

P&H 220-TC

20-TON TRUCK CRANE Crane, Clamshell



 **KOBE STEEL**

Bulletin No. 220-TC-2

Specifications

• UPPER MACHINERY



POWER PLANT:

Diesel: Perkins 4-236 (standard)
4 cyl., 93.4 mm (3 $\frac{1}{2}$ ") bore x 127 mm (5")
stroke, 3,860 cc (236 cubic inch) displacement, 4 cycle, water cooled, 12 volt electric starting, 55 hp @ 1,660 rpm full load engine output, dry type air cleaner.
Isuzu DA 220 (Optional)...4 cycle, 4 cyl., 51 hp @ 1,700 rpm
G.M. 3-53 (Opt. Extra) ...2 cycle, 3 cyl., 60 hp @ 1,700 rpm

RADIATOR: Capacity.....26.8 lt (7.1 gal.)
Fin and tube type.

FUEL TANK: Capacity 90 lt (24 gal.)

THROTTLE: Twist grip control on swing lever.

TRANSMISSION: 4 speed transmission, second gear is normal operating speed. When magnet generator is furnished third and fourth gear are locked out.



BOOM HOIST ASSEMBLY: Independent planetary gear type with external ratchet and automatic brake provides for raising and lowering boom under power and locking boom.
Drum mounted on anti-friction bearings.

Clutch—double shoe type, internal expanding, 308 mm (12 $\frac{1}{2}$ ") dia. x 64 mm (2 $\frac{1}{2}$ ") wide.

Brake—band type, external contracting, 336 mm (13 $\frac{1}{4}$ ") dia. x 57 mm (2 $\frac{1}{4}$ ") wide.

Drum Pitch Dia. 241 mm (9 $\frac{1}{2}$ ")

Drum Length..... 143 mm (5 $\frac{5}{8}$ ")

Drum Capacity (1st layer) 8.2 m (27')

Drum Total Capacity..... 32 m (105')

Cable Dia..... 12 mm ($\frac{1}{2}$ ")

Line pulls.....4,200 kg (9,260 lbs.)

Line Speed (1st layer):

Raising 48.0 m/min (157 fpm)

Lowering..... 22.4 m/min (74.5 fpm)



MAIN DRUM ASSEMBLY: Drums in tandem, mounted on anti-friction bearings.

Clutches—double shoe type, internal expanding, 381 mm (15") dia. x 64 mm (2 $\frac{1}{2}$ ") wide.

Brakes—Band type, external contracting, 470 mm (18 $\frac{1}{2}$ ") dia. x 64 mm (2 $\frac{1}{2}$ ") wide.

Drum pitch Dia. 306 mm (12")

Drum Length 152.5 mm (6")

Drum Capacity (1st layer) 9.6 m (31'6")

Drum Total Capacity L.H.: 65 m (213'3"), R.H.: 50 m (164')

Cable Dia..... 14 mm ($\frac{9}{16}$ ")

Line Pulls 4,040 kg (8,910 lbs.)

Line Speed (1st layer):

Raising 49 m/min (161 fpm)

Lowering..... 23.2 m/min (76 fpm)

[Jib Hoist Drum (R.H.) is not equipped with Planetary Power Lowering Device.]



TYPE OF FASTENING TO LOWER: P&H swing circle, roller bearing type. 5 adjustable hook rollers—two double hook rollers rear, one single hook roller front.

SWING ROLLERS: 20 rollers live roller circle.

ROLLER TRUCK: 1,270 mm (4'-2") pitch dia.

SWING GEAR: Internal cut teeth, 1,016 mm (3'-4") pitch dia.

ROTATING SPEED: 4.0 rpm.

SWING CLUTCHES: Double shoe type, internal expanding—308 mm (12 $\frac{1}{2}$ ") dia. x 64 mm (2 $\frac{1}{2}$ ") wide.

SWING BRAKE: Band type, external contracting—305 mm (12") dia. x 51 mm (2") wide.



CONTROLS: Direct acting hydraulic.

POWER BOX: All gears run in oil bath, all shafts are involute splined.

COUNTERWEIGHT: Non-removable punchings in counterweight box at rear of machine.....

..... 2,380 kg (5,250 lbs.)

Single piece external removal casting...1,918 kg (4,230 lbs.)

Total4,298 kg (9,480 lbs.)

SAFETY DEVICES: Boom over hoist alarm bell. Crane over hoist alarm bell, Swing warning horn, Boom angle indicator, Boom backstop, Boom over hoist clutch kickout (Automatic boom hoist limiting device).

ELECTRICAL INSTALLATIONS: Inside cab light, ammeter, water temperature gauge, fuel gauge, flood light, trouble lamp.

• CARRIER

6 WHEELS, 4 WHEEL DRIVE, 10 Tires

MAKE AND MODEL: Nissan Diesel Motor KW 30 MXL

TYPE: Front engine, forward control, 6x4, left-hand steering for 18,150 kg (40,000 lbs.) truck crane carrier.

WEIGHT: Including turret, outrigger beams, housing and floats, with standard tires—9,500 kg (20,940 lbs.)

FRAME: All welded construction, ladder type, high tensile steel.



OUTRIGGER HOUSINGS: Double box, front and rear.

OUTRIGGER BEAMS: Alloy steel, welded box section with screw jack at beam ends. Extended position from center of truck ... 2.15 m (7'- $\frac{1}{8}$ ")

HYDRAULIC OUTRIGGERS: Total of 8 double acting hydraulic cylinders provide independent horizontal and vertical motion of each beam. The outriggers are controlled by manual operated valves. (optional extra)



POWER PLANT:

Diesel: Nissan Diesel PE6 (standard)...4 cycle, direct injection, water cooled, in-line diesel engine, 6 cyl., 133 mm (5 $\frac{1}{4}$ ") bore x 140 mm (5 $\frac{1}{2}$ ") stroke, 11,670 cc (712 cubic inch) displacement, 24 volt electric starting, 24 volt-25 amp alternator, 220 hp @ 2,300 rpm.

placement, 24 volt electric starting, 24 volt-25 amp alternator, 220 hp @ 2,300 rpm.

CLUTCH: Dry single plate, hydraulically operated clutch release mechanism with air assisted booster. 410 mm (16 $\frac{1}{8}$ ") dia. x 250 mm (9 $\frac{7}{8}$ ") wide.
Total lining area 830 cm² (128.7 sq-in.) x 2

TRANSMISSION: Nissan Diesel TMH414, constant mesh, mechanical type, 5 speeds forward plus 1 reverse. Gear ratios—1st: 6.540, 2nd: 3.780, 3rd: 2.511, 4th: 1.442, 5th: 1.000, reverse: 6.533

AUXILIARY TRANSMISSION: Nissan Diesel TF 453, 2 speeds, Gear ratios—high: 1.036, low: 1.483. (Optional Extra)



FRONT AXLE: Drop forged steel "I" section beam, reverse "ELLIOT" steering knuckles. Rated capacity.....6,200 kg (13,670 lbs.) each axle.

REAR AXLE: Full floating pressed steel banjo type housing, in-line tandem type. Rated capacity..... 11,000 kg (24,250 lbs.) each axle Single reduction, hipoid gear, ratio 6.166



STEERING: Recirculating ball screw type with linkage power assistance, 27.7 to 1 gear ratio, 510 mm (20¹/₈") dia. wheel.

SERVICE BRAKE: Full air brake on all wheels, dual air line system, internal expanding leading and trailing shoe type.

Front drum 400 mm (15³/₄") dia. x 130 mm (5¹/₈") wide
Rear drum 410 mm (16¹/₈") dia. x 180 mm (7¹/₈") wide
Front lining area 2,056 cm² (318.7 sq. in.)
Rear lining area 6,128 cm² (949.8 sq. in.)
Total lining area 8,184 cm² (1,268.7 sq. in.)

PARKING BRAKE (HAND BRAKE): Mechanically operated by hand brake lever, internal expanding duo-servo shoe type acting on drum at transmission case rear.

Drum.....304.8 mm (12") dia. x 75 mm (3") wide
Total effective lining area.....531 cm² (82.3 sq. in.)

ENGINE RETARDER (EXHAUST BRAKE): Electric-pneumatic operated shutter.

AIR RESERVOIR: Pressed type air reservoir with an automatic drain valve. Safety valve to be fitted on the first reservoir.

Capacity—for service brake 38 lt (10 gal.) x 2

FRONT SUSPENSION: Semi-elliptic leaf spring with anchor at front and sliding contractor at rear, 1,400 mm (4'-7³/₈") length x 90 mm (3⁵/₈") width x 11 mm (7⁷/₈") thickness—11 leaves. Shock absorbers—single acting telescopic type.

REAR SUSPENSIONS: Underhanging high tensil steel equalizer beams with self-adjusting spherical bearings at ends, includes two torque rods (no spring).

WHEELS: Pressed steel disc type, 2 pieces.



TIRES: Ten, 9.00 x 20—14 PR.

FUEL TANK: Located on the right hand side of chassis frame.

Capacity 200 lt (52.8 gal.)

RADIATOR: (Tropical zone) Corrugate fin type, flow capacity—214 lt (56.5 gal.)/min at engine rev. 1,200 rpm.

CAB: Steel, two men, semi under floor type one side cab. All windows are safety glass with wind-down door window, side-by right side window. 2 speed electric windshield wiper, full reclining driver seat.

ELECTRICAL EQUIPMENT: 24 volt DC. electric system, battery. Dual type sealed beam head lights, directional signal lights, tail lights, stop lights, fog lights, licence lights, parking lights, reverse lights, reflectors, side clearance lights.



INSTRUMENTS: Meter: speedometer with odometer, tachometer, fuel gauge, water temperature gauge, ammeter, air pressure gauge, oil pressure gauge. Warning light with buzzer: low oil pressure, low air pressure, over speed.

Indicating light: air heater indicator, hand brake indicator, battery switch indicator, turn signal indicator, head light high beam indicator, exhaust brake indicator.

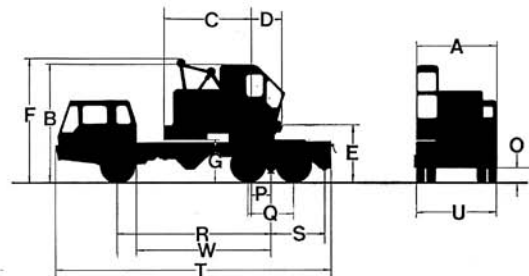
EQUIPMENT: Sun visor, sigarete lighter, window washer with water tank, cab heater and defroster, digging brake valve. Tool (one set), spare tire carrier.

PERFORMANCE:

(Based on Nissan Diesel PE6 Engine)

Max. travel speed..... 69 km/h (48.2 mph.)
Max. travel speed (aux. transmission) 67 km/h (41.6 mph.)
Percent grade..... 29%
Percent grade (aux. transmission) 44%
Brake distance..... 9 m (29'-6³/₈")
Min. turning radius..... 9.5 m (31'-2")

● GENERAL DIMENSIONS



	Meters	Ft.-Ins.
A—Width of cab	2.44	(8-1/8)
B—Height to top of cab	3.22	(10-6 1/4)
C—Radius of rear end	2.635	(8-7 3/4)
D—Center of rotation to boom foot pin	0.877	(2-10 1/2)
E—Height from ground to boom foot pin	1.63	(5-4 3/8)
F—Clearance height over gantry	3.47	(11-4 3/8)
G—Counterweight ground clearance	1.23	(4-7/8)
O—Ground clearance	0.25	(0-9 3/8)
P—Center of rotation to center of bogie	0.50	(1-7 3/8)
Q—Distance between rear axles	1.30	(4-3 3/8)
R—Wheelbase	4.60	(15-1 1/2)
S—Center of bogie to rear of carrier	1.77	(5-9 3/8)
T—Overall length of carrier	8.69	(28-5 3/8)
U—Overall width of carrier	2.49	(8-2)
V—Turning circle (min.) radius	9.50	(31-2)
W—Back of truck cab to center of bogie	3.70	(12-1 1/2)

20-ton Truck Crane

24.38m Boom

24.38m Boom+6.1m Jib

• GENERAL DATA

BOOM: Angle lattice alloy steel construction.
 Basic length, bolt connected in two sections.....7.62 m (25')
 Open throat with four offset boom point sheaves on bronze sleeve bearings, pitch dia. 344 mm (13 5/8")
 10 part boom hoist reeving, standard.

BOOM INSERT: Insert length 1.52 m (5')
 3.05 m (10'), 6.10 m (20').
 Maximum boom length.....24.38 m (80')

HOOK BLOCK 18,150 kg (40,000 lbs.)
 Three sheaves with swivel hook and seven part hoist line, standard.

JIB BOOM: Tubular lattice carbon steel construction.
 Basic length, bolt connected in two sections.....4.57 m (15')
 Open throat with one boom point sheave.

JIB INSERT: Insert length.....1.52 m (5')
 Maximum jib length 6.10 m (20')

POWER CONTROLLED LOAD LOWERING: Planetary device for lowering load under power, right hand smooth drum, optional extra.

GANTRY: Fixed type, standard.

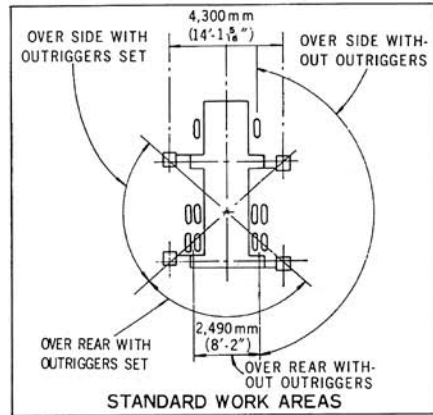
WORKING WEIGHT.....approx. 19,800 kg (43,650 lbs.)
 Including hook block, manual outrigger and 4,298 kg (9,480 lbs.) counterweight.

DRUM SHAFT ASSEMBLY

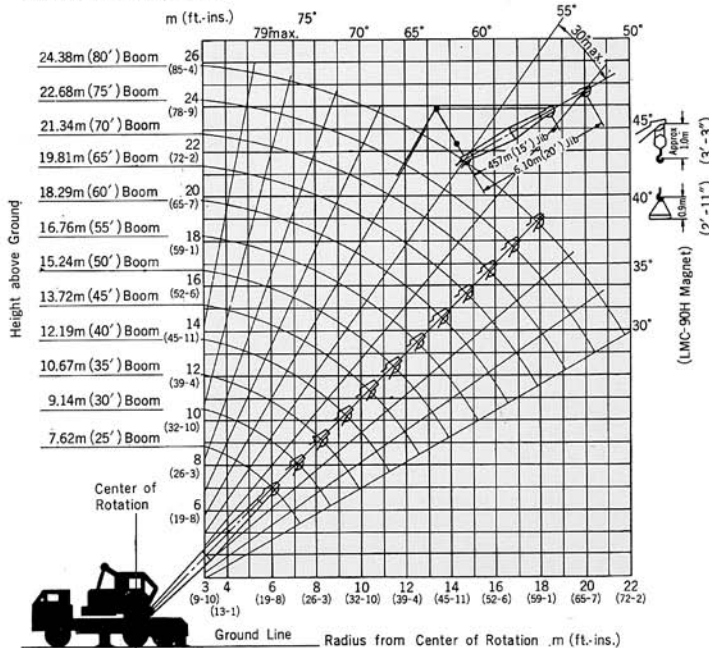
	Lifting Crane Drums (P.D.)	Cable Dia.	Max. Cable Capacity	*Line Pulls	*Line Speeds
L.H.	306 mm (12")	14 mm (5/8")	65 m (213'-3 3/4")	4,040 kg (8,910 lbs.)	49 m/min (161 fpm)
R.H.	306 mm (12")	14 mm (5/8")	50 m (164'-1/2")	4,040 kg (8,910 lbs.)	49 m/min (161 fpm)

*Line Pulls and Line Speeds based on single part line in normal operating (2nd) gear.

To fit job requirements, line pull and line speed can be varied by shifting into other gears.



WORKING RANGES



● LIFTING CAPACITIES

RATED CRANE LOADS IN KG (LBS.) WITH OUTRIGGERS FULLY EXTENDED

Operating Radius in Meters (Ft.-Ins.)	7.62 m (25') Boom				9.14 m (30') Boom				10.67 m (35') Boom				12.19 m (40') Boom			
	Angle	Hook Pt. El.	Over Side	Over Rear	Angle	Hook Pt. El.	Over Side	Over Rear	Angle	Hook Pt. El.	Over Side	Over Rear	Angle	Hook Pt. El.	Over Side	Over Rear
3.0 (9-10)	74°	7.9 m (26'-1")	18,150 (40,000)	18,150 (40,000)	77°	9.5 m (31'-3")	18,150 (40,000)	18,150 (40,000)								
4.0 (13-1)	66°	7.6 m (24'-11")	13,420 (29,590)	14,000 (30,860)	70°	9.2 m (30'-3")	13,420 (29,590)	14,000 (30,860)	73°	10.8 m (35'-7")	12,500 (27,560)	12,500 (27,560)	75°	12.4 m (40'-9")	12,500 (27,560)	12,500 (27,560)
5.0 (16-5)	57°	7.0 m (23'-1")	10,360 (22,840)	11,310 (24,930)	63°	8.8 m (28'-10")	10,360 (22,840)	11,310 (24,930)	67°	10.5 m (34'-4")	10,340 (22,800)	11,280 (24,870)	70°	12.1 m (39'-8")	10,310 (22,730)	11,280 (24,870)
6.0 (19-8)	48°	6.3 m (20'-7")	8,400 (18,520)	9,600 (21,160)	56°	8.2 m (26'-11")	8,400 (18,520)	9,600 (21,160)	62°	10.0 m (32'-9")	7,960 (17,550)	9,580 (21,120)	65°	11.7 m (38'-4")	7,930 (17,480)	9,580 (21,120)
7.0 (23-0)	37°	5.2 m (17'-0")	6,800 (14,990)	7,930 (17,480)	48°	7.4 m (24'-4")	6,800 (14,990)	7,930 (17,480)	55°	9.4 m (30'-9")	6,240 (13,760)	7,900 (17,420)	60°	11.2 m (36'-8")	6,210 (13,690)	7,900 (17,420)
8.0 (26-3)									48°	8.6 m (28'-2")	5,080 (11,200)	6,520 (14,370)	54°	10.5 m (34'-6")	5,050 (11,130)	6,520 (14,370)
9.0 (29-6)									41°	7.6 m (24'-9")	4,270 (9,410)	5,510 (12,150)	48°	9.7 m (31'-11")	4,240 (9,350)	5,510 (12,150)
10.0 (32-10)									31°	6.2 m (20'-3")	3,680 (8,110)	4,780 (10,540)	42°	8.7 m (28'-7")	3,650 (8,050)	4,780 (10,540)
12.0 (39-4)																
14.0 (45-11)																
16.0 (52-6)																
18.0 (59-1)																
20.0 (65-7)																
21.8 (71-6)																

RATED CRANE LOADS IN KG (LBS.) WITHOUT OUTRIGGERS

Operating Radius in Meters (Ft.-Ins.)	7.62 m (25') Boom		9.14 m (30') Boom		10.67 m (35') Boom		12.19 m (40') Boom		15.24 m (50') Boom		18.29 m (60') Boom	
	Angle	Over Side Over Rear	Angle	Over Side Over Rear	Angle	Over Side Over Rear	Angle	Over Side Over Rear	Angle	Over Side Over Rear	Angle	Over Side Over Rear
3.0 (9-10)	74°	7,630 (16,820)	77°	7,630 (16,820)								
4.0 (13-1)	66°	5,250 (11,570)	70°	5,250 (11,570)	73°	5,210 (11,490)						
5.0 (16-5)	57°	3,800 (8,380)	63°	3,800 (8,380)	67°	3,760 (8,290)	70°	3,730 (8,220)	75°	3,680 (8,110)		
6.0 (19-8)	48°	2,980 (6,570)	56°	2,980 (6,570)	62°	2,930 (6,460)	65°	2,900 (6,390)	71°	2,850 (6,280)		
7.0 (23-0)	37°	2,420 (5,340)	48°	2,420 (5,340)	55°	2,380 (5,250)	60°	2,350 (5,180)	67°	2,300 (5,070)	71°	2,250 (5,000)
8.0 (26-3)			39°	2,050 (4,520)	48°	2,010 (4,430)	54°	1,980 (4,370)	62°	1,930 (4,250)	67°	1,880 (4,160)
9.0 (29-6)					41°	1,710 (3,770)	48°	1,680 (3,700)	58°	1,630 (3,590)	64°	1,580 (3,480)
10.0 (32-10)					31°	1,490 (3,280)	42°	1,460 (3,220)	53°	1,410 (3,110)	60°	1,360 (3,000)
12.0 (39-4)									43°	1,080 (2,380)	53°	1,030 (2,270)
14.0 (45-11)									31°	810 (1,790)	44°	760 (1,680)
16.0 (52-6)											34°	510 (1,120)
18.0 (59-1)												

Boom	15.24 m (50') Boom				18.29 m (60') Boom				21.34 m (70') Boom				24.38 m (80') Boom				
	Over Rear	Angle	Hook Pt. El.	Over Side	Over Rear	Angle	Hook Pt. El.	Over Side	Over Rear	Angle	Hook Pt. El.	Over Side	Over Rear	Angle	Hook Pt. El.	Over Side	Over Rear
12,500 (27,560)																	
11,260 (24,820)	75°	15.3 m (50'-2")	10,000 (22,050)	10,000 (22,050)													
9,550 (21,050)	71°	15.0 m (49'-2")	7,900 (17,420)	9,520 (20,990)	74°	18.2 m (59'-8")	7,500 (16,530)	7,500 (16,530)									
7,860 (17,330)	67°	14.6 m (47'-10")	6,180 (13,620)	7,820 (17,240)	71°	17.9 m (58'-7")	6,140 (13,540)	7,500 (16,530)	74°	21.1 m (69'-2")	6,100 (13,450)	7,500 (16,530)					
6,480 (14,290)	62°	14.1 m (46'-3")	5,010 (11,050)	6,440 (14,200)	67°	17.5 m (57'-4")	4,970 (10,960)	6,400 (14,110)	71°	20.7 m (68'-1")	4,930 (10,870)	6,350 (14,000)	73°	23.9 m (78'-7")	4,890 (10,780)	5,500 (12,130)	
5,480 (12,080)	58°	13.5 m (44'-5")	42,000 (9,260)	5,440 (11,990)	64°	17.0 m (55'-10")	4,160 (9,170)	5,400 (11,900)	68°	20.4 m (66'-10")	4,120 (9,080)	5,350 (11,790)	71°	23.6 m (77'-6")	4,080 (8,990)	5,300 (11,680)	
4,750 (10,470)	53°	12.8 m (42'-2")	3,610 (7,960)	4,700 (10,360)	60°	16.5 m (54'-1")	3,570 (7,870)	4,650 (10,250)	65°	19.9 m (65'-4")	3,530 (7,780)	4,600 (10,140)	68°	23.2 m (76'-3")	3,490 (7,690)	4,550 (10,030)	
	43°	11.1 m (36'-3")	2,790 (6,150)	3,670 (8,090)	53°	15.2 m (49'-9")	2,750 (6,060)	3,620 (7,980)	59°	18.8 m (61'-10")	2,710 (5,970)	3,570 (7,870)	63°	22.3 m (73'-3")	2,670 (5,890)	3,520 (7,760)	
	31°	8.4 m (27'-6")	2,260 (4,980)	2,980 (6,570)	44°	13.4 m (43'-11")	2,220 (4,890)	2,930 (6,460)	52°	17.5 m (57'-3")	2,180 (4,810)	2,880 (6,350)	58°	21.2 m (69'-6")	2,140 (4,720)	2,830 (6,240)	
					34°	10.9 m (35'-10")	1,830 (4,030)	2,440 (5,380)	45°	15.7 m (51'-6")	1,790 (3,950)	2,390 (5,270)	52°	19.8 m (64'-10")	1,740 (3,840)	2,340 (5,160)	
									37°	13.4 m (43'-10")	1,490 (3,280)	2,000 (4,410)	46°	18.0 m (59'-0")	1,440 (3,170)	1,950 (4,300)	
													39°	15.8 m (51'-8")	1,180 (2,600)	1,660 (3,660)	
													31°	13.1 m (43'-2")	1,060 (2,340)	1,470 (3,240)	

NOTE:

1. Operating radius is the horizontal distance from centerline of rotation to a vertical line through the centerline of gravity of the load.
2. Ratings shown do not exceed 78% of tipping load, and including weight of hook block, slings and all other crane handling accessories.
3. Ratings shown are based on freely suspended loads and make no allowance for such factors as wind effect on lifted load, ground conditions, out-of-level, operating speeds or any other condition that could be detrimental to the safe operation of this equipment. The operator, therefore, has the responsibility to judge the existing conditions and reduce lifted loads and operating speed accordingly.
4. When boom is equipped with jib, main hook ratings must be reduced by 410 kg (900 lbs.).
5. Gantry must be in raised position for all crane operations.
6. Boom backstops are required for all boom lengths.
7. When operating crane "without outriggers" loads lifted over rear and swing over side, will increase in radius due to tire deflection. This increase in radius must be compensated for by raising boom, or machine may tip over.

WARNING: The wind effect on the lifted load can cause sufficient side load to overstress boom or jib structure. When suspended load will not remain in line with boom, derated chart 25%. We recommend stopping operation when wind is above 10 m/sec. (20 mph) and tying off, or lowering, boom when wind is above 16 m/sec. (35 mph).

15.24 m (50') Boom	21.34 m (70') Boom		24.38 m (80') Boom	
Over Side Over Rear	Angle	Over Side Over Rear	Angle	Over Side Over Rear
2,260 (4,980)	74°	2,210 (4,870)		
1,890 (4,170)	71°	1,840 (4,060)	73°	1,800 (3,970)
1,590 (3,510)	68°	1,540 (3,400)	71°	1,500 (3,310)
1,370 (3,020)	65°	1,320 (2,910)	68°	1,280 (2,820)
1,010 (2,230)	59°	910 (2,010)	63°	850 (1,870)
730 (1,610)	52°	640 (1,410)	58°	560 (1,230)
510 (1,120)	45°	440 (970)	52°	380 (840)
	37°	340 (750)	46°	290 (640)

MAXIMUM JIB RATINGS IN KG (LBS.)

Offset Angle Jib to Boom Under Full Load	4.57 m (15') Jib	6.10 m (20') Jib
30° max.	2,260 (4,980)	2,260 (4,980)

NOTE:

1. Jib crane ratings are based on strength of materials.
2. Use of outriggers is recommended when boom is equipped with jib.
3. Jib ratings at any radius are the same as main boom ratings when operated at that radius, but do not exceed maximum jib ratings shown.
4. Maximum jib operating radius is not to exceed length of main boom on which it is being used.

MAXIMUM BOOM LENGTH TO LIFT OFF GROUND

Boom Over	WITH OUTRIGGERS		WITHOUT OUTRIGGERS	
	Boom Only	Boom & Jib	Boom Only	Boom & Jib
Side	24.38 m (80')	24.38 m+6.1 m (80'+20')	24.38 m (80')	18.29 m+6.1 m (60'+20')
Rear	24.38 m (80')	24.38 m+6.1 m (80'+20')	24.38 m (80')	19.81 m+6.1 m (65'+20')

HOIST REEVING IN KG (LBS.)

No. of Parts of Line	1	2	3	4	5	6	7
Max. Load—Kg (Lbs.)	3,000 (6,610)	6,000 (13,230)	8,500 (18,740)	11,000 (24,250)	13,500 (29,760)	16,000 (32,270)	18,150 (40,000)

RECOMMENDED WIRE ROPE LENGTH FOR DRUM IN METER (FT.)

Boom Length Meters (Ft.)	Main Hoist Drum	*Jib Hoist Drum	Boom Length Meters (Ft.)	Main Hoist Drum	*Jib Hoist Drum
7.62 (25)	73 (240)	—	15.24 (50)	84 (276)	
9.14 (30)	75 (246)	—	18.29 (60)	79 (259)	55 (180)
10.67 (35)	73 (240)	—	21.34 (70)	91.5 (300)	61 (200)
12.19 (40)	82.5 (271)	—	24.38 (80)	104 (341)	67.5 (221)

*Jib length: 6.1m (20')

Clamshell

0.3m³ (3/8 CU. YD.)

• GENERAL DATA

BOOM:

Angle lattice alloy steel construction.
Basic length, bolt connected in two sections.....7.62 m (25')
Open throat with two offset boom point sheaves on bronze sleeve bearings, pitch dia. 344 mm (13 5/8")
10 part boom hoist reeving, standard.

GANTRY Fixed type, standard.

TAGLINE WINDER McCaffrey, Spring type No. 630.

WORKING WEIGHT:

(with bucket) approx. 20,600 kg (45,410 lbs.)
[4,130 kg (9,105 lbs.) counterweight include in working weight, furnished as standard.]

DRUM SHAFT ASSEMBLY

Clam. Drums	Pitch Dia.	Cable Dia.	*Line Pulls	*Line Speeds
L. H.	306 mm (12")	14 mm (5/8")	4,200 kg (9,260 lbs.)	49 m/min (161 fpm.)
R. H.	306 mm (12")	14 mm (5/8")	4,200 kg (9,260 lbs.)	49 m/min (161 fpm.)

*Line Pulls and Line Speeds based on single part line in normal operating (2nd) gear.

To fit job requirements, line pull and line speed can be varied by shifting into other gears.

CLAMSHELL RATED LOADS IN KG (LBS.)

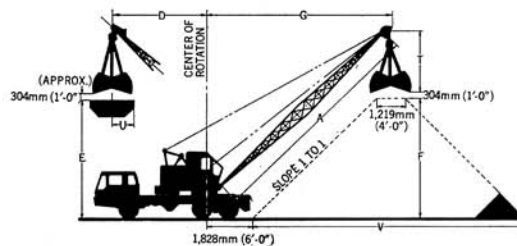
Operating Radius in Meters (Ft.-ins.)	7.62 m (25') Boom	9.14 m (30') Boom	10.67 m (35') Boom
6.0 (19-8)	2,140 (4,720)	2,140 (4,720)	2,140 (4,720)
7.0 (23-0)	2,140 (4,720)	2,140 (4,720)	2,140 (4,720)
8.0 (26-3)		1,840 (4,060)	1,810 (3,990)
10.0 (32-10)			1,340 (2,950)

Clamshell ratings shown also apply to magnet, grapple and all other material handling bucket except dragline which is rated separately. For clamshell and magnet operations, the weight of bucket or magnet is considered a part of the load and the total weight of bucket plus contents must not exceed the corresponding ratings shown.

- Maximum boom length recommended for clamshell operation 10.67 m (35')
- Limit on clamshell rating 2,140 kg (4,720 lbs.)
- Maximum allowable heavy digging bucket size 0.3 m³ (3/8 cu. yd.)

Note:

To select bucket size best suited for your application, use the following formula: Refer to chart above to obtain clamshell capacity in kgs. Clamshell capacity=(cubic meter capacity of bucket) × (weight of material per cubic meter) + (weight of specific clamshell bucket).



CLAMSHELL WORKING RANGES IN METERS (FT.-INS.)

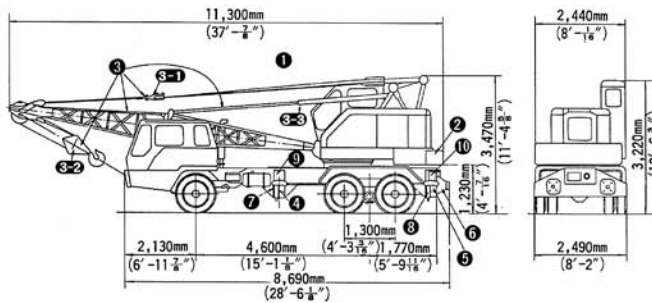
Boom Length A	7.62 m (25') Boom		9.14 m (30') Boom		10.67 m (35') Boom	
	Height and 1/2 Width of Bin					
Operating Radius D	E	U	E	U	E	U
4.0 (13-1)	5.71 (18-9)	1.00 (3-3)	7.32 (24-0)	0.85 (2-9)	8.45 (27-9)	0.80 (2-7)
5.0 (16-5)	5.20 (17-1)	1.50 (4-11)	6.91 (22-8)	1.20 (3-11)	8.30 (27-3)	1.02 (3-4)
6.0 (19-8)	4.48 (14-8)	2.10 (6-11)	6.35 (20-10)	1.63 (5-4)	8.03 (26-4)	1.34 (4-5)
7.0 (23-0)	3.33 (10-11)	3.15 (10-4)	5.50 (18-1)	2.20 (7-3)	7.56 (24-10)	1.72 (5-8)
8.0 (26-3)			4.60 (15-1)	3.00 (9-10)	6.58 (21-7)	2.16 (7-1)
Height and Width of Stock Pile	F	V	F	V	F	V
	3.98 (13-1)	9.16 (30-1)	5.10 (16-9)	11.58 (38-0)	6.25 (20-6)	13.87 (45-6)
At Operating Radius G	6.54 (21-5)		7.62 (25-0)		8.69 (28-6)	
Height T	(Depends on size and make of bucket) 2.59 (8'-6")					

Crane Axle Loadings

NISSAN KW30MXL (6x4 CARRIER) WITH MANUAL OUTRIGGERS

Use table below to determine weight adjustments to conform with local highway regulations. Item ❶ is the base figure (total weight). From this item ❶, deduct "minus" figures or add "plus" figures shown. All figures indicate weight in kgs (lbs.).

Item No.	Effect of Removing	Total Weight or Adjustment	Boom Over Front of Carrier		Boom Over Rear of Carrier	
			Front Axle	Rear Bogie	Front Axle	Rear Bogie
1	Complete Standard Machine with 7.62 m (25') Boom Lowered to travel position, three sheave block, boom backstop	19,500 (42,990)	4,440 (9,790)	15,060 (33,200)	6,900 (15,210)	12,600 (27,780)
2	Cast Counterweight	-1,920 (-4,230)	+800 (+1,760)	-2,720 (-6,000)	-700 (-1,540)	-1,220 (-2,690)
3	7.62 m (25') Boom with Guy Line, Three Sheave, Block, Boom Backstop and Upper Spreader	-940 (-2,070)	-1,100 (-2,430)	+160 (+350)	+910 (+2,010)	-1,850 (-4,080)
3-1	Upper Spreader	- 70 (-150)	- 91 (-200)	+ 21 (+ 46)	+ 76 (+170)	-146 (-320)
3-2	Three Sheave Hook Block	-180 (-400)	-302 (-670)	+122 (+270)	+282 (+620)	-462 (-1,020)
3-3	Boom Backstop	- 77 (-170)	- 33 (- 70)	- 44 (- 97)	+ 27 (+ 60)	-104 (-230)
4	Front Outrigger Beams and Jack Screws	-280 (-620)	-150 (-330)	-130 (-290)	-150 (-330)	-130 (-290)
5	Rear Outrigger Beams and Jack Screws	-280 (-620)	+100 (+220)	-380 (-840)	+100 (+220)	-380 (-840)
6	Four Outrigger Floats	- 80 (-180)	- 10 (- 22)	- 70 (-370)	- 10 (- 22)	- 70 (-370)



NISSAN KW30MXL (6x4 CARRIER) WITH HYDRAULIC OUTRIGGERS

Use table below to determine weight adjustments to conform with local highway regulations. Item ❶ is the base figure (total weight). From this item ❶, deduct "minus" figures or add "plus" figures shown. All figures indicate weight in kgs (lbs.).

Item No.	Effect of Removing	Total Weight or Adjustment	Boom Over Front of Carrier		Boom Over Rear of Carrier	
			Front Axle	Rear Bogie	Front Axle	Rear Bogie
1	Complete Standard Machine with 7.62 m (25') Boom Lowered to travel position, three sheave block, boom backstop	19,890 (43,850)	4,030 (8,880)	15,860 (34,970)	7,780 (17,150)	12,110 (26,700)
2	Cast Counterweight	-1,920 (-4,230)	+800 (+1,760)	-2,720 (-6,000)	-700 (-1,540)	-1,220 (-2,690)
3	7.62 m (25') Boom with Guy Line, Three Sheave, Block, Boom Backstop and Upper Spreader	-940 (-2,070)	-1,100 (-2,430)	+160 (+350)	+910 (+2,010)	-1,850 (-4,080)
3-1	Upper Spreader	- 70 (-154)	- 91 (-200)	+ 21 (+ 46)	+ 76 (+168)	-146 (-320)
3-2	Three Sheave Block	-180 (-400)	-302 (-670)	+122 (+270)	+282 (+620)	-462 (-1,020)
3-3	Boom Backstop	- 77 (-170)	- 33 (- 73)	- 44 (- 97)	+ 27 (+ 60)	-104 (-230)
4	Front Outrigger Beams with Outrigger Float and Extension Cylinder	-430 (-950)	-230 (-510)	-200 (-440)	-230 (-510)	-200 (-440)
5	Rear Outrigger Beams and Extension Cylinders	-430 (-950)	+150 (+330)	-580 (-1,280)	+150 (+330)	-580 (-1,280)
7	Front Outrigger Housings	-360 (-790)	-190 (-420)	-170 (-375)	-190 (-420)	-170 (-375)
8	Rear Outrigger Housings	-360 (-790)	+130 (+290)	-490 (-1,080)	+130 (+290)	-490 (-1,080)
9	Front Vertical Cylinders and Trunion Pins	-170 (-375)	- 90 (-198)	- 80 (-176)	- 90 (-198)	- 80 (-176)
10	Rear Vertical Cylinders and Trunion Pins	-170 (-375)	+ 60 (+132)	-230 (- 510)	+ 60 (+132)	-230 (-510)

P&H 220-TC

NOTE: In furtherance of our policy of continual product improvement, all designs and specifications are subject to change without advance notice. Data herein is informational in nature and shall not be construed to warrant suitability of the machine for any particular purpose as performance may vary with the conditions encountered.

Licensed by HARNISCHFEGER INTERNATIONAL CORPORATION
Milwaukee, Wisconsin, U.S.A.



CONSTRUCTION MACHINERY DIVISION

Tokyo Head Office:

Tekko Bldg.

No. 8-2, 1-chome, Marunouchi Chiyoda-ku, Tokyo, Japan

Phone: Tokyo (03) 218-7111

Cable: "KOBESTEEL TOKYO"

Telex: No. 222-3601 (KOBESTEEL TOK)

Construction Machinery Plant:

123, Fukuda, Okubo-cho, Akashi-city, Japan

Phone: Akashi (078) 936-1331

Cable: "KOBESTEEL AKA"

Telex: No. 5628944 (KOBESTL J)

Address Inquiries to:

Printed in Japan 7706500 (F)