

SECTION 1 GENERAL



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SECTION 1 GENERAL

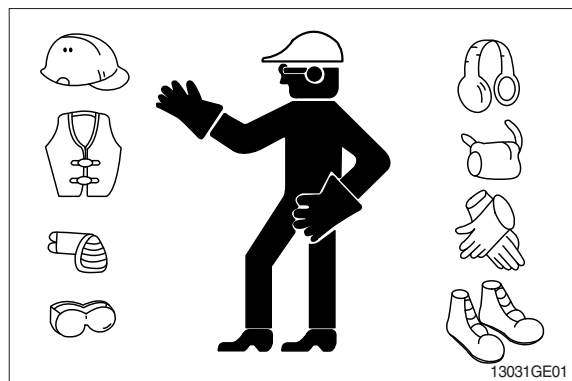
GROUP 1 SAFETY

FOLLOW SAFE PROCEDURE

Unsafe work practices are dangerous. Understand service procedure before doing work; Do not attempt shortcuts.

WEAR PROTECTIVE CLOTHING

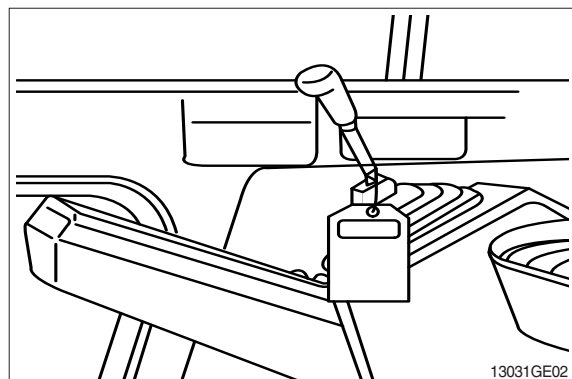
Wear close fitting clothing and safety equipment appropriate to the job.



WARN OTHERS OF SERVICE WORK

Unexpected machine movement can cause serious injury.

Before performing any work on the excavator, attach a 「Do Not Operate」 tag on the right side control lever.



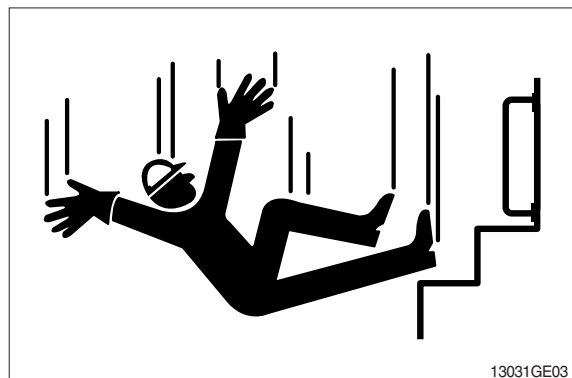
USE HANDHOLDS AND STEPS

Falling is one of the major causes of personal injury.

When you get on and off the machine, always maintain a three point contact with the steps and handrails and face the machine. Do not use any controls as handholds.

Never jump on or off the machine. Never mount or dismount a moving machine.

Be careful of slippery conditions on platforms, steps, and handrails when leaving the machine.

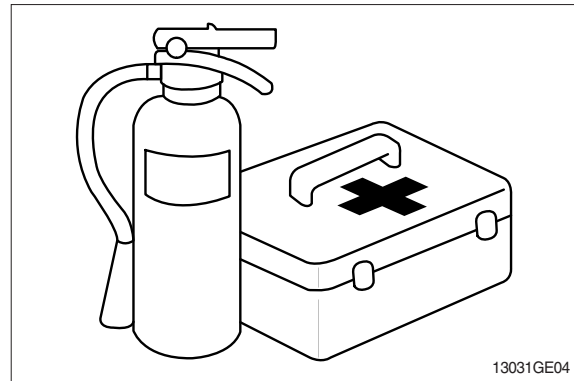


PREPARE FOR EMERGENCIES

Be prepared if a fire starts.

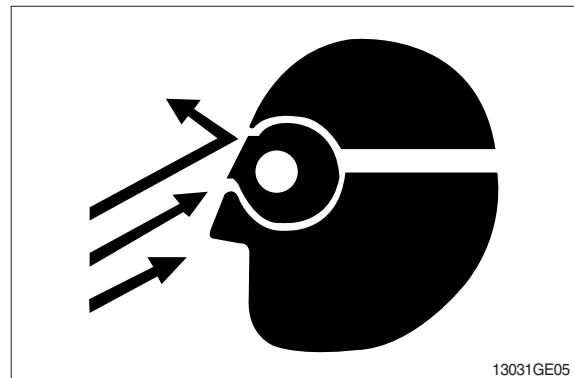
Keep a first aid kit and fire extinguisher handy.

Keep emergency numbers for doctors, ambulance service, hospital, and fire department near your telephone.



PROTECT AGAINST FLYING DEBRIS

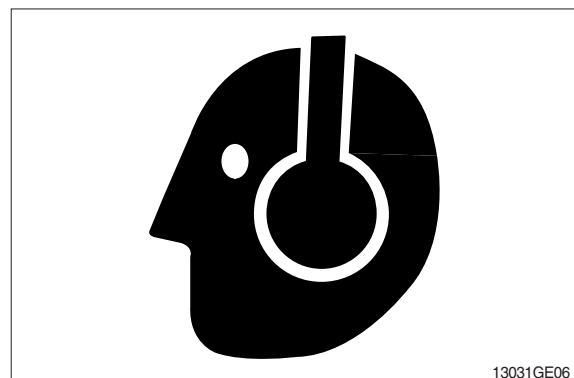
Guard against injury from flying pieces of metal or debris; Wear goggles or safety glasses.



PROTECT AGAINST NOISE

Prolonged exposure to loud noise can cause impairment or loss of hearing.

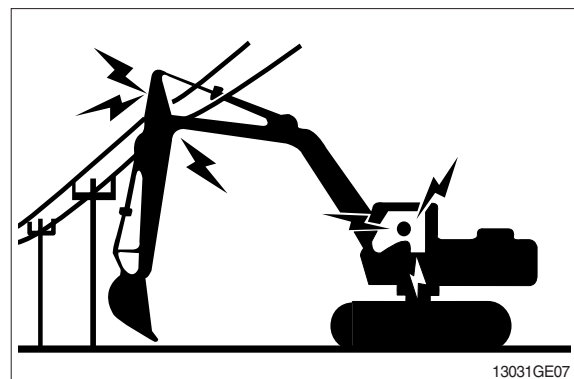
Wear a suitable hearing protective device such as earmuffs or earplugs to protect against objectionable or uncomfortable loud noises.



AVOID POWER LINES

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

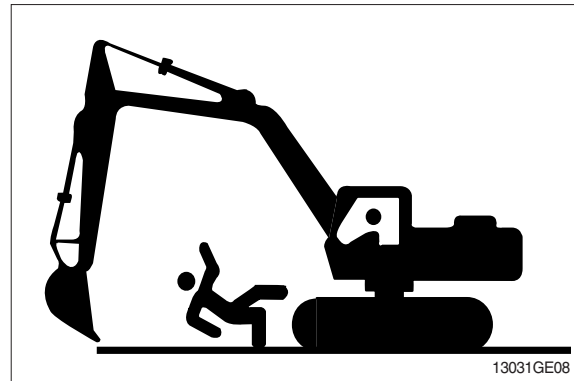
Never move any part of the machine or load closer to electric line than 3m(10ft) plus twice the line insulator length.



KEEP RIDERS OFF EXCAVATOR

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

Riders on excavator are subject to injury such as being struck by foreign objects and being thrown off the excavator. Riders also obstruct the operator's view resulting in the excavator being operated in an unsafe manner.

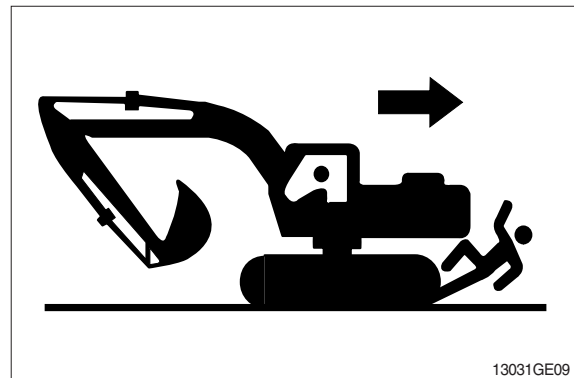


MOVE AND OPERATE MACHINE SAFELY

Bystanders can be run over. Know the location of bystanders before moving, swinging, or operating the machine.

Always keep the travel alarm in working condition. It warns people when the excavator starts to move.

Use a signal person when moving, swinging, or operating the machine in congested areas. Coordinate hand signals before starting the excavator.



OPERATE ONLY FROM OPERATOR'S SEAT

Avoid possible injury machine damage. Do not start engine by shorting across starter terminals.

NEVER start engine while standing on ground. Start engine only from operator's seat.



PARK MACHINE SAFELY

Before working on the machine:

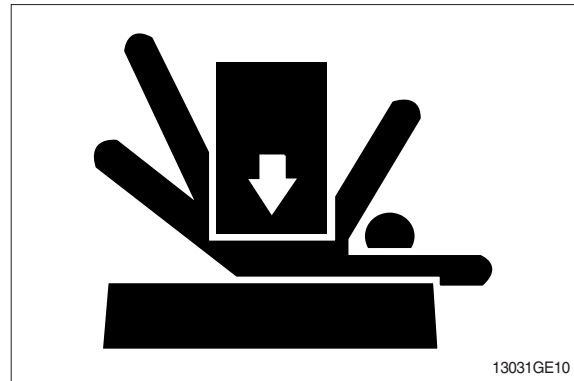
- Park machine on a level surface.
- Lower bucket to the ground.
- Turn auto idle switch off.
- Run engine at 1/2 speed without load for 2 minutes.
- Turn key switch to OFF to stop engine.
Remove key from switch.
- Move pilot control shutoff lever to locked position.
- Allow engine to cool.

SUPPORT MACHINE PROPERLY

Always lower the attachment or implement to the ground before you work on the machine. If you must work on a lifted machine or attachment, securely support the machine or attachment.

Do not support the machine on cinder blocks, hollow tiles, or props that may crumble under continuous load.

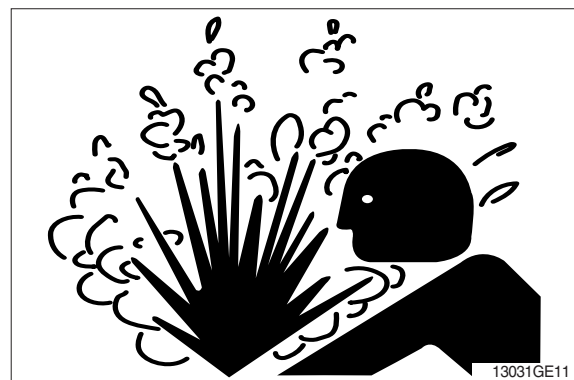
Do not work under a machine that is supported solely by a jack. Follow recommended procedures in this manual.



SERVICE COOLING SYSTEM SAFELY

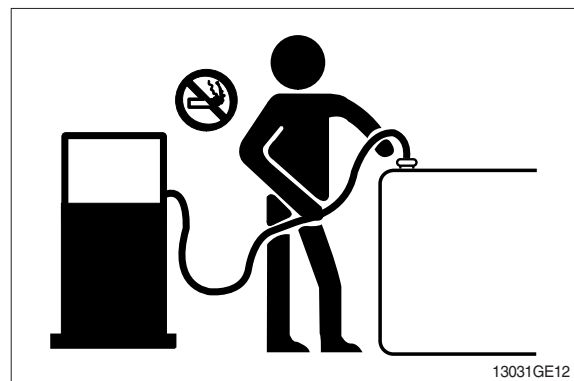
Explosive release of fluids from pressurized cooling system can cause serious burns.

Shut off engine. Only remove filler cap when cool enough to touch with bare hands.



HANDLE FLUIDS SAFELY-AVOID FIRES

Handle fuel with care; It is highly flammable. Do not refuel the machine while smoking or when near open flame or sparks. Always stop engine before refueling machine. Fill fuel tank outdoors.



Store flammable fluids away from fire hazards. Do not incinerate or puncture pressurized containers.

Make sure machine is clean of trash, grease, and debris.

Do not store oily rags; They can ignite and burn spontaneously.



BEWARE OF EXHAUST FUMES

Prevent asphyxiation. Engine exhaust fumes can cause sickness or death.

If you must operate in a building, be positive there is adequate ventilation. Either use an exhaust pipe extension to remove the exhaust fumes or open doors and windows to bring enough outside air into the area.

REMOVE PAINT BEFORE WELDING OR HEATING

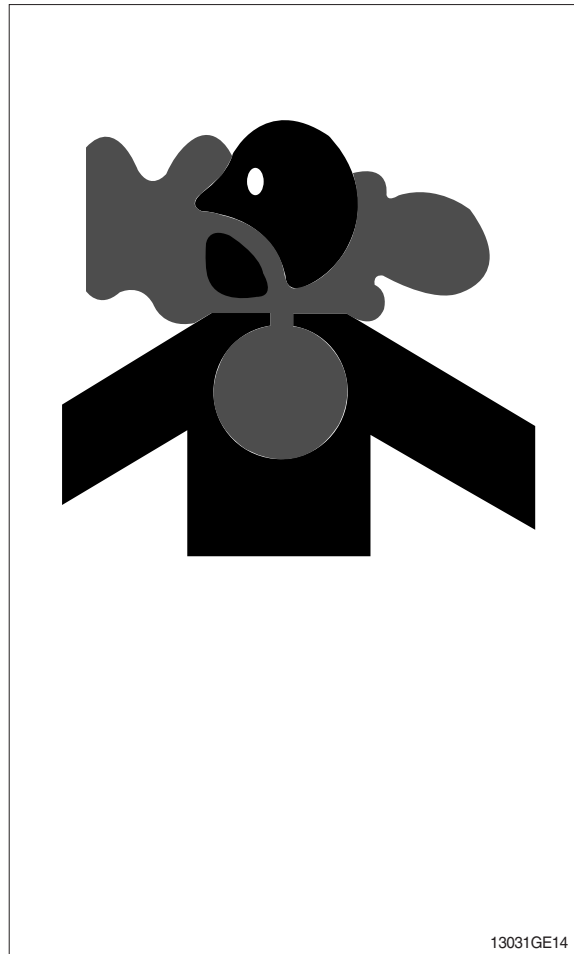
Avoid potentially toxic fumes and dust.

Hazardous fumes can be generated when paint is heated by welding, soldering, or using a torch.

Do all work outside or in a well ventilated area. Dispose of paint and solvent properly.

Remove paint before welding or heating:

- If you sand or grind paint, avoid breathing the dust. Wear an approved respirator.
- If you use solvent or paint stripper, remove stripper with soap and water before welding. Remove solvent or paint stripper containers and other flammable material from area. Allow fumes to disperse at least 15 minutes before welding or heating.



ILLUMINATE WORK AREA SAFELY

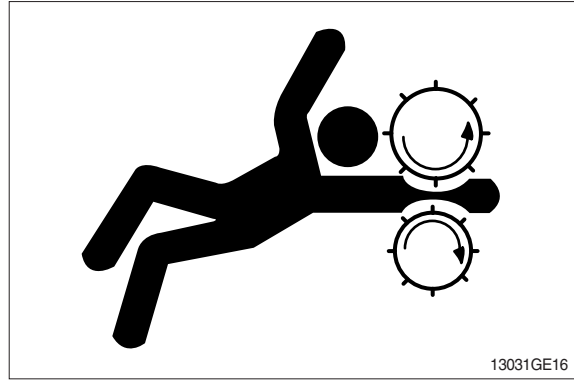
Illuminate your work area adequately but safely. Use a portable safety light for working inside or under the machine. Make sure the bulb is enclosed by a wire cage. The hot filament of an accidentally broken bulb can ignite spilled fuel or oil.



SERVICE MACHINE SAFELY

Tie long hair behind your head. Do not wear a necktie, scarf, loose clothing or necklace when you work near machine tools or moving parts. If these items were to get caught, severe injury could result.

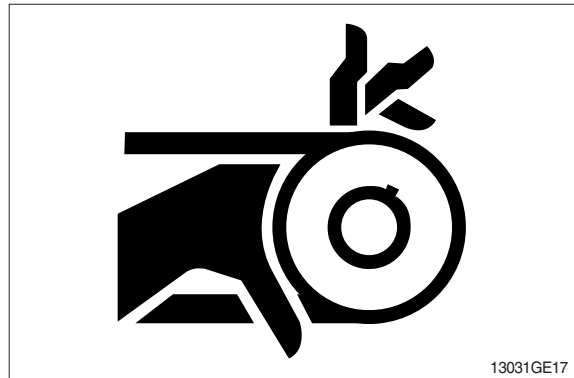
Remove rings and other jewelry to prevent electrical shorts and entanglement in moving parts.



STAY CLEAR OF MOVING PARTS

Entanglements in moving parts can cause serious injury.

To prevent accidents, use care when working around rotating parts.



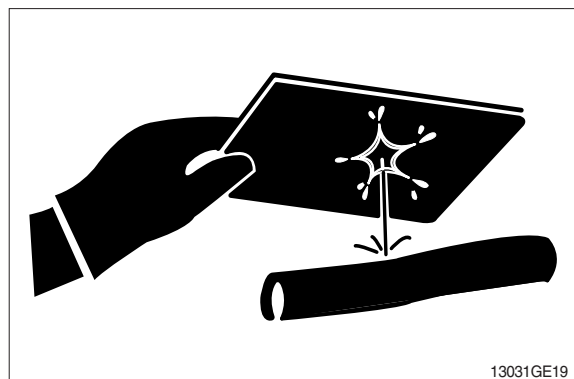
AVOID HIGH PRESSURE FLUIDS

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

Avoid the hazard by relieving pressure before disconnecting hydraulic or other lines. Tighten all connections before applying pressure.

Search for leaks with a piece of cardboard. Protect hands and body from high pressure fluids.

If an accident occurs, see a doctor immediately. Any fluid injected into the skin must be surgically removed within a few hours or gangrene may result.



AVOID HEATING NEAR PRESSURIZED FLUID LINES

Flammable spray can be generated by heating near pressurized fluid lines, resulting in severe burns to yourself and bystanders. Do not heat by welding, soldering, or using a torch near pressurized fluid lines or other flammable materials.

Pressurized lines can be accidentally cut when heat goes beyond the immediate flame area. Install fire resisting guards to protect hoses or other materials.



PREVENT BATTERY EXPLOSIONS

Keep sparks, lighted matches, and flame away from the top of battery. Battery gas can explode.

Never check battery charge by placing a metal object across the posts. Use a volt-meter or hydrometer.

Do not charge a frozen battery; It may explode. Warm battery to 16°C (60°F).



PREVENT ACID BURNS

Sulfuric acid in battery electrolyte is poisonous. It is strong enough to burn skin, eat holes in clothing, and cause blindness if splashed into eyes.

Avoid the hazard by:

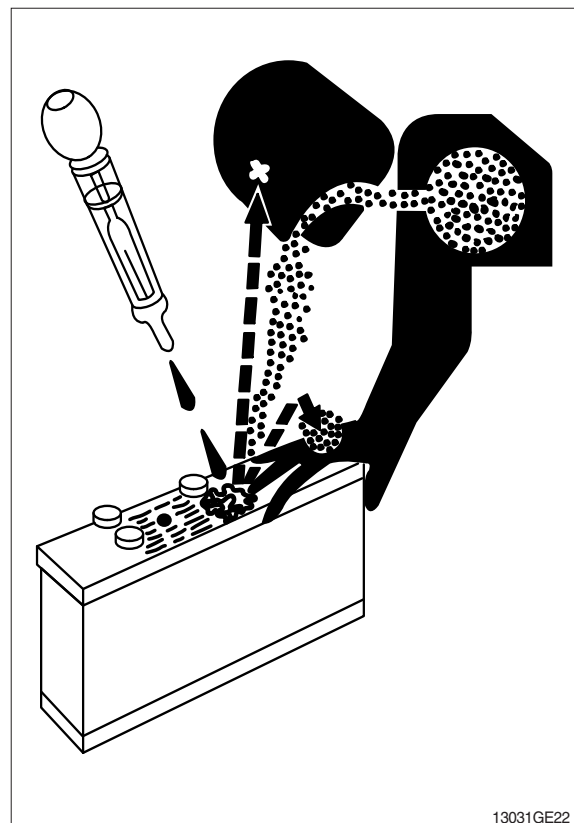
1. Filling batteries in a well-ventilated area.
2. Wearing eye protection and rubber gloves.
3. Avoiding breathing fumes when electrolyte is added.
4. Avoiding spilling or dripping electrolyte.
5. Use proper jump start procedure.

If you spill acid on yourself:

1. Flush your skin with water.
2. Apply baking soda or lime to help neutralize the acid.
3. Flush your eyes with water for 10-15 minutes. Get medical attention immediately.

If acid is swallowed:

1. Drink large amounts of water or milk.
2. Then drink milk of magnesia, beaten eggs, or vegetable oil.
3. Get medical attention immediately.



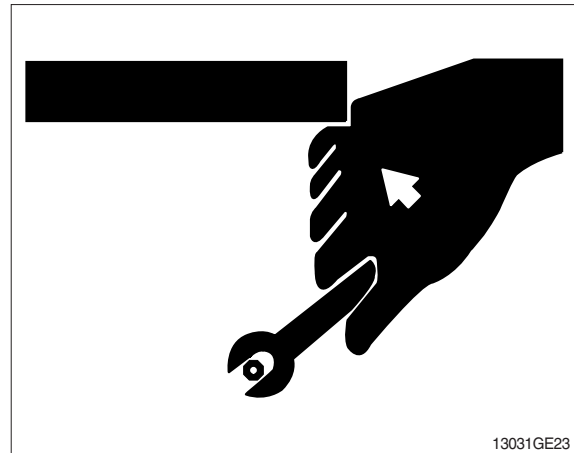
USE TOOLS PROPERLY

Use tools appropriate to the work. Makeshift tools, parts, and procedures can create safety hazards.

Use power tools only to loosen threaded tools and fasteners.

For loosening and tightening hardware, use the correct size tools. **DO NOT** use U.S. measurement tools on metric fasteners. Avoid bodily injury caused by slipping wrenches.

Use only recommended replacement parts.(see Parts catalogue.)

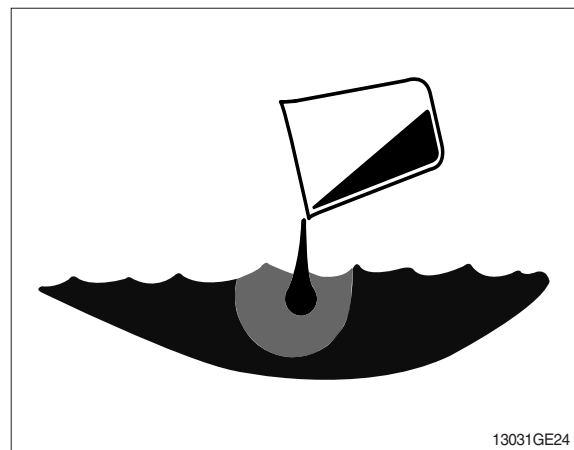


DISPOSE OF FLUIDS PROPERLY

Improperly disposing of fluids can harm the environment and ecology. Before draining any fluids, find out the proper way to dispose of waste from your local environmental agency.

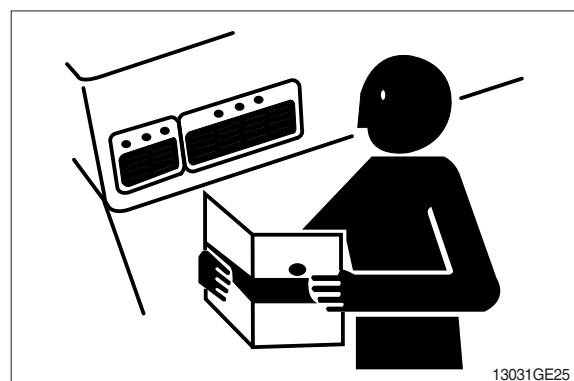
Use proper containers when draining fluids. Do not use food or beverage containers that may mislead someone into drinking from them.

DO NOT pour oil into the ground, down a drain, or into a stream, pond, or lake. Observe relevant environmental protection regulations when disposing of oil, fuel, coolant, brake fluid, filters, batteries, and other harmful waste.



REPLACE SAFETY SIGNS

Replace missing or damaged safety signs. See the machine operator's manual for correct safety sign placement.

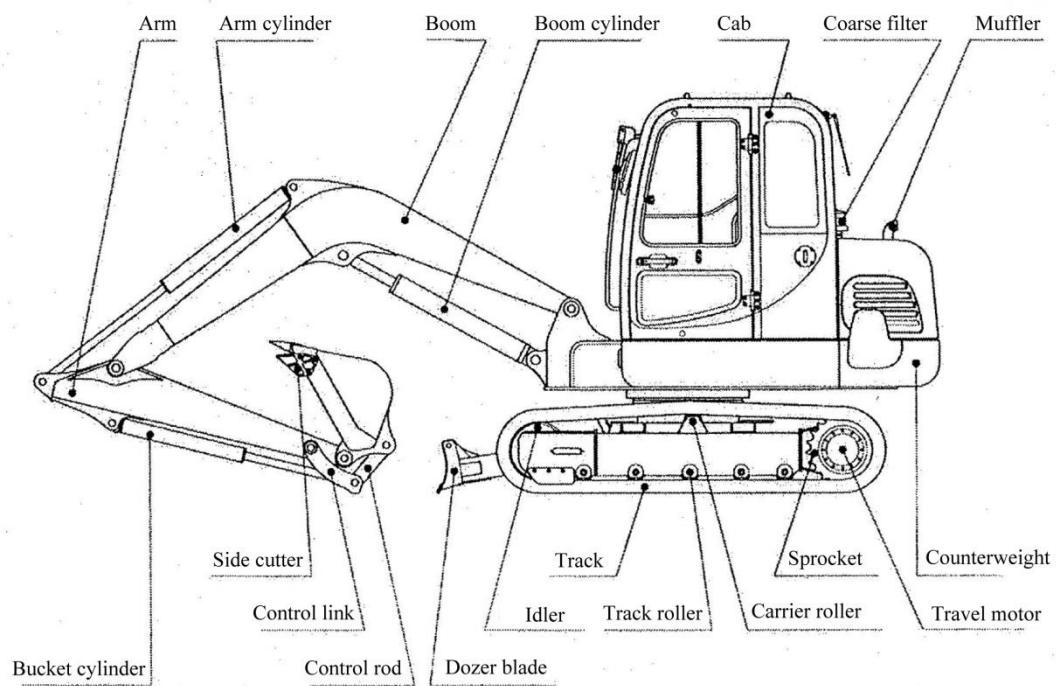
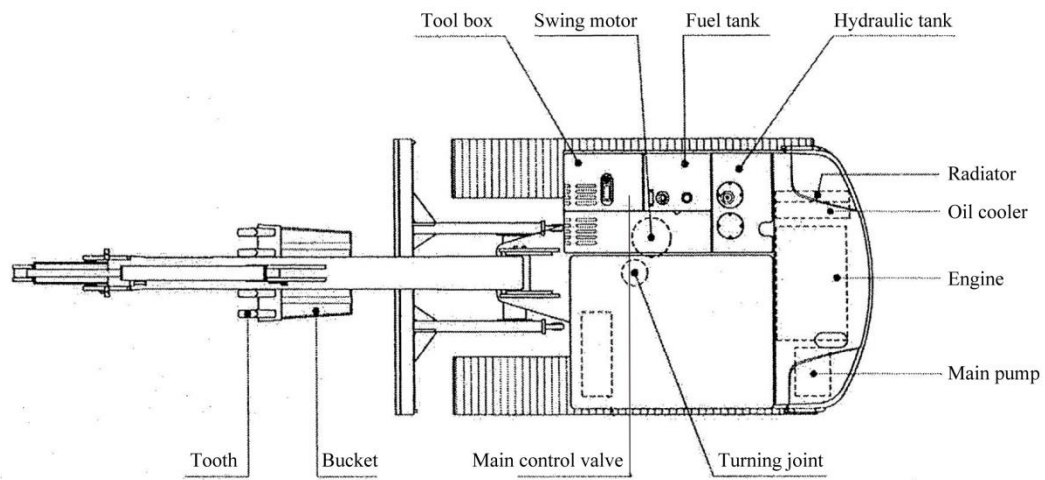


LIVE WITH SAFETY

Before returning machine to customer, make sure machine is functioning properly, especially the safety systems. Install all guards and shields.

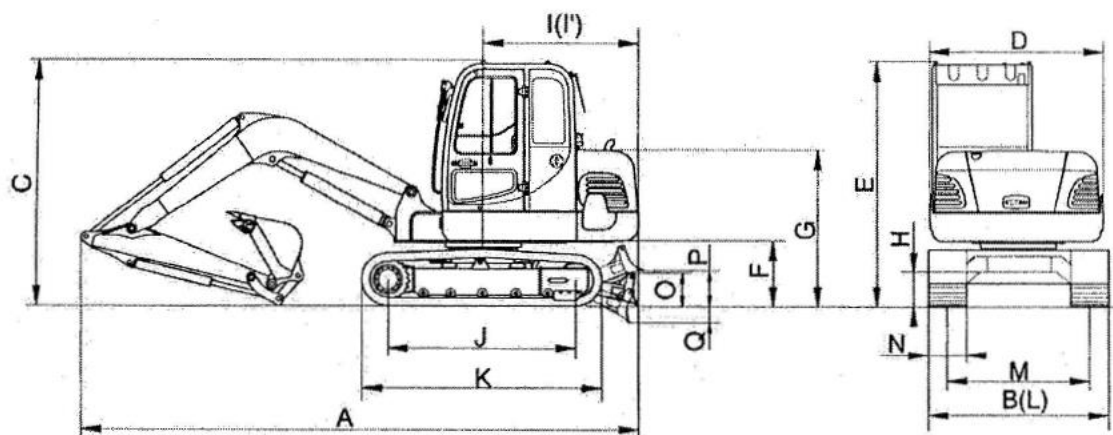
GROUP 2 SPECIFICATIONS

1. MAJOR COMPONENT



2. SPECIFICATIONS

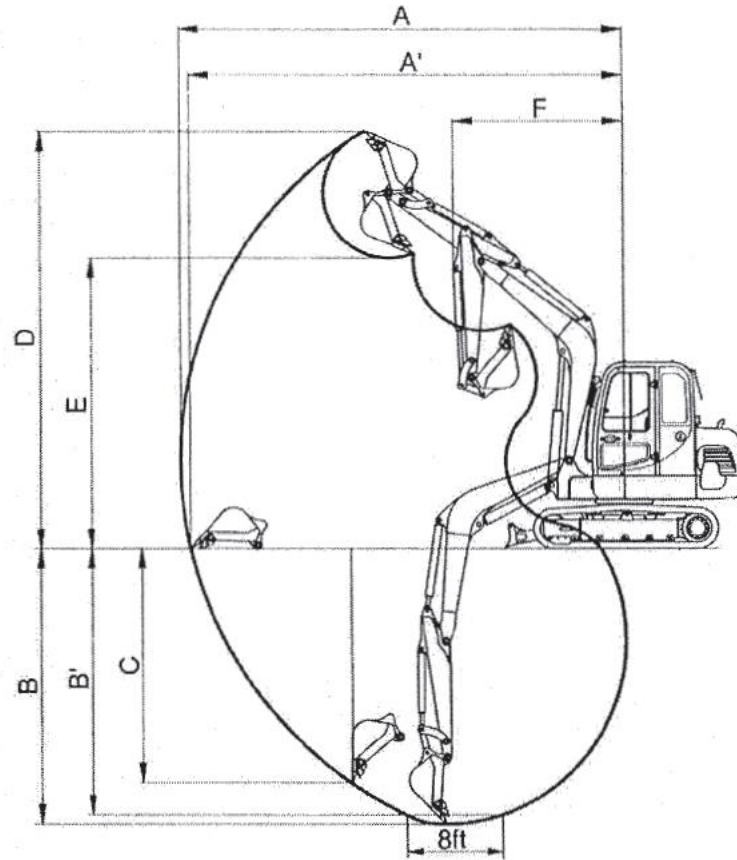
1) 3.0 m (9'10") mono boom, 1.6 m (5'3") arm



Description		Unit	Specification
Operating weight		kg	5,560
Bucket capacity (SAE heaped), standard		m ³	0.18
Overall length	A	mm	5,900
Overall width (400 mm track)	B		1,920
Overall height	C		2,500
Superstructure width	D		1,830
Overall height of cab	E		2,550
Ground clearance of counterweight	F		690
Engine cover height	G		1,650
Minimum ground clearance	H		380
Rear-end distance	I		1,640
Rear-end swing radius	I'		1,650
Distance between tumblers	J		1,990
Undercarriage length	K		2,530
Undercarriage width	L		1,900
Track gauge	M		1,500
Track shoe width, standard	N		400
Height of blade	O		350
Ground clearance of blade up	P		420
Depth of blade down	Q		540
Travel speed (low/high)		km/h	2.38/4.13
Swing speed		rpm	10.88
Gradeability		Degree (%)	35
Ground pressure (400 mm shoe)		kgf/cm ²	0.32

3. WORKING RANGE

1) 3.0 m (9'10") mono boom



Description		1.6 m Arm
Max digging reach	A	6,110 mm
Max digging reach on ground	A'	5,970 mm
Max digging depth	B	3,730 mm
Max digging depth (8' level)	B'	3,330 mm
Max vertical digging depth	C	2,835 mm
Max digging height	D	5,740mm
Max dumping height	E	4,040 mm
Min swing radius	F	2,350 mm
Bucket digging force	ISO	4,670 kgf
Arm digging force	ISO	2,750 kgf

4. WEIGHT

Item	HX55S
	kg
Upperstructure assembly	2,535
Main frame weld assembly	679
Engine assembly	260
Main pump assembly	22
Main control valve assembly	38
Swing motor assembly	76
Hydraulic oil tank assembly	80
Fuel tank assembly	60
Counterweight	220
Cab assembly	280
Lower undercarriage assembly	2,070
Track frame weld assembly	726
Swing bearing	100
Travel motor assembly	54
Turning joint	30
Tension body	30
Idler	70
Carrier roller	10
Track roller	10
Sprocket	20
Track-chain assembly (400 mm standard triple grouser shoe)	310
Dozer blade assembly	206
Working device assembly (3.0 m boom, 1.6 m arm, 0.21 m ³ SAE heaped bucket)	814
3.0 m boom assembly	282
1.6 m arm assembly	128
0.18m ³ SAE heaped bucket	168
Boom cylinder assembly	72
Arm cylinder assembly	54
Bucket cylinder assembly	36
Bucket control link assembly	40
Dozer cylinder assembly	34

5. LIFTING CAPACITIES

3.0 m (9'10") boom, 1.6 m (5'3") arm equipped with 0.18m³ (SAE heaped) bucket and 400 mm triple grouser shoe, the dozer blade down.

The parameters of HX55N are the same as those in the table below.

Table of Lifting Capacities

HX55S

Boom: 3.0 m (9'10")



Rating over-front

Arm: 1.6 m (5'3")



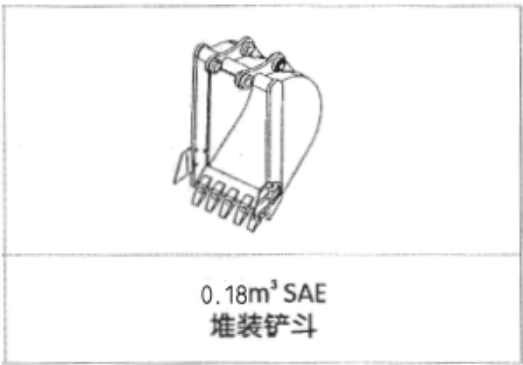
Rating over-side or 360 degree

Bucket: 0.18 m³ (SAE heaped)

Load point height (m/ft)		Load radius								At max. reach		
		2.0 m (6.6 ft)		3.0 m (9.8 ft)		4.0 m (13.1 ft)		5.0 m (16.4 ft)		Capacity		Reach
												m (ft)
4.0 m	kg					*1000	*990			*900	860	4.3
13.1 ft	lb					*2200	*2100			*1980	1900	(14.1)
3.0 m	kg					*1070	960			840	660	4.9
9.8 ft	lb					*2360	2120			1850	1460	(16.1)
2.0 m	kg	*3060	2870	*1670	1460	1150	910	790	620	730	580	5.2
6.6 ft	lb	*6750	6330	*3680	3220	2540	2010	1740	1370	1630	1280	(17.1)
1.0 m	kg			1720	1330	1090	860	740	59	700	560	5.27
3.3 ft	lb			3790	2930	2400	1900	1630	1300	1540	1230	(17.3)
Ground	kg	*1920	*1920	1640	1260	1050	820	740	580	720	560	5.1
line	lb	*4230	*4230	3620	2780	2310	1810	1630	1280	1590	1230	(16.7)
-1.0 m	kg	*3160	2480	1640	1260	1030	800			810	630	4.7
-3.3 ft	lb	*6970	5470	3620	2780	2270	1760			1790	1390	(15.4)
-2.0 m	kg	3470	2530	1650	127					1080	840	3.9
-6.6 ft	lb	7650	5580	364	2800					238	1850	(12.9)
-3.0 m	kg									*1640	*1640	2.35
-9.8 ft	lb									*3620	*3620	(7.7)

- 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		3.0 m boom
					1.6 m arm
0.18m³	0.15m³	694 mm	757 mm	168 kg	Applicable for materials with density of 1600 kgf/m³ (2700 lb/yd³) or less

7. UNDERCARRIAGE

1) Track

Model	Category		Triple grouser shoe
			
HX55S	Shoe width	mm	400
	Operating weight	kg	5,560
	Ground pressure	kgf/cm ²	0.32
	Overall width	mm	1,900

2) Number of rollers and shoes on each side

Item	Quantity
Carrier rollers	1EA
Track rollers	5EA
Track shoes	40EA

8. SPECIFICATIONS FOR MAJOR COMPONENTS

1) Engine

Item	Specification
Model	XSNSRE/4TNV94L-ZXSHYB/4TNV94L-ZXSHYBC
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	94 × 110 mm
Piston displacement	3,054cc
Compression ratio	19:1
Rated gross horse power (SAE J1995)	36.2/2,200 (KW/rpm)
Maximum torque at 1,400 rpm	201.1N•m
Engine oil quantity	11.6L
Net weight of engine	260 kg
High idling speed	2,200+50 rpm
Low idling speed	1,050 ±100 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	63 cc/rev
Maximum pressure	240 kgf/cm ²
Rated oil flow	138 L/min
Rated speed	2,200 rpm

3) Main control valve

Item	Specification
Type	Sectional, 8 spools (one optional)
Operating method	Hydraulic pilot system
Main relief valve pressure	240 kgf/cm ²
Overload relief valve pressure	265 kgf/cm ²

4) Swing motor

Item	Specification
Type	Fixed-displacement axial piston motor
Capacity	28.87 cc/rev
Relief pressure	230 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 (284-570 psi)
Reduction gear type	2-stage planetary
Swing speed	10.88 rpm

5) Travel motor

Item	Specification
Type	Variable-displacement axial piston motor
Relief pressure	240 kgf/cm ²
Reduction gear type	2-stage planetary
Braking system	Automatic, spring applied hydraulic release

6) Remote control valve

Item		Specification
Type		Proportional pressure reduction
Operating pressure	Min.	6.5kgf/cm ²
	Max.	26kgf/cm ²
One-way operating stroke	Handle	6.5/8.5 mm (0.26/0.33 in)

7) Cylinder

Item		Specification
Boom cylinder	Bore dia × Rod dia × Stroke	Φ105 × Φ60 × 715 mm
	Cushion	Extend only
Arm cylinder	Bore dia × Rod dia × Stroke	Φ85 × Φ55 × 850 mm
	Cushion	Extend and retract
Bucket cylinder	Bore dia × Rod dia × Stroke	Φ80 × Φ50 × 660 mm
	Cushion	
Dozer cylinder	Bore dia × Rod dia × Stroke	Φ105 × Φ55 × 214 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.

8) Shoe

Item	Width	Ground pressure	Link quantity	Overall width
HX55S/HX55N	400 mm (16")	0.32 kgf/cm ²	40	1,900 mm (6'3")

9) Bucket

Item		Capacity		Tooth quantity	Width	
		SAE heaped	CECE heaped		Without side cutter	With side cutter
HX55S	Standard	0.18 m ³	0.15m ³	5	694mm	757 mm

9. RECOMMENDED OILS

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

Do not mix oils of different grades.

Service point	Kind of Fluid	Capacity (L)	Ambient temperature °C/°F						
			-20 (-4)	-10 (-14)	0 (32)	10 (50)	20 (68)	30 (86)	40 (104)
Engine oil pan	Engine oil	11.6					SAE 30		
			SAE 10W						
			SAE 10W-30						
				SAE 15W-140					
Swing drive	Grease	0.2	NLGI NO.1						
						NLGI NO.2			
Swing drive	Gear oil	1.5				SAE 85W-140			
Final drive		0.8x2							
Hydraulic tank	Hydraulic oil	Tank: 70 System: 120	ISO VG 32						
				ISO VG 46					
					ISO VG 68				
Fuel tank	Diesel fuel	118.5	ASTM D975 NO.1						
					ASTM D975 NO.2				
Fitting (grease nipple)	Grease	As required	NLGI NO.1						
					NOGI NO.2				
Radiator (reservoir tank)	Mixture of antifreeze and water 50:50	10							
					Ethylene glycol base permanent type				

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