Forcword

This manual contains a number of instructions regarding driving, lubrication, maintenance, inspection and adjustment of the crawler excavator.
The manual is to promote safety maintenance and enhance machine performance.
Keep this manual handy and have all personnel read it periodically.
If you sell the machine, be sure to give this manual to the new owner.

1. Read and understand this manual before operating the machine.
This operator's manual may contain working devices and optional equipment that are not used. Please consult the local vendor of Hyundai.
Improper operation and maintenance of this machine can be hazardous and could result in serious injury or death.
Some actions involved in operation and maintenance of the machine can cause a serious accident, if they are not done in a manner described in this manual.

2. Inspect the jobsite and follow the safety hints before operating the machine.

3. Use genuine Hyundai spare parts for the replacement.
We expressly point out that Hyundai will not accept any responsibility for defects resulting from non-genuine parts or non workman like repair.
In such cases Hyundai cannot assume liability for any damage.

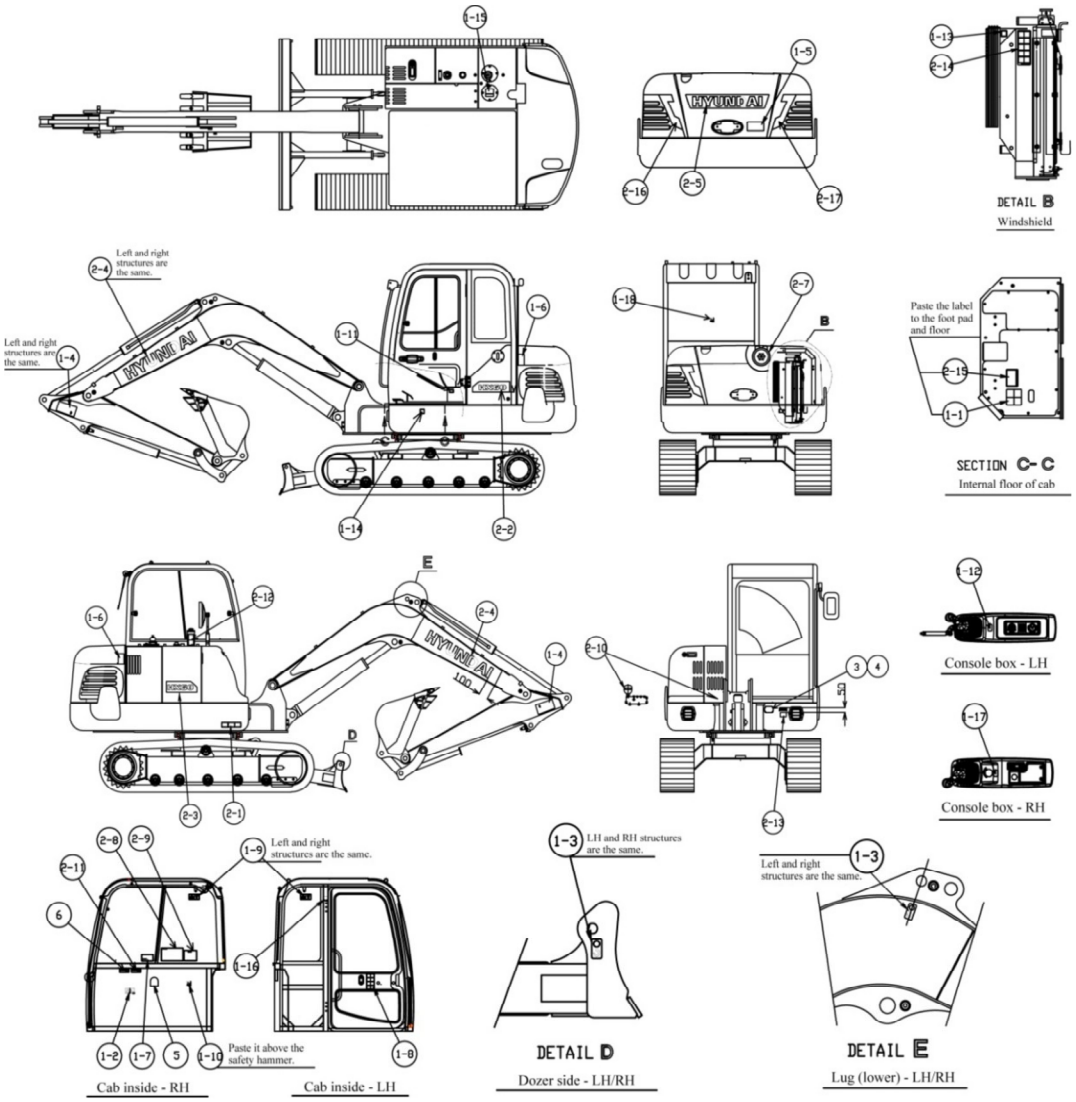
Continuing improvements in the design of this machine can lead to changes in detail which may not be reflected in this manual. Consult Hyundai or its local vendor for further information in the case of questions regarding information in this manual.
The technical parameters in this manual are for reference only, which may differ from the actual parameters. This manual may be modified without prior notice.
If you have any question, consult Hyundai or its agent.
Please replace this manual if it is lost, damaged or illegible.

※ Important Note
In accordance with the provisions of the Ministry of Agriculture and Rural Affairs, the upper turning angle of agricultural excavators must be within 270°. Accordingly, the turning stopper must be removed as required for agricultural excavators, so that the upper part can turn within 360° to facilitate loading and unloading during transportation. After the machine is transported to and unload at the destination, the stopper should be reassembled to meet the national requirements for agricultural excavators. The machine with a stopper can be used as an ordinary hydraulic excavator. The user should be liable for the impact or loss arising from no stopper instead of compliance with local regulations for agricultural excavators. If the user has any question about stopper dismantling and installation, consult Hyundai or its agent.
Since relevant national policies vary on the technical requirements for agricultural excavator, technical changes may be made without prior notice, and the actual product shall prevail.

Safety Labels

1. Location

Replace the labels and signs that are lost, damaged, covered with paint, loose or illegible.



1 Fueling (2-12)	15 Radiator fan beating label (1-13)	29 Model label (2-2, 2-3)
2 Battery accident (1-1)	16 Hydraulic oil lubrication (1-15)	30 Pre-filter (2-11)
3 Keep clear-boom/arm (1-4)	17 Conventional warning label (2-1)	31 ECU connector (2-15)
4 Keep clear-rear (1-5)	18 Engine OFF label (1-2)	32 Reflecting label (2-16, 2-17)
5 Keep clear-side (1-6)	19 Grease label (2-13)	33 Environmental information label (3)
6 Caution-cab (1-8)	20 Lifting point label (1-3)	34 Rivet (4)
7 Engine room caution (2-14)	21 Hammer label (1-10)	35 After-sales service hotline (5)
8 Control ideograms (1-7)	22 Accumulator (2-10)	36 Accelerator knob warning label (6)
9 Air cleaner (2-7)	23 Battery position (1-14)	
10 Safety front window (1-9)	24 Fire extinguisher (1-16)	
11 Emergency escape (1-18)	25 Service instruction (2-8)	
12 Aircon filter (1-11)	26 Lifting Capacity Chart (2-9)	
13 Tilting console box (1-12)	27 Trade mark-boom (2-4)	
14 Control ideogram - dozer (1-17)	28 Trade mark-CWT (2-5)	

2. Description

Be familiar with specific warning labels on this machine. Replace any safety label that is damaged or missing.

1) Fueling (2-12)

This label is positioned on the right side of the fuel filling port.

⚠ Stop the engine when refueling. All lights or flames shall be kept at a safe distance while refueling.

2) Battery accident (1-1)

This warning label is positioned on the battery cover.

⚠ Electrolyte containing sulfuric acid cause severe burns. Avoid being in contact with skin, eyes or clothes. In the event of splashing, flush with clean water, and call a physician.

※ Maintain the electrolyte at the recommended level. Add distilled water to the battery only when starting up, never when shutting down.

Keep electrolyte at a proper level. Insufficient electrolyte may cause the gases to be accumulated in the battery.

3) Keep clear-boom/arm (1-4)

This warning label is positioned on both sides of the boom.

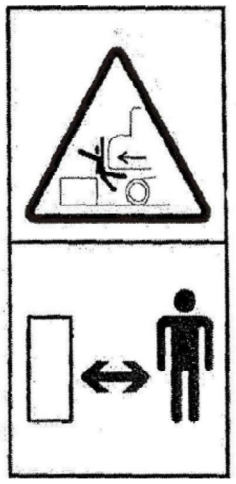
⚠ Serious injury or death can result from falling of the working device. It is forbidden to stand underneath the working device. Instead, keep clear the underneath of working device, to prevent serious accidents.

4) Keep clear-rear (1-5)

This warning label is positioned on the rear of engine hood.

⚠ Keep clear of machine swing radius.

※ Do not deface or remove this label from the machine.

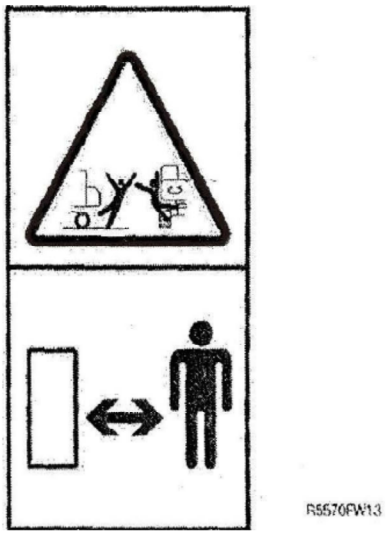


5) Keep clear-side (1-6)

This warning label is positioned on the side of engine hood.

⚠ Keep clear of machine swing radius.

⚠ Do not deface or remove this label from the machine.



6) Caution-cab (1-8)

This warning label is positioned on the left side door of the cab.

⚠ Serious injury or death can result from contact with electric lines. An electric shock being received by merely coming into the vicinity of electric lines, the minimum distance should be kept considering the supply voltage in 1-4.

⚠ Operating the machine with quick clamp switch unlocked or without safety pin of moving hook can cause the bucket to drop off.

⚠ Read the operator's manual before operating the machine.

7) Engine room caution (2-14)

This warning label is positioned on the side of radiator.

⚠ Do not open the engine hood during the engine's running.

⚠ Do not touch the exhaust pipe or it may cause severe burn.

⚠ Escaping fluid under pressure can penetrate the skin, causing serious injury.

※ Study the service manual before service job.

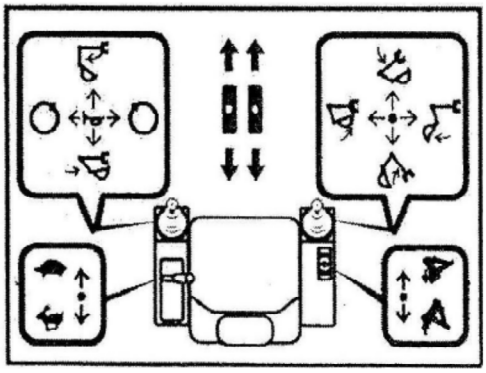
⚠ Never open the filler cap during engine running or at high coolant oil temperature.

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

8) Control ideogram (1-7)

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

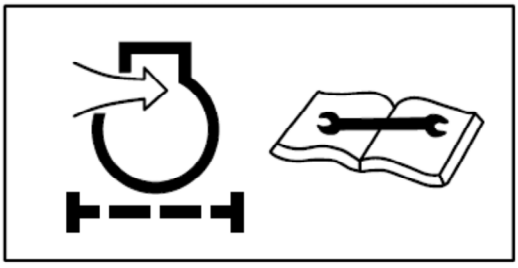
Δ See page 4-7 for details.



9) Air cleaner (2-7)

This warning label is positioned on the cap of the air cleaner.

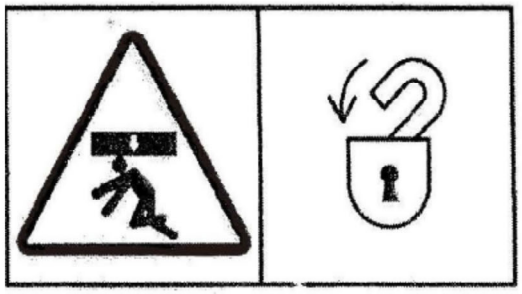
※ Periodic inspection, cleaning and change of the filter can prolong the engine life and maintain good performance of the engine.



10) Safety front window (1-9)

This warning label is positioned on both side windows of the cab.

⚠ Be careful that the front window may be promptly closed.



21070FW24

11) Emergency escape (1-18)

This warning label is positioned on the rear window of the cab.

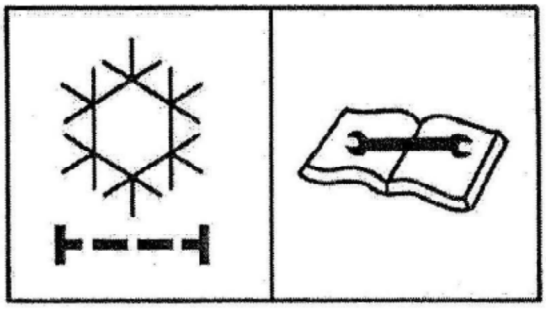
※ There is an escape exit on the rear window.

※ Break the rear window of the cab with the safety hammer in an emergency.

12) Aircon filter (1-11)

This warning label is positioned on the lower seat base.

※ Periodic and proper inspection, cleaning and change of the filter can prolong the air-conditioner life time and maintain good performance.

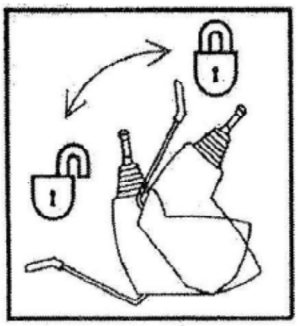


21070FW26

13) Console tilting (1-12)

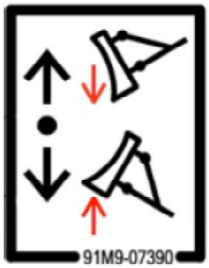
This warning label is positioned on the LH console box.

※ Before you get off the machine be sure to tilt the LH console box.



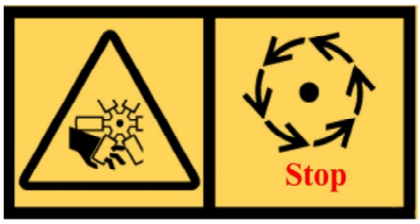
R5570FW17

14) Control ideogram-dozer (1-17)
This is positioned on the RH console box.



15) Radiator fan beating label (1-13)
This warning label is positioned on one side of the radiator.

⚠ Avoid beating by the fan during service. Shut off the engine before servicing.



16) Hydraulic oil lubrication (1-15)
This warning label is positioned on the right side face of air breather.

※ Do not mix with different brand oils.

⚠ Never open the filler cap while engine running or at high hydraulic oil temperature.

⚠ Loosen the cap slowly and release internal pressure completely.

17) General warning label (2-1)
This warning label is positioned on the right side of the upper frame.

⚠ Study the operator's manual before transporting the machine. Be aware of how to tie the arm and undercarriage with wire ropes.

※ See Pages 5-6 for details.

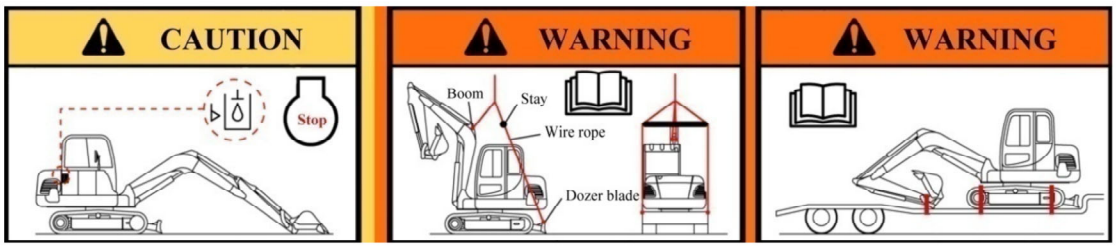
⚠ Make sure that wire ropes have an appropriate size, and use the correct hoisting method.

※ See Pages 5-7 for details.

⚠ Place the bucket on the ground whenever servicing the hydraulic system.

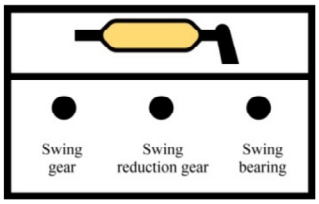
※Check the oil level on the level gauge.

※ Refill the recommended hydraulic oil up to specified level if necessary.

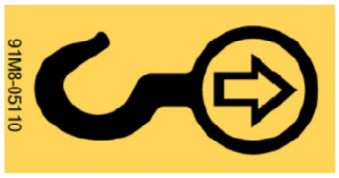


18) Engine OFF label (1-2)
This warning label is positioned on the right finish of the cab.
※ Stop the machine on the flat ground, shut off the engine and remove the key before servicing.

19) Grease label (2-13)
This label is positioned on the right side of the superstructure.



20) Lifting position label (1-3)
This label indicates the lifting position.



21) Safety hammer label (1-10)
This label is near the safety hammer on the right inside the cab.
Break glass with the safety hammer in an emergency.

22) Accumulator (2-10)
This warning label is positioned on the accumulator of the solenoid valve.
※ 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 or expose the accumulator 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 Hyundai's distributor.

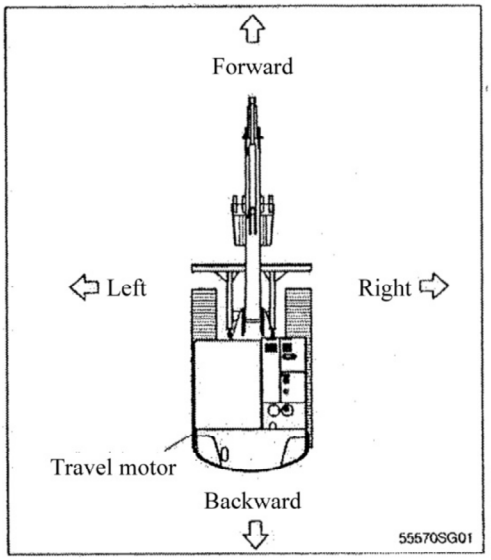
23) Battery position (1-14)
This warning label is positioned on the left side of the upper frame under the cab.

24) Fire extinguisher (1-16) (optional)
This warning label is positioned the left side inside the cab.
※ Please follow the operating instructions of the fire extinguisher during operation.

Guide

1. Direction

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



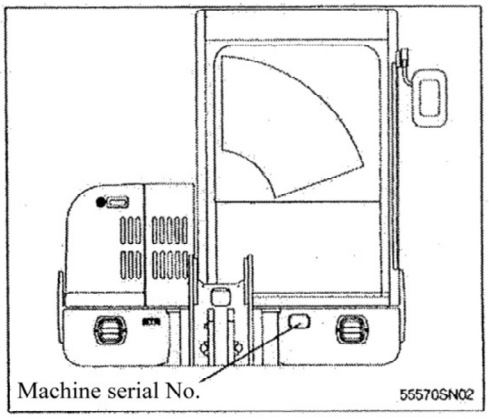
2. Serial number

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

1) Machine serial number

The numbers are located below the front window of the cab.

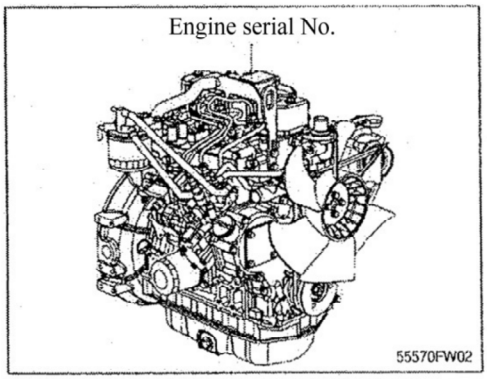
It is also stamped on the upper surface of the front end of the superstructure.



2) Engine serial number

The numbers are located on the engine name plate.

※ The numbers of other main components are available on these components. If you have any question, consult Hyundai or its agent.



3. Symbols

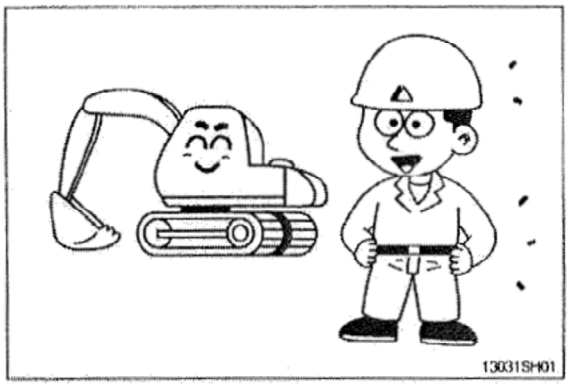
⚠ Important safety hint.

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

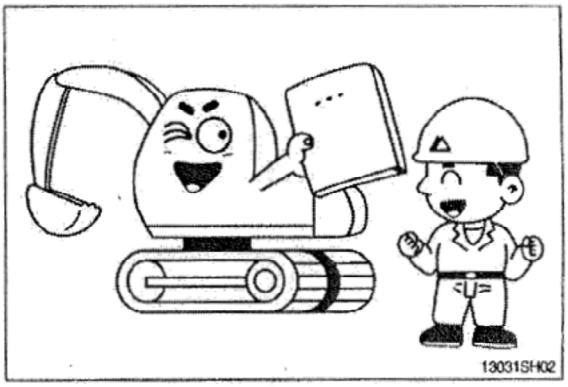
※It indicates the useful information for operator.

1. Before Operation

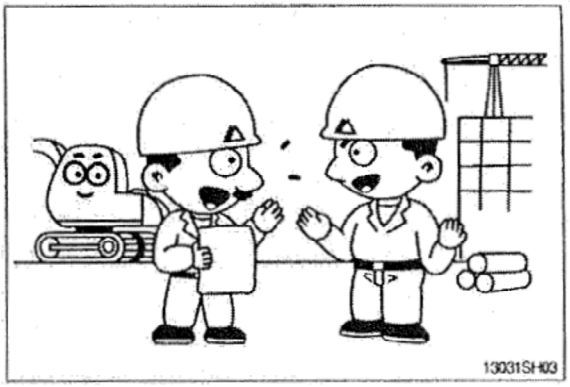
Think safety first.
In special situation, wear protective clothing including a safety helmet, safety shoes, gloves, safety glasses and ear protection as required by the job condition.
Almost every accident is caused by disregarding the simple and fundamental safety hints.



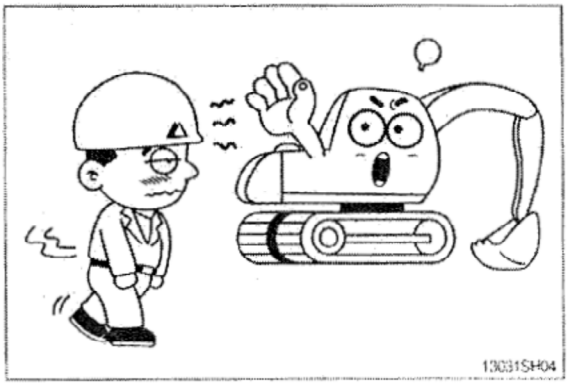
Be sure to understand thoroughly all about the operator's manual before operating the machine.



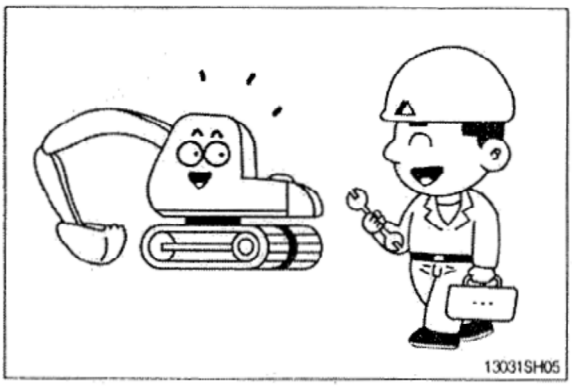
Fully understand the details and process of the construction before starting the work.
If you find anything dangerous on the job, consult with the job supervisor for the preventive measures.



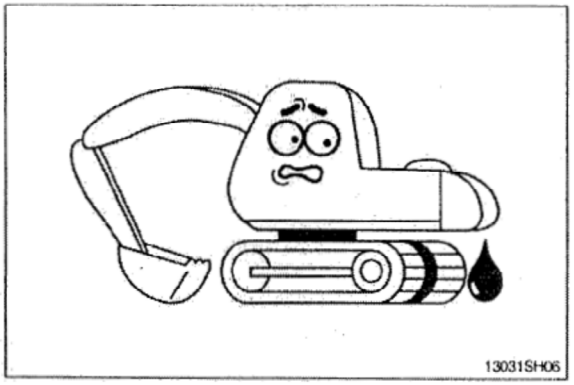
Do not operate when tired or drunk.



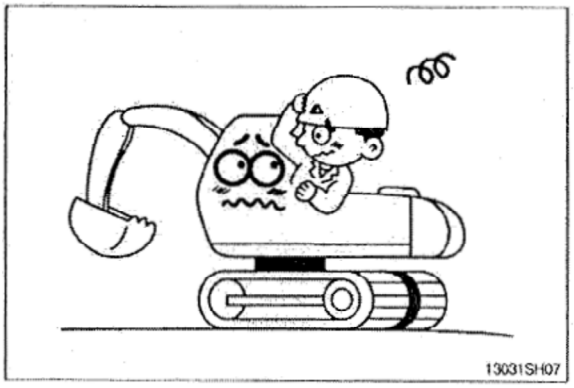
Check daily according to the operation manual.
Repair the damaged parts and tighten the loosened bolts.



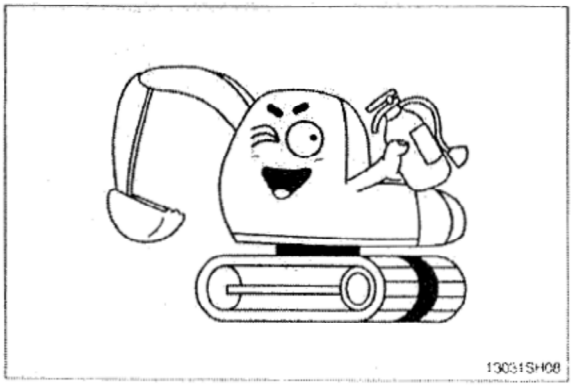
Check for leakage of engine oil, hydraulic oil, fuel and coolant.
Keep the machine clean.



Do not operate the machine until it is properly repaired.

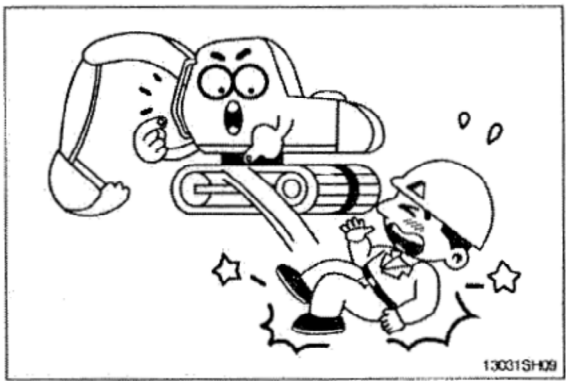


Be prepared if a fire starts.
For emergency handling, keep a fire extinguisher handy and emergency numbers for a fire department.

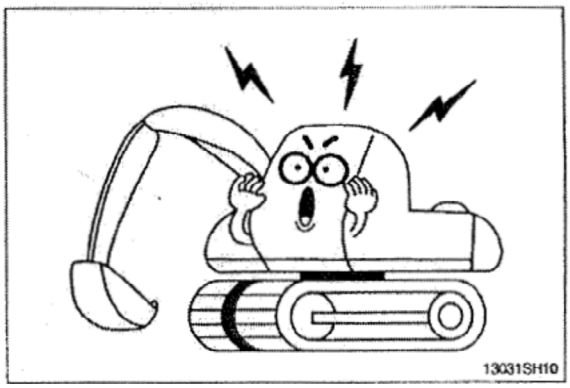


2. During Operation

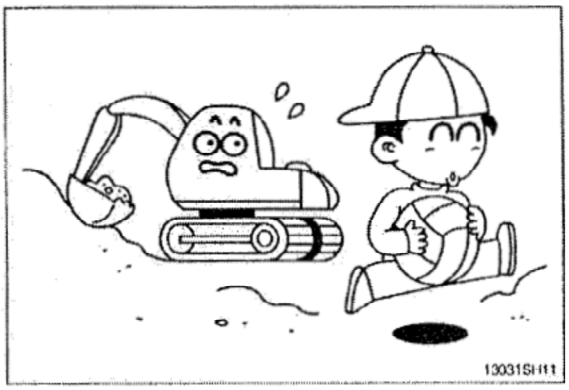
Use the handle and footstep when getting on or off the machine.
Do not jump on or off the machine.



Sound the horn to warn nearby personnel before operating the machine.
Remove all the obstacles like frost on the window before operating the machine for the good visibility.

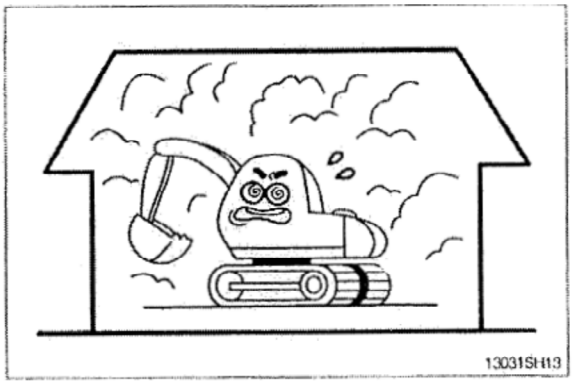


Operate carefully to make sure all personnel or obstacles are clear within the working range of the machine.
Place safety guards if necessary.

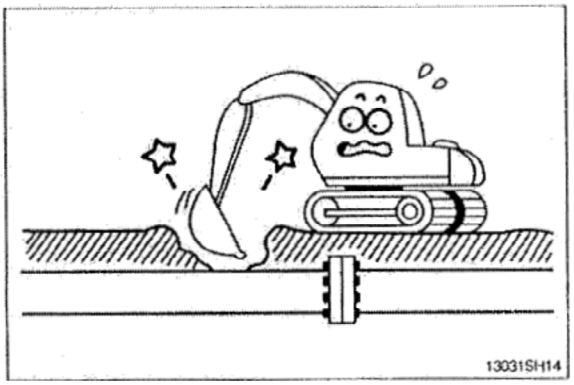


When using the work equipment, pay attention to the job site.

Provide proper ventilation when operating engine in a closed area to avoid the danger of exhaust gases.

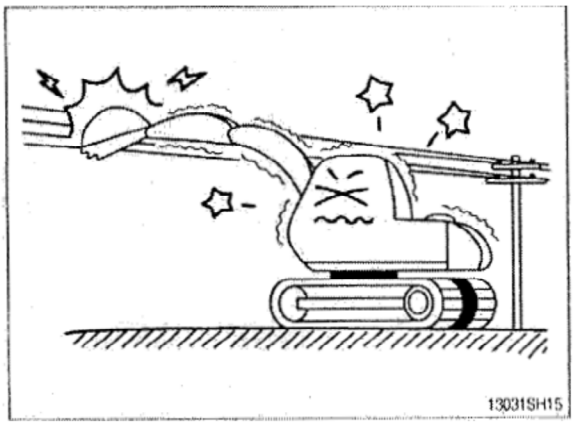


Check the locations of underground gas pipes or water line and secure the safety before operation.

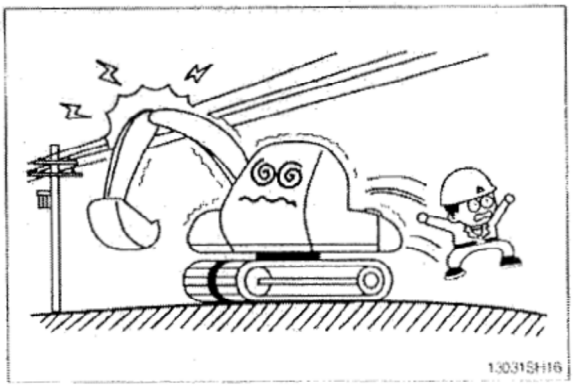


The operation near the electrical lines is very dangerous.
Operate the machine within safe working range permitted as below.

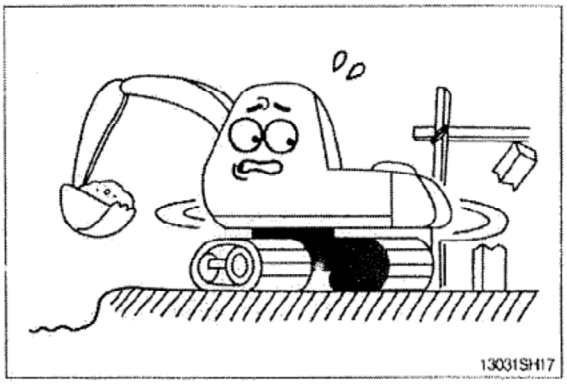
Voltage of High-voltage Line	Min. Safe Separation
6.6 kV	3 m (10 ft)
33.0 kV	4 m (13 ft)
66.0 kV	5 m (16 ft)
154.0 kV	8 m (26 ft)
275.0 kV	10 m (33 ft)



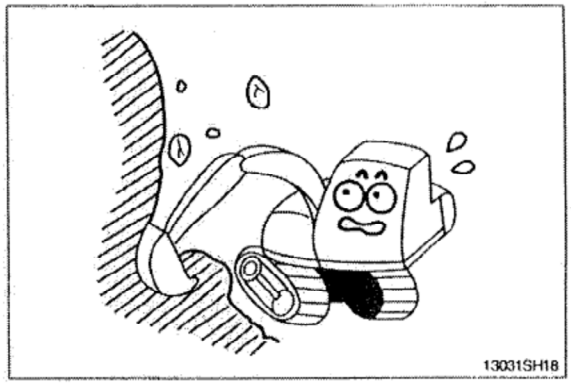
If the machine is in contact with the electric power lines, keep sitting on the operator's seat and make sure the personnel on the ground not to touch the machine until turning off the electric current. Jump off the machine without contacting the machine when you need to get off.



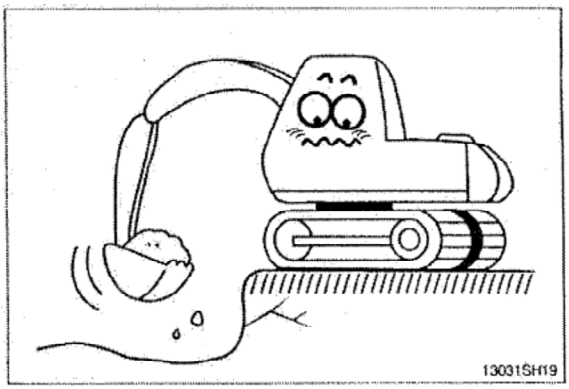
Watch out for obstacles.
Be particularly careful to check the machine clearance during the swing.



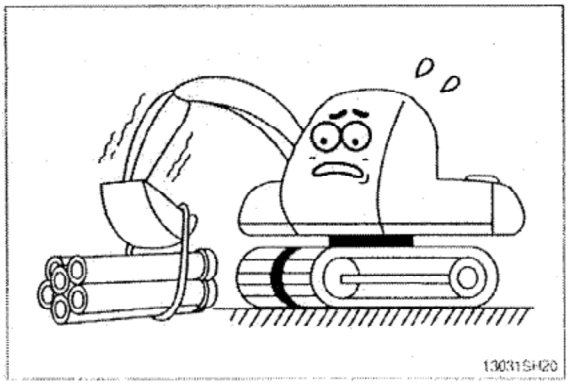
When using the machine as breaker or working in a place where stones may fall down, the cab roof guard and head guard should be provided for proper protection.



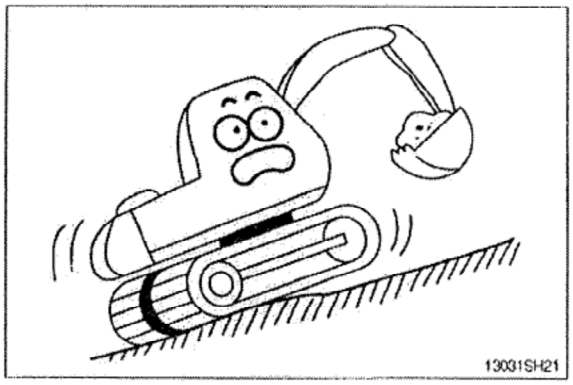
Avoid operating on a cliff or soft ground as there is danger of rolling over.
Make sure to get off easily as keeping the track at a right angle and putting the travel motor into the backward position when working on a cliff or soft ground inevitably.



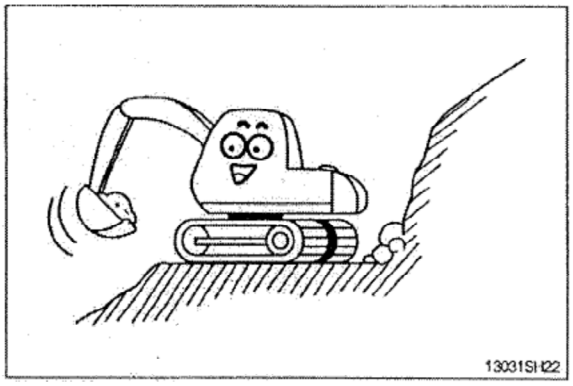
Consider the capacity of machine as well as the weight and width of the load during lifting.
Be careful not to lift the load exceeding the machine capacity as it can be the cause of machine damage and safety accident.



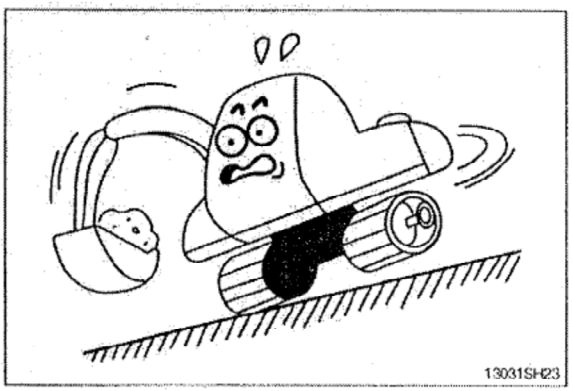
The operation on a slope is dangerous.
Avoid operating the machine on a slope of over 10 degrees.



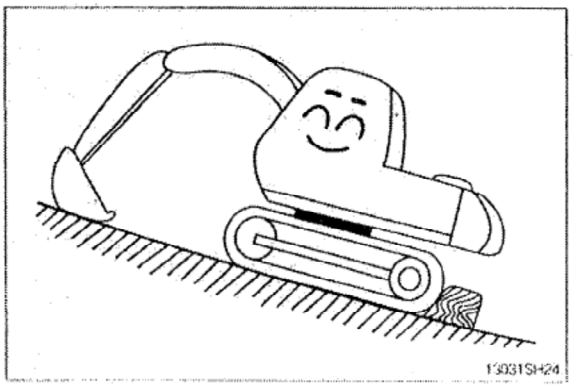
Operate the machine after making ground flat when operation is required on a slope.



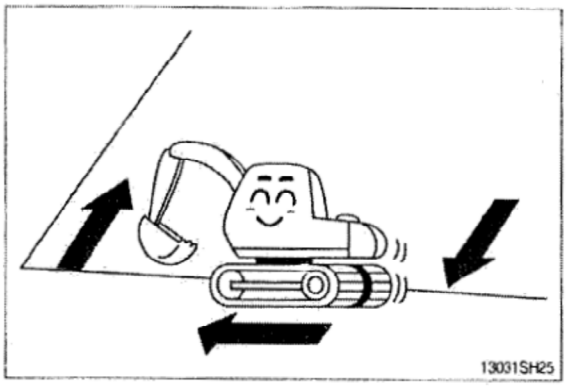
The swing on the slope can be danger of rolling over.
Do not operate to swing the machine with the bucket loaded on a slope since the machine may lose its balance under such an instance.



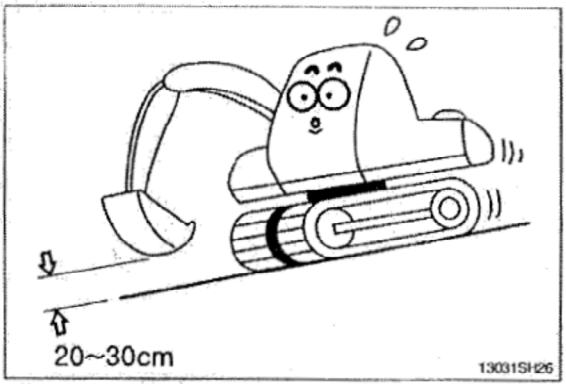
Avoid parking and stopping on a slope.
Lower the bucket to the ground and block the track when parking.



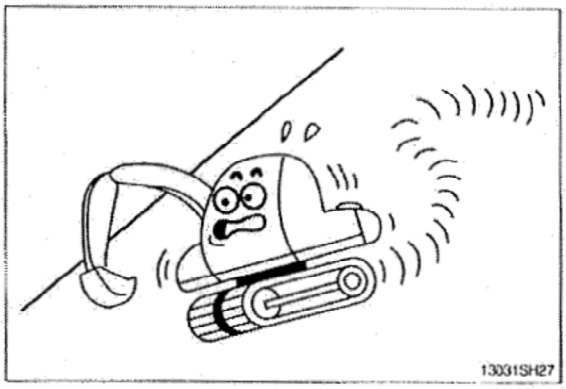
Avoid traveling in a cross direction on a slope as it can cause the danger of rolling over and sliding.



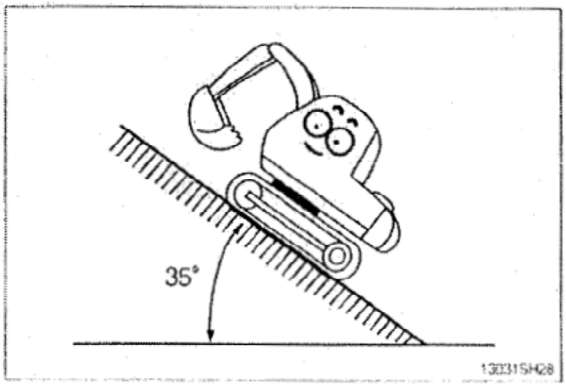
Traveling on a slope is dangerous.
Be sure to operate slowly when traveling down a slope and maintain the bucket at a height of 20-30 cm (1 ft) above the ground so that it can be used as brake in an emergency.



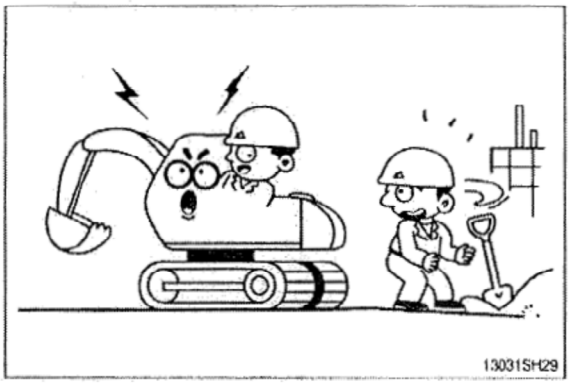
Steering of the machine in traveling on a slope is dangerous.
When an inevitable turning of direction is required, turn on the flat and solid ground.



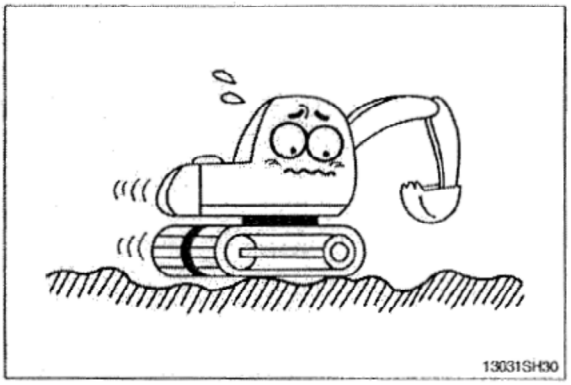
The engine angularity limits are 35 degrees. Do not operate by more than the engine limits in any case.



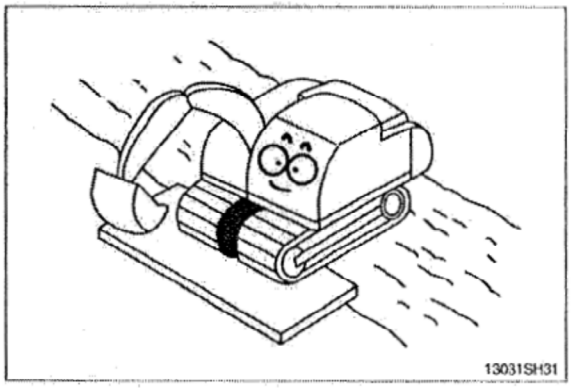
Before traveling the machine, sound the horn to warn nearby personnel.
Operate forward and backward correctly with confirming the location of the travel motor.



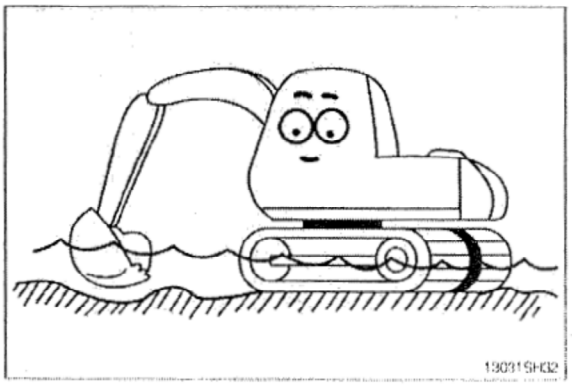
Slow down when traveling through obstacles or uneven ground.



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

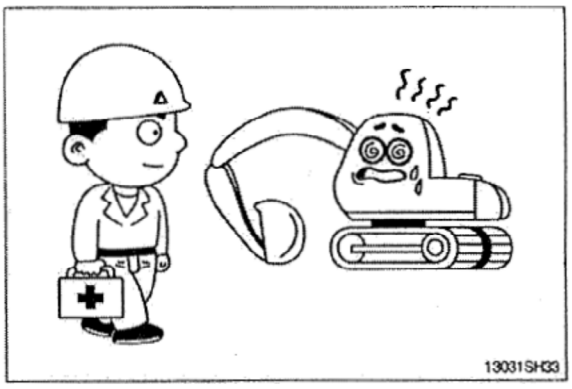


When operating in water or when crossing shallow, check the bed soil condition and depth and flow speed of water, and proceed taking care that water is not above carrier roller.

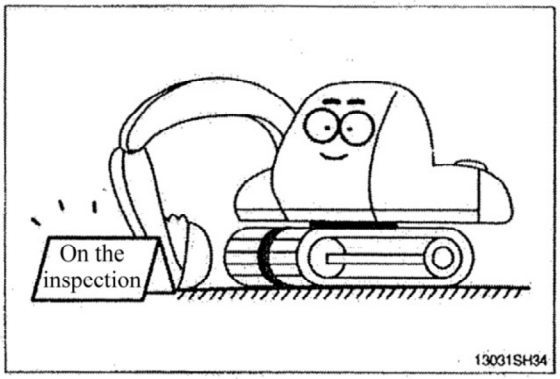


3. During Maintenance

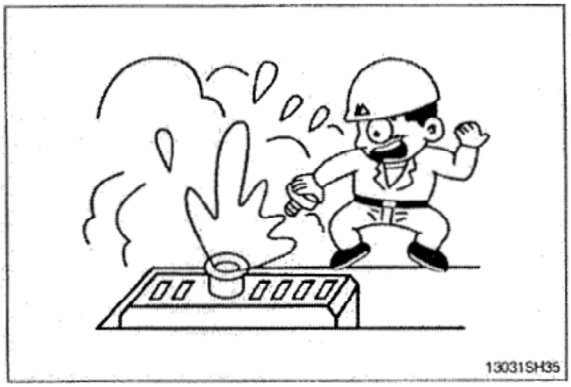
Stop the engine immediately when the trouble of the machine is found.
Inspect immediately the cause of trouble such as vibration, overheating and trouble in the cluster then repair.



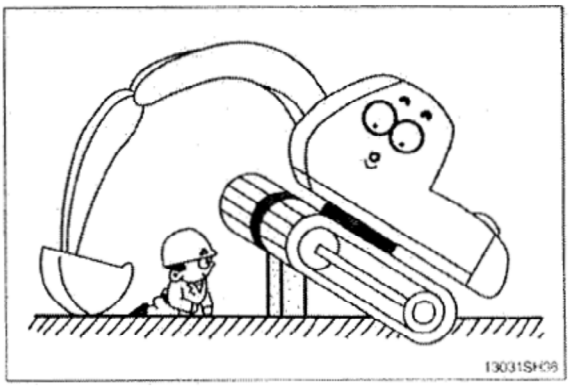
Park on a flat place and stop the engine for inspecting and repairing. Properly TAG machine is not operational. (Remove start key) Extreme care shall be taken during maintenance work. Parts may require additional safe guard.



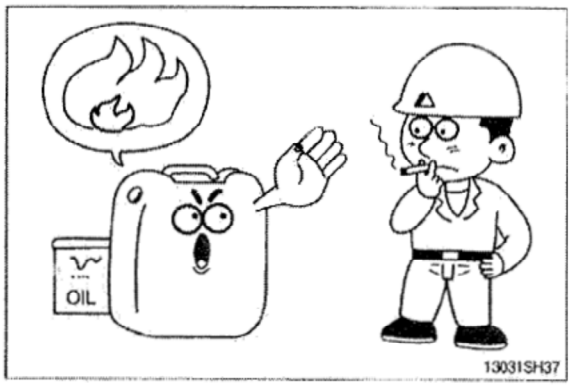
Do not remove the radiator cap from hot engine. Open the cap after the engine cools, below 50°C (112°F) to prevent personal injury from heated coolant spray or steam.



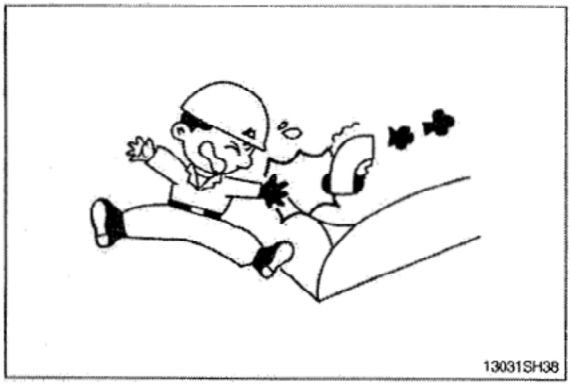
Do not work below the machine.
Be sure to work with proper safety supports.
Do not depend on the hydraulic cylinders to hold up the equipment and working device.



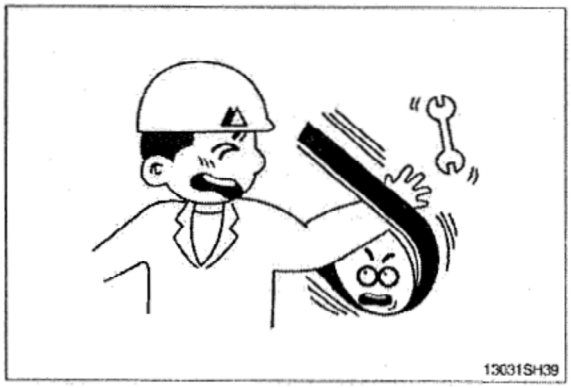
There is the danger of fire in diesel and oil. Store diesel and oil in a cool and dry area and away from any open flames.



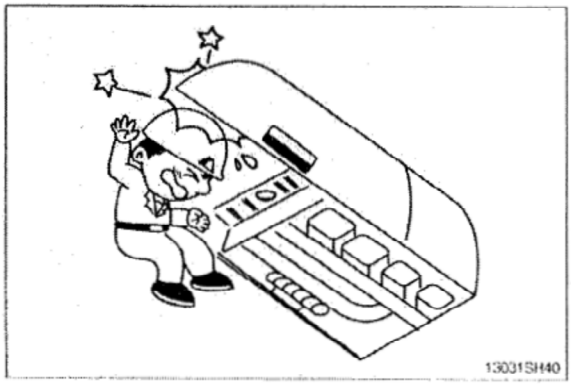
Do not touch the exhaust pipe, or it may cause severe burn.



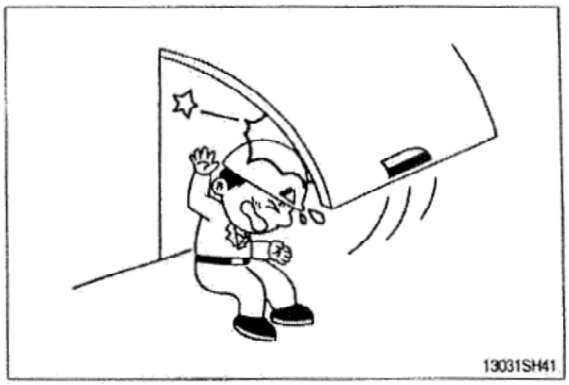
Do not open the engine hood and covers while the engine is running.



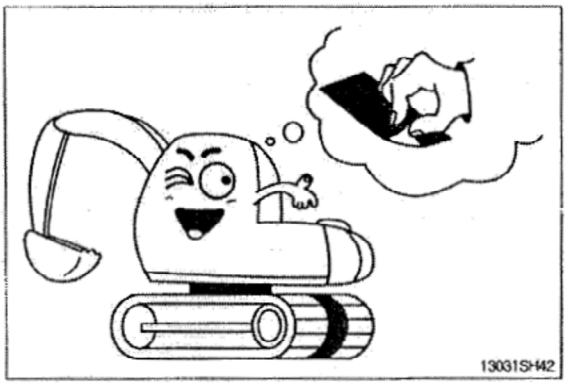
Be careful of not hitting the edges when you service engine.



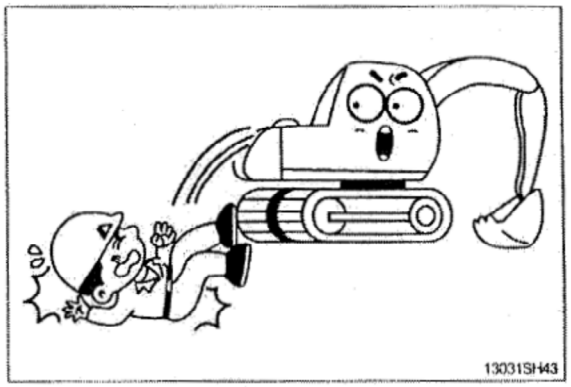
Be careful that the front window may be promptly closed.
Lock the side door securely if it is open.
Be careful that the open side door may be closed under external forces or natural forces such as strong winds.



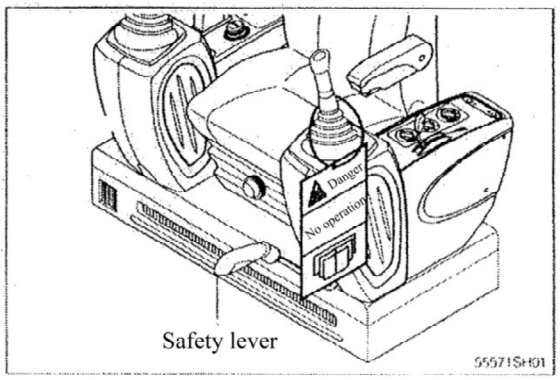
The anti-slip protection should be replaced if they have become worn or have been printed over. Be sure to free of oil, water and grease etc.



Be careful of not touching slip, fall down etc., when you work at the upper frame to service engine and/or other component.



Before servicing, hang the “Prohibition” sign on the control lever to avoid accidents.
Check whether the safety lever is in the LOCK position.



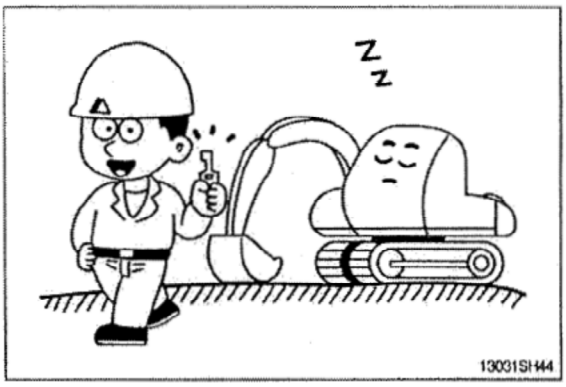
It is forbidden to stand under the counterweight during the removal and assembly of the counterweight, in order to facilitate repair.

Check whether the appliances and conditions are complete for removal of the counterweight.

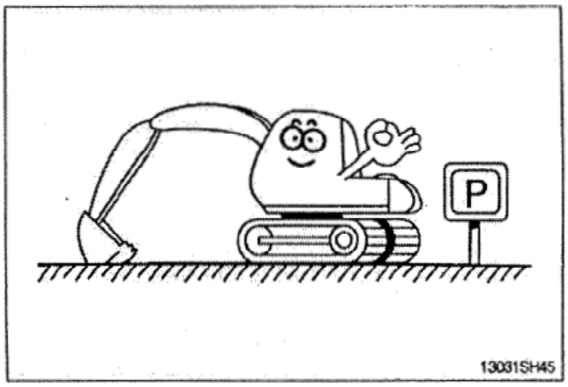
Drain oil or fuel from the hydraulic oil tank or fuel tank before removing these tanks. When the tank containing oil or fuel is lifted, damage to the hook or tank may result in personal injury.

4. Parking

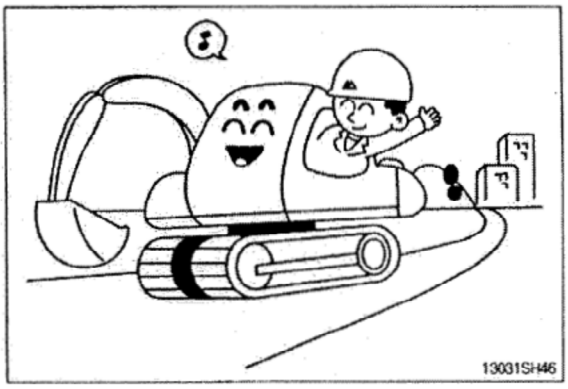
When leaving the machine after parking, lower the bucket to the ground completely and put the safety lever at parking position then remove the key. Lock the cab door.



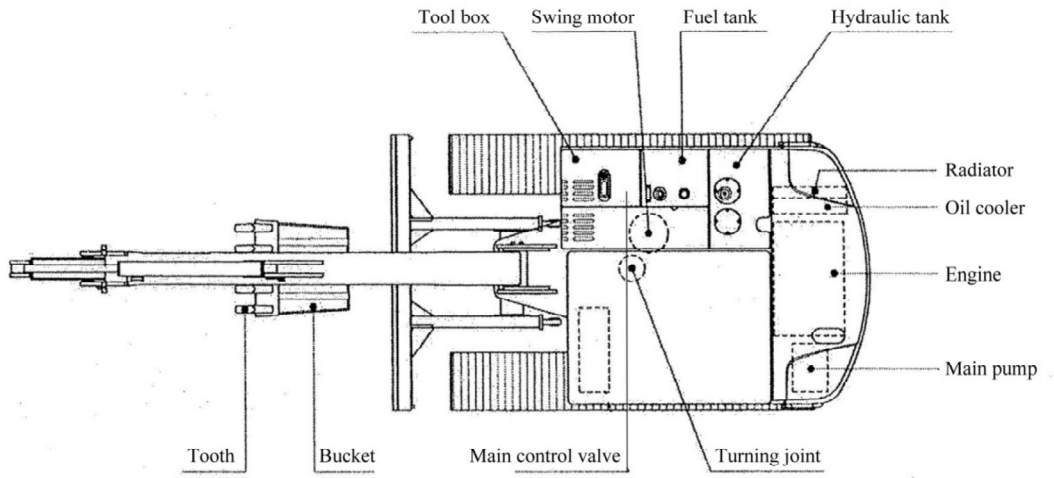
Park the machine in the flat and safe place.

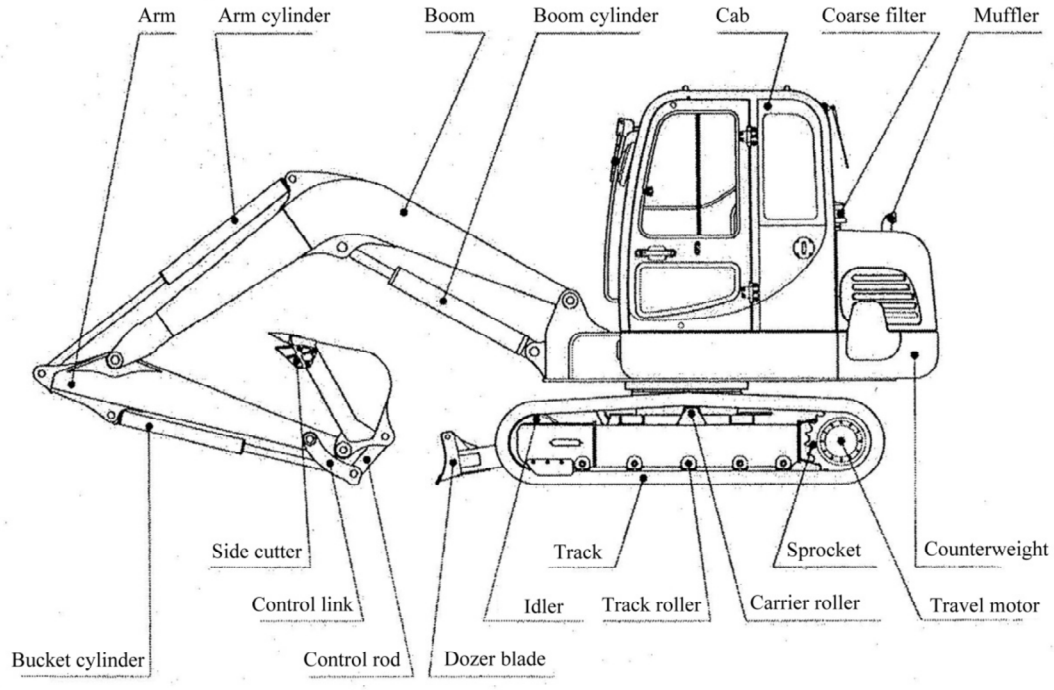


Hope you can work easily and safely observing safety rules.
For safe operation, observe all safety rules.



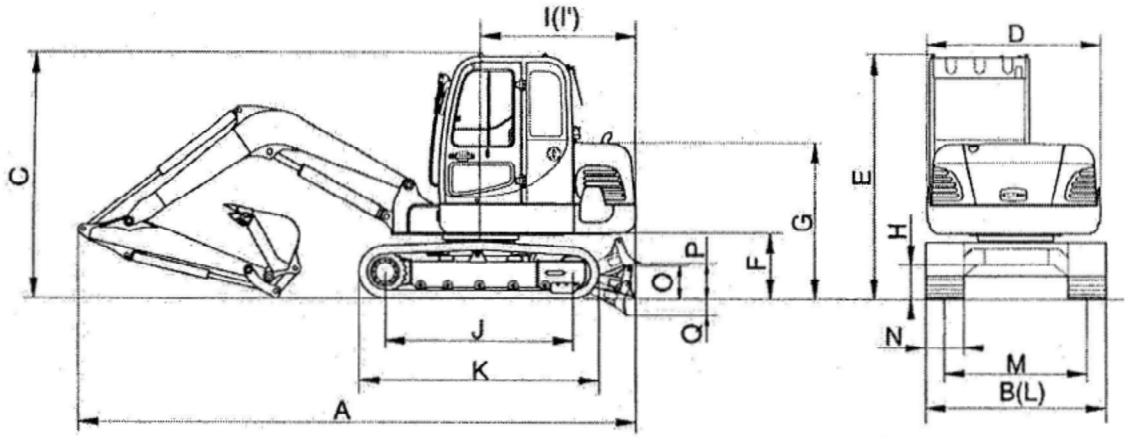
1. Major Components





2. Specifications

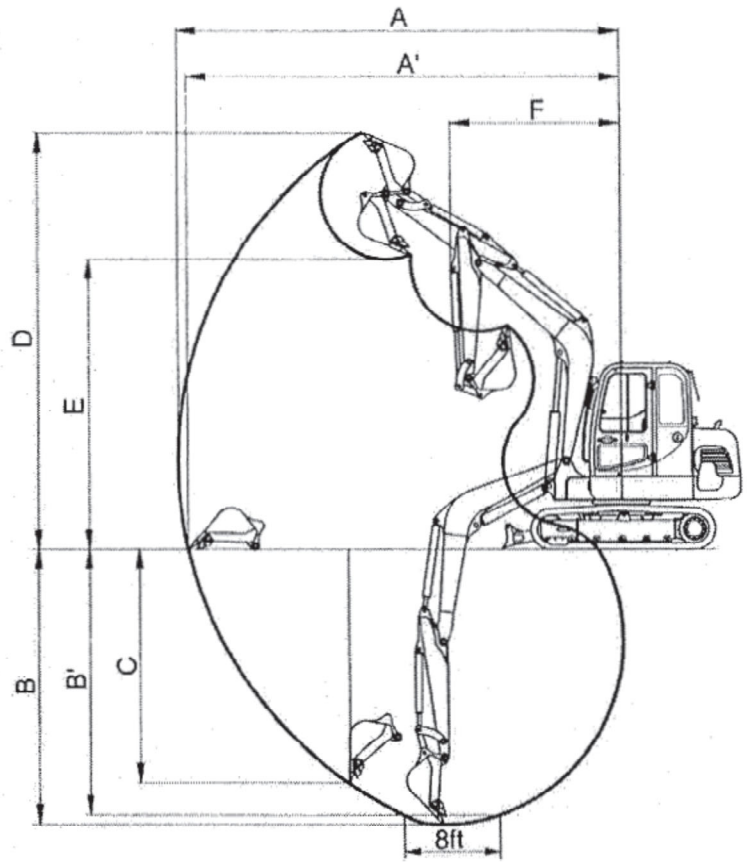
1) 3.7 m (12’2’’) mono boom, 1.67 m (5’6’’) arm



Description		Unit	Specification
Operating weight		kg	6,980
Bucket capacity (SAE heaped), standard		m^3	0.32
Overall length	A	mm	6,080
Overall width (400 mm track)	B		2,260
Overall height	C		2,690
Superstructure width	D		2,250
Overall height of cab	E		2,550
Ground clearance of counterweight	F		755
Engine cover height	G		1,755
Minimum ground clearance	H		360
Rear-end distance	I		1,730
Rear-end swing radius	I’		1,750
Distance between tumblers	J		2,130
Undercarriage length	K		2,725
Undercarriage width	L		2,200
Track gauge	M		1,750
Track shoe width, standard	N		450
Height of blade	O		460
Ground clearance of blade up	P		400
Depth of blade down	Q		280
Travel speed (low/high)		km/h	2.9/4.7
Swing speed		rpm	16.4
Gradeability		Degree (%)	35
Ground pressure (400 mm shoe)		kgf/cm^2	0.35

3. Working Range

1) 3.7 m (9’10’’) mono boom



Description		1.67 m Arm
Max digging reach	A	6,335 mm
Max digging reach on ground	A’	6,185 mm
Max digging depth	B	4,015 mm
Max digging depth (8’ level)	B’	3,625 mm
Max vertical digging depth	C	3,210 mm
Max digging height	D	7,175 mm
Max dumping height	E	5,080 mm
Min swing radius	F	1,750 mm
Bucket digging force	ISO	4,874 kgf
Arm digging force	ISO	3,967 kgf

4. Weight

Item	HX75S/HX75N
	kg
Upper structure assembly	3,430
Main frame weld assembly	737
Engine assembly	234
Main pump assembly	50
Main control valve assembly	60
Swing motor assembly	80
Hydraulic oil tank assembly	100
Fuel tank assembly	73
Counterweight	390
Cab assembly	450
Lower undercarriage assembly	2,780
Track frame weld assembly	900
Swing bearing	140
Travel motor assembly	87
Turning joint	27
Tension body	110
Idler	65
Carrier roller	8
Track roller	16
Sprocket	20
Track-chain assembly (450 mm standard triple grouser shoe)	810
Dozer blade assembly	315
Working device assembly (3.7 m boom, 1.67 m arm, 0.32 m^3 SAE heaped bucket)	1,185
3.7 m boom assembly	481
1.67 m arm assembly	192
0.32 m^3 SAE heaped bucket	250
Boom cylinder assembly	120
Arm cylinder assembly	80
Bucket cylinder assembly	50
Bucket control link assembly	60
Dozer cylinder assembly	50

5. Lifting Capacities

3.7 m (12’2’’) boom, 1.67 m (5’6’’) arm equipped with 0.32 m^3 (SAE heaped) bucket and 450 mm triple grouser shoe, the dozer blade down.
The parameters of HX60N are the same as those in the table below.

Table of Lifting Capacities

HX75S

Boom: 3.7 m (12’2’’)

 Rating over-front

Arm: 1.67 m (5’6’’)

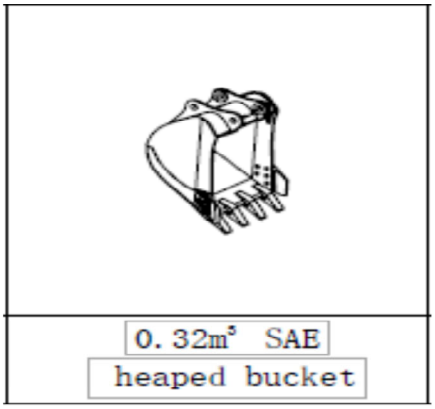
 Rating over-side or 360 degree

Bucket: 0.32 m^3 (SAE heaped)

Load point height (m/ft)		Load radius						At max. reach		
		1.5 m (5 ft)		3.0 m (10 ft)		4.5m (15 ft)		Capacity		Reach
										m (ft)
4.5 m	kg			*1800	*1800			*1680	1090	5.06
15 ft	lb			*3970	*3970			*3700	2400	(16.6)
3.0 m	kg	*3890	*3890	*2370	*2370	*1930	1300	*1710	820	5.75
10 ft	lb	*8580	*8580	*5220	*5220	*4250	2870	*3770	1810	(18.9)
1.5 m	kg			*3340	2350	*2230	1210	*1760	740	5.95
5 ft	lb			*7340	5180	*4920	2670	*3880	1630	(19.5)
Ground line	kg			*3820	2160	*2430	1140	*1810	770	5.70
	lb			*8420	4760	*5360	2510	*3990	1700	(18.7)
-1.5 m	kg	*4810	*4810	1700	2130	*2230	1120	*1790	990	4.93
-5 ft	lb	*10600	*10600	3750	4700	*4920	2470	*3950	2180	(16.2)
-3.0 m	kg	*4000	*4000	1720	2220					
-10 ft	lb	*8820	*8820	3790	4890					

- The ratings of lifting capacities are based on SAE J1097 and ISO 10567.
- The load point is a hook located on the back of the bucket (standard).
- * Indicate the load limited by hydraulic capacity.
- If you want to install a non-recommended working device, refer to the service manual.
- Install the working device to prevent the boom from falling during lifting.
- The aforesaid lifting capacity include the sling weight.
- Read the operator’s manual before operation and observe it during operation.

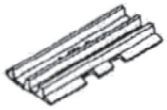
6. Bucket Selection Guide



Capacity		Width		Weight	Recommendation
SAE heaped	CECE heaped	Without side cutter	With side cutter		3.7 m boom 1.67 m arm
0.32 m^3	0.28 m^3	760 mm	840 mm	250 kg	Applicable for materials with density of 2200 kgf/m^3 (3370 lb/yd^3) or less

7. Undercarriage

1) Track

Model	Category		Triple grouser shoe
			
HX75S	Shoe width	mm	450
	Operating weight	kg	6800
	Ground pressure	kgf/cm^2	0.35
	Overall width	mm	2,260

2) Number of rollers and shoes on each side

Item	Quantity
Carrier rollers	1EA
Track rollers	5EA
Track shoes	38EA

8. Specifications for Major Components

1) Engine

Item	Specification
Model	XSNSRE/4TNV98-ZCV
Type	4-cycle diesel engine, low emission
Cooling method	Water cooling
Number of cylinders and arrangement	4 cylinders, in-line
Firing order	1-3-4-2
Combustion chamber type	Direct injection type
Cylinder bore × stroke	98 × 110 mm
Piston displacement	3,318 cc
Compression ratio	18.5:1
Rated gross horse power (SAE J1995)	44.42/2,100 (KW/rpm)
Maximum torque at 1,575 rpm	240.1N•m
Engine oil quantity	12L
Net weight of engine	234 kg
High idling speed	2,200+50 rpm
Low idling speed	1,050 ±50 rpm
Starting motor	12 V-3.0 kW
Alternator	12 V-80 A
Battery	1×12 V×100 Ah

2) Main pump

Item	Specification
Type	Variable-displacement axial piston pump
Capacity	72 cc/rev
Maximum pressure	275 kgf/cm^2
Rated oil flow	158.4 L/min
Rated speed	2,200 rpm

3) Gear pump

Item	Specification
Type	**Single stage quantitative gear pump**
Capacity	8 cc/rev
Maximum pressure	35 kgf/cm^2
Rated oil flow	17.6 L/min

4) Main control valve

Item	Specification
Type	Sectional, 8 spools (one optional)
Operating method	Hydraulic pilot system
Main relief valve pressure	275 kgf/cm^2
Overload relief valve pressure	-

5) Swing motor

Item	Specification
Type	Fixed-displacement axial piston motor
Capacity	43 cc/rev
Relief pressure	210 kgf/cm^2
Braking system	Automatic, spring applied hydraulic release
Braking torque	14 kgf•m (101 lbf•ft)
Brake release pressure	20-40 kgf/cm^2 (284-569 psi)
Reduction gear type	2-stage planetary
Swing speed	16.4 rpm

6) Travel motor

Item	Specification
Type	Variable-displacement axial piston motor
Relief pressure	300 kgf/cm^2
Reduction gear type	2-stage planetary
Braking system	Automatic, spring applied hydraulic release

7) Remote control valve

Item		Specification
Type		Proportional pressure reduction
Operating pressure	Min.	5kgf/cm^2
	Max.	20.5kgf/cm^2
One-way operating stroke	Handle	6.5/8.5 mm (0.26/0.33 in)

8) Cylinder

Item		Specification
Boom cylinder	Bore dia × Rod dia × Stroke	Φ115 × Φ70 × 980 mm
	Cushion	Extend only
Arm cylinder	Bore dia × Rod dia × Stroke	Φ95 × Φ60 × 860 mm
	Cushion	Extend and retract
Bucket cylinder	Bore dia × Rod dia × Stroke	Φ90 × Φ55 × 665 mm
	Cushion	
Dozer cylinder	Bore dia × Rod dia × Stroke	Φ110 × Φ65 × 152 mm

※ Discoloration may occur to the cylinder rod due to surface friction during operation.

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

9) Shoe

Item	Width	Ground pressure	Link quantity	Overall width
HX75S	450 mm (18'')	0.35 kgf/cm^2	38	2,260 mm (7'5'')

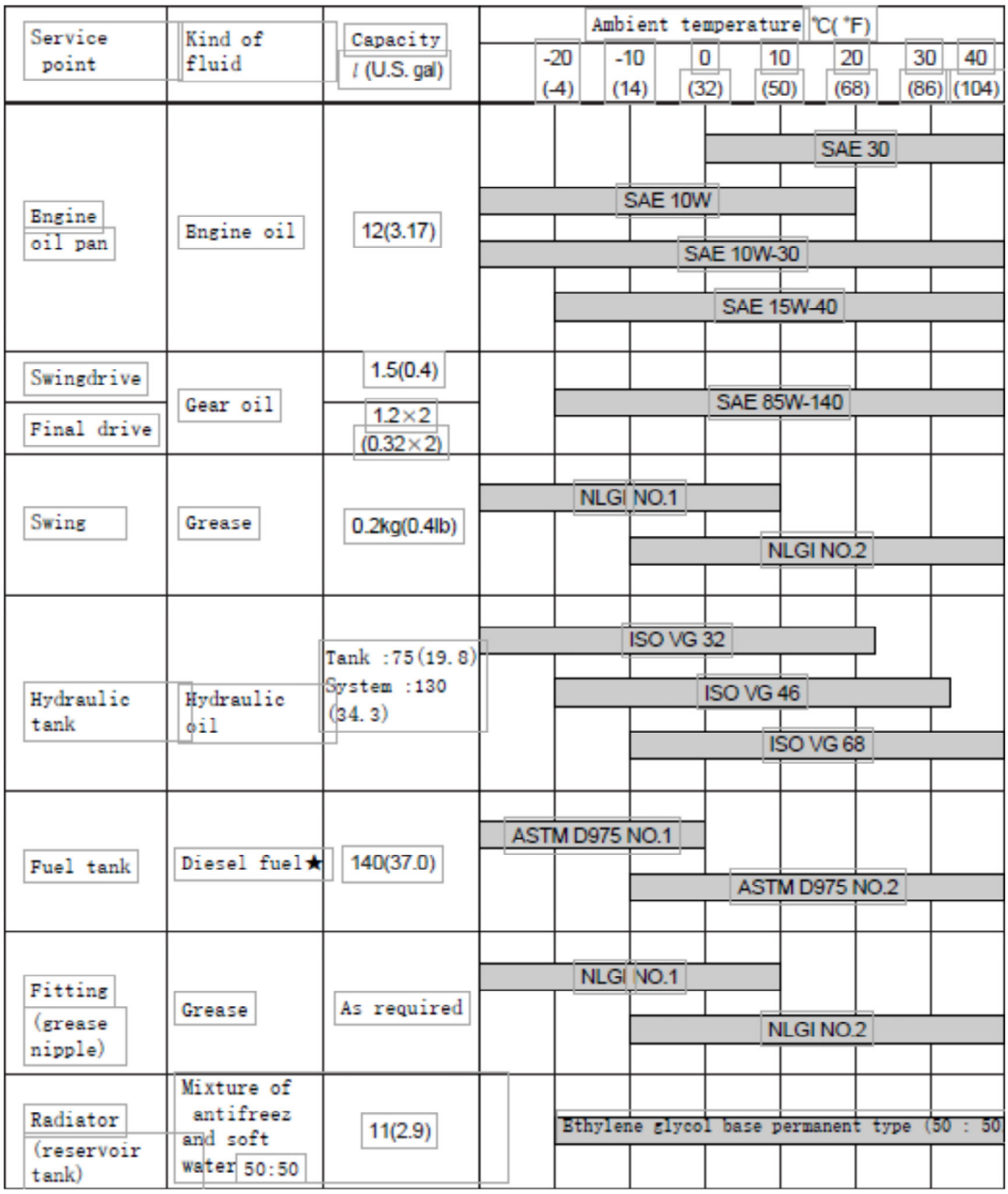
10) Bucket

Item		Capacity		Tooth quantity	Width	
		SAE heaped	CECE heaped		Without side cutter	With side cutter
HX75S	Standard	0.32 m^3	0.28 m^3	5	760 mm	840 mm

9. Recommended Oils

Use the oils listed below or those of the same grade or above.

Do not mix oils of different grades.



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

1. Cab Devices

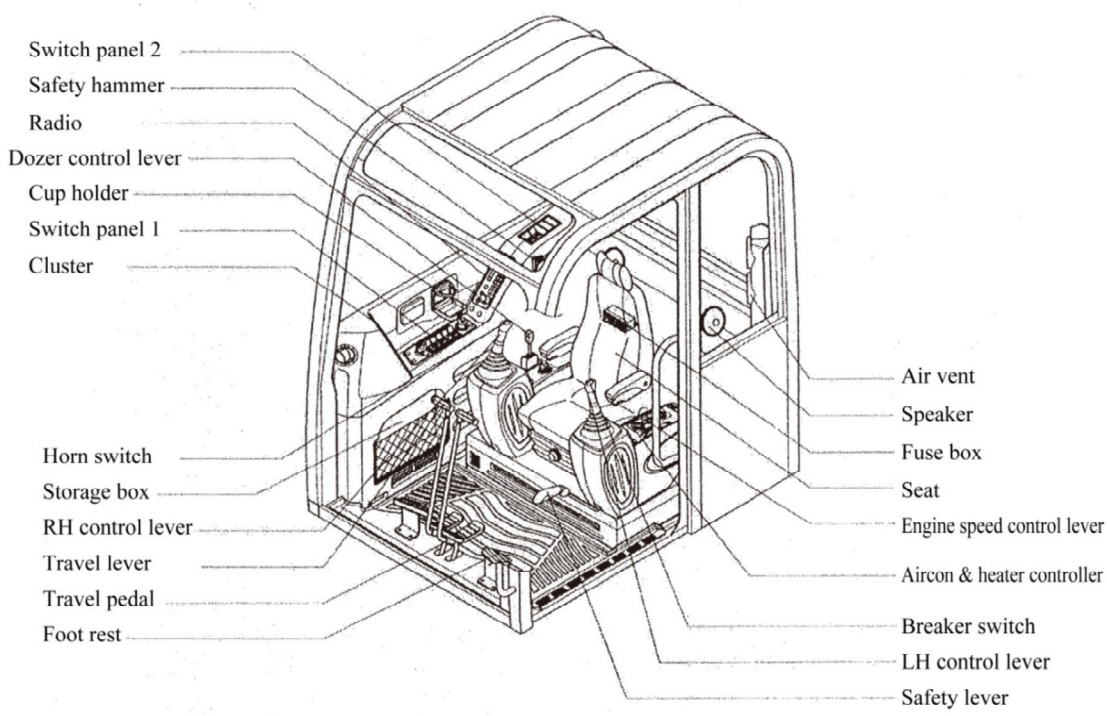
1) The ergonomically designed console box and luxury seat provide the operator with comfort.

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.

(3) Malfunction of electrical devices can be identified by instruments, which is conducive to maintenance.



2. Cluster

1. Overview

The cluster consists of the LCD and switches, as shown below. The LCD is to warn the operator in case of abnormal machine operation or conditions for the appropriate operation and inspection. It is also to set and display modes, monitoring and functions.

※ If a device malfunctions, the indicator will be ON and an alarm will be sent. Turn off the buzzer to cancel the alarm. If the indicator is still ON after the buzzer is turned off, take appropriate measures.

2. Cluster

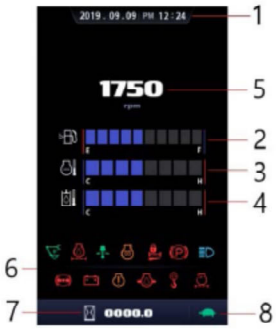
1) Structure

2) Gauge

(1) Operation screen

Default (A type)

Option (B type)

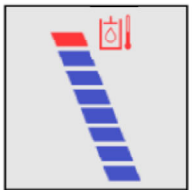


1. Clock 2. Fuel level gauge 3. Engine coolant temperature gauge
4. Hydraulic oil temperature gauge 5. Engine rpm 6. Warning lamp/indicator
7. Working hour gauge 8. Travel speed indicator

(2) Fuel level gauge

① This gauge indicates the amount of fuel in the fuel tank.
② Fill the fuel when the pointer is within the stage 1 or the red lamp is ON.
※ If this gauge indicates the red range or the warning lamp is ON, check the electrical device for poor contact and sensor for malfunction.

(3) Hydraulic oil temperature gauge



① This gauge indicates the temperature of hydraulic oil at 8 stages.

- Stage 0: 44°C and below
- Stages 1-7: 45°C to 104°C
- Stage 8: 105°C and above

② The pointer normally indicates the stages 2-6 during driving.

③ The machine runs at the stages 2-6 during low-speed idling after startup.

④ Reduce the load when the pointer indicates the stages 7-8. If the pointer still indicates the stages 7-8 after load reduction, stop the machine and check it.

(4) Engine coolant temperature gauge

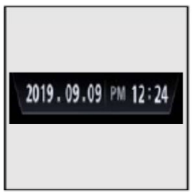
① This gauge indicates the temperature of hydraulic oil at 8 stages.

- Stage 0: 44°C and below
- Stages 1-7: 45°C to 114°C
- Stage 8: 115°C and above

② The engine must not be shut down if the red warning lamp is ON. Instead, the engine should be shut down after cooling at an intermediate speed.

※ If the engine is shut down without adequate cooling its temperature will rise rapidly, which may cause damage to internal parts.

(5) Current time



① Indicate the current time.

(6) Working hour gauge

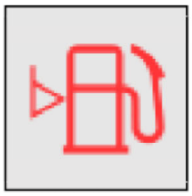
① Indicate the total working hours of the machine.

(7) Engine rpm

① Indicate the engine speed in rpm.

3) Warning lamps

(1) Fuel level warning lamp



① Indicate the amount of fuel in the fuel tank.
② Fill fuel immediately if this lamp flickers.

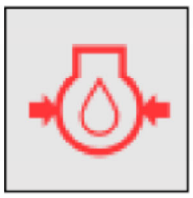
(2) Hydraulic oil temperature warning lamp

① The lamp is ON and the buzzer sounds when the hydraulic oil temperature is over the reference temperature (105°C).
② When this lamp is ON, check the oil cooling system.
③ Check the oil cooler and radiator.

(3) Cooling water temperature warning lamp

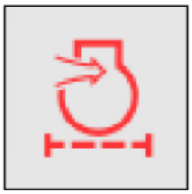
④ The lamp is ON and the buzzer sounds when the cooling water temperature is over the reference temperature (115°C).
① Check the cooling water level if this warning lamp is ON.

(4) Engine oil pressure warning lamp



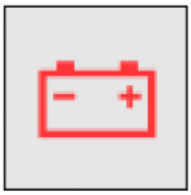
① The lamp is ON and the buzzer sounds due to low oil pressure before engine startup. The alarm will be canceled after startup.
② If the engine warning lamp is ON, reduce the engine speed or immediately shut down the engine, and check the engine oil level.

(5) Air cleaner warning lamp



① This lamp is ON and the buzzer sounds when the filter of the air cleaner is clogged.
② If this lamp is ON, check the filter and clean or replace it.

(6) Battery charging warning lamp



① Check whether the charging indicator is ON before starting the engine. If the warning lamp is ON and the buzzer sounds, ignition must not be performed.
② If the starting switch is made ON, the warning lamp will be ON and the buzzer will sound. After the engine is started, the warning lamp will be OFF. Check the battery charging line if the warning lamp is ON during engine operation.

(7) Engine check

① If the communication between the MCU and engine ECM is abnormal and the engine ECM sends a fault code to the cluster.
② Check the communication line. If communication is in good conditions, check the fault code on the cluster.

4) Pilot lamps

(1) Engine preheat pilot lamp

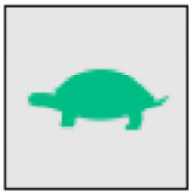
① When preheating is enabled automatically or manually, this lamp will be ON.

② Start the engine after this lamp is OFF.

(2) Travel speed pilot lamp (high speed)

① If this lamp is ON, the machine is running at a high speed.

(3) Travel speed pilot lamp (low speed)



① If this lamp is ON, the machine is running at a low speed.

5) Switches

(1) Travel speed switch

① Press the travel speed switch on the right side once to enable the high speed mode and again to enable the low speed mode.

(2) Buzzer stop switch

① When the starting switch is turned on, the alarm buzzer sound for 6 seconds under normal circumstances.
② If the machine fails, the red pilot lamp will be ON, and the buzzer will wound. In this case, press this switch to shut down the buzzer. Then the LED on this switch will be ON. Wait until it is OFF.

(3) ESC switch

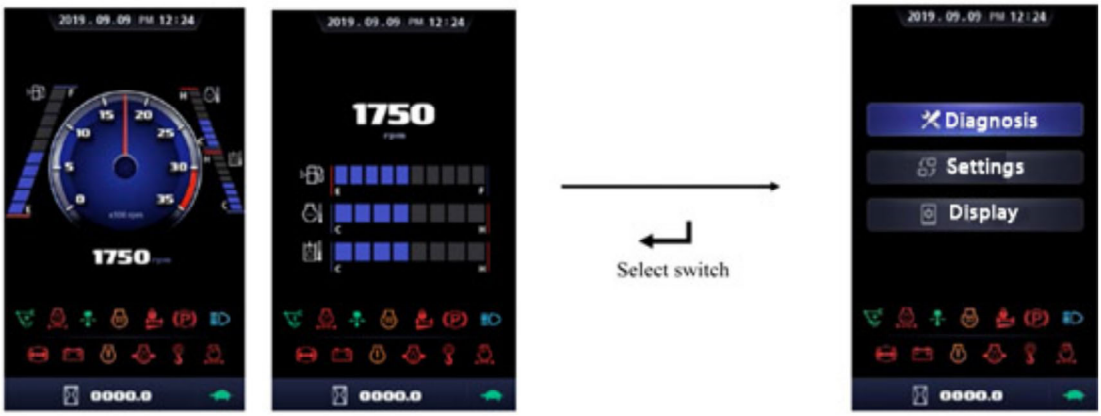
① Go back to the previous menu.

(4) Select switch

① Go back to the menu or use it after changing the input value.

3. Functions

1) Menu

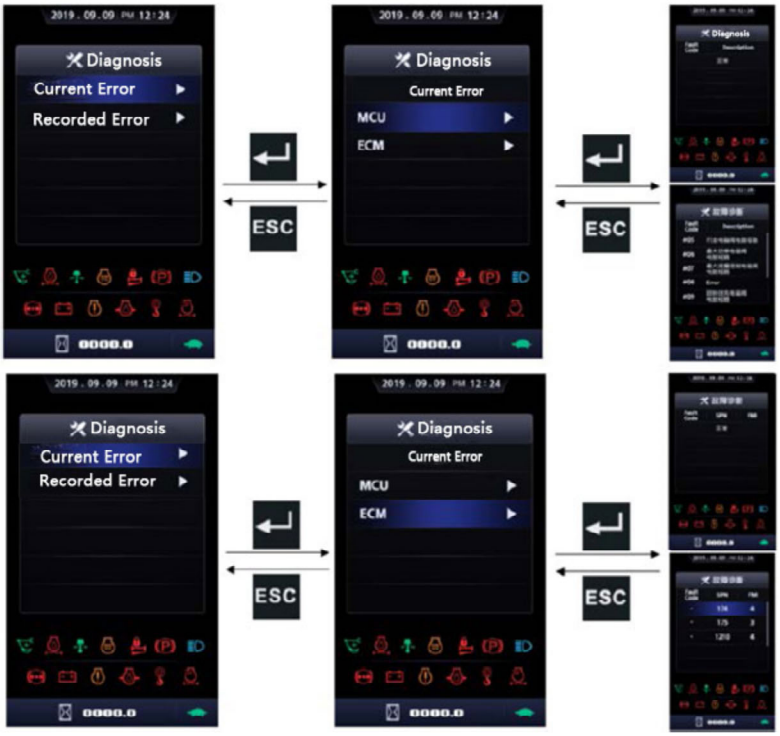


2) Structure

No	Main menu	Sub-menu	Description
1	Fault diagnosis	Active fault diagnosis Logged fault diagnosis	Confirmation and deletion of faults recorded in MCU and engine ECM
2	Change setting	Time setting Start limit	Time setting Start limit and password change
3	Screen setting	Operation screen Screen brightness Language Version Info	Working mode selection Brightness setting Language setting Device information confirmation

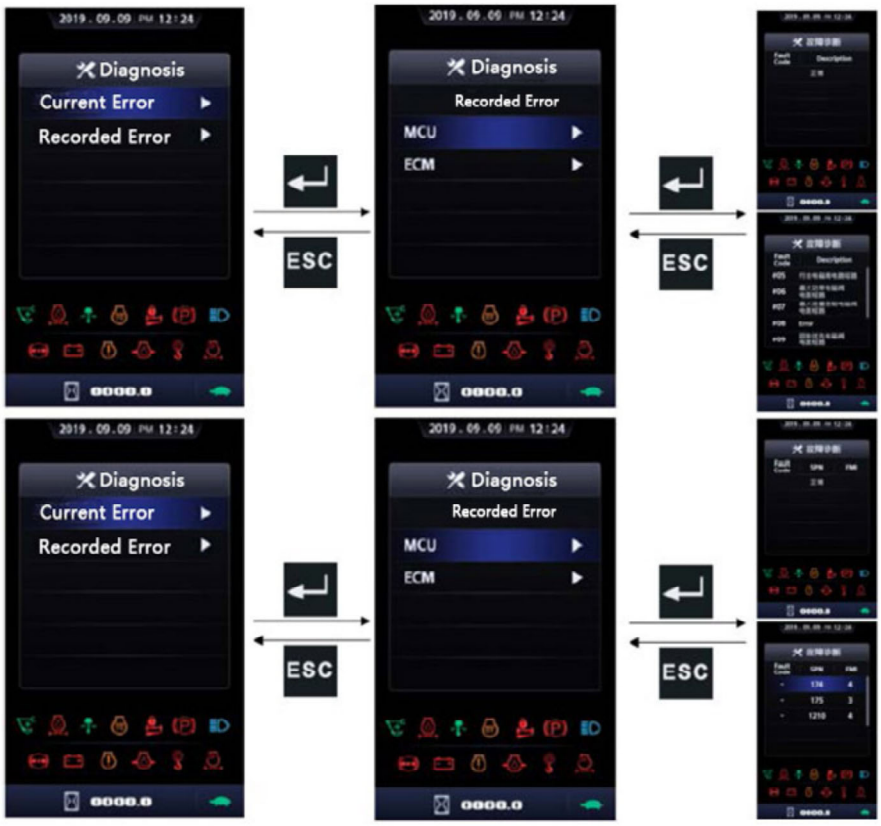
3) Fault diagnosis

(1) Active fault diagnosis



① The active fault of the MCU or engine ECM can be checked.

(2) Logged fault diagnosis



① The logged fault of the MCU or engine ECM can be checked.

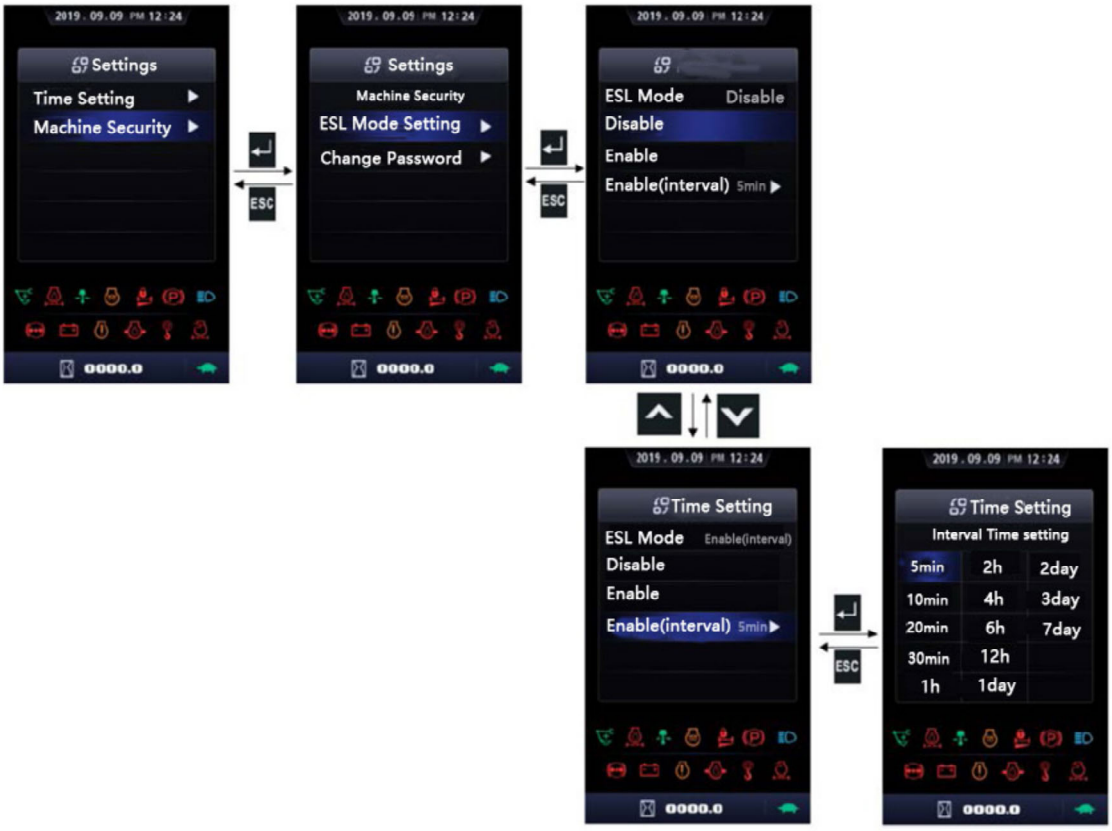
4) Change setting

(1) Time setting

① The year, month, day, hour and minute can be set.

(2) Start limit

a. Start limit setting



① This is designed against stealing and for the device that is not permitted to work.

② If the starting switch is ON during the start limit setting, it is required to enter the password.

- This function is disabled when not used.
- The operator needs to enter the password each time before startup.
- To set the start delay, it is required to enter the password after the first startup, but not required to restart the machine during the delay period. The maximum delay period is 7 days.

b. Change password

① The password consists of 4 digits. Press "↵" after entering the password.

② The initial password is "0000".

5) Screen setting

(1) Operation screen

① The type of the operation screen can be set: analog/digital.

(2) Screen brightness

① The screen brightness can be set.

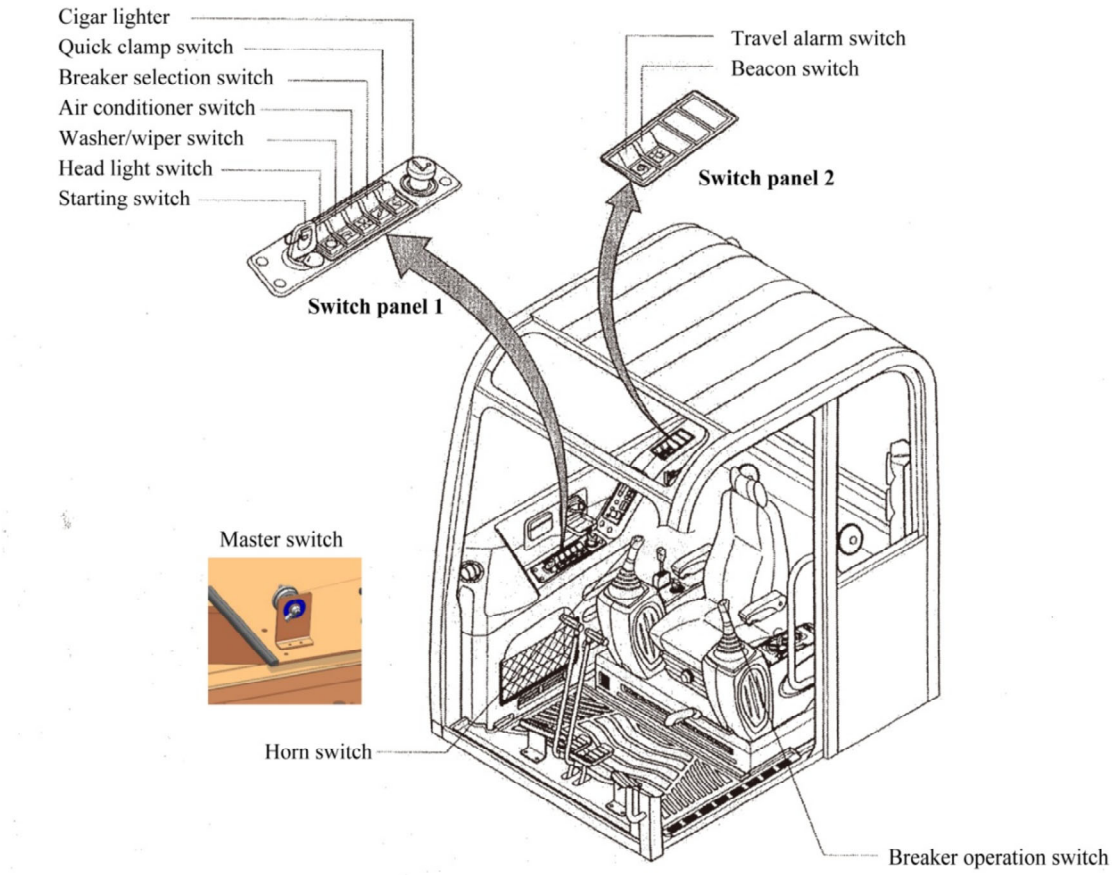
(3) Language

① The desired language can be selected. The screen will show the selected language.

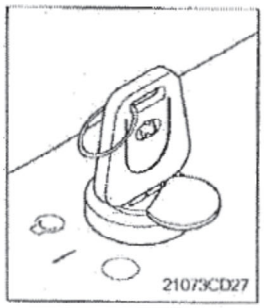
(4) Version information

① The F/W, Image, GPS version and model of the device can be confirmed.

2. Switches



1) Starting switch



(1) There are three positions: OFF, ON and START.

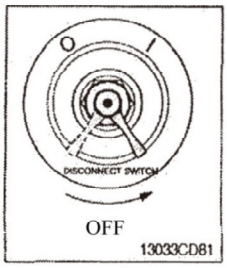
(2) ○ (OFF): None of electrical systems activate.

(3) | (ON): All the systems operate.

(4) (START): Use when starting the engine. Release the key immediately after starting.

※ The key must be in the ON position with engine running to maintain electrical and hydraulic functions and prevent serious machine damage.

2) 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.

3) Main light switch

(1) This switch has two modes for operation of the head light and work light.
● Mode 1: The beacons of the head light and instrument are ON.
● Mode 2: The work light and the beacon below it are ON.

4) Wiper and washer switch

(1) This switch has two modes for operation of the wiper and washer.
● Mode 1: the wiper can be operated.
● Mode 2: If this switch is turned to the mode 2, washing fluid will be sprayed and the wiper will work. If this switch is released, the mode 1 will be enabled.

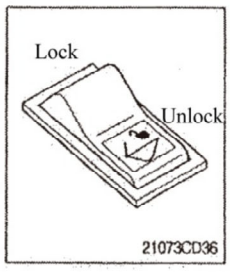
5) Travel alarm switch (optional)

(1) This switch is used to alarm surroundings when the machine travels to forward and backward.
(2) On pressing this switch, the alarm operates only when the machine is traveling.

6) Air conditioner switch

(1) This switch is used to operate the air conditioner.
(2) See the air conditioner and heater instructions for details.

7) Quick clamp switch (optional)



(1) This switch is used to engage or disengage the hook on the quick clamp.

(2) See the “Quick Clamp” for details.

※ The quick clamp must be operated with the quick clamp switch in the lock position and the safety pin assembled.

8) Breaker selection switch (optional)

(1) This switch is used to control the breaker.

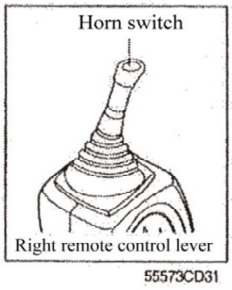
(2) On pressing this switch, the breaker will operate.

9) Swing beacon switch (optional)

(1) This switch is used to turn on the swing beacon in the cab.

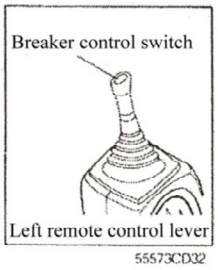
(2) On pressing this switch, the beacon below will be ON.

10) Horn switch



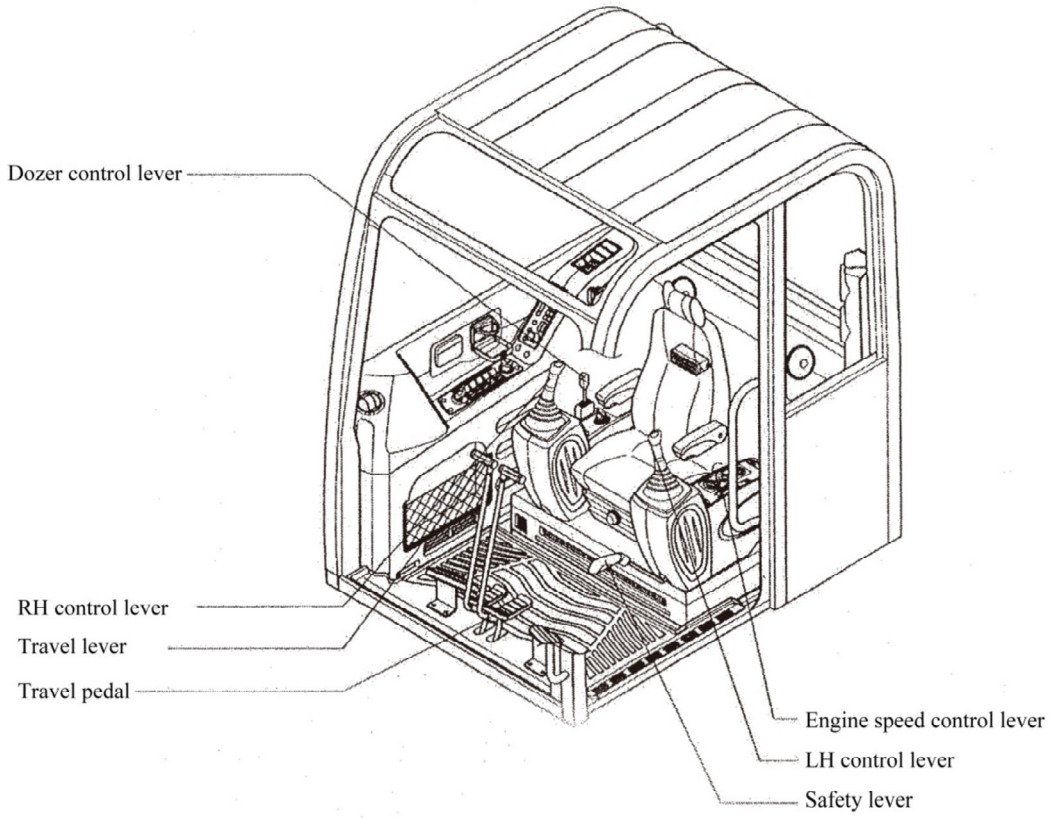
(1) This switch is at the top of left side control lever. On pressing, the horn sounds.

11) Breaker operation switch



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

4. Levers and Pedals



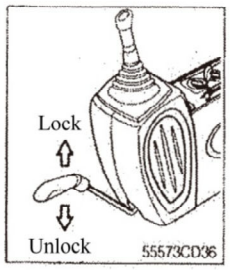
1) LH control lever

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

2) RH control lever

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

3) Safety lever



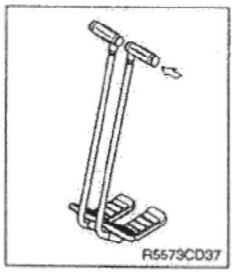
(1) When this lever is in the LOCK position, the console box will be raised, the pilot oil line will be cut off, and the working device and swing will not work.

※ Be sure to raise the lever to the LOCK position when leaving from operator's seat.

(2) By pushing the lever to UNLOCK position, the machine is operational.

※ Do not use the safety lever as a handle when getting on or off the machine.

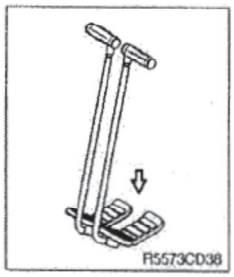
4) Travel lever



(1) This lever is mounted on the travel pedal and used for traveling by hand. The operation principle is same as that of the travel pedal.

(2) Refer to the "Traveling of Machine" for details.

5) Travel pedal

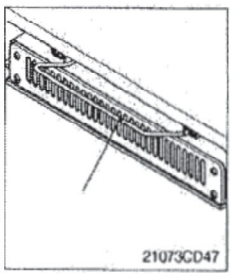


(1) This pedal is used to move the machine forward or backward.

(2) If the left side pedal is pressed, the left track will move. If the right side pedal is pressed, the right track will move.

(3) Refer to the "Traveling of Machine" for details.

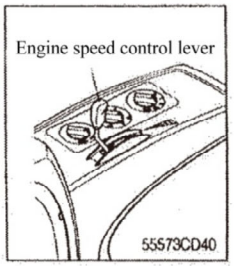
6) Seat and console box adjust lever



(1) This lever is used to move the seat and console box to fit the contours of the operator's body.

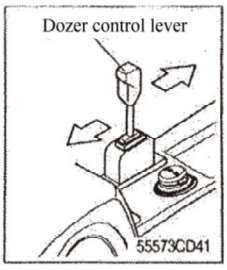
(2) Pull the lever to adjust forward or backward over 90 mm (3.5").

7) Engine speed control lever



(1) This control lever is to increase or decrease the engine speed.
(2) Move this control lever backward to increase the engine speed and forward to decrease the engine speed.
(3) To stop the engine, move the engine speed control lever forward to the maximum, and turn the key to the OFF position.

8) Dozer control lever

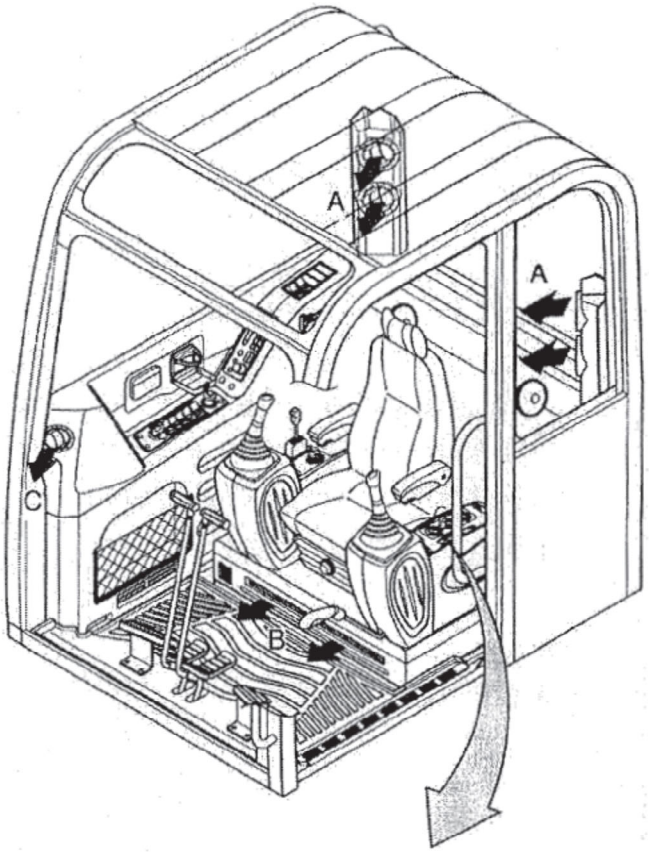


(1) This lever is used to operate the dozer blade.
(2) If the lever is pushed forward, the dozer blade will be going down. If the lever is pulled back, the dozer blade will be going up.

5. Air Conditioner and Heater

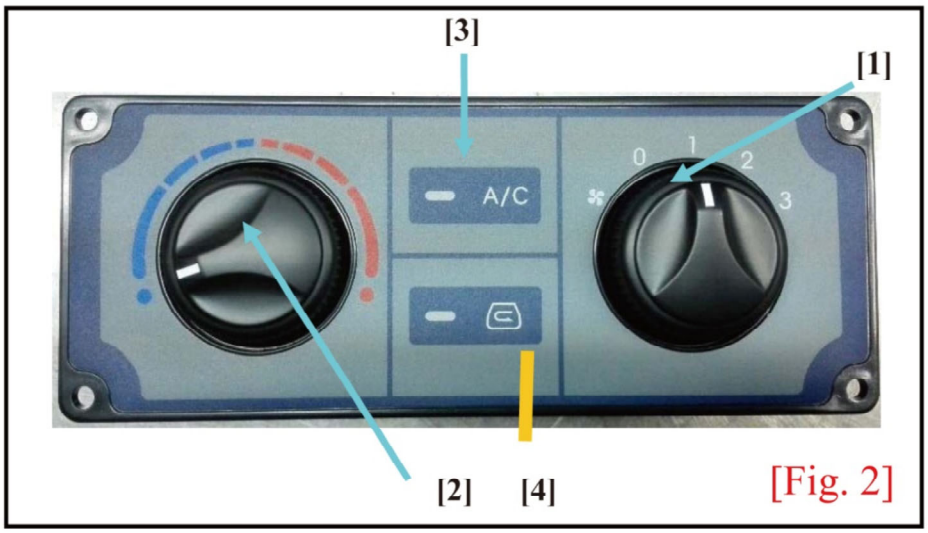
The air conditioner and heater are provided to ensure the comfort during operation.

● Air flow duct



1. Start of air-conditioner

The air conditioner is started by operating the controller inside the vehicle. The main structure and function of the controller are as follows:



2. Start of air conditioner

No.	Name	Main Function
1	Air volume adjustment switch	Adjust the air volume of the unit in the cooling or heating mode (3 levels: LOW/MIDDLE/HIGH).
2	Internal temperature adjustment switch	This is used by the operator to set the internal temperature in the cooling mode. ▶ Turn this switch left to the maximum. The internal temperature will be set to 30°C (until the power switch of the compressor clutch is turned on or off). ▶ Turn this switch right to the maximum. The internal temperature will be set to 15°C.
3	Cooling start LED	This LED indicates the clutch action in the cooling mode.
4	Internal/external air circulation switch	Enable the internal/external air circulation (this function is not available at present).

2-1. Operation order of air conditioner

No.	Operation Switch	Start Order and Method
1	Engine	Start the engine of the vehicle.
2	Cooling operation	▶ Close the heating water valve [13] shown in Fig. 1 to prevent the engine cooling water from flowing into the HVAC unit.
		▶ Turn the internal temperature setting switch in Fig. 2 right to the maximum in the cooling mode. (2) Internal temperature setting: right to the maximum = 15°C middle position = 22-24°C left to the maximum = 30°C ※ Note: If there is a “click” sound within the OFF range when this switch is turned left to set the temperature, it indicates that the compressor power switch is engaged but the compressor clutch is OFF. Thus, the clutch must not be turned OFF when this switch is turned left.
3	Air volume adjustment switch	▶ Turn the air volume adjustment switch [1] in Fig. 2 to the Level 1 (LOW) position. The compressor will be powered on and start working. At the same time, the motor of the HVAC unit will work and cold air will be supplied into the vehicle. ▶ During the initial start of the air conditioner, turn the air volume adjustment switch right to the Level 3 (HIGH) position to quickly reduce the internal temperature.

No.	Operation Switch	Start Order and Method
4	Internal temperature setting switch (in cooling mode)	► As shown in Fig. 2, when the internal temperature setting switch [2] is set in the middle "(A)" position, the air conditioner will continue working. If the internal temperature reaches 22-24°C, the power supply of the compressor clutch will be automatically turned on/off, to maintain the internal temperature. ※ Note: The above functions are available only in the cooling mode. In the heating mode, the switch must be turned left to the maximum and kept in the OFF state.

2-1. Operation order of air conditioner

No.	Operation Switch	Operation Order and Method
1	Heating	► For heating, open the heating water valve in Fig. 1, making the engine cooling water flow into the HVAC unit.
2	Internal temperature setting switch	► Turn the temperature setting switch left to the maximum until there is a "click" sound in the OFF range, and keep this state. ※ Note: If the temperature setting switch turned right, the compressor clutch will be driven to work, which will obviously affect heating and cause compressor failure.
3	Air volume adjustment switch	► Turn the air volume adjustment switch in Fig. 2 to the Level 1 (LOW) position or any desired position, the motor of the HVAC unit will be driven to work, and hot air will be supplied into the vehicle.

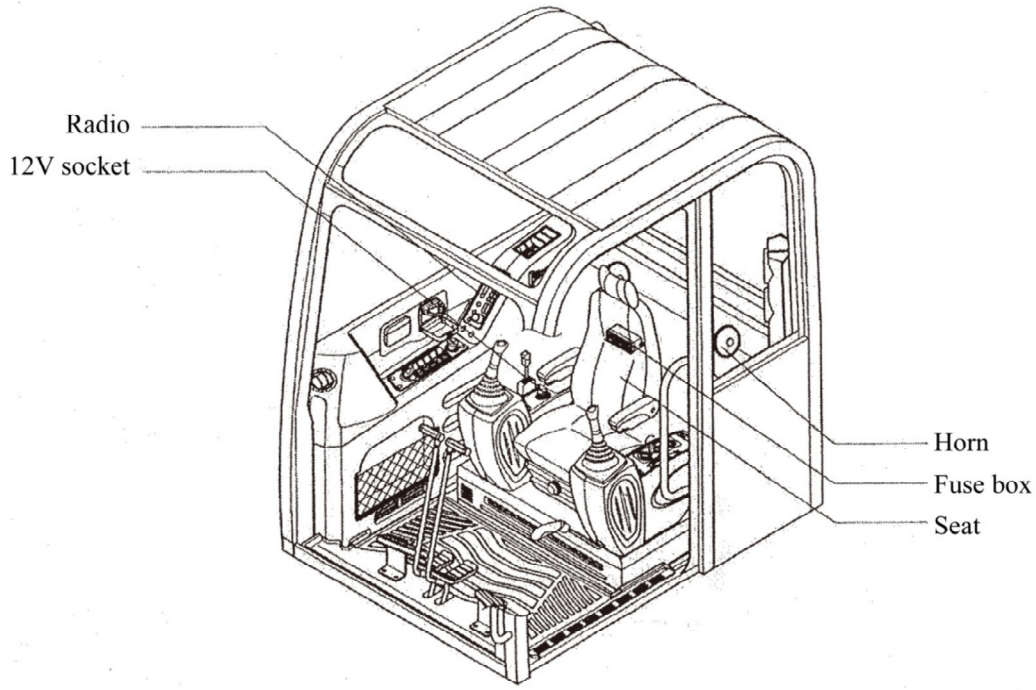
2-2. Installation and precaution of air conditioner

Item	Installation Method and Precaution
Compression installation	▶ 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. 
Condenser installation	▶ 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.
Dryer installation	▶ The dryer is secured vertically with at least two bolts.
HVAC unit installation	▶ 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.
Hose and wire	▶ 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.

2-3. Refrigerant filling and commissioning

<table>
<tr><th>Item</th><th>Use Method and Precaution</th></tr>
<tr><td>Seal check</td><td>► After hose and wire connection, check seals for air leakage. (Mark hose connections with a marker.)
► Check seals with nitrogen. Apply the pressure of 20kg/cm^2(use the same high or low pressure) via the pressure gauge. Observe the change in the reading of the pressure gauge in about 15 minutes, and check air leakage.
※ Note: Use nitrogen only in seal check.
► Completely drain residual nitrogen after seal check.</td></tr>
<tr><td>Vacuum operation</td><td>► Connect the vacuum pump and pressure gauge, and carry out vacuum operation (about 10-15 minutes) with the vacuum pump when vacuum conditions are met.
► Close the instrument valve after vacuum operation. Observe the change in the reading of the instrument in about 10 minutes.
※ Note: The pressure gauge used in air leakage check and vacuum operation should be inspected and calibrated on a regular basis.</td></tr>
<tr><td>Refrigerant filling</td><td>► If no air leakage is found, connect the refrigerant to the pressure gauge with an inspected and calibrated scale, to drain residual air in the gauge tube via the refrigerant.
► Align the pointer of the scale with 0, and fill a specified amount of gaseous refrigerant through the high-pressure gauge tube.</td></tr>
<tr><td>Commissioning</td><td>► After filling the refrigerant, start the engine with the attached pressure gauge, check the pressure indicated by the pressure gauge via the air conditioner controller, and inspect the system.
► In principle, the system pressure should be checked at the ambient temperature above 25°C.
<table>
<tr><th>Ambient Temperature</th><th>Low Pressure (kg/cm^2)</th><th>High Pressure (kg/cm^2)</th><th>Condition</th></tr>
<tr><td>25-30°C</td><td>1.0-2.5</td><td>11-15</td><td rowspan="2">►Speed: 1,800 rpm
►Internal temperature: 25-28°C</td></tr>
<tr><td>30-35°C</td><td>1.8-3.5</td><td>13-18</td></tr>
</table>
※ Note: The above results vary with the ambient temperature changing, so they cannot be used as a basis of judgment.</td></tr>
</table>

6. Others



1) Radio

A high-performance sound can make work pleasant. (The radio model may change without prior notice.)

RADIO/USBMP3/BASS/CLOCK

- Introduction to Features
- Introduction to Panel
- Operation Instructions
- Operation Guide
- Installation
- Troubleshooting
- Technical Specifications

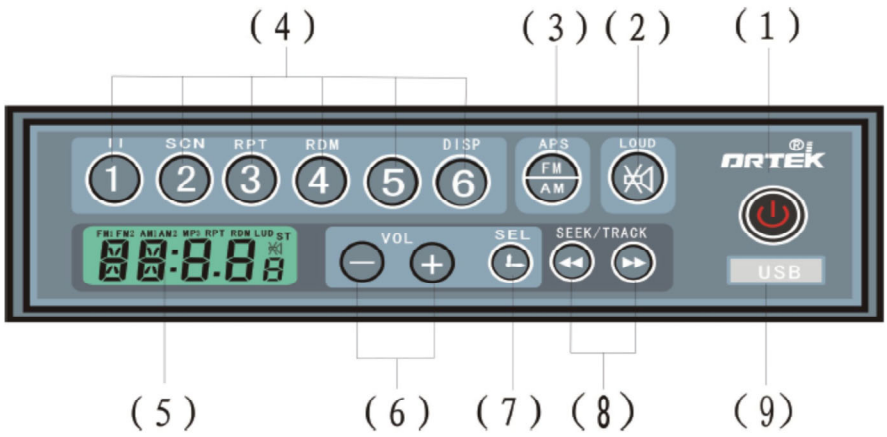
Operation Instructions

1. Please read the accompanying documents before using this product.
2. Please properly keep this manual for further reference.
3. Use the fuse with the rated current as that of the accompanying fuse of this product.
4. Do not use the speaker with the resistance less than 4Ω, in order to avoid damage to the machine.
5. For normal operation, keep this product away from water, dust, magnetic emission and the like.
6. If this product fails, immediately turn off the power supply and contact professionals.
7. The company is not responsible for any damage caused by human factors.

Introduction to Features:

◆ FM/AM digital turning radio function.
◆ Automatic and manual search of radio programs, and automatic storage of radio programs.
◆ 24 preset radio programs (12 FM programs and 12 AM programs).
◆ USB MP3 player.
◆ MP3 forward/backward and quick selection of sings.
◆ MP3 repeat, random and browse playback.
◆ MP3 sing playback/time display.
◆ MP3 breakpoint memory playback.
◆ BEEP button prompt.
◆ MUTE and LOUD functions.
◆ Electronic volume, TRE, BAS and BAL functions.
◆ Clock function: 12/24 hours.
◆ AUX auxiliary input function (optional).
◆ LCD display.

Introduction to Panel



(1) Power/Mode button
(2) Mute/Loud button
(3) APS automatic program storage/band button
(4) Preset program button
(5) LCD screen
(6) Volume +/- button
(7) SEL sound/clock button
(8) Program search/sing selection button
(9) USB jack

Operation Instructions

(1) Power/Mode button

◇ Power ON/OFF: short-press this button to turn on the radio, and long-press it to turn off the radio in operation.

◇ Mode switching: short-press this button in the operation state for switching between the radio and MP3 (⇔IN: optional). (Short-press: less than 2 seconds; long-press: more than 2 seconds)

(2) Mute/Loud button

◇ Short-press this button to enable or disable the “Mute” function.

◇ Long-press this button to enable or disable the “Loud” function.

(3) Band/automatic program storage button

◇ Short-press this button to switch the band: FM1/FM2/AM1/AM2.

◇ Long-press this button to automatically search the program from a low frequency within the current band, and the searched programs will be saved sequentially in the preset programs.

(4) Preset program button

◇ In the radio mode, short-press this button to select a corresponding preset program, and long-press it to save the active program into the preset programs.

◇ In the MP3 mode:

<1/PAUSE> Pause/Play.

<2/SCN> Scan/Normal playback.

<3/RPT> Repeat/Normal playback.

<4/RDM> Random/Normal playback.

<6/DISP> Display the number of sing being played/time.

(5) ◀◀ / ▶▶: program search and MP3 sing selection button.

◇ In the radio mode, search a program forward or backward.

◇ In the MP3 mode, select a sing forward or backward or rapidly.

(6) SEL sound/clock button

◇ Short-press this button to display the clock, and then press it within 5 seconds to enable the mode of sound settings.

◇ If this button is not pressed within 5 seconds, return to the display of playback information.

(7) Volume +/- button

Press the volume +/- button to increase or decrease the volume.

Operation Guide

I. Radio function

● Band selection

Short-press the <APS> button to switch the band: FM1/FM2/AM1/AM2.

● Automatic program search

Short-press the " ◀◀ / ▶▶ " to search a program forward or backward. Once a program is found, search will be stopped and playback will be started.

● Manual program search

Long-press the " ◀◀ / ▶▶ " to manually search a program. If this button is kept held down, the frequency will change forward/backward. If this button is released, the frequency will remain unchanged. In this case, you can still short-press "◀◀ / ▶▶" to adjust the frequency. In case that this button is not pressed within 2 seconds, the last program found will be played.

● Automatic program storage

Long-press the <APS> button to automatically search programs from the minimum frequency within the current band, and the program found will be stored sequentially into the preset programs.

● Selection of preset program

Short-press the number key (1, 2, 3, 4, 5 or 6) and select the preset program to be played.

● Saving of preset program

In the playback mode, long-press the number key (1, 2, 3, 4, 5 or 6), and save the current program frequency into the corresponding preset program.

II. MP3 Function

● Short-press the <Power/Mode button> in the radio mode, to enable the MP3 playback.

● Reading of USB flash disk

The "---" will be displayed in the case of no USB flash disk.

The "000" will be displayed if a USB flash disk is available but without MP3 files.

After the USB flash disk is read, the total number of sings will be first displayed and then played.

● Display of sing number/playback time

Once the MP3 playback is enabled, the number of the sing will be displayed by default. Press <6/DISP> to switch these two modes. In the mode of playback time display, the number of the sing will be displayed for 2 seconds automatically once a sing is selected, and then the playback time will be displayed.

● (Quick) Sing selection

Press the <◀◀ / ▶▶ > button to select a sing forward/backward. If <◀◀ / ▶▶ > is held down,

the number of the sing will quickly increase or decrease. After releasing this button, you can short-press the <◀◀ / ▶▶> button to adjust the number of the sing separately. If this button is not pressed within 2 seconds, the sing selected finally will be played.

● Pause, repeat, random and browse playback

Select the corresponding playback mode by pressing <1/ ▮▮>, <2/SCN>, <3/REPT> or <4/RDM>. Return to the normal playback mode by pressing the corresponding button again.

III. Sound Setting

Press the <SEL> button to select VOL->BAS->TRE->BAL in sequence.

Volume: Press the <SEL> button, select "VOL" and then adjust the volume by pressing <VOL+/->.

Bass: Press the <SEL> button, select "BAS" and then adjust the bass intensity by pressing <VOL+/->.

Treble: Press the <SEL> button, select "TRE" and then adjust the treble intensity by pressing <VOL+/->.

Balance: Press the <SEL> button, select "BAL" and then adjust the channel balance by pressing <VOL+/->.

IV. Clock Setting

● Clock display:

First short-press the <SEL> button to display the clock in the case of no clock display or sound adjustment.

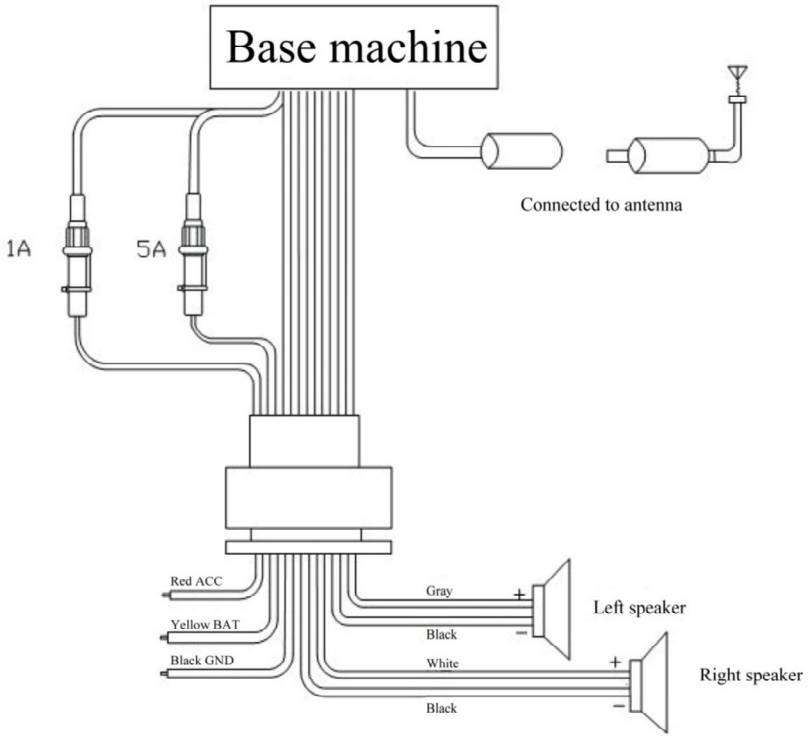
● Clock adjustment

When the clock is displayed, long-press the <SEL> button to enable the mode of clock adjustment. First, increase or decrease the hour by pressing <VOL+/->. Short-press the <SEL> button to enable minute adjustment, and increase or decrease the minute by pressing <VOL+/->. Then short-press the <SEL> button to terminate clock adjustment.

● If the <SEL> button is long-pressed during hour or minute adjustment, the 12/24h system will be switched.

Installation

Connect wires as follows. Turn off the power supply before connecting wires, in order to avoid short circuits. (Below is a standard wiring diagram, and special requirements of customers are not indicated.)



Troubleshooting

Fault	Causc/Solution
No sound	1. Check whether the machine is connected properly. 2. Disable the Mute function. 3. Adjust the volume by pressing the volume control keys. 4. Restart the machine.
Display failure	Wires are not connected properly or the fuse is blown.
USB failure	1. The memory is not inserted properly. 2. The media file is not an MP3 file. 3. The number of MP3 files exceeds 511.

Technical Specifications

FM part

Frequency range	87.5-108 MHz
Intermediate frequency	10.4 MHz
Actual sensitivity	10 dB
Signal-to-noise ratio	60 dB

AM part

Frequency range	522-1620 KHz
Intermediate frequency	450 KHz
Actual sensitivity	30 dB
Signal-to-noise ratio	60 dB

MP3 part

Applicable interface	USB1.1 and 2.0
File type	MPEG 1/2/2.5 Layer 3 Audio
Code rate	32Kbps-320Kbps, VBR

Sampling frequency	8k, 11.025k, 12k, 16k, 22.05k, 24k, 32k, 44.1k and 48k

General features

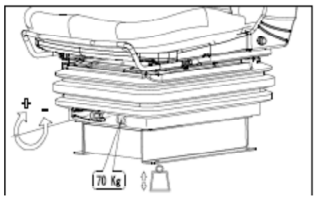
Power supply voltage	12V/24V
Max. output power	25×2W

Note: Improvements or changes in technical specifications and designs may be carried out without prior notice.

2) Seat

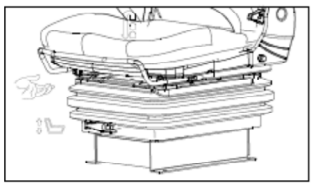
Technical features:

1. The maximum suspension travel of the shock absorber is 90 mm;
2. Stepless adjustment is allowed based on the human weight (50-130 kg);
3. The backrest can be adjusted within 136.5°;
4. The forward/backward adjustment range of the seat is 165 mm;
5. The height adjustment range of the seat headrest is 120 mm.



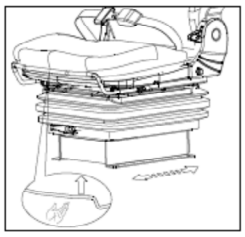
Instructions for weight adjustment of the shock absorber:

1. Turn the weight adjustment lever;
2. Turn this lever clockwise (+) to increase the weight adjustment scale; Turn this lever clockwise (-) to decrease the weight adjustment scale;
3. Release the weight adjustment lever after adjustment is made to the comfortable weight scale.



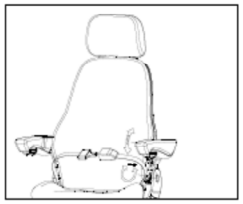
Instructions for seat height adjustment:

1. The seat height can be adjusted at three levels. The Level 1 is in the lowest position.
2. Fix the seat, and then slowly raise it until a click sound is heard (Level 2); continue to raise the seat until a click sound is heard again (Level 3); Further raise the seat to the highest position, and then the seat will automatically return to Level 1.



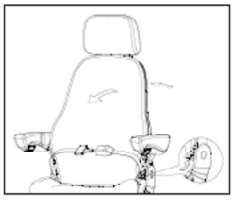
Instructions for forward/Backward adjustment of seat:

1. Turn the seat slide adjustment lever up;
2. Make the seat slide forward or backward;
3. Adjust the seat to a suitable position, and release the slide adjustment lever.



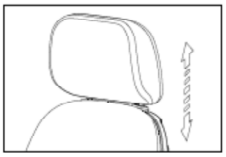
Instructions for armrest adjustment:

1. Turn the hand wheel at the bottom of the armrest to adjust the armrest angle. Do not press the hand wheel during adjustment. Instead, gently raise the armrest before adjustment.
2. Turn the hand wheel out (+) to raise the front end of the armrest.
3. Turn the hand wheel in (-) to lower the front end of the armrest.



Instructions for backrest adjustment:

1. Turn the backrest adjustment lever on the left side of the seat.
2. If the backrest is inclined forward or backward after the lever is turned, adjust the angle of the backrest.
3. After adjustment to a comfortable angle, release the backrest adjustment lever.



Instructions for seat headrest adjustment:

1. Directly raise the headrest by hand;
2. Directly lower the headrest by hand.

Notes:

1. Turn the adjustment lever until it is completely unlocked before the forward/backward adjustment of seat and the angle adjustment of backrest.
2. Turn the corresponding lever in place after adjustment, ensuring that the locking mechanism is locked reliably.
3. When the weight adjustment scale reaches the red alert line, downward adjustment is not allowed!

⚠ Check and tie the safety belt before operating the machine.

⚠ Replace the safety belt at least once every three years.

3) Cigar lighter

(1) This can be used when the starting key is ON.

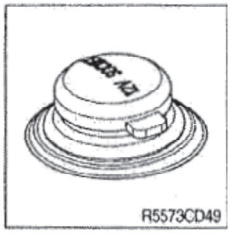
(2) The lighter can be used when it springs out in a short after this switch being pressed down.

※ Service socket

Use the cigar lighter socket when you need emergency power.

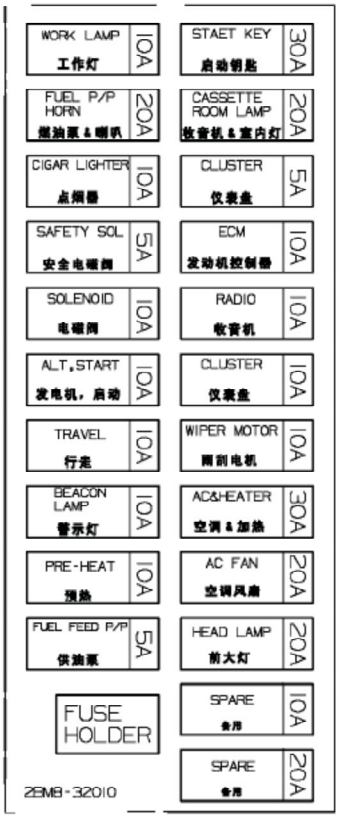
Do not use the lighter exceeding 12V and 120W.

4) 12V socket (optional)



(1) Utilize the power of 12V as your need. Do not exceed 12V and 120W.

5) Fuse box



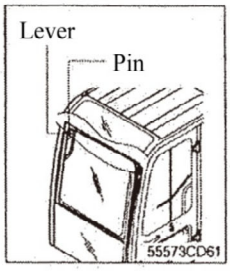
(1) The fuses protect the electrical parts and wiring from burning out.

(2) The fuse box cover indicates the capacity of each fuse and circuit it protects.

※ Replace a fuse with another of the same capacity.

⚠ Before replacing a fuse, be sure to turn OFF the starting switch.

6) Upper windshield



(1) Perform the following procedure in order to open the upper windshield.

① Release both latches in order to release the upper windshield.

② Hold both grips that are located at both side the windshield frame and push the windshield upward.

③ Push the windshield back until the latches are engaged automatically.

(2) Perform the following procedure in order to close the upper windshield.

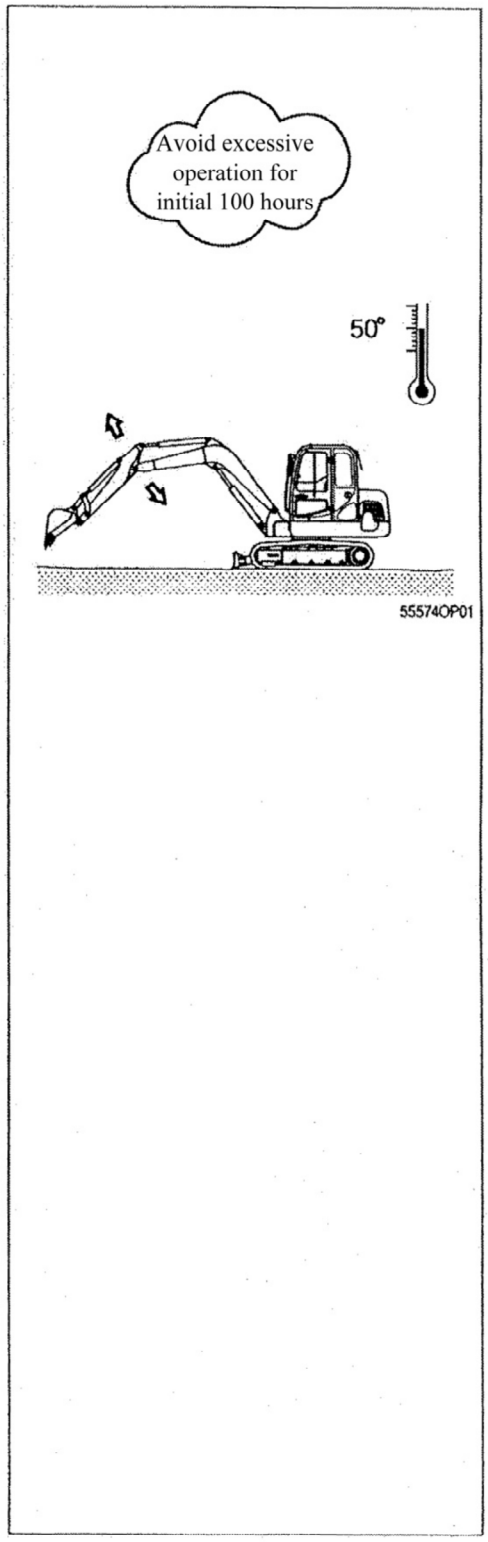
Reverse the step ① through step ③ in order to close the upper windshield.

1. Suggestion for New Machine

1) It takes about 100 operation hours to enhance its designed performance.
2) Operate according to below three steps and avoid excessive operation for the initial 100 hours.

Service Time	Load
Until 10 hours	About 60%
Until 100 hours	About 80%
After 100 hours	100%

※ Excessive operation may deteriorate the potential performance of machine and shorten lifetime of the machine.



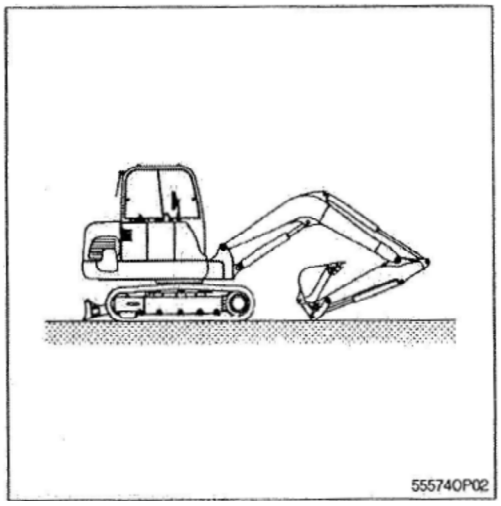
3) Be careful during the initial 100 hours operation

(1) Check daily for the level and leakage of coolant, engine oil, hydraulic oil and fuel.
(2) Check regularly the lubrication and fill grease daily all lubrication points.
(3) Tighten bolts.
(4) Warm up the machine fully before operation.
(5) Check the gauges occasionally during the operation.
(6) Check if the machine is operating normally during operation.

4) Replace followings after initial 50 hours operation

Check Item	Maintenance
Engine oil	Replace
Engine oil filter element	
Hydraulic oil return filter element	
Pilot line filter element	
Fuel filter	

2. Check before Engine Start



1) Look around the machine and under the machine to check for loose nuts or bolts, or leakage of hydraulic oil, fuel or coolant and check the condition of the work equipment and hydraulic system. Check loose wiring, and collection of dust at places which reach high temperature.

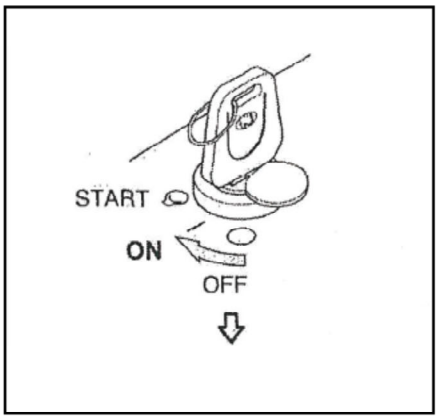
※ Refer to the daily check in Chapter 6 “Maintenance”.

2) Adjust the seat to fit the contours of the operator’s body for the pleasant operation.

3) Adjust the rear view mirror to avoid impact on the visibility.

3. Engine Start and Stop

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, and check as follows:

Check whether all lights are ON.

① With the buzzer sounding for 4 seconds, the following indicators are ON, and others are OFF.

- Battery charging warning lamp
- Engine oil pressure warning lamp

② The preheat pilot lamp is ON if the coolant temperature is below 10°C.

2) Start the engine

※ Sound the horn to warn the surroundings after checking if personnel or obstacles are in the area.

※ Check the engine oil level before starting the engine.

※Fill the anti-freeze solution to the coolant as required.

(1) Check if all the levers are in the neutral position.

(2) Turn the starting switch to the ON position.

(3) Check whether the preheat pilot lamp is ON.

※ Preheating is enabled within 15 seconds after the preheat pilot lamp is ON.

※ The engine is started within 10 seconds after the preheat pilot lamp is OFF.

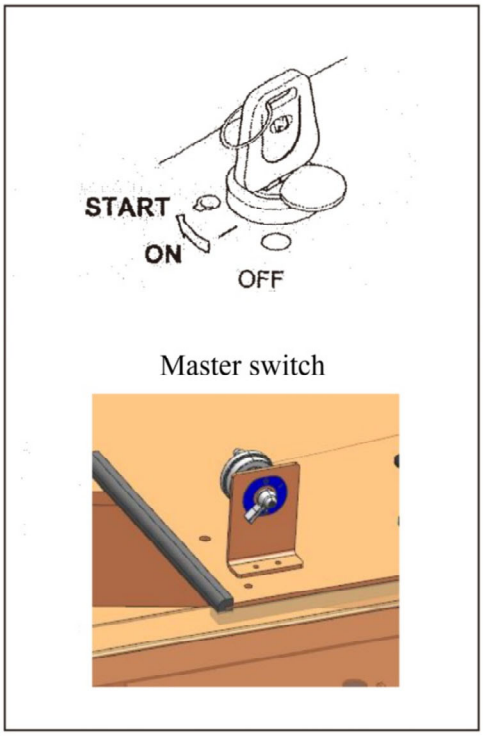
(4) Turn the starting switch to the “START” position to start the engine.

(5) Release the starting switch immediately after the engine is started, in order to avoid damage in motor startup.

※ If the engine is started before the preheat pilot lamp is OFF, the pilot lamp will remain ON within 15 seconds after engine startup.

※ If the engine cannot be started, wait further for 10-15 seconds in addition to 10-15 seconds after starting the motor.

The start intervals should exceed 2 minutes in cold weather.



Master switch

3) Inspection after engine start

Inspect and confirm the following after the engine starts.

(1) Is the oil level in the hydraulic oil tank is normal?

(2) Are there leakages of oil or water?

(3) Are all the warning lamps OFF?

(4) Is the engine coolant temperature gauge is within the normal range?

(5) Are the engine sound and the color of exhaust gas normal?

(6) Are the sound and vibration normal?

※ Do not increase the engine speed quickly after startup; otherwise, the engine or turbocharger may be damaged.

※ If there are problems in the cluster, stop the engine immediately and correct problems as required.

4) Warming-up operation

※ The most suitable temperature for the hydraulic oil is 50°C (122°F).

It can cause serious trouble in the hydraulic system by sudden operation when the hydraulic oil temperature is below 25°C (77°F).

(1) Run the engine at a low idle speed for 5 minutes.

(2) Increase the engine speed into the mid-range.

(3) Operate the bucket lever for 5 minutes.

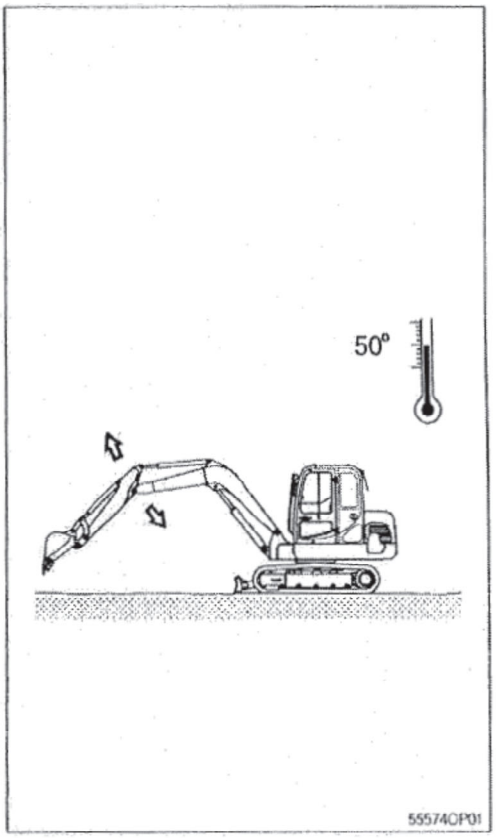
※ Do not operate anything except the bucket lever.

(4) Run the engine at a high speed and operate the bucket lever and arm lever for 5-10 minutes.

※ Operate only the bucket lever and arm lever.

(5) This warming-up operation will be completed by operation of all cylinders several times, and operation of swing and traveling.

※ Increase the warming-up time during winter.



5) Stop the engine

※ If the engine is abruptly stopped before it is cooled down, the engine life may be greatly shortened. Consequently, the engine must not be stopped abruptly apart from an emergency.

※ If the engine has overheated, do not abruptly stop it but run it at a medium speed to allow it to cool gradually, then stop it.

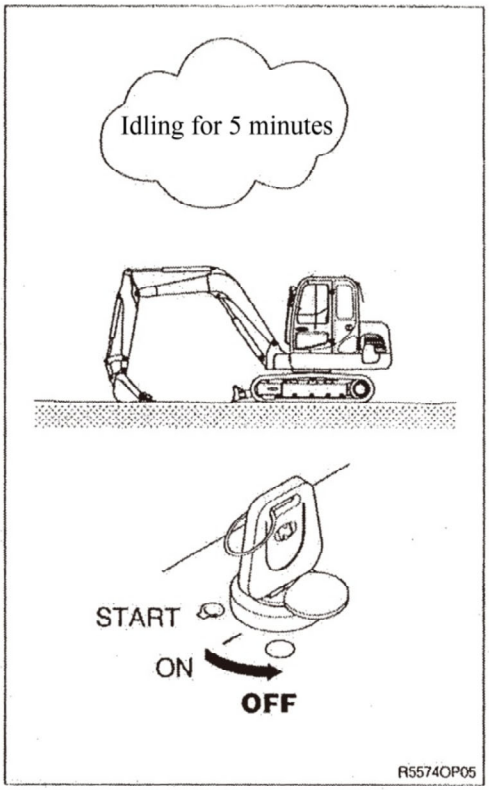
(1) Down the bucket on the ground, and then put all the levers in the neutral position.

(2) Run the engine at a low idling speed for about 5 minutes.

(3) Turn the starting switch to the OFF position.

(4) Remove the key to prevent other people using the machine and lock the safety lever.

(5) Lock the cab door.



4. Operation of Working Device

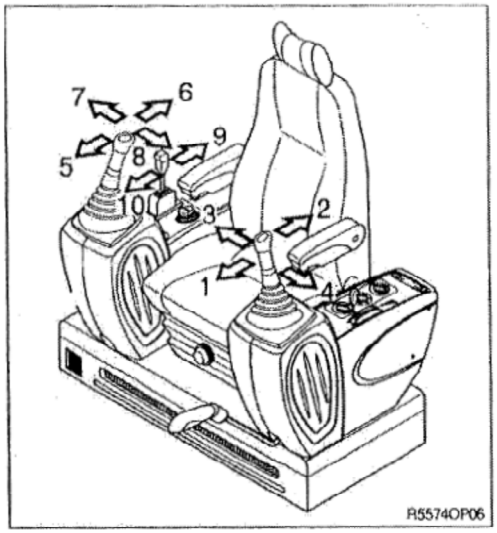
※ Confirm the operation of control lever and working device.

1) The LH control lever controls the arm and swing.

2) The RH control lever controls the boom and bucket.

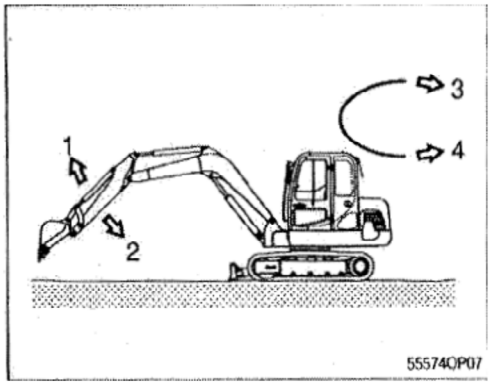
3) If released, the control lever will return to neutral position automatically.

※ Consider the swing distance by inertia during the swing operation.



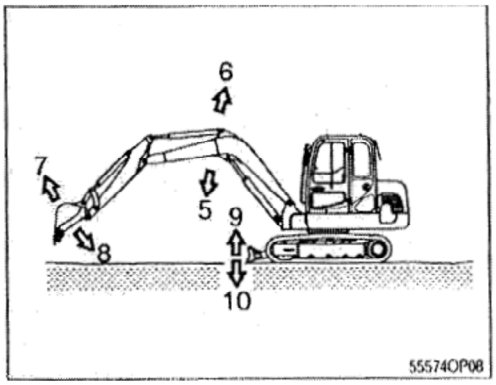
※ LH control lever

1. Arm roll-out
2. Arm roll-in
3. Swing right
4. Swing left



※ RH 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

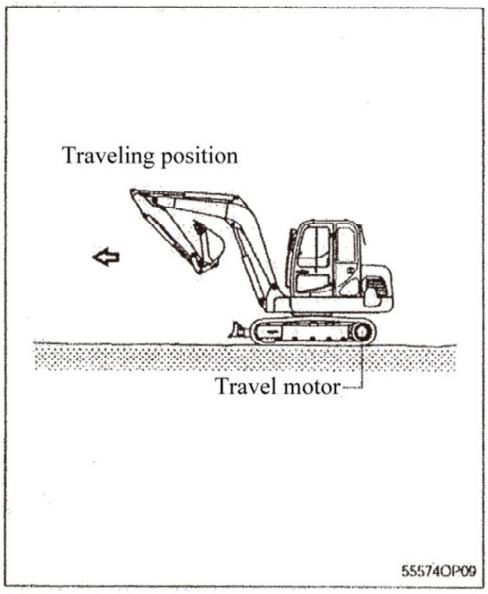
5. Traveling of Machine

1) Basic Operation

(1) Traveling position

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

⚠ The traveling direction will be reversed when the whole machine is swung for 180°.



(2) Traveling operation

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

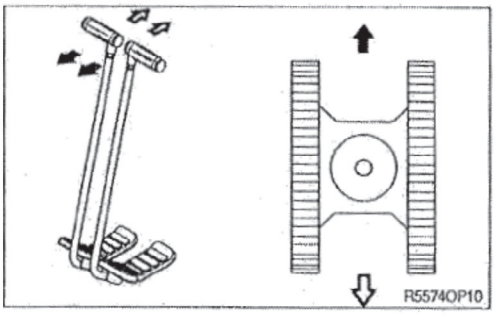
※ Do not travel continuously for a long time.

※ Reduce the engine speed and travel at a low speed when traveling on the uneven ground.

(3) Forward and backward traveling

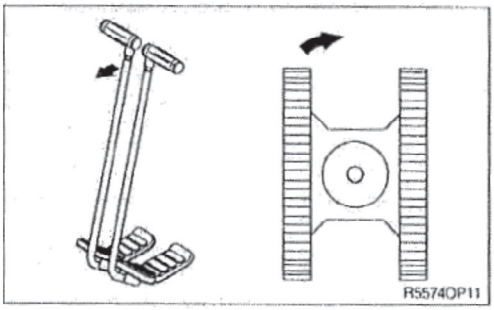
When the LH and RH travel levers or pedals are pushed at the same time, the machine will travel forward or backward.

※ The speed can be controlled by the operation stroke of the lever or pedal, and the change in direction can be controlled by the difference of left and right strokes.



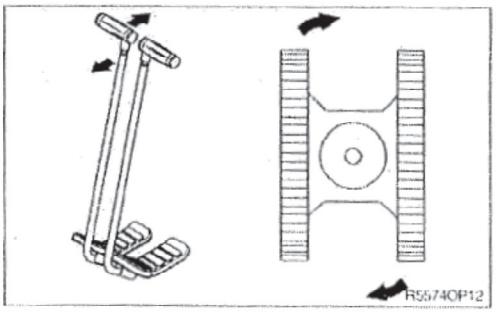
(4) Pivot turning

The operation of the lever or pedal on one side can change the direction 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. The levers or pedals on both sides are operated to the other way at the same time.



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.

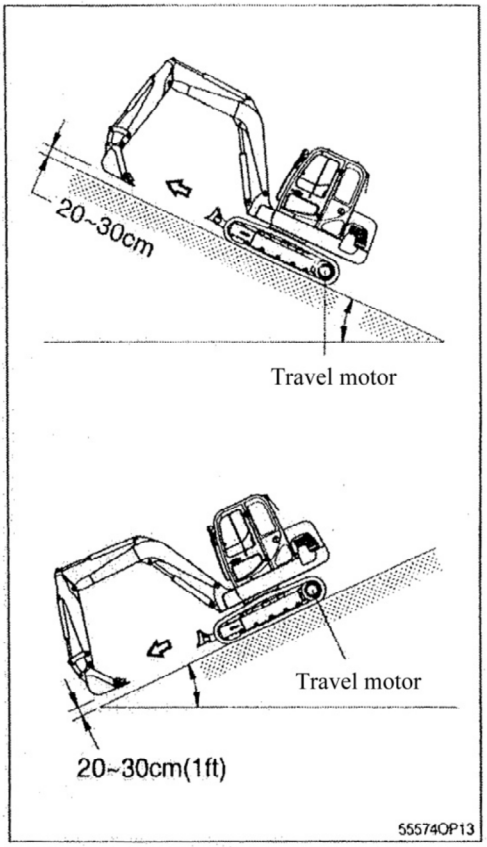
(3) If the machine starts to slide or loses stability, lower the bucket immediately and brake the machine.

(4) When parking on a slope, use the bucket as a brake and place blocks behind the tracks to prevent sliding.

※ The 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.



3) Traveling on soft ground

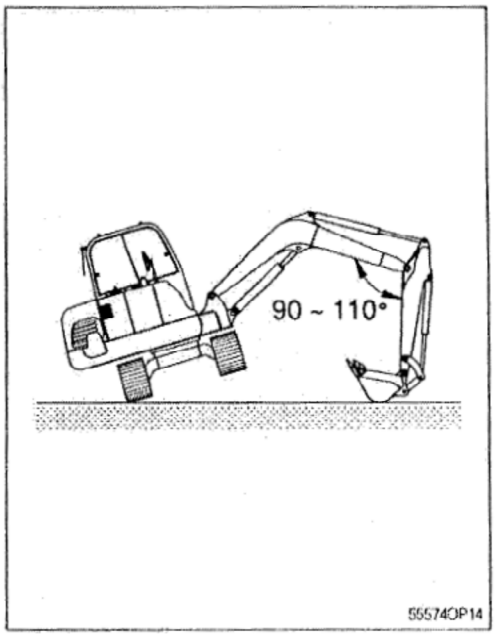
※If possible, avoid operation on the soft ground.

(1) Move forward as far as the 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 the bucket and use the boom and arm to pull the machine.

Operate the boom, arm and travel lever at the same time to avoid machine sinking.



4) Towing the machine

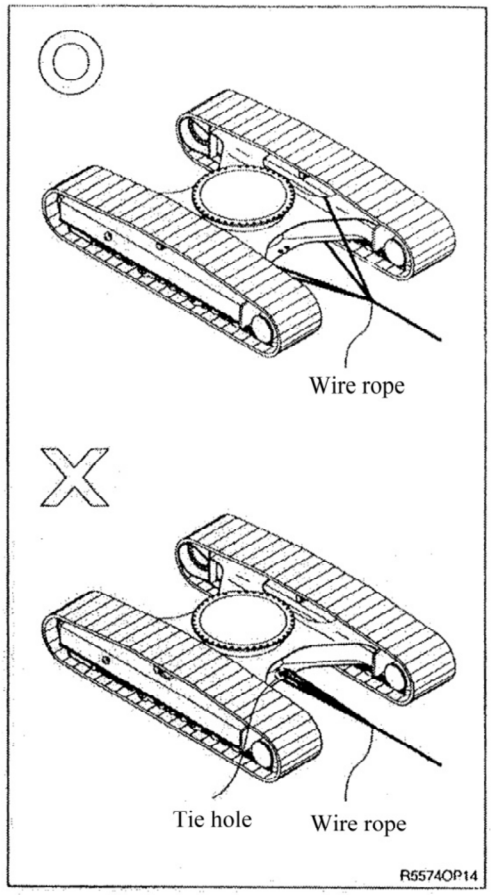
Tow the machine as follows when it cannot move on its own.

(1) Tow the machine by another machine after hooking the wire rope to the frame as shown in picture at right.

(2) Hook the wire rope to the frame, and put a support where the wire rope is in contact with the frame, in order to prevent damage.

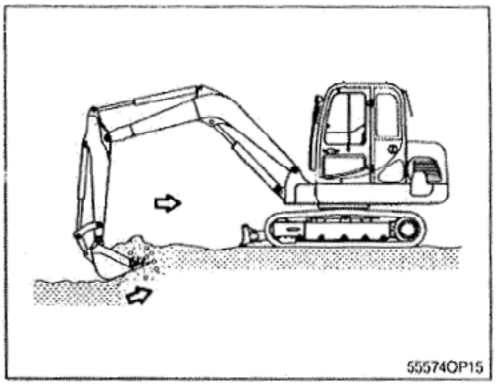
※ Never tow the machine using only the tie hole, because it may break.

⚠ Make sure no personnel are standing close to the tow rope.



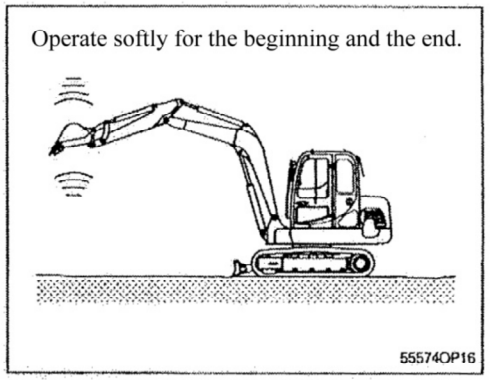
6. Effective Working Method

1) Do the digging work by arm.
Use the pulling force of the arm for digging and use together with the digging force of the bucket if necessary.

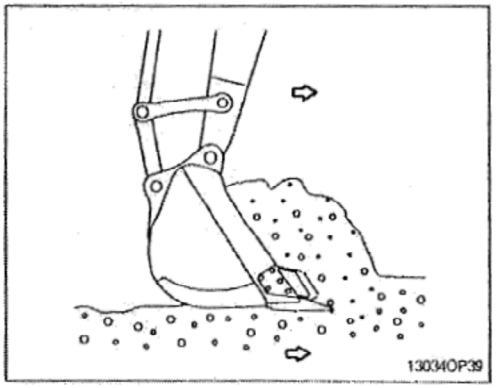


2) When lowering and raising the boom, operate softly for the beginning and the end. In particularly, sudden stops while lowering the boom may cause damage to the machine.

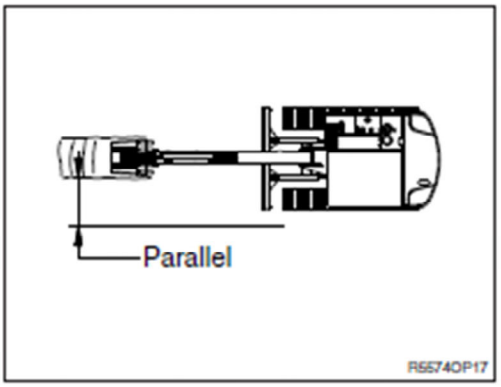
⚠ Prevent the boom cylinder and track from collision when the working device operates to one side during digging.



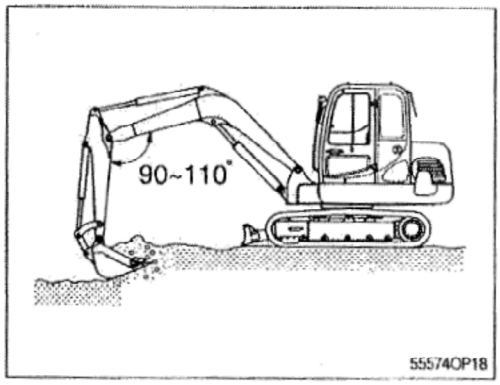
3) The digging resistance and wearing of tooth can be reduced by putting the end of bucket tooth to the digging direction.



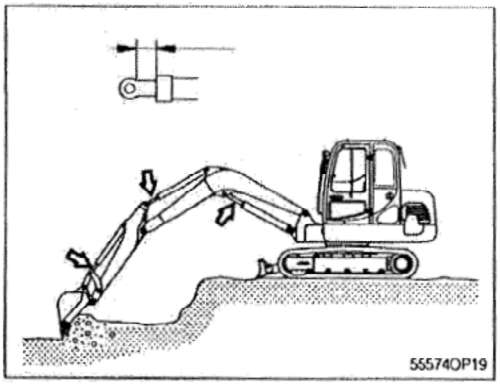
4) Set the tracks parallel to the line of the ditch to be excavated when digging ditch. Do not swing while digging.



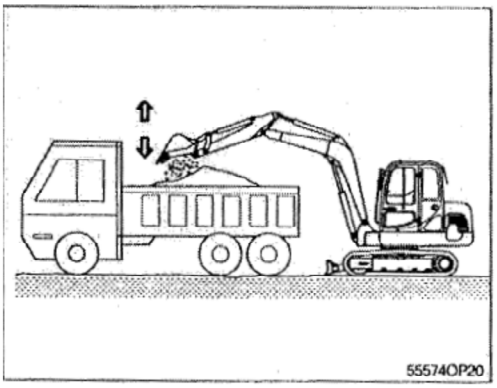
5) Dig slowly with keeping the angle of boom and arm within 90-110 degrees when maximum digging force is required.



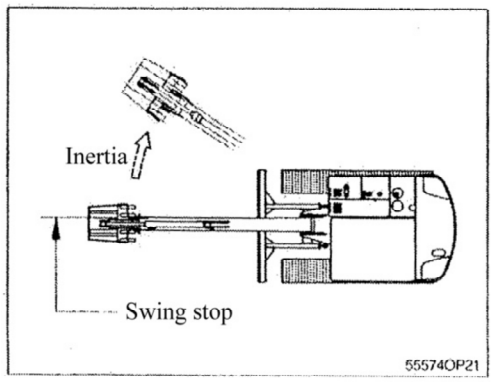
6) Operate with a small safety margin of cylinder stroke to prevent damage to the cylinder when working with the machine.



7) Keep the bucket to the dumping position and the arm horizontal when dumping the soil from the bucket.
Operate bucket lever 2 or 3 times when it is hard to dump.
※ Do not use the impact of bucket tooth when dumping.

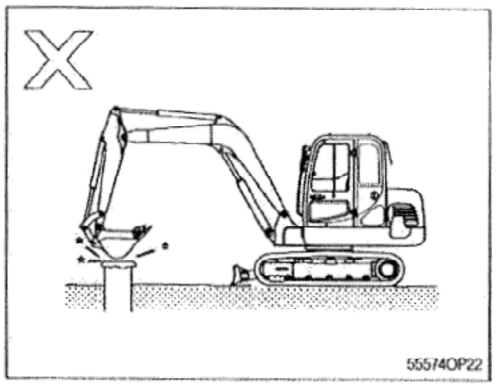


8) For swing stop, consider that the swing slip distance is created by inertia after neutralizing the swing lever.

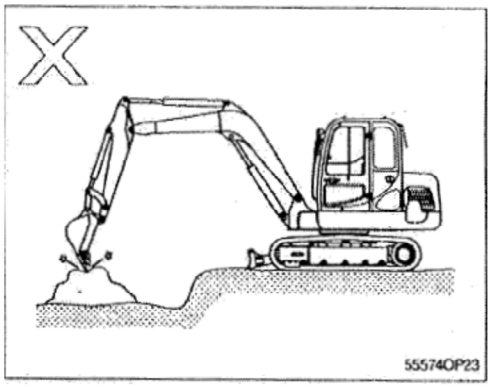


9) Do not use the dropping force of the working device to hit other objects. The machine can be damaged by the impact.

⚠ Do not level or push mounds or stones by rotating the bucket and other working devices; otherwise, the rotary system and working device may be damaged.

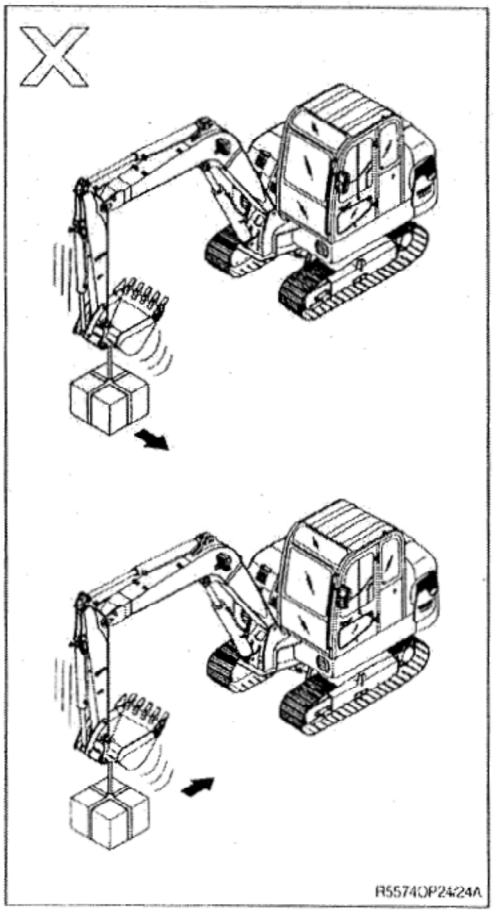


10) Do not use the bucket to crack hard objects like concrete or rocks.
This may break a tooth or pin, or bend the boom.



11) Never carry out excessive operations.
Operation exceeding the machine performance may result in accidents.
Carry out lifting operation within specified load limit.
Never carry out operations which may damage the machine such as overload or over-impact- load.
Never travel while carrying a load.
In case you need installing an overload warning device, please contact Hyundai's distributor.

⚠ This machine is not provided with a boom lowering controller.
For the lifting operation, the boom lowering controller must be installed to ensure the safety.



12) Bucket with lifting hole

When carrying out lifting work, the special sling is necessary.

The following operations are prohibited.

● Lifting loads with a wire rope fitted around the bucket teeth.

● Lifting loads with the wire rope wrapped directly around the boom or arm.

When performing lifting operation, securely hook the wire rope onto the lifting sling.

When performing lifting operation, never raise or lower a person.

Due to the possible danger of the load falling or of collision with the load, no persons shall be allowed in the working area.

Before performing lifting operation, designate an operation supervisor.

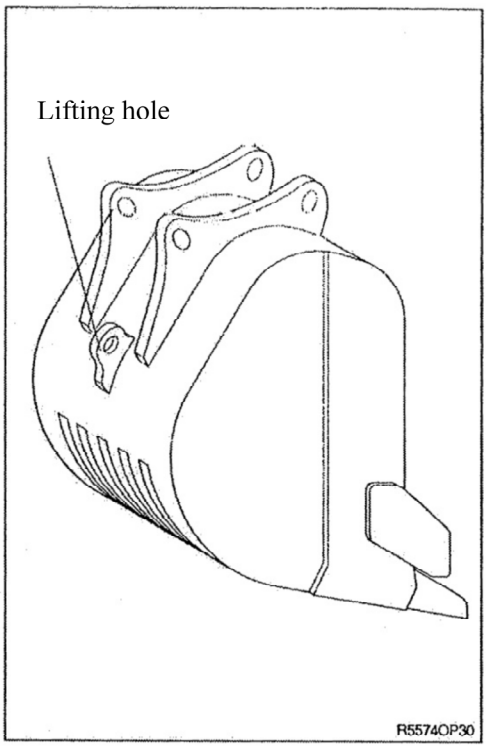
Always execute operation according to his instructions.

● Execute operating methods and procedures under his direction.

● Select a person responsible for signaling.

Operate only on signals given by this person.

Never leave the operator's seat while lifting a load.

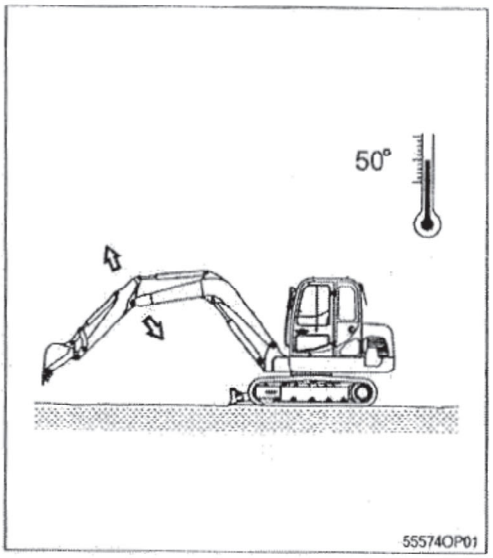


⚠ This machine is not provided with a boom lowering controller.

For the lifting operation, the boom lowering controller must be installed to ensure the safety.

7. Operation in Special Work Sites

1) Operation the machine in cold weather



(1) Use appropriate engine oil and fuel.
(2) Fill the required amount of antifreeze in the coolant.
(3) Refer to the procedures for engine start in the cold weather. Start the engine and extend the warming-up time.
(4) Be sure to open the heater cock when using the heater.
(5) Always keep the battery completely charged.
※ Discharged batteries will freeze more easily than those fully charged.
(6) Clean the machine and park on the wood plates.

2) Operation in sandy or dusty work sites

(1) Inspect the air cleaner element frequently. Clean or replace this element more frequently, if the warning lamp comes ON and the buzzer sounds simultaneously, regardless of inspection period.
※ Replace the inner and outer elements after cleaning 4 times.
(2) Inspect the radiator frequently, and keep cooling fins clean.
(3) Prevent sand or dust from getting into the fuel tank and hydraulic tank during refilling.
(4) Prevent sand or dust from penetrating into the hydraulic circuit by tightly closing the breather cap of the hydraulic oil tank. Replace the hydraulic oil filter frequently.
(5) Keep all lubricated parts, such as pins and bushings, clean at all times.
(6) If the air conditioner and heater filters are clogged, the heating or cooling capacity will drop. Clean or replace the filter element more frequently.

3) Operation at sea shore

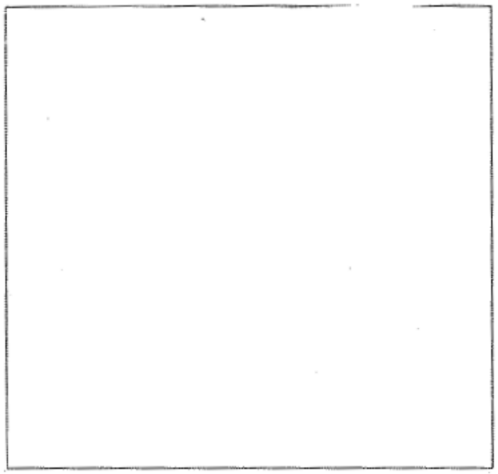
(1) Prevent ingress of salt by securely tightening plugs, cocks and bolts of each part.

(2) Wash the machine after operation to remove salt residue.

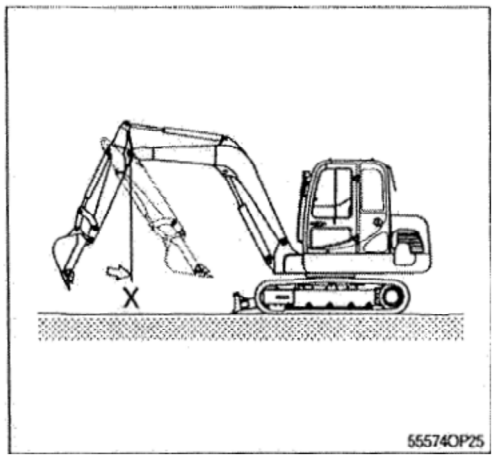
Pay special attention to electrical parts and hydraulic cylinders to prevent corrosion.

(3) Inspection and lubrication must be carried out more frequently.

Supply sufficient grease to replace all old grease in bearings which have been submerged in water for a long time.



8. Normal Operation of Excavator



Followings may occur during operation due to the nature of a hydraulic excavator.

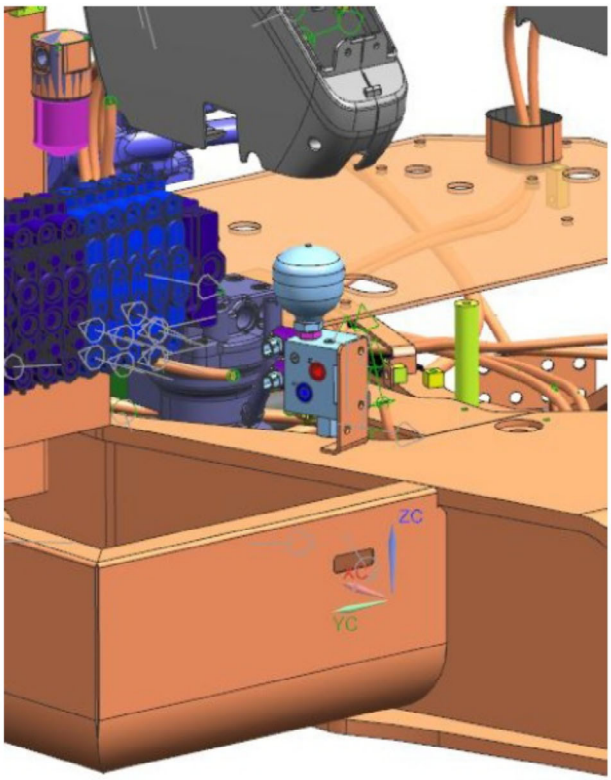
1) When rolling in the arm, the roll-in movement may stop momentarily at the point “x” in the picture shown, and then recover again after passing the point “x”. The reason for this phenomenon is that movement by the arm weight is faster than the speed of oil flow into the cylinder.

2) When lowering the boom, one may hear continuous sound. This is caused by oil flow in the valve.

3) Overloaded movement will produce sound due to the relief valves, which are for the protection of the hydraulic systems.

4) When the machine starts or stops swinging, a noise near the swing motor may be heard. The noise is generated when the brake valve relieves.

9. Working Device Lowering with Engine Stopped



(1) As an optional component, an accumulator is mounted on the pilot hydraulic pipeline, so that the working device can be lowered to the ground when the engine is stopped.
If the boom control lever is pushed forward, the working device will drop under its own weight.

⚠ Be sure that no one is under or near the working device 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 to export 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 Hyundai's distributor.

10. Storage

Maintain the machine as follows when storing the machine for a long time, over 1 month.

1) Cleaning of the machine

Clean the machine. Check and adjust tracks.

Grease each lubrication part.

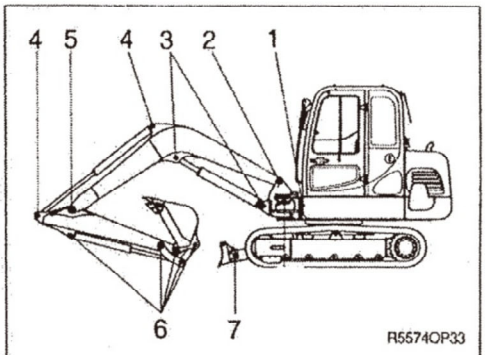
2) Lubrication position of each part

Change all oil.

※ Be particularly careful when you reuse the machine.

Oil may be diluted during storage.

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

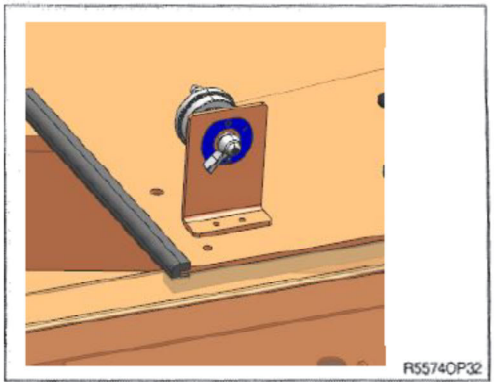


1. Lubricating manifold (4EA)
2. Boom connection pin (2EA)
3. Boom cylinder pin (2EA)
4. Arm cylinder pin (2EA)
5. Boom and arm connection pin (1EA)
6. Arm and bucket (5EA)
7. Dozer blade and cylinder (4EA)

3) Master electrical switch

Turn the master electrical switch on the battery box to the “OFF” position before storing the machine.

4) Be sure to mix anticorrosive and antifreeze solution in the radiator.



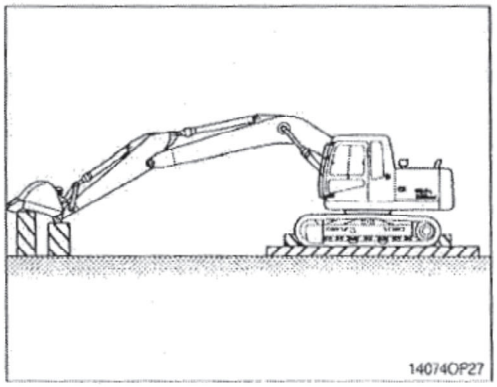
(5) Prevention of dust and moisture

Keep the machine dry. Store the machine on wood plates.

※ Cover the exposed part of piston rod of cylinder.

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

※ Keep the bucket on the ground or cushion it when the machine is not in use. If the user needs to lift the bucket to above the ground, it is forbidden to put objects or stand under the working devices (e.g. boom and bucket), in order to prevent the damage to objects or personal injury due to the falling of working devices due to system leakage or others.



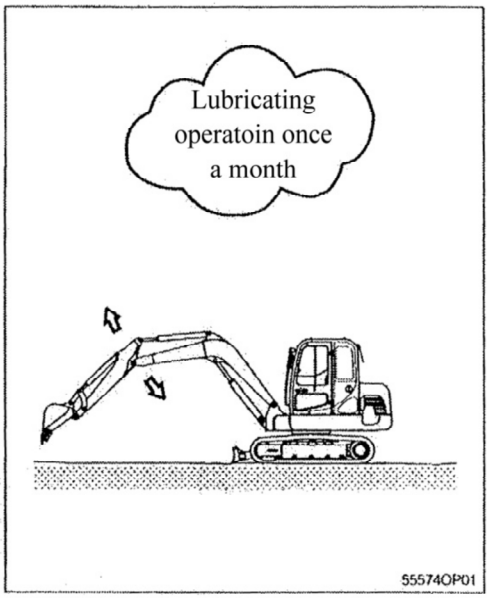
6) During storage

Start the machine, run the machine and working device several times, and apply grease to each part on a monthly basis.

※ Check the level of engine oil and coolant and fill if required before starting the engine.

※ Clean the anticorrosive on the piston rod of cylinder.

※ Operate the machine such as traveling, swing and working device operation, to make sure enough lubrication of all functional components.



1. Preparation for Transportation

1) When transporting the machine, observe the various road rules, road transportation vehicle laws and vehicle limit ordinances, etc.

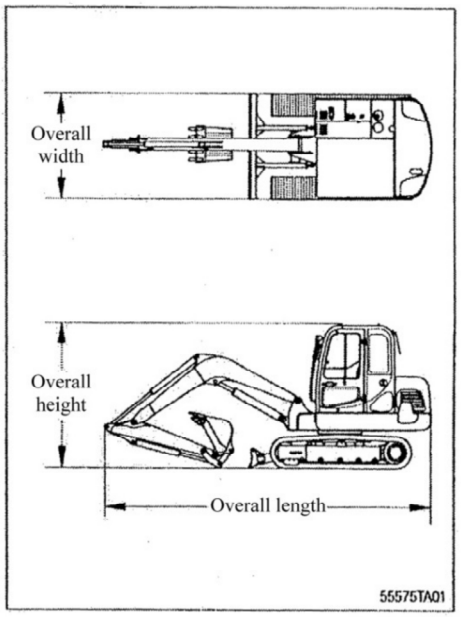
2) Select a proper trailer after confirming the weight and dimension according to the specifications in Chapter 2.

3) Check the whole transportation route such as the road width, bridge height, weight limit, etc.

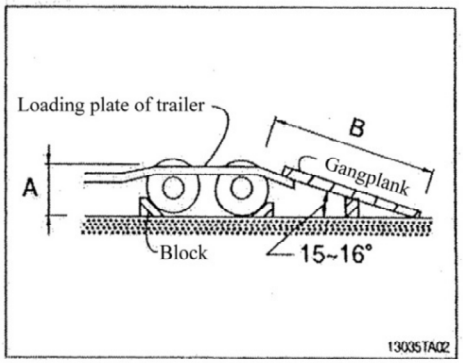
4) Get the permission from the related authority if necessary.

5) Prepare a trail with suitable capacity to transport the machine.

6) Prepare the gangplank for safe loading referring to the table and illustration below.

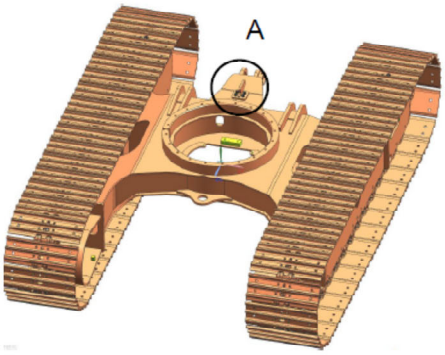


A	B
1.0	3.65-3.85
1.1	4.00-4.25
1.2	4.35-4.60
1.3	4.75-5.00
1.4	5.10-5.40
1.5	5.50-5.75



7) Precaution for compliance with the requirements for agricultural excavators

In accordance with the provisions of the Ministry of Agriculture and Rural Affairs, the upper turning angle of agricultural excavators must be within 270°. Accordingly, the turning stopper (A) must be removed as required for agricultural excavators, so that the upper part can turn within 360° to facilitate loading and unloading during transportation. After the machine is transported to and unload at the destination, the stopper should be reassembled (A) to meet the national requirements for agricultural excavators. The machine with a stopper can be used as an ordinary hydraulic excavator.



※ The user should be liable for the impact or loss arising from no stopper instead of compliance with local regulations for agricultural excavators. If the user has any question about stopper dismantling and installation, consult Hyundai or its agent.

※ If the user has any question about stopper dismantling and installation, consult Hyundai or its agent.

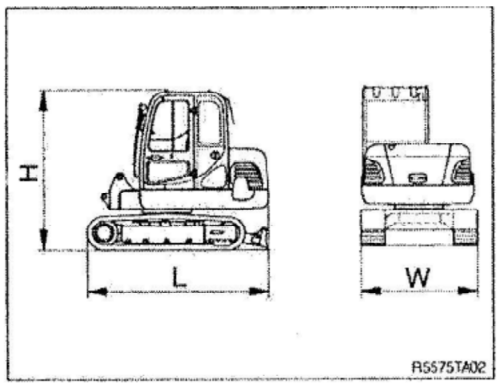
2. Dimension and Weight

1) HX75S

(1) Base machine

Mark	Description	Unit	Specification
L	Length	mm	3,409
H	Height	mm	2,550
Wd	Width	mm	2,250
Wt	Weight	kg	5,510

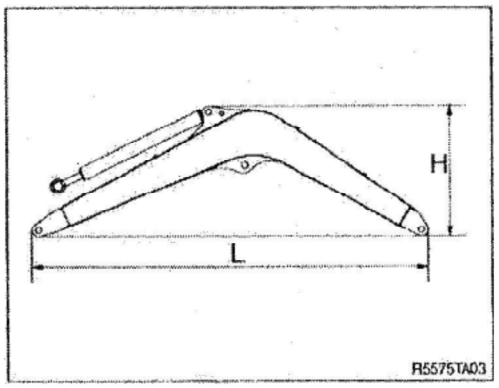
※ With 450 mm (18'') triple grouser shoes and 390 kg counterweight.



(2) Boom assembly

Mark	Description	Unit	Specification
L	Length	mm	3,850
H	Height	mm	1,480
Wd	Width	mm	410
Wt	Weight	kg	580

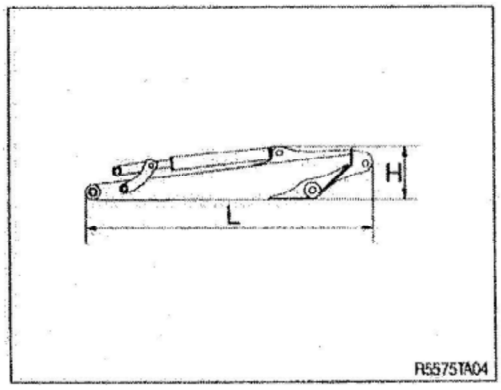
※ 3.7 m (12'2'') boom with arm cylinder (included piping and pins).



(3) Arm assembly

Mark	Description	Unit	Specification
L	Length	mm	2,230
H	Height	mm	570
Wd	Width	mm	220
Wt	Weight	kg	290

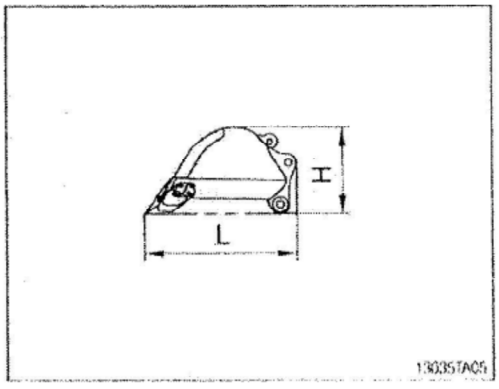
※ 1.67 m (5'6'') arm with bucket cylinder (including linkage and pins).



(4) Bucket assembly

Mark	Description	Unit	Specification
L	Length	mm	1,170
H	Height	mm	710
Wd	Width	mm	840
Wt	Weight	kg	250

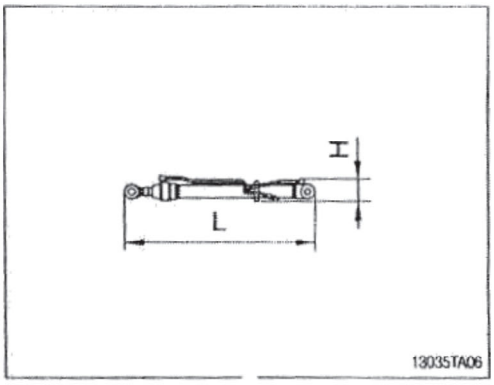
※ 0.32m^3 SAE heaped bucket (including tooth and side cutters).



(5) Boom cylinder

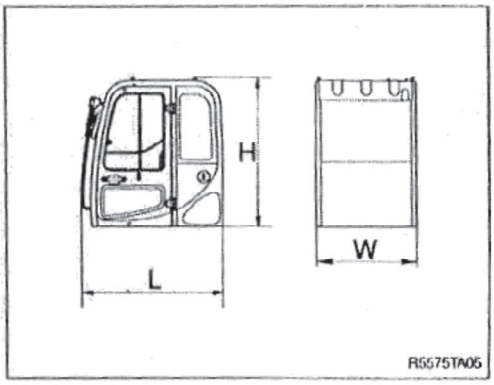
Mark	Description	Unit	Specification
L	Length	mm	1,550
H	Height	mm	260
Wd	Width	mm	200
Wt	Weight	kg	120

※ Including piping.



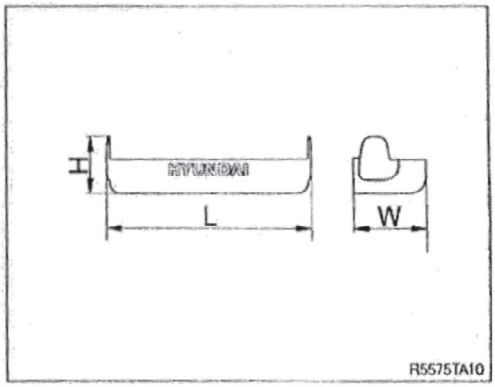
(6) Cab assembly

Mark	Description	Unit	Specification
L	Length	mm	2,000
H	Height	mm	1,740
Wd	Width	mm	1,288
Wt	Weight	kg	450



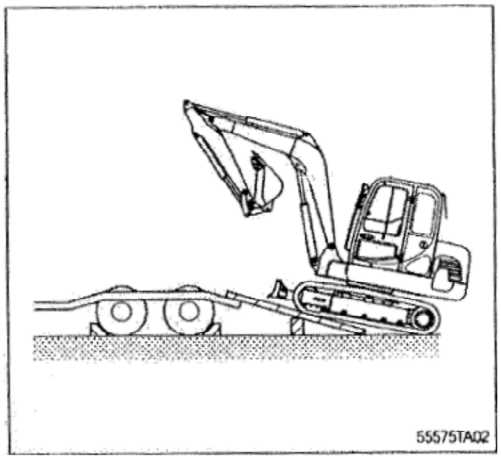
(7) Counterweight

Mark	Description	Unit	Specification
L	Length	mm	2,250
H	Height	mm	400
Wd	Width	mm	830
Wt	Weight	kg	390

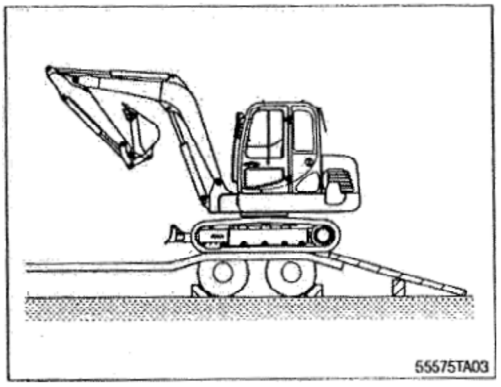


3. Loading of Machinc

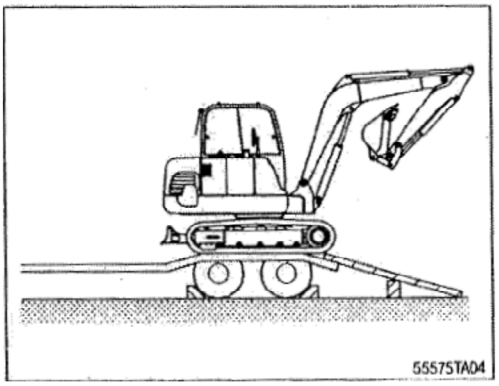
1) Load and unload the machine on a flat ground.
2) Use the gangplank with sufficient length, width, thickness and gradient.
3) Place the swing lock lever to the LOCK position before fixing the machine at the bed of the trailer. Confirm if the machine is parallel to the bed of the trailer. Keep the travel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



4) Do the following after loading the machine.
(1) Stop loading when the machine is located horizontally on the trailer.



(2) Swing the machine 180 degrees.



(3) Lower the working device gently after the location is determined.

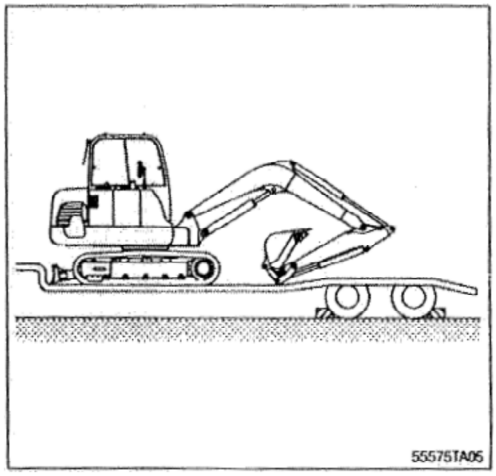
※ Place the rectangular timber under the bucket cylinder to prevent the damage of it during transportation.

⚠ Be sure to keep the travel speed switch in the LOW (turtle mark) position while loading and unloading the machine.

⚠ Avoid using the working device for loading and unloading since it will be very dangerous.

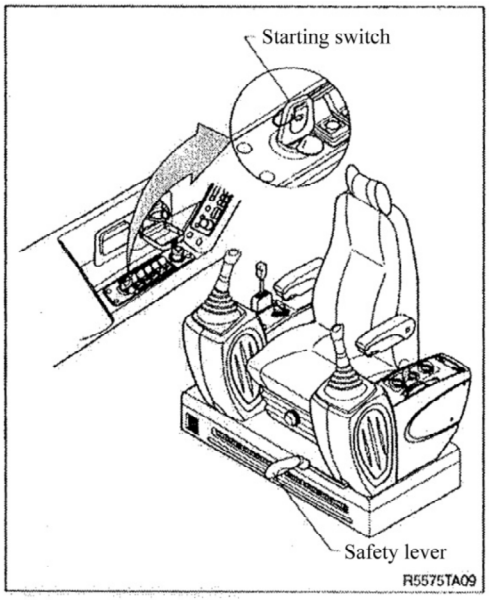
⚠ Do not operate any other device when loading.

⚠ Be careful on the boundary place of the loading plate or trailer edge as the balance of machine will abruptly be changed on the point.

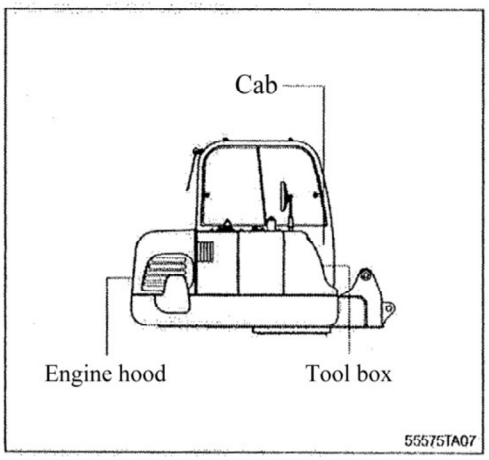


4. Fixing of Machine

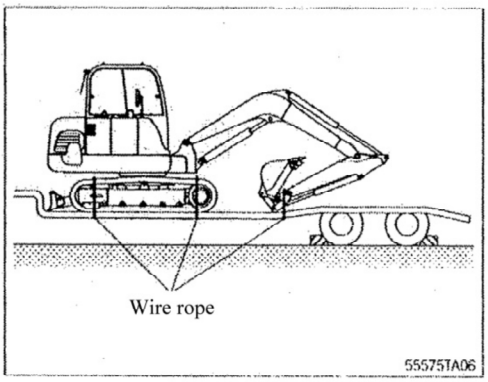
1) Lower down the working device on the loading plate of trailer.
2) Keep the safety lever on the LOCK position.
3) Turn OFF all the switches and remove the key.



4) Secure all locks.



5) Place timber underneath of the track and fix firmly with wire rope to prevent the machine from moving forward, backward, right or left.



5. Loading and Unloading by Crane

1) Check the weight, length, width and height of the machine referring to the specifications in Chapter 2 when you are going to hoist the machine.
2) Use the long wire rope and stay to keep the distance with the machine, in order to avoid damage to the machine.
3) Put a rubber plate where the wire rope is in contact with the machine, in order to avoid damage to the machine.
4) Place crane in the proper place.
5) Install the wire rope and stay as shown in the illustration.

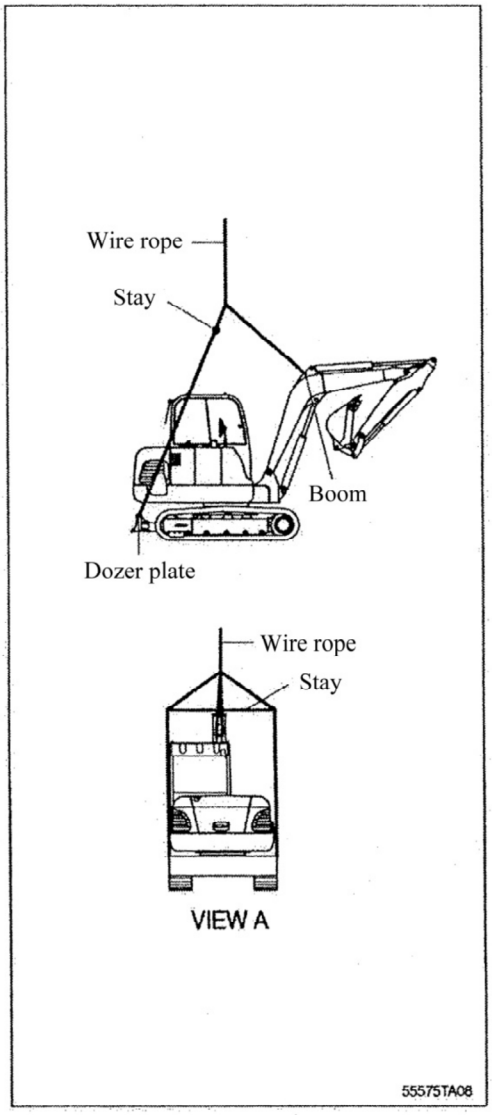
⚠ Make sure that the wire rope has an appropriate size.

⚠ Place the safety lever to LOCK position to prevent the machine from moving during hoisting.

⚠ Improper hoisting or wire rope installation may cause damage to the machine.

⚠ Do not load the machine abruptly.

⚠ Keep the lifting area clear of personnel.



1. Instruction

1) Interval of maintenance

(1) You may inspect and service the machine by the period as described on Pages 6-11.

(2) Shorten the interval of inspection and service depending on site conditions, such as dusty area, quarries and sea shores.

(3) If the service interval is upgraded, conduct all inspections. For example, in case of the maintenance intervals of 100 hours, carry out all maintenance at intervals of 100 hours, 50 hours and on a daily basis.

2) Precaution

(1) Start maintenance after you have the full knowledge of the machine.

(2) The monitor installed on this machine does not entirely guarantee the condition of the machine. Daily inspection should be performed according to Cause 4 “Maintenance Check List”.

(3) The engine and hydraulic components have been preset in the factory. Do not allow unauthorized personnel to reset them.

(4) Ask to your local dealer or Hyundai for the maintenance advice if unknown.

(5) Drain the used oil and coolant in a container and handle them according to the method of handling for industrial waste to meet with regulations of each province or country.

3) Proper maintenance

(1) Replacement and repair of parts

It is required to regularly replace the wearable and consumable parts such as bucket teeth, side cutters, filters, etc.

Replace damaged or worn parts at proper time to keep the performance of the machine.

(2) Use genuine parts.

(3) Use the recommended oil.

(4) Remove the dust or water around the inlet of oil tank before supplying oil.

(5) Drain oil when it is warm.

(6) Do not repair anything while operating the engine. Stop the engine before filling the oil.

(7) Relieve the pressure inside the hydraulic system before repairing the hydraulic system.

(8) Confirm if the cluster is in the normal condition after completion of service.

(9) For more detail information of maintenance, please contact local Hyundai dealer.

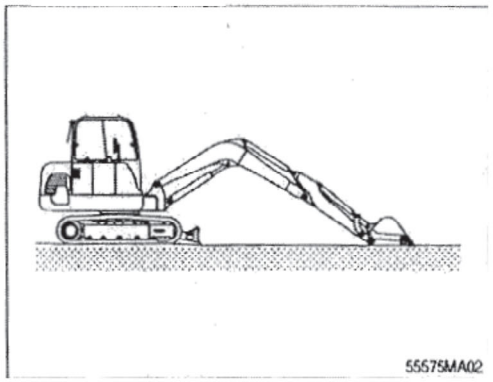
※ Be sure to start the maintenance after fully understand Chapter 1 “Safety Hints”.

4) Relieve the pressure in the hydraulic system

※ Spouting of oil can cause an accident when the cap or hose is loosened right after startup, as the pressure of hydraulic oil is high.

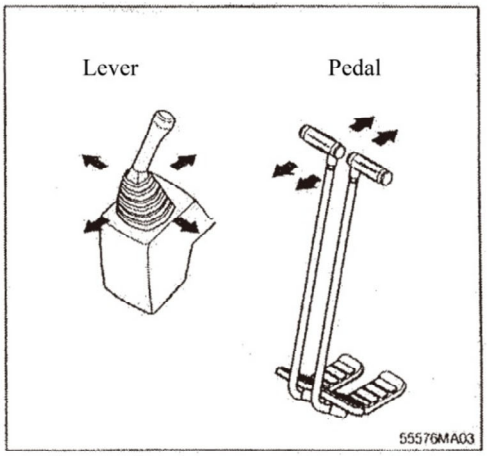
Be sure to relieve the pressure before repairing hydraulic system.

(1) Place the machine in the parking position, and stop the engine.

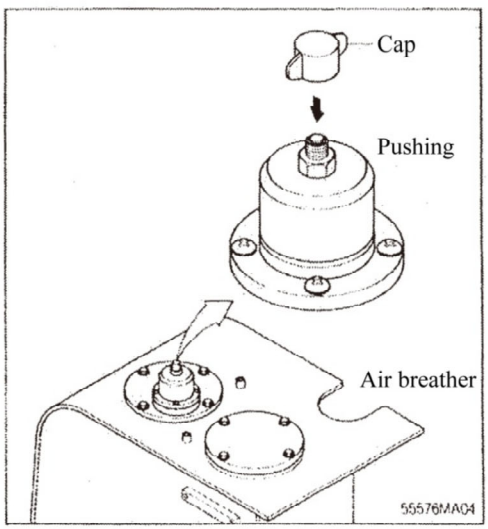


(2) Set the safety lever completely in the release position, operate the control levers and pedals fully to the front, rear, left and right, to release the pressure in the hydraulic pipeline [with the accumulator].

※ This may not completely release the pressure, so when serving hydraulic component, loosen the connections slowly and do not stand in the direction where the oil spurt out.



(3) Loosen the cap and relieve the pressure in the tank by pushing the top of the air breather.



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) Conduct assembly after cleaning the hose, pipe and joint of functioning item.

(3) Use genuine parts.

(4) Do not assemble the hose in the condition of twist or sharp radius.

(5) Carry out tightening to the specified torque.

6) Periodical replacement of safety parts

(1) It is desirable to do periodical maintenance the machine for using the machine safely for a long time.

Periodical replacement of safety parts can guarantee not only the safety but also satisfactory performance.

(2) These parts can cause the disaster of life and property as the quality changes by passing time and it is worn, diluted, and gets fatigued due to repeated operations. Thus, the remaining lifetime of such parts cannot be judged by the operator through visual inspection.

(3) Repair or replace these parts if any abnormality is found before the recommended replacement interval.

<table>
<tr><th colspan="3">Periodical Replacement of Safety Parts</th><th>Interval</th></tr>
<tr><td colspan="2" rowspan="2">Engine</td><td>Fuel hose(tank-engine)</td><td rowspan="2">Every 2 years</td></tr>
<tr><td>Heater hose (heater-engine)</td></tr>
<tr><td rowspan="6">Hydraulic system</td><td rowspan="3">Main circuit</td><td>Pump suction hose</td><td rowspan="3">Every 2 years</td></tr>
<tr><td>Pump delivery hose</td></tr>
<tr><td>Swing hose</td></tr>
<tr><td rowspan="3">Working device</td><td>Boom cylinder line hose</td><td rowspan="3">Every 2 years</td></tr>
<tr><td>Arm cylinder line hose</td></tr>
<tr><td>Bucket cylinder line hose</td></tr>
</table>

※ 1. Replace the O-ring and gasket at the same time when replacing the hose.

2. Replace the clamp at the same time if it is cracked during hose check and replacement.

2. Tightening Torque

Use the following table for unspecified torque.

1) Bolt and nut

(1) Coarse thread

Bolt Size	8T		10T	
	kgf·m	lbf·ft	kgf·m	lbf·ft
M6×1.0	0.9-1.3	6.5-9.4	1.1-1.7	8.0-12.3
M8×1.25	2.0-3.0	14.5-21.7	2.7-4.1	19.5-29.7
M10×1.5	4.0-6.0	28.9-43.4	5.5-8.3	39.8-60.0
M12×1.75	7.4-11.2	53.5-81.0	9.8-15.8	70.9-114
M14×2.0	12.2-16.6	88.2-120	16.7-22.5	121-163
M16×2.0	18.6-25.2	135-182	25.2-34.2	182-247
M18×2.0	25.8-35.0	187-253	35.1-47.5	254-344
M20×2.5	36.2-49.0	262-354	49.2-66.6	356-482
M22×2.5	48.3-63.3	349-458	65.8-98.0	476-709
M24×3.0	62.5-84.5	452-611	85.0-115	615-832
M30×3.0	124-168	898-1214	169-229	1223-1656
M36×4.0	174-236	1261-1704	250-310	1808-2242

(2) Fine thread

Bolt Size	8T		10T	
	kgf·m	lbf·ft	kgf·m	lbf·ft
M8×1.0	2.2-3.4	15.6-24.6	3.0-4.4	21.7-31.8
M10×1.2	4.5-6.7	32.5-48.5	5.9-8.9	42.7-64.4
M12×1.25	7.8-11.6	56.4-83.9	10.6-16.0	76.7-116
M14×1.5	13.3-18.1	96.2-131	17.9-24.1	130-174
M16×1.5	19.9-26.9	144-195	26.6-36.0	192-260
M18×1.5	28.6-43.6	207-315	38.4-52.0	278-376
M20×1.5	40.0-54.0	289-391	53.4-72.2	386-522
M22×1.5	52.7-71.3	381-516	70.7-95.7	511-692
M24×2.0	67.9-91.9	491-665	90.9-123	658-890
M30×2.0	137-185	990-1339	182-248	1314-1796
M36×3.0	192-260	1390-1880	262-354	1894-2562

2) Pipe and hose

Thread size	Width across flat (mm)	kgf·m	lbf·ft
1/4’’	19	3	21.7
3/8’’	22	4	28.9
1/2’’	27	5	36.2
3/4’’	36	12	86.8
1’’	41	14	101

3) 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	6	43.4
3/4’’	36	13	94.0
1’’	41	15	109

4) Tightening torque of major component

No.	Description		Bolt size	Torque	
				kgf·m	lbf·ft
1	Engine	Engine mounting bolt (Engine-Bracket)	M10×1.5	6.9±1.0	50 ±7.2
2		Engine mounting bolt (Bracket-Frame)	M16×2.0	25±2.5	181±18.1
3		Radiator mounting bolt, nut	M10×1.5	6.9±1.4	50±10.0
4		Coupling mounting bolt	M10×1.5	6.0±1.0	43.4±7.2
5	Hydraulic system	Main pump mounting bolt	M12×1.75	12.8±3.0	92 ±22.0
6		Main control valve mounting bolt	M 8×1.25	2.5±0.5	18±3.6
7		Fuel tank mounting bolt	M16×2.0	25±2.5	181±18.1
8		Hydraulic oil tank mounting bolt	M16×2.0	25±2.5	181±18.1
9		Turning joint mounting bolt, nut	M12×1.75	12.8±3.0	92±22.0
10	Power train system	Swing motor mounting bolt	M16×2.0	29.7±4.5	215±33.0
11		Swing bearing upper mounting bolt	M16×2.0	29.7±3.0	215±22.0
12		Swing bearing lower mounting bolt	M16×2.0	29.7±3.0	215±22.0
13		Travel motor mounting bolt	M14×2.0	20±2.0	145±14.0
14		Sprocket mounting bolt	M14×2.0	19.6±2.0	142±14.0
15	Under carriage	Carrier roller mounting bolt, nut	M18×2.0	41.3±4.0	298.8±28.9
16		Track roller mounting bolt	M18×2.0	41.3±4.0	298.8±28.9
17		Track tension cylinder mounting bolt	M12×1.75	12.8±3.0	92 ±22.0
18		Track shoe mounting bolt, nut	1/2-20UNF	19±1.0	137±7.2
19		Track guard mounting bolt	M16×2.0	29.6±3.2	214±23.0
20	Others	Counterweight mounting bolt	M20×2.5	57.8±6.4	418±46.3
21		Cab mounting bolt, nut	M12×1.75	12.8±3.0	92±22.0
22		Operator’s seat mounting bolt	M8×1.25	1.17±0.1	8.5±0.7

3. Fucl, Coolant and Lubricant Specifications

1) New machine

A new machine is filled with following lubricants.

Description	Specification
Engine oil	SAE 15W-40 (APICI-4)
Hydraulic oil	Hyundai genuine long life hydraulic oil (ISO VG46, VG68), conventional hydraulic oil (ISO VG32)
Swing and travel reduction gear	SAE 85W-140 (APIGL-5)
Grease	Lithium base grease NLGI No. 2
Fuel	ASTM D975-No. 2
Coolant	Mixture of 50% ethylene glycol base antifreeze and 50% water.

SAE: Society of Automotive Engineers

API: American Petroleum Institute

ISO: International Organization for Standardization

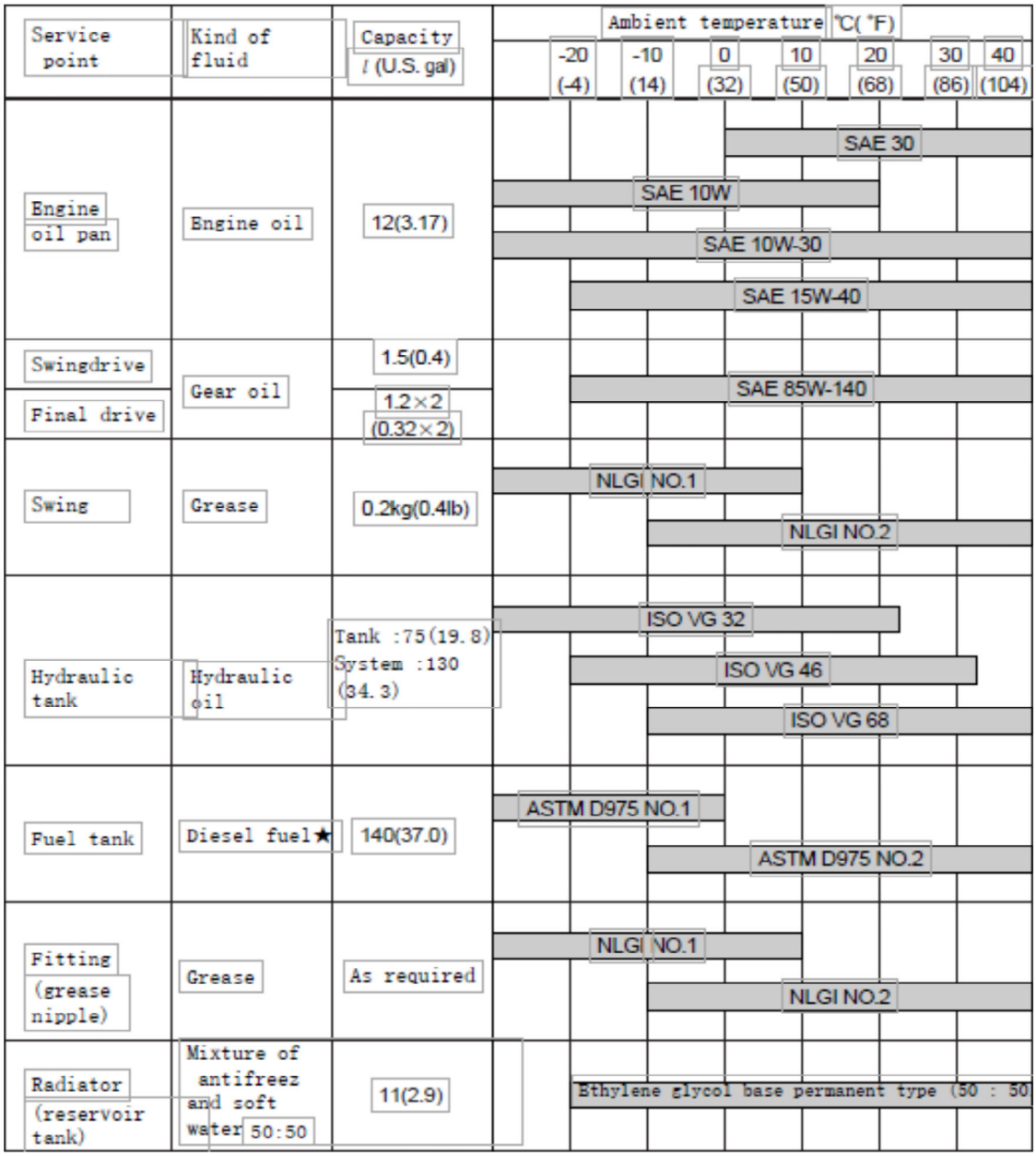
NLGI: National Lubricating Grease Institute

ASTM: American Society of Testing and Material

2) Recommended oils

Use the oils listed below or those of the same grade or above.

Do not mix oils of different grades.



SAE: Society of Automotive Engineers

ΛPI: American Petroleum Institute

ISO: International Organization for Standardization

NLGI: National Lubricating Grease Institute

ASTM: American Society of Testing and Material

4. Maintenance Check List

1) Daily service before starting

Check Item	Service	Page
Visual check		
Fuel tank	Check and refill	6-25
Hydraulic oil level	Check and add	6-27
Engine oil level	Check and add	6-18
Coolant level	Check and add	6-20
Control panel & pilot lamp	Check and clean	6-36
Prefilter	Check and drain	6-25
Fan belt tension	Check and adjust	6-23

2) Service at intervals of 50 hours

Check Item	Service	Page
Fuel tank (water, sediment)	Drain	6-25
Track tension	Check and adjust	6-32
Swing reduction gear oil	Check and add	6-30

3) Service of new machine in initial 50 hours

Check Item	Service	Page
Pin and bushing lubricant	Lubricate	6-35
• Boom cylinder head and rod		
• Boom joint		
• Arm cylinder head and rod		
• Boom and arm connection		
• Bucket cylinder head and rod		
• Arm and bucket connection		
• Arm and bucket rod connection		
• Bucket rod		
• Boom swing cylinder head and rod		
• Dozer and undercarriage connection		
• Dozer cylinder head and rod		
Bolt and nut	Check and tighten	6-8
• Sprocket mounting bolts		
• Travel motor mounting bolts		
• Swing motor mounting bolts		
• Swing bearing mounting bolts		
• Engine mounting bolts		
• Counterweight mounting bolts		
• Turning joint locating bolts		
• Track shoe mounting bolts and nuts		
• Hydraulic pump mounting bolts		

Service the above items only for the new machine, and thereafter keep the normal service intervals.

4) Service at intervals of 100 hours

Check Item	Service	Page
★ Hydraulic oil return filter	Replace	6-29
★ Pilot line filter	Replace	6-29
★ Filter element of air breather of hydraulic oil tank	Replace	6-29

★ Replace the three filters for continuous operation of the hydraulic breaker only.

5) Service at intervals of 250 hours

Check Item	Service	Page
☆★Engine oil	Change	6-18, 19
☆★Engine oil filter	Replace	6-18, 19
Battery (electrolyte and voltage)	Check	6-36
Swing bearing	Add lubricant	6-30
Aircon & heater fresh air filter	Clean	6-39
Hydraulic oil return filter	Replace	6-29
☆Swing reduction gear oil	Change	6-30
☆Swing reduction gear grease	Check and add	6-30
Pilot line filter	Replace	6-29
☆ Fuel filter	Replace	6-26
Pin and bushing lubricant	Lubricate	6-35
• Boom cylinder head and rod		
• Boom joint		
• Arm cylinder head and rod		
• Boom and arm connection		
• Bucket cylinder head and rod		
• Arm and bucket connection		
• Arm and bucket rod connection		
• Bucket rod		
• Boom swing cylinder head and rod		
• Dozer and undercarriage connection		
• Dozer cylinder head and rod		
Bolt and nut	Check and tighten	6-8
• Sprocket mounting bolts		
• Travel motor mounting bolts		
• Swing motor mounting bolts		
• Swing bearing mounting bolts		
• Engine mounting bolts		
• Counterweight mounting bolts		
• Turning joint locating bolts		
• Track shoe mounting bolts and nuts		
• Hydraulic pump mounting bolts		

★ Shorten the service interval if the sulfur content of fuel exceeds 0.5% or low-grade engine oil is used.

☆ Replace it after initial 250 hours operation.

6) Service at intervals of 500 hours

Check Item	Service	Page
★Engine oil filter	Replace	6-18, 19
★Engine oil	Change	6-18, 19
Radiator and cooling fin	Check and clean	6-23
☆Air cleaner element	Check and clean	6-24
Fuel filter	Replace	6-26
◆Travel reduction gear oil	Change	6-31

★ Shorten the service interval if the sulfur content of fuel exceeds 0.5% or low-grade engine oil is used.

☆ Clean the coarse filter element after 500 hours operation or when the air cleaner warning lamp flickers. Both the coarse filter element and fine filter element should be replaced after the coarse filter element has been cleaned 4 times.

◆ Change the oil after initial 500 hours operation.

7) Service at intervals of 1,000 hours

Check Item	Service	Page
Swing reduction gear grease	Add	6-30
Travel motor reduction gear oil	Change	6-31
Swing reduction gear oil	Change	6-30
Swing gear and pinion grease	Change	6-30
Hydraulic oil return filter	Replace	6-29
Air breather element	Replace	6-26
Pilot line filter	Replace	6-29

8) Service at intervals of 2,000 hours

Check Item	Service	Page
Hydraulic tank		
★● Oil	Change	6-27
● Oil suction strainer	Check and clean	6-28
Coolant	Change	6-20, 21, 22, 23

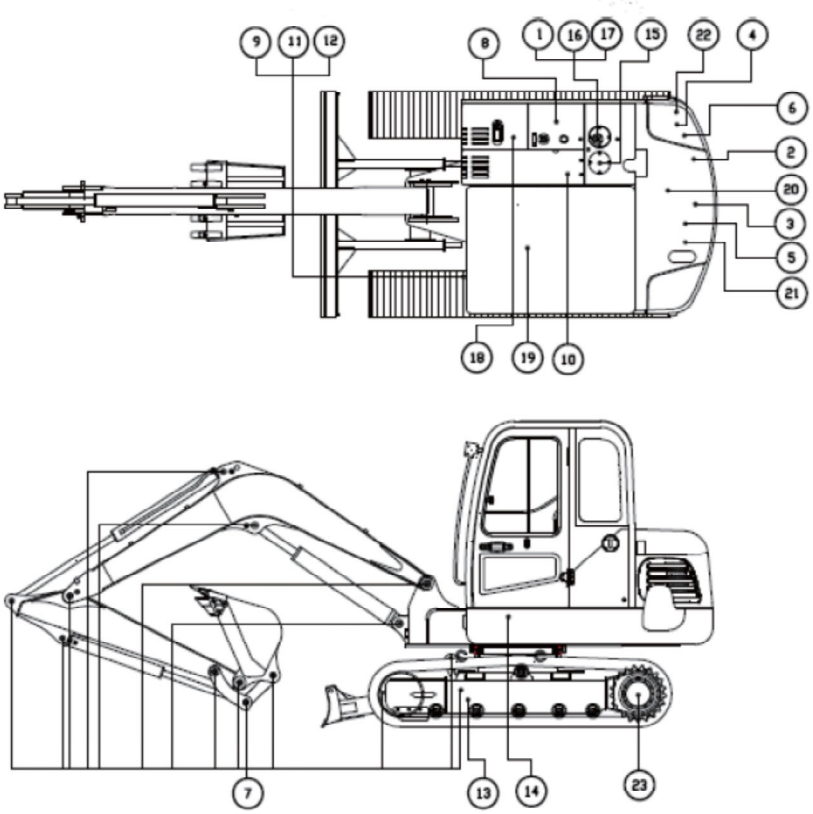
★ Change the oil after 600 hours continuous operation of the hydraulic breaker.

9) When required

Whenever you have trouble in the machine, you must perform the service of related items.

Check Item	Service	Page
Fuel system		
• Fuel tank	Drain or clean	6-25
• Prefilter	Drain or clean	6-25
• Fuel filter	Replace	6-26
Engine lubrication system		
• Engine oil	Change	6-18, 19
• Engine oil filter	Replace	6-18, 19
Engine cooling system		
• Coolant	Add or change	6-20, 21,22, 23
• Radiator	Clean or flush	6-20, 21, 22, 23
Engine air supply system		
• Air cleaner	Replace	6-24
Hydraulic system		
• Hydraulic oil	Add or change	6-27
• Return filter	Replace	6-29
• Pilot line filter	Replace	6-29
• Air breather element	Replace	6-29
• Suction strainer	Clean	6-28
Undercarriage		
• Track tension	Check and adjust	6-32
Bucket		
• Tooth	Replace	6-34
• Side cutter	Replace	6-33
• Linkage	Adjust	6-33
• Bucket assembly	Replace	6-33
Air conditioner and heater		
• Circulating air filter	Clean and replace	6-39

5. Maintenance Chart



※ 1. Service intervals are based on the hour meter reading.

2.The service intervals in this table are applicable to general conditions other than harsh conditions.

3. Stop engine before filling oil and liquid.

4. Do not open the cover or drain plug when the coolant or oil is hot, in order to avoid burns.

5. Open the cover slowly to relieve the pressure.

6. Keep the cluster and other operation panels clean.
Replace the panel that is damaged or fails.

7. For other details and initial service items, refer to the service manual.

Service interval	No	Description	Service action	Oil symbol	Capacity	Service points No.
10 hours or daily	1	Hydraulic oil level	Check and add	HO	70	1
	2	Engine oil level	Check and add	EO	11.6	1
	4	Radiator coolant	Check and add	C	10	1
	5	Prefilter	Check and drain	-	-	1
	6	Safety belt tension and damage	Check and adjust	-	-	1
50 hours or weekly	8	Fuel tank strainer (water, sediment)	Check and drain	-	-	1
	10	Swing drive gear case (gear oil)	Check and add	GO	1.5	1
	13	Track tension	Check and adjust	PGL	-	2
250 hours	7	Working device pin	Check and add	PGL	-	15
	9	Swing bearing	Lubricate	PGL	-	1
	14	Battery (electrolyte)	Check and add	-	-	1
	19	Air conditioner and heater filter (outer)	Check and clean	-	-	1
500 hours	2	Engine oil level	Change	EO	11.6	1
	3	Engine oil filter	Replace	-	-	1
	20	Air cleaner element (outer)	Clean	-	-	1
	22	Radiator and cooling fin	Check and clean	-	-	2
	21	Fuel filter element	Replace	-	-	2
1,000 hours	10	Swing drive gear case (gear oil)	Replace	GO	1.5	1
	11	Swing drive gear case (grease)	Change	PGL	0.2	1
	12	Swing gear and pinion	Replace	PGL	-	1
	15	Hydraulic oil return filter	Replace	-	-	1
	16	Air breather element	Replace	-	-	1
	18	Pilot line filter	Replace	-	-	1
	23	Travel reduction gear oil	Change	GO	0.8	2
2,000 hours	1	Hydraulic oil level	Change	HO	70	1
	4	Radiator coolant	Change	C	10	1
	17	Hydraulic oil suction strainer	Check and clean	-	-	1
As required	20	Air cleaner element (inner/outer)	Replace	-	-	2
	19	Air conditioner filter	Replace	-	-	1

※ Oil symbols:

Refer to the recommended lubricants to get their properties.

DF: diesel fuel GO: gear oil

HO: hydraulic oil C: coolant

PGL: lubricant EO: engine oil

6. Service Instruction

1) Check engine oil level

Check the oil level with the machine on a flat ground before starting the engine.

(1) Pull out the dipstick and wipe with clean cloth.

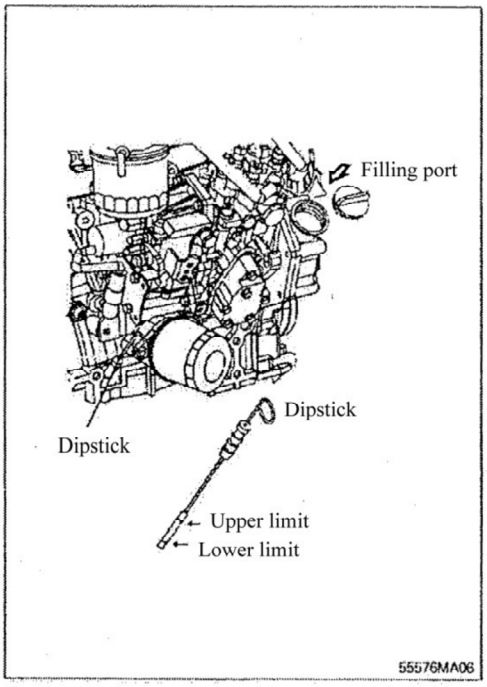
(2) Check the oil level by inserting the dipstick completely into the hole and pulling it out again.

(3) If the oil level is low, add oil and then check it again.

※ If oil is contaminated or diluted, change the oil regardless of the regular change interval.

※ Check the oil level after engine has been stopped for 15 minutes.

⚠ Do not operate the machine unless the oil level is in the normal range.

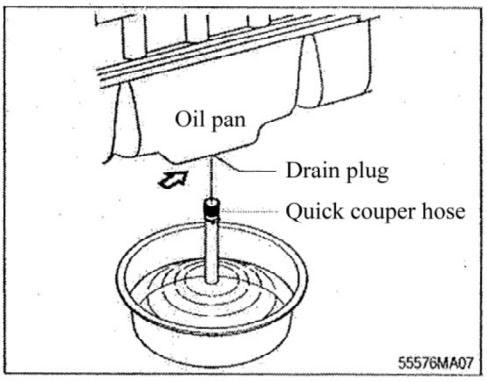


2) Replacement of engine oil and oil filter

(1) Warm up the engine.

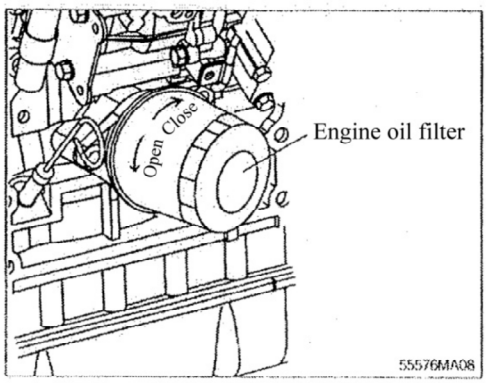
(2) Remove the cover of drain plug and connect the quick coupler hose.

※ A drain pan with a capacity of 20 liters (5 U.S. gallons) will be adequate.



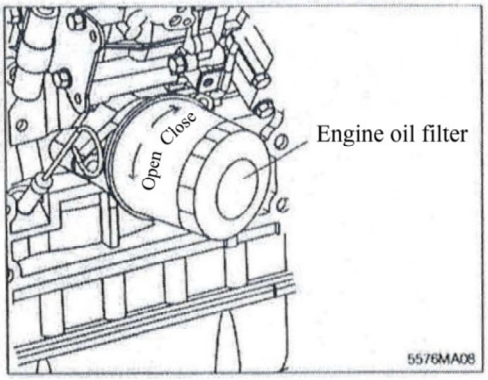
(3) Clean around the filter head, remove the filter with a filter wrench and clean the gasket surface.

● Wrench specification: 90-95 mm.

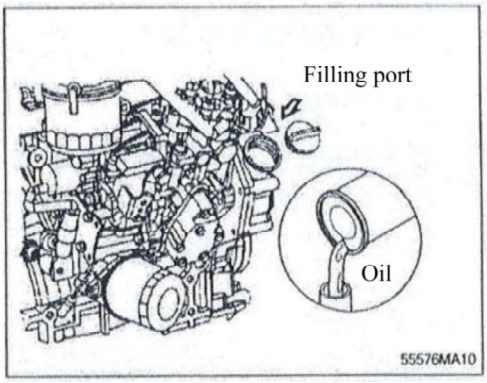


(4) Apply a light film of lubricating oil to the gasket sealing surface before installing the filters.

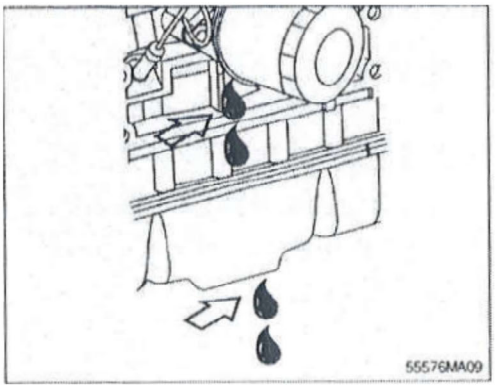
(5) Install the filter.
Remove the quick coupler hose.
※ Mechanical over-tightening may distort the threads or damage the filter element seal.
● Install the filter according to the filter manufacturer's instructions.



(6) Fill the engine with clean oil to the proper level.
• Quantity: 11.6L



(7) Operate the engine in the idle state, and check the filter and drain plug for leakage. Shut the engine off and check the oil level with the dipstick.



3) Check coolant

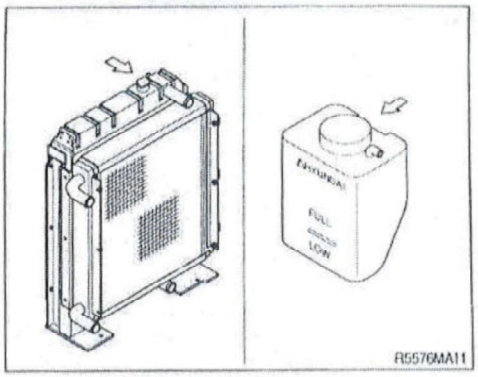
(1) Check if the level of coolant in the reservoir tank is between FULL and LOW.

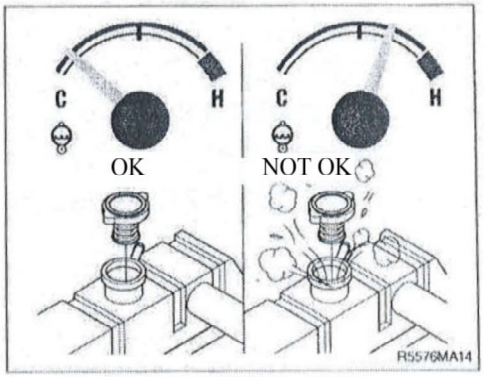
(2) Add the mixture of antifreeze and water after removing the cap of the reservoir tank if coolant is not sufficient.

(3) Be sure to add the coolant by opening the cap of radiator when the coolant level is below LOW.

(4) Replace the gasket of radiator cap when it is damaged.

⚠ Hot coolant can spray out if the radiator cap is removed while the engine is hot. Remove the cap after the engine has cooled down.





4) Flushing and refilling of radiator

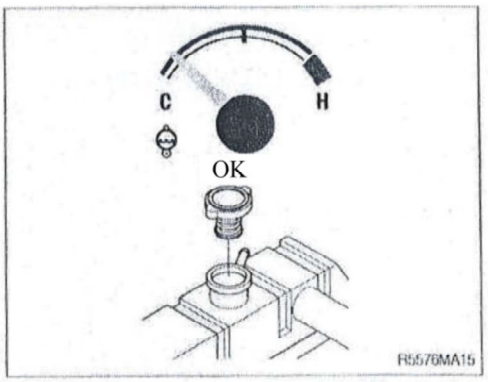
(1) Change coolant

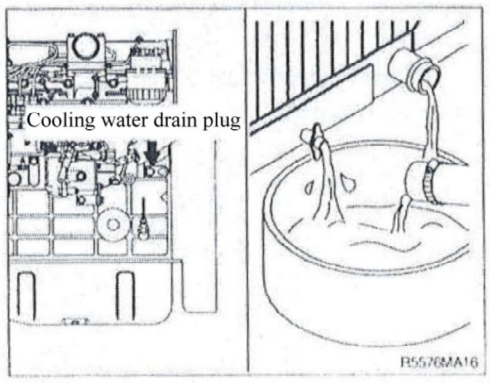
⚠ Avoid prolonged and repeated skin contact with the used antifreeze. Such prolonged repeated contact can cause skin disorders or other bodily injury.

Keep out of reach of children.

⚠ Do not open the lid of the water tank if the temperature of cooling water is not below 50 ℃, in order to prevent burns due to spouting of cooling water in a hot state.

※ Protect the environment: Handling and disposal of the used antifreeze should be subject to federal, state, and local laws and regulations. Use authorized waste disposal facilities, such as disposal facilities for domestic wastewater and auto waste. If you have any doubt, contact your local authorities for guidance as to proper handling of the used antifreeze.



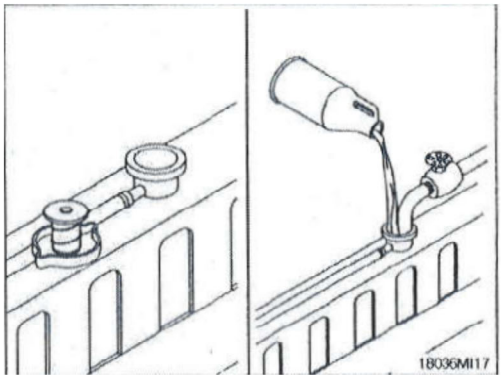


(2) Flushing of cooling system

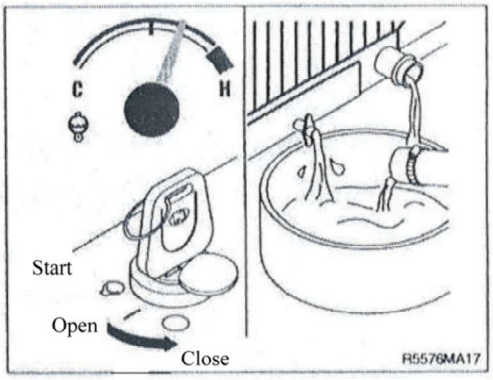
① Fill the system with a mixture of sodium carbonate and water (or equivalent).

※ Use 0.5 kg (1.0 pound) of sodium carbonate for every 23 liters (6.0 U.S. gallons) of water.

Do not install the radiator cap.



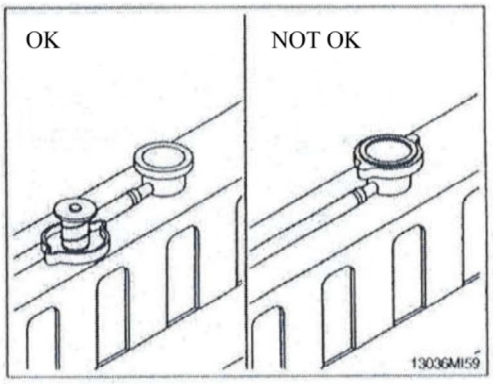
② Operate the engine for 5 minutes with the coolant temperature above 80°C (176°F). Shut the engine off, and drain the cooling system.



③ Fill the cooling system with clean water.

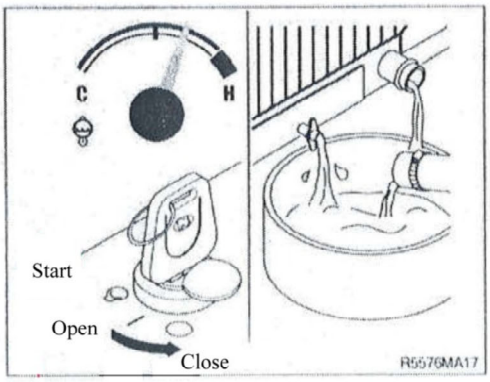
※ Be sure to vent the engine and intercooler for complete filling.

※ Do not install the radiator cap or new coolant filter.



④ Operate the engine for 5 minutes with the coolant temperature above 80°C (176°F). Shut the engine off, and drain the cooling system.

※ If the water being drained is still dirty, the system must be flushed again until the water is clean.

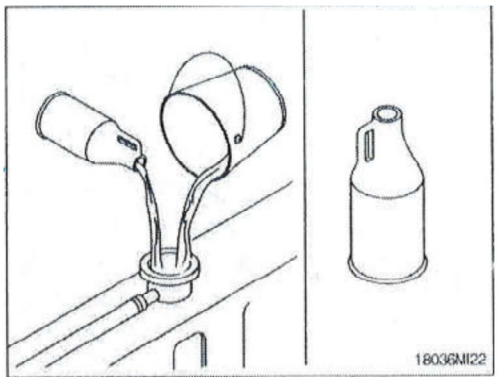


(3) Cooling system filling

① Use a mixture of 50 percent water and 50 percent ethylene glycol antifreeze to fill the cooling system.

Coolant capacity (engine only): 10L (2.6 U.S. gal.)

※ Add an appropriate amount of DCA4 anticorrosive to protect the cooling system.

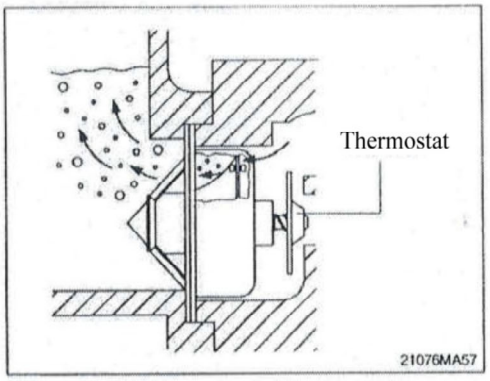


② The system has a maximum fill rate of 14L/min (3.5 U.S. gal/min).

Do not exceed this fill rate.

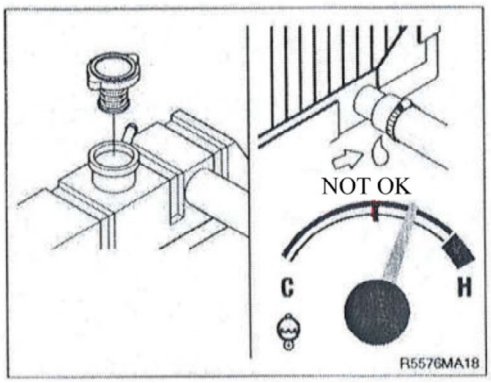
※ The system must be filled slowly to prevent air locks.

During filling, air must be vented from the engine coolant passage.



③ Install the pressure cap. Operate the engine until it reaches a temperature 80°C (176°F), and check for coolant leaks.

Check the coolant level again to make sure the system is full of coolant.



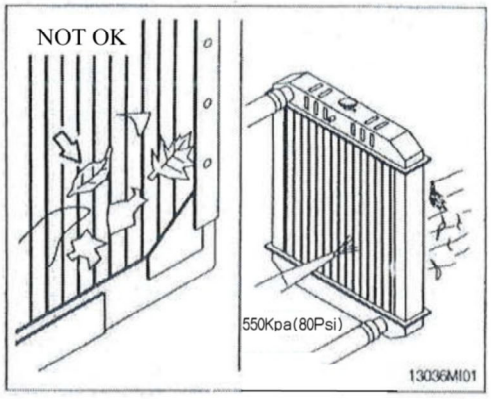
5) Clean radiator and oil cooler

Check, and if necessary, clean and dry the outside of the radiator and oil cooler. After working in a dusty place, clean radiator more frequently.

(1) Visually inspect the radiator for clogged radiator fins.

(2) Use the 550 kPa (80 psi) air pressure to blow the dirt and debris from the fins.

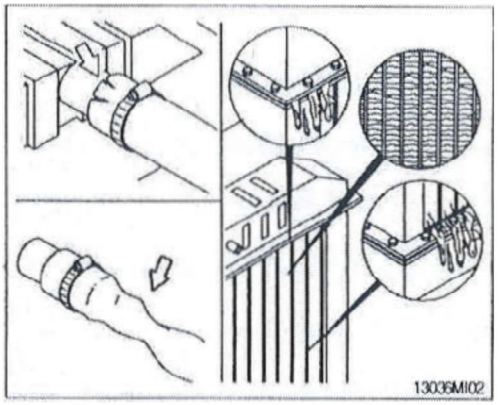
Blow the air in the opposite direction of the fan air flow.



(3) Visually inspect the radiator for bent or broken fins.

※ If the radiator must be replaced due to bent or broken fins which can cause the engine to overheat, refer to the manufacturer's replacement guide.

(4) Visually inspect the radiator for core and gasket leaks.

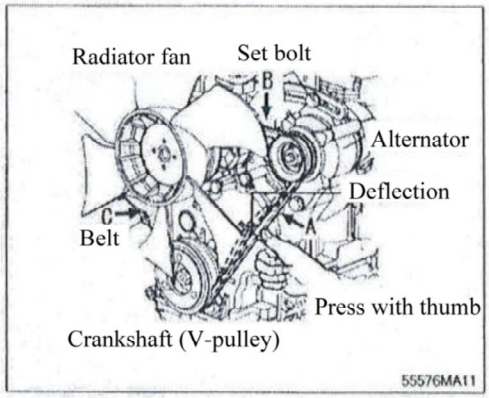


6) Fan belt tension

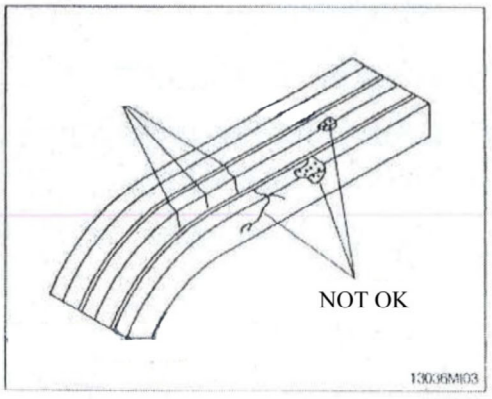
(1) Measure the belt deflection at the longest span of the belt.

●Deflection

	A	B	C
Used belt	10-14	7-10	9-13
New belt	8-12	5-8	7-11



(2) Inspect for damage.



7) Inspection of cooling fan

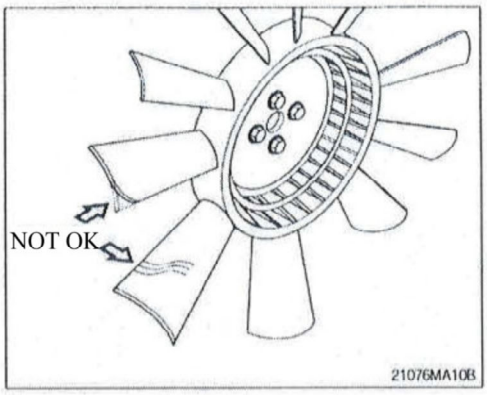
⚠ Personal injury can result from a fan blade failure. Never pull or pry on the fan. This can damage the fan blade and cause fan failure.

※ Rotate the crankshaft by using the engine barring gear.

※ Visual inspection of the cooling fan is required daily.

Check for cracks, twists, looseness and loose rivets.

Check the fan to make sure it is securely mounted. Tighten the cap screws if necessary. Replace any fan that is damaged.



8) Cleaning of air cleaner

(1) Loosen the nut and remove the element.

(2) Clean the inside of the filter.

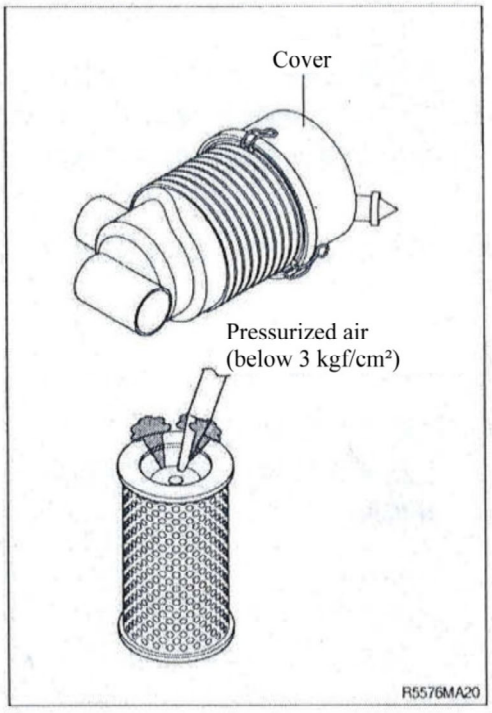
(3) Clean or purge the element with compressed air.

① Use pressurized air

Remove the dust inside of the element with pressurized air (below 3 kgf/cm^2, 100 psi) forward and backward equally.

② Purge

Purge the element with non-foaming neutral cleaning agent, then clean it with water and dry it.



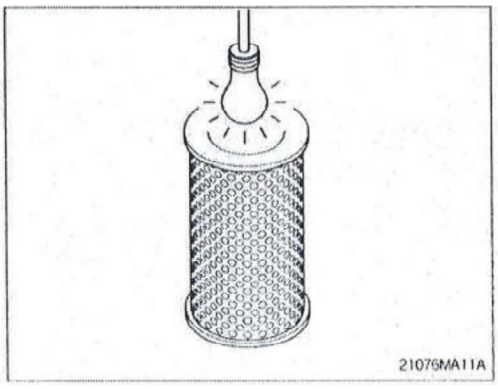
(4) Inspect for cracks or damage of the element by putting a light bulb inside the element.

(5) Install the element and tighten the disc nut.

※ Replace the element immediately if it has been cleaned 4 times or damaged.

※ Clean the element if the air cleaner warning lamp on the cluster is ON.

Check the filter installed.



9) Fuel tank

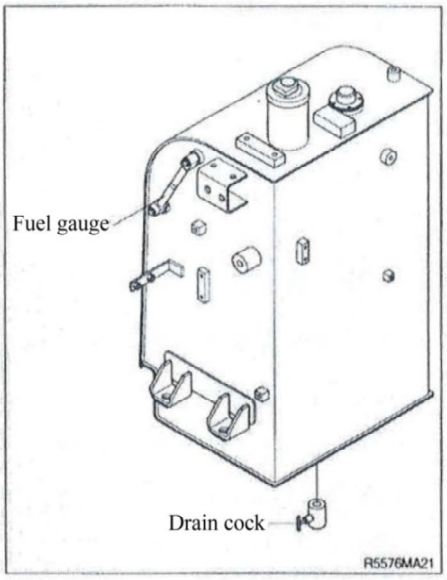
(1) Check the oil level before starting the machine. Fill oil to minimize water condensation.

(2) Drain the water and sediment in the fuel tank by opening the drain cock.

※ Be sure to LOCK the cap of fuel tank.

※ Remove the strainer of the fuel tank and clean it if contaminated.

⚠ Stop the engine when refueling.



10) Prefilter

(1) Prepare a waste oil container.

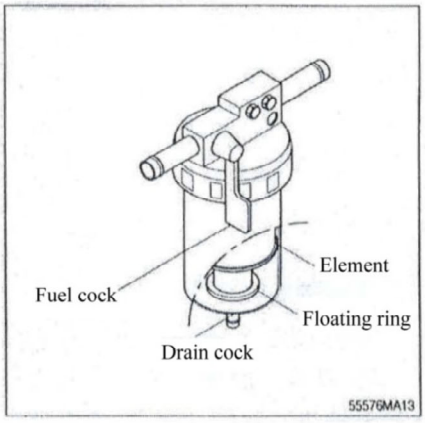
(2) Close the fuel inlet.

(3) Loosen the drain cock at the bottom of the prefilter, and drain any water collected inside.

(4) Drain air inside the fuel system.

※ Use the clean fuel filter and cup.

※ Drain water after the fuel tank is full of fuel.



10-1) Prefilter

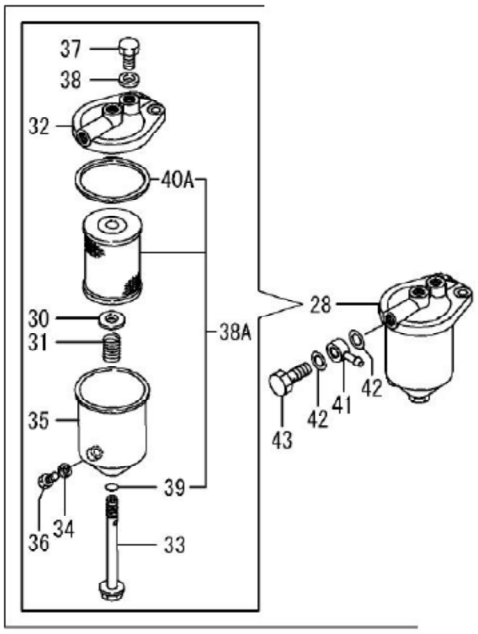
(1) Clean around the filter cover and loosen #33 bolt.

(2) Replace the spare parts (#39 and #40Λ) and element.

(3) Release air after installation is completed.

※ Check fuel for leakage after starting the engine.

※ The engine cannot be started if there is air inside the fuel system. Drain air by the corresponding method before starting the engine.



11) Replacement of fuel filter

(1) Clean around the filter cover, remove the filter and clean the gasket surface.

(2) Apply a small amount of fuel to the O-ring of a new filter cartridge.

(3) Install the new filter cartridge.

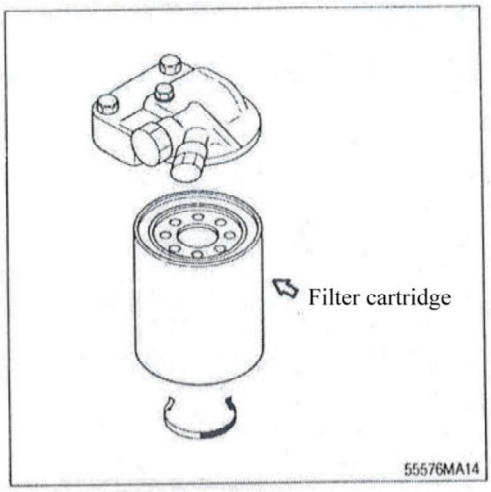
※ Screw the filter by hand completely to the mounting surface,

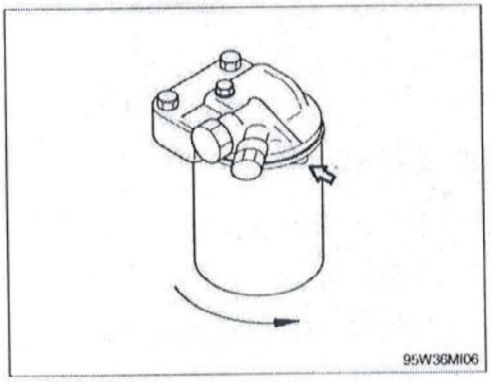
Tighten the filter for 1/2 turn with the filter wrench.

(4) Release the air after installation is completed.

※ Check fuel for leakage after starting the engine.

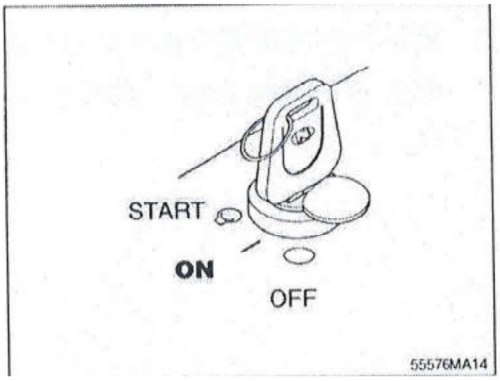
※ The engine cannot be started if there is air inside the fuel system. Drain air by the corresponding method before starting the engine.





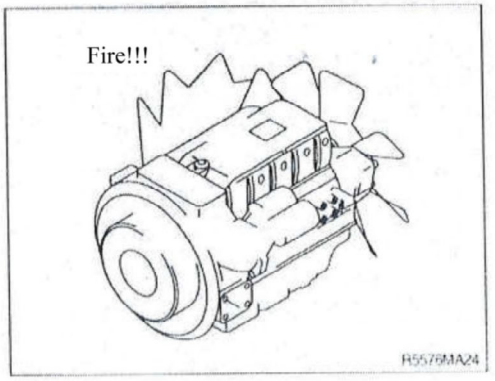
12) Priming of fuel system

(1) Turn the starting switch to the “ON” position for 10-15 seconds. This will allow the electric fuel pump to prime the fuel system.



13) Leakage of fuel

⚠ Be careful and clean the fuel hose, injection pump, fuel filter and other connections as the leakage from these part can cause fire.

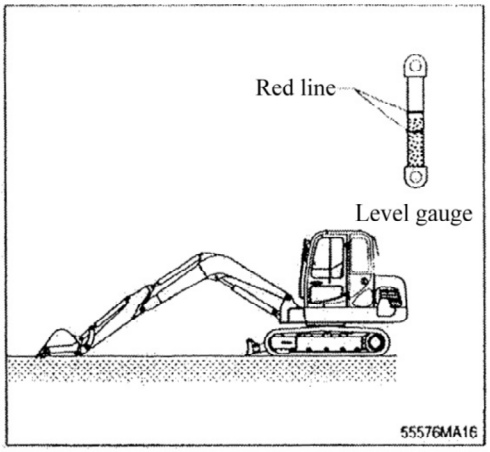


14) Hydraulic oil check

(1) Stop the engine after retracting the arm and bucket cylinders, then lower the boom and set the bucket on the ground at a flat location as in the illustration.

(2) Check the oil level at the level gauge of hydraulic oil tank.

(3) The oil level is normal if between the red lines.



15) Filling hydraulic oil

(1) Stop the engine to the position of level check.

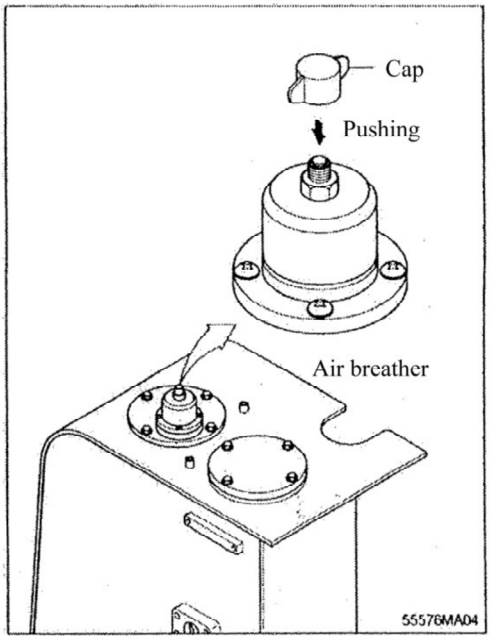
(2) Loosen the cap and relieve the pressure in the tank by pushing the top of the air breather.

(3) Remove the breather on the top of oil tank and fill the oil to the specified level.

● Tightening torque: 1.44±0.3 kgf·m

(4) Start the engine after filling and operate the working device several times.

(5) Stop the engine, check the oil level at the level check position, and install the air breather.



16) Change hydraulic oil

※ Hydraulic oil is hot after the engine is started. Change hydraulic oil after it cools down to be touchable by hand.

(1) Lower the bucket on the ground, and pull the arm and bucket cylinder to the maximum.

(2) Push the top of the air breather.

(3) Remove the cover.

● Tightening torque: 6.9±1.4 kgf·m
(50±10 lbf·m)

(4) Prepare a suitable container.

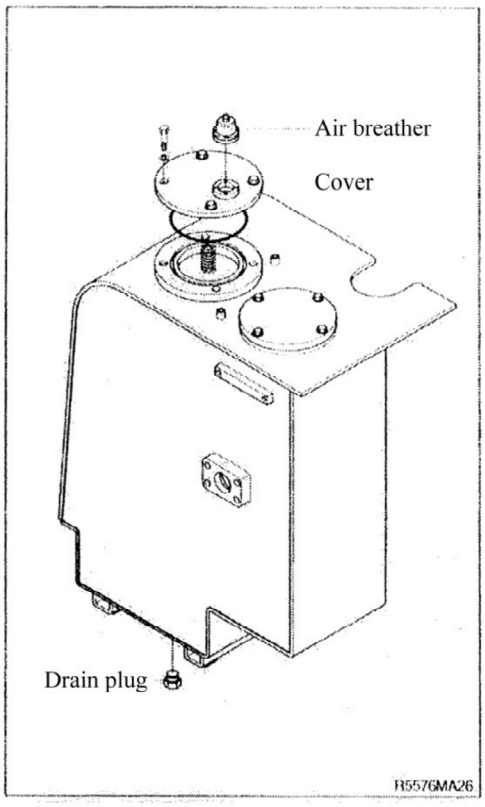
(5) Loosen the drain plug at the bottom of the fuel tank to drain oil.

(6) Fill an appropriate amount of recommended oil.

(7) Put the air breather in the right position.

(8) Bleed air by loosening the air breather at top of the main pump.

(9) Start the engine and run it continually. Release the air by operating all control levers to their full strokes.



17) Clean suction strainer

Hydraulic oil is hot after the engine is started. Change hydraulic oil after it cools down to be touchable by hand.

Clean the suction strainer as follows during oil filling.

(1) Remove the cover on the top of the oil tank.

● Tightening torque: 6.9±1.4 kgf·m
(50±10 lbf·m)

(2) Pull out the strainer in the tank.

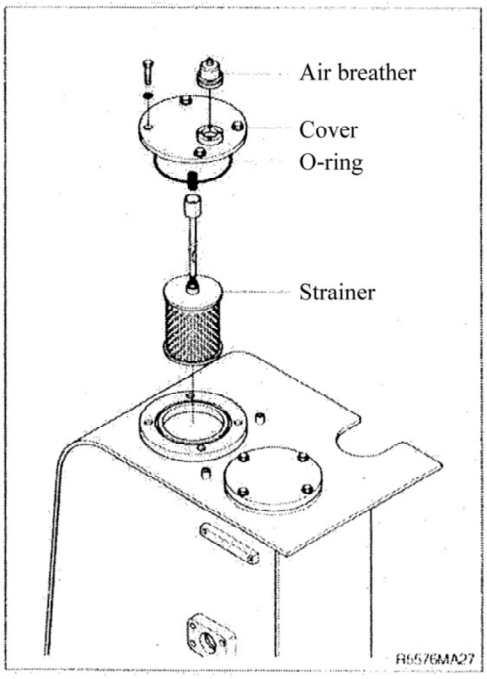
(3) Wash the foreign material off the suction strainer with gasoline or cleaning oil.

(4) Replace the suction strainer if it is damaged.

(5) Assemble according to the reverse order of disassembly.

Be sure to install a new O-ring and reinsert in the oil tank.

※ Loosen the bolt slowly at the cover. The cover may spring out due to the spring when removed.



18) Replacement of return filter

Hydraulic oil is hot after the engine is started. Change hydraulic oil after it cools down to be touchable by hand.

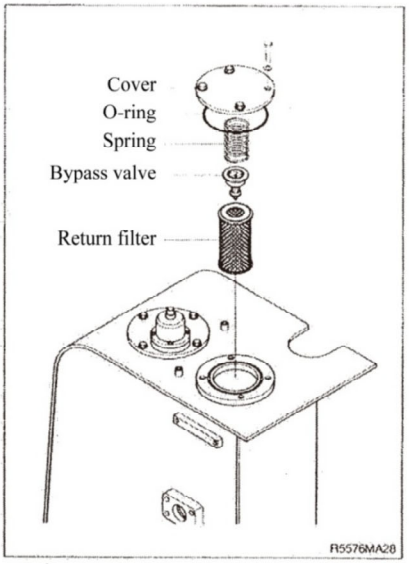
Pay attention to protection during replacement of the above items.

(1) Remove the cover at the top of the oil tank.

● Tightening torque: 6.9±1.4 kgf·m
(50±10 lbf·m)

(2) Remove the spring, bypass valve and return filter in the tank.

(3) Replace the element with a new one.



19) Replacement of element in hydraulic tank breather

Hydraulic oil is hot after the engine is started. Change hydraulic oil after it cools down to be touchable by hand.

(1) Loosen the cap and relieve the pressure in the tank by loosening the cap.

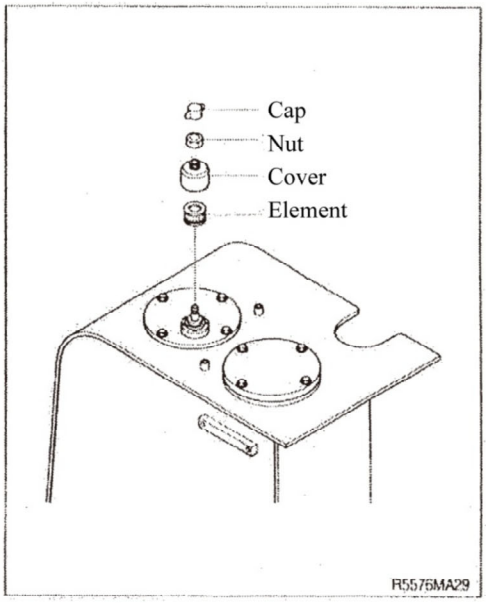
(2) Loosen the lock nut and remove the cover.

(3) Pull out the filter element.

(4) Replace the filter element with a new one.

(5) Apply oil on the O-ring, and install according to the reverse order of disassembly.

● Tightening torque: 0.2-0.3 kgf·m
(1.4-2.1 lbf·ft)



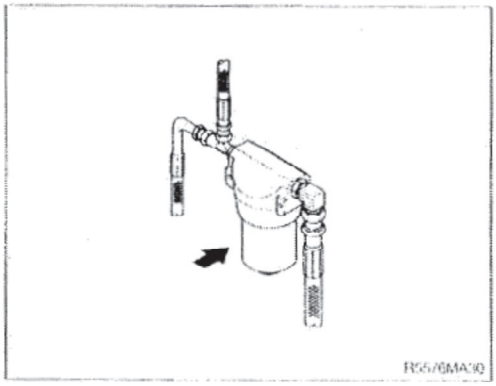
20) Replacement of pilot line filter

(1) Loosen the nut positioned on the filter body.

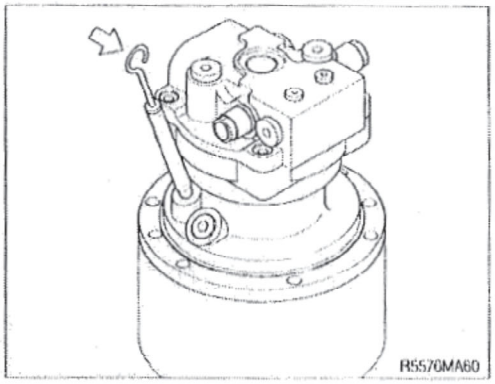
(2) Pull out the filter element and clean the filter housing.

(3) Install a new element and tighten it to the specified torque.

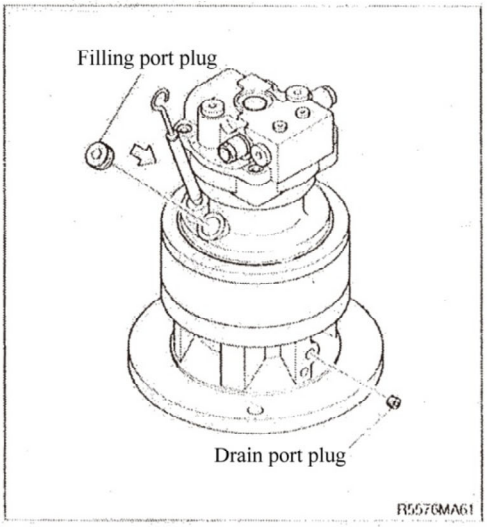
※ Change the cartridge after initial 250 hours of operation. Thereafter, change the cartridge every 1,000 hours.



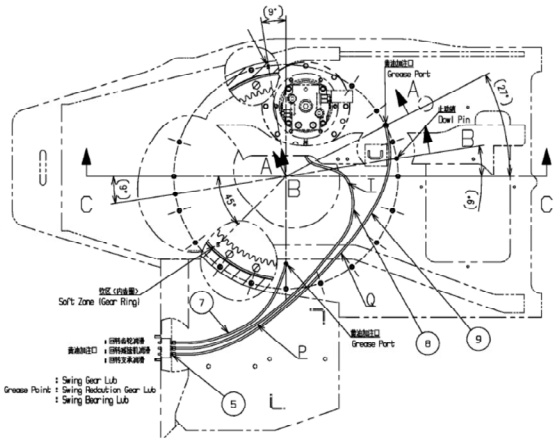
21) Check of swing reduction gear oil
(1) Pull out the dipstick and clean it.
(2) Insert it again.
(3) Pull out one more time to check the oil level and fill the oil if the level is not sufficient.



22) Change of swing reduction gear oil
(1) Park the machine on the flat ground, and Raise the temperature of oil by swinging the machine before changing the oil.
(2) Loosen the plug of the drain port.
(3) Drain oil into a suitable container.
(4) Wash the drain plug, and secure it with the sealing tape. Fill an appropriate amount of recommended oil.
• Amount of oil: 1.5 L (0.4 U.S. gal)



23) Lubrication of bearing of output shaft in reduction gear
(1) Fill grease to the fitting.
※ Conduct lubrication at intervals of 1,000 hours.
24) Lubrication of swing bearing
(1) Fill grease outside double fittings.
※ Conduct lubrication at intervals of 250 hours.



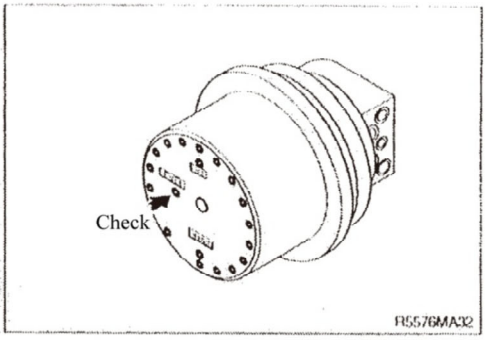
25) Check of travel reduction gear oil

(1) Stop the machine on the flat ground, with the drain plug facing down.

(2) Loosen the level plug and check the oil level.

If the level is at the hole of the plug, it is normal. Fill the oil if it is not sufficient.

Amount of oil: 0.8 L



26) Change of the travel reduction gear oil

(1) First raise the oil temperature by traveling the machine.

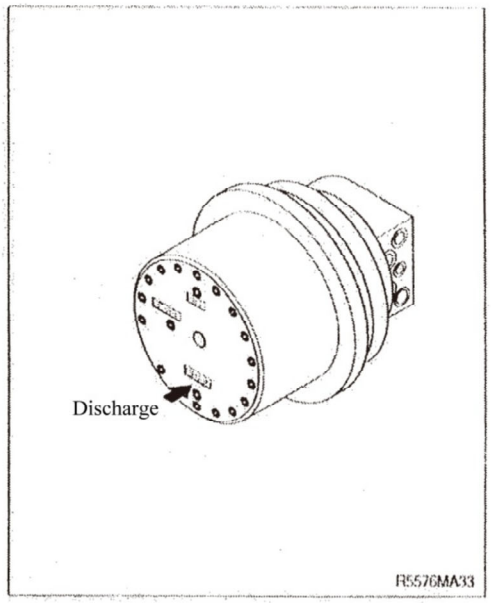
(2) Stop the machine when the drain plug faces down.

(3) Loosen the level plug and then the drain plug.

(4) Drain the oil to an appropriate container.

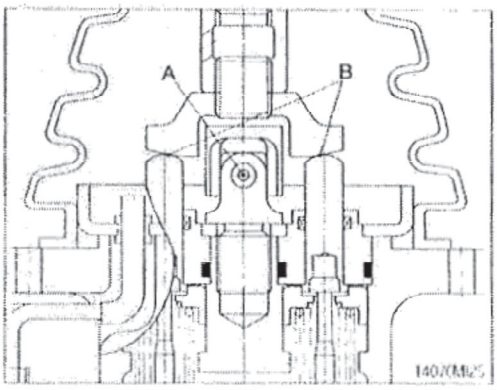
(5) Tighten the drain plug and fill the specified amount of oil.

(6) Tighten the level plug and travel slowly to check if there is any leakage of oil.



27) Lubrication of remote control lever

Remove the bellows and apply grease at the joint part (A) and sliding part (B) via the grease gun.



28) Adjustment of track tension

※ It is important to adjust the tension of track properly to extend the lifetime of track and traveling device.

※ The wear of pins and bushings on the undercarriage will vary with the working conditions and soil properties.

It is thus necessary to continually inspect the track tension so as to maintain the standard tension on it.

(1) Raise the undercarriage with the boom and arm.

(2) Measure the distance between bottom of track frame and the track shoe.

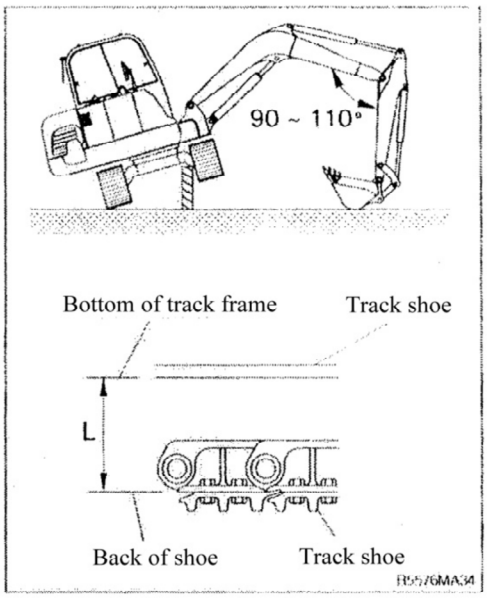
※ Remove mud before measurement.

(3) If the tension is tight, drain the grease in the grease nipple. If the tension is loose, charge the grease.

⚠ Personal injury or death can result from grease under pressure.

⚠ Unscrew the grease nipple for no more than one turn, as grease may be sprayed out under high pressure.

※ Move the track gently back and forth to drain grease. If the track tension is insufficient even after grease is charged to the maximum, change the pins and bushings as there are worn seriously.



Length (L)	
130-150 mm	5.1-5.9''

29) 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, gloves, and other protective equipment.

※ When the bucket is removed, place it on the flat ground.

※ Pay attention to the safety during the assembly and disassembly.

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

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

(3) Remove the bolt (1) and nut (2) first, then pins (3, 4) and finally the bucket.

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

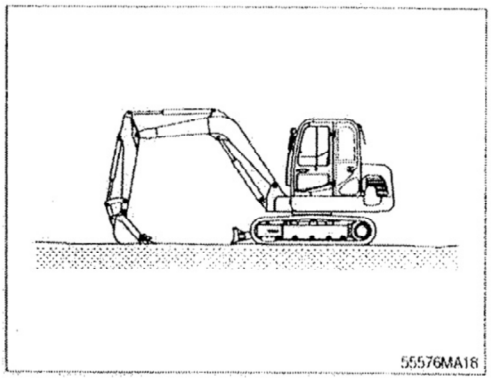
※ If the bucket is lowered strongly to the ground, the resistance will be increased and it will be difficult to remove the pins.

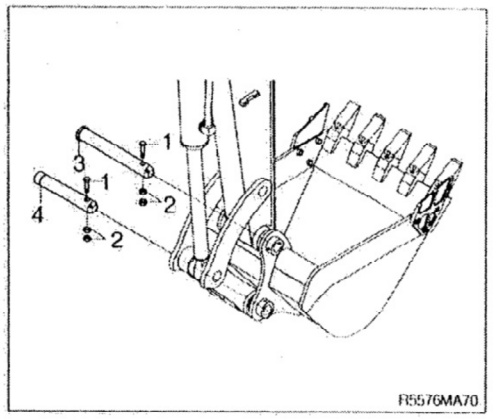
※ After removing the pins, make sure that they do not become contaminated with sand or mud and that the seals of bushing on both sides are not damaged.

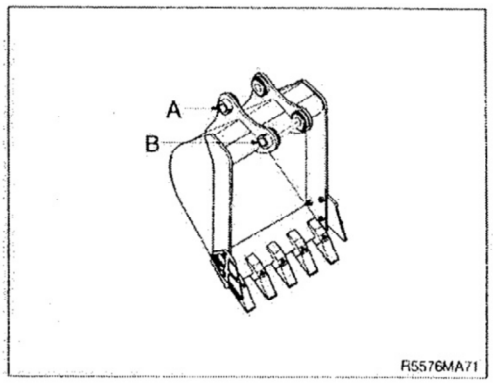
(4) Align the arm with holes (A) and the rod with holes (B), then coat with grease and install pins (3, 4).

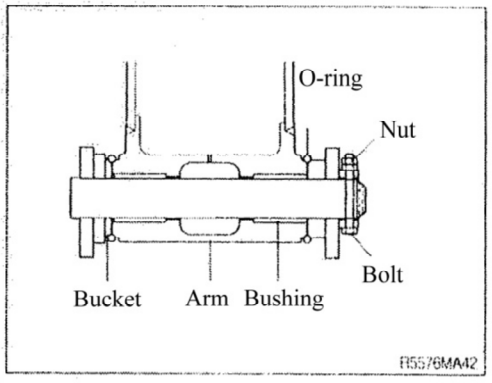
※When installing the bucket, the O-rings are easily damaged, so fit the O-rings on the boss of the bucket as shown in the picture. After knocking the pin, move the O-ring down to the groove.

(5) Install the stopper bolt (1) and nut (2), and apply grease.







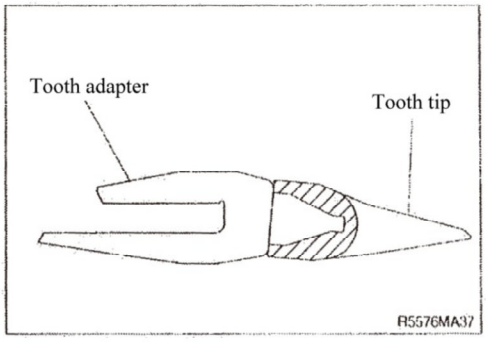


30) Replacement of bucket tooth

(1) Replacement cycle

① Check wear as shown in the illustration and replace tooth tip before the adapter starts to wear.

② In the case of excessive use, the tooth adapter has worn out and replacement may become impossible.



(2) Instructions for replacement

① Pull out pin by striking pin with punch or hammer, avoiding damage to locking washer.

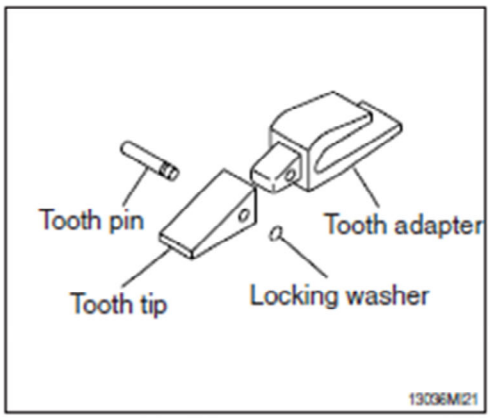
② Remove dust and mud from the surface of the tooth adapter by using a knife.

③ Place the locking washer properly and fit the tooth tip to adapter.

④ Insert the pin until the locking washer is just in the tooth pin groove.

⚠ Personal injury can result from bucket falling.

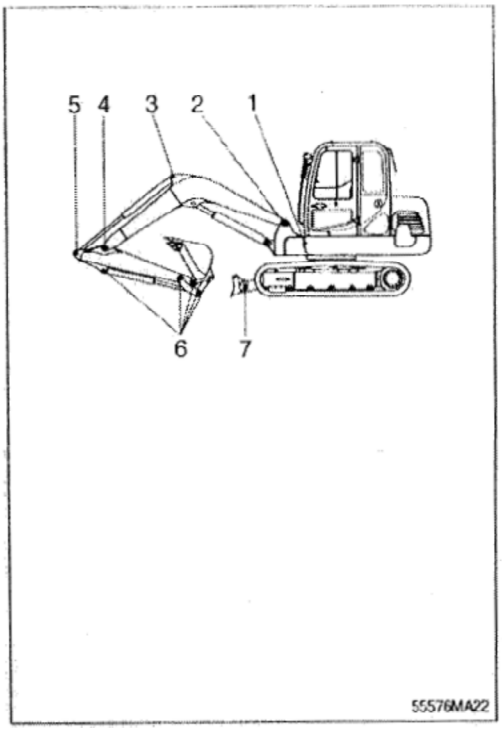
⚠ Block the bucket before changing tooth tips or side cutters.



31) Lubrication of pin and bushing

(1) Lubricate each pin of the working device. Apply grease to the grease nipple according to the lubricating interval.

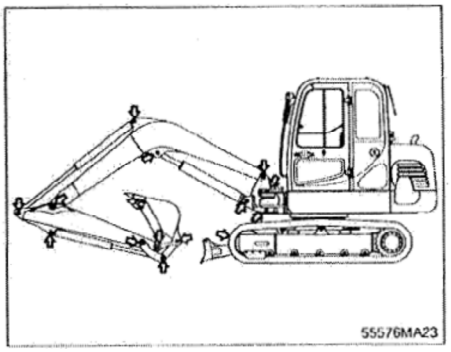
No.	Description	Qty
1	Lubrication manifold at upper frame	4
2	Boom connection pin	2
3	Boom cylinder (head and rod side)	2
4	Arm cylinder pin (head and rod side)	2
5	Boom and arm connection pin	1
6	Bucket cylinder pin (head and rod)	2
	Bucket rod (control rod)	1
	Arm and bucket connection pin	1
	Arm and control rod connection pin	1
7	Dozer connection pin	2
	Dozer cylinder pin	2



※ Shorten the lubrication interval when working in the water or dusty place.

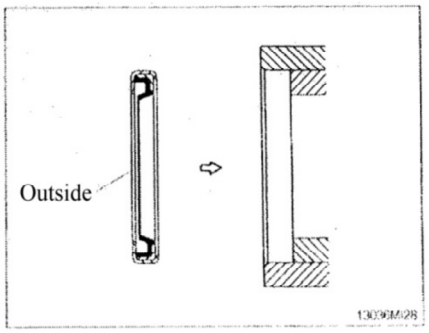
(2) Dust seals are mounted on the rotating part of the working device to extend the lubrication interval.

※ Mount the lip to face outside when replacing the dust seal.



※ If it is assembled in a wrong direction, it will cause fast wear of the pin and bushing, and create noise and vibration during operation.

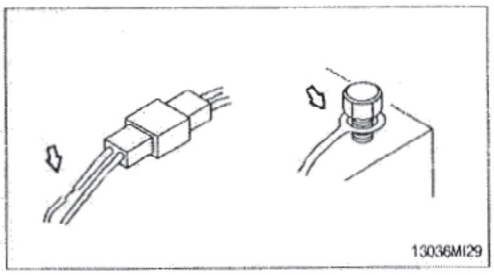
※ Assemble the seal in the same direction, as shown in the picture. Use a plastic hammer during assembly.



7. Electrical System

1) Wiring and gauges

Check regularly and repair loose or malfunctioning gauges when found.



2) Battery

(1) Cleaning

① Wash the terminal with hot water if it is contaminated, and apply grease to the terminal after washing.

⚠ Battery gas may explode. Keep sparks and flames away from batteries.

⚠ Always wear protective glasses when working with batteries.

⚠ Do not stain clothes or skin with electrolyte as it is acid.

Be careful not to get the electrolyte in eyes. Wash with clean water and go to the doctor if it enters the eyes.

(2) Recycling

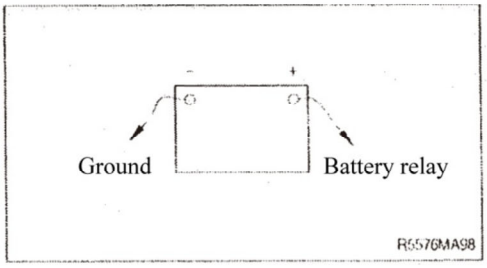
Never discard a battery.

Always return the used batteries to one of the following locations.

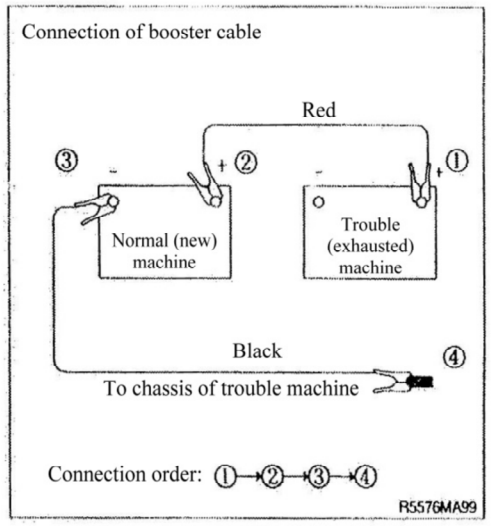
- Battery supplier
- Authorized battery collection facilities
- Recycling facilities

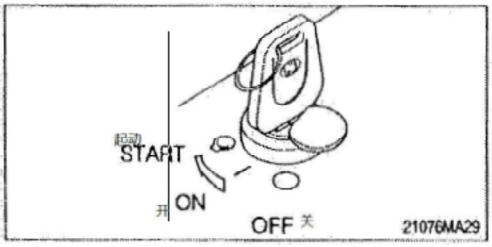
(3) Removal of battery cable

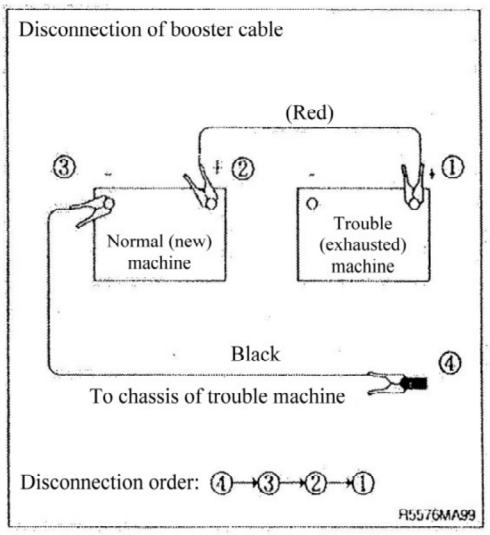
Remove the ground cable (O terminal) and install it last during reassembly.



3) Start the engine with booster cable
Start the engine with a booster cable as follows.
(1) Connection of booster cable
※ Use the battery that has the same capacity.
① Make sure that the starting switches of the normal machine and trouble machine are both in the “OFF” position.
② Connect the red terminal of the booster cable to the battery terminal (+).
③ Connect the black terminal of the booster cable between the battery terminal (-) and the undercarriage of the trouble machine.
※ Keep proper contact, and loose contacts may cause sparks.
(2)Start of engine
① Start the engine of the normal machine and keep running at a high speed.
② Start the trouble machine with the starting switch.
③ If you cannot start it by one time, restart the engine after 2 minutes.
(3) Removal of booster cable
① Remove the booster cable (black) of the trouble machine.
② Remove the booster cable (red) from the terminal (+) of the normal machine.
③ Remove the booster cable (red) from the terminal (+) of the normal machine.
④ Remove the booster cable from the terminal (+) of the trouble machine.
⚠ Flammable gas is generated when the battery is used or charged. Keep away from flames and be careful not to cause the spark.
※ Charge the battery in a well ventilated place.
※ Place the machine on the ground or concrete floor instead of a steel plate during charging.
※ Do not connect the terminals (+ and -) when connecting the booster cable. Otherwise, short circuits may be caused.







(4) Welding repair

Before welding, follow the procedures below.

① Shut off the engine and remove the starting switch.

② Disconnect the ground cable from the battery to avoid short circuits.

③ Disconnect the wiring of the alternator.

⚠ Do not start welding before the above procedures are completed!

Otherwise, the electrical system may be damaged seriously.

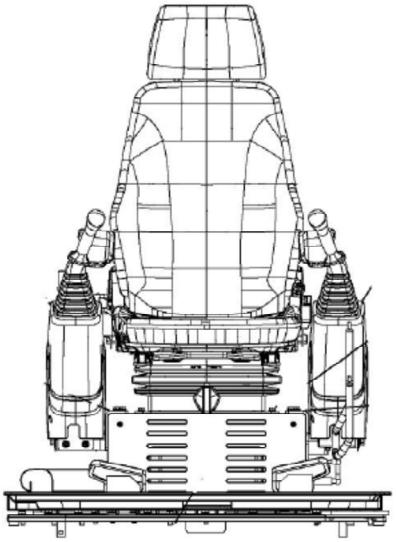
8. Air Conditioner and Heater

1) Cleaning and replacement of circulation filter

※ Always stop the engine before servicing.

(1) Remove the screw and cover on the seat base.

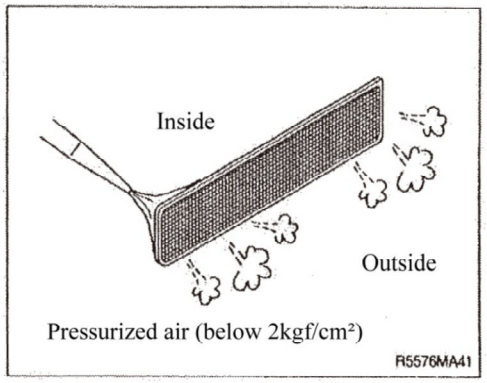
(2) Remove the circulation filter.



(4) Clean the filter using pressurized air (below 2 kgf/cm^2, 28psi).

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

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



2) Precautions for use of air conditioner

(1) When using the air conditioner for a long time, open the window once an hour.

(2) Be careful not to overcool the cab.

(3) The cab is properly cooled (about 5°C lower than the outside temperature) if the operator feels cool after entering there from outside.

(4) When cooling, change air occasionally.

3) Check during season

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

4) 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.

1. Engine

This guide is not intended to cover every condition, but many of common possibilities are listed.

Trouble	Service	Remark
The engine oil pressure lamp is ON when the engine speed is raised after warming up.	• Add engine oil to the specified level. • Replace the engine oil filter element. • Check oil leakage from the pipe or joint. • Replace the monitor.	
Steam is emitted from the top (pressure valve) of the radiator. The coolant level warning lamp is ON.	• Supply the coolant and check leakage. • Adjust the fan belt tension. • Wash the inside of the cooling system. • Clean or repair the radiator fin. • Check the thermostat. • Tighten the radiator cap firmly or replace its bushing. • Replace the monitor.	
The starting motor works normally but the engine cannot be started.	• Add fuel. • Check where air is leaking into fuel system. • Check the injection pump or nozzle. • Check the valve clearance. • Check the compression pressure of the engine.	
Exhaust gas is white or blue.	• Adjust to the specified oil quantity. • Replace fuel as required.	
Exhaust gas occasionally turns black.	• Clean or replace the air cleaner element. • Check the nozzle. • Check the compression pressure of the engine. • Clean or replace the turbocharger.	
Combustion noise occasionally turns abnormal.	• Check the nozzle.	
The engine has abnormal noise.	• Check fuel for conformity. • Check overheating. • Replace the muffler. • Adjust the valve clearance.	

2. Electrical System

Trouble	Service	Remark
The lamp is not ON even when the engine runs at a high speed. Or, the lamp flickers when the engine is running.	• Check for loose terminals and open-circuit wiring. • Adjust the belt tension.	
The battery charging lamp is ON when the engine runs at a high speed.	• Check the alternator. • Check and repair wiring.	
Unusual noise is emitted from the alternator.	• Check the alternator.	
The starting motor does not turn when the starting switch is turned to the "START" position.	• Check and repair the wiring. • Charge the battery. • Check the starting motor. • Check the safety relay.	
The pinion of the starting motor keeps going in and out.	• Charge the battery. • Check the safety relay.	
The starting motor turns the engine sluggishly.	• Charge the battery. • Check the starting motor.	
The starting motor is disengaged before the engine is started.	• Check and repair the wiring. • Charge the battery.	
The engine warming-up lamp does not go ON.	• Check and repair wiring. • Check the monitor.	
The engine oil pressure lamp does not light up when the engine is stationary (the starting switch is in the ON position.)	• Check the monitor. • Check the warning lamp.	
The battery charging lamp does not light up when the engine is stationary (the starting switch is in the ON position.)	• Check the monitor. • Check and repair the wiring.	

3. Others

Trouble	Service	Remark
The track slips out of place. The sprocket is worn excessively.	• Adjust the track tension.	
The bucket either rises slowly or not at all.	• Add oil to the specified level.	
The speed of travel, swing, boom, arm and bucket is low.	• Add oil to the specified level.	
Unusual noise is emitted from the main pump.	• Clean the hydraulic tank strainer.	
The temperature of hydraulic oil rises too quickly.	• Clean the oil cooler. • Adjust the fan belt tension. • Add oil to the specified level.	

1. Selection of Hydraulic Breaker

1) Be familiar with the manual and select the breaker suitable to machine specifications.

2) Make careful selection in consideration of oil quantity, pressure and striking force, to enable satisfied performance.

3) For selection of a breaker, consult your local dealer of Hyundai.

2. Circuit Configuration

1) As for the breaker oil pressure line, use the extra spool of main control valve.
2) Set the proper breaker pressure on the load relief valve.
3) The pressure of the HX60S system is 240 kgf/cm^2.
4) The accumulator should be used to the breaker charging and return line.
If the accumulator is not used, the machine may be damaged due to vibration.
※ Keep the pressure pulsation of the pump below 60 kgf/cm^2 (853 psi) by installing the accumulator.
5) Do not connect the breaker return line to the main control valve, but to the return line.
6) Do not connect the breaker return line to drain lines, such as that of the swing motor, travel motor or pump. Otherwise they may be damaged.
7) One spool of the main control valve should be connected to the tank.
8) Select the oil pipe with an appropriate diameter, considering the back pressure.
9) The seamless pipe should be use, and the hoses and seals used must be supplied by Hyundai.
10) Weld a bracket for the pipe lamp, to prevent damage caused by vibration.
11) Contact us for the installation of other parts.

3. Maintenance

1) Maintenance of hydraulic oil and filter

(1) For a machine with a hydraulic breaker, hydraulic oil is prone to severe contamination.

(2) Unless frequently maintained, the machine may easily go out of order.

(3) Inspect and maintain hydraulic oil and 4 kinds of filter elements on a regular basis, in order to prolong the machine life.

(4) Replace the hydraulic oil and element after the breaker has been used for some time, according to the criteria in the right table.

Maintenance Cycle

Unit: hour

Working Device	Operation Rate	Hydraulic Oil	Filter Element
Bucket	100%	2,000	250
Breaker	100%	600	100

- Replace the following filters at the same time.
- Hydraulic oil return filter: 1 pc
- Pilot oil line filter: 1 pc
- Air breather element of hydraulic tank: 1 pc

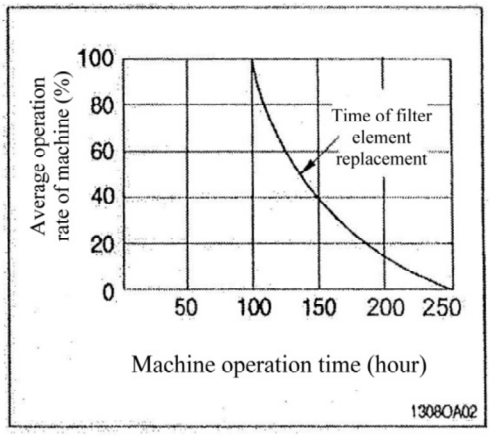
2) Release of the pressure in breaker circuit

When breaker operation is finished, stop the engine and push the pedal or breaker switch to release the pressure in the breaker circuit.

3) Be careful to prevent contamination by dust, sand and etc.

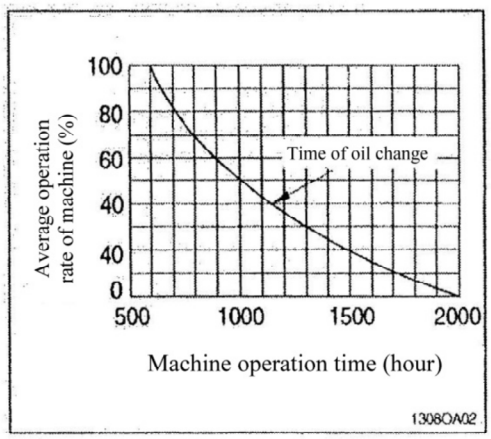
If such pollutants are mixed into the oil, the moving parts of the pump will be worn abnormally, which will shorten their lifetime.

Guide for Replacement of Hydraulic Breaker Filter



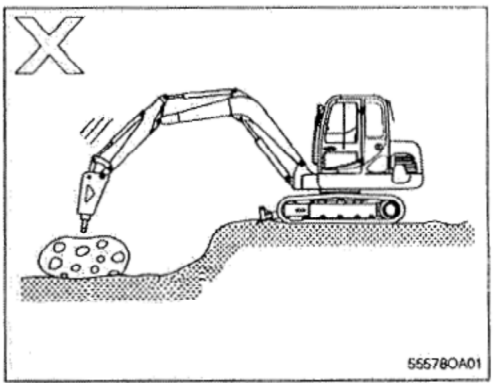
4) When the breaker is operating, bolts and nuts of main parts may be loosened by vibration. So, they must be inspected periodically.

Guide for Replacement of Hydraulic Oil Change of Hydraulic Breaker



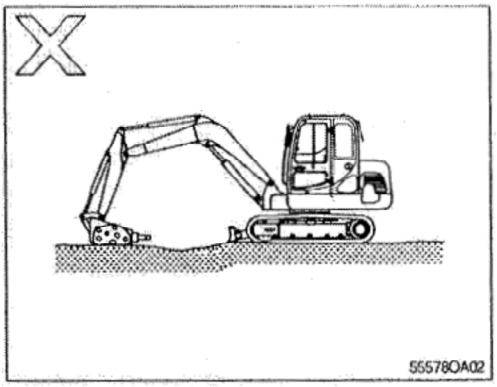
4. Precautions for Breaker Operation

⚠ Before using the breaker, fully estimate whether fragments will be splashed onto the cab, and whether any part will fall off. If these dangers may occur, install a protective net on the front side of the cab and a protective structure against falling objects. Close the front window and skylight window of the cab before operation.

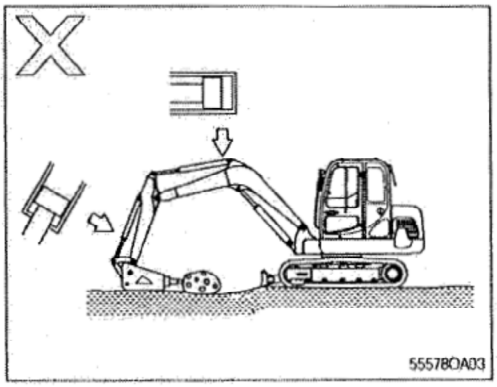


1) Do not break rocks while lowering.
As the breaker is heavy in comparison with the bucket, it must be operated slowly.
If the breaker is rapidly pushed down, the working device may be damaged.

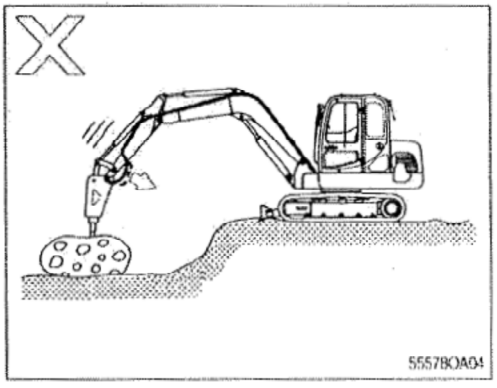
2) Do not use the breaker to carry broken stones or rocks by swing operation.
This may damage the operation device and swing system.



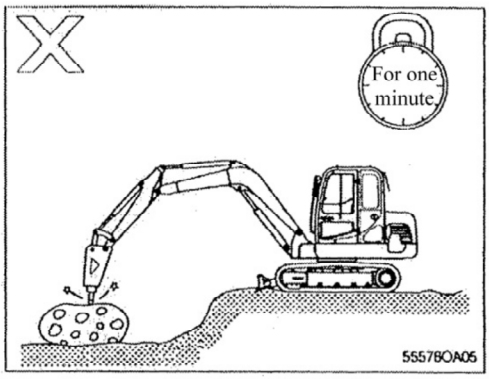
3) Operate the breaker with a gap in excess of 100 mm (4 inches) between the piston tip and cylinder.
If the piston tip is in contact with the cylinder, the cylinder may be damaged during breaker operation.



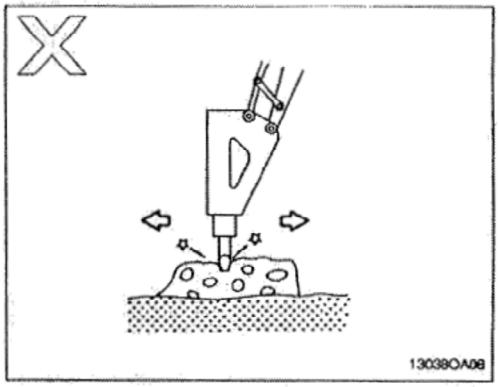
4) Excessive vibration of hydraulic hose
If this frequently occurs, bolt loosening, oil leakage and pump pipe damage will be caused.



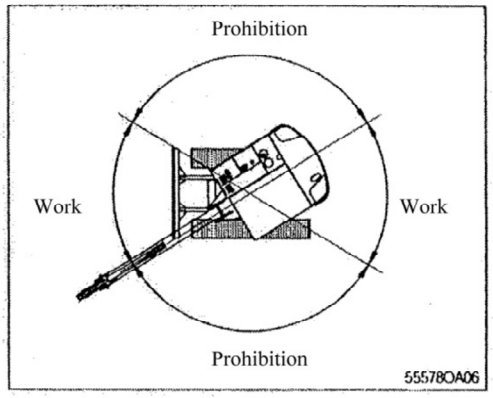
5) Do not continue to working over one minute in the same position of the boom and arm.
This will increase the oil temperature, and cause damage to the accumulator and seals.



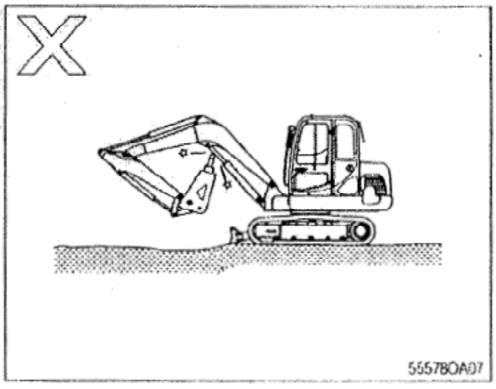
6) Do not move the machine or breaker during striking.
Do not move the hammer during striking.
This will cause damage to the working device and swing system.



7) Do not operate the breaker in the swing state.
Do not operate the breaker when the superstructure is swinging.
Otherwise, it may cause oil leakage of the roller and damage to the track.



8) Prevent the boom surface from damage caused by the breaker.
Pay particular attention to the operation of the arm and bucket control levers.

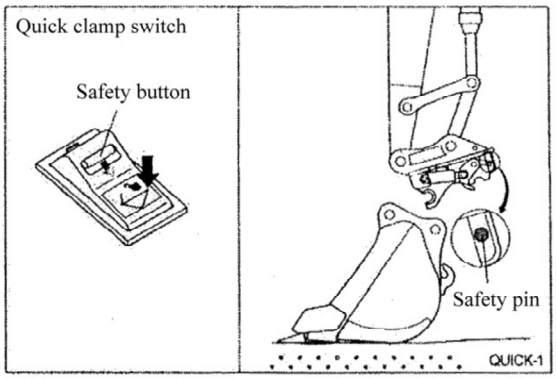


5. Quick Clamp

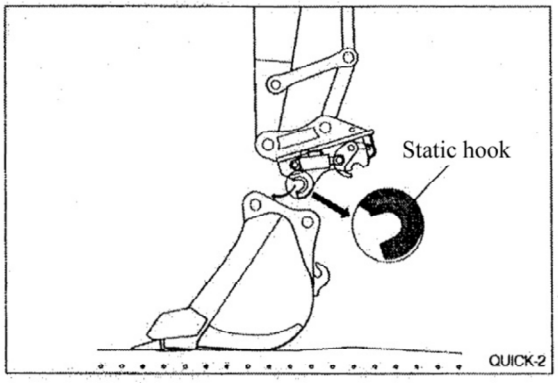
1) Fixing bucket with quick clamp

(1) Before fixing the bucket, remove the safety pin from the hook.

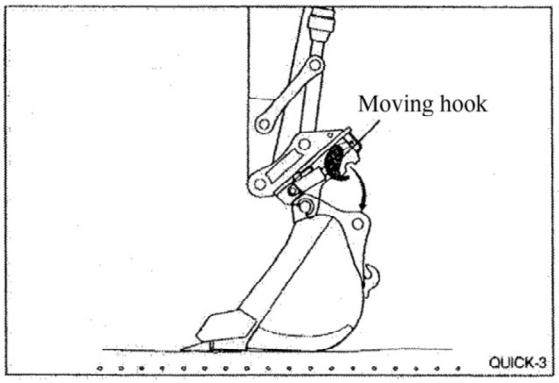
(2) Pull the safety button, and press the quick clamp switch to release the hook.



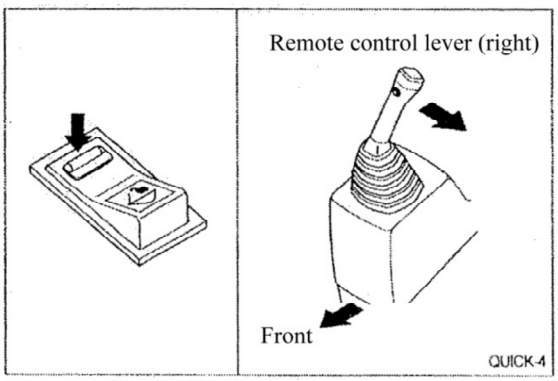
(3) Align the arm and bucket, and insert the static hook of the quick clamp to the bucket pin.



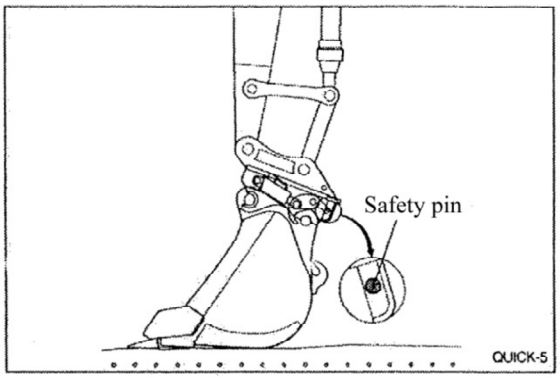
(4) Operate the remote control lever to the bucket-in position. Then, the static hook is coupled with the bucket rod pin.
Make sure that the moving hook is completely in contact with the bucket rod pin.



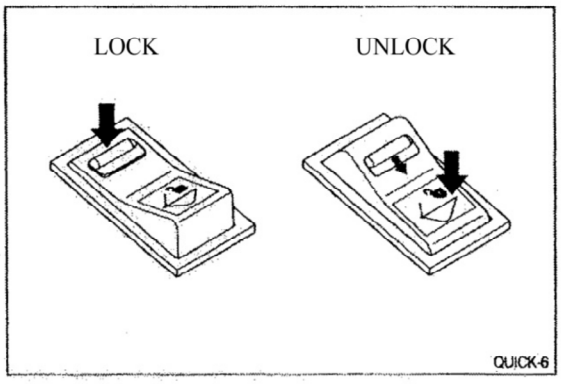
(5) Press the quick clamp switch to the "LOCK" position.
Operate the remote control lever to the bucket-in position.
※ Check the connection between the bucket pins and hooks of quick clamp.



(6) After checking the connection between the bucket pins and hooks of quick clamp, insert the safety pin until the moving hook is in the LOCK position.



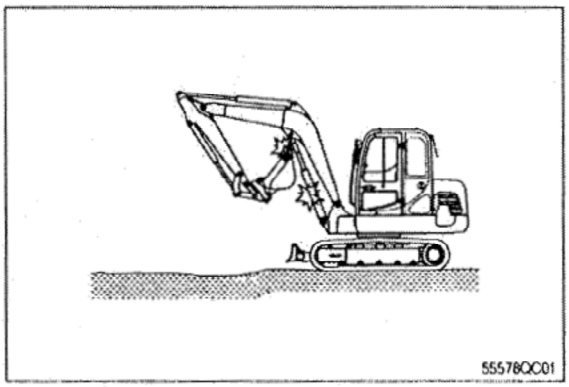
2) Remove the bucket from the quick clamp.
The procedures of removal are reverse of fixing.



3) Precaution for use of quick clamp

⚠ The quick clamp must be operated in the LOCK position and with the safety pin. If the machine is started with the quick clamp switch unlocked or no safety pin, the bucket may drop off, causing an accident.

⚠ If a quick clamp is used, the swing radius of the working device will increase. Prevent the collision against the cab, boom or arm cylinder during operation.



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