

**KOBELCO**

**SERVICE MANUAL**

**HYDRAULIC EXCAVATOR**

**SK400 IV**

**SK400LC IV**

Applicable: SK400 IV YSJ00001~  
Applicable: SK400LC IV YSU0001~  
S5YSU0002E-01 03/95

## 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 its 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 labels 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 Compartment.
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 attachments to the ground before performing any work on the machine. If this cannot be done, make sure the bucket, blade, ripper or other attachments 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 compartments.
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 capscrews with same part number. Do not use a lesser quality capscrew 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

YSU · YSJ

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**YSU01**

**YSU03**

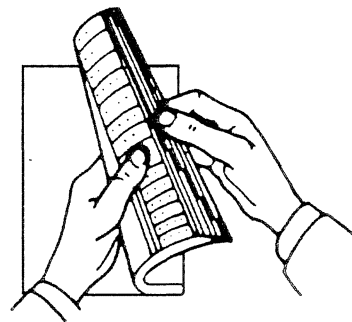
**YSU04**

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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

YSU  
YSJ

List of Shop Manual GENERAL Section

Index No.	Title	Book Code No.		
		Distribution Year - Month		
YSU01	SPECIFICATION	S5YSU0102E 1995-03		
—	OPERATION	YSJK95S0010M Refer to Operators manual		
YSU03	LOCATION AND WEIGHT OF COMPONENTS	S5YSU0302E 1995-03		
YSU04	MAINTENANCE STANDARDS AND TEST PROCEDURES	S5YSU0402E 1995-03		
—	PREVENTIVE MAINTENANCE	YSJK95S0010M Refer to Operators manual		
YSU07	WORKING STANDARDS	S5YSU0702E 1995-03		
	Applicable Machines	YSJ0001~		

# KOBELCO

## SHOP MANUAL

## YSU · YSJ

**YSU01**

### SPECIFICATION

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**KOBELCO CONSTRUCTION MACHINERY(U.S.A.) INC.**

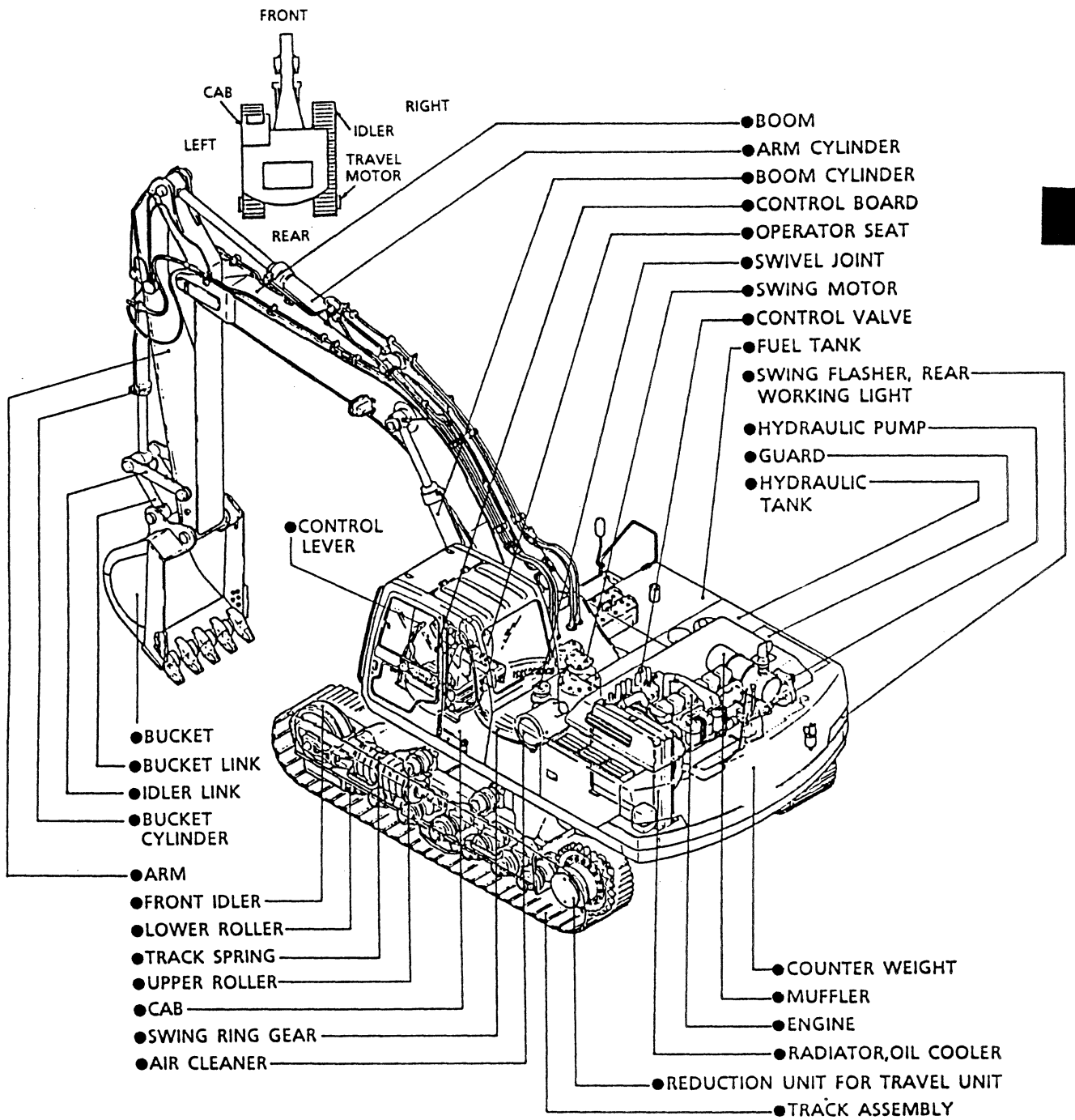
Applicable Machines

YSJ0001~

LSU0001~

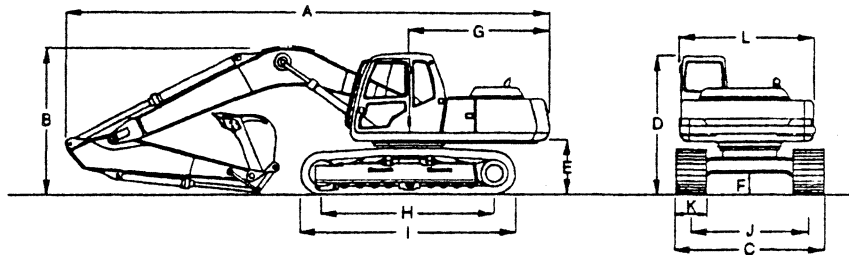
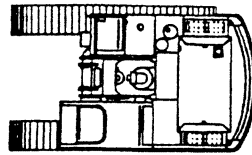
Revision	Date of Issue	Remarks
First edition	March, 1995	S5YSU0102E K

# 1. LOCATION OF COMPONENTS





## 2. GENERAL DIMENSIONS



Unit : m (ft)

	Arm length	3.0 (9-10)	3.45 (11-4)	3.95 (13-0)	4.9 (16-1)
A	Overall length	11.79 (38-5)	11.73 (38-6)	11.78 (38-8)	11.81 (38-7)
B	Overall height (to top of boom)	3.58 (11-10)	3.43 (11-3)	3.55 (11-8)	4.12 (13-9)
C-1	Overall width (900mm (35.4in) Shoe)	3.65 (12-0)	3.65 (12-0)	3.65 (12-0)	3.65 (12-0)
C-2	Overall width (800mm (31.5in) Shoe)	3.55 (11-8)	3.55 (11-8)	3.55 (11-8)	3.55 (11-8)
C-3	Overall width (600mm (23.6in) Shoe)	3.35 (11-0)	3.35 (11-0)	3.35 (11-0)	3.35 (11-0)
D	Overall height (to top of cab)	3.21 (10-6)	3.21 (10-6)	3.21 (10-6)	3.21 (10-6)
E	Ground clearance of rear end*	1.325 (4-4)	1.325 (4-4)	1.325 (4-4)	1.325 (4-4)
F	Ground clearance*	490mm (19.3in)	490mm (19.3in)	490mm (19.3in)	490mm (19.3in)
G	Tail swing radius	3.40 (11-2)	3.46 (11-4)	3.40 (11-2)	3.40 (11-2)
H	Tumbler distance	4.37 (14-4)	4.37 (14-4)	4.37 (14-4)	4.37 (14-4)
I	Overall length of crawler	5.46 (17-11)	5.46 (17-11)	5.46 (17-11)	5.46 (17-11)
J	Track gauge	2.75 (9-0)	2.75 (9-0)	2.75 (9-0)	2.75 (9-0)
K-1	Shoe width	900mm (35.4in)	900mm (35.4in)	900mm (35.4in)	900mm (35.4in)
K-2	Shoe width	800mm (32in)	800mm (32in)	800mm (32in)	800mm (32in)
K-3	Shoe width	600mm (24in)	600mm (24in)	600mm (24in)	600mm (24in)
L	Overall width of upper structure	3.25 (10-8)	3.25 (10-8)	3.25 (10-8)	3.25 (10-8)

NOTE : Figure of asterisk (\*) apply to value without shoe lug.

### 3. SPECIFICATIONS AND PERFORMANCE

#### ■ SPEED AND CLIMBING ABILITY

Item	Model	YSJ
Swing speed		9.0rpm
Travel speed		5.5 / 3.5km / h (3.4 / 2.2 mph)
Gradeability		35° (70%)

#### ■ ENGINE

Model		Mitsubishi 6D22-TC
Type		Water-cooled 4-cycle, direct injection type diesel engine with intercooled, turbo-charger
Number of cylinder - Bore × Stroke		6 - 130mm(5.11in) × 140mm(5.51in)
Total displacement		11,149c.c. (680cuin)
Rated output power/revolution	JISD 1005 NET	300 HP / 2,000rpm
	SAE J 1349 NET	300 HP / 2,000rpm / 224KW / 2,000rpm
	DIN 6270 NET	296 HP / 1,400rpm
Maximum torque/revolution	JISD 1005 NET	121 kgf·m / 1,200rpm
	SAE J 1349 NET	875 lb·ft / 1,200rpm
	DIN 6270 NET	121 kgf·m / 1,200rpm

#### ■ HYDRAULIC COMPONENTS

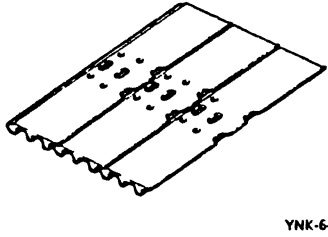
Hydraulic pump	Double-pump variable displacement, axial piston + gear pump
Hydraulic motor (swing)	Axial piston motor
Hydraulic motor (travel)	Axial piston motor
Control valve	6 -spool multiple control valve + 1-spool control valve (swing)
Cylinders (boom, arm, and bucket)	Double acting cylinder
Return filter	Safety valve containing filter type
Oil cooler	Air-cooled type

#### ■ WEIGHT

Unit : kg (lbs)

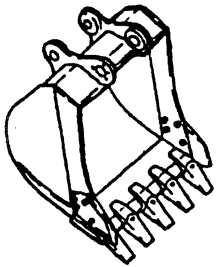
Item	Model	LSU			YSJ		
Fully-equipped weight		42,900 (94,500)	44,300 (97,700)	45,100 (99,400)	43,600 (96,100)	45,100 (99,400)	45,800 (100,900)
Upper machinery		19,500 (43,000)	←	←	←	←	←
Lower machinery with grouser shoe	600 (24")	15,600 (34,400)	—	—	16,300 (35,900)	—	—
	800 (32")	—	17,100 (37,700)	—	—	17,800 (39,200)	—
	900 (36")	—	—	17,800 (39,200)	—	—	18,500 (40,700)
7.0m (23ft) Boom + 3.45m (11ft-4in) Arm + 1.8m <sup>3</sup> (2.35 cuyd) Bucket		7,800 (17,200)	←	←	←	←	←

#### 4. TYPE OF SHOES

Shape	Model	Width of track shoe (mm(ft-in))	Overall width of crawler (mm(ft-in))	Ground pressure [kg/cm <sup>2</sup> (psi)]	
	LSU	600 (24")	3,350 (11')	0.81 (11.52)	
		50 link	800 (32")	3,550 (11'8")	0.63 (8.96)
			900 (36")	3,650 (12')	0.57 (8.10)
	YSJ	53 link	600 (24")	3,350 (11')	0.77 (10.95)
			800 (32")	3,550 (11'8")	0.60 (8.53)
			900 (36")	3,650 (12')	0.54 (7.68)

NOTE: The 800mm (32") shoes is applied for general civil work, while the 900mm (36") one is used for soft ground operation. Do not use them in rough operations, such as gravel and rock digging.

#### 5. TYPES AND COMBINATIONS OF ATTACHMENTS

HOE BUCKET	SAE, JIS Heaped capacity m <sup>3</sup> (cuyd)	Outside width of bucket mm (ft in)		No. of teeth	Equipped with side cutter	Possibility of turnover	Weight kg (lbs)
		With side cutter	Without side cutter				
	1.35(1.77)	1,230(4'0")	1,100(3'7")	4	Yes	Yes	1,210(2,670)
	1.60(2.09)	1,380(4'6")	1,250(4'1")	4	Yes	Yes	1,280(2,820)
	1.80(2.35)	1,520(5'0")	1,395(4'7")	5	Yes	Yes	1,380(3,040)
	※1.80(2.35)	1,535(5'1")	1,440(4'9")	4	Yes	Yes	1,400(3,100)
	2.10(2.75)	1,690(5'7")	1,540(5'1")	5	Yes	Yes	1,460(3,220)
	2.30(3.00)	1,820(6'0")	1,690(5'7")	5	Yes	Yes	1,530(3,400)
	※ mark indicates one for heavy digging work.						

#### ■ COMBINATIONS OF ATTACHMENTS

Type	Bucket		Applicable arm			
	SAE-JIS heaped capacity m <sup>3</sup> (cuyd)	JIS-SAE struck capacity m <sup>3</sup> (cuyd)	3.0m (9ft-10in) arm	3.45m (11ft-4in) arm	3.95m (13ft-0in) arm	4.9m (16ft-1in) arm
※ Mark indicates one for heavy digging work	1.35 (1.77)	1.05 (1.37)	○	○	○	◎
	1.60 (2.09)	1.20 (1.57)	○	○	◎	△
	1.80 (2.35)	1.40 (1.83)	○	◎	○	×
	※ 1.80 (2.35)	1.40 (1.83)	○	○	○	×
	2.10 (2.75)	1.60 (2.09)	◎	△	×	×
	2.30 (3.00)	1.70 (2.22)	△	×	×	×

NOTE : ◎ Standard combinations

○ General operation : Digging and loading of sand, gravels and clay-mixed soil

△ Light operation : Operations mainly consisting of loading of loose sand and soil (for instance, operations in paddy fields and loading of sand and gravels)

× Not usable : Do not operate in such combinations as guarantee does not cover them.

#### ⚠ CAUTION

● If a bucket other than a hoe bucket is used to execute face shovel operation, it will cause damage to the arm and the bucket.

● The combinations other than those mentioned in the above table cannot be used in principle. For further details, contact KOBELCO.

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