HYDRAULIC EXCAVATOR

SHOP MANUAL model SK40SR SK45SR

This is the shop manual for KOBELCO hydraulic excavator. Contained is the necessary technical data concerning the maintenance and repair of this model. The manual is divided into the following four major sections; GENERAL, SYSTEMS, COMPONENTS and PROCEDURE.

When checking or repairing the machine we suggest that you refer to this manual carefully. We hope that reference to this manual will help to maintain a high level of working efficiency and reliability. For further details on maintenance and checks refer to the "OPERATORS MANUAL" which has been supplied with the machine.

Although all data was correct at the time of printing, due to continual design changes and improvements, some contents may not conform to the actual machine. Take special care to order parts only after confirming the validity of the part number in the "PARTS MANUAL".

If you notice any explanatory discrepancies, after consulting one of our representatives, please update your manual according to the latest data. However, in the event of any specification changes, we will issue revised edition.

INDEX

KOBELCO

Book code No. S5PH0001E①

⚠ WARNING

SAFETY

⚠ WARNING

The proper and safe lubrication and maintenance for this machine, recommended by KOBELCO are outlined in the OPERATION & MAINTENANCE GUIDE for this machine.

Improper performance of lubrication or maintenance procedures is dangerous and could result in injury or death. Read and understand the OPERATION & MAINTENANCE GUIDE before performing any lubrication or maintenance.

The serviceman or mechanic may be unfamiliar with many of the systems on this machine. This makes it important to use caution when performing service work. A knowledge of the system and or components is important before the removal or disassembly of any component.

Because of the size of some of the machine components, the serviceman or mechanic should check the weights noted in this Manual. Use proper lifting procedures when removing any components.

Following is a list of basic precautions that should always be observed.

1. Read and understand all Warning plates and decals on the machine before operating, lubricating or repairing this product.

2. Always wear protective glasses and protective shoes when working around machines. In particular, wear protective glasses when pounding on any part of the machine or its attachments with a hammer or sledge. Use welders gloves, hood/goggles, apron and other protective clothing appropriate to the welding job being performed. Do not wear loose-fitting or torn clothing. Remove all rings from fingers when working on machinery.

3. Disconnect battery and discharge any capacitors before starting to work on machine. Hang "Do Not Operate" tag in the Operator's Cab.
4. If possible, make all repairs with the machine parked on a level, hard surface. Block machine so it does not roll while working on or under machine.

5. Do not work on any machine that is supported only by lift jacks or a hoist. Always use blocks or jack stands to support the machine before performing any disassembly.

⚠ WARNING

Do not operate this machine unless you have read and understand the instructions in the OPERATORS MANUAL. Improper machine operation is dangerous and could result in injury or death.

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6. Relieve all pressure in air, oil or water systems before any lines, fittings or related items are disconnected or removed. Always make sure all raised components are blocked correctly and be alert for possible pressure when disconnecting any device from a system that utilizes pressure.

7. Lower the bucket, blade, ripper or other attachment to the ground before performing any work on the machine. If this cannot be done, make sure the bucket, blade, ripper or other attachment is blocked correctly to prevent it from dropping unexpectedly.

8. Use steps and grab handles when mounting or dismounting a machine. Clean any mud or debris from steps, walkways or work platforms before using. Always face machine when using steps, ladders and walkways. When it is not possible to use the designed access system, provide ladders, scaffolds, or work platforms to perform safe repair operations.

9. To avoid back injury, use a hoist when lifting components which weigh 23 kg (50 lbs) or more. Make sure all chains, hooks, slings, etc., are in good condition and are in the correct capacity. Be sure hooks are positioned correctly. Lifting eyes are not to be side loaded during a lifting operation.

10. To avoid burns, be alert for hot parts on machines which have just been stopped and hot fluids in lines, tubes and components.

11. Be careful when removing cover plates. Gradually back off the last two bolts or nuts located at opposite ends of the cover or device and pry cover loose to relieve any spring or other pressure, before removing the last two bolts or nuts completely.

12. Be careful when removing filler caps, breathers and plugs on the machine. Hold a rag over the cap or plug to prevent being sprayed or splashed by liquids under pressure. The danger is even greater if the machine has just been stopped because fluids can be hot.

⚠ WARNING

13. Always use tools that are in good condition and be sure you understand how to use them before performing any service work.

14. Reinstall all fasteners with same part number. Do not use a lesser quality fastener if replacements are necessary.

15. Repairs which require welding should be performed only with the benefit of the appropriate reference information and by personnel adequately trained and knowledgeable in welding procedures. Determine type of metal being welded and select correct welding procedure and electrodes, rods or wire to provide a weld metal strength equivalent at least to that of parent metal. Always disconnect battery during welding operations to protect sensitive electric equipment.

16. Do not damage wiring during removal operations. Reinstall the wiring so it is not damaged nor will it be damaged in operation by contacting sharp corners, or by rubbing against some object or hot surface. Do not connect wiring to a line containing fluid.

17. Be sure all protective devices including guards and shields are properly installed and functioning correctly before starting a repair. If a guard or shield must be removed to perform the repair work, use extra caution.

18. Loose or damaged fuel, lubricant and hydraulic lines, tubes and hoses can cause fires. Do not bend or strike high pressure lines or install ones which have been bent or damaged. Inspect lines, tubes and hoses carefully. Do not check for leaks with your hands. Pin hole (very small) leaks can result in a high velocity oil stream that will be invisible close to the hose. This oil can penetrate the skin and cause personal injury. Use cardboard or paper to locate pin hole leaks.

19. Tighten connections to the correct torque. Make sure that all heat shields, clamps and guards are installed correctly to avoid excessive heat, vibration or rubbing against other parts during operation. Shields that protect against oil spray onto hot exhaust components in event of a line, tube or seal failure must be installed correctly.

20. Do not operate a machine if any rotating part is damaged or contacts any other part during operation. Any high speed rotating component that has been damaged or altered should be checked for balance before reusing.

21. On track-type machines, be careful when servicing or separating tracks. Chips can fly when removing or installing a track pin. Wear safety glasses and long sleeve shirts. Track can unroll very quickly when separated. Keep away from front and rear of machine. The machine can move unexpectedly when both tracks are disengaged from the sprockets. Block the machine to prevent it from moving.

22. Caution should be used to avoid breathing dust that may be generated when handling components containing asbestos fibers. If this dust is inhaled, it can be hazardous to your health. Components in KOBELCO products that may contain asbestos fibers are brake pads, brake band and lining assemblies, clutch plates and some gaskets. The asbestos used in these components is usually bound in a resin or sealed in some way. Normal handling is not hazardous as long as airborne dust which contains asbestos is not generated.

If dust which may contain asbestos is present, there are several common sense guidelines that should be followed.

a. Never use compressed air for cleaning.
b. Avoid brushing or grinding of asbestos containing materials.
c. For clean up, use wet methods or a vacuum equipped with a high efficiency particulate air (HEPA) filter.
d. Use exhaust ventilation on permanent machining jobs.
e. Wear an approved respirator if there is no other way to control the dust.
f. Comply with applicable rules and regulations for the work place.
g. Follow environmental rules and regulations for disposal of asbestos.
h. Avoid areas where asbestos particles may be in the air.

SHOP MANUAL model SK40SR SK45SR

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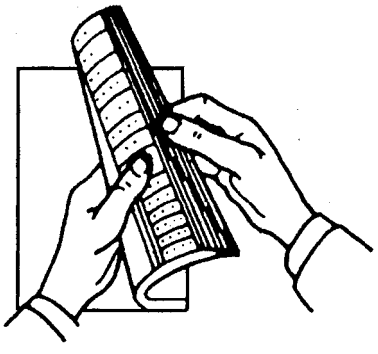
○How to Index each Shop Manual Section
The GENERAL of this shop manual consists of 8 headings as shown above. Each section can be easily referred to by indexes appended to the margin of the page as indicated on the right. Please use the indexes for speedy reference.



KOBELCO

GENERAL

SK40SR SK45SR List of Shop Manual GENERAL Section

Index No.	Title	Book Code No. / Distribution Year – Month		
PH01	SPECIFICATION	S5PH0101E 1997-05	←	
—	OPERATION	S2PH0001E Refer to Operators manual	S2PH0002E Refer to Operators manual	
PH03	LOCATION AND WEIGHT OF COMPONENTS	S5PH0301E 1997-05	←	
PH04	MAINTENANCE STANDARDS AND TEST PROCEDURES	S5PH0401E 1997-05	←	
—	PREVENTIVE MAINTENANCE	S2PH0001E Refer to Operators manual	S2PH0002E Refer to Operators manual	
PH07	WORKING STANDARDS	S5PH0701E 1997-05	←	
	Applicable Machines	PH00101~01100 PY06001~07100	PH01101~ PY07101~	

Book code No. S5PH0101E

KOBELCO

SHOP MANUAL

SK40SR
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PH01

SPECIFICATION

TABLE OF CONTENTS

KOBE STEEL, LTD.

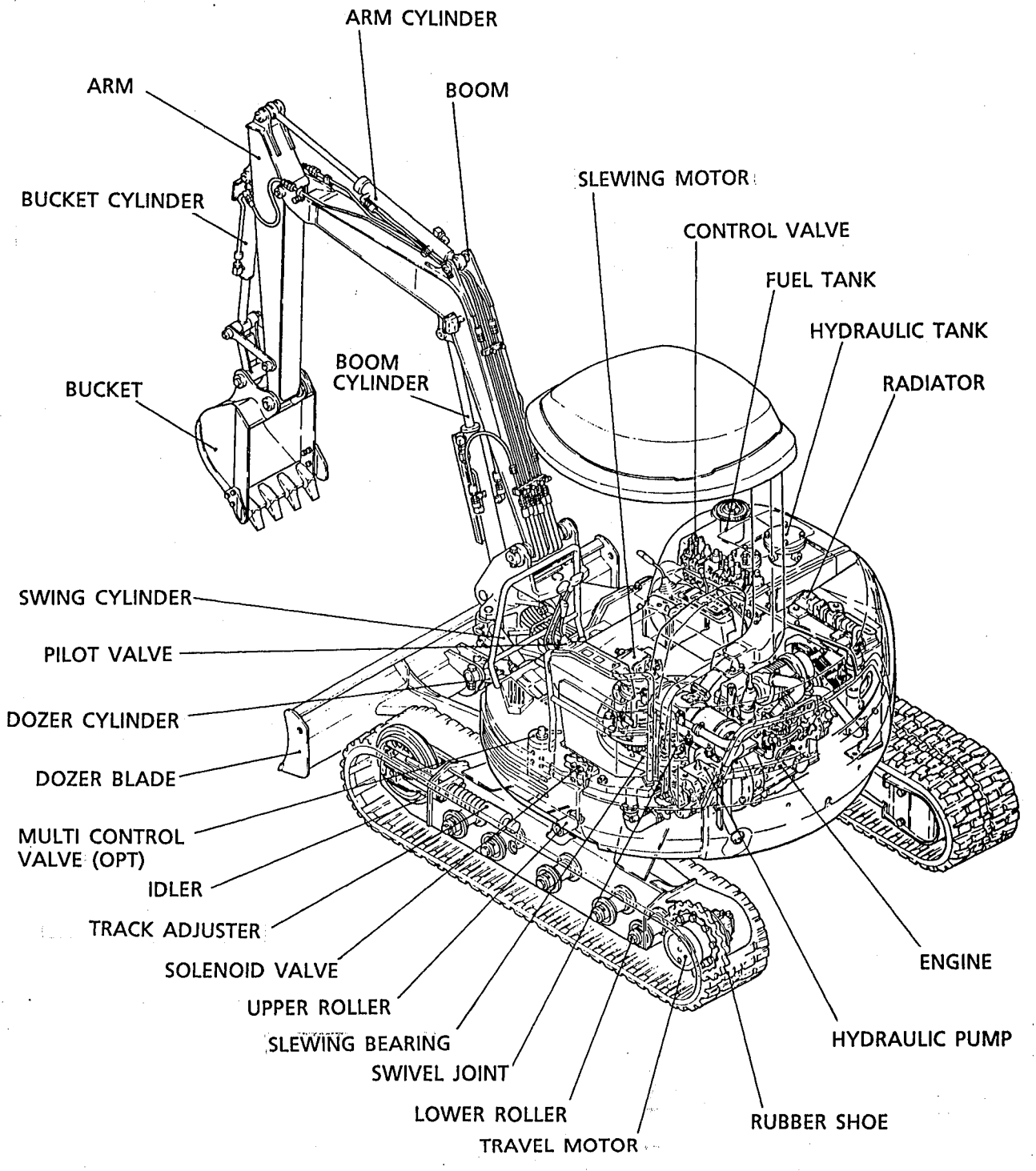
Applicable Machines

PH00101~

PY06001~

Revision	Date of Issue	Remarks
First edition	May, 1997	S5PH0101E K

1. NAME OF COMPONENTS



PH-883

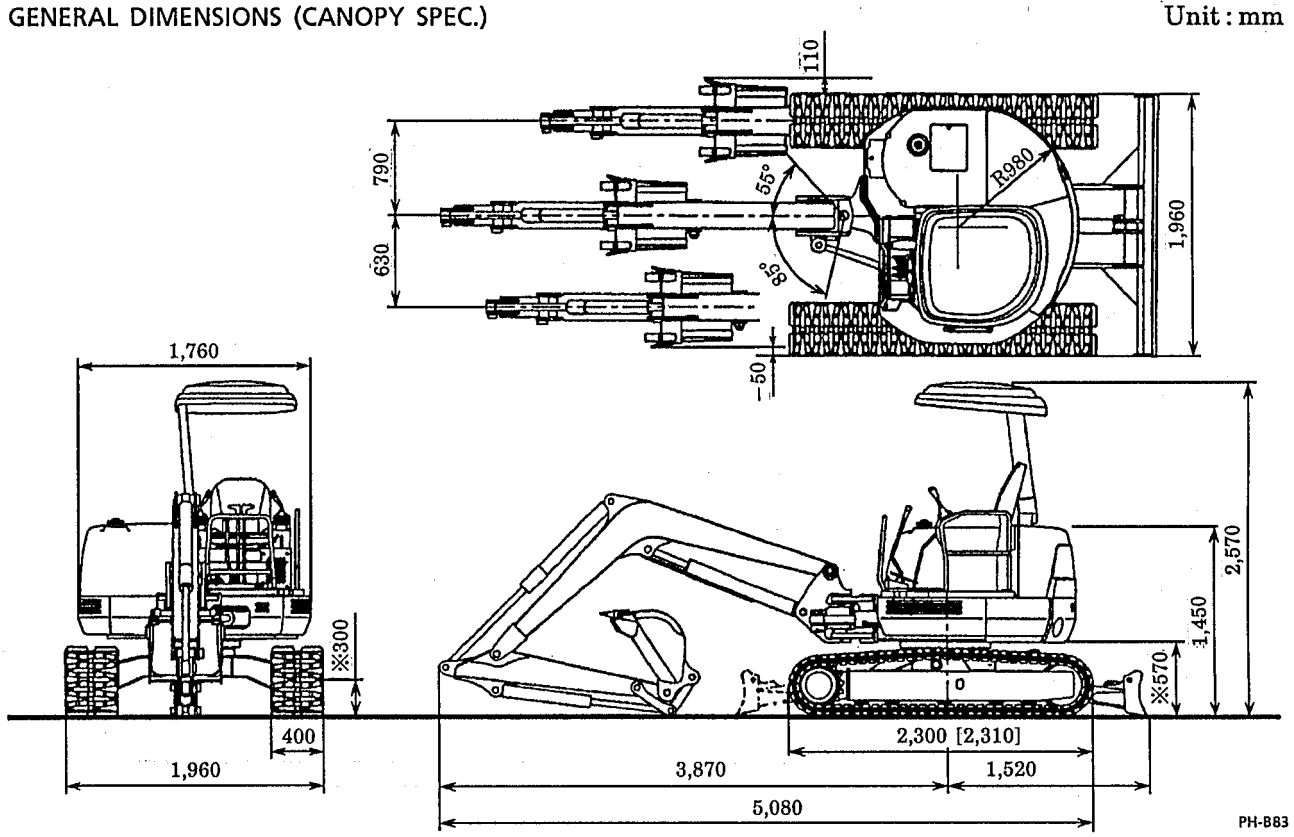
※ This machine is canopy spec. for SK40SR.

2. GENERAL DIMENSIONS

2.1 SK40SR GENERAL DIMENSIONS

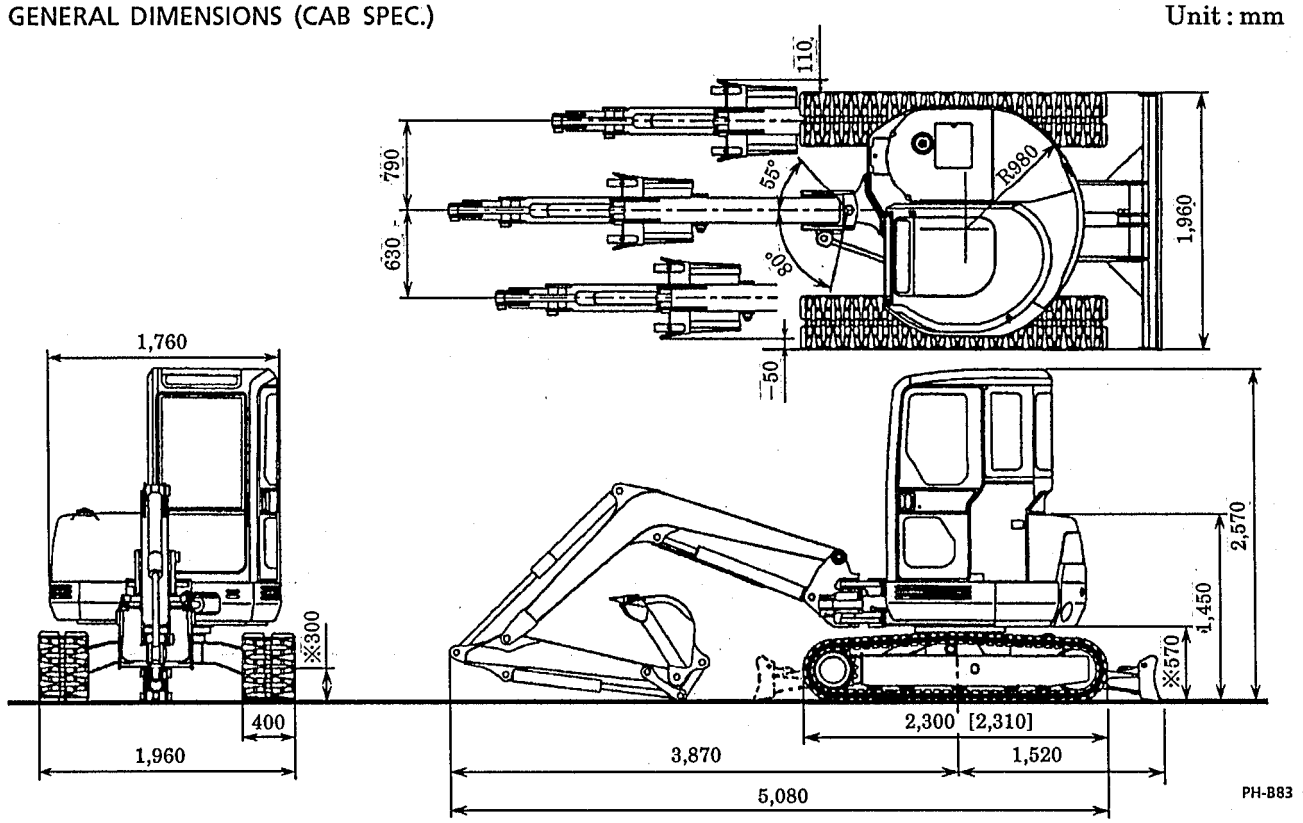
● GENERAL DIMENSIONS (CANOPY SPEC.)

Unit : mm



● GENERAL DIMENSIONS (CAB SPEC.)

Unit : mm

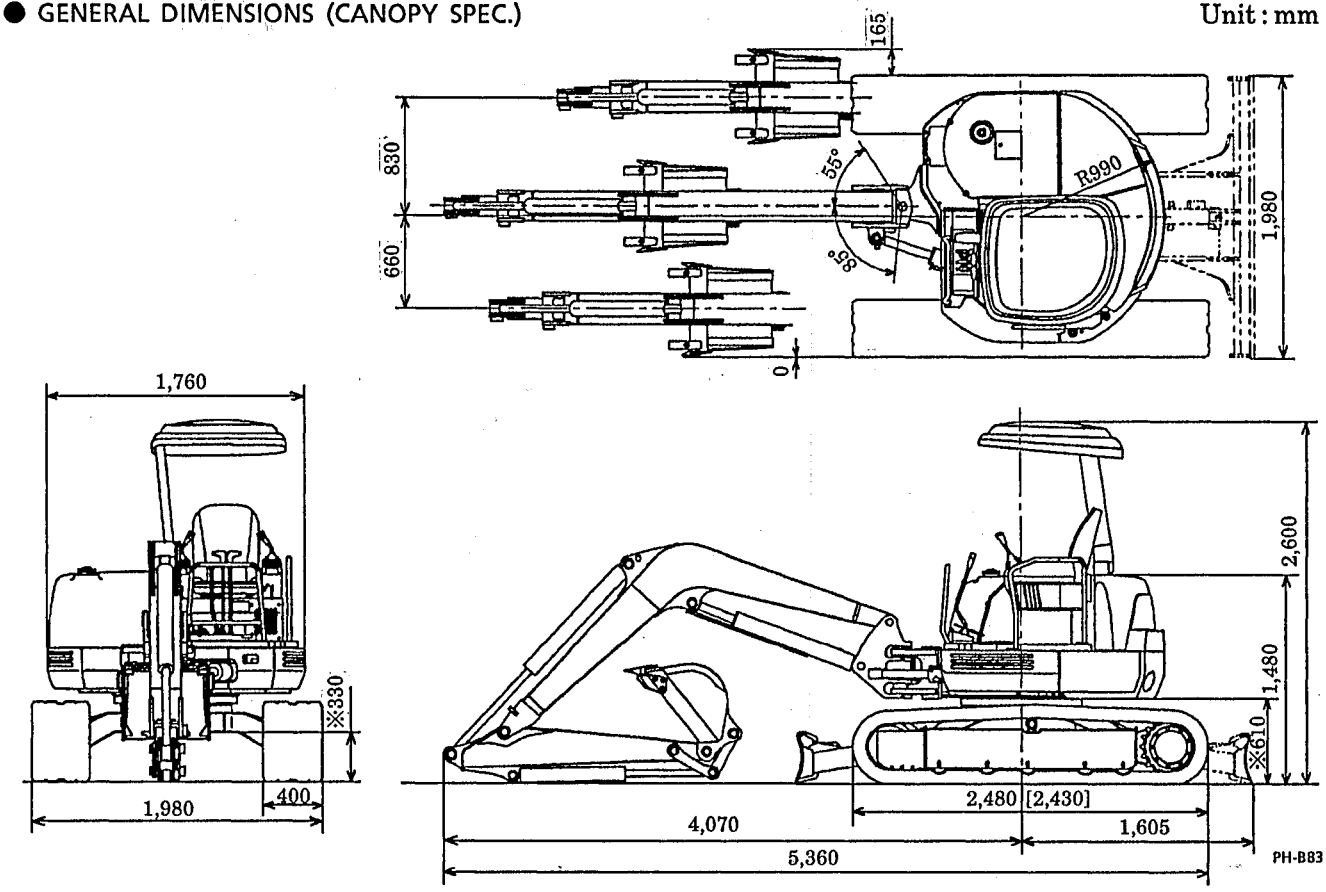


Note : Numerical values marked ※ include the height of the shoe lug. Numerical values enclosed in parentheses [ ] indicate the steel crawler specifications.

2.2 SK45SR GENERAL DIMENSIONS

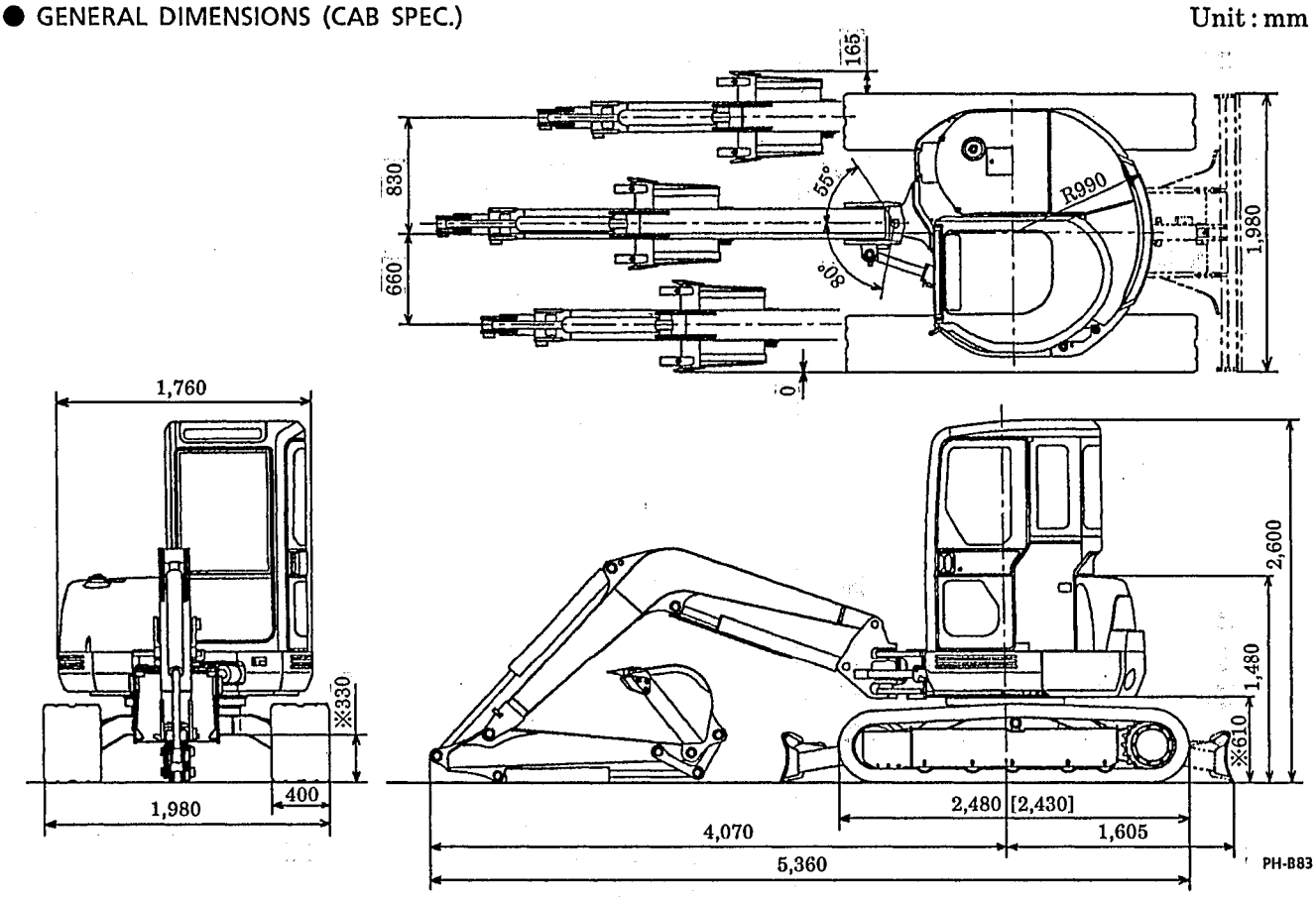
● GENERAL DIMENSIONS (CANOPY SPEC.)

Unit : mm



● GENERAL DIMENSIONS (CAB SPEC.)

Unit : mm



Note : Numerical values marked ※ include the height of the shoe lug. Numerical values enclosed in parentheses [ ] indicate the steel crawler specifications.

3. SPECIFICATIONS AND PERFORMANCE

● SPEED AND GRADABILITY

Model		SK40SR				SK45SR			
Item \ Type		Rubber shoe spec.		Steel shoe spec.		Rubber shoe spec.		Steel shoe spec.	
Swing speed	rpm	7.7				8.1			
Travel Speed	km/h	Low (1-speed)	High (2-speed)	Low (1-speed)	High (2-speed)	Low (1-speed)	High (2-speed)	Low (1-speed)	High (2-speed)
		2.7	4.7	2.5	4.4	2.9	4.8	2.6	4.4
Gradability		30° (58%)							

● ENGINE

Model	SK40SR	SK45SR
Engine model	YANMAR DIESEL 3TNE88	YANMAR DIESEL 4TNE88
Type	4-cycle, water-cooled in-line 3-cylinder, direct injection type	4-cycle, water-cooled in-line 4-cylinder, direct injection type
Number of Cylinders · Bore×Stroke	3×88mm×90mm	4×88mm×90mm
Total Displacement	1.64ℓ (0.43gal)	2.19ℓ (0.58gal)
Rated Output / Rotation Speed	30.5PS / 2,400rpm	37PS / 2,200rpm
Maximum Torque / Rotation Speed	10.5kgf·m / about 1,600rpm	13.5kgf·m / about 1,600rpm
Starter	12V / 1.4kW	12V / 2.0kW
Alternator	12V / 40A	12V / 40A

● HYDRAULIC COMPONENTS

Model	SK40SR	SK45SR
Hydraulic pump	Variable displacement axial piston + 2 gear pump	
Hydraulic motor (Slewing)	Axial piston motor	
Hydraulic motor (Travel)	2−axial piston, 2-speed motor	
Control valve	8-functions multiple control valve	
Cylinder (boom, arm, bucket and dozer blade)	Double action cylinder	
Return filter	Safety valve containing filter type (10μ)	

● SIDE DIGGING

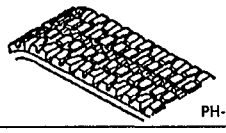
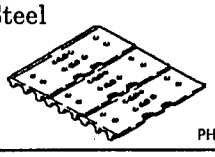
Model		SK40SR	SK45SR
Type		Boom swing by hydraulic cylinder	
Boom swing angle	Canopy	55° (Right) 85° (Left)	
	Cab	55° (Right) 80° (Left)	

● WEIGHT

Unit ; kg

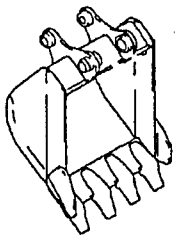
Model	SK40SR				SK45SR			
Fully equipped weight	Rubber shoe		Steel shoe		Rubber shoe		Steel shoe	
	Canopy	Cab	Canopy	Cab	Canopy	Cab	Canopy	Cab
	3,970	4,100	1,030	4,160	4,660	4,790	4,700	4,830
Upper machinery	1,950	2,080	1,950	2,080	2,320	2,450	2,320	2,450
Lower machinery	1,525	←	1,585	←	1,750	←	1,790	←
Attachment	495	←	←	←	590	←	←	←
	2.63m Boom+1.35m Arm +0.13m³ Bucket				2.84m Boom+1.43m Arm +0.14m³ Bucket			
Dozer blade (width×height)	1,960mm×350mm				1.980mm×350mm			
Strokes of blade (up / down)	360mm / 380mm				370mm / 380mm			

4. TYPE OF SHOES

Shape	Model	Track shoe width (mm)	Total width of crawler (mm)	Ground Pressure (kgf/cm²)	
				Canopy	Cab
Rubber shoe  PH-B83	SK40SR	400	1,960	0.25	0.26
	SK45SR	400	1,980	0.27	0.28
Steel  PH-B83	SK40SR	400	1,960	0.25	0.26
	SK45SR	400	1,980	0.28	0.29

5. TYPE OF BUCKETS

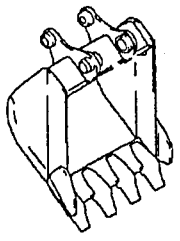
SK40SR

Backhoe bucket  PH-B83

Heaped Capacity (m³)	Struck capacity (m³)	Width of bucket (mm)		Number of teeth	Weight (kg)
		With side cutters	Without side cutters		
0.086	0.066	450	390	3	80
STD 0.13	0.10	600	540	4	100
HD 0.13	0.10	600	540	4	105
0.16	0.12	700	640	5	110

NOTE : HD means Heavy Duty Type.

SK45SR

Backhoe bucket  PH-B83

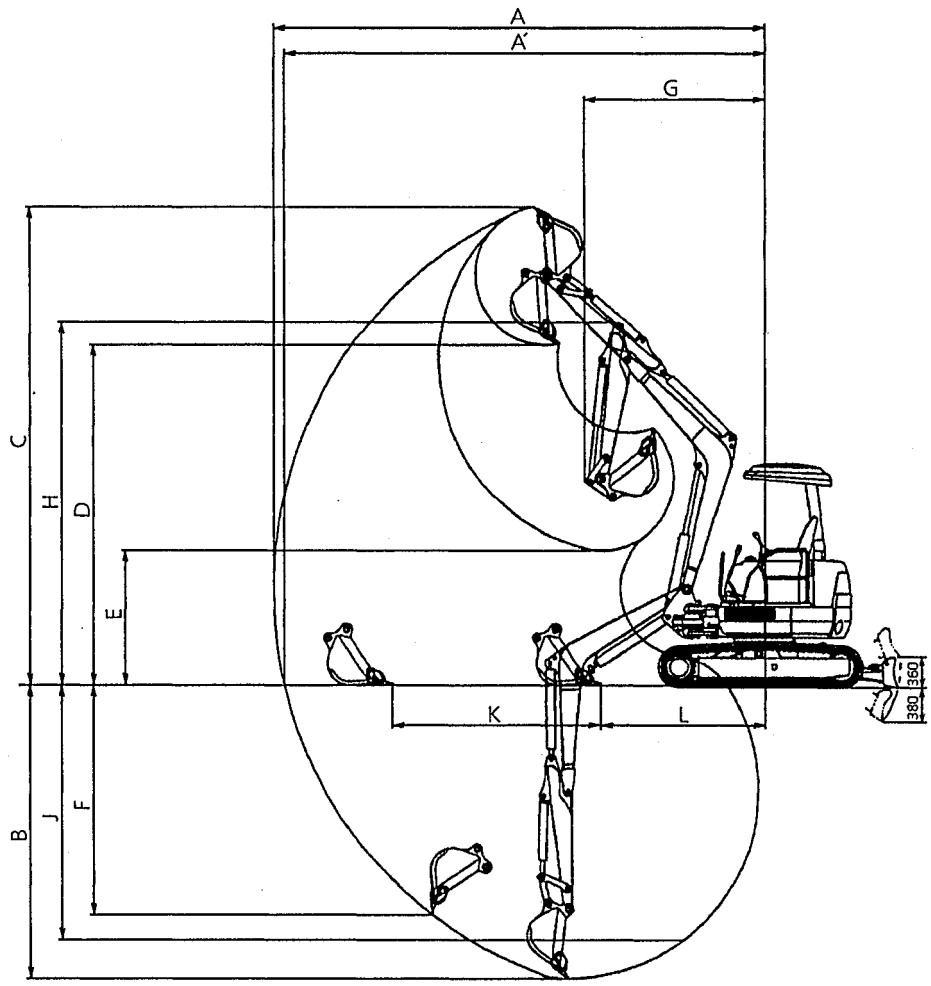
Heaped Capacity (m³)	Struck capacity (m³)	Width of bucket (mm)		Number of teeth	Weight (kg)
		With side cutters	Without side cutters		
0.088	0.068	450	390	3	90
0.12	0.086	550	490	4	100
STD 0.14	0.11	650	590	4	110
HD 0.14	0.11	650	590	4	113
0.16	0.12	700	640	5	120
0.18	0.13	750	690	5	125

NOTE : HD means Heavy Duty Type.

6. WORKING RANGES OF ATTACHMENTS

SK40SR

● BACKHOE ATTACHMENT (CANOPY SPEC.)



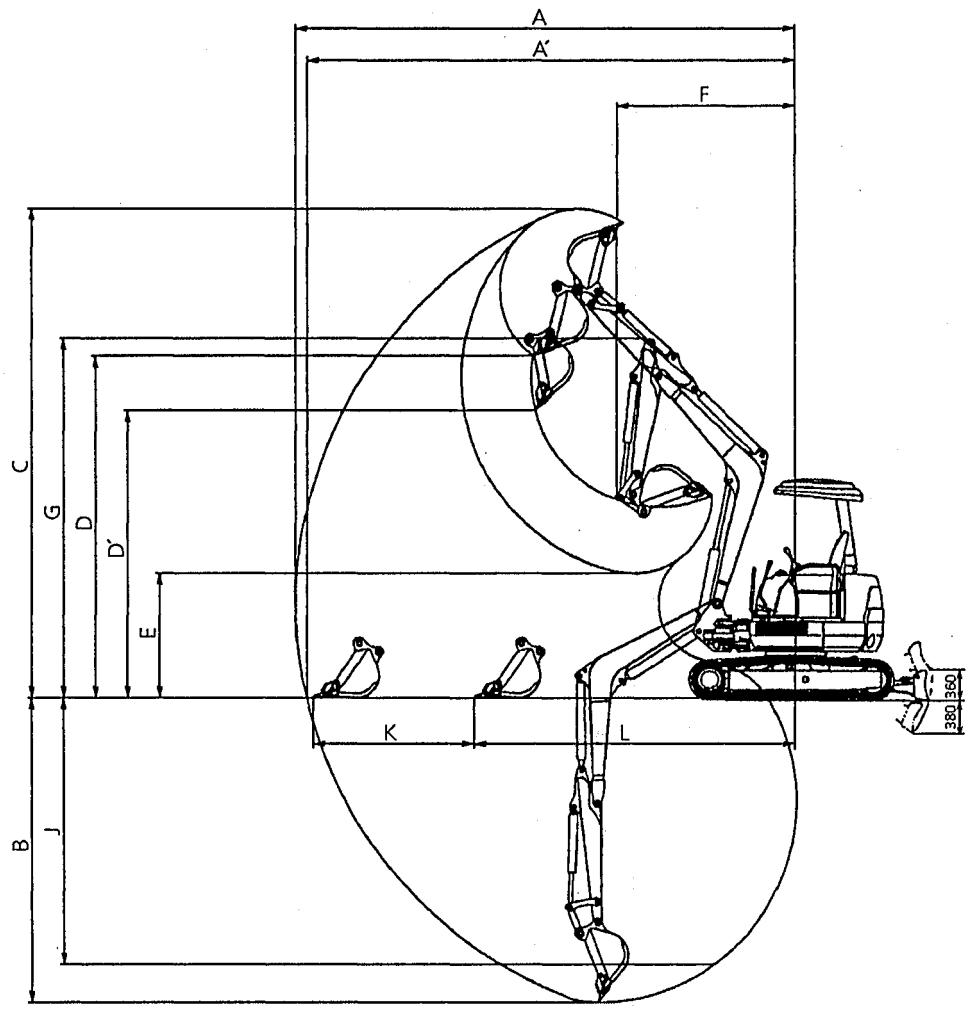
Unit : mm

Item			Attachment Type: 1.35m arm 0.13m³ bucket	1.65m arm 0.13m³ bucket
A	Maximum digging reach		5,550	5,840
A'	Maximum digging reach at ground level		5,420	5,720
※ B	Maximum digging depth		3,330	3,630
※ C	Maximum digging height		5,390	5,640
※ D	Maximum dumping height		3,800	4,050
※ E	Minimum dumping height		1,510	1,230
※ F	Vertical digging depth		2,570	2,910
G	Minimum slewing radius		2,040	2,140
※ H	Height at minimum slewing		4,070	4,070
※ J	8-feet level digging depth		2,880	3,240
K	Horizontal digging stroke at ground level	Stroke	2,360	2,800
L		Minimum	1,840	1,700

NOTE : Dimensions marked ※ do not include the height of the shoe lug.

SK40SR

● FACE SHOVEL ATTACHMENT (CANOPY SPEC.)



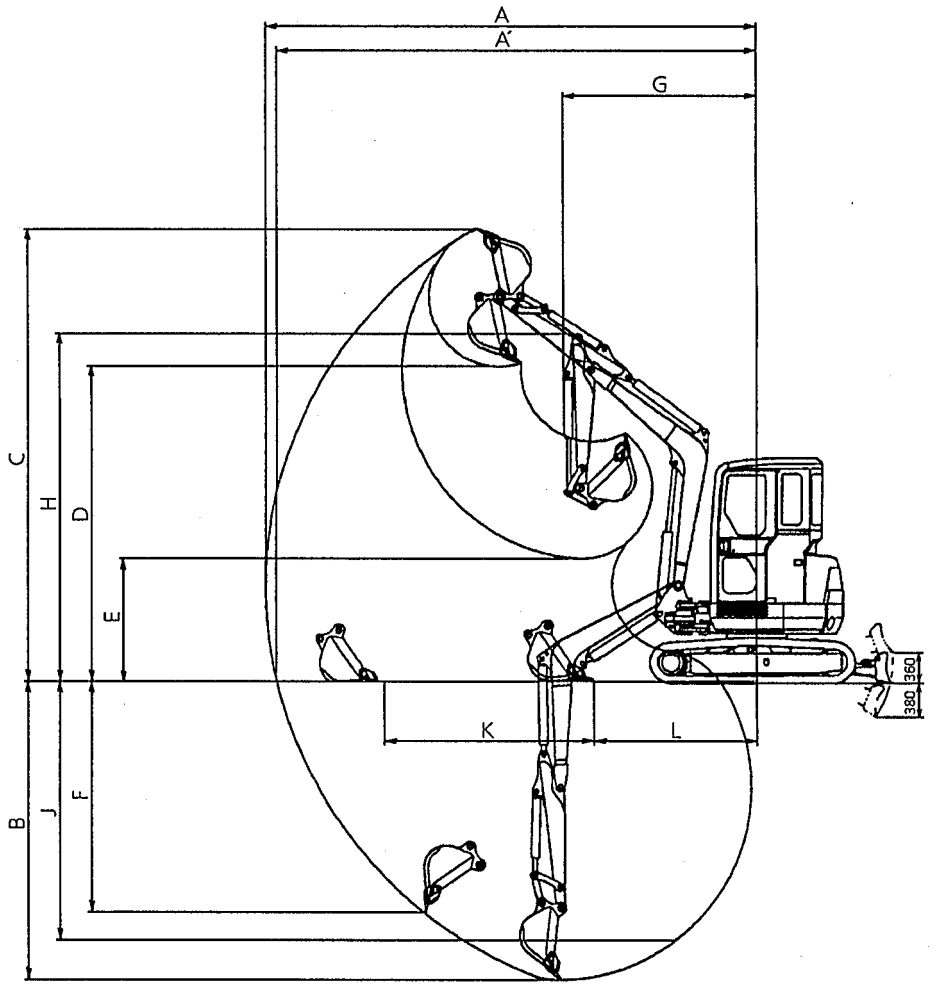
Unit : mm

Item			Attachment Type: 1.35m arm 0.13m³ bucket	1.65m arm 0.13m³ bucket
A	Maximum digging reach		5,630	5,930
A'	Maximum digging reach at ground level		5,510	5,820
※ B	Maximum digging depth		3,420	3,720
※ C	Maximum digging height		5,490	5,740
※ D	Maximum dumping height		3,870	4,130
※ D'	Maximum dumping height (45°)		3,250	3,360
※ E	Minimum dumping height		1,420	1,140
F	Minimum slewing radius		2,040	2,140
※ G	Height at minimum slewing		4,070	4,070
※ J	8-feet level digging depth		2,990	3,340
K	Horizontal digging stroke at ground level	Stroke	1,820	2,330
L		Minimum	3,610	3,400

NOTE : Dimensions marked ※ do not include the height of the shoe lug.

SK40SR

● BACKHOE ATTACHMENT (CAB SPEC.)



PH-B83

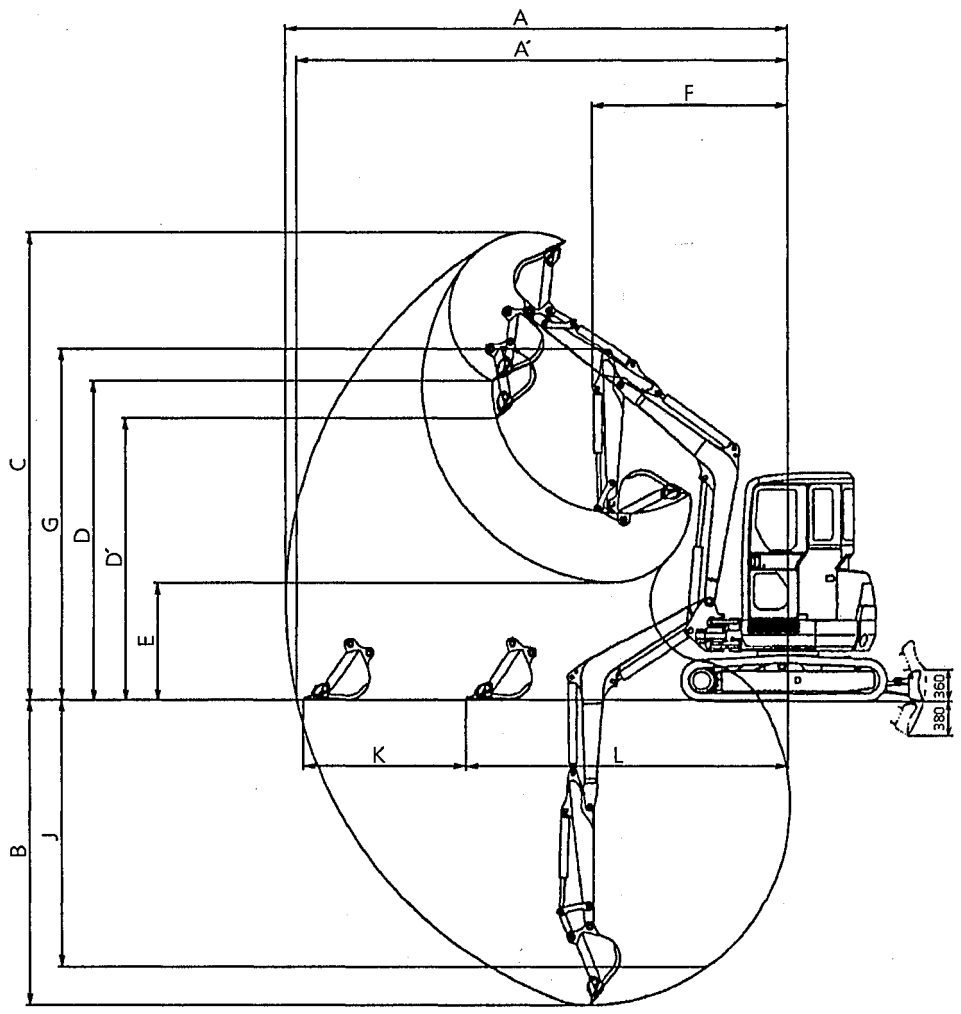
Unit : mm

Item	Attachment Type		1.35m arm 0.13m³ bucket	1.65m arm 0.13m³ bucket
A	Maximum digging reach		5,550	5,840
A'	Maximum digging reach at ground level		5,420	5,720
※ B	Maximum digging depth		3,330	3,630
※ C	Maximum digging height		5,130	5,360
※ D	Maximum dumping height		3,570	3,800
※ E	Minimum dumping height		1,370	1,080
※ F	Vertical digging depth		2,570	2,910
G	Minimum slewing radius		2,190	2,250
※ H	Height at minimum slewing		3,950	3,950
※ J	8-feet level digging depth		2,880	3,240
K	Horizontal digging stroke at ground level	Stroke	2,360	2,800
L		Minimum	1,840	1,700

NOTE : Dimensions marked ※ do not include the height of the shoe lug.

SK40SR

● FACE SHOVEL ATTACHMENT (CAB SPEC.)



PH-B83

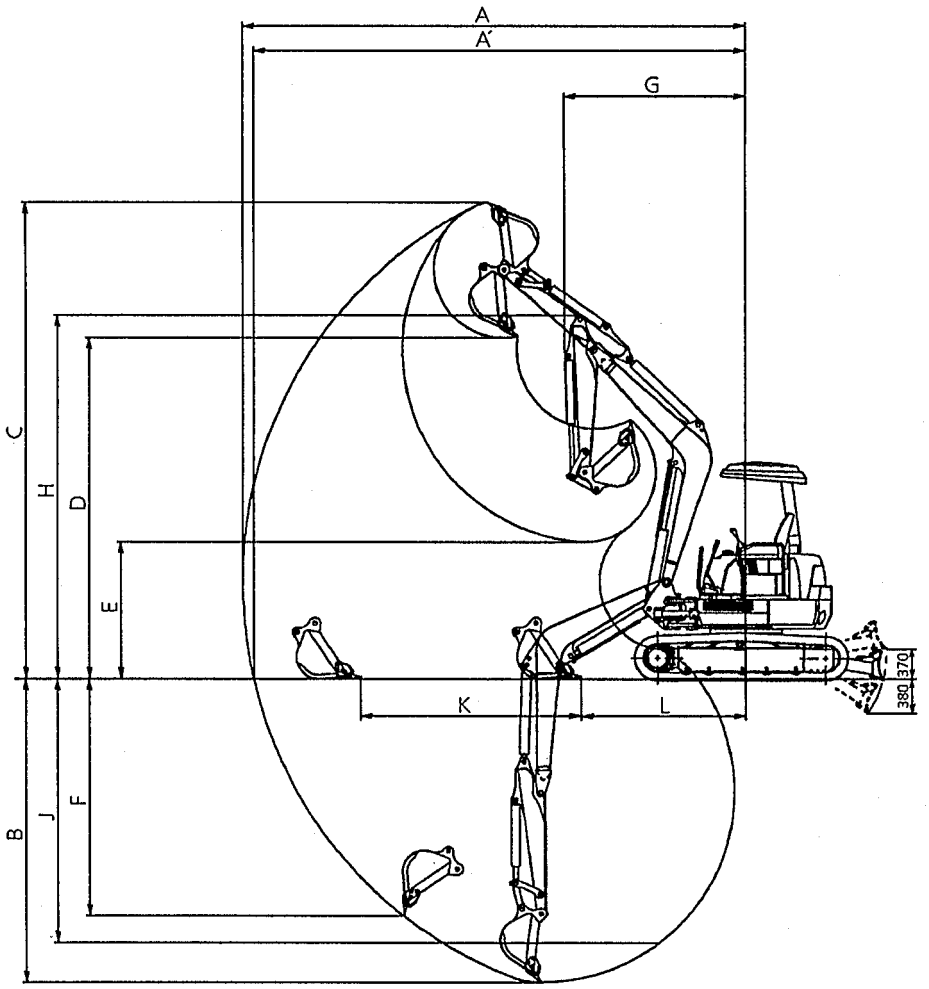
Unit : mm

Item			Attachment Type: 1.35m arm 0.13m³ bucket	1.65m arm 0.13m³ bucket
A	Maximum digging reach		5,630	5,930
A'	Maximum digging reach at ground level		5,510	5,820
※ B	Maximum digging depth		3,420	3,720
※ C	Maximum digging height		5,260	5,490
※ D	Maximum dumping height		3,580	3,820
※ D'	Maximum dumping height (45°)		3,150	3,260
※ E	Minimum dumping height		1,290	1,000
F	Minimum slewing radius		2,190	2,250
※ G	Height at minimum slewing		3,950	3,950
※ J	8-feet level digging depth		2,990	3,340
K	Horizontal digging stroke at ground level	Stroke	1,820	2,330
L		Minimum	3,610	3,400

NOTE : Dimensions marked ※ do not include the height of the shoe lug.

SK45SR

● BACKHOE ATTACHMENT (CANOPY SPEC.)



PH-B83

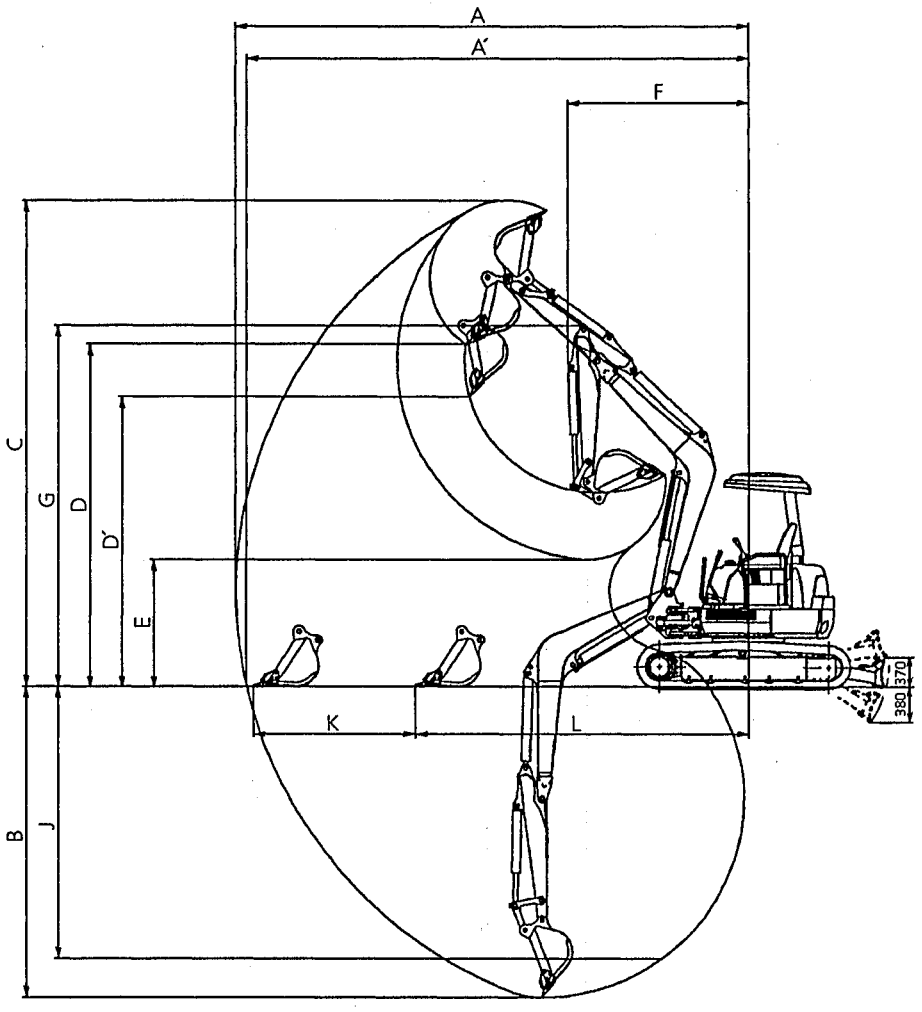
Unit : mm

Item	Attachment Type		1.43m arm 0.14m³ bucket	1.73m arm 0.12m³ bucket
A	Maximum digging reach		5,880	6,160
A'	Maximum digging reach at ground level		5,750	6,040
※ B	Maximum digging depth		3,570	3,860
※ C	Maximum digging height		5,600	5,800
※ D	Maximum dumping height		3,980	4,180
※ E	Minimum dumping height		1,580	1,300
※ F	Vertical digging depth		2,850	3,030
G	Minimum slewing radius		2,100	2,190
※ H	Height at minimum slewing		4,250	4,270
※ J	8-feet level digging depth		3,090	3,440
K	Horizontal digging stroke at ground level	Stroke	2,580	3,010
L		Minimum	1,910	1,770

NOTE : Dimensions marked ※ do not include the height of the shoe lug.

SK45SR

● FACE SHOVEL ATTACHMENT (CANOPY SPEC.)



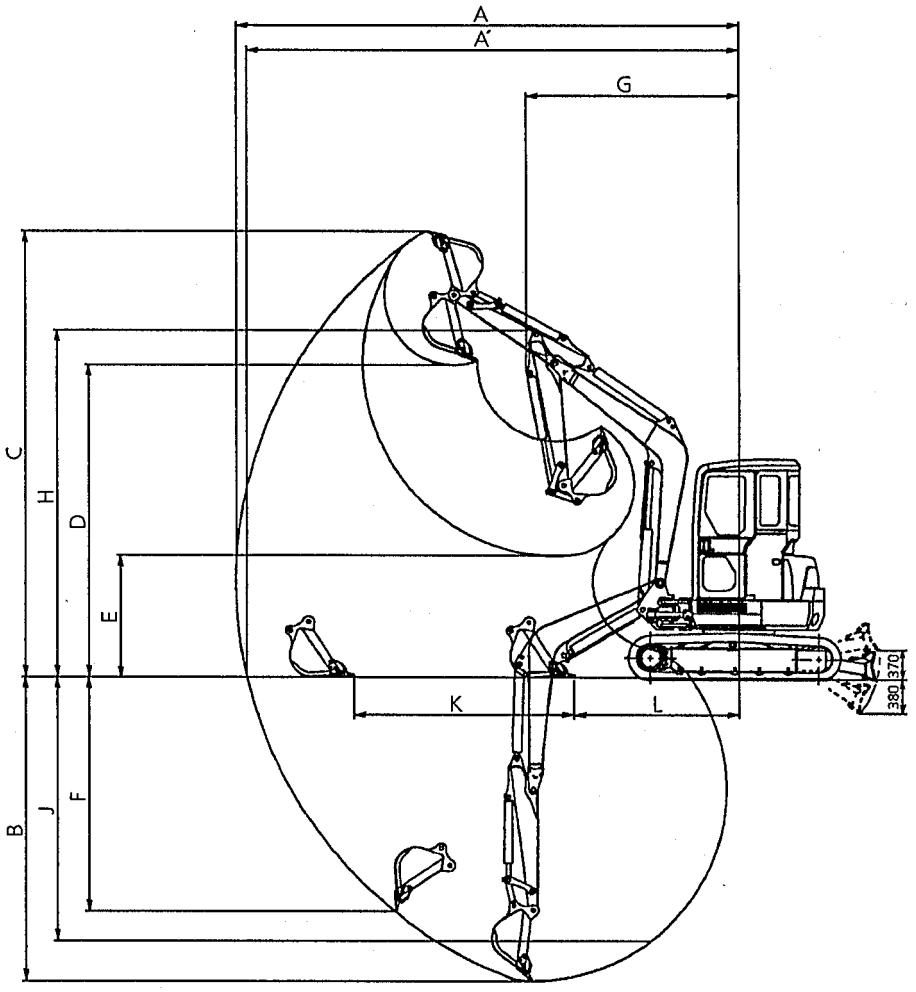
Unit : mm

Item			Attachment Type: 1.43m arm 0.14m³ bucket	1.73m arm 0.12m³ bucket
A	Maximum digging reach		5,960	6,250
A'	Maximum digging reach at ground level		5,840	6,130
※ B	Maximum digging depth		3,650	3,950
※ C	Maximum digging height		5,710	5,910
※ D	Maximum dumping height		4,040	4,240
D'	Maximum dumping height (45°)		3,430	3,540
※ E	Minimum dumping height		1,500	1,210
F	Minimum slewing radius		2,100	2,190
※ G	Height at minimum slewing		4,250	4,270
※ J	8-feet level digging depth		3,200	3,540
K	Horizontal digging stroke at ground level	Stroke	1,890	2,390
L		Minimum	3,860	3,660

NOTE : Dimensions marked ※ do not include the height of the shoe lug.

SK45SR

● BACKHOE ATTACHMENT (CAB SPEC.)



PH-B83

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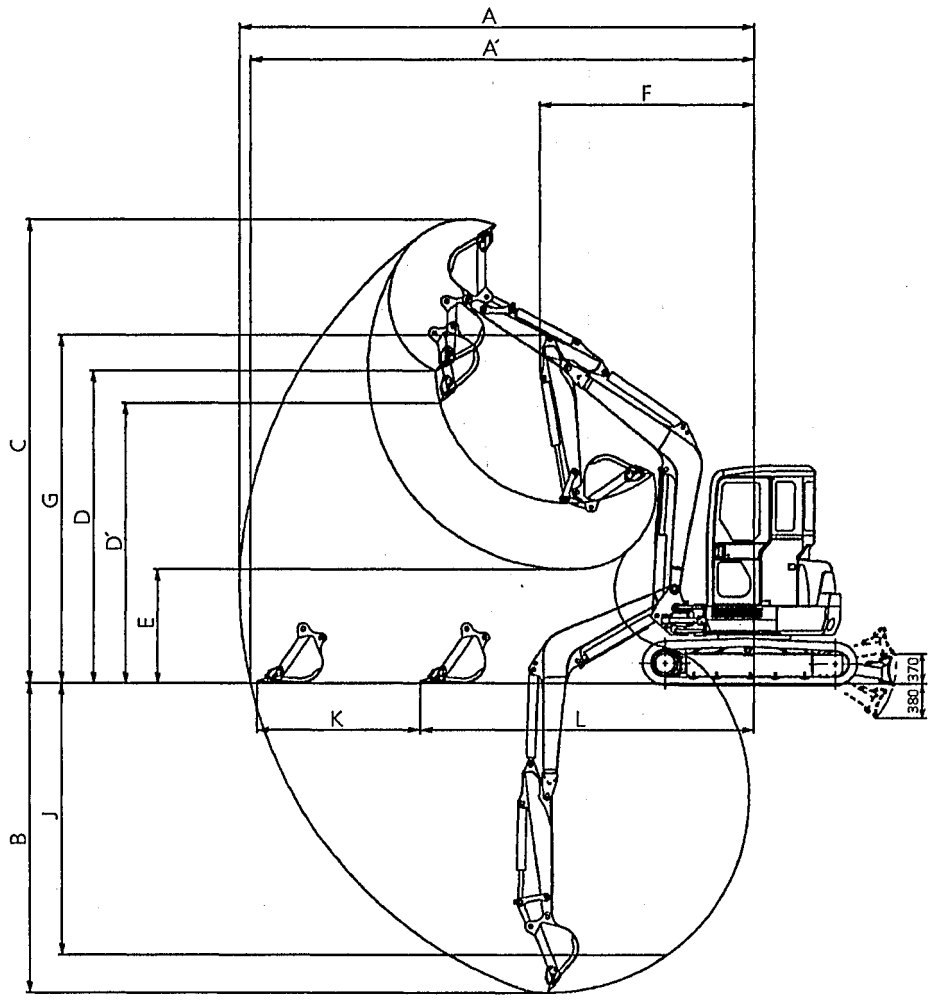
※ B	Maximum digging depth		3,570	3,860
※ C	Maximum digging height		5,250	5,400
※ D	Maximum dumping height		3,660	3,830
※ E	Minimum dumping height		1,420	1,130
※ F	Vertical digging depth		2,850	3,030
G	Minimum slewing radius		2,480	2,480
※ H	Height at minimum slewing		4,070	4,090
※ J	8-feet level digging depth		3,090	3,440
K	Horizontal digging stroke at ground level	Stroke	2,580	3,010
L		Minimum	1,910	1,770

NOTE : Dimensions marked ※ do not include the height of the shoe lug.

SK45SR

● FACE SHOVEL ATTACHMENT (CAB SPEC.)



PH-B83

Unit : mm

Item			Attachment Type: 1.43m arm 0.14m³ bucket	Attachment Type: 1.73m arm 0.12m³ bucket
A	Maximum digging reach		5,960	6,250
A'	Maximum digging reach at ground level		5,840	6,130
※ B	Maximum digging depth		3,650	3,950
※ C	Maximum digging height		5,390	5,550
※ D	Maximum dumping height		3,650	3,820
D'	Maximum dumping height (45°)		3,280	3,380
※ E	Minimum dumping height		1,340	1,040
F	Minimum slewing radius		2,100	2,480
※ G	Height at minimum slewing		4,070	4,090
※ J	8-feet level digging depth		3,200	3,540
K	Horizontal digging stroke at ground level	Stroke	1,890	2,390
L		Minimum	3,860	3,660

NOTE : Dimensions marked ※ do not include the height of the shoe lug.

7. LIFTING DIAGRAM

⚠ WARNING

Do not use this excavator as a crane.
Unless you have complied with the legal requirements as laid down. To do otherwise puts yourself and your company into risk.

(1) Calculation condition
The numerical values in the diagrams indicate either 87% of the hydraulic lift capacity or 75% of the tipping load, whichever value is smaller.

1) The load point is the fulcrum of the bucket and the bucket position is an embraced posture.

2) The figures on the upper stage indicate the lifting-up ability of a machine facing sideways, while the figures at the bottom stage represent a machine facing longitudinally.

3) Dozer blade up

4) Main relief pressure : 210kgf/cm^2

5) Crawler : Rubber

6) Unit : ton

EU Spec.

The numerical values in the diagrams indicate either 87% of the hydraulic lift capacity or 71% of the tipping load, whichever value is smaller. (*Marks indicate values limited by the hydraulic lift capacity.)

● **PREVENT UNAUTHORIZED LIFTING OPERATION**
Prepare the following equipment under the provision of EN474-5 sub clause 4.1.7.3, 4.1.7.4, 4.1.7.5.

1. Load safety valve.
2. Safety valve.
3. Bucket hook.
4. Rated object handling capacity table.
5. These lifting charts are calculated with KOBELCO standard buckets.
6. The lifting capacities are calculated without any devices to increase stability. The dozer equipment dose not have an interlocking device and it is therefore not permitted to use it to increase stability.

⚠ WARNING

A standard equipped hydraulic excavator can not be used for lifting operations.
Serious damage, injury or death may occur.
A hydraulic excavator must be equipped per EN 474-5, section 4.1.7.3, 4.1.7.4 and 4.1.7.5, prior to operation in a lifting application.

(2) Lifting diagram arrange No. table

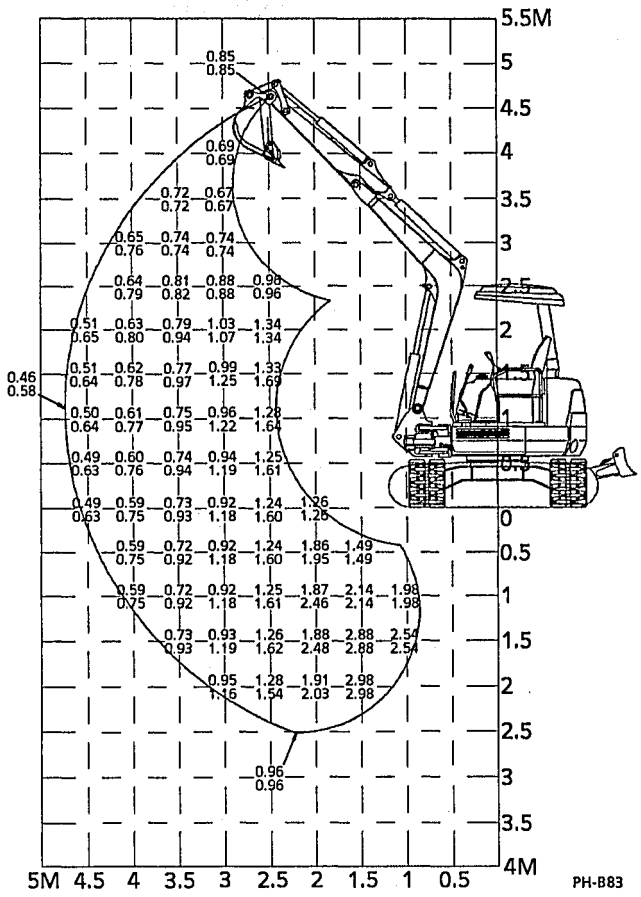
SK40SR

Blade position \ ATT	1.35m standard arm + 0.13m^3 bucket	1.65m long arm + 0.13m^3 bucket
Rear	(1)	(2)
Front	(3)	(4)

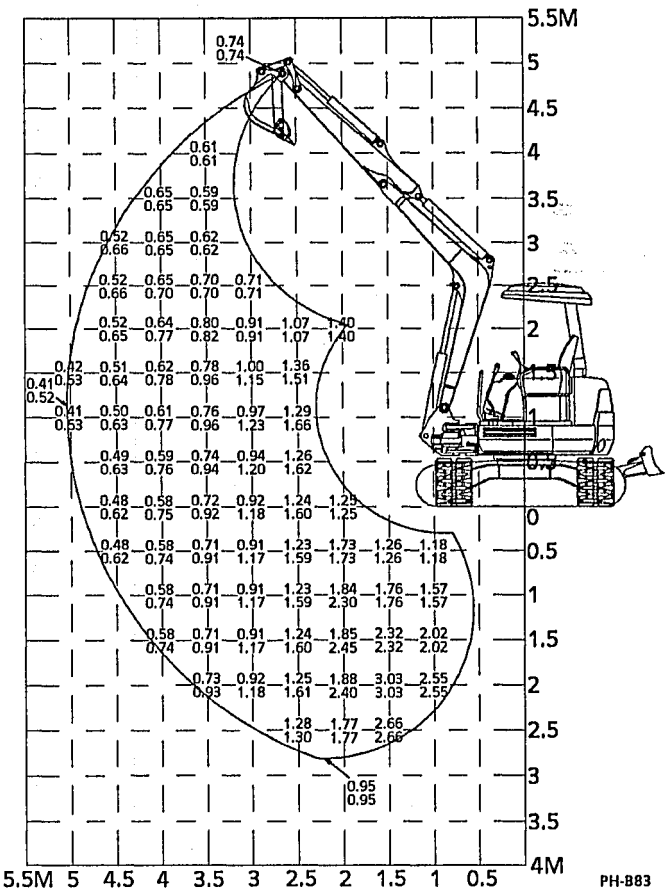
SK45SR

Blade position \ ATT	1.43m standard arm + 0.14m^3 bucket	1.73m long arm + 0.12m^3 bucket
Rear	(5)	(6)
Front	(7)	(8)

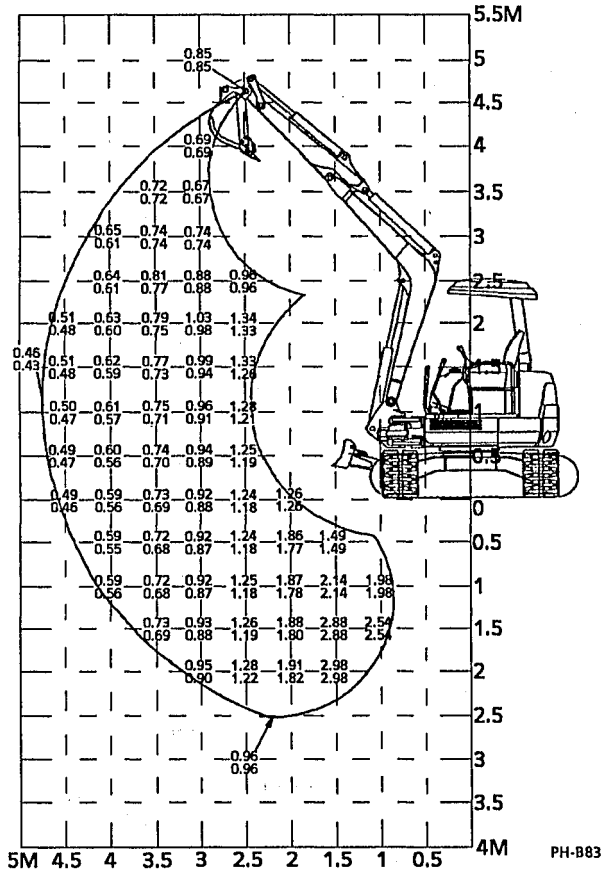
(1) Unit : ton



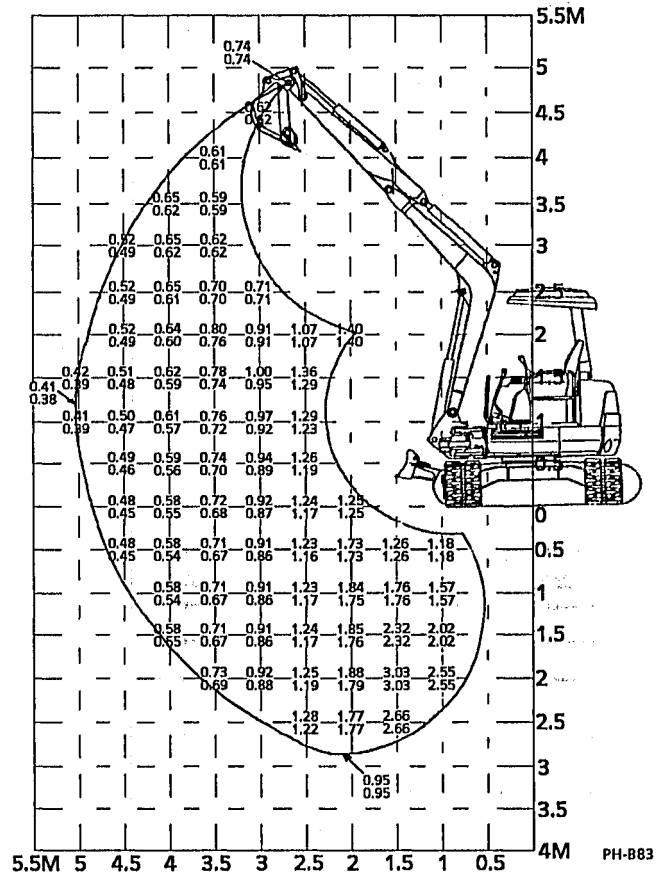
(2) Unit : ton



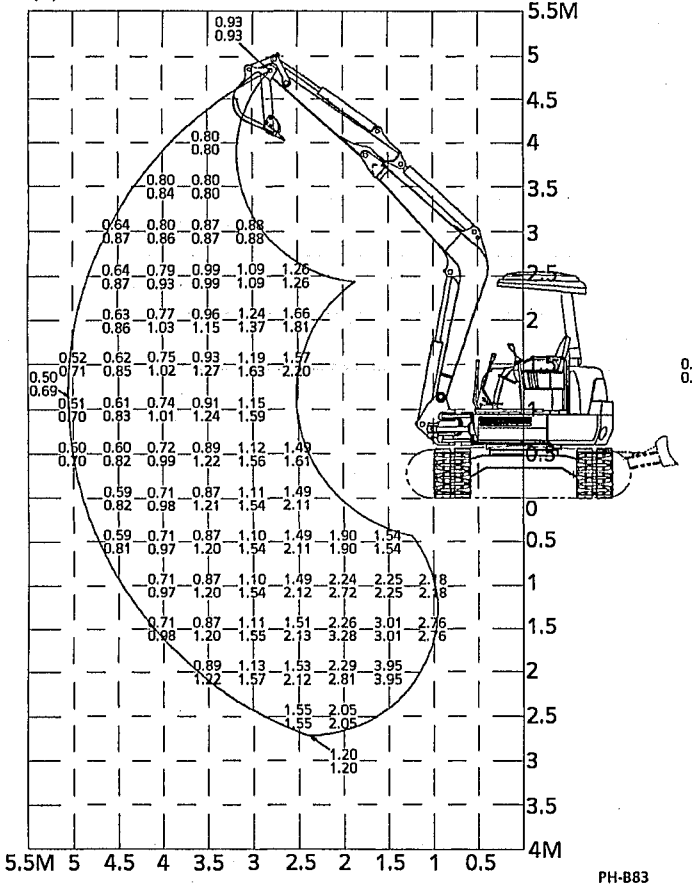
(3) Unit : ton



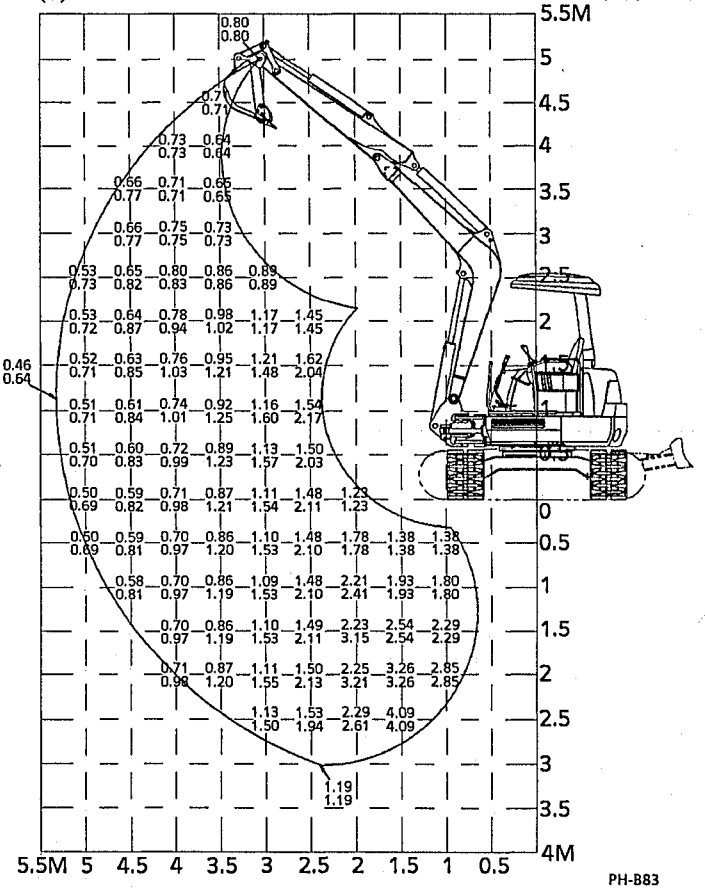
(4) Unit : ton



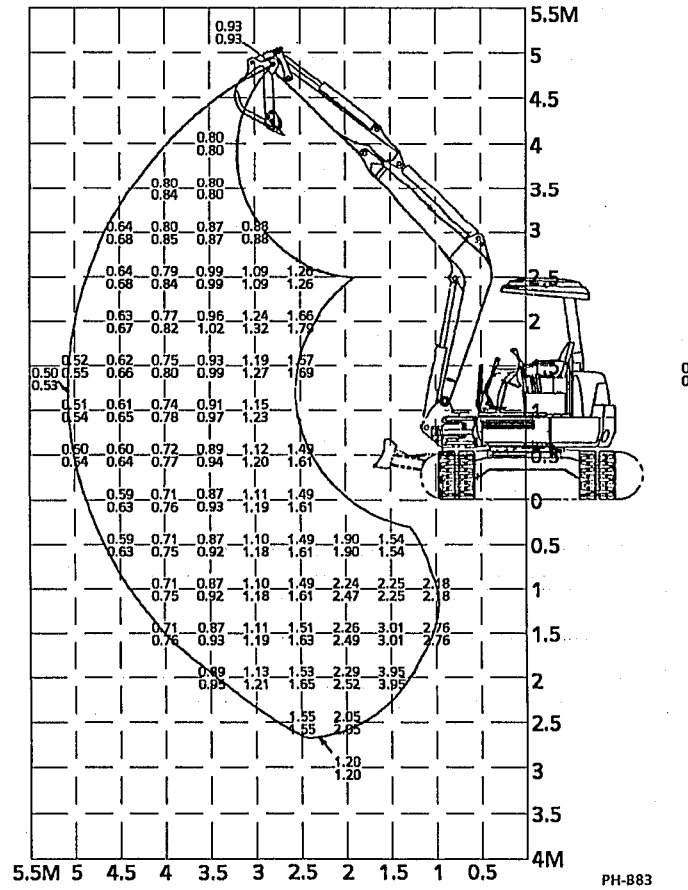
(5) Unit : ton



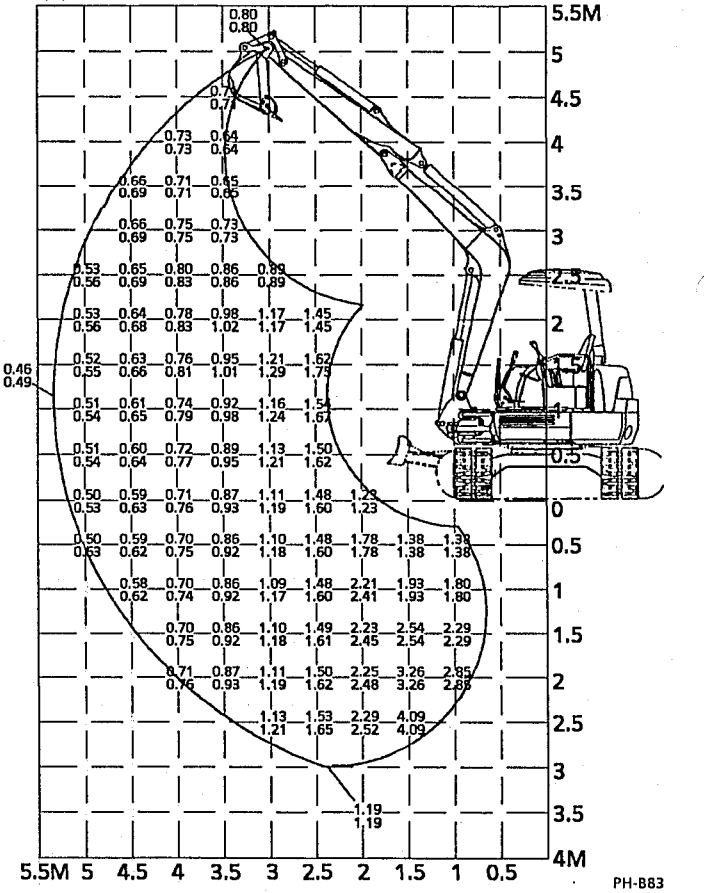
(6) Unit : ton



(7) Unit : ton



(8) Unit : ton



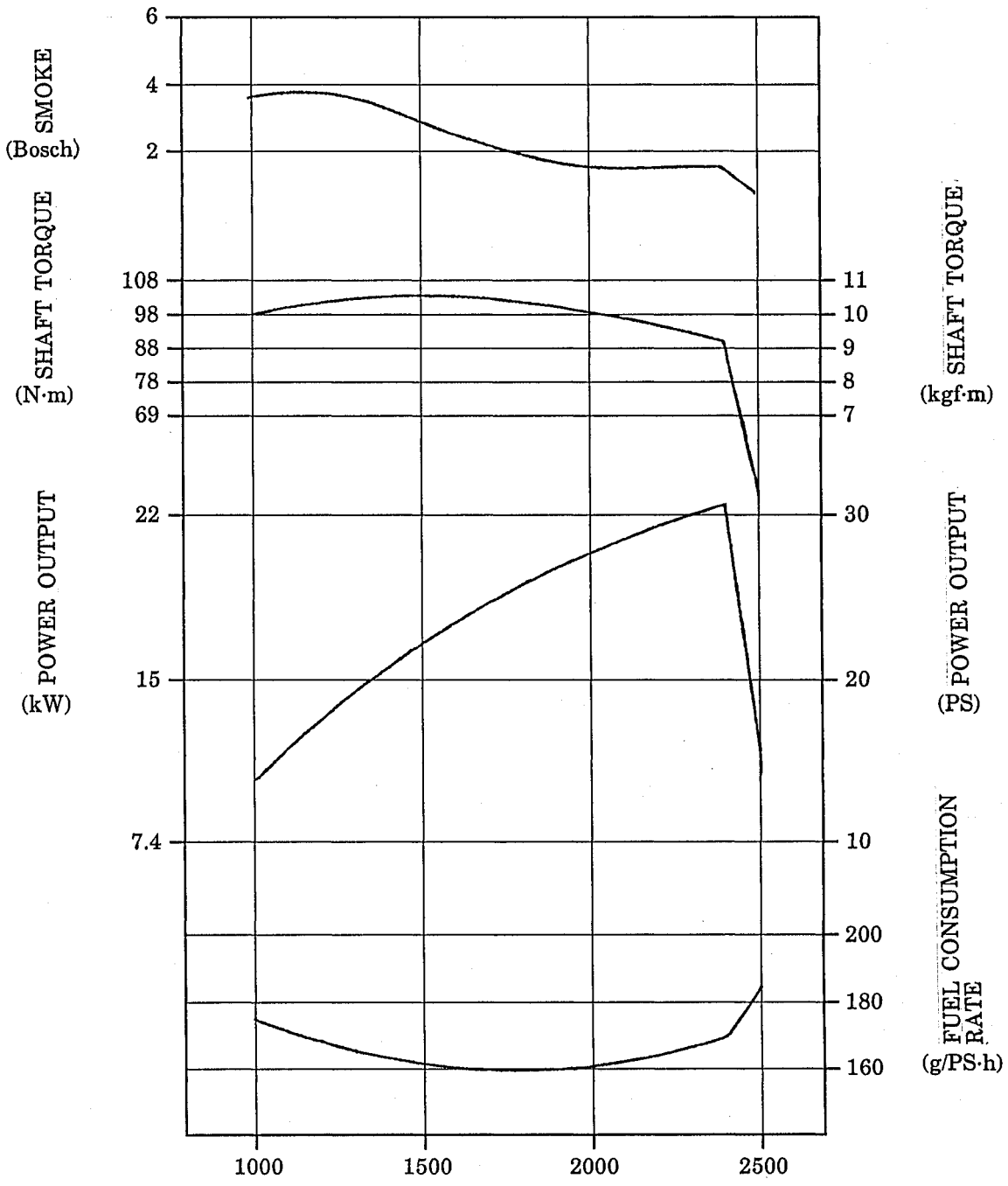
8. ENGINE SPECIFICATIONS

Model		SK40SR			SK45SR
Parts No.		PH02P00001F1			PY02P00007F1
Engine model		3TNE88−YB			4TNE88−YBB
No. of cylinders−Bore×Stroke		3−88mm×90mm			4−88mm×90mm
Total displacement		1,642cc			2,189cc
Compression ratio		18.0			←
Output rating		30.5 PS / 2,400rpm (22kW/2,400 rpm)			37.0 PS / 2,200rpm (27kW/2,200 rpm)
Max. torque		10.5kgf·m/1,600rpm			13.5kgf·m/1,600rpm
High idling		2,600±25rpm			2,400±25rpm
Low idling		1,175±25rpm			1,075±25rpm
Injection start pressure		200^{+10}_{0} kgf/cm^2			←
Thermostat temperature		Valve opening 71°C Full open 85°C			←
Ignition order		1−3−2			1−3−4−2
Compression pressure		33±1kgf/cm^2 at 250rpm (at battery rating)			35±1kgf/cm^2 at 250rpm (at battery rating)
Operating lube oil pressure reading		—			—
Fuel injection timing (bTDC)		14°±1			12°±1
Valve clearance, valve action timing		Valve clearance	Open	Close	←
	Intake valve	0.2±0.05mm	10°~20° before the top dead point	40°~50° before the bottom dead point	
	Exhaust valve	0.2±0.05mm	51°~61° before the bottom dead point	13°~23° before the top dead point	
Starter capacity		12V×1.4kW			12V×2.0kW
Generator capacity		12V×40A			←
Cooling fan drive method		Ø335 Discharge type, 6 blades, crank pulley/fun pulley=Ø110/Ø96			Ø350 Discharge type, 6 blades, crank pulley/fun pulley=Ø120/Ø90
Engine oil volume		Full volume 4.7ℓ (1.2gal), Effective 1.8ℓ (0.48gal)			Full volume 5.8ℓ (1.5gal), Effective 2.3ℓ (0.61gal)
Dry weight		155^{+5}_{0}kg			180^{+5}_{0}kg
Fuel consumption rate		Less than 180g / PS·h			Less than 175g / PS·h
Allowable tilting angles		Back and forth, left and right 25° (momentary 30°)			←
Engine dimension (total length×total width×total height)		585×537×715mm			695×520×635mm
Rotating direction		Counterclockwise as seen from flywheel side			←

9. ENGINE CHARACTERISTIC CURVE

SK40SR

Applicable machine : PH00101~
Engine (YANMAR) : 3TNE88−YB
Rated output : 22.5kW / 2,400min^{-1} (30.5PS / 2,400rpm)



$$\text{FUEL CONSUMPTION VOLUME} = \frac{\text{FUEL CONSUMPTION RATE}}{0.835\times1000}\times\text{PS}\times\text{LOAD RATIO}(\alpha)$$

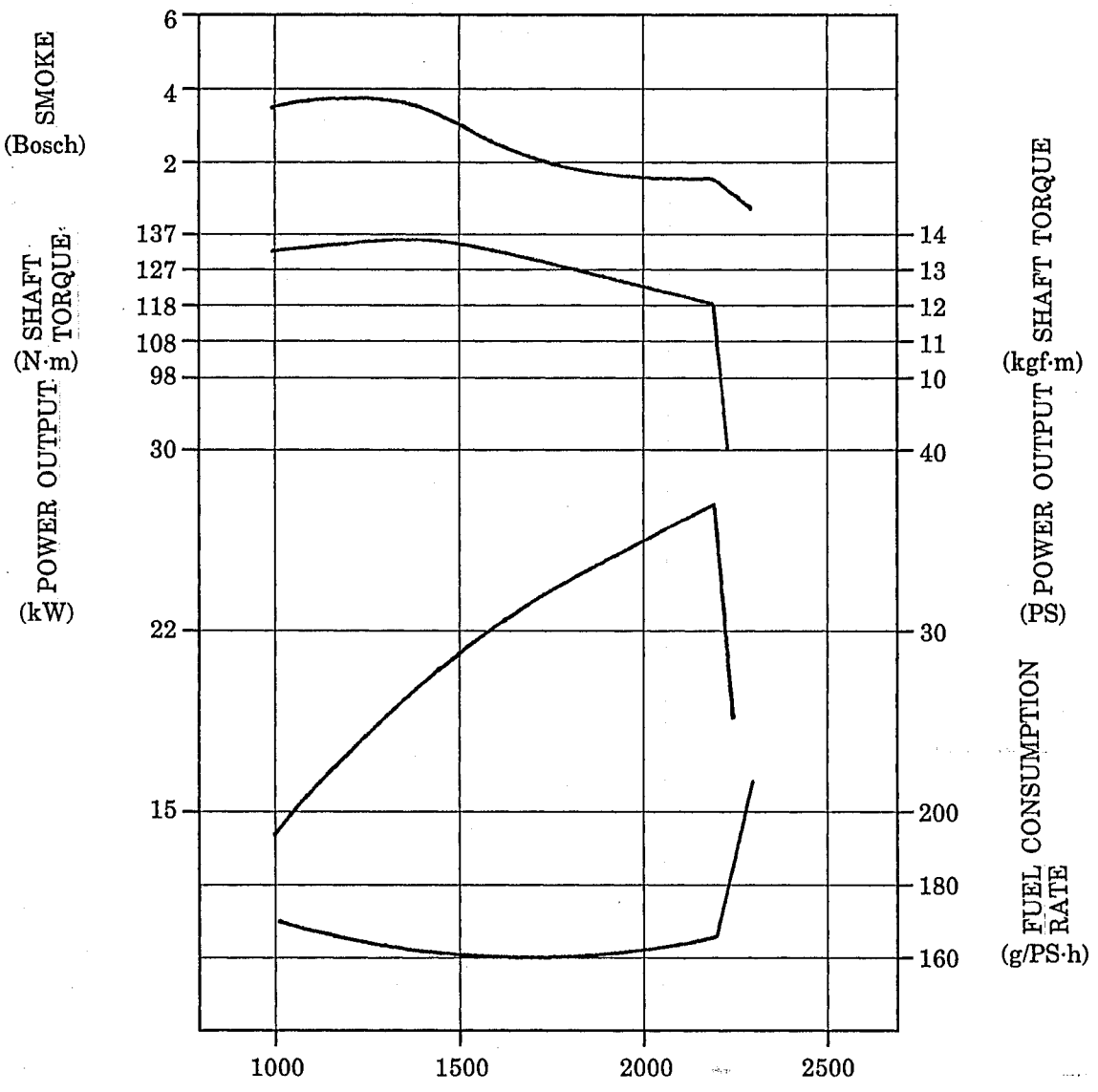
$$= \frac{180\ \text{g/PS·h}}{0.835\times1000}\times30.5\text{PS}\times\alpha$$

$$= 6.57\alpha\cdot\ell/\text{h}\ (1.74\alpha\cdot\text{gal/h})$$

α : at standard working ; 0.60~0.70

SK45SR

Applicable machine : PY06001~
Engine (YANMAR) : 4TNE88−YBB
Rated output : 27.2kW / 2,200min^{-1} (37.0PS / 2,200rpm)



$$\text{FUEL CONSUMPTION VOLUME} = \frac{\text{FUEL CONSUMPTION RATE}}{0.835\times1000}\times\text{PS}\times\text{LOAD RATIO}(\alpha)$$

$$= \frac{175\ \text{g/PS·h}}{0.835\times1000}\times37.0\text{PS}\times\alpha$$

$$= 7.75\alpha\cdot\ell/\text{h}\ (2.05\alpha\cdot\text{gal/h})$$

α : at standard working ; 0.60~0.70

Book code No. S5PH03 01E

KOBELCO

SHOP MANUAL

SK40SR
SK45SR

LOCATION AND WEIGHT OF COMPONENTS

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KOBE STEEL, LTD.

Applicable Machines
PH00101~
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