

# ROUGH TERRAIN CRANE

## TR-250M

### *JAPANESE SPECIFICATIONS*

OUTLINE	SPEC. NO.
4-section Boom, 2-stage Jib	TR-250M-4-00101

Control No. JA-04

## TR-250M

## CRANE SPECIFICATIONS

## CRANE CAPACITY

9.0m Boom	25,000kg	at 3.5m	( 8 part-line)
15.5m Boom	19,400kg	at 4.0m	( 6 part-line)
22.0m Boom	12,500kg	at 5.0m	( 4 part-line)
28.5m Boom	8,000kg	at 6.5m	( 4 part-line)
7.2m Jib	3,000kg	at 70°	( 1 part-line)
12.8m Jib	2,000kg	at 74.5°	( 1 part-line)
Single top	3,000kg		( 1 part-line)

## MAX. LIFTING HEIGHT

Boom	29.5m
Jib	41.7m

## MAX. WORKING RADIUS

Boom	26.0m
Jib	36.5m

## BOOM LENGTH

9.0m – 28.5m

## BOOM EXTENSION

19.5m

## BOOM EXTENSION SPEED

19.5m / 82s

## JIB LENGTH

7.2m, 12.8m

## MAIN WINCH SINGLE LINE SPEED

High range:	125m/min	(4th layer)
Low range:	62m/min	(4th layer)

## MAIN WINCH HOOK SPEED

High range:	15.6m/min	(8 part-line)
Low range:	7.7m/min	(8 part-line)

## AUXILIARY WINCH SINGLE LINE SPEED

High range:	125m/min	(4th layer)
Low range:	62m/min	(4th layer)

## AUXILIARY WINCH HOOK SPEED

High range:	125m/min	(1 part-line)
Low range:	62m/min	(1 part-line)

## BOOM ELEVATION ANGLE

0° – 83°

## BOOM ELEVATION SPEED

0° – 83° / 43s

## SWING ANGLE

360° continue

## SWING SPEED

3.0rpm

## WIRE ROPE

## Main Winch

16mm × 170m (Diameter×Length)  
 7×7+6×Fi(29) Class B ordinary · Z twist  
 Spin-resistant wire rope  
 Breaking strength 17.6t

## Auxiliary Winch

16mm × 95m (Diameter×Length)  
 7×7+6×Fi(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 cylinder  
 1 wire rope type telescoping device

## JIB

2-staged swingaround boom extension which stores alongside boom base section.  
 (with 2nd stage being a pull-out type)  
 Triple offset (5°, 25°, 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.  
 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	6.3m
Middle extended width	5.0m
Minimum extended width	3.6m

## MAX. OUTRIGGER LOAD

25.1t

## HYDRAULIC PUMPS

2 variable piston pumps  
 2 gear pumps

## HYDRAULIC OIL TANK CAPACITY

407 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

Cab heater (with front and side defrosters)  
 Hydraulic oil temperature indication lamp  
 Radio  
 Fan  
 Oil cooler  
 Winch drum rotation indicator  
 Operation pedals for elevating/telescoping  
 Jib extending device

## 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 215PS at 2,800rpm  
 Max. torque 65.0kg·m at 1,800rpm

### 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 16.00-25-28PR (OR)

Rear 16.00-25-28PR (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	10,910mm
Overall width	2,620mm
Overall height	3,520mm
Wheel base	3,450mm
Tread Front	2,140mm
Rear	2,140mm

### WEIGHTS

Gross vehicle weight	
Total	26,300kg
Front	13,150kg
Rear	13,150kg

### PERFORMANCE

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

**TOTAL RATED LOADS**

(1) With outriggers set (360°)  
(i)

Unit : ton

A B (m)		Outriggers fully extended																	
		9.0m			15.5m			22.0m			28.5m			E (°)					
		C			D			E (°)			7.2m			12.8m					
		5°			25°			45°			5°			25°			45°		
2.5	25.0	19.4	12.5	12.5	8.0	83	3.0	2.1	1.6	2.0	1.2	0.8	3.0	2.1	1.6	2.0	1.2	0.8	
3.0	25.0	19.4	12.5	12.5	8.0	74.5	3.0	2.1	1.6	2.0	1.2	0.8	3.0	2.1	1.6	2.0	1.2	0.8	
3.5	25.0	19.4	12.5	12.5	8.0	70	3.0	2.1	1.6	1.7	1.1	0.8	3.0	2.1	1.6	1.7	1.1	0.8	
4.0	23.0	19.4	12.5	12.5	8.0	68	2.8	2.1	1.6	1.6	1.05	0.8	2.8	2.1	1.6	1.6	1.05	0.8	
4.5	21.2	18.0	12.5	12.5	8.0	65	2.5	1.9	1.6	1.45	1.0	0.8	2.5	1.9	1.6	1.45	1.0	0.8	
5.0	19.4	16.7	12.5	12.5	8.0	60	2.1	1.65	1.4	1.25	0.95	0.75	2.1	1.65	1.4	1.25	0.95	0.75	
5.5	17.8	15.5	11.7	8.0	8.0	55	1.85	1.5	1.25	1.1	0.9	0.7	1.85	1.5	1.25	1.1	0.9	0.7	
6.0	16.3	14.4	11.0	8.0	8.0	50	1.45	1.3	1.15	1.0	0.85	0.65	1.45	1.3	1.15	1.0	0.85	0.65	
6.5	15.1	13.4	10.4	8.0	8.0	45	1.15	1.05	1.0	0.93	0.8	0.6	1.15	1.05	1.0	0.93	0.8	0.6	
7.0		12.5	9.8	7.6	7.6	40	0.9	0.85		0.7	0.65		0.9	0.85		0.7	0.65		
8.0		10.7	8.7	6.9	6.9	35	0.7	0.65		0.55	0.5		0.7	0.65		0.55	0.5		
9.0		8.45	7.7	6.2	6.2	30	0.55	0.5		0.43	0.41		0.55	0.5		0.43	0.41		
10.0		6.95	6.8	5.65	5.65	25	0.43	0.42					0.43	0.42					
11.0		5.75	6.1	5.15	5.15														
12.0		4.85	5.4	4.7	4.7														
13.0		4.1	4.65	4.3	4.3														
14.0			4.0	4.0	4.0														
15.0			3.5	3.7	3.7														
16.0			3.1	3.4	3.4														
17.0			2.75	3.0	3.0														
18.0			2.45	2.7	2.7														
19.0			2.15	2.4	2.4														
20.0				2.15	2.15														
22.0				1.75	1.75														
24.0				1.4	1.4														
26.0				1.15	1.15														

A = Boom length

B = Working radius

C = Jib length

D = Jib offset

E = Boom angle

(ii) Unit : ton

Outriggers middle extended													
A B (m)	9.0m	15.5m	22.0m	28.5m	C			7.2m			12.8m		
					E (°)	D	5°	25°	45°	5°	25°	45°	5°
2.5	25.0	19.4	12.5		83		3.0	2.1	1.6	2.0	1.2	0.8	
3.0	25.0	19.4	12.5		74.5		3.0	2.1	1.6	2.0	1.2	0.8	
3.5	25.0	19.4	12.5	8.0	70		3.0	2.1	1.6	1.7	1.1	0.8	
4.0	23.0	19.4	12.5	8.0	68		2.8	2.1	1.6	1.6	1.05	0.8	
4.5	21.2	18.0	12.5	8.0	65		2.5	1.9	1.6	1.45	1.0	0.8	
5.0	18.1	16.7	12.5	8.0	60		1.8	1.55	1.4	1.25	0.95	0.75	
5.5	15.35	14.6	11.7	8.0	55		1.3	1.15	1.0	1.0	0.88	0.7	
6.0	12.9	12.4	11.0	8.0	50		0.9	0.85	0.75	0.65	0.6	0.5	
6.5	11.1	10.8	10.4	8.0	45		0.6	0.55	0.55	0.45	0.4	0.4	
7.0		9.4	9.8	7.6									
8.0		7.3	7.8	6.9									
9.0		5.85	6.45	6.2									
10.0		4.75	5.35	5.55									
11.0		3.9	4.5	4.75									
12.0		3.3	3.8	4.1									
13.0		2.75	3.25	3.5									
14.0			2.8	3.05									
15.0			2.45	2.65									
16.0			2.1	2.35									
17.0			1.8	2.05									
18.0			1.55	1.8									
19.0			1.35	1.55									
20.0				1.4									
22.0				1.05									
24.0				0.75									
26.0				0.5									

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

(iii)

Unit : ton

Outriggers minimum extended																
A B (m)		9.0m		15.5m		22.0m		28.5m		C						
		7.2m		5°		45°		45°		12.8m						
		E (°)		D		25°		5°		25°						
2.5	25.0	19.4	12.5	19.4	12.5	19.4	12.5	19.4	12.5	3.0	2.1	1.6	2.0	1.2	0.8	45°
3.0	25.0	19.4	12.5	19.4	12.5	19.4	12.5	19.4	12.5	3.0	2.1	1.6	2.0	1.2	0.8	0.8
3.5	19.6	19.4	12.5	19.4	12.5	19.4	12.5	19.4	12.5	3.0	2.1	1.6	1.95	1.18	0.8	0.8
4.0	15.55	15.6	12.5	15.6	12.5	15.6	12.5	15.6	12.5	2.3	1.85	1.6	1.7	1.1	0.8	0.8
4.5	12.65	12.6	12.5	12.6	12.5	12.6	12.5	12.6	12.5	1.9	1.6	1.4	1.5	1.05	0.8	0.8
5.0	10.6	10.3	10.5	10.3	10.5	10.3	10.5	10.3	10.5	1.45	1.25	1.15	1.15	0.95	0.7	0.7
5.5	8.9	8.7	9.0	8.7	9.0	8.7	9.0	8.7	9.0	0.9	0.8	0.75	0.7	0.6	0.5	0.5
6.0	7.6	7.5	7.8	7.5	7.8	7.5	7.8	7.5	7.8	0.45	0.4	0.4				
6.5	6.4	6.5	6.85	6.5	6.85	6.5	6.85	6.5	6.85							
7.0		5.6	6.1	5.6	6.1	5.6	6.1	5.6	6.1							
8.0		4.4	4.9	4.4	4.9	4.4	4.9	4.4	4.9							
9.0		3.4	3.95	3.4	3.95	3.4	3.95	3.4	3.95							
10.0		2.7	3.25	2.7	3.25	2.7	3.25	2.7	3.25							
11.0		2.15	2.7	2.15	2.7	2.15	2.7	2.15	2.7							
12.0		1.7	2.25	1.7	2.25	1.7	2.25	1.7	2.25							
13.0		1.3	1.9	1.3	1.9	1.3	1.9	1.3	1.9							
14.0			1.55		1.55		1.55		1.55							
15.0			1.25		1.25		1.25		1.25							
16.0			1.0		1.0		1.0		1.0							
17.0			0.8		0.8		0.8		0.8							
18.0			0.6		0.6		0.6		0.6							
19.0			0.45		0.45		0.45		0.45							
20.0																

A	9.0m	15.5m	22.0m	28.5m	J
H	8	6	4	4	1

**NOTES:**

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 the slings and hooks (main winch hook: 260kg, 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 3.2t for the main winch and 3.0t for the auxiliary winch.

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.

## (2) Without outriggers

Unit : ton

B (m)	Stationary						Creep (travelling at 1.6km/h or less)					
	9.0m BOOM		15.5m BOOM		22.0m BOOM		9.0m BOOM		15.5m BOOM		22.0m BOOM	
	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	9.5	4.3	8.2	4.0	6.5	4.3	8.0	3.6	7.0	3.3	5.5	3.2
5.5	8.2	3.6	7.3	3.3	6.05	3.7	6.9	3.0	6.15	2.7	5.15	3.1
6.0	7.0	3.0	6.45	2.8	5.65	3.2	5.9	2.5	5.5	2.3	4.8	2.7
6.5	6.1	2.5	5.8	2.35	5.25	2.75	5.1	2.1	4.9	1.9	4.45	2.3
7.0			5.2	1.95	4.85	2.4			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			3.2	0.95	3.5	1.4			2.7	0.7	2.95	1.1
10.0			2.55	0.6	2.95	1.05			2.15		2.45	0.8
11.0			2.05		2.45	0.75			1.7		2.05	0.6
12.0			1.65		2.05				1.35		1.7	
13.0			1.3		1.7				1.05		1.4	
14.0					1.4						1.15	
15.0					1.15						0.95	
16.0					0.95						0.8	
17.0					0.75						0.65	
18.0					0.6						0.5	

B = Working radius F = Front G = 360°

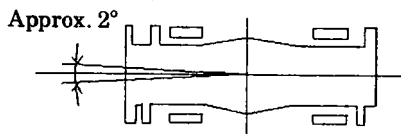
**NOTES:**

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: 7.75kg/cm<sup>2</sup>).
2. The weights of the slings and hooks (main winch hook: 260kg) 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 3.2t (main winch hook).

A	9.0m	15.5m	22.0m
H	8	6	4

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

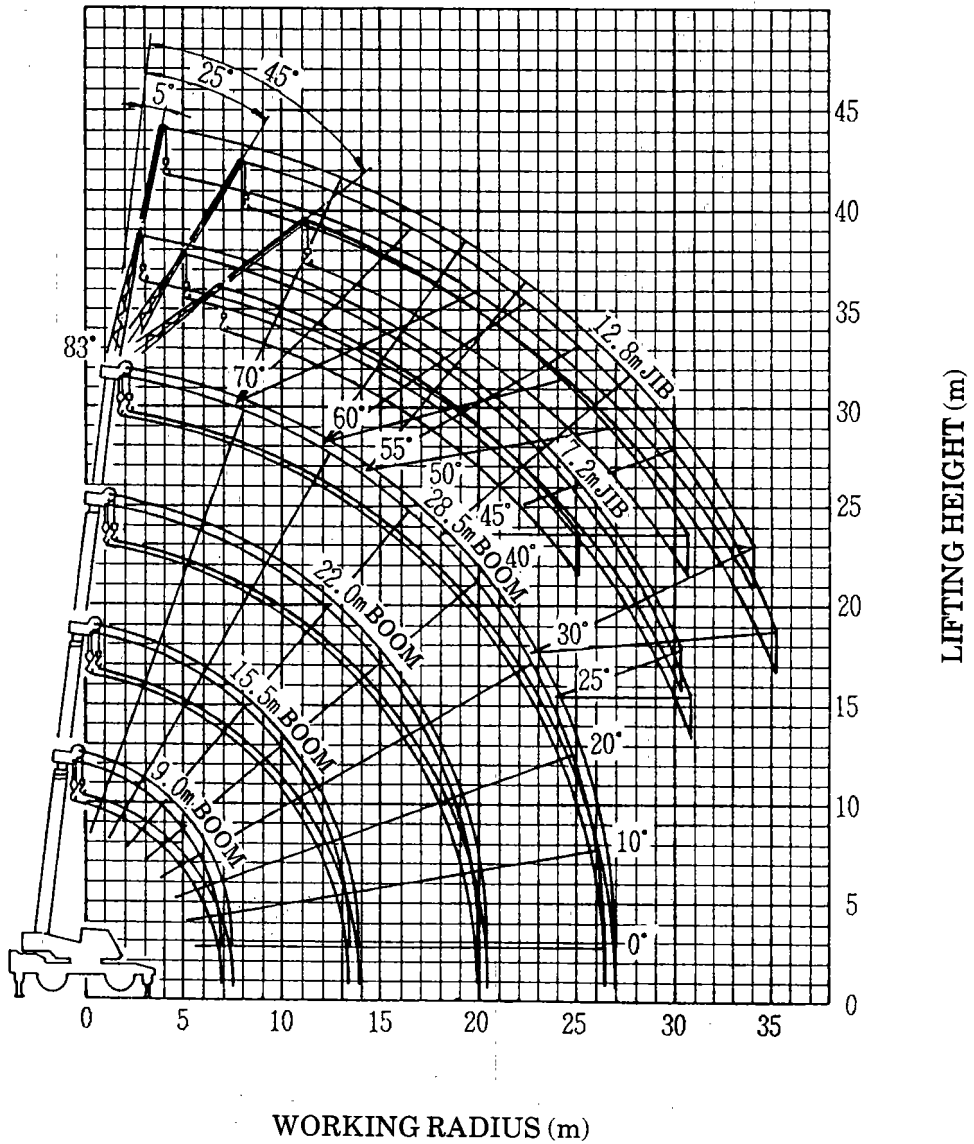
5. The total rated load for the single top shall be the value obtained by subtracting 150kg from the total rated load of the boom and must not exceed 3.0t.
6. Free-fall operations should not be performed without outriggers.
7. The 28.5m boom and the jib should not be used without outriggers.
8. The boom 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.



**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)

