

# SECTION 1 GENERAL

Group 1 Safety Hints .....	1-1
Group 2 Specifications .....	1-9

## SECTION 1 GENERAL

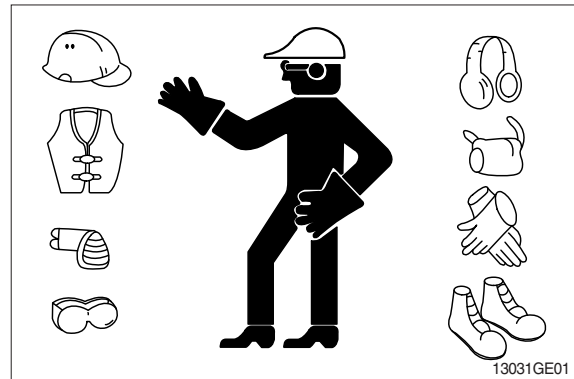
### GROUP 1 SAFETY

#### FOLLOW SAFE PROCEDURE

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

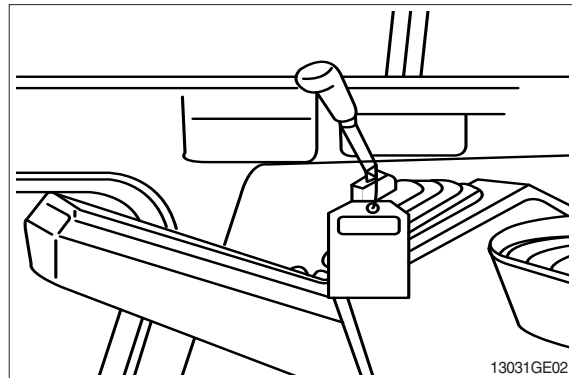
#### WEAR PROTECTIVE CLOTHING

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



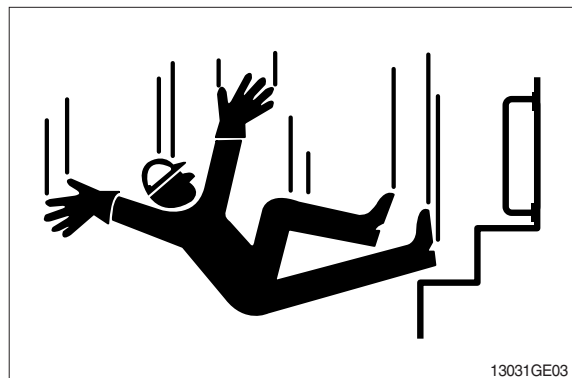
#### WARN OTHERS OF SERVICE WORK

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.

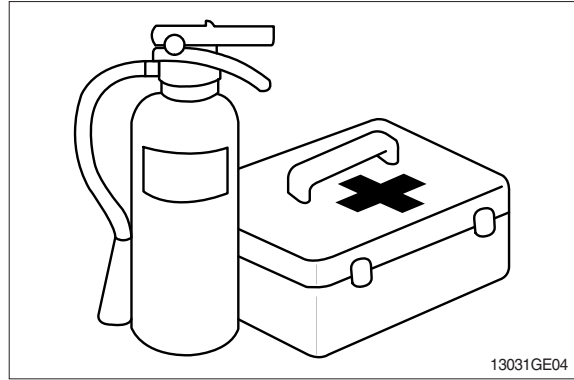


## PREPARE FOR EMERGENCIES

Be prepared if a fire starts.

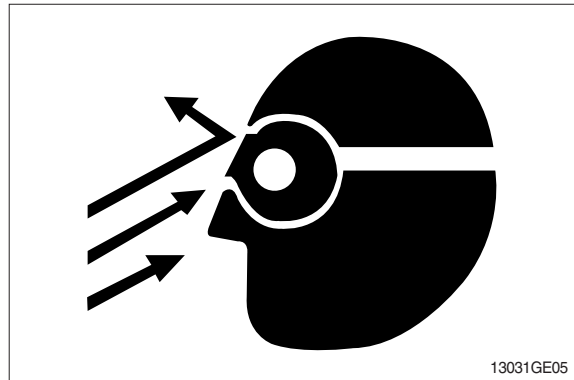
Keep a first aid kit and fire extinguisher handy.

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



## PROTECT AGAINST FLYING DEBRIS

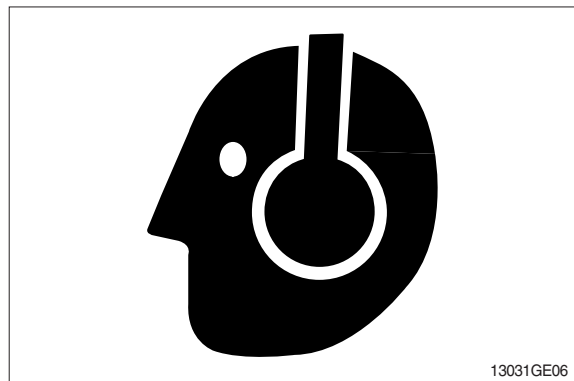
Guard against injury from flying pieces of metal or debris; Wear goggles or safety glasses.



## PROTECT AGAINST NOISE

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

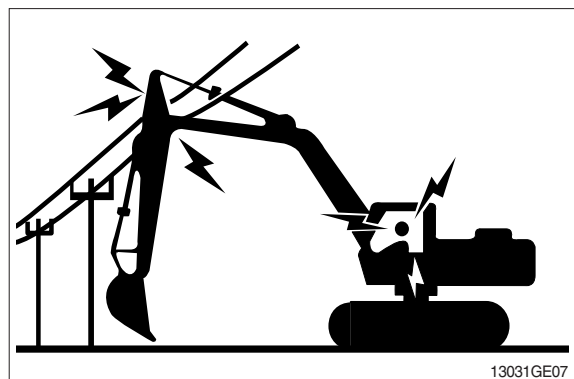
Wear a suitable hearing protective device such as earmuffs or earplugs to protect against objectionable or uncomfortable loud noises.



## AVOID POWER LINES

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

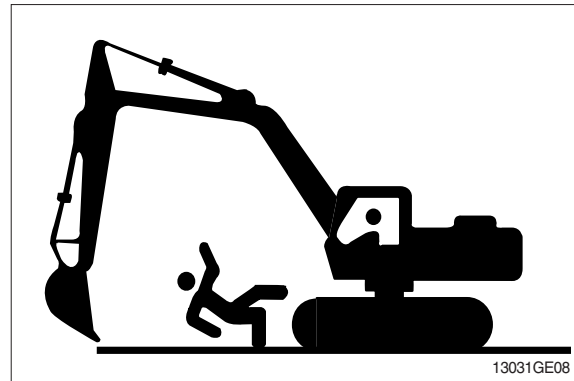
Never move any part of the machine or load closer to electric line than 3m(10ft) plus twice the line insulator length.



## 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.

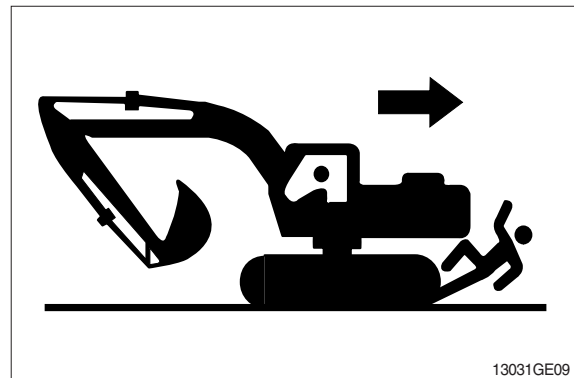


## MOVE AND OPERATE MACHINE SAFELY

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:

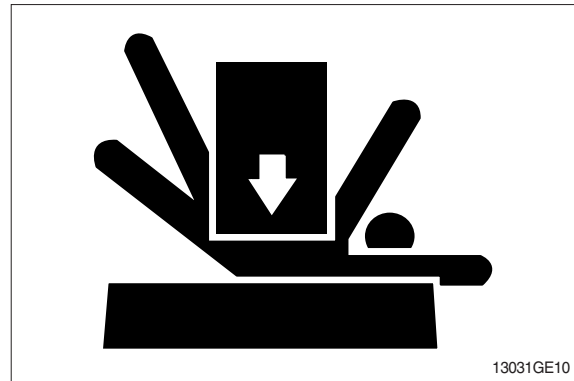
- Park machine on a level surface.
- Lower bucket to the ground.
- Turn auto idle switch off.
- Run engine at 1/2 speed without load for 2 minutes.
- Turn key switch to OFF to stop engine.  
Remove key from switch.
- Move pilot control shutoff lever to locked position.
- Allow engine to cool.

### 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.

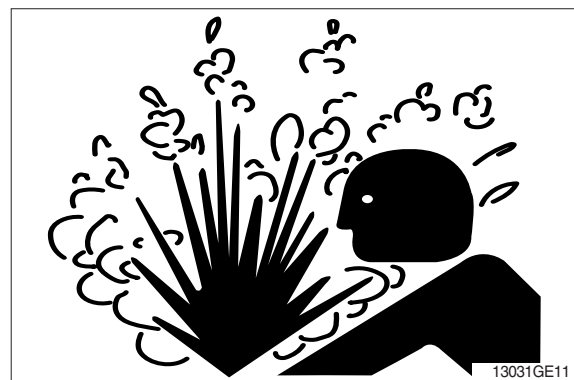
Do not work under a machine that is supported solely by a jack. Follow recommended procedures in this manual.



### SERVICE COOLING SYSTEM SAFELY

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

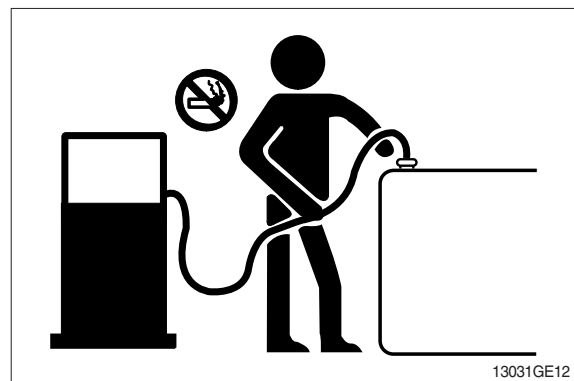
Shut off engine. Only remove filler cap when cool enough to touch with bare hands.



### 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

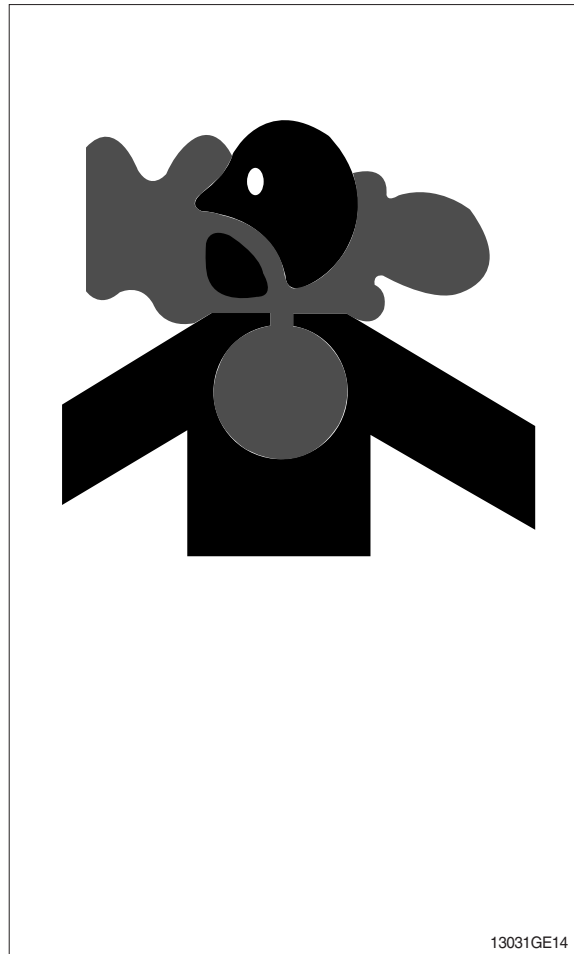
Avoid potentially toxic fumes and dust.

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.

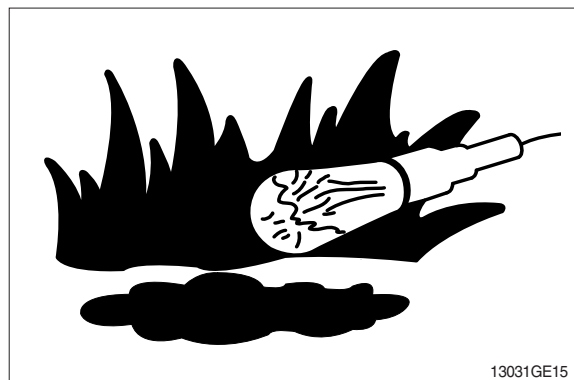
Remove paint before welding or heating:

- 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

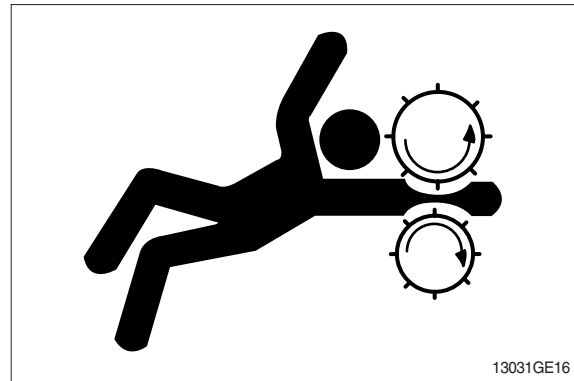
Illuminate your work area adequately but safely. Use a portable safety light for working inside or under the machine. Make sure the bulb is enclosed by a wire cage. The hot filament of an accidentally broken bulb can ignite spilled fuel or oil.



## 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.

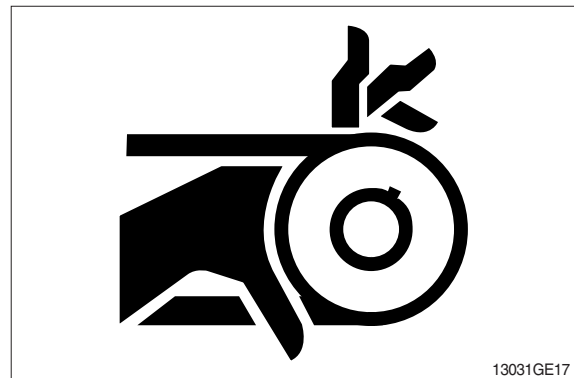
Remove rings and other jewelry to prevent electrical shorts and entanglement in moving parts.



## STAY CLEAR OF MOVING PARTS

Entanglements in moving parts can cause serious injury.

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



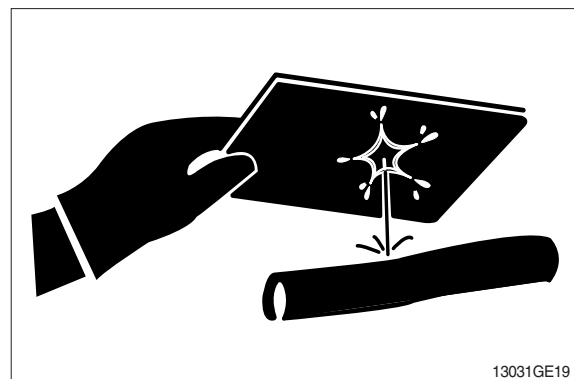
## AVOID HIGH PRESSURE FLUIDS

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:

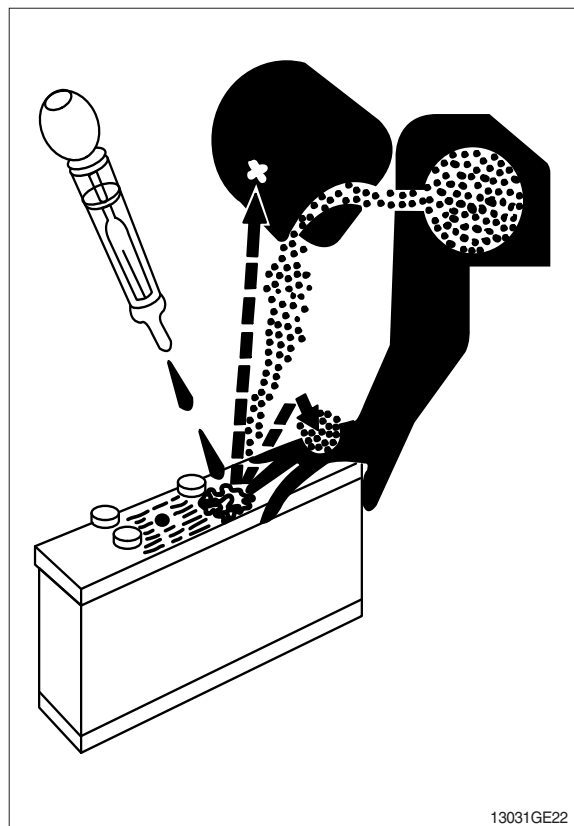
1. Filling batteries in a well-ventilated area.
2. Wearing eye protection and rubber gloves.
3. Avoiding breathing fumes when electrolyte is added.
4. Avoiding spilling or dripping electrolyte.
5. Use proper jump start procedure.

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.





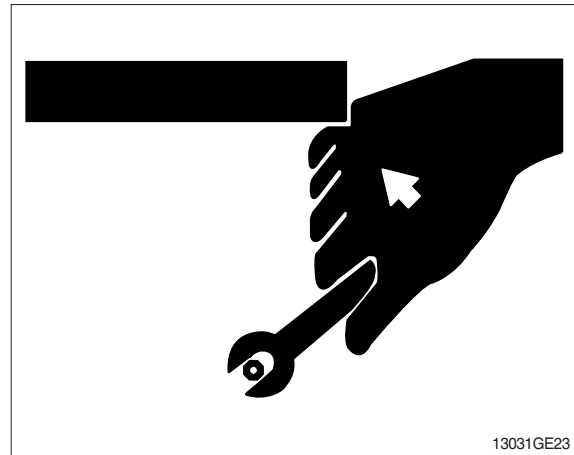
## USE TOOLS PROPERLY

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.)

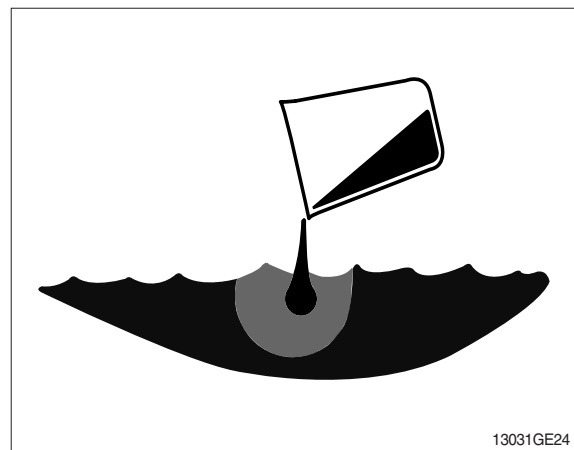


## DISPOSE OF FLUIDS PROPERLY

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.

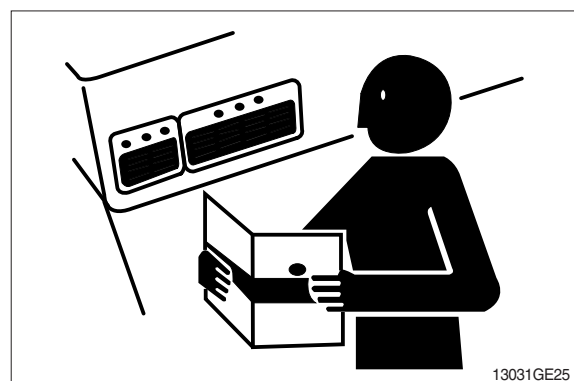
Use proper containers when draining fluids. Do not use food or beverage containers that may mislead someone into drinking from them.

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.

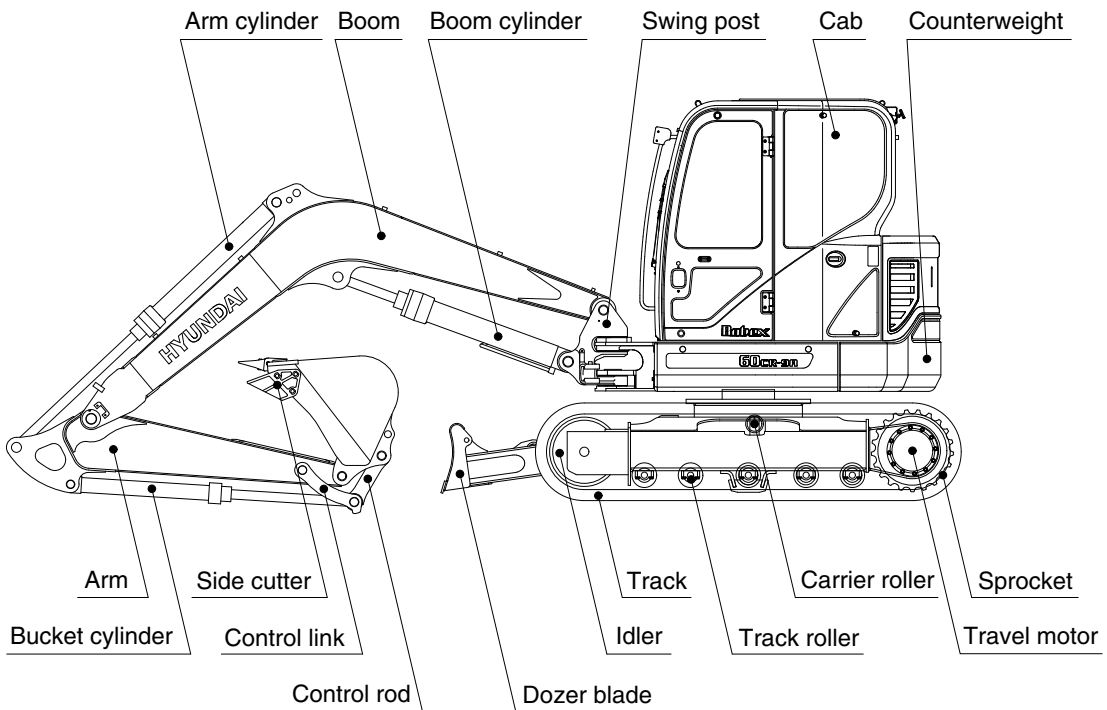
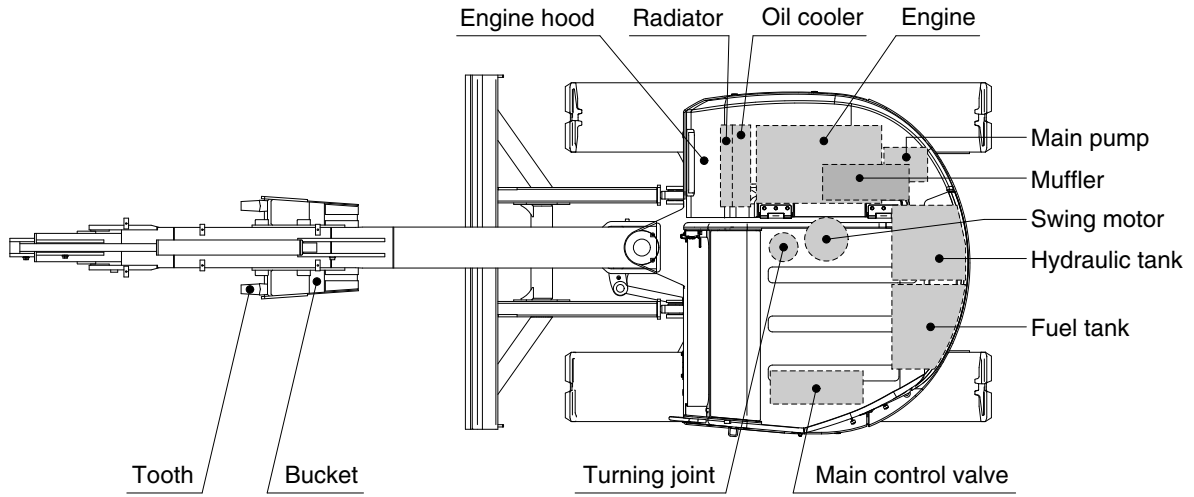


## LIVE WITH SAFETY

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

# GROUP 2 SPECIFICATIONS

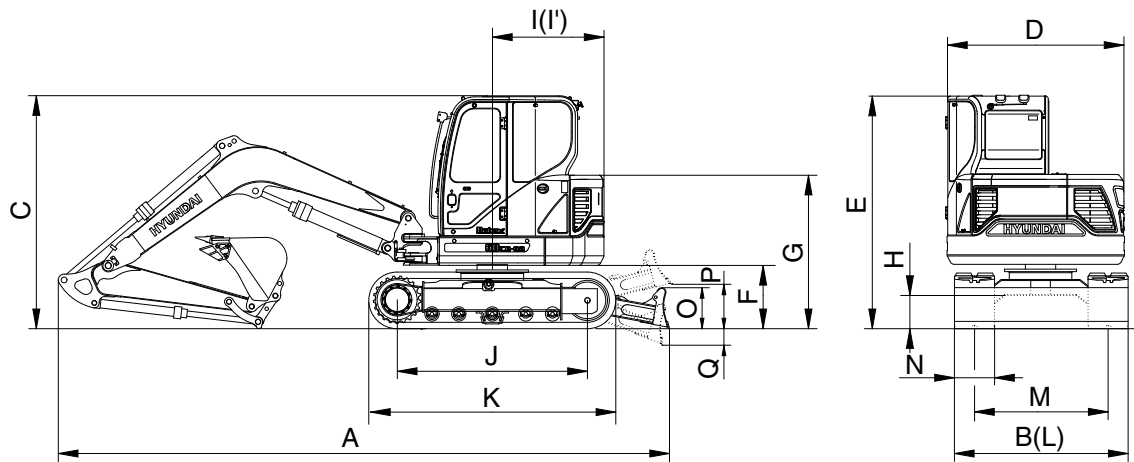
## 1. MAJOR COMPONENT



60CR9A2SP01

## 2. SPECIFICATIONS

### 1) 2.9 m ( 9' 6") MONO BOOM, 1.48 m ( 4' 10") ARM, WITH BOOM SWING SYSTEM

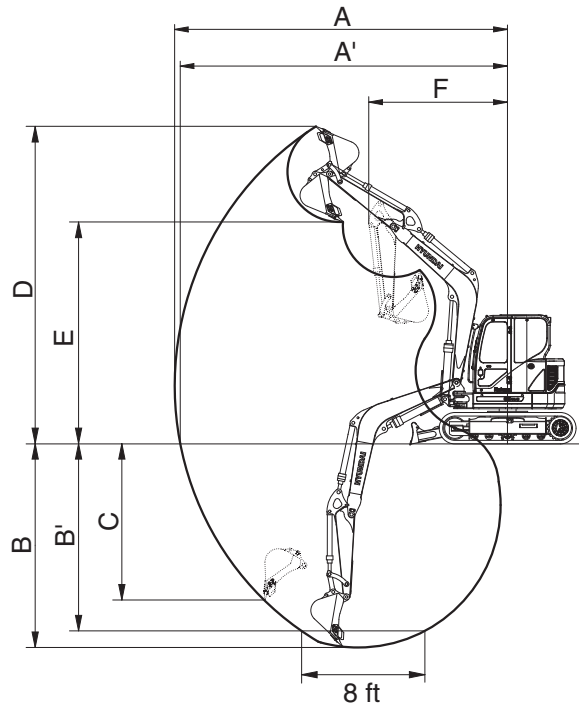


60CR9A2SP02

Description		Unit	Specification	
Operating weight		kg (lb)	5900 (13010)	
Bucket capacity (SAE heaped), standard		m <sup>3</sup> (yd <sup>3</sup> )	0.18 (0.24)	
Overall length	A	mm (ft-in)	5600 (18' 3")	
Overall width, with 380 mm shoe	B		1980 (6' 6")	
Overall height	C		2550 (8' 4")	
Superstructure width	D		1950 (6' 5")	
Overall height of cab	E		2550 (8' 4")	
Ground clearance of counterweight	F		660 (2' 2")	
Engine cover height	G		1670 (5' 6")	
Minimum ground clearance	H		380 (1' 3")	
Rear-end distance	I		1080 (3' 7")	
Rear-end swing radius	I'		1080 (3' 7")	
Distance between tumblers	J		1990 (6' 6")	
Undercarriage length	K		2530 (8' 4")	
Undercarriage width	L		1980 (6' 6")	
Track gauge	M		1600 (5' 3")	
Track shoe width, standard	N		380 (15")	
Height of blade	O		350 (1' 2")	
Ground clearance of blade up	P		200 (8")	
Depth of blade down	Q		700 (2' 4")	
Travel speed (low/high)			km/hr (mph)	2.2/4.0 (1.4/2.5)
Swing speed			rpm	8.8
Gradeability		Degree (%)	35 (70)	
Ground pressure (380 mm shoe)		kgf/cm <sup>2</sup> (psi)	0.36 (5.12)	
Max traction force		kg (lb)	5300 (11680)	

### 3. WORKING RANGE

#### 1) 2.9 m (9' 6") MONO BOOM WITH BOOM SWING SYSTEM



60CR92SP03

Description		1.48 m (4' 10") Arm
Max digging reach	A	6150 mm (25' 5")
Max digging reach on ground	A'	6010 mm (24' 11")
Max digging depth	B	3570 mm (11' 9")
Max digging depth (8ft level)	B'	3160 mm (10' 5")
Max vertical wall digging depth	C	3040 mm (10' 0")
Max digging height	D	5680 mm (18' 8")
Max dumping height	E	3930 mm (12' 10")
Min swing radius	F	2420 mm ( 7' 11")
Boom swing radius (left/right)		70°/50°
Bucket digging force	SAE	36.6 kN
		3730 kgf
		8220 lbf
	ISO	40.9 kN
		4170 kgf
		9190 lbf
Arm crowd force	SAE	25.6 kN
		2610 kgf
		5750 lbf
	ISO	26.5 kN
		2700 kgf
		5950 lbf

#### 4. WEIGHT











Item	kg	lb
Upperstructure assembly	2895	6380
Main frame weld assembly	570	1260
Engine assembly	280	620
Main pump assembly	30	65
Main control valve assembly	40	90
Swing motor assembly	50	110
Hydraulic oil tank assembly	60	130
Fuel tank assembly	55	120
Boom swing post	135	300
Counterweight	470	1040
Cab assembly	350	770
Lower chassis assembly	2275	5020
Track frame weld assembly	790	1740
Swing bearing	94	210
Travel motor assembly	80 × 2	180 × 2
Turning joint	30	65
Track recoil spring	20	45
Idler & tension body	73 × 2	160 × 2
Carrier roller	12 × 2	30 × 2
Track roller	12 × 10	30 × 10
Sprocket	17 × 2	40 × 2
Track-chain assembly (380 mm standard triple grouser shoe)	325 × 2	715 × 2
Dozer blade assembly	210	460
Front attachment assembly (3.0 m boom, 1.6 m arm, 0.18 m <sup>3</sup> SAE heaped bucket)	730	1610
2.9 m boom assembly	240	530
1.48 m arm assembly	120	260
0.18 m <sup>3</sup> SAE heaped bucket	170	370
Boom cylinder assembly	78	175
Arm cylinder assembly	53	120
Bucket cylinder assembly	33	75
Bucket control link assembly	40	90
Dozer cylinder assembly	35	80
Boom swing cylinder assembly	40	90

## 5. LIFTING CAPACITIES

1) 2.9 m ( 9' 6") boom, 1.48 m ( 4' 10") arm equipped with 0.18 m<sup>3</sup> (SAE heaped) bucket and 380 mm (15") triple grouser shoe, the dozer blade down with 470 kg (1040 lb) counterweight.

·  : Rating over-front

·  : Rating over-side or 360 degree

Load point height		Load radius								At max. reach		
		2.0 m (7 ft)		3.0 m (10 ft)		4.0 m (13 ft)		5.0 m (16 ft)		Capacity		Reach m (ft)
												
4.0 m (13 ft)	kg lb					*1120 *2470	*1120 *2470			*1050 *2310	790 1740	4.99 (16.4)
3.0 m (10 ft)	kg lb					*1180 *2600	*1130 *2490			*1080 *2380	640 1410	5.56 (18.2)
2.0 m (7 ft)	kg lb			*1890 *4170	*1710 *3770	*1430 *3150	1080 2380	*1250 *2760	740 1630	*1120 *2470	580 1280	5.82 (19.1)
1.0 m (3 ft)	kg lb			*2670 *5890	1580 3480	*1740 *3840	1020 2250	*1360 *3000	720 1590	*1160 *2560	560 1230	5.84 (19.2)
Ground Line	kg lb	*1980 *4370	*1980 *4370	*3000 *6610	1520 3350	*1930 *4250	980 2160	*1430 *3150	700 1540	*1190 *2620	590 1300	5.61 (18.4)
-1.0 m (-3 ft)	kg lb	*3230 *7120	3030 6680	*2890 *6370	1500 3310	*1910 *4210	970 2140			*1210 *2670	690 1520	5.09 (16.7)
-2.0 m (-7 ft)	kg lb	*3960 *8730	3080 6790	*2370 *5220	1530 3370					*1110 *2450	990 2180	4.12 (13.5)

- 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 located on the back of the bucket.
  4. \*indicates load limited by hydraulic capacity.











※ Please be aware of the local regulations and instructions for lifting operations.

## ANGLE DOZER BLADE

2.9 m (9' 6") boom, 1.48 m (4' 10") arm equipped with 0.18 m<sup>3</sup> (SAE heaped) bucket and 380 mm (15") triple grouser shoe, the dozer blade down with 670 kg (1477 lb) counterweight.

·  : Rating over-front

·  : Rating over-side or 360 degree

Load point height		Load radius								At max. reach		
		2.0 m (7 ft)		3.0 m (10 ft)		4.0 m (13 ft)		5.0 m (16 ft)		Capacity		Reach
												m (ft)
4.0 m (13 ft)	kg lb					*1370 1170	*3020 2580			*1200 1100	1100 2430	4.15 (13.6)
3.0 m (10 ft)	kg lb					*1400 1160	*3090 2560			*1110 860	860 1900	4.81 (15.8)
2.0 m (7 ft)	kg lb			*2240 4940	1730 3810	*1650 3640	1120 2470	*1440 3170	800 1760	*1120 2470	770 1700	5.13 (16.8)
1.0 m (3 ft)	kg lb			*2960 6530	1620 3570	*1940 4280	1080 2380	*1530 3370	780 1720	*1200 2650	740 1630	5.20 (17.1)
Ground Line	kg lb			*3160 6970	1570 3460	*2090 4610	1050 2310	*1540 3400	770 1700	*1380 3040	760 1680	5.03 (16.5)
-1.0 m (-3 ft)	kg lb	*2870 6330	*2870 6330	*2950 6500	1570 3460	*2000 4410	1040 2290			*1580 3480	860 1900	4.59 (15.1)
-2.0 m (-7 ft)	kg lb	*3620 7980	3180 7010	*2290 5050	1600 3530					*1580 3480	1160 2560	3.75 (12.3)

Note 1. Lifting capacity are based on ISO 10567.

- 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.
- The lift-point is bucket pivot mounting pin on the arm (without bucket mass).
- \*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.











※ Please be aware of the local regulations and instructions for lifting operations.

▲ 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.

2) 2.9 m ( 9' 6") boom, 1.48 m ( 4' 10") arm equipped with 0.18 m<sup>3</sup> (SAE heaped) bucket and 380 mm (15") triple grouser shoe, the dozer blade up with 470 kg (1040 lb) counterweight.

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

Load point height		Load radius								At max. reach		
		2.0 m (7.0 ft)		3.0 m (10.0 ft)		4.0 m (13.0 ft)		5.0 m (16.0 ft)		Capacity		Reach
												m (ft)
4.0 m (13.0 ft)	kg					*1120	1070			1040	740	4.99
	lb					*2470	2360			2290	1630	(16.4)
3.0 m (10.0 ft)	kg					*1180	1060			860	600	5.56
	lb					*2600	2340			1900	1320	(18.2)
2.0 m (7.0 ft)	kg			*1890	1600	1430	1010	990	690	780	540	5.82
	lb			*4170	3530	3150	2230	2180	1520	1720	1190	(19.1)
1.0 m (3.0 ft)	kg			2150	1470	1370	960	970	670	770	520	5.84
	lb			4740	3240	3020	2120	2140	1480	1700	1150	(19.2)
Ground Line	kg	*1980	*1980	2080	1410	1330	920	950	650	810	550	5.61
	lb	*4370	*4370	4590	3110	2930	2030	2090	1430	1790	1210	(18.4)
-1.0 m (-3.0 ft)	kg	*3230	2770	2070	1400	1320	900			940	650	5.09
	lb	*7120	6110	4560	3090	2910	1980			2070	1430	(16.7)
-2.0 m (-7.0 ft)	kg	*3960	2820	2090	1420					*1110	920	4.12
	lb	*8730	6220	4610	3130					*2450	2030	(13.5)

- 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 located on the back of the bucket.
  4. \*indicates load limited by hydraulic capacity.











※ Please be aware of the local regulations and instructions for lifting operations.



## ANGLE DOZER BLADE

2.9 m ( 9' 6") boom, 1.48 m ( 4' 10") arm equipped with 0.18 m<sup>3</sup> (SAE heaped) bucket and 380 mm (15") triple grouser shoe, the dozer blade down with 670 kg (1477 lb) counterweight.

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

Load point height		Load radius								At max. reach		
		2.0 m (7 ft)		3.0 m (10 ft)		4.0 m (13 ft)		5.0 m (16 ft)		Capacity		Reach
												m (ft)
4.0 m (13 ft)	kg					1160	1080			1090	1020	4.15
	lb					2560	2380			2400	2250	(13.6)
3.0 m (10 ft)	kg					1150	1080			850	800	4.81
	lb					2540	2380			1870	1760	(15.8)
2.0 m (7 ft)	kg		1740	1590	1110	1030	790	740	750	710	5.13	
	lb		3840	3510	2450	2270	1740	1630	1650	1570	(16.8)	
1.0 m (3 ft)	kg		1620	1480	1060	990	770	720	720	680	5.20	
	lb		3570	3260	2340	2180	1700	1590	1590	1500	(17.1)	
Ground Line	kg		1570	1440	1030	960	750	710	750	700	5.03	
	lb		3460	3170	2270	2120	1650	1570	1650	1540	(16.5)	
-1.0 m (-3 ft)	kg	*2870	2800	1570	1430	1030	950		850	790	4.59	
	lb	*6330	6170	3460	3150	2270	2090		1870	1740	(15.1)	
-2.0 m (-7 ft)	kg	3290	2850	1600	1460				1150	1070	3.75	
	lb	7250	6280	3530	3220				2540	2360	(12.3)	

Note 1. Lifting capacity are based on 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 lift-point is bucket pivot mounting pin on the arm (without bucket mass).

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.

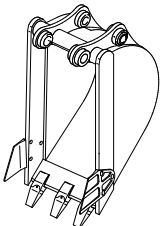
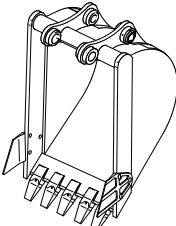
※ Please be aware of the local regulations and instructions for lifting operations.

▲ 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

	
<p>0.07m<sup>3</sup> SAE heaped bucket</p>	<p>0.18 m<sup>3</sup> SAE heaped bucket</p>

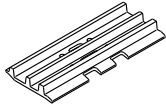

Capacity		Width		Weight	Recommendation
SAE heaped	CECE heaped	Without side cutter	With side cutter		2.9 m (9' 6") boom
0.07 m <sup>3</sup> (0.09 yd <sup>3</sup> )	0.06 m <sup>3</sup> (0.08 yd <sup>3</sup> )	315 mm (12.4")	360 mm (14.2")	115 kg (255 lb)	1.48 m (4' 10") arm
0.18 m <sup>3</sup> (0.24 yd <sup>3</sup> )	0.15 m <sup>3</sup> (0.20 yd <sup>3</sup> )	670 mm (26.4")	740 mm (29.1")	170 kg (375 lb)	Applicable for materials with density of 1600 kgf/m <sup>3</sup> (2700 lb/yd <sup>3</sup> ) or less
0.18 m <sup>3</sup> (0.24 yd <sup>3</sup> )	0.15 m <sup>3</sup> (0.20 yd <sup>3</sup> )	610 mm (24.0")	665 mm (26.2")	170 kg (375 lb)	

## 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		Rubber track
					
R60CR-9A	Shoe width	mm (in)	380 (15)	450(18)	400 (16)
	Operating weight	kg (lb)	5900 (13010)	5960(13140)	5800 (12790)
	Ground pressure	kgf/cm <sup>2</sup> (psi)	0.36 (5.12)	0.31(4.41)	0.34 (4.83)
	Overall width	mm (ft-in)	1980 (6' 6")	2050 (6' 9")	2000 (6' 7")

### 3) NUMBER OF ROLLERS AND SHOES ON EACH SIDE

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

## 8. SPECIFICATIONS FOR MAJOR COMPONENTS

### 1) ENGINE

Item	Specification
Model	Yanmar 4TNV98C
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 borexstroke	98 × 110 mm (3.85" × 4.33")
Piston displacement	3319 cc (203 cu in)
Compression ratio	18 : 1
Rated gross horse power (SAE J1995)	64.7 Hp at 2200 rpm (48.3 kW at 2200 rpm)
Maximum torque at 1560 rpm	24 kgf · m (173.6 lbf · ft)
Engine oil quantity	11.6 ℓ (3.1 U.S. gal)
Dry weight	270 kg (595 lb)
High idling speed	2550 ± 50 rpm
Low idling speed	1000 ± 50 rpm
Rated fuel consumption	170 g/Hp · hr at 2400 rpm
Starting motor	12 V-3.0 kW
Alternator	12V-80A(-#0788), 12V-100 A(#0789-)
Battery	1 × 12 V × 100 Ah

### 2) MAIN PUMP (P1, P2)

Item	Specification
Type	Variable displacement axis piston pumps
Capacity	2 × 27.5 cc/rev
Maximum pressure	220 kgf/cm <sup>2</sup> (3130 psi)
Rated oil flow	2 × 55 ℓ /min (14.5 U.S. gpm / 12.1 U.K. gpm)
Rated speed	2000 rpm

### 3) GEAR PUMP (P3, P4)

Item	Specification
Type	Fixed displacement gear pump double stage
Capacity	18.3/4.5 cc/rev
Maximum pressure	220/30 kgf/cm <sup>2</sup> (3130/430 psi)
Rated oil flow	36.6/9 ℓ /min (9.7/2.4 U.S. gpm / 8.1/2.0 U.K. gpm)

### 4) MAIN CONTROL VALVE

Item	Specification
Type	Sectional, 10 spools+1 option
Operating method	Hydraulic pilot system+Mechanical control system
Main relief valve pressure	220 kgf/cm <sup>2</sup> (3130 psi)
Overload relief valve pressure	240 kgf/cm <sup>2</sup> (3410 psi)

### 5) SWING MOTOR

Item	Specification	
	Type 1	Type 2
Type	Fixed displacement axial piston motor	
Capacity	28 cc/rev	31.5 cc/rev
Gear ratio	23.2	19.46
Relief pressure	220 kgf/cm <sup>2</sup> (3130 psi)	220 kgf/cm <sup>2</sup> (3130 psi)
Braking torque	11.8 kgf · m (85 lbf · ft)	14.5 kgf · m (105 lbf · ft)
Brake release pressure	30~50 kgf/cm <sup>2</sup> (427~711 psi)	12~20 kgf/cm <sup>2</sup> (171~284 psi)
Reduction gear type	2 - stage planetary	2 - stage planetary
Braking system	Automatic, spring applied hydraulic released	

### 6) TRAVEL MOTOR

Item	Specification
Type	Variable displacement axial piston motor
Relief pressure	220 kgf/cm <sup>2</sup> (3130 psi)
Reduction gear type	2-stage planetary
Braking system	Automatic, spring applied hydraulic released
Brake release pressure	9 kgf/cm <sup>2</sup> (128 psi)
Braking torque	8.4 kgf · m (61 lbf · ft)
Capacity (1 <sup>st</sup> speed / 2 <sup>nd</sup> speed)	43.7 / 22.7 cc/rev
Gear ratio	53.706

## 7) CYLINDER

Item		Specification
Boom cylinder	Bore dia × Rod dia × Stroke	Ø 110 × Ø 60 × 715 mm
	Cushion	Extend only
Arm cylinder	Bore dia × Rod dia × Stroke	Ø 85 × Ø 55 × 840 mm
	Cushion	Extend and retract
Bucket cylinder	Bore dia × Rod dia × Stroke	Ø 80 × Ø 50 × 660 mm
	Cushion	-
Boom swing cylinder	Bore dia × Rod dia × Stroke	Ø 95 × Ø 50 × 519 mm
	Cushion	-
Dozer blade	Bore dia × Rod dia × Stroke	Ø 110 × Ø 60 × 224 mm
	Cushion	-

※ 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
R60CR-9A	380 mm (15")	0.36 kgf/cm <sup>2</sup> (5.12 psi)	40	1980 mm (6' 6")
R60CR-9A	450 mm (18")	0.31 kgf/cm <sup>2</sup> (4.41 psi)	40	2050 mm (6' 9")

## 9) BUCKET

Item		Capacity		Tooth quantity	Width	
		SAE heaped	CECE heaped		Without side cutter	With side cutter
R60CR-9A	STD	0.18 m <sup>3</sup> (0.24 yd <sup>3</sup> )	0.15 m <sup>3</sup> (0.20 yd <sup>3</sup> )	5	610 mm (24")	665 mm (26.2")
	OPT	0.07 m <sup>3</sup> (0.09 yd <sup>3</sup> )	0.06 m <sup>3</sup> (0.08 yd <sup>3</sup> )	3	315 mm (12.4")	360 mm (14.2")

## 9. RECOMMENDED OILS

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

We recommend that you use only HYUNDAI genuine lubricating oils and grease officially approved by HYUNDAI.

Service point	Kind of fluid	Capacity ℓ (U.S. gal)	Ambient temperature °C ( °F)								
			-50 (-58)	-30 (-22)	-20 (-4)	-10 (14)	0 (32)	10 (50)	20 (68)	30 (86)	40 (104)
Engine oil pan	Engine oil	11.6 (3.1)	★SAE 5W-40					SAE 30			
			SAE 10W				SAE 10W-30				
			SAE 15W-40								
Final drive	Gear oil	1.2×2 (0.3×2)	SAE 80W-90								
Hydraulic tank	Hydraulic oil	Tank; 60 (15.9)	★ISO VG 15					ISO VG 32			
			ISO VG 46, HBHO VG 46★ <sup>3</sup>					ISO VG 68			
		System; 110 (29.1)									
Fuel tank	Diesel fuel★ <sup>1</sup>	82 (21.7)	★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★ <sup>2</sup>	11 (2.9)	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

**UTTO** : Universal Tractor Transmission Oil

★ : Cold region

Russia, CIS, Mongolia

★<sup>1</sup> : Ultra low sulfur diesel

- sulfur content ≤ 15 ppm

★<sup>2</sup> : Soft water

City water or distilled water

★<sup>3</sup> : Hyundai Bio Hydraulic Oil

- For more information, contact HYUNDAI dealers.

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

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

※ Do not use any engine oil other than that specified above, as it may clog the diesel particulate filter(DPF).

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