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## 17) REF OPERATOR'S MANUAL

### (1) REF OPERATOR MANUAL

- ▲ Study the operator's manual before starting and operating machine.

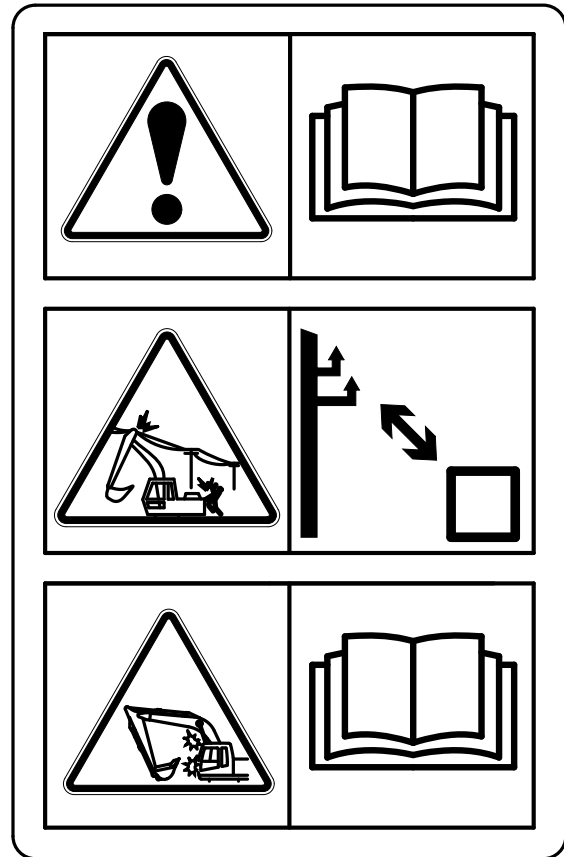
### (2) MAX HEIGHT

- ▲ Serious injury or death can result from contact with electric lines.

An electric shock being received by merely coming into the vicinity of an electric lines, the minimum distance should be kept considering the supply voltage as page 1-7.

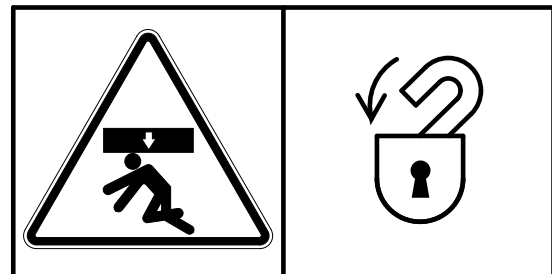
### (3) INTERFERENCE

- ▲ Be careful to operate machine equipped with quick clamp or extensions. Bucket may hit cab or boom, boom cylinders when it reached vicinity of them.



## 18) SAFETY FRONT WINDOW

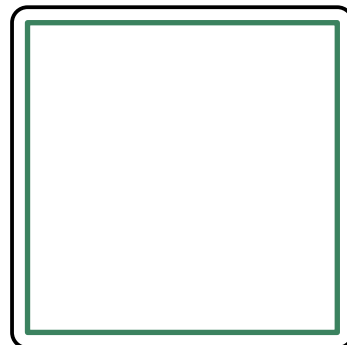
- ▲ Be careful that the front window may be promptly closed.



## SAFETY REAR WINDOW

The rear window serves us an alternate exit.

To remove rear window, pull the ring and push out the glass.

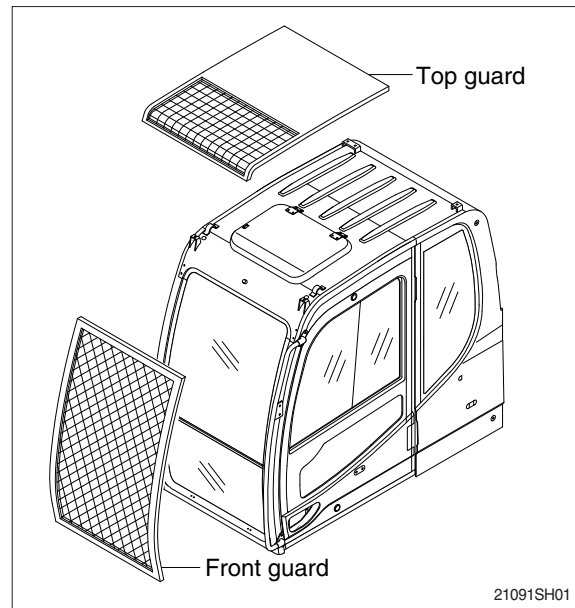


## PROTECTION AGAINST FALLING OR FLYING OBJECTS

If there is any danger of falling or flying objects hitting the operator, install protective guards in place to protect the operator as required for each particular situation.

Be sure to close the front window before commencing work.

Make sure to keep all persons other than operator outside the range of falling or flying objects. In case you need top guard, front guard and FOPS (falling object protective structure), please contact Hyundai distributor in Europe.



## UNAUTHORIZED MODIFICATION

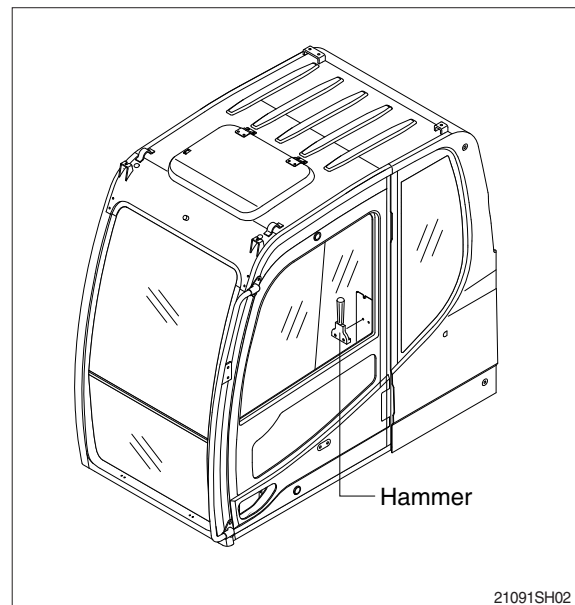
Any modification made without authorization from Hyundai can create hazards.

Before making a modification, consult your Hyundai distributor. Hyundai will not be responsible for any injury or damage caused by any unauthorized modification.

## PREPARE FOR EMERGENCY

Only in case of emergency, use the installed hammer for breaking the windshield of the cab, and then exit carefully.

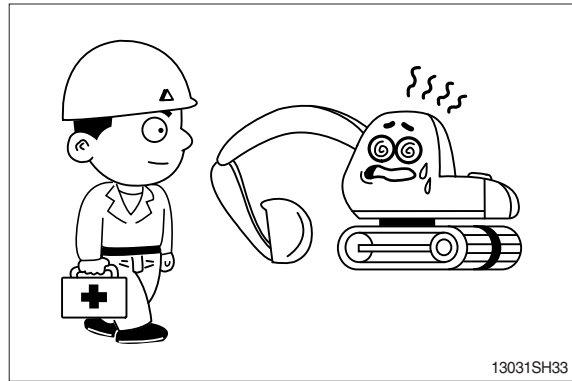
Be sure you know the phone numbers of persons you should contact in case of an emergency.



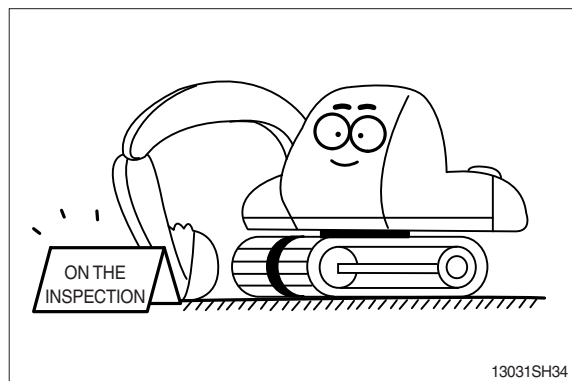
### 3. DURING MAINTENANCE

Stop the engine immediately when the trouble of the machine is found.

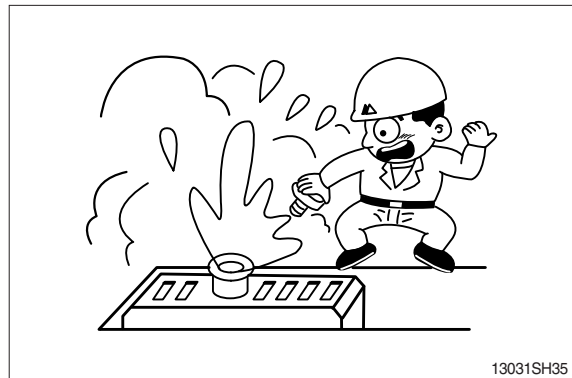
Inspect immediately the cause of trouble such as vibration, overheating and trouble in the cluster then repair.



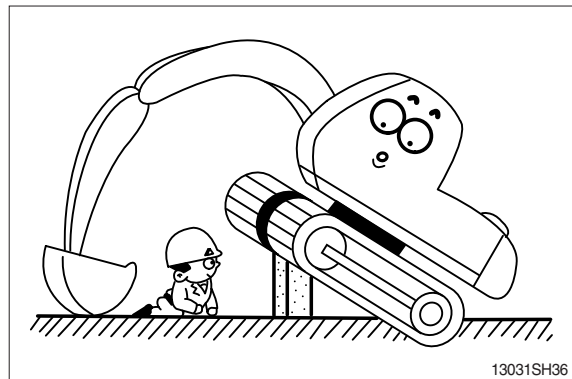
Park on a flat place and stop the engine for inspecting and repairing. Properly TAG machine is not operational. (remove start key)  
Extreme care shall be taken during maintenance work. Parts may require additional safe guard.



Do not remove the radiator cap from hot engine. Open the cap after the engine cools, below 50 °C (122 °F) to prevent personal injury from heated coolant spray or steam.



Do not work below the machine.  
Be sure to work with proper safety supports.  
Do not depend on the hydraulic cylinders to hold up the equipment and attachment.



## 2) R220LC-9SB LONG REACH

Item	R220LC-9SB LONG REACH	
	kg	lb
Upperstructure assembly	9400	20720
Main frame weld assembly	1920	4230
Engine assembly	520	1146
Main pump assembly	166	366
Main control valve assembly	220	485
Swing motor assembly	236	520
Hydraulic oil tank assembly	205	450
Fuel tank assembly	195	430
Counterweight	5300	11680
Cab assembly	440	970
Lower chassis assembly	8700	19180
Track frame weld assembly	2720	6000
Swing bearing	284	626
Travel motor assembly type 1	305	672
Travel motor assembly type 2, 3	360	794
Turning joint	53	116
Track recoil spring	141.5	312
Idler	150.5	332
Carrier roller	23.2	51.1
Track roller	47.5	104.7
Track-chain assembly (800 mm standard triple grouser shoe)	1734	3822.8
Sprocket	56	123.5
Front attachment assembly (8.2 m boom, 6.3 m arm, 0.52 m <sup>3</sup> SAE heaped bucket)	4600	10140
8.2 m boom assembly	2105	4640
6.3 m arm assembly	1100	2430
0.52 m <sup>3</sup> SAE heaped bucket	465	1030
Boom cylinder assembly	180	400
Arm cylinder assembly	270	600
Bucket cylinder assembly	130	290
Bucket control rod assembly	170	370

## 7) REMOTE CONTROL VALVE

Item		Specification
Type		Pressure reducing type
Operating pressure	Minimum	6.5 kgf/cm <sup>2</sup> (92 psi)
	Maximum	25 kgf/cm <sup>2</sup> (356 psi)
Single operation stroke	Lever	90 mm (3.5 in)
	Pedal	130 mm (4.4 in)

## 8) CYLINDER

Item		Specification
Boom cylinder	Bore dia × Rod dia × Stroke	∅ 120 × ∅ 85 × 1290 mm
	Cushion	Extend only
Arm cylinder	Bore dia × Rod dia × Stroke	∅ 140 × ∅ 100 × 1510 mm # ∅ 140 × ∅ 100 × 1460 mm
	Cushion	Extend and retract
Bucket cylinder	Bore dia × Rod dia × Stroke	∅ 120 × ∅ 85 × 1055 mm # ∅ 100 × ∅ 70 × 870 mm
	Cushion	Extend only

※ Discoloration of cylinder rod can occur when the friction reduction additive of lubrication oil spreads on the rod surface.

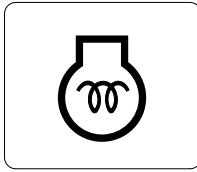
※ Discoloration does not cause any harmful effect on the cylinder performance.

# : LONG REACH

## 9) SHOE

Item		Width	Ground pressure	Link quantity	Overall width
R220LC-9	Standard	600 mm (24")	0.47 kgf/cm <sup>2</sup> (6.68psi)	49	2990 mm (9' 10")
	Option	700 mm (28")	0.41 kgf/cm <sup>2</sup> (5.83 psi)	49	3090 mm (10' 2")
		800 mm (32")	0.36 kgf/cm <sup>2</sup> (5.12 psi)	49	3190 mm (10' 6")
		900 mm (36")	0.32 kgf/cm <sup>2</sup> (4.55 psi)	49	3290 mm (10' 10")
R220LC-9 LONG REACH	Standard	800 mm (32")	0.39 kgf/cm <sup>2</sup> (5.55 psi)	49	3190 mm (10' 6")

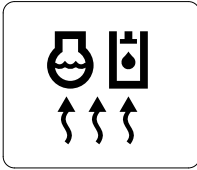
### (3) Preheat pilot lamp



21093CD39

- ① Turning the start key switch ON position starts preheating in cold weather.
- ② Start the engine after this lamp is OFF.

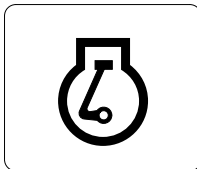
### (4) Warming up pilot lamp



21093CD40

- ① This lamp is turned ON when the coolant temperature is below 30°C (86°F).
- ② The automatic warming up is cancelled when the engine coolant temperature is above 30°C, or when 10 minutes have passed since starting the engine.

### (5) Decel pilot lamp



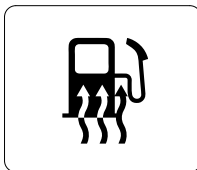
Operating one touch decel switch on the RCV lever makes the lamp ON.

Also, the lamp will be ON and engine speed will be lowered automatically to save fuel consumption when all levers and pedals are at neutral position, and the auto idle function is selected.

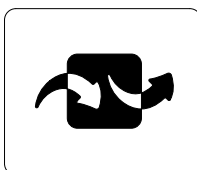
**One touch decel is not available when the auto idle pilot lamp is turned ON.**

**Refer to the page 3-26.**

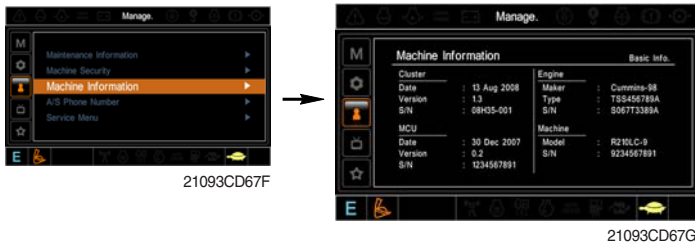
### (6) Fuel warmer pilot lamp



### (7) Maintenance pilot lamp



### ③ Machine Information

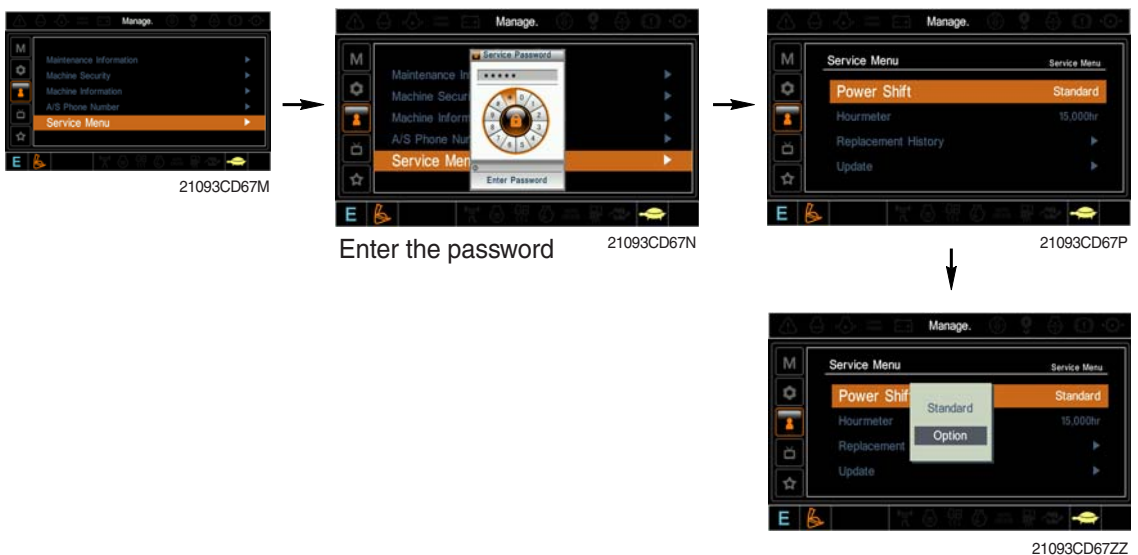


- This can confirm the identification of the cluster, MCU, engine and machine.

### ④ A/S phone number

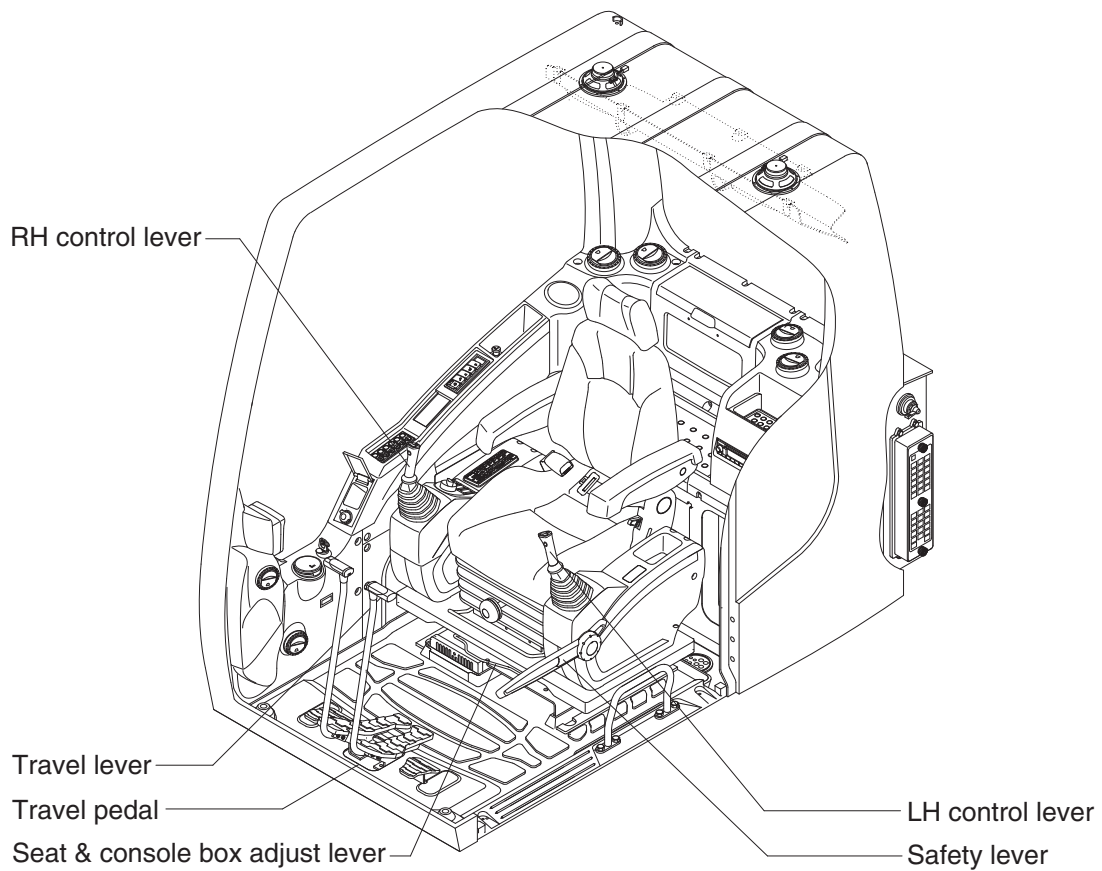


### ⑤ Service menu



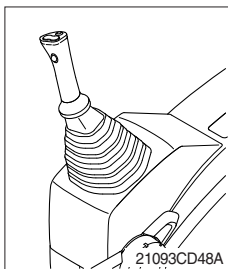
- Power shift (standard/option) : Power shift pressure can be set by option menu.
- Hourmeter : Operating hours since the machine line out can be checked by this menu.
- Replacement history : Replacement history of the MCU and cluster can be checked by this menu.
- Update : Firm ware can be upgraded by this menu. (the USB port is located under the cluster)

## 4. LEVERS AND PEDALS



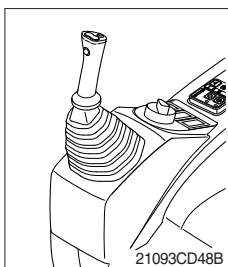
2209S3CD48

### 1) LH CONTROL LEVER



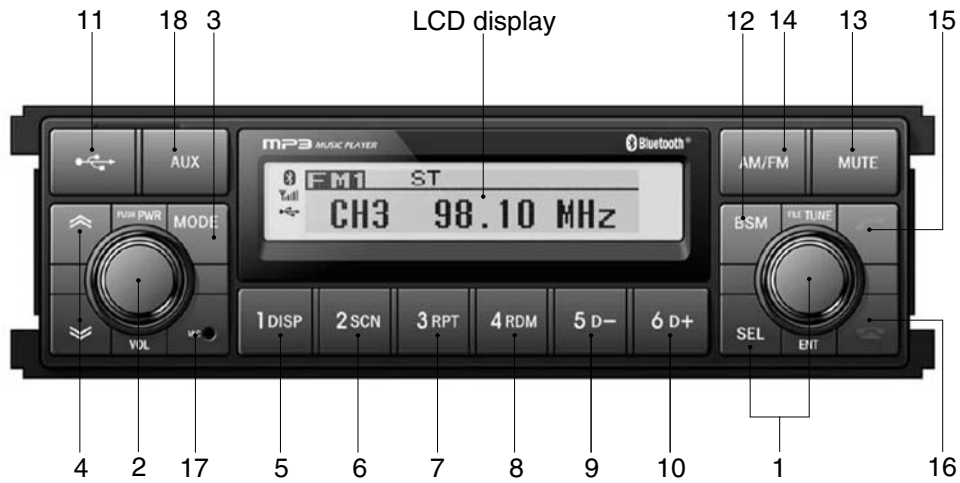
- (1) This joystick is used to control the swing and the arm.
- (2) Refer to operation of working device in chapter 4 for details.

### 2) RH CONTROL LEVER





















- (1) This joystick is used to control the boom and the bucket.
- (2) Refer to operation of working device in chapter 4 for details.

**RADIO AND USB PLAYER : MACHINE SERIAL NO.: -#5232**



75793CD62-2

**■ FRONT PANEL PRESENTATION**

- |  |   |
|--|---|
| <p>1  ..... Audio selection button</p> <p> ..... Audio selection knob</p> <p>2  ..... Power and volume button</p> <p>3  ..... Mode button<br/>(select RADIO / USB / AUX)</p> <p>4  ..... UP / DOWN tuning button</p> <p>5  ..... Preset memory button 1<br/>DISP ..... ID3 v2 display</p> <p>6  ..... Preset memory button 2<br/>SCN ..... File scan</p> <p>7  ..... Preset memory button 3<br/>RPT ..... Repeat play selector</p> <p>8  ..... Preset memory button 4<br/>RDM ..... Random play selector</p> <p>9  ..... Preset memory button 5<br/>D- ..... Directory down</p> | <p>10  ..... Preset memory button 6<br/>D+ ..... Directory up</p> <p>11  ..... Aux function</p> <p>12  ..... Preset scan (PS)<br/>Best station memory (BSM)</p> <p>13  ..... Audio mute button</p> <p>14  ..... AM / FM button (radio)</p> <p>15  ..... Send</p> <p>16  ..... End</p> <p>17  ..... MIC (microphone)</p> <p>18  ..... Aux connector</p> |
|--|---|

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## ■ GENERAL

### (1) Power and volume button



#### ① Power ON / OFF button

Press power button (1) to turn the unit on or off.

#### ② Volume UP/DOWN control knob

Turn VOL knob (1) right to increase the volume level.

Turn VOL knob (1) left to decrease the volume.

After 5 seconds the display will return to the previous display mode.

#### ③ Initial volume level set up

I-VOL is the volume level the unit will play at when next turned on.

To adjust the I-VOL level, press and hold VOL button (1) for longer than 2 seconds. The current volume level displays on the display panel.

Then turn button (1) right or left to set the volume level as the I-VOL level.

#### ④ Clock ON/OFF control

The CLOCK was default at off status. To turn CLOCK ON, press and hold VOL button (1) for longer than 2 seconds to display I-VOL, then short press VOL again, turn VOL knob while CLOCK OFF display, then the CLOCK ON will be displayed.

※ **Due to time tolerance, the clock display on the Audio unit might have little difference.**

#### ⑤ Clock adjustment

With CLOCK ON selected, press VOL knob again after CLOCK ON display, the hour will blink, turn VOL knob right or left to adjust hour.

Simply press VOL again, the minute will blink, turn VOL knob to adjust minute. Then press VOL again to confirm the clock once finished.

#### 4) Bluetooth connection and disconnection

- (1) When established bluetooth connection between this audio unit and the cellular phone, bluetooth icon on the display appears and then the display shows HF/AV CONN when handsfree & AV profile connected.



- (2) To disconnect bluetooth link  
Press and hold CALL END button (4) for 2 seconds, it shows DIS CON and disappears bluetooth icon on the display.



- (3) To disconnect bluetooth link  
Press CALL button (3) briefly, it blinks bluetooth icon on the display while bluetooth is being connected. If the connection is completed, it appears bluetooth icon on the display.

- ※ When your cellular phone battery is at low charge, the bluetooth connection may occasionally be lost. To maintain good connectivity ensure that your phone battery is adequately charged.
- ※ In case of failure of bluetooth pairing :
  - Delete item in paired list on your phone.
  - Reset both phone by power off/on and the audio unit by ACC off/on.
- ※ Connecting priority of handsfree profile is higher than headset profile.
- ※ The headset mode does not support caller ID, reject call and call Transfer.

#### 5) Using the audio unit as a handsfree device

- (1) When the audio unit is ringing, it shows CALL and follows with the phone number \*\*\*\*\* on the display.



- (2) To accept call  
Press CALL button (4), it appears ANSWER CALL and follows TALKING on the display.

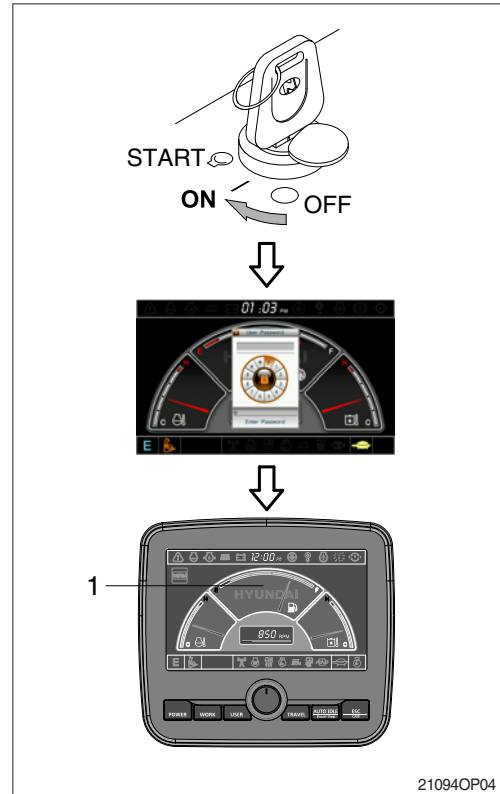
- (3) To end call  
To end call, press CALL END button (5), it appears REJECT on the display.

- ※ If reject call is activated in your phone, then your cellular phone does not support reject call function.

### 3. STARTING AND STOP THE ENGINE

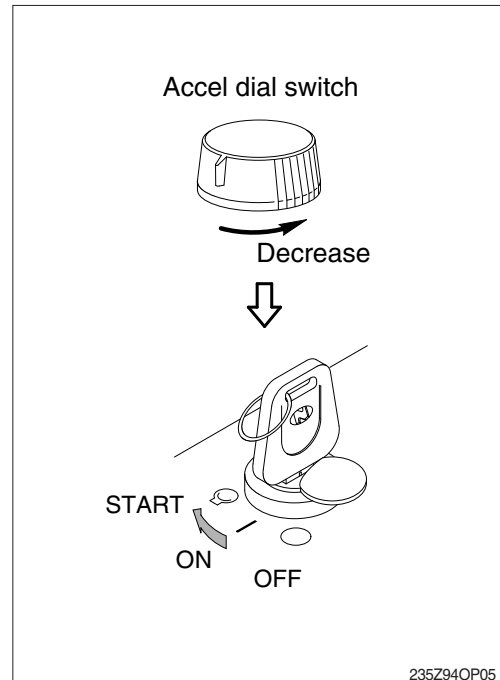
#### 1) CHECK INDICATOR LIGHTS

- (1) Check if all the operating levers are in the neutral position.
- (2) Turn the starting switch to the ON position.  
Buzzer sounding for 4 seconds with HYUNDAI logo on cluster.
  - ※ If the ESL mode is set to the enable, enter the password to start engine.
  - ※ If the password has failed 5 times, please wait 30 minutes before re-attempting to enter the password.
  - ※ Refer to page 3-17 for ESL mode.
- (3) After initialization of cluster, the operating screen is displayed on LCD (1).  
Also, self-diagnostic function is carried out.



#### 2) STARTING ENGINE IN NORMAL TEMPERATURE

- ※ Sound the horn to warn the surroundings after checking if personnel or obstacles are in the area.
- (1) Turn the accel dial switch to low idle position.
  - (2) Turn the starting switch to START position to start the engine.
    - ※ Do not hold the starting switch in the START position for longer than 20 seconds.  
The start system may be seriously damaged.
    - ※ If the engine does not start, allow the starter to cool for about 2 minutes before re-attempting to start the engine again.
  - (3) Release the starting switch instantly after the engine starts to avoid possible damage to the starting motor.



## 6. TRAVELING OF THE MACHINE

### 1) BASIC OPERATION

#### (1) Traveling position

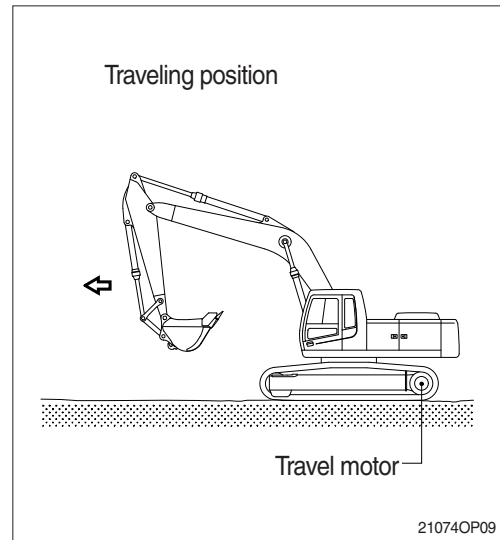
It is the position which the traveling motor is in the rear and the working device is forward.

- ▲ **Be careful as the traveling direction will be reversed when the whole machine is swung 180 degree.**

#### (2) Traveling operation

It is possible to travel by either travel lever or pedal.

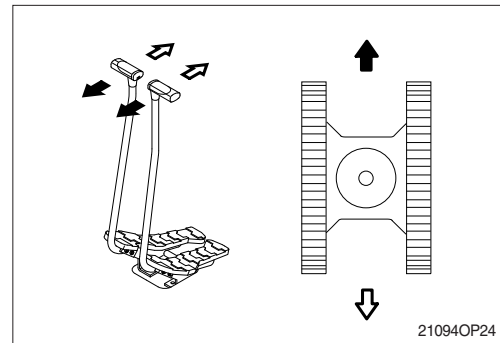
- ※ **Do not travel continuously for a long time.**
- ※ **Reduce the engine speed and travel at a low speed when traveling on uneven ground.**



#### (3) Forward and backward traveling

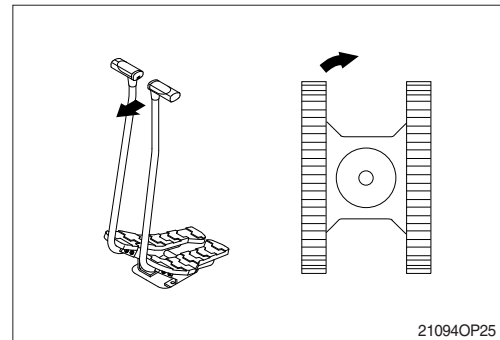
When the left and right travel lever or pedal are pushed at the same time, the machine will travel forward or backward.

- ※ **The speed can be controlled by the operation stroke of lever or pedal and change of direction will be controlled by difference of the left and right stroke.**



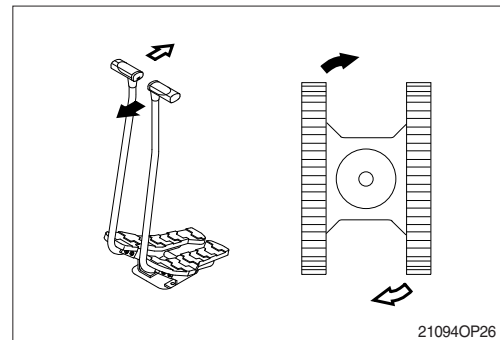
#### (4) Pivot turning

Operating only one side of lever or pedal make the change of direction possible by moving only one track.



#### (5) Counter rotation

It is to change the direction at the original place by moving the right and left track. Both side of lever or pedal are operated to the other way at the same time.



## 10. ATTACHMENT LOWERING (when engine is stopped)

1) On machines equipped with an accumulator, for a short time (within 1 minute) after the engine is stopped, the attachment will lower under its own weight when the attachment control lever is shifted to LOWER. That is happen only starting switch ON position and safety lever UNLOCK position. After the engine is stopped, set the safety lever to the LOCK position.

**▲ Be sure no one is under or near the attachment before lowering the boom.**

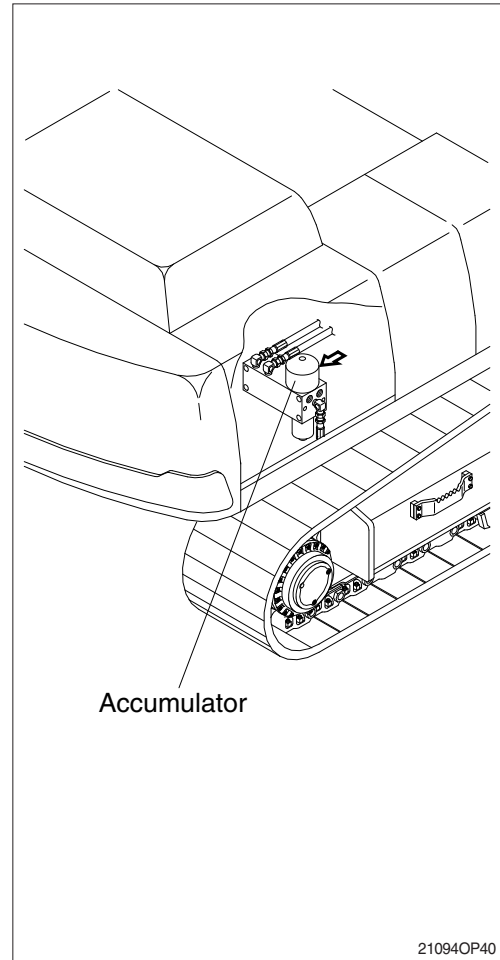
2) The accumulator is filled with high-pressure nitrogen gas, and it is extremely dangerous if it is handled in the wrong way. Always observe the following precautions.

**▲ Never make any hole in the accumulator expose it to flame or fire.**

**▲ Do not weld anything to the accumulator.**

※ When carrying out disassembly or maintenance of the accumulator, or when disposing of the accumulator, it is necessary to release the gas from the accumulator.

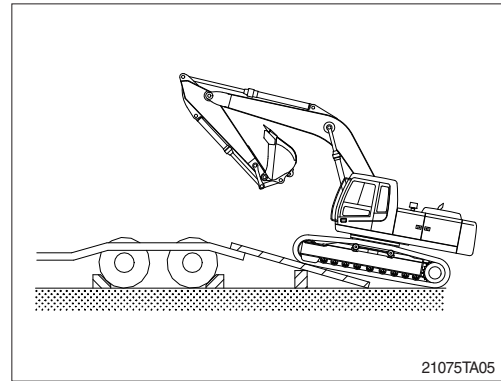
A special air bleed valve is necessary for this operation, so please contact your Hyundai distributor.



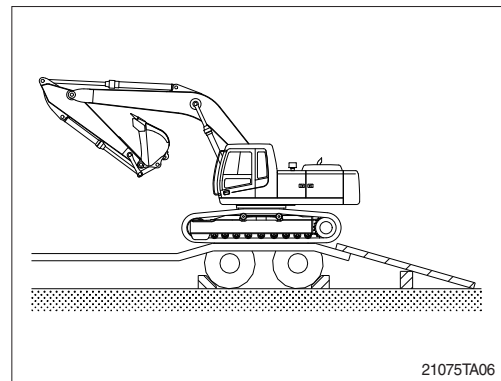
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### 3. LOADING THE MACHINE

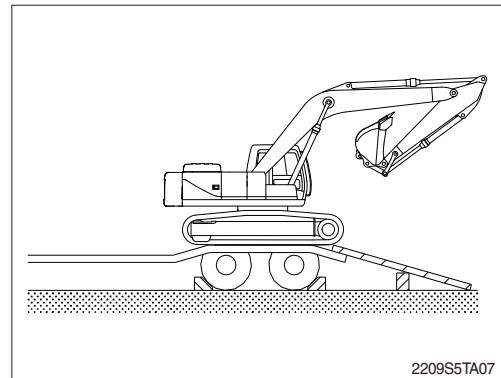
- 1) Load and unload the machine on a flat ground.
- 2) Use the gangplank with sufficient length, width, thickness and gradient.
- 3) Place the swing lock lever to the LOCK position before fixing the machine at the bed of trailer and confirm if the machine parallels the bed of trailer. Keep the travel motor in the rear when loading and in the front when unloading.



- 4) Do the following after loading the machine to the trailer.
  - (1) Stop loading when the machine is located horizontally with the rear wheel of trailer.



- (2) Place the swing lock lever to the LOCK position after the swing the machine 180 degree.



**2) PIPE AND HOSE (FLARE type)**

Thread size (PF)	Width across flat (mm)	kgf · m	lbf · ft
1/4"	19	4	28.9
3/8"	22	5	36.2
1/2"	27	9.5	68.7
3/4"	36	18	130.2
1"	41	21	151.9
1-1/4"	50	35	253.2

**3) PIPE AND HOSE (ORFS type)**

Thread size (UNF)	Width across flat (mm)	kgf · m	lbf · ft
9/16-18	19	4	28.9
11/16-16	22	5	36.2
13/16-16	27	9.5	68.7
1-3/16-12	36	18	130.2
1-7/16-12	41	21	151.9
1-11/16-12	50	35	253.2

**4) FITTING**

Thread size	Width across flat (mm)	kgf · m	lbf · ft
1/4"	19	4	28.9
3/8"	22	5	36.2
1/2"	27	9.5	68.7
3/4"	36	18	130.2
1"	41	21	151.9
1-1/4"	50	35	253.2

Service interval	No.	Description	Service action	Oil symbol	Capacity l (U.S.gal)	Service points No.
10 Hours or daily	1	Hydraulic oil level	Check, Add	HO	160 (42)	1
	2	Engine oil level	Check, Add	EO	24 (6.3)	1
	4	Radiator coolant	Check, Add	C	35 (9.2)	1
	5	Prefilter (water, element)	Check, Clean	-	-	1
	6	Fan belt tension and damage	Check, Adjust	-	-	1
	8	Fuel tank	Check, Refill	DF	400 (106)	1
50 Hours or weekly	8	Fuel tank (water, sediment)	Check, Clean	-	-	1
	10	Swing reduction gear case	Check, Add	GO	5.0 (1.3)	1
	13	Track tension	Check, Adjust	PGL	-	2
	25	Bucket linkage pins	Check, Add	PGL	-	5
250 Hours	7	Attachment pins & bushing	Check, Add	PGL	-	12
	9	Swing bearing grease	Check, Add	PGL	-	2
	14	Battery (voltage)	Check, Clean	-	-	1
	20	Aircon and heater fresh air filter	Check, Clean	-	-	1
500 Hours	2	Engine oil	Change	EO	24 (6.3)	1
	3	Engine oil filter	Replace	-	-	1
	5	Prefilter	Replace	-	-	1
	21	Air cleaner element (primary)	Check, Clean	-	-	1
	22	Fuel filter element	Replace	-	-	1
	23	Radiator, oil cooler	Check, Clean	-	-	3
1000 Hours	10	Swing reduction gear case	Change	GO	5.0 (1.3)	1
	11	Swing reduction gear grease	Check, Add	PGL	1.2 kg (0.3 lb)	1
	12	Swing gear and pinion grease	Change	PGL	7.9 kg (17.5 lb)	1
	15	Hydraulic oil return filter	Replace	-	-	1
	16	Drain filter cartridge	Replace	-	-	1
	17	Air breather element	Replace	-	-	1
	19	Pilot line filter element	Replace	-	-	1
	24	Travel reduction gear case	Change	GO	5.8 (1.5)	2
2000 Hours	1	Hydraulic oil * <sup>1</sup>	Change	HO	160 (42)	1
	4	Radiator coolant	Change	C	35 (9.2)	1
	18	Hydraulic oil suction strainer	Check, Clean	-	-	1
5000 Hours	1	Hydraulic oil * <sup>2</sup>	Change	HO	160 (42)	1
As required	20	Aircon & heater fresh filter	Replace	-	-	1
	20	Aircon & heater recirculation filter	Clean, Replace	-	-	1
	21	Air cleaner element (primary, safety)	Replace	-	-	2

\*<sup>1</sup> Conventional hydraulic oil      \*<sup>2</sup> Hyundai genuine long life hydraulic oil

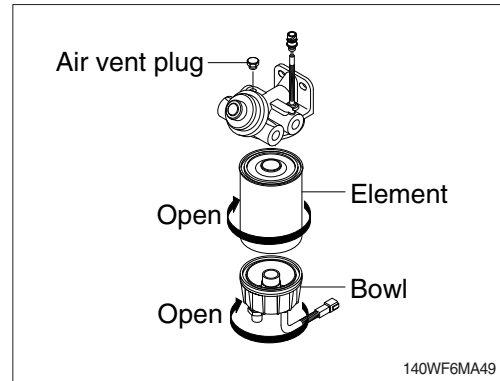
※ Oil symbol

Please refer to the recommended lubricants for specification.

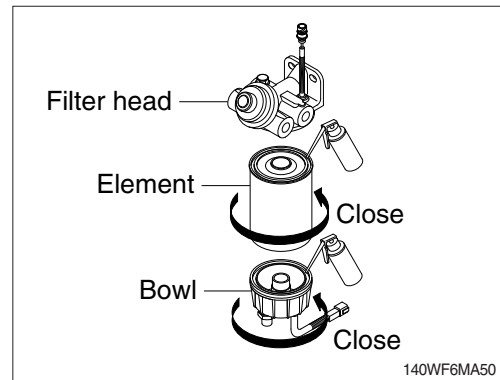
DF : Diesel fuel      GO : Gear oil      HO : Hydraulic oil  
C : Coolant      PGL : Grease      EO : Engine oil

## (2) Replace element

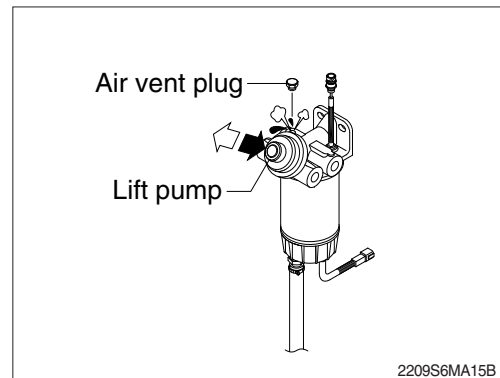
- ① Loosen the air vent plug and drain the unit of fuel. Follow "Drain water" instructions above.
- ② Remove element and bowl from filter head.
  - ※ **The bowl is reusable, do not damage or discard.**
- ③ Separate element from bowl. Clean bowl and seal gland.



- ④ Lubricate new bowl seal with clean fuel or motor oil and place in bowl gland.
- ⑤ Attach bowl to new element firmly by hand.
- ⑥ Lubricate new element seal and place in element top gland.
- ⑦ Attach the element and bowl to the head.

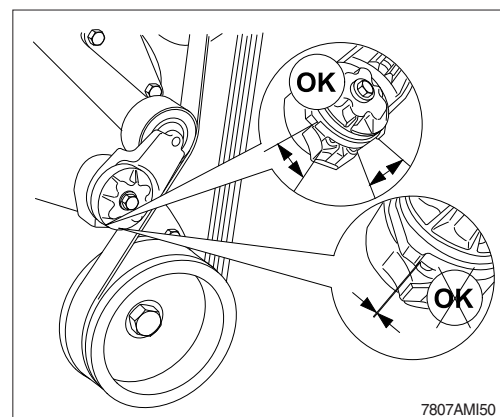


- ⑧ Do hand-priming the lift pump repeatedly until air bubbles comes out from air vent hole completely.
- ⑨ Tighten the air vent plug to its origin position.
- ▲ **The fuel pump, high-pressure fuel lines, and fuel rail contain very high-pressure fuel. Do not loosen any fittings while the engine is running. Personal injury and property damage can result. Wait at least 10 minutes after shutting down the engine before loosening any fittings in the high-pressure fuel system to allow pressure to decrease to a lower level.**



## 13) BELT TENSIONER, AUTOMATIC ADJUSTMENT

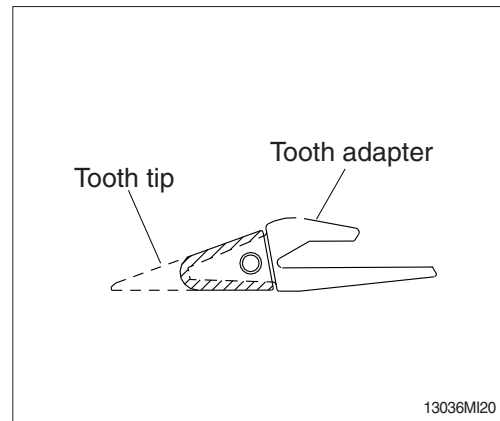
- (1) Every 1000hours, or 1 year, whichever occurs first, inspect the automatic belt tensioner. With the engine turned off, check that neither the top nor bottom tensioner arm stop is touching the cast boss on the tensioner body. If either of the stops is touching a boss, the alternator belt must be replaced. Check to make sure the correct belt part number is being used if either condition exists.



### 33) REPLACEMENT OF BUCKET TOOTH

#### (1) Timing of replacement

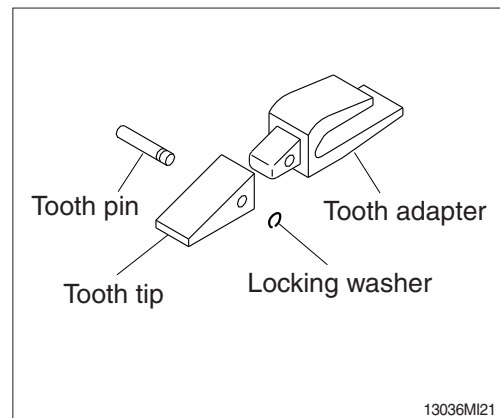
- ① Check wearing condition as shown in the illustration and replace tooth tip before adapter starts to wear.
- ② If excessive use, tooth adapter has worn out, replacement may become impossible.



#### (2) Instructions for replacement

- ① Pull out pin by striking pin with punch or hammer, avoiding damage to locking washer.
- ② Remove dust and mud from surface of tooth adapter by using knife.
- ③ Place locking washer in its proper place, and fit tooth tip to adapter.
- ④ Insert pin until locking washer is positioned at tooth pin groove.

- ▲ Personal injury can result from bucket falling.
- ▲ Block the bucket before changing tooth tips or side cutters.



### 3. OTHERS

Trouble	Service	Remark
Track slip out of place. Excessive wear of the sprocket.	<ul style="list-style-type: none"><li>• Adjust tension of track.</li></ul>	
Bucket either rises slowly or not at all.	<ul style="list-style-type: none"><li>• Add oil to specified level.</li></ul>	
Slow speed of travel, swing, boom, arm and bucket.	<ul style="list-style-type: none"><li>• Add oil to specified level.</li></ul>	
Unusual noise emitted from pump.	<ul style="list-style-type: none"><li>• Clean the hydraulic tank strainer.</li></ul>	
Excessive oil temperature rise of hydraulic oil.	<ul style="list-style-type: none"><li>• Clean the oil cooler.</li><li>• Adjust fan belt tension.</li><li>• Add oil to specified level.</li></ul>	

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