

# SECTION 1 GENERAL



Group 1 Safety Hints .....	1-1
Group 2 Specifications .....	1-10

# SECTION 1 GENERAL

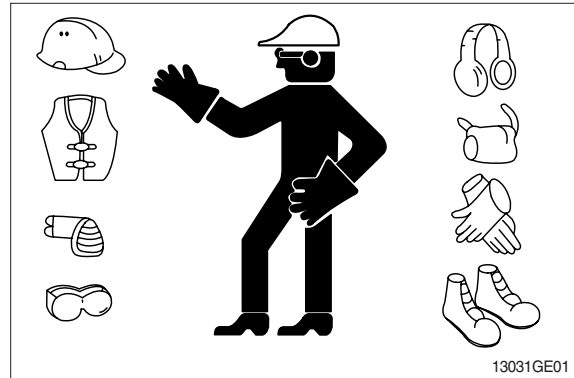
## GROUP 1 SAFETY

### FOLLOW SAFE PROCEDURE

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

### WEAR PROTECTIVE CLOTHING

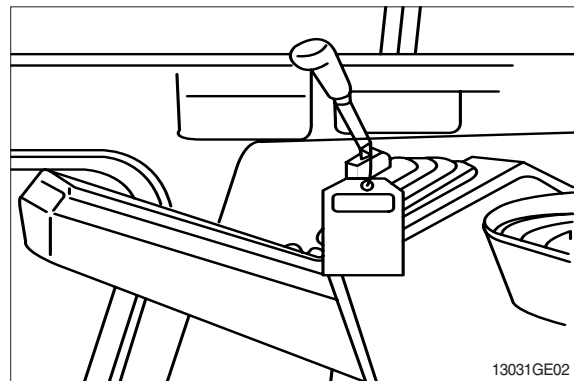
Wear close fitting clothing and safety equipment appropriate to the job.



### 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.



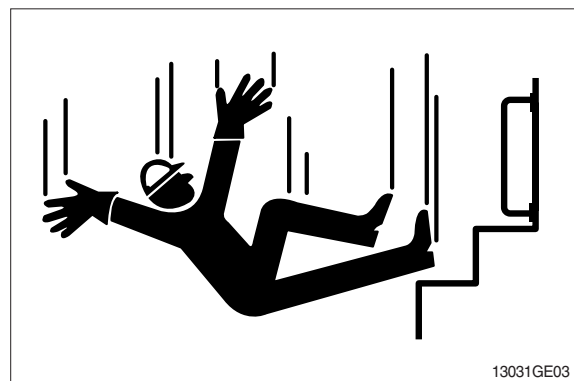
### USE HANDHOLDS AND STEPS

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.

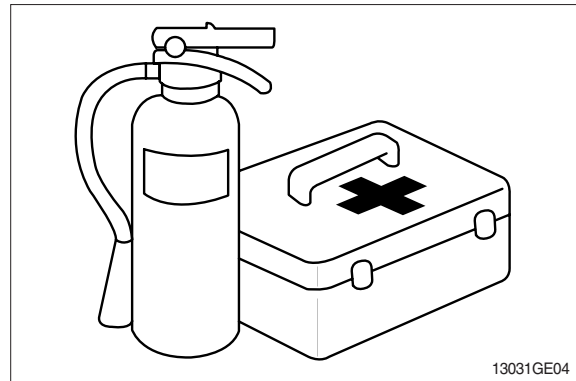


## PREPARE FOR EMERGENCIES

Be prepared if a fire starts.

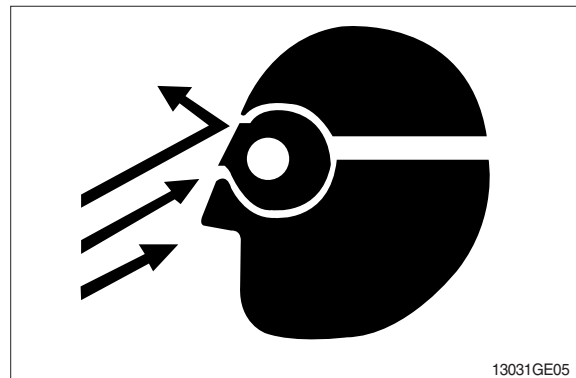
Keep a first aid kit and fire extinguisher handy.

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



## PROTECT AGAINST FLYING DEBRIS

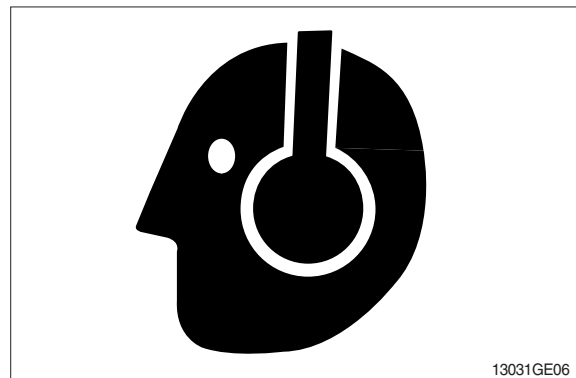
Guard against injury from flying pieces of metal or debris; Wear goggles or safety glasses.



## PROTECT AGAINST NOISE

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

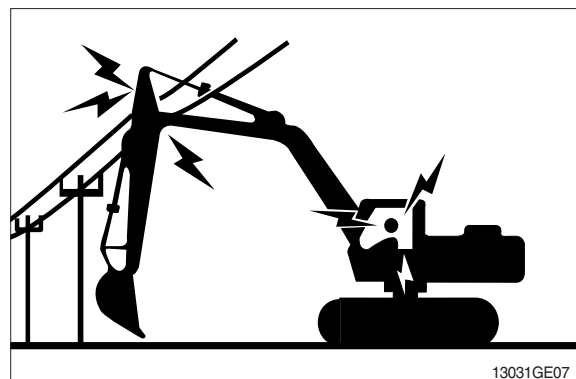
Wear a suitable hearing protective device such as earmuffs or earplugs to protect against objectionable or uncomfortable loud noises.



## AVOID POWER LINES

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

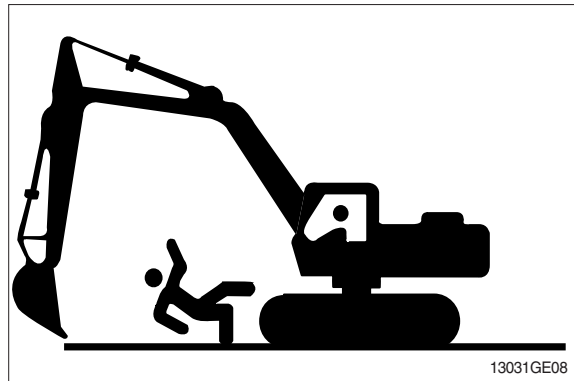
Never move any part of the machine or load closer to electric line than 3m(10ft) plus twice the line insulator length.



## 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.

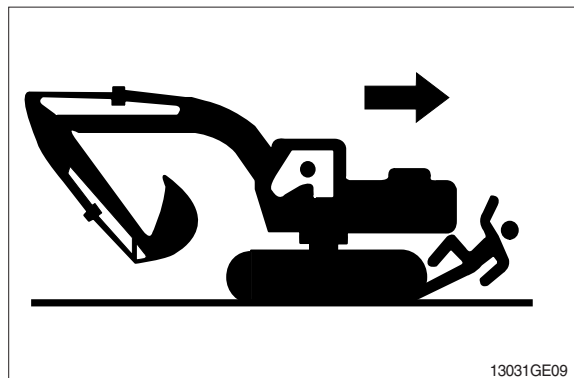


## MOVE AND OPERATE MACHINE SAFELY

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:

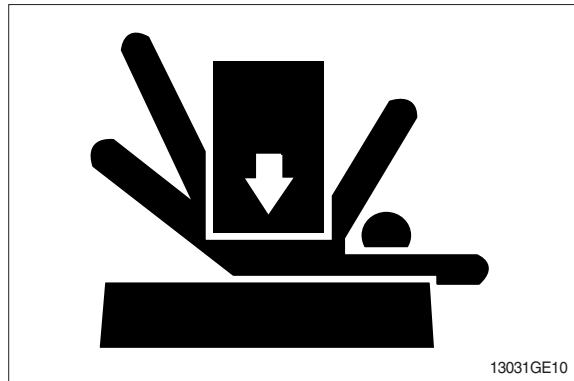
- Park machine on a level surface.
- Lower bucket to the ground.
- Turn auto idle switch off.
- Run engine at 1/2 speed without load for 2 minutes.
- Turn key switch to OFF to stop engine. Remove key from switch.
- Move pilot control shutoff lever to locked position.
- Allow engine to cool.

## 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.

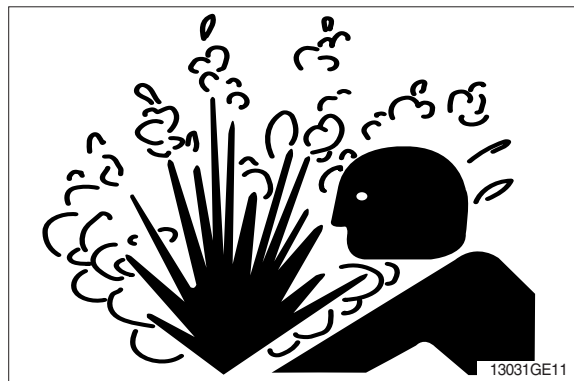
Do not work under a machine that is supported solely by a jack. Follow recommended procedures in this manual.



## SERVICE COOLING SYSTEM SAFELY

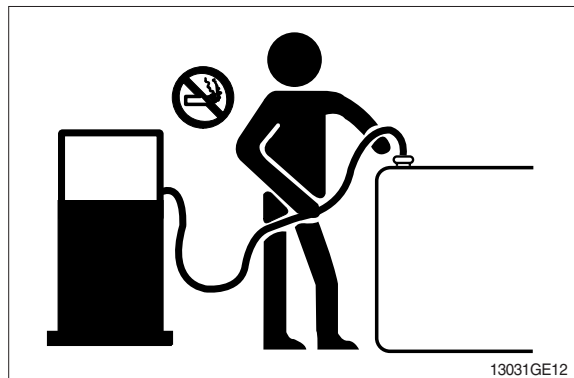
Explosive release of fluids from pressurized cooling system can cause serious burns.

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



## HANDLE FLUIDS SAFELY-AVOID FIRES

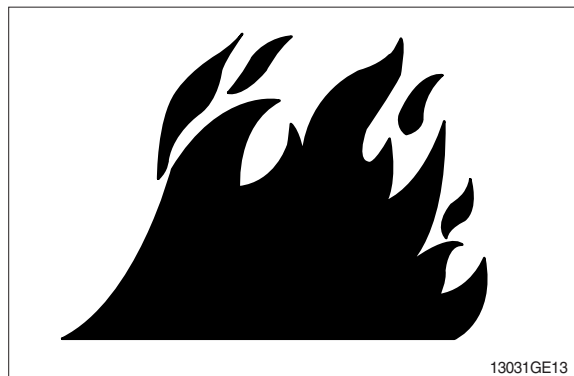
Handle fuel with care; It is highly flammable. Do not refuel the machine while smoking or when near open flame or sparks. Always stop engine before refueling machine. Fill fuel tank outdoors.



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.

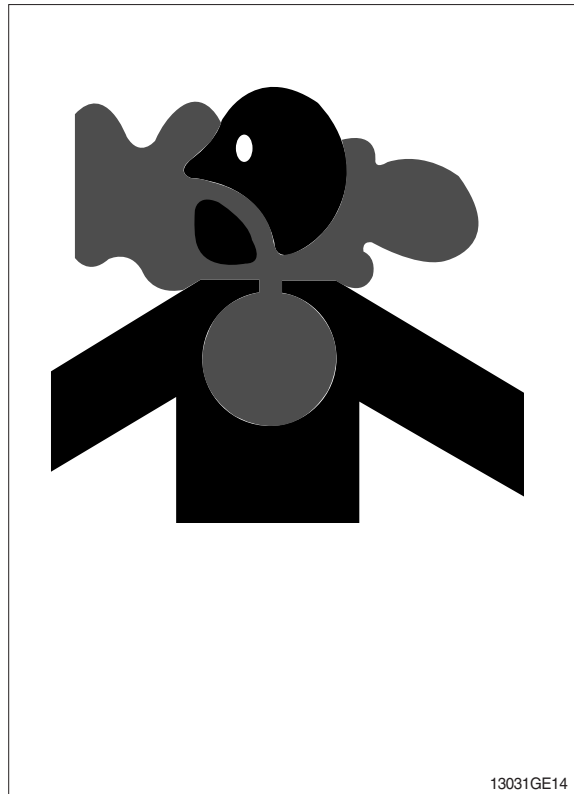
Do all work outside or in a well ventilated area. Dispose of paint and solvent properly.

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

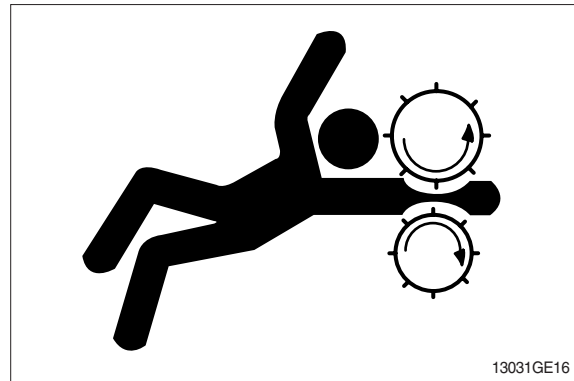
Illuminate your work area adequately but safely. Use a portable safety light for working inside or under the machine. Make sure the bulb is enclosed by a wire cage. The hot filament of an accidentally broken bulb can ignite spilled fuel or oil.



### 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.

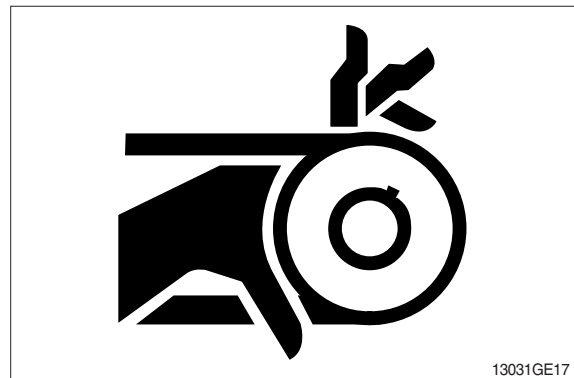
Remove rings and other jewelry to prevent electrical shorts and entanglement in moving parts.



### STAY CLEAR OF MOVING PARTS

Entanglements in moving parts can cause serious injury.

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



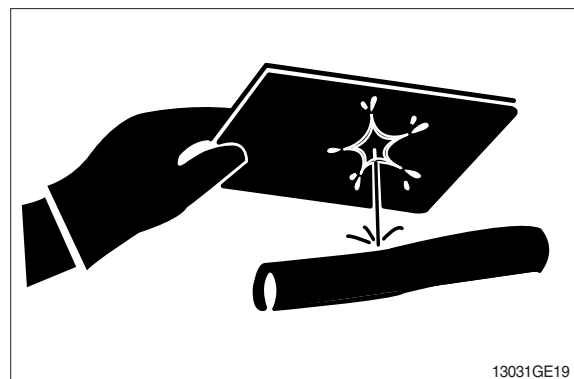
### AVOID HIGH PRESSURE FLUIDS

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.

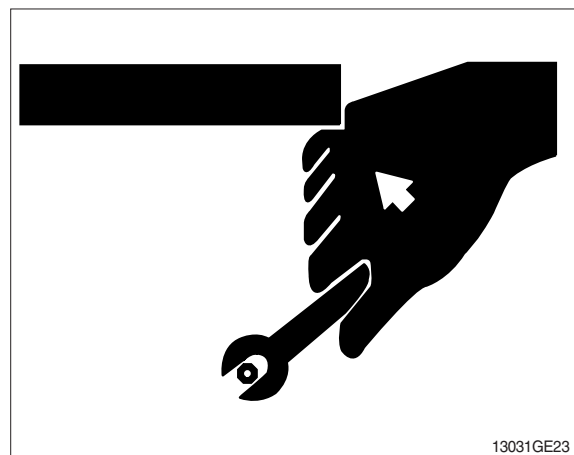
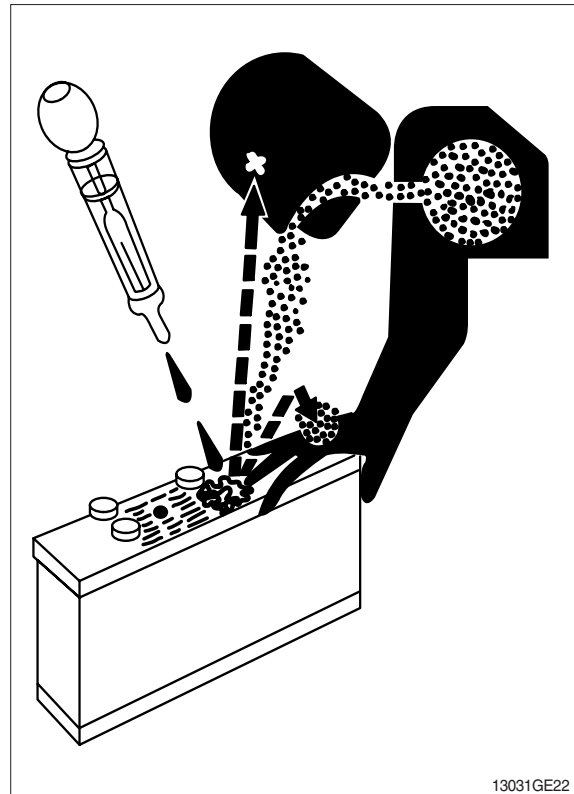
## USE TOOLS PROPERLY

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.)

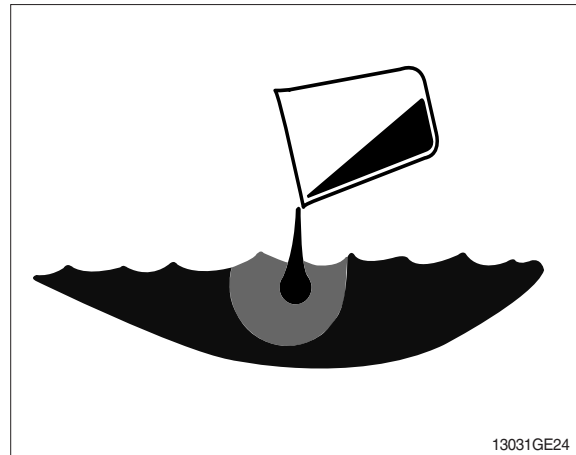


## DISPOSE OF FLUIDS PROPERLY

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.

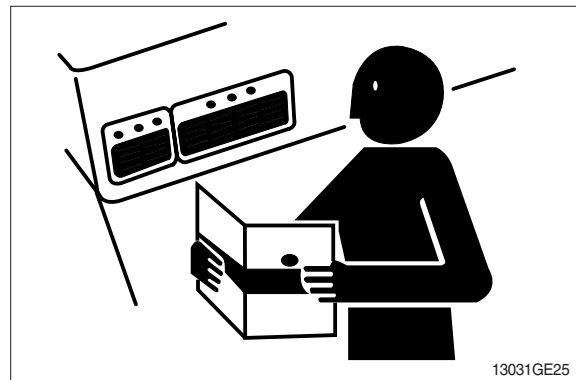
Use proper containers when draining fluids. Do not use food or beverage containers that may mislead someone into drinking from them.

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.

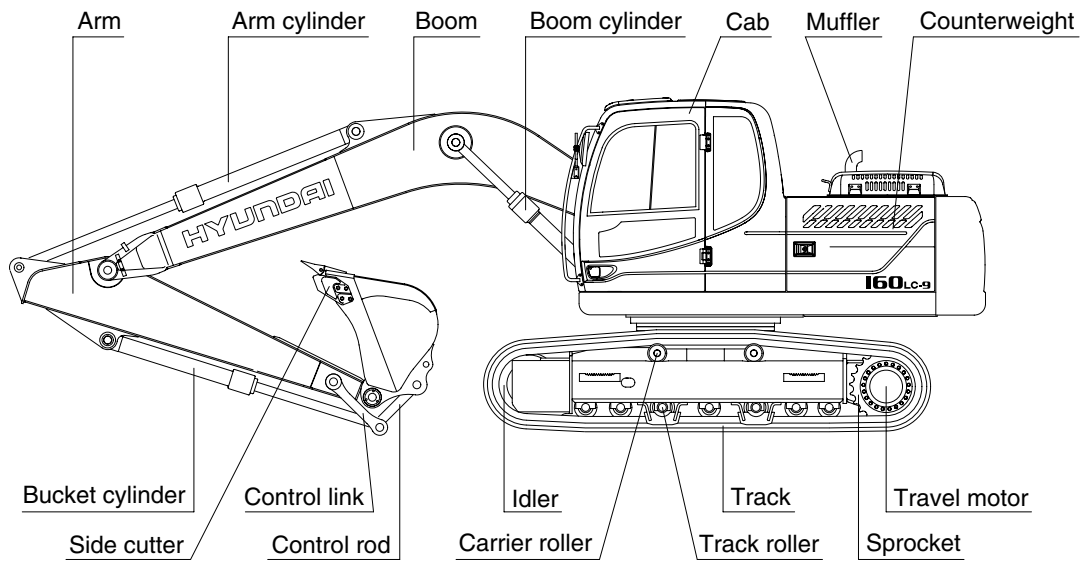
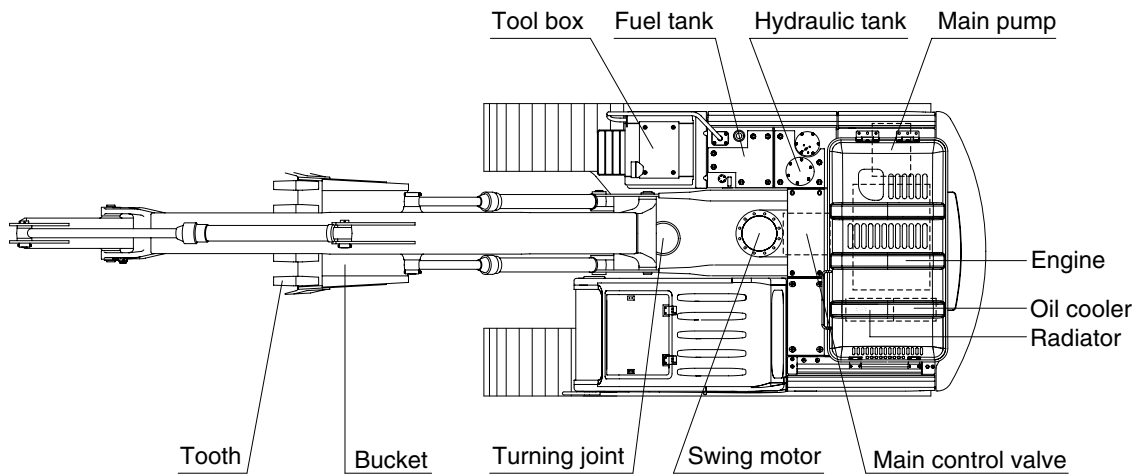


## LIVE WITH SAFETY

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

# GROUP 2 SPECIFICATIONS (R160LC-9)

## 1. MAJOR COMPONENT

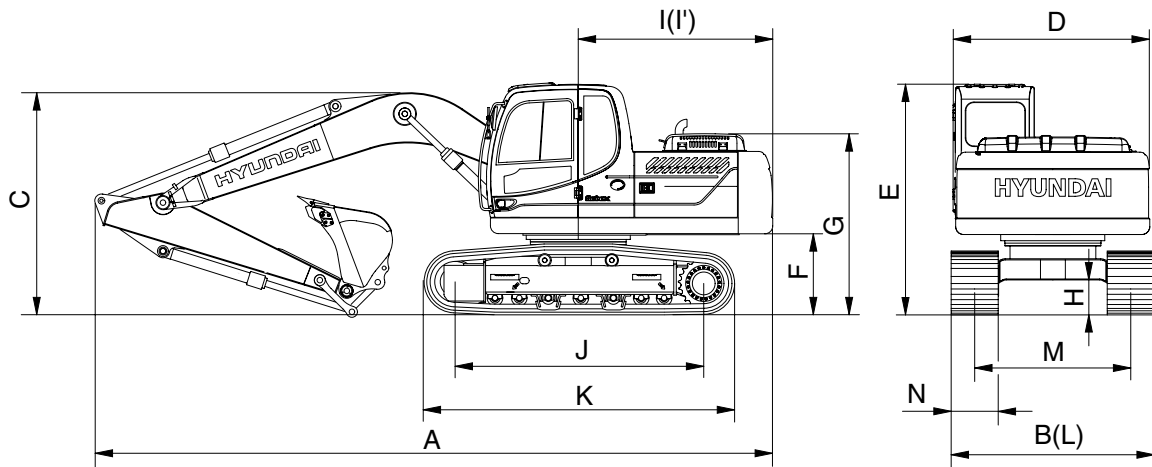


16092SP01

## 2. SPECIFICATIONS

### 1) R160LC-9

· 5.1 m (16' 9") BOOM and 2.6 m (8' 6") ARM

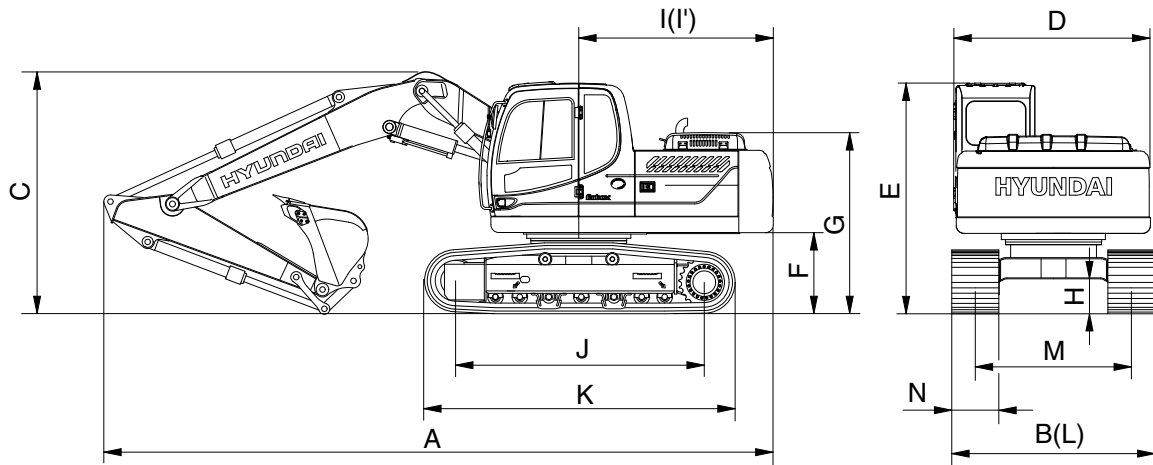


16092SP02

Description		Unit	Specification
Operating weight		kg (lb)	17800 (39240)
Bucket capacity (SAE heaped), standard		m <sup>3</sup> (yd <sup>3</sup> )	0.70 (0.92)
Overall length	A	mm (ft-in)	8650 (28' 5")
Overall width, with 600 mm shoe	B		2590 ( 8' 6")
Overall height	C		2990 ( 9' 10")
Superstructure width	D		2475 ( 8' 1")
Overall height of cab	E		2980 ( 9' 9")
Ground clearance of counterweight	F		1055 ( 3' 6")
Engine cover height	G		2315 ( 7' 7")
Minimum ground clearance	H		460 ( 1' 6")
Rear-end distance	I		2480 ( 8' 2")
Rear-end swing radius	I'		2530 ( 8' 4")
Distance between tumblers	J		3170 (10' 5")
Undercarriage length	K		3960 (13' 0")
Undercarriage width	L		2590 ( 8' 6")
Track gauge	M		1990 ( 6' 6")
Track shoe width, standard	N		600 (24")
Travel speed (low/high)		km/hr (mph)	3.2/5.5 (2.0/3.4)
Swing speed		rpm	11.3
Gradeability		Degree (%)	30 (58)
Ground pressure (600 mm shoe)		kgf/cm <sup>2</sup> (psi)	0.43 (6.11)
Max traction force		kg (lb)	17000 (37500)

## 2) R160LC-9

- 5.1 m (16' 9") HYDRAULIC ADJUSTABLE BOOM AND 2.6 m (8' 6") ARM

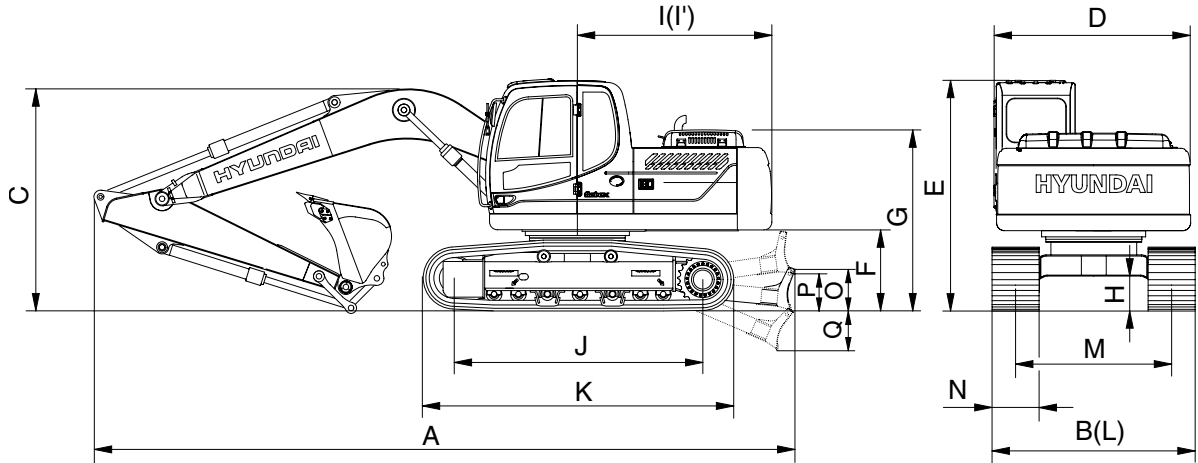


16092SP03

Description		Unit	Specification
Operating weight		kg (lb)	18290 (40320)
Bucket capacity (SAE heaped), standard		m <sup>3</sup> (yd <sup>3</sup> )	0.70 (0.92)
Overall length	A	mm (ft-in)	8610 ( 28' 3")
Overall width, with 600 mm shoe	B		2590 ( 8' 6")
Overall height	C		3060 ( 10' 0")
Superstructure width	D		2475 ( 8' 1")
Overall height of cab	E		2980 ( 9' 9")
Ground clearance of counterweight	F		1055 ( 3' 6")
Engine cover height	G		2315 ( 7' 7")
Minimum ground clearance	H		460 ( 1' 6")
Rear-end distance	I		2480 ( 8' 2")
Rear-end swing radius	I'		2530 ( 8' 4")
Distance between tumblers	J		3170 ( 10' 5")
Undercarriage length	K		3960 ( 13' 0")
Undercarriage width	L		2590 ( 8' 6")
Track gauge	M		1990 ( 6' 6")
Track shoe width, standard	N		600 (24")
Travel speed (low/high)		km/hr (mph)	3.2/5.5 (2.0/3.4)
Swing speed		rpm	11.3
Gradeability		Degree (%)	30 (58)
Ground pressure (600 mm shoe)		kgf/cm <sup>2</sup> (psi)	0.44 (6.11)
Max traction force		kg (lb)	17000 (37500)

### 3) R160LCD-9

· 5.1 m (16' 9") BOOM and 2.6 m (8' 6") ARM

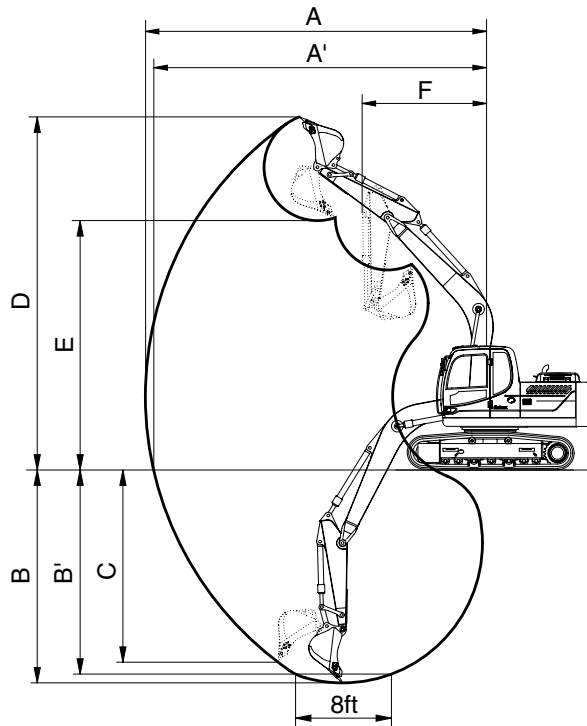


16092SP04

Description		Unit	Specification
Operating weight		kg (lb)	18800 (41450)
Bucket capacity (SAE heaped), standard		m <sup>3</sup> (yd <sup>3</sup> )	0.70 (0.92)
Overall length	A	mm (ft-in)	9100 (29' 10")
Overall width, with 600 mm shoe	B		2590 ( 8' 6")
Overall height	C		2990 ( 9'10")
Superstructure width	D		2475 ( 8' 1")
Overall height of cab	E		2980 ( 9' 9")
Ground clearance of counterweight	F		1055 ( 3' 6")
Engine cover height	G		2315 ( 7' 7")
Minimum ground clearance	H		460 ( 1' 6")
Rear-end distance	I		2480 ( 8' 2")
Rear-end swing radius	I'		2530 ( 8' 4")
Distance between tumblers	J		3170 (10' 5")
Undercarriage length	K		3960 (13' 0")
Undercarriage width	L		2590 ( 8' 6")
Track gauge	M		1990 ( 6' 6")
Track shoe width, standard	N		600 (24")
Height of blade	O		640 (2' 1")
Ground clearance of blade up	P		615 (2' 0")
Depth of blade down	Q		675 (2' 3")
Travel speed (low/high)			km/hr (mph)
Swing speed		rpm	11.3
Gradeability		Degree (%)	30 (58)
Ground pressure (600 mm shoe)		kgf/cm <sup>2</sup> (psi)	0.46 (6.54)
Max traction force		kg (lb)	17000 (37500)

### 3. WORKING RANGE

#### 1) 5.1 m (16' 9") MONO BOOM

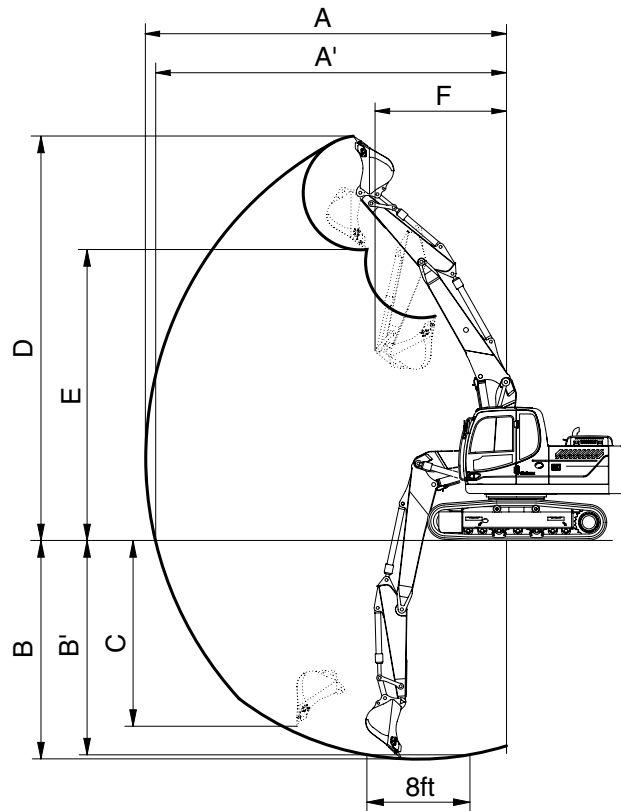


16092SP05

Description		2.2 m (7' 3") Arm	2.6 m (8' 6") Arm	3.1 m (10' 2") Arm
Max digging reach	A	8690 mm (28' 6")	9020 mm (29' 7")	9450 mm (31' 0")
Max digging reach on ground	A'	8530 mm (27' 12")	8860 mm (29' 1")	9300 mm (30' 6")
Max digging depth	B	5660 mm (18' 7")	6060 mm (19' 11")	6560 mm (21' 6")
Max digging depth (8ft level)	B'	5430 mm (17' 10")	5850 mm (19' 2")	6370 mm (20' 11")
Max vertical wall digging depth	C	5120 mm (16' 10")	5380 mm (17' 8")	5710 mm (18' 9")
Max digging height	D	8750 mm (28' 8")	8840 mm (29' 0")	8980 mm (29' 6")
Max dumping height	E	6110 mm (20' 1")	6220 mm (20' 5")	6390 mm (21' 0")
Min swing radius	F	3180 mm (10' 5")	3170 mm (10' 5")	3170 mm (10' 5")
Bucket digging force	SAE	107.9 [117.2] kN	107.9 [117.2] kN	107.9 [117.2] kN
		11000 [11940] kgf	11000 [11940] kgf	11000 [11940] kgf
		24250 [26330] lbf	24250 [26330] lbf	24250 [26330] lbf
	ISO	123.6 [134.2] kN	123.6 [134.2] kN	123.6 [134.2] kN
		12600 [13680] kgf	12600 [13680] kgf	12600 [13680] kgf
		27780 [30160] lbf	27780 [30160] lbf	27780 [30160] lbf
Arm crowd force	SAE	87.2 [94.7] kN	77.3 [83.9] kN	69.0 [74.9] kN
		8890 [9650] kgf	7880 [8560] kgf	7030 [7630] kgf
		19600 [21280] lbf	17370 [18860] lbf	15500 [16830] lbf
	ISO	91.0 [98.8] kN	80.3 [87.2] kN	71.4 [77.5] kN
		9280 [10080] kgf	8190 [8890] kgf	7280 [7900] kgf
		20460 [22210] lbf	18060 [19600] lbf	16050 [17430] lbf

[ ] : Power boost

## 2) 5.1 m (16' 9") HYDRAULIC ADJUSTABLE BOOM



16092SP06

Description		2.2 m (7' 3") Arm	2.6 m (8' 6") Arm
Max digging reach	A	8760 mm (28' 9")	9110 mm (29' 11")
Max digging reach on ground	A'	8590 mm (28' 2")	8950 mm (29' 4")
Max digging depth	B	5430 mm (17' 10")	5830 mm (19' 2")
Max digging depth (8ft level)	B'	5330 mm (17' 6")	5730 mm (18' 10")
Max vertical wall digging depth	C	4630 mm (15' 2")	4980 mm (16' 4")
Max digging height	D	9420 mm (30' 11")	9610 mm (31' 6")
Max dumping height	E	6710 mm (22' 0")	6910 mm (22' 8")
Min swing radius	F	3100 mm (10' 2")	2970 mm (9' 9")
Bucket digging force	SAE	107.9 [117.2] kN	107.9 [117.2] kN
		11000 [11940] kgf	11000 [11940] kgf
		24250 [26330] lbf	24250 [26330] lbf
	ISO	123.6 [134.2] kN	123.6 [134.2] kN
		12600 [13680] kgf	12600 [13680] kgf
		27780 [30160] lbf	27780 [30160] lbf
Arm crowd force	SAE	87.2 [94.7] kN	77.3 [83.9] kN
		8890 [9650] kgf	7880 [8560] kgf
		19600 [21280] lbf	17370 [18860] lbf
	ISO	91.0 [98.8] kN	80.3 [87.2] kN
		9280 [10080] kgf	8190 [8890] kgf
		20460 [22210] lbf	18060 [19600] lbf

[ ] : Power boost





#### 4. WEIGHT













Item	R160LC-9		R160LCD-9	
	kg	lb	kg	lb
Upper structure assembly	7880	17370	←	
Main frame weld assembly	1470	3240	←	
Engine assembly	420	930	←	
Fan clutch assembly	45	100	←	
Main pump assembly	100	220	←	
Main control valve assembly	140	310	←	
Swing motor assembly	250	550	←	
Hydraulic oil tank assembly	165	360	←	
Fuel tank assembly	130	290	←	
Counterweight	2900	6390	←	
Cab assembly	500	1100	←	
Lower chassis assembly	6900	15210	7900	17420
Track frame weld assembly	2290	5050	2270	5000
Swing bearing	260	570	←	
Travel motor assembly	300	660	←	
Turning joint	60	130	←	
Track recoil spring	140	310	←	
Idler	160	350	←	
Carrier roller	20	45	←	
Track roller	40	90	←	
Track-chain assembly (600 mm standard triple grouser shoe)	1180	2600	←	
Front attachment assembly (5.1 m boom, 2.6 m arm, 0.7 m <sup>3</sup> SAE heaped bucket)	3020	6660	←	
5.1 m boom assembly	1040	2290	←	
2.6 m arm assembly	540	1190	←	
0.7 m <sup>3</sup> SAE heaped bucket	540	1190	←	
Boom cylinder assembly	155	340	←	
Arm cylinder assembly	180	400	←	
Bucket cylinder assembly	125	280	←	
Bucket control link assembly	120	265	←	
Dozer blade assembly	-	-	655	1445
Dozer blade cylinder assembly	-	-	66	146

## 5. LIFTING CAPACITIES

### 1) R160LC-9















(1) 5.1 m (16' 9") boom, 2.6 m (8' 6") arm equipped with 0.70 m<sup>3</sup> (SAE heaped) bucket and 600 mm (24") triple grouser shoe and 2900 kg (6390 lb) counterweight.

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

Load point height		Load radius										At max. reach				
		1.5 m (5.0 ft)		3.0 m (10.0 ft)		4.5 m (15.0 ft)		6.0 m (20.0 ft)		7.5 m (25.0 ft)		Capacity		Reach		
														m (ft)		
7.5 m (25.0 ft)	kg lb													*3410 *7520	3190 7030	6.11 (20.0)
6.0 m (20.0 ft)	kg lb							*3040 *6700	*3040 *6700					*3380 *7450	2240 4940	7.37 (24.2)
4.5 m (15.0 ft)	kg lb							*3790 *8360	3150 6940					3000 6610	1820 4010	8.11 (26.6)
3.0 m (10.0 ft)	kg lb			*7930 *17480	*7930 *17480	*5330 *11750	4770 10520	*4320 *9520	2990 6590	*2830 *6240	2020 4450	2730 6020	1630 3590	8.48 (27.8)		
1.5 m (5.0 ft)	kg lb			*8090 *17840	8060 17770	*6680 *14730	4380 9660	4670 10300	2820 6220	3250 7170	1940 4280	2650 5840	1560 3440	8.53 (28.0)		
Ground Line	kg lb			*7880 *17370	7700 16980	7150 15760	4130 9110	4520 9960	2680 5910	3190 7030	1880 4140	2750 6060	1620 3570	8.28 (27.2)		
-1.5 m (-5.0 ft)	kg lb	*6690 *14750	*6690 *14750	*10670 *23520	7660 16890	7030 15500	4020 8860	4440 9790	2610 5750			3090 6810	1830 4030	7.69 (25.2)		
-3.0 m (-10.0 ft)	kg lb	*9970 *21980	*9970 *21980	*10310 *22730	7780 17150	*6990 *15410	4050 8930	4470 9850	2640 5820			*3770 *8310	2350 5180	6.64 (21.8)		
-4.5 m (-15.0 ft)	kg lb			*7500 *16530	*7500 *16530	*4980 *10980	4230 9330									

- 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) 5.1 m (16' 9") hydraulic adjustable boom, 2.6 m (8' 6") arm equipped with 0.70 m<sup>3</sup> (SAE heaped) bucket and 600 mm (24") triple grouser shoe and 2900 kg (6390 lb) counterweight.













Load point height		Load radius										At max. reach				
		1.5 m (5.0 ft)		3.0 m (10.0 ft)		4.5 m (15.0 ft)		6.0 m (20.0 ft)		7.5 m (25.0 ft)		Capacity		Reach		
																m (ft)
6.0 m (20.0 ft)	kg lb													*3450 *7610	2160 4760	7.48 (24.5)
4.5 m (15.0 ft)	kg lb													2950 6500	1760 3880	8.20 (26.9)
3.0 m (10.0 ft)	kg lb							*4350 *9590	2980 6570	*3250 *7170	2000 4410	2680 5910	1570 3460	8.57 (28.1)		
1.5 m (5.0 ft)	kg lb			*6980 *15390	*6980 *15390	*6660 *14680	4350 9590	4690 10340	2790 6150	3260 7190	1920 4230	2610 5750	1510 3330	8.62 (28.3)		
Ground Line	kg lb			*7040 *15520	*7040 *15520	7160 15790	4080 8990	4530 9990	2650 5840	3190 7030	1850 4080	2710 5970	1570 3460	8.37 (27.5)		
-1.5 m (-5.0 ft)	kg lb	*6030 *13290	*6030 *13290	*9960 *21960	7580 16710	7040 15520	3970 8750	4450 9810	2580 5690			3050 6720	1780 3920	7.78 (25.5)		
-3.0 m (-10.0 ft)	kg lb	*9490 *20920	*9490 *20920	*9860 *21740	7730 17040	*6740 *14860	4010 8840	4490 9900	2610 5750			*3350 *7390	2290 5050	6.76 (22.2)		
-4.5 m (-15.0 ft)	kg lb			*6840 *15080	*6840 *15080	*4560 *10050	4220 9300									

## 2) R160LCD-9

(1) 5.1 m (16' 9") boom, 2.6 m (8' 6") arm equipped with 0.7 m<sup>3</sup> (SAE heaped) bucket and 600 mm (24") triple grouser shoe and 2900 kg (6390 lb) counterweight.














•  : Rating over-front

•  : Rating over-side or 360 degree

Load point height		Load radius										At max. reach					
		1.5 m (5.0 ft)		3.0 m (10.0 ft)		4.5 m (15.0 ft)		6.0 m (20.0 ft)		7.5 m (25.0 ft)		Capacity		Reach			
														kg	lb	m (ft)	
7.5 m (25.0 ft)	kg														*3410	3350	6.11
	lb														*7520	7390	(20.0)
6.0 m (20.0 ft)	kg							*3040	*3040						*3380	2370	7.37
	lb							*6700	*6700						*7450	5220	(24.2)
4.5 m (15.0 ft)	kg							*3790	3310						3340	1940	8.11
	lb							*8360	7300						7360	4280	(26.6)
3.0 m (10.0 ft)	kg			*7930	*7930	*5330	5000	*4320	3160	*2830	2140				3040	1730	8.48
	lb			*17480	*17480	*11750	11020	*9520	6970	*6240	4720				6700	3810	(27.8)
1.5 m (5.0 ft)	kg			*8090	*8090	*6680	4620	*4950	2980	3620	2070				2960	1670	8.53
	lb			*17840	*17840	*14730	10190	*10910	6570	7980	4560				6530	3680	(28.0)
Ground Line	kg			*7880	*7880	*7520	4360	5010	2840	*3490	2010				3080	1730	8.28
	lb			*17370	*17370	*16580	9610	11050	6260	*7690	4430				6790	3810	(27.2)
-1.5 m (-5.0 ft)	kg	*6690	*6690	*10670	8080	*7650	4260	4930	2780						3450	1950	7.69
	lb	*14750	*14750	*23520	17810	*16870	9390	10870	6130						7610	4300	(25.2)
-3.0 m (-10.0 ft)	kg	*9970	*9970	*10310	8200	*6990	4280	*4900	2800						*3770	2500	6.64
	lb	*21980	*21980	*22730	18080	*15410	9440	*10800	6170						*8310	5510	(21.8)
-4.5 m (-15.0 ft)	kg			*7500	*7500	*4980	4460										
	lb			*16530	*16530	*10980	9830										

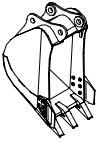
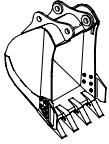
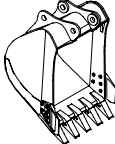
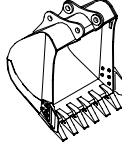
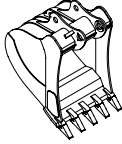
- Note
1. Lifting capacity are based on SAE J1097 and ISO 10567.
  2. Lifting capacity of the ROBEX series does not exceed 75% of tipping load with the machine on firm, level ground or 87% of full hydraulic capacity.
  3. The load point is a hook located on the back of the bucket.
  4. \*indicates load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

(2) 5.1 m (16' 9") hydraulic adjustable boom, 2.6 m (8' 6") arm equipped with 0.7 m<sup>3</sup> (SAE heaped) bucket and 600 mm (24") triple grouser shoe and 2900 kg (6390 lb) counterweight.

Load point height		Load radius										At max. reach			
		1.5 m (5.0 ft)		3.0 m (10.0 ft)		4.5 m (15.0 ft)		6.0 m (20.0 ft)		7.5 m (25.0 ft)		Capacity		Reach	
															m (ft)
6.0 m (20.0 ft)	kg lb												*3450 *7610	2280 5030	7.48 (24.5)
4.5 m (15.0 ft)	kg lb												3280 7230	1870 4120	8.20 (26.9)
3.0 m (10.0 ft)	kg lb							*4350 *9590	3150 6940	*3250 *7170	2120 4670	2990 6590	1680 3700	8.57 (28.1)	
1.5 m (5.0 ft)	kg lb			*6980 *15390	*6980 *15390	*6660 *14680	4590 10120	*4920 *10850	2960 6530	3630 8000	2040 4500	2920 6440	1620 3570	8.62 (28.3)	
Ground Line	kg lb			*7040 *15520	*7040 *15520	*7420 *16360	4310 9500	5020 11070	2810 6190	3560 7850	1980 4370	3030 6680	1680 3700	8.37 (27.5)	
-1.5 m (-5.0 ft)	kg lb	*6030 *13290	*6030 *13290	*9960 *21960	8010 17660	*7480 *16490	4210 9280	4940 10890	2740 6040			3400 7500	1900 4190	7.78 (25.5)	
-3.0 m (-10.0 ft)	kg lb	*9490 *20920	*9490 *20920	*9860 *21740	8150 17970	*6740 *14860	4250 9370	*4700 *10360	2780 6130			*3350 *7390	2430 5360	6.76 (22.2)	
-4.5 m (-15.0 ft)	kg lb			*6840 *15080	*6840 *15080	*4560 *10050	4460 9830								

## 6. BUCKET SELECTION GUIDE

### 1) GENERAL BUCKET

				
0.39 m <sup>3</sup> SAE heaped bucket	0.50 m <sup>3</sup> SAE heaped bucket	0.64, ※0.70 m <sup>3</sup> SAE heaped bucket	0.89, 1.05 m <sup>3</sup> SAE heaped bucket	◆0.69 m <sup>3</sup> SAE heaped bucket

Capacity		Width		Weight	Recommendation				
					5.1 m (16' 9") Mono boom			5.1 m (16' 9") Hyd adjustable boom	
SAE heaped	CECE heaped	Without side cutter	With side cutter		2.2 m arm (7' 3")	2.6 m arm (8' 6")	3.1 m arm (10' 2")	2.2 m arm (7' 3")	2.6 m arm (8' 6")
0.39 m <sup>3</sup> (0.51 yd <sup>3</sup> )	0.34 m <sup>3</sup> (0.44 yd <sup>3</sup> )	620 mm (24.4")	740 mm (29.1")	410 kg (900 lb)					
0.50 m <sup>3</sup> (0.65 yd <sup>3</sup> )	0.44 m <sup>3</sup> (0.58 yd <sup>3</sup> )	760 mm (29.9")	880 mm (34.6")	470 kg (1040 lb)					
0.64 m <sup>3</sup> (0.84 yd <sup>3</sup> )	0.55 m <sup>3</sup> (0.72 yd <sup>3</sup> )	920 mm (36.2")	1040 mm (40.9")	510 kg (1120 lb)					
※0.70 m <sup>3</sup> (0.92 yd <sup>3</sup> )	0.60 m <sup>3</sup> (0.78 yd <sup>3</sup> )	990 mm (39.0")	1110 mm (43.7")	540 kg (1190 lb)					
0.89 m <sup>3</sup> (1.16 yd <sup>3</sup> )	0.77 m <sup>3</sup> (1.01 yd <sup>3</sup> )	1220 mm (48.0")	1340 mm (52.8")	610 kg (1340 lb)					
1.05 m <sup>3</sup> (1.37 yd <sup>3</sup> )	0.90 m <sup>3</sup> (1.18 yd <sup>3</sup> )	1400 mm (55.1")	1520 mm (59.8")	680 kg (1500 lb)					
◆0.69 m <sup>3</sup> (0.90 yd <sup>3</sup> )	0.62 m <sup>3</sup> (0.81 yd <sup>3</sup> )	990 mm (39.0")	-	700 kg (1540 lb)					

◆ : Heavy duty bucket

※ : Standard bucket

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

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

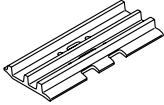
 Applicable for materials with density of 1100 kg/m<sup>3</sup> (1850 lb/yd<sup>3</sup>) or less

## 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		
					
R160LC-9	Shoe width	mm (in)	500 (20)	* 600 (24)	700 (28)
	Operating weight	kg (lb)	17550 (38690)	17800 (39240)	18050 (39790)
	Ground pressure	kgf/cm <sup>2</sup> (psi)	0.51 (7.25)	0.43 (6.11)	0.38 (5.40)
	Overall width	mm (ft-in)	2490 (8' 2")	2590 (8' 6")	2690 (8' 10")
R160LCD-9	Shoe width	mm (in)	500 (20)	* 600 (24)	700 (28)
	Operating weight	kg (lb)	18550 (40900)	18800 (41450)	19050 (42000)
	Ground pressure	kgf/cm <sup>2</sup> (psi)	0.54 (7.68)	0.46 (6.54)	0.40 (5.69)
	Overall width	mm (ft-in)	2490 (8' 2")	2590 (8' 6")	2690 (8' 10")

\* : Standard

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

Item	Quantity
	R160LC/LCD-9
Carrier rollers	2 EA
Track rollers	7 EA
Track shoes	49 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) 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

※ **Table 1**

Track shoe	Specification	Category
600 mm triple grouser	Standard	A
500 mm triple grouser	Option	A
700 mm triple grouser	Option	B

※ **Table 2**

Category	Applications	Applications
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>



## 8. SPECIFICATIONS FOR MAJOR COMPONENTS

### 1) ENGINE

Item	Specification
Model	Mitsubishi D04FD-TAA
Type	4-cycle turbocharged charge 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 × 130 mm (4.02" × 5.12")
Piston displacement	4250 cc (260 cu in)
Compression ratio	16.5 : 1
Rated gross horse power (SAE J1995)	126 Hp (94 kW) at 2000 rpm
Maximum torque	47.7 kgf · m (345 lbf · ft) at 1800 rpm
Engine oil quantity	17.5 l (4.6 U.S. gal)
Dry weight	420 kg (930 lb)
High idling speed	2100 ± 50 rpm
Low idling speed	950 ± 100 rpm
Rated fuel consumption	170.6 g/Hp · hr at 2000 rpm
Starting motor	24 V-5.0 kW
Alternator	24 V-50 A
Battery	2 × 12 V × 80 Ah

### 2) MAIN PUMP

Item	Specification
Type	Variable displacement tandem axis piston pumps
Capacity	2 × 80 cc/rev
Maximum pressure	350 kgf/cm <sup>2</sup> (4980 psi) [380 kgf/cm <sup>2</sup> (5400 psi)]
Rated oil flow	2 × 160 l /min (42.3 U.S. gpm / 35.2 U.K. gpm)
Rated speed	2000 rpm

[ ] : Power boost

### 3) GEAR PUMP

Item	Specification
Type	Fixed displacement gear pump single stage
Capacity	15cc/rev
Maximum pressure	40 kgf/cm <sup>2</sup> (570 psi)
Rated oil flow	30 l /min (7.9 U.S. gpm / 6.6 U.K. gpm)

### 4) MAIN CONTROL VALVE

Item	Specification
Type	11 spools two-block
Operating method	Hydraulic pilot system
Main relief valve pressure	350 kgf/cm <sup>2</sup> (4980 psi) [380 kgf/cm <sup>2</sup> (5400 psi)]
Overload relief valve pressure	400 kgf/cm <sup>2</sup> (5690 psi)

[ ] : Power boost

### 5) SWING MOTOR

Item	Specification
Type	Two fixed displacement axial piston motor
Capacity	117.8 cc/rev
Relief pressure	285 kgf/cm <sup>2</sup> (4054 psi)
Braking system	Automatic, spring applied hydraulic released
Braking torque	59 kgf · m (427 lbf · ft)
Brake release pressure	33~50 kgf/cm <sup>2</sup> (469~711 psi)
Reduction gear type	2 - stage planetary

### 6) TRAVEL MOTOR

Item	Specification
Type	Variable displacement axial piston motor
Relief pressure	350 kgf/cm <sup>2</sup> (4980 psi)
Reduction gear type	Planetary & differential type
Braking system	Automatic, spring applied hydraulic released
Brake release pressure	11 kgf/cm <sup>2</sup> (156 psi)
Braking torque	49.3 kgf · m (357 lbf · ft)

## 7) CYLINDER

Item		Specification
Boom cylinder	Bore dia × Rod dia × Stroke	∅ 115 × ∅ 80 × 1090 mm
	Cushion	Extend only
Arm cylinder	Bore dia × Rod dia × Stroke	∅ 120 × ∅ 85 × 1355 mm
	Cushion	Extend and retract
Bucket cylinder	Bore dia × Rod dia × Stroke	∅ 110 × ∅ 75 × 995 mm
	Cushion	Extend only
Adjust cylinder(opt)	Bore dia × Rod dia × Stroke	∅ 160 × ∅ 95 × 650 mm
	Cushion	Extend only
Adjust boom cylinder(opt)	Bore dia × Rod dia × Stroke	∅ 115 × ∅ 80 × 960 mm
	Cushion	Extend only
Dozer cylinder(opt)	Bore dia × Rod dia × Stroke	∅ 110 × ∅ 85 × 320 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
R160LC-9	Option	500 mm (20")	0.51 kgf/cm <sup>2</sup> (7.25 psi)	49	2490 mm ( 8' 2")
	Standard	600 mm (24")	0.43 kgf/cm <sup>2</sup> (6.11 psi)	49	2590 mm ( 8' 6")
	Option	700 mm (28")	0.38 kgf/cm <sup>2</sup> (5.40 psi)	49	2690 mm ( 8' 10")

## 9) BUCKET

Item	Capacity		Tooth quantity	Width	
	SAE heaped	CECE heaped		Without side cutter	With side cutter
R160LC-9	0.39 m <sup>3</sup> (0.51 yd <sup>3</sup> )	0.34 m <sup>3</sup> (0.44 yd <sup>3</sup> )	3	620 mm (24.4")	740 mm (29.1")
	0.50 m <sup>3</sup> (0.65 yd <sup>3</sup> )	0.44 m <sup>3</sup> (0.58 yd <sup>3</sup> )	4	760 mm (29.9")	880 mm (34.6")
	0.64 m <sup>3</sup> (0.84 yd <sup>3</sup> )	0.55 m <sup>3</sup> (0.72 yd <sup>3</sup> )	5	920 mm (36.2")	1040 mm (40.9")
	0.70 m <sup>3</sup> (0.92 yd <sup>3</sup> )	0.60 m <sup>3</sup> (0.78 yd <sup>3</sup> )	5	990 mm (39.0")	1110 mm (43.7")
	0.89 m <sup>3</sup> (1.16 yd <sup>3</sup> )	0.77 m <sup>3</sup> (1.01 yd <sup>3</sup> )	6	1220 mm (48.0")	1340 mm (52.8")
	◆0.69 m <sup>3</sup> (0.90 yd <sup>3</sup> )	0.62 m <sup>3</sup> (0.81 yd <sup>3</sup> )	5	990 mm (39.0")	-

◆ : Heavy duty bucket

## 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 (U.S. gal)	Ambient temperature °C (°F)							
			-50 (-58)	-30 (-22)	-20 (-4)	-10 (14)	0 (32)	10 (50)	20 (68)	30 (86)
Engine oil pan	Engine oil	17.5 (4.6)	★SAE 5W-40				SAE 30			
			SAE 10W				SAE 10W-30			
			SAE 15W-40							
Swing drive	Gear oil	5.0 (1.3) <sup>★2</sup>	★SAE 75W-90							
Final drive		6.2 (1.7)	SAE 80W-90							
Hydraulic tank	Hydraulic oil	Tank: 160 (42.3) System: 240 (63.4)	★ISO VG 15				ISO VG 32			
			ISO VG 46				ISO VG 68			
Fuel tank	Diesel fuel	260 (68.7)	★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>★1</sup>	15.5 (4.1)	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

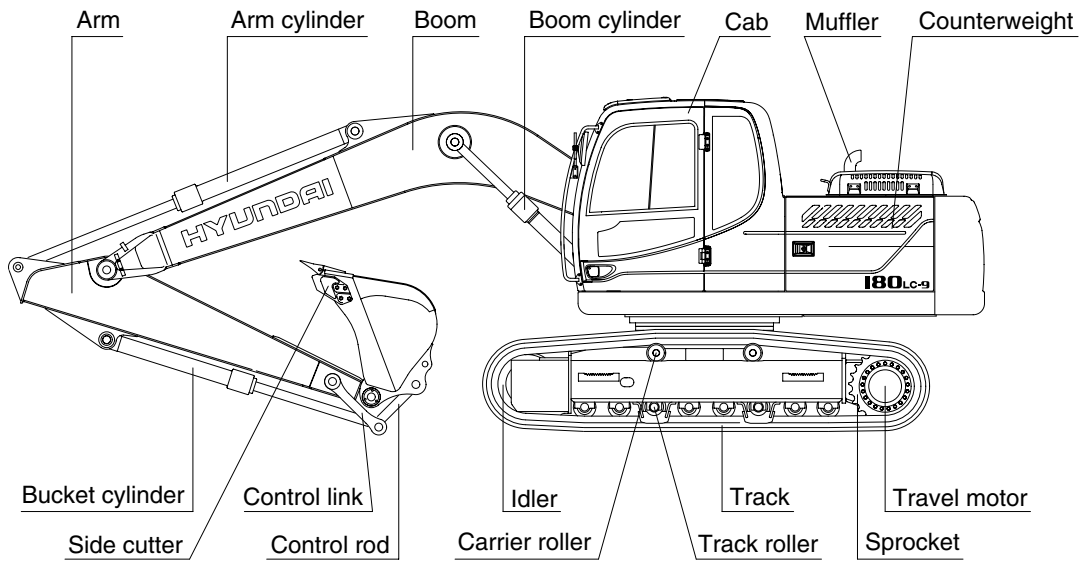
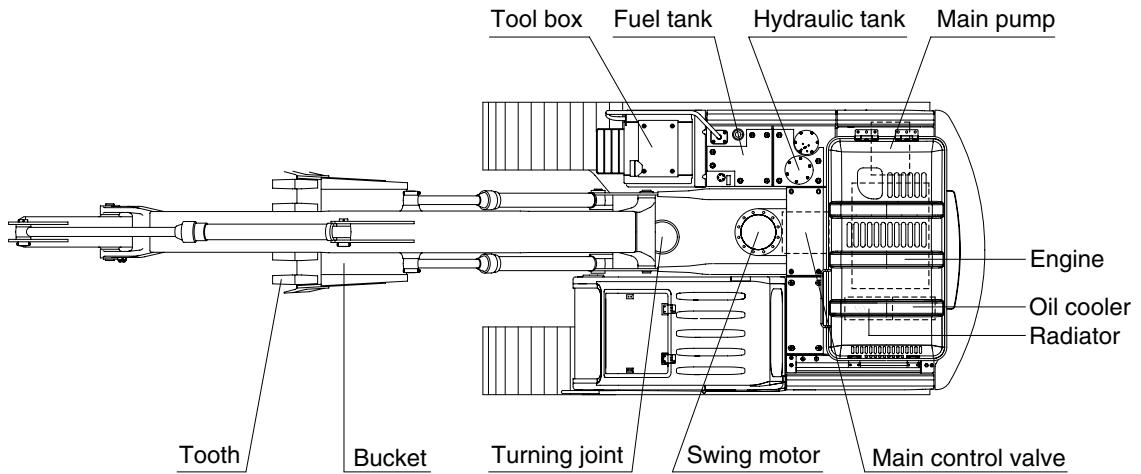
City water or distilled water

★2 : Service when the grease

inlet exists on the equipment

# GROUP 3 SPECIFICATIONS (R180LC-9)

## 1. MAJOR COMPONENT

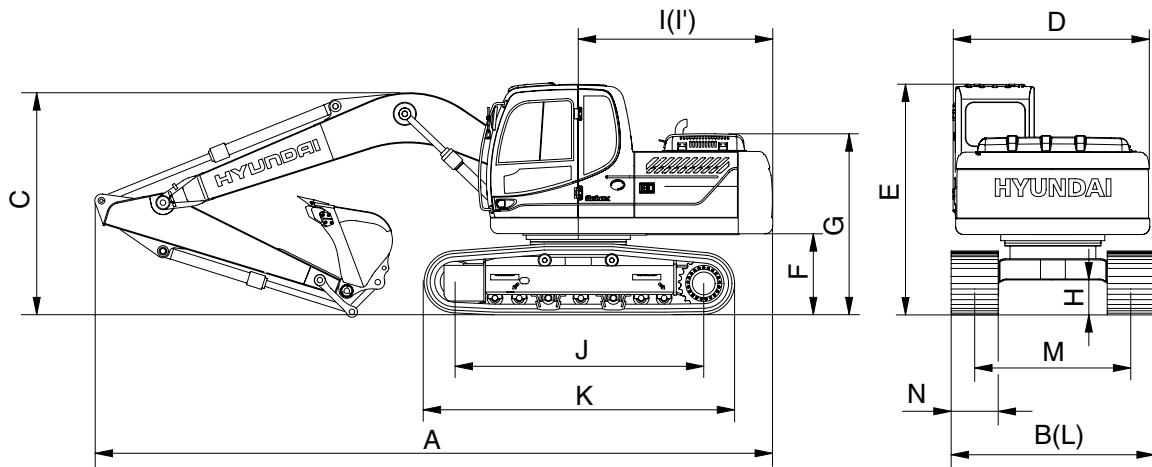


18092SP01

## 2. SPECIFICATIONS

### 1) R180LC-9

· 5.1 m (16' 9") BOOM and 2.6 m (8' 6") ARM

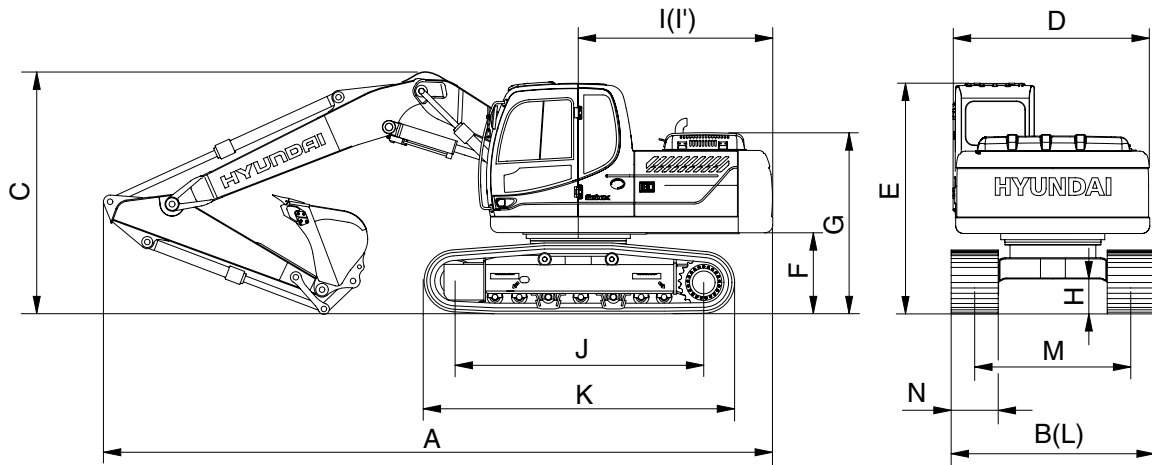


16092SP02

Description		Unit	Specification
Operating weight		kg (lb)	18600 (41010)
Bucket capacity (SAE heaped), standard		m <sup>3</sup> (yd <sup>3</sup> )	0.76 (0.99)
Overall length	A	mm (ft-in)	8650 (28' 5")
Overall width, with 600 mm shoe	B		2850 ( 9' 4")
Overall height	C		2990 ( 9' 10")
Superstructure width	D		2475 ( 8' 1")
Overall height of cab	E		2980 ( 9' 9")
Ground clearance of counterweight	F		1055 ( 3' 6")
Engine cover height	G		2315 ( 7' 7")
Minimum ground clearance	H		460 ( 1' 6")
Rear-end distance	I		2480 ( 8' 2")
Rear-end swing radius	I'		2530 ( 8' 4")
Distance between tumbler	J		3360 (11' 0")
Undercarriage length	K		4150 (13' 7")
Undercarriage width	L		2850 ( 9' 4")
Track gauge	M		2250 ( 7' 5")
Track shoe width, standard	N		600 (24")
Travel speed (low/high)		km/hr (mph)	3.2/5.5 (2.0/3.4)
Swing speed		rpm	11.3
Gradeability		Degree (%)	30 (58)
Ground pressure (600 mm shoe)		kgf/cm <sup>2</sup> (psi)	0.43 (6.11)
Max traction force		kg (lb)	17000 (37500)

## 2) R180LC-9

· 5.1 m (16' 9") HYDRAULIC ADJUSTABLE BOOM AND 2.6 m (8' 6") ARM

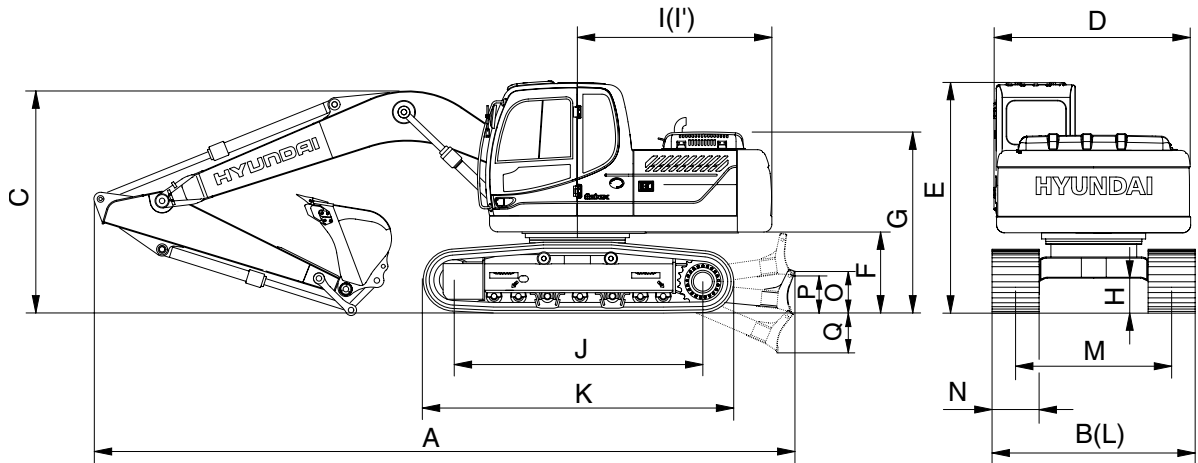


16092SP03

Description		Unit	Specification
Operating weight		kg (lb)	19090 (42090)
Bucket capacity (SAE heaped), standard		m <sup>3</sup> (yd <sup>3</sup> )	0.76 (0.99)
Overall length	A	mm (ft-in)	8610 (28' 3")
Overall width, with 600 mm shoe	B		2850 ( 9' 4")
Overall height	C		3060 ( 10' 0")
Superstructure width	D		2475 ( 8' 1")
Overall height of cab	E		2980 ( 9' 9")
Ground clearance of counterweight	F		1055 ( 3' 6")
Engine cover height	G		2315 ( 7' 7")
Minimum ground clearance	H		460 ( 1' 6")
Rear-end distance	I		2480 ( 8' 2")
Rear-end swing radius	I'		2530 ( 8' 4")
Distance between tumbler	J		3360 (11' 0")
Undercarriage length	K		4150 (13' 7")
Undercarriage width	L		2850 ( 9' 4")
Track gauge	M		2250 ( 7' 5")
Track shoe width, standard	N		600 (24")
Travel speed (low/high)		km/hr (mph)	3.2/5.5 (2.0/3.4)
Swing speed		rpm	11.3
Gradeability		Degree (%)	30 (58)
Ground pressure (600 mm shoe)		kgf/cm <sup>2</sup> (psi)	0.44 (6.26)
Max traction force		kg (lb)	17000 (37500)

### 3) R180LCD-9

· 5.1 m (16' 9") BOOM and 2.6 m (8' 6") ARM



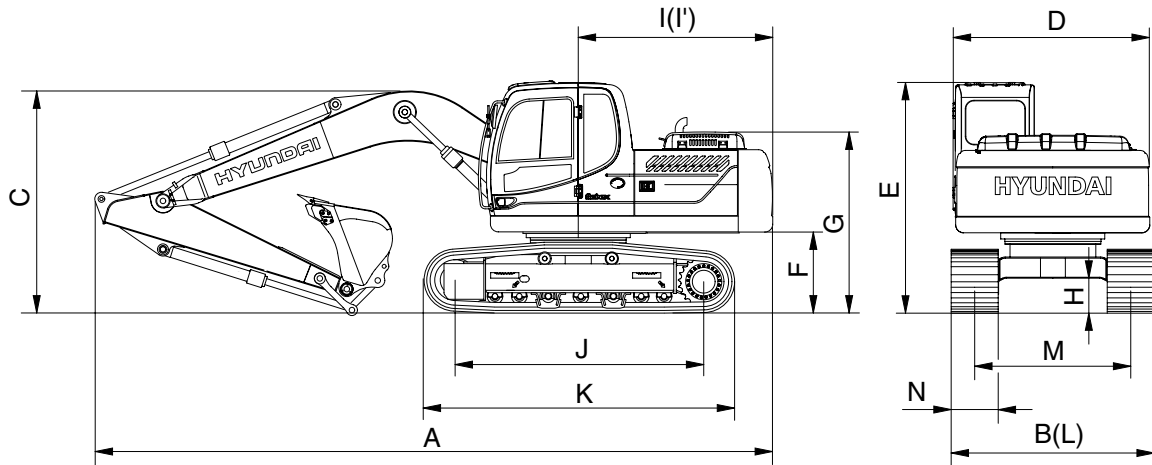
16092SP04

Description		Unit	Specification
Operating weight		kg (lb)	19660 (43210)
Bucket capacity (SAE heaped), standard		m <sup>3</sup> (yd <sup>3</sup> )	0.76 (0.99)
Overall length	A	mm (ft-in)	9100 (29' 10")
Overall width, with 600 mm shoe	B		2850 ( 9' 4")
Overall height	C		2990 ( 9'10")
Superstructure width	D		2475 ( 8' 1")
Overall height of cab	E		2980 ( 9' 9")
Ground clearance of counterweight	F		1055 ( 3' 6")
Engine cover height	G		2315 ( 7' 7")
Minimum ground clearance	H		460 ( 1' 6")
Rear-end distance	I		2480 ( 8' 2")
Rear-end swing radius	I'		2530 ( 8' 4")
Distance between tumblers	J		3360 (11' 0")
Undercarriage length	K		4150 (13' 7")
Undercarriage width	L		2850 ( 9' 4")
Track gauge	M		2250 ( 7' 5")
Track shoe width, standard	N		600 (24")
Height of blade	O		640 ( 2' 1")
Ground clearance of blade up	P		615 ( 2' 0")
Depth of blade down	Q		675 ( 2' 3")
Travel speed (low/high)			km/hr (mph)
Swing speed		rpm	11.3
Gradeability		Degree (%)	30 (58)
Ground pressure (600 mm shoe)		kgf/cm <sup>2</sup> (psi)	0.45 (6.40)
Max traction force		kg (lb)	17000 (37500)



#### 4) R180NLC-9

· 5.1 m (16' 9") BOOM and 2.6 m (8' 6") ARM

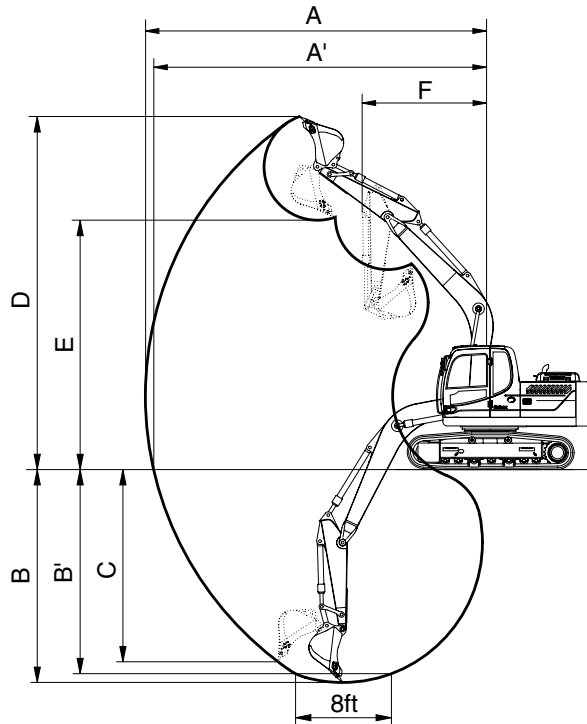


16092SP02

Description		Unit	Specification
Operating weight		kg (lb)	18510 (40810)
Bucket capacity (SAE heaped), standard		m <sup>3</sup> (yd <sup>3</sup> )	0.76 (0.99)
Overall length	A	mm (ft-in)	8650 (28' 5")
Overall width, with 600 mm shoe	B		2600 ( 8' 6")
Overall height	C		2990 ( 9'10")
Superstructure width	D		2475 ( 8' 1")
Overall height of cab	E		2980 ( 9' 9")
Ground clearance of counterweight	F		1055 ( 3' 6")
Engine cover height	G		2315 ( 7' 7")
Minimum ground clearance	H		460 ( 1' 6")
Rear-end distance	I		2480 ( 8' 2")
Rear-end swing radius	I'		2530 ( 8' 4")
Distance between tumblers	J		3360 (11' 0")
Undercarriage length	K		4150 (13' 7")
Undercarriage width	L		2600 ( 8' 6")
Track gauge	M		2000 ( 6' 7")
Track shoe width, standard	N		600 (24")
Travel speed (low/high)		km/hr (mph)	3.2/5.2 (2.0/3.2)
Swing speed		rpm	11.3
Gradeability		Degree (%)	30 (58)
Ground pressure (600 mm shoe)		kgf/cm <sup>2</sup> (psi)	0.42 (5.97)
Max traction force		kg (lb)	17000 (37500)

### 3. WORKING RANGE

#### 1) 5.1 m (16' 9") MONO BOOM

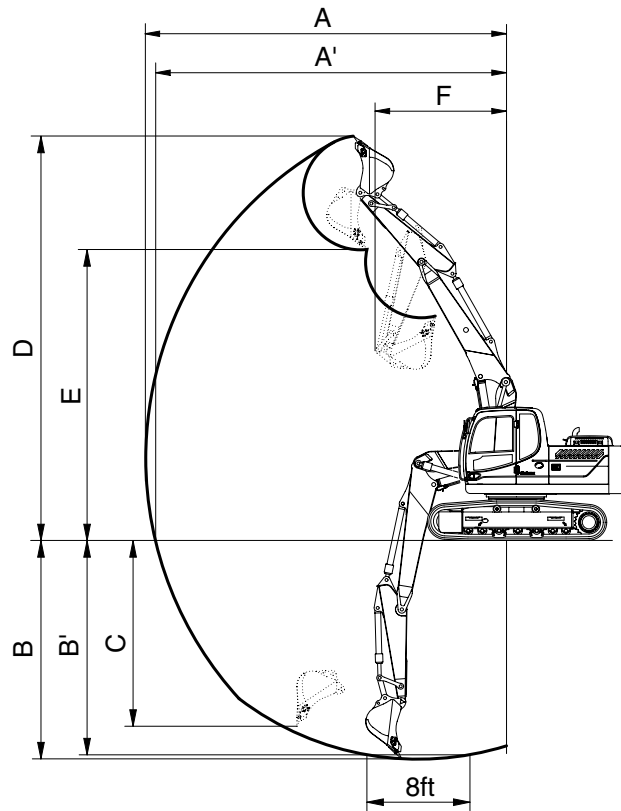


16092SP05

Description		2.2 m (7' 3") Arm	2.6 m (8' 6") Arm	3.1 m (10' 2") Arm
Max digging reach	A	8690 mm (28' 6")	9020 mm (29' 7")	9450 mm (31' 0")
Max digging reach on ground	A'	8530 mm (27'12")	8860 mm (29' 1")	9300 mm (30' 6")
Max digging depth	B	5660 mm (18' 7")	6060 mm (19'11")	6560 mm (21' 6")
Max digging depth (8ft level)	B'	5430 mm (17'10")	5850 mm (19' 2")	6370 mm (20'11")
Max vertical wall digging depth	C	5120 mm (16'10")	5380 mm (17' 8")	5710 mm (18' 9")
Max digging height	D	8750 mm (28' 8")	8840 mm (29' 0")	8980 mm (29' 6")
Max dumping height	E	6110 mm (20' 1")	6220 mm (20' 5")	6390 mm (21' 0")
Min swing radius	F	3180 mm (10' 5")	3170 mm (10' 5")	3170 mm (10' 5")
Bucket digging force	SAE	107.9 [117.2] kN	107.9 [117.2] kN	107.9 [117.2] kN
		11000 [11940] kgf	11000 [11940] kgf	11000 [11940] kgf
		24250 [26330] lbf	24250 [23660] lbf	24250 [26330] lbf
	ISO	123.6 [134.2] kN	123.6 [134.2] kN	123.6 [134.2] kN
		12600 [13680] kgf	12600 [13680] kgf	12600 [13680] kgf
		27780 [30160] lbf	27780 [30160] lbf	27780 [30160] lbf
Arm crowd force	SAE	87.2 [94.7] kN	77.3 [83.9] kN	69.0 [74.9] kN
		8890 [9650] kgf	7880 [8560] kgf	7030 [7630] kgf
		19600 [21280] lbf	17370 [18860] lbf	15500 [16830] lbf
	ISO	91.0 [98.8] kN	80.3 [87.2] kN	71.4 [77.5] kN
		9280 [10080] kgf	8190 [8890] kgf	7280 [7900] kgf
		20460 [22210] lbf	18060 [19600] lbf	16050 [17430] lbf

[ ] : Power boost

## 2) 5.1 m (16' 9") HYDRAULIC ADJUSTABLE BOOM



16092SP06

Description		2.2m(7' 3") Arm	2.6m(8' 6") Arm
Max digging reach	A	8760 mm (28' 9")	9110 mm (29' 11")
Max digging reach on ground	A'	8590 mm (28' 2")	8950 mm (29' 4")
Max digging depth	B	5430 mm (17' 10")	5830 mm (19' 2")
Max digging depth (8ft level)	B'	5330 mm (17' 6")	5730 mm (18' 10")
Max vertical wall digging depth	C	4630 mm (15' 2")	4980 mm (16' 4")
Max digging height	D	9420 mm (30' 11")	9610 mm (31' 6")
Max dumping height	E	6710 mm (22' 0")	6910 mm (22' 8")
Min swing radius	F	3100 mm (10' 2")	2970 mm ( 9' 9")
Bucket digging force	SAE	107.9 [117.2] kN	107.9 [117.2] kN
		11000 [11940] kgf	11000 [11940] kgf
		24250 [26330] lbf	24250 [26330] lbf
	ISO	123.6 [134.2] kN	123.6 [134.2] kN
		12600 [13680] kgf	12600 [13680] kgf
		27780 [30160] lbf	27780 [30160] lbf
Arm crowd force	SAE	87.2 [94.7] kN	77.3 [83.9] kN
		8890 [9650] kgf	7880 [8560] kgf
		19600 [21280] lbf	17370 [18860] lbf
	ISO	91.0 [98.8] kN	80.3 [87.2] kN
		9280 [10080] kgf	8190 [8890] kgf
		20460 [22210] lbf	18060 [19600] lbf

[ ] : Power boost



#### 4. WEIGHT













Item	R180LC-9		R180LCD-9		180NLC-9	
	kg	lb	kg	lb	kg	lb
Upper structure assembly	7880	17370	←		←	
Main frame weld assembly	1470	3240	←		←	
Engine assembly	420	930	←		←	
Fan clutch assembly	45	100	←		←	
Main pump assembly	100	220	←		←	
Main control valve assembly	140	310	←		←	
Swing motor assembly	250	550	←		←	
Hydraulic oil tank assembly	165	360	←		←	
Fuel tank assembly	130	290	←		←	
Counterweight	2900	6390	←		←	
Cab assembly	500	1100	←		←	
Lower chassis assembly	7670	16910	8670	19110	7580	16710
Track frame weld assembly	2130	4700	2370	5230	1980	4370
Swing bearing	260	570	←		←	
Travel motor assembly	300	660	←		←	
Turning joint	60	130	←		←	
Track recoil spring	140	310	←		←	
Idler	160	350	←		←	
Carrier roller	20	45	←		←	
Track roller	40	90	←		←	
Track-chain assembly (600 mm standard triple grouser shoe)	1180	2600	←		←	
Front attachment assembly (5.1 m boom, 2.6 m arm, 0.76 m <sup>3</sup> SAE heaped bucket)	3020	6660	←		←	
5.1 m boom assembly	1040	2290	←		←	
2.6 m arm assembly	540	1190	←		←	
0.76 m <sup>3</sup> SAE heaped bucket	570	1260	←		←	
Boom cylinder assembly	155	340	←		←	
Arm cylinder assembly	180	400	←		←	
Bucket cylinder assembly	125	260	←		←	
Bucket control link assembly	120	265	←		←	
Dozer blade assembly	-	-	715	1575	-	-
Dozer blade cylinder assembly	-	-	66	146	-	-

## 5. LIFTING CAPACITIES

### 1) R180LC-9

(1) 5.1 m (16' 9") boom, 2.6 m (8' 6") arm equipped with 0.76 m<sup>3</sup> (SAE heaped) bucket and 600 mm (24") triple grouser shoe and 2900 kg (6390 lb) counterweight.

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

Load point height		Load radius										At max. reach					
		1.5 m (5.0 ft)		3.0 m (10.0 ft)		4.5 m (15.0 ft)		6.0 m (20.0 ft)		7.5 m (25.0 ft)		Capacity		Reach			
														m (ft)			
7.5 m (25.0 ft)	kg														*3380	*3380	6.11
	lb														*7450	*7450	(20.0)
6.0 m (20.0 ft)	kg							*3020	*3020			*3360	2660	7.37			
	lb							*6660	*6660			*7410	5860	(24.2)			
4.5 m (15.0 ft)	kg							*3770	3720			*3410	2190	8.11			
	lb							*8310	8200			*7520	4830	(26.6)			
3.0 m (10.0 ft)	kg			*7910	*7910	*5310	*5310	*4300	3560	*2810	2420	3130	1970	8.48			
	lb			*17440	*17440	*11710	*11710	*9480	7850	*6190	5340	6900	4340	(27.8)			
1.5 m (5.0 ft)	kg			*8120	*8120	*6650	5270	*4920	3380	*3650	2350	3050	1900	8.53			
	lb			*17900	*17900	*14660	11620	*10850	7450	*8050	5180	6720	4190	(28.0)			
Ground Line	kg			*7910	*7910	*7500	5010	5220	3240	*3470	2280	3170	1970	8.28			
	lb			*17440	*17440	*16530	11050	11510	7140	*7650	5030	6990	4340	(27.2)			
-1.5 m (-5.0 ft)	kg	*6710	*6710	*10690	9550	*7620	4900	5140	3170			3560	2220	7.69			
	lb	*14790	*14790	*23570	21050	*16800	10800	11330	6990			7850	4890	(25.2)			
-3.0 m (-10.0 ft)	kg	*9990	*9990	*10280	9680	*6960	4930	*4870	3200			*3750	2830	6.64			
	lb	*22020	*22020	*22660	21340	*15340	10870	*10740	7050			*8270	6240	(21.8)			
-4.5 m (-15.0 ft)	kg			*7470	*7470	*4960	*4960										
	lb			*16470	*16470	*10930	*10930										













- 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) R180LCD-9

(1) 5.1 m (16' 9") boom, 2.6 m (8' 6") arm equipped with 0.76 m<sup>3</sup> (SAE heaped) bucket and 600 mm (24") triple grouser shoe and 2900 kg (6390 lb) counterweight.

•  : Rating over-front

•  : Rating over-side or 360 degree

Load point height		Load radius										At max. reach					
		1.5 m (5.0 ft)		3.0 m (10.0 ft)		4.5 m (15.0 ft)		6.0 m (20.0 ft)		7.5 m (25.0 ft)		Capacity		Reach			
														m (ft)			
7.5 m (25.0 ft)	kg														*3380	*3380	6.11
	lb														*7450	*7450	(20.0)
6.0 m (20.0 ft)	kg							*3020	*3020					*3360	2800	7.37	
	lb							*6660	*6660					*7410	6170	(24.2)	
4.5 m (15.0 ft)	kg							*3770	*3770					*3410	2320	8.11	
	lb							*8310	*8310					*7520	5110	(26.6)	
3.0 m (10.0 ft)	kg			*7910	*7910	*5310	*5310	*4300	3750	*2810	2570	*3500	2090	8.48			
	lb			*17440	*17440	*11710	*11710	*9480	8270	*6190	5670	*7720	4610	(27.8)			
1.5 m (5.0 ft)	kg			*8120	*8120	*6650	5550	*4920	3570	*3650	2490	3490	2020	8.53			
	lb			*17900	*17900	*14660	12240	*10850	7870	*8050	5490	7690	4450	(28.0)			
Ground Line	kg			*7910	*7910	*7500	5280	*5380	3430	*3470	2430	3630	2100	8.28			
	lb			*17440	*17440	*16530	11640	*11860	7560	*7650	5360	8000	4630	(27.2)			
-1.5 m (-5.0 ft)	kg	*6710	*6710	*10690	10060	*7620	5180	*5460	3360			*3810	2360	7.69			
	lb	*14790	*14790	*23570	22180	*16800	11420	*12040	7410			*8400	5200	(25.2)			
-3.0 m (-10.0 ft)	kg	*9990	*9990	*10280	10180	*6960	5200	*4870	3390			*3750	3000	6.64			
	lb	*22020	*22020	*22660	22440	*15340	11460	*10740	7470			*8270	6610	(21.8)			
-4.5 m (-15.0 ft)	kg			*7470	*7470	*4960	*4960										
	lb			*16470	*16470	*10930	*10930										













- 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.

### 3) R180NLC-9

(1) 5.1 m (16' 9") boom, 2.6 m (8' 6") arm equipped with 0.76 m<sup>3</sup> (SAE heaped) bucket and 600 mm (24") triple grouser shoe and 2900 kg (6390 lb) counterweight.

•  : Rating over-front

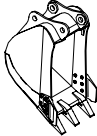
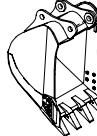
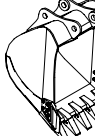
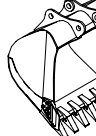
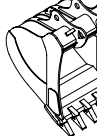
•  : Rating over-side or 360 degree

Load point height		Load radius										At max. reach					
		1.5 m (5 ft)		3.0 m (10 ft)		4.5 m (15 ft)		6.0 m (20 ft)		7.0 m (25 ft)		Capacity		Reach			
														kg	lb	m (ft)	
7.5 m (25 ft)	kg																
	lb																
6.0 m (20 ft)	kg							*3020	*3020								
	lb							*6660	*6660								
4.5 m (15 ft)	kg							*3770	3250								
	lb							*8310	7170								
3.0 m (10 ft)	kg			*7910	*7910	*5310	4930	*4300	3100	*2810	2090	3110	1690	8.48			
	lb			*17440	*17440	*11710	10870	*9480	6830	*6190	4610	6860	3730	(27.8)			
1.5 m (5 ft)	kg			*8120	*8120	*6650	4550	*4920	2930	*3650	2020	3030	1620	8.53			
	lb			*17900	*17900	*14660	10030	*10850	6460	*8050	4450	6680	3570	(28.0)			
Ground Line	kg			*7910	*7910	*7500	4290	5180	2790	*3470	1960	3150	1680	8.28			
	lb			*17440	*17440	*16530	9460	11420	6150	*7650	4320	6940	3700	(27.2)			
-1.5 m (-5 ft)	kg	*6710	*6710	*10690	7980	*7620	4190	5110	2720			3540	1900	7.69			
	lb	*14790	*14790	*23570	17590	*16800	9240	11270	6000			7800	4190	(25.2)			
-3.0 m (-10 ft)	kg	*9990	*9990	*10280	8100	*6960	4210	*4870	2750			*3750	2440	6.64			
	lb	*22020	*22020	*22660	17860	*15340	9280	*10740	6060			*8270	5380	(21.8)			
-1.5 m (-15 ft)	kg			*7470	*7470	*4960	4390										
	lb			*16470	*16470	*10930	9680										

- 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.

## 6. BUCKET SELECTION GUIDE


### 1) GENERAL BUCKET

				
0.39 m <sup>3</sup> SAE heaped bucket	0.50 m <sup>3</sup> SAE heaped bucket	0.64, 0.76 m <sup>3</sup> SAE heaped bucket	0.89, 1.05 m <sup>3</sup> SAE heaped bucket	◆0.69 m <sup>3</sup> SAE heaped bucket

Capacity		Width		Weight	Recommendation				
					5.1 m (16' 9") Mono boom			5.1 m (16' 9") Hyd adjustable boom	
SAE heaped	CECE heaped	Without side cutter	With side cutter		2.2 m arm (7' 3")	2.6 m arm (8' 6")	3.1 m arm (10' 2")	2.2 m arm (7' 3")	2.6 m arm (8' 6")
0.39 m <sup>3</sup> (0.51 yd <sup>3</sup> )	0.34 m <sup>3</sup> (0.44 yd <sup>3</sup> )	620 mm (24.4")	740 mm (29.1")	410 kg (900 lb)					
0.50 m <sup>3</sup> (0.65 yd <sup>3</sup> )	0.44 m <sup>3</sup> (0.58 yd <sup>3</sup> )	760 mm (29.9")	880 mm (34.6")	470 kg (1040 lb)					
0.64 m <sup>3</sup> (0.84 yd <sup>3</sup> )	0.55 m <sup>3</sup> (0.72 yd <sup>3</sup> )	920 mm (36.2")	1040 mm (40.9")	510 kg (1120 lb)					
0.76 m <sup>3</sup> (0.99 yd <sup>3</sup> )	0.65 m <sup>3</sup> (0.85 yd <sup>3</sup> )	1060 mm (41.7")	1180 mm (46.5")	570 kg (1260 lb)					
0.89 m <sup>3</sup> (1.16 yd <sup>3</sup> )	0.77 m <sup>3</sup> (1.01 yd <sup>3</sup> )	1220 mm (48.0")	1340 mm (52.8")	610 kg (1340 lb)					
1.05 m <sup>3</sup> (1.37 yd <sup>3</sup> )	0.90 m <sup>3</sup> (1.18 yd <sup>3</sup> )	1400 mm (55.1")	1520 mm (59.8")	680 kg (1500 lb)					
◆0.69 m <sup>3</sup> (0.90 yd <sup>3</sup> )	0.62 m <sup>3</sup> (0.81 yd <sup>3</sup> )	990 mm (39.0")	-	700 kg (1540 lb)					

◆ : Heavy duty bucket

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

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

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

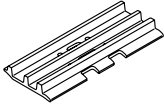


## 7. UNDERCARRIAGE

### 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			
						
R180LC-9	Shoe width	mm (in)	500 (20)	600 (24)	700 (28)	800 (32)
	Operating weight	kg (lb)	18350 (40450)	18600 (41010)	18850 (41560)	19100 (42110)
	Ground pressure	kgf/cm <sup>2</sup> (psi)	0.51 (7.25)	0.43 (6.11)	0.37 (5.26)	0.33 (4.69)
	Overall width	mm (ft-in)	2750 (9' 0")	2850 (9' 4")	2950 (9' 8")	3050 (10' 0")
R180LCD-9	Shoe width	mm (in)	500 (20)	600 (24)	700 (28)	800 (32)
	Operating weight	kg (lb)	19350 (42660)	19600 (43210)	19850 (43760)	20100 (44310)
	Ground pressure	kgf/cm <sup>2</sup> (psi)	0.54 (7.54)	0.45 (6.40)	0.39 (5.55)	0.35 (4.98)
	Overall width	mm (ft-in)	2750 (9' 0")	2850 (9' 4")	2950 (9' 8")	3050 (10' 0")

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

Item	Quantity
Carrier rollers	2 EA
Track rollers	8 EA
Track shoes	51 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

※ **Table 1**

Track shoe	Specification	Category
500 mm triple grouser	Option	A
600 mm triple grouser	Standard	A
700 mm triple grouser	Option	B
800 mm triple grouser	Option	C

※ **Table 2**

Category	Applications	Applications
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>

## 8. SPECIFICATIONS FOR MAJOR COMPONENTS

### 1) ENGINE

Item	Specification
Model	Mitsubishi D04FD-TAA
Type	4-cycle turbocharged charge 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 × 130 mm (4.02" × 5.12")
Piston displacement	4250cc (260cu in)
Compression ratio	16.5 : 1
Rated gross horse power (SAE J1995)	126 Hp (94 kW) at 2000 rpm
Maximum torque	47.7 kgf · m (345 lbf · ft) at 1800 rpm
Engine oil quantity	17.5 l (4.6 U.S. gal)
Dry weight	420 kg (930 lb)
High idling speed	2100 ± 50 rpm
Low idling speed	950 ± 100 rpm
Rated fuel consumption	170.6 g/Hp · hr at 2000 rpm
Starting motor	24 V-5.0 kW
Alternator	24 V-50 A
Battery	2 × 12 V × 80 Ah

### 2) MAIN PUMP

Item	Specification
Type	Variable displacement tandem axis piston pumps
Capacity	2 × 80 cc/rev
Maximum pressure	350 kgf/cm <sup>2</sup> (4980 psi) [380 kgf/cm <sup>2</sup> (5400 psi)]
Rated oil flow	2 × 160 l /min (42.3 U.S. gpm / 35.2 U.K. gpm)
Rated speed	2000 rpm

[ ] : Power boost

### 3) GEAR PUMP

Item	Specification
Type	Fixed displacement gear pump single stage
Capacity	15cc/rev
Maximum pressure	40 kgf/cm <sup>2</sup> (570 psi)
Rated oil flow	30 l /min (7.9 U.S. gpm / 6.6 U.K. gpm)

### 4) MAIN CONTROL VALVE

Item	Specification
Type	11 spools two-block
Operating method	Hydraulic pilot system
Main relief valve pressure	350 kgf/cm <sup>2</sup> (4980 psi) [380 kgf/cm <sup>2</sup> (5400 psi)]
Overload relief valve pressure	400 kgf/cm <sup>2</sup> (5690 psi)

[ ]: Power boost

### 5) SWING MOTOR

Item	Specification
Type	Two fixed displacement axial piston motor
Capacity	117.8 cc/rev
Relief pressure	285 kgf/cm <sup>2</sup> (4053 psi)
Braking system	Automatic, spring applied hydraulic released
Braking torque	59 kgf · m (427 lbf · ft)
Brake release pressure	33~50 kgf/cm <sup>2</sup> (469~711 psi)
Reduction gear type	2 - stage planetary

### 6) TRAVEL MOTOR

Item	Specification
Type	Variable displacement axial piston motor
Relief pressure	350 kgf/cm <sup>2</sup> (4980 psi)
Reduction gear type	Planetary & differential type
Braking system	Automatic, spring applied hydraulic released
Brake release pressure	11 kgf/cm <sup>2</sup> (156 psi)
Braking torque	49.3 kgf · m (357 lbf · ft)

## 7) CYLINDER

Item		Specification
Boom cylinder	Bore dia × Rod dia × Stroke	∅ 115 × ∅ 80 × 1090 mm
	Cushion	Extend only
Arm cylinder	Bore dia × Rod dia × Stroke	∅ 120 × ∅ 85 × 1355 mm
	Cushion	Extend and retract
Bucket cylinder	Bore dia × Rod dia × Stroke	∅ 110 × ∅ 75 × 995 mm
	Cushion	Extend only
Adjust cylinder(opt)	Bore dia × Rod dia × Stroke	∅ 160 × ∅ 95 × 650 mm
	Cushion	Extend only
Adjust boom cylinder(opt)	Bore dia × Rod dia × Stroke	∅ 115 × ∅ 80 × 960 mm
	Cushion	Extend only
Dozer cylinder(opt)	Bore dia × Rod dia × Stroke	∅ 110 × ∅ 85 × 320 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
R180LC-9	Option	500 mm (20")	0.51 kgf/cm <sup>2</sup> (7.25 psi)	51	2750 mm (9' 0")
	Standard	600 mm (24")	0.43 kgf/cm <sup>2</sup> (6.11 psi)	51	2850 mm (9' 4")
	Option	700 mm (28")	0.37 kgf/cm <sup>2</sup> (5.26 psi)	51	2950 mm (9' 8")
	Option	800 mm (32")	0.33 kgf/cm <sup>2</sup> (4.69 psi)	51	3050 mm (10' 0")

## 9) BUCKET

Item	Capacity		Tooth quantity	Width	
	SAE heaped	CECE heaped		Without side cutter	With side cutter
R180LC-9	0.76 m <sup>3</sup> (0.99 yd <sup>3</sup> )	0.65 m <sup>3</sup> (0.85 yd <sup>3</sup> )	5	1060 mm (41.7")	1180 mm (46.5")
	0.39 m <sup>3</sup> (0.51 yd <sup>3</sup> )	0.34 m <sup>3</sup> (0.44 yd <sup>3</sup> )	3	620 mm (24.4")	740 mm (29.1")
	0.50 m <sup>3</sup> (0.65 yd <sup>3</sup> )	0.44 m <sup>3</sup> (0.58 yd <sup>3</sup> )	4	760 mm (29.9")	880 mm (34.6")
	0.64 m <sup>3</sup> (0.84 yd <sup>3</sup> )	0.55 m <sup>3</sup> (0.72 yd <sup>3</sup> )	5	920 mm (36.2")	1040 mm (40.9")
	0.89 m <sup>3</sup> (1.16 yd <sup>3</sup> )	0.77 m <sup>3</sup> (1.01 yd <sup>3</sup> )	6	1220 mm (48.0")	1340 mm (52.8")
	1.05 m <sup>3</sup> (1.37 yd <sup>3</sup> )	0.90 m <sup>3</sup> (1.18 yd <sup>3</sup> )	6	1400 mm (55.1")	1520 mm (59.8")
	◆ 0.69 m <sup>3</sup> (0.90 yd <sup>3</sup> )	0.62 m <sup>3</sup> (0.81 yd <sup>3</sup> )	5	990 mm (39.0")	-

◆ : Heavy duty bucket

## 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 (U.S. gal)	Ambient temperature °C (°F)							
			-50 (-58)	-30 (-22)	-20 (-4)	-10 (14)	0 (32)	10 (50)	20 (68)	30 (86)
Engine oil pan	Engine oil	17.5 (4.6)	★SAE 5W-40				SAE 30			
			SAE 10W				SAE 10W-30			
			SAE 15W-40							
Swing drive	Gear oil	5.0 (1.3) <sup>★2</sup>	★SAE 75W-90							
Final drive		6.2 (1.7)	SAE 80W-90							
Hydraulic tank	Hydraulic oil	Tank: 160 (42.3) System: 270 (71.3)	★ISO VG 15				ISO VG 32			
			ISO VG 46				ISO VG 68			
Fuel tank	Diesel fuel	260 (68.7)	★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>★1</sup>	15.5 (4.1)	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

★2 : Service when the grease

inlet exists on the equipment