Mechanical Truck Crane

6350-TC

KOBE STEEL, LTD.

MAY 17, 1982

1. GENERAL

Type: Truck mounted, fully revolving

Max. lifting capacity: 210,000 kg
(21.34 m heavy duty boom, at operating radius 7.0 m)

Working weight: Approx. 246 metric tons
(Machine consists of: Upper, lower 4 counterweights, module, 21.34 m heavy duty boom, mast, 34Ø hoist cable, 7 sheave 210 ton hook block.)

2. GENERAL DIMENSIONS

Overall length of carrier w/outriggers 16,120 mm

Width of machinery cab 3,360 mm

Height to top of machinery cab 4,400 mm

Radius of rear end (counterweight 1, 2, 3, 4) 6,960 mm

Radius of rear end (machinery cab) 5,250 mm

Radius of rear end (gantry folded) 7,930 mm

Center of rotation to boom foot pin 1,630 mm

Height from ground to boom foot pin 2,890 mm

Clearance height over gantry (raised) 8,720 mm

Counterweight ground clearance 1,790 mm

Center of rotation to center of rear axles 740 mm

Overall width of carrier 3,700 mm

Ground clearance (rear suspension) 230 mm

Wheel base 8,320 mm

Main hoist cable dia 34 mm

Auxiliary hoist cable dia 26 mm

Boom hoist cable dia 26 mm

3. UPPER MACHINERY

3.1 POWER PLANT

Diesel: Cummins NTA 855-C400, 6 cylinder, 139.7 mm bore x 152.4 mm stroke, 14.01 liter displacement, 4 cycle, turbocharged aftercooled, water cooled, 24 volt electric starting 400 PS @ 2100 rpm full load engine out put, full flow and by-pass lube oil filters, two stage dry type air cleaner with restriction indicator.

3.2 TORQUE CONVERTER:

Single stage, stationary housing with modulated clutch, two double power take off towers.

3.3 TRANSMISSIONS

Right Hand Transmission: Two speed, electro-hydraulic power shift transmission, chain drive. Pressure lubricated bearing gears and chain. (Driven by torque converter).

Left Hand Transmission: Two speed, hydraulic disc clutches non-power shift, input & output thru universal drive shafts. Pressure lubricated, anti-friction bearings, roller chain and spur gears. (Drive by engine crankshaft)

3.4 FUEL TANK

Double tanks, enclosed fuel filter:
Total capacity: 570 liters

3.5 TORQUE CONVERTER TRANSMISION HYDRAULIC SYSTEM

Combined system for control, driven and lubrication. 265 litter reservoir with level indicator, oil to water heat exchanger cooled.

High efficiency, fuel flow pressure line filters with exchanger cooled.

3.6 BATTERIES

(4) - 12 volt H.D. rates, series and parallel connected, 150 Amp. Hour rated.

3.7 BOOM HOIST ASSEMBLY

Independent planetary gear hoisting and lowering.

Mechanically interlocked, spring set boom hoist drum pawl and hydraulically set boom lowering

planetary pawl.
Driven from front of engine.
Interlocked with left-hand transmission to prevent boom lowering with transmission in neutral. Grooved double drums mounted on anti-friction bearing.
Clutch: Planetary boom hoist and lowering, band type internal expanding
Brake: Band-type external contracting double brakes, spring set hydraulic release.
Line Speed (based engine full load speed)
Low speed hoisting: 10 m/min
Low speed lowering: 9 m/min
High speed hoisting: 28 m/min
High speed lowering: 2.5 m/min

3.7 MAIN DRUMS

Front and rear drum assembly. Tandem: anti-friction bearing, driven from flywheel end of engine through torque converter and two speed transmission. Both drums over winding.
Clutch: Band type, internal expanding.
Brake: Band type, external contracting, hydraulically applied, spring set safety devices, spring set hydraulic release safety pawl.
Line Speed (based on max. rated load of hoist line)

	Aux. hoist	Main hoist
Wire rope	26 mm dia	34 mm dia
Max. rated load		
Low gear line speed		
High gear line speed		

3.9 SWING UNIT

Swing motion through two electro-magnetic magne-torque units.
Bevel and spur gear drive. Drive from front of engine.

3.10 SWING BRAKE

External contracting band brake double action, spring set hydraulic release.

3.11 SWING SPEED

Based on engine at full load speed, with 21.34 m boom and no load - high speed, 1.5 rpm, low speed 0.6 rpm.

3.12 TYPE OF FASTENING UPPER TO CARRIER

Swing circle roller bearing type, detachable.
Ring gear internal teeth.

3.13 ONTROLS

Twist grip engine throttle an modulated clutch control.
Engine instrument console mounted beside operator.
Engine tachometer, hour meter, transmission oil pressure gauges. Electric transmission, drum pawl, drum locks and swing brake controls.
Full flow power hydraulic system

3.14 GANTRY

High gantry lowers automatically toward rear into cab of recess. Two positions: full up and full down with rear toggle linkage. Gantry can be locked in up position.
Hydraulic gantry-assist cylinders.

3.15 COUNTERWEIGHT

Four pieces, external mounted, cast construction. Quickly removing. Pin connected.
Total weight: 60000 kg

3.16 MACINERY CAB

All steel construction, access panels on both sides and roof. Removable panels for main drum brake access. No lines pass thru cab. Low profile, recessed center roof, sliding doors. Auxiliary platform (optional)

3.17 OPERATORS CAB

Detachable for transportation. Quick disconnects for hydraulic and electric connection.

High visibility, welded construction, side mounted consoles for auxiliary controls and instruments.
Sliding door, all tinted safety glass. Auxiliary platform.
Optional: Heater, cooler, window wipers and flood lights.
Cooler require 3 KVA generator set.

4. CARRIER

4.1 POWER PLANT

Diesel, Cummins KT-450, 6 cylinder, 155.3 mm bore x 158.3 mm stroke, 18.96 liter displacement, 4 cycle, turbocharged, water cooled, 24 volts electric starting, 450 PS @ 2100 rpm full load engine output, full flow and by-pass lube oil filters, two stage dry type sir cleaner.

4.2 TRANSMISSION

Main: Power shift with torque converter, six forward speeds on reverse with lock-up mode and integral retarder.
Auxiliary: Air shift, four-speed.

4.3 FUEL TANK

Capacity: 490 liters, meets FHWA requirements.
Optional: 490 liters for 920 liters total capacity.

4.4 BATTERIES

(29 - 12 volt H.D. rated, 8-D series, series and parallel connected. 215 Amp hours rated @ 20 hour rate.

4.5 FRAME

Front section is fabricated channel. Rear section is a fabricated box section, cross braced and reinforced. Front bumper of bent plate. High strength low ally steel plate used extensively.

4.6 CAB

One-man cab offset to left side of engine compartment,, all window safety glass, electric windshield wiper, removable dash panel (with tachometer, speedometer, air pressure gouge, ammeter, coolant temperature gauge, engine oil pressure gauge, fuel level gauge and switches), air horn dome light, amber rotary light, seat with belt and large rear view mirrors (both sides). Crank down door window and slide-by type right side windows. Air vent on left side.

4.7 LIGHTING

Two headlights with foot operated dimeter switch.
Stop, tail, directional, clearance, fog, parking and rear license plate lights. Two weather-proof sockets provided for upper lighting during transit.
In cab: dome light, illuminated gauges, indicator lights for hi-beam, directional, emergency flasher and low air pressure warning, maxi-brakes set warning and hydraulic circuit warning lights.

4.8 STEERING

Ross warn and roller steering gear 32.2 to 1 ratio.
53 cm diameter steering wheel. Garrison power assist.

4.9 AXLE

Front: Anderson-Bolling in tridem. 2930 mm track.
Rear: Clark BD-91000 planetary drive axles in tridem.
2820 mm track. 12.0 to 1 total ratio. No interaxle differential.

4.10 BRAKE

Service: Dual air brake circuit with front and rear brakes on separate circuits.
Emergency/Parking: Air release, spring set brake chambers on all wheels controlled from cab. Separate reservoir for release of spring set brakes.

4.11 SUSPENSION - FRONT & REAR

Hendrickson solid mounted tridem suspension with torque rods.

4.12 TIRES

Eighteen 14.00 x 24 - 24 PR. on-off highway tread, on Goodyear 1024 MD rims.

4.13 OUTRIGGERS

Boxes: Four fabricated boxes of high strength low alloy steel plate.

Beams: Four fabricated reinforced box section beams of high strength low alloy steel plate. Beams telescope to fully extended position of 4600 mm from longitudinal center of carrier to center line of float.

Hydraulic outrigger assembly:

Twelve double acting hydraulic cylinders provide independent horizinrtal and vertical movement of each beam.

Vertical cylinders have lock check valves.

Electric solenoid actuated directional control valves are operated from two control panels. Each panel controls outriggers on control side only.

Floats: Four aluminum floats.

4.14 PERFORMANCE - ON HIGHWAY

18 forward speed, 3 reverse speeds. Performance in highest and lowest gear based on engine at full load and class 1 good surface road and less upper.

Lowest gear on 19.7 % grade: 8 km/h

Highest gear on 0.5 % grade: 75 km/h

5. CRANE ATTACHMENT

5.1 HEAVY DUTY BOOM

Tubular T-1 steel, lattice construction, pin connented.

Open throat, cross section 2390 mm square with seven boom point sheaves on tapered tip mounted on anti-friction bearings.

Basic length, two section: 21.34 m

Tapered base section: 12.19 m

Tapered tip section: 9.14 m

Maximum boom length: 88.39 m

5.2 BOOM INSERT

Main boom inserts with suspension cable assemblies, pin connections 3.05 m, 6.10 m and 12.19 m boom insert available.

5.3 JIB (Optional)

Tubular T-1 steel, lattice construction, pin connected.

Extensible up to 24.38 m

Basic length, two equal sections: 9.14 m

Jib cross section 1070 mm square with one boom point sheave on anti-friction bearings.

5.4 JIB INSERT (Optional)

Jib boom inserts with cable assemblies, pin connections.

3.05 m, 6.10 m and 9.14 m jib boom insert available.

5.5 BOOM HOIST REEVING

20 parts of balanced line - spreader sheaves mounted on anti-friction bearings.

5.6 HOOK BLOCK FOR MAIN BOOM

90 ton three sheave swivel hook (Optional)

210 ton seven sheave swivel hook

5.7 HOOK BLOCK FOR JIB (Optional)

13.5 ton weighted ball hook, single line

25 ton single sheave swivel hook

5.8 POWER CONTROLLED LOAD LOWERING

Planetary gear type power lowering with external contracting clutch band.

5.9 MAST - REQUIRED FOR ALL BOOMS

Fabricated high tensile strength steel, two rec-

tangular legs of box section cross laced design 13.72 m long.

5.10 SAFETY DEVICE

Over load warning device
Crane over hoist limit
Boom over hoist limit
Single horn
Drum lock
Main hoist drum lock
Boom back stop

6. TOOLS AND ACCESSORIES

A set of tools and accessories are furnished to each units.

7. PANTING

Machine will be painted with standard colors as follows:

Outside of cab: High visibility yellow
Inside of cab: Light gray
Carrier chassis and attachment: black

Remarks:

We may comply with your special request as to the painting if you have any.

Operating radius (m)	21.34 m boom	24.38 m boom	27.43 m boom	30.48 m boom	33.53 m boom	36.58 m boom	39.62 m boom	42.67 m boom	45.72 m boom	48.77 m boom	51.32 m boom	Operating radius (m)
6	210.0											6
7	210.0	210.0	210.0					NOTE: (A)				7
8	180.0	180.0	180.0	180.0								8
9	162.9	162.6	162.3	162.0	161.0							9
10	148.4	148.1	147.8	147.5	147.2	146.9	135.0					10
12	122.9	122.6	122.3	122.0	121.7	121.4	118.0	117.5	115.0	105.0		12
14	104.6	104.3	104.0	103.7	103.4	89.4	89.1	102.0	101.0	99.0	97.8	14
16	90.9	90.6	90.3	90.0	89.7	79.1	78.9	88.7	88.3	87.5	86.2	16
18	80.1	79.9	79.7	79.5	79.3	70.7	69.7	78.7	78.5	78.2	77.1	18
20	71.5	71.2	70.9	70.6	70.3	61.6	61.4	69.5	69.3	69.0	68.7	20
22		62.4	62.2	62.0	61.8	54.2	54.0	61.2	61.0	60.8	60.5	22
24			54.9	54.6	54.4	48.1	47.9	53.8	53.6	53.4	53.2	24
26				48.5	48.3	43.5	43.3	47.7	47.5	47.3	47.1	26
28				43.9	43.7	39.6	39.4	43.1	42.9	42.7	42.5	28
30					39.8	36.2	36.0	39.2	39.0	38.8	38.6	30
32							33.2	35.8	35.6	35.4	35.2	32
34							30.7	33.0	32.8	32.6	32.4	34
36								30.5	30.3	30.1	29.9	36
38								28.5	28.3	28.1	27.9	38
40									26.5	26.3	26.0	40
42										25.0	24.7	42
44											23.1	44
46											21.7	46

Operating radius (m)	54.86 m boom	57.91 m boom	60.96 m boom	64.01 m boom	67.06 m boom	70.10 m boom	73.15 m boom	76.20 m boom	79.25 m boom	82.30 m boom	85.34 m boom	88.39 m boom	Operating radius (m)
14	90.0	87.0	82.0		NOTE[A]					NOTE[A,B]			14
16	82.5	80.2	76.2	75.0	69.0	64.3	60.0						16
18	75.0	73.4	70.4	69.5	65.4	62.1	59.1	54.2	51.7	49.0			18
20	67.5	66.6	64.6	64.0	61.8	59.9	58.2	51.8	49.3	46.8	43.5	40.8	20
22	60.0	59.5	58.8	58.5	58.2	57.7	57.3	49.4	46.9	44.6	41.5	39.0	22
24	53.0	52.7	52.3	51.8	51.3	51.0	50.6	47.0	44.5	42.4	39.5	37.2	24
26	46.9	46.7	46.5	46.0	45.5	45.3	45.0	44.6	42.1	40.2	37.5	35.4	26
28	42.3	42.0	41.7	41.4	41.1	40.8	40.5	40.1	39.7	38.0	35.5	33.6	28
30	38.4	38.1	37.8	37.5	37.2	36.9	36.6	36.3	36.0	35.8	33.5	31.8	30
32	34.9	34.6	34.3	34.0	33.7	33.4	33.1	32.7	32.3	31.9	31.5	30.0	32
34	32.2	31.9	31.6	31.3	31.0	30.7	30.3	29.9	29.5	29.1	28.7	28.2	34
36	29.7	29.5	29.3	29.0	28.6	28.2	27.8	27.4	27.0	26.6	26.2	25.8	36
38	27.7	27.5	27.3	27.0	26.6	26.2	25.8	25.3	24.8	24.3	23.8	23.4	38
40	25.8	25.6	25.4	25.1	24.7	24.3	23.8	23.3	22.8	22.3	21.8	21.3	40
42	24.2	24.0	23.7	23.4	23.0	22.5	22.0	21.5	21.0	20.5	20.0	19.5	42
44	22.7	22.4	22.1	21.8	21.4	20.9	20.4	19.9	19.4	18.9	18.4	17.9	44
46	21.3	19.6	19.8	20.8	19.9	19.4	18.9	18.4	17.9	17.4	16.9	16.4	46
48	20.0	18.4	18.1	19.0	18.5	18.0	17.5	17.0	16.5	16.0	15.5	15.0	48
50			17.0	17.8	17.3	16.8	16.3	15.8	15.3	14.8	14.3	13.8	50
52			16.0	16.7	16.2	15.7	15.2	14.7	14.2	13.7	13.2	12.7	52
54				15.7	15.2	13.8	14.2	13.7	13.2	12.7	12.2	11.7	54
56				14.8	14.3	12.9	13.3	12.8	12.3	11.8	11.2	10.6	56
58					13.4	12.1	12.4	11.9	11.4	10.9	10.3	9.7	58
60						11.3	11.6	11.1	10.6	10.1	9.5	8.9	60
62							10.8	10.3	9.8	9.3	8.7	8.1	62
64							10.1	9.6	9.1	8.6	8.0	7.4	64

Note (A): Ratings are limited by strength of materials

Note (B): Require mid point suspension

1. Operating radius ids the horizontal distance from centerline of rotation to a vertical line through the center of gravity of the load.
2. Rating do not exceed 78 % of tipping load.
3. Deduct weight of hook block, sling, and all other load handling accessories from main boom or jib rating shown.
4. Rating shown are based on freely suspended load and make no allowance for such factors as wind effect on lifted load, ground condition, out-of-level, operating speeds or any other condition that could be detrimental to the safe operation of this equipment.
5. The operator, therefore, has the responsibility to judge the existing conditions and reduce lifted loads and operating speeds accordingly.
6. At radii and boom length where no ratings are shown on plate, operation is not intended or approved.
7. Mast required with gantry in up position.
8. Boom backstops are required for all boom length.
9. Boom insert and guy cables must be arranged as shown in the “Owner and Operators Manual”.
10. Boom hoist reeving is 20 part line.
11. Boom 54.86 m and over require three boom point sheaves.
12. Outriggers must be fully extended and set to rotate upper with counterweights attached.

13. Main Hoist Rated Loads

Number of parts of main hoist reeving	1	2	3	4	5	6	7
Max. load - metric ton	15	30	45	60	75	90	105
Number of parts of main hoist reeving	8	9	10	11	12	13	14
Max. load - metric ton	120	135	150	165	180	195	210

*When boom is equipped with jib, main hook ratings must be reduced by 1600 kg.
For 9.14 m jib: 1900 kg
For 12.19 m jib: 2100 kg
For 15.24 m jib: 2300 kg
For 18.29 m jib: 2600 kg
For 21.34 m and 24.38 m jib: 2800 kg

14. Boom with jib must be erected on outriggers over rear end of carrier

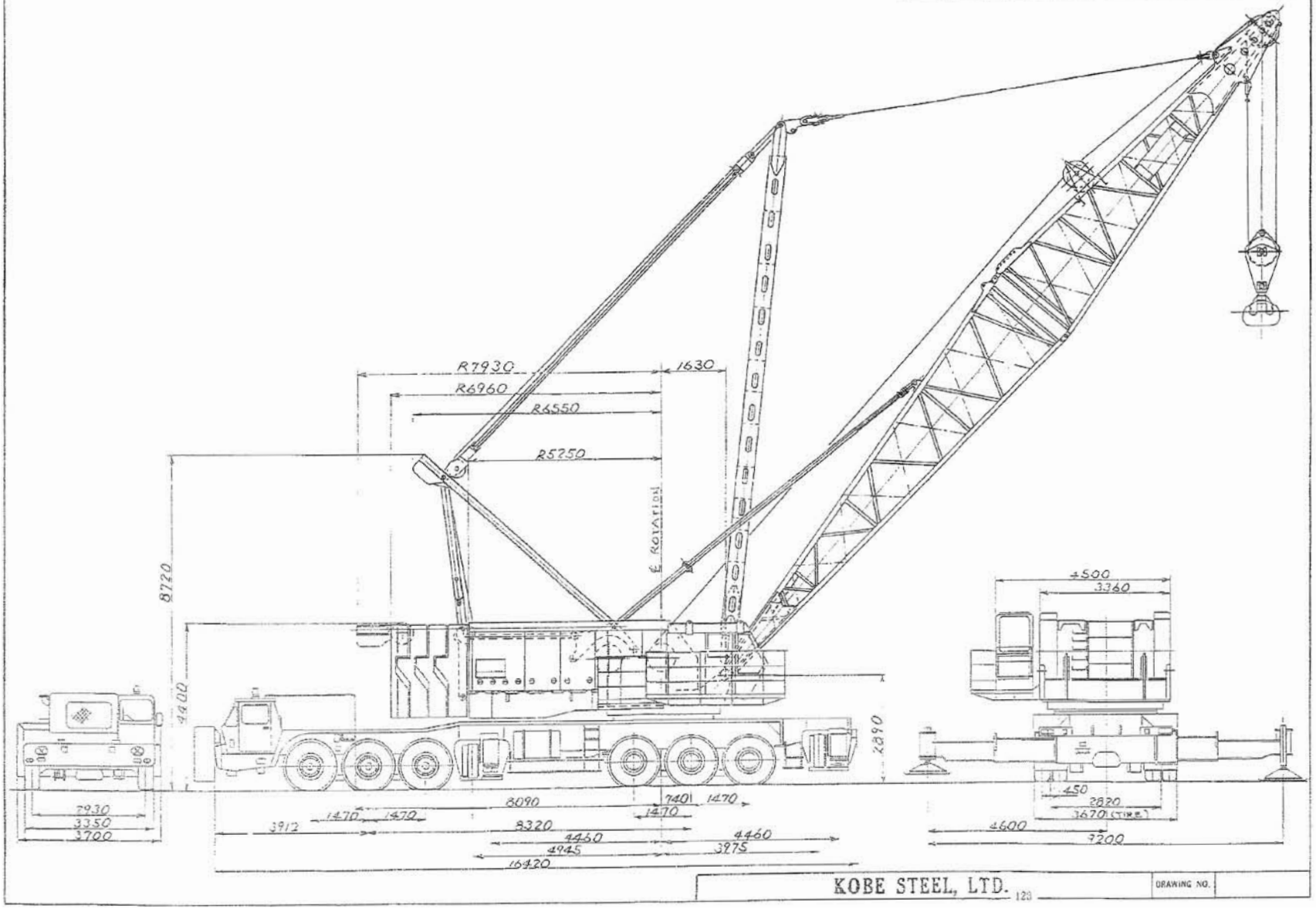
Maximum Jib Ratings for Lifting Crane Service - kg						
*Use Two Parts of Line for Loads above 10500 kg						
Offset Angle Jib to Boom Under Full Load	9.14 m jib	12.19 m jib	15.24 m jib	18.29 m jib	21.34 m jib	24.38 m jib
10°	*21000	*15500	*12200	9600	7700	6300
30°	*15800	*12100	9800	7800	6100	4900

15. Jib crane ratings are based on strength of materials.
16. When main boom load rating at operating radius is less than maximum jib ratings stability governs and the lower value of main boom load rating must be used.
17. Jibs are intended to increase lifting height - not operating radius - therefore maximum jib operating radius is limited to maximum rated radius of boom length on which jib is mounted.
18. Jib booms can be mounted on boom 60.96 m to 88.39 m long.

19. Hook blocks

Block capacity	Number sheaves	Wire rope size	Weight
90,000 kg	3	34 mm	2,300 kg
210,000 kg	7	34 mm	3,400 kg
13,500 kg	Weighted hook	26 mm	500 kg
kg	1	26 mm	800 kg

6350-TC TRUCK CRANE GENERAL DIMENSION



KOBE STEEL, LTD. 120

DRAWING NO.