

SECTION **3B**

**HYDRAULIC
LOADING SHOVELS**

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Outstanding Work Performance Increases the Productivity

- Mode selection system for higher work efficiency
- An efficient hydraulic system for increased productivity.
- Wide working range and large undercarriage assure stable operation for max. working performance.
- Swing holding brake facilitates work on slope

Comfortable Cab, Easy Operation

- A deluxe cab with a wider working visibility.
- Low noise at operator's ears.
- The wrist control levers are arranged for comfortable, easy operation.
- Smooth swing control.

Dependable Components and Easy Maintenance to increase the Machine Availability

- Dependable hydraulic system and units.
- Tough undercarriage and work equipment.
- An advanced monitoring system helps to prevent minor problem becoming major one.

Breakthroughs in Fuel Economy

- A mode selection system reduces fuel consumption.
- An OLSS hydraulic system provides great energy saving.

- Fuel efficient Komatsu engine.
- An autodeceleration system for higher energy saving

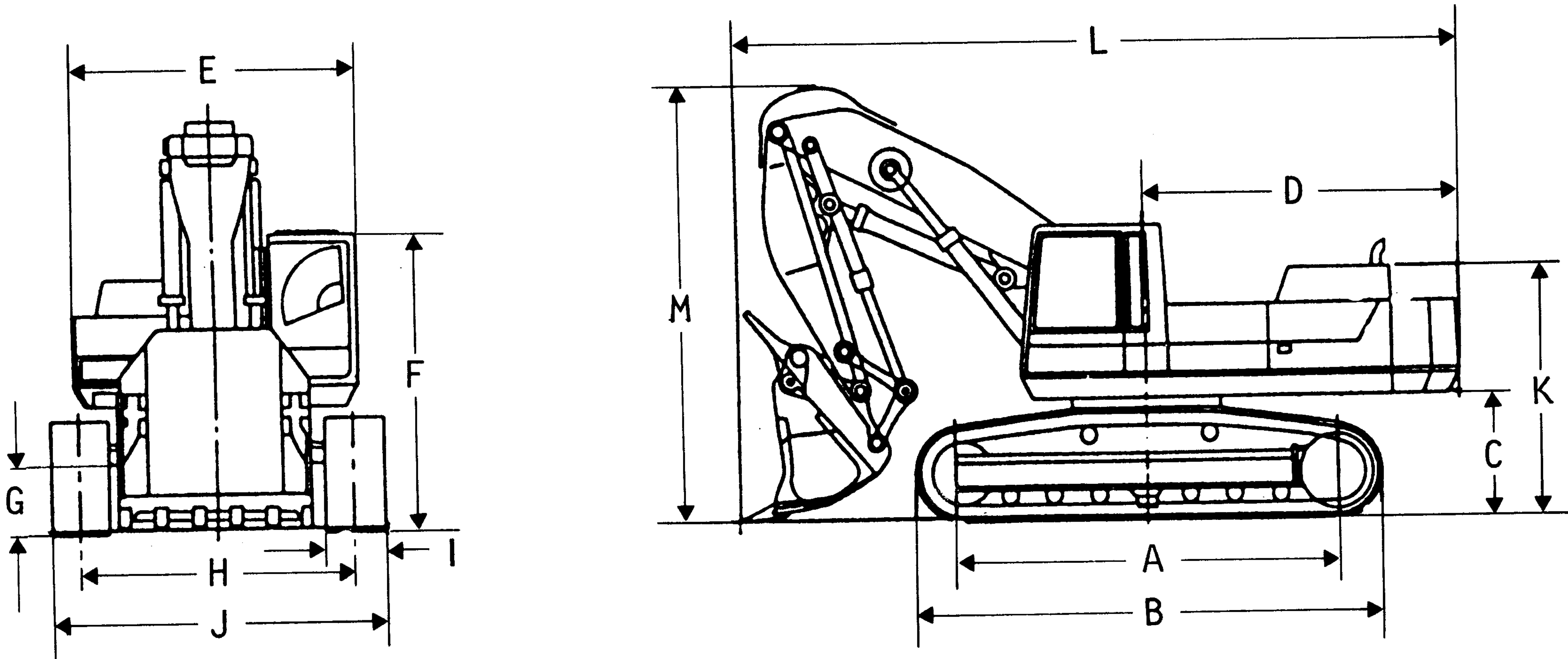
Specifications

HYDRAULIC
LOADING SHOVELS

Model		PC400-3	PC650-3	PC1000-1	PC1600-1
Item					
OPERATING WEIGHT	kg(lb)	42000(92,590)	67000(147,700)	98000(216,100)	162000(357,100)
FLYWHEEL HORSEPOWER:	(SAE) HP(kW)/RPM	266(199)/2000	404(302)/1800	542(405)/1700	2 × 404(302) /1800
	(DIE) PS(kW)/RPM	270(199)/2000	410(302)/1800	550(405)/1700	2 × 410(302) /1800
BUCKET CAPACITY RANGE (SAE)	m ³ (cu.yd)	2.6 (3.4)	3.8, 4.5 (5.0)(5.9)	6.1, 7.0, 8.5 (8.0)(9.2)(11.1)	8.0~13.0 (10.5)(17.0)
PERFORMANCE:					
Swing speed	RPM	9.0	5.7	4.5	4.5
Max. travel speed High	km/h (MPH)	4.3 (2.7)	4.1 (2.5)	3.4 (2.1)	2.5 (1.6)
Low		2.9 (1.8)	2.7 (1.7)	2.4 (1.5)	—
DIMENSIONS:					
Overall length	mm(ft.in)	7820 (25' 8")	9540 (31' 4")	10715 (35' 2")	13235 (43' 5")
Overall height		4630 (15' 2")	5050 (16' 7")	5960 (19' 7")	6750 (22' 2")
Overall width		3480 (11' 5")	3910 (12'10")	4610 (15' 2")	6020 (19' 9")
Lenght of track on ground		4020 (13' 2")	4500 (14' 9")	5030 (16' 6")	5780 (19')
Track gauge		2870 (9' 5")	3300 (10'10")	3900 (12'10")	4350 (14' 3")
Tail swing radius		3430 (11' 3")	4100 (13' 5")	4650 (15' 4")	5980 (19' 7")
Ground clearance		640 (2' 1")	880 (2'11")	970 (3' 2")	730 (12' 5")
ENGINE:		KOMATSU	KOMATSU	KOMATSU	KOMATSU
Model		S6D125	SA6D140	SA6D170	SA6D140 × 2
No. of cylinder – bore × stroke	mm (in)	6 – 125 × 150 (4.92'')(5.91'')	6 – 140 × 165 (5.5'')(6.5'')	6 – 170 × 170 (6.69'')(6.69'')	6 – 140 × 165 (5.51'')(6.5'')
Piston displacement	ltr.(cu.in)	11.05 (674)	15.2 (927)	23.15 (1413)	15.24 × 2 (930 × 2)
HYDRAULIC SYSTEM:					
Hydraulic pump		2 × Variable Piston	3 × Variable Piston	3 × Variable Piston	4 × Variable Piston
Max. oil flow	ltr.(U.S.Gal)/ min.	600 (159)	1152 (304)	1704 (450)	2617 (691)
Max. oil pressure	kg/cm ² (PSI)	320 (4550)	320 (4550)	320 (4550)	320 (4550)
TRACK SHOES:					
Width/ground pressure	mm(in) kg/cm ² (PSI/kPa)	610 (24'')/ 0.85 (12.1/83)	610 (24'')/ 1.09 (15.5/107)	710 (28'')/ 1.27 (18.1/125)	810 (32'')/ 1.57 (22.3/154)
CAPACITY (Refilled):					
Fuel tank	ltr.(U.S.Gal)	510 (134.7)	740 (196)	1140 (301)	2050 (542)
Hydraulic oil tank		225 (59.4)	480 (127)	650 (172)	1500 (396)

Dimensions

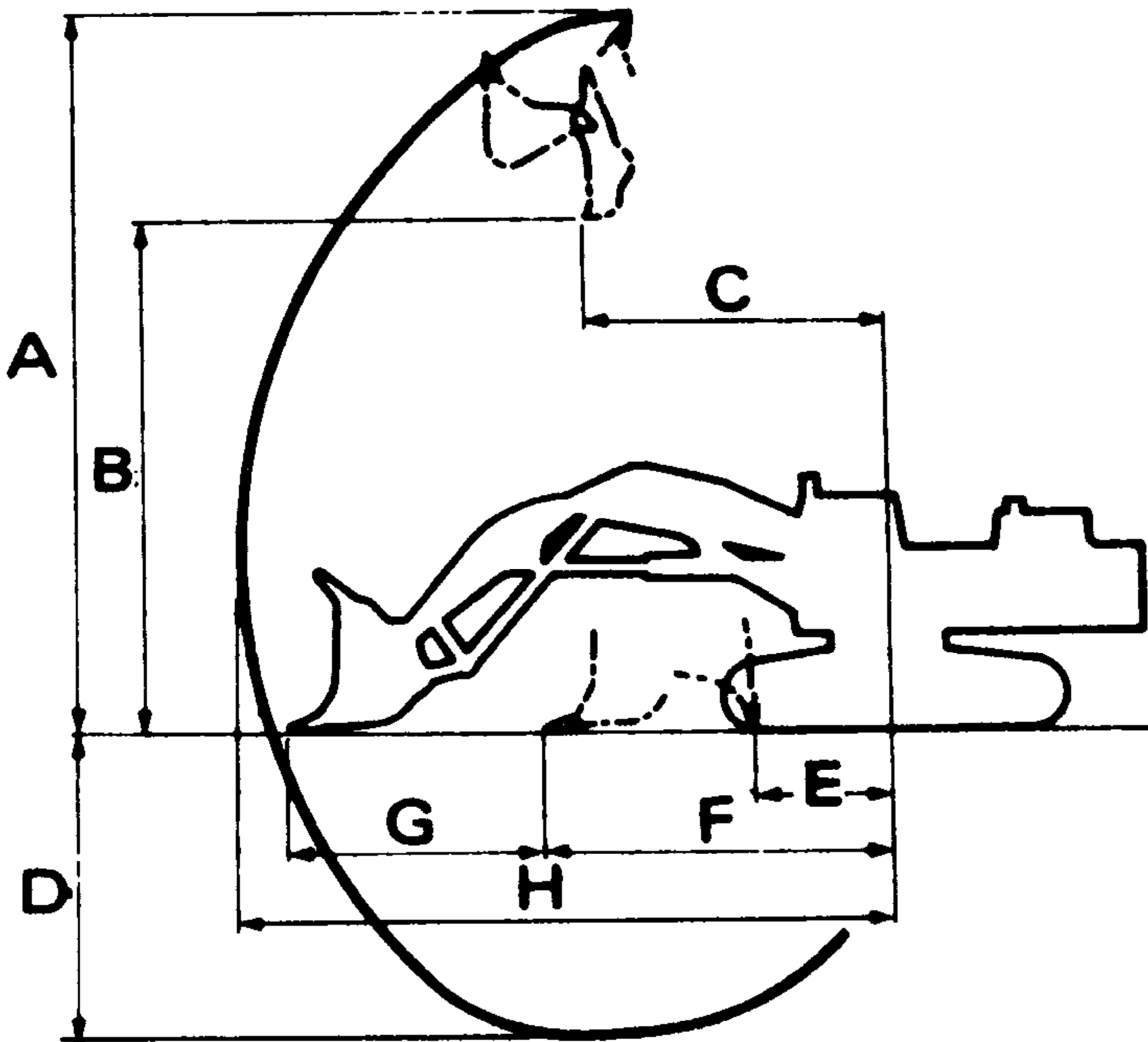
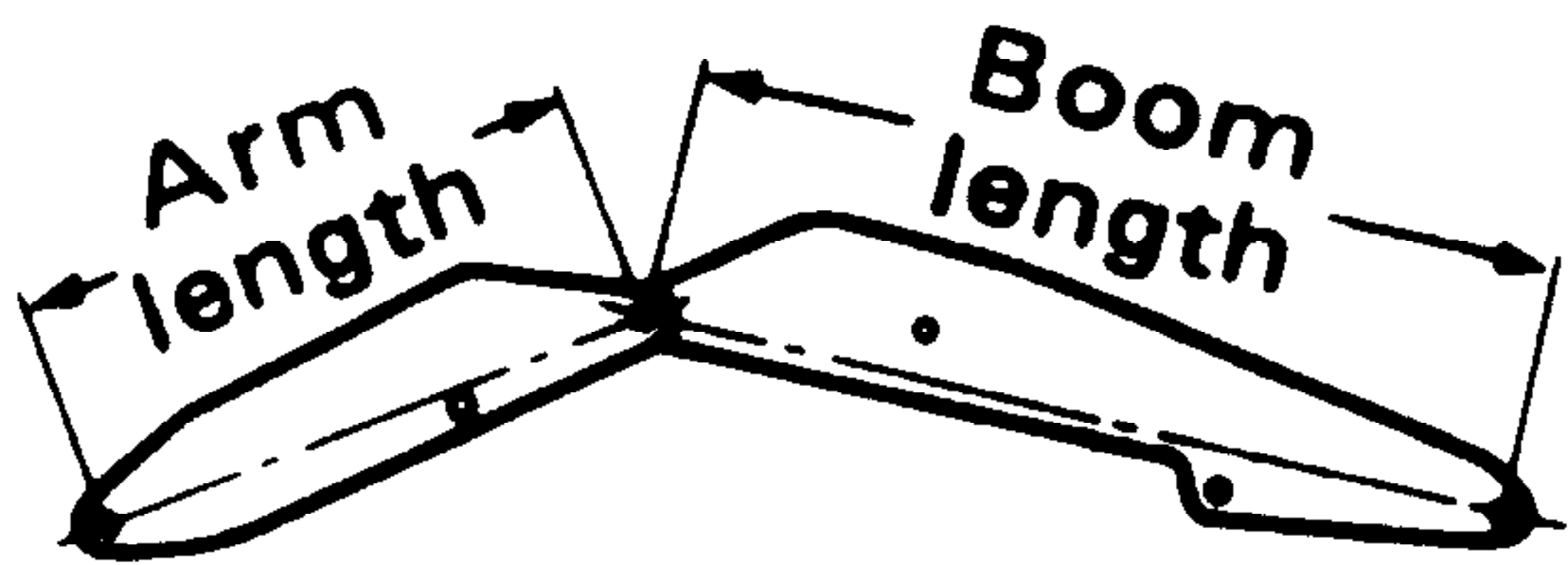
HYDRAULIC
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	A mm (ft.in)	B mm (ft.in)	C mm (ft.in)	D mm (ft.in)	E mm (ft.in)	F mm (ft.in)	G mm (ft.in)	H mm (ft.in)	I mm (in)	J mm (ft.in)	K mm (ft.in)	L mm (ft.in)	M mm (ft.in)
PC400-3	4020 (13'2")	5040 (16'6")	1310 (4'4")	3360 (11')	2960 (9'9")	3220 (10'7")	640 (2'1")	2870 (9'5")	610 (24")	3480 (11'5")	2680 (8'10")	7820 (25'8")	4630 (15'2")
PC650-3	4500 (14'9")	5815 (19'1")	1550 (5'1")	4020 (13'2")	3280 (10'9")	3600 (11'10")	880 (2'11")	3300 (10'10")	610 (24")	3910 (12'10")	3555 (11'8")	9540 (31'4")	5050 (16'7")
PC1000-1	5030 (16'6")	6355 (20'10")	1635 (5'4")	4590 (15'1")	3610 (11'10")	4620 (15'2")	970 (3'2")	3900 (12'10")	710 (28")	4610 (15'2")	3740 (12'3")	10715 (35'2")	5960 (19'7")
PC1600-1	5780 (19')	7445 (24'5")	2015 (6'7")	5880 (19'4")	3940 (12'11")	6220 (20'5")	730 (12'5")	4350 (14'3")	810 (32')	5160 (16'11")	4470 (14'8")	13235 (43'5")	6750 (22'2")

Working Ranges
 Digging Force

HYDRAULIC
 LOADING SHOVELS



Unit: mm (ft. in)

	Boom length m(ft.in)	Arm length m(ft.in)	A. mm (ft.in)	B mm (ft.in)	C mm (ft.in)	D mm (ft.in)	E mm (ft.in)	F mm (ft.in)	G mm (ft.in)	H mm (ft.in)	Breakout force kg (lb/kN)	Arm crowd force kg (lb/kN)
PC400-3	4.30 (14'1")	2.92 (9'7")	9820 (32'3")	7130 (23'5")	3870 (12'8")	4020 (13'2")	1445 (4'9")	4460 (14'8")	3650 (12')	8770 (28'9")	27400 (60,410/269)	28800 (63,490/282)
PC650-3	4.60 (15'1")	3.40 (11'2")	10680 (35')	7710 (25'4")	5550 (18'3")	3430 (11'3")	3200 (10'6")	5685 (18'8")	3965 (13')	10000 (32'10")	44000 (97,000/431)	45000 (99,230/441)
			10845 (35'7")			3530 (11'7")	3335 (10'11")	5800 (19')	3970 (13')	10135 (33'3")	40800 (89,950/400)	45000 (99,230/441)
PC1000-1	5.10 (16'9")	3.80 (12'6")	12170 (39'11")	8780 (28'10")	6350 (20'10")	3910 (12'10")	3480 (11'5")	6125 (20'1")	4720 (15'6")	11380 (37'4")	58500 (129,000/573)	56000 (123,500/549)
PC1600-1	5.90 (19'4")	4.40 (14'5")	14110 (46'4")	10000 (32'10")	7210 (23'8")	4050 (13'3")	4340 (14'3")	7450 (24'5")	5150 (16'11")	13140 (43'1")	73000 (161,000/716)	73000 (161,000/716)

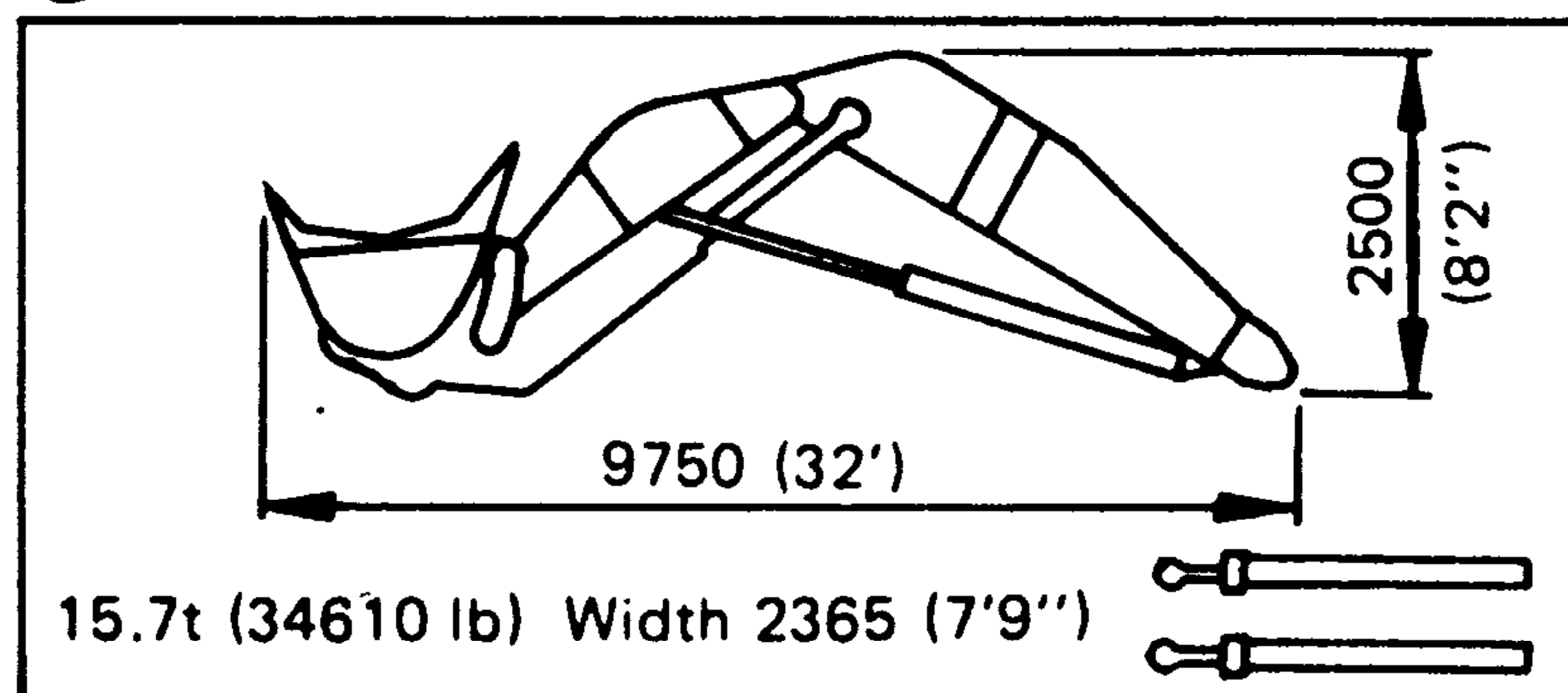
Component Dimensions and Weights

HYDRAULIC LOADING SHOVELS

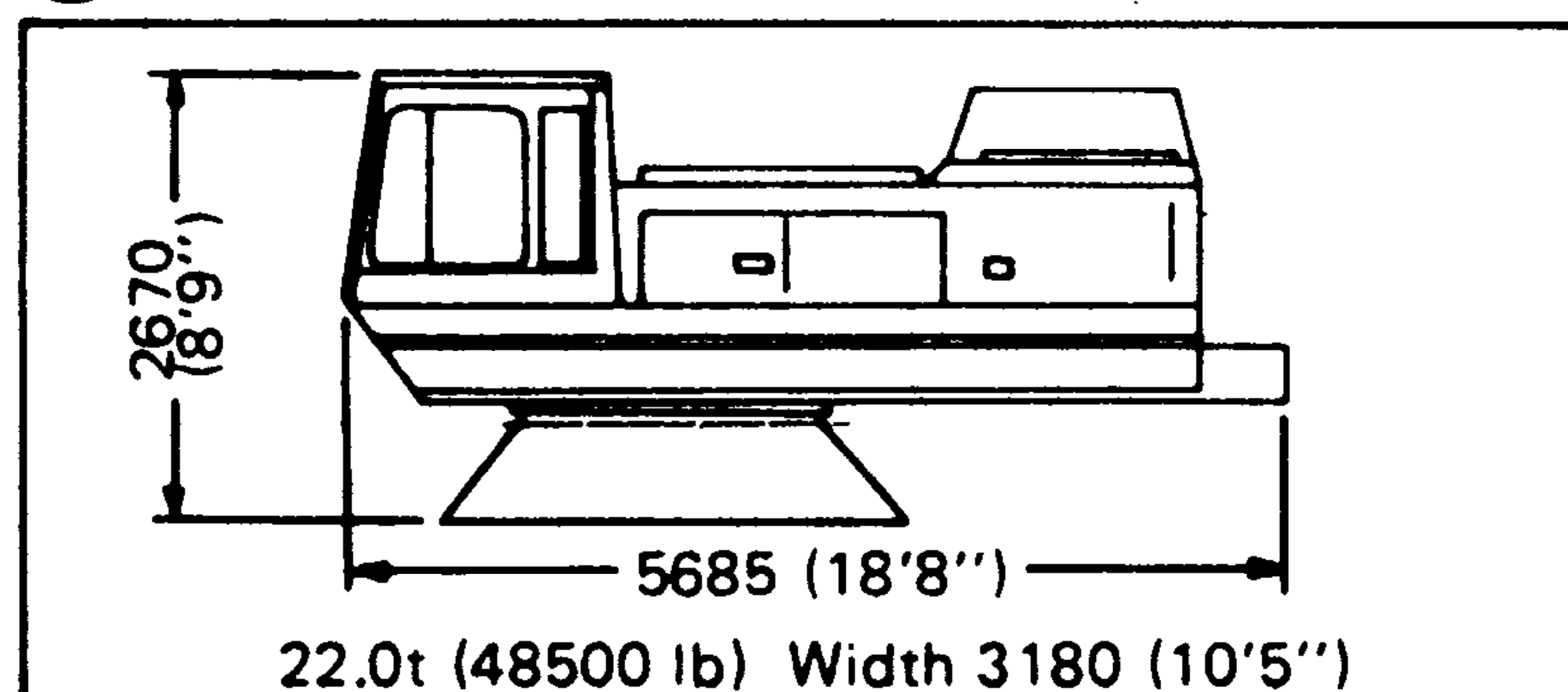
PC650-3

■ Four-part structure

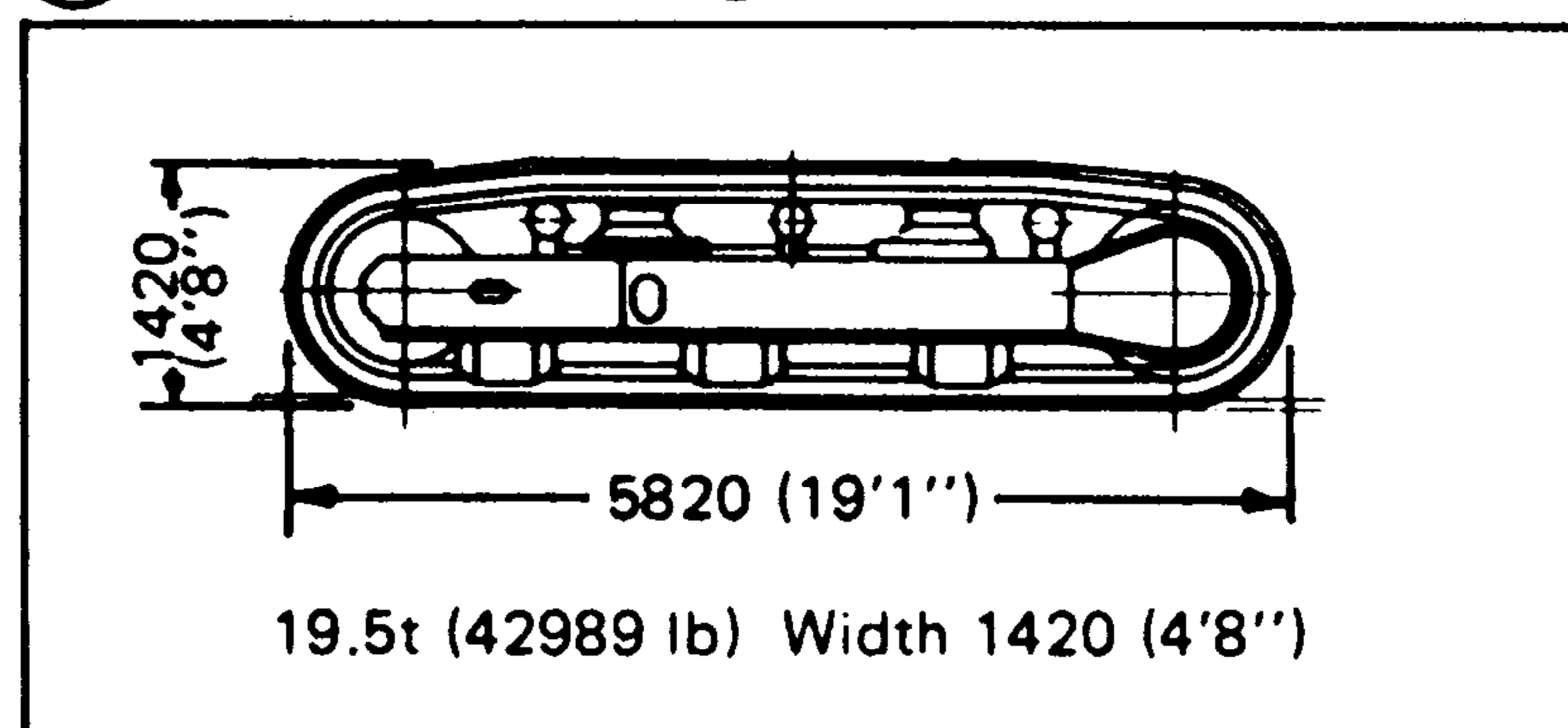
① Work equipment ass'y (L/S) 15.7t(34610 lb)



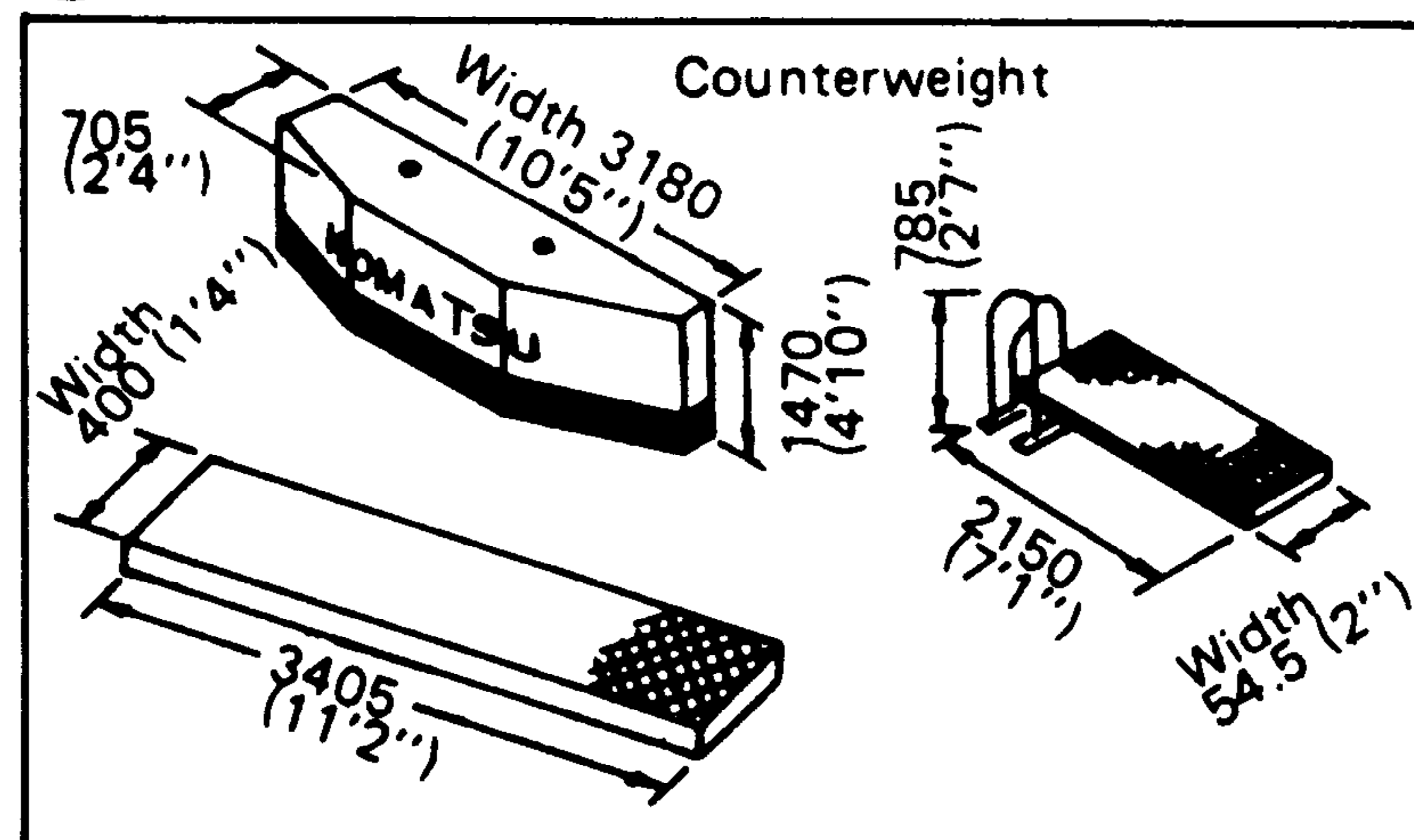
② Upper structure 22.0t (48500 lb)



③ Undercarriage 19.5t (42989 lb)



④ Others 9.3t (20503 lb)

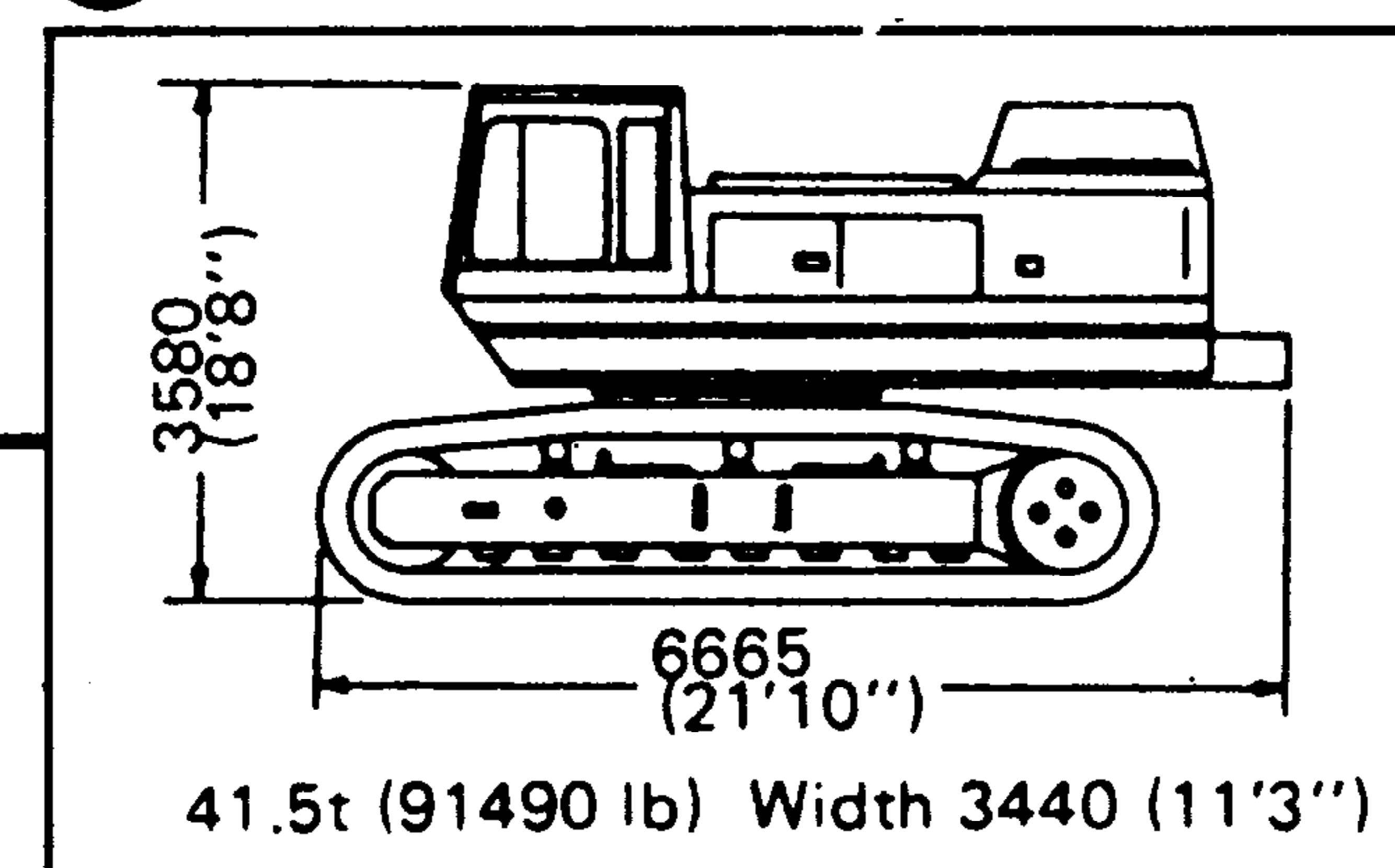


■ Three-part structure

①

Work equipment ass'y

⑤ Base machine 41.5t (91490 lb)



④

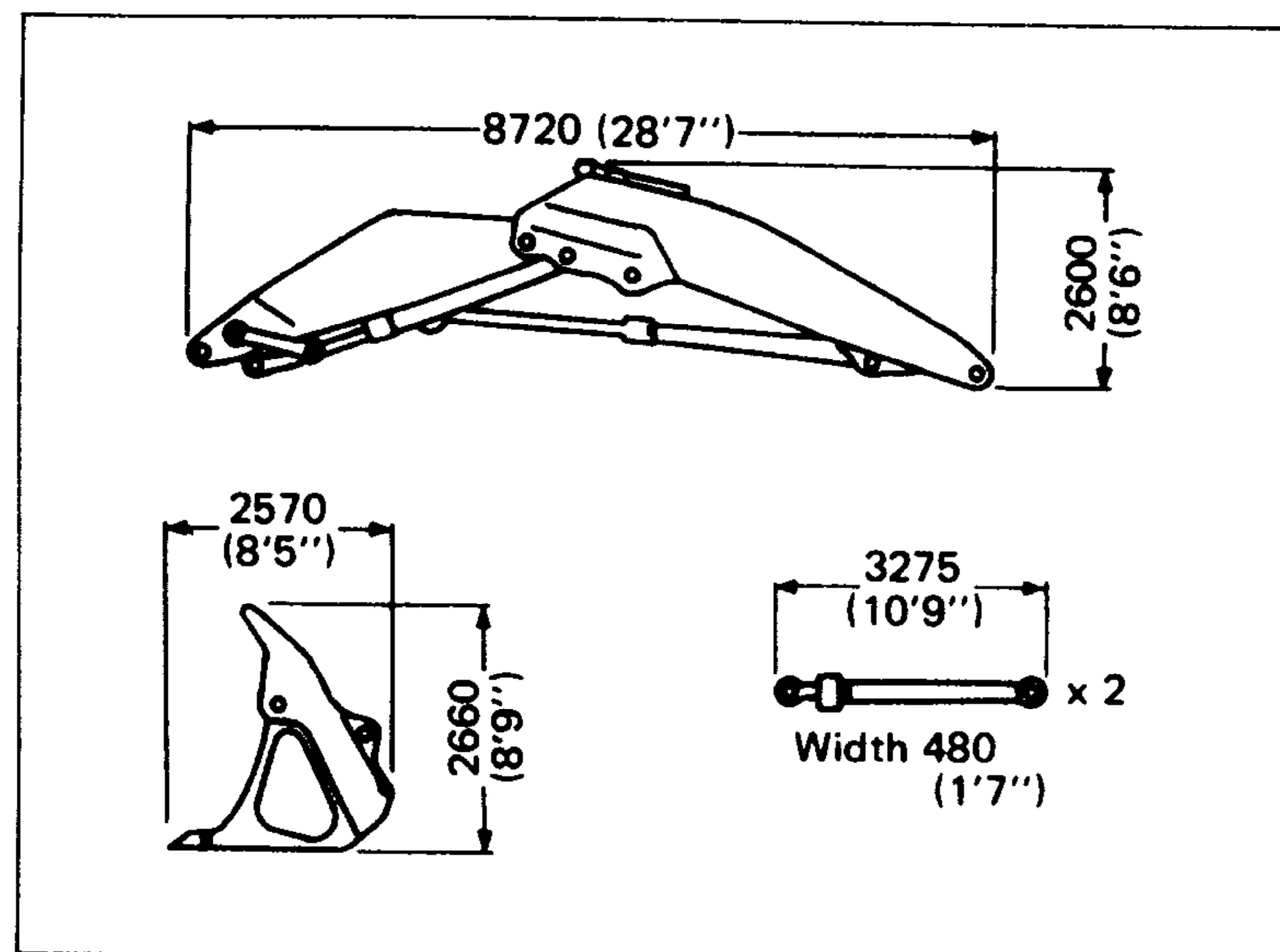
Others

Component Dimensions and Weights

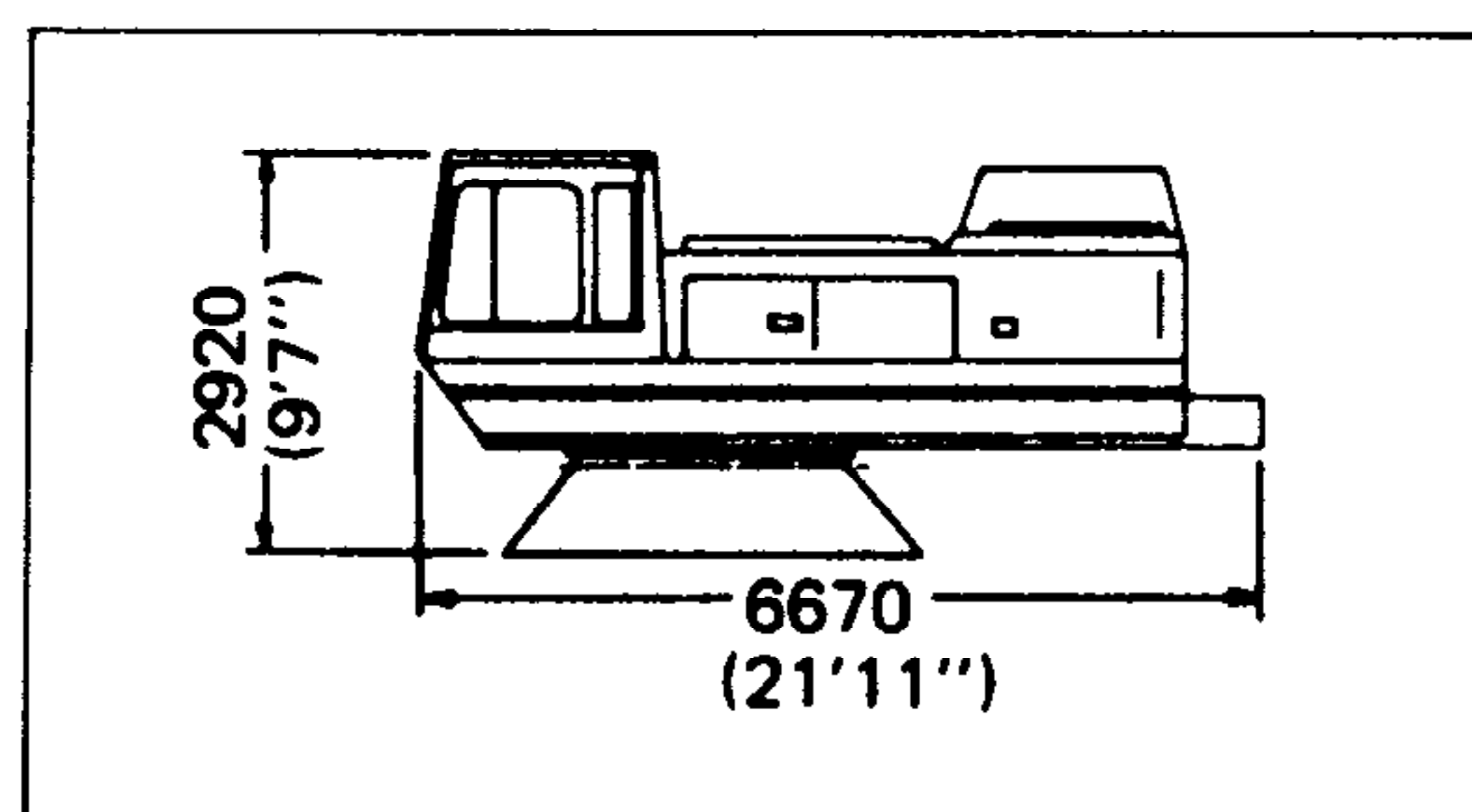
HYDRAULIC LOADING SHOVELS

PC1000-1

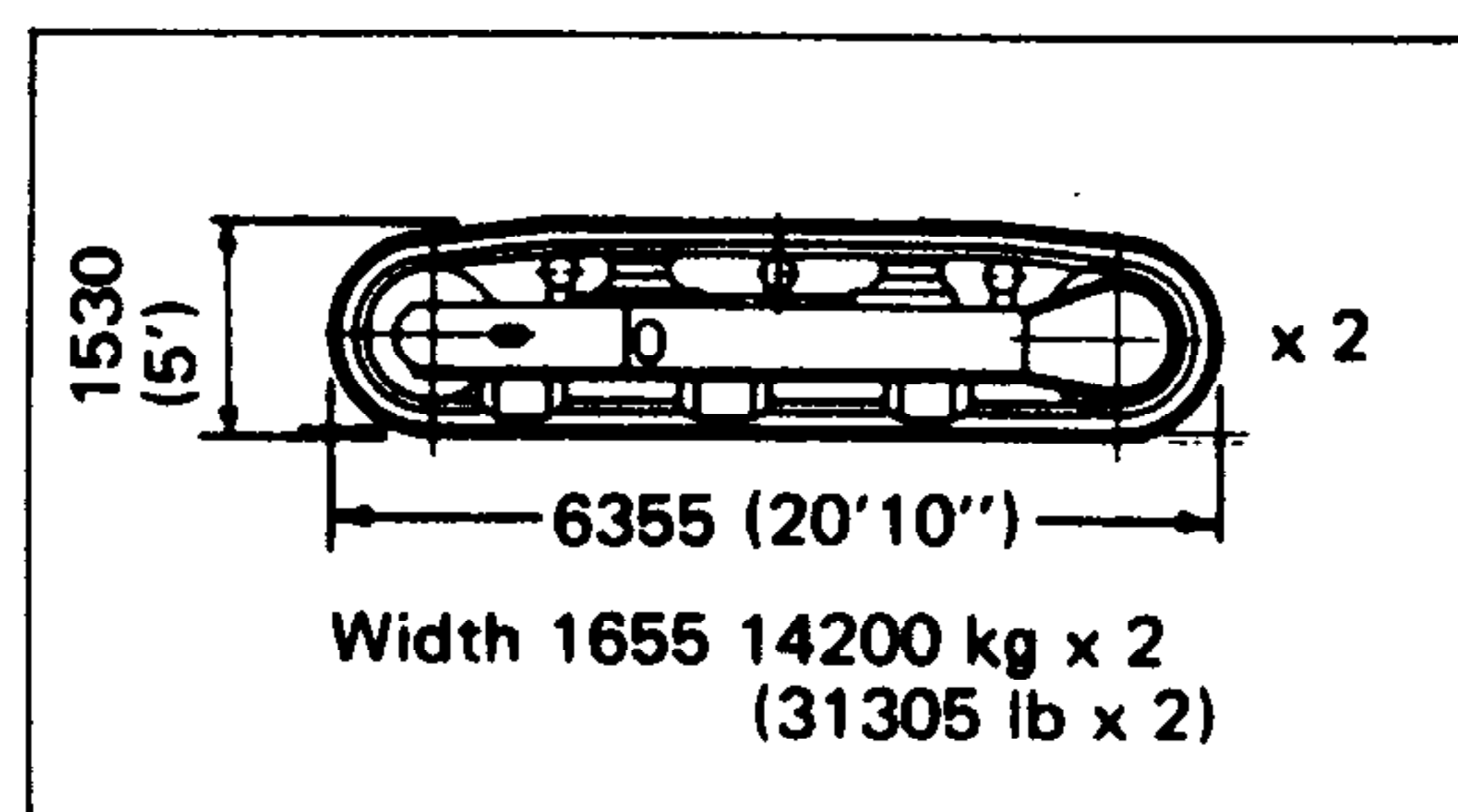
- ① Work equipment ass'y (Loading shovel)
25100 kg (55335 lb)



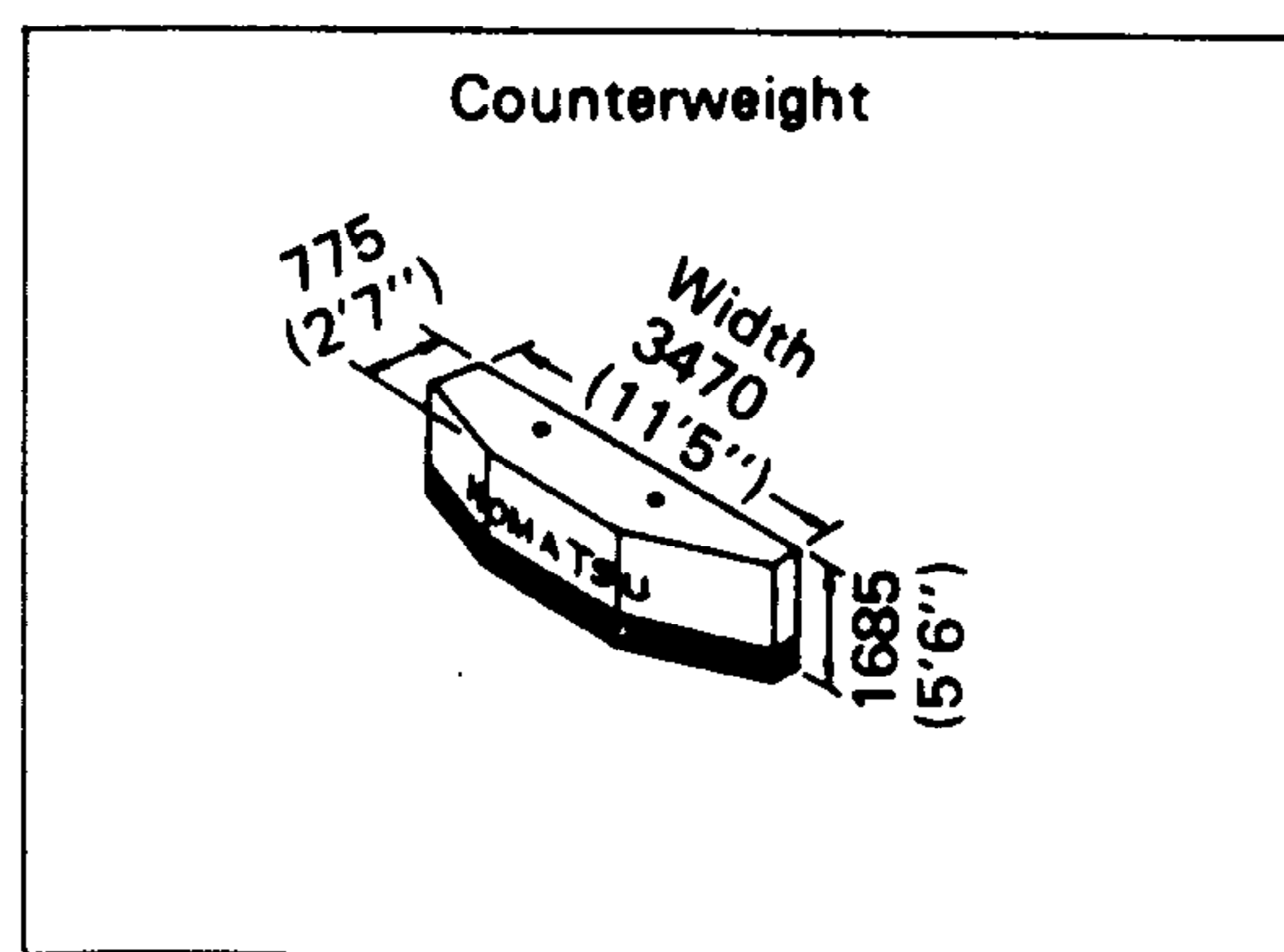
- ② Upper structure
29500 kg (65035 lb)



- ③ Undercarriage
28400 kg (62610 lb)



- ④ Others (Counterweight)
14900 kg (32848 lb)

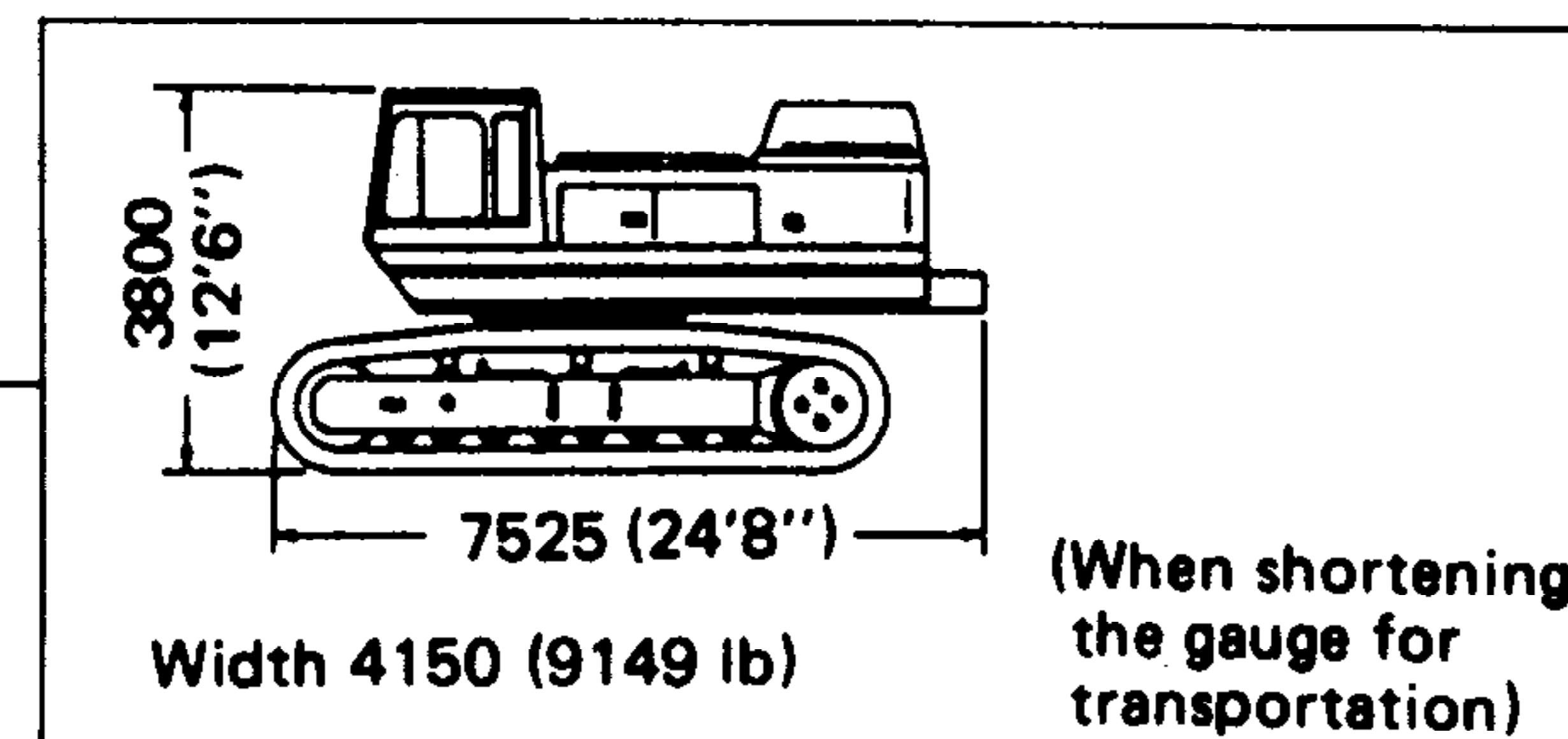


■ Three-part structure

It is possible in some U.S. states to transport in a three-part structure.

- ① Work equipment ass'y

- Base machine
57900 kg (127646 lb)

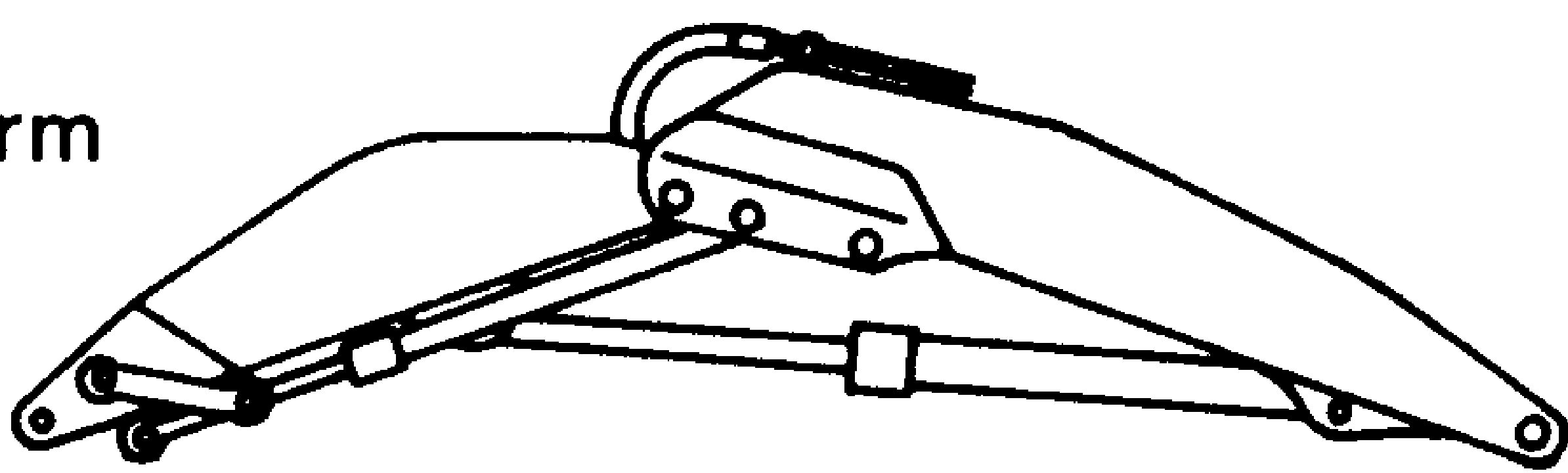
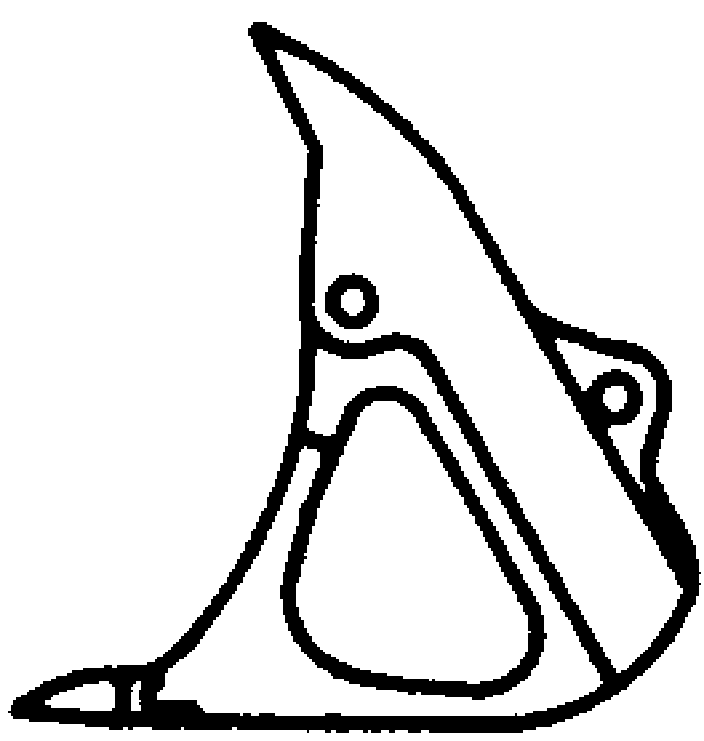
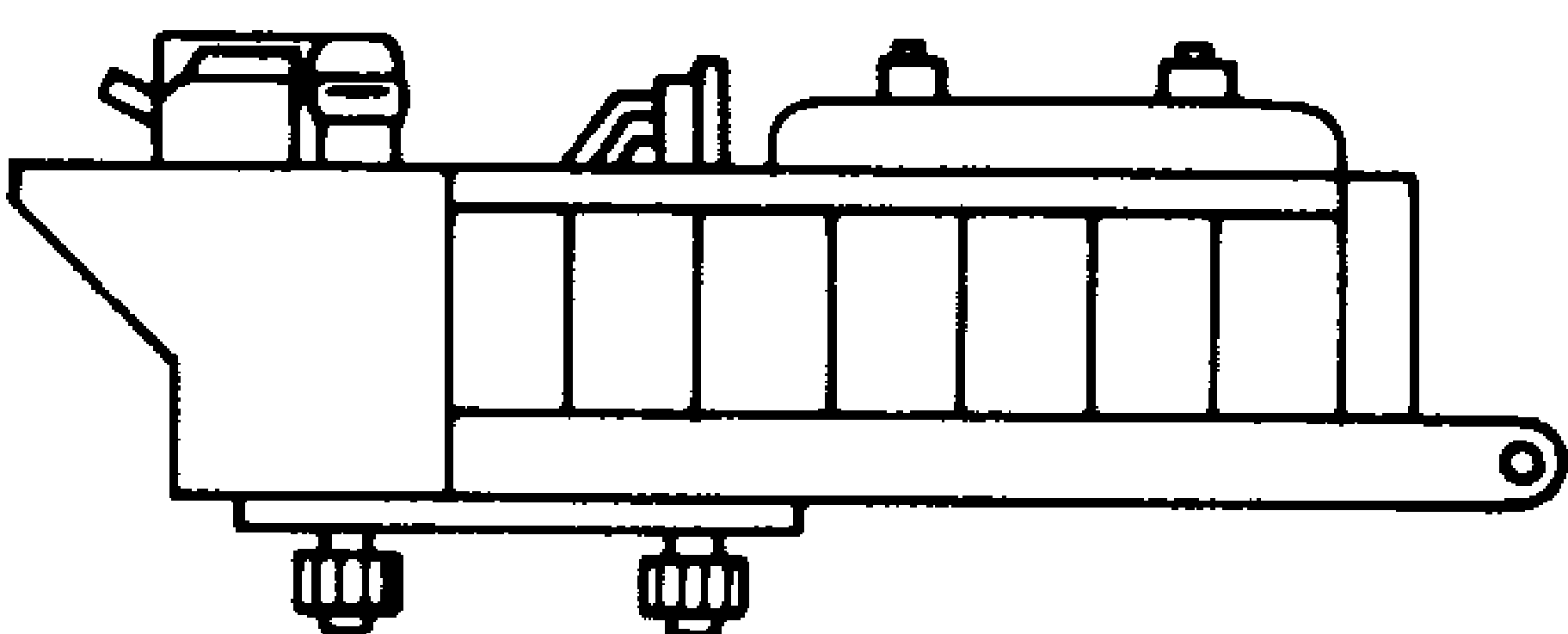
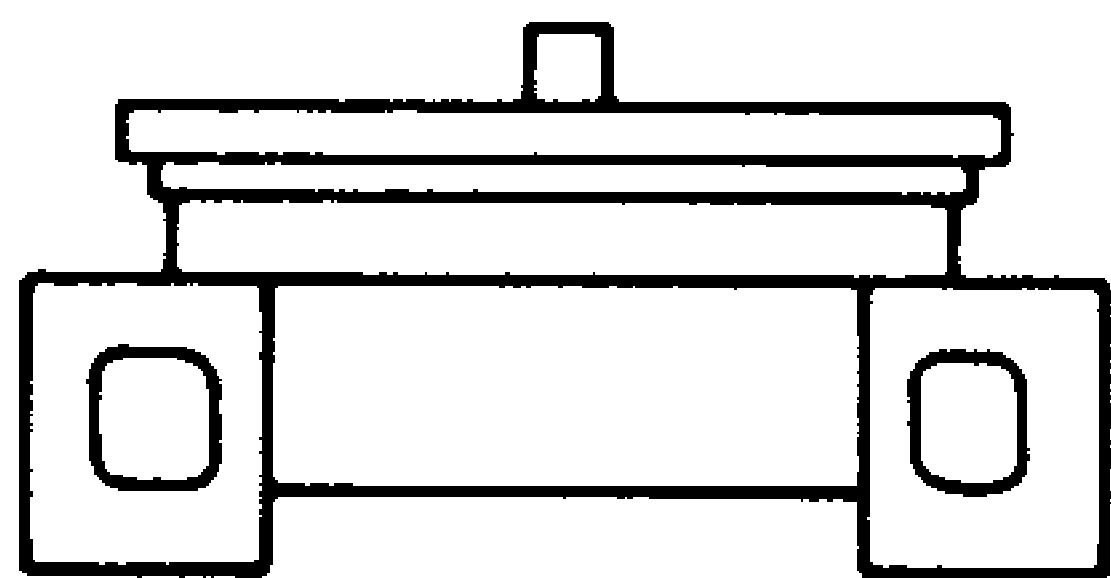
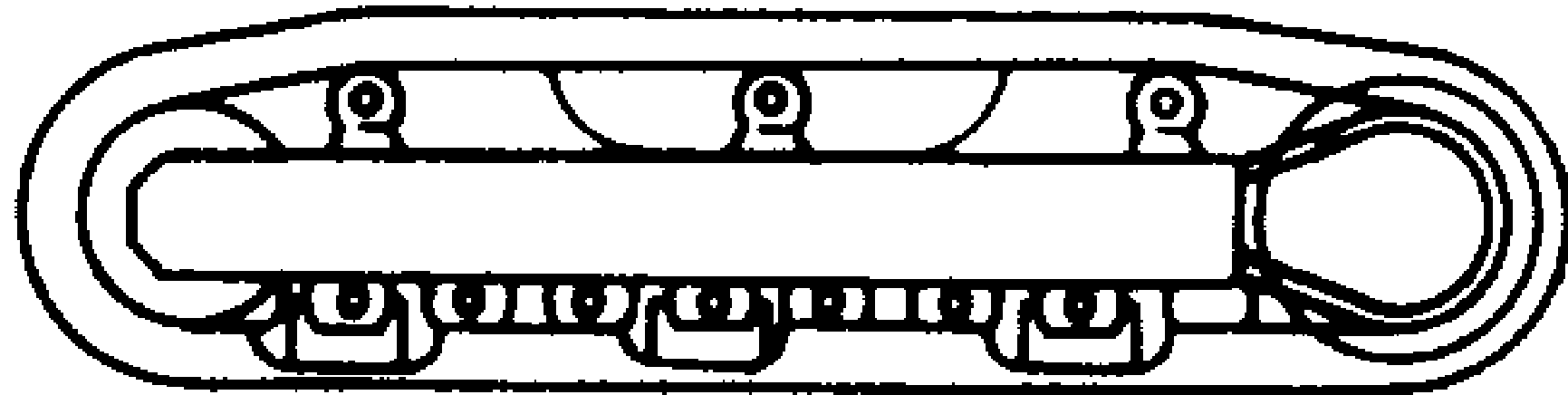
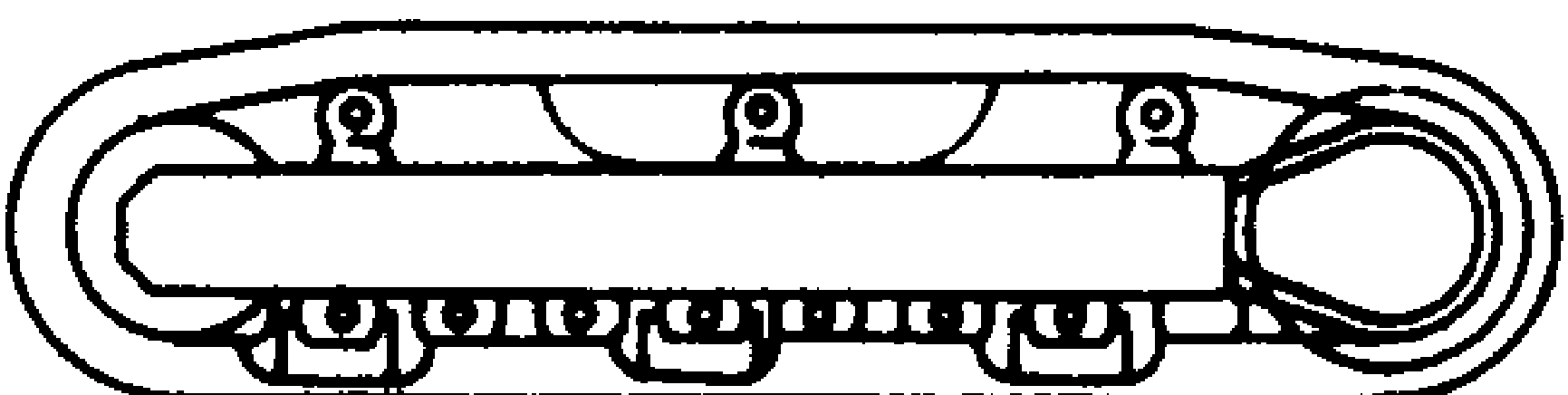
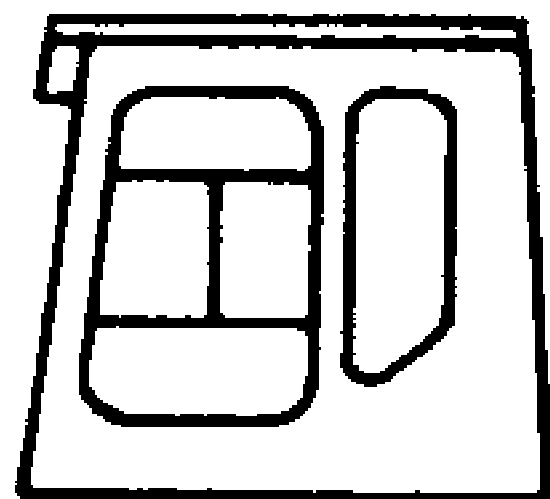
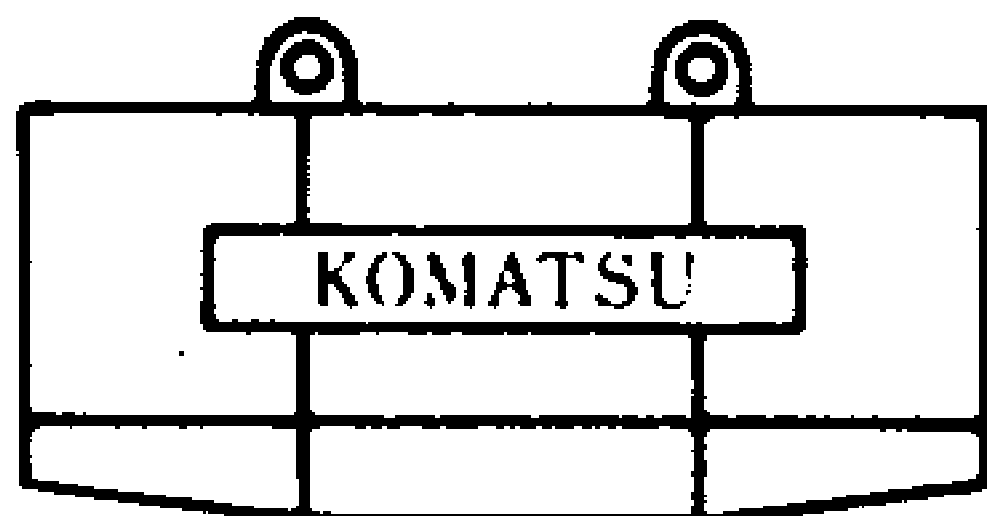


- ④ Others

Component Dimensions
and Weights

HYDRAULIC
LOADING SHOVELS

PC1600-1

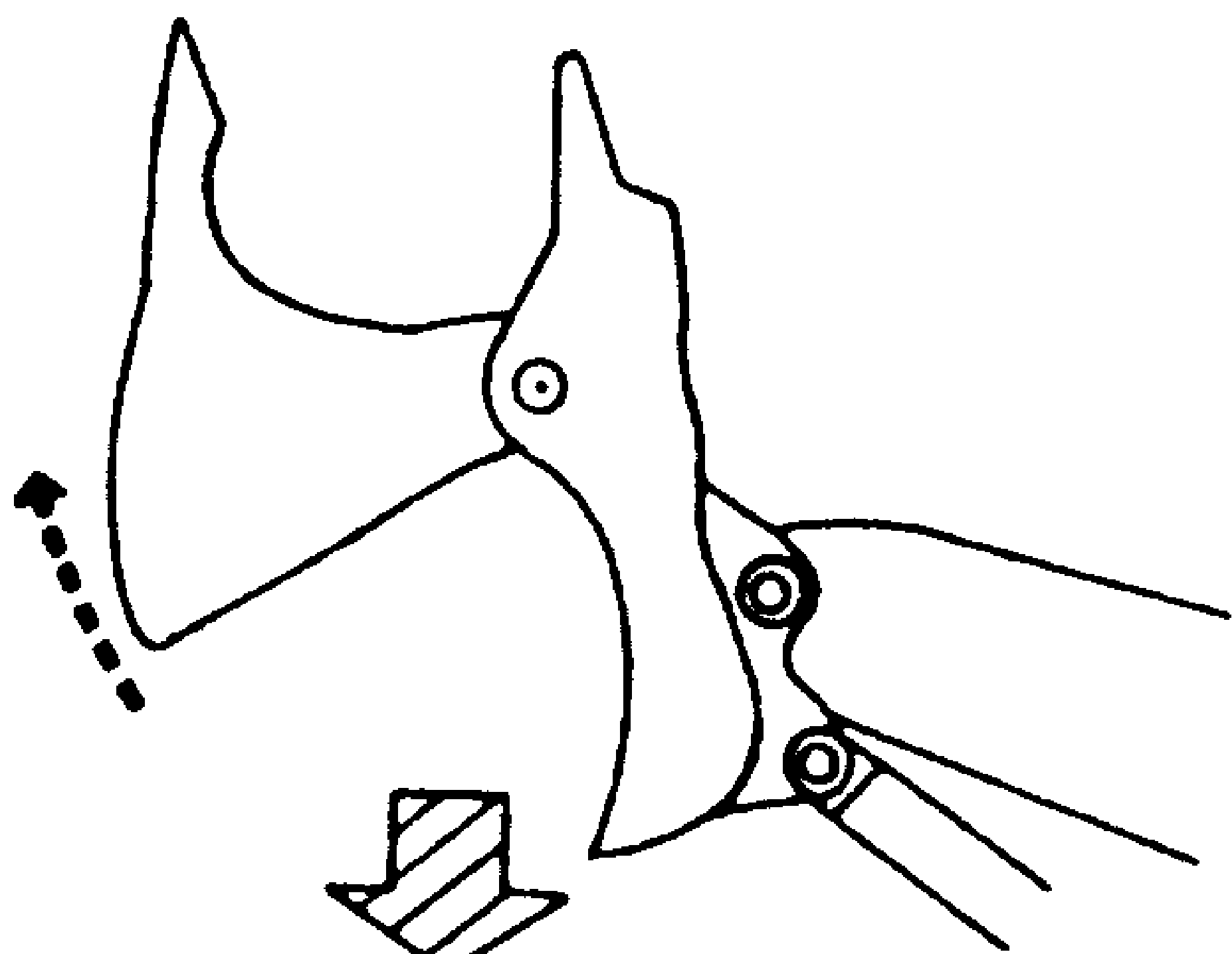
Unit name	Dimension	Length mm (ft.in.)	Width mm (ft.in.)	Height mm (ft.in.)	Weight kg (lb)
① Boom and Arm		10100 (33'2")	2220 (7'3")	3100 (10'2")	23900 (52690)
② Bucket		3110 (10'2")	3190 (10'6")	3030 (9'11")	12900 (28439)
③ Upper structure		8500 (27'11")	3500 (11'6")	3300 (10'10")	34000 (74956)
④ Center frame		3330 (10'11")	3520 (11'7")	2050 (6'9")	15300 (33730)
⑤ Undercarriage		7340 (24'1")	1930 (6'4")	1890 (6'2")	24200 (53351)
⑥ Undercarriage		7340 (24'1")	1930 (6'4")	1890 (6'2")	24200 (53351)
⑦ Operator cab		2100 (6'11")	1600 (5'3")	2080 (6'10")	850 (1874)
⑧ Counterweight		4910 (16'1")	710 (2'4")	2295 (7'6")	2100 (46296)
⑨ Others		—	—	—	5650 (12456)

Loading Shovel Buckets

HYDRAULIC LOADING SHOVELS

The bucket weight is heavier than the tilt-dump bucket. However, its characteristics of vertical dumping provide the following features.

- Accurate loading is possible, because it is easy to position the bucket on the dumping point.
- Load spillage is less.
- Larger dumping clearance permits easier loading on the hauler.
- As it is possible to more closely position the bucket over the hauler's body, loading shock to the hauler can be minimized, extending the service life of the hauler.
- As a result of the above advantages, the cycle time is shortened.



Bottom dump bucket

	Bucket	Capacity m3(cu.yd)	Width mm(in)	Weight kg(lb)	Dump type	Recommen- dation
PC400-3	Standard Bucket	2.6 (3.4)	1900 (74.8'')	4680 (10,320)	Bottom	○
PC650-3	Standard Bucket	3.8 (5.0)	2320 (91.3'')	5400 (11,900)	Bottom	○
	Light-material Bucket	4.5 (5.9)	2320 (91.3'')	5700 (12,570)	Bottom	□
	Front dump Bucket	3.8 (5.9)	2320 (91.3'')	4300 (9,480)	Tilt	●
PC1000-1	Standard Bucket	6.1 (8.0)	2650 (104.3'')	8200 (18,080)	Bottom	○
	Light-material Bucket	7.0 (9.2)	2650 (104.3'')	8550 (18,850)	Bottom	□
	Coal Bucket	8.5 (11.1)	3150 (120.0'')	9800 (21,610)	Bottom	△
	Heavy-duty Bucket	5.5 (7.2)	2410 (94.9'')	8300 (18,300)	Bottom	●
PC1600-1	Standard Bucket	9.5 (12.4)	3000 (118.1'')	12900 (28,440)	Bottom	○

Applications

- :

General digging and loading
- :

Light material work
(Specific gravity, 1.5 and less)
- :

Heavy-duty work
(Specific gravity, 1.5~2.0)
- △

:

Light material work
(Specific gravity, 1.2 and less)

Production

HYDRAULIC
LOADING SHOVELS

Estimated Production

ESTIMATED CYCLE TIME		BUCKET SIZE** (m³) OR (cu.yd)															
SEC.	MIN.	2.5	2.8	3.1	3.4	3.7	4.0	4.3	4.6	5.0	5.5	6.0	6.5	7.0	7.5	8.0	8.5
15.0	0.25	600	672	744	816	888	960	1032	1104	1200	1320	1440	1560	1680	1800	1920	2040
18.0	0.30	500	560	620	680	740	800	860	920	1000	1100	1200	1300	1400	1500	1600	1700
21.0	0.35	429	480	531	583	634	686	737	789	857	943	1029	1114	1200	1286	1371	1457
24.0	0.40	375	420	465	510	555	600	645	690	750	825	900	975	1050	1125	1200	1275
27.0	0.45	333	373	413	453	493	533	573	613	667	733	800	867	933	1000	1067	1133
30.0	0.50	300	336	372	408	444	480	516	552	600	660	720	780	840	900	960	1020
33.0	0.55	273	305	338	371	404	436	469	502	545	600	655	709	764	818	873	927
36.0	0.60	250	280	310	340	370	400	430	460	500	550	600	650	700	750	800	850

ESTIMATED CYCLE TIME		BUCKET SIZE** (m³) OR (cu.yd)											
SEC.	MIN.	9.0	9.5	10.0	11.0	12.0	13.0	14.0	15.0	16.0	17.0	18.0	
15.0	0.25	2160	2280	2400	2640	2880	3120	3360	3600	3840	4080	4320	
18.0	0.30	1800	1900	2000	2200	2400	2600	2800	3000	3200	3400	3600	
21.0	0.35	1543	1629	1714	1886	2057	2229	2400	2571	2743	2914	3086	
24.0	0.40	1350	1425	1500	1650	1800	1950	2100	2250	2400	2550	2700	
27.0	0.45	1200	1267	1333	1467	1600	1733	1867	2000	2133	2267	2400	
30.0	0.50	1080	1140	1200	1320	1440	1560	1680	1800	1920	2040	2160	
33.0	0.55	982	1036	1091	1200	1309	1418	1527	1636	1745	1855	1964	
36.0	0.60	900	950	1000	1100	1200	1300	1400	1500	1600	1700	1800	

* Actual production = (Estimated production) x (Bucket factor) x (Job efficiency)

** Bucket size: Heaped bucket capacity

*** Cycle time: Refer to the section 12 “Productivity”

Bucket factor (K)

Loading conditions	K
Easy loading	1.0 ~ 1.1
Average loading	0.95 ~ 1.0
Rather difficult loading	0.90 ~ 0.95
Difficult loading	0.85 ~ 0.90

Job efficiency (E)

Operating conditions	E
Good	0.83
Average	0.75
Rather poor	0.67
Poor	0.58