COMPACT EXCAVATOR

TB020

WORKSHOP MANUAL

SERIAL NUMBER
TB020 : 1203001

FOREWORD

This manual is intended for persons who engage in maintenance operations, and explains procedures for disassembly and reassembly procedures for the machine, check and maintenance procedures, maintenance reference values, troubleshooting and outline specifications, etc. Please use this manual as a reference in service activities to improve maintenance techniques.
Further, please be advised that items contained in this manual are subject to change without notice due to design modifications, etc.

MACHINE FRONT AND REAR, LEFT AND RIGHT

The end where the dozer blade is mounted is the front and the end with the track gearboxes is the rear. Also the right and left sides of the operator when he is seated in the driver's seat are the right and left sides of the machine.

MACHINE SERIAL NUMBER

The machine serial number is stamped on the identification plate. When sending reports and inquires, and when ordering parts, etc., be sure to include this number.

MANUAL CONTROL

Information on those to whom this manual is distributed is recorded in the ledger in the section in charge at this company, so please decide on a person to be in charge of it and control it. When there are updates or additions, etc., we will notify the person in charge.

I. GENERAL

FOREWORD

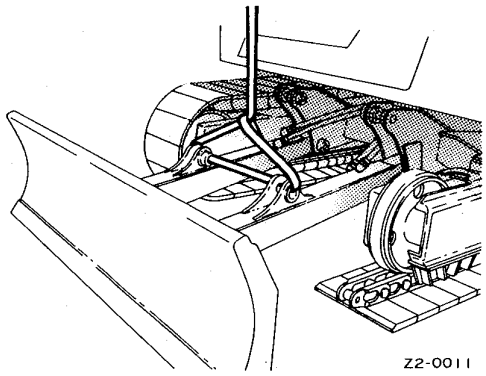
This section "General", summarizes the basic items which persons servicing the machine should be cautious about, and includes only those items which are essential for safe and correct operation. Please read this section thoroughly and apply it in maintenance operations.

Further, since the contents of this Workshop Manual may change due to future revisions, if you have any opinions or observations concerning this manual, please notify the person responsible.

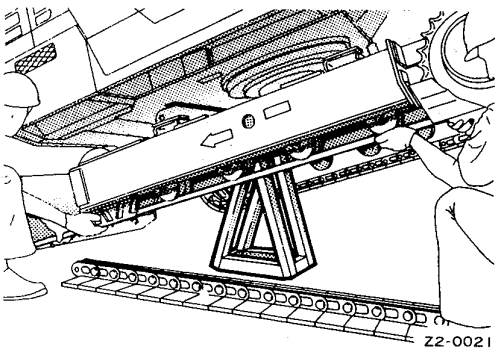
CONTENTS

GENERAL CAUTIONS

1. Wear a helmet, safety shoes and work clothes.
2. Be sure to check equipment and tools, particularly equipment used for hoisting.
3. If more than one person is working together, decide the job and call sign and maintain good communications during operations.
4. Crane operation and hoisting should be done by persons with the proper qualifications.
5. Keep all persons from getting underneath a suspended load.
6. Before removing the installation bolts of heavy parts, support the parts by temporary hoisting using a crane.



7. If lifting a machine with a hoe attachment, etc. and going underneath it, be sure to support it with stands etc.



8. When repairing the electrical system, disconnect the cables from the battery before beginning the operation.
9. When welding the machine, disconnect the battery first.
10. Maintain the standard tightening torques for piping and bolts, etc.
11. After completing repairs, run the engine at low speed, and conduct trial operation after filling it full with operating oil.

CAUTIONS DURING DISASSEMBLY AND ASSEMBLY

1. Clean the machine before disassembly operations.

2. Before disassembly, check the machine conditions and record them.
   - Model, Machine Serial Number, Hourmeter
   - Reason for Repairs, Repair History
   - Dirtiness of Filters
   - Fuel and Oil Conditions
   - Damage to each part, etc.

3. To make reassembly operations easy, make matching marks at the necessary points.

4. Clean all disassembled parts and all new parts, then arrange them in the proper sequence.

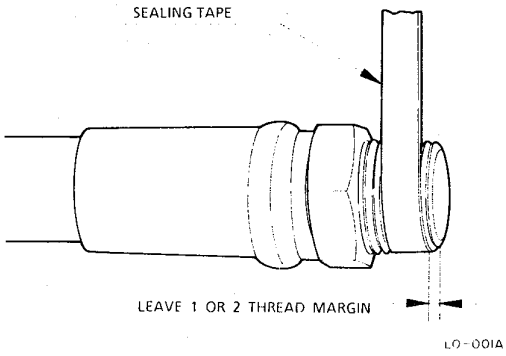
5. Be sure to replace all seals and cotter pins, etc. with new parts.

6. Keep parts which should not come in contact with oil and water separate from parts with oil on them.
   - Electrical Parts, Rubber, V-Belts, etc.

7. When installing bearings, bushings and oil seals, as a rule, use a press. When a hammer, etc. is used, it leaves bruises.

8. Wipe all joining surfaces clean so that there is no dirt or dust adhering to them.

9. Wrap seal tape from the front end, wrapping it tight and leaving 1 or 2 threads bare, Overlap the tape by about 10 mm.

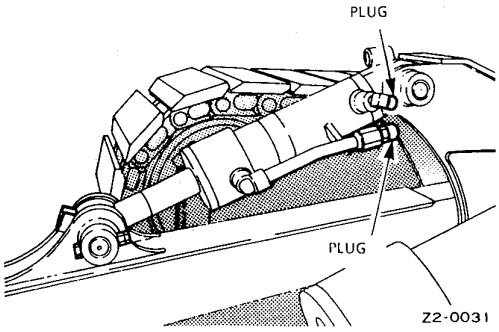


CAUTIONS DURING REMOVAL AND INSTALLATION OF THE HYDRAULIC UNITS

1. Make sure that the hydraulic oil's temperature has dropped.

2. To prevent a loss of flow of the hydraulic oil, the residual pressure in the piping and the internal pressure in the hydraulic oil tank should be bled out.

3. Be sure to install caps or plugs on all openings in the hydraulic unit to prevent dirt from getting into the unit through the openings.



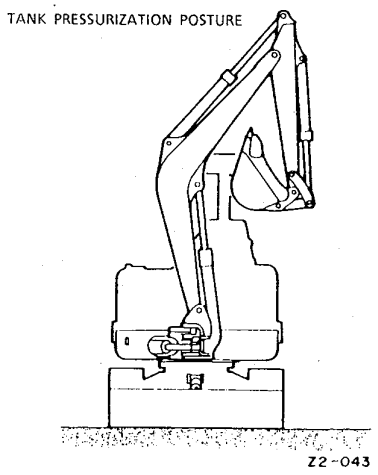
4. It is easy to mistake hydraulic oil adhering to the hydraulic unit for an oil leak, so wipe the unit off throughly.

5. Be sure that no damage is done to the plating on the rod in the hydraulic cylinder.

6. As a rule, removal and installation of the hydraulic cylinder should be done with the rod fully retracted.

7. When removing and installing the hydraulic cylinder, be sure to bleed out the air.
(See the item in "IV. Hydraulic Units, Cylinder".)

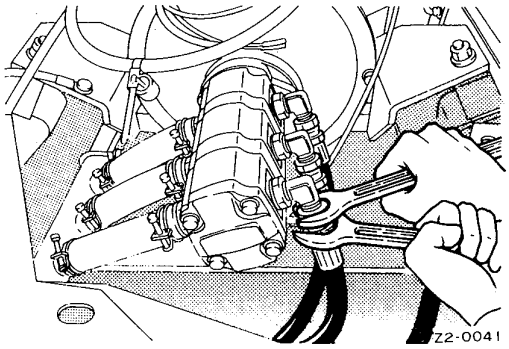
8. After installation of the hydraulic unit, be sure to pressurize the hydraulic oil tank. If this operation is forgotten, it could cause cavitation of the hydraulic pump. Also, it could have a drastic effect on the life of the hydraulic pump.
   - Hydraulic tank prerssurization method :
     Lower the dozer blade until it comes in contact with the ground. Extend all the cylinders fully except the blade cylinder. In this state, tighten the air vent plug to seal the tank tight.



CAUTIONS DURING REMOVAL AND INSTALLATION OF PIPING

1. When hydraulic hoses are installed, tighten them once to the prescribed torque, then loosen them slightly and retighten them to the prescribed torque.
   - Tighten the fittings after the installation surfaces fit snugly together.
   - Pieces wrapped with seal tape are exlcuded.

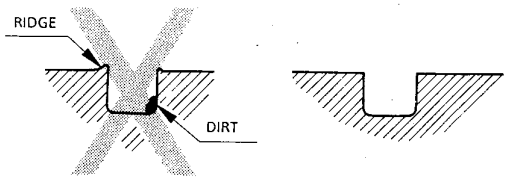
2. Use 2 spanners, each on an opposite side, to remove and tighten fittings so that the hoses or steel pipes are not twisted.



3. After installation of hydraulic hoses or steel pipes, apply the maximum working pressure 5 or 6 times and confirm that there is no leakage.

HANDLING OF SEALS

1. Clean the grooves for O-rings and if there is any ridge, etc., remove it.



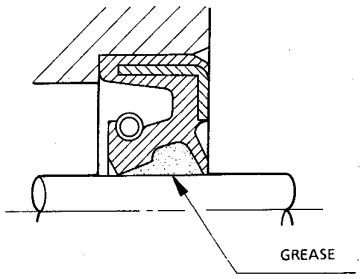
LO-002A

2. Be careful not to twist O-rings. If an O-ring is twisted, remove the twist with the fingertips.

3. During insertion, be careful not to damage the seal.

4. Handling of Floating Seals
   - Wipe all oil off the O-ring and housing of the floating seal.
   - When assembling, apply a thin coating of gear oil to the contact surface of the housing.
   - After assembly, turn the seal 2 or 3 times to get it to fit snugly.

5. Apply grease to the lip of the oil seal.
   - This is to prevent wear when it is first started up after assembly.

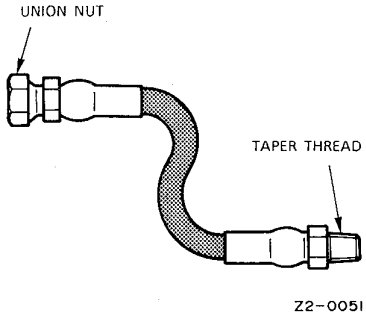


LO-003A

TIGHTENING TORQUES

Hydraulic Hoses

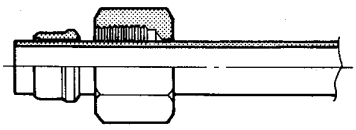
Hose Fitting Size	Torque			
	Union Nut (PF)		Taper Threads (PT)	
	kgf·m	ft-lb	kgf·m	ft-lb
1/8	$1.0^{+0.5}_{0}$	$7.3^{+3.5}_{0}$	$1.2^{\pm 0.12}$	$8.7^{\pm 0.8}$
1/4	$2.5^{+0.5}_{0}$	$18.1^{+3.5}_{0}$	$3.0^{\pm 0.30}$	$21.7^{\pm 2.1}$
3/8	$5.0^{+0.5}_{0}$	$36.2^{+3.5}_{0}$	$5.5^{\pm 0.55}$	$39.8^{\pm 3.9}$
1/2	$6.0^{+0.5}_{0}$	$43.4^{+3.5}_{0}$	$9.0^{\pm 0.90}$	$65.1^{\pm 6.4}$
3/4	$12.0^{+0.5}_{0}$	$86.8^{+3.5}_{0}$	$15.0^{\pm 1.50}$	$108.5^{\pm 10.7}$
1	$14.0^{+0.5}_{0}$	$101.3^{+3.5}_{0}$	$20.0^{\pm 2.00}$	$144.7^{\pm 14.3}$



Z2-0051

Bite Type Pipe Fitting For Steel Pipe

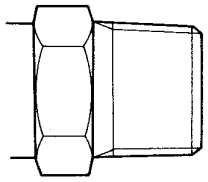
Pipe Outer Diameter (mm)	Torque	
	kgf·m	ft-lb
8	$3.5^{\pm 0.5}$	$25.3^{\pm 3.5}$
10	$4.25^{\pm 0.25}$	$30.7^{\pm 1.7}$
12	$6.0^{\pm 0.5}$	$43.4^{\pm 3.5}$
15	$9.0^{\pm 0.5}$	$65.1^{\pm 3.5}$
16	$9.5^{\pm 0.5}$	$68.7^{\pm 3.5}$
18	$13.5^{\pm 0.5}$	$97.6^{\pm 3.5}$
22	$21.0^{\pm 1.0}$	$151.8^{\pm 7.2}$
27.2	$25.0^{\pm 1.0}$	$181.0^{\pm 7.2}$
28	$32.0^{\pm 2.0}$	$231.4^{\pm 14.3}$
32	$32.0^{\pm 2.0}$	$231.4^{\pm 14.3}$
35	$42.0^{\pm 2.0}$	$303.7^{\pm 14.3}$



Z2-0061

Joints for Piping

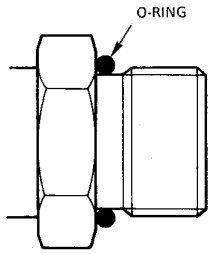
Thread Nominal Diameter (PT)	Torque			
	Steel		Cast Steel	
	kgf·m	ft-lb	kgf·m	ft-lb
1/8	$1.2^{\pm 0.12}$	$8.7^{\pm 0.8}$	$1.1^{\pm 0.11}$	$8.0^{\pm 0.7}$
1/4	$3.0^{\pm 0.30}$	$21.7^{\pm 2.1}$	$2.5^{\pm 0.25}$	$18.1^{\pm 1.7}$
3/8	$5.5^{\pm 0.55}$	$39.8^{\pm 3.9}$	$5.0^{\pm 0.50}$	$36.2^{\pm 3.5}$
1/2	$9.0^{\pm 0.90}$	$65.1^{\pm 6.4}$	$7.5^{\pm 0.75}$	$54.3^{\pm 5.3}$
3/4	$15.0^{\pm 1.50}$	$108.5^{\pm 10.7}$	$13.0^{\pm 1.30}$	$94.1^{\pm 9.3}$
1	$20.0^{\pm 2.00}$	$144.7^{\pm 14.3}$	$17.5^{\pm 1.75}$	$126.6^{\pm 12.5}$



Z2-0071

Joints for Piping (O-Ring Seal Type)

Thread Nominal Diameter (PF)	Torque	
	kgf·m	ft-lb
1/8	$2.0^{\pm 0.2}$	$14.5^{\pm 1.4}$
1/4	$3.5^{\pm 0.5}$	$25.3^{\pm 3.5}$
3/8	$5.5^{\pm 0.5}$	$39.8^{\pm 3.5}$
1/2	$6.5^{\pm 0.5}$	$47.0^{\pm 3.5}$
3/4	$9.5^{\pm 0.5}$	$68.7^{\pm 3.5}$
1	$11.0^{\pm 01.0}$	$79.5^{\pm 7.2}$
1-1/4	$12.0^{\pm 1.0}$	$86.8^{\pm 7.2}$
1-1/2	$14.0^{\pm 1.0}$	$101.2^{\pm 7.2}$



Z2-0081

Thread Nominal Diameter (UNF)	Torque	
	kgf·m	ft-lb
7/16-20	$1.7^{\pm 0.2}$	$12.3^{\pm 1.4}$
1/2-20	$2.3^{\pm 0.2}$	$16.6^{\pm 1.4}$
9/16-18	$3.2^{\pm 0.3}$	$23.1^{\pm 2.1}$
3/4-16	$6.1^{\pm 0.5}$	$44.1^{\pm 3.5}$
1-1/16-12	$10.4^{\pm 0.6}$	$75.2^{\pm 4.4}$
1-5/16-12	$13.8^{\pm 0.8}$	$99.8^{\pm 5.8}$
1-5/8-12	$18.5^{\pm 1.0}$	$133.8^{\pm 7.2}$

Bolts and Nuts (For ISO Strength Category 10.9)

Category	Size × Pitch	Torque			
		General Connection Points		Special Connection Points	
		kgf·m	ft-lb	kgf·m	ft-lb
Coarse	M 6 × 1.0	1.0±0.05	7.3± 0.3	1.2±0.06	8.7± 0.3
	M 8 × 1.25	2.3±0.11	16.7± 0.7	2.7±0.13	19.6± 0.8
	M10 × 1.5	4.8±0.24	34.8± 1.6	5.6±0.28	40.5± 2.0
	M12 × 1.5	8.9±0.44	64.4± 3.1	10.4±0.52	75.3± 3.6
	M12 × 1.75	8.5±0.42	61.5± 2.9	9.9±0.49	71.6± 3.5
	M14 × 2.0	13.7±0.68	99.1± 4.8	15.9±0.79	115.0± 5.7
	M16 × 2.0	21.2±1.06	153.3± 7.5	24.6±1.23	178.0± 8.8
	M20 × 2.5	41.9±2.09	303.1±15.0	48.5±2.42	350.8±17.4
Fine	M 6 ×	—	—	—	—
	M 8 × 1.0	2.5±0.12	18.1± 0.8	2.9±0.14	21.0± 0.9
	M10 × 1.25	5.1±0.25	36.9± 1.7	6.0±0.30	43.4± 2.1
	M12 × 1.25	9.3±0.46	67.3± 3.2	10.8±0.54	78.2± 3.8
	M14 × 1.5	13.8±0.69	99.9± 4.9	16.1±0.80	116.5± 5.7
	M16 × 1.5	22.5±1.12	162.8± 8.0	26.1±1.30	188.8± 9.3
	M20 × 1.5	46.1±2.30	333.5±16.5	53.5±2.66	387.0±19.1

1. Standard Tightening Points (Non-lubricated)
   - All securing points other than the special types.

2. Special Tightening Parts (Parts where grease with molybdenum disulfide is applied.)
   - Parts where particular necessary due to function.
   a. Connections between the Slew Bearing and Body
   b. Other parts where it is deemed particularly necessary due to the design.

3. Parts where thread lock is used (Three Bond #1324 is applied.)
   a. Connections between the slew bearing and lower frame.
   b. Engine foot connections.
   c. Pump coupling connections.
   d. Lever assembly rod end connections.
   e. Travel motor connections.
   f. Joints of the drive sprocket.

4. If tightening torque values are provided in this manual, then tightening should be done according to those values.
   (This indicates that the tightening torque differs from the values given in this table.)

5. In order to tighten bolts and nuts evenly, they should be tightened alternately top, bottom, left, right.

Ⅱ. SPECIFICATIONS

FOREWORD

This section, "Specifications", includes brief specifications and maintenance standards, etc. for this machine, and is organized around the data required for service operations. Please use this manual in checks of the machine before servicing, checks after servicing and when replacing parts, etc.
We want, through future revisions of this manual, etc. to improve it and make it as complete as we possibly can. We welcome any opinions or suggestions, etc., which you may have that would help us. Please address all comments to the person in charge.

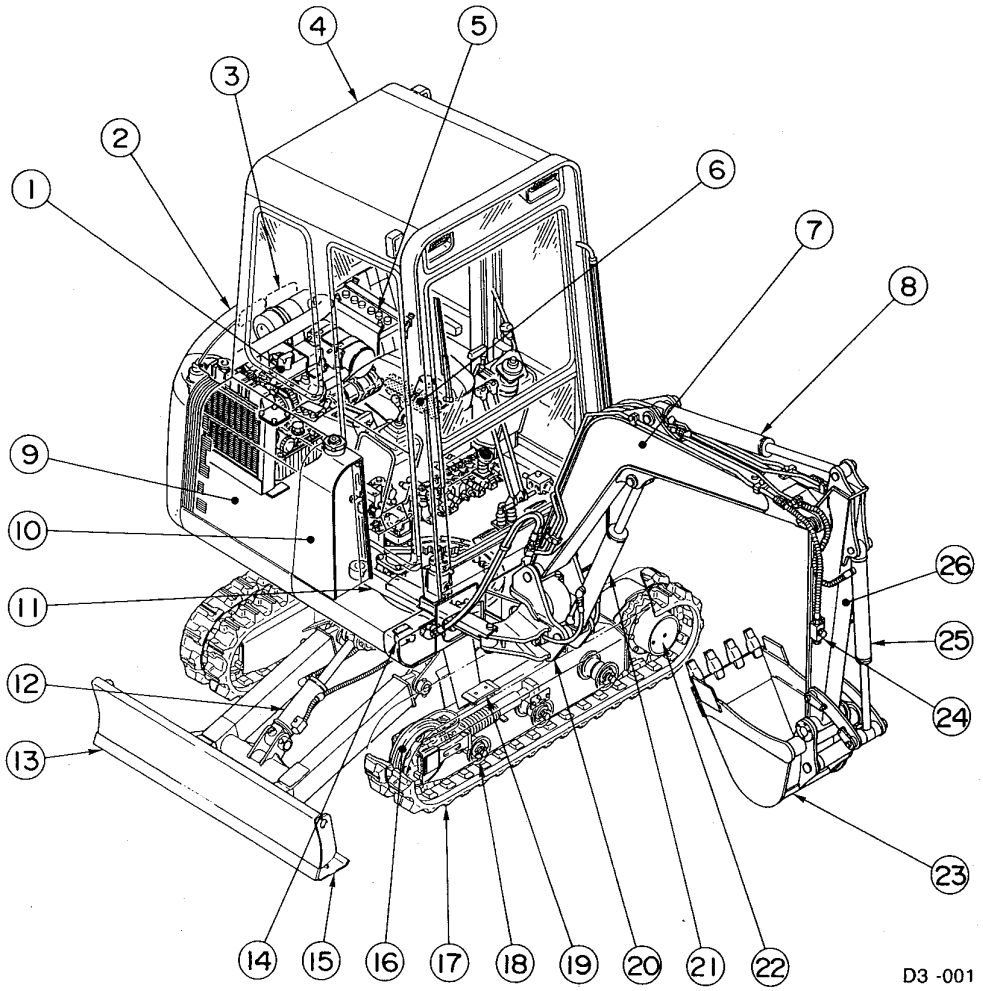
In regard to Standard Values and Allowable Values
The terms used in the items "Servicing Standards" and "Standards for Judging Performance" have the following meanings.

Standard Value ..... This indicates the standard value for the new machine at the time of shipping from the factory.
It should be used as the target value for maintenance work after operation etc.

Allowable Value ..... The dimensions of parts change during use because of wear and deformation. Also, the performance of pumps, motors, and other hydraulic equipment drops, and this is the estimated value indicating the use limit for the respective part. It is decided under reference to the standard at the time of shipping, the results of various tests, etc. As the use conditions, the degree of repairs, etc. differ for each machine, these should be combined and used as reference for servicing standards and standards for judging performance.
* Do not use the standard values and the allowable values as standards for customer claims.

CONTENTS

NAMES OF COMPONENTS

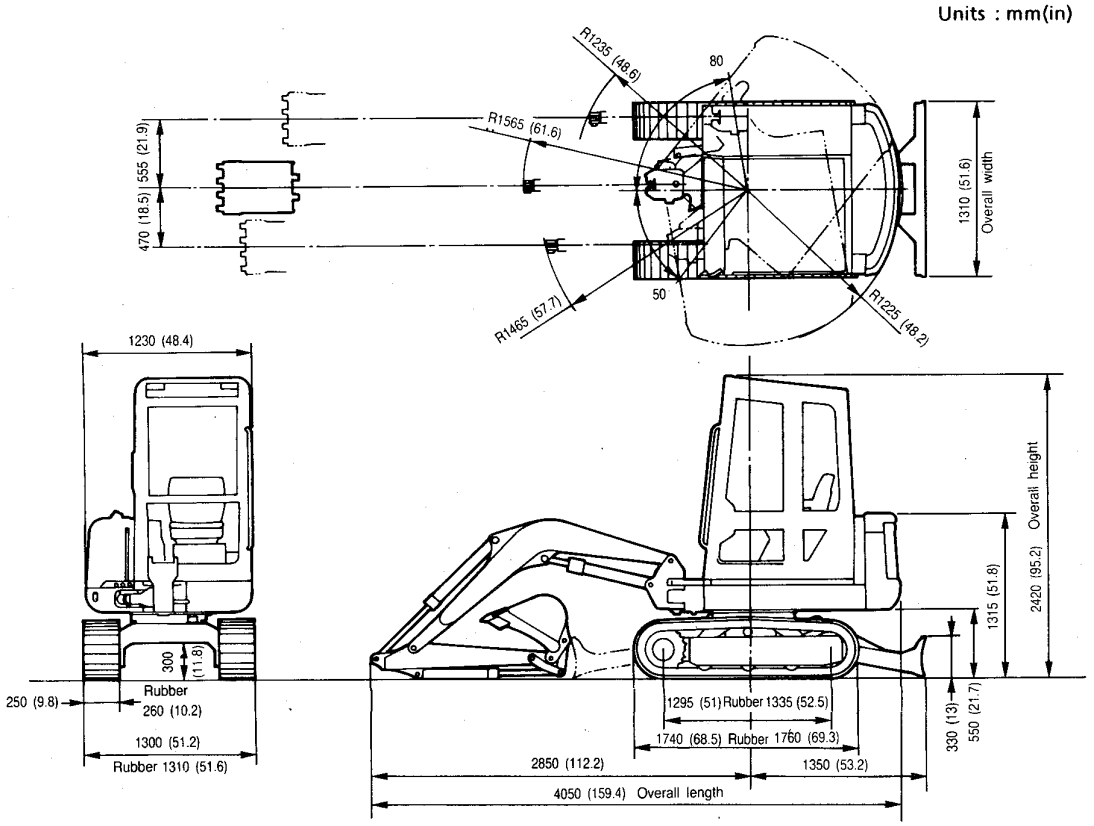


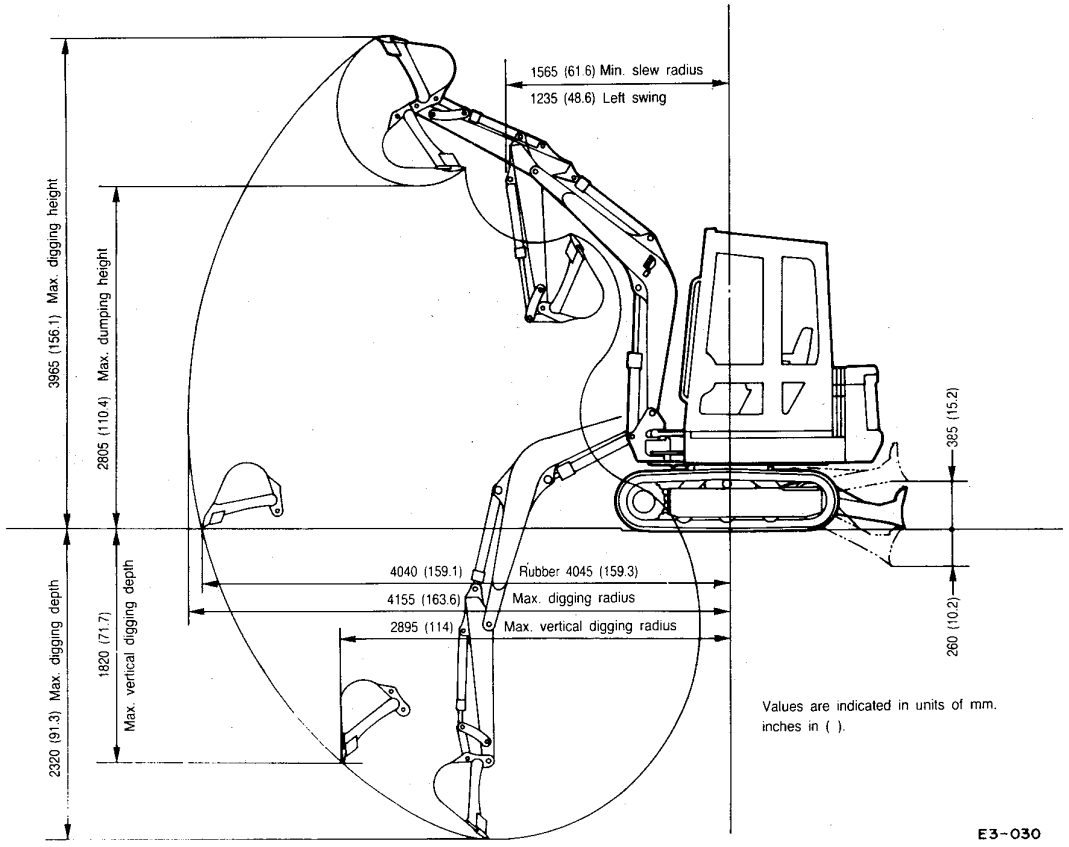
1. Engine
2. Bonnet
3. Flasher Lamp
4. Cabin
5. Battery
6. Tools
7. Boom
8. Arm Cylinder
9. Hydraulic Tank
10. Fuel Tank
11. Swing Cylinder
12. Dozer Blade Cylinder
13. Dozer Blade
14. Stop Valve
15. Road Surface Protector
16. Idler
17. Crawler Belt
18. Track Roller
19. Shoe Slide
20. Swing Bracket
21. Boom Cylinder
22. Travel Motor
23. Bucket
24. Auxiliary Port
25. Bucket Cylinder
26. Arm

DIMENSIONS

Cabin

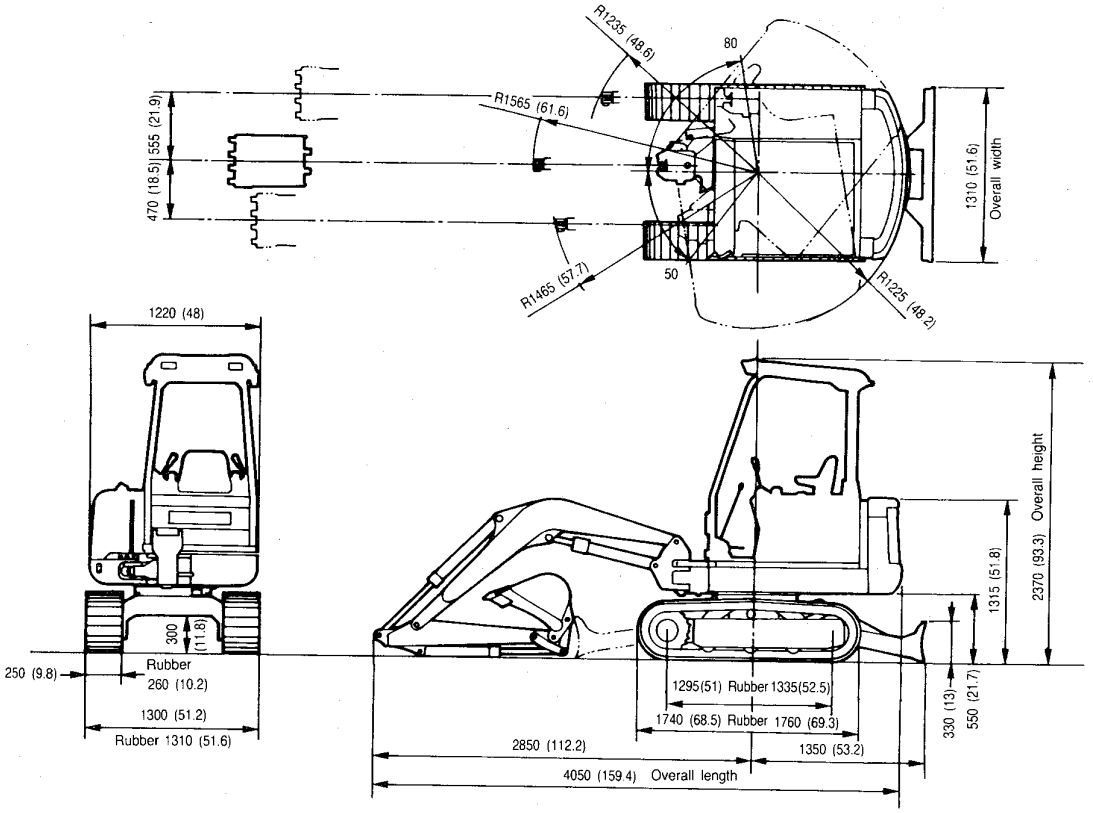
Units : mm(in)

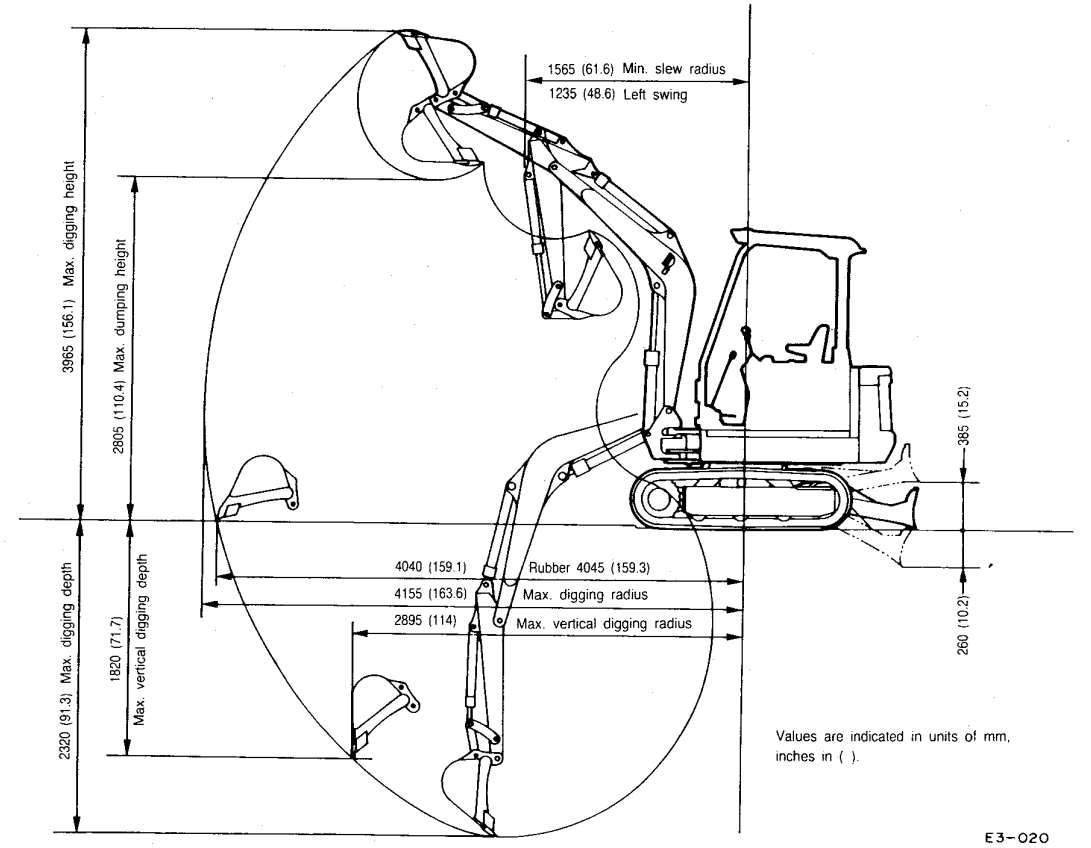




Canopy

Units : mm(in)





LIFTING CAPACITIES

Rated lift capacity chart

- The numerical values in the charts indicate either 87% of the hydraulic lift capacity or 75% of the tipping load, whichever value is smaller. (*Marks indicate values limited by the hydraulic lift capacity.)
- The mass of slings and any auxiliary lifting devices shall be deducted from the rated load to determine the net load that may be lifted.
- The load point is the bucket hinge pin, and the bucket posture is with the standard bucket completely retracted under the arm.
- Units: kg (lbs.)

Load hooking system

A load hooking system with all of the following capacities must be provided and used.

① A system which can withstand a weight of two times the rated lift capacity no matter at what position the load is applied.

② A system in which there is no risk of the lifted load falling from the hooking device, for example one equipped with a hook slippage prevention device.

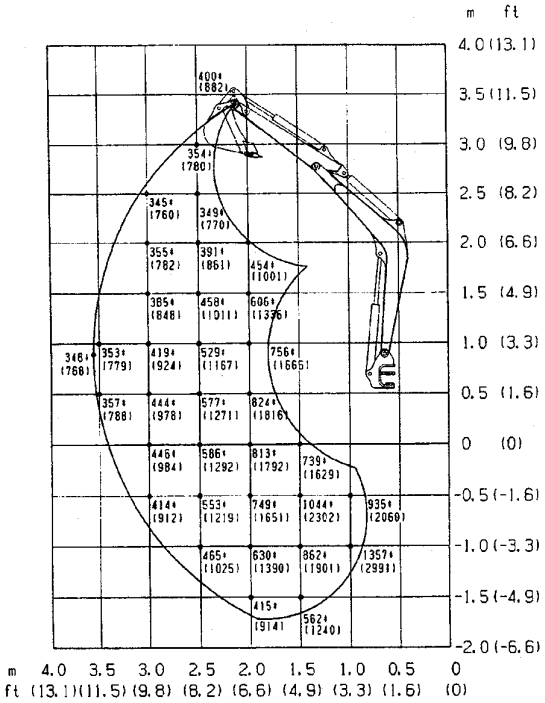
③ A system in which there is no risk of the hooking system slipping from the hoe attachment.

⚠ WARNING

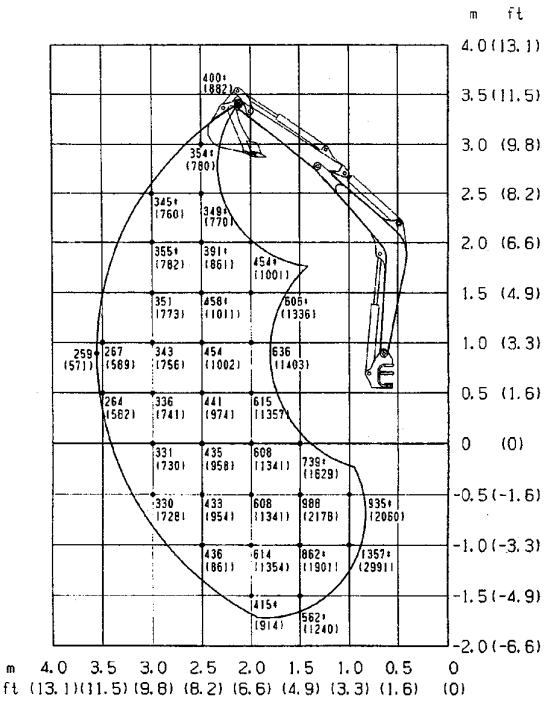
- **DO NOT attempt to lift or hold any load that is greater than these rated values at their specified load radii and height.**
- **All rated lift capacities are based on the machine being level and on a firm supporting surface. For safe working loads, the user is expected to make due allowance for the particular job conditions such as soft or uneven ground, non-level conditions, side loads, hazardous conditions, experience of personnel, etc. The operator and other personnel should fully acquaint themselves with the operator's manual furnished by the manufacturer before operating this machine, and rules for safe operation of equipment shall be adhered to at all times.**

EQUIPPED WITH STSNDARD ARM

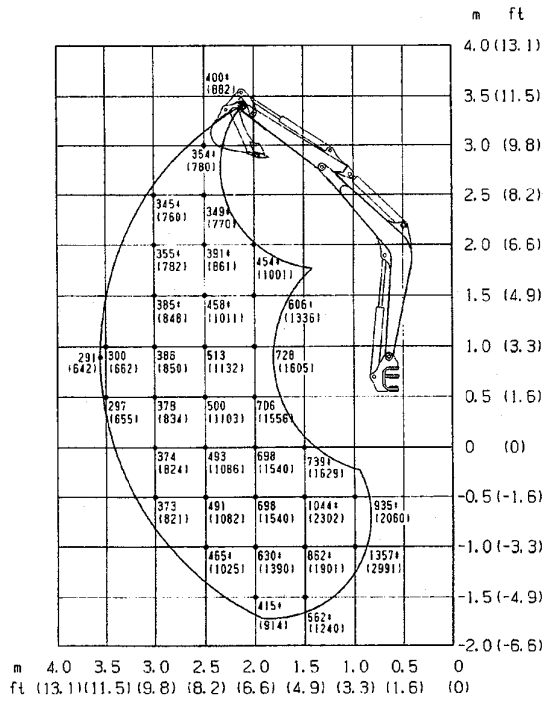
OVER FRONT ; Dozer Blade Down



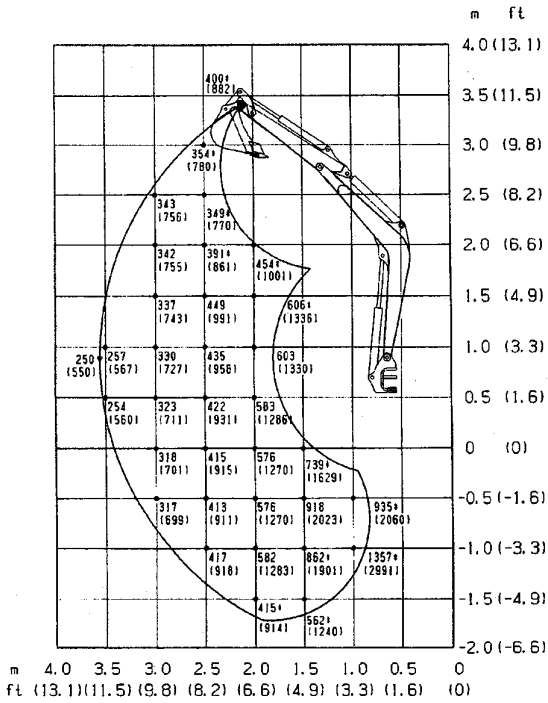
OVER FRONT ; Dozer Blade Up



OVER REAR



OVER SIDE



D3-020

SPECIFICATIONS

SPECIFICATIONS

SPECIFICATIONS

Serial Number		1203001~	
Type		Rubber Crawler	Steel Crawler
Standard Bucket Capacity (SAE Rated)	$m^3(yd^3)$	0.057 (0.075)	←
Weight in Transport Condition	kg(lb)	2030 (4480)[1940 (4280)] 2040 (4490)[1950 (4290)] *	2150 (4740) [2060(4540)] 2160 (4750) [2070(4550)]*
Dimensions	mm(in)		
Overall Length		4050 (159.4)	←
Overall Width		1310 (51.6)	←
Overall Height		2420 (95.2)[2370 (93.3)]	←
Minimum Ground Clearance		300 (11.8)	←
Minimum Height of Upper Machinery		550 (21.7)	←
Overall Width of Upper Machinery		1250 (49.2)	←
Overall Width of Crawler		1310 (51.6)	1300 (51.2)
Overall Length of Crawler		1775 (69.9)	1740 (68.4)
Minimum Slew Radius		1565 (61.6)	←
Maximum Height of Hoe at Minimum Slew Radius		3105 (122.3)	←
Tail Swing Radius		1225 (48.2)	←
Dozer Blade Width		1310 (51.6)	←
Dozer Blade Height		330 (13)	←
Working Range	mm(in)		
Maximum Digging Height		3965 (156.1)	←
Maximum Digging Depth		2320 (91.3)	←
Vertical Digging Depth		1820 (71.6)	←
Maximum Digging Reach		4155 (163.6)	←
Maximum Reach at Ground		4045 (159.3)	4040 (159.1)
Maximum Dumping Height		2805 (110.5)	←
Bucket Offset : Right/Left		555 (21.9)/470 (18.5)	←
Dozer Blade Lift : Above/ Below ground		385 (15.1)/260 (10.3)	←
Performance			
Digging Force : Arm/Bucket	kg(lb)	1100 (2425)/1500 (3307)	←
Slew Speed	rpm	10	←
Travel Speed	km/h(mph)	Low2.4(1.47)/High 4.3(2.65)	Low2.2(1.37)/High 4.0(2.50)
Traction Force	kg(lb)	2210 (4860)	←
Gradeability	deg	30	←
Ground Pressure (JIS)	$kgf/cm^2(psi)$	0.27 (3.84)[0.26(3.70)]	0.30 (4.33)[0.29 (4.12)]

Values in [ ] are for models with canopy specifications.

Values with the * mark are for Northern Europe specification models.

Serial Number		1203001~
Engine		
Model		Kubota D-1105-B
Type		3-Cycle Water Cooled Diesel
No. of Cylinders – Bore × Stroke	(mm)	3 – 78 × 78.4
Total Displacement	(cc)	1123
Compression Ratio		22
Dry Weight	(kg)	119
Performance		
Rated Output	(PS/rpm)	21/2500
Maximum Torque	(kgfm/rpm)	6.6/1600
Maximum No-load R.P.M.	(rpm)	2700
Minimum No-load R.P.M.	(rpm)	1000
Specific Fuel Consumption	(g/PS·h)	185
Starter	(V – kW)	12 – 1.4
Generator	(V – A)	12 – 40
Battery	(V – A·h)	12 – 55
Hydraulic Pump		
Model		YPT2A888A3H9-R847
Type		Gear Pump
Displacement	(cc/rev)	8.02 + 8.02 + 8.02
Rated Discharge Volume	(*l*/min)	20.05 + 20.05 + 20.05
Rated Pressure	(kgf/cm^2)	190 (P1,P2), 175 (P3)
Weight	(kg)	5.7
Control Valve		
Model		SC2-9C
No. of Sections		9
Main Relief Valve Settings	(kgf/cm^2@ *l*/min)	190@20(P1,P2),175@20(P3),
Port Relief Valve Settings	(kgf/cm^2@ *l*/min)	230@20(A2,B2,B3,A6,B6),210@20(B9)
Weight	(kg)	20
Control Valve (Sub)		
Model		YV179-000
Flow During Use	(*l*/min)	30(P),5(A)
Reducing Valve Settings	(kgf/cm^2)	40
Weight	(kg)	6.8
Pilot Valve		
Model		TH40K1051
Secondary Side Pressure	(kgf/cm^2)	0~40
Operating Angle: Single (Ports 1, 3)	(deg)	19
Single (Ports 2, 4)	(deg)	25
Simultaneous	(deg)	25
Weight	(kg)	4.6

Serial Number		1203001~
Cylinders		
Boom		
Bore Diameter× Rod Diameter	(mm)	65×35
Stroke	(mm)	440
Fully Retracted Length (Pitch)	(mm)	760
Cushion Mechanism		Rod Side
Weight	(kg)	19
Arm		
Bore Diameter× Rod Diameter	(mm)	63×35
Stroke	(mm)	500
Fully Retracted Length (Pitch)	(mm)	750
Cushion Mechanism		–
Weight	(kg)	18
Bucket		
Bore Diameter× Rod Diameter	(mm)	55×30
Stroke	(mm)	425
Fully Retracted Length (Pitch)	(mm)	645
Cushion Mechanism		–
Weight	(kg)	11
Swing		
Bore Diameter× Rod Diameter	(mm)	70×40
Stroke	(mm)	425
Fully Retracted Length (Pitch)	(mm)	745
Cushion Mechanism		Rod side
Weight	(kg)	23
Dozer Blade		
Bore Diameter× Rod Diameter	(mm)	80×45
Stroke	(mm)	130
Fully Retracted Length (Pitch)	(mm)	465
Cushion Mechanism		–
Weight	(kg)	19
Travel Motor		
Model		MAG-18VP-160
Type		Piston Motor
Total Displacement : 1st /2nd Speed	(cc/rev)	587.7/319.0
Motor Displacement : 1st /2nd Speed	(c/rev)	14.96/8.12
Reduction Ratio		1/39.286
Plunger Switching Pressure	(kgf/cm^2)	6~7
2-Speed Control Pressure	(kgf/cm^2)	6 or more
Parking Brake Torque	(kgfm)	113
Parking Brake Releace Pressure	(kgf/cm^2)	11 or more
Redution Gear Lubricating Oil Volume	(*l*)	0.5
Weight	(kg)	33

Serial Number		1203001~	
Slew Motor		without Parking Brake	with Parking Brake
Model		2-290EOP5-E	2-290EOP7-E
Type		Orbit	←
Motor Displacement	(cc/rev)	288	←
Relief Valve Settings	(kgf/cm²@ *l*/min)	105@20	←
Parking Brake Torque	(kgfm)	–	23
Parking Brake Release Pressure	(kgf/cm²)	–	13 or more
Weight	(kg)	20	21.2
Swivel Joint			
Model		YV-7104	
Weight	(kg)	11	

WEIGHTS

UNIT DRY WEIGHT

Units : kg (lb)

Serial Number	1203001~	
	Cabin	Canopy
Upper Machinery	1010(2230)[1015(2239)]	910(2013)[915(2022)]
Engine	119(262)	←
Radiator	5.3(12)	←
Hydraulic Pump	5.7(13)	←
Hydraulic Tank	53(117)	←
Fuel Tank	25(55)	←
Control Valve	20(44)	←
Control Valve (Sub)	6.8(15.0)	←
Pilot Valve	4.6(10.1)	←
Slew Motor : without/ with P.B.	20(44)/21.2(47)	←
Cabin/Canopy	205(452)	76(168)
Counter Weight (C)	10(22)	←
Counter Weight (R)	10(22)	←
Counter Weight (L)	10(22)	←
Swing Bracket	35(77)	←
Swing Cylinder	23(51)	←
	Rubber Crawler	Steel Crawler
Lower Machinery	690(1523)	810(1785)
Swivel Joint	11(24)	←
Slew Bearing	32(71)	←
Crawler Belt	77(170)	137(302)
Track Motor	33(73)	←
Track Roller	5.7(13)	←
Idler	22(49)	28(62)
Sprocket	8.7(19)	←
Track Tension	12(26)	←
Dozer Blade	83(183)	←
Dozer Blade Cylinder	19(42)	←
Hoe Attachment	250(550)	
Boom	75(165)	
Arm	35(77)	
Bucket : Standard 630mm	48(106)	
Boom Cylinder	19(42)	
Arm Cylinder	18(40)	
Bucket Cylinder	11(24)	

Values in [ ] are for models with canopy specifications.