

# SECTION 1 GENERAL



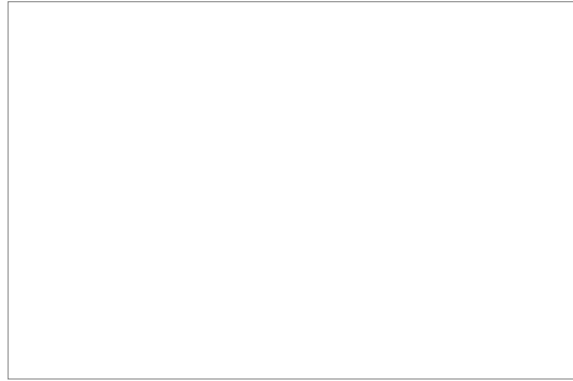
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# SECTION 1 GENERAL

## GROUP 1 SAFETY

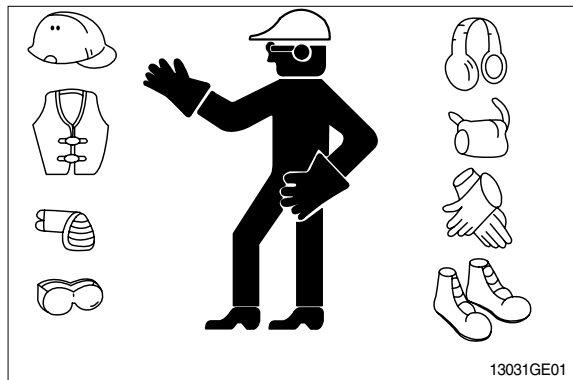
### FOLLOW SAFE PROCEDURE

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



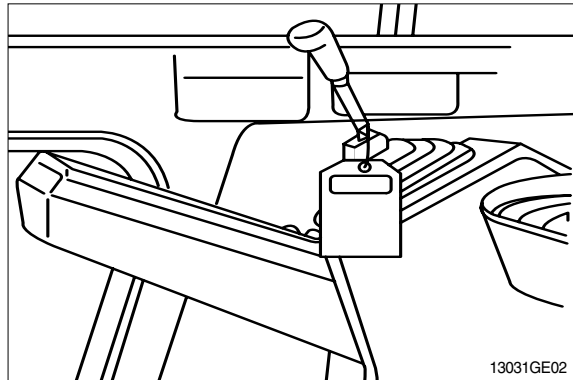
### WEAR PROTECTIVE CLOTHING

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



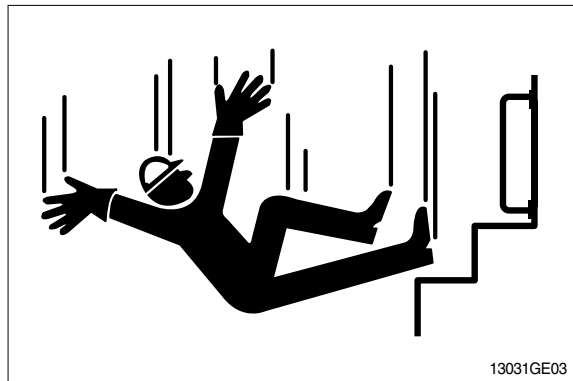
### WARN OTHERS OF SERVICE WORK

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.

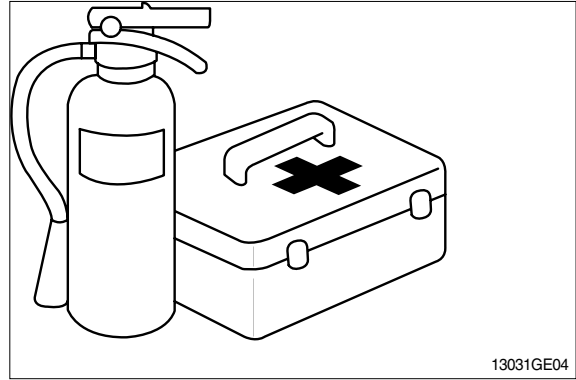


## PREPARE FOR EMERGENCIES

Be prepared if a fire starts.

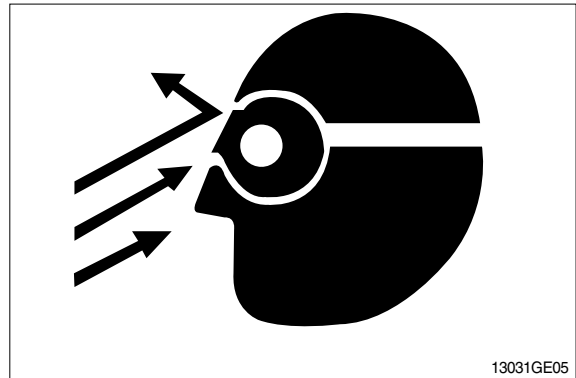
Keep a first aid kit and fire extinguisher handy.

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



## PROTECT AGAINST FLYING DEBRIS

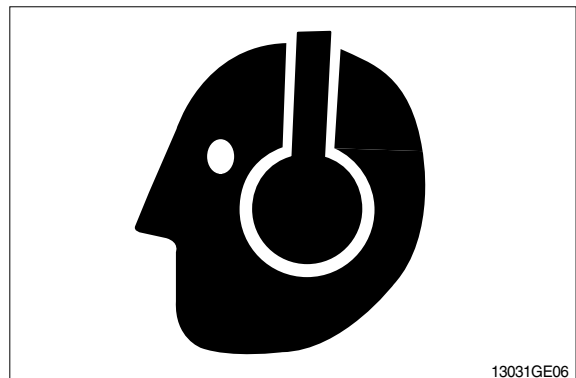
Guard against injury from flying pieces of metal or debris; Wear goggles or safety glasses.



## PROTECT AGAINST NOISE

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

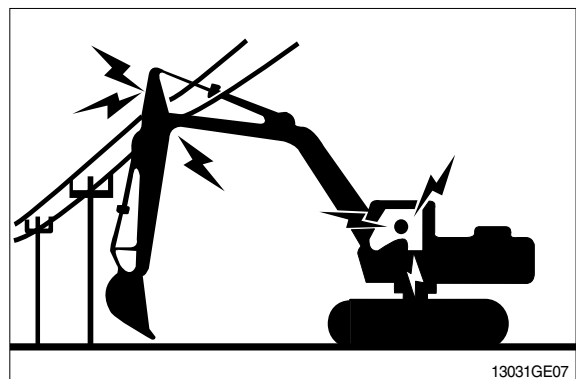
Wear a suitable hearing protective device such as earmuffs or earplugs to protect against objectionable or uncomfortable loud noises.



## AVOID POWER LINES

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

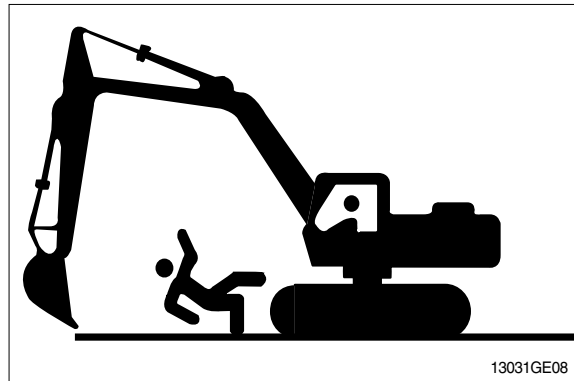
Never move any part of the machine or load closer to electric line than 3m(10ft) plus twice the line insulator length.



## 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.

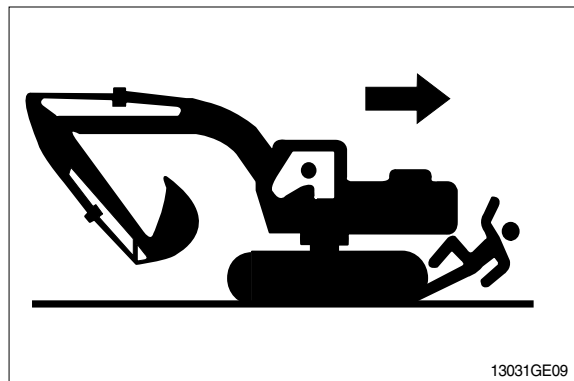


## MOVE AND OPERATE MACHINE SAFELY

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:

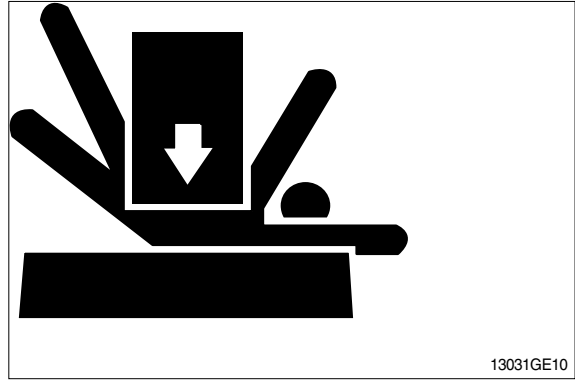
- Park machine on a level surface.
- Lower bucket to the ground.
- Turn auto idle switch off.
- Run engine at 1/2 speed without load for 2 minutes.
- Turn key switch to OFF to stop engine.  
Remove key from switch.
- Move pilot control shutoff lever to locked position.
- Allow engine to cool.

### 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.

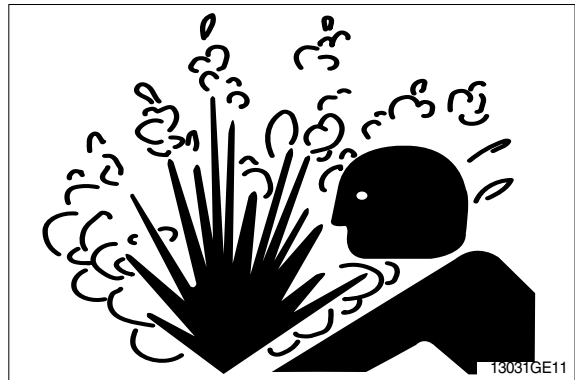
Do not work under a machine that is supported solely by a jack. Follow recommended procedures in this manual.



### 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

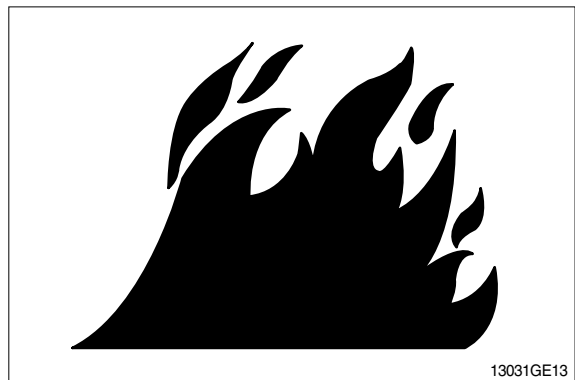
Handle fuel with care; It is highly flammable. Do not refuel the machine while smoking or when near open flame or sparks. Always stop engine before refueling machine. Fill fuel tank outdoors.



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

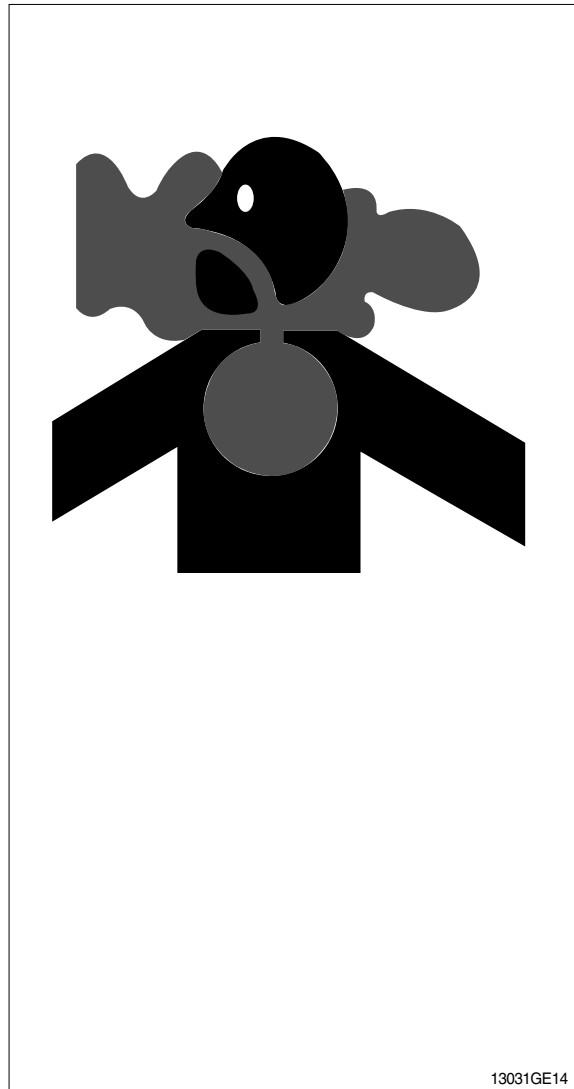
Avoid potentially toxic fumes and dust.

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.

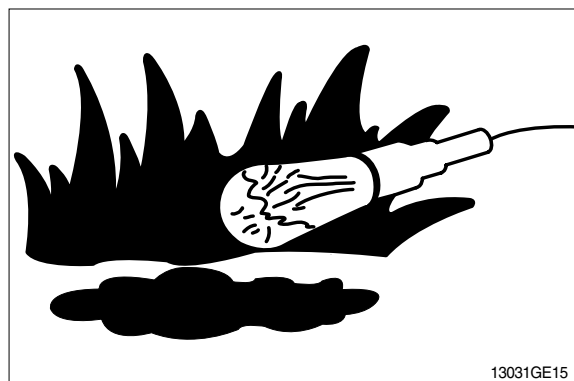
Remove paint before welding or heating:

- 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

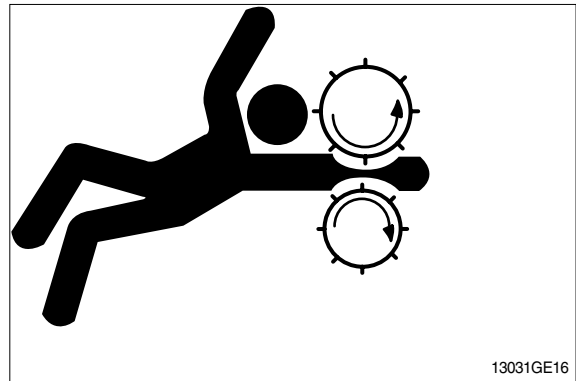
Illuminate your work area adequately but safely. Use a portable safety light for working inside or under the machine. Make sure the bulb is enclosed by a wire cage. The hot filament of an accidentally broken bulb can ignite spilled fuel or oil.



## 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.

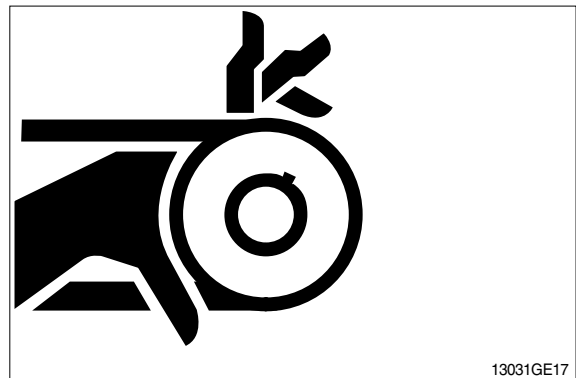
Remove rings and other jewelry to prevent electrical shorts and entanglement in moving parts.



## STAY CLEAR OF MOVING PARTS

Entanglements in moving parts can cause serious injury.

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



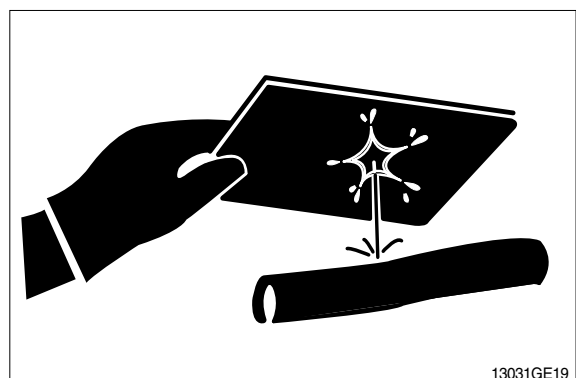
## AVOID HIGH PRESSURE FLUIDS

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:

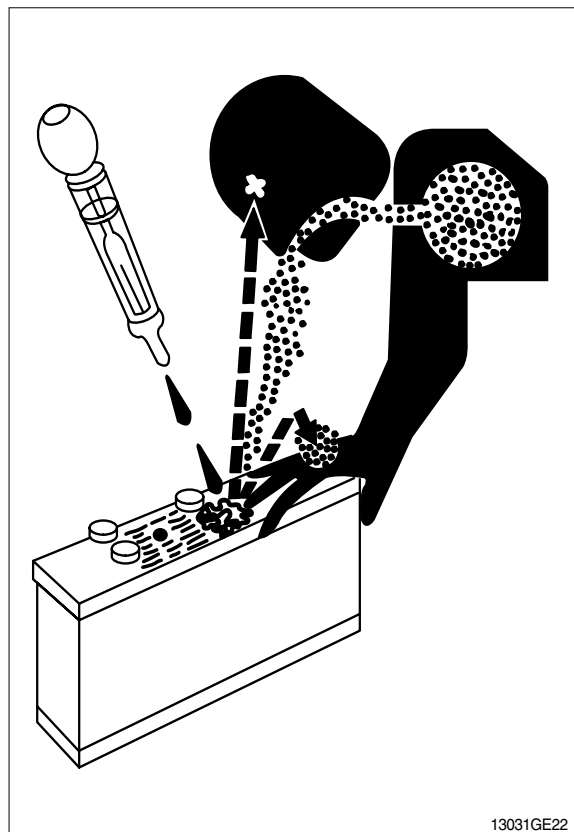
1. Filling batteries in a well-ventilated area.
2. Wearing eye protection and rubber gloves.
3. Avoiding breathing fumes when electrolyte is added.
4. Avoiding spilling or dripping electrolyte.
5. Use proper jump start procedure.

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.





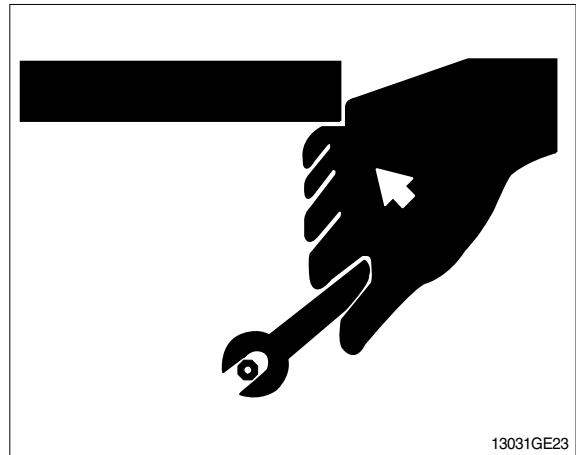
## USE TOOLS PROPERLY

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.)

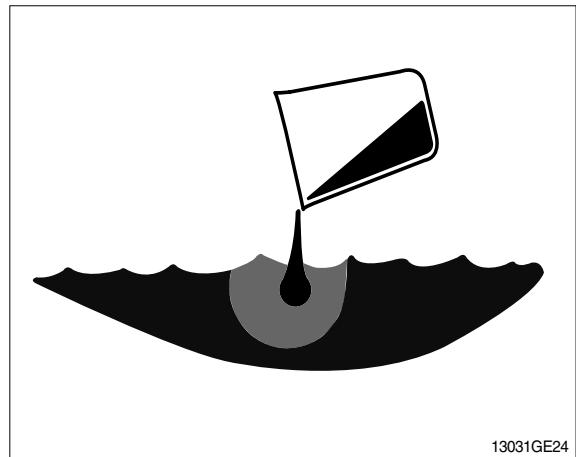


## DISPOSE OF FLUIDS PROPERLY

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.

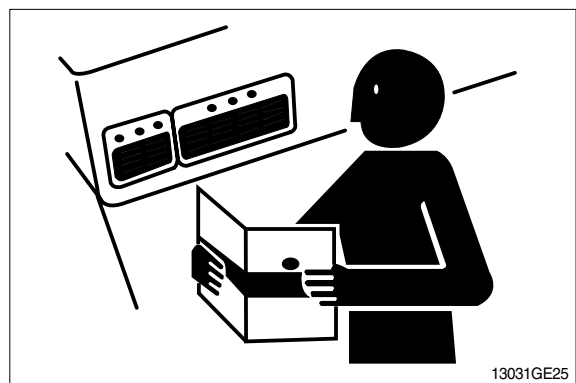
Use proper containers when draining fluids. Do not use food or beverage containers that may mislead someone into drinking from them.

**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.

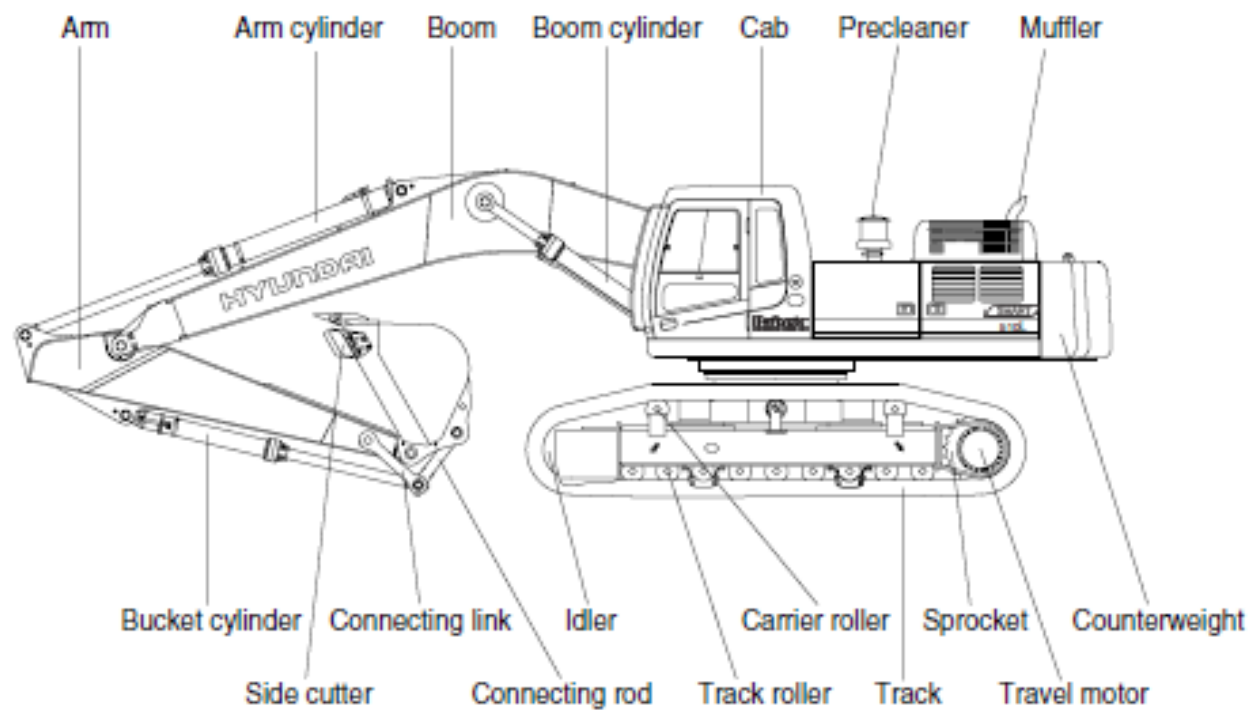
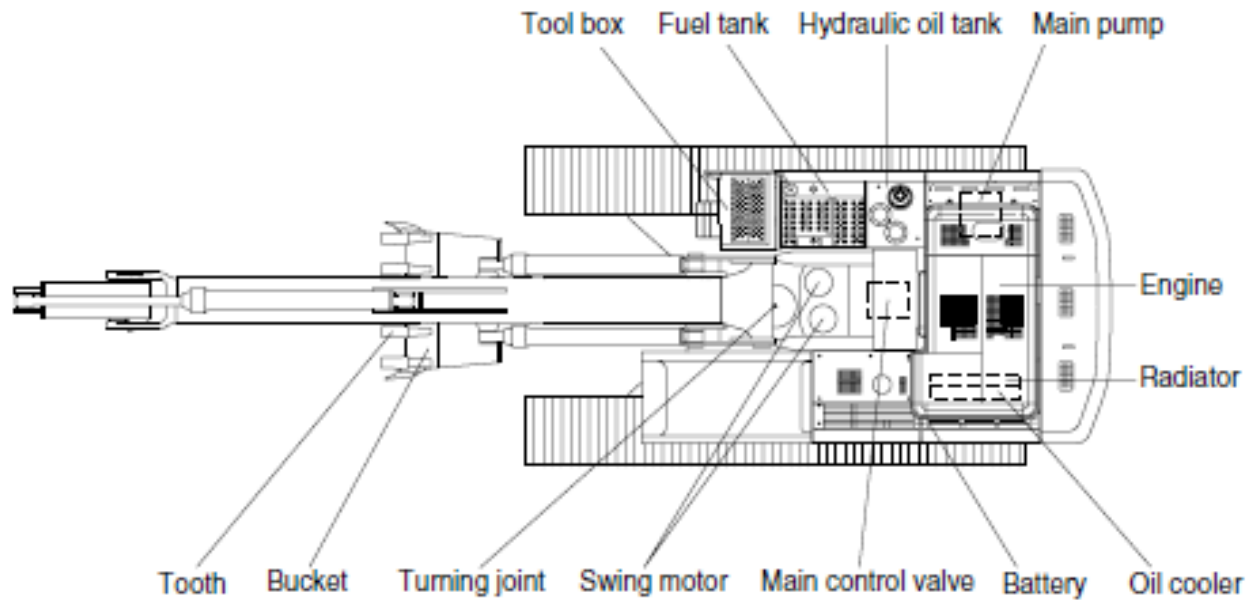


## LIVE WITH SAFETY

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

## GROUP 2 SPECIFICATIONS

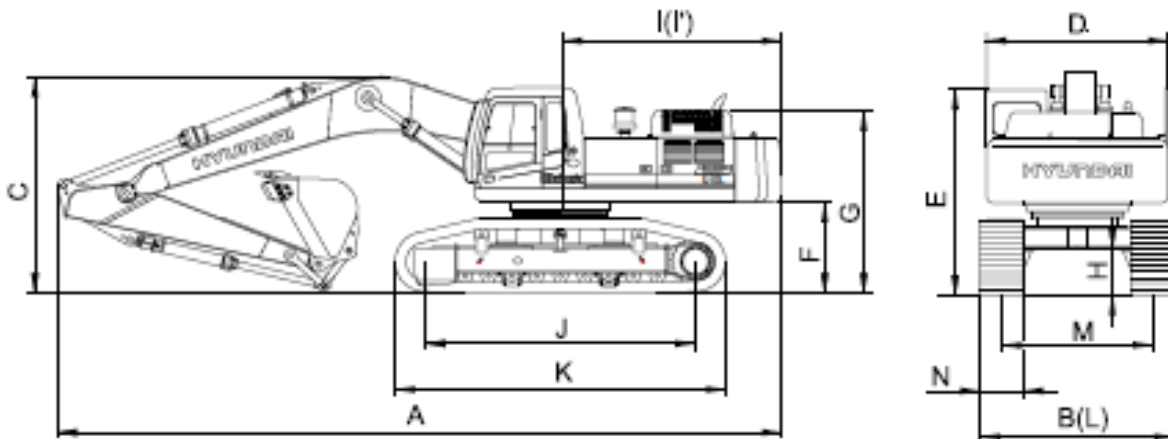
### 1. MAJOR COMPONENT



51072SP00

## 2. SPECIFICATIONS

· 6.55m(21' 6") BOOM and 2.70m(8' 10") ARM

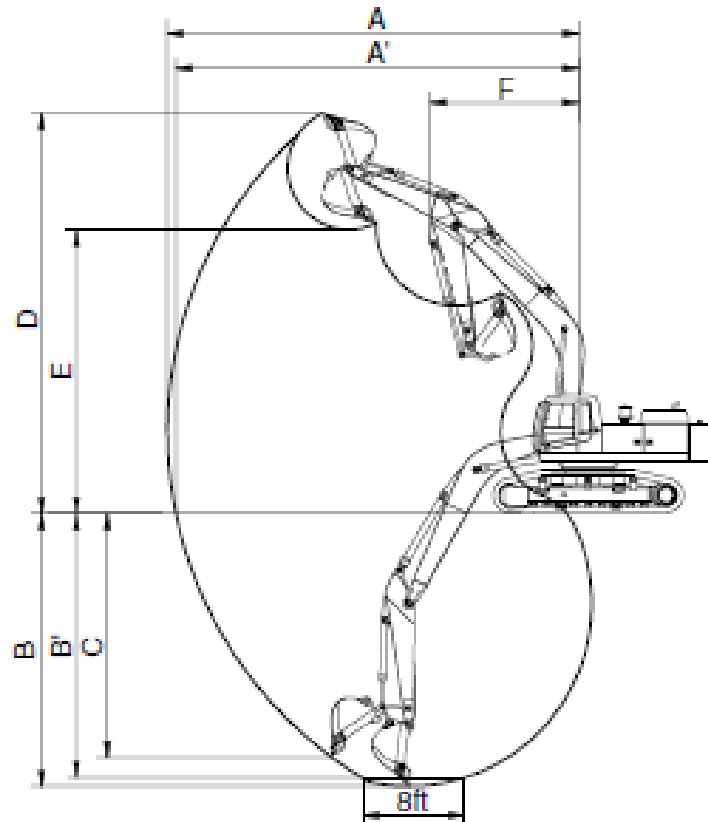


510725P02

Description		Unit	Specification	
Operating weight		kg(lb)	50000(110230)	
Bucket capacity(SAE heaped), standard		m <sup>3</sup> (yd <sup>3</sup> )	3.03(3.96)	
Overall length	A	mm(ft-in)	11750(38' 7")	
Overall width, with 600mm shoe	B		3480(11' 5")	
Overall height	C		3950(13' 0")	
Superstructure width	D		2980( 9' 9")	
Overall height of cab	E		3180(10' 5")	
Ground clearance of counterweight	F		1295( 4' 3")	
Engine cover height	G		3015( 9'11")	
Minimum ground clearance	H		555( 1'10")	
Rear-end distance	I		3665(12' 0")	
Rear-end swing radius	I'		3720(12' 2")	
Distance between tumbler rollers	J		4470(14' 8")	
Undercarriage length	K		5460(17'11")	
Undercarriage width	L		3480(11' 5")	
Track gauge	M		2880( 9' 5")	
Track shoe width, standard	N		600(24")	
Travel speed(Low/high)			km/hr(mph)	3.3/5.2(2.0/3.2)
Swing speed			rpm	9.0
Gradeability		Degree(%)	35(70)	
Ground pressure(600mm shoe)		kgf/cm <sup>2</sup> (psi)	0.87(12.37)	

### 3. WORKING RANGE

· 6.55m(21' 6") BOOM (standard)



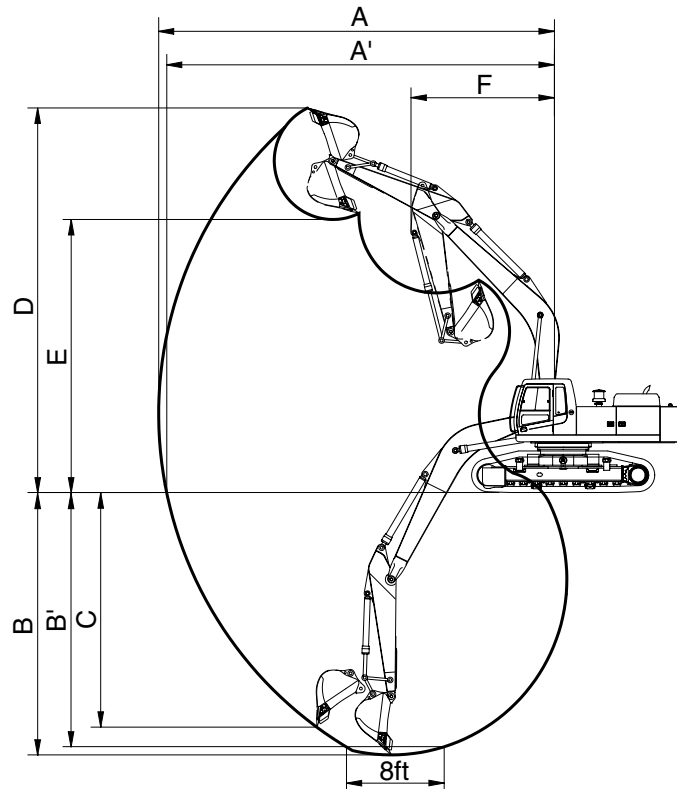
5000723P04

Description		2.40m(7' 10") Arm	* 2.70m(8' 10") Arm
Max digging reach	A	10590mm (34' 9")	10920mm (35' 10")
Max digging reach on ground	A'	10320mm (33' 10")	10650mm (34' 11")
Max digging depth	B	6130mm (20' 1")	6600mm (21' 8")
Max digging depth (8ft level)	B'	6150mm (20' 2")	6440mm (21' 2")
Max vertical wall digging depth	C	4590mm (15' 1")	5200mm (17' 1")
Max digging height	D	10060mm (33' 0")	10370mm (34' 0")
Max dumping height	E	6720mm (22' 1")	6990mm (22' 11")
Min swing radius	F	4650mm (15' 3")	4530mm (14' 10")
Bucket digging force	SAE	247.1[269.6] kN	248.1[270.7] kN
		25200[27490] kgf	25300[27600] kgf
		55560[60610] lbf	55780[60850] lbf
	ISO	286.4[312.4] kN	288.3[314.5] kN
		29200[31850] kgf	29400[32070] kgf
		64370[70220] lbf	64820[70710] lbf
Arm crowd force	SAE	278.5[303.8] kN	237.3[258.9] kN
		28400[30980] kgf	24200[26400] kgf
		62610[68300] lbf	53350[58200] lbf
	ISO	291.3[317.7] kN	248.1[270.7] kN
		29700[32400] kgf	25300[27600] kgf
		65480[71430] lbf	55780[60850] lbf

[ ] : Power boost

\* Standard

- 7.06m(23' 2") BOOM (option)

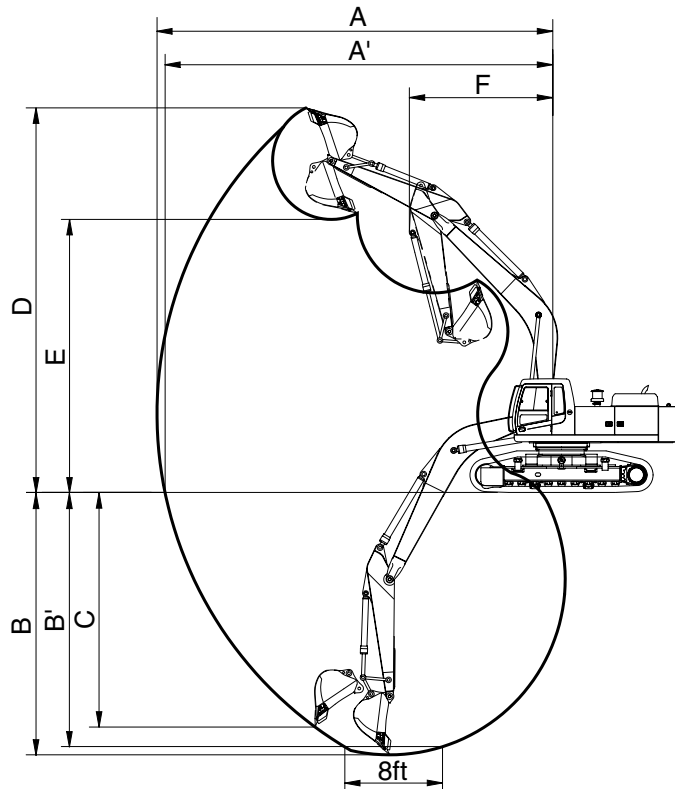


500072SP04

Description		2.40m(7'10") Arm	2.90m(9' 6") Arm	3.38m(11' 1") Arm	4.00m(13' 1") Arm	4.50m(14' 9") Arm
Max digging reach	A	11140mm (36' 7")	11530mm (37'10")	12080mm (39' 8")	12640mm (41' 6")	13130mm (43' 1")
Max digging reach on ground	A'	10890mm (35' 9")	11290mm (37' 0")	11840mm (38'10")	12420mm (40' 9")	12910mm (42' 4")
Max digging depth	B	6610mm (21' 8")	7110mm (23' 4")	7590mm (24'11")	8210mm (26'11")	8710mm (28' 7")
Max digging depth (8ft level)	B'	6430mm (21' 1")	6940mm (22' 9")	7440mm (24' 5")	8080mm (26' 6")	8590mm (28' 2")
Max vertical wall digging depth	C	4880mm (16' 0")	4780mm (15' 8")	5470mm (17'11")	5980mm (19' 7")	6480mm (21' 3")
Max digging height	D	10640mm (34'11")	10610mm (34'10")	11080mm (36' 4")	11290mm (37' 0")	11550mm (37'11")
Max dumping height	E	7290mm (23'11")	7350mm (24' 1")	7760mm (25' 6")	7980mm (26' 2")	8230mm (27' 0")
Min swing radius	F	5110mm (16' 9")	4910mm (16' 1")	4830mm (15'10")	4910mm (16' 1")	4960mm (16' 3")
Bucket digging force	SAE	247.1[269.6] kN	251.1[273.9] kN	253.0[276.0] kN	253.0[276.0] kN	253.0[276.0] kN
		25200[27490] kgf	25600[27930] kgf	25800[28150] kgf	25800[28150] kgf	25800[28150] kgf
		55560[60610] lbf	56440[61570] lbf	56880[62050] lbf	56880[62050] lbf	56880[62050] lbf
	ISO	286.4[312.4] kN	290.3[316.7] kN	292.2[318.8] kN	292.2[318.8] kN	292.2[318.8] kN
		29200[31850] kgf	29600[32290] kgf	29800[32510] kgf	29800[32510] kgf	29800[32510] kgf
		64370[70220] lbf	65260[71190] lbf	65700[71670] lbf	65700[71670] lbf	65700[71670] lbf
Arm crowd force	SAE	278.5[303.8] kN	225.6[246.1] kN	192.2[209.7] kN	171.6[187.2] kN	159.9[174.4] kN
		28400[30980] kgf	23000[25090] kgf	19600[21380] kgf	17500[19090] kgf	16300[17780] kgf
		62610[68300] lbf	50710[55320] lbf	43210[47140] lbf	38580[42090] lbf	35940[39210] lbf
	ISO	291.3[317.7] kN	235.4[256.8] kN	200.1[218.2] kN	177.5[193.6] kN	164.8[179.7] kN
		29700[32400] kgf	24000[26180] kgf	20400[22250] kgf	18100[19750] kgf	16800[18330] kgf
		65480[71430] lbf	52910[57720] lbf	44970[49060] lbf	39900[43530] lbf	37040[40410] lbf

[ ] : Power boost

- 9.00m(29' 6") BOOM (option)



500072SP04

Description		5.85m(19' 2") Arm
Max digging reach	A	16280mm (53' 5")
Max digging reach on ground	A'	16100mm (52'10")
Max digging depth	B	11380mm (37' 4")
Max digging depth (8ft level)	B'	11280mm (37' 0")
Max vertical wall digging depth	C	10070mm (33' 0")
Max digging height	D	13930mm (45' 8")
Max dumping height	E	10530mm (34' 7")
Min swing radius	F	5940mm (19' 6")
Bucket digging force	SAE	251.1[273.9] kN
		25600[27930] kgf
		56440[61570] lbf
	ISO	296.2[323.1] kN
		30200[32950] kgf
		66580[72630] lbf
Arm crowd force	SAE	126.5[138.0] kN
		12900[14070] kgf
		28440[31030] lbf
	ISO	130.4[142.3] kN
		13300[14510] kgf
		29320[31990] lbf



[ ] : Power boost











#### 4. WEIGHT

Item	R510LC-7	
	kg	lb
Upperstructure assembly	25470	56150
Main frame weld assembly	3940	8680
Engine assembly	940	2070
Main pump assembly	180	400
Main control valve assembly	420	930
Swing motor assembly	250	550
Hydraulic oil tank assembly	450	990
Fuel tank assembly	300	660
Counterweight	10700	23590
Cab assembly	310	680
Lower chassis assembly	13970	30800
Lower frame weld assembly	6100	13450
Swing bearing	600	1320
Travel motor assembly	425	940
Turning joint	50	110
Track recoil spring and idler	300	660
Idler	250	550
Carrier roller	40	90
Track roller	80	180
Track-chain assembly(600mm standard triple grouser shoe)	2790	6160
Front attachment assembly(6.55m boom, 2.70m arm, 3.03m <sup>3</sup> SAE heaped bucket)	10560	23280
6.55m boom assembly	3410	7520
2.70m arm assembly	1790	3950
3.03m <sup>3</sup> SAE heaped bucket	2490	5490
Boom cylinder assembly	910	2010
Arm cylinder assembly	540	1190
Bucket cylinder assembly	300	660
Bucket control rod assembly	130	290

## 5. LIFTING CAPACITIES

1) 6.55m(21' 6") boom, 2.70m(8' 10") arm equipped with 3.03m<sup>3</sup>(SAE heaped) bucket, 600mm (24") triple grouser shoe and 10,700kg(23,590lb) counterweight.











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

Load point height		Load radius								At max. reach		
		3.0m(10.0ft)		4.5m(15.0ft)		6.0m(20.0ft)		7.5m(25.0ft)		Capacity		Reach
												m(ft)
7.5m (25.0ft)	kg lb									*9320 *20550	8380 18470	8.30 (27.2)
6.0m (20.0ft)	kg lb					*12260 *27030	*12260 *27030	*10760 *23720	9780 21560	*9130 *20130	6760 14900	9.15 (30.0)
4.5m (15.0ft)	kg lb			*18300 *40340	*18300 *40340	*13740 *30290	*13740 *30290	*11380 *25090	9440 20810	*9090 *20040	5900 13010	9.65 (31.7)
3.0m (10.0ft)	kg lb					*15360 *33860	12940 28530	*12150 *26790	9000 19840	*9120 *20110	5490 12100	9.86 (32.3)
1.5m (5.0ft)	kg lb					*16470 *36310	12210 26920	*12730 *28060	8590 18940	*9160 *20190	5420 11950	9.80 (32.2)
Ground Line	kg lb			*22630 *49890	18650 41120	*16670 *36750	11800 26010	*12800 *28220	8330 18360	*9130 *20130	5700 12570	9.47 (31.1)
-1.5m (-5.0ft)	kg lb	*25090 *55310	*25090 *55310	*20780 *45810	18720 41270	*15800 *34830	11690 25770	*12060 *26590	8250 18190	*8870 *19550	6450 14220	8.84 (29.0)
-3.0m (-10.0ft)	kg lb	*21470 *47330	*21470 *47330	*17630 *38870	*17630 *38870	*13610 *30000	11850 26120			*8020 *17680	*8020 *17680	7.80 (25.6)
-4.5m (-15.0ft)	kg lb			*12370 *27270	*12370 *27270							

- 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.

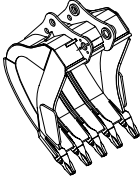
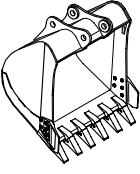


2) 6.55m(21' 6") boom, 2.70m(8' 10") arm equipped with 2.79m<sup>3</sup>(SAE heaped) bucket, 600mm (24") triple grouser shoe and 10,700kg(23,590lb) counterweight.

Load point height		Load radius								At max. reach		
		3.0m(10.0ft)		4.5m(15.0ft)		6.0m(20.0ft)		7.5m(25.0ft)		Capacity		Reach
												m(ft)
7.5m (25.0ft)	kg lb									*9400 *20720	8450 18630	8.30 (27.2)
6.0m (20.0ft)	kg lb					*12330 *27180	*12330 *27180	*10840 *23900	9840 21690	*9210 *20300	6830 15060	9.15 (30.0)
4.5m (15.0ft)	kg lb			*18380 *40520	*18380 *40520	*13820 *30470	*13820 *30470	*11460 *25260	9500 20940	*9170 *20220	5980 13180	9.65 (31.7)
3.0m (10.0ft)	kg lb					*15440 *34040	13010 28680	*12230 *26960	9060 19970	*9200 *20280	5560 12260	9.86 (32.3)
1.5m (5.0ft)	kg lb					*16560 *36510	12280 27070	*12810 *28240	8660 19090	*9240 *20370	5490 12100	9.80 (32.2)
Ground Line	kg lb			*22720 *50090	18730 41290	*16750 *36930	11870 26170	*12880 *28400	8400 18520	*9210 *20300	5770 12720	9.47 (31.1)
-1.5m (-5.0ft)	kg lb	*25210 *55580	*25210 *55580	*20870 *46010	18800 41450	*15880 *35010	11760 25930	*12140 *26760	8320 18340	*8960 *19750	6520 14370	8.84 (29.0)
-3.0m (-10.0ft)	kg lb	*21580 *47580	*21580 *47580	*17720 *39070	*17720 *39070	*13690 *30180	11930 26300			*8100 *17860	*8100 *17860	7.80 (25.6)
-4.5m (-15.0ft)	kg lb			*12460 *27470	*12460 *27470							

## 6. BUCKET SELECTION GUIDE

### 1) GENERAL BUCKET

	
2.79m <sup>3</sup> SAE heaped bucket	※ 3.03m <sup>3</sup> SAE heaped bucket

Capacity		Width		Weight	Recommendation					
					7.06m (23' 2") boom					6.55m(21'5") boom
SAE heaped	CECE heaped	Without side cutter	With side cutter		2.4m arm (7' 10")	2.9m arm (9' 6")	3.38m arm (11' 1")	4.0m arm (13' 1")	4.5m arm (14' 9")	※ 2.4m arm (7' 10")
2.79m <sup>3</sup> (3.65yd <sup>3</sup> )	2.47m <sup>3</sup> (3.23yd <sup>3</sup> )	1830mm (69.3")	1865mm (75.2")	1960kg (4320lb)						
※ 3.03m <sup>3</sup> (3.96yd <sup>3</sup> )	2.67m <sup>3</sup> (3.49yd <sup>3</sup> )	1890mm (74.4")	2040mm (80.3")	2485kg (5480lb)						

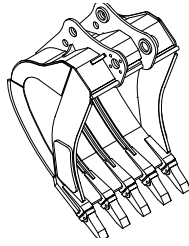
※ : Standard bucket

Applicable for materials with density of 2000kgf/m<sup>3</sup> (3370lbf/yd<sup>3</sup>) or less

Applicable for materials with density of 1600kgf/m<sup>3</sup> (2700lbf/yd<sup>3</sup>) or less

Applicable for materials with density of 1100kgf/m<sup>3</sup> (1850lbf/yd<sup>3</sup>) or less

## 2) ROCK BUCKET



⊙ 2.2m<sup>3</sup> SAE  
 ⊙ 2.43m<sup>3</sup> SAE  
 heaped bucket

Capacity		Width		Weight	Recommendation					
					7.06m (23' 2") boom					6.55m boom
SAE heaped	CECE heaped	Without side cutter	With side cutter		2.4m arm (7' 10")	2.9m arm (9' 6")	3.38m arm (11' 1")	4.0m arm (13' 1")	4.5m arm (14' 9")	※ 2.4m arm (7' 10")
⊙2.20m <sup>3</sup> (2.88yd <sup>3</sup> )	1.80m <sup>3</sup> (2.35yd <sup>3</sup> )	1835mm (72.2")	-	2295kg (5060lb)						
⊙2.43m <sup>3</sup> (3.18yd <sup>3</sup> )	2.10m <sup>3</sup> (2.75yd <sup>3</sup> )	1885mm (74.2")	-	2335kg (5150lb)						

⊙ : Rock bucket

Applicable for materials with density of 2000kg/m<sup>3</sup> (3370lb/yd<sup>3</sup>) or less

Applicable for materials with density of 1600kg/m<sup>3</sup> (2700lb/yd<sup>3</sup>) or less

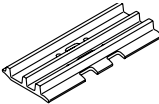
Applicable for materials with density of 1100kg/m<sup>3</sup> (1850lb/yd<sup>3</sup>) or less

## 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			
						
R510LC-7	Shoe width	mm(in)	※600(24)	700(28)	750(30)	800(32)
	Operating weight	kg(lb)	50000(110230)	50540(111420)	50810(112020)	51020(112610)
	Ground pressure	kgf/cm <sup>2</sup> (psi)	0.87(12.37)	0.75(10.67)	0.71(10.10)	0.67(9.53)
	Overall width	mm(ft-in)	3480(11' 5")	3580(11' 9")	3640(11' 11")	3680(12' 1")

※ : Standard

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

Item	Quantity
Carrier rollers	2EA
Track rollers	9EA
Track shoes	53EA

### 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
600mm triple grouser	Standard	A
600mm double grouser	Option	A
700mm triple grouser, double grouser	Option	B
750mm triple grouser	Option	B
800mm triple grouser	Option	C

※ **Table 2**

Category	Applications	Precautions
A	Rocky ground, river beds, normal soil	<ul style="list-style-type: none"> <li>• Travel at low speed on rough ground with large obstacles such as boulders or fallen trees</li> </ul>
B	Normal soil, soft ground	<ul style="list-style-type: none"> <li>• These shoes cannot be used on rough ground with large obstacles such as boulders or fallen trees</li> <li>• Travel at high speed only on flat ground</li> <li>• Travel slowly at low speed if it is impossible to avoid going over obstacles</li> </ul>
C	Extremely soft ground (Swampy ground)	<ul style="list-style-type: none"> <li>• Use the shoes only in the conditions that the machine sinks and it is impossible to use the shoes of category A or B</li> <li>• These shoes cannot be used on rough ground with large obstacles such as boulders or fallen trees</li> <li>• Travel at high speed only on flat ground</li> <li>• Travel slowly at low speed if it is impossible to avoid going over obstacles</li> </ul>

## 8. SPECIFICATIONS FOR MAJOR COMPONENTS

### 1) ENGINE

Item	Specification
Model	Cummins QSM 11
Type	4-cycle turbocharged diesel engine
Cooling method	Water cooling
Number of cylinders and arrangement	6 cylinders, in-line
Firing order	1-5-3-6-2-4
Combustion chamber type	Direct injection type
Cylinder bore × stroke	125 × 147.1mm(4.92" × 5.79")
Piston displacement	10800cc(505cu in)
Compression ratio	16.3 : 1
Rated gross horse power(SAE J1995)	358ps at 1900rpm(353Hp / 263kW at 1900rpm)
Maximum torque	182.5kgf · m(1320lb · ft) at 1300rpm
Engine oil quantity	37.85 l (10U.S. gal)
Dry weight	942kg(2077lb)
High idling speed	1950 ± 50rpm
Low idling speed	800 ± 50rpm
Rated fuel consumption	144g/Hp · hr at 1900rpm
Starting motor	Delco remy 42MT (24V-7.2kW)
Alternator	Delco Remy 24V-70A
Battery	2 × 12V × 200Ah

### 2) MAIN PUMP

Item	Specification
Type	Variable displacement tandem axis piston pumps
Capacity	2 × 200cc/rev
Maximum pressure	330kgf/cm <sup>2</sup> (4690psi)[360kgf/cm <sup>2</sup> (5120psi)]
Rated oil flow	2 × 380 l /min (100.4U.S. gpm/83.6U.K. gpm)
Rated speed	1900rpm

[ ]: Power boost

### 3) GEAR PUMP

Item	Specification
Type	Fixed displacement gear pump single stage
Capacity	15cc/rev
Maximum pressure	35kgf/cm <sup>2</sup> (498psi)
Rated oil flow	28.5 l /min(7.5U.S. gpm/6.3U.K. gpm)

### 4) MAIN CONTROL VALVE

Item	Specification
Type	9 spools
Operating method	Hydraulic pilot system
Main relief valve pressure	330kgf/cm <sup>2</sup> (4690psi) [360kgf/cm <sup>2</sup> (5120psi)]
Overload relief valve pressure	380kgf/cm <sup>2</sup> (5400psi)

[ ]: Power boost

### 5) SWING MOTOR

Item	Specification
Type	Fixed displacement axial piston motor
Capacity	148.5cc/rev
Relief pressure	285kgf/cm <sup>2</sup> (4050psi)
Braking system	Automatic, spring applied hydraulic released
Braking torque	63kgf · m(456lb · ft)
Brake release pressure	23~50kgf/cm <sup>2</sup> (327~711psi)
Reduction gear type	2 - stage planetary
Swing speed	9.0rpm

### 6) TRAVEL MOTOR

Item	Specification
Type	Variable displacement axial piston motor
Relief pressure	345kgf/cm <sup>2</sup> (4910psi)
Capacity(max / min)	160/100cc/rev
Reduction gear type	3-stage planetary
Braking system	Automatic, spring applied hydraulic released
Brake release pressure	17~50kgf/cm <sup>2</sup> (242~711psi)
Braking torque	103kgf · m(745lb · ft)

## 7) REMOTE CONTROL VALVE

Item		Specification
Type		Pressure reducing type
Operating pressure	Minimum	6.5kgf/cm <sup>2</sup> (92psi)
	Maximum	26kgf/cm <sup>2</sup> (370psi)
Single operation stroke	Lever	61mm(2.4in)
	Pedal	123mm(4.84in)

## 8) CYLINDER

Item		Specification
Boom cylinder	Bore dia × Rod dia × Stroke	∅ 170 × ∅ 115 × 1570mm
	Cushion	Extend only
Arm cylinder	Bore dia × Rod dia × Stroke	∅ 190 × ∅ 130 × 1820mm
	Cushion	Extend and retract
Bucket cylinder	Bore dia × Rod dia × Stroke	∅ 170 × ∅ 115 × 1370mm
	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.**

## 9) SHOE

Item		Width	Ground pressure	Link quantity	Overall width
R510L	Standard	600mm(24")	0.87kgf/cm <sup>2</sup> (12.37psi)	53	3480mm(11' 5")
	Option	700mm(28")	0.75kgf/cm <sup>2</sup> (10.67psi)	53	3580mm(11' 9")
		750mm(30")	0.71kgf/cm <sup>2</sup> (10.10psi)	53	3640mm(11' 11")
		800mm(32")	0.67kgf/cm <sup>2</sup> ( 9.53psi)	53	3680mm(12' 1")

## 10) BUCKET

Item		Capacity		Tooth quantity	Width	
		SAE heaped	CECE heaped		Without side cutter	With side cutter
R510L	Standard	3.03m <sup>3</sup> (3.96yd <sup>3</sup> )	2.67m <sup>3</sup> (3.49yd <sup>3</sup> )	6	1890mm (74.4")	2040mm (80.3")
	Option	2.79m <sup>3</sup> (3.65yd <sup>3</sup> )	2.47m <sup>3</sup> (3.23yd <sup>3</sup> )	5	1830mm (69.3")	1865mm (75.2")
		⊙2.20m <sup>3</sup> (2.88yd <sup>3</sup> )	1.80m <sup>3</sup> (2.35yd <sup>3</sup> )	5	1835mm (72.2")	-
		⊙2.43m <sup>3</sup> (3.18yd <sup>3</sup> )	2.10m <sup>3</sup> (2.75yd <sup>3</sup> )	5	1885mm (74.2")	-

⊙ : Rock bucket(Esco type)



## 9. RECOMMENDED OILS

Use only oils listed below or equivalent.  
Do not mix different brand oil.

Service point	Kind of fluid	Capacity l (U.S. gal)	Ambient temperature °C (°F)								
			-20 (-4)	-10 (14)	0 (32)	10 (50)	20 (68)	30 (86)	40 (104)		
Engine oil pan	Engine oil	38(10)									
							SAE 30				
			SAE 10W								
			SAE 10W-30								
						SAE 15W-40					
Swing drive	Gear oil	5.0×2 (1.3×2)									
Final drive		5.0×2 (1.3×2)	SAE 85W-140								
Hydraulic tank	Hydraulic oil	Tank; 250(66) System; 380(100)	ISO VG 32								
			ISO VG 46								
			ISO VG 68								
Fuel tank	Diesel fuel	610(161)	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 water 50 : 50	50(13.2)	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