

# ROUGH TERRAIN CRANE

## TR-500M

*JAPANESE SPECIFICATIONS*

OUTLINE	SPEC. NO.
6-section Boom, 2-stage Jib	TR-500M-1-00102

Control No. JA-03

## TR-500M

## CRANE SPECIFICATIONS

## CRANE CAPACITY

9.7m Boom	45,000kg	at 3.5m	(11 part-line)
16.0m Boom	30,000kg	at 4.5m	( 8 part-line)
22.3m Boom	20,000kg	at 5.0m	( 5 part-line)
28.6m Boom	12,000kg	at 8.0m	( 4 part-line)
34.9m Boom	10,000kg	at 7.0m	( 4 part-line)
38.05m Boom	8,000kg	at 9.0m	( 4 part-line)
41.2m Boom	6,000kg	at 11.0m	( 4 part-line)
7.8m Jib	3,500kg	at 76°	( 1 part-line)
12.5m Jib	2,500kg	at 76°	( 1 part-line)
Single top	4,000kg		( 1 part-line)

## MAX. LIFTING HEIGHT

Boom	41.6m
Jib	54.6m

## MAX. WORKING RADIUS

Boom	34.0m
Jib	40.0m

## BOOM LENGTH

9.7m – 41.2m

## BOOM EXTENSION

31.5m

## BOOM EXTENSION SPEED

31.5m / 123s

## JIB LENGTH

7.8m, 12.5m

## MAIN WINCH SINGLE LINE SPEED

High range:	124m/min	(5th layer)
Low range:	62m/min	(5th layer)

## MAIN WINCH HOOK SPEED

High range:	11.2m/min	(11 part-line)
Low range:	5.6m/min	(11 part-line)

## AUXILIARY WINCH SINGLE LINE SPEED

High range:	124m/min	(5th layer)
Low range:	62m/min	(5th layer)

## AUXILIARY WINCH HOOK SPEED

High range:	124m/min	(1 part-line)
Low range:	62m/min	(1 part-line)

## BOOM ELEVATION ANGLE

0° – 83°

## BOOM ELEVATION SPEED

0° – 83° / 68s

## SWING ANGLE

360° continue

## SWING SPEED

High range:	2.4 rpm
Low range:	1.5 rpm

## WIRE ROPE

## Main Winch

18mm × 224m (Diameter × Length)  
 7×7+6×Fi(29) Class C ordinary · Z twist  
 Spin-resistant wire rope  
 Breaking strength 24.3t

## Auxiliary Winch

18mm × 120m (Diameter × Length)  
 7×7+6×Fi(29) Class C ordinary · Z twist  
 Spin-resistant wire rope  
 Breaking strength 24.3t

## BOOM

6-section hydraulically telescoping boom of hexagonal box construction  
 (stages 2,3: synchronized; stages 4,5,6: synchronized)

## BOOM EXTENSION

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

## JIB

2-staged type which stores alongside below the base boom section and extendible from under the boom.  
 Triple offset (5°, 25°, 45°) type

## SINGLE TOP

Single sheave. Mounted to main boom head.

## HOIST

Driven by hydraulic motor driven and via bevel gear reducer.

With free-fall device.

Automatic brake (with foot brake for free-fall device)

2 single winches

## BOOM ELEVATION

2 double-acting hydraulic cylinders

## SWING

Hydraulic motor driven planetary gear reducer

Swing bearing

High/Low speed selection

Swing free/lock changeover type

Hand brake

## OUTRIGGERS

Fully hydraulic H-type (floats mounted integrally)

Slides and jacks each provided with independent operation device.

Full extended width 7.25m

Middle extended width 5.5m, 4.0m

Minimum extended width 2.57m

## MAX. OUTRIGGER LOAD

39.2t

## HYDRAULIC PUMPS

2 variable piston pumps

2 gear pumps

## HYDRAULIC OIL TANK CAPACITY

650 liters

## SAFETY DEVICES

Automatic moment limiter (AML)

Over-winding cutout

Working area control device

Winch drum lock

Level gauge

Hook safety latch

Hydraulic safety valve

Telescopic counterbalance valve

Elevation counterbalance valve

Jack pilot check valve

Swing lock

## EQUIPMENTS

Heat pump type air-conditioner

Hydraulic oil temperature indication lamp

Radio

Oil cooler

Winch drum rotation indicator

Operation pedals for elevating/telescoping.

## CARRIER SPECIFICATIONS

### ENGINE

Model NISSAN DIESEL MOTOR CO., LTD. PF6T  
(with turbo charger)  
Type 4-cycle, 6-cylinder, direct-injection, water-cooled diesel engine  
Piston displacement 12,503cc  
Max. output 290PS at 2,100rpm  
Max. torque 122kg·m at 1,200rpm

### 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  
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 18.00R25☆☆(OR)  
Rear 18.00R25☆☆(OR)

### CAB

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

### SAFETY DEVICES

Emergency steering device  
Spring lock device  
Rear wheel steering lock device  
Engine over-run alarm  
Overshift prevention device  
Parking brake alarm

## GENERAL DATA

### DIMENSIONS

Overall length	11,930mm
Overall width	3,000mm
Overall height	3,770mm
Wheel base	4,850mm
Tread Front	2,430mm
Tread Rear	2,430mm

### WEIGHTS

Gross vehicle weight	
Total	37,790kg
Front	18,900kg
Rear	18,890kg

### PERFORMANCE

Max. traveling speed	45km/h
Gradeability (tan θ)	0.6
Min. turning radius	6.3m (4-wheel steering) 10.8m (2-wheel steering)

<b>TOTAL RATED LOADS</b>
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(1) With outriggers set (360°)  
[BOOM]

Unit : ton

Outriggers fully extended (7.25m)							
A B (m)	9.7 m	16.0 m	22.3 m	28.6 m	34.9 m	38.05m	41.2 m
2.5	45.0	30.0	20.0	12.0			
3.0	45.0	30.0	20.0	12.0			
3.5	45.0	30.0	20.0	12.0	10.0		
4.0	39.5	30.0	20.0	12.0	10.0	8.0	
4.5	35.5	30.0	20.0	12.0	10.0	8.0	
5.0	32.0	28.0	20.0	12.0	10.0	8.0	6.0
5.5	29.0	26.0	19.8	12.0	10.0	8.0	6.0
6.0	26.5	24.1	18.7	12.0	10.0	8.0	6.0
6.5	24.0	22.4	17.6	12.0	10.0	8.0	6.0
7.0	22.0	20.6	16.7	12.0	10.0	8.0	6.0
8.0		17.5	15.0	12.0	9.2	8.0	6.0
9.0		14.2	13.4	11.5	8.5	8.0	6.0
10.0		11.8	11.05	10.5	8.0	7.75	6.0
11.0		9.8	9.2	9.5	7.6	7.25	6.0
12.0		8.2	7.75	8.5	7.1	6.75	5.9
13.0		7.0	6.6	7.4	6.7	6.3	5.5
14.0			5.65	6.5	6.3	6.0	5.2
16.0			4.15	4.9	5.3	5.3	4.6
18.0			2.95	3.75	4.15	4.4	4.1
20.0				2.9	3.3	3.5	3.6
22.0				2.2	2.6	2.8	2.95
24.0				1.6	2.05	2.3	2.35
26.0				1.0	1.6	1.85	1.95
28.0					1.2	1.4	1.6
30.0					0.8	1.0	1.2
32.0						0.65	0.85
34.0							0.55

A = Boom length B = Working radius

**[BOOM]**

Unit : ton

Outriggers middle extended (5.5m)							
A B (m)	9.7 m	16.0 m	22.3 m	28.6 m	34.9 m	38.05m	41.2 m
2.5	45.0	30.0	20.0	12.0			
3.0	45.0	30.0	20.0	12.0			
3.5	41.0	30.0	20.0	12.0	10.0		
4.0	36.8	30.0	20.0	12.0	10.0	8.0	
4.5	33.2	30.0	20.0	12.0	10.0	8.0	
5.0	30.2	26.0	20.0	12.0	10.0	8.0	6.0
5.5	25.2	23.0	19.8	12.0	10.0	8.0	6.0
6.0	21.0	20.7	18.7	12.0	10.0	8.0	6.0
6.5	18.2	18.0	16.8	12.0	10.0	8.0	6.0
7.0	15.5	15.2	15.1	12.0	10.0	8.0	6.0
8.0		11.9	11.6	12.0	9.2	8.0	6.0
9.0		9.5	9.15	10.2	8.5	8.0	6.0
10.0		7.65	7.35	8.35	8.0	7.75	6.0
11.0		6.25	6.0	6.95	7.0	7.25	6.0
12.0		5.15	4.9	5.85	6.3	6.3	5.9
13.0		4.2	4.0	4.95	5.5	5.5	5.5
14.0			3.25	4.2	4.75	4.8	5.0
16.0			2.05	3.0	3.55	3.6	3.8
18.0			1.05	2.1	2.65	2.7	2.9
20.0				1.35	1.95	2.05	2.25
22.0				0.7	1.3	1.5	1.7
24.0					0.8	1.0	1.2
26.0						0.6	0.8

A = Boom length B = Working radius

**[BOOM]**

Unit : ton

Outriggers middle extended (4.0m)							
A B (m)	9.7 m	16.0 m	22.3 m	28.6 m	34.9 m	38.05m	41.2 m
2.5	40.0	30.0	20.0	12.0			
3.0	40.0	30.0	20.0	12.0			
3.5	33.4	30.0	20.0	12.0	10.0		
4.0	26.5	27.0	20.0	12.0	10.0	8.0	
4.5	21.0	21.5	20.0	12.0	10.0	8.0	
5.0	17.4	17.4	17.0	12.0	10.0	8.0	6.0
5.5	14.6	14.5	14.2	12.0	10.0	8.0	6.0
6.0	12.5	12.2	12.0	12.0	10.0	8.0	6.0
6.5	10.5	10.5	10.4	11.3	10.0	8.0	6.0
7.0	9.0	9.1	9.0	10.0	9.5	8.0	6.0
8.0		6.9	6.8	7.8	8.0	8.0	6.0
9.0		5.4	5.25	6.2	6.65	6.7	6.0
10.0		4.3	4.1	5.0	5.6	5.7	5.9
11.0		3.4	3.15	4.05	4.65	4.75	5.0
12.0		2.6	2.45	3.3	3.85	4.0	4.2
13.0		1.85	1.75	2.7	3.2	3.35	3.55
14.0			1.15	2.15	2.7	2.85	3.0
16.0				1.2	1.8	2.0	2.15
18.0					1.1	1.3	1.5
20.0						0.75	0.95

A = Boom length B = Working radius

## [BOOM]

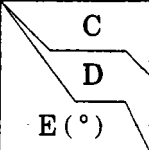
Unit : ton

Outriggers minimum extended (2.57m)							
A \ B (m)	9.7 m	16.0 m	22.3 m	28.6 m	34.9 m	38.05m	41.2 m
2.5	15.0	11.0	11.0	7.0			
3.0	15.0	11.0	11.0	7.0			
3.5	15.0	11.0	11.0	7.0	6.0		
4.0	13.8	11.0	11.0	7.0	6.0	5.5	
4.5	11.3	10.5	10.4	7.0	6.0	5.5	
5.0	9.3	8.8	8.55	7.0	6.0	5.5	5.0
5.5	7.7	7.3	7.15	6.5	6.0	5.5	5.0
6.0	6.5	6.1	6.0	5.8	5.5	5.3	5.0
6.5	5.5	5.2	5.0	5.1	5.0	5.0	5.0
7.0	4.6	4.4	4.2	4.5	4.5	4.5	4.5
8.0		3.2	3.0	3.5	3.6	3.7	3.8
9.0		2.3	2.05	2.5	2.8	2.9	3.1
10.0		1.5	1.35	1.8	2.1	2.3	2.5
11.0		0.8					

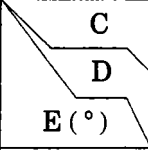
A = Boom length B = Working radius

**(JIB)**

Unit : ton

Outriggers fully extended (7.25m)						
 C D E (°)	7.8 m			12.5 m		
	5°	25°	45°	5°	25°	45°
83	3.5	2.4	1.5	2.5	1.4	0.8
76	3.5	2.4	1.5	2.5	1.4	0.8
74	3.25	2.2	1.5	2.25	1.4	0.8
72	2.95	2.1	1.48	2.05	1.3	0.8
70	2.65	1.95	1.45	1.9	1.25	0.8
68	2.4	1.85	1.43	1.75	1.2	0.79
65	2.1	1.7	1.4	1.55	1.1	0.77
60	1.7	1.45	1.3	1.3	0.95	0.74
55	1.3	1.2	1.15	1.08	0.85	0.72
50	0.75	0.65	0.6	0.6	0.5	0.48
48	0.55	0.45	0.4	0.4	0.35	0.33

Unit : ton

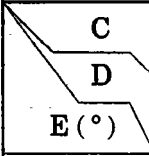
Outriggers middle extended (5.5m)						
 C D E (°)	7.8 m			12.5 m		
	5°	25°	45°	5°	25°	45°
83	3.5	2.4	1.5	2.5	1.4	0.8
76	3.5	2.4	1.5	2.5	1.4	0.8
74	3.25	2.2	1.5	2.25	1.4	0.8
72	2.95	2.1	1.48	2.05	1.3	0.8
70	2.65	1.95	1.45	1.9	1.25	0.8
68	2.4	1.85	1.43	1.75	1.2	0.79
65	1.75	1.55	1.4	1.45	1.1	0.77
60	0.8	0.7	0.65	0.6	0.5	0.45

C = Jib length D = Jib offset E = Boom angle



[JIB]

Unit : ton

Outriggers middle extended (4.0m)						
 C D E (°)	7.8 m			12.5 m		
	5°	25°	45°	5°	25°	45°
83	3.5	2.4	1.5	2.5	1.4	0.8
76	3.5	2.4	1.5	2.5	1.4	0.8
74	2.6	2.2	1.5	2.1	1.4	0.8
72	2.0	1.7	1.48	1.6	1.3	0.8
70	1.5	1.25	1.1	1.2	0.95	0.8

C = Jib length D = Jib offset E = Boom angle

**NOTES:**

- 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.
- The weights of slings and hooks (390kg for a 45 ton capacity hook, 290kg for a 25 ton capacity hook and 100kg for a 4 ton capacity hook) are included in the total rated loads shown.
- The total rated load is based on the actual working radius including the deflection of the boom.
- The chart below shows the standard number of part lines for each boom length. The load per line should not exceed 4.1t for the main winch and 4.0t for the auxiliary winch.

A	9.7 m	16.0 m	22.3 m	28.6 m	34.9 m	38.05m	41.2 m	J
H	11	8	5(6)	4	4	4	4	1

The value in ( ) is for a 25t hook.

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

- 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.
- The total rated load for the single top shall be the value obtained by subtracting 300kg from the total rated load of the boom and must not exceed 4.0t.

## (2) Without outriggers

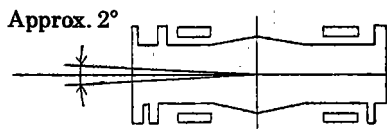
Unit : ton

B (m)	Stationary						Creep (travelling at 1.6km/h or less)					
	9.7m BOOM		16.0m BOOM		22.3m BOOM		9.7m BOOM		16.0m BOOM		22.3m BOOM	
	F	G	F	G	F	G	F	G	F	G	F	G
3.0	20.0	12.5	15.0	10.0			14.5	8.0	10.5	6.5		
3.5	20.0	12.5	15.0	10.0			14.5	8.0	10.5	6.5		
4.0	20.0	11.0	15.0	10.0	11.0	5.5	14.5	8.0	10.5	6.5	8.0	4.5
4.5	18.0	9.0	15.0	8.5	11.0	5.5	12.9	6.8	10.5	6.5	8.0	4.5
5.0	16.0	7.4	15.0	7.0	11.0	5.5	11.5	5.8	10.5	5.3	8.0	4.5
5.5	14.3	6.2	14.0	5.7	11.0	5.3	10.3	4.8	10.5	4.4	8.0	4.1
6.0	12.8	5.2	13.0	4.8	11.0	4.4	9.3	4.0	10.0	3.7	8.0	3.55
6.5	11.7	4.35	12.0	4.05	10.0	3.7	8.6	3.35	9.3	3.15	8.0	3.05
7.0	10.8	3.7	11.0	3.4	9.2	3.0	7.9	2.8	8.5	2.7	7.4	2.55
8.0			9.0	2.3	7.7	2.0			7.0	1.85	6.4	1.65
9.0			7.0	1.3	6.4	1.15			5.9	1.1	5.4	0.95
10.0			5.7	0.6	5.4				4.8	0.5	4.5	
11.0			4.7		4.5				3.9		3.7	
12.0			4.0		3.8				3.3		3.1	
13.0			3.4		3.2				2.8		2.6	
14.0					2.7						2.2	
16.0					1.8						1.5	
18.0					1.05						0.85	

B = Working radius F = Front G = 360°

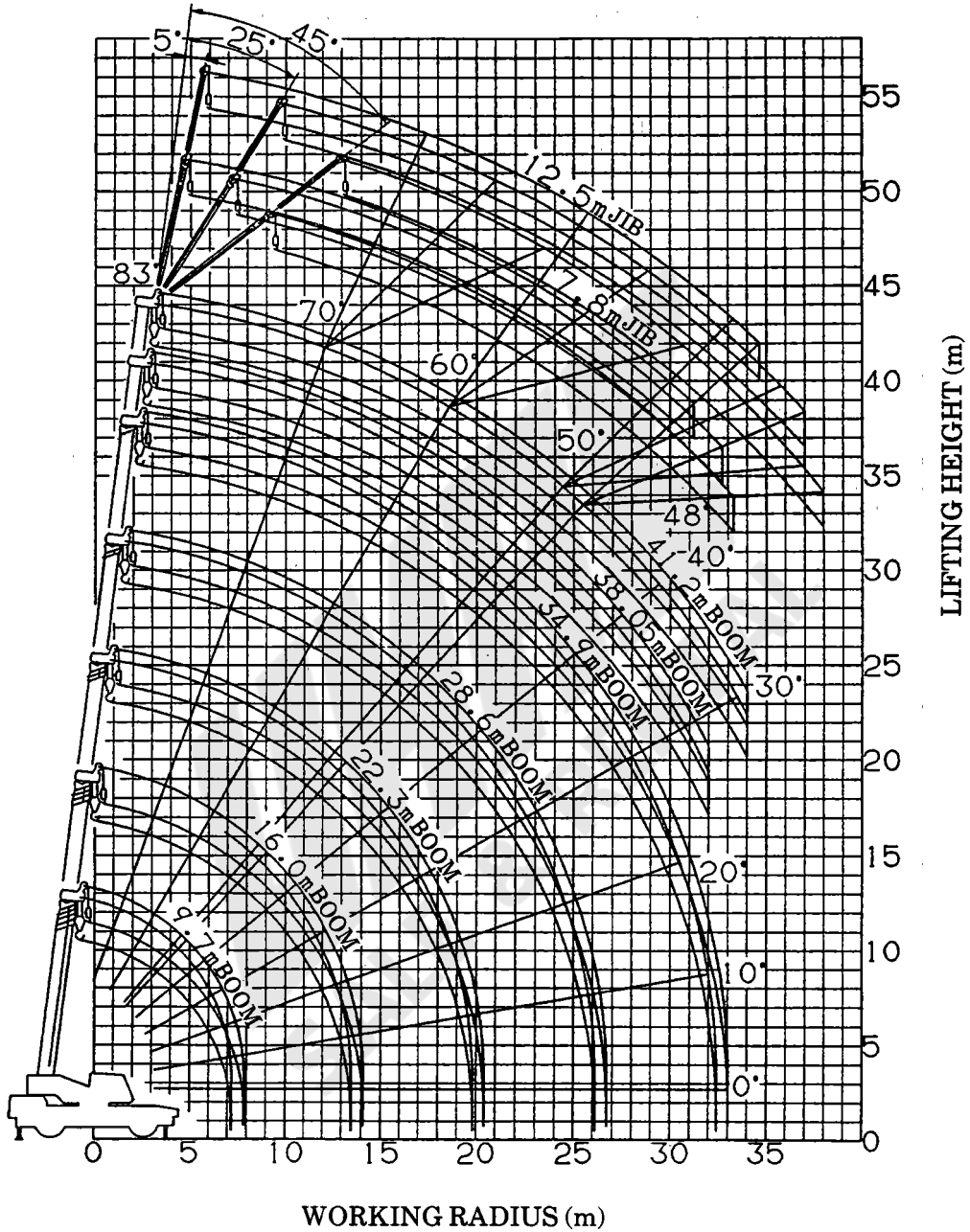
**NOTES:**

1. The total rated loads shown are for the case when the crane is 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. The foundation, working conditions, etc. should be taken into consideration adequately when using the crane for actual work. (Tire air pressure: 8.0kg/cm<sup>2</sup>).
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 total rated load for the single top shall be the value obtained by subtracting 300kg from the total rated load of the boom and must not exceed 4.0t.
5. Free-fall operations should not be performed without outriggers.
6. Booms over 22.3m in length and jibs should not be used without outriggers.
7. Perform "Over front" crane operations only when the "Over Front Range Indication Lamp" is lit. The boom must be kept inside a 2° area in front of the carrier when performing "Over front" operations without the outriggers.



8. The "Drive, Speed Selection" switch should be set to "4-wheel · Lo" for creeping while hoisting a load.
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.

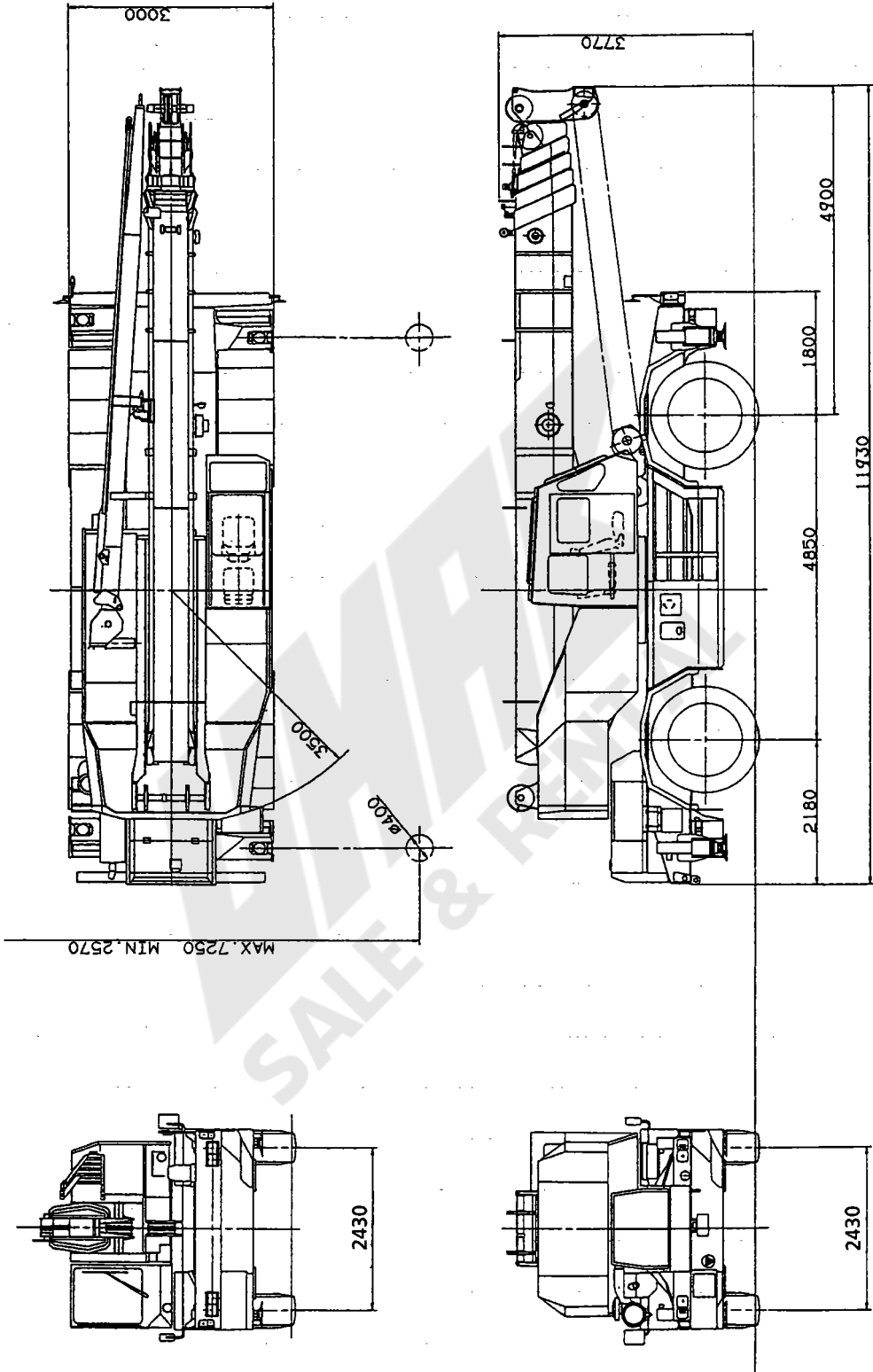
**WORKING RADIUS - LIFTING HEIGHT**



**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)



◆ MEMO ◆

Lined area for writing the memo content.

