TR

ROUGH TERRAIN CRANE

TR-250M

JAPANESE SPECIFICATIONS

OUTLINE	SPEC. NO.
4-section Boom, 2-staged Power Tilt Jib	TR-250M-5-00104

Control No. JA-05

TR-250M

CRANE SPECIFICATIONS

CRANE CAPACITY

9.5m	Boom	25,000kg	at 3.5m	(8 part-line)
16.5m	Boom	19,000kg	at 4.0m	(6 part-line)
23.5m	Boom	12,500kg	at 5.0m	(4 part-line)
30.5m	Boom	7,000kg	at 8.0m	(4 part-line)
8.0m	Jib	3,000kg	at 72°	(1 part-line)
13.0m	Jib	2,000kg	at 76°	(1 part-line)
Single top		3,000kg		(1 part-line)

MAX. LIFTING HEIGHT

Boom 31.3m
Jib 44.2m

MAX. WORKING RADIUS

Boom 28.0m
Jib 35.0m

BOOM LENGTH

9.5m – 30.5m

BOOM EXTENSION

21.0m

BOOM EXTENSION SPEED

21.0m / 90s

JIB LENGTH

8.0m, 13.0m

MAIN WINCH SINGLE LINE SPEED

120m/min (4th layer)

MAIN WINCH HOOK SPEED

15.0 m/min (8 part-line)

AUXILIARY WINCH SINGLE LINE SPEED

120m/min (4th layer)

AUXILIARY WINCH HOOK SPEED

120m/min (1 part-line)

BOOM ELEVATION ANGLE

0° – 83°

BOOM ELEVATION SPEED

0° – 83° / 43s

SWING ANGLE

360° continue

SWING SPEED

3.0 rpm

WIRE ROPE

Main Winch
16mm × 170m (Diameter × Length)
Spin-resistant wire rope
Auxiliary Winch
16mm × 95m (Diameter × Length)
Spin-resistant wire rope

BOOM

4-section hydraulically telescoping boom of box construction.
(stage 2: sequential; stages 3,4: synchronized)

BOOM EXTENSION

2 double-acting hydraulic cylinder
1 wire rope type telescoping device

JIB

Quick-turn type (2-staged type which stores alongside below the base boom section and extendible from under the boom (with 2nd stage being a pull-out type))
Hydraulic non-stage offset (5°-45°) type

SINGLE TOP

Single sheave. Mounted to main boom head for single line work.

HOIST

Driven by hydraulic motor and via spur gear speed reducer.
With free-fall device.
(with operation lever lock device for prevention of misoperation)
Automatic brake (with foot brake for free-fall device)
2 single winches
With flow regulator valve with pressure compensation

BOOM ELEVATION

1 double-acting hydraulic cylinders
With flow regulator valve with pressure compensation

SWING

Hydraulic motor driven planetary gear reducer
Swing bearing
Swing free/lock changeover type
Hand brake

OUTRIGGERS

Fully hydraulic X-type (floats mounted integrally)
Slides and jacks each provided with independent operation device.

Full extended width	6.3m
Middle extended width	5.0m
Minimum extended width	3.6m

OPERATION METHOD

Hydraulic pilot valve operation

MAX. OUTRIGGER LOAD

26.7t

HYDRAULIC PUMPS

2 variable piston pumps
2 gear pumps

HYDRAULIC OIL TANK CAPACITY

380 liters

SAFETY DEVICES

Automatic moment limiter (AML)
Multi-display indication
Over-winding cutout
Working area control device
Outrigger extension width detector
Winch drum lock
Level gauge
Hook safety latch
Hydraulic safety valve
Telescopic counterbalance valve
Elevation counterbalance valve
Power tilt counterbalance valve
Jack pilot check valve
Swing lock

EQUIPMENTS

Heat pump type air-conditioner
Hydraulic oil temperature indication lamp
Radio
Oil cooler
Tactile-type winch drum rotation indicator
Operation pedal for elevating operation
Centralized oiling device (carrier)
Television (option)

CARRIER SPECIFICATIONS

ENGINE
Model MITSUBISHI 6D16 (with turbo charger)
Type 4-cycle, 6-cylinder, direct-injection, water-cooled diesel engine
Piston displacement 7,545cc
Max. output 220PS at 2,800rpm
Max. torque 65.0kg·m at 1,600rpm

TORQUE CONVERTER
3-element, 1-stage unit (with automatic lock-up mechanism)

TRANSMISSION
Automatic and manual transmission
Power shift type (wet multi-plate clutch)
3 forward and 1 reverse speeds (with Hi/Low settings)

REDUCER
Axle dual-ratio reduction

DRIVE
2-wheel drive (4×2) / 4-wheel drive (4×4) selection

FRONT AXLE
Full floating type

REAR AXLE
Full floating type (with no-spin differential)

SUSPENSION
Front Parallel leaf spring type
Rear Parallel leaf spring type

STEERING
Fully hydraulic power steering
With reverse steering correction mechanism

BRAKE SYSTEM
Service Brake
Hydro-pneumatic brake
Disk brake
Parking Brake
Mechanically operated, internal expanding duo-servo shoe type acting on drum at transmission case rear.
Auxiliary Brake
Hydrodynamic retarder
Electro-pneumatic operated exhaust brake.
Auxiliary braking device for operations

FRAME
Welded box-shaped structure

ELECTRIC SYSTEM
24 V DC. 2 batteries of 12V (120Ah)

FUEL TANK CAPACITY
300 liters

TIRES
Front 16.00R25☆☆(OR)
or 17.5R29☆☆☆(OR)
Rear 16.00R25☆☆(OR)
or 17.5R29☆☆☆(OR)

CAB
Two-man type
With sun visor and trim
Rubber mounted type
Fully adjustable foldable seat
(with headrest, armrest, seat belt)
Adjustable handle (tilt, telescoping)
Roof windshield lock warning
Intermittent type roof wiper (with washer)

SAFETY DEVICES
Emergency steering device
Spring lock device
Rear wheel steering lock device
Engine over-run alarm
Overshift prevention device
Parking brake alarm
Powered mirror for right side of boom
Monitor TV for left side of boom

GENERAL DATA

DIMENSIONS
Overall length 11,120mm
Overall width 2,620mm
Overall height
(16.00R25☆☆(OR) mounting vehicle)
3,495mm
(17.5R29☆☆☆(OR) mounting vehicle)
3,480mm
Wheel base 3,450mm
Tread Front 2,120mm
Rear 2,120mm

WEIGHTS
Gross vehicle weight
Total 26,400kg
Front 13,200kg
Rear 13,200kg

PERFORMANCE
Max. traveling speed 49km/h
Gradeability (tan θ) 0.6
Min. turning radius 5.3m (4-wheel steering)
9.0m (2-wheel steering)

TOTAL RATED LOADS

(1) With outriggers set

(i)

Unit : ton

Outriggers fully extended (360°)												
A / B (m)	9.5 m	16.5 m	23.5 m	30.5 m	C / D / E	8.0 m			13.0 m			
						5°	25°	45°	5°	25°	45°	
2.5 m	25.0	19.0	12.5		83°	3.0	2.1	1.6	2.0	1.2	0.8	
3.0 m	25.0	19.0	12.5	7.0	76°	3.0	2.1	1.6	2.0	1.2	0.8	
3.5 m	25.0	19.0	12.5	7.0	72°	3.0	2.1	1.6	1.75	1.1	0.8	
4.0 m	23.0	19.0	12.5	7.0	70°	2.8	2.1	1.6	1.65	1.05	0.8	
4.5 m	21.2	18.0	12.5	7.0	65°	2.35	1.8	1.5	1.4	0.95	0.78	
5.0 m	19.4	16.7	12.5	7.0	60°	2.0	1.55	1.35	1.2	0.9	0.75	
5.5 m	17.8	15.6	11.75	7.0	55°	1.45	1.35	1.2	1.05	0.85	0.74	
6.0 m	16.3	14.6	11.1	7.0	50°	1.05	1.0	0.95	0.85	0.75	0.7	
6.5 m	15.1	13.8	10.5	7.0	45°	0.75	0.7	0.7	0.6	0.55	0.55	
7.0 m	13.7	13.0	10.0	7.0	40°	0.55	0.5		0.4	0.4		
8.0 m		10.9	9.0	7.0	35°	0.38	0.35					
9.0 m		8.65	8.2	6.3								
10.0 m		7.05	7.3	5.8								
11.0 m		5.85	6.4	5.3								
12.0 m		4.95	5.5	4.9								
13.0 m		4.2	4.75	4.5								
14.0 m		3.6	4.1	4.15								
15.0 m			3.6	3.8								
16.0 m			3.15	3.45								
17.0 m			2.8	3.05								
18.0 m			2.45	2.7								
19.0 m			2.15	2.45								
20.0 m			1.9	2.2								
21.0 m			1.7	1.95								
22.0 m				1.75								
24.0 m				1.4								
26.0 m				1.15								
28.0 m				0.95								

A = Boom length
B = Working radius
C = Jib length
D = Jib offset
E = Boom angle

(ii)

Unit : ton

Outriggers middle extended (Over sides)												
A / B	9.5 m	16.5 m	23.5 m	30.5 m	C / D / E	8.0 m			13.0 m		
						5°	25°	45°	5°	25°	45°
2.5 m	25.0	19.0	12.5		83°	3.0	2.1	1.6	2.0	1.2	0.8
3.0 m	25.0	19.0	12.5		76°	3.0	2.1	1.6	2.0	1.2	0.8
3.5 m	25.0	19.0	12.5	7.0	72°	3.0	2.1	1.6	1.75	1.1	0.8
4.0 m	23.0	19.0	12.5	7.0	70°	2.8	2.1	1.6	1.65	1.05	0.8
4.5 m	21.2	18.0	12.5	7.0	65°	2.0	1.8	1.5	1.4	0.95	0.78
5.0 m	18.4	16.7	12.5	7.0	60°	1.3	1.15	1.1	1.0	0.9	0.75
5.5 m	15.4	15.0	11.75	7.0	55°	0.8	0.75	0.75	0.65	0.6	0.5
6.0 m	13.0	12.6	11.1	7.0	50°	0.5	0.45	0.45	0.4	0.35	0.3
6.5 m	11.2	10.8	10.5	7.0							
7.0 m	9.5	9.4	10.0	7.0							
8.0 m		7.3	8.0	7.0							
9.0 m		5.85	6.5	6.3							
10.0 m		4.75	5.4	5.6							
11.0 m		3.9	4.55	4.8							
12.0 m		3.3	3.85	4.15							
13.0 m		2.75	3.3	3.55							
14.0 m		2.3	2.85	3.1							
15.0 m			2.45	2.7							
16.0 m			2.1	2.35							
17.0 m			1.8	2.1							
18.0 m			1.55	1.8							
19.0 m			1.35	1.6							
20.0 m			1.15	1.4							
21.0 m			0.95	1.2							
22.0 m				1.05							
24.0 m				0.75							
26.0 m				0.5							

A = Boom length
B = Working radius
C = Jib length
D = Jib offset
E = Boom angle

(iii)

Unit : ton

Outriggers minimum extended (Over sides)

A / B	9.5 m	16.5 m	23.5 m	30.5 m
2.5 m	25.0	19.0	12.5	
3.0 m	25.0	19.0	12.5	
3.5 m	20.5	19.0	12.5	7.0
4.0 m	16.0	15.7	12.5	7.0
4.5 m	12.8	12.6	12.5	7.0
5.0 m	10.7	10.5	11.0	7.0
5.5 m	9.05	8.8	9.4	7.0
6.0 m	7.7	7.6	8.2	7.0
6.5 m	6.6	6.5	7.25	7.0
7.0 m	5.8	5.6	6.4	6.5
8.0 m		4.4	5.05	5.3
9.0 m		3.4	4.05	4.35
10.0 m		2.7	3.3	3.65
11.0 m		2.15	2.75	3.05
12.0 m		1.7	2.3	2.6
13.0 m		1.3	1.9	2.2
14.0 m		1.0	1.6	1.85
15.0 m			1.35	1.55
16.0 m			1.1	1.3
17.0 m			0.9	1.05
18.0 m			0.7	0.9
19.0 m			0.5	0.7
20.0 m				0.55

C / D / E	8.0 m			13.0 m		
	5°	25°	45°	5°	25°	45°
83°	3.0	2.1	1.6	2.0	1.2	0.8
76°	3.0	2.1	1.6	2.0	1.2	0.8
72°	2.2	1.8	1.6	1.75	1.1	0.8
70°	1.8	1.5	1.35	1.4	1.05	0.8
65°	1.0	0.9	0.8	0.8	0.65	0.55
60°	0.5	0.45	0.4	0.4	0.35	0.3

A = Boom length
B = Working radius
C = Jib length
D = Jib offset
E = Boom angle

PRECAUTIONS TO BE TAKEN WHEN THE OUTRIGGERS ARE EXTENDED:

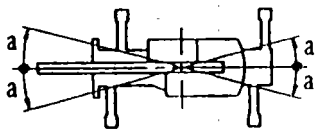
1. The total rated loads shown are for the case when the outriggers are set horizontally on firm ground. The values above the bold lines are based on the crane strength while those below are based on the crane stability.
2. The weights of slings and hooks (main winch hook: 260kg, Intermediate hook: 170kg, auxiliary winch: 60kg) are included in the total rated loads shown.
3. The total rated load is based on the actual working radius including the deflection of the boom.
4. The chart below shows the standard number of part lines for each boom length. The load per line should not exceed 3.2t for the main winch and 3.0t for the auxiliary winch.

A	9.5m	16.5m	23.5m	30.5m	J
H	8	6	4	4	1

A = Boom length H = No. of part-line J = Jib / Single top

5. As a rule, free-fall operation should be performed only when lowering the hook alone. If a hoisted load must be lowered by free-fall operation, the load must be kept below 1/5th of the total rated load and sudden braking operations must be avoided.
6. The total rated load for the single top shall be the value obtained by subtracting 200kg from the total rated load of the boom and must not exceed 3.0t.
7. The hoisting performance for the "Over sides" range will differ according to the extended width of the outriggers. Operations should be performed in accordance with the performance corresponding to the extended width.
   Also, although the hoisting performances for the "Over front" and "Over rear" ranges are equivalent to those of the "Outriggers fully extended" condition, the front and rear ranges (angle a) will differ according to the width to which the outriggers are extended in the left and right directions.

Extended width	Middle extended	Minimum extended
Angle a°	25	15



(2) Without outriggers

Unit : ton

B	Stationary						Creep (travelling at 1.6km/h or less)					
	9.5 m BOOM		16.5 m BOOM		23.5 m BOOM		9.5m BOOM		16.5m BOOM		23.5m BOOM	
(m)	F	G	F	G	F	G	F	G	F	G	F	G
3.0	14.0	9.0	9.0	7.3			10.5	7.0	7.5	5.1		
3.5	14.0	7.6	9.0	7.3	6.5	4.5	10.5	6.2	7.5	5.1	5.5	3.2
4.0	12.5	6.3	9.0	5.85	6.5	4.5	9.5	5.3	7.5	4.9	5.5	3.2
4.5	10.9	5.2	9.0	4.75	6.5	4.5	8.7	4.4	7.5	3.95	5.5	3.2
5.0	9.55	4.3	8.2	4.0	6.5	4.3	8.0	3.6	7.0	3.3	5.5	3.2
5.5	8.3	3.6	7.4	3.3	6.1	3.7	6.9	3.0	6.2	2.7	5.15	3.1
6.0	7.2	3.0	6.6	2.8	5.65	3.2	5.9	2.5	5.5	2.3	4.8	2.7
6.5	6.25	2.5	5.9	2.35	5.25	2.75	5.1	2.1	4.9	1.9	4.45	2.3
7.0	5.2	2.0	5.25	1.95	4.85	2.4	4.3	1.7	4.35	1.6	4.15	2.0
8.0			4.1	1.4	4.1	1.8			3.4	1.1	3.5	1.5
9.0			3.25	0.95	3.5	1.4			2.7	0.7	2.95	1.1
10.0			2.6	0.6	3.0	1.05			2.15		2.45	0.8
11.0			2.1		2.55	0.75			1.7		2.05	0.6
12.0			1.7		2.2				1.35		1.7	
13.0			1.35		1.85				1.1		1.45	
14.0			1.0		1.55				0.8		1.2	
15.0					1.3						1.0	
16.0					1.05						0.85	
17.0					0.85						0.7	
18.0					0.65						0.55	
19.0					0.5							

B = Working radius F = Front G = 360°
a = Boom angle range (for the unladen condition)

PRECAUTIONS TO BE TAKEN WHEN THE OUTRIGGERS ARE NOT MOUNTED:

1. The total rated loads shown are for the case when the crane is set horizontally on firm ground, with the air pressure of the tires being at the prescribed pressure and with the spring lock being applied completely. The values above the bold lines are based on the tire strength while those below are based on the crane stability. The foundation, working conditions, etc. should be taken into consideration adequately when using the crane for actual work.

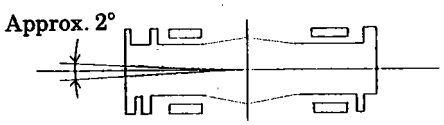
   (Tire air pressure: 16.00R25☆☆(OR) 8.00kg/cm^2
   17.5R29☆☆☆(OR) 9.00kg/cm^2)

2. The weights of the slings and hooks are included in the total rated loads shown.
3. The total rated loads are based on the actual working radii into which are included the deflection of the boom and the tires.
4. The chart below shows the standard number of part lines for each boom length. The load per line should not exceed 3.2t for the main winch and 3.0t for the auxiliary winch.

A	9.5 m	16.5 m	23.5 m	Single top
H	8	6	4	1

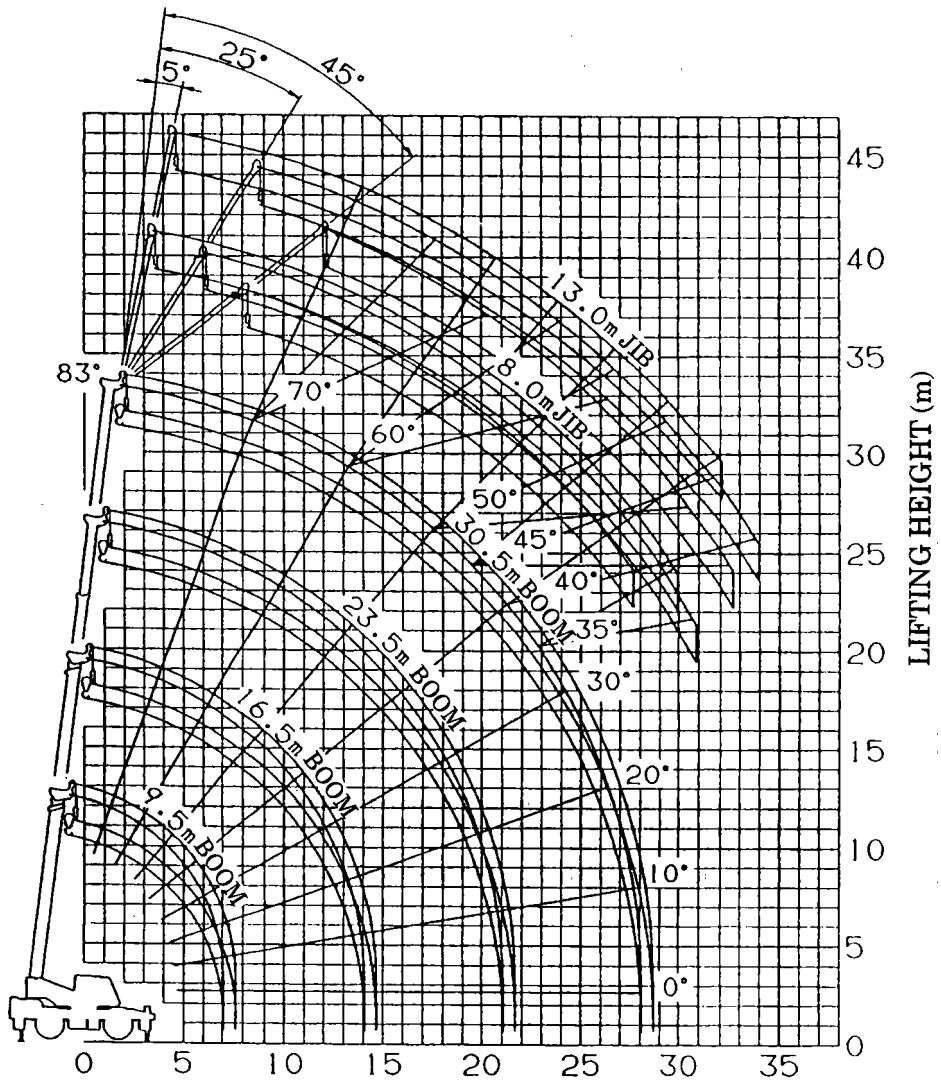
A = Boom length H = No. of part-line

5. The total rated load for the single top shall be the value obtained by subtracting 200kg from the total rated load of the boom and must not exceed 3.0t.
6. Free-fall operations should not be performed without outriggers.
7. Booms over 30.5m in length and jibs should not be used without outriggers.
8. "Over front" crane operations should be performed with the boom being inside a 2° area (1° each to the left and right) over front of the carrier.



9. When creeping while hoisting a load, the swing brake should be applied, the load should be kept as close to the ground as possible but not touching the ground and the speed should be kept at 1.6km/h or less. In particular, any abrupt steering, starting or braking must be avoided.
10. Crane operations should not be performed when creeping while hoisting a load.

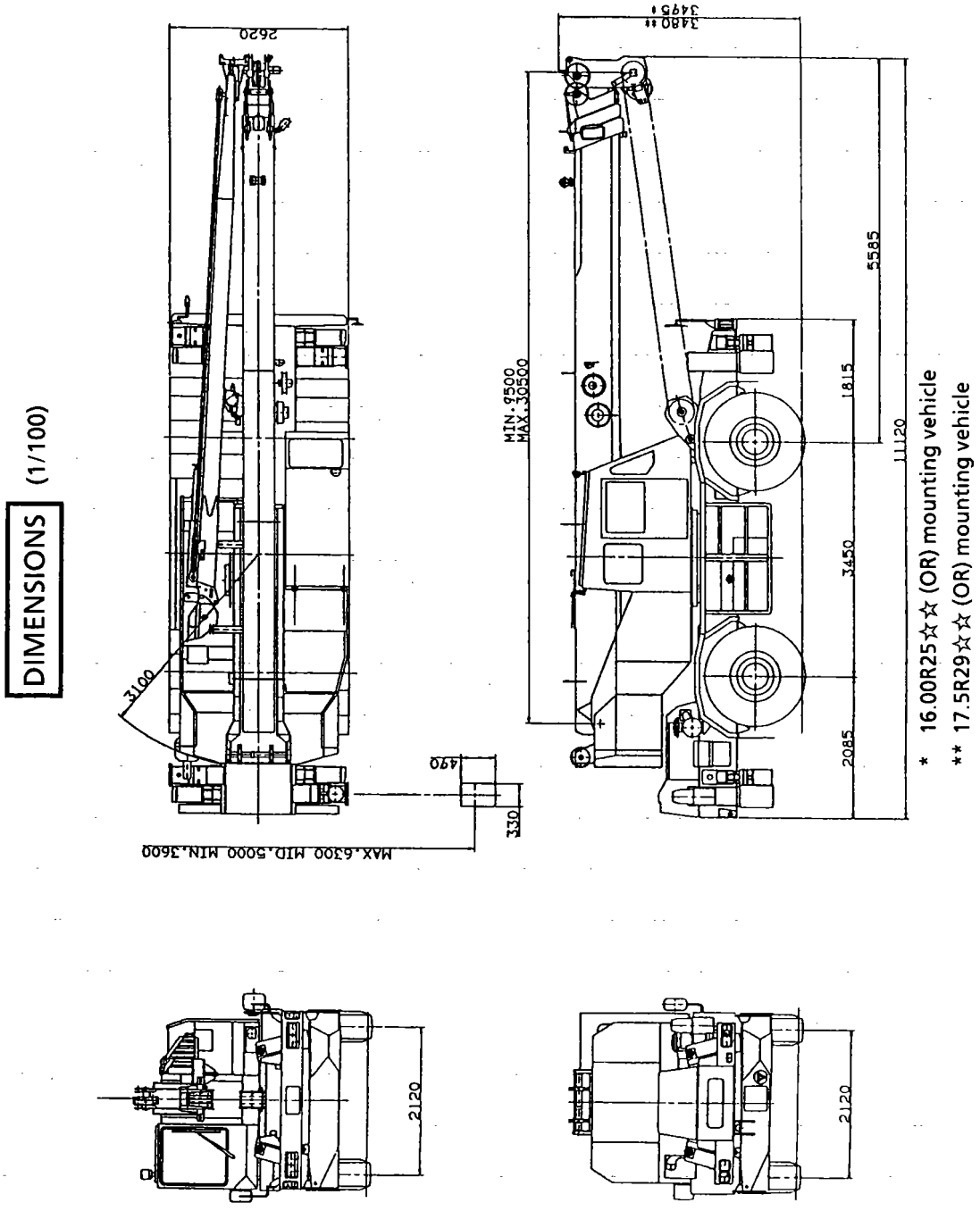
WORKING RADIUS - LIFTING HEIGHT



NOTES:

1. The deflection of the boom is not incorporated in the figure above.
2. The figure above is for the case when the outriggers are fully extended (360°).

DIMENSIONS (1/100)



* 16.00R25☆☆ (OR) mounting vehicle
** 17.5R29☆☆ (OR) mounting vehicle

◆ MEMO ◆