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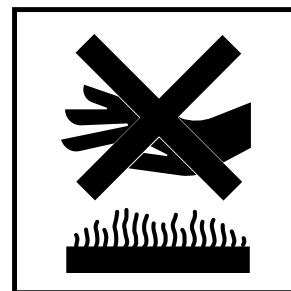
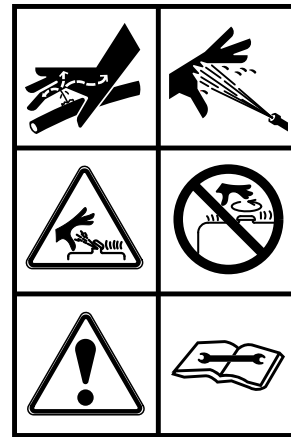
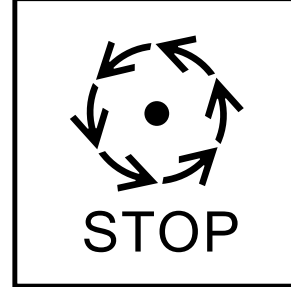
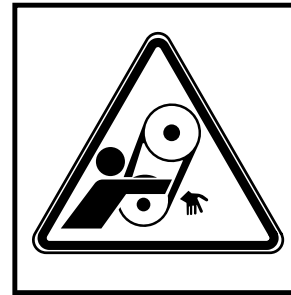
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7) ENGINE ROOM CAUTION (item 8)

This warning label is positioned on the side of radiator.

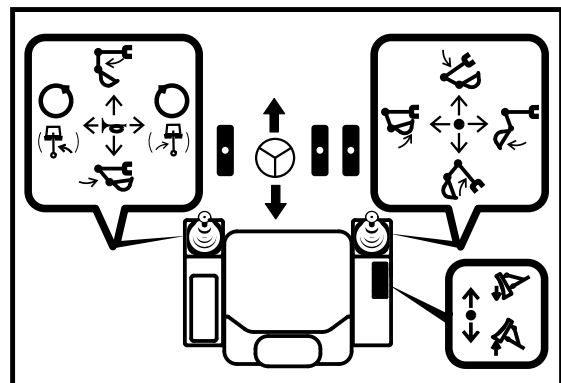
- ▲ Do not open the engine hood during the engine's running.
- ▲ Escaping fluid under pressure can penetrate the skin causing serious injury.
- ※ Study the service manual before service job.
- ▲ Never open the filler cap while engine running or at high coolant oil temperature.
- ▲ Study the operator's manual before starting and operating machine.
- ▲ Do not touch exhaust pipe or it may cause severe burn.



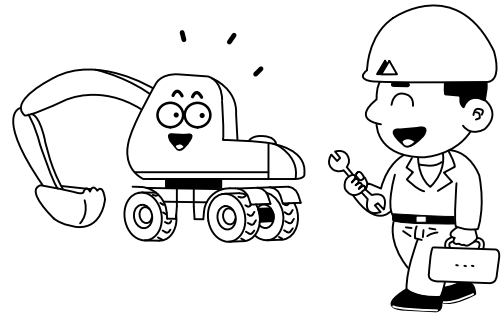
8) CONTROL IDEOGRAM-SWIVEL (item 9)

This warning label is positioned in right window of the cab.

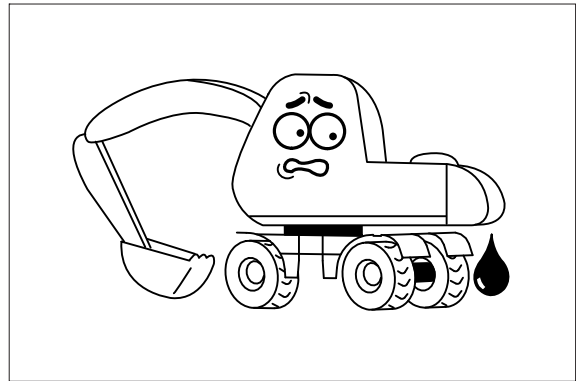
- ▲ Check the machine control pattern for conformance to pattern on this label. If not, change label to match pattern before operating machine.
- ▲ Failure to do so could result in injury or death.
- ※ See page 4-7 for details.



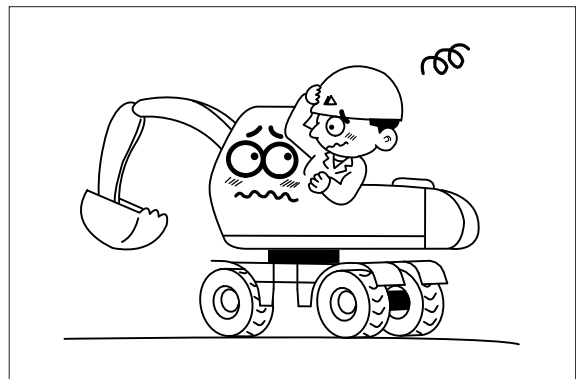
Check daily according to the operation manual.
Repair the damaged parts and tighten the loosened bolts.



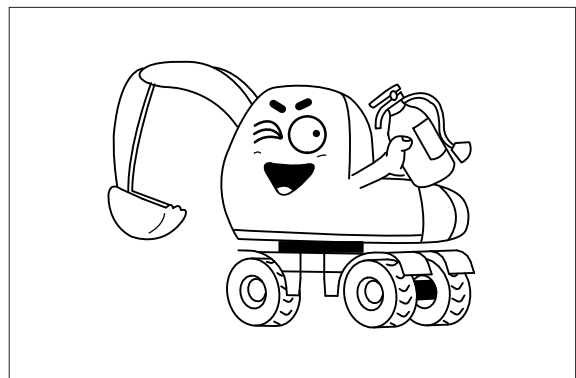
Check for leakage of engine oil, hydraulic oil,
fuel and coolant.
Keep machine clean, clean machine regularly.



Do not operate the machine if it requires repairs.
Operate after complete repair.



Be prepared if a fire starts.
Keep a fire extinguisher handy and emergency
numbers for a fire department near your
telephone.



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Vibration Data for Earth-moving Machines

Information Concerning Hand/Arm Vibration Level

When the machine is operated according to the intended use, the hand/arm vibration of this machine is below 2.5 m/s^2 .

Information Concerning Whole Body Vibration Level

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

This section provides vibration data and a method for estimating the vibration level for earth moving machines.

Vibration levels are influenced by many different parameters. Many items are listed below.

- Operator training, behavior, mode and stress
- Job site organization, preparation, environment, weather and material
- Machine type, quality of the seat, quality of the suspension system, attachments and condition of the equipment

It is not possible to get precise vibration levels for this machine. The expected vibration levels can be estimated with the information in below Table in order to calculate the daily vibration exposure. A simple evaluation of the machine application can be used.

Estimate the vibration levels for the three vibration directions. For typical operating conditions, use the average vibration levels as the estimated level. With an experienced operator and smooth terrain, subtract the Scenario Factors from the average vibration level. For aggressive operations and severe terrain, add the Scenario Factors to the average vibration level in order to obtain the estimated vibration level.

MOUNTING AND DISMOUNTING

Never jump on or off the machine. Never get on or off a moving machine.

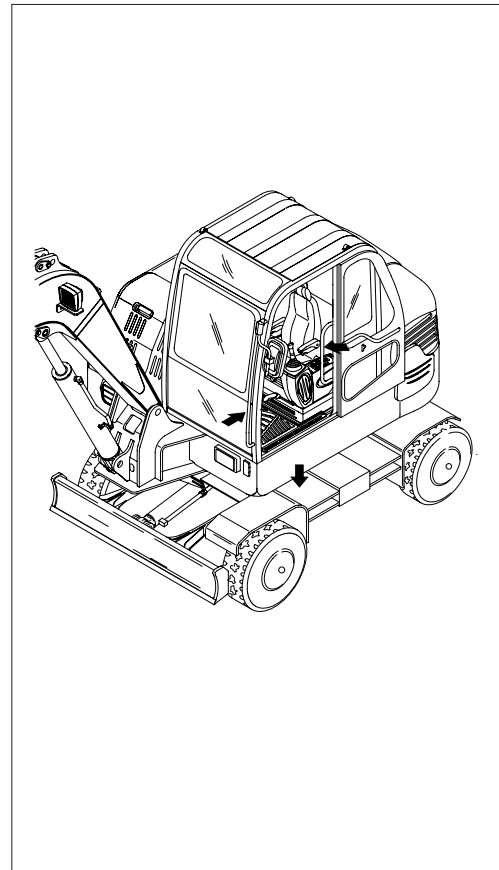
When mounting or dismounting, always face the machine and use the handrails, machine or foot steps. In this case please contact your Hyundai distributor.

Do not hold any control levers when getting on or off the machine.

Ensure safety by always maintaining at least three-point contact of hands and feet with the handrails, foot steps.

Always remove any oil or mud from the handrails, foot steps. If they are damaged, repair them and tighten any loose bolts.

If grasping the door handrail when mounting or dismounting or moving on the tires, open and lock the door securely in the open position. Otherwise, the door may move suddenly, causing you to lose balance and fall.



KEEP RIDERS OFF MACHINE

Riders on a machine are subject to injury such as being struck objects and being thrown off the machine.

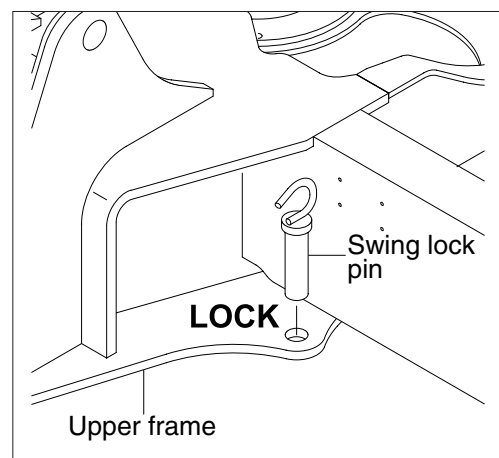
Only allow the operator on the machine. Keep riders off.

ALWAYS APPLY LOCK WHEN LEAVING MACHINE

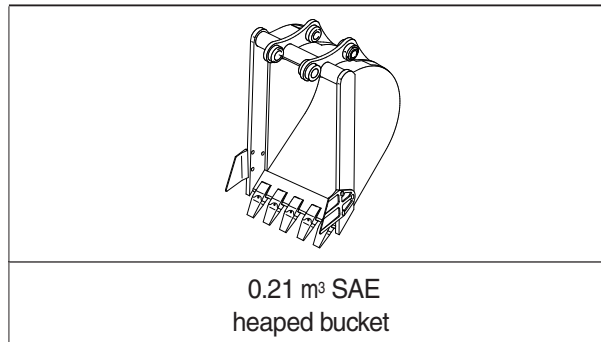
When leaving the machine, always place the swing lock pin securely in the LOCK position.

If you accidentally touch the travel or swing lever when they are not locked, the work equipment may suddenly move and cause serious injury or damage.

When leaving the machine, lower the work equipment completely to the ground, stop the engine and use the key to lock all the equipment. Then set the swing lock pin to the lock position. Always take the key with you.



6. BUCKET SELECTION GUIDE



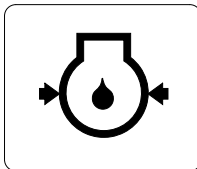
Capacity		Width		Weight	Recommendation
SAE heaped	CECE heaped	Without side cutter	With side cutter		3.0 m (9' 10") boom
					1.6 m (5' 3") arm
0.21 m ³	0.15 m ³	705 mm	770 mm	170 kg	Applicable for materials with density of 1600 kgf/m ³ (2700 lb/yd ³) or less

(4) Emergency warning lamp



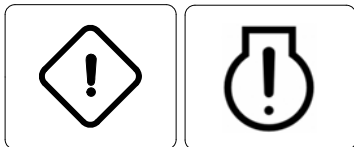
- ① This lamp pops up and the buzzer sounds when each of the below warnings are happened.
 - Engine coolant overheating (over 115°C)
 - Hydraulic oil overheating (over 105°C)
 - MCU input voltage abnormal
 - Accel dial circuit abnormal or open
- ※ **The pop-up warning lamp moves to the original position and lights ON when the buzzer stop switch is pushed or pop-up is touched. Also the buzzer stops. This is same as following warning lamps.**
- ② When this warning lamp lights ON, machine must be checked and serviced immediately.

(5) Engine oil pressure warning lamp



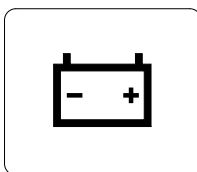
- ① This lamp lights ON when the engine oil pressure is low.
- ② If the lamp lights ON, shut OFF the engine immediately. Check oil level.

(6) Check engine warning lamp



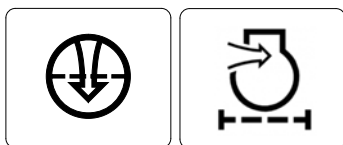
- ① This lamp lights ON when the communication between MCU and engine ECM on the engine is abnormal, or if the cluster received any fault code from engine ECM.
- ② Check the communication line between them.
If the communication line is OK, then check the fault codes on the cluster.

(7) Battery charging warning lamp



- ① This lamp lights ON when the battery charging voltage is low.
- ② Check the battery charging circuit when this lamp is ON.

(8) Air cleaner warning lamp



This lamp lights ON when the filter of air cleaner is clogged.
Check the filter and clean or replace it.

(3) Management

① ESL mode setting



ESL mode setting

- ESL : Engine Starting Limit
- ESL mode is designed to be a theft deterrent or will prevent the unauthorized operation of the machine.
- If the ESL mode was selected Enable, the password will be required when the start switch is turned ON.
- **Disable** : Not used ESL function
- **Enable (always)** : The password is required whenever the operator starts engine.
- **Enable (Interval)**: The password is required when the operator starts engine first.
But the operator can restart the engine within the interval time without inputting the password.
The interval time can be set maximum 2 days.

※ **Default password** : 00000

※ **Password length** : 5~10 digit

② Change password

- The password is 5~10 digits.



Enter the current password

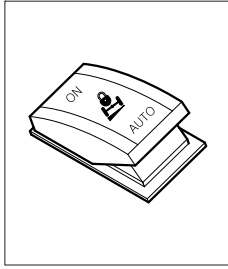
Enter the new password



The new password is stored in the MCU.

Enter the new password again

11) AUTO RAM LOCK SWITCH



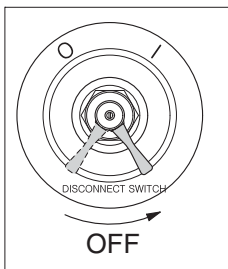
(1) This switch activate front axle oscillation cylinder to locking position for increase of stability.

- ON : Set front axle to locking position for excavation work or travels even ground. Also, the ram lock pilot lamp comes ON at the travel pilot lamp.
- AUTO : Set front axle to locking or unlocking as table.

※ Refer to page 3-31 for select switch.

Select switch (parking/working/traveling)	Ram lock	Conditions
Parking (P)	Locking	· Always
Traveling (T)	Unlocking	· Always
Working (W)	Locking	· FNR lever in neutral position · Service brake pedal is depressed.
	Unlocking	· FNR lever in forward/reverse position and service brake pedal is not depressed. · 2 way pedal is equipped and service brake pedal is not depressed.

12) MASTER SWITCH

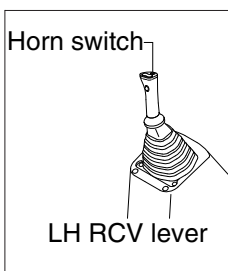


(1) This switch is used to shut off the entire electrical system.

- (2) I : The battery remains connected to the electrical system.
 O : The battery is disconnected to the electrical system.

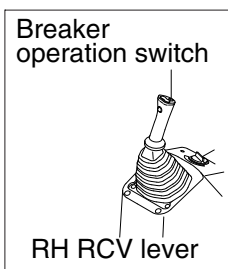
※ **Never turn the master switch to O (OFF) with the engine running. It could result in engine and electrical system damage.**

13) HORN SWITCH



(1) This switch is at the top of left side control lever.
 On pressing, the horn sounds.

14) BREAKER OPERATION SWITCH



(1) On pressing this switch, the breaker operates only when the breaker selection switch on the switch panel is selected.

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5-2 Installation and precaution of air conditioner

Item	Installation Method and Precaution
<p>Compression installation</p>	<ul style="list-style-type: none"> ▶ Compressor installation: The compressor is installed with the vehicle engine and auxiliary bracket, and must be secured with more than three bolts. (The strength of fixing bolts must be 9.8T or above.) ▶ Parallelism of V-belt: The deviation of parallelism between the engine pulley and compressor clutch pulley must be within ± 1.0 mm. ▶ Tension of V-belt: The tension of the V-belt refers to the tension measured at about 10 mm away from the belt center when the force of about 10 Kg is applied, as shown in the figure. The belt tension must be checked and adjusted once a week. 
<p>Condenser installation</p>	<ul style="list-style-type: none"> ▶ The condenser is secured on the frame with at least 4 bolts of 8T or above (torque: 2Kg/m). ▶ If the condenser is in front of and also far from the radiator and air does not pass through the condenser, an additional air cutoff device should be installed.
<p>Dryer installation</p>	<ul style="list-style-type: none"> ▶ The dryer is secured vertically with at least two bolts.
<p>HVAC unit installation</p>	<ul style="list-style-type: none"> ▶ The HVAC unit is secured on the frame with at least 4 bolts of 8T or above (torque: 2Kg/m). ▶ The air duct cannot be connected without sealing measures, in order to prevent air leakage.
<p>Hose and wire</p>	<ul style="list-style-type: none"> ▶ Avoid interference by protrusions in the surrounding environment during hose and wire connection. The parts that may be subject to friction due to vehicle vibration should be secured with clips onto the frame.

Function for radio



Td-650 is a knob-type car audio system, including FM, AM tuning radio, Bluetooth, MP3 (USB/SD) clock sound adjustment, external audio input, loudness and other functions.

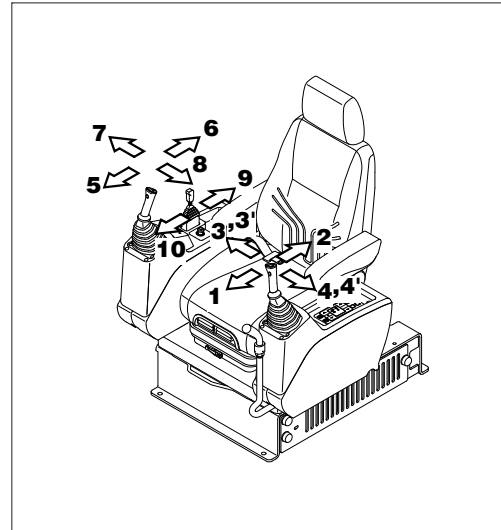
- . System configuration: digital tuned radio, USB/SD-MP3 player, electronic clock display.
- . Radio function: support FM (87.5~108MHz), AM (522~1620KHz), can store 24 stations.
- . AUX function: Supports the play of MP3 files in U disk or SD card, and supports the input of audio from mobile phone and MP3.
- . Sound function: support POP/ROCK/Classic/Flat sound.
- . Bluetooth function: Support bluetooth phone connection and bluetooth music playback function.

4. OPERATION OF WORKING DEVICE

※ **Confirm the operation of control lever and working device.**

- 1) Left control lever controls arm and swing.
- 2) Right control lever controls boom and bucket.
- 3) When you release the control lever, control lever returns to neutral position automatically.

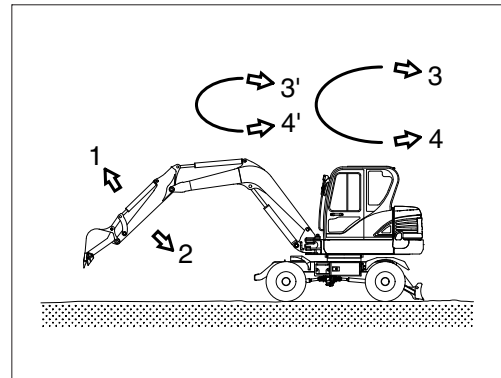
※ **When operating swing, consider the swing distance by inertia.**



※ **Left control lever**

- 1 Arm roll-out
- 2 Arm roll-in
- 3 Swing right
- 4 Swing left
- 3' Boom right (boom swing switch selected)
- 4' Boom left (boom swing switch selected)

※ **Refer to page 3-26 for boom offset switch.**

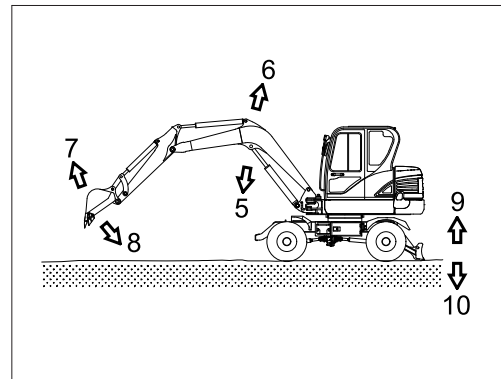


※ **Right control lever**

- 5 Boom lower
- 6 Boom raise
- 7 Bucket roll-out
- 8 Bucket roll-in

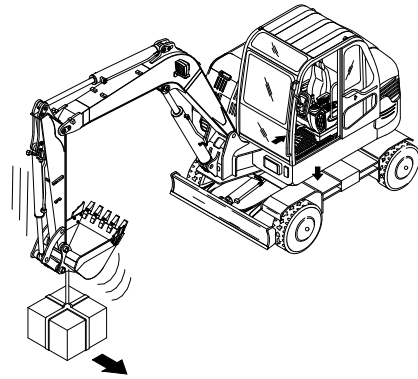
※ **Dozer control lever**

- 9 Dozer blade up
- 10 Dozer blade down

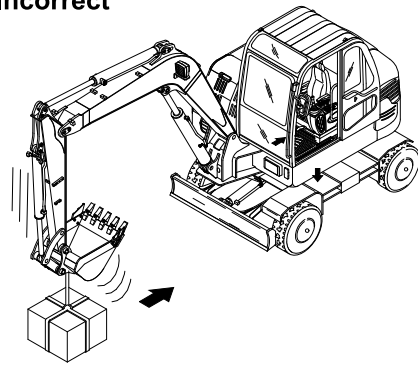


12) NEVER CARRY OUT EXCESSIVE
OPERATIONS

Incorrect



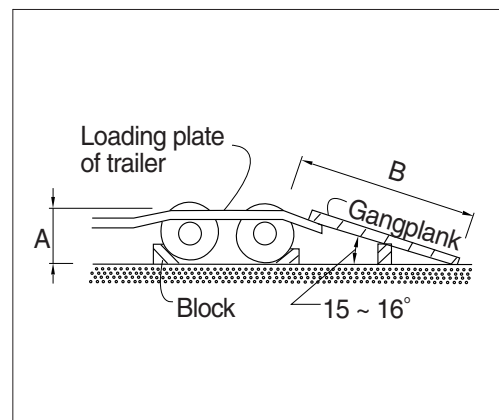
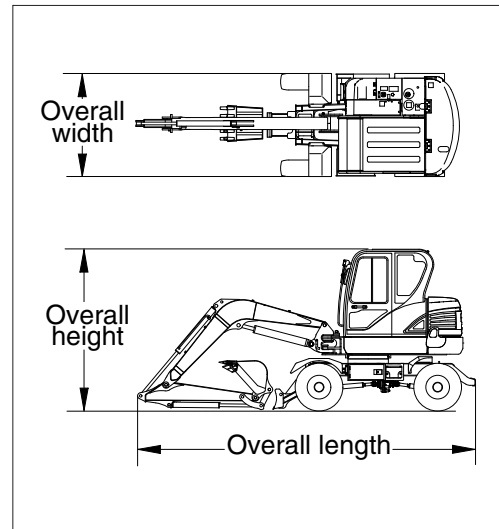
Incorrect



2. PREPARATION FOR TRANSPORTATION

- 1) When transporting the machine, observe the various road rules, road transportation vehicle laws and vehicle limit ordinances, etc.
- 2) Select proper trailer after confirming the weight and dimension from the chapter 2, specification.
- 3) Check the whole route such as the road width, the height of bridge and limit of weight and etc., which will be passed.
- 4) Get the permission from the related authority if necessary.
- 5) Prepare suitable capacity of trailer to support the machine.
- 6) Prepare gangplank for safe loading referring to the below table and illustration.

A	B
1.0	3.65 ~ 3.85
1.1	4.00 ~ 4.25
1.2	4.35 ~ 4.60
1.3	4.75 ~ 5.00
1.4	5.10 ~ 5.40
1.5	5.50 ~ 5.75



5) PRECAUTION WHEN INSTALLING HYDRAULIC HOSES OR PIPES

- (1) Be particularly careful that the joint of hose, pipe and functioning item are not damaged.
Avoid contamination.
- (2) Assemble after cleaning the hose, pipe and joint of functioning item.
- (3) Use genuine parts.
- (4) Do not assemble the hose in the condition of twisted or sharp radius.
- (5) Keep the specified tighten torque.

10) EVERY 1500 HOURS SERVICE

Check items	Service	Page
Crankcase breather	Check	6-24

11) EVERY 2000 HOURS SERVICE

Check items	Service	Page
Hydraulic oil* ¹	Change	6-28
HBHO (Hyundai Bio Hydraulic Oil, ISO VG 46)* ²	Change	6-28
Hydraulic tank suction strainer	Check, Clean	6-28
Coolant	Change	6-20, 21, 22, 23
Hoses, fittings, clamps (fuel, coolant, hydraulic)	Check, Retighten, Replace	-

*¹ Conventional hydraulic oil

*² If do not want to change HBHO every 2000 hours, contact HYUNDAI dealer and ask about SAMPLING.

※ **Change oil every 600 hours of continuous hydraulic breaker operation.**

12) EVERY 5000 HOURS SERVICE

Check items	Service	Page
Hydraulic oil* ³	Change	6-28

*³ Hyundai genuine long life hydraulic oil

※ **Change oil every 1000 hours of continuous hydraulic breaker operation.**

7) INSPECTION OF COOLING FAN

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

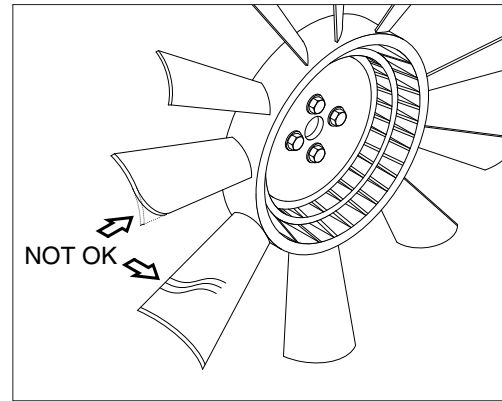
※ Rotate the crankshaft by using the engine barring gear.

※ A visual inspection of the cooling fan is required daily.

Check for cracks, loose rivets, and bent or loose blades.

Check the fan to make sure it is securely mounted. Tighten the capscrews if necessary.

Replace any fan that is damaged.



8) CLEANING OF AIR CLEANER

(1) Primary element

① Open cover and remove the element.

② Clean the inside of the body.

③ Clean the element with pressurized air.

· Remove the dust inside of the element by the pressurized air (below 3 kgf/cm², 40 psi) forward and backward equally.

④ Inspect for cracks or damage of element by putting a light bulb inside of the element.

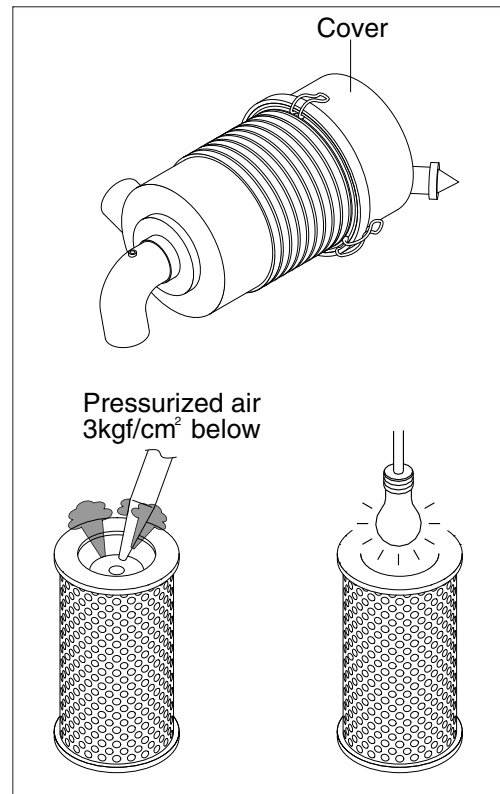
⑤ Insert element and close cover.

※ Replace the primary element after 4 times cleanings.

(2) Safety element

※ Replace the safety element only when the primary element is cleaned for the 4 times.

※ Always replace the safety element. Never attempt to reuse the safety element by cleaning the element.



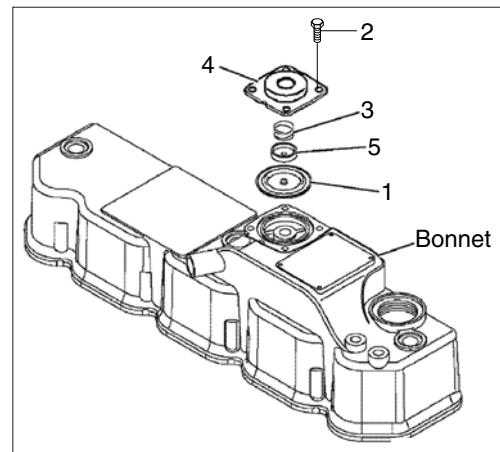
9) CRANKCASE BREATHER

(1) Remove the bolts (2) retaining the diaphragm cover.

(2) Remove the diaphragm cover (4), spring (3), diaphragm plate (5) and diaphragm (1).

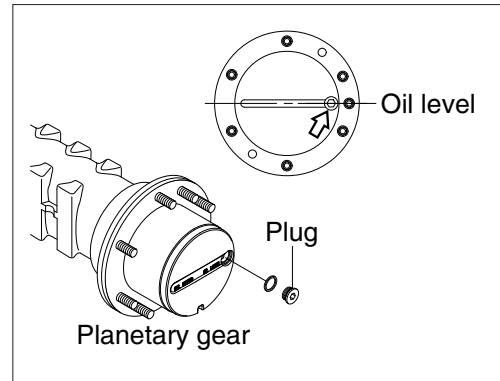
(3) Inspect the diaphragm for tears. Inspect the spring for distortion. Replace components if necessary.

(4) Reinstall the diaphragm, diaphragm plate, spring and diaphragm cover. Tighten the bolts.



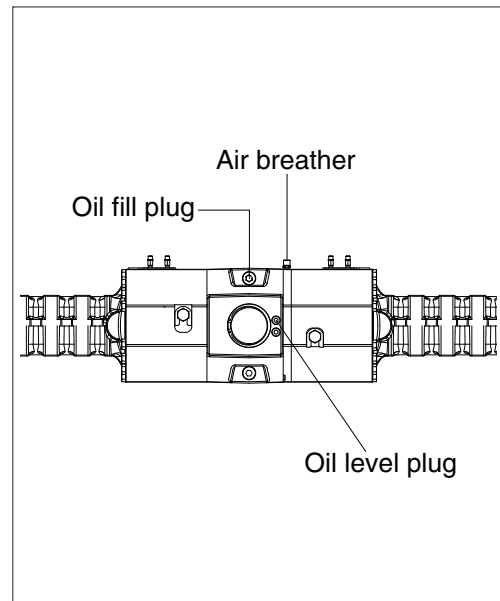
27) CHECK PLANETARY GEAR OIL LEVEL

- (1) Move the machine to flat ground.
 - (2) Remove the plug and check the oil amount.
 - (3) If the oil level is below the plug hole, supply oil through a plug hole.
- ※ **Set the plug of planetary gear in parallel to the ground.**
- (4) After checking, install plug.



28) CHECK AND SUPPLYING AXLE OIL

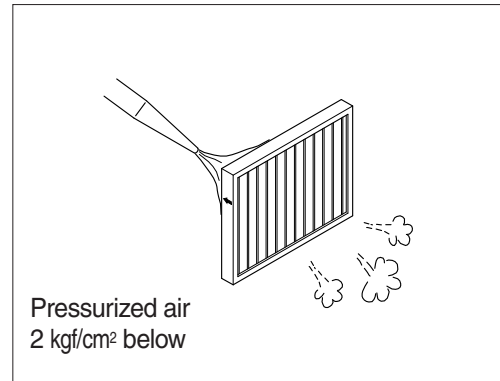
- (1) Move the machine to flat ground.
 - (2) Open the axle air breather to relieve internal air pressure.
 - (3) Remove the oil level plug and check the oil amount. If the oil level is at the hole of the plug, it is normal.
 - (4) If the oil level is below the plug hole, supply oil through a oil fill plug hole.
- ▲ **When checking the oil level, press the service brake.**
- ▲ **As the machine is hot after operation, wait until the oil temperature has dropped.**



- (3) Clean the recirculation filter using a pressurizes are (Below 2 kgf/cm², 28psi) or washing with water.

△
When using pressurized air, be sure to wear safety glasses.

- (4) Inspect the filter after cleaning. If it is damaged or badly contaminated, use a new filter.



3) PRECAUTIONS FOR USING AIR CONDITIONER

- (1) When using the air conditioner for a long time, open the window once every one hour.
- (2) Be careful not to overcool the cab.
- (3) The cab is properly cooled if the operator feels cool when entering there from outside (about 5°C lower than the outside temperature).
- (4) When cooling, change air occasionally.

4) CHECK DURING SEASON

Ask the service center for replenishment of refrigerant or other maintenance service so that the cooling performance is not damaged.

5) CHECK DURING OFF-SEASON

Operate the air conditioner 2 or 3 times a month (each for a few minutes) to avoid loss of oil film in the compressor.

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