UNIVERSAL CRANES

## CRANE SPECIFICATION

# TADANO
# TR-200M

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# ROUGH TERRAIN CRANE

## TR-200M

*JAPANESE SPECIFICATIONS*

| OUTLINE | SPEC. NO. |
|---|---|
| Jib which stores in boom | TR-200M-4-00107 |

**Control No. JA-01**



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# TR-200M

## CRANE SPECIFICATIONS

**CRANE CAPACITY**

| | | | | |
|---|---|---|---|---|
| 8.5m | Boom | 20,000kg | at 3.5m | ( 7part-line) |
| 14.6m | Boom | 16,000kg | at 3.5m | ( 6part-line) |
| 20.7m | Boom | 9,000kg | at 6.0m | ( 4part-line) |
| 26.8m | Boom | 6,800kg | at 7.0m | ( 4part-line) |
| 7.4m | Jib | 3,000kg | at 70 ° | ( 1part-line) |
| Single top | | 3,000kg | | ( 1part-line) |

**MAX.LIFTING HEIGHT**

Boom 27.5m
Jib 34.6m

**MAX.WORKING RADIUS**

Boom 25.0m
Jib 30.0m

**BOOM LENGTH**

8.5m – 26.8m

**BOOM EXTENSION**

18.3m

**BOOM EXTENSION SPEED**

18.3m/78s

**JIB LENGTH**

7.4m

**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 (1 part-line)
Low range: 50m/min (1 part-line)

**BOOM ELEVATION ANGLE**

0 °– 82 °

**BOOM ELEVATION SPEED**

0 °– 82 °/34s

**SWING ANGLE**

360 °continue

**SWING SPEED**

3.4rpm

**WIRE ROPE**

Main Winch
16mm x 150m (Diameter x Length)
7x7+6xFi(29) Class B ordinary Z twist
Spin-resistant wire rope
Breaking strength 17.6t

Auxiliary Winch
16mm x 80m (Diameter x Length)
7x7+6xFi(29) Class B ordinary Z twist
Spin-resistant wire rope
Breaking strength 17.6t

**BOOM**

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

**BOOM EXTENSION**

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

**JIB**

Single stage which stores in the boom
Dual offset (0 °– 30 °) type

**SINGLE TOP**

Single sheave. Mounted on 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 cylinder

**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.

| | |
|---|---|
| Fully extended width | 5.8m |
| Middle extended width | 4.7m |
| Minimum extended width | 3.6m |

**MAX. VERTICAL LOAD CAPACITY OF OUTRIGGER**

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 limiting function
Over-winding cutout device
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

**EQUIPMENT**

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 58.0kg·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 (4X2) / 4-wheel drive (4X4) 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
12 V DC. 2 batteries of 24V (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 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 | | 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 | | 23,330kg |
| | Front | 11,665kg |
| | Rear | 11,665kg |

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

# TOTAL RATED LOADS

## (1) With outriggers set

### ( i )

Unit : ton

| Outriggers fully extended –360 °– | | | | | | | |
|---|---|---|---|---|---|---|---|
| B \ A | 8.5m | 14.6m | 20.7m | 26.8m | C / D / E ( ° ) | 7.4m | |
| | | | | | | 0 ° | 30 ° |
| 2.5m | 20.0 | 16.0 | 9.0 | | 82 | 3.0 | 2.0 |
| 3.0m | 20.0 | 16.0 | 9.0 | | 75 | 3.0 | 2.0 |
| 3.5m | 20.0 | 16.0 | 9.0 | 6.8 | 70 | 3.0 | 2.0 |
| 4.0m | 18.5 | 15.5 | 9.0 | 6.8 | 65 | 2.6 | 1.85 |
| 4.5m | 16.5 | 14.3 | 9.0 | 6.8 | 60 | 2.2 | 1.7 |
| 5.0m | 15.0 | 13.2 | 9.0 | 6.8 | 55 | 1.8 | 1.55 |
| 5.5m | 13.7 | 12.2 | 9.0 | 6.8 | 50 | 1.4 | 1.25 |
| 6.0m | 12.5 | 11.4 | 9.0 | 6.8 | 45 | 1.05 | 1.0 |
| 6.5m | 11.5 | 10.6 | 8.5 | 6.8 | 40 | 0.85 | 0.8 |
| 7.0m | | 9.9 | 8.1 | 6.8 | 35 | 0.7 | 0.65 |
| 8.0m | | 8.0 | 7.3 | 6.15 | 30 | 0.55 | 0.55 |
| 9.0m | | 6.5 | 6.5 | 5.55 | 25 | 0.45 | |
| 10.0m | | 5.45 | 5.65 | 5.05 | | | |
| 11.0m | | 4.55 | 4.8 | 4.65 | | | |
| 12.0m | | 3.8 | 4.15 | 4.25 | | | |
| 13.0m | | | 3.6 | 3.8 | | | |
| 14.0m | | | 3.15 | 3.25 | | | |
| 15.0m | | | 2.75 | 2.8 | | | |
| 16.0m | | | 2.4 | 2.5 | | | |
| 17.0m | | | 2.1 | 2.25 | | | |
| 18.0m | | | 1.85 | 2.0 | | | |
| 19.0m | | | | 1.75 | | | |
| 20.0m | | | | 1.55 | | | |
| 22.0m | | | | 1.2 | | | |
| 24.0m | | | | 0.9 | | | |
| 25.0m | | | | 0.8 | | | |

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

( ii )

Unit : ton

| Outriggers middle extended –360 °– | | | | | | | |
|---|---|---|---|---|---|---|---|
| A / B | 8.5m | 14.6m | 20.7m | 26.8m | C / D / E ( ° ) | 7.4m | |
| | | | | | | 0 ° | 30 ° |
| 2.5m | 20.0 | 16.0 | 9.0 | | 82 | 3.0 | 2.0 |
| 3.0m | 20.0 | 16.0 | 9.0 | | 75 | 3.0 | 2.0 |
| 3.5m | 20.0 | 16.0 | 9.0 | 6.8 | 70 | 3.0 | 2.0 |
| 4.0m | 18.5 | 15.5 | 9.0 | 6.8 | 65 | 2.3 | 1.85 |
| 4.5m | 16.5 | 14.3 | 9.0 | 6.8 | 60 | 1.65 | 1.4 |
| 5.0m | 15.0 | 13.2 | 9.0 | 6.8 | 55 | 1.2 | 1.05 |
| 5.5m | 12.5 | 11.85 | 9.0 | 6.8 | 50 | 0.9 | 0.8 |
| 6.0m | 10.6 | 10.1 | 9.0 | 6.8 | 45 | 0.65 | 0.6 |
| 6.5m | 9.0 | 8.7 | 8.5 | 6.8 | 40 | 0.45 | 0.4 |
| 7.0m | | 7.6 | 8.0 | 6.8 | | | |
| 8.0m | | 5.85 | 6.4 | 6.15 | | | |
| 9.0m | | 4.7 | 5.2 | 5.35 | | | |
| 10.0m | | 3.85 | 4.3 | 4.4 | | | |
| 11.0m | | 3.15 | 3.55 | 3.75 | | | |
| 12.0m | | 2.6 | 3.0 | 3.15 | | | |
| 13.0m | | | 2.5 | 2.7 | | | |
| 14.0m | | | 2.1 | 2.3 | | | |
| 15.0m | | | 1.8 | 2.0 | | | |
| 16.0m | | | 1.5 | 1.7 | | | |
| 17.0m | | | 1.3 | 1.45 | | | |
| 18.0m | | | 1.1 | 1.2 | | | |
| 19.0m | | | | 1.05 | | | |
| 20.0m | | | | 0.9 | | | |
| 22.0m | | | | 0.6 | | | |
| 24.0m | | | | 0.4 | | | |
| | | | | | | | |

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

( iii )

Unit : ton

| Outriggers minimum extended –360 °– | | | | | | | |
|---|---|---|---|---|---|---|---|
| B \ A | 8.5m | 14.6m | 20.7m | 26.8m | C / D / E ( ° ) | 7.4m | |
| | | | | | | 0 ° | 30 ° |
| 2.5m | 20.0 | 16.0 | 9.0 | | 82 | 3.0 | 2.0 |
| 3.0m | 20.0 | 16.0 | 9.0 | | 75 | 3.0 | 2.0 |
| 3.5m | 18.8 | 16.0 | 9.0 | 6.8 | 73 | 3.0 | 2.0 |
| 4.0m | 14.5 | 13.6 | 9.0 | 6.8 | 72 | 2.8 | 2.0 |
| 4.5m | 11.5 | 11.1 | 9.0 | 6.8 | 70 | 2.3 | 1.75 |
| 5.0m | 9.5 | 9.1 | 9.0 | 6.8 | 65 | 1.45 | 1.2 |
| 5.5m | 8.0 | 7.65 | 8.1 | 6.8 | 60 | 0.95 | 0.8 |
| 6.0m | 6.9 | 6.55 | 6.95 | 6.8 | 55 | 0.55 | 0.5 |
| 6.5m | 6.0 | 5.7 | 6.1 | 6.3 | | | |
| 7.0m | | 5.0 | 5.3 | 5.55 | | | |
| 8.0m | | 3.8 | 4.2 | 4.35 | | | |
| 9.0m | | 2.95 | 3.35 | 3.55 | | | |
| 10.0m | | 2.35 | 2.75 | 2.9 | | | |
| 11.0m | | 1.85 | 2.25 | 2.4 | | | |
| 12.0m | | 1.45 | 1.8 | 2.0 | | | |
| 13.0m | | | 1.5 | 1.65 | | | |
| 14.0m | | | 1.25 | 1.35 | | | |
| 15.0m | | | 1.0 | 1.1 | | | |
| 16.0m | | | 0.8 | 0.9 | | | |
| 17.0m | | | 0.6 | 0.75 | | | |
| 18.0m | | | 0.4 | 0.6 | | | |
| 19.0m | | | | 0.45 | | | |
| | | | | | | | |
| | | | | | | | |
| | | | | | | | |
| | | | | | | | |

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 where the outriggers are set horizontally on firm level 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 hook: 220kg, auxiliary hook: 60kg) are included in the total rated loads shown.
3. The total rated load is based on the actual working radii 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 | 14.6m | 20.7m | 26.8m | J |
|---|---|---|---|---|---|
| H | 7 | 6 | 4 | 4 | 1 |

A= Boom length H= No. of part-lines
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 160kg from the total rated load of the boom and must not exceed 3.0t.

## (2) Without outriggers

Unit:ton

| B (m) | Stationary | | | | | | Creep (travelling at 1.6km/h or less) | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 8.5m Boom | | 14.6m Boom | | 20.7m Boom | | 8.5m Boom | | 14.6m Boom | | 20.7m Boom | |
| | 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 °

**PRECAUTIONS TO BE TAKEN WHEN THE OUTRIGGERS ARE NOT MOUNTED:**

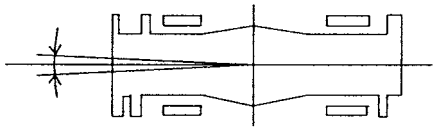
1. The total rated loads shown are for the case where the crane is set on firm level ground. The values above the bold lines are based on the crane strength while those below are based on the crane stability. The foundation, working conditions, etc. should be taken into consideration adequately when using the crane for actual work. (Tire air pressure: 9.00kg/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 2.9t (for the main winch).

| A | 8.5m | 14.6m | 20.7m | Single top |
|---|---|---|---|---|
| H | 7 | 6 | 4 | 1 |

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

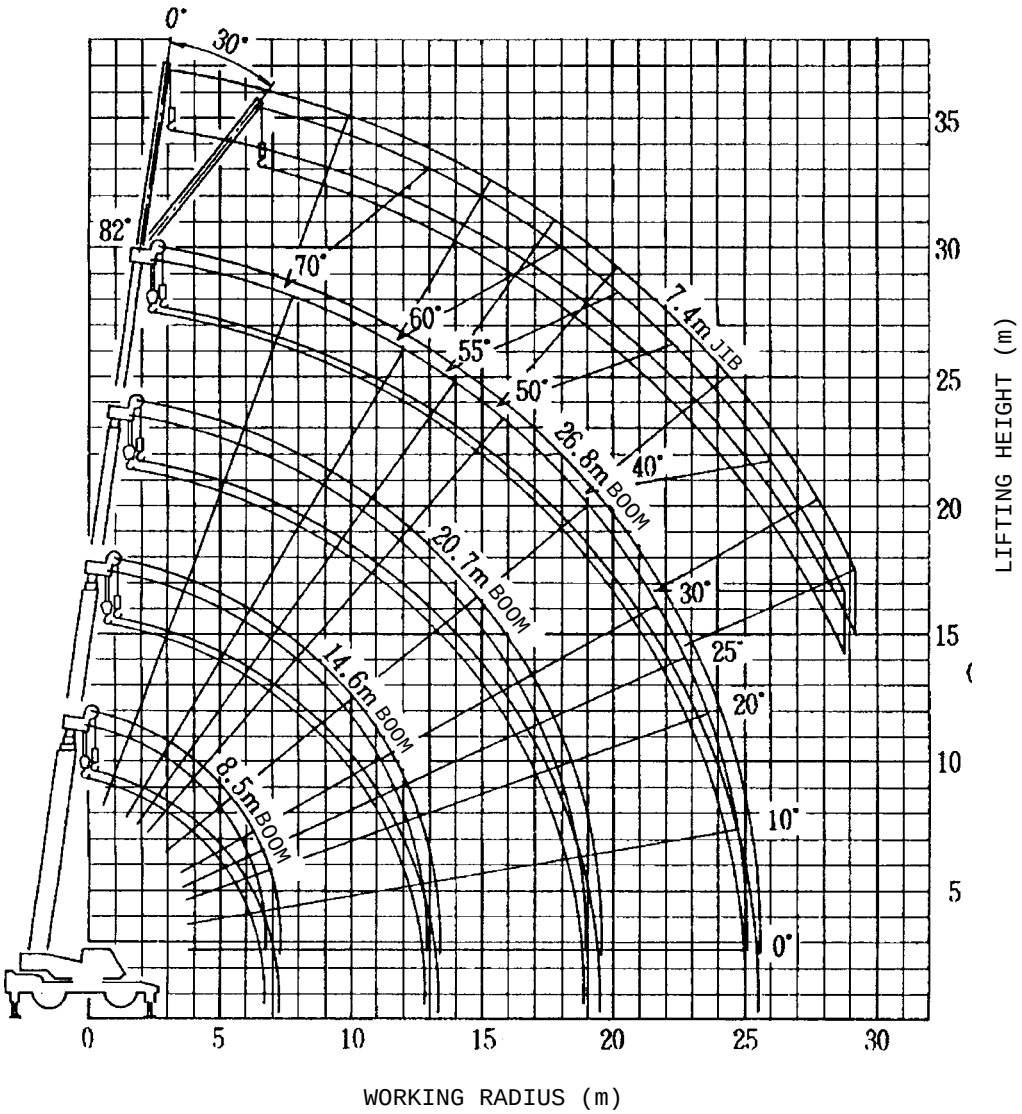
5. The total rated load for the single top shall be the value obtained by subtracting 120kg from the total rated load of the boom and must not exceed 3.0t.
6. Free-fall operations should not be performed without outriggers.
7. The 26.8m boom and the jib should not be used without the outriggers.
8. The 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.

Approx.2 °



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.

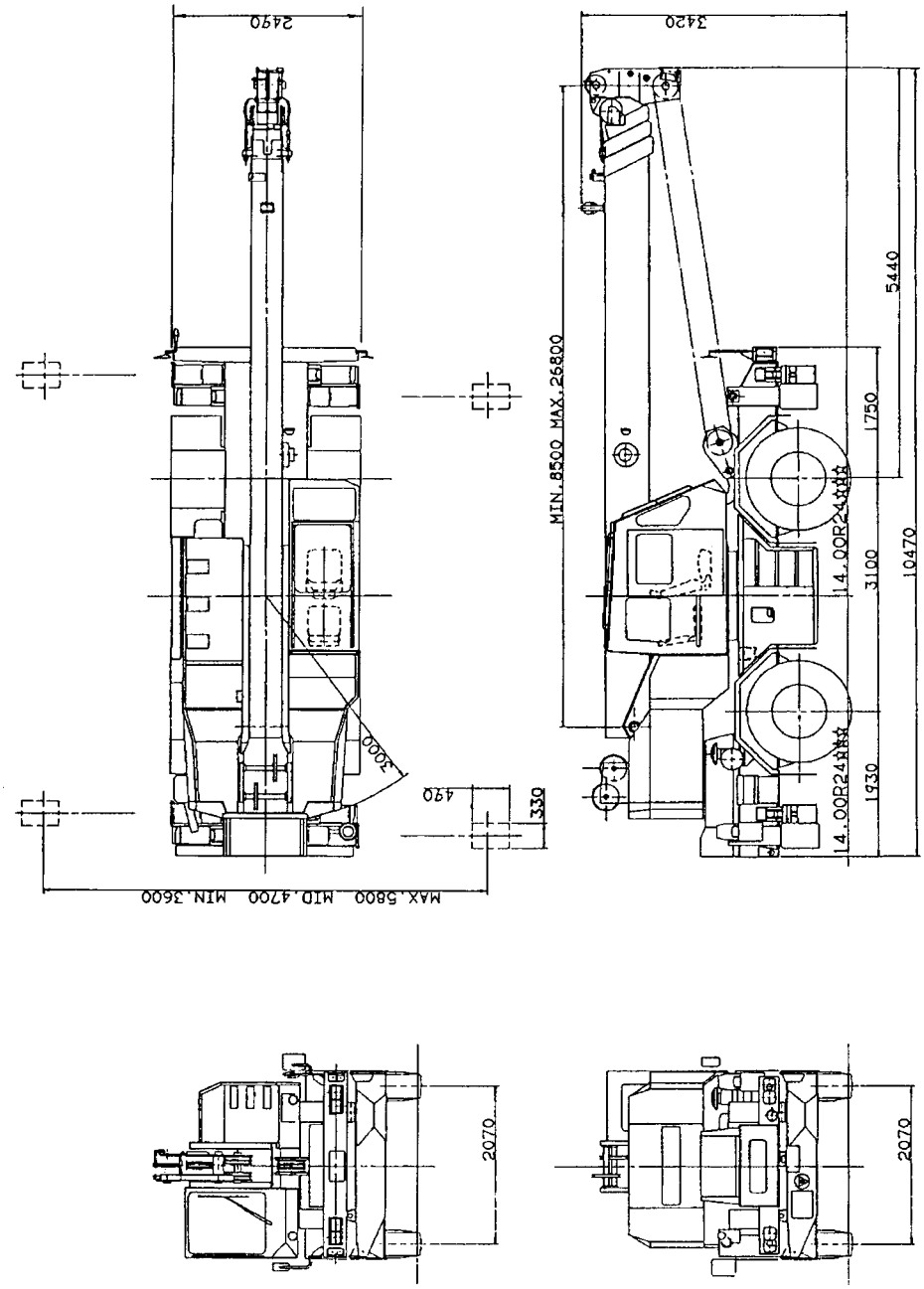
# WORKING RADIUS - LIFTING HEIGHT




**NOTES:**

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

## DIMENSIONS (1/100)



# ◆ MEMO ◆