SECTION 1 GENERAL

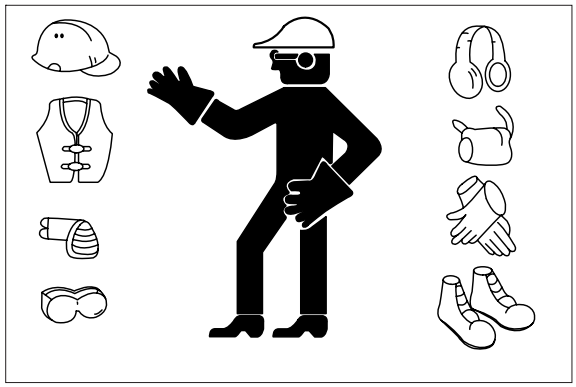
GROUP 1 SAFETY

FOLLOW SAFE PROCEDURE

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

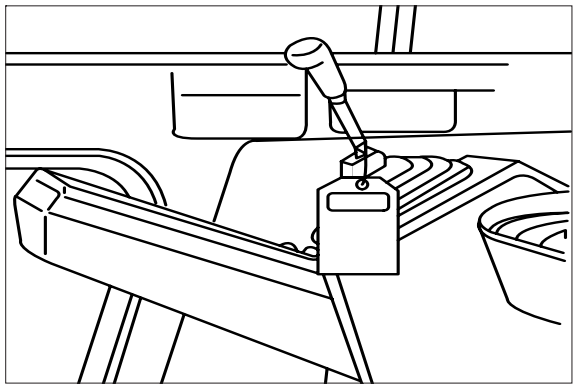
WEAR PROTECTIVE CLOTHING

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



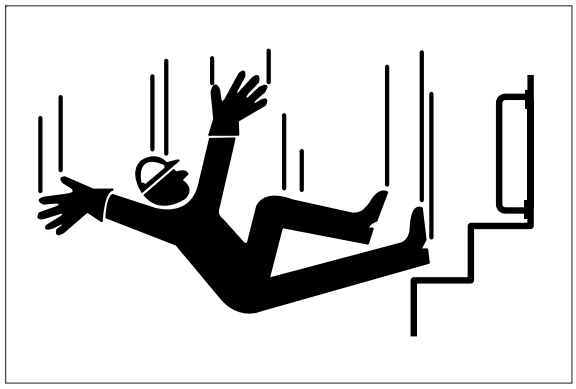
WARN OTHERS OF SERVICE WORK

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.

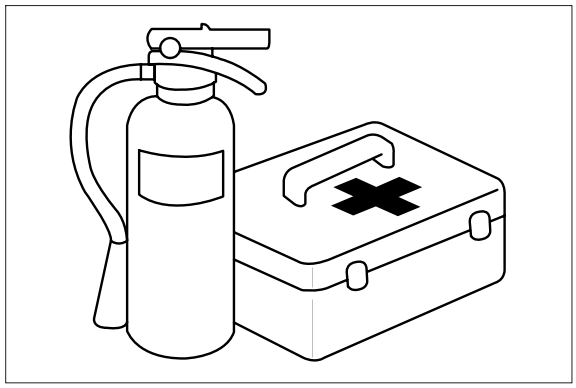


PREPARE FOR EMERGENCIES

Be prepared if a fire starts.

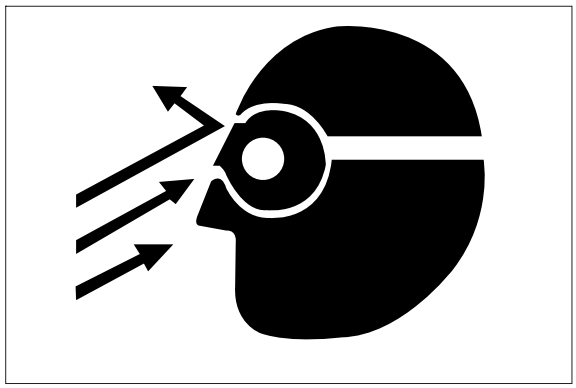
Keep a first aid kit and fire extinguisher handy.

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



PROTECT AGAINST FLYING DEBRIS

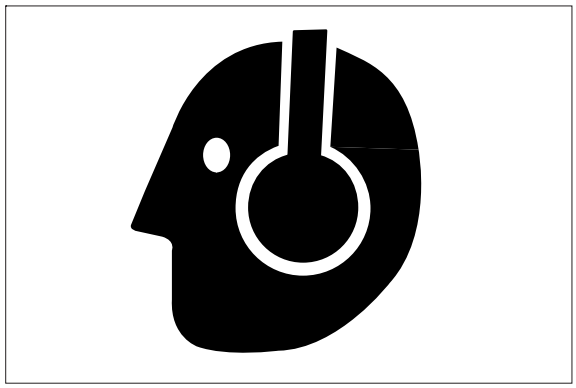
Guard against injury from flying pieces of metal or debris; Wear goggles or safety glasses.



PROTECT AGAINST NOISE

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

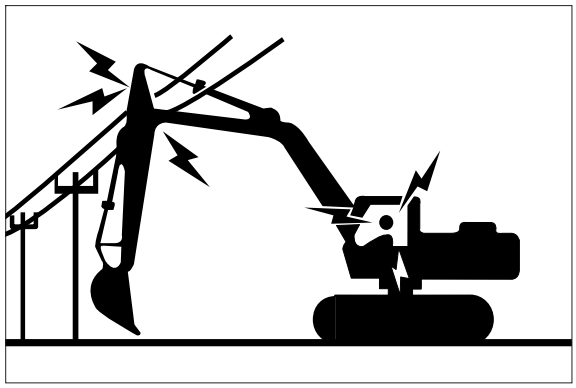
Wear a suitable hearing protective device such as earmuffs or earplugs to protect against objectionable or uncomfortable loud noises.



AVOID POWER LINES

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

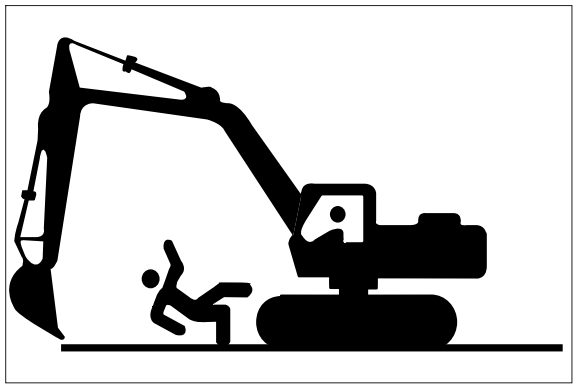
Never move any part of the machine or load closer to electric line than 3m(10ft) plus twice the line insulator length.



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.

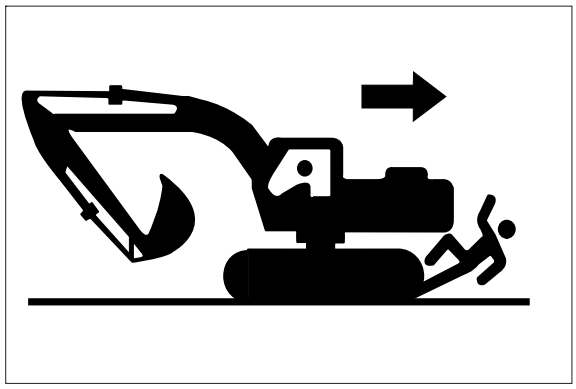


MOVE AND OPERATE MACHINE SAFELY

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.

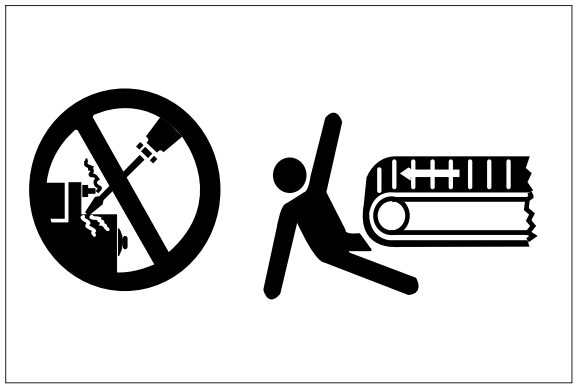
Use a signal person when moving, swinging, or operating the machine in congested areas. Coordinate hand signals before starting the excavator.



OPERATE ONLY FORM 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.

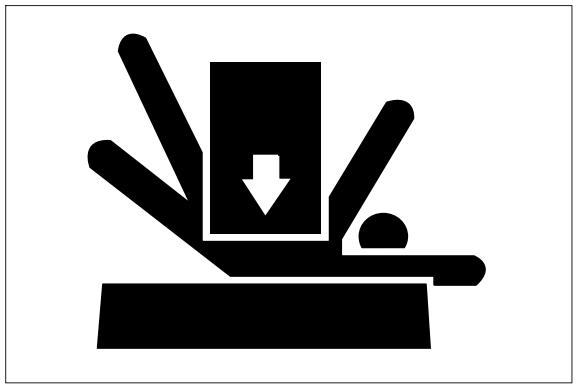


PARK MACHINE SAFELY

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.

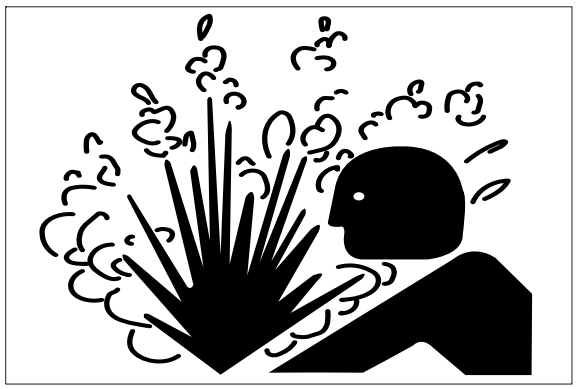
SUPPORT MACHINE PROPERLY



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

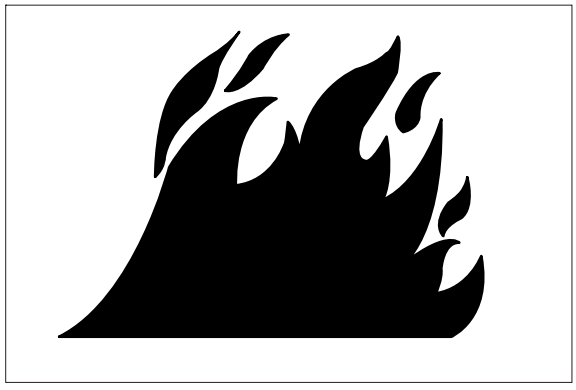


Explosive release of fluids from pressurized cooling system can cause serious burns.

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.

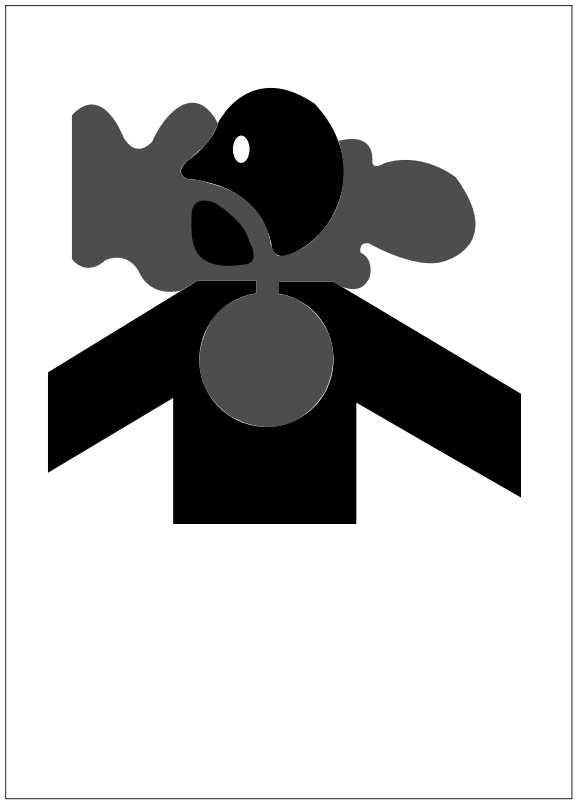


Store flammable fluids away from fire hazards. Do not incinerate or puncture pressurized containers.

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.

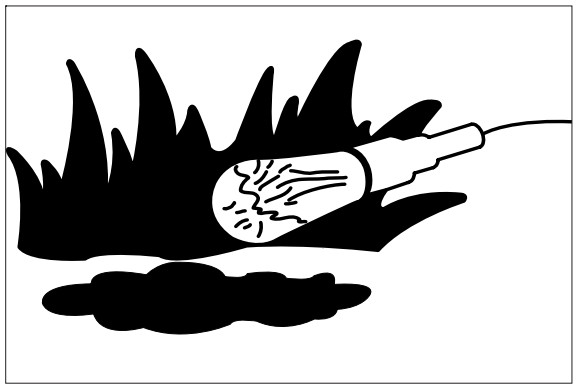
Hazardous fumes can be generated when paint is heated by welding, soldering, or using a torch.

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

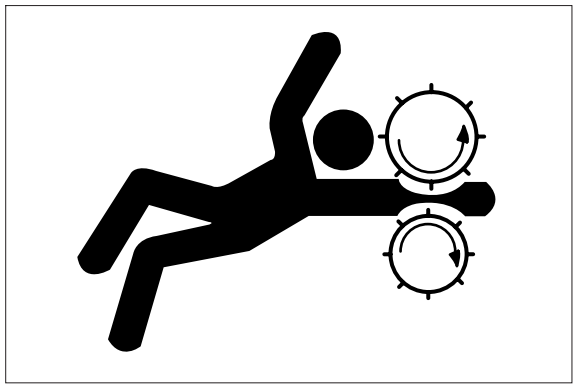


Illuminate your work area adequately but safely. Use a portable safety light for working inside or under the machine. Make sure the bulb is enclosed by a wire cage. The hot filament of an accidentally broken bulb can ignite spilled fuel or oil.

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.

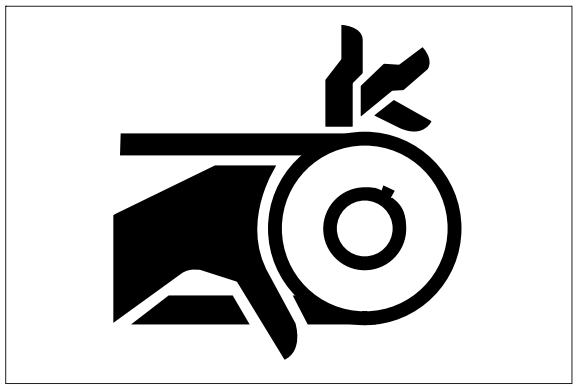
Remove rings and other jewelry to prevent electrical shorts and entanglement in moving parts.



STAY CLEAR OF MOVING PARTS

Entanglements in moving parts can cause serious injury.

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



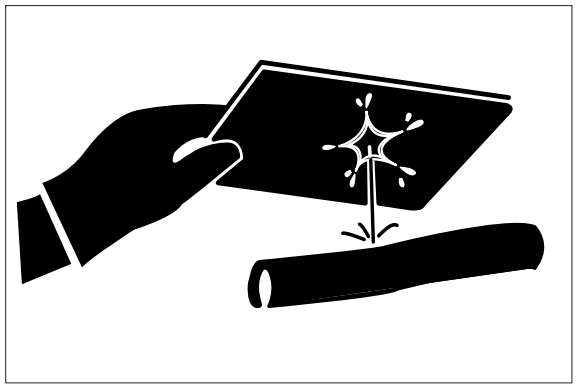
AVOID HIGH PRESSURE FLUIDS

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.

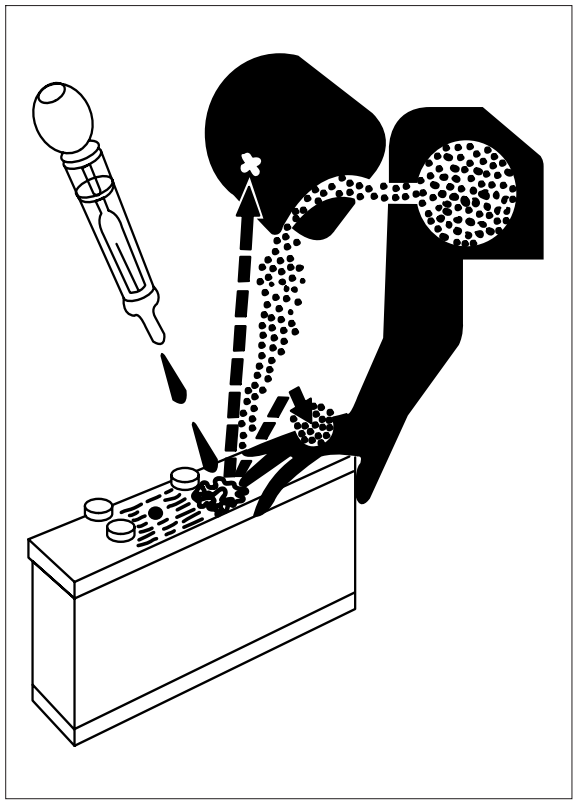
PREVENT BATTERY EXPLOSIONS

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 of dripping electrolyte.
5. Use proper jump start procedure.

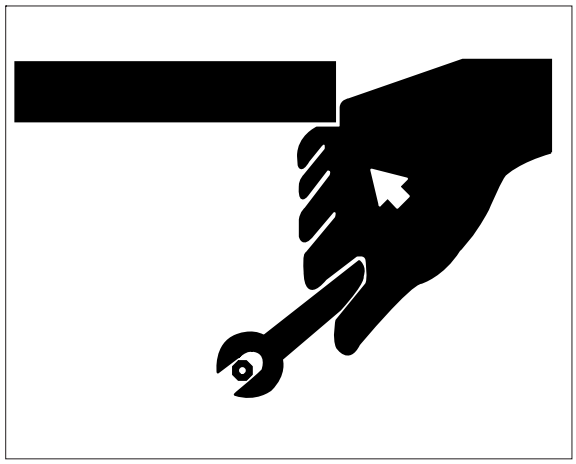
If you spill acid on yourself:

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



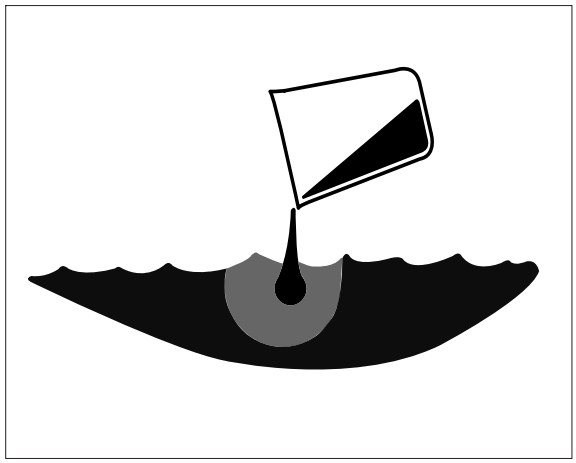
Use tools appropriate to the work. Makeshift tools, parts, and procedures can create safety hazards.

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

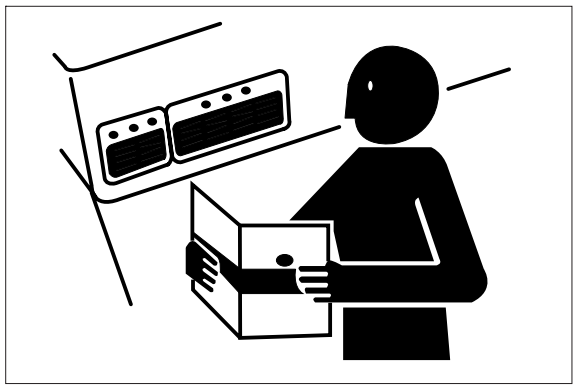


Improperly disposing of fluids can harm the environment and ecology. Before draining any fluids, find out the proper way to dispose of waste from your local environmental agency.

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.

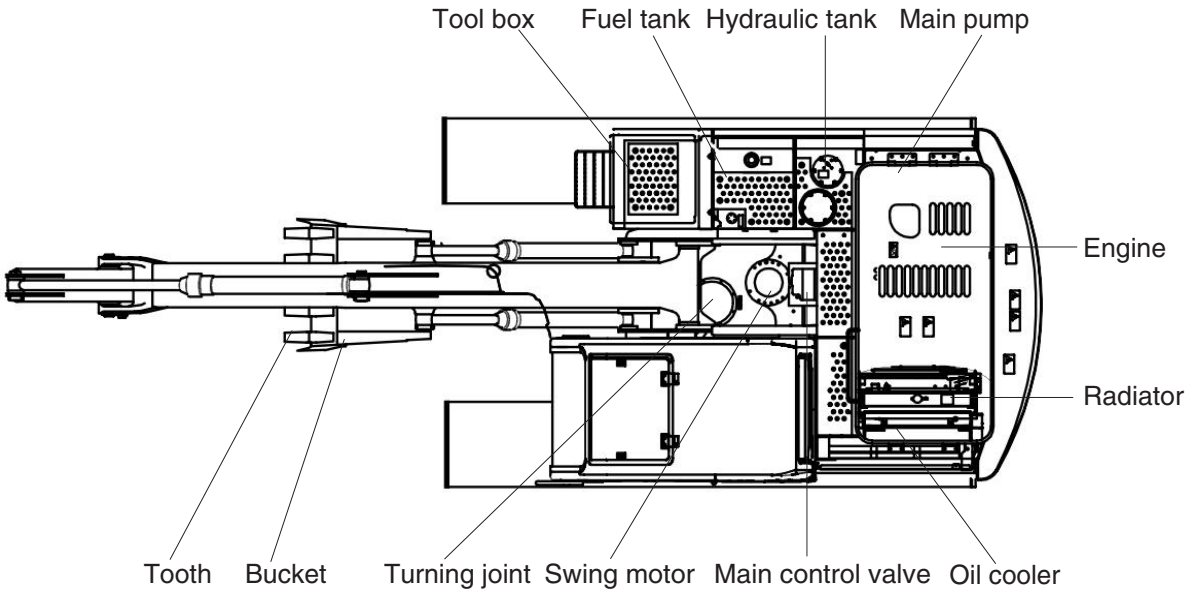
REPLACE SAFETY SIGNS

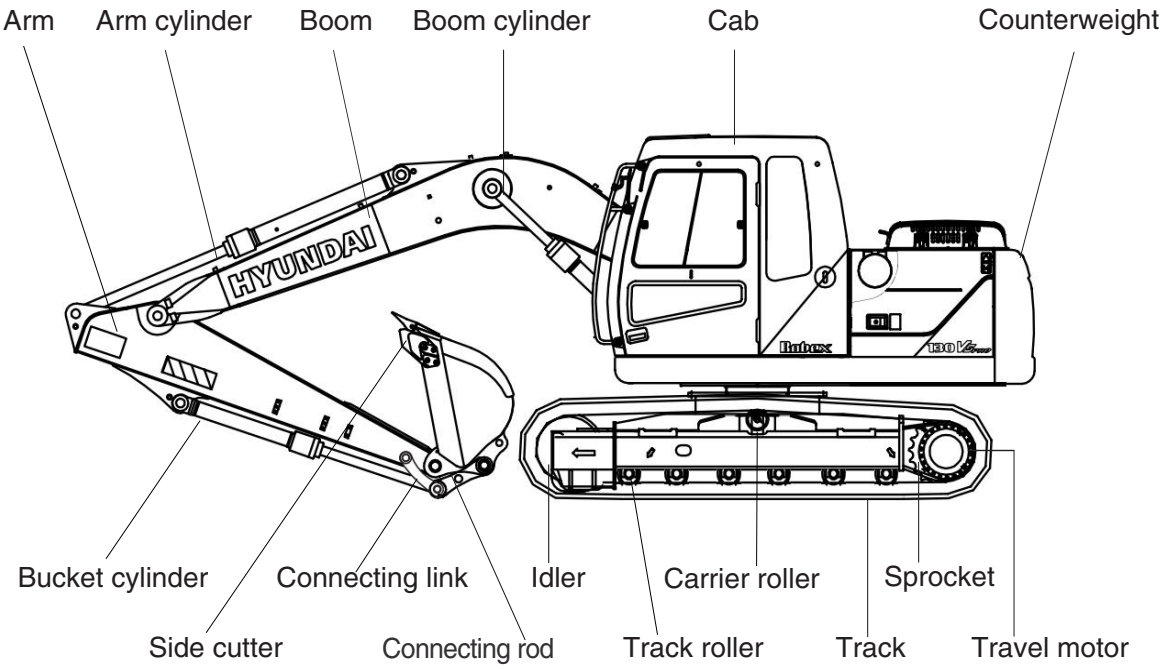


Replace missing or damaged safety signs. See the machine operator's manual for correct safety sign placement.

LIVE WITH SAFETY

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

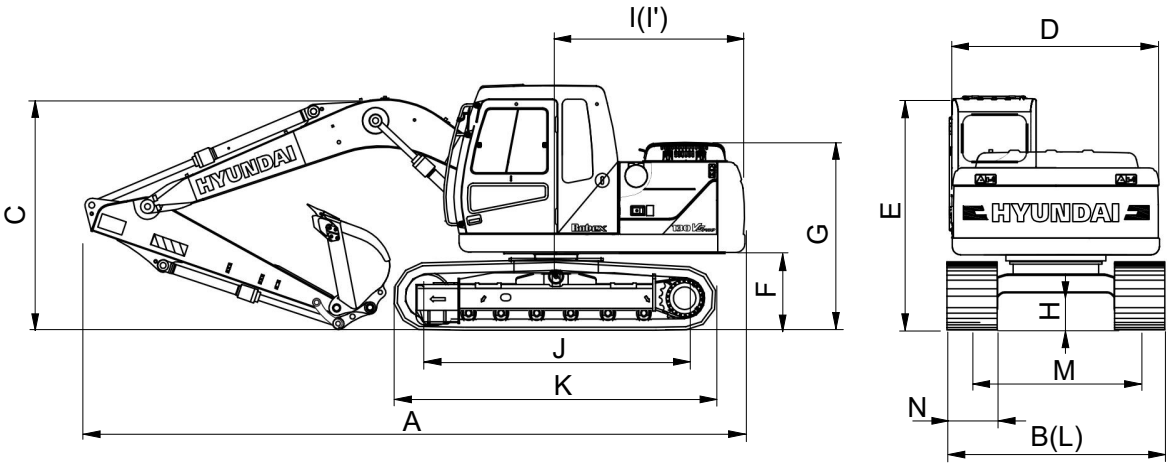

Tool box
Fuel tank
Hydraulic tank
Main pump
Engine
Radiator
Tooth
Bucket
Turning joint
Swing motor
Main control valve
Oil cooler


Arm
Arm cylinder
Boom
Boom cylinder
Cab
Counterweight
HYUNDAI
Bucket cylinder
Connecting link
Idler
Carrier roller
Sprocket
Side cutter
Connecting rod
Track roller
Track
Travel motor

2. SPECIFICATIONS

1) R130VS PRO

· 4.60 m (15' 1") BOOM and 2.50 m (8' 2") ARM

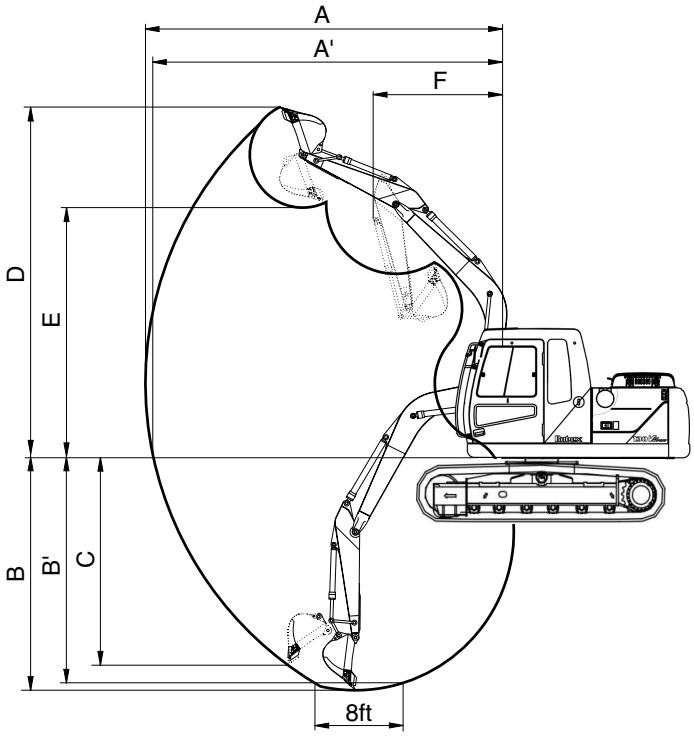


Description		Unit	Specification
Operating weight		kg	13400
Bucket capacty (SAE heaped)		m^3	0.52
Overall length	A	mm	7820
Overall width	B		2500
Overall height	C		2850
Superstructure width	D		2476
Overall height of cab	E		2860
Ground clearance of counterweight	F		935
Engine cover height	G		2215
Minimum ground clearance	H		440
Rear-end distance	I		2000
Rear-end swing radius	I'		2000
Distance between tumblers	J		2830
Undercarriage length	K		3580
Undercarriage width	L		2500
Track gauge	M		2000
Track shoe width, standard	N		500
Travel speed (low/high)		km/hr	3.2/5.5
Swing speed		rpm	12
Gradeability		Degree (%)	35 (70)
Ground pressure		kgf/cm^2	0.43
Max traction force		kg (lb)	13300

3. WORKING RANGE

1) R130VS PRO

· 4.60 m (15' 1") BOOM



Description		※2.50m Arm
Max digging reach	A	8330mm
Max digging reach on ground	A'	8180mm
Max digging depth	B	5550mm
Max digging depth (8 ft level)	B'	5340mm
Max vertical wall digging depth	C	5330mm
Max digging height	D	8500mm
Max dumping height	E	6060mm
Min swing radius	F	2650mm
Bucket digging force(0.52m³)	SAE	87.3 kN
Arm digging force	SAE	62.8 kN

※ : STD

4. WEIGHT

1) R130VS PRO

Item	R130VS PRO	
	kg	lb
Upperstructure assembly	5630	12420
Main frame weld assembly	1160	2560
Engine assembly	335	739
Main pump assembly	100	220
Main control valve assembly	140	310
Swing motor assembly	120	260
Hydraulic oil tank assembly	160	350
Fuel tank assembly	130	290
Counterweight	2000	4410
Cab assembly	500	1100
Lower chassis assembly	5340	11760
Track frame weld assembly	1590	3510
Swing bearing	190	410
Travel motor assembly	480	1060
Turning joint	50	110
Track recoil spring	210	460
Idler	250	550
Carrier roller	40	90
Track roller	490	1080
Track-chain assembly (500 mm standard triple grouser shoe)	1010	2230
Front attachment assembly (4.60 m boom, 2.50 m arm, 0.52 m^3 SAE heaped bucket)	2420	5330
4.60 m boom assembly	830	1830
2.50 m arm assembly	435	960
0.52 m^3 SAE heaped bucket	472	1041
Boom cylinder assembly	130	290
Arm cylinder assembly	160	350
Bucket cylinder assembly	100	220
Bucket control rod assembly	90	200

5. LIFTING CAPACITIES

1) R130VS PRO

(1) 4.60 m (15' 1") boom, 2.50 m (8' 2 ") arm equipped with 0.52 m³ (SAE heaped) bucket and 500 mm (24") triple grouser shoe and 2000 kg (4410 lb) counterweight.

· : Rating over-front · : Rating over-side or 360 degree

Load point height		Load radius								At max. reach		
		1.5m (5.0ft)		3.0 m (10.0 ft)		4.5 m (15.0 ft)		6.0 m (20.0 ft)		Capacity		Reach
												m(ft)
6.0m (20ft)	kg									*2810	1920	6.69
	lb									*6190	4230	(21.9)
4.5m (15.0ft)	kg							*2770	2270	2440	1500	7.53
	lb							*6110	5000	5380	3310	(24.7)
3.0m (10.0ft)	kg			*4930	*4930	*3830	3570	*3380	2190	2170	1310	7.95
	lb			*10870	*10870	*8440	7870	*7450	4830	4780	2890	(26.1)
1.5m (5.0ft)	kg			*8030	6240	*5010	3300	3380	2070	2100	1250	8.03
	lb			*17700	13760	*11050	7280	7450	4560	4630	2760	(26.3)
Ground Line	kg			*8780	5800	5200	3090	3270	1970	2180	1300	7.77
	lb			*19360	12790	11460	6810	7210	4340	4810	2870	(25.5)
-1.5m (-5.0ft)	kg	*5740	*5740	*9910	5700	5080	2990	3220	1920	2500	1500	7.15
	lb	*12650	*12650	*21850	12570	11200	6590	7100	4230	5510	3310	(23.5)
-3.0m (-10.0ft)	kg	*8760	*8760	*9040	5770	5100	3000			3340	2030	6.01
	lb	*19310	*19310	*19930	12720	11240	6610			7360	4480	(19.7)
-4.5m (-15.0ft)	kg			*6590	6030							
	lb			*14530	13290							

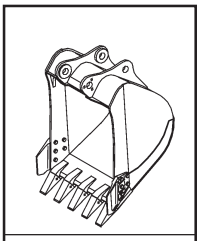
Note 1. Lifting capacity are based on SAE J1097 and ISO 10567.
2. Lifting capacity of the ROBEX series does not exceed 75% of tipping load with the machine on firm, level ground or 87% of full hydraulic capacity.
3. The load point is a hook (standard equipment) located on the back of the bucket.
4. *indicates load limited by hydraulic capacity.

※ Lifting capacities are based upon a standard machine conditions.
Lifting capacities will vary with different work tools, ground conditions and attachments.
The difference between the weight of a work tool attachment must be subtracted.
Consult your Hyundai dealer regarding the lifting capacities for specific work tools and attachments.

⚠ Failure to comply to the rated load can cause possible personal injury or property damage.
Make adjustments to the rated load as necessary for non-standard configurations.

6. BUCKET SELECTION GUIDE

1) GENERAL BUCKET



※0.52m³SAE heaped bucket

Type	Capacity		Width		Weight	Tooth	Recommendation
	SAE Heaped	CECE heaped	With side cutter	Without side cutter			4.60 m (15' 1") Boom
	m^3	m^3	mm	mm	kg	EA	–
General bucket	0.52m^3	0.45 m^3	915 mm	1015 mm	472kg	5	

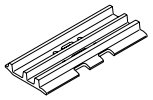
※ Applicable for materials with density of 1600 kg/m^3 (2700 lb/yd^3) or less

7. UNDERCARRIAGE

1) TRACKS

X-leg type center frame is integrally welded with reinforced box-section track frames. The design includes dry tracks, lubricated rollers, idlers, sprockets, hydraulic track adjusters with shock absorbing springs and assembled track-type tractor shoes with triple grousers.

2) TYPES OF SHOES

Model	Shapes		Triple grouser
			
R130VS PRO	Shoe width	mm	500
	Operating weight	kg	13400
	Ground pressure	kgf/cm^2	0.43
	Overall width	mm	2500

3) NUMBER OF ROLLERS AND SHOES ON EACH SIDE

Item	Quantity
	R130 VS PRO
Carrier rollers	1 EA
Track rollers	6 EA
Track shoes	44 EA

4) SELECTION OF TRACK SHOE

Suitable track shoes should be selected according to operating conditions.

Method of selecting shoes

Confirm the category from the list of applications in table 2, then use table 1 to select the shoe. Wide shoes(Categories B and C) have limitations on applications. Before using wide shoes, check the precautions, then investigate and study the operating conditions to confirm if these shoes are suitable.

Select the narrowest shoe possible to meet the required flotation and ground pressure. Application of wider shoes than recommendations will cause unexpected problem such as bending of shoes, crack of link, breakage of pin, loosening of shoe bolts and the other various problems.

※ Table 1

Track shoe	Specification	Category
500㎜ triple grouser	Option	A

※ Table 2

Category	Applications	Precautions
A	Rocky ground, river beds, normal soil	· Travel at low speed on rough ground with large obstacles such as boulders or fallen trees

8. SPECIFICATIONS FOR MAJOR COMPONENTS

1) ENGINE

Item	Specification
Model	Cummins F3.8
Type	4-cycle turbocharged charger air cooled diesel engine
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	102 ×115mm
Piston displacement	3760 c c
Compression ratio	17 : 1
Rated gross horse power (SAE J1995)	115Hp at 2200rpm (86kW at 2200 rpm)
Maximum torque	48kgf · m (3471lbf· ft) at 1100 -1700 rpm
Engine oil quantity	11ℓ (2.9 U.S. gal, CI - 4)
Dry weight	335kg (739lb)
High idling speed	2200 ± 50rpm
Low idling speed	800 ± 50rpm
Rated fuel consumption	185.9g/Hp · hr at 2200rpm
Starting motor	24V-4.8 KW
Alternator	28V-70A
Battery	2 ×12V× 72 Ah

2) MAIN PUMP

Item	Specification
Type	Variable displacement tandem axis piston pumps
Capacity	2 × 72.9 cc/rev
Maximum pressure	350 kgf/cm² [380 kgf/cm²]
Rated oil flow	2 × 124 ℓ /min
Rated speed	1700rpm

[ ] : Power boost

3) GEAR PUMP

Item	Specification
Type	Fixed displacement gear pump single stage
Capacity	15 cc/rev
Maximum pressure	40 kgf/cm^2
Rated oil flow	25.5 ℓ /min

4) MAIN CONTROL VALVE

Item	Specification
Type	11 spools
Operating method	Hydraulic pilot system
Main relief valve pressure	350 kgf/cm^2 [380 kgf/cm^2]
Overload relief valve pressure	400 kgf/cm^2

[ ] : Power boost

5) SWING MOTOR

Item	Specification
Type	Axial piston motor
Capacity	72 cc/rev
Relief pressure	280 kgf/cm^2
Braking system	Automatic, spring applied hydraulic released
Braking torque	640 kgf · m
Brake release pressure	24 kgf/cm^2
Reduction gear type	2 - stage planetary

6) TRAVEL MOTOR

Item	Specification
Type	Axial piston motor
Relief pressure	400 kgf/cm^2
Capacity (max / min)	77.1/ 45 cc/rev
Reduction gear type	Planetary differential
Braking system	Automatic, spring applied hydraulic released
Brake release pressure	9.5 kgf/cm^2
Braking torque	29.5 kgf · m

7) CYLINDER

Item		Specification
Boom cylinder	Bore dia × Rod dia × Stroke	ø105× ø75× 1075 mm
	Cushion	Extend only
Arm cylinder	Bore dia × Rod dia × Stroke	ø115× ø80 ×1138 mm
	Cushion	Extend and retract
Bucket cylinder	Bore dia × Rod dia × Stroke	ø100× ø70× 850 mm
	Cushion	Extend only

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

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

8) SHOE

Item		Width	Ground pressure	Link quantity	Overall width
R130VSPRO	Standard	500 mm (20")	0.43 kgf/cm^2 (6.11 psi)	44	2500 mm (8' 2")

9) BUCKET

Item		Capacity		Tooth quantity	Width	
		SAE heaped	CECE heaped		Without side cutter	With side cutter
R130VSPRO	Standard	0.52m^3 (0.68yd^3)	0.45m^3 (0.59 yd^3)	5	915mm (36.0")	1015 mm(40.0")

9. RECOMMENDED OILS

Use only oils listed below. Do not mix different brand oil.
Please use HYUNDAI genuine oil and grease.

Service point	Kind of fluid	Capacity ℓ	Ambient temperature °C(°F) -50 (-58) -30 (-22) -20 (-4) -10 (14) 0 (32) 10 (50) 20 (68) 30 (86) 40 (104)
Engine oil pan	Engine oil	11	★ SAE 5W-40 SAE 30 SAE 10W SAE 10W-30 SAE 15W-40
Swing drive	Gear oil	3.5	★ SAE 80W-90
Final drive		2.2×2	SAE 85W-140
Hydraulic tank	Hydraulic oil	Tank 124 System 210	★ ISO VG 15 ISO VG 32 ISO VG 46 ISO VG 68
Fuel tank	Diesel fuel	270	★ ASTM D975 NO.1 ASTM D975 NO.2
Fitting (grease nipple)	Grease	As required	★ NLGI NO.1 NLGI NO.2
Radiator (reservoir tank)	Mixture of antifreeze and soft water★1	15.5	Ethylene glycol base permanent type (50 : 50) ★ Ethylene glycol base permanent type (60 :40)

SAE : Society of Automotive Engineers
API : American Petroleum Institute
ISO : International Organization for Standardization
NLGI : National Lubricating Grease Institute
ASTM : American Society of Testing and Material

★ : Cold region
Russia, CIS, Mongolia

★1 : Soft water
City water or distilled water