

SEBM0383B01

# SHOP MANUAL



# W120-2

## WHEEL LOADER

MACHINE MODEL  
**W120-2**

SERIAL NO.  
**11001** AND UP

# KOMATSU





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## IMPORTANT SAFETY NOTICE

Proper service and repair is extremely important for the safe operation of machine. The service and repair techniques recommended by Komatsu and described in this manual are both effective and safe methods of operation. Some of these operations require the use of tools specially designed by Komatsu for the purpose.

To prevent injury to workers, the symbols  and  are used to mark safety precautions in this manual. The cautions accompanying these symbols should always be followed carefully. If any dangerous situation arises or may possibly arise, first consider safety, and take the necessary actions to deal with the situation.

## FOREWORD

This shop manual has been prepared as an aid in improving the quality of repairs by giving the serviceman an accurate understanding of the product and by showing him the correct way to perform repairs and make judgements. Make sure you understand the contents of this manual and use it to full effect at every available opportunity.

### **Organization**

This shop manual mainly contains the necessary technical information for operations performed in a service workshop. For ease of understanding, the manual is divided into chapters for each main group of components; these chapters are further divided into the following sections.

#### **Structure and function**

This section explains the structure and function of each component. It serves not only to give an understanding of the structure, but also serves as reference material for troubleshooting.

#### **Testing and adjusting**

This section explains checks to be made before and after performing repairs, as well as adjustments to be made at completion of the checks and repairs. Troubleshooting charts correlating "Diagnoses" to "Causes" are also included in this section.

#### **Disassembly and assembly**

This section explains the order to be followed when removing, installing, disassembling or assembling each component, as well as precautions to be taken for these operations.

#### **Maintenance standards**

This section gives the judgement standards when inspecting disassembled parts.

## USING THE SHOP MANUAL

### Volumes

Shop manuals are issued for carrying out repairs.

They are divided as follows:

**Chassis volume:** issued for every machine model

Engine volume: issued for each engine series

Electrical volume :  
Fuel system volume : } each issued as one volume to cover all models  
Attachments volume : }

In addition, the following volumes are issued for high level rebuilding techniques to cover all models.

Engine volume

The following volumes are issued for inspection and tests after repairs:

Guidance for reusable parts volume

Bench test methods volume

These various volumes are designed to avoid duplicating the same information. Therefore to deal with all repairs for any model, it is necessary to have the shop manual for that model as well as the relevant engine volume, the fuel system volume and the electrical volume.

This shop manual is **chassis volume**.




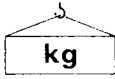
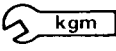



### Distribution and Updating

Recipients of shop manuals are recorded at the Komatsu Head Office. Any additions, amendments or other changes will be sent to all recipients without fail, so someone should be appointed to be in charge of manuals. In this way, pages can be added or removed immediately and the manuals kept up to date and easy to use.



Symbols

So that the shop manual can be of sufficient practical use, we have marked important places for safety and quality with the following symbols.

SYMBOL	ITEM	REMARKS
	Safety	Special safety precautions are necessary when performing the work.
		Extra special safety precautions are necessary when performing the work because it is under internal pressure.
	Caution	Special technical precautions or other precautions for preserving standards are necessary when performing the work.
	Weight	Weight of parts or systems. Caution necessary when selecting hoisting wire, or when working posture is important, etc.
	Tightening torque	Places that require special care with the tightening torque when assembling.
	Coat	Places to be coated with adhesives, etc. when assembling.
	Oil, water	Places for filling with oil, etc. Oil capacity.
	Drain	Places for draining oil, etc. Quantity to be drained.



## DEFINITION

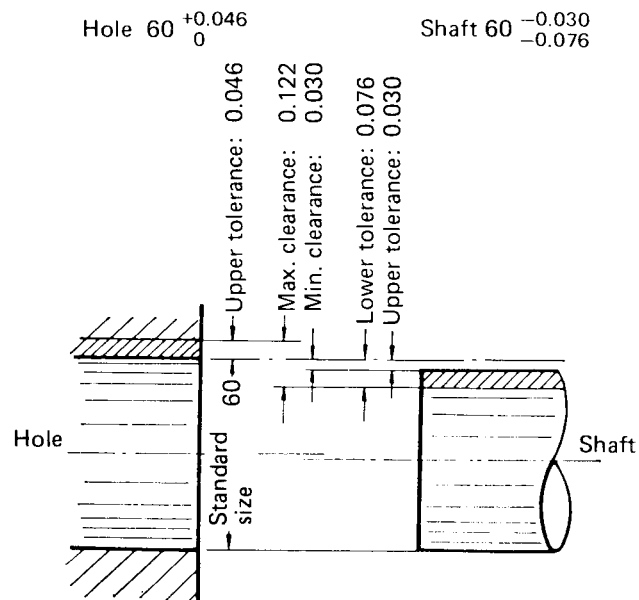
### Standard Size, Tolerance

The dimensions of finished parts each differ a little. Therefore, when determining the finished dimensions of parts, a dimension that will be standard is determined provisionally, and then the difference allowed from it is indicated. The former is called the **standard size**, and the latter the **tolerance**.

The way to show this is by a plus or a minus sign with the tolerance in smaller numerals to the right the standard size.

**Example:**  $120_{-0.126}^{-0.022}$  (The same meaning as 119.874 — 119.978)

Moreover, when expressing the dimensions of a hole and the shaft that goes inside it, for the sake of convenience, the standard size for the hole and the shaft usually taken as the same, and the tolerances changed to indicate the tightness of the fit. For example, the fit of revolving shaft is indicated as follows, and is shown in the drawing.



**Standard Size** This is the standard value at the time of design, the finished dimension of new parts.

**Repair Limit** This is the limit in dimension up to which the part can be used. (The size of parts changes due to wear or distortion during use). When parts exceed the repair limit, they must be repaired or replaced as specified.

**Standard Clearance** This is the clearance between two new parts after assembly, shown as a range between minimum clearance and maximum clearance. In general, parts are adjusted to this clearance after repair.

**Clearance Limit** This is the maximum clearance allowed between parts. (The clearance increases due to wear, etc. during use.)  
When the clearance exceeds the clearance limit, the parts must be repaired or replaced as specified.

**Maintenance Standard** This is the number given to items in diagrams of individual components. The same number is given in the left-hand column for ease of identification.

Unit: mm

No.	Check item	Criteria			Remedy
		Serial No.	Standard size	Repair limit	
1					

Unit: mm

No.	Check item	Criteria						Remedy
		Serial No.	Standard size	Tolerance		Standard clearance	Clearance limit	
				Shaft	Hole			
10								

# SHOP MANUAL

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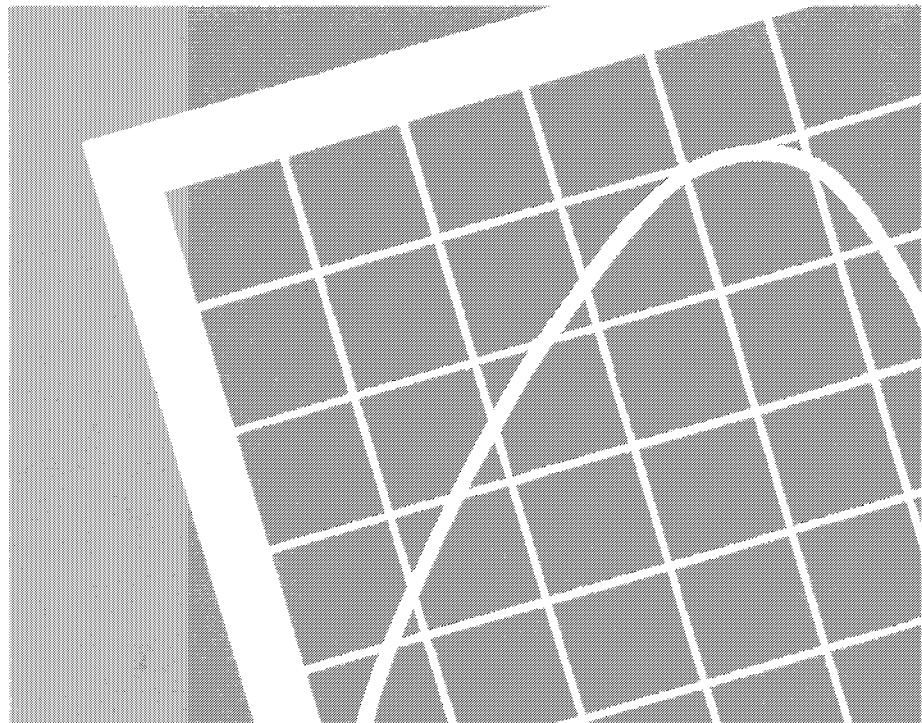
## **W120-2**

SERIAL NO. W120-2 11001 and up

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## **01 GENERAL**

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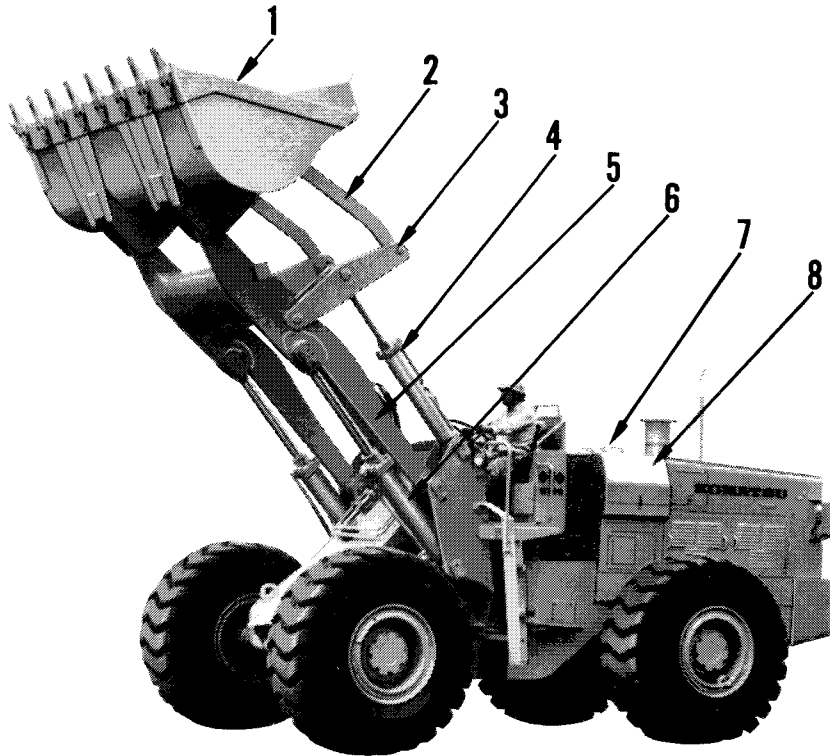


# GENERAL

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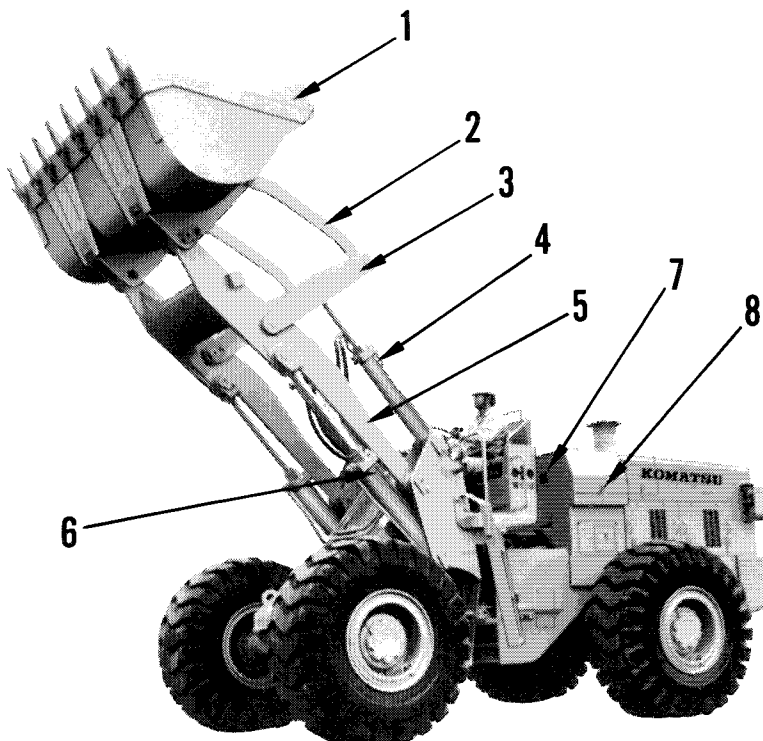
### GENERAL VIEW

Serial No. 11001 ~ 11361



P7-2004P

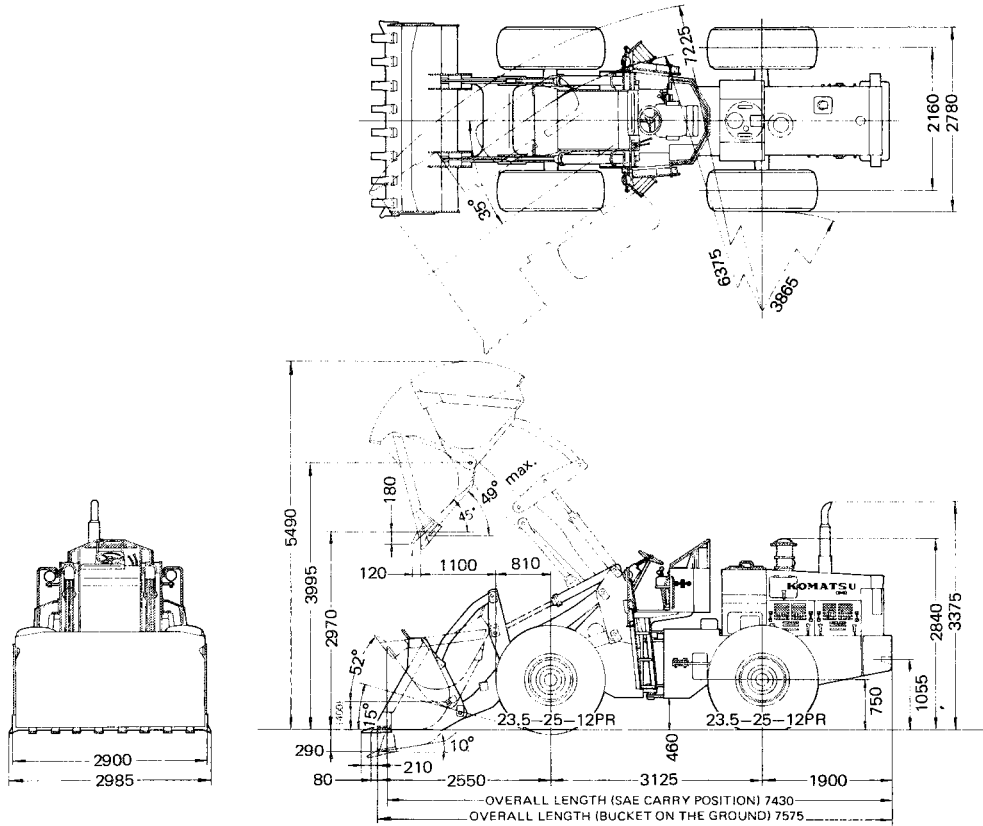
Serial No. 11362 ~



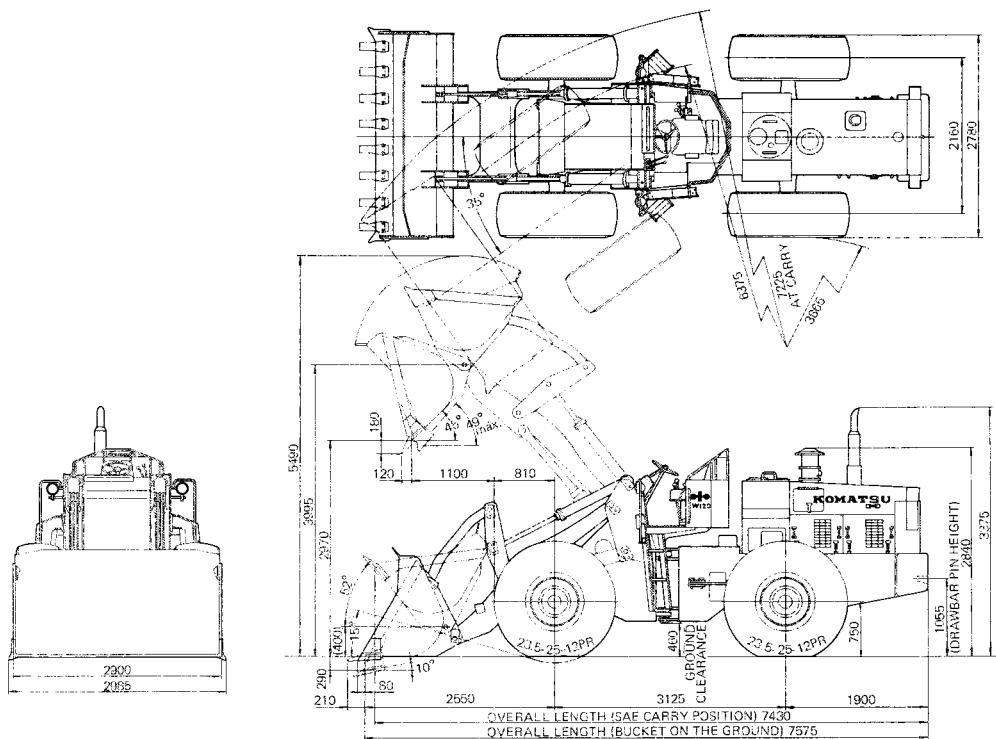
- 1. Bucket
- 2. Link
- 3. Lever
- 4. Bucket cylinder
- 5. Boom
- 6. Boom cylinder
- 7. Hydraulic tank
- 8. Battery box

# GENERAL ASSEMBLY DRAWING

Serial No. 11001 ~ 11361



Serial No. 11362 ~




**SPECIFICATIONS**

Machine name and model		W120-2			
Serial numbers		11001 ~ 11361	11362 ~		
Weight	Operating weight	kg	16,330		
	Front wheel loading	kg	7,480		
	Rear wheel loading	kg	8,850		
Dimensions	Overall length	mm	7,575		
	Overall width	Overall width of machine	mm	2,780	
		Overall width of bucket	mm	2,985	
	Overall height	Top edge of canopy	mm	3,480	
		During bucket ascent	mm	5,490	
	Wheel base	mm	3,125		
	Tread	mm	2,160		
	Bucket hinge pin height	mm	3,995		
	Dumping clearance (blade edge)	mm	2,970		
	Dumping reach (blade edge)	mm	1,100		
	Bucket dump angle	°	45		
	Bucket tilt angle (traveling posture)	°	52		
	Excavation depth (10° dump)	mm	290		
	Minimum height above ground	mm	460		
Performance	Bucket capacity	m <sup>3</sup>	3.3		
	Operating load	kg	5,400		
	Bucket ascent time	sec	6.3		
	Bucket descent time	sec	3.2		
	Maximum traction force	kg	12,400		
	Gradeability	°	25		
	Minimum turning radius	At outside of machine	mm	6,375	
		At center of outermost wheel	mm	7,225	
	Travel speed	Forward	1st speed	km/h	0 ~ 7.1
			2nd speed	km/h	0 ~ 12.6
			3rd speed	km/h	0 ~ 30.0
Reverse		1st speed	km/h	0 ~ 7.5	
		2nd speed	km/h	0 ~ 13.3	
		3rd speed	km/h	0 ~ 32.2	



Machine name and model		W120-2	
Serial numbers		11001 ~ 11361	11362 ~
Engine	Name	Komatsu SA6D110	
	Model	4-cycle direct injection, turbocharged diesel with aftercooler	
	Number of cylinders – Diameter x bore	6 – 110 mm x 125 mm	
	Overall displacement	7,130 cc	
	Rated output	200HP/2,500 rpm	
	Maximum torque	69 kgm/1,800 rpm	
	Fuel consumption	231 g/kW.h	
	Starting motor	24V, 7.5kW	
	Battery	24V(12Vx2) – 150Ah	
Power train	Torque converter	Komatsu TCA34-1A, 3-element, single stage, single phase	
	Transmission	Constant-mesh, full power shift	
	Reduction unit	Hypoid gear	
	Differential	Straight bevel gear	
	Final drive	Planetary gear	
Shaft and wheel	Drive system	Four wheel drive	
	Front wheel shaft	Fixed frame, full floating	
	Rear wheel shaft	Center pin support, full floating	
	Tire	23.5–25–12PR	
Brake	Foot brake	Air over hydraulic actuated on four wheels with separate axle-by-axle, dry single disc.	
	Hand brake	Drum, air release, apply spring	
Steering unit		Full hydraulic power, smooth steering at any engine speed	
Hydraulic units	Work equipment pump discharge	290ℓ/min. / 2,500rpm	
	Work equipment valve set pressure	193 kg/cm <sup>2</sup>	
	Steering valve set pressure	140 kg/cm <sup>2</sup>	
	Cylinder (Number— Bore x stroke)	Boom cylinder	2 – 160 mm x 780 mm
Bucket cylinder		2 – 120 mm x 750 mm	
Steering cylinder		2 – 100 mm x 432 mm	

## WEIGHT OF COMPONENT PARTS

 When servicing the machine, select the adequate hoist or support for working safety.

	Unit: kg
Engine ass'y (Komatsu SA6D110)	725
Radiator ass'y	110
Torque converter ass'y	105
Torque converter oil cooler	40
Transmission ass'y	390
Transmission control valve	25
Transmission 1st clutch pack ass'y	25
Transmission F & R clutch pack ass'y	35
Transmission 2nd & 3rd clutch pack ass'y	45
Front axle ass'y	1,190
Rear axle ass'y	1,240
Caliper ass'y (1)	45
Planetary carrier ass'y (1)	70
Wheel hub and disc ass'y (1)	125
Front differential ass'y	165
Rear differential ass'y	165
Tire (w/wheel, 23.5 x 25-12PR) (1)	530
Steering valve ass'y	25
Steering cylinder ass'y (1)	35
Transfer drive	50

	Unit: kg
Front frame (w/o accessory)	1,650
Rear frame (w/o accessory)	1,500
Counter weight	1,320
Bolster	220
Top hood	27
Side hood	23
Radiator grille (with support)	80
Operator's compartment	125
Operator's seat	35
Bulkhead ass'y (with two batteries)	170
Hydraulic tank	100
Main control valve ass'y	65
Boom cylinder ass'y (1)	195
Bucket cylinder ass'y (1)	114
Boom ass'y	1,040
Bucket lever (1)	138
Bucket link (1)	54
Bucket 3.3 m <sup>3</sup> (w/teeth)	1,190
Fuel tank	250
Battery (Wet) (1)	45
Steering and switch pump	25

**SYSTEM CAPACITY**

Location	Capacity (ℓ)		Remark
	Initial fill	Refill	
Engine cooling water	49	As required	Water (incl. radiator)
Fuel tank	303	As required	Diesel oil ASTM D975 No. 2 or No. 1
Engine oil pan	29	22	EO30-CD or EO10W-CD
Transmission system (w/torque converter & cooler)	33	13.2	EO30-CD, EO10WCD or EO20W20-CD (TCO, DEXRON ® A.T.F)
Axle (diff. & palanetary, each axle)	34	30	Gear oil #90 or #140
Transfer drive	0.5	0.5	Gear oil #90 or #140
Brake oil	1.5	As required	SAEJ-1703f
Hydraulic system	151	101	EO20W20-CD or EO30-CD

## GENERAL INSPECTION AND TEST

- Check disassembled parts to see if they will be re-usable, or it repaired. If the part failed due to an external source, determine the cause and correct before assembly.

### 1. GENERAL PRECAUTION

- Visually inspect parts for cracks, pitting, corrosion, scoring, ridging, etc. For proper inspection, every part should be correctly cleaned before inspection.
- If the cause of part defect can be found out, it will be great help to analyze the part condition; whether the defect will progress or not, or the possibility of future trouble.  
Knowing the cause of the defect, the service man can give good advice to the user to prevent him from having the same trouble again.
- Visual inspection can not find minute or hidden damage. Other methods of inspection are as follows;
  - a) Water-pressure or air-pressure test
  - b) Color check or magnetic damage test

### 2. CRACKS

- If the part is found to be cracked by visual inspection it should be replaced or repaired.
- If the length or depth of crack exceeds 1/3 of thickness of the part, it should be replaced and not repaired.
- A part having an internal crack should be replaced.

### 3. PITTING

#### a) Pitting by cavitation

In most cases, cavitation is accompanied by chemical corrosion. After removing rust or scale, carefully inspect the depth of pitting.

- When the pitting can not be repaired within the allowable limit, replace the part.
- If pitting is not deep, resurface the part after removing the rust or scale.

#### b) Pitting due to removal of surface

- If ball bearing is pitted, replace it.
- If more than 1/3 of contact face is pitted, the part should be replaced.
- If pitting is not serious, resurface the part.

### 4. TEST BY MEASURING DEVICE

- To avoid measuring error, measure 2 to 3 times. If the readings are not constant, repeat the measuring.
- When checking inside diameter or outside diameter, measure at 2 points at right angle. Measurements should be carried out at several portions along the whole length of the part.
- The accuracy of the measurement is assured only by the minimum unit of the reading on the measuring tool used.
- The measuring tool used should be determined according to the allowable limit.  
When determining the kind of measuring tool, use the following table as reference.

