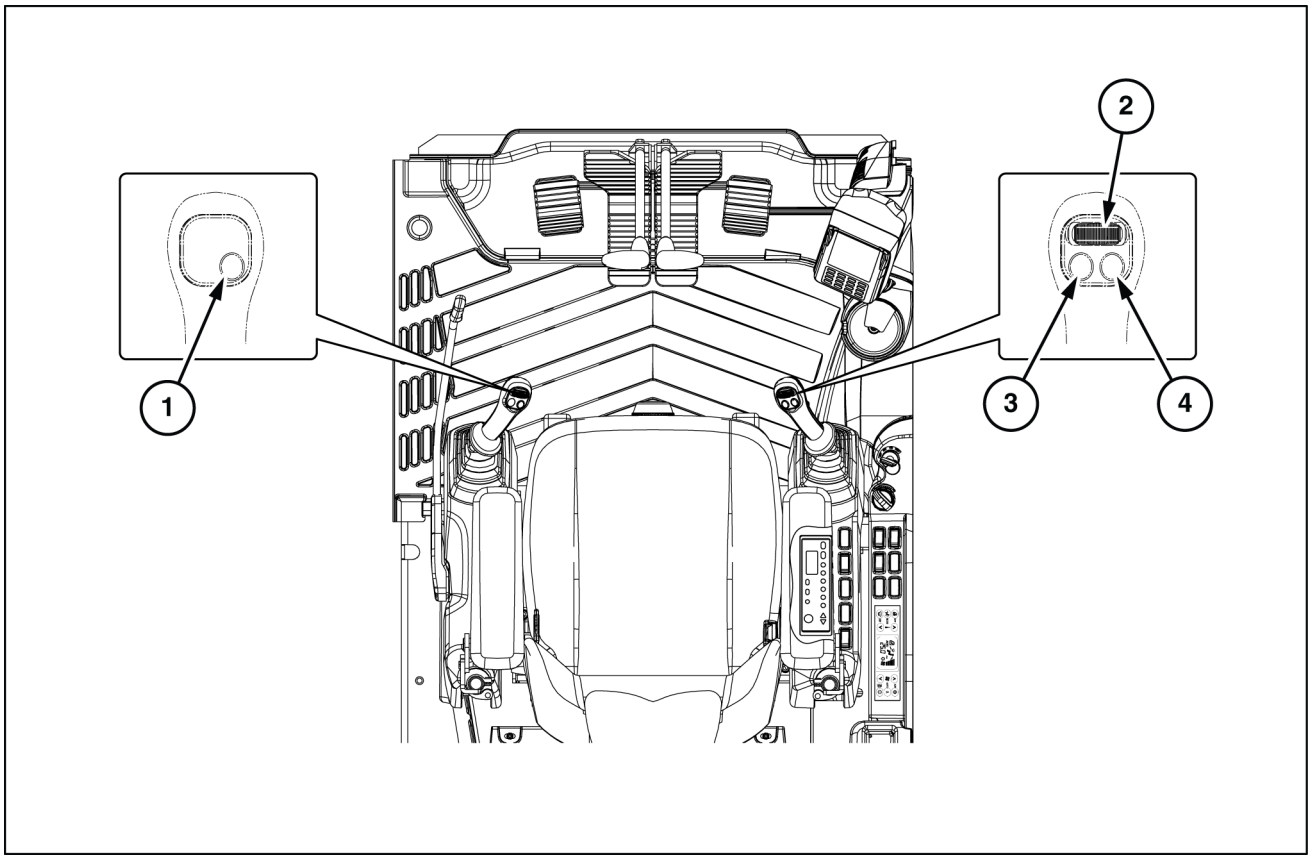
Proportional hand control (nibbler and breaker)

To actuate the “Nibbler” operate the switch **(2)** and to actuate the “Breaker” operate the switch **(3)** that is located on right control lever.



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Left hand control lever switch		Right hand control lever switch	
1.	Horn switch	2.	Nibbler control switch
		3.	Breaker control switch
		4.	Power boost switch

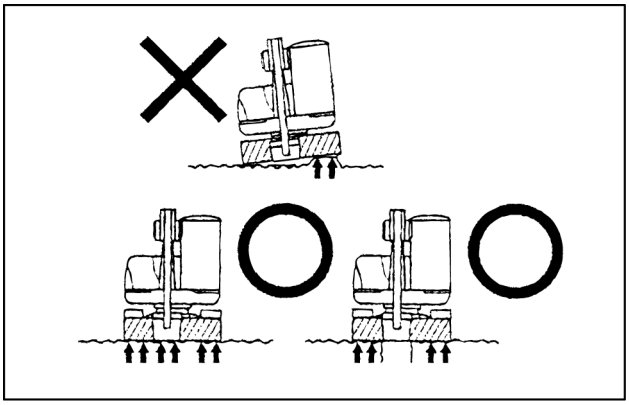
Basic operation

ATTENTION: *Read, understand and follow all safety precautions and operation procedures found in this manual before operating the machine or any attachment.*

NOTICE: *Regarding the procedures of nibbler and breaker operation, refer to the paragraph headed “Proportional hand control (extra, nibbler and breaker)”.*

Do not support machine with blade at one end

When the dozer blade is used as an outrigger, do not support the machine at one end of the dozer blade. Make sure the support at both ends.



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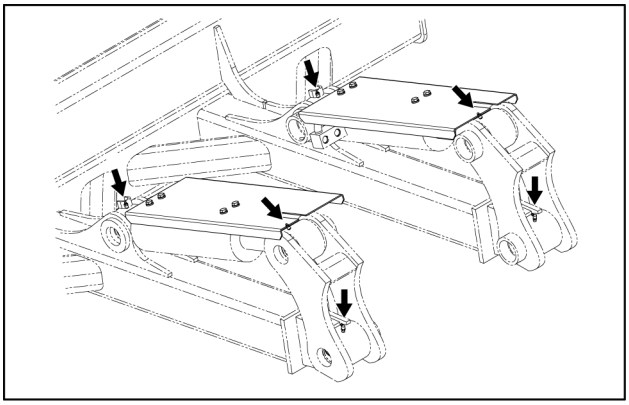
Periodic inspection and maintenance interval

Check and service the component of dozer blade with reference to the following table.

Component	When required	Internal (Hours on Hour meter)		
		Pre-start inspection or every 8 h	Every 3 months or 250 h	Lubricant, etc (Replacement part)
Grease dozer blade pin		O (Until **50 h**)	O	EP grease
Inspection for oil leak and damage of dozer cylinders and hoses	O			
Inspection for damage of dozer blades	O			

NOTE: *Location of lubrication points:*
Lubricate all grease nipples in the figure.
Blade foot pin (2 places)
Dozer cylinder rod head (each 2 places)



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