



TR

ROUGH TERRAIN CRANE

TR-200M

JAPANESE SPECIFICATIONS

OUTLINE	SPEC. NO.
5-section Boom	TR-200M-4-00109

Control No. JA-01



TR-200M-4-00109

TR-200M

CRANE SPECIFICATIONS

CRANE CAPACITY

8.5m	4-Boom	20,000kg	at 3.5m	(7 part-line)
	5-Boom	4,800kg	at 6.5m	(7 part-line)
14.4m	4-Boom	12,000kg	at 5.5m	(6 part-line)
	5-Boom	4,800kg	at 11.0m	(6 part-line)
20.3m	4-Boom	9,000kg	at 6.0m	(4 part-line)
	5-Boom	4,800kg	at 10.0m	(4 part-line)
26.2m	4-Boom	7,000kg	at 6.5m	(4 part-line)
	5-Boom	4,800kg	at 7.0m	(4 part-line)
32.1m	5-Boom	3,400kg	at 10.0m	(4 part-line)
Single top				
	4-Boom	3,000kg		(1 part-line)
	5-Boom	2,500kg		(1 part-line)

MAX. LIFTING HEIGHT

4-Boom	26.9m
5-Boom	32.7m

MAX. WORKING RADIUS

4-Boom	24.0m
4-Boom	30.0m

BOOM LENGTH

8.5m – 32.1m

BOOM EXTENSION

23.6m (5-Boom)

BOOM EXTENSION SPEED

23.6m / 45s

MAIN WINCH SINGLE LINE SPEED

High range:	121m/min	(4th layer)
Low range:	58m/min	(4th layer)

MAIN WINCH HOOK SPEED

High range:	17.3m/min	(7 part-line)
Low range:	8.3m/min	(7 part-line)

AUXILIARY WINCH SINGLE LINE SPEED

High range:	103m/min	(2nd layer)
Low range:	50m/min	(2nd layer)

AUXILIARY WINCH HOOK SPEED

High range:	103m/min	(1th layer)
Low range:	50m/min	(1th layer)

BOOM ELEVATION ANGLE

0° – 82°

BOOM ELEVATION SPEED

0° – 82° / 34s

SWING ANGLE

360° continue

SWING SPEED

3.4rpm

WIRE ROPE

Main Winch

16mm × 175m (Diameter×Length)
7×7+6×WS(36) Spin-resistant wire rope

Auxiliary Winch

16mm × 80m (Diameter×Length)
7×7+6×Fi(29) Spin-resistant wire rope

BOOM

5-section hydraulically telescoping boom of box construction.
(stages 2~5;synchronized: stages 2~4; synchronized)

BOOM EXTENSION

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

SINGLE TOP

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

HOIST

Driven by hydraulic motor and via planetary gear reducer.
With free-fall device.

Automatic brake (with foot brake for free-fall device)
2 single winches

BOOM ELEVATION

1 double-acting hydraulic cylinders

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	5.8m
Middle extended width	4.7m
Minimum extended width	3.6m

MAX. OUTRIGGER LOAD

22.6t

HYDRAULIC PUMPS

Variable piston pump and gear pump

HYDRAULIC OIL TANK CAPACITY

375 liters

SAFETY DEVICES

Automatic moment limiter (AML)

With working range function

Over-winding cutout

Working area control device

Level gauge

Hook safety latch

Winch drum lock

Hydraulic safety valve

Telescopic counterbalance valve

Elevation counterbalance valve

Jack pilot check valve

Swing lock

EQUIPMENTS

Crane cab heater (with defroster)

Hydraulic oil temperature indication lamp

Oil cooler

Winch drum rotation indicator

Operation pedals for elevating/ telescoping

Radio

**CARRIER SPECIFICATIONS****ENGINE**

Model MITSUBISHI 6D14
Type 4-cycle, 6-cylinder, direct-injection, water-cooled diesel engine
(with turbo charger)
Piston displacement 6,557cc
Max. output 185PS at 2,800rpm
Max. torque 58kg·m at 1,600rpm

TORQUE CONVERTER

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

TRANSMISSION

Power shift type (wet multi-plate clutch)
3 forward and 1 reverse speeds

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

250 liters

TIRES

Front 14.00R24 ☆☆ ☆(OR)
Rear 14.00R24 ☆☆ ☆(OR)

CAB

Two-man type
With sun visor and trim
Rubber mounted type
Fully adjustable seat (with headrest, 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 10,470mm
Overall width 2,490mm
Overall height 3,420mm
Wheel base 3,100mm
Tread Front 2,070mm
Rear 2,070mm

WEIGHTS

Gross vehicle weight
Total 23,200kg
Front 11,575kg
Rear 11,625kg

PERFORMANCE

Max. traveling speed 49km/h
Gradeability (tan θ) 0.6
Min. turning radius 4.7m (4-wheel steering)
8.0m (2-wheel steering)



TR-200M-4-00109

TOTAL RATED LOADS

- (1) With outriggers set (360°)
(i) 4 section boom condition

Unit:ton				
Outriggers fully extended				
A B (m)	8.5m	14.4m	20.3m	26.2m
2.5	20.0	12.0	9.0	
3.0	20.0	12.0	9.0	
3.5	20.0	12.0	9.0	7.0
4.0	18.5	12.0	9.0	7.0
4.5	16.5	12.0	9.0	7.0
5.0	15.0	12.0	9.0	7.0
5.5	13.7	12.0	9.0	7.0
6.0	12.5	11.4	9.0	7.0
6.5	11.5	10.6	8.5	7.0
7.0		9.9	8.0	6.8
8.0		8.4	7.2	6.15
9.0		6.8	6.4	5.55
10.0		5.8	5.8	5.05
11.0		4.8	4.9	4.65
12.0		4.15	4.2	4.2
13.0			3.65	3.65
14.0			3.2	3.2
15.0			2.8	2.8
16.0			2.5	2.5
17.0			2.2	2.2
18.0			2.0	2.0
19.0				1.75
20.0				1.4
22.0				1.1
24.0				0.8

Unit:ton				
Outriggers middle extended				
A B (m)	8.5m	14.4m	20.3m	26.2m
2.5	20.0	12.0	9.0	
3.0	20.0	12.0	9.0	
3.5	20.0	12.0	9.0	7.0
4.0	18.5	12.0	9.0	7.0
4.5	16.5	12.0	9.0	7.0
5.0	14.5	12.0	9.0	7.0
5.5	12.0	12.0	9.0	7.0
6.0	10.1	10.3	9.0	7.0
6.5	8.7	8.9	8.5	7.0
7.0		7.9	7.85	6.8
8.0		6.15	6.15	6.15
9.0		5.0	5.05	5.05
10.0		4.15	4.2	4.2
11.0		3.5	3.55	3.55
12.0		3.0	3.05	3.05
13.0			2.65	2.65
14.0			2.3	2.3
15.0			2.0	2.0
16.0			1.75	1.75
17.0			1.55	1.4
18.0			1.35	1.2
19.0				1.0
20.0				0.85
22.0				0.6
24.0				0.4

Unit:ton				
Outriggers minimum extended				
A B (m)	8.5m	14.4m	20.3m	26.2m
2.5	20.0	12.0	9.0	
3.0	20.0	12.0	9.0	
3.5	18.9	12.0	9.0	7.0
4.0	14.2	12.0	9.0	7.0
4.5	11.3	11.5	9.0	7.0
5.0	9.3	9.5	9.0	7.0
5.5	7.9	8.0	8.1	7.0
6.0	6.8	6.9	6.95	6.95
6.5	5.9	6.0	6.05	6.05
7.0		5.3	5.35	5.35
8.0		4.2	4.25	4.25
9.0		3.4	3.45	3.45
10.0		2.8	2.9	2.85
11.0		2.35	2.4	2.4
12.0		2.0	2.0	2.05
13.0			1.7	1.7
14.0			1.4	1.35
15.0			1.1	1.1
16.0			0.9	0.9
17.0			0.75	0.75
18.0			0.6	0.6
19.0				0.45

A = Boom length
B = Working radius



(ii) 5 section boom condition

Unit:ton

Outriggers fully extended					Outriggers middle extended					Outriggers minimum extended							
A B (m)	8.5m	14.4m	20.3m	26.2m	32.1m	A B (m)	8.5m	14.4m	20.3m	26.2m	32.1m	A B (m)	8.5m	14.4m	20.3m	26.2m	32.1m
2.5	4.8	4.8	4.8			2.5	4.8	4.8	4.8			2.5	4.8	4.8	4.8		
3.0	4.8	4.8	4.8			3.0	4.8	4.8	4.8			3.0	4.8	4.8	4.8		
3.5	4.8	4.8	4.8	4.8		3.5	4.8	4.8	4.8	4.8		3.5	4.8	4.8	4.8	4.8	
4.0	4.8	4.8	4.8	4.8	3.4	4.0	4.8	4.8	4.8	4.8	3.4	4.0	4.8	4.8	4.8	4.8	3.4
4.5	4.8	4.8	4.8	4.8	3.4	4.5	4.8	4.8	4.8	4.8	3.4	4.5	4.8	4.8	4.8	4.8	3.4
5.0	4.8	4.8	4.8	4.8	3.4	5.0	4.8	4.8	4.8	4.8	3.4	5.0	4.8	4.8	4.8	4.8	3.4
5.5	4.8	4.8	4.8	4.8	3.4	5.5	4.8	4.8	4.8	4.8	3.4	5.5	4.8	4.8	4.8	4.8	3.4
6.0	4.8	4.8	4.8	4.8	3.4	6.0	4.8	4.8	4.8	4.8	3.4	6.0	4.8	4.8	4.8	4.8	3.4
6.5	4.8	4.8	4.8	4.8	3.4	6.5	4.8	4.8	4.8	4.8	3.4	6.5	4.8	4.8	4.8	4.8	3.4
7.0		4.8	4.8	4.8	3.4	7.0		4.8	4.8	4.8	3.4	7.0		4.8	4.8	4.8	3.4
8.0		4.8	4.8	4.7	3.4	8.0		4.8	4.8	4.7	3.4	8.0		4.3	4.45	4.5	3.4
9.0		4.8	4.8	4.3	3.4	9.0		4.8	4.8	4.3	3.4	9.0		3.55	3.7	3.7	3.4
10.0		4.8	4.8	4.0	3.4	10.0		4.3	4.45	4.0	3.4	10.0		2.95	3.05	3.1	3.1
11.0		4.8	4.5	3.8	3.2	11.0		3.65	3.8	3.6	3.0	11.0		2.5	2.6	2.6	2.6
12.0		4.3	4.3	3.5	3.0	12.0		3.15	3.25	3.1	2.8	12.0		2.1	2.2	2.2	2.2
13.0			3.85	3.2	2.85	13.0			2.85	2.7	2.5	13.0			1.9	1.9	1.9
14.0			3.4	3.0	2.7	14.0			2.5	2.5	2.3	14.0			1.65	1.7	1.7
15.0			3.0	2.85	2.5	15.0			2.2	2.2	2.1	15.0			1.45	1.5	1.5
16.0			2.7	2.65	2.4	16.0			1.95	1.95	1.9	16.0			1.1	1.1	1.1
17.0			2.4	2.4	2.3	17.0			1.7	1.7	1.7	17.0			1.0	1.0	1.0
18.0			2.2	2.2	2.15	18.0			1.55	1.55	1.55	18.0			0.8	0.8	0.8
19.0				2.0	2.0	19.0				1.3	1.3	19.0				0.7	0.7
20.0				1.8	1.8	20.0				1.1	1.1	20.0				0.5	0.5
22.0				1.5	1.5	22.0				0.9	0.9	A = Boom length					
24.0				1.1	1.1	24.0				0.6	0.6	B = Working radius					
26.0					0.9	26.0					0.4						
28.0					0.7												
30.0					0.5												

A = Boom length
B = Working radius



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PRECAUTIONS TO BE TAKEN WHEN THE OUTRIGGERS ARE EXTENDED:

- 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.
- 2. The weights of the slings and hooks (main winch hook: 220kg, auxiliary winch hook: 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 2.9t for the main winch and 3.0t for the auxiliary winch.

A	8.5m	14.4m	20.3m	26.2m	32.1m	J
H	7	6	4	4	4	1

A = Boom length H = No. of part-line J = 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 160kg from the total rated load of the boom and must not exceed 3.0t. However, for a boom length which exceeds 26.2m, the limit shall be 2.5t.



2-(2) Without outriggers
(i) 4 section boom condition

Unit:ton

B (m)	Stationary						Creep (travelling at 1.6km/h or less)					
	8.5m BOOM		14.4mBOOM		20.3mBOOM		8.5m BOOM		14.4mBOOM		20.3mBOOM	
	F	G	F	G	F	G	F	G	F	G	F	G
3.0	12.2	8.2	8.7	7.2			8.5	6.5	6.7	5.0		
3.5	10.7	7.2	8.7	7.0	6.2	4.5	8.3	5.6	6.7	5.0	5.2	3.7
4.0	10.2	6.0	8.7	5.6	6.2	4.5	7.5	4.7	6.7	4.6	5.2	3.7
4.5	9.1	4.9	8.0	4.5	6.2	4.5	6.8	3.7	6.3	3.7	5.2	3.7
5.0	8.0	4.0	7.2	3.75	6.2	4.1	6.1	3.1	5.8	3.0	5.2	3.3
5.5	6.9	3.4	6.4	3.2	5.7	3.5	5.4	2.6	5.2	2.5	4.8	2.8
6.0	6.1	2.8	5.65	2.7	5.3	3.0	4.9	2.2	4.6	2.1	4.4	2.3
6.5	5.2	2.4	4.9	2.2	4.85	2.55	4.2	1.8	4.05	1.7	4.0	2.0
7.0			4.3	1.85	4.5	2.2			3.6	1.4	3.7	1.7
8.0			3.3	1.25	3.7	1.65			2.75	0.9	3.1	1.2
9.0			2.55	0.8	3.0	1.2			2.15	0.6	2.5	0.9
10.0			2.05	0.4	2.5	0.85			1.75		2.05	0.6
11.0			1.6		2.0	0.55			1.35		1.65	
12.0			1.25		1.6				1.05		1.3	
13.0					1.3						1.05	
14.0					1.05						0.85	
15.0					0.85						0.65	
16.0					0.65						0.5	
17.0					0.45							

B = Working radius F = Front G = 360°



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(ii) 5 section boom condition

Unit:ton

B (m)	Stationary						Creep (travelling at 1.6km/h or less)					
	8. 5m BOOM		14. 4m BOOM		20. 3m BOOM		8. 5m BOOM		14. 4m BOOM		20. 3m BOOM	
	F	G	F	G	F	G	F	G	F	G	F	G
3.0	4.8	4.8	4.8	4.8			4.8	4.8	4.8	4.8		
3.5	4.8	4.8	4.8	4.8	4.8	4.5	4.8	4.8	4.8	4.8	4.8	3.7
4.0	4.8	4.8	4.8	4.8	4.8	4.5	4.8	4.7	4.8	4.6	4.8	3.7
4.5	4.8	4.8	4.8	4.5	4.8	4.5	4.8	3.7	4.8	3.7	4.8	3.7
5.0	4.8	4.0	4.8	3.75	4.8	4.1	4.8	3.1	4.8	3.0	4.8	3.3
5.5	4.8	3.4	4.8	3.2	4.8	3.5	4.8	2.6	4.8	2.5	4.8	2.8
6.0	4.8	2.8	4.8	2.7	4.8	3.0	4.8	2.2	4.6	2.1	4.4	2.3
6.5	4.8	2.4	4.8	2.2	4.8	2.55	4.2	1.8	4.05	1.7	4.0	2.0
7.0			4.3	1.85	4.5	2.2			3.6	1.4	3.7	1.7
8.0			3.3	1.25	3.7	1.65			2.75	0.9	3.1	1.2
9.0			2.55	0.8	3.0	1.2			2.15	0.6	2.5	0.9
10.0			2.05	0.4	2.5	0.85			1.75		2.05	0.6
11.0			1.6		2.0	0.55			1.35		1.65	
12.0			1.25		1.6				1.05		1.3	
13.0					1.3						1.05	
14.0					1.05						0.85	
15.0					0.85						0.65	
16.0					0.65						0.5	
17.0					0.45							

B = Working radius F = Front G = 360°



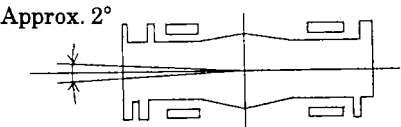
PRECAUTIONS TO BE TAKEN WHEN THE OUTRIGGERS ARE NOT MOUNTED:

1. The total rated loads shown are for the case when the crane is set horizontally on firm ground. 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: $9.0\text{kg}/\text{cm}^2$).
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 deflections 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 2.9t (main winch hook).

A	8.5m	14.4m	20.3m	J
H	7	6	4	1

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

5. The total rated load for the single top shall be the value obtained by subtracting 120kg 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. The 20.3m boom, the jib and the single top should not be used without the outriggers.
8. The boom must be kept inside a 2° area (1° each to the left and right) over front of the carrier when performing "Over front" crane operations without the outriggers.

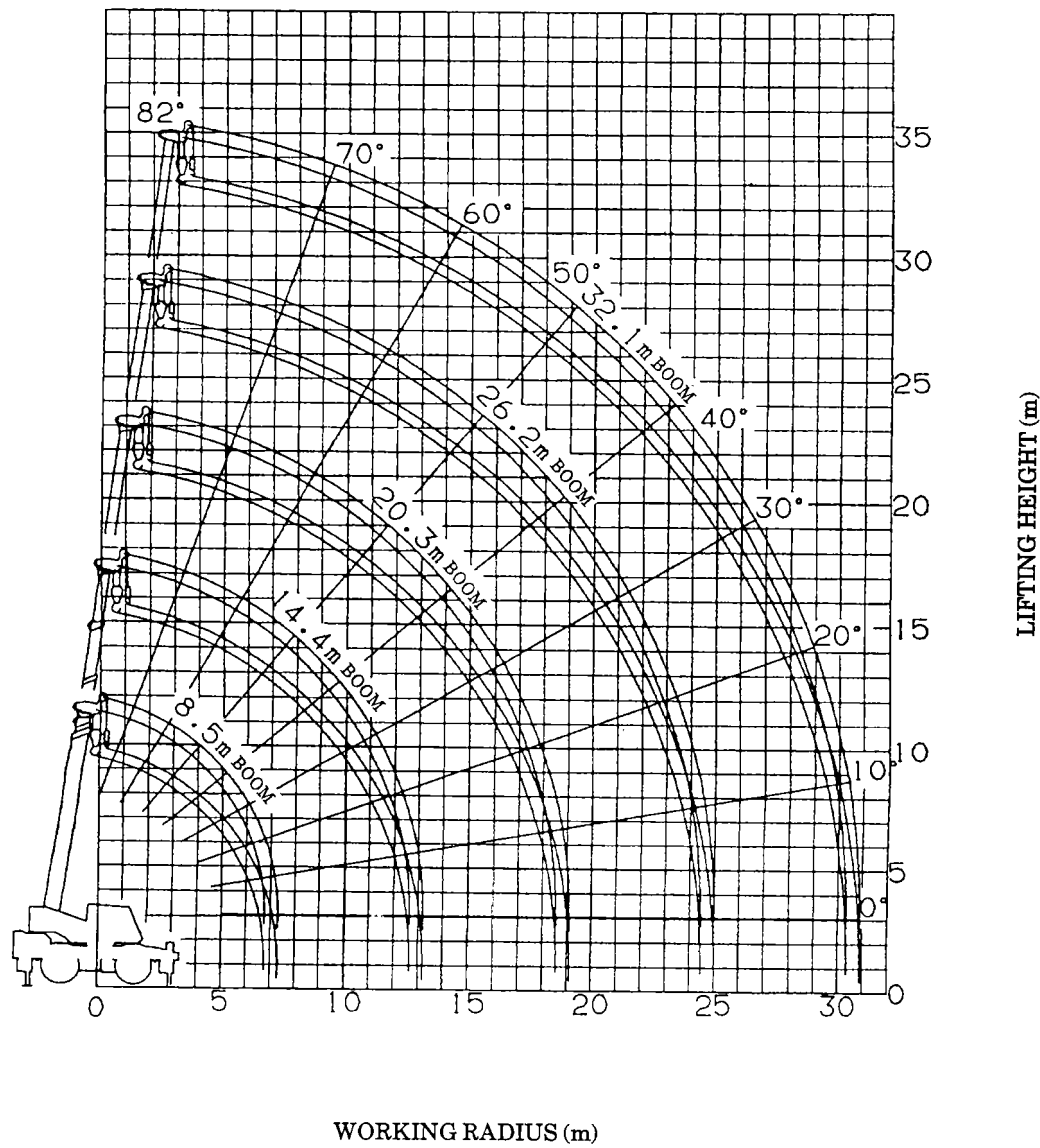


9. When creeping while hoisting a load, the swing brake should be applied, the load should be kept as close to the ground as possible but not touching the ground and the speed should be kept at 1.6km/h or less. In particular, any abrupt steering, starting or braking must be avoided.
10. Crane operations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



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WORKING RADIUS - LIFTING HEIGHT

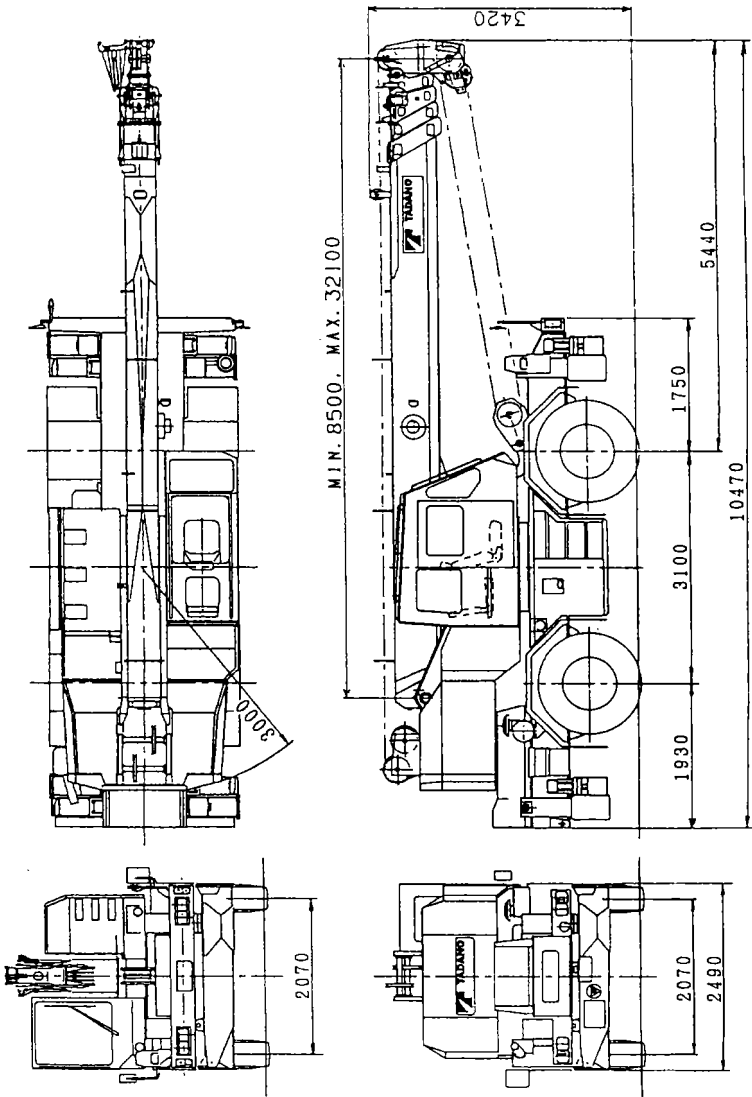


NOTES:

- 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)





This image shows a full page of a handwriting practice worksheet. It consists of multiple sets of three horizontal dashed lines, designed to help children learn letter height and placement. The lines are evenly spaced across the entire page, providing ample space for practicing various letters and words. There is no text or other markings on the page.