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17) REF OPERATOR'S MANUAL

(1) Ref operator manual

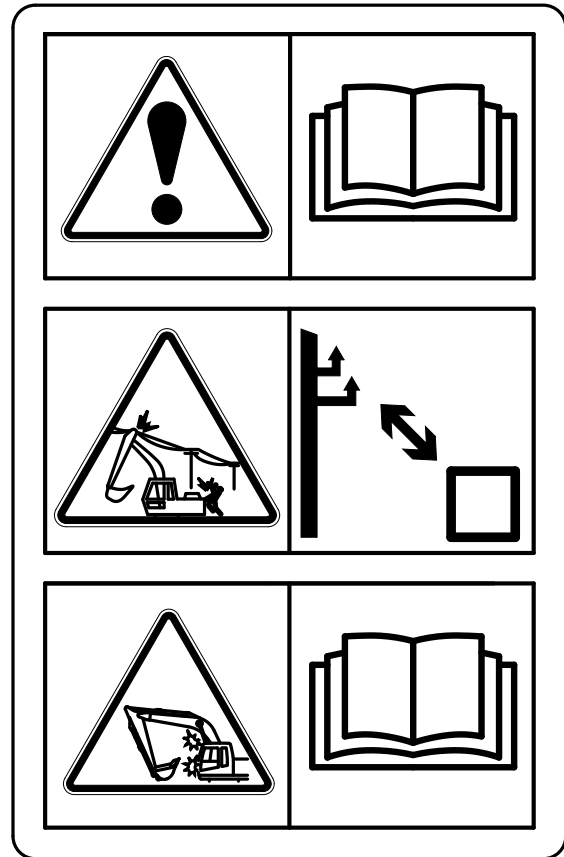
- ▲ Study the operator's manual before starting and operating machine.
- ▲ Do not operate this machine unless you have read and understand the instructions and warnings in this manual. Failure to follow the instructions or warnings could result in injury or death.

(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 1-16.

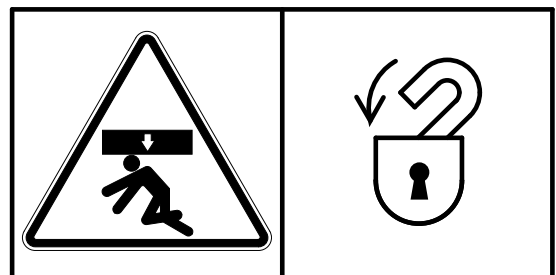
(3) Interference

- ▲ 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

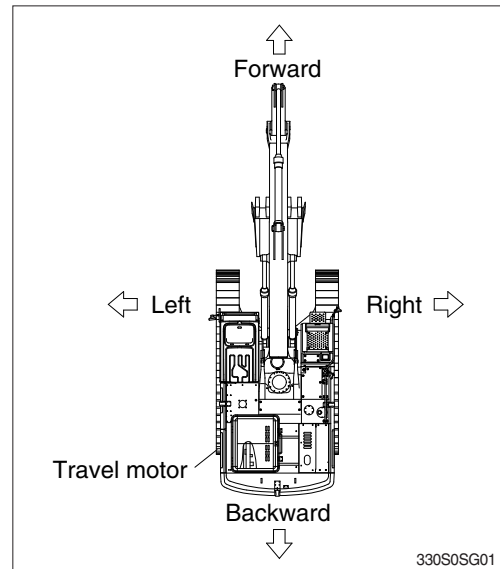
- ▲ Be careful that the front window may be promptly closed. See page 3-60 for details.



GUIDE

1. DIRECTION

The direction of this manual indicate forward, backward, right and left on the standard of operator when the travel motor is in the rear and machine is on the traveling direction.

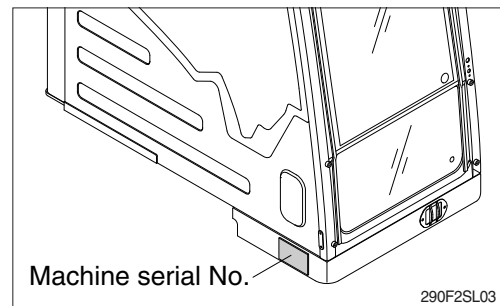


2. SERIAL NUMBER

Inform following when you order parts or the machine is out of order.

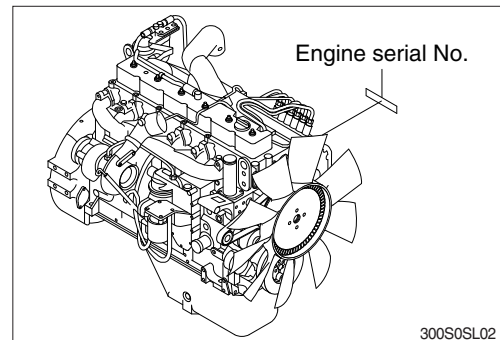
1) MACHINE SERIAL NUMBER

The numbers are located below the right window of the operator's cab.



2) ENGINE SERIAL NUMBER

The numbers are located on the engine name plate.



3. INTENDED USE

This machine is designed to be used mainly for the following work.

- Digging work
- Loading work
- Smoothing work
- Ditching work

※ Please refer to the section 4 (efficient working method) further details.

4. SYMBOLS

▲ Important safety hint.

△ It indicates matters which can cause the great loss on the machine or the surroundings.

※ It indicates the useful information for operator.

Fire Extinguisher

As an additional safety measure, keep a fire extinguisher on the machine.

Be familiar with the operation of the fire extinguisher. Inspect the fire extinguisher and service the fire extinguisher regularly. Follow the recommendations on the instruction plate.

Consider installation of an aftermarket Fire Suppression System, if the application and working conditions warrant the installation.

Fire Safety

※ **Locate secondary exits and how to use the secondary exits before you operate the machine.**

※ **Locate fire extinguishers and how to use a fire extinguisher before you operate the machine.**

If you find that you are involved in a machine fire, your safety and that of others on site is the top priority. The following actions should only be performed if the actions do not present a danger or risk to you and any nearby people. At all times you should assess the risk of personal injury and move away to a safe distance as soon as you feel unsafe.

Move the machine away from nearby combustible material such as fuel/oil stations, structures, trash, mulch and timber.

Lower any implements and turn off the engine as soon as possible. If you leave the engine running, the engine will continue to feed a fire. The fire will be fed from away damaged hoses that are attached to the engine or pumps.

If possible, turn the battery disconnect switch to the OFF position. Disconnecting the battery will remove the ignition source in the event of an electrical short. Disconnecting the battery will eliminate a second ignition source if electrical wiring is damaged by the fire, resulting in a short circuit.

Notify emergency personnel of the fire and your location.

If your machine is equipped with a fire suppression system, follow the manufacturers procedure for activating the system.

※ **Fire suppression systems need to be regularly inspected by qualified personnel. You must be trained to operate the fire suppression system.**

Use the on-board fire extinguisher and use the following procedure :

1. Pull the pin.
2. Aim the extinguisher or nozzle at the base of the fire.
3. Squeeze the handle and release the extinguishing agent.
4. Sweep the extinguisher from side to side across the base of the fire until the fire is out.

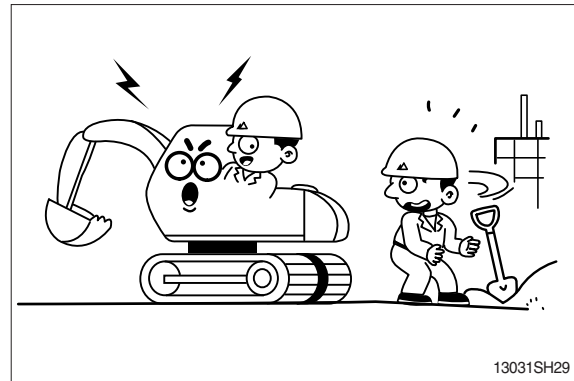
Remember, if you are unable to do anything else, shut off the machine before exiting. By shutting off the machine, fuels will not continue to be pumped into the fire.

If the fire grows out of control, be aware of the following risks :

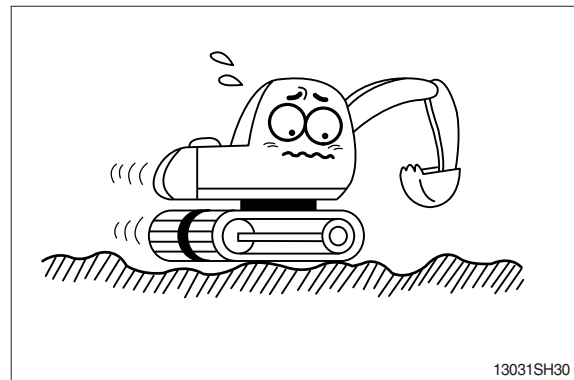
- Tires on wheeled machines pose a risk of explosion as tires burn. Hot shrapnel and debris can be thrown great distances in an explosion.
- Tanks, accumulators, hoses, and fittings can rupture in a fire, spraying fuels and shrapnel over a large area.

Remember that nearby all of the fluids on the machine are flammable, including coolant and oils. Additionally, plastics, rubbers, fabrics, and resins in fiberglass panels are also flammable.

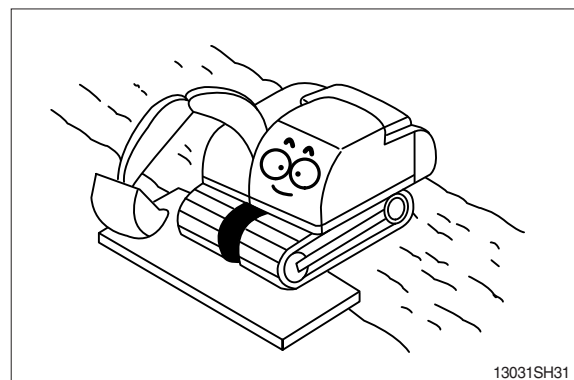
Before traveling the machine, sound the horn to warn nearby personnel.
Operate forward and backward correctly with confirming the location of the travel motor.



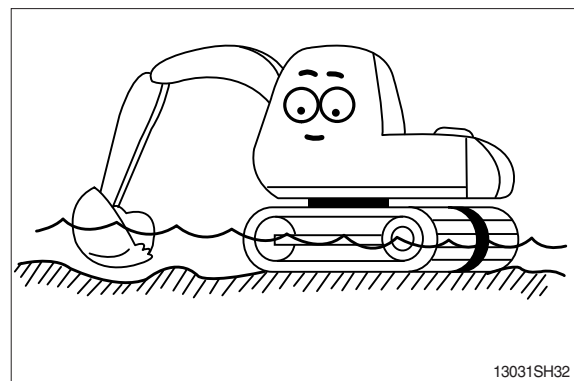
Slow down when traveling through obstacles or uneven ground.



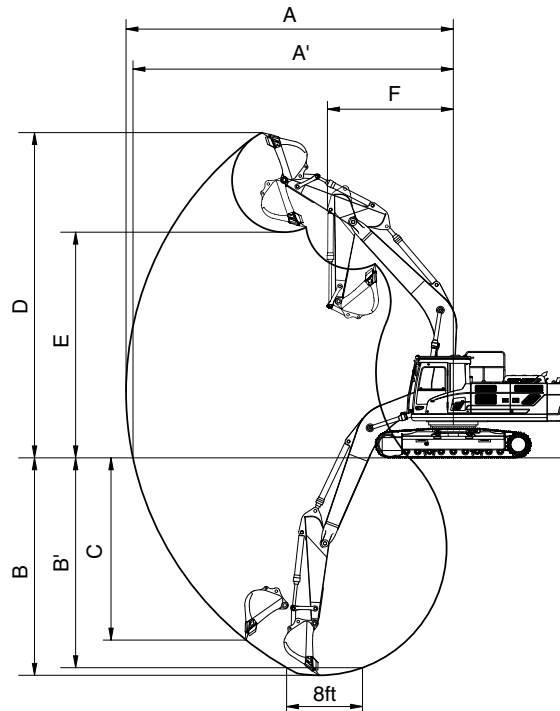
When working on soft ground, place mats or wood boards on the ground to prevent the machine sinking.



When operating in water or when crossing shallow, check the bed soil condition and depth and flow speed of water, then proceed taking care that water is not above carrier roller.



2) HX340S L, HEAVY DUTY BUCKET



Description	m (ft-in)	Boom	6.15 (20' 2")		6.45 (21' 2")	
		Arm	2.20 (7' 3")	2.50 (8' 2")	2.20 (7' 3")	2.50 (8' 2")
Max digging reach	mm (ft-in)	A	10020 (32'10")	10190 (33' 5")	10330 (33'11")	10500 (34' 5")
Max digging reach on ground		A'	9810 (32' 2")	9980 (32' 9")	10120 (33' 2")	10290 (33' 9")
Max digging depth		B	6150 (20' 2")	6450 (21' 2")	6360 (20'10")	6660 (21'10")
Max digging depth (8ft level)		B'	5950 (19' 6")	6230 (20' 5")	6170 (20' 3")	6450 (21' 2")
Max vertical wall digging depth		C	5700 (18' 8")	5420 (17' 9")	5970 (19' 7")	5660 (18' 7")
Max digging height		D	9980 (32' 9")	9760 (32' 0")	10260 (33' 8")	10050 (33' 0")
Max dumping height		E	6790 (22' 3")	6670 (21'11")	7060 (23' 2")	6950 (22'10")
Min swing radius		F	4450 (14' 7")	4290 (14' 1")	4630 (15' 2")	4440 (14' 7")
Bucket digging force	kN	SAE	200.1 [217.2]	187.3 [203.4]	200.1 [217.2]	187.3 [203.4]
	kgf		20400 [22150]	19100 [20740]	20400 [22150]	19100 [20740]
	lbf		44970 [48830]	42110 [45720]	44970 [48830]	42110 [45720]
	kN	ISO	230.5 [250.2]	215.7 [234.3]	230.5 [250.2]	215.7 [234.3]
	kgf		23500 [25510]	22000 [23890]	23500 [25510]	22000 [23890]
	lbf		51810 [56240]	48500 [52670]	51810 [56240]	48500 [52670]
Arm digging force	kN	SAE	220.7 [239.6]	198.1 [215.1]	220.7 [239.6]	198.1 [215.1]
	kgf		22500 [24430]	20200 [21930]	22500 [24430]	20200 [21930]
	lbf		49600 [53860]	44530 [48350]	49600 [53860]	44530 [48350]
	kN	ISO	231.4 [251.3]	207.9 [225.8]	231.4 [251.3]	207.9 [225.8]
	kgf		23600 [25620]	21200 [23020]	23600 [25620]	21200 [23020]
	lbf		52030 [56480]	46740 [50750]	52030 [56480]	46740 [50750]

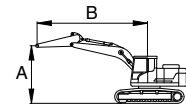
[] : Power boost











Unit : mm

Model	Boom	Boom	Arm	Counterweight	Shoe	Dozer		Outrigger	
	Type	Length	Length	Weight (kg)	Width	Front	Rear	Front	Rear
HX340S L	Heavy duty	6450	2200	6600	600	-	-	-	-

·  : Rating over-front

·  : Rating over-side or 360 degree



Load point height		Load radius								At max. reach		
		3.0 m (9.8 ft)		4.5 m (14.8 ft)		6.0 m (19.7 ft)		7.5 m (24.6 ft)		Capacity		Reach
												m (ft)
7.5m 24.6ft	kg lb					*9180 *20240	*9180 *20240			*9300 *20500	8290 18280	6.71 (22.0)
6.0m 19.7ft	kg lb					*9660 *21300	*9660 *21300	*9060 *19970	6840 15080	*9090 *20040	6510 14350	7.71 (25.3)
4.5m 14.8ft	kg lb					*10910 *24050	9380 20680	*9420 *20770	6680 14730	8440 18610	5640 12430	8.32 (27.3)
3.0m 9.8ft	kg lb					*12390 *27320	8850 19510	9740 21470	6440 14200	7850 17310	5220 11510	8.62 (28.3)
1.5m 4.9ft	kg lb					13290 29300	8460 18650	9500 20940	6220 13710	7700 16980	5090 11220	8.65 (28.4)
0.0m 0.0ft	kg lb					13070 28810	8260 18210	9360 20640	6100 13450	7960 17550	5240 11550	8.41 (27.6)
-1.5m -4.9ft	kg lb			*17750 *39130	12670 27930	13050 28770	8250 18190	9370 20660	6100 13450	8770 19330	5750 12680	7.88 (25.8)
-3.0m -9.8ft	kg lb	*19890 *43850	*19890 *43850	*15830 *34900	12910 28460	*12210 *26920	8410 18540			*9890 *21800	6910 15230	6.98 (22.9)
-4.5m -14.8ft	kg lb			*12030 *26520	*12030 *26520					*9280 *20460	*9280 *20460	5.54 (18.2)

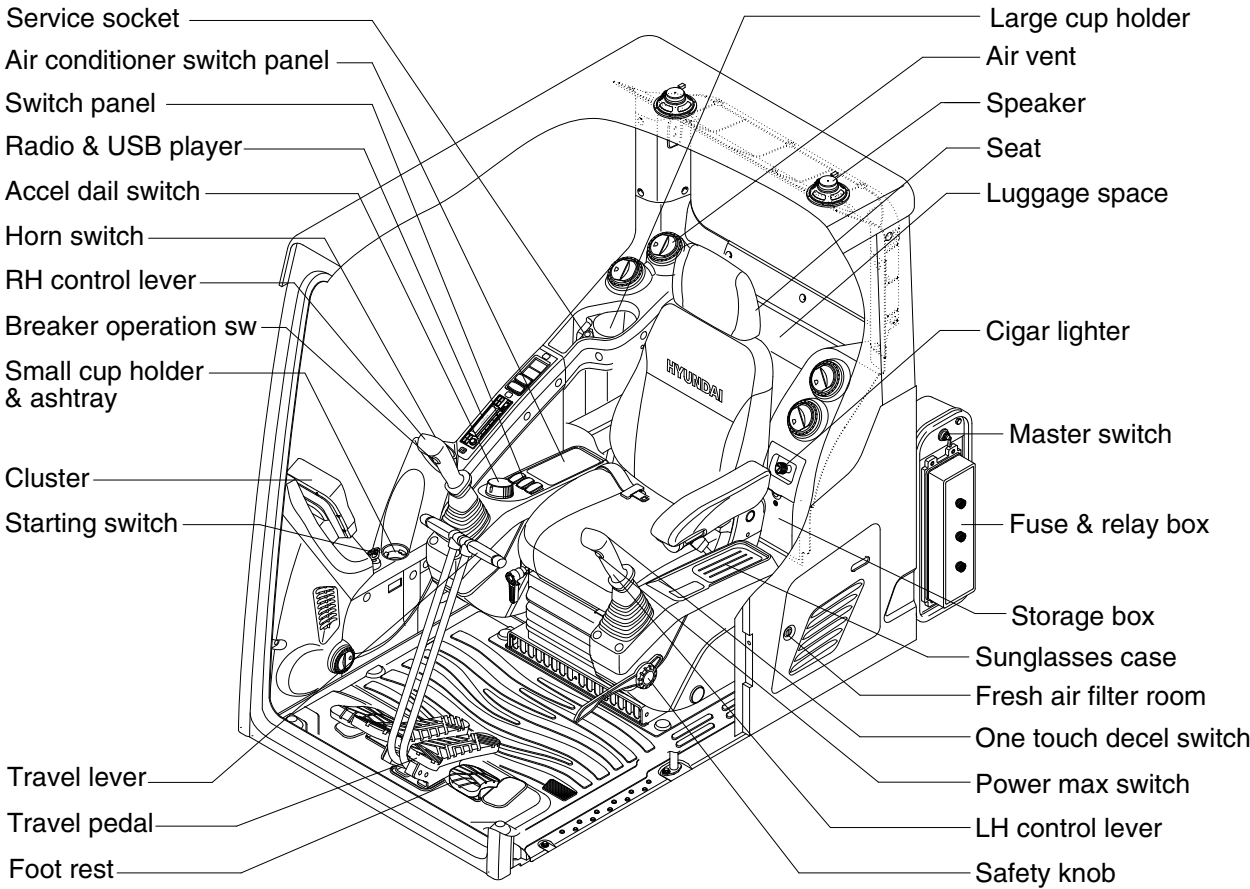
CONTROL DEVICES

1. CAB DEVICES

1) The ergonomically designed console box and suspension type seat provide the operator with comfort.

2) ELECTRONIC MONITOR SYSTEM

- (1) The centralized electronic monitor system allows the status and conditions of the machine to be monitored at a glance.
- (2) It is equipped with a safety warning system for early detection of machine malfunction.



300S3CD31

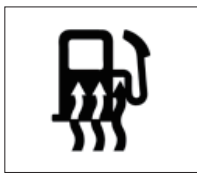
(5) Decel pilot lamp



290F3CD81

- ① Operating one touch decel switch on the RCV lever makes the lamp ON.
 - ② 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 3-36.**

(6) Fuel warmer pilot lamp



290F3CD82

- ① This lamp is turned ON when the coolant temperature is below 10°C (50°F) or the hydraulic oil temperature 20°C (68°F).
- ② The automatic fuel warming is cancelled when the engine coolant temperature is above 60°C, and the hydraulic oil temperature is above 45°C since the start switch was ON position.

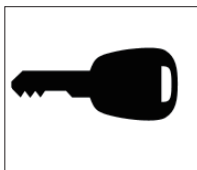
(7) Maintenance pilot lamp



290F3CD83

- ① This lamp will be ON when the consuming parts are needed to change or replace. It means that the change or replacement interval of the consuming parts remains below 30 hours.
 - ② Check the message in maintenance information of main menu. Also, this lamp lights ON for 3 minutes when the start switch is ON position.
- ※ **Refer to the page 3-24.**

(8) Smart key pilot lamp (premium type, opt)



290F3CD214

- ① This lamp is ON when the engine is started by the start button.
 - ② This lamp is red when the authentication fails, green when succeeds.
- ※ **Refer to the page 3-25.**

(9) Auto engine shutdown pilot lamp (opt)



220A3CD202A

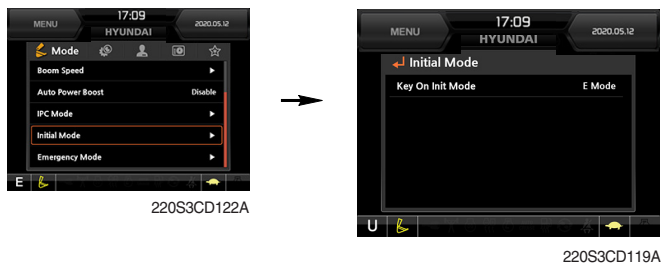
- ① This lamp is turned ON when the auto engine shutdown is activated.
- ※ **Refer to page 3-21.**

⑥ Automatic engine shutdown (option)



- The automatic engine shutdown function can be set by this menu.
 - One time
 - Always
 - Disable
 - Wait time setting : Max 40 minutes, min 2 minutes

⑦ Initial mode



- **Key on initial mode**
 - Selected the power mode is activated when the engine is started.

⑧ Emergency mode

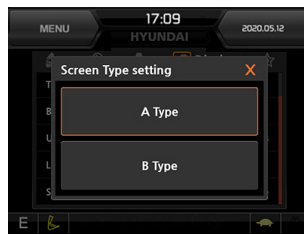


- This mode can be used when the switches are abnormal on the cluster.
- The cluster switches will be selected by touched each icon.

⑥ Screen type (premium type)



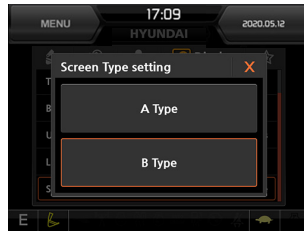
220S3CD165A



A Type (Default) 220S3CD166A



220S3CD156A

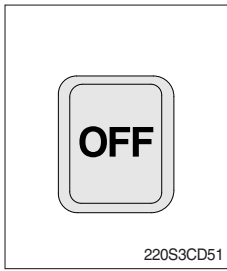


B Type (Option) 220S3CD174A



220S3CD167A

1) POWER OFF SWITCH

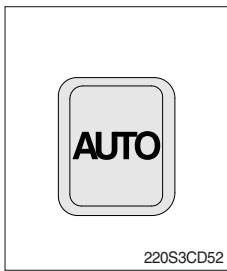


- (1) This switch makes the system and the LCD OFF.
Just before the power OFF, set values are stored.

(2) Default setting values

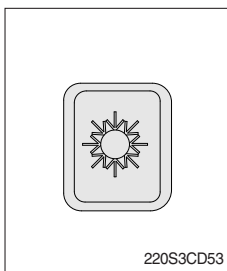
Function	Air conditioner	In/outlet	LCD	Temperature	Mode
Value	OFF	Inlet	OFF	Previous sw OFF	Previous sw OFF

2) AUTO SWITCH



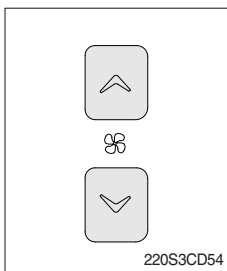
- (1) Turn the starting switch to ON position, LCD lights ON.
Auto air conditioner and heater system automatically keeps the optimum condition in accordance with operator's temperature configuration sensing ambient and cabin inside temperature.
- (2) This switch can restart system after system OFF.

3) AIR CONDITIONER SWITCH



- (1) This switch turns the compressor ON/OFF.
- (2) In accordance with the temperature sensed by duct (evaporator) sensor, compressor turns ON or OFF automatically.
- ※ **Air conditioner operates to remove vapor and drains water through a drain hose. Water can be sprayed into the cab in case that the drain cock at the ending point of drain hose has a problem. In this case, exchange the drain cock.**

4) FAN SPEED SWITCH



- (1) Fan speed is controlled automatically by setted temperature.
- (2) This switch controls fan speed manually.
- There are 5 steps (OFF, 1 ~ 4 speed) to control fan speed.
 - The maximum step or the minimum step beeps 5 times.
- (3) This switch makes the system ON.

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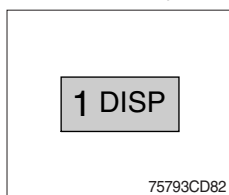
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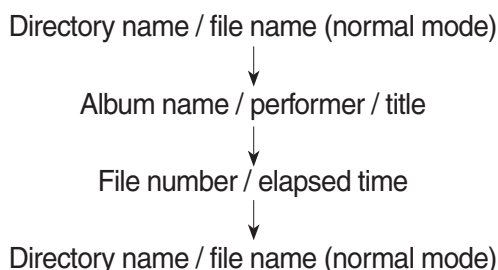
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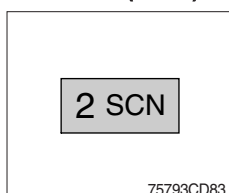
(5) ID3 v2 display



- ① Disp button is used to change the display information. While playing an MP3 file, you can change the file information shown on the LCD display. Each time you press DISP (display), the display changes to show the following.
- ※ If the MP3 disc does not have any ID3 information, the display will show NO ID3 on LCD display.

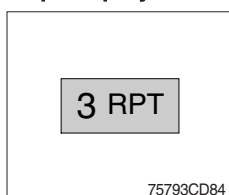


(6) File scan (SCN)



- ① During USB play, press SCN button to play the first 10 seconds of each file on the whole file on the USB (SCN mark will appear on the LCD display). When a desired file is reached, press the SCN button again to cancel the function. The unit will then play the selected file.
- ※ In case of playing MP3 file, when the SCN (scan) button is pressed and held for longer than 2 seconds, the SCN mark will blink on the LCD display and all files in the selected directory will be introduced until the file scan mode is cancelled by pressing the SCN button again or by activating the random or repeat functions.

(7) Repeat play selector (RPT)



- ① During USB play, press RPT button to play the selected file repeatedly (RPT will appear on the LCD display). Play of the file will continue to repeat until this button is pressed again and the RPT disappears from the LCD display.
- ※ In case of playing MP3 file, when the RPT button is pressed and held longer than 2 seconds, the RPT mark will blink on the LCD display and play all files in the selected directory and will be repeated until the directory repeat mode is cancelled by pressing the repeat button again or by activating the scan or random functions (RPT mark will disappear from LCD display).

■ 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 it is 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 slight 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 is made 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 is connected.

② To disconnect bluetooth link
Press and hold CALL END button (5) for 2 seconds, it shows DIS CON and bluetooth Icon disappears on the display.

③ To connect bluetooth link
Press CALL button (4) briefly, it blinks bluetooth Icon on the display while bluetooth is being connected. If the connection is completed, bluetooth Icon displays 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), ANSWER CALL followed by TALKING will show in the display.

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

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

3) STARTING ENGINE IN COLD WEATHER

- ※ Sound horn to warn surroundings after checking if there are obstacles in the area.
- ※ Replace the engine oil and fuel referring to recommended oils at page 2-19.
- ※ Fill the anti-freeze solution to the coolant as required.
- ※ If you turn ON the starting switch, the fuel warmer is automatically operated to heat the fuel by sensing the coolant temperature.

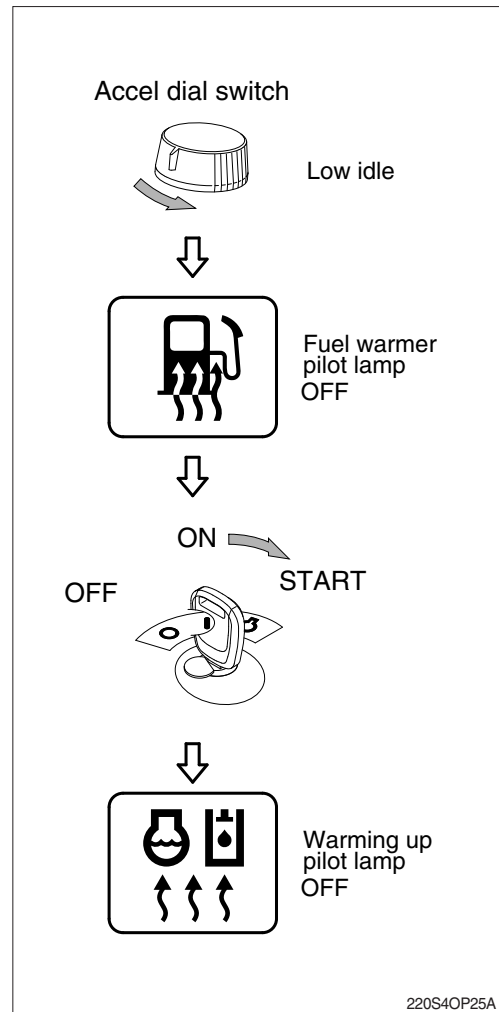
- (1) Check if all the levers are in the neutral position.
- (2) Turn the accel dial switch to low idle position.
- (3) Turn the starting switch to the ON position, and wait 1~2 minutes. More time may take according to ambient temperature.
- (4) Start the engine by turning the starting switch to START position after the fuel warmer pilot lamp OFF.

- ※ If the engine does not start, allow the starter to cool for about 2 minutes before attempting to start the engine again.

- (5) Release the starting switch immediately after starting engine.

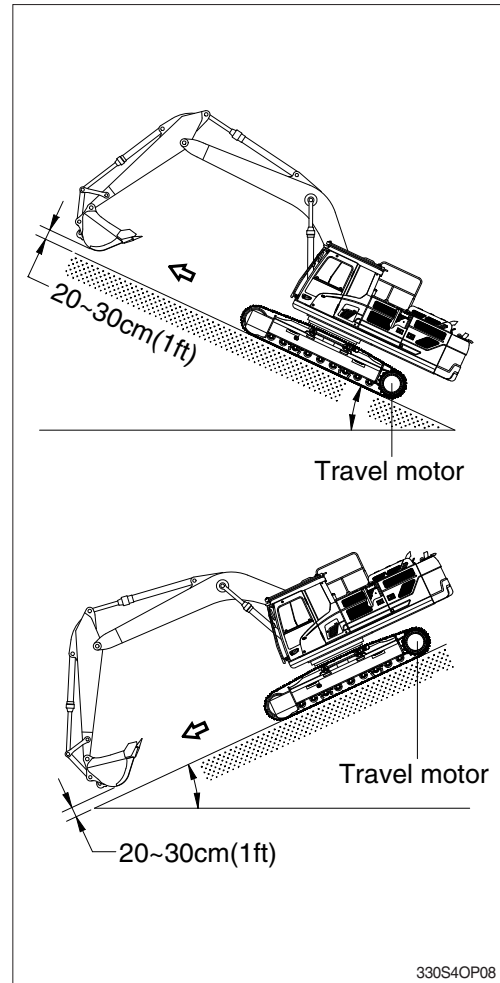
- (6) If the temperature of the coolant is lower than 30°C the warming up automatically starts.

- ※ Do not operate the working devices, or convert the operation mode into other mode during the warming up.



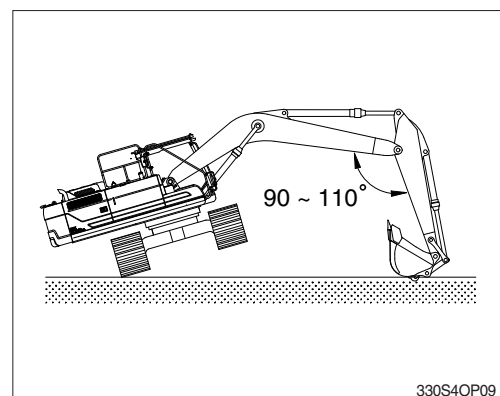
2) TRAVELING ON A SLOPE

- (1) Make sure that the travel lever is properly maneuvered by confirming the travel motor is in the right location.
 - (2) Lower the bucket 20 to 30 cm (1 ft) to the ground so that it can be used as a brake in an emergency.
 - (3) If the machine starts to slide or loses stability, lower the bucket immediately and brake the machine.
 - (4) When parking on a slope, use the bucket as a brake and place blocks behind the tracks to prevent sliding.
- ※ Machine cannot travel effectively on a slope when the oil temperature is low. Do the warming-up operation when it is going to travel on a slope.
- ▲ Be careful when working on slopes. It may cause the machine to lose its balance and turn over.
- ▲ Be sure to keep the travel speed switch on the LOW (turtle mark) while traveling on a slope.
- ▲ Be sure to keep the swing lock/fine switch on the LOCK while traveling on a slope (if equipped).



3) TRAVELING ON SOFT GROUND

- ※ If possible, avoid to operate on soft ground.
- (1) Move forward as far as machine can move.
 - (2) Take care not to go beyond the depth where towing is impossible on soft ground.
 - (3) When driving becomes impossible, lower bucket and use boom and arm to pull the machine. Operate boom, arm, and travel lever at the same time to avoid the machine sinking.



11. STORAGE

Maintain the machine taking care of following to prevent the deterioration of machine when storing the machine for a long time, over 1 month.

1) BEFORE STORAGE

(1) Cleaning the machine

Clean the machine. Check and adjust tracks.
Grease each lubrication part.

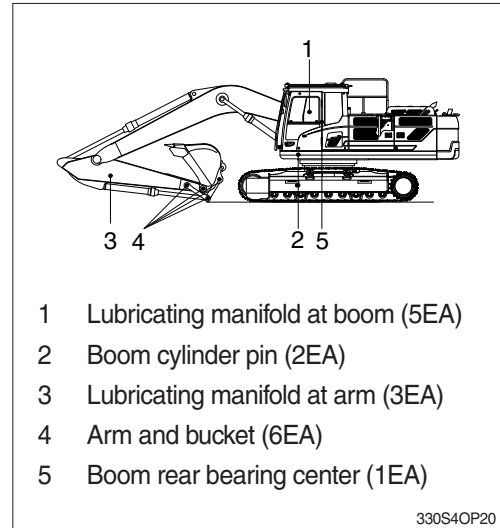
(2) Lubrication position of each part

Change all oil.

※ **Be particularly careful when you reuse the machine.**

As oil can be diluted during storage.

Apply an anticorrosive lubricant on the exposed part of piston rod of cylinder and in places where the machine rusts easily.



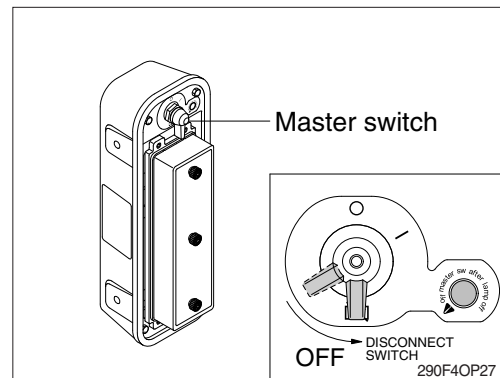
(3) Master switch

Turn OFF the master switch mounted electric box and store the machine.

▲ **Off the master switch after lamp off.**

▲ **It may cause severe failure of aftertreatment device.**

(4) Be sure to mix anticorrosive antifreezing solution in the radiator.

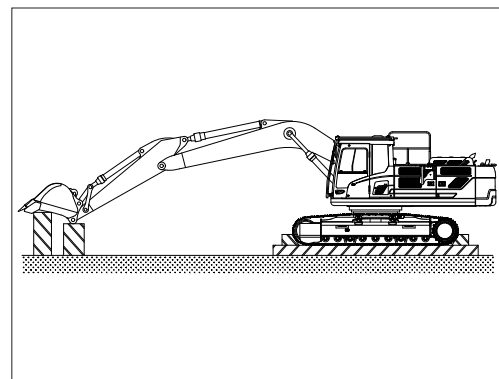


(5) Prevention of dust and moisture

Keep machine dry. Store the machine setting wood on the ground.

※ **Cover exposed part of piston rod of cylinder.**

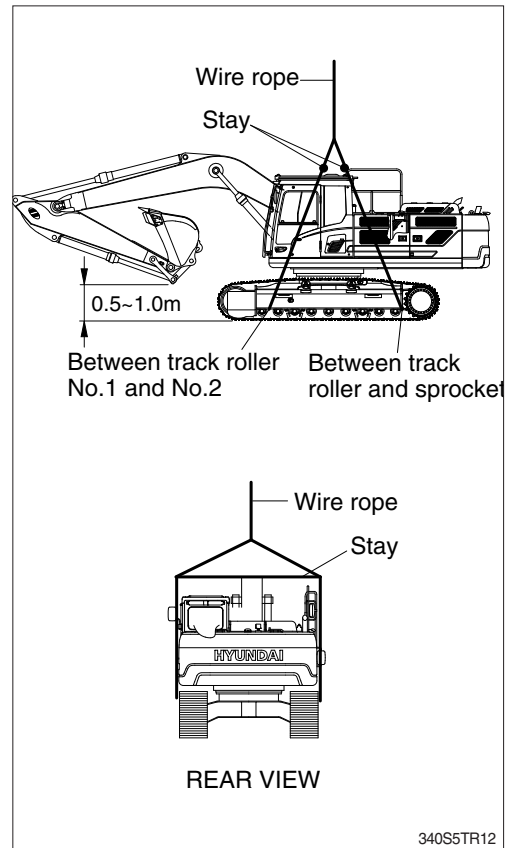
※ **Lower the bucket to the ground and set a support under track.**



5. LOADING AND UNLOADING BY CRANE

- 1) Check the weight, length, width and height of the machine referring to chapter 2, Specification when you are going to hoist the machine.
- 2) Use long wire rope and stay to keep the distance with the machine as it should avoid touching with the machine.
- 3) Put a rubber plate contact with wire rope and machine to prevent damage.
- 4) Place crane on the proper place.
- 5) Install the wire rope and stay like the illustration.

- ▲ Make sure wire rope is proper size.
- ▲ Place the safety knob to LOCK position to prevent the machine moving when hoisting the machine.
- ▲ The wrong hoisting method or installation of wire rope can cause damage to the machine.
- ▲ Do not load abruptly.
- ▲ Keep area clear of personnel.



2) RECOMMENDED OILS

HD Hyundai Construction Equipment genuine lubricating oils have been developed to offer the best performance and service life for your equipment. These oils have been tested according to the specifications of HD Hyundai Construction Equipment and, therefore, will meet the highest safety and quality requirements.

We recommend that you use only HD Hyundai Construction Equipment genuine lubricating oils and grease officially approved by HD Hyundai Construction Equipment.

Service point	Kind of fluid	Capacity ℓ (U.S. gal)	Ambient temperature °C (°F)								
			-50 (-58)	-30 (-22)	-20 (-4)	-10 (14)	0 (32)	10 (50)	20 (68)	30 (86)	40 (104)
Engine oil pan	Engine oil★ ¹	26.5 (7.0)	★SAE 0W-40								
			★SAE 0W-30								
			SAE 5W-30								
			SAE 10W-30								
			SAE 15W-40								
Swing drive	Gear oil	11 (2.91)	★SAE 75W-90								
Final drive		7.8×2 (2.1×2)	SAE 80W-90								
Hydraulic tank	Hydraulic oil	Tank : 210 (55.5)	★ISO VG 15								
		System : 414 (109.4)	ISO VG 32								
			ISO VG 46, HBHO VG 46★ ³								
			ISO VG 68								
Fuel tank	Diesel fuel	600 (158.5)	★ASTM D975 NO.1								
			ASTM D975 NO.2								
Fitting (grease nipple)	Grease	As required	★NLGI NO.1								
			NLGI NO.2								
Radiator (reservoir tank)	Mixture of antifreeze and soft water★ ²	27 (7.1)	Ethylene glycol base permanent type (50 : 50)								
			★Ethylene glycol base permanent type (60 : 40)								

SAE : Society of Automotive Engineers

API : American Petroleum Institute

ISO : International Organization for Standardization

NLGI : National Lubricating Grease Institute

ASTM : American Society of Testing and Material

★ : Cold region

Russia, CIS, Mongolia

★¹ : Meet or exceeds API CH-4 grade

★² : Soft water

City water or distilled water

★³ : HD Hyundai Construction Equipment
Bio Hydraulic Oil

※ Using any lubricating oils other than HD Hyundai Construction Equipment genuine products may lead to a deterioration of performance and cause damage to major components.

※ Do not mix HD Hyundai Construction Equipment genuine oil with any other lubricating oil as it may result in damage to the systems of major components.

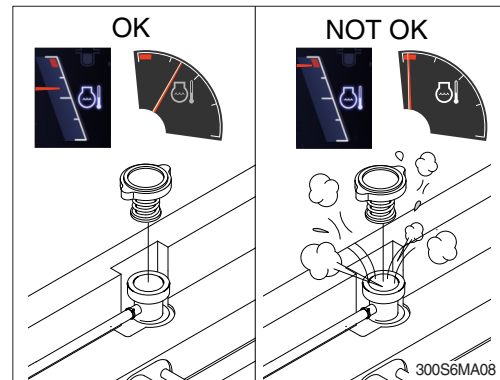
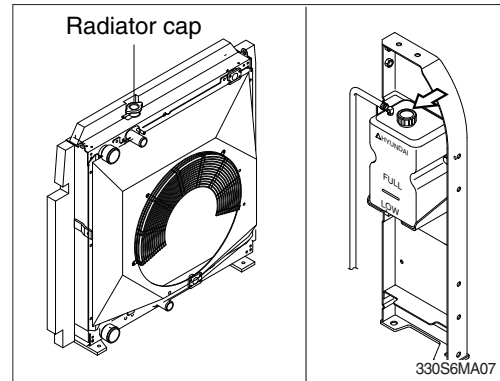
※ Do not use any engine oil other than that specified above.

※ For HD Hyundai Construction Equipment genuine lubricating oils and grease for use in regions with extremely low temperatures, please contact HD Hyundai Construction Equipment dealers.

3) CHECK COOLANT

- (1) Check if the level of coolant in reservoir tank is between FULL and LOW.
- (2) Add the mixture of antifreeze and water after removing the cap of the reservoir tank if coolant is not sufficient.
- (3) Be sure to use the reservoir empty, add the coolant by opening the cap of radiator.
- (4) Replace gasket of radiator cap when it is damaged.

▲ Hot coolant can spray out if surge tank cap is removed while engine is hot. Remove the cap after the engine has cooled down.



4) FLUSHING AND REFILLING OF RADIATOR

(1) Change coolant

▲ Avoid prolonged and repeated skin contact with used antifreeze. Such prolonged repeated contact can cause skin disorders or other bodily injury.

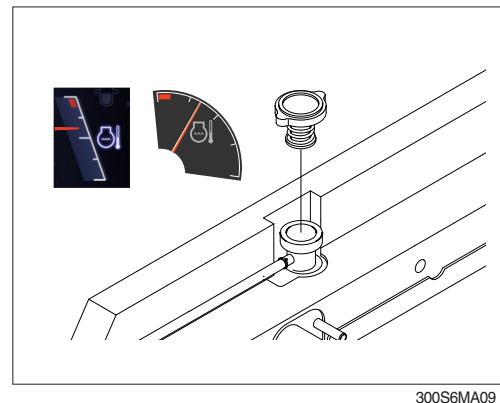
Avoid excessive contact-wash thoroughly after contact.

Keep out of reach of children.

※ Protect the environment : Handling and disposal of used antifreeze can be subject to federal, state, and local law regulation.

Use authorized waste disposal facilities, including civic amenity sites and garages providing authorized facilities for the receipt of used antifreeze.

If in doubt, contact your local authorities for guidance as to proper handling of used antifreeze.

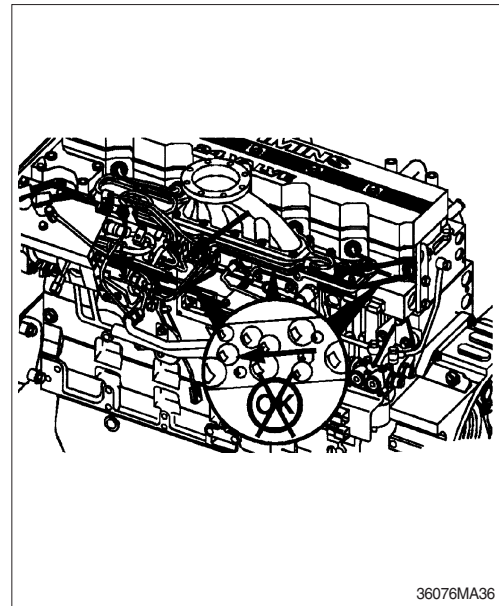


- ④ A stuck open injector can also blow combustion gas back into the pump and cause air to be present in the overflow.

If the engine seems to be misfiring or running rough, break all the injector supply lines loose at the pump end. Crank the engine and observe the lines. If combustion gas seems to be blowing back through the line, the injector is stuck open.

- ※ Use two wrenches when loosening the lines at the fuel pump, one to hold the delivery valve and one to loosen the line.

- Wrench size : 19 mm
- Tightening torque : 2.45 kgf·m (18 lbf·ft)



(2) Venting the high pressure lines

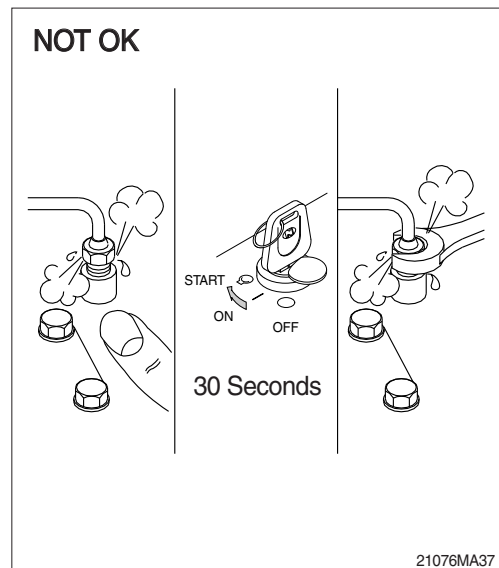
- ▲ The pressure of the fuel in the line is sufficient to penetrate the skin and cause serious bodily harm.

- ① Loosen the fittings at the cylinder head and crank the engine to allow entrapped air to bleed from the line. Tighten the fittings.

- Wrench size : 19mm
- Torque : 3.9 kgf·m (28 lbf·ft)

- ② Start the engine and vent one line at a time until the engine runs smoothly.

- ▲ Do not bleed a hot engine as this can cause fuel to spill onto a hot exhaust manifold, creating a danger of fire.



33) REPLACEMENT OF BUCKET

△ When knocking the pin in with a hammer, metal particles may fly and cause serious injury, particularly if they get into your eyes. When carrying out this operation, always wear goggles, helmet, gloves, and other protective equipment.

※ When the bucket is removed, place it in a stable condition.

※ When performing joint work, make sure signals to each other and work carefully for safety's sake.

(1) Lower the bucket on the ground as the picture shown in the right.

(2) Lock the safety knob to the LOCK position and stop the engine.

(3) Remove the stopper bolts(1) and nuts(2), then remove pins(3, 4) and remove the bucket.

※ When removing the pins, place the bucket so that it is in light contact with the ground.

※ If the bucket is lowered strongly to the ground, the resistance will be increased and it will be difficult to remove the pins.

※ After remove the pins, make sure that they do not become contaminated with sand or mud and that the seals of bushing on both sides do not become damaged.

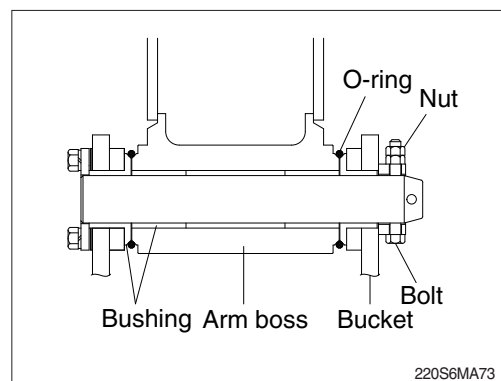
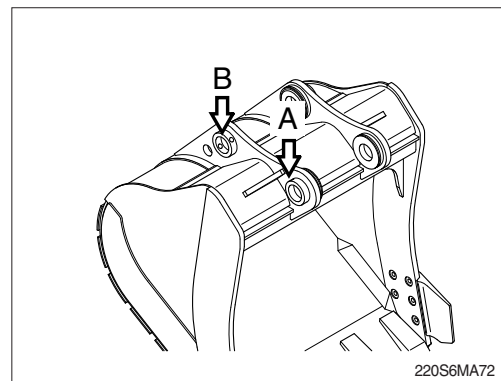
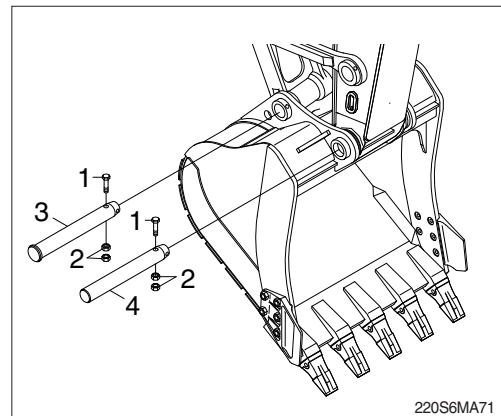
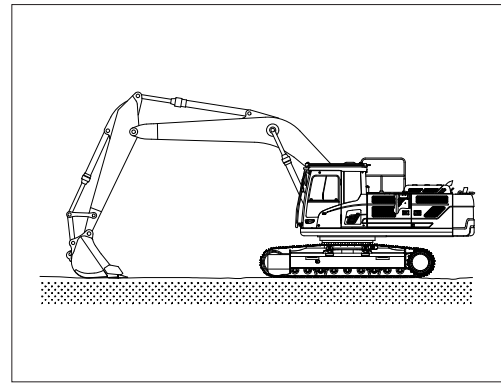
(4) Align the arm with holes (A) and the link with holes (B), then coat with grease and install pins (3, 4)

※ When installing the bucket, the O-rings are easily damaged, so fit the O-rings on the boss of the bucket as shown in the picture.

After knocking the pin, move the O-ring down to the regular groove.

(5) Install the stopper bolt (1) and nuts (2) for each pin, then grease the pin.

· Tightening torque : $29.7 \pm 4.5 \text{ kgf} \cdot \text{m}$
($215 \pm 32.5 \text{ lbf} \cdot \text{ft}$)



TROUBLESHOOTING GUIDE

1. ENGINE

※ This guide is not intended to cover every conditions, however many of the more common possibilities are listed.

Trouble	Service	Remark
The engine oil pressure lamp lights ON when engine speed is raised after completion of warm up.	<ul style="list-style-type: none"> · Add the oil to the specified level. · Replace the oil filter cartridge. · Check oil leakage from the pipe or the joint. · Replace the monitor. 	
Steam is emitted from the top part of the radiator (the pressure valve). Coolant level warning lamp lights ON.	<ul style="list-style-type: none"> · Supply the coolant and check leakage. · Adjust fan belt tension. · Wash out inside of cooling system. · Clean or repair the radiator fin. · Check the thermostat. · Tighten the radiator cap firmly or replace the packing of it. · Replace the monitor. 	
The engine does not start when the starting motor is turned over.	<ul style="list-style-type: none"> · Add fuel. · Repair where air is leaking into fuel system. · Check the injection pump or the nozzle. · Check the valve clearance. · Check engine compression pressure. · In cold weather, check if fuel warmer system is working normal. 	Refer to the pages 3-33 and 4-4.
Exhaust gas is white or blue.	<ul style="list-style-type: none"> · Adjust to specified oil quantity. · Replace with specified fuel. 	
Exhaust gas occasionally turns black.	<ul style="list-style-type: none"> · Clean or replace the air cleaner element. · Check the nozzle. · Check engine compression pressure. · Clean or replace the turbocharger. 	
Combustion noise occasionally changes to breathing sound.	<ul style="list-style-type: none"> · Check the nozzle. 	
Unusual combustion noise or mechanical noise.	<ul style="list-style-type: none"> · Check with specified fuel. · Check over-heating · Replace the muffler. · Adjust valve clearance. 	

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