TR

ROUGH TERRAIN CRANE

TR-400M

JAPANESE SPECIFICATIONS

OUTLINE	SPEC. NO.
5-section Boom, 2-staged Power Tilt Jib	TR-400M-1-00110

Control No. JA-01

Return to index

TR-400M

CRANE SPECIFICATIONS

CRANE CAPACITY

9.0m	Boom	40,000kg	at 3.0m	(10 part-line)
15.1m	Boom	25,000kg	at 4.0m	(7 part-line)
21.2m	Boom	18,000kg	at 4.5m	(5 part-line)
27.3m	Boom	13,000kg	at 5.0m	(4 part-line)
33.4m	Boom	7,500kg	at 7.0m	(4 part-line)
7.8m	Jib	4,000kg	at 78°	(1 part-line)
13.0m	Jib	2,500kg	at 78°	(1 part-line)
Single top		4,000kg		(1 part-line)

MAX. LIFTING HEIGHT
Boom 34.0m
Jib 46.6m

MAX. WORKING RADIUS
Boom 31.0m
Jib 35.2m

BOOM LENGTH
9.0m – 33.4m

BOOM EXTENSION
24.4m

BOOM EXTENSION SPEED
24.4m / 107s

JIB LENGTH
7.8m, 13.0m

MAIN WINCH SINGLE LINE SPEED
High range: 126m/min (4th layer)
Low range: 63m/min (4th layer)

MAIN WINCH HOOK SPEED
High range: 12.6m/min (10 part-line)
Low range: 6.3m/min (10 part-line)

AUXILIARY WINCH SINGLE LINE SPEED
High range: 120m/min (4th layer)
Low range: 60m/min (4th layer)

AUXILIARY WINCH HOOK SPEED
High range: 120m/min (1 part-line)
Low range: 60m/min (1 part-line)

BOOM ELEVATION ANGLE
0° – 80°

BOOM ELEVATION SPEED
0° – 80° / 55s

SWING ANGLE
360° continue

SWING SPEED
2.8rpm

WIRE ROPE
Main Winch
18mm × 185m (Diameter × Length)
7×7+6×Fi(29) Class C ordinary · Z twist
Spin-resistant wire rope
Breaking strength 24.3t
Auxiliary Winch
18mm × 106m (Diameter × Length)
7×7+6×Fi(29) Class C ordinary · Z twist
Spin-resistant wire rope
Breaking strength 24.3t

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

BOOM EXTENSION
3 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).
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.
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
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 7.0m
Middle extended width 5.4m
Minimum extended width 4.0m

MAX. OUTRIGGER LOAD
32.0t

HYDRAULIC PUMPS
2 variable piston pumps
2 gear pumps

HYDRAULIC OIL TANK CAPACITY
555 liters

SAFETY DEVICES
Automatic moment limiter (AML)
With working range limiting 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)
Reclining seat (with headrest)
Radio
Fan

CARRIER SPECIFICATIONS

ENGINE
Model NISSAN DIESEL MOTOR CO., LTD. PE6(T)
Type 4-cycle, 6-cylinder, direct-injection, water-cooled diesel engine (with turbo charger)
Piston displacement 11,670cc
Max. output 280PS at 2,200rpm
Max. torque 110kg·m at 1,200rpm

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

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 (Option)

FRAME
Welded box-shaped structure

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

FUEL TANK CAPACITY
300 liters

CAB
Two-man type

TIRES
Front 18.00-25-28PR (OR)
Rear 18.00-25-28PR (OR)

SAFETY DEVICES
Emergency steering device
Spring lock device

GENERAL DATA

DIMENSIONS
Overall length	11,680mm
Overall width	2,980mm
Overall height	3,740mm
Wheel base	4,200mm
Tread Front	2,420mm
Rear	2,420mm

WEIGHTS
Gross vehicle weight
Total	34,660kg
Front	17,330kg
Rear	17,330kg

PERFORMANCE
Max. traveling speed	45km/h	
Gradeability (tan θ)	0.6	
Min. turning radius	6.2m	(4-wheel steering)
	10.5m	(2-wheel steering)

TOTAL RATED LOADS

(1) With outriggers set (360°)

(i)

Unit:ton

Outriggers fully extended

A / B (m)	9.0m	15.1m	21.2m	27.3m	33.4m
3.0	40.0	25.0			
3.5	35.0	25.0	18.0		
4.0	31.5	25.0	18.0		
4.5	28.5	23.5	18.0	13.0	
5.0	26.0	22.0	17.6	13.0	7.5
5.5	23.7	20.5	16.4	12.3	7.5
6.0	21.8	19.2	15.3	11.7	7.5
6.5	20.1	18.1	14.3	11.2	7.5
7.0	18.6	17.1	13.4	10.7	7.5
8.0		14.2	11.9	10.0	7.2
9.0		11.6	10.6	9.0	6.7
10.0		9.6	9.4	8.3	6.3
11.0		8.0	7.9	7.5	5.8
12.0		6.9	6.7	6.9	5.3
13.0		6.0	5.8	6.3	4.9
14.0			5.0	5.5	4.5
16.0			3.9	4.3	3.9
18.0			2.9	3.35	3.4
20.0				2.7	3.0
22.0				2.15	2.4
24.0				1.65	1.95
26.0					1.55
28.0					1.25
30.0					1.0
31.0					0.9

C / D / E (°)	7.8m			13.0m		
	5°	25°	45°	5°	25°	45°
80	4.0	2.2	1.6	2.5	1.3	0.8
78	4.0	2.2	1.6	2.5	1.3	0.8
77	3.85	2.2	1.6	2.3	1.3	0.8
75	3.35	2.2	1.6	2.05	1.3	0.8
73	3.0	2.0	1.6	1.8	1.2	0.8
70	2.55	1.75	1.5	1.55	1.05	0.8
68	2.3	1.65	1.4	1.4	1.0	0.8
65	1.95	1.45	1.3	1.2	0.9	0.75
60	1.55	1.25	1.1	1.0	0.75	0.65
55	1.25	1.05	1.0	0.8	0.65	0.55
50	1.05	0.95	0.9	0.7	0.55	0.5
45	0.9	0.8	0.8	0.6	0.5	
40	0.5	0.5				

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

Unit:ton

Outriggers middle extended												
A / B (m)	9.0m	15.1m	21.2m	27.3m	33.4m	C / D / E (°)	7.8m			13.0m		
							5°	25°	45°	5°	25°	45°
3.0	40.0	25.0				80	4.0	2.2	1.6	2.5	1.3	0.8
3.5	35.0	25.0	18.0			78	4.0	2.2	1.6	2.5	1.3	0.8
4.0	31.5	25.0	18.0			77	3.85	2.2	1.6	2.3	1.3	0.8
4.5	26.0	23.5	18.0	13.0		75	3.35	2.2	1.6	2.05	1.3	0.8
5.0	21.5	21.0	17.6	13.0	7.5	73	3.0	2.0	1.6	1.8	1.2	0.8
5.5	18.0	17.5	16.4	12.3	7.5	70	2.55	1.75	1.5	1.55	1.05	0.8
6.0	15.5	15.0	15.0	11.7	7.5	68	2.3	1.65	1.4	1.4	1.0	0.8
6.5	13.8	13.2	13.0	11.2	7.5	65	1.95	1.45	1.3	1.2	0.9	0.75
7.0	12.5	11.7	11.5	10.7	7.5	60	1.35	1.25	1.1	1.0	0.75	0.65
8.0		9.2	9.0	9.8	7.2	55	0.85	0.75	0.7	0.65	0.55	0.5
9.0		7.6	7.4	8.1	6.7							
10.0		6.3	6.1	6.8	6.3							
11.0		5.3	5.1	5.8	5.8							
12.0		4.4	4.3	5.0	5.3							
13.0		3.7	3.6	4.2	4.6							
14.0			3.0	3.6	4.0							
16.0			2.1	2.7	3.0							
18.0			1.5	1.9	2.3							
20.0				1.4	1.75							
22.0				1.0	1.4							
24.0				0.7	1.1							
26.0					0.85							

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	15.1m	21.2m	27.3m	33.4m	C / D / E (°)	7.8m			13.0m		
							5°	25°	45°	5°	25°	45°
3.0	40.0	25.0				80	4.0	2.2	1.6	2.5	1.3	0.8
3.5	30.0	25.0	18.0			78	4.0	2.2	1.6	2.5	1.3	0.8
4.0	23.5	22.5	18.0			77	3.85	2.2	1.6	2.3	1.3	0.8
4.5	19.0	18.5	18.0	13.0		75	3.35	2.2	1.6	2.05	1.3	0.8
5.0	15.5	15.0	15.0	12.0	7.5	73	2.8	2.0	1.6	1.8	1.2	0.8
5.5	13.0	13.0	13.0	11.0	7.5	70	2.0	1.75	1.5	1.55	1.05	0.8
6.0	11.0	11.0	11.0	10.0	7.5	68	1.6	1.4	1.2	1.25	0.9	0.75
6.5	9.5	9.5	9.5	9.1	7.5	65	1.15	1.0	0.9	0.85	0.65	0.5
7.0	8.5	8.3	8.3	8.3	7.5							
8.0		6.5	6.5	7.0	6.6							
9.0		5.2	5.2	5.8	5.8							
10.0		4.2	4.2	4.8	5.0							
11.0		3.4	3.4	4.0	4.2							
12.0		2.7	2.7	3.3	3.6							
13.0		2.2	2.1	2.7	3.0							
14.0			1.6	2.2	2.6							
16.0			0.9	1.4	1.8							
18.0				0.9	1.2							
20.0				0.6	0.85							

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 (450kg for a 40 ton capacity hook, 250kg for a 20 ton capacity hook and 100kg for a 4 ton capacity hook) 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 4.0t for both the main winch and the auxiliary winch.

A	9.0m	15.1m	21.2m	27.3m	33.4m	J
H	10	7	5	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 350kg from the total rated load of the boom and must not exceed 4.0t.
7. When changing jib ofset with the load lifted, consider the working condition, safety, etc and use at 50% or less of the total rated load.

(2) Without outriggers

Unit:ton

B	Stationary						Creep (travelling at 1.6km/h or less)					
	9.0m BOOM		15.1mBOOM		21.2mBOOM		9.0m BOOM		15.1mBOOM		21.2mBOOM	
(m)	F	G	F	G	F	G	F	G	F	G	F	G
3.0	20.0	13.5					14.5	8.5				
3.5	20.0	11.5	15.0	10.0			14.5	8.5	10.0	7.0		
4.0	17.7	9.5	15.0	8.7			13.0	7.2	10.0	7.0		
4.5	16.0	8.0	15.0	7.5	9.0	5.0	11.7	6.2	10.0	6.0		
5.0	14.6	6.7	14.0	6.5	9.0	5.0	10.5	5.3	10.0	5.2	7.5	4.2
5.5	13.3	5.7	13.0	5.5	9.0	5.0	9.5	4.6	9.2	4.5	7.5	4.2
6.0	12.1	4.8	12.0	4.6	9.0	4.5	8.7	4.0	8.5	3.9	7.5	3.7
6.5	11.0	4.1	11.0	3.9	8.5	3.8	8.0	3.4	7.9	3.3	7.3	3.2
7.0	10.0	3.5	10.0	3.4	8.0	3.3	7.3	2.9	7.3	2.8	6.9	2.8
8.0			7.9	2.5	7.0	2.5			6.2	2.0	5.8	2.0
9.0			6.4	1.8	5.8	1.8			5.2	1.4	4.9	1.4
10.0			5.2	1.2	4.8	1.2			4.4	0.9	4.1	0.9
11.0			4.3		4.0				3.7		3.4	
12.0			3.6		3.4				3.1		2.8	
13.0			2.9		2.8				2.5		2.4	
14.0					2.4						2.0	
16.0					1.6						1.4	
18.0					1.0						0.9	

B = Working radius F = Front G = 360°

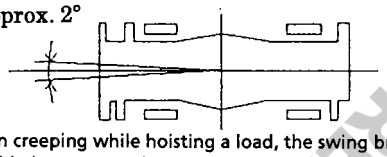
PRECAUTIONS TO BE TAKEN WHEN THE OUTRIGGERS ARE NOT MOUNTED:

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: 6.75kg/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 4.0t.

A	9.0m	15.1m	21.2m
H	10	7	5

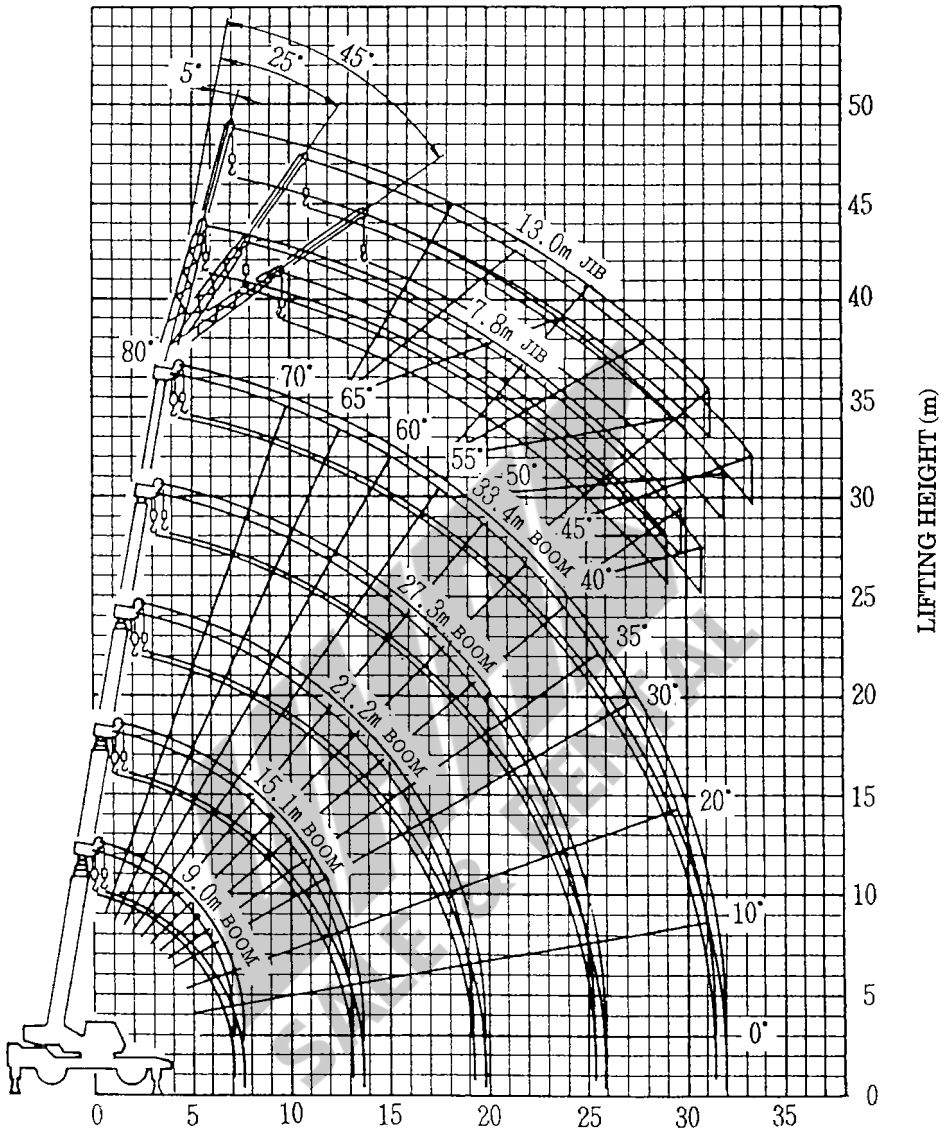
A = Boom length
H = No. of part-line

5. The total rated load for the single top shall be the value obtained by subtracting 230kg from the total rated load of the boom and must not exceed 4.0t.
6. Free-fall operations should not be performed without outriggers.
7. The 27.3m boom, the 33.4m 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)