HYUNDAI
CONSTRUCTION EQUIPMENT

HX330 SL

CRAWLER EXCAVATOR

SERVICE MANUAL

Table of Content

1. STRUCTURE

This service manual has been prepared as an aid to improve the quality of repairs by giving the serviceman an accurate understanding of the product and by showing him the correct way to perform repairs and make judgements. Make sure you understand the contents of this manual and use it to full effect at every opportunity.
This service manual mainly contains the necessary technical information for operations performed in a service workshop.
For ease of understanding, the manual is divided into the following sections.

SECTION 1 GENERAL
This section explains the safety hints and gives the specification of the machine and major components.

SECTION 2 STRUCTURE AND FUNCTION
This section explains the structure and function of each component. It serves not only to give an understanding of the structure, but also serves as reference material for troubleshooting.

SECTION 3 HYDRAULIC SYSTEM
This section explains the hydraulic circuit, single and combined operation.

SECTION 4 ELECTRICAL SYSTEM
This section explains the electrical circuit, monitoring system and each component. It serves not only to give an understanding electrical system, but also serves as reference material for trouble shooting.

SECTION 5 MECHATRONICS SYSTEM
This section explains the computer aided power optimization system and each component.

SECTION 6 TROUBLESHOOTING
This section explains the troubleshooting charts correlating **problems** to **causes**.

SECTION 7 MAINTENANCE STANDARD
This section gives the judgement standards when inspecting disassembled parts.

SECTION 8 DISASSEMBLY AND ASSEMBLY
This section explains the order to be followed when removing, installing, disassembling or assembling each component, as well as precautions to be taken for these operations.

The specifications contained in this shop manual are subject to change at any time and without any advance notice. Contact your HYUNDAI distributor for the latest information.

2. HOW TO READ THE SERVICE MANUAL

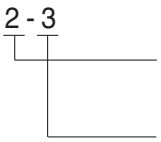
Distribution and updating

Any additions, amendments or other changes will be sent to HYUNDAI distributors.

Get the most up-to-date information before you start any work.

Filing method

1. See the page number on the bottom of the page.
   File the pages in correct order.
2. Following examples shows how to read the page number.
   Example 1



Item number (2. Structure and Function)

Consecutive page number for each item.

3. Additional pages : Additional pages are indicated by a hyphen (-) and number after the page number. File as in the example.

8 - 4
8 - 4 - 1
8 - 4 - 2] Added pages
8 - 5

Revised edition mark (①②③…)

When a manual is revised, an edition mark is recorded on the bottom outside corner of the pages.

Revisions

Revised pages are shown at the list of revised pages on the between the contents page and section 1 page.

Symbols

So that the shop manual can be of ample practical use, important places for safety and quality are marked with the following symbols.

Symbol	Item	Remarks
	Safety	Special safety precautions are necessary when performing the work.
		Extra special safety precautions are necessary when performing the work because it is under internal pressure.
	Caution	Special technical precautions or other precautions for preserving standards are necessary when performing the work.

3. CONVERSION TABLE

Method of using the Conversion Table

The Conversion Table in this section is provided to enable simple conversion of figures. For details of the method of using the Conversion Table, see the example given below.

Example

1. Method of using the Conversion Table to convert from millimeters to inches

Convert 55mm into inches.

(1) Locate the number 50 in the vertical column at the left side, take this as ⓐ, then draw a horizontal line from ⓐ.

(2) Locate the number 5 in the row across the top, take this as ⓑ, then draw a perpendicular line down from ⓑ.

(3) Take the point where the two lines cross as ⓒ. This point ⓒ gives the value when converting from millimeters to inches. Therefore, 55 mm = 2.165 inches.

2. Convert 550 mm into inches.

(1) The number 550 does not appear in the table, so divide by 10 (Move the decimal point one place to the left) to convert it to 55 mm.

(2) Carry out the same procedure as above to convert 55 mm to 2.165 inches.

(3) The original value (550 mm) was divided by 10, so multiply 2.165 inches by 10 (Move the decimal point one place to the right) to return to the original value.
This gives 550 mm = 21.65 inches.

Millimeters to inches

1 mm = 0.03937 in

	0	1	2	3	4	5 (ⓑ)	6	7	8	9
0		0.039	0.079	0.118	0.157	0.197	0.236	0.276	0.315	0.354
10	0.394	0.433	0.472	0.512	0.551	0.591	0.630	0.669	0.709	0.748
20	0.787	0.827	0.866	0.906	0.945	0.984	1.024	1.063	1.102	1.142
30	1.181	1.220	1.260	1.299	1.339	1.378	1.417	1.457	1.496	1.536
40	1.575	1.614	1.654	1.693	1.732	1.772	1.811	1.850	1.890	1.929
ⓐ 50	1.969	2.008	2.047	2.087	2.126	ⓒ 2.165	2.205	2.244	2.283	2.323
60	2.362	2.402	2.441	2.480	2.520	2.559	2.598	2.638	2.677	2.717
70	2.756	2.795	2.835	2.874	2.913	2.953	2.992	3.032	3.071	3.110
80	3.150	3.189	3.228	3.268	3.307	3.346	3.386	3.425	3.465	3.504
90	3.543	3.583	3.622	3.661	3.701	3.740	3.780	3.819	3.858	3.898

Millimeters to inches

1mm = 0.03937in

	0	1	2	3	4	5	6	7	8	9
0		0.039	0.079	0.118	0.157	0.197	0.236	0.276	0.315	0.354
10	0.394	0.433	0.472	0.512	0.551	0.591	0.630	0.669	0.709	0.748
20	0.787	0.827	0.866	0.906	0.945	0.984	1.024	1.063	1.102	1.142
30	1.181	1.220	1.260	1.299	1.339	1.378	1.417	1.457	1.496	1.536
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80	3.150	3.189	3.228	3.268	3.307	3.346	3.386	3.425	3.465	3.504
90	3.543	3.583	3.622	3.661	3.701	3.740	3.780	3.819	3.858	3.898

Kilogram to Pound

1kg = 2.2046lb

	0	1	2	3	4	5	6	7	8	9
0		2.20	4.41	6.61	8.82	11.02	13.23	15.43	17.64	19.84
10	22.05	24.25	26.46	28.66	30.86	33.07	35.27	37.48	39.68	41.89
20	44.09	46.30	48.50	50.71	51.91	55.12	57.32	59.5.	61.73	63.93
30	66.14	68.34	70.55	72.75	74.96	77.16	79.37	81.57	83.78	85.98
40	88.18	90.39	92.59	94.80	97.00	99.21	101.41	103.62	105.82	108.03
50	110.23	112.44	114.64	116.85	119.05	121.25	123.46	125.66	127.87	130.07
60	132.28	134.48	136.69	138.89	141.10	143.30	145.51	147.71	149.91	152.12
70	154.32	156.53	158.73	160.94	163.14	165.35	167.55	169.76	171.96	174.17
80	176.37	178.57	180.78	182.98	185.19	187.39	189.60	191.80	194.01	196.21
90	198.42	200.62	202.83	205.03	207.24	209.44	211.64	213.85	216.05	218.26

Liter to U.S. Gallon

1 ℓ = 0.2642 U.S.Gal

	0	1	2	3	4	5	6	7	8	9
0		0.264	0.528	0.793	1.057	1.321	1.585	1.849	2.113	2.378
10	2.642	2.906	3.170	3.434	3.698	3.963	4.227	4.491	4.755	5.019
20	5.283	5.548	5.812	6.6076	6.340	6.604	6.869	7.133	7.397	7.661
30	7.925	8.189	8.454	8.718	8.982	9.246	9.510	9.774	10.039	10.303
40	10.567	10.831	11.095	11.359	11.624	11.888	12.152	12.416	12.680	12.944
50	13.209	13.473	13.737	14.001	14.265	14.529	14.795	15.058	15.322	15.586
60	15.850	16.115	16.379	16.643	16.907	17.171	17.435	17.700	17.964	18.228
70	18.492	18.756	19.020	19.285	19.549	19.813	20.077	20.341	20.605	20.870
80	21.134	21.398	21.662	21.926	22.190	22.455	22.719	22.983	23.247	23.511
90	23.775	24.040	24.304	24.568	24.832	25.096	25.631	25.625	25.889	26.153

Liter to U.K. Gallon

1 ℓ = 0.21997 U.K.Gal

	0	1	2	3	4	5	6	7	8	9
0		0.220	0.440	0.660	0.880	1.100	1.320	1.540	1.760	1.980
10	2.200	2.420	2.640	2.860	3.080	3.300	3.520	3.740	3.950	4.179
20	4.399	4.619	4.839	5.059	5.279	5.499	5.719	5.939	6.159	6.379
30	6.599	6.819	7.039	7.259	7.479	7.969	7.919	8.139	8.359	8.579
40	8.799	9.019	9.239	9.459	9.679	9.899	10.119	10.339	10.559	10.778
50	10.998	11.281	11.438	11.658	11.878	12.098	12.318	12.528	12.758	12.978
60	13.198	13.418	13.638	13.858	14.078	14.298	14.518	14.738	14.958	15.178
70	15.398	15.618	15.838	16.058	16.278	16.498	16.718	16.938	17.158	17.378
80	17.598	17.818	18.037	18.257	18.477	18.697	18.917	19.137	19.357	19.577
90	19.797	20.017	20.237	20.457	20.677	20.897	21.117	21.337	21.557	21.777

kgf · m to lbf · ft

1kgf · m = 7.233lbf · ft

	0	1	2	3	4	5	6	7	8	9
		7.2	14.5	21.7	28.9	36.2	43.4	50.6	57.9	65.1
10	72.3	79.6	86.8	94.0	101.3	108.5	115.7	123.0	130.2	137.4
20	144.7	151.9	159.1	166.4	173.6	180.8	188.1	195.3	202.5	209.8
30	217.0	224.2	231.5	238.7	245.9	253.2	260.4	267.6	274.9	282.1
40	289.3	396.6	303.8	311.0	318.3	325.5	332.7	340.0	347.2	354.4
50	361.7	368.9	376.1	383.4	390.6	397.8	405.1	412.3	419.5	426.8
60	434.0	441.2	448.5	455.7	462.9	470.2	477.4	484.6	491.8	499.1
70	506.3	513.5	520.8	528.0	535.2	542.5	549.7	556.9	564.2	571.4
80	578.6	585.9	593.1	600.3	607.6	614.8	622.0	629.3	636.5	643.7
90	651.0	658.2	665.4	672.7	679.9	687.1	694.4	701.6	708.8	716.1
100	723.3	730.5	737.8	745.0	752.2	759.5	766.7	773.9	781.2	788.4
110	795.6	802.9	810.1	817.3	824.6	831.8	839.0	846.3	853.5	860.7
120	868.0	875.2	882.4	889.7	896.9	904.1	911.4	918.6	925.8	933.1
130	940.3	947.5	954.8	962.0	969.2	976.5	983.7	990.9	998.2	10005.4
140	1012.6	1019.9	1027.1	1034.3	1041.5	1048.8	1056.0	1063.2	1070.5	1077.7
150	1084.9	1092.2	1099.4	1106.6	1113.9	1121.1	1128.3	1135.6	1142.8	1150.0
160	1157.3	1164.5	1171.7	1179.0	1186.2	1193.4	1200.7	1207.9	1215.1	1222.4
170	1129.6	1236.8	1244.1	1251.3	1258.5	1265.8	1273.0	1280.1	1287.5	1294.7
180	1301.9	1309.2	1316.4	1323.6	1330.9	1338.1	1345.3	1352.6	1359.8	1367.0
190	1374.3	1381.5	1388.7	1396.0	1403.2	1410.4	1417.7	1424.9	1432.1	1439.4

kgf/cm² to lbf/in²

1kgf / cm² = 14.2233lbf / in²

	0	1	2	3	4	5	6	7	8	9
		14.2	28.4	42.7	56.9	71.1	85.3	99.6	113.8	128.0
10	142.2	156.5	170.7	184.9	199.1	213.4	227.6	241.8	256.0	270.2
20	284.5	298.7	312.9	327.1	341.4	355.6	369.8	384.0	398.3	412.5
30	426.7	440.9	455.1	469.4	483.6	497.8	512.0	526.3	540.5	554.7
40	568.9	583.2	597.4	611.6	625.8	640.1	654.3	668.5	682.7	696.9
50	711.2	725.4	739.6	753.8	768.1	782.3	796.5	810.7	825.0	839.2
60	853.4	867.6	881.8	896.1	910.3	924.5	938.7	953.0	967.2	981.4
70	995.6	1010	1024	1038	1053	1067	1081	1095	1109	1124
80	1138	1152	1166	1181	1195	1209	1223	1237	1252	1266
90	1280	1294	1309	1323	1337	1351	1365	1380	1394	1408
100	1422	1437	1451	1465	1479	1493	1508	1522	1536	1550
110	1565	1579	1593	1607	1621	1636	1650	1664	1678	1693
120	1707	1721	1735	1749	1764	1778	1792	1806	1821	1835
130	1849	2863	1877	1892	1906	1920	1934	1949	1963	1977
140	1991	2005	2020	2034	2048	2062	2077	2091	2105	2119
150	2134	2148	2162	2176	2190	2205	2219	2233	2247	2262
160	2276	2290	2304	2318	2333	2347	2361	2375	2389	2404
170	2418	2432	2446	2460	2475	2489	2503	2518	2532	2546
180	2560	2574	2589	5603	2617	2631	2646	2660	2674	2688
200	2845	2859	2873	2887	2901	2916	2930	2944	2958	2973
210	2987	3001	3015	3030	3044	3058	3072	3086	3101	3115
220	3129	3143	3158	3172	3186	3200	3214	3229	3243	3257
230	3271	3286	3300	3314	3328	3343	3357	3371	3385	3399
240	3414	3428	3442	3456	3470	3485	3499	3513	3527	3542

TEMPERATURE

Fahrenheit-Centigrade Conversion.

A simple way to convert a fahrenheit temperature reading into a centigrade temperature reading or vice verse is to enter the accompanying table in the center or boldface column of figures.

These figures refer to the temperature in either Fahrenheit or Centigrade degrees.

If it is desired to convert from Fahrenheit to Centigrade degrees, consider the center column as a table of Fahrenheit temperatures and read the corresponding Centigrade temperature in the column at the left.

If it is desired to convert from Centigrade to Fahrenheit degrees, consider the center column as a table of Centigrade values, and read the corresponding Fahrenheit temperature on the right.

˚C		˚F	˚C		˚F	˚C		˚F	˚C		˚F
-40.4	-40	-40.0	-11.7	11	51.8	7.8	46	114.8	27.2	81	117.8
-37.2	-35	-31.0	-11.1	12	53.6	8.3	47	116.6	27.8	82	179.6
-34.4	-30	-22.0	-10.6	13	55.4	8.9	48	118.4	28.3	83	181.4
-31.7	-25	-13.0	-10.0	14	57.2	9.4	49	120.2	28.9	84	183.2
-28.9	-20	-4.0	-9.4	15	59.0	10.0	50	122.0	29.4	85	185.0
-28.3	-19	-2.2	-8.9	16	60.8	10.6	51	123.8	30.0	86	186.8
-27.8	-18	-0.4	-8.3	17	62.6	11.1	52	125.6	30.6	87	188.6
-27.2	-17	1.4	-7.8	18	64.4	11.7	53	127.4	31.1	88	190.4
-26.7	-16	3.2	-6.7	20	68.0	12.8	55	131.0	32.2	90	194.0
-26.1	-15	5.0	-6.7	20	68.0	12.8	55	131.0	32.2	90	194.0
-25.6	-14	6.8	-6.1	21	69.8	13.3	56	132.8	32.8	91	195.8
-25.0	-13	8.6	-5.6	22	71.6	13.9	57	134.6	33.3	92	197.6
-24.4	-12	10.4	-5.0	23	73.4	14.4	58	136.4	33.9	93	199.4
-23.9	-11	12.2	-4.4	24	75.2	15.0	59	138.2	34.4	94	201.2
-23.3	-10	14.0	-3.9	25	77.0	15.6	60	140.0	35.0	95	203.0
-22.8	-9	15.8	-3.3	26	78.8	16.1	61	141.8	35.6	96	204.8
-22.2	-8	17.6	-2.8	27	80.6	16.7	62	143.6	36.1	97	206.6
-21.7	-7	19.4	-2.2	28	82.4	17.2	63	145.4	36.7	98	208.4
-21.1	-6	21.2	-1.7	29	84.2	17.8	64	147.2	37.2	99	210.2
-20.6	-5	23.0	-1.1	35	95.0	21.1	70	158.0	51.7	125	257.0
-20.0	-4	24.8	-0.6	31	87.8	18.9	66	150.8	40.6	105	221.0
-19.4	-3	26.6	0	32	89.6	19.4	67	152.6	43.3	110	230.0
-18.9	-2	28.4	0.6	33	91.4	20.0	68	154.4	46.1	115	239.0
-18.3	-1	30.2	1.1	34	93.2	20.6	69	156.2	48.9	120	248.0
-17.8	0	32.0	1.7	35	95.0	21.1	70	158.0	51.7	125	257.0
-17.2	1	33.8	2.2	36	96.8	21.7	71	159.8	54.4	130	266.0
-16.7	2	35.6	2.8	37	98.6	22.2	72	161.6	57.2	135	275.0
-16.1	3	37.4	3.3	38	100.4	22.8	73	163.4	60.0	140	284.0
-15.6	4	39.2	3.9	39	102.2	23.3	74	165.2	62.7	145	293.0
-15.0	5	41.0	4.4	40	104.0	23.9	75	167.0	65.6	150	302.0
-14.4	6	42.8	5.0	41	105.8	24.4	76	168.8	68.3	155	311.0
-13.9	7	44.6	5.6	42	107.6	25.0	77	170.6	71.1	160	320.0
-13.3	8	46.4	6.1	43	109.4	25.6	78	172.4	73.9	165	329.0
-12.8	9	48.2	6.7	44	111.2	26.1	79	174.2	76.7	170	338.0
-12.2	10	50.0	7.2	45	113.0	26.7	80	176.0	79.4	172	347.0

SECTION 1 GENERAL

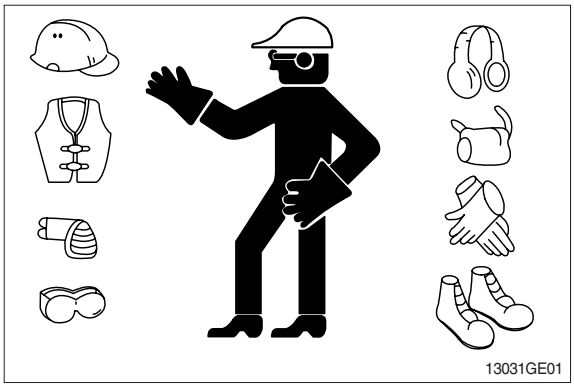
GROUP 1 SAFETY

FOLLOW SAFE PROCEDURE

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

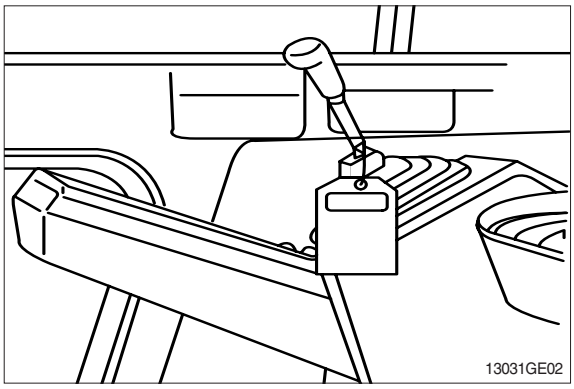
WEAR PROTECTIVE CLOTHING

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



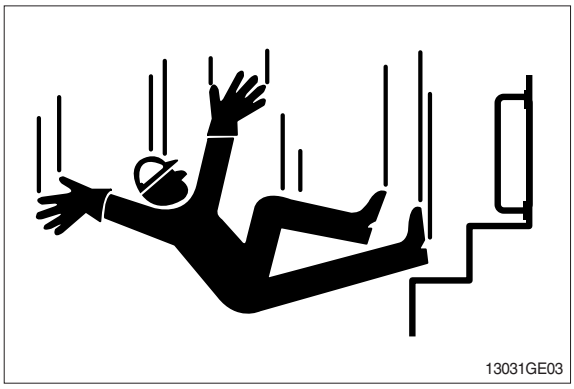
WARN OTHERS OF SERVICE WORK

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.

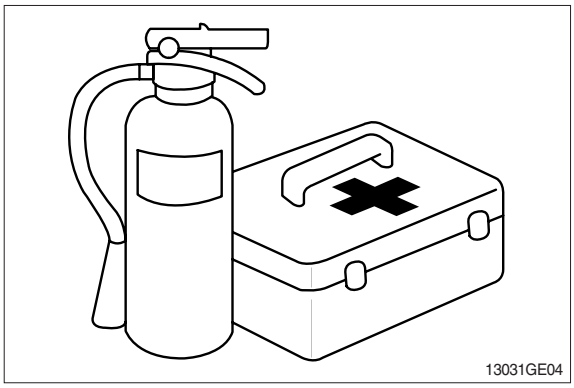


PREPARE FOR EMERGENCIES

Be prepared if a fire starts.

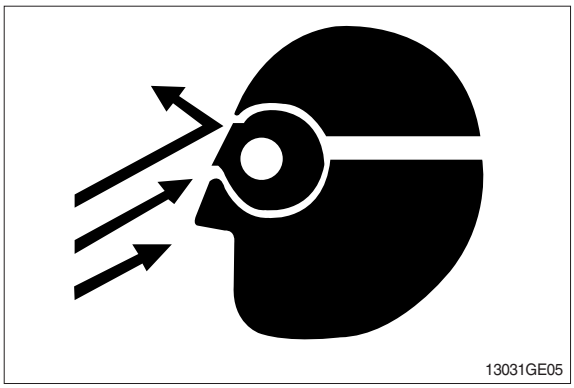
Keep a first aid kit and fire extinguisher handy.

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



PROTECT AGAINST FLYING DEBRIS

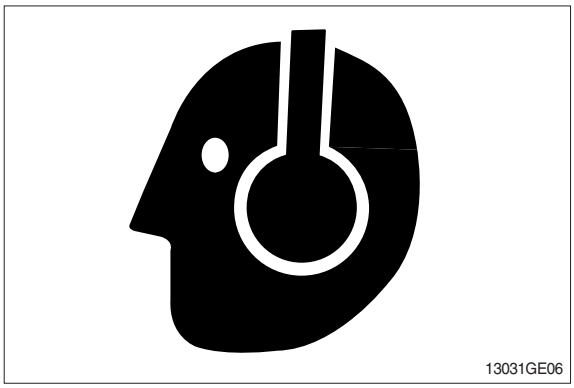
Guard against injury from flying pieces of metal or debris; Wear goggles or safety glasses.



PROTECT AGAINST NOISE

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

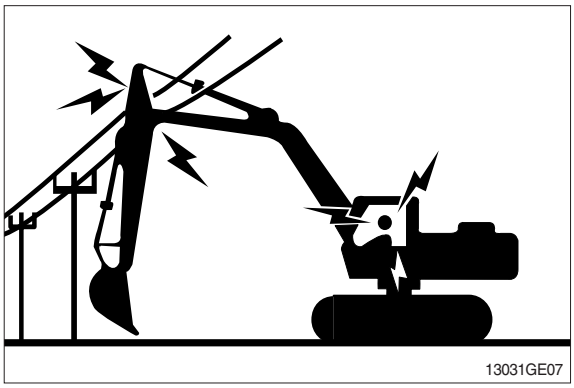
Wear a suitable hearing protective device such as earmuffs or earplugs to protect against objectionable or uncomfortable loud noises.



AVOID POWER LINES

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

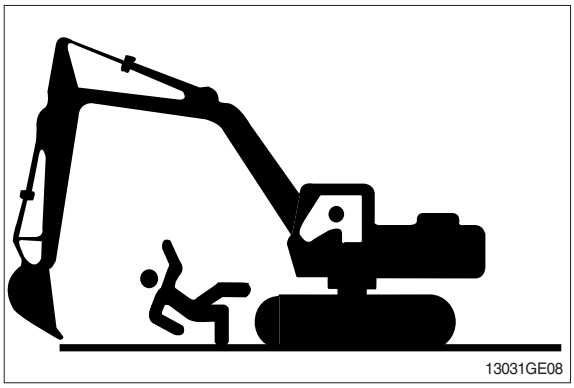
Never move any part of the machine or load closer to electric line than 3m(10ft) plus twice the line insulator length.



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.

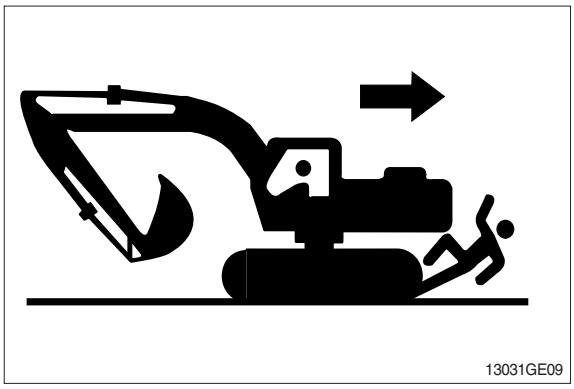

13031GE08

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.

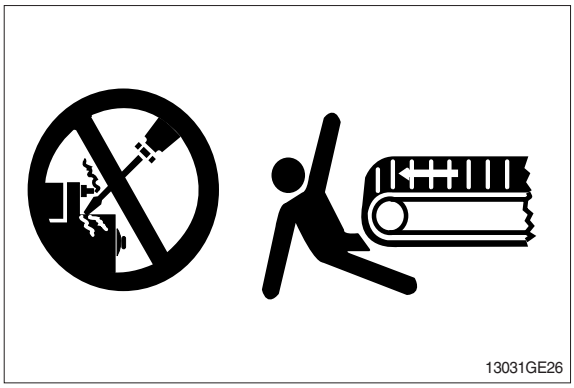
Use a signal person when moving, swinging, or operating the machine in congested areas. Coordinate hand signals before starting the excavator.


13031GE09

OPERATE ONLY FORM OPERATOR'S SEAT

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

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


13031GE26

PARK MACHINE SAFELY

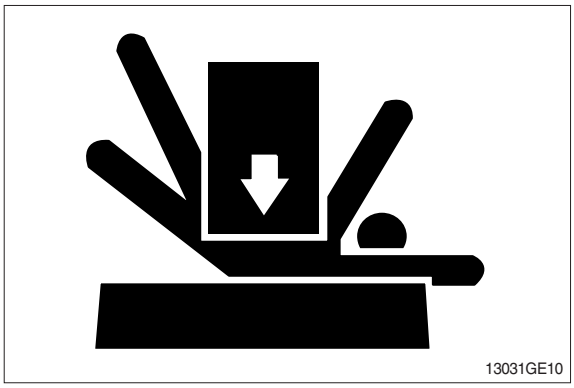
Before working on the machine:

- 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.

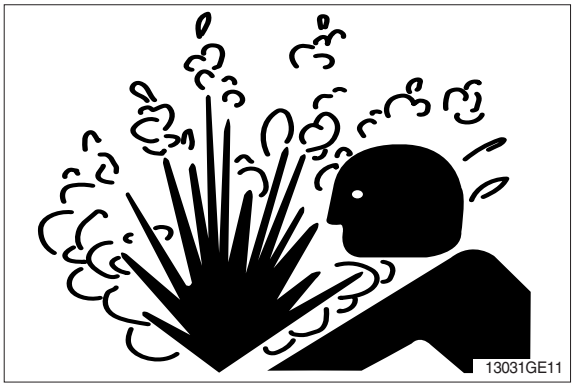
Do not support the machine on cinder blocks, hollow tiles, or props that may crumble under continuous load.
Do not work under a machine that is supported solely by a jack. Follow recommended procedures in this manual.


13031GE10

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.


13031GE11

HANDLE FLUIDS SAFELY-AVOID FIRES

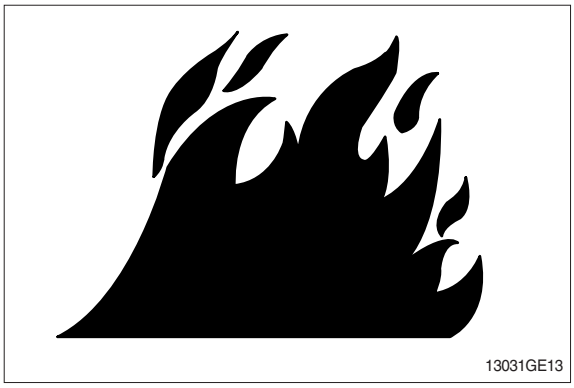
Handle fuel with care; It is highly flammable. Do not refuel the machine while smoking or when near open flame or sparks. Always stop engine before refueling machine.
Fill fuel tank outdoors.


13031GE12

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

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

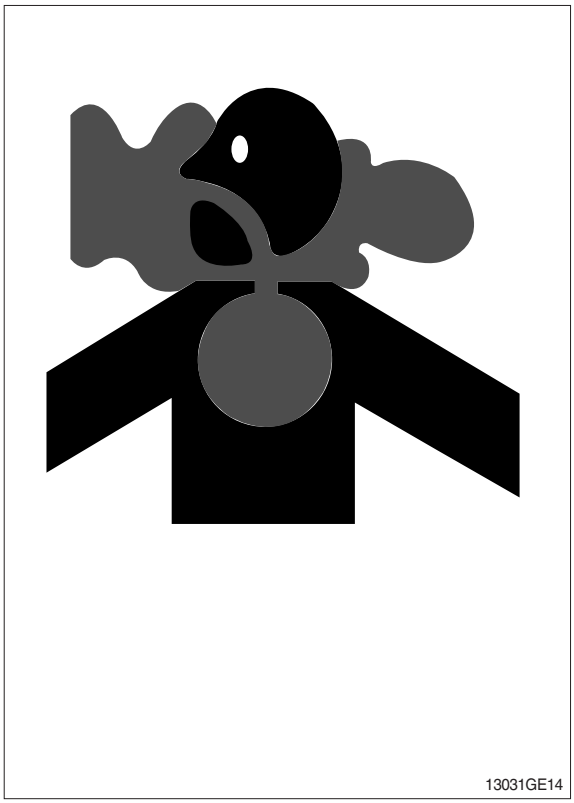
Do not store oily rags; They can ignite and burn spontaneously.


13031GE13

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.


13031GE14

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.

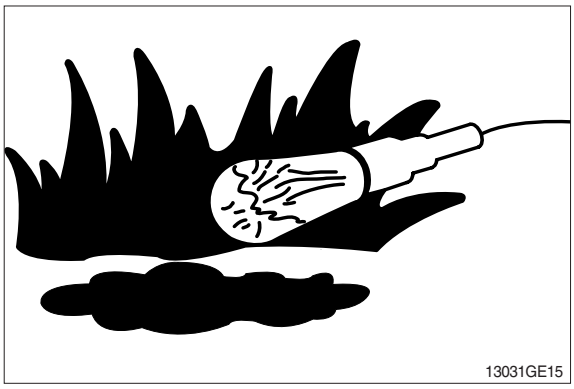
Do all work outside or in a well ventilated area. Dispose of paint and solvent properly.

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

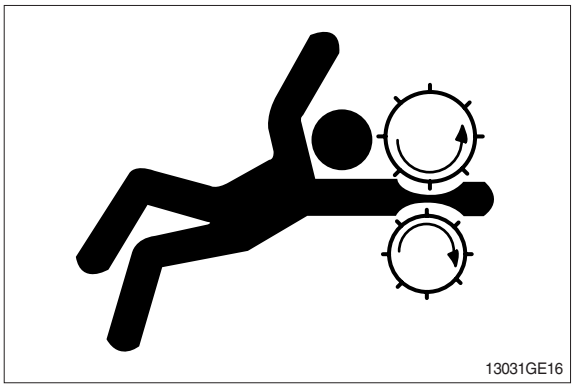
Illuminate your work area adequately but safely. Use a portable safety light for working inside or under the machine. Make sure the bulb is enclosed by a wire cage. The hot filament of an accidentally broken bulb can ignite spilled fuel or oil.


13031GE15

SERVICE MACHINE SAFELY

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

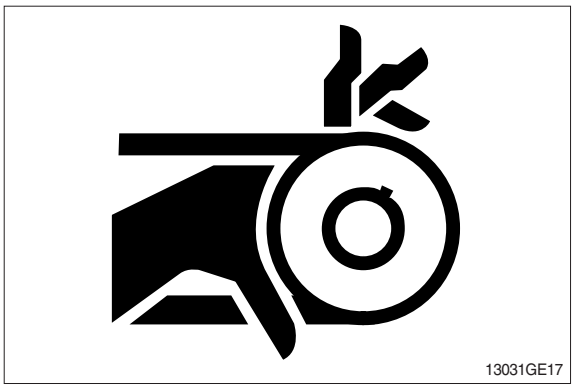
Remove rings and other jewelry to prevent electrical shorts and entanglement in moving parts.



STAY CLEAR OF MOVING PARTS

Entanglements in moving parts can cause serious injury.

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



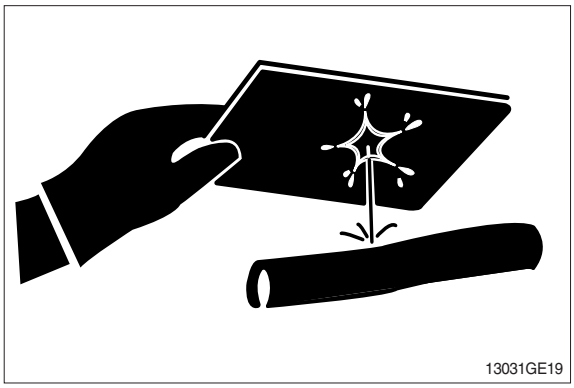
AVOID HIGH PRESSURE FLUIDS

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

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

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

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



AVOID HEATING NEAR PRESSURIZED FLUID LINES

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

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

PREVENT BATTERY EXPLOSIONS

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

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

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

PREVENT ACID BURNS

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

Avoid the hazard by:

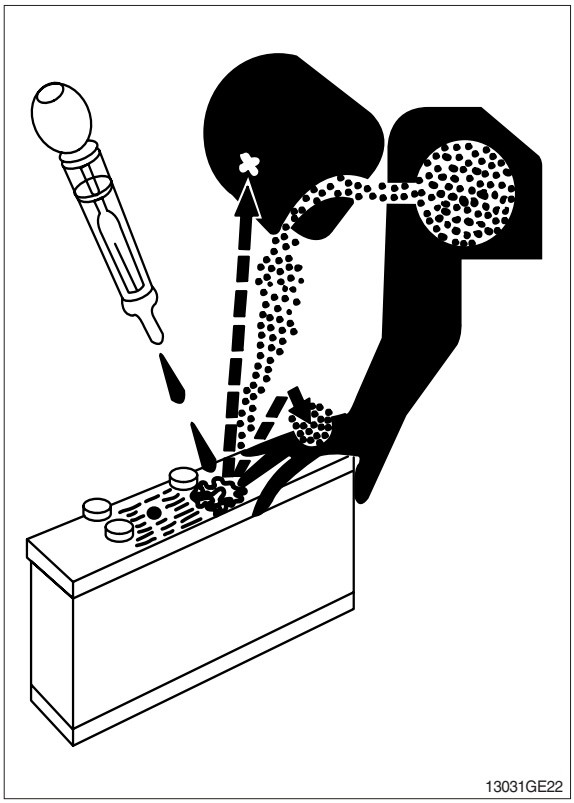
1. Filling batteries in a well-ventilated area.
2. Wearing eye protection and rubber gloves.
3. Avoiding breathing fumes when electrolyte is added.
4. Avoiding spilling of dripping electrolyte.
5. Use proper jump start procedure.

If you spill acid on yourself:

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

If acid is swallowed:

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



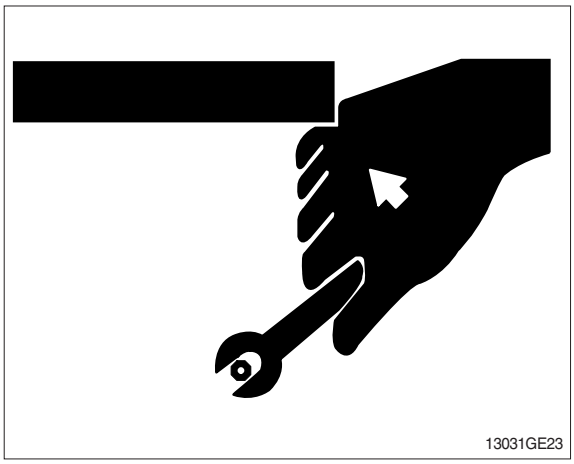
USE TOOLS PROPERLY

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

Use power tools only to loosen threaded tools and fasteners.

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

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

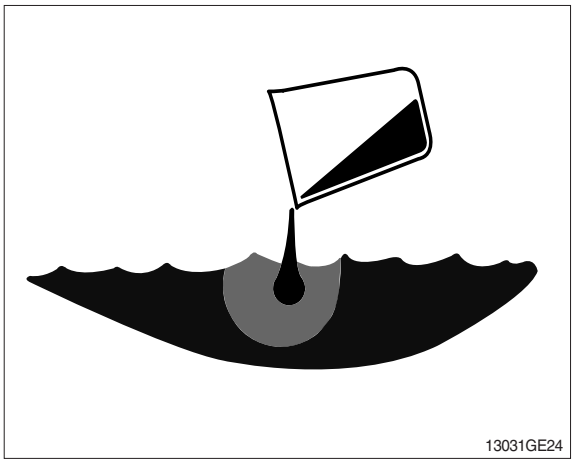


DISPOSE OF FLUIDS PROPERLY

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

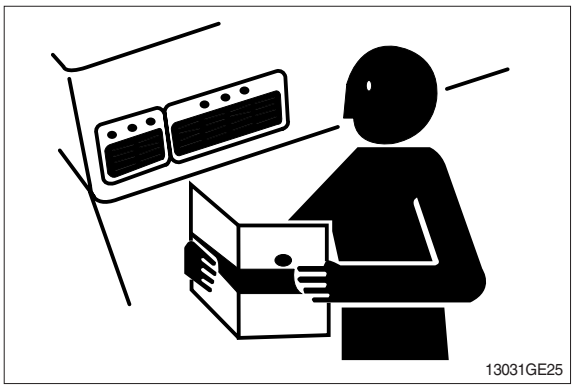
Use proper containers when draining fluids. Do not use food or beverage containers that may mislead someone into drinking from them.

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



REPLACE SAFETY SIGNS

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

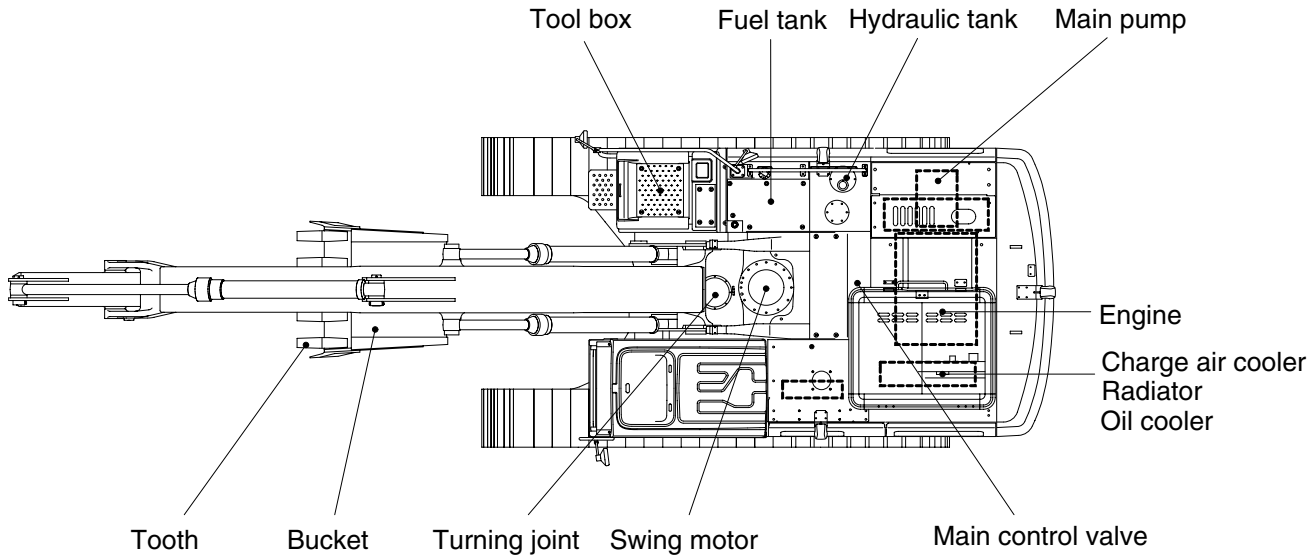


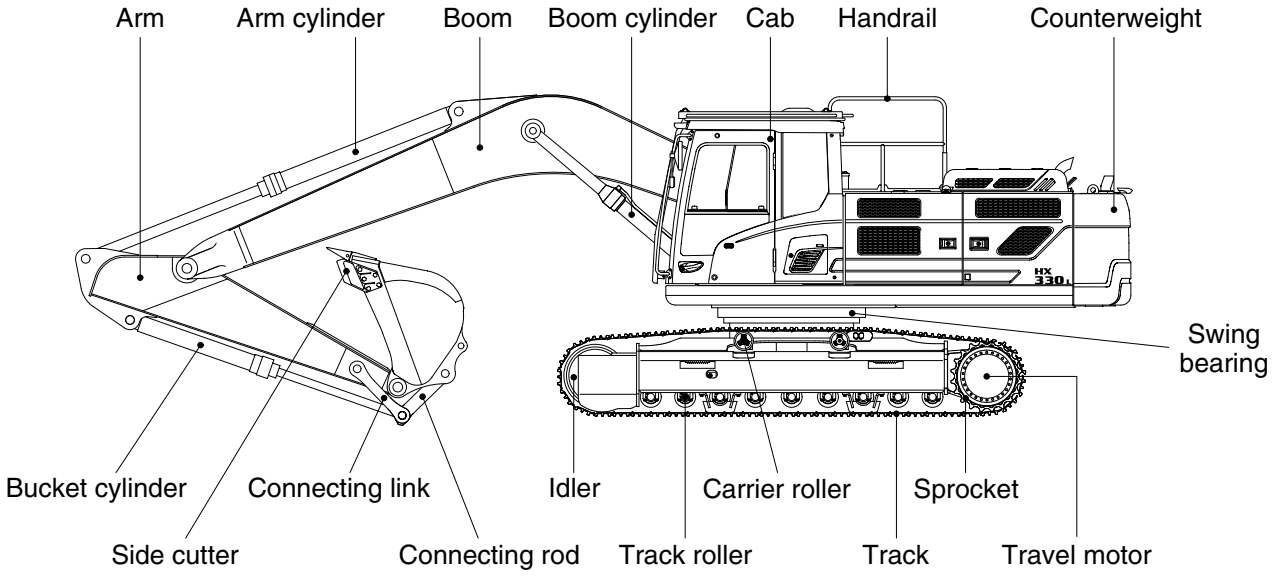
LIVE WITH SAFETY

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

GROUP 2 SPECIFICATIONS

1. MAJOR COMPONENT



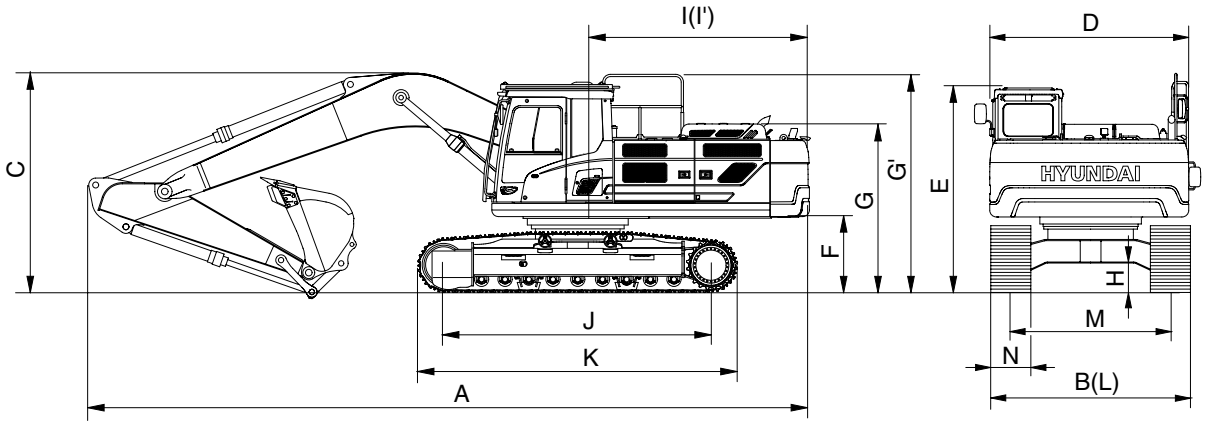


330S2SP01

2. SPECIFICATIONS

1) HX330S L

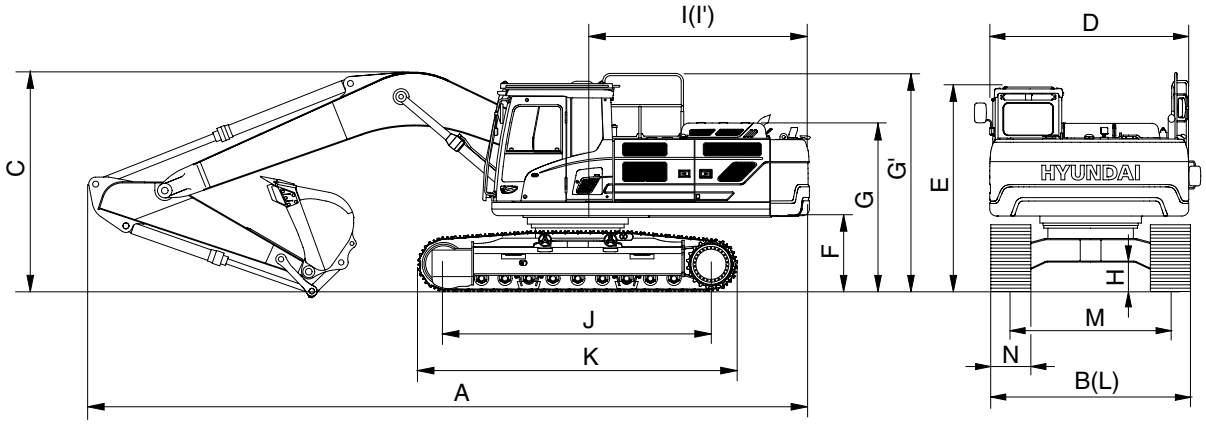
(1) 6.45 m (21' 2") boom and 3.20 m (10' 6") arm



330S2SP02

Description		Unit	Specification
Operating weight		kg (lb)	33000 (72750)
Bucket capacity (SAE heaped), standard		m^3 (yd^3)	1.44 (1.88)
Overall length	A	mm (ft-in)	11220 (36' 10")
Overall width, with 600 mm shoe	B		3280 (10' 9")
Overall height of boom	C		3360 (11' 0")
Superstructure width	D		2980 (9' 9")
Overall height of cab	E		3145 (10' 4")
Ground clearance of counterweight	F		1200 (3' 11")
Overall height of engine hood	G		2672 (8' 9")
Overall height of handrail	G'		3350 (11' 0")
Minimum ground clearance	H		500 (1' 8")
Rear-end distance	I		3510 (11' 6")
Rear-end swing radius	I'		3570 (11' 9")
Distance between tumblers	J		4030 (13' 3")
Undercarriage length	K		4940 (16' 2")
Undercarriage width	L		3280 (10' 9")
Track gauge	M		2680 (8' 10")
Track shoe width, standard	N		600 (24")
Travel speed (low/high)		km/hr (mph)	3.6/6.4 (2.11/3.98)
Swing speed		rpm	11.2
Gradeability		Degree (%)	35 (70)
Ground pressure (600 mm shoe)		kgf/cm^2(psi)	0.64 (9.03)
Max traction force		kg (lb)	29500 (65030)

(2) 6.15 m (20' 2") boom and 2.2 m (7' 3") arm

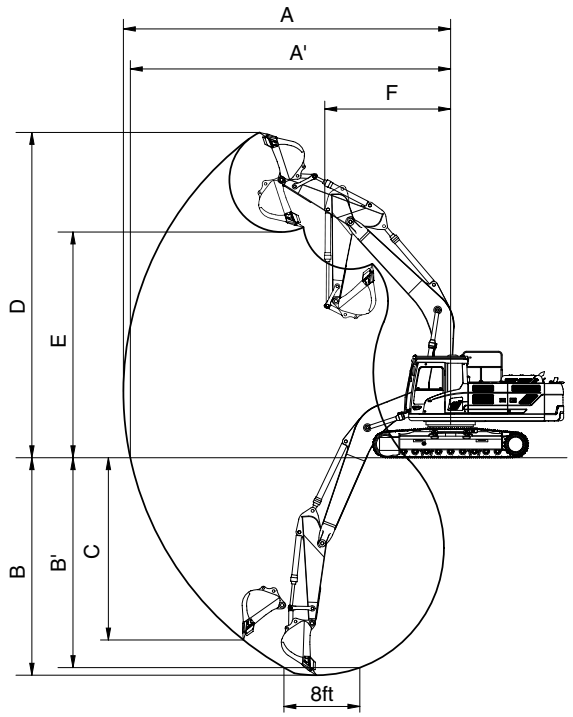


330S2SP02

Description		Unit	Specification
Operating weight		kg (lb)	32806 (72325)
Bucket capacity (SAE heaped), standard		m^3 (yd^3)	1.44 (1.88)
Overall length	A	mm (ft-in)	11170 (36' 8")
Overall width, with 600 mm shoe	B		3280 (10' 9")
Overall height of boom	C		3680 (12' 1")
Superstructure width	D		2980 (9' 9")
Overall height of cab	E		3145 (10' 4")
Ground clearance of counterweight	F		1200 (3' 11")
Overall height of engine hood	G		2672 (8' 9")
Overall height of handrail	G'		3350 (11' 0")
Minimum ground clearance	H		500 (1' 8")
Rear-end distance	I		3510 (11' 6")
Rear-end swing radius	I'		3570 (11' 9")
Distance between tumblers	J		4030 (13' 3")
Undercarriage length	K		4940 (16' 2")
Undercarriage width	L		3280 (10' 9")
Track gauge	M		2680 (8' 10")
Track shoe width, standard	N		600 (24")
Travel speed (low/high)		km/hr (mph)	3.6/6.4 (2.11/3.98)
Swing speed		rpm	11.2
Gradeability		Degree (%)	35 (70)
Ground pressure (600 mm shoe)		kgf/cm^2(psi)	0.63 (8.98)
Max traction force		kg (lb)	29500 (65030)

3. WORKING RANGE

1) HX330S L



330S2SP05

Description		6.45 m (21' 2") Arm				6.15 m (20' 2") Boom
		2.2 m (7' 3") Arm	2.5 m (8' 2") Arm	3.2 m (10' 6") Arm	4.05 m (13' 3") Arm	2.2 m (7' 3") Arm
Max digging reach	A	10330 mm (33'11")	10500 mm (34' 5")	11150 mm (36' 7")	11950 mm (39' 2")	10020 mm (32'10")
Max digging reach on ground	A'	10120 mm (33' 2")	10290 mm (33' 9")	10950 mm (35'11")	11770 mm (38' 7")	9810 mm (32' 2")
Max digging depth	B	6360 mm (20'10")	6660 mm (21'10")	7360 mm (24' 2")	8210 mm (26'11")	6150 mm (20' 2")
Max digging depth (8ft level)	B'	6170 mm (20' 3")	6450 mm (21' 2")	7200 mm (23' 7")	8080 mm (26' 6")	5950 mm (19' 6")
Max vertical wall digging depth	C	5970 mm (19' 7")	5660 mm (18' 7")	6330 mm (20' 9")	7240 mm (23' 9")	5700 mm (18' 8")
Max digging height	D	10260 mm (33' 8")	10050 mm (33' 0")	10360 mm (34' 0")	10780 mm (35' 4")	9980 mm (32' 9")
Max dumping height	E	7060 mm (23' 2")	6950 mm (22'10")	7260 mm (23'10")	7670 mm (25' 2")	6790 mm (22' 3")
Min swing radius	F	4630 mm (15' 2")	4440 mm (14' 7")	4360 mm (14' 4")	4290 mm (14' 1")	4450 mm (14' 7")
Bucket digging force	SAE	186.3 [203.3] kN	187.3 [204.4] kN	188.3 [205.5] kN	189.3 [206.4] kN	186.3 [203.3] kN
		19000 [20730] kgf	19100 [20840] kgf	19200 [20950] kgf	19300 [21050] kgf	19000 [20730] kgf
		41890 [45700] lbf	42110 [45940] lbf	42330 [46190] lbf	42550 [46410] lbf	41890 [45700] lbf
	ISO	214.8 [234.3] kN	215.7 [235.4] kN	216.7 [236.4] kN	217.7 [237.5] kN	214.8 [234.3] kN
		21900 [23890] kgf	22000 [24000] kgf	22100 [24110] kgf	22200 [24220] kgf	21900 [23890] kgf
		48280 [52670] lbf	48500 [52910] lbf	48720 [53150] lbf	48940 [53400] lbf	48280 [52670] lbf
Arm crowd force	SAE	195.2 [212.9] kN	175.5 [191.5] kN	140.2 [153.0] kN	118.7 [129.4] kN	195.2 [212.9] kN
		19900 [21710] kgf	17900 [19530] kgf	14300 [15600] kgf	12100 [13200] kgf	19900 [21710] kgf
		43870 [47860] lbf	39460 [43060] lbf	31530 [34390] lbf	26680 [29100] lbf	43870 [47860] lbf
	ISO	205.0 [223.6] kN	184.4 [201.1] kN	145.1 [158.4] kN	123.6 [134.8] kN	205.0 [223.6] kN
		20900 [22800] kgf	18800 [20510] kgf	14800 [16150] kgf	12600 [13750] kgf	20900 [22800] kgf
		46080 [50270] lbf	41450 [45220] lbf	32630 [35600] lbf	27780 [30310] lbf	46080 [50270] lbf

[ ] : Power boost

4. WEIGHT

1) HX330S L

Item	HX330S L	
	kg	lb
Upperstructure assembly	15420	33995
Main frame weld assembly	3910	8620
Engine assembly	617	1360
Main pump assembly	201	443
Main control valve assembly	220	485
Swing motor assembly	370	820
Hydraulic oil tank assembly	300	661
Fuel tank assembly	350	772
Counterweight	6000	13230
Cab assembly	422	930
Radiator assy	230	510
Oil cooler assy	80	180
Lower chassis assembly	11500	25350
Track frame weld assembly	3970	8750
Swing bearing	470	1040
Travel motor assembly	440	970
Turning joint	54	119
Tension cylinder	225	496
Idler	250	551
Sprocket	83	183
Carrier roller	35	77
Track roller	56	123
Track-chain assembly (600 ㎜ standard triple grouser shoe)	1880	4145
Front attachment assembly (6.45 m boom, 3.2 m arm, 1.44 m^3 SAE heaped bucket)	6580	14510
6.45 m boom assembly	2560	5640
3.2 m arm assembly	1170	2580
1.44 m^3 SAE heaped bucket	1230	2710
Boom cylinder assembly	305	670
Arm cylinder assembly	380	840
Bucket cylinder assembly	265	580
Bucket control linkage assembly	370	820

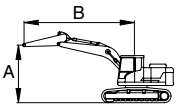
5. LIFTING CAPACITIES

1) HX330S L

Unit : mm

Model	Boom	Boom	Arm	Counterweight	Shoe	Dozer		Outrigger	
	Type	Length	Length	Weight (kg)	Width	Front	Rear	Front	Rear
HX330S L	Mono	6150	2200	6000	600	-	-	-	-

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



Load point height		Load radius												At max. reach		
		1.5 m (4.9 ft)		3.0 m (9.8 ft)		4.5 m (14.8 ft)		6.0 m (19.7 ft)		7.5 m (24.6 ft)		9.0 m (29.5 ft)		Capacity		Reach
																m (ft)
7.5m	kg							*9740	9610					*9890	8800	6.31
24.6ft	lb							*21470	21190					*21800	19400	(20.7)
6.0m	kg							*9940	9490					*9660	6770	7.36
19.7ft	lb							*21910	20920					*21300	14930	(24.2)
4.5m	kg							*11120	9120	9690	6480			8710	5830	8.00
14.8ft	lb							*24520	20110	21360	14290			19200	12850	(26.2)
3.0m	kg							*12620	8680	9480	6290			8080	5380	8.31
9.8ft	lb							*27820	19140	20900	13870			17810	11860	(27.3)
1.5m	kg							13020	8330	9280	6110			7930	5260	8.34
4.9ft	lb							28700	18360	20460	13470			17480	11600	(27.4)
0.0m	kg							12810	8150	9170	6010			8230	5440	8.10
0.0ft	lb							28240	17970	20220	13250			18140	11990	(26.6)
-1.5m	kg					*18500	12460	12800	8140	9220	6050			9150	6010	7.54
-4.9ft	lb					*40790	27470	28220	17950	20330	13340			20170	13250	(24.7)
-3.0m	kg			*21230	*21230	*16370	12690	*12350	8310					*10680	7360	6.60
-9.8ft	lb			*46800	*46800	*36090	27980	*27230	18320					*23550	16230	(21.6)

※ 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 lift-point is bucket mounting pin on the arm (without bucket).
4. *indicates load limited by hydraulic capacity.

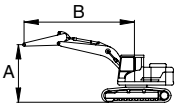
※ Lifting capacities are based upon a standard machine conditions.
Lifting capacities will vary with different work tools, ground conditions and attachments.
The difference between the weight of a work tool attachment must be subtracted.
Consult your Hyundai dealer regarding the lifting capacities for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

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

Unit : mm

Model	Boom	Boom	Arm	Counterweight	Shoe	Dozer		Outrigger	
	Type	Length	Length	Weight (kg)	Width	Front	Rear	Front	Rear
HX330S L	Mono	6450	2200	6000	600	-	-	-	-

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

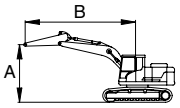


Load point height		Load radius												At max. reach		
		1.5 m (4.9 ft)		3.0 m (9.8 ft)		4.5 m (14.8 ft)		6.0 m (19.7 ft)		7.5 m (24.6 ft)		9.0 m (29.5 ft)		Capacity		Reach
																m (ft)
7.5m	kg							*9270	*9270					*9420	7920	6.71
24.6ft	lb							*20440	*20440					*20770	17460	(22.0)
6.0m	kg							*9780	9400	*9190	6550			*9230	6240	7.71
19.7ft	lb							*21560	20720	*20260	14440			*20350	13760	(25.3)
4.5m	kg							*11070	8980	*9570	6410			8120	5420	8.32
14.8ft	lb							*24410	19800	*21100	14130			17900	11950	(27.3)
3.0m	kg							*12590	8510	9370	6190			7570	5030	8.62
9.8ft	lb							*27760	18760	20660	13650			16690	11090	(28.3)
1.5m	kg							12820	8160	9160	6000			7440	4920	8.65
4.9ft	lb							28260	17990	20190	13230			16400	10850	(28.4)
0.0m	kg							12630	7990	9050	5900			7700	5070	8.41
0.0ft	lb							27840	17610	19950	13010			16980	11180	(27.6)
-1.5m	kg					*18120	12280	12630	7990	9060	5910			8480	5560	7.88
-4.9ft	lb					*39950	27070	27840	17610	19970	13030			18700	12260	(25.8)
-3.0m	kg			*20410	*20410	*16200	12500	*12490	8140					*10120	6680	6.98
-9.8ft	lb			*45000	*45000	*35710	27560	*27540	17950					*22310	14730	(22.9)
-4.5m	kg					*12370	*12370							*9550	*9550	5.54
-14.8ft	lb					*27270	*27270							*21050	*21050	(18.2)

Unit : mm

Model	Boom	Boom	Arm	Counterweight	Shoe	Dozer		Outrigger	
	Type	Length	Length	Weight (kg)	Width	Front	Rear	Front	Rear
HX330S L	Mono	6450	2500	6000	600	-	-	-	-

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

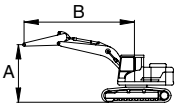


Load point height		Load radius												At max. reach		
		1.5 m (4.9 ft)		3.0 m (9.8 ft)		4.5 m (14.8 ft)		6.0 m (19.7 ft)		7.5 m (24.6 ft)		9.0 m (29.5 ft)		Capacity		Reach
																m (ft)
7.5m	kg													*8820	7570	6.93
24.6ft	lb													*19440	16690	(22.7)
6.0m	kg							*9310	*9310	*8740	6590			*8740	6020	7.90
19.7ft	lb							*20530	*20530	*19270	14530			*19270	13270	(25.9)
4.5m	kg					*13730	*13730	*10630	9020	*9230	6410			7860	5240	8.49
14.8ft	lb					*30270	*30270	*23440	19890	*20350	14130			17330	11550	(27.9)
3.0m	kg							*12200	8520	9360	6180			7330	4860	8.79
9.8ft	lb							*26900	18780	20640	13620			16160	10710	(28.8)
1.5m	kg							12800	8130	9130	5960			7190	4740	8.82
4.9ft	lb							28220	17920	20130	13140			15850	10450	(28.9)
0.0m	kg					*15200	12060	12570	7930	8990	5830			7410	4860	8.58
0.0ft	lb					*33510	26590	27710	17480	19820	12850			16340	10710	(28.2)
-1.5m	kg					*18400	12120	12530	7890	8970	5820			8110	5300	8.06
-4.9ft	lb					*40570	26720	27620	17390	19780	12830			17880	11680	(26.4)
-3.0m	kg			*21480	*21480	*16690	12330	12670	8020					9700	6300	7.19
-9.8ft	lb			*47360	*47360	*36800	27180	27930	17680					21380	13890	(23.6)
-4.5m	kg					*13340	12750							*10060	8800	5.80
-14.8ft	lb					*29410	28110							*22180	19400	(19.0)

Unit : mm

Model	Boom	Boom	Arm	Counterweight	Shoe	Dozer		Outrigger	
	Type	Length	Length	Weight (kg)	Width	Front	Rear	Front	Rear
HX330S L	Mono	6450	3200	6000	600	-	-	-	-

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

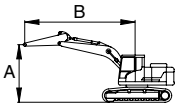


Load point height		Load radius												At max. reach		
		1.5 m (4.9 ft)		3.0 m (9.8 ft)		4.5 m (14.8 ft)		6.0 m (19.7 ft)		7.5 m (24.6 ft)		9.0 m (29.5 ft)		Capacity		Reach
																m (ft)
7.5m	kg									*6830	6770			*5610	*5610	7.74
24.6ft	lb									*15060	14930			*12370	*12370	(25.4)
6.0m	kg									*7870	6710			*5430	5270	8.62
19.7ft	lb									*17350	14790			*11970	11620	(28.3)
4.5m	kg					*11980	*11980	*9660	9210	*8520	6500	*6670	4820	*5450	4660	9.17
14.8ft	lb					*26410	*26410	*21300	20300	*18780	14330	*14700	10630	*12020	10270	(30.1)
3.0m	kg					*15550	13250	*11360	8680	*9400	6240	7090	4700	*5650	4350	9.44
9.8ft	lb					*34280	29210	*25040	19140	*20720	13760	15630	10360	*12460	9590	(31.0)
1.5m	kg					*17440	12390	*12870	8220	9160	5990	6960	4580	*6050	4240	9.47
4.9ft	lb					*38450	27320	*28370	18120	20190	13210	15340	10100	*13340	9350	(31.1)
0.0m	kg					*17250	12040	12590	7940	8970	5810	6870	4500	6600	4320	9.25
0.0ft	lb					*38030	26540	27760	17500	19780	12810	15150	9920	14550	9520	(30.4)
-1.5m	kg			*10800	*10800	*18950	11990	12460	7820	8880	5730			7110	4650	8.77
-4.9ft	lb			*23810	*23810	*41780	26430	27470	17240	19580	12630			15670	10250	(28.8)
-3.0m	kg			*17460	*17460	*17750	12120	12510	7870	8940	5790			8210	5350	7.98
-9.8ft	lb			*38490	*38490	*39130	26720	27580	17350	19710	12760			18100	11790	(26.2)
-4.5m	kg			*20680	*20680	*15250	12440	*11460	8100					*9640	6910	6.76
-14.8ft	lb			*45590	*45590	*33620	27430	*25260	17860					*21250	15230	(22.2)

Unit : mm

Model	Boom	Boom	Arm	Counterweight	Shoe	Dozer		Outrigger	
	Type	Length	Length	Weight (kg)	Width	Front	Rear	Front	Rear
HX330S L	Mono	6450	4050	6000	600	-	-	-	-

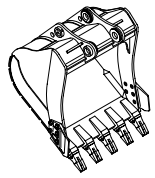
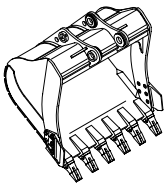
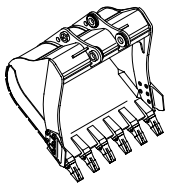
· : Rating over-front · : Rating over-side or 360 degree



Load point height		Load radius												At max. reach		
		1.5 m (4.9 ft)		3.0 m (9.8 ft)		4.5 m (14.8 ft)		6.0 m (19.7 ft)		7.5 m (24.6 ft)		9.0 m (29.5 ft)		Capacity		Reach
																m (ft)
7.5m	kg													*4200	*4200	8.72
24.6ft	lb													*9260	*9260	(28.6)
6.0m	kg									*6810	*6810	*5820	4970	*4070	*4070	9.50
19.7ft	lb									*15010	*15010	*12830	10960	*8970	*8970	(31.2)
4.5m	kg									*7560	6600	*7140	4860	*4080	4020	10.00
14.8ft	lb									*16670	14550	*15740	10710	*8990	8860	(32.8)
3.0m	kg					*13330	*13330	*10120	8860	*8540	6290	7110	4710	*4210	3760	10.25
9.8ft	lb					*29390	*29390	*22310	19530	*18830	13870	15670	10380	*9280	8290	(33.6)
1.5m	kg					*16570	12650	*11870	8300	9180	5990	6930	4540	*4460	3670	10.28
4.9ft	lb					*36530	27890	*26170	18300	20240	13210	15280	10010	*9830	8090	(33.7)
0.0m	kg			*6350	*6350	*18440	12020	12580	7910	8920	5750	6780	4400	*4880	3720	10.08
0.0ft	lb			*14000	*14000	*40650	26500	27730	17440	19670	12680	14950	9700	*10760	8200	(33.1)
-1.5m	kg	*6460	*6460	*9880	*9880	*18970	11790	12340	7690	8760	5600	6700	4330	*5560	3940	9.64
-4.9ft	lb	*14240	*14240	*21780	*21780	*41820	25990	27210	16950	19310	12350	14770	9550	*12260	8690	(31.6)
-3.0m	kg	*10380	*10380	*14460	*14460	*18440	11810	12290	7650	8730	5580			*6730	4420	8.92
-9.8ft	lb	*22880	*22880	*31880	*31880	*40650	26040	27090	16870	19250	12300			*14840	9740	(29.3)
-4.5m	kg	*15030	*15030	*20820	*20820	*16780	12020	12430	7770	8870	5700			8320	5380	7.86
-14.8ft	lb	*33140	*33140	*45900	*45900	*36990	26500	27400	17130	19550	12570			18340	11860	(25.8)
-6.0m	kg			*18490	*18490	*13330	12470	*9580	8140					*8920	7700	6.26
-19.7ft	lb			*40760	*40760	*29390	27490	*21120	17950					*19670	16980	(20.5)

6. BUCKET SELECTION GUIDE

1) GENERAL BUCKET

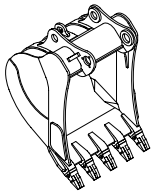
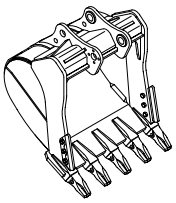
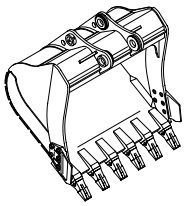
		
1.44 m³ SAE heaped bucket	1.74 m³ SAE heaped bucket	2.10 m³ SAE heaped bucket

Capacity		Width		Weight	Recommendation				
					6.45 m (21' 2") boom				6.15 m (20' 2") boom
SAE heaped	CECE heaped	Without side cutter	With side cutter		2.2 m arm (7' 3")	2.5 m arm (8' 2")	3.2 m arm (10' 6")	4.05 m arm (13' 3")	2.2 m arm (7' 3")
1.44 m³ (1.88 yd³)	1.25 m³ (1.63 yd³)	1380 mm (54")	1500 mm (59")	1150 kg (2540 lb)	●	●	●	■	●
1.74 m³ (2.28 yd³)	1.50 m³ (1.96 yd³)	1620 mm (64")	1740 mm (69")	1260 kg (2780 lb)	◐	◐	■	▲	●
2.10 m³ (2.75 yd³)	1.80 m³ (2.35 yd³)	1910 mm (75")	2030 mm (80")	1650 kg (3640 lb)	■	■	▲	X	■

● Applicable for materials with density of 2100 kg/m³ (3500 lb/yd³) or less
◐ Applicable for materials with density of 1800 kg/m³ (3000 lb/yd³) or less
■ Applicable for materials with density of 1500 kg/m³ (2500 lb/yd³) or less
▲ Applicable for materials with density of 1200 kg/m³ (2000 lb/yd³) or less
X Not recommended

※ These recommendations are for general conditions and average use.
Work tools and ground conditions have effects on machine performance.
Select an optimum combination according to the working conditions and the type of work that is being done.
Consult your Hyundai dealer for information on selecting the correct boom−arm−bucket combination.

2) HEAVY DUTY AND ROCK-HEAVY DUTY BUCKET

		
◈ 1.44 m³ SAE heaped bucket	◆ 1.44 m³ SAE ◆ 1.60 m³ SAE ◆ 1.73 m³ SAE heaped bucket	◆ 1.83 m³ SAE heaped bucket

Capacity		Width		Weight	Recommendation				
					6.45 m (21' 2") boom				6.15 m (20' 2") boom
SAE heaped	CECE heaped	Without side cutter	With side cutter		2.2 m arm (7' 3")	2.5 m arm (8' 2")	3.2 m arm (10' 6")	4.05 m arm (13' 3")	2.2 m arm (7' 3")
◈ 1.44 m³ (1.88 yd³)	1.25 m³ (1.63 yd³)	1470 mm (58")	-	1410 kg (3110 lb)	●	●	◐	■	●
◆ 1.44 m³ (1.88 yd³)	1.25 m³ (1.63 yd³)	1470 mm (58")	-	1485 kg (3270 lb)	●	●	◐	X	●
◆ 1.60 m³ (2.09 yd³)	1.39 m³ (1.82 yd³)	1585 mm (62")	-	1650 kg (3640 lb)	●	◐	■	X	●
◆ 1.73 m³ (2.26 yd³)	1.5 m³ (1.96 yd³)	1710 mm (67")	-	1675 kg (3690 lb)	◐	◐	■	X	●
◆ 1.83 m³ (2.39 yd³)	1.59 m³ (2.08 yd³)	1765 mm (69")	-	1850 kg (4080 lb)	■	■	▲	X	◐

◈ : Heavy duty bucket

◆ : Rock-Heavy duty bucket

● Applicable for materials with density of 2100 kg/m³ (3500 lb/yd³) or less

◐ Applicable for materials with density of 1800 kg/m³ (3000 lb/yd³) or less

■ Applicable for materials with density of 1500 kg/m³ (2500 lb/yd³) or less

▲ Applicable for materials with density of 1200 kg/m³ (2000 lb/yd³) or less

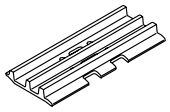
X Not recommended

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		
					
HX330S L	Shoe width	mm (in)	600 (24)	700 (28)	800 (32)
	Operating weight	kg (lb)	33000 (72750)	33570 (74010)	33950 (74850)
	Ground pressure	kgf/cm^2 (psi)	0.64 (9.03)	0.55 (7.88)	0.49 (6.97)
	Overall width	mm (ft-in)	3280 (10' 9")	3380 (11' 1")	3480 (11' 5")

3) NUMBER OF ROLLERS AND SHOES ON EACH SIDE

Item	Quantity
Carrier rollers	2EA
Track rollers	9EA
Track shoes	48EA

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
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	· Travel at low speed on rough ground with large obstacles such as boulders or fallen trees or a wide range of general civil engineering work
B	Normal soil, soft ground	· These shoes cannot be used on rough ground with large obstacles such as boulders or fallen trees · Travel at high speed only on flat ground · Travel slowly at low speed if it is impossible to avoid going over obstacles
C	Extremely soft gound (swampy ground)	· Use the shoes only in the conditions that the machine sinks and it is impossible to use the shoes of category A or B · These shoes cannot be used on rough ground with large obstacles such as boulders or fallen trees · Travel at high speed only on flat ground · Travel slowly at low speed if it is impossible to avoid going over obstacles

8. SPECIFICATIONS FOR MAJOR COMPONENTS

1) ENGINE

Item	Specification
Model	Hyundai HM8.3
Type	4-cycle turbocharged charger air cooled 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	114 × 134.9 mm (4.49" × 5.31")
Piston displacement	8290 cc (506 cu in)
Compression ratio	18 : 1
Rated net horse power (SAE J1349)	245 Hp (183 kW) at 2200 rpm
Rated gross horse power (SAE J1995)	250 Hp (186 kW) at 2200 rpm
Maximum torque	124 kgf · m (899 lbf · ft) at 1300 rpm
Engine oil quantity	26.5 ℓ (7.0 U.S. gal)
Wet weight	617 kg (1360 lb)
High idling speed	2457+50 rpm
Low idling speed	850±100 rpm
Rated fuel consumption	151 g/Hp · hr at 1400 rpm
Starting motor	24V-7.2 kW
Alternator	24V 90A
Battery	2 × 12V × 150Ah

2) MAIN PUMP

Item	Specification
Type	Variable displacement tandem axis piston pumps
Capacity	2 × 175 cc/rev
Rated oil flow	2 × 306 ℓ/min (80.8 U.S. gpm / 67.3 U.K. gpm)
Rated speed	1750 rpm

3) GEAR PUMP

Item	Specification
Type	Fixed displacement gear pump single stage
Capacity	15cc/rev
Maximum pressure	40 kgf/cm^2 (570 psi)
Rated oil flow	26.3 ℓ /min (6.9 U.S. gpm/5.8 U.K. gpm)

4) MAIN CONTROL VALVE

Item	Specification
Type	10 spools
Operating method	Hydraulic pilot system
Main relief valve pressure	350 kgf/cm^2 (4980 psi) [380 kgf/cm^2 (5400 psi)]
Overload relief valve pressure	400 kgf/cm^2 (5690 psi)

[ ]: Power boost

5) SWING MOTOR

Item	Specification
Type	Axial piston motor
Capacity	156.9 cc/rev
Relief pressure	300 kgf/cm^2 (4270 psi)
Braking system	Automatic, spring applied hydraulic released
Braking torque	84.4 kgf · m (610 lbf · ft)
Brake release pressure	36.5 kgf/cm^2 (519 psi)
Reduction gear type	2 - stage planetary

6) TRAVEL MOTOR

Item	Specification
Type	Variable displacement axial piston motor
Relief pressure	350 kgf/cm^2 (4980 psi)
Capacity (max / min)	282.6/156.9 cc/rev
Reduction gear type	2-stage planetary
Braking system	Automatic, spring applied hydraulic released
Brake release pressure	17 kgf/cm^2 (242 psi)
Braking torque	134 kgf · m (969 lbf · ft)

7) CYLINDER

Item		Specification
Boom cylinder	Bore dia × Rod dia × Stroke	Ø150 × Ø105 × 1480 mm
	Cushion	Extend only
Arm cylinder	Bore dia × Rod dia × Stroke	Ø160 × Ø110 × 1685 mm
	Cushion	Extend and retract
Bucket cylinder	Bore dia × Rod dia × Stroke	Ø140 × Ø100 × 1285 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
HX330S L	Standard	☆ 600 mm (24")	0.64 kgf/cm² (9.03 psi)	48	3280 mm (10' 9")
	Option	☆ 700 mm (28")	0.55 kgf/cm² (7.88 psi)	48	3380 mm (11' 1")
		☆ 800 mm (32")	0.49 kgf/cm² (6.97 psi)	48	3480 mm (11' 5")

☆ : Triple grouser

9. RECOMMENDED OILS

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

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

Service point	Kind of fluid	Capacity ℓ (U.S. gal)	Ambient temperature ˚C(˚F) -50 (-58) -30 (-22) -20 (-4) -10 (14) 0 (32) 10 (50) 20 (68) 30 (86) 40 (104)
Engine oil pan	Engine oil★1	26.5 (7.0)	★SAE 0W-40 ★SAE 0W-30 SAE 5W-30 SAE 10W-30 SAE 15W-40
Swing drive	Gear oil	11 (2.91)	★SAE 75W-90
Final drive		7.8×2 (2.1×2)	SAE 80W-90
Hydraulic tank	Hydraulic oil	Tank : 210 (55.5) System : 414 (109.4)	★ISO VG 15 ISO VG 32 ISO VG 46, HBHO VG 46★3 ISO VG 68
Fuel tank	Diesel fuel	600 (158.5)	★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★2	27 (7.1)	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 : Meet or exceeds API CH-4 grade
★2 : Soft water
City water or distilled water
★3 : Hyundai Bio Hydraulic Oil

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

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

※ Do not use any engine oil other than that specified above.

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

SECTION 2 STRUCTURE AND FUNCTION