HYDRAULIC EXCAVATOR

SHOP MANUAL

model MD320B$^{L}_{E}$

GENERAL

SYSTEMS

COMPONENTS

PROCEDURE

MDI YUTANI

Book code No. S5YC0002E ①

SHOP MANUAL model MD320B L E

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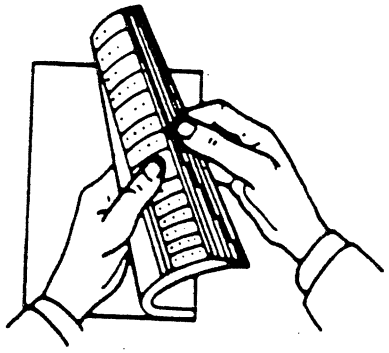

○ How to Index each Shop Manual Section
The GENERAL of this shop manual consists of 7 headings as shown above. Each section can be easily referred to by indexes appended to the margin of the page as indicated on the right. Please use the indexes for speedy reference.

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GENERAL

MD320B$^{L}_{E}$ List of Shop Manual GENERAL Section

Title	Book Code No. / Distribution Year–Month		
SPECIFICATION	S5YC0102E 1988-07	←	
OPERATION	S2YC1002E Refer to Operators Manual	←	
LOCATION AND WEIGHT OF COMPONENTS	S5YC0302E 1988-07	←	
MAINTENANCE STANDARDS AND TEST PROCEDURES	~~S5YC0404E 1988-07~~	S5YC0404E① 1989-01	
TROUBLESHOOTING	S5YC0502E 1988-07	←	
PREVENTIVE MAINTENANCE	S2YC1002E Refer to Operators Manual	←	
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SHOP MANUAL MD320B LC

SPECIFICATION

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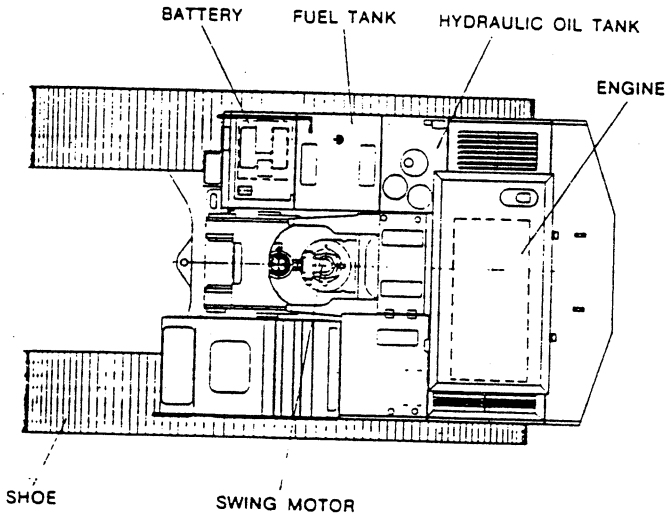
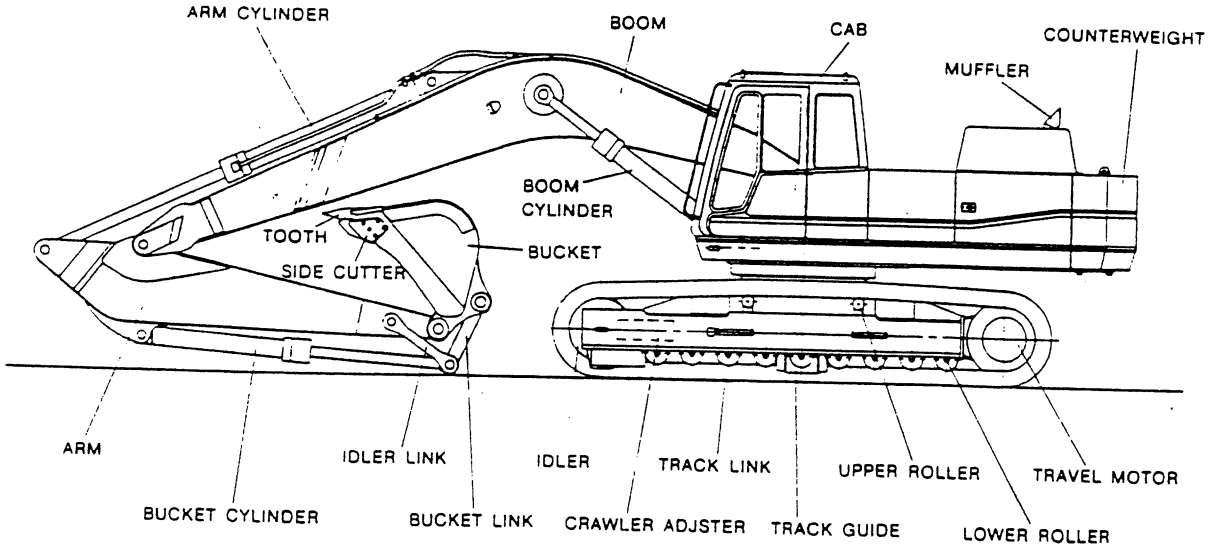
Applicable Machines

YC-0301~

Revision	Date of Issue	Remarks
First edition	July, 1988	118K

1. NAME OF COMPONENTS

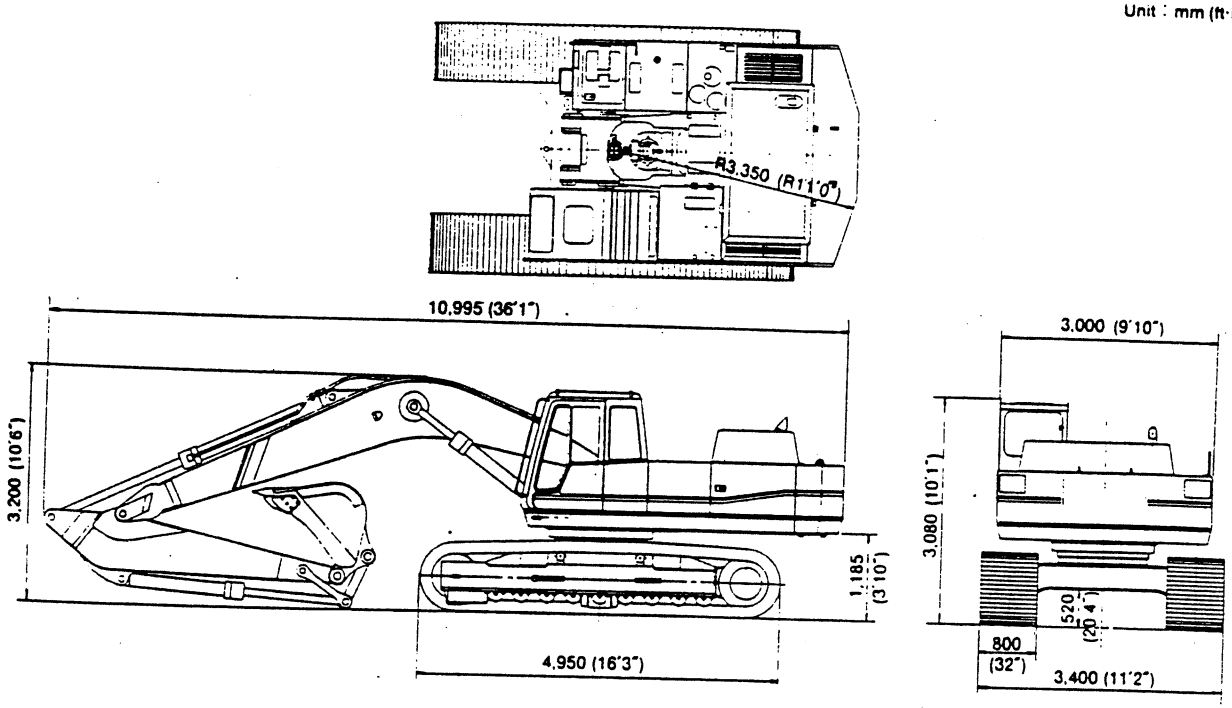




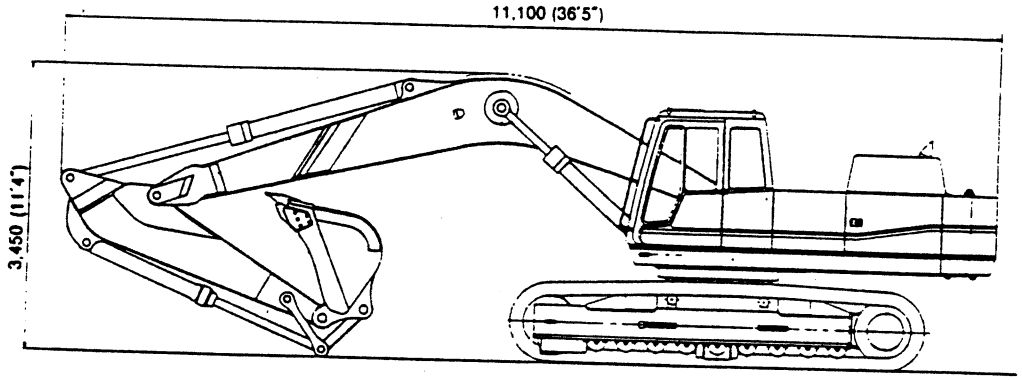
2. GENERAL DIMENSIONS

MD320BLC 3.1m (10'2") ARM (STD)

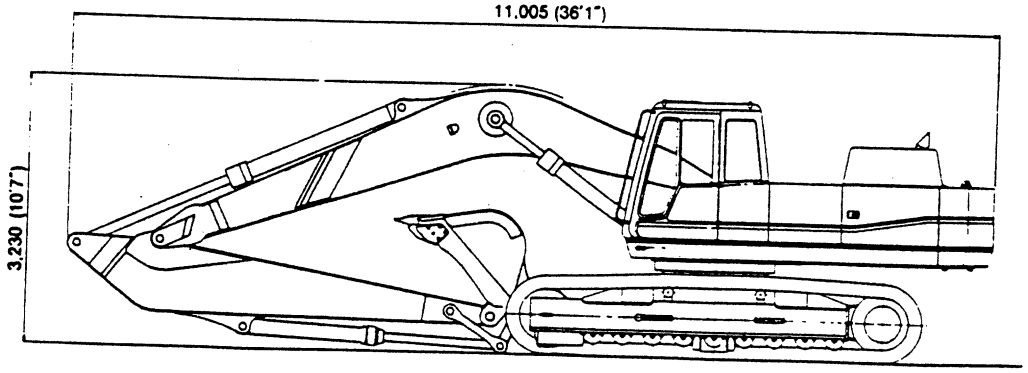
Unit : mm (ft·in)



MD320BLC 2.5m (8'2") ARM



MD320BLC 4.1m (13'5") ARM



3. SPECIFICATIONS AND PERFORMANCE

SPEED AND GRADEABILITY

	MD320BLC
Swing speed	9.8 r.p.m
Travel speed	5.5/3.7km/hr (3.4/2.3 MPH)
Gradeability	35° (70%)

ENGINE

		MD320BLC
Model		Mitsubishi 6D22-T
Type		4-cycle, water-cooled, direct injection type diesel with turbo charger
Number of cylinder × Bore × Stroke		6×130mm×140mm (6×5.1 in×5.5 in)
Total displacement		11.149 ℓ (680 cuin)
Rated output power/ revolution	JIS D 1005 Net	230 PS/1,900 r.p.m
	SAE J 1349 Net	169 kW/1,900 r.p.m
	DIN 6270 Net	230 PS/1,900 r.p.m
Maximum torque/ revolution	JIS D 1005 Net	95 kg·m/1,400 r.p.m
	SAE J 1349 Net	932 N·m/1,400 r.p.m
	DIN 6270 Net	95 kgf·m/1,400 r.p.m

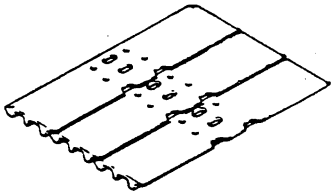
HYDRUALIC COMPONENTS

	MD320BLC
Hydraulic pump	Double variable displacement pump+Gear pump
Hydraulic motor (swing)	Axial piston motor
Hydraulic motor (travel)	Axial piston motor
Control valve	5-section multiple control valve+ 1-section control valve (swing)
Cylinder (Boom, Arm, Bucket)	Double acting cylinders
Return filter	Filter paper with safety valve
Oil cooler	Air-cooled type

WEIGHT

	MD320BLC
Fully equipped weight	Approx. 30,800 kg (Approx. 67,900 lbs)
Upper machinery	Approx. 12,900 kg (Approx 28,440 lbs)
Lower machinery (with 600 mm (24") grouser shoes)	Approx. 11,900 kg (Approx. 26,230 lbs)
Attachment{with boom+3.1m (10'2") arm+1.2m³ (1.57 cu yd)}bucket	Approx. 6,000 kg (Approx 13,230 lbs)

4. TYPE OF SHOES

Shape	Model	Width of Track Shoe mm (ft-in)	Overall Width of Crawler mm (ft-in)	Ground Pressure kg/ cm² (psi)
Grouser (Equal height) 	MD320BLC Number of links: 51	600 (24")	3,200 (10'6")	0.59 (8.39)
		800 (32")	3,400 (11'2")	0.45 (6.39)

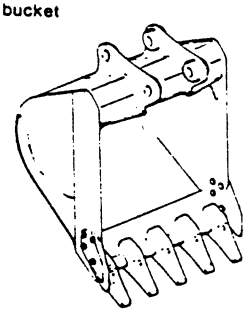
CAUTION

800mm (32") shoes are for use in general construction work at earth, sand sites. Do not use in gravel pits or rocky areas.

5. TYPE AND COMBINATION OF ATTACHMENTS

TYPE OF BUCKET

Hoe bucket

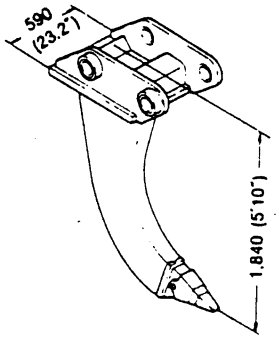


Heaped Capacity m³ (cu yd)	Outer Width mm (ft-in)		Number of Tooth	Side Cutters	Possibility of Face Shovel	Weight kg (lbs)
	With Side Cutters	Without Side Cutters				
1.0 (1.31)	1.300 (4'3")	1.170 (3'10")	4	Yes	Yes	1.010 (2.230)
1.2 (1.57)	1.490 (4'10")	1.360 (4'5")	5	Yes	Yes	1.120 (2.470)
1.2 (※1.57)	1.320 (4'4")	1.300 (4'3")	5	No	Yes	1.100 (2.425)
1.4 (1.83)	1.690 (5'6")	1.560 (5'1")	5	Yes	Yes	1.220 (2.690)
1.6 (2.09)	1.600 (5'0")	1.490 (4'10")	5	Yes	Yes	1.230 (2.710)

*mark shows for heavy duty digging.

Rippel

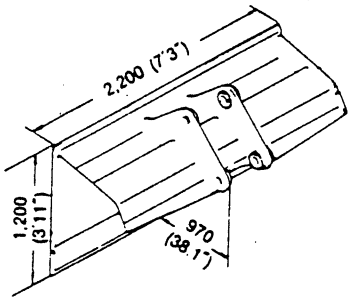
Weight : 780 kg (1,720 lbs)



Side slope finishing bucket

Capacity : 0.76 m³ (0.98 cu yd)

Weight : 1,050 kg (2,314 lbs)



COMBINATION OF ATTACHMENTS

MD320B$_{LC}$

Type	Bucket			Applicable Arm		
	JIS heaped capacity m^3 (cu yd)	SAE heaped capacity m^3 (cu yd)	JIS·SAE struck capacity m^3 (cu yd)	with 3.1m (10'2") arm	with 2.5m (8'2") arm	with 4.1m (13'5") ext. arm
Hoe bucket	1.0 (1.31)	1.12 (1.46)	0.84 (1.10)	○	○	○
	1.2 (1.57)	1.4 (1.83)	1.0 (1.31)	◎	○	△
	※1.2 (1.57) (For heavy duty digging)	1.4 (1.83) (←)	1.0 (1.31)	○	○	×
	1.4 (1.83)	1.6 (2.09)	1.15 (1.50)	△	○	×
	1.6 (2.09)	1.83 (2.39)	1.35 (1.79)	×	△	×
Side slope finishing bucket	0.76 (0.99)	—	—	○	○	×
Ripper	—	—	—	○	○	×

◎ Standard combination

○ General use: Digging and loading of gravel, sand and clayey soil

△ Light duty: Work mainly loading loose gravel or clayey soil

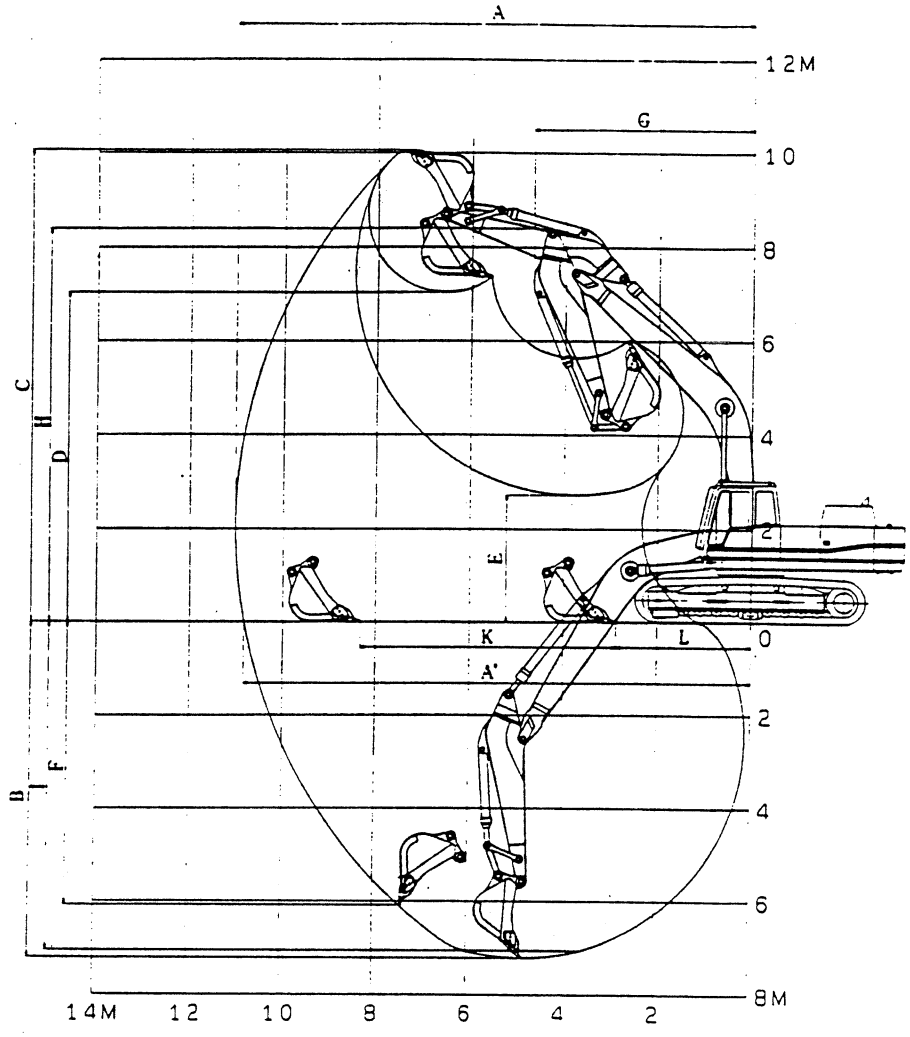
× Not usable: Not warranted

CAUTION

If a bucket other than the hoe bucket is turned over for operation, the arm and the bucket may be broken.

6. WORKING RANGE OF ATTACHMENTS

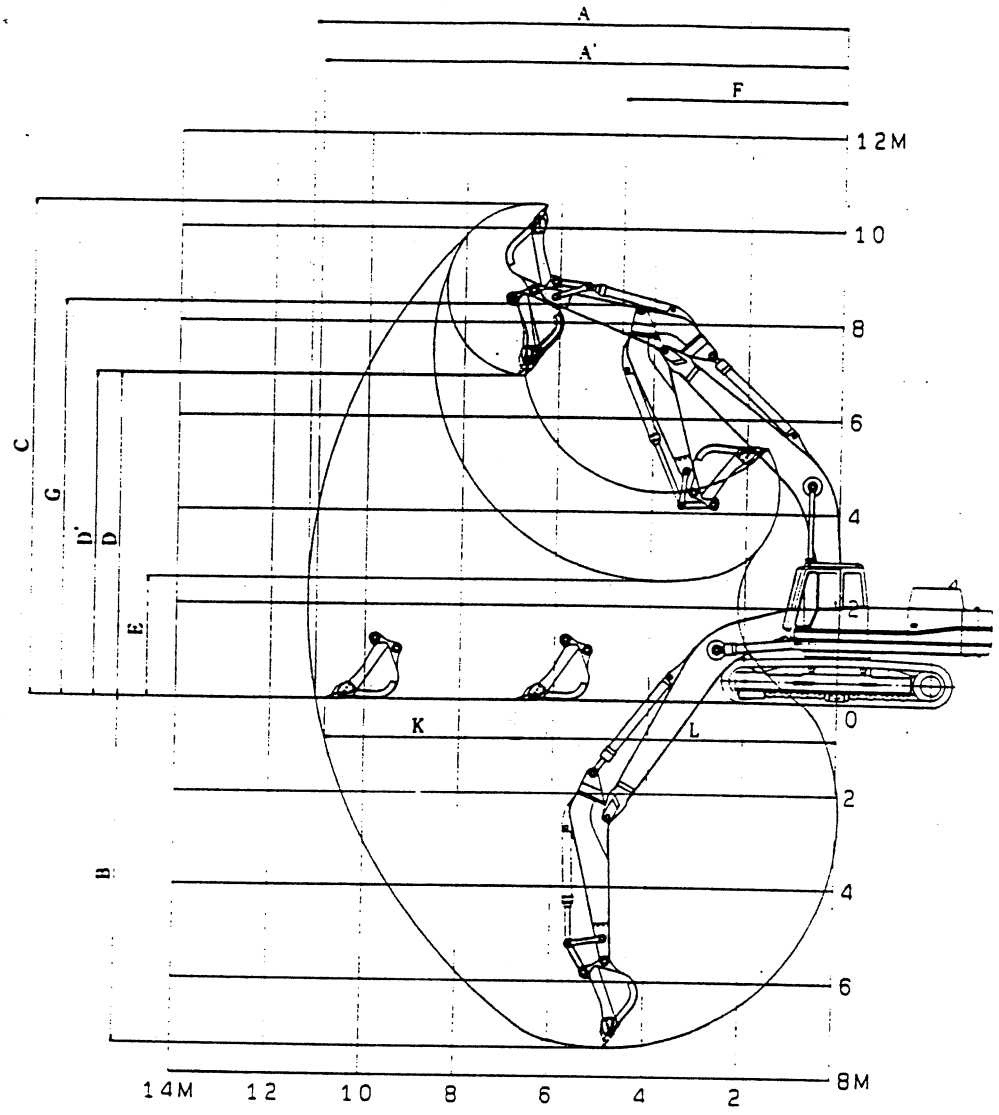
MD320BLC BACKHOE ATTACHMENT



Unit : m (ft·in)

Item \ Type of Attachment		2.5m (8'2") ARM (With 1.4m³ (1.83 cu yd) bucket)	3.1m (10'2") ARM (STD) (With 1.2m³ (1.57 cu yd) bucket)	4.1m (13'5") ARM (With 1.0m³ (1.31 cu yd) bucket)
A Maximum digging reach		10.52 (34'6")	11.10 (36'5")	11.89 (39'0")
A' Maximum reach at ground level		10.32 (33'10")	10.92 (35'10")	11.71 (38'5")
B Maximum digging depth		6.62 (21'9")	7.3 (23'11")	8.30 (27'3")
C Maximum digging height		9.92 (32'7")	10.06 (33'0")	10.24 (33'7")
D Maximum dumping clearance		6.87 (22'6")	7.04 (23'1")	7.23 (23'9")
E Minimum dumping clearance		3.32 (10'11")	2.72 (8'11")	1.72 (5'8")
F Vertical digging depth		5.63 (18'6")	6.08 (19'11")	6.99 (22'11")
G Minimum swing radius		4.81 (15'9")	4.68 (15'4")	4.61 (15'1")
H Height at minimum swing radius		8.52 (27'11")	8.39 (27'6")	8.39 (27'6")
I Digging depth 8' flat floor		6.44 (21'2")	7.06 (23'2")	8.08 (26'6")
K, L Horizontal digging distance	Stroke	4.01 (13'2")	5.45 (17'10")	7.21 (23'8")
	Minimum	3.82 (12'6")	2.90 (9'6")	1.99 (6'6")

MD320BLC FACE SHOVEL ATTACHMENT



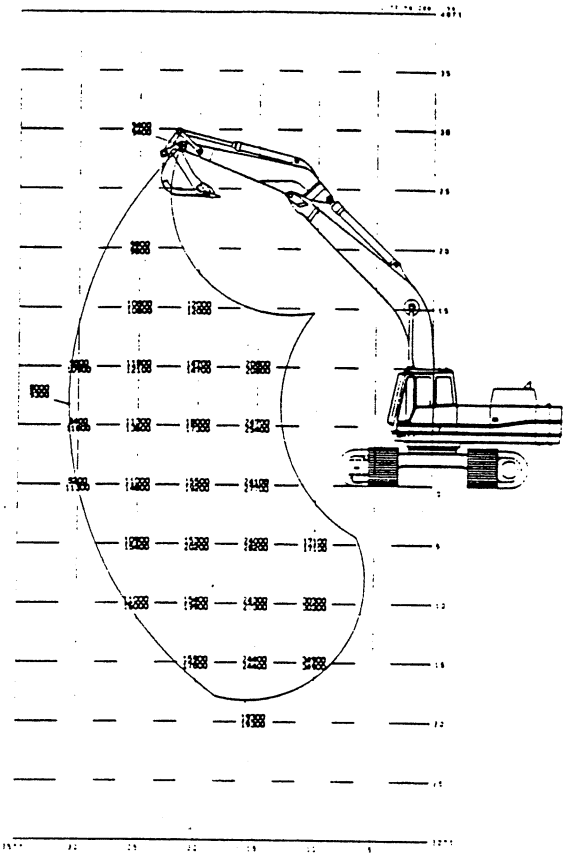
Unit : m (in)

Item \ Type of Attachment		2.5m (8'2") ARM (With 1.4m³ (1.83 cu yd) bucket)	3.1m (10'2") ARM (STD) (With 1.2m³ (1.57 cu yd) bucket)	4.1m (13'5") ARM (With 1.0m³ (1.31 cu yd) bucket)
A Maximum digging reach		10.71 (35'1")	11.22 (36'9")	12.07 (39'7")
A' Maximum reach at ground level		10.51 (34'6")	11.04 (36'2")	11.90 (39'0")
B Maximum digging depth		6.80 (22'4")	7.40 (24'3")	8.40 (27'6")
C Maximum digging height		10.36 (33'0")	10.52 (34'6")	10.71 (35'1")
D Maximum dumping clearance		6.70 (21'11")	6.86 (22'6")	7.05 (23'1")
D' Maximum dumping clearance(45°)		6.71 (22'0")	6.87 (22'6")	7.06 (23'2")
E Minimum dumping clearance		3.11 (10'2")	2.51 (8'3")	1.51 (4'11")
F Minimum swing radius		4.82 (15'9")	4.68 (15'4")	4.61 (15'1")
G Height at minimum swing radius		8.52 (27'11")	8.39 (27'6")	8.39 (27'6")
K Horizontal digging distance	Stroke	3.12 (10'3")	4.01 (13'2")	5.70 (18'8")
L	Minimum	7.18 (23'6")	6.81 (22'4")	5.98 (19'7")

7. LIFTING CAPACITY

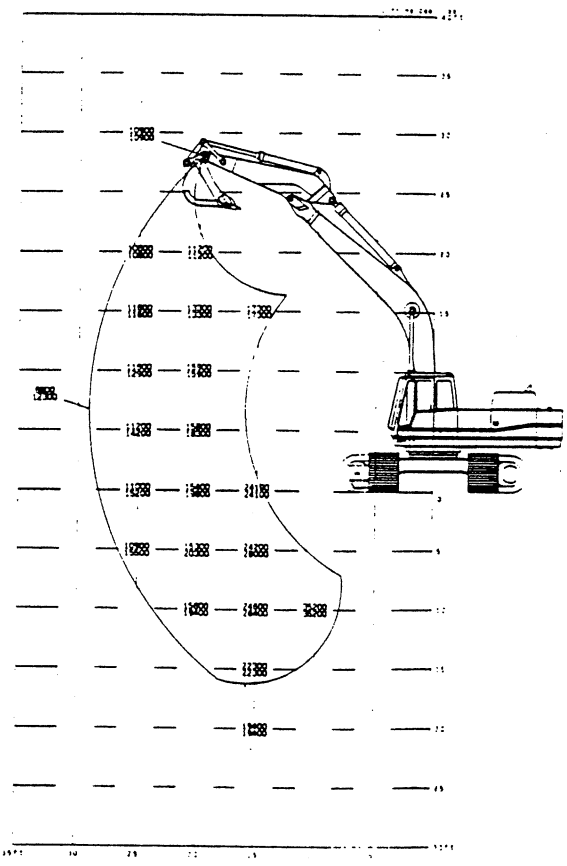
MD320BLC 3.1m (10'2") ARM (STD)
360° SWING (FRONT)

Lifting capacity figures (metric ton) are for 360 ° swing (and over the front) at 87% of main relief valve pressure for arm or boom cylinders and not exceeding 75% of static tipping load. (SAE J1097)



MD320BLC 2.5m (8'2") ARM
360° SWING (FRONT)

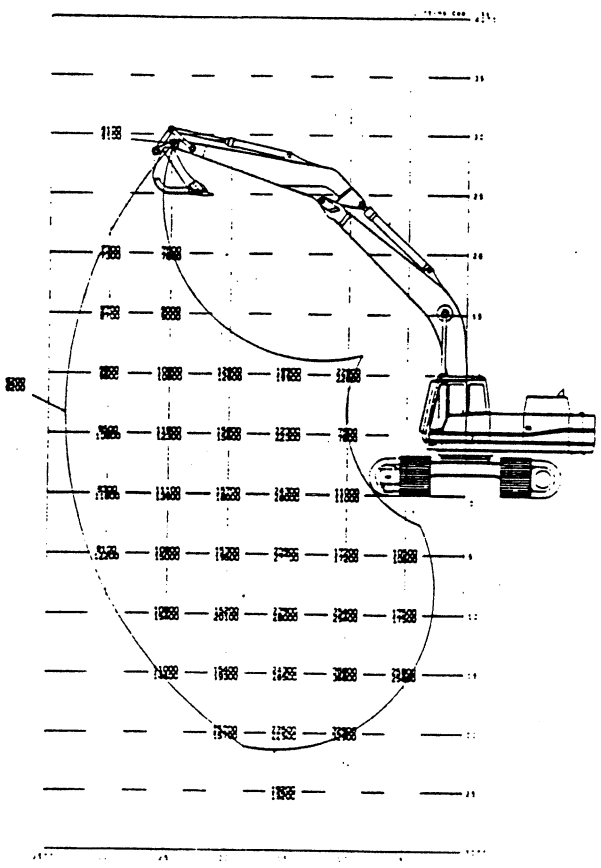
Lifting capacity figures (metric ton) are for 360 ° swing (and over the front) at 87% of main relief valve pressure for arm or boom cylinders and not exceeding 75% of static tipping load. (SAE J1097)



MD320BLC 4.1m (13'5") ARM

360° SWING (FRONT)

Lifting capacity figures (metric ton) are for 360 ° swing (and over the front) at 87% of main relief valve pressure for arm or boom cylinders and not exceeding 75% of static tipping load. (SAE J1097)



8. ENGINE SPECIFICATIONS

1. Type	Mitsubishi 6D22-T
2. No. of cylinders	6
Dia. × Stroke	130mm × 140mm (5.1 in × 5.5 in)
3. Total displacement	11.149 ℓ (680 cuin)
4. Compression ratio	16
5. Output rating	
JIS D1005	230 PS/1,900 r.p.m
SAE J1349	169 kw/1,900 r.p.m
DIN 6270	230 PS/1,900 r.p.m
6. Max. torque	
JIS D1005	95kgf·m/1,400 r.p.m
SAE J1349	932 N·m/1,400 r.p.m
DIN 6270	95kgf·m/1,400 r.p.m
7. High idling	2,070 ± 20 r.p.m
8. Low idling	850 ± 30 r.p.m
9. Injection start pressure	220kgf/cm² (3129 psi)
10. Injection timing	Before top-dead center 76.5 ℃
	Full open 90℃
11. Ignition order	1-5-3-6-2-4
12. Compression pressure	28kgf/cm² (390 psi) (at 200 r.p.m)
13. Lube oil pressure	Rating 3~4 kgf/cm² (42.7~56.9 lbs/in²)
14. Fuel injection timing	17°C
15. Valve clearance (Cool)	0.4 mm (0.016 in)
16. Starter capacity	4.5 kw
17. Generator capacity	800 W (30A)
18. Super Charging type	Turbo type
19. Cooling fan drive method	φ800 (φ32 in) suction type
	Belt drive pulley ratio: 1.0
20. Engine oil volume	Engine body 25 ℓ (6.6 gal)
	Filter and other 4 ℓ (1.05 gal)
21. Dry weight	1,040 kg (2,292 lbs)