



HYUNDAI
CONSTRUCTION EQUIPMENT

HX85A

CRAWLER EXCAVATOR

HX85A



SERVICE MANUAL

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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.

SECTION 9 COMPONENT MOUNTING TORQUE

This section shows bolt specifications and standard torque values needed when mounting components to the machine.

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

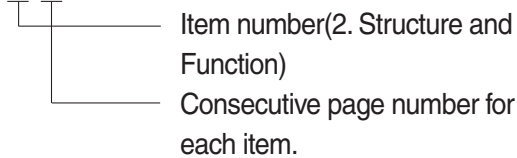
1. See the page number on the bottom of the page.

File the pages in correct order.

2. Following examples shows how to read the page number.

Example 1

2 - 3



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

10 - 4

10 - 4 - 1

10 - 4 - 2

10 - 5

Added pages

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 (a), then draw a horizontal line from (a).
- (2) Locate the number 5 in the row across the top, take this as (b), then draw a perpendicular line down from (b).
- (3) Take the point where the two lines cross as (c). This point (c) gives the value when converting from millimeters to inches. Therefore, 55mm = 2.165 inches.

2. Convert 550mm 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 55mm.
- (2) Carry out the same procedure as above to convert 55mm to 2.165 inches.
- (3) The original value (550mm) 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 550mm = 21.65 inches.

Millimeters to inches

(b)

1mm = 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
(a) 50	1.969	2.008	2.047	2.087	2.126	(c) 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

1l = 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	6.076	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	25.361	25.625	25.889	26.153

Liter to U.K. Gallon

1l = 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	7.699	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

1 kgf·m = 7.233 lbf·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	296.6	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 versa 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	°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 Hints	1-1
Group 2 Specifications	1-9

SECTION 1 GENERAL

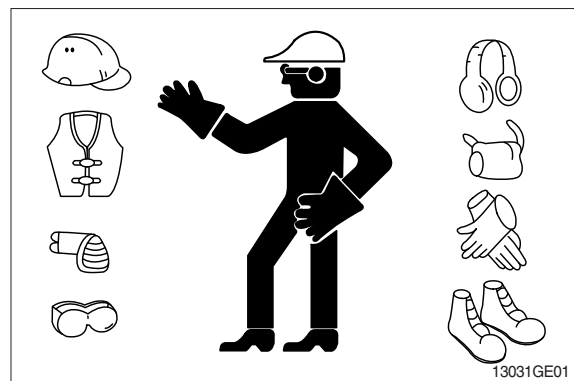
GROUP 1 SAFETY

FOLLOW SAFE PROCEDURE

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

WEAR PROTECTIVE CLOTHING

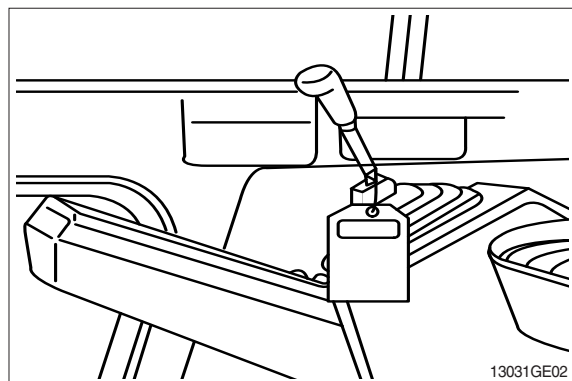
Wear close fitting clothing and safety equipment appropriate to the job.



WARN OTHERS OF SERVICE WORK

Unexpected machine movement can cause serious injury.

Before performing any work on the excavator, attach a 「Do Not Operate」 tag on the right side control lever.



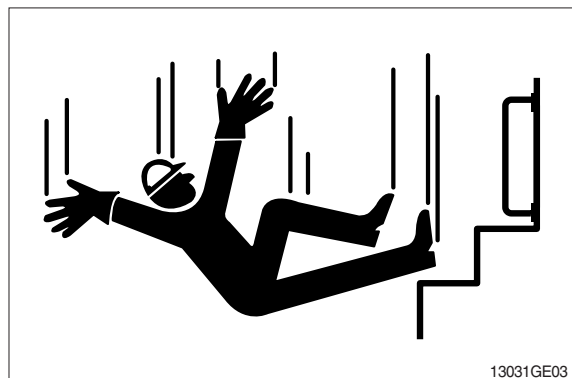
USE HANDHOLDS AND STEPS

Falling is one of the major causes of personal injury.

When you get on and off the machine, always maintain a three point contact with the steps and handrails and face the machine. Do not use any controls as handholds.

Never jump on or off the machine. Never mount or dismount a moving machine.

Be careful of slippery conditions on platforms, steps, and handrails when leaving the machine.

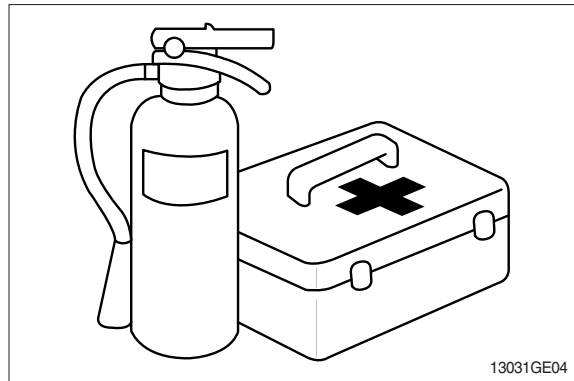


PREPARE FOR EMERGENCIES

Be prepared if a fire starts.

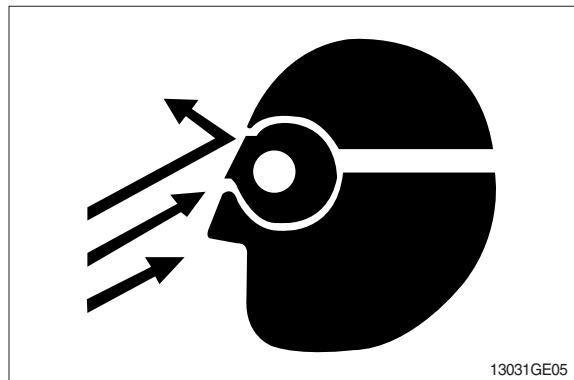
Keep a first aid kit and fire extinguisher handy.

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



PROTECT AGAINST FLYING DEBRIS

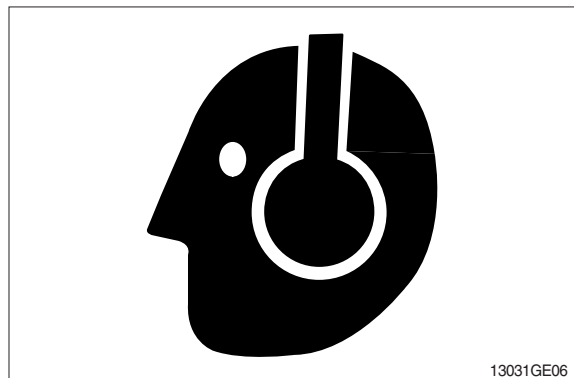
Guard against injury from flying pieces of metal or debris; Wear goggles or safety glasses.



PROTECT AGAINST NOISE

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

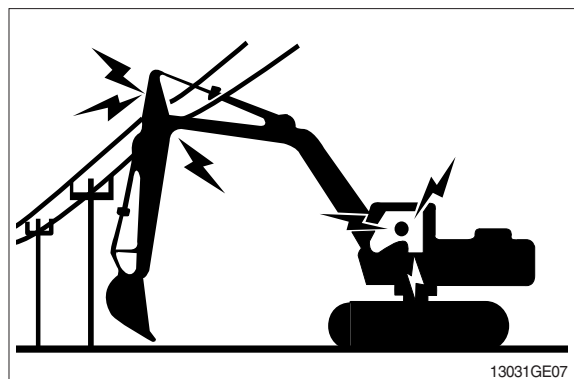
Wear a suitable hearing protective device such as earmuffs or earplugs to protect against objectionable or uncomfortable loud noises.



AVOID POWER LINES

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

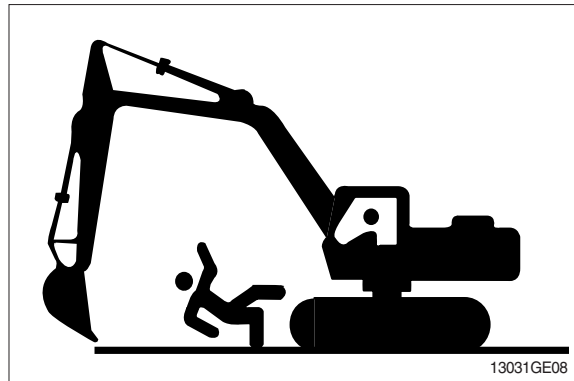
Never move any part of the machine or load closer to electric line than 3m(10ft) plus twice the line insulator length.



KEEP RIDERS OFF EXCAVATOR

Only allow the operator on the excavator. Keep riders off.

Riders on excavator are subject to injury such as being struck by foreign objects and being thrown off the excavator. Riders also obstruct the operator's view resulting in the excavator being operated in an unsafe manner.

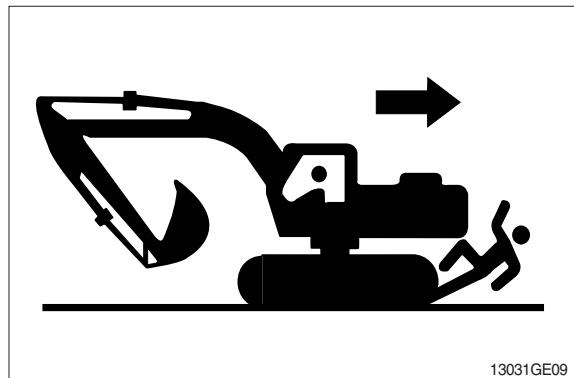


MOVE AND OPERATE MACHINE SAFELY

Bystanders can be run over. Know the location of bystanders before moving, swinging, or operating the machine.

Always keep the travel alarm in working condition. It warns people when the excavator starts to move.

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



OPERATE ONLY FROM OPERATOR'S SEAT

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

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



PARK MACHINE SAFELY

Before working on the machine:

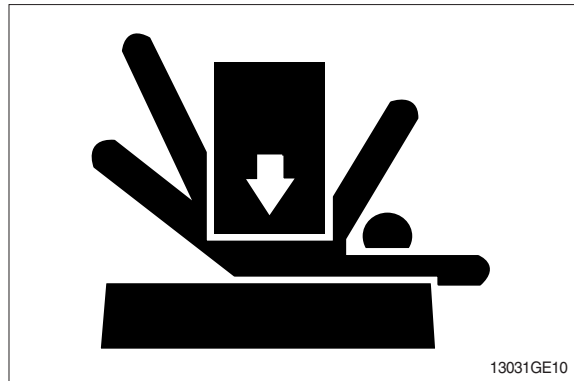
- Park machine on a level surface.
- Lower bucket to the ground.
- Turn auto idle switch off.
- Run engine at 1/2 speed without load for 2 minutes.
 - Turn key switch to OFF to stop engine.
 - Remove key from switch.
- Move pilot control shutoff lever to locked position.
- Allow engine to cool.

SUPPORT MACHINE PROPERLY

Always lower the attachment or implement to the ground before you work on the machine. If you must work on a lifted machine or attachment, securely support the machine or attachment.

Do not support the machine on cinder blocks, hollow tiles, or props that may crumble under continuous load.

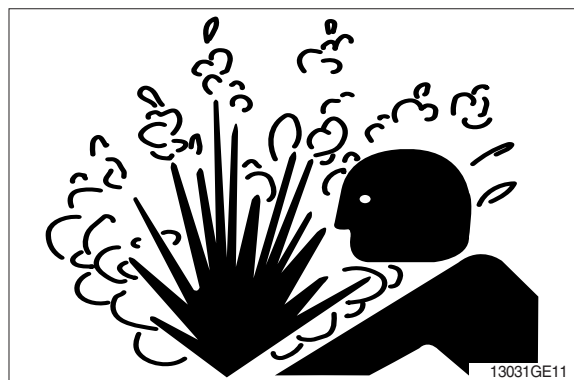
Do not work under a machine that is supported solely by a jack. Follow recommended procedures in this manual.



SERVICE COOLING SYSTEM SAFELY

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

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



HANDLE FLUIDS SAFELY-AVOID FIRES

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

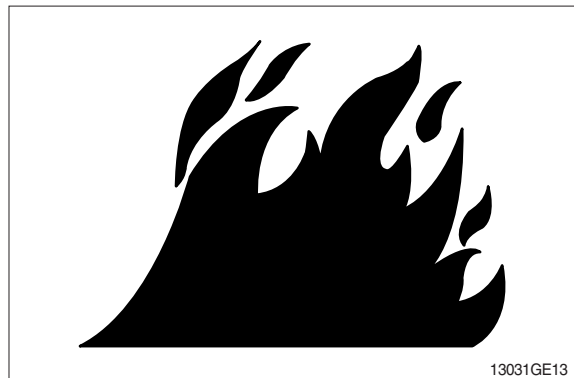
Fill fuel tank outdoors.



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

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

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



BEWARE OF EXHAUST FUMES

Prevent asphyxiation. Engine exhaust fumes can cause sickness or death.

If you must operate in a building, be positive there is adequate ventilation. Either use an exhaust pipe extension to remove the exhaust fumes or open doors and windows to bring enough outside air into the area.

REMOVE PAINT BEFORE WELDING OR HEATING

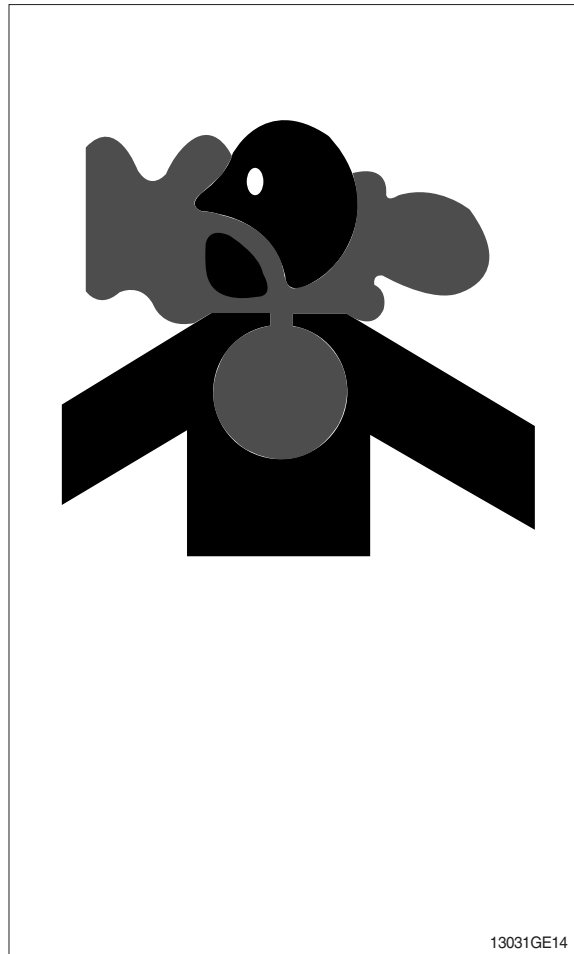
Avoid potentially toxic fumes and dust.

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

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

Remove paint before welding or heating:

- If you sand or grind paint, avoid breathing the dust. Wear an approved respirator.
- If you use solvent or paint stripper, remove stripper with soap and water before welding. Remove solvent or paint stripper containers and other flammable material from area. Allow fumes to disperse at least 15 minutes before welding or heating.



ILLUMINATE WORK AREA SAFELY

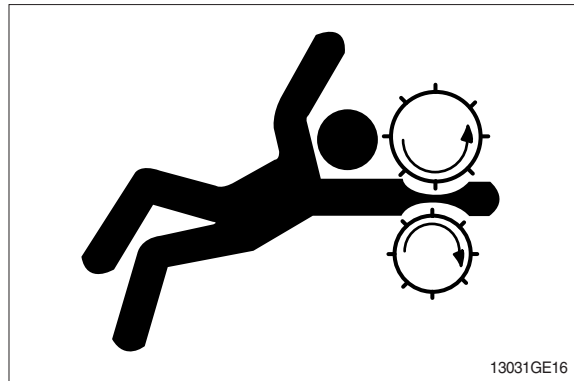
Illuminate your work area adequately but safely. Use a portable safety light for working inside or under the machine. Make sure the bulb is enclosed by a wire cage. The hot filament of an accidentally broken bulb can ignite spilled fuel or oil.



SERVICE MACHINE SAFELY

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

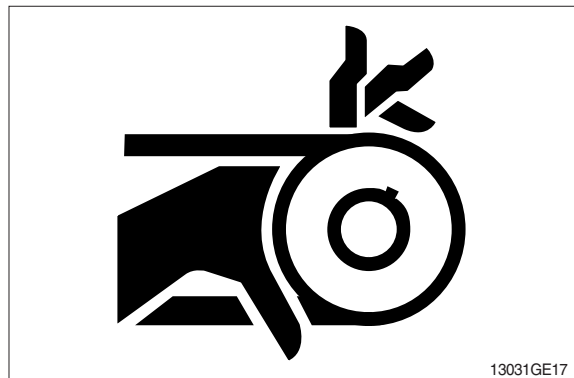
Remove rings and other jewelry to prevent electrical shorts and entanglement in moving parts.



STAY CLEAR OF MOVING PARTS

Entanglements in moving parts can cause serious injury.

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



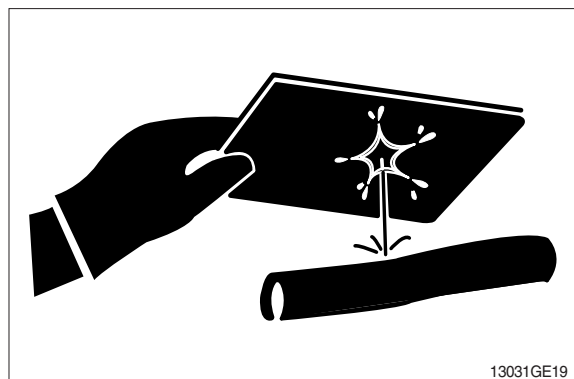
AVOID HIGH PRESSURE FLUIDS

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

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

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

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



AVOID HEATING NEAR PRESSURIZED FLUID LINES

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

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



PREVENT BATTERY EXPLOSIONS

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

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

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



PREVENT ACID BURNS

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

Avoid the hazard by:

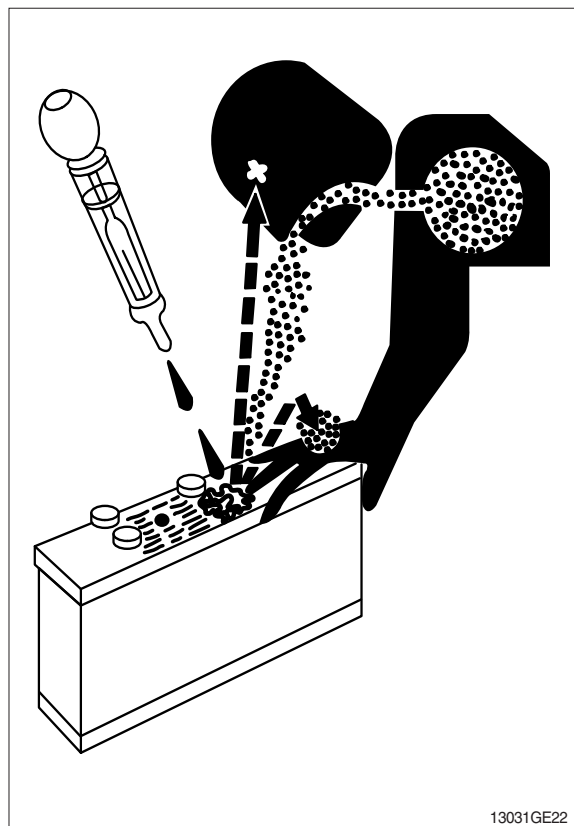
1. Filling batteries in a well-ventilated area.
2. Wearing eye protection and rubber gloves.
3. Avoiding breathing fumes when electrolyte is added.
4. Avoiding spilling or dripping electrolyte.
5. Use proper jump start procedure.

If you spill acid on yourself:

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

If acid is swallowed:

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



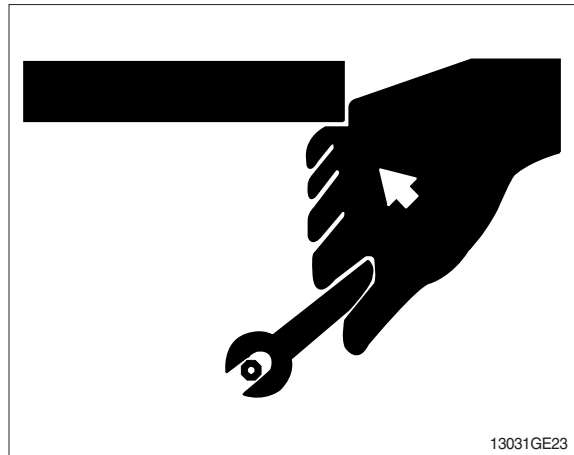
USE TOOLS PROPERLY

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

Use power tools only to loosen threaded tools and fasteners.

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

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



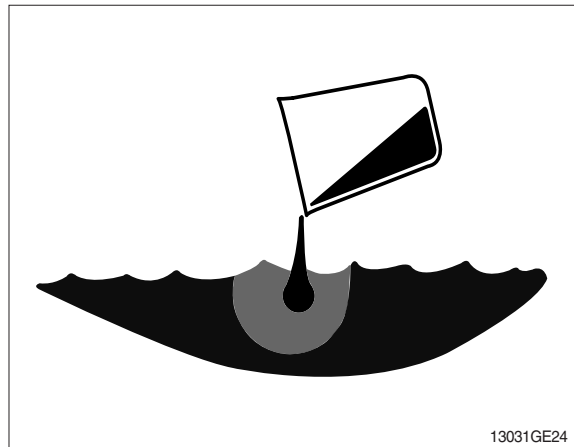
13031GE23

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.

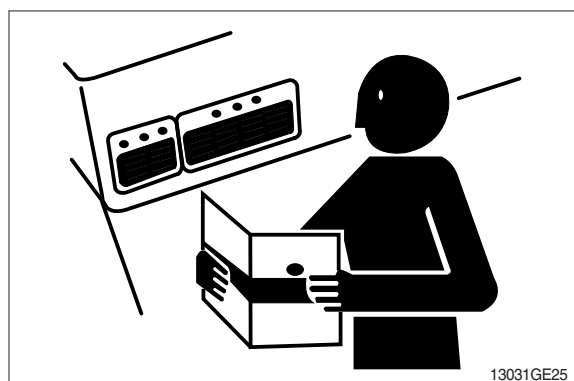
DO NOT pour oil into the ground, down a drain, or into a stream, pond, or lake. Observe relevant environmental protection regulations when disposing of oil, fuel, coolant, brake fluid, filters, batteries, and other harmful waste.



13031GE24

REPLACE SAFETY SIGNS

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



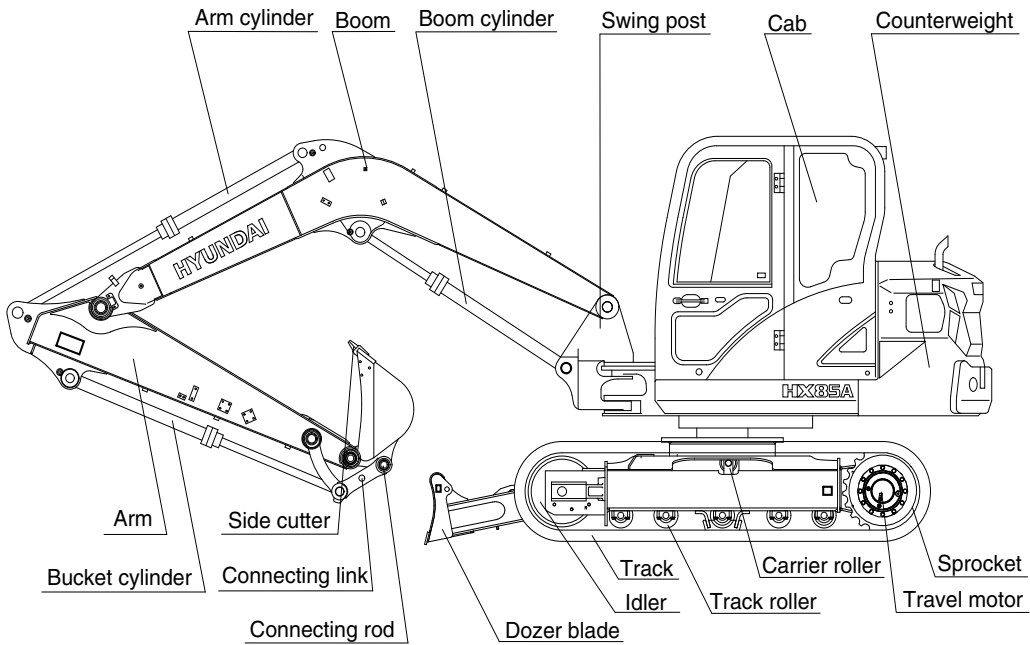
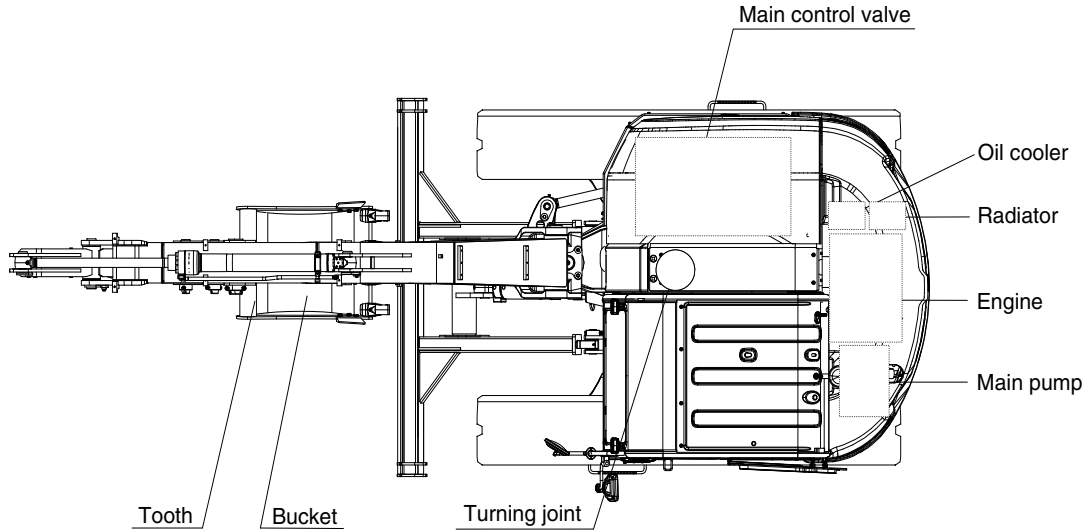
13031GE25

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

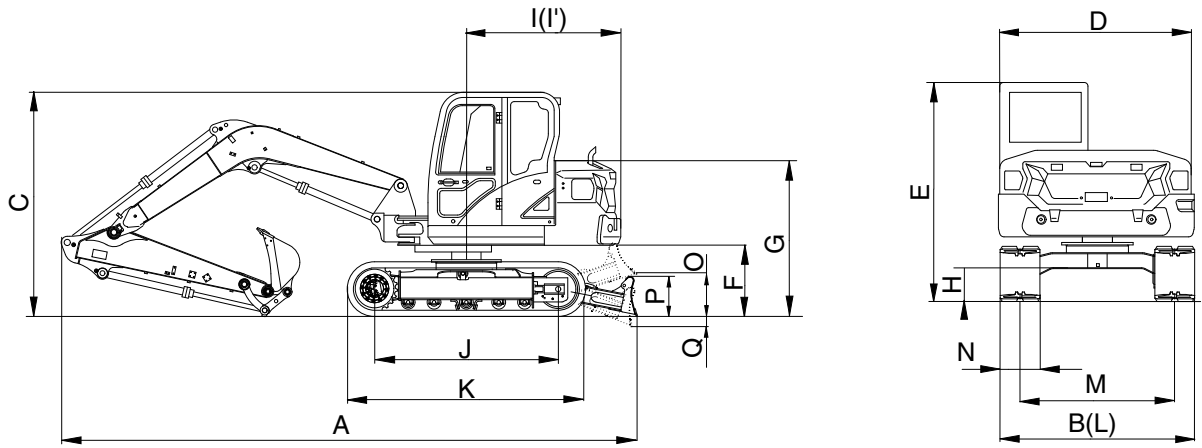
1. MAJOR COMPONENT



856A2SP01

2. SPECIFICATIONS

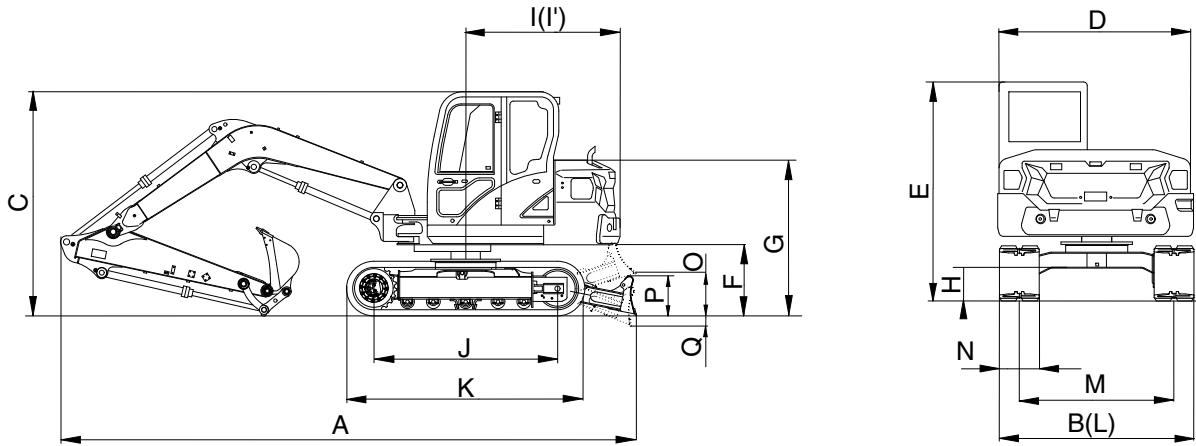
1) 3.55 m (11' 8") MONO BOOM, 1.75 m (5' 9") ARM WITH BOOM SWING SYSTEM



85A2SP02

Description		Unit	Specification
Operating weight		kg (lb)	8530 (18810)
Bucket capacity (SAE heaped), standard		m ³ (yd ³)	0.25 (0.33)
Overall length	A	mm (ft-in)	6585 (21' 7")
Overall width, with 450 mm shoe	B		2300 (7' 7")
Overall height	C		2560 (8' 5")
Superstructure width	D		2300 (7' 7")
Overall height of cab	E		2560 (8' 5")
Ground clearance of counterweight	F		745 (2' 5")
Engine cover height	G		1750 (5' 9")
Minimum ground clearance	H		260 (1' 0")
Rear-end distance	I		1600 (5' 3")
Rear-end swing radius	I'		1645 (5' 5")
Distance between tumblers (Steel)	J		2280 (7' 6")
Distance between tumblers (Rubber)			2270 (7' 5")
Undercarriage length (Steel)	K		2906 (9' 6")
Undercarriage length (Rubber)			2900 (9' 6")
Undercarriage width	L		2300 (7' 7")
Track gauge	M		1850 (6' 1")
Track shoe width, standard	N		450 (1' 6")
Height of blade	O		460 (1' 6")
Ground clearance of blade up	P		430 (1' 4")
Depth of blade down	Q		410 (1' 3")
Travel speed (Low/high)		km/hr (mph)	2.7/5.2 (1.7/3.2)
Swing speed		rpm	9.5
Gradeability		Degree (%)	30 (58)
Ground pressure (450 mm shoe)		kgf/cm ² (psi)	0.38 (5.42)
Max traction force		kg (lb)	7580 (16700)

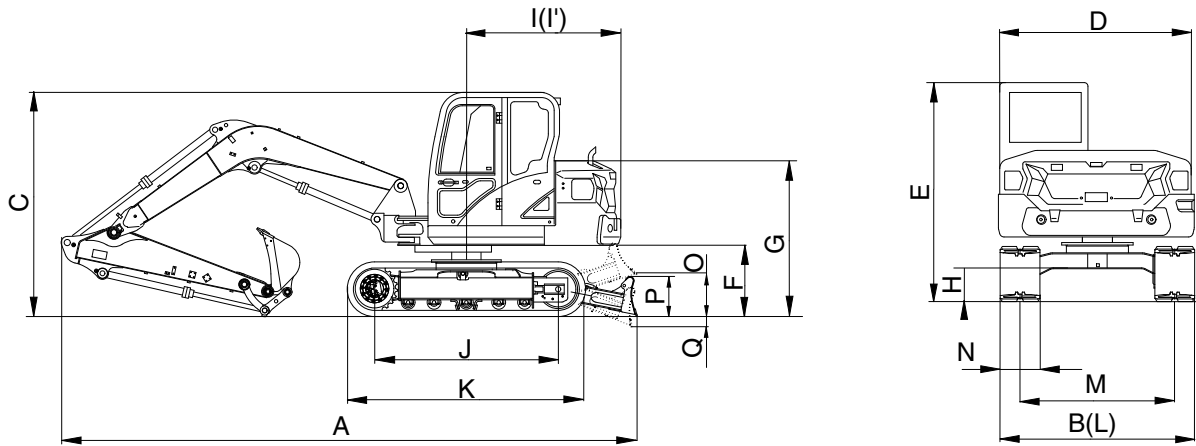
2) 3.55 m (11' 8") MONO BOOM, 2.1 m (6' 11") ARM WITH BOOM SWING SYSTEM



85A2SP02

Description		Unit	Specification
Operating weight		kg (lb)	8610 (18980)
Bucket capacity (SAE heaped), standard		m ³ (yd ³)	0.25 (0.33)
Overall length	A	mm (ft-in)	6655 (21' 10")
Overall width, with 450 mm shoe	B		2300 (7' 7")
Overall height	C		2560 (8' 5")
Superstructure width	D		2300 (7' 7")
Overall height of cab	E		2560 (8' 5")
Ground clearance of counterweight	F		745 (2' 5")
Engine cover height	G		1750 (5' 9")
Minimum ground clearance	H		360 (1' 2")
Rear-end distance	I		1600 (5' 3")
Rear-end swing radius	I'		1645 (5' 5")
Distance between tumblers (Steel)	J		2280 (7' 6")
Distance between tumblers (Rubber)			2270 (7' 5")
Undercarriage length (Steel)	K		2906 (9' 6")
Undercarriage length (Rubber)			2900 (9' 6")
Undercarriage width	L		2300 (7' 7")
Track gauge	M		1850 (6' 1")
Track shoe width, standard	N		450 (1' 6")
Height of blade	O		460 (1' 6")
Ground clearance of blade up	P		400 (1' 4")
Depth of blade down	Q		280 (0' 11")
Travel speed (Low/high)		km/hr (mph)	2.7/5.2 (1.7/3.2)
Swing speed		rpm	9.5
Gradeability		Degree (%)	30 (58)
Ground pressure (450 mm shoe)		kgf/cm ² (psi)	0.38 (5.47)
Max traction force		kg (lb)	7580 (16700)

3) 3.92 m (12' 1") 2PCS BOOM, 1.75 m (5' 9") ARM WITH BOOM SWING SYSTEM

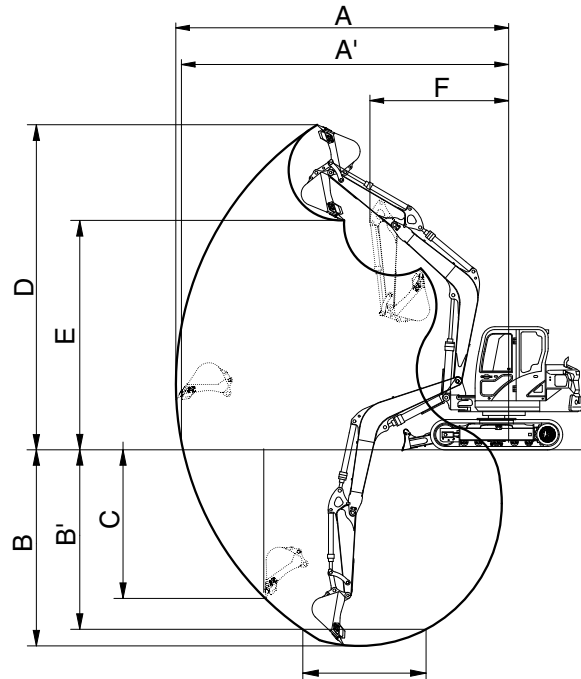


85A2SP02

Description		Unit	Specification
Operating weight		kg (lb)	9000 (19840)
Bucket capacity (SAE heaped), standard		m ³ (yd ³)	0.25 (0.33)
Overall length	A	mm (ft-in)	6790 (22' 3")
Overall width, with 450 mm shoe	B		2300 (7' 7")
Overall height	C		2560 (8' 5")
Superstructure width	D		2300 (7' 7")
Overall height of cab	E		2560 (8' 5")
Ground clearance of counterweight	F		745 (2' 5")
Engine cover height	G		1750 (5' 9")
Minimum ground clearance	H		360 (1' 2")
Rear-end distance	I		1600 (5' 3")
Rear-end swing radius	I'		1645 (5' 5")
Distance between tumblers (Steel)	J		2280 (7' 6")
Distance between tumblers (Rubber)			2270 (7' 5")
Undercarriage length (Steel)	K		2906 (9' 6")
Undercarriage length (Rubber)			2900 (9' 6")
Undercarriage width	L		2300 (7' 7")
Track gauge	M		1850 (6' 1")
Track shoe width, standard	N		450 (1' 6")
Height of blade	O		460 (1' 6")
Ground clearance of blade up	P		400 (1' 4")
Depth of blade down	Q		280 (0' 11")
Travel speed (Low/high)		km/hr (mph)	2.7/5.2 (1.7/3.2)
Swing speed		rpm	9.5
Gradeability		Degree (%)	30 (58)
Ground pressure (450 mm shoe)		kgf/cm ² (psi)	0.40 (5.72)
Max traction force		kg (lb)	7580 (16700)

3. WORKING RANGE

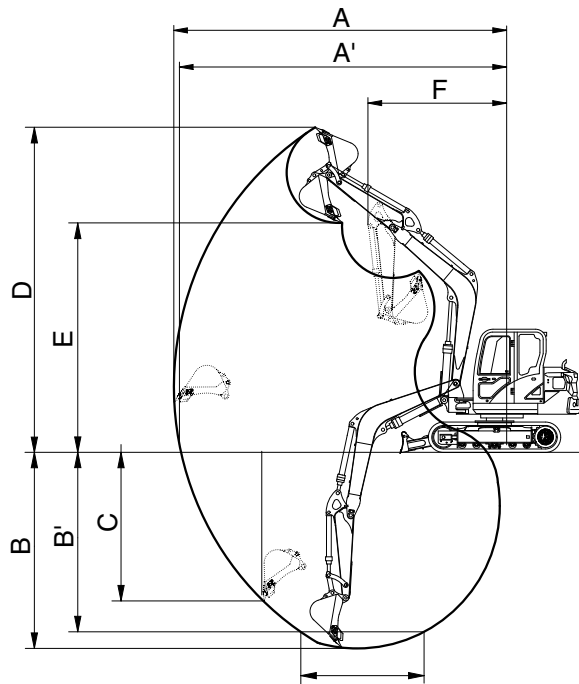
1) HX85A, MONO BOOM



85A0SP03

Description	m (ft-in)	Boom	3.55 (11' 8")	
		Arm	1.75 (5' 9")	2.10 (6' 11")
Max digging reach	mm (ft-in)	A	7090 (23' 3")	7420 (24' 4")
Max digging reach on ground		A'	6940 (22' 8")	7280 (23' 9")
Max digging depth		B	4240 (13' 9")	4590 (15' 0")
Max digging depth (8 ft level)		B'	3880 (12' 7")	4270 (14' 0")
Max vertical wall digging depth		C	3660 (12' 0")	4010 (13' 2")
Max digging height		D	7035 (23' 0")	7290 (23' 9")
Max dumping height		E	5000 (16' 4")	5250 (17' 3")
Min swing radius		F	2560 (8' 4")	2770 (9' 10")
Boom swing radius (left/right)		70°/60°		
Bucket digging force	kN	SAE	52.9	52.9
	kgf		5389	5389
	lbf		11882	11882
	kN	ISO	61.5	61.5
	kgf		6268	6268
	lbf		13819	13819
Arm digging force	kN	SAE	39.7	35.8
	kgf		4042	3646
	lbf		8911	8038
	kN	ISO	41.4	37.1
	kgf		4222	3787
	lbf		9307	8348

2) HX85A, 2PCS BOOM



85A0SP03

Description	m (ft-in)	Boom	3.92 (12' 10")	
		Arm	1.75 (5' 9")	2.10 (6' 11")
Max digging reach	mm (ft-in)	A	7550 (24' 8")	7890 (25' 9")
Max digging reach on ground		A'	7400 (24' 3")	7750 (25' 5")
Max digging depth		B	4260 (13' 9")	4610 (15' 2")
Max digging depth (8 ft level)		B'	4100 (13' 5")	4460 (14' 7")
Max vertical wall digging depth		C	3840 (12' 6")	4185 (13' 8")
Max digging height		D	7910 (25' 9")	8230 (27' 0")
Max dumping height		E	5870 (19' 3")	6195 (20' 4")
Min swing radius		F	2470 (8' 10")	2780 (9' 2")
Boom swing radius (left/right)		70°/60°		
Bucket digging force	kN	SAE	52.9	52.9
	kgf		5389	5389
	lbf		11882	11882
	kN	ISO	61.5	61.5
	kgf		6268	6268
	lbf		13819	13819
Arm digging force	kN	SAE	39.7	35.8
	kgf		4042	3646
	lbf		8911	8038
	kN	ISO	41.4	37.1
	kgf		4222	3787
	lbf		9307	8348

4. WEIGHT

Item	kg	lb
Upperstructure assembly		
· Main frame weld assembly	790	1740
· Engine assembly	270	600
· Main pump assembly	32	70
· Main control valve assembly	90	200
· Swing motor assembly	80	170
· Hydraulic oil tank assembly	76	168
· Fuel tank assembly	57	126
· Boom swing post	225	500
· Counterweight	1006	2220
· Cab assembly	332	730
Lower chassis assembly		
· Track frame weld assembly	858	1890
· Swing bearing	155	340
· Travel motor assembly	85	190
· Turning joint	26	57
· Track recoil spring	123	271
· Idler	130	290
· Carrier roller	14	31
· Track roller	160	360
· Track-chain assembly (450 mm standard triple grouser shoe)	858	1890
· Dozer blade assembly	337	740
Front attachment assembly (3.55 m boom, 1.75 m arm, 0.25 m ³ SAE heaped bucket)		
· 3.55 m boom assembly	405	890
· 1.75 m arm assembly	167	370
· 0.25 m ³ SAE heaped bucket	188	410
· Boom cylinder assembly	113	249
· Arm cylinder assembly	67	150
· Bucket cylinder assembly	60	130
· Dozer cylinder assembly	64	141
· Bucket control link assembly	80	180
· Boom swing cylinder assembly	66	150
· Angle dozer cylinder assembly	63	139
· Dozer cylinder assembly (for angle)	64	141
· Adjust cylinder assembly	65	143
· Angle blade assembly	485	1070

※ This information is different with operating and transportation weight because it is not including harness, pipe, oil, fuel so on.

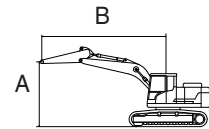
※ Refer to Transportation for actual weight information and Specifications for operating weight.











5. LIFTING CAPACITIES

Type	Boom	Arm	Counterweight	Shoe	Wheel	Dozer		Outrigger	
MONO BOOM	Length [mm]	Length [mm]	weight [kg]	width [mm]	width [mm]	Front	Rear	Front	Rear
	3550	1750	1000	450	-	Down	-	-	-

·  : 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)		Capacity		Reach
												m (ft)
6.0 m (19.7 ft)	kg lb									*2280 *5030	*2280 *5030	3.21 (10.5)
4.5 m (14.8 ft)	kg lb					*1890 *4170	1860 4100			*1910 *4210	1540 3400	5.02 (16.5)
3.0 m (9.8 ft)	kg lb			*2970 *6550	*2970 *6550	*2140 *4720	1800 3970			*1820 *4210	1210 2670	5.81 (19.1)
1.5 m (4.9 ft)	kg lb					*2620 *5780	1700 3750	*1970 *4340	1120 2470	*1930 *4250	1100 2430	6.06 (19.9)
Ground Line	kg lb			3620 7980	2960 6530	*2870 *6330	1630 3590			*2010 *4430	1130 2490	5.87 (19.2)
-1.5 m (-4.9 ft)	kg lb	*3910 *8620	*3910 *8620	4210 9280	2990 6590	*2590 *5710	1630 3590			*2040 *4500	1360 3000	5.16 (16.9)
-3.0 m (-9.8 ft)	kg lb			*2290 *5050	*2290 *5050					*1750 *3860	*1750 *3860	3.57 (11.7)

※ Note

1. Lifting capacity are based on ISO 10567.
2. Lifting capacity of the HX series does not exceed 75% of tipping load with the machine on firm, level ground or 87% of full hydraulic capacity.
3. The lift-point is bucket pivot mounting pin on the arm (without bucket mass).
4. *indicates load limited by hydraulic capacity.

※ Lifting capacities are based upon a standard machine conditions.

Lifting capacities will vary with different work tools, ground conditions and attachments.

The difference between the weight of a work tool attachment must be subtracted.

Consult your Hyundai dealer regarding the lifting capacities for specific work tools and attachments.

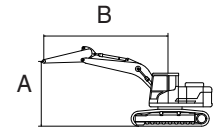
▲ Failure to comply to the rated load can cause possible personal injury or property damage.











Make adjustments to the rated load as necessary for non-standard configurations.

Type	Boom	Arm	Counterweight	Shoe	Wheel	Dozer		Outtriger	
MONO BOOM	Length [mm]	Length [mm]	weight [kg]	width [mm]	width [mm]	Front	Rear	Front	Rear
	3550	1750	1000	450	-	Up	-	-	-

·  : 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)		Capacity		Reach
												m (ft)
6.0 m (19.7 ft)	kg									*2280	*2280	3.21 (10.5)
	lb									*5030	*5030	
4.5 m (14.8 ft)	kg					*1890	1710			1720	1420	5.02 (16.5)
	lb					*4170	3770			3790	3130	
3.0 m (9.8 ft)	kg			*2970	*2970	2020	1660			1340	1110	5.81 (19.1)
	lb			*6550	*6550	4450	3660			2950	2450	
1.5 m (4.9 ft)	kg					1910	1560	1240	1030	1220	1010	6.06 (19.9)
	lb					4210	3440	2730	2270	2690	2230	
Ground Line	kg			3460	2680	1840	1500			1260	1040	5.87 (19.2)
	lb			7630	5910	4060	3310			2780	2290	
-1.5 m (-4.9 ft)	kg	*3910	*3910	3490	2710	1840	1490			1520	1240	5.16 (16.9)
	lb	*8620	*8620	7690	5970	4060	3280			3350	2730	
-3.0 m (-9.8 ft)	kg			*2290	*2290					*1750	*1750	3.57 (11.7)
	lb			*5050	*5050					*3860	*3860	

※ Note

1. Lifting capacity are based on ISO 10567.
2. Lifting capacity of the HX series does not exceed 75% of tipping load with the machine on firm, level ground or 87% of full hydraulic capacity.
3. The lift-point is bucket pivot mounting pin on the arm (without bucket mass).
4. *indicates load limited by hydraulic capacity.

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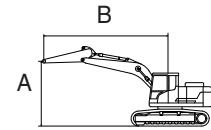
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
Make adjustments to the rated load as necessary for non-standard configurations.

Type	Boom	Arm	Counterweight	Shoe	Wheel	Dozer		Outtriger	
MONO BOOM	Length [mm]	Length [mm]	weight [kg]	width [mm]	width [mm]	Front	Rear	Front	Rear
	3550	1750	1150	450	-	Down	-	-	-

·  : 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)		Capacity		Reach
												m (ft)
6.0 m (19.7 ft)	kg									*2280	*2280	3.21 (10.5)
	lb									*5030	*5030	
4.5 m (14.8 ft)	kg					*1890	*1890			*1910	1620	5.02 (16.5)
	lb					*4170	*4170			*4210	3570	
3.0 m (9.8 ft)	kg			*2970	*2970	*2140	1880			*1820	1270	5.81 (19.1)
	lb			*6550	*6550	*4720	4140			*4010	2800	
1.5 m (4.9 ft)	kg					*2620	1780	*1970	1180	*1930	1160	6.06 (19.9)
	lb					*5780	3920	*4340	2600	*4250	2560	
Ground Line	kg			*3620	3110	*2870	1720			*2010	1190	5.87 (19.2)
	lb			*7980	6860	*6330	3790			*4430	2620	
-1.5 m (-4.9 ft)	kg	*3910	*3910	*4210	3130	*2590	1710			*2040	1430	5.16 (16.9)
	lb	*8620	*8620	*9280	6900	*5710	3770			*4500	3150	
-3.0 m (-9.8 ft)	kg			*2290	*2290					*1750	*1750	3.57 (11.7)
	lb			*5050	*5050					*3860	*3860	

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