

HYDRAULIC EXCAVATOR

**SHOP
MANUAL**

model

SK200(LC)VI
SK210(LC)VI
SK210NLCVI

INDEX

1	SPECIFICATION SECTION
2	MAINTENANCE SECTION
3	SYSTEM SECTION
4	DISASSEMBLY SECTION
5	TROUBLESHOOTING
6	ENGINE SECTION
7	INSTALLATION PROCEDURES FOR OPTIONAL ATTACHMENT

SPECIFICATION

MAINTENANCE

SYSTEM

DISASSEMBLING

TROUBLESHOOTING

E/G

OPT.

KOBELCO

Book code No. S5YN0012E③

Product: Kobelco Model SK200(LC)VI,SK210(LC)VI,SK200NLCVI Hydraulic Excavator Service Repair Workshop Manual
Full Download: <https://www.arepairmanual.com/downloads/kobelco-model-sk200lcvisk210lcvisk200nlcvi-hydraulic-excavator-service-repair-workshop-manual/>

Sample of manual. Download All 1054 pages at:
<https://www.arepairmanual.com/downloads/kobelco-model-sk200lcvisk210lcvisk200nlcvi-hydraulic-excavator-service-repair-workshop-manual/>

⚠ 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.

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. Pinhole (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 pinhole 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.

SK200(LC)VI
SK210(LC)VI
SK210NLCVI

Index of Shop Manual

Book Code No.		Index No	Title	
Distribution Year—Month				
S5YN0112E 1999-12		SPECIFICATION	OUTLINE	YN01
S5YN0212E 2000-02			SPECIFICATION	YN02
S5YN0312E 1999-12			ATTACHMENT DIMENSION	YN03
S5YN1112E 1999-12		MAINTENANCE	TOOLS	YN11
S5YN1212E 2000-02			STANDARD MAINTENANCE TIME SCHEDULE	YN12
S5YN1312E 1999-12			MAINTENANCE STANDARD AND TEST PROCEDURE	YN13
S5YN2112E 1999-12		SYSTEM	MECHATRO CONTROL SYSTEM	YN21
S5YN2212E 1999-12			HYDRAULIC SYSTEM	YN22
S5YN2312E 1999-12			ELECTRICAL SYSTEM	YN23
S5YN2412E② 2002-05			COMPONENTS SYSTEM	YN24
S5YN2512E 1999-12			AIR-CONDITIONER SYSTEM	YN25
—			—	
S5YN3112E 2000-02		DISASSEMBLING	DISASSEMBLING AND ASSEMBLING	YN31
S5YN3212E① 2002-05			ATTACHMENT	YN32
S5YN3312E① 2001-06			UPPER STRUCTURE	YN33
S5YN3412E 1999-12			TRAVEL SYSTEM	YN34
S5YN4112E 2000-02		TROUBLESHOOTING	MECHATRO CONTROL	YN41
S5YN4212E 1999-12			HYDRAULIC	YN42
S5YN4312E 2000-02			ELECTRICAL	YN43
S5YN4412E 1999-12			ENGINE	YN44
S5YN5112E 2000-02		E/G	ENGINE	YN51
S5YN6301E 2000-09		OPT.	MOUNTING THE BREAKER AND NIBBLER & BREAKER	YN63
YN07-30001~ YQ07-03501~			APPLICABLE MACHINES	

KOBELCO

Book code No.

S5 YN01 12E

SHOP MANUAL

SK200(LC)VI

SK210(LC)VI **YN01**

SK210NLCVI

OUTLINE

TABLE OF CONTENTS

1. GENERAL PRECAUTIONS FOR MAKING REPAIRS 1
2. ESCAPING PROCEDURE IN CASE OF EMERGENCY 4
3. INTERNATIONAL UNIT CONVERSION SYSTEM 5

KOBELCO CONSTRUCTION MACHINERY CO., LTD.

Applicable Machines
YN07-30001~
YQ07-03501~

Revision	Date of Issue	Remarks
First edition	December, 1999	S5YN0112E K

1. GENERAL PRECAUTIONS FOR MAKING REPAIRS



1.1 PREPARATION BEFORE DISASSEMBLING

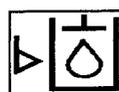
- (1) Knowledge of operating procedure
Read Operator's Manual carefully to understand the operating procedure.
- (2) Cleaning machines
Clean machines of soil, mud, and dust before carrying into the service shop.
Carrying a soiled machine into the service shop, causes making less efficient work and damage of parts, and interferes with rust prevention and dust protection while reassembling.
- (3) Inspecting machines
Confirm the disassembling section before starting work, determine the disassembly procedure taking the conditions in work shop into account, and request to procure necessary parts in advance.
- (4) Recording
Record the following items to keep contact and prevent malfunction from recurring.
 - 1) Inspecting date, place
 - 2) Model name, Applicable machine No., Records on hour meter
 - 3) Trouble condition, place, cause
 - 4) Visible oil leakage, water leakage and damage
 - 5) Clogging of filters, etc., oil level, oil quality, oil contamination and looseness which can be inspected.
 - 6) Examine the problems on the basis of operation rate with the last inspection date and records on hour meter.
- (5) Arrangement and cleaning in service shop
 - 1) Tools required for repair work.
 - 2) Specify places to put the disassembled parts on in advance.
 - 3) Prepare oil pans for leaking oil, etc.



1.2 SAFETY WHEN DISASSEMBLING AND ASSEMBLING

- (1) Safety
 - 1) Wear appropriate clothing, safety shoes, safety helmet, goggles, and clothes with long sleeves.
 - 2) Suspend warning tag "Don't operate" from lever, and begin preliminaries before getting down to work.
 - 3) Before starting inspection and maintenance which contain the danger of being caught in machine, stop the engine.

- 4) Confirm the position of first-aid kit and fire extinguisher, and also where to make contact for emergency measure and ambulance to prepare for accidents and fire.
- 5) Choose a hard, flat and safe place, and put attachment on the ground without fail.
- 6) Use crane, etc. to remove parts of heavy weight (20kg [44 lbs] or more).
- 7) Use proper tools, and change or repair defective tools.
- 8) Machine and attachment required to work in the lifting condition should be supported with supports or blocks securely.



1.3 DISASSEMBLING AND ASSEMBLING HYDRAULIC EQUIPMENT

- (1) Removing hydraulic equipment assy
 - 1) Before removing pipes, release the pressure of hydraulic oil tank, or open the cover on the return side to tank, and take out the filter.
 - 2) Put the oil in the removed pipes in reservoir taking care it is not spilled on the ground.
 - 3) Pipes with plugs or caps to prevent oil leaking, entry of dust, etc.
 - 4) Clean the outside surface of equipment, etc. before disassembling, and drain hydraulic oil and gear oil before putting them on working bench.
- (2) Disassembling hydraulic equipment
 - 1) Since performance and function of hydraulic equipment after disassembly and assembly results in immunity from responsibility on the manufacture's side, disassembly, assembly and conversion without permission are strictly prohibited.
 - 2) If it is unavoidably necessary to disassemble and convert, it should be carried out by experts or personnel authorized through service training.
 - 3) Make match mark on parts for reassembling.
 - 4) Before disassembling, read Disassembling Instruction in advance, and determine if the disassembly and assembly are permitted or not.
 - 5) For parts which are required to use jig and tools, don't fail to use the specified jig and tools.
 - 6) For parts which can not be removed in the specified procedure, never force removal. First check for the cause.

- 7) The removed parts should be put in order and tagged so as to install on proper places without confusion.
- 8) For common parts, pay attention to the quantity and places.
- (3) Inspecting parts
 - 1) Check that the disassembled parts are free from adherence, interference and non-uniform working face.
 - 2) Measure the wear of parts and clearance, and record the measured values.
 - 3) If an abnormality is detected, repair or replace the parts.
- (4) Reassembling hydraulic equipment
 - 1) Before cleaning, turn the fun on or open doors to ventilate air.
 - 2) Before assembly, clean parts roughly first, and then completely.
 - 3) Remove with oil by compressed air, and apply hydraulic oil or gear oil, and then assemble them.
 - 4) Replace the removed O ring, back-up rings and oil seal with new ones, and apply grease oil on them before assembling.
 - 5) Removes stain and water on the surface on which liquid sealant are applied, decrease them, and apply liquid sealant on them.
 - 6) Before assembling, remove rust preventives on new parts.
 - 7) Use special tools to fit bearings, bushing and oil seal.
 - 8) Assemble parts matching to the marks.
 - 9) After completion, check that there is no omission of parts.
- (5) Installing hydraulic equipment
 - 1) Confirm hydraulic oil and lubrication oil.
 - 2) Air release is required in the following cases ;
 - a. Change of hydraulic oil
 - b. Replacement of parts on suction pipe side
 - c. Removing and attaching hydraulic pump
 - d. Removing and attaching swing motor
 - e. Removing and attaching travel motor
 - f. Removing and attaching hydraulic cylinder

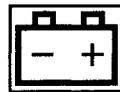
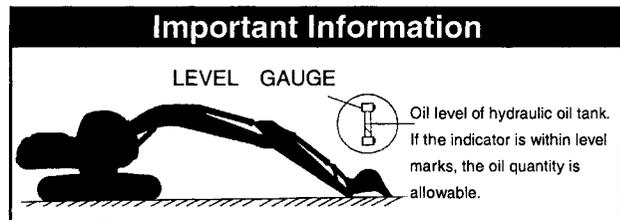
⚠ If hydraulic oil and lubricating oil are not filled and also air bleed is not performed, the hydraulic equipment may be damaged.

- 3) For air bleed of hydraulic pump and swing motor, loosen drain plug on the upper part, start engine, and run in low idling, then bleed air until hydraulic oil is oozed out. After completion of air bleed, tighten plug securely.
- 4) For air bleed of travel motor and hydraulic cylinder, starts engine and operate it for 10 minutes or more at no-load and low speed.

⚠ For cylinder, don't move it to the stroke end at beginning.

- 5) Air in pilot circuit can be bled out by only operating digging, swing and traveling motions thoroughly.
- 6) Check hydraulic oil level.
Move attachments to hydraulic oil check position, and check hydraulic oil level of tank. Refill oil if the oil level is lower than the minimum level.

How to check oil level of hydraulic oil tank



1.4 ELECTRICAL EQUIPMENT

- (1) The disassembly of electrical equipment is not allowed.
- (2) Handle equipment with care so as not to drop it or bump it.
- (3) Connector should be removed by unlocking while holding the connector.
Never stress in tension to the caulked section by pulling wire.
- (4) Check that connector is connected and locked completely.
- (5) Starter key off before removing and connecting connector
- (6) Starter key off before touching terminals of starter and alternator.
- (7) Remove battery grounding terminal before beginning work close to battery and battery relay with tools.
- (8) Wash machine with care so as not to splash water on electrical equipment and connector.

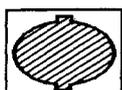
- (9) When water has entered in the waterproofed connector, the removing of water is not easy. So check the removed waterproofed connector with care to protect it from entry of water. If moisture adheres on it, dry it completely before connecting.



Battery electrolyte is dangerous.

The battery electrolyte is dilute sulfuric acid, and causes scald and loss of eyesight by adhering on eyes, skin and clothes. When the electrolyte has adhered on them, take an emergency measure immediately and see a doctor for medical advice.

- When it has adhered on skin ;
Wash with soap and water.
- When it has got in eyes ;
Wash in water for 10 minutes or more immediately.
- When it has spilled out in large quantity ;
Use sodium bicarbonate to neutralize, or wash away with water.
- When it was swallowed ;
Drink milk or water.
- When it has adhered on clothes ;
Wash it immediately.



1.5 HYDRAULIC PARTS

1) O ring

- Check that O ring is free from flaw and has elasticity before fitting.
- Even if the size of O ring is equal, the usage differs, for example in dynamic and static sections, the rubber hardness also differs according to the pressure force, and also the quality differs depending on the materials to be seated. So, choose proper O ring.
- Fit O ring so as to be free from distortion and bend.
- Floating seal should be put in pairs.

2) Flexible hose (F hose)

- Even if the connector and length of hose are the same, the parts differ according to the withstanding pressure. Use proper parts.

- Tighten it to the specified torque, and check that it is free from distortion, over tension, interference, and oil leakage.

1.6 WELD REPAIR

- (1) The weld repair should be carried out by authorized personnel in the specified procedure after disconnecting the grounding cable of battery. If the grounding cable is not disconnected, the electrical equipment may be damaged.
- (2) Remove parts which may cause flame due to the entry of spark beforehand.
- (3) Repair attachments which are damaged, giving particular attention to the plated section of piston rod to protect it from sparks, and don't fail to cover the section with fire clothes.

1.7 ENVIRONMENTAL ISSUES

- (1) Engine should be started and operated in the place where air can be sufficiently ventilated.
- (2) Industrial waste disposal
The following parts follows the regulation.
Waste oil, waste container
Battery
- (3) Asbestos parts
Breathing dust that may be generated when handling components containing asbestos fibers raises danger of getting lung cancer.
Don't raise dust by compressed air and breath it.

Parts to be handled with care :

Brake parts, gasket, etc.

(4) Precautions for handling hydraulic oil

Hydraulic oil may cause inflammation of eyes.

Wear goggles to protect eyes on handling it.

- When it has got in eyes ;
Wash eyes with water until the stimulus is gone.
- When it was swallowed ;
Don't force him to vomit it, but immediately receive medical treatment.
- When it has adhered on skin ;
Wash with soap and water.

(5) Others

For spare parts, grease and oil, use KOBELCO genuine ones.

2. ESCAPING PROCEDURE IN CASE OF EMERGENCY

2.1 WHEN CAB DOOR DOES NOT OPEN ;

- (1) Escape from the front window.
- (2) Escape from skylight.
- (3) When front window and skylight do not open ;
A life hammer is provided on the right-hand side of the cab at all times. Escape by breaking the glass at the escape label (seal mark) at the back of the cab.

⚠ Break the window glass with care to protect eyes, and don't fail to break the window on which label "Emergency exit" is stuck.

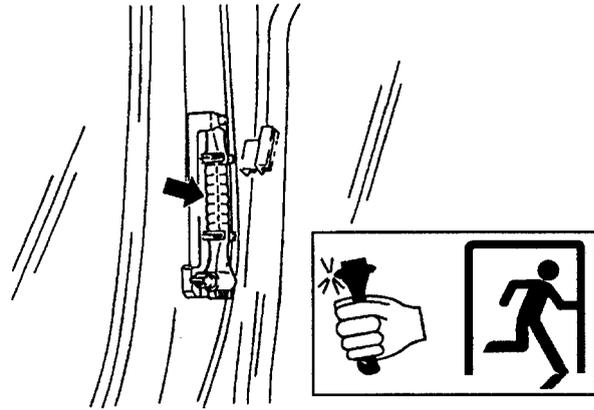


Fig. 2-1 Life hammer and "Emergency Exit" seal

2.2 WHEN IT IS IMPOSSIBLE TO GO OUT FROM THE SOFT GROUND BY ITSELF ;

- (1) Towing by other machine
There are holes to pass through shackle on the front and rear sides of track frame as in the right figure. Tow it with shackle and wire rope passing through those holes.

Wire dia ; $\text{Ø}26(1.024") \times 4\text{m}(13'1")$ or more

⚠ Before starting towing, keep away from the wire rope between two machines, and move it slowly at low speed.

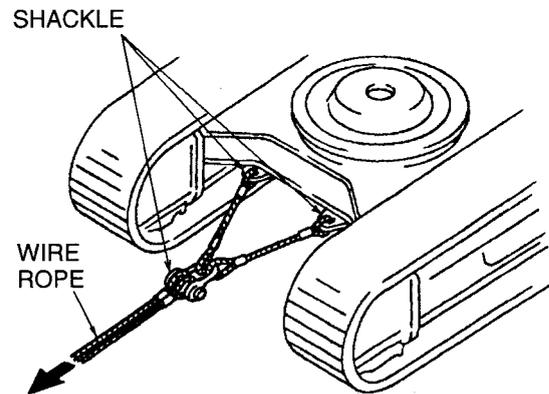


Fig. 2-2 Towing by track frame

3. INTERNATIONAL UNIT CONVERSION SYSTEM

Introduction

Although this manual uses the JIS unit system. If you need SI unit, refer to following international system of units.

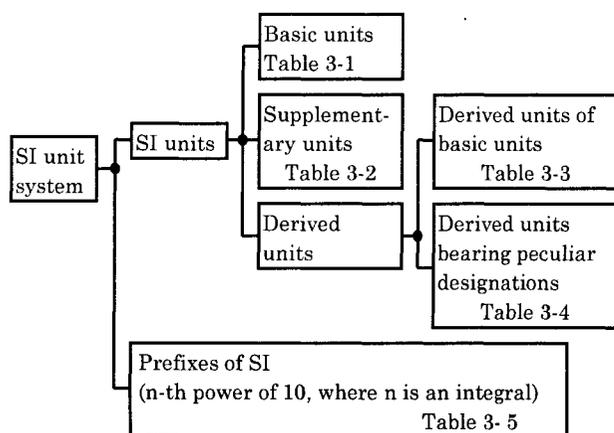
Given hereinunder are an excerpt of the units that are related to this manual :

1. Etymology of SI Units

French : Le Système International d' Unitès

English: International System of Units

2. Construction of SI Unit System



(1) Basic Units

Table 3-1

QUANTITIES	DESIGNATION	SIGN
Length	Meter	m
Mass	Kilogram	kg
Time	Second	s
Current	Ampere	A
Thermodynamic temperature	Kelvin	K
Gram molecule	Mol	mol
Luminous intensity	Candela	cd

(2) Supplementary Units

Table 3-2

QUANTITIES	DESIGNATION	SIGN
Plane angle	Radian	rad
Solid angle	Steradian	sr

(3) Derived Units of Basic Units

Table 3-3

QUANTITIES	DESIGNATION	SIGN
Area	Square meter	m ²
Volume	Cubic meter	m ³
Velocity	Meter per second	m/s
Acceleration	Meter per second / second	m/s ²
Density	Kilogram per cubic meter	kg/m ³

(4) Derived Units bearing Peculiar Designations

Table 3-4

QUANTITIES	DESIGNATION	SIGN	DERIVED UNIT
Frequency	Hertz	Hz	1Hz=1s ⁻¹
Force	Newton	N	1N=1kgf·m/s ²
Pressure, Stress	Pascal	Pa	1Pa=1N/m ²
Energy, Work, Quantity of heat	Joule	J	1J=1N·m
Power, Motive power, Electric power	Watt	W	1W=1J/s
Charge, Quantity of electricity	Coulomb	C	1C=1A·s
Potential, Voltage, Electromotive force	Volt	V	1V=1J/C (1W/A)
Quantity of static electricity, Capacitance	Farad	F	1F=1C/V
Electric resistance	Ohm	Ω	1Ω=1V/A
Celcius temperature	Celcius degree or degree	°C	t°C=(t+273.15)K
Illuminance	lux	lx	1lx=1lm/m ²

(5) Prefixes of SI

Table 3-5

PREFIX		POWER
DESIGNATION	SIGN	
Giga-	G	10 ⁹
Mega-	M	10 ⁶
Kilo-	k	10 ³
Hecto-	h	10 ²
Deca-	da	10
Deci-	d	10 ⁻¹
Centi-	c	10 ⁻²
Milli-	m	10 ⁻³
Micro-	μ	10 ⁻⁶
Nano-	n	10 ⁻⁹
Pico-	p	10 ⁻¹²

(6) Unit Conversion Table

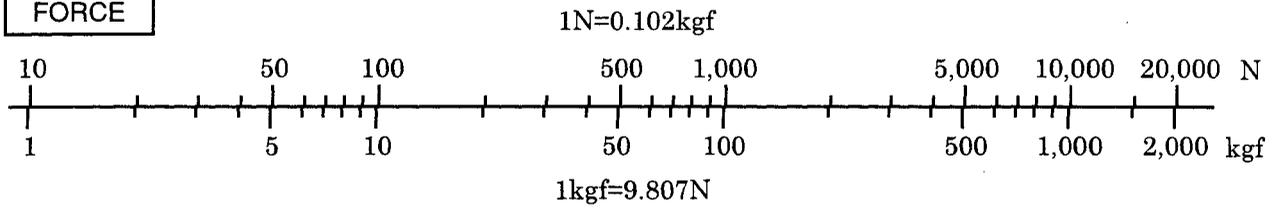
Table 3-6

QUANTITIES	JIS	SI	REMARKS
Mass	kgf	kg	
Force	kgf	N	1kgf=9.807N
Torque	kgf·m	N·m	kgf·m=9.807N·m
Pressure	kgf/cm ²	MPa	1kgf/cm ² =0.098MPa
Motive power	PS	kW	1PS=0.7355kW
Revolution	rpm	min ⁻¹	r/min ※1

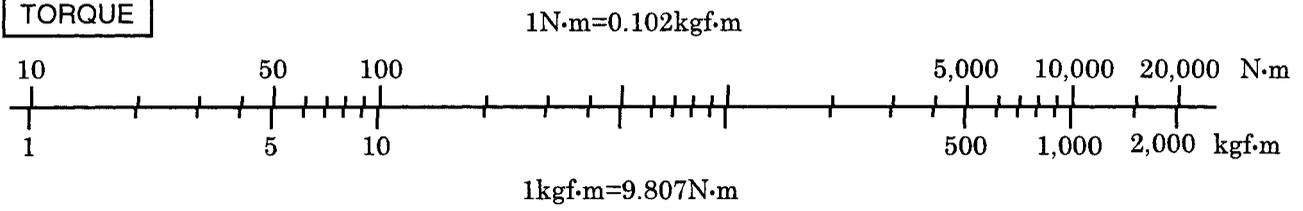
※1 Units that are allowed to use

(7) Unit conversion logarithmic chart

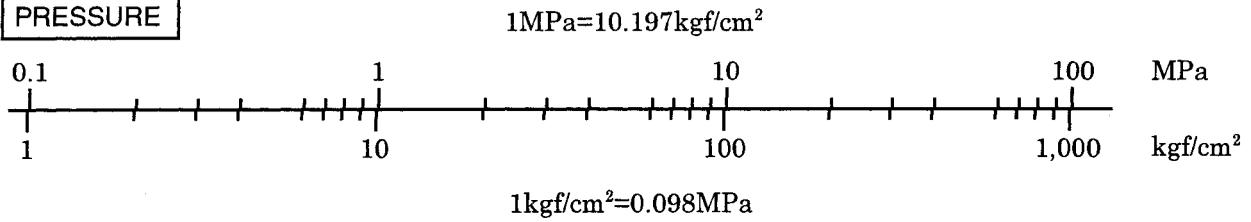
FORCE



TORQUE



PRESSURE



KOBELCO

Book code No.

S5 YN02_{12E}

SHOP MANUAL

SK200(LC)VI

SK210(LC)VI

SK210NLCVI

YN02

SPECIFICATION

TABLE OF CONTENTS

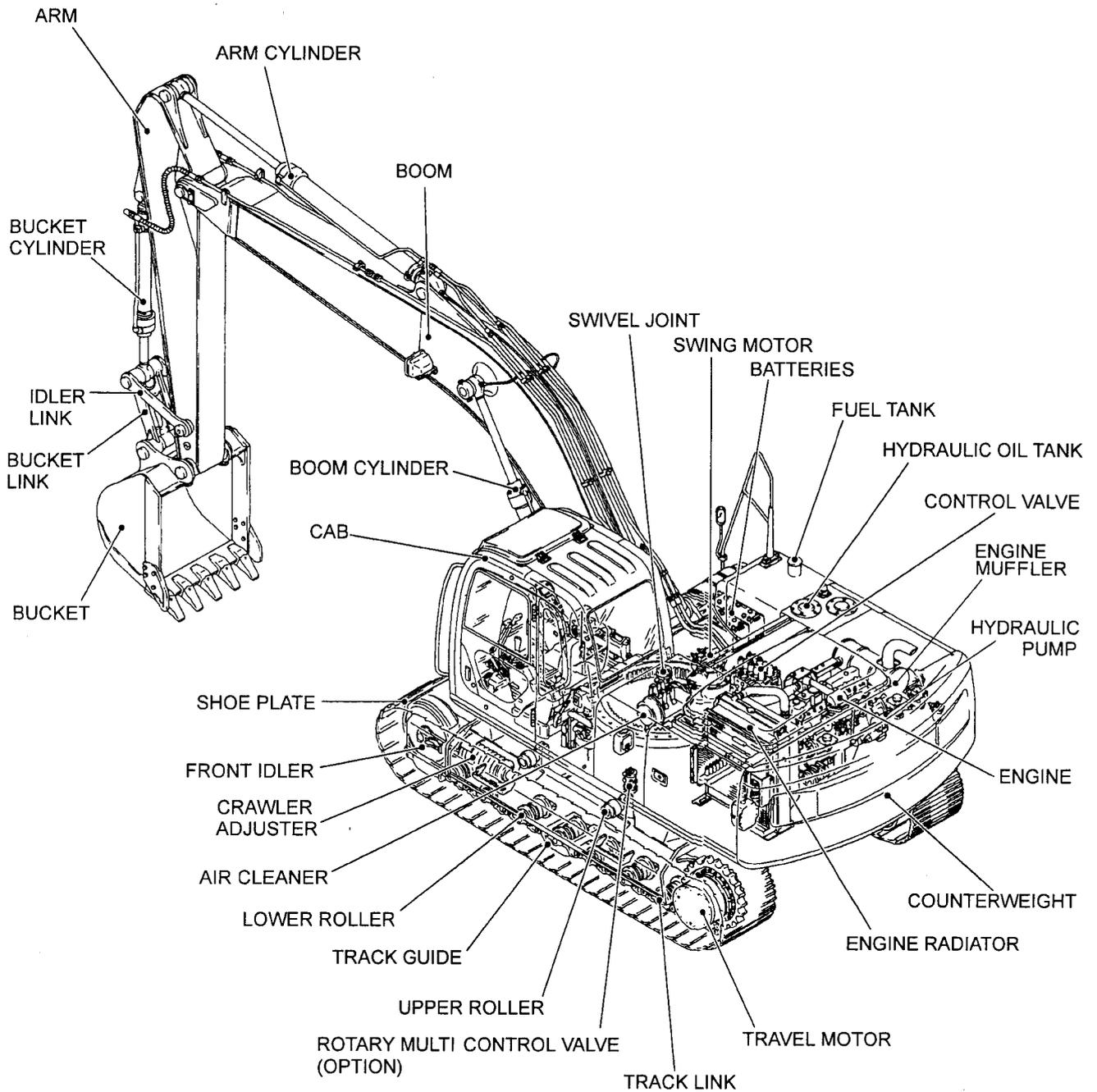
1. NAME OF COMPONENTS	1
2. GENERAL DIMENSIONS	2
3. WEIGHT OF COMPONENTS	4
4. TRANSPORTATION	5
5. MACHINE LIFTING PROCEDURE	8
6. WORKING RANGE	11
7. LIFTING DIAGRAM	16
8. SPECIFICATIONS AND PERFORMANCE	25
9. TYPE OF CRAWLER	26
10. TYPE OF BUCKET	27
11. COMBINATIONS OF ATTACHMENT	28
12. ENGINE SPECIFICATIONS	29

KOBELCO CONSTRUCTION MACHINERY CO., LTD.

Applicable Machines
YN07-30001~
YQ07-03501~

Revision	Date of Issue	Remarks
First edition	February, 2000	S5YN0212E K

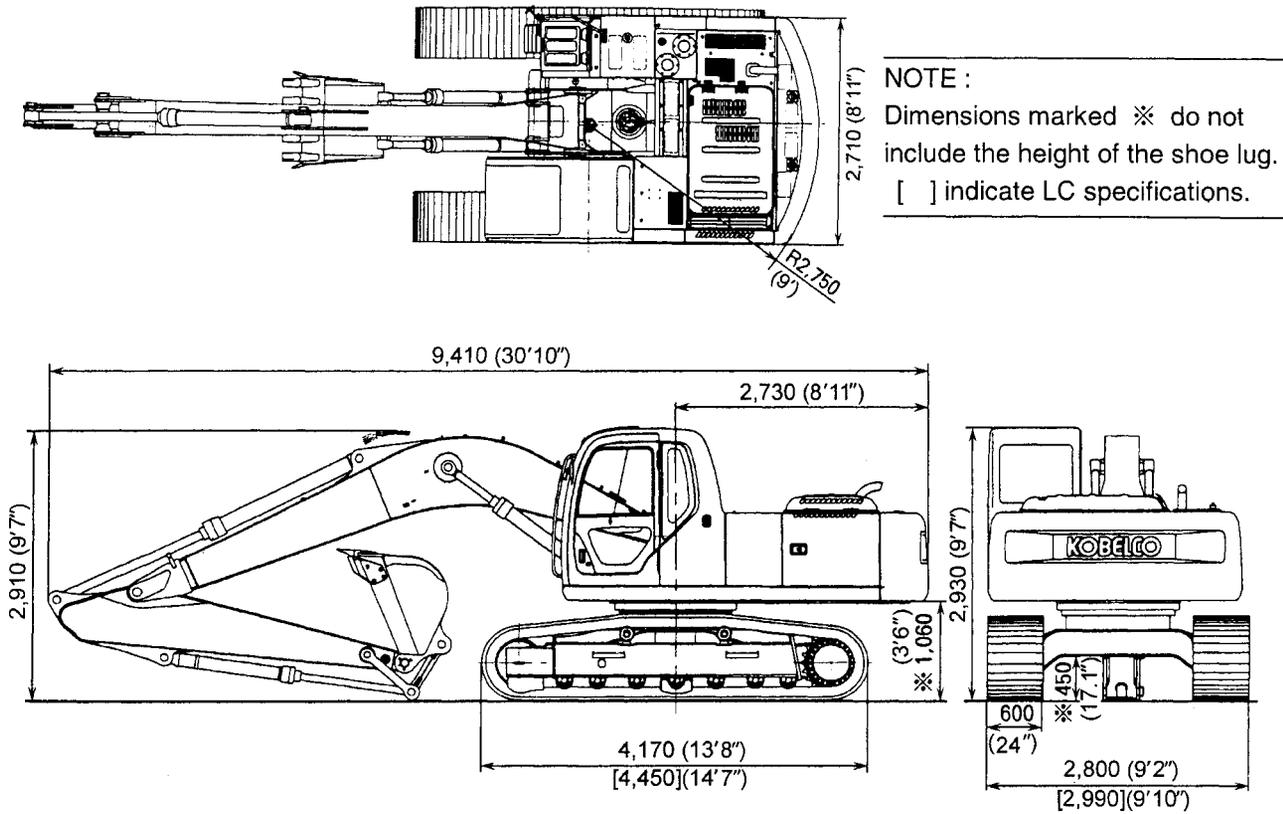
1. NAME OF COMPONENTS



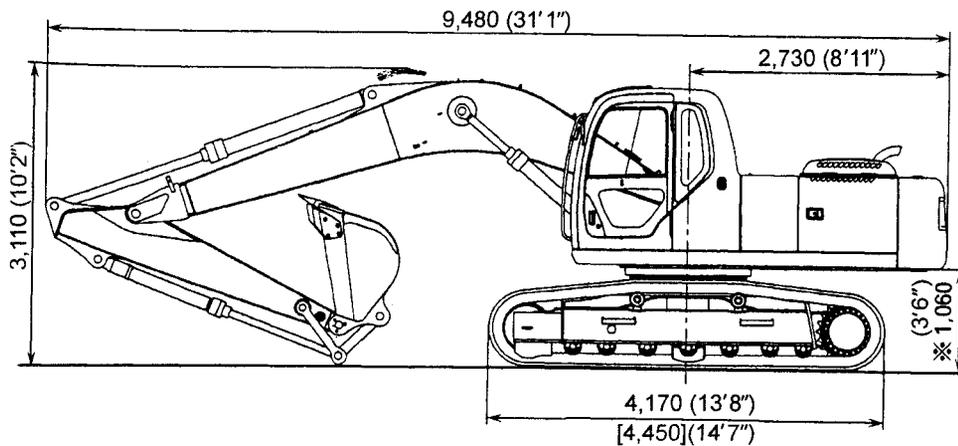
2. GENERAL DIMENSIONS

Unit : mm (ft-in)

2.1 5.65m (18' 6") Boom+2.94m (9' 8") Standard Arm+0.80m³ (1.05cu.yd) Bucket+600mm (24") Shoe

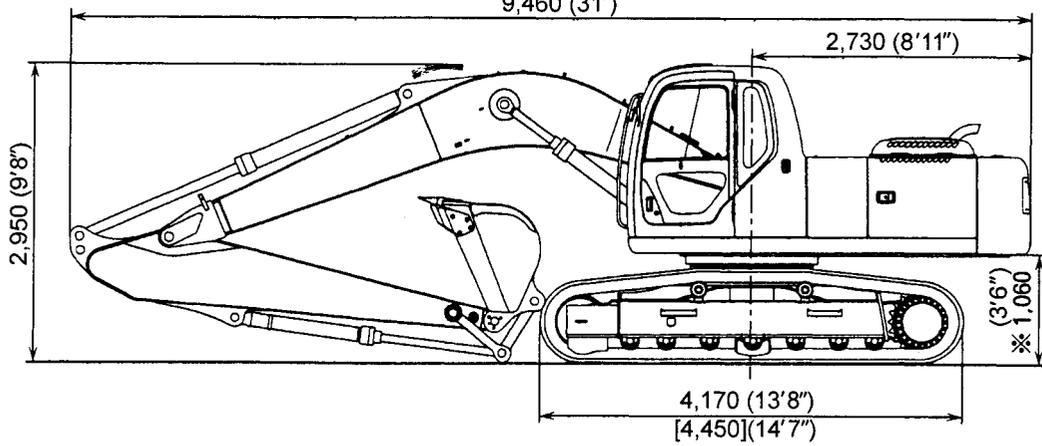


2.2 5.65m (18' 6") Boom+2.4m (7' 10") Short Arm+0.93m³ (1.22cu.yd) Bucket+600mm (24") Shoe

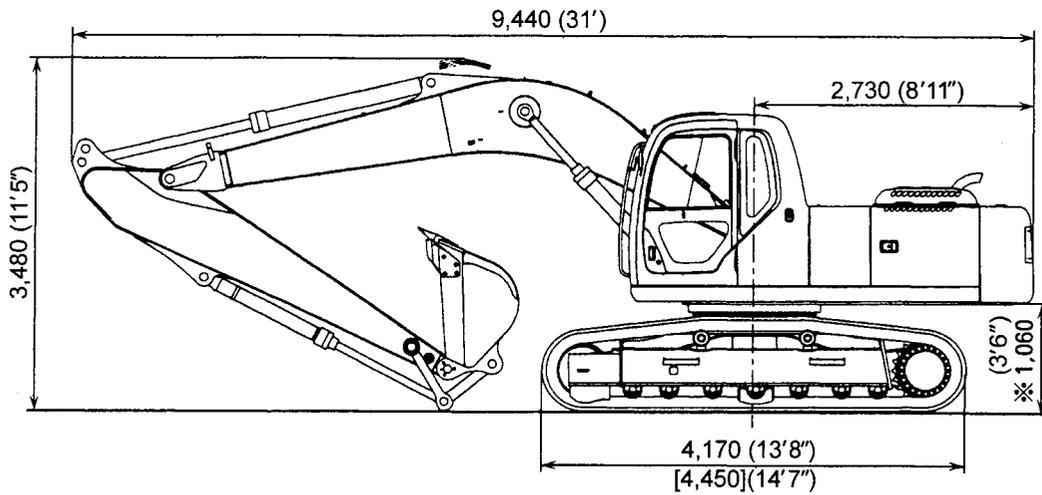


Unit : mm (ft-in)

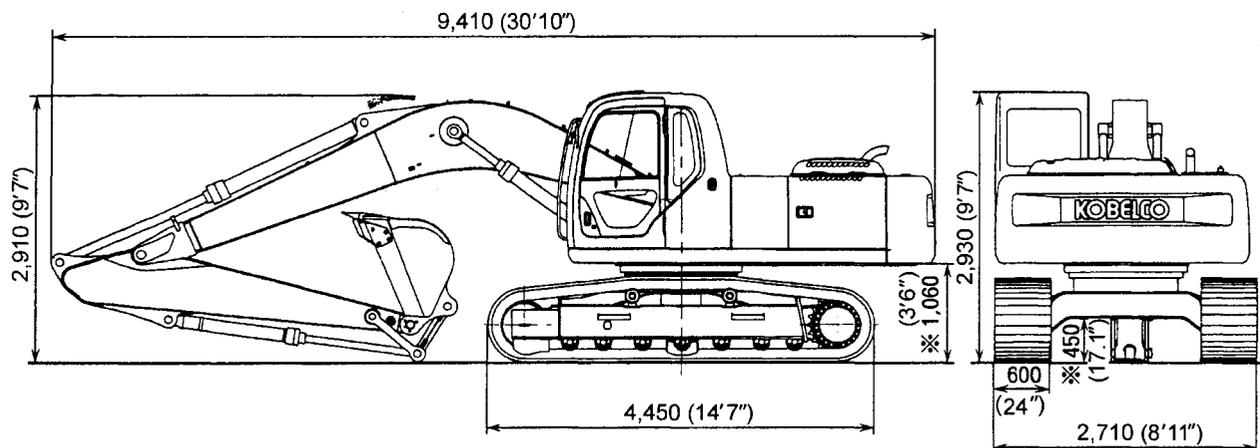
2.3 5.65m (18' 6") Boom+3.3m (10' 10") Long Arm+0.70m³ (0.92cu-yd) Bucket / Transportation Position



2.4 5.65m (18' 6") Boom+3.3m (10' 10") Long Arm+0.70m³ (0.92cu-yd) Bucket / Working Position



2.5 SK210NLCVI ; 5.65m (18' 6") Boom+2.94m (9' 8") Arm



3. WEIGHT OF COMPONENTS

Unit : kg (lbs)

Item	Model	SK200VI	SK210LCVI	SK210NLCVI
Machine complete		20,000 (44,100)	20,500 (45,200)	←
1. Upper frame assy (including the following :)		9,400 (20,720)	←	←
1.1 Upper frame		1,700 (3,750)	←	←
1.2 Counterweight		4,500 (9,920)	←	←
1.3 Cab		260 (570)	←	←
1.4 Engine		※ 470 (1,040)	←	←
1.5 Hydraulic oil tank		※ 143 (310)	←	←
1.6 Fuel tank		※ 91 (200)	←	←
1.7 Slewing motor (including reduction unit)		235 (520)	←	←
1.8 Control valve		280 (620)	←	←
1.9 Boom cylinder		※ 168 (370)×2	←	←
1.10 Pin (for mounting boom)		26 (57)	←	←
1.11 Pump		142 (313)	←	←
1.12 Radiator		97 (214)	←	←
2. Lower frame assy (including the following :)		7,000 (15,400)	7,500 (16,500)	←
2.1 Lower frame		2,450 (5,400)	←	←
2.2 Slewing bearing		245 (540)	←	←
2.3 Travel motor (including reduction unit)		250 (550)×2	←	←
2.4 Upper roller		22 (49)×4	←	←
2.5 Lower roller		35 (77)×14	35 (77)×16	←
2.6 Front idler		106 (234)×2	←	←
2.7 Idler adjuster		150 (331)×2	←	←
2.8 Sprocket		54 (119)×2	←	←
2.9 Swivel joint		30 (66)	←	←
2.10 Track link with 600mm (24in) shoes assy		1,260 (2,780)×2	1,350 (2,980)×2	←
Track link with 700mm (28in) shoes assy		1,470 (3,240)×2	1,560 (3,440)×2	←
Track link with 800mm (32in) shoes assy		1,600 (3,530)×2	1,700 (3,750)×2	←
Track link with 600mm (24in) with flat shoes assy		1,510 (3,330)×2	1,600 (3,530)×2	←
2.10.1 Track link assy		510 (1,120)×2	540 (1,190)×2	←
3. Attachment (including the following / STD :) (5.65m (18ft-6in) Boom+2.94m (9ft-8in) Arm +0.80m ³ (1cu.yd) Bucket)		3,300 (7,280)	←	←
3.1 Bucket assy (STD)		650 (1,430)	←	←
3.2 STD Arm assy (including the following :)		980 (2,160)	←	←
3.2.1 STD Arm		610 (1,345)	←	←
3.2.2 Bucket cylinder		※ 135 (300)	←	←
3.2.3 Idler link		21 (46)×2	←	←
3.2.4 Bucket link		91 (200)	←	←
3.2.5 Pin (2pcs. for mounting bucket cylinder / 2pcs. for mounting bucket)		70 (154)	←	←
3.3 Boom assy		1,650 (3,640)	←	←
3.3.1 Boom		1,320 (2,910)	←	←
3.3.2 Arm cylinder		※ 230 (510)	←	←
3.3.3 Pin (Mounting arm • Mounting arm cylinder)		52 (115)	←	←
4. Lubricant and water (including the following :)		540 (1,190)	←	←
4.1 Hydraulic oil		215 (470)	←	←
4.2 Engine oil		20 (44)	←	←
4.3 Fuel		285 (630)	←	←
4.4 Water		20 (44)	←	←

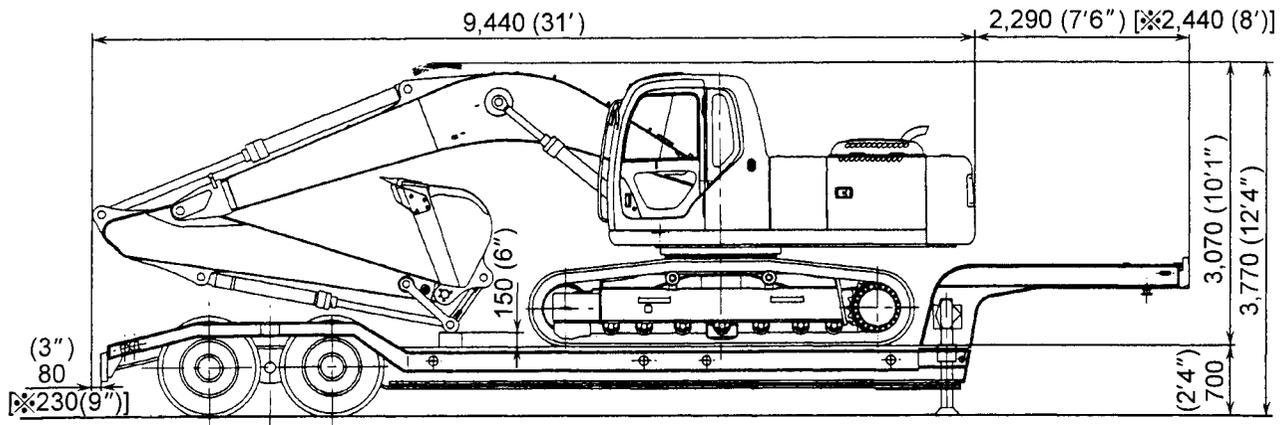
NOTE : Numerical values marked ※ indicate the dry weight.

4. TRANSPORTATION

4.1 OVERALL DIMENSIONS OF MACHINE ON A TRAILER

(1) 5.65m (18ft-6in) Boom+2.94m (9ft-8in) Arm+0.80m³ (1.05cu-yd) Bucket

Item	Model	SK200 VI	SK200Lc VI
Width 600mm (24in) shoes	mm(ft-in)	2,800 (9' 2")	2,990 (9' 6")
Weight	kg(lbs)	20,000 (44,090)	20,500 (45,200)

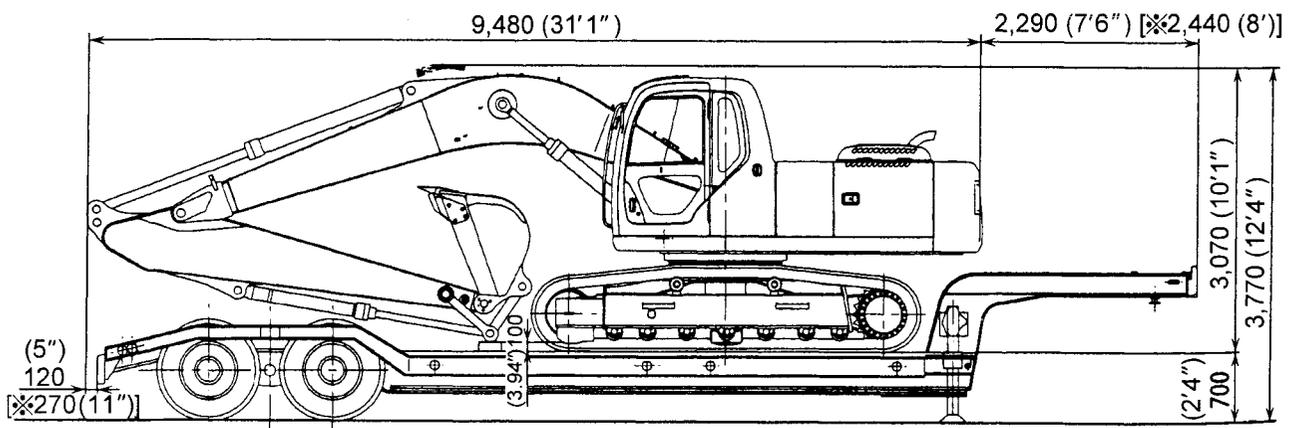


Unit : mm (ft-in)

NOTE : ※ marks indicate LC specifications.

(2) 5.65m (18ft-6in) Boom+3.3m (10ft-10in) Long Arm+0.70m³ (0.92cu-yd) Bucket

Item	Model	SK200 VI	SK200Lc VI
Width 600mm (24in) shoes	mm(ft-in)	2,800 (9' 2")	2,990 (9' 6")
Weight	kg(lbs)	21,000 (46,300)	20,600 (45,400)



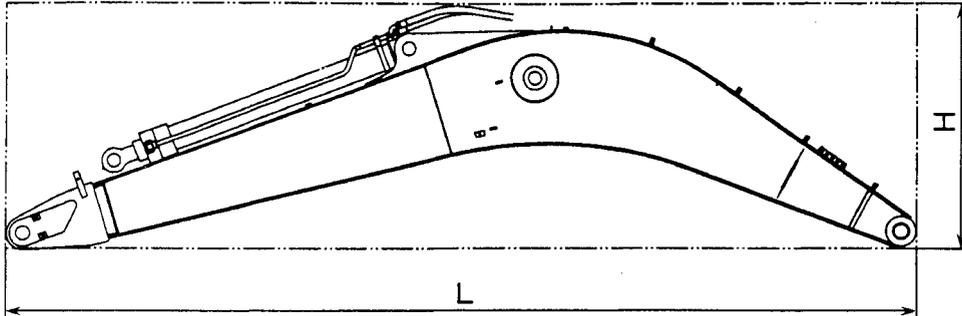
Unit : mm(ft-in)

NOTE : ※ marks indicate LC specifications.

4.2 DIMENSIONS OF ATTACHMENT

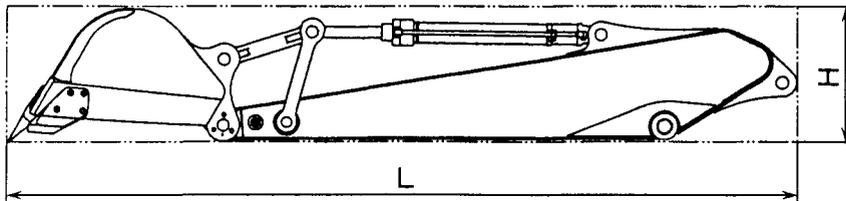
(1) BOOM

Item	Type	5.65m (18ft-6in) Boom	5.65m (18ft-6in) Boom (HD)
Length×Height×Width L×H×W	m(ft-in)	5.85×1.57×0.675 (19' 2"×5' 2"×2' 3")	5.85×1.57×0.675 (19' 2"×5' 2"×2' 3")
Weight	kg (lbs)	1,500 (3,310)	1,650 (3,640)



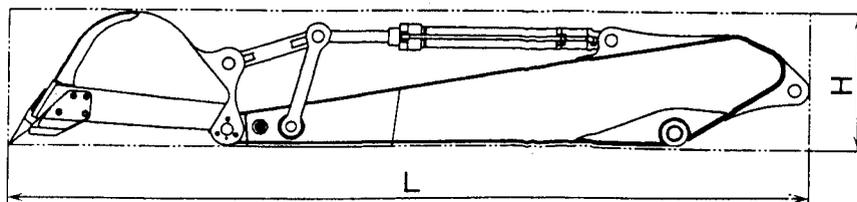
(2) ARM AND BUCKET

Item	Type	2.4m (7ft-10in) Arm +0.93m ³ (1.22cu.-yd) Bucket	2.94m (9ft-8in) Arm +0.80m ³ (1.05cu.-yd) Bucket	3.3m (10ft-10in) Arm +0.70 m ³ (0.92cu.-yd) Bucket
Length×Height×Width L×H×W	m(ft-in)	4.72×0.895×1.16 (15' 6"×2' 11"×3' 10")	5.25×0.895×1.33 (17' 3"×2' 11"×4' 4")	5.70×0.895×1.08 (18' 8"×2' 11"×3' 7")
Weight	kg (lbs)	1,590 (3,500)	1,610 (3,550)	1,710 (3,770)



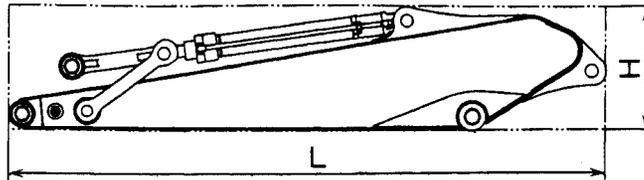
(3) ARM AND BUCKET (HD Spec.)

Item	Type	2.94m (9ft-8in) Arm+0. 80m ³ (1.05cu.-yd) Bucket
Length×Height×Width L×H×W	m(ft-in)	5.25×0.90×1.18 (17' 3"×2' 11"×3' 10")
Weight	kg (lbs)	1,750 (3,860)



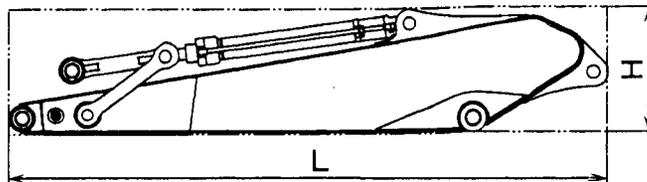
(4) ARM

Item	Type	2.4m (7ft-10in) Arm	2.94m (9ft-8in) Arm	3.3m (10ft-10in) Arm
Length×Height×Width L×H×W	m(ft-in)	3.36×0.80×0.47 (11' 0"×2' 7"×1' 7")	3.90×0.80×0.47 (12' 10"×2' 7"×1' 7")	4.35×0.80×0.47 (14' 3"×2' 7"×1' 7")
Weight	kg (lbs)	840 (1,850)	920 (2,030)	1,040 (2,290)



(5) ARM (HD Spec.)

Item	Type	2.94m (9ft-8in) Arm
Length×Height×Width L×H×W	m(ft-in)	3.90×0.80×0.50 (12' 10"×2' 7"×1' 8")
Weight	kg (lbs)	1,010 (2,230)

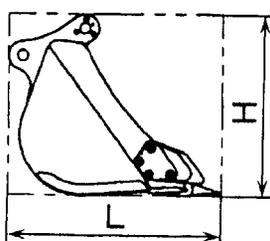


(6) BUCKET

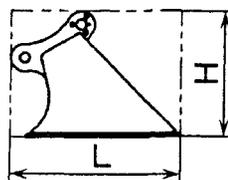
Type	Hoe bucket			
Length×Height×Width L×H×W m (ft-in)	1.37×1.26×0.87 (4' 6"×4' 2"×2' 10")	1.37×1.26×1.08 (4' 6"×4' 2"×3' 6")	1.37×1.26×1.16 (4' 6"×4' 2"×3' 10")	1.37×1.26×1.33 (4' 6"×4' 2"×4' 4")
Weight kg (lbs)	520 (1,150)	630 (1,390)	650 (1,430)	710 (1,560)
Bucket capacity m ³ (cu·yd)	0.51 (0.67)	0.70 (0.92)	STD 0.80 (1.05)	0.93 (1.22)

Type	Hoe bucket	Slope finishing bucket		
Length×Height×Width L×H×W m (ft-in)	1.37×1.26×1.16 (4' 6"×4' 2"×3' 10")	1.25×0.90×2.20 (4' 1"×2' 11"×7' 3")		
Weight kg (lbs)	730 (1,610)	890 (1,960)		
Bucket capacity m ³ (cu·yd)	0.80 (1.05) HD	0.83 (1.10)		

● Hoe bucket



● Slope finishing bucket



5. MACHINE LIFTING PROCEDURE

5.1 LIFTING PROCEDURES FOR MACHINE COMPLETE

Those who operate a crane for lifting and slinging operations must have the following qualifications :

- License for moving crane operator
- Certificate showing the receiving a cable slinging training course

! WARNING

- The cable to be used for lifting the machine should have sufficient strength against the machine weight.
- Improper lifting method and / or roping manner might cause for a movement or slip of the machine while it is lifted up, resulting serious injury or damages on the machine.
- Do not impose a load quickly on the cable and slings.
- When the lifting work is carried out in cooperation with plural persons, make sure to confirm every situations with exchanging signals with each other.
- During the lifting work, keep any persons away from around the lifting machine especially under the machine.

! WARNING

Do not use the counterweight lifting eyes to lift machine.

● PROCEDURE (WITH ATTACHMENT)

Tools name	Remarks
Cable (A)	∅33.5×15.0m 1pc.
Cable (B)	∅33.5×14.9m 1pc.
Spreader bars (C)	4.0m 2pcs.

! Lift the machine on a flat place

- 1 Operate the control levers so each attachment take the positions in the figure.
- 2 After the engine stops, confirm that there is no obstacle around the operator's seat, turn the safety lock lever to " LOCKED POSITION" and get off the machine.
- 3 Sling a cable in the position in the following figure, using a lifting tool.
- 4 Operate the crane as below :
 1. Take off.
 2. Confirm safety.
 3. Wind up.
 Land the machine on the ground gently.

NOTE :

It may be necessary to place reinforced spreader bars between lifting cables to prevent damaged to the machine during lifting. See page 8 to 10.

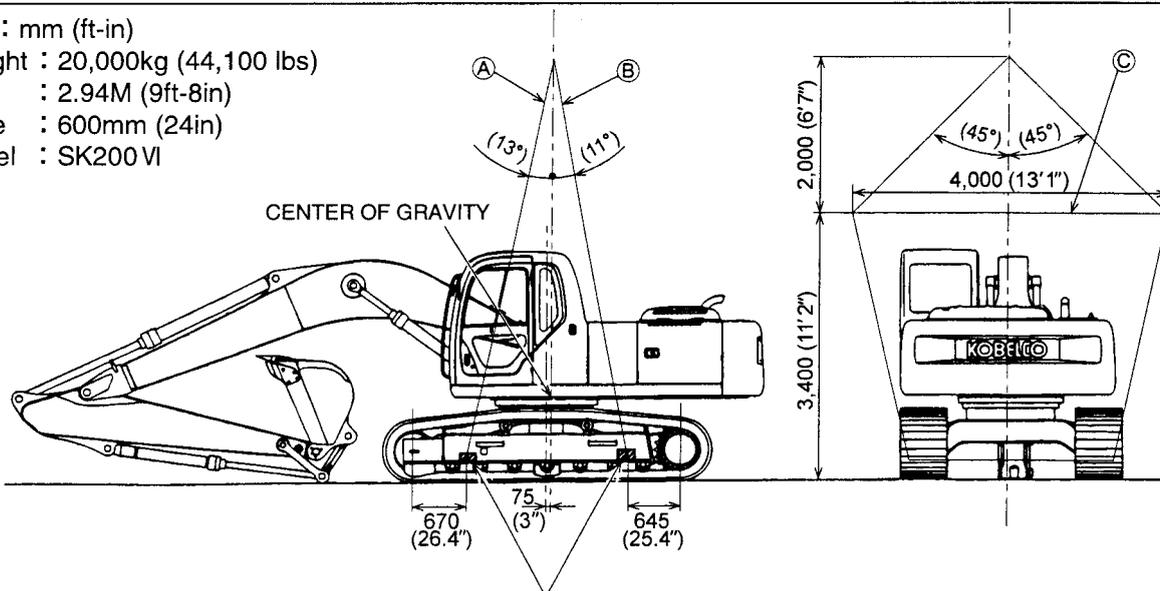
Unit : mm (ft-in)

Weight : 20,000kg (44,100 lbs)

Arm : 2.94M (9ft-8in)

Shoe : 600mm (24in)

Model : SK200 VI



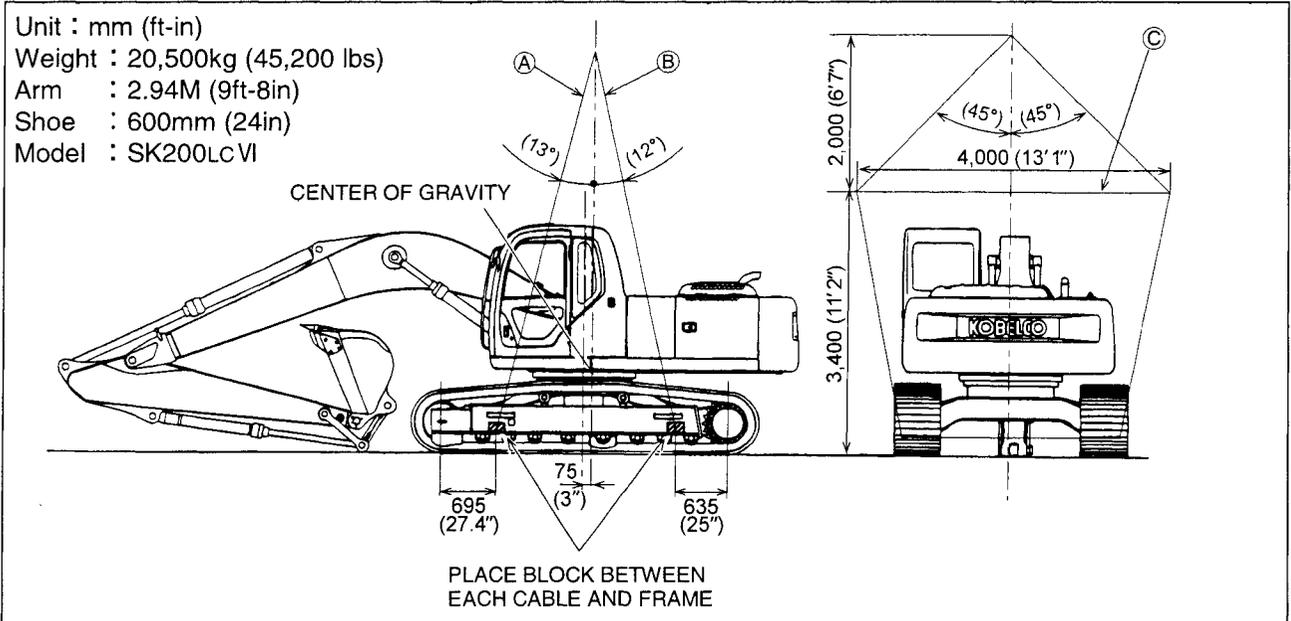
PLACE BLOCK BETWEEN EACH CABLE AND FRAME

NOTE :

Lifting machine with wider track shoes will tend to shift the Center of Gravity slightly forward, toward the center of the slewing ring.

● PROCEDURE (WITH ATTACHMENT)

Tools name	Remarks
Cable (A)	∅33.5×15.2m 1pc.
Cable (B)	∅33.5×15.1m 1pc.
Spreader bars (C)	4.0m 2pcs.

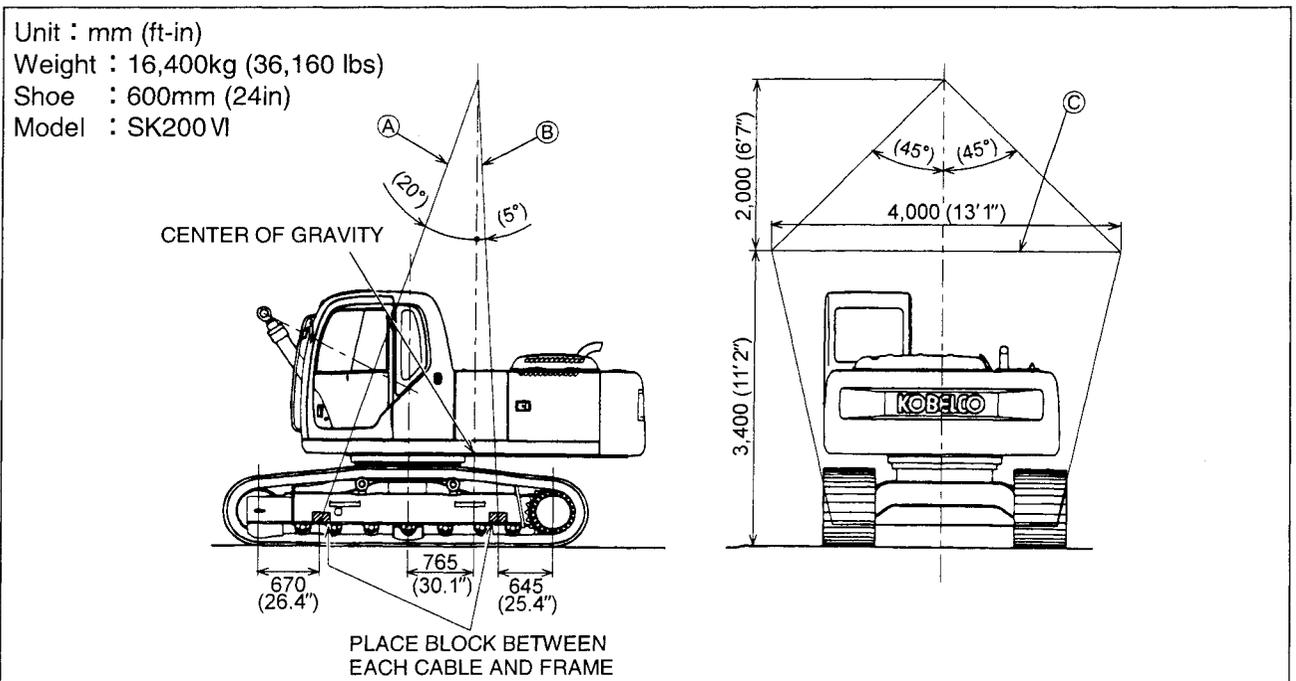


5.2 LIFTING PROCEDURES FOR MACHINE COMPLETE

Pass the cables through the lifting points on the crawlers as indicated in the figure and bring loose ends of cables together at machine center of gravity and attach to an overhead lifting device with a rated lifting capacity sufficient to lift the machine.

● PROCEDURE (WITHOUT ATTACHMENT)

Tools name	Remarks
Cable (A)	∅33.5×15.4m 1pc.
Cable (B)	∅33.5×14.7m 1pc.
Spreader bars (C)	4.0m 2pcs.



NOTE :
 Lifting machine with wider track shoes will tend to shift the Center of Gravity slightly forward, toward the center of the slewing ring.

● PROCEDURE

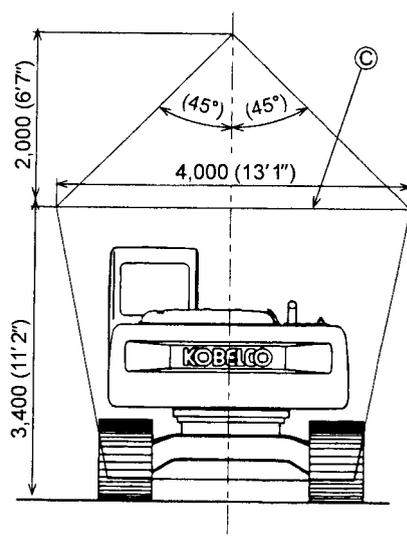
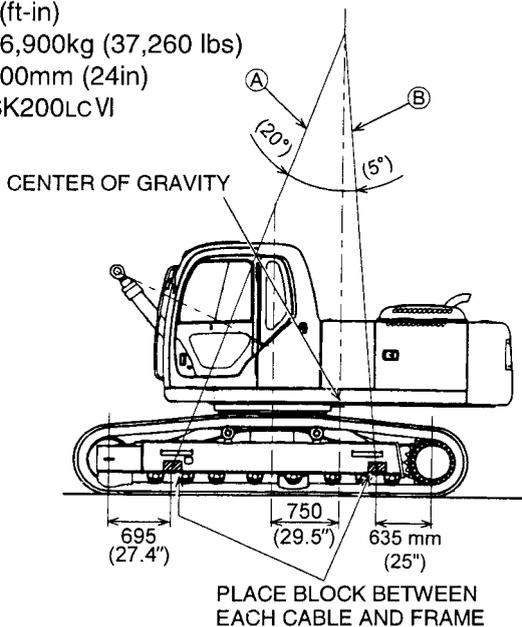
Tools name	Remarks	
Cable (A)	∅33.5×15.6m	1pc.
Cable (B)	∅33.5×14.9m	1pc.
Spreader bars (C)	4.0m	2pcs.

Unit : mm (ft-in)

Weight : 16,900kg (37,260 lbs)

Shoe : 600mm (24in)

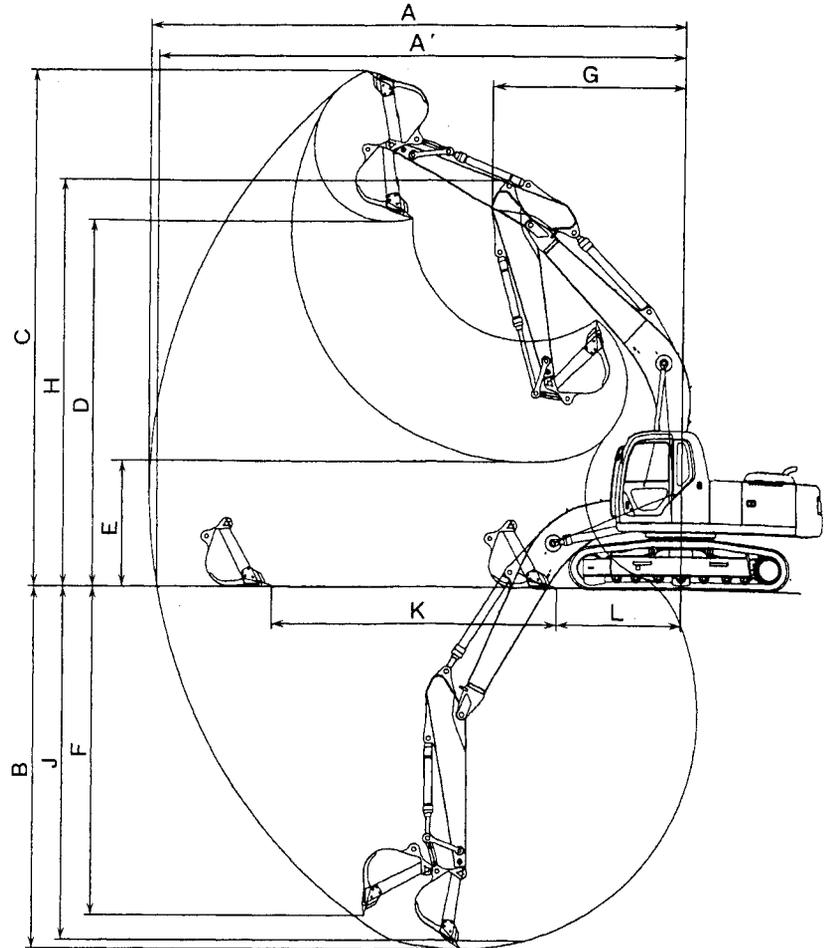
Model : SK200LC VI



6. WORKING RANGE

6.1 BACKHOE

CAUTION
 In the case of a long arm machine, do not perform digging work in its transport position ; it may cause damage to the arm and interference with the cab.



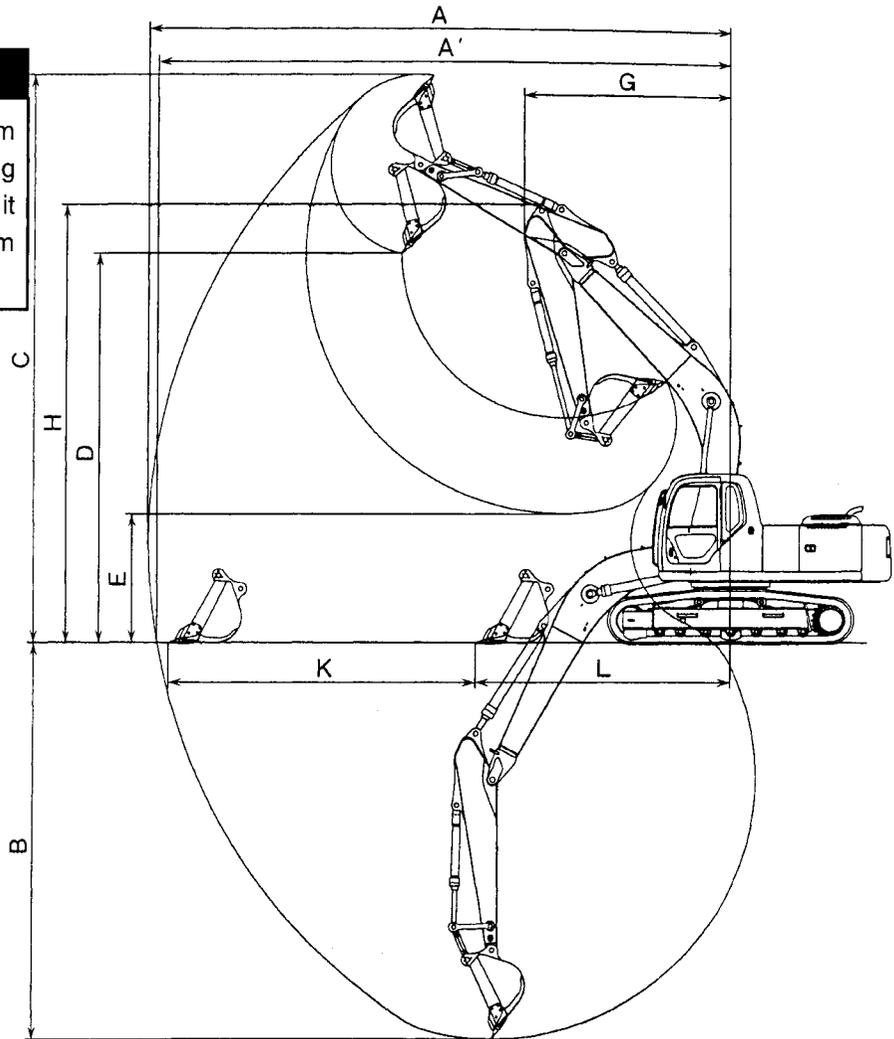
Unit :mm (ft-in)

Attachment Type		2.94m (9ft-8in) Standard Arm with 0.80m ³ (1.05cu.yd) Bucket	2.4m (7ft-10in) Short Arm with 0.93m ³ (1.22cu.yd) Bucket	3.3m (10ft-10in) Long Arm with 0.70m ³ (0.92cu.yd) Bucket	
Item					
A	Maximum digging reach	9,900 (32'6")	9,420 (30'11")	10,260 (33'8")	
A'	Maximum reach at ground level	9,750 (31'12")	9,250 (30'4")	10,100 (33'2")	
※ B	Maximum digging depth	6,700 (21'12")	6,160 (20'2")	7,090 (23'3")	
※ C	Maximum digging height	9,600 (31'6")	9,380 (30'9")	9,760 (32")	
※ D	Maximum dumping height	6,790 (22'3")	6,560 (21'6")	6,950 (22'10")	
※ E	Minimum dumping height	2,330 (7'8")	2,870 (9'5")	1,940 (6'4")	
※ F	Vertical digging depth	6,040 (19'10")	5,500 (18')	6,440 (2'1")	
G	Minimum swing radius	3,560 (11'8")	3,550 (11'8")	3,560 (11'8")	
※ H	Height at minimum swing	7,540 (24'9")	7,600 (24'11")	7,650 (25'1")	
※ J	8-foot level digging depth	6,530 (21'5")	5,960 (19'7")	6,930 (22'9")	
K	Horizontal digging	Stroke	5,270 (17'3")	4,080 (13'5")	5,530 (18'2")
L	stroke at ground level	Minimum	2,310 (7'7")	3,020 (9'11")	2,410 (7'11")

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

6.2 FACE SHOVEL

CAUTION
 In the case of a long arm machine, do not perform digging work in its transport position ; it may cause damage to the arm and interference with the cab.

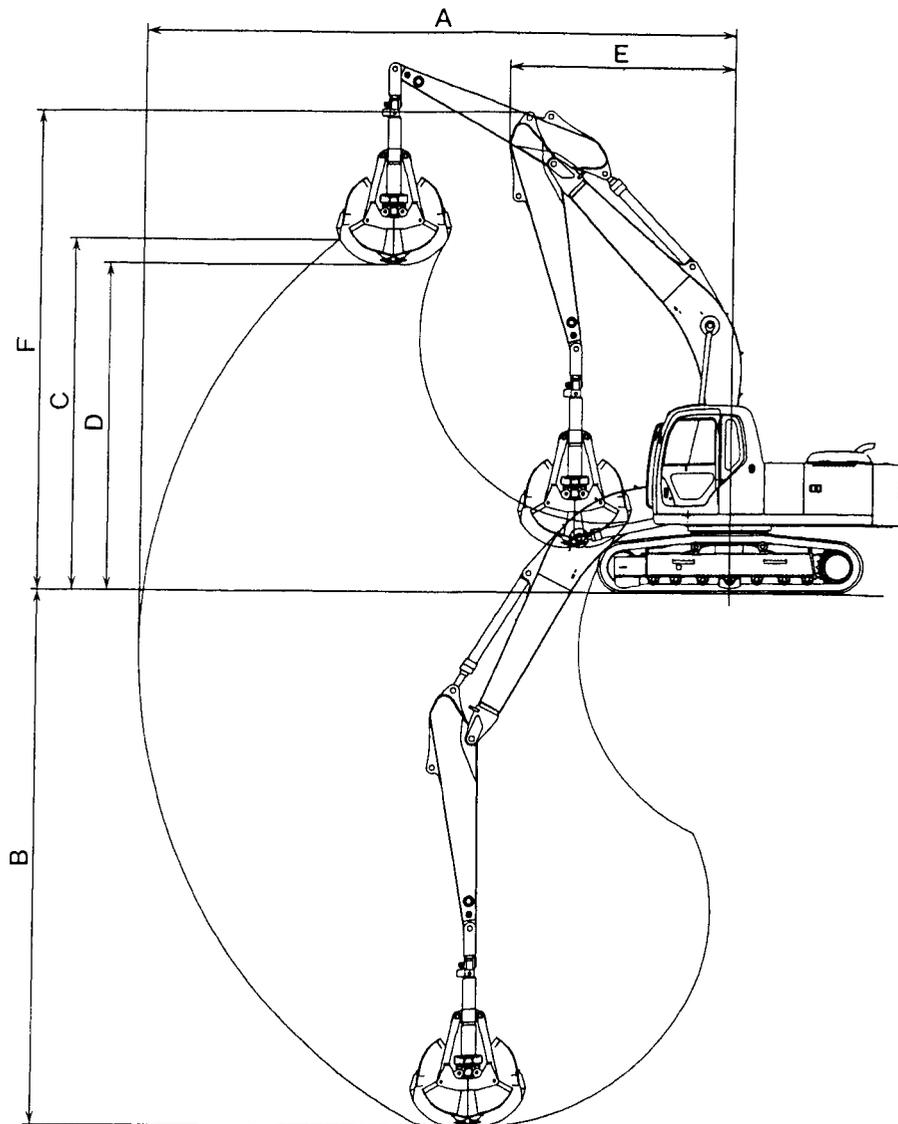


Unit :mm (ft-in)

Attachment Type		Unit :mm (ft-in)		
		2.94m (9ft-8in) Standard Arm with 0.80m ³ (1.05cu-yd) Bucket	2.4m (7ft-10in) Short Arm with 0.93m ³ (1.22cu-yd) Bucket	3.3m (10ft-10in) Long Arm with 0.70m ³ (0.92cu-yd) Bucket
Item				
A	Maximum digging reach	10,010 (32'10")	9,520 (31'3")	10,360 (33'12")
A'	Maximum reach at ground level	9,850 (22'4")	9,360 (30'8")	10,210 (33'6")
※ B	Maximum digging depth	6,800 (22'4")	6,260 (20'6")	7,190 (23'7")
※ C	Maximum digging height	9,770 (32'1")	9,540 (31'3")	9,940 (32'7")
※ D	Maximum dumping height	6,720 (22')	6,500 (21'4")	6,880 (22'7")
※ E	Minimum dumping height	2,220 (7'3")	2,760 (9'1")	1,830 (6')
G	Minimum swing radius	3,560 (11'8")	3,550 (11'8")	3,560 (11'8")
※ H	Height at minimum swing	7,540 (24'9")	7,600 (24'11")	7,650 (25'1")
K	Horizontal digging stroke at ground level	Stroke	5,300 (17'5")	4,100 (13'5")
L		Minimum	4,360 (14'4")	5,080 (16'8")

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

6.3 CLAMSHELL

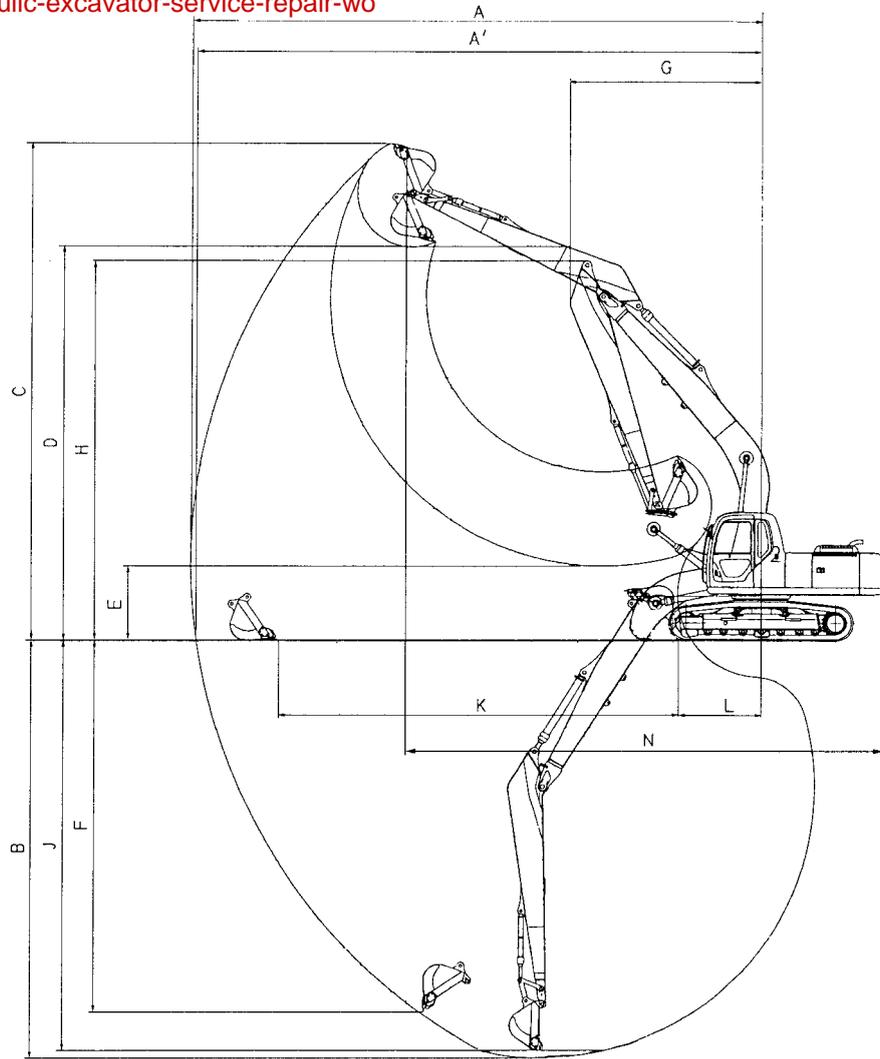


Unit :mm (ft-in)

Item	Attachment Type	2.94m (9ft-8in) Standard Arm with	2.4m (7ft-10in) Short Arm with
		0.5m ³ (0.65cu-yd) Bucket	0.5m ³ (0.65cu-yd) Bucket
A	Maximum digging reach	9,320 (30'3")	8,840 (29')
※ B	Maximum digging depth	8,360 (27'5")	7,820 (25'8")
※ C	Maximum digging height	5,540 (18'2")	5,310 (17'5")
※ D	Maximum dumping height	5,130 (16'10")	4,900 (16'1")
※ E	Minimum swing radius	3,560 (11'8")	3,550 (11'8")
※ F	Height at minimum swing	7,540 (24'9")	7,600 (24'11")

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

6.4 LONG RANGE
 6.4.1 40FT BACK HOE



Unit :mm (ft-in)

Item	Attachment Type	7.00m (23ft) Boom 4.93m (16ft-2in) Arm	+0.60m ³ (0.78cu-yd) Bucket
A	Maximum digging reach	12,850 (42'2")	
A'	Maximum reach at ground level	12,730 (41'9")	
※ B	Maximum digging depth	9,500 (31'2")	
※ C	Maximum digging height	11,350 (37'3")	
※ D	Maximum dumping height	9,000 (29'6")	
※ E	Minimum dumping height	1,700 (5'7")	
※ F	Vertical digging depth	8,450 (27'9")	
G	Minimum swing radius	4,340 (14'3")	
※ H	Height at minimum swing	8,680 (28'6")	
※ J	8-foot level digging depth	9,380 (30'9")	
K	Horizontal digging	Stroke	9,000 (29'6")
L	stroke at ground level	Minimum	1,870 (6'2")

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

Sample of manual. Download All 1054 pages at:

<https://www.arepairmanual.com/downloads/kobelco-model-sk200lcvisk210lcvisk200nlcvi-hydraulic-excavator-service-repair-workshop-manual/>