

HYDRAULIC EXCAVATOR

SHOP MANUAL model SK80MSR-1E(S)

INDEX

1	SPECIFICATIONS SECTION
2	MAINTENANCE SECTION
3	SYSTEM SECTION
4	DISASSEMBLY SECTION
5	TROUBLESHOOTING
6	ENGINE SECTION
7	PROCEDURE OF INSTALLING OPTIONS SECTION

KOBELCO

SAFETY PRECAUTIONS

Product: Kobelco Model SK80MSR-1E(S) Hydraulic Excavator Service Repair Workshop Manual

GENERAL SAFETY INFORMATION

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Do not operate or perform any maintenance on this machine until all instructions found in the OPERATOR'S MANUAL and this MANUAL have been thoroughly read and understood.

Improper operation or maintenance of this machine may cause accidents and could result in serious injury or death.

Always keep the manual in storage.

If it is missing or damaged, place an order with an authorized our Distributor for a replacement.

If you have any questions, please consult an authorized our Distributor.

(1) Most accidents, which occur during operation, are due to neglect of precautionary measures and safety rules. Sufficient care should be taken to avoid these accidents. Erroneous operation, lubrication or maintenance services are very dangerous and may cause injury or death of personnel. Therefore all precautionary measures, NOTES, DANGERS, WARNINGS and CAUTIONS contained in the manual and on the machine should be read and understood by all personnel before starting any work with or on the machine.

(2) Operation, inspection, and maintenance should be carefully carried out, and safety must be given the first priority. Messages of safety are indicated with marks. The safety information contained in the manual is intended only to supplement safety codes, insurance requirements, local laws, rules and regulations.

(3) Messages of safety appear in the manual and on the machine : All messages of safety are identified by either word of "DANGER", "WARNING" and "CAUTION".

1) **DANGER**- Indicates an imminently hazardous situation which, if not avoided, will result in death or serious injury and is represented as follows:



2) **WARNING**- Indicates a potentially hazardous situation which, if not avoided, could result in death or serious injury and is represented as follows:



3) **CAUTION** Indicates a potentially hazardous situation which, if not avoided, may result in minor or moderate injury. It may also be used to alert against possible damage to the machine and its components and is represented as follows:

It may also be used to alert against possible damage to the machine and its components and is represented as follows:



- (4) It is very difficult to forecast every danger that may occur during operation. However, safety can be ensured by fully understanding proper operating procedures for this machine according to methods recommended by Manufacturer.
- (5) While operating the machine, be sure to perform work with great care, so as not to damage the machine, or allow accidents to occur.
- (6) Continue studying the manual until all Safety, Operation and Maintenance procedures are completely understood by all persons working with the machine.

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SAFETY PRECAUTIONS



The proper and safe lubrication and maintenance for this machine, recommended by Manufacturer, are outlined in the OPERATOR'S MANUAL for the machine.

Improper performance of lubrication or maintenance procedures are dangerous and could result in injury or death. Read and understand the MANUAL 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. Weight of components table is shown in the section ; SPECIFICATIONS.

The following is a list of basic precautions that must always be observed.

- (1) Read and understand all Warning plates and decal on the machine before Operating, Maintaining or Repairing this machine.
- (2) Always wear protective glasses and protective shoes when working around machines. In particular, wear protective glasses when using hammers, punches or drifts on any part of the machine or attachments. Use welders gloves, hood/goggles, apron and the protective clothing appropriate to the welding job being performed. Do not wear loose fitting or torn clothing. Remove all rings from fingers, loose jewelry, confine long hair and loose clothing before working on this machinery.
- (3) Disconnect the battery and hang a "Do Not Operate" tag in the Operators Compartment. Remove ignition keys.
- (4) If possible, make all repairs with the machine parked on a level, hard surface. Block the machine so it does not roll while working on or under the machine. Hang a "Do Not Operate" tag in the Operators Compartment.
- (5) Do not work on any machine that is supported only by lift, jacks or a hoist. Always use blocks or jack

stands, capable of supporting the machine, before performing any disassembly.



Do not operate this machine unless you have read and understand the instructions in the OPERATOR'S 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, dozer, or other attachments to the ground before performing any work on the machine. If this cannot be done, make sure the bucket, dozer, 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 to the 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 20kg (45lbs) or more. Make sure all chains, hooks, slings, etc., are in good condition and are 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 compartments.
- (11) Be careful when removing cover plates. Gradually back off the last two capscrews or nuts located at opposite ends of the cover or device and carefully pry cover loose to relieve any spring or other pressure, before removing the last two capscrews 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.

SAFETY PRECAUTIONS

- (13) Always use the proper tools that are in good condition and that are suited for the job at hand. Be sure you understand how to use them before performing any service work.
- (14) Reinstall all fasteners with the 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 the parent metal. Make sure to disconnect battery before any welding procedures are attempted.
- (16) Do not damage wiring during removal operations. Reinstall the wiring so it is not damaged nor will be damaged in operation of the machine 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 and replace the guard or shield after repair is completed.
- (18) The maintenance and repair work while holding the bucket raised is dangerous due to the possibility of a falling attachment. Don't fail to lower the attachment and place the bucket to the ground before starting the work.
- (19) 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. Very small (pinhole) 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 card-board or paper to locate pinhole leaks.
- (20) 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.
- (21) 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.
- (22) Be careful when servicing or separating the tracks (crawlers). Chips can fly when removing or installing a track (crawlers) pin. Wear safety glasses and long sleeve protective clothing. Tracks (crawlers) can unroll very quickly when separated. Keep away from front and rear of machine. The machine can move unexpectedly when both tracks (crawlers) are disengaged from the sprockets. Block the machine to prevent it from moving.

INDEX

SK80MSR-1E(S)

Book Code No. Distribution Year–Month			Title	Index No.
S5PW0108E01 2004-9		SPECIFICATIONS	OUTLINE	1
S5LF0205E01 2004-9			SPECIFICATIONS	2
S5LF0305E01 2004-9			ATTACHMENT DIMENSIONS	3
S5LF1105E01 2004-9		MAINTENANCE	TOOLS	11
S5LF1205E01 2004-9			STANDARD MAINTENANCE TIME SCHEDULE	12
S5LF1305E01 2004-9			MAINTENANCE STANDARDS AND TEST PROCEDURES	13
S5LF2105E01 2004-9		SYSTEM	MECHATRO CONTROL SYSTEM	21
S5LF2205E01 2004-9			HYDRAULIC SYSTEM	22
S5LF2305E01 2004-9			ELECTRICAL SYSTEM	23
S5LF2405E01 2004-9			COMPONENTS SYSTEM	24
S5YT2503E01 2004-9			AIR-CONDITIONER SYSTEM	25
—				
S5PW3108E01 2004-9		DISASSEMBLING	DISASSEMBLING & ASSEMBLING	31
S5LF3205E01 2004-9			ATTACHMENTS	32
S5LF3305E01 2004-9			UPPER SWING BODY	33
S5LF3405E01 2004-9			TRAVEL FRAME	34
S5LF4105E01 2004-9		TROUBLESHOOTING	MECHATRO CONTROL	41
S5LF4205E01 2004-9			HYDRAULIC SYSTEM	42
S5LF4305E01 2004-9			ELECTRICAL SYSTEM	43
S5YT4403E01 2004-9			ENGINE	44
S5YT5103E01 2004-9		E/G	ENGINE	51
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LF04-02001~			APPLICABLE MACHINES	

NOTE:

This Manual is prepared as a technical material in which the information necessary for the maintenance and repairing services of our hydraulic excavators are collected, and is categorized into 7 Chapters, Specification, Maintenance, System, Disassembly, Troubleshooting, Engine, and Installation Procedures for Optional Attachment.

- The Chapter "Specification" describes the specifications for entire machine and material, which are instructive for replacement and repairing of attachments.
- The Chapter "Maintenance" describes the material, which is helpful for maintenance service and adjustments for entire machine.
- The Chapter "System" describes the operating system like hydraulic system, electric system, components, and so on.
- The Chapter "Disassembly" describes the removal and installing of assembly mounted on the upper structure and undercarriage, and the assembling and disassembling of the associated hydraulic equipment.
- The Chapter "Troubleshooting" describes how to find the fault equipment.
- The Chapter "Engine" describes the engines making use of the "Maintenance Manual" provided by the suppliers.
- The Chapter "Installation Procedures for Optional Attachment" describes the supplements added on request as required.

This Manual may be properly revised due to the improvement of products, modification of specifications, etc. And there are cases where the system on actual machine and a part of the contents of this manual may differ due to the variations of specification by countries. For the section in which the description is hardly understood, contact our distributor.

The number is assigned to every part handled in this Manual on account of the description, but the parts, which cannot be supplied as service parts are contained. Therefore, the order must be placed with respective formal number with due confirmation on the Parts Manual for applicable machine.

1. OUTLINE

TABLE OF CONTENTS

1.1	GENERAL PRECAUTIONS FOR REPAIRS	1-3
1.1.1	PREPARATION BEFORE DISASSEMBLING	1-3
1.1.2	SAFETY IN DISASSEMBLING AND ASSEMBLING	1-3
1.1.3	DISASSEMBLING AND ASSEMBLING HYDRAULIC EQUIPMENT	1-3
1.1.4	ELECTRICAL EQUIPMENT	1-4
1.1.5	HYDRAULIC PARTS	1-5
1.1.6	WELDING REPAIR	1-5
1.1.7	ENVIRONMENTAL MEASURE	1-5
1.2	INTERNATIONAL UNIT CONVERSION SYSTEM(Based on MARKS' STANDARD HANDBOOK FOR MECHANICAL ENGINEERS)	1-6

1. OUTLINE

Issue	Data of Issue	Applicable Machines	Remarks
First Edition	June, 2004	EH30.B : PW11-30001~ EH35.B : PX12-11001~	S5PW0108E01 (NH Australia) KE
↑	↑	SK40SR-3 : PH05-03501~ SK50SR-3 : PJ04-03001~	S5PW0108E01 (KCM Australia) KE
↑	↑	EH50.B : PJ04-03001~	S5PW0108E01 (NH Australia) KE
↑	↑	EH27.B : PV10-27001~	↑ SZ
↑	↑	SK20SR-3 : PM07-07001~ SK27SR-3 : PV10-27001~	S5PW0108E01 (KCM Australia) SZ
↑	↑	SK30SR-3 : PW11-30001~ SK35SR-3 : PX12-11001~	S5PW0108E01 (KCM Australia) KE
↑	August, 2004	SK50SR-3 : PJ04-03001~	S5PW0108E01 (KCM North America) KE
↑	↑	SK30SR-3 : PW11-30001~ SK35SR-3 : PX12-11001~	↑ KE
↑	↑	SK27SR-3 : PV10-27001~	↑ SZ
↑	September, 2004	SK70SR-1E(S) : YT04-07001~	S5PW0108E01 KE
↑	↑	SK80MSR-1E(S) : LF04-02001~	↑ KE

1.1 GENERAL PRECAUTIONS FOR REPAIRS

1.1.1 PREPARATION BEFORE DISASSEMBLING



- (1) Understanding operating procedure
Read OPERATOR'S MANUAL and this MANUAL carefully to understand the operating procedure.
- (2) Cleaning machines
Remove soil, mud, and dust from the machine before carrying it into the service shop to prevent loss of work efficiency, damage of parts, and difficulty in rust prevention and dust protection while reassembling.
- (3) Inspecting machines
Identify the parts to be disassembled before starting work, determine the disassembling procedure by yourself considering the workshop situations etc., and request procurement of necessary parts in advance.
- (4) Recording
Record the following items for communication and prevention of recurring malfunction.
 - 1) Inspection date and place
 - 2) Model name, applicable machine number, and hour meter read
 - 3) Trouble condition, place and cause.
 - 4) Visible oil leakage, water leakage and damage
 - 5) Clogging of filters, oil level, oil quality, oil contamination and loosening of connections
 - 6) Result of consideration if any problem exists based on the operation rate per month calculated from hour meter indication after the last inspection date.
- (5) Arrangement and cleaning in service shop
 - 1) Tools required for repair work.
 - 2) Prepare space to place the disassembled parts.
 - 3) Prepare oil containers for draining oil etc.

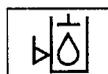
1.1.2 SAFETY IN DISASSEMBLING AND ASSEMBLING



- (1) Wear appropriate clothes with long sleeves, safety shoes, safety helmet and protective glasses.

- (2) Suspend warning tag "DO NOT OPERATE" from the doorknob or the operating lever, and have a preliminary meeting before starting work.
- (3) Stop the engine before starting inspection and maintenance to prevent the operator being caught in machine.
- (4) Identify the location of a first-aid kit and a fire extinguisher, and also where to make contact in a state of emergency.
- (5) Choose a hard, level and safe place, and place the attachment on the ground securely.
- (6) Use a lifter such as a crane to remove heavy parts (20 kg [45 lbs] or more) from the machine.
- (7) Use proper tools, and replace or repair defective tools.
- (8) Support the machine and attachment with supports or blocks if the work is performed in the lifted condition.

1.1.3 DISASSEMBLING AND ASSEMBLING HYDRAULIC EQUIPMENT



- (1) Removing hydraulic equipment
 - 1) Before disconnecting pipes, release the hydraulic pressure of the system, or open the return side cover and take out the filter.
 - 2) Carefully drain oil of the removed pipes into a containers without spilling on the floor.
 - 3) Apply plugs or caps on the pipe ends to avoid oil spillage and dust intrusion.
 - 4) Clean off the external surface of the equipment before disassembling, and drain hydraulic and gear oil before placing it on the workbench.
- (2) Disassembling hydraulic equipment
 - 1) Do not disassemble, reassemble or modify the hydraulic equipment without the permission of the manufacturer, who is not responsible for the performance and function of the product after modification.
 - 2) When disassembling and reassembling for unavoidable reason, refer the work to qualified personnel who have the specific knowledge or completed the parts service training.
 - 3) Provide matching marks to facilitate reassembling work.
 - 4) Before starting the work, read the manual of disassembling procedure, if it is provided, and decide whether the work can be performed by yourself.

1. OUTLINE

- 5) Use the special jig and tools without fail if they are specified.
 - 6) If it is hard to remove a part according to the procedure, do not try it by force but investigate the cause.
 - 7) Place the removed parts in order and attach tags to facilitate the reassembling.
 - 8) Note the location and quantity of parts commonly applied to multiple locations.
- (3) Inspecting parts
- 1) Ensure that the disassembled parts are free from seizure, interference and uneven contact.
 - 2) Measure and record wear condition of parts and clearance.
 - 3) If the problem is found in a part, repair or replace it with a new one.
- (4) Reassembling hydraulic equipment
- 1) Turn ON the ventilation fan or open windows to maintain good ventilation prior to starting the cleaning of parts.
 - 2) Perform rough and finish cleaning before assembling.
 - 3) Remove washing oil by air and apply clean hydraulic or gear oil for assembling.
 - 4) Always replace the removed O-rings, backup rings and oil seals with new ones by applying grease in advance.
 - 5) Remove dirt and moisture from and perform degreasing on the surface where liquid gasket to be applied.
 - 6) Remove rust preventive agent from the new parts before use.
 - 7) Fit bearings, bushings and oil seals using special jigs.
 - 8) Assemble the parts utilizing matching marks.
 - 9) Ensure all the parts are completely assembled after the work.
- (5) Installing hydraulic equipment
- 1) Ensure hydraulic oil and lubricant are properly supplied.
 - 2) Perform air bleeding when:
 1. Hydraulic oil changed
 2. Parts of suction side piping replaced
 3. Hydraulic pump installed
 4. Slewing motor installed
 5. Travel motor installed
 6. Hydraulic cylinder installed



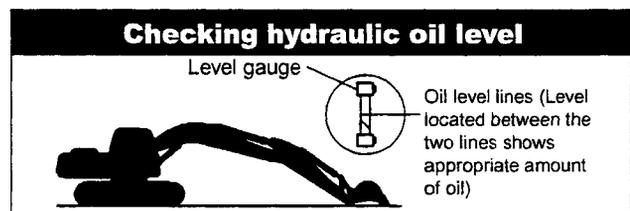
Operation of the hydraulic equipment without filling hydraulic oil or lubricant or without performing air bleeding will result in damage to the equipment.

- 3) Perform air bleeding of the hydraulic pump and slewing motor after loosening the upper drain plug, starting the engine and keep it in low idle condition.
Complete the air bleeding when seeping of hydraulic oil is recognized, and tightly plug.
- 4) Perform air bleeding of the travel motor and the hydraulic cylinders by running the engine for more than 5 minutes at low speed without load.

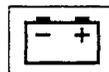


Do not allow the hydraulic cylinder to bottom on the stroke end just after the maintenance.

- 5) Perform air bleeding of pilot line by performing a series of digging, slewing and travel.
- 6) Check hydraulic oil level after placing the attachment to the oil check position, and replenish oil if necessary.



1.1.4 ELECTRICAL EQUIPMENT



- (1) Do not disassemble electrical equipment.
- (2) Handle it carefully not to drop and give a shock.
- (3) Turn the key OFF prior to connecting and disconnecting work.
- (4) Disconnect the connector by holding it and pressing the lock. Do not pull the wire to apply force to the caulking portion.
- (5) Connect the connector and ensure it is completely locked.
- (6) Turn the key OFF prior to touching the terminal of starter or generator.
- (7) Remove the ground (earth) terminal of battery when handling tools around the battery or its relay.

- (8) Do not splash water on the electrical equipment and connectors during machine washing.
- (9) Check for moisture adhesion inside the waterproof connector after pulling it out, since it is hard to remove moisture from the connector.
If moisture adhesion is found, dry it completely before the connection.



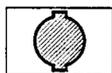
Battery electrolyte is hazardous.

Battery electrolyte is dilute sulfuric acid. Exposure of skin or eyes to this liquid will cause burning or loss of eyesight.

If the exposure occurs, take the following emergency measures and seek the advice of a medical specialist.

- **When skin exposed:**
Wash with water and soap sufficiently.
- **When eyes exposed:**
Immediately wash away with city water continuously for more than 10 minutes.
- **When a large amount of the liquid flows out:**
Neutralize with sodium bicarbonate or wash away with city water.
- **When swallowed:**
Drink a large amount of milk or water.
- **When clothes exposed:**
Immediately undress and wash.

1.1.5 HYDRAULIC PARTS



- (1) O-ring
 - Ensure O-rings have elasticity and are not damaged before use.
 - Use the appropriate O-rings. O-rings are made of various kinds of materials having different hardness to apply to a variety of parts, such as the part for moving or fixed portion, subjected to high pressure, and exposed to corrosive fluid, even if the size is same.
 - Fit the O-rings without distortion and bend.
 - Always handle floating seals as a pair.
- (2) Flexible hose (F hose)
 - Use the appropriate parts. Different parts are used depending on the working pressure even the size of fitting and the total length of the hose is same.

- Tighten the fitting at the specified torque. Ensure no kink, tension, interference nor oil leakage is recognized.

1.1.6 WELDING REPAIR

- (1) Refer repair welding to qualified personnel according to the appropriate procedure.
- (2) Disconnect the ground (earth) cable of the battery before starting the repair.
Failure to do so will cause damage to the electrical equipment.
- (3) Move away the articles in advance that may cause fire if exposed to sparks.
- (4) Before starting the repair of the attachment, do not fail to cover the plated surface of the piston rod with flameproof sheet to prevent it from being exposed to sparks.

1.1.7 ENVIRONMENTAL MEASURE

- (1) Run the engine at the place that is sufficiently ventilated.
- (2) Industrial waste disposal
Dispose of the following parts according to the relevant regulations:
Waste oil and waste container
Battery
- (3) Precautions for handling hydraulic oil
Exposure of eyes to hydraulic oil will cause inflammation. Wear protective glasses before handling to avoid an accident. If an eye is exposed to the oil, take the following emergency measures:
 - When an eye exposed:
Immediately wash away with city water sufficiently till stimulative feeling vanishes.
 - When swallowed:
Do not let vomit, and receive medical treatment immediately.
 - When skin exposed:
Wash with water and soap sufficiently.
- (4) Others
Use replacement parts and lubricants authorized as the manufacturer's genuine parts.

1. OUTLINE

1.2 INTERNATIONAL UNIT CONVERSION SYSTEM (Based on MARKS' STANDARD HANDBOOK FOR MECHANICAL ENGINEERS)

Introduction

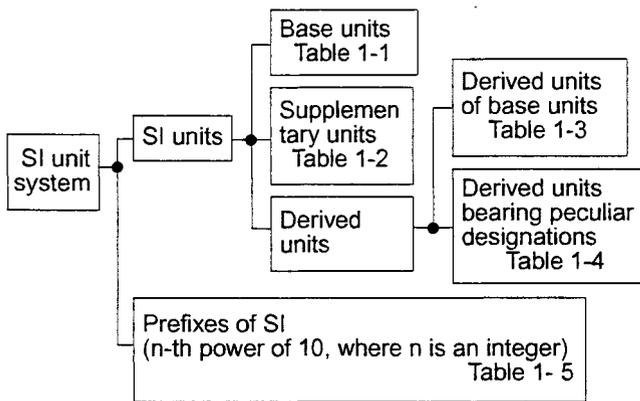
Although this manual includes International System of Unit and Foot-Pound System of Units, if you need SI unit, refer to the following international system of units. Given hereinafter is an excerpt of the units that are related to this manual.

1. Etymology of SI Unites

French : Le Systeme International d' Unites

English : International System of Units

2. Construction of SI Unit System



(1) Base units

Table 1-1

QUANTITY	UNIT	SYMBOL
Length	meter	m
Mass	kilogram	kg
Time	second	s
Electric current	ampere	A
Thermodynamic temperature	kelvin	K
Amount of substance	mol	mol
Luminous intensity	candela	cd

(2) Supplementary units

Table 1-2

QUANTITY	UNIT	SYMBOL
Plane angle	radian	rad
Solid angle	steradian	sr

(3) Derived Units

Table 1-3

QUANTITY	UNIT	SYMBOL
Area	square meter	m ²
Volume	cubic meter	m ³
Velocity	meter per second	m/s
Acceleration	meter per second squared	m/s ²
Density	kilogram per cubic meter	kg/m ³

(4) Derived Units bearing Peculiar Designations

Table 1-4

QUANTITY	UNIT	SYMBOL	FORMULA
Frequency	hertz	Hz	1/s
Force	newton	N	kg • m/s ²
Pressure and Stress	pascal	Pa	N/m ²
Energy, Work and Quantity of heat	joule	J	N•m
Power	watt	W	J/s
Quantity of electricity	coulomb	C	A•s
Electric potential difference, Voltage, and Electromotive force	volt	V	W/A
Quantity of static electricity and Electric capacitance	farad	F	C/V
Electric resistance	ohm	Ω	V/A
Celcius temperature	celcius degree or degree	°C	(t+273.15)K
Illuminance	lux	lx	l m/m ²

(5) Prefixes of SI

Table 1-5

PREFIX	SYMBOL	MULTIPLICATION FACTORS
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 1-6

QUANTITY	Gravitational	SI	CONVERSION FACTOR
Mass	kg	kg	
Force	kgf	N	1 kgf=9.807 N
Torque	kgf•m	N•m	kgf•m=9.807 N•m
Pressure	kgf/cm ²	MPa	1 kgf/cm ² =0.09807 MPa
Motive Power	PS	kW	1 PS=0.7355 kW
Revolution	rpm	min ⁻¹	r/min *1

*1 Units that are allowed to use.

[MEMO]

2. SPECIFICATIONS

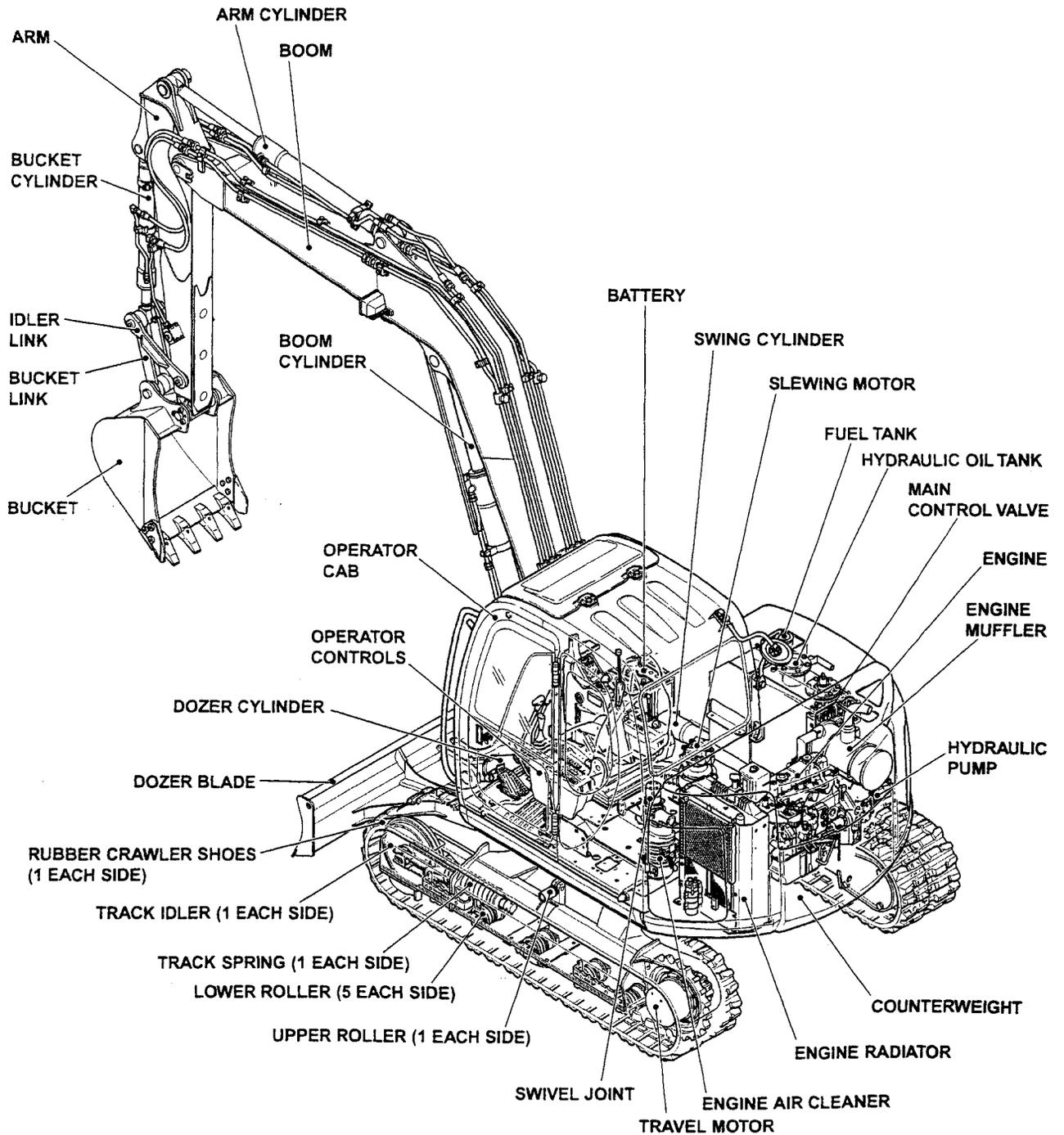
TABLE OF CONTENTS

- 2.1 NAME OF COMPONENTS 2-3
- 2.2 MACHINE DIMENSIONS 2-4
 - 2.2.1 3.72 m (12 ft-2 in) Boom + 1.8 m (5 ft-11 in) Arm + 0.28 m³ (0.37 cu•yd) Bucket 2-4
- 2.3 WEIGHT OF COMPONENTS 2-5
- 2.4 TRANSPORTATION DIMENSION AND WEIGHT 2-7
- 2.5 SPECIFICATIONS AND PERFORMANCE 2-10
 - 2.5.1 SPEED AND CLIMBING CAPABILITY 2-10
 - 2.5.2 ENGINE 2-10
 - 2.5.3 HYDRAULIC COMPONENTS 2-10
 - 2.5.4 WEIGHT 2-10
- 2.6 TYPE OF CRAWLER 2-11
- 2.7 TYPE OF BUCKET 2-11
- 2.8 COMBINATIONS OF ATTACHMENT 2-12
- 2.9 ENGINE SPECIFICATION 2-13
 - 2.9.1 SPECIFICATIONS 2-13
 - 2.9.2 ENGINE CHARACTERISTIC CURVE (ISUZU 4JG1) 2-14

2. SPECIFICATIONS

Issue	Date of Issue	Applicable Machines	Remarks
First edition	September, 2004	SK80MSR—1E(S) : LF04—02001~	S5LF0205E01 KE

2.1 NAME OF COMPONENTS

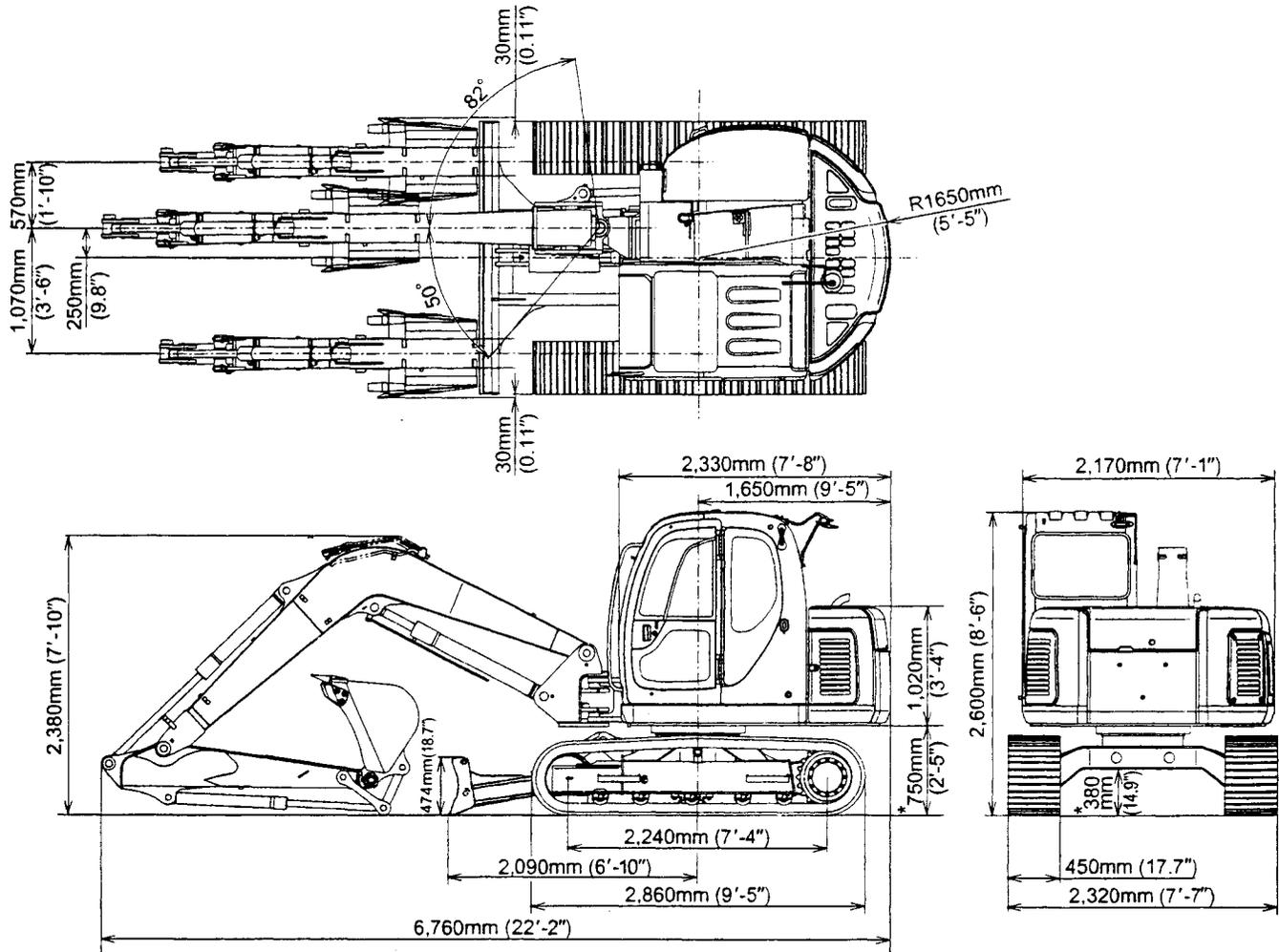


2. SPECIFICATIONS

2.2 MACHINE DIMENSIONS

2.2.1 3.72 m (12 ft-2 in) Boom + 1.8 m (5 ft-11 in) Arm + 0.28 m³ (0.37 cu yd) Bucket

Unit: mm (ft-in)



* Marked dimensions do not include height of shoe lug.

2.3 WEIGHT OF COMPONENTS

Unit : kg (lbs)

Item	Model	1.8 M (5 ft-11 in) Arm + 450 mm (17.7 in shoe)
Machine complete		8,000 (17,640)
1. Upper frame assy (including the following :)		3,815 (8,410)
1.1 Counterweight		820 (1,810)
Counterweight (Add-on)		400 (880)
1.2 Cab		191 (420)
1.3 Engine		*250 (550)
1.4 Hydraulic oil tank		*65 (143)
1.5 Fuel tank		*59 (130)
1.6 Slewing motor (including reduction unit)		67 (150)
1.7 Control valve		63 (140)
1.8 Boom cylinder		*92 (203)
1.9 Pin (2pcs. for mounting boom)		14 (31)
1.10 Pump		44 (97)
1.11 Radiator		*39 (86)
1.12 Swing cylinder		*59 (130)
1.13 Swing bracket		244 (538)
2. Lower frame assy (including the following :)		2,910 (6,420)
2.1 Slewing bearing		115 (250)
2.2 Travel motor (including reduction unit)		81 (180)×2
2.3 Upper roller		4 (9)×2
2.4 Lower roller		15 (33)×10
2.5 Front idler		44 (97)×2
2.6 Track tension adjuster		29 (64)×2
2.7 Sprocket		27 (59)×2
2.8 Swivel joint		21 (46)
2.9 Dozer blade		350 (770)
2.10 Dozer cylinder		*60 (130)×2
2.11 Track link with 450 mm (17.7 in) shoes assy		421 (928)×2
3 Attachment		1,050 (2,315)
{3.72 m (12 ft-2 in) Boom + 1.80 m (5 ft-11 in) Arm + 0.28 m (0.37 cy*yd) bucket}		
3.1 Bucket assy		200 (440)
3.2 Arm assy (including the following :)		330 (728)
3.2.1 Arm		190 (420)
3.2.2 Bucket cylinder		*48 (106)
3.2.3 Idler link		17 (37)
3.2.4 Bucket link		8 (17)×2
3.2.5 Pin (2 pcs. for mounting bucket cylinder / 2 pcs. for mounting bucket)		*18 (40)
3.3 Boom assy (including the following :)		514 (1,130)
3.3.1 Boom		390 (860)
3.3.2 Arm cylinder		72 (160)
3.3.3 Pin (Mounting arm • Mounting arm cylinder)		16 (35)
4. Lubricant and water (including the following :)		208 (460)
4.1 Hydraulic oil		*102 (225)
4.2 Engine oil		9 (20)

2. SPECIFICATIONS

Item	Model
4.3 Fuel	1.8 M (5 ft-11 in) Arm + 450 mm (17.7 in shoe) 83 (183)
4.4 Water	10 (22)

Note

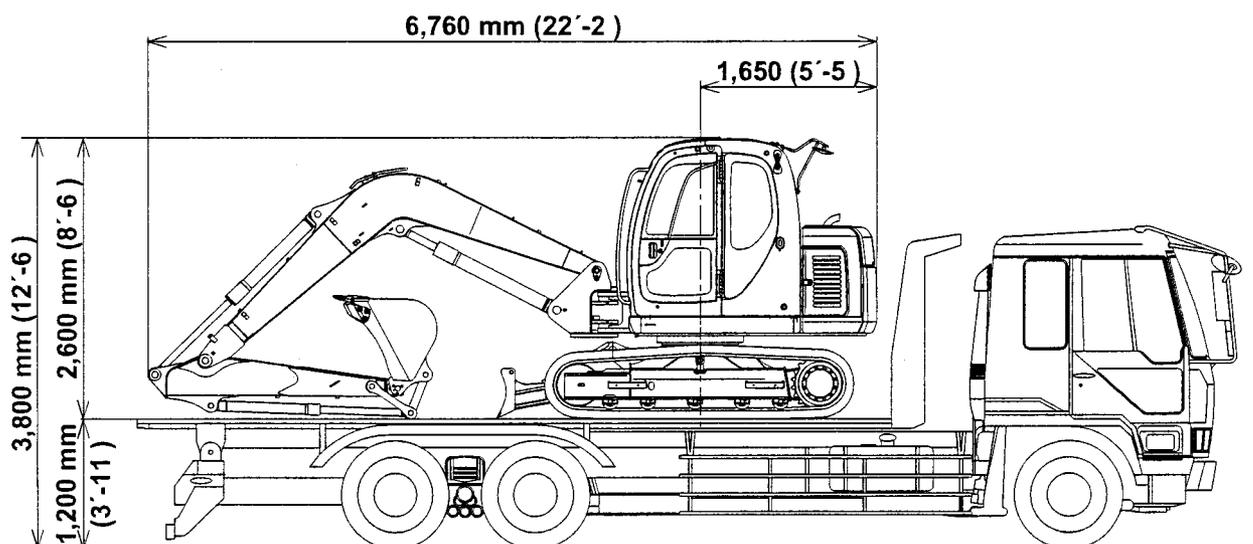
Numerical values marked * indicate the dry weight.

2.4 TRANSPORTATION DIMENSION AND WEIGHT

OVERALL DIMENSIONS OF MACHINE ON A TRAILER

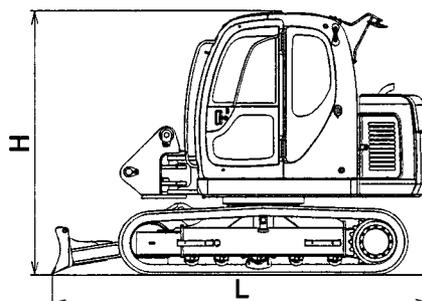
OVERALL DIMENSIONS OF A COMPLETE MACHINE ON A TRAILER

Item	Type	1.80 M (5 ft-11 in) Arm + 450 mm (17.7 in) shoes
Width	m (ft-in)	2,320 (7'7")
Weight	kg (lb)	8,000 (17,640)



OVERALL DIMENSIONS OF WITHOUT BOOM, ARM AND BUCKET

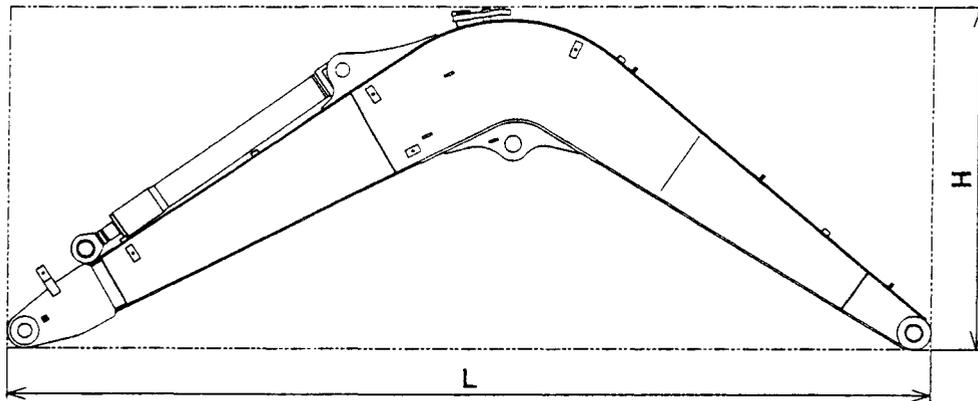
Combination	Type	A : Shoe width mm (ft-in)	L : Length mm (ft-in)	H : Height mm (ft-in)	W : Width mm (ft-in)	Weight kg (lb)
Without boom, arm and bucket		450 (17.7")	3,730 (12'3")	2,600 (8'6")	2,320 (7'7")	6,940 (15,300)
		600 (23.6")	3,730 (12'3")	2,600 (8'6")	2,470 (8'1")	7,160 (15,800)



2. SPECIFICATIONS

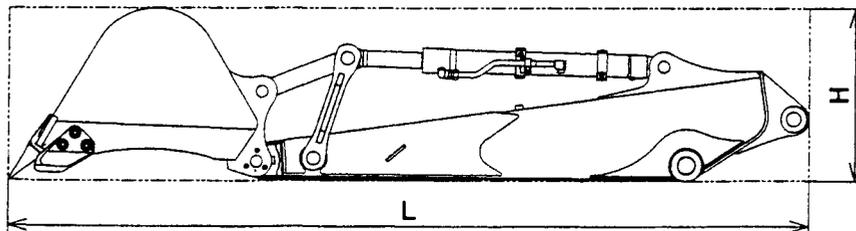
OVERALL DIMENSIONS OF BOOM

Item	Type	3.72 m (12 ft-2 in) Boom
Length × Height × Width	m (ft-in)	3.86 × 1.43 × 0.40
L × H × W		(12'8" × 4'8" × 1'4")
Weight	kg (lb)	520 (1,150)



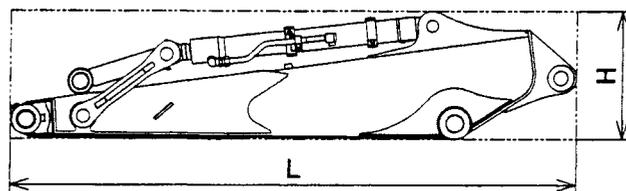
OVERALL DIMENSIONS OF ARM + BUCKET

Item	Type	1.80 m (5 ft-11 in) Arm+ 0.28 m ³ (0.37 cu*yd) Bucket	2.07 m (6 ft-9 in) Arm+ 0.22 m ³ (0.29 cu*yd) Bucket
Length × Height × Width	m (ft-in)	3.34 × 0.70 × 0.75	3.61 × 0.71 × 0.65
L × H × W		(10'4" × 2'4" × 2'6")	(11'10" × 2'4" × 2'2")
Weight	kg (lb)	520 (1,150)	530 (1,170)



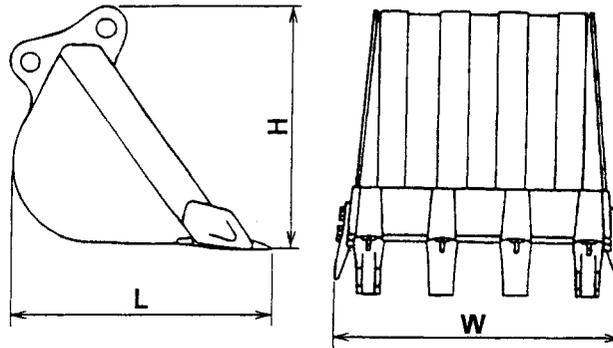
OVERALL DIMENSIONS OF ARM

Item	Type	1.80 m (5 ft-11 in) Arm	2.07 m (6 ft-9 in) Arm
Length × Height × Width	m (ft-in)	2.37 × 0.53 × 0.36	2.64 × 0.53 × 0.36
L × H × W		(7'1" × 1'9" × 1'2")	(8'8" × 1'9" × 1'2")
Weight	kg (lb)	320 (705)	340 (750)



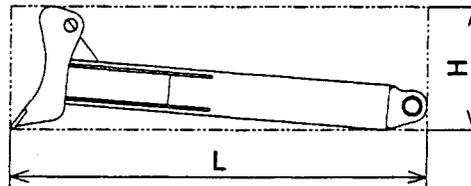
OVERALL DIMENSIONS OF BUCKET

Type	Hoe bucket	
Length × Height × Width	0.98 × 0.89 × 0.75	0.98 × 0.89 × 0.85
L × H × W m (ft-in)	(3'3" × 2'11" × 2'6")	(3'3" × 2'11" × 2'9")
Weight kg (lbs)	200 (440)	220 (490)
Bucket capacity m ³ (cu•yd)	0.28 (0.37)	0.35 (0.45)



OVERALL DIMENSIONS OF DOZER

Length × Height × Width m (ft-in)	1.62 × 0.45 × 2.32 (5'4" × 1'6" × 7'7")
Weight kg (lb)	350 (770)



2. SPECIFICATIONS

2.5 SPECIFICATIONS AND PERFORMANCE

2.5.1 SPEED AND CLIMBING CAPABILITY

Item	Model & Shoe spec.	SK80MSR-1E(S)
Slewing speed	min ⁻¹ (rpm)	12.5 (12.5)
Travel speed (1st/2nd speed)	km/h	3.1 / 5.5
Gradeability	% (degree)	70 (35)

2.5.2 ENGINE

Engine model	ISUZU 4JG1NABGA
Type	Water-cooled 4-cycle direct injection type engine
Number of cylinders-Bore × Stroke	4-95.4 mm × 107 mm (3.76 in × 4.21 in)
Total displacement	3,059 cc (187 cu•in)
Rated output / Rotation speed	40.5 kW (55 PS) / 2,100 rpm
Maximum torque / Rotation speed	19.1 kgf•m (139 lbf•ft) / 1,800 rpm
Starter	24 V / 3.2 kW
Alternator	24 V / 30A

2.5.3 HYDRAULIC COMPONENTS

Hydraulic pump	Variable displacement axial piston+gear pump
Hydraulic motor (Slewing)	Axial piston motor
Hydraulic motor (Travel)	2-speed axial piston motor
Control valve	8-spool control valve
Cylinder (Boom, Arm, Swing and Bucket)	Double action cylinder
Oil cooler	Air-cooled type

2.5.4 WEIGHT

Unit : kg (lbs)

Item	Model & Shoe spec.	Iron shoe	Rubber shoe
Fully equipped weight		8,000 (17,640)	7,930 (17,500)
Upper structure		3,810 (8,400)	←
Lower machinery (With 450 mm (17.7 in) grouser shoe)		2,910 (6,420)	2,840 (6,260)
Attachment [Boom + 1.80 m (5 ft-11 in) Arm +0.28 m ³ (0.37 cu•yd) bucket]		1,070 (2,360)	←

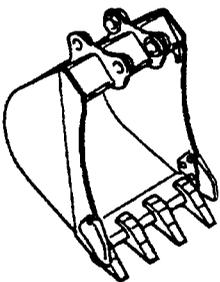
2.6 TYPE OF CRAWLER

Shape	Shoe width mm (in)	Overall width of crawler mm (in)	Ground pressure kgf/cm ² (psi)
Rubber crawler 	450 (17.7)	2,320 (7'7")	0.36 (5.1)
P/No. YR61D00009P1			
Iron crawler 	450 (17.7)	2,320 (7'7")	0.32 (4.5)
Assy No. YT60D00012F1 P/No. YT60D00008P1			
Iron crawler 	600 (23.6)	2,470 (8'1")	0.28 (4.0)
Assy No. YT60D00012F2 P/No. YT60D00009P1			

Note

Use grouser shoes 600 mm (23.6 in) or 450 mm (17.7 in) on rough ground (areas covered with rocks and gravel). If you drive or excavate with other shoes, this may cause shoe bending, shoe bolt looseness, and track assembly (link, roller, etc.) damage.

2.7 TYPE OF BUCKET

Hoe bucket 	Heaped capacity m ³ (cu·yd)	Struck m ³ (cu·yd)	Outer width mm (ft-in)		Number of tooth	W or W/O side cutter	Availability of face shovel	Weight kg (lbs)
			With side cutter	Without side cutter				
	STD 0.28 (0.37)	0.22 (0.29)	750 (2'6")	680 (2'3")	4	Yes	Yes	200 (440)

2. SPECIFICATIONS

2.8 COMBINATIONS OF ATTACHMENT

Type	Bucket		Applicable Arm	
	Heaped capacity m ³ (cu·yd)	Struck m ³ (cu·yd)	1.8 m (5 ft-1 in) Arm (STD)	2.07 m (6 ft-9 in) Arm
Hoe bucket	0.11 (0.14)	0.09 (0.12)	○	○
	0.14 (0.18)	0.12 (0.16)	○	○
	0.18 (0.24)	0.14 (0.18)	○	○
	0.22 (0.29)	0.18 (0.24)	○	◎
	STD 0.28 (0.37)	0.22 (0.29)	◎	△
	0.35 (0.46)	0.26 (0.34)	△	×
V-bucket	0.24 (0.31)	0.16 (0.21)	△	△
Slope finishing bucket	0.26 (0.34)	0.14 (0.18)	△	△
Breaker	—	—	○	○
Nibbler	—	—	○	○

Note

◎ Standard combination

○ General operation : Excavation or loading of sand, gravel, and clay

△ Light operation : Mainly loading or loose gravel (e.g., cultivation or loading of sand or gravel)

× Prohibited combination : There are problems from the view points of strength and stability.

- Use the attachments recommended by KOBELCO. Reinforcement of arm allows to use it as nibbler and breaker. The trouble due to the use in the condition "Use not allowed" described in the above table is not included in our responsibility
- When bucket marked by △ has been attached or nibbler has been attached on long arm, the specified stability may not be obtained. So add weight 400 kg (880 lbs) in add-on type as required.

CAUTION

If any other bucket, except for the backhoe bucket, is turned over and used for excavation, damage to the arm and bucket may occur.

2.9 ENGINE SPECIFICATION

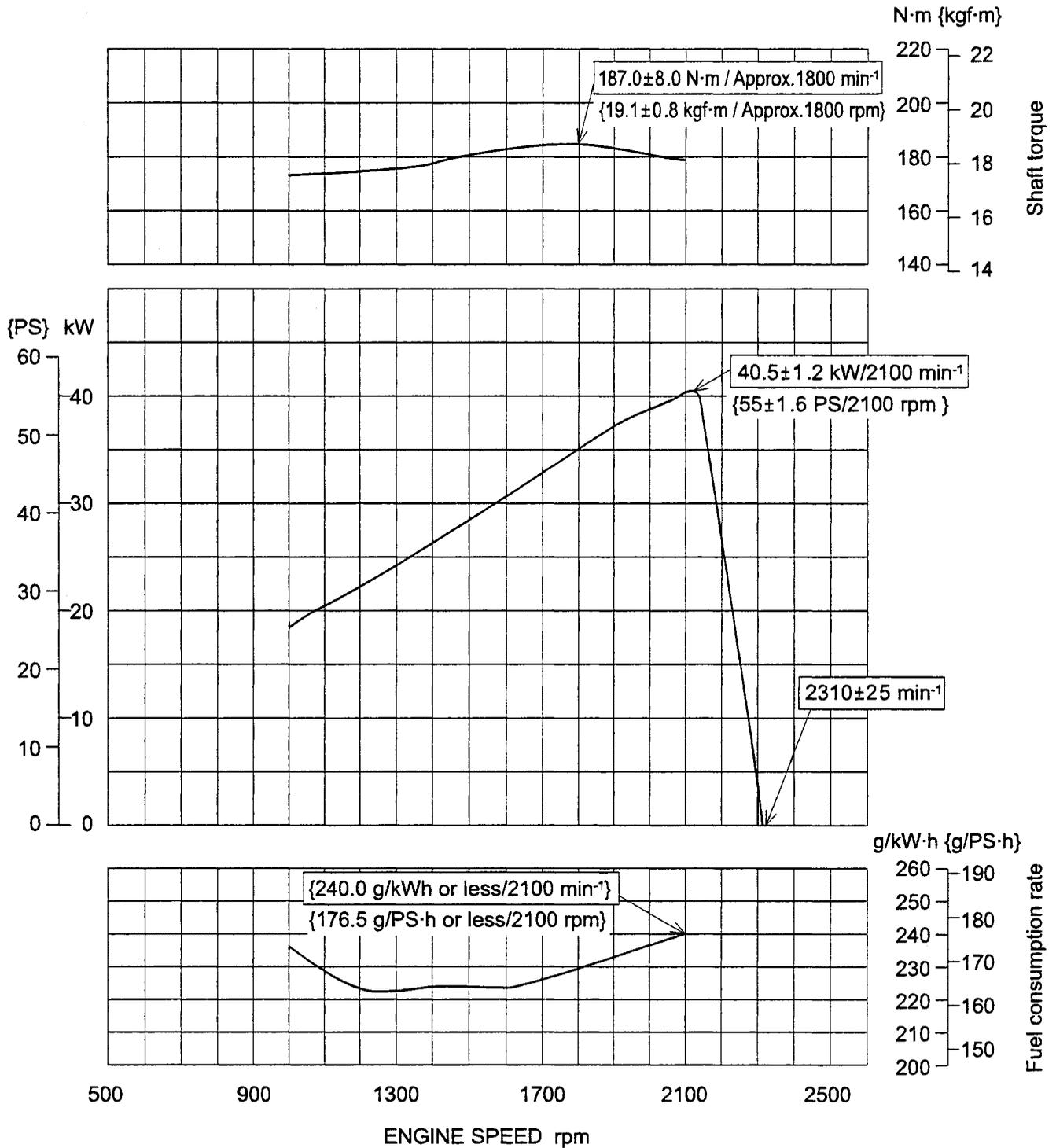
2.9.1 SPECIFICATIONS

Model	SK80MSR-1E(S)			
Engine model	ISUZU 4JG1 NABGA			
Type	Diesel, 4-cycle water -cooled, in-line, Direct injection			
Number of cylinder-Bore × Stroke	4-95.4mm (3.76 in) ×107 mm (4.21 in)			
Total displacement	3,059 (187 cu•in)			
Compression ratio	18.6			
Rated out put	55 PS (40.5 kW) at 2,100 rpm			
Maximum torque	19.1 kgf•m (138 lbf•ft) at 1,800 rpm			
High idling	2,310±25rpm			
Low idling	1,000±25rpm			
Injection valve opening pressure	185 kgf/cm ² (2,632 psi)			
Thermostat action	Start 82C°(180°F)/Full open 95C°(203°F)			
Firing order	1-3-4-2			
Compression pressure	30 kgf/cm ² (427 psi) at 200 rpm			
Lubrication oil pressure	—			
Fuel injection timing	10±1° before top dead point			
Valve clearance		Valve clearance	Open	Close
	Intake valve	0.4 mm (0.016") in cold condition	24.5° before top dead point	55.5° after bottom dead point
	Exhaust valve	0.4 mm (0.016") in cold condition	54° before top dead point	26° after top dead point
Starter capacity	3.2kW × 24 V			
Generator capacity (Alternator)	24 V×30 A			
Cooling fan drive method	Ø450 (17.7 in) suction type seven fans V-belt drive, pulley ratio Crank / Fan=1.12			
Engine oil quantity	Full level 10.6 L (2.8 gal) Low level sensor actuation Oil filter, etc			
Dry weight	250 kg (550 lbs)			
Fuel consumption ratio	176 g / PS•h			
Allowable inclination	Front / Rear and Right / Left : 35°			
Dimension (L × W × H)	760 mm × 610 mm × 710 mm (29.9 in × 24.0 in × 28.0 in)			
Rotating direction	Counterclockwise seeing from flywheel side			

2. SPECIFICATIONS

2.9.2 ENGINE CHARACTERISTIC CURVE (ISUZU 4JG1)

Condition to be measured : With fan and generator
Without muffler and air cleaner



$$\text{Fuel consumption volume} = \frac{\text{Fuel consumption rate}}{0.835 \times 1000} \times \text{PS} \times \text{Load factor } (\alpha)$$

$$= \frac{176 \text{ g} / \text{PS}\cdot\text{h}}{0.853 \times 1000} \times 55 \text{ PS} \times \alpha$$

$$= 11.6 \alpha \cdot \text{L} / \text{h}$$

α : Standard load factor (0.60 ~ 0.70)

Fuel consumption in regular operation

(load factor : 0.60 ~ 0.70)

7.0 ~ 8.1 L/h

3. ATTACHMENT DIMENSIONS

TABLE OF CONTENTS

3.1	BOOM.....	3-3
3.1.1	BOOM DIMENSIONAL DRAWING	3-3
3.1.2	BOOM MAINTENANCE STANDARD	3-4
3.2	ARM	3-6
3.2.1	ARM DIMENSIONAL DRAWING	3-6
3.2.2	ARM MAINTENANCE STANDARDS	3-9
3.3	BUCKET	3-12
3.3.1	BUCKET DIMENSIONAL DRAWING	3-12
3.3.2	BUCKET DIMENSIONAL TABLE	3-12
3.3.3	DETAIL DIMENSIONAL DRAWING OF LUG SECTION	3-13
3.3.4	DETAIL DIMENSIONAL DRAWING OF BOSS SECTION	3-14
3.4	DOZER	3-15
3.4.1	DOZER DIMENSIONAL DRAWING	3-15
3.4.2	DOZER MAINTENANCE STANDARD	3-16
3.5	SWING	3-18
3.5.1	SWING BRACKET DIMENSION	3-18
3.5.2	SWING MAINTENANCE STANDARD	3-19

3. ATTACHMENT DIMENSIONS

Product: Kobelco Model SK80MSR-1F(S) Hydraulic Excavator Service Repair Workshop Manual				
Issue	Date of Issue	Applicable Machines		Remarks
Full Download: http://www.arespairmanual.com/downloads/kobelco-model-sk80msr-1es-hydraulic-excavator-service-repair-workshop-manual	September 2004	SK80MSR-1F(S)	E04-02001~	S5LF0305E01 KE

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