

SPEC. F808-E-1

Date: November, 2000

SPECIFICATION

“NISSHA”

PHOENIX Series

Hydraulic Pile Driving Rig

Model : DH808-170M, M110D

(Standard version)

Quantity: **unit**

November, 2000

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1. GENERAL CONDITIONS

This specification shall cover the standard specification of NISSHA, Hydraulic Pile Driving Rig; model DH808-170M (here-in-after called "The machine") manufactured by NIPPON SHARYO, LTD.

The general arrangement and principal dimensions of the machine are shown in the drawings attached.

1) DESIGN AND WORKMANSHIP

The machine shall be designed to perform the maximum efficiency with the least fuel consumption and the lowest maintenance costs.

The workmanship shall be of the first class in all respects.

The machine shall be built for simple mechanical arrangement and easy in inspection and maintenance.

2) MATERIALS

The materials used in the manufacture of the machine shall be of the highest quality, free from defects and imperfections.

Principal materials such as bolts, nuts, seals and steel plates used in the machine confirm to the Japanese Industrial Standards. (Almost equal to ISO)

3) TEST AND INSPECTION

Routine test and inspection in our factory shall be final.

4) PAINTING AND LETTERING

Under-coating by anti-rust paint and enamel finishing shall be performed in accordance with manufacturer's standard practice.

Main parts of the equipment shall be painted in NISSHA Green and other equipment in manufacturer's standard.

5) LANGUAGE AND UNIT OF MEASUREMENT

All documentation, such as specifications, manuals, etc. shall be written in English and all of equipment shall be designed in metric system.

6) SERVICE CONDITIONS

The equipment shall meet the following service conditions.

Ambient temperature: -10 or higher and 40 or lower.

7) WARRANTY

All the machines specified herein shall be warranted by us for a period of twelve (12) calendar months after the date of being to put into operation, or fourteen (14) months after the date of shipment at a Japanese port, or one thousand engine operation hours according to the service hour meter, whichever is soonest.

The warranty shall cover defects in design, materials and workmanship only, shall not applicable to damage sustained mishandling of the machine or normal wear and tear.

The warranty shall not be applicable to the parts and materials mentioned below.

- 1) Linings as brake/clutch bands and disc.**
- 2) Wear plates**
- 3) Wire ropes**
- 4) Rubber made parts**
- 5) Seals as o-rings, seal rings, back-up rings, etc.**
- 6) Gaskets and sheet packings**
- 7) Filter elements**
- 8) Batteries**
- 9) Electric wiring**
- 10) Glasses**
- 11) Other quick moving parts**
- 12) Lubricants**

... concluded

2. FEATURES

1) High performance in hydraulic pile hammer work

The machine is specially designed for various heavy duty pile driving works equipped with a hydraulic pile hammer and an earth auger drive + flight auger, or etc.

2) Durable and stable pile driving work

A durable cylindrical leader with a pair of back stay mechanism provided to specially designed basic machine for pile foundation work purposes gives a high degree of durability and stability of the machine.

3) Excellent maneuverability

The maximum allowable operating weight of 180,000kgf assures facile maneuverability in the site.

R.H. and L.H. independent traveling mechanism with a high traction force enables the machine to make both pivot and spin turns, and to steer the crawlers smoothly and continuously.

4) Smooth swing

The swing mechanism with NIPPON SHARYO original reaction device makes operator easy to control sensitive swing motion and accurate positioning of the superstructure.

5) Comfortable operator's room with low sound level

Well insulated operator room with five (5) wide wind-shields assures bright and quiet operation circumference with minimum fatigue.

6) Easy winch operation

Hydraulic actuated control levers are easy to operate, and high/low winch speed change and winging-stop/automatic braking-rewinding functions can be done by one control lever with mode indicating lamps.

7) Ultra low winch speed control / Constant winch speed control (Optional extra)

Winch rope line speed can be controlled at the desired speed of 1/13 to 1/1 times of its rating.

Every winch rope line speed can be maintained at the desired constant speed by "Constant speed controller" as optional extra.

8) Easy maintenance

Adopting floating ring seals in drive tumblers, take-up tumblers and lower track rollers, and sealed bearings to every sheaves require minimum daily maintenance service. A grease-bath type swing pinion gear prolongs its service interval.

9) Low fuel consumption

The machine is powered by a direct fuel injection type diesel engine with a pair of variable displacement type plunger pumps of efficient performance, accordingly economical operation can be assured.

10) Folding type outrigger beam

Minimizing of useless play of outrigger beams assures less swaying of back stays and leader and reducing re-assembling time of the machine at site.

11) Durable M110D leader

The maximum permissible torque applied to the leader is up to 30 ton-m and the maximum permissible pulling load at the distance of 1000mm from the guide pipe center with the front jacks provided is 75 ton.

Self-erection limit of the leader is 24m long maximum.

3. SPECIFICATIONS OF PILE DRIVING RIG

3.1 Model of basic machine NISSHA ; DH808-180M

3.2 Nominal dimensions

1) Overall width in transportation.....	3,300mm
2) Crawler overall width in working.....	4,960mm
3) Crawler center to center distance in working.....	4,000mm
4) Crawler shoe width.....	960mm
5) Crawler overall length.....	6,315mm
6) Tumblers center to center distance.....	5,245mm
7) Ground clearance.....	360mm
8) Cab width.....	3,261mm
9) Cab height.....	3,541mm
10) Gantry height (Working).....	8,696mm
11) Rear end radius (Counterweight end; working)	6,373mm
12) Rear end clearance.....	700mm
13) Distance from swing center to boom foot pin center	1,350mm
14) Height from boom foot pin center	2,220mm

3.3 Operation speed

1) Main, auxiliary and third drums, winding speed (Low)	* 34m/min.
2) Main, auxiliary and third drums, winding speed (High).....	* 67m/min.
3) Fourth drum, winding speed (Option).....	* 41m/min.
4) Leader drum, winding speed	* 53m/min.
5) Swing speed	2.0 rpm
6) Travel speed	0.64/1.1 km/hr.
7) Gradeability (Basic machine)	30%
8) Weight of basic machine	62.5tf
9) Counterweight.....	(9.5 + 6.0 + 6.5) 22.0tf
10) Standard leader length	21m
11) Maximum permissible operating weight	180,000kgf
12) Ground contacting area	100,704 cm ²

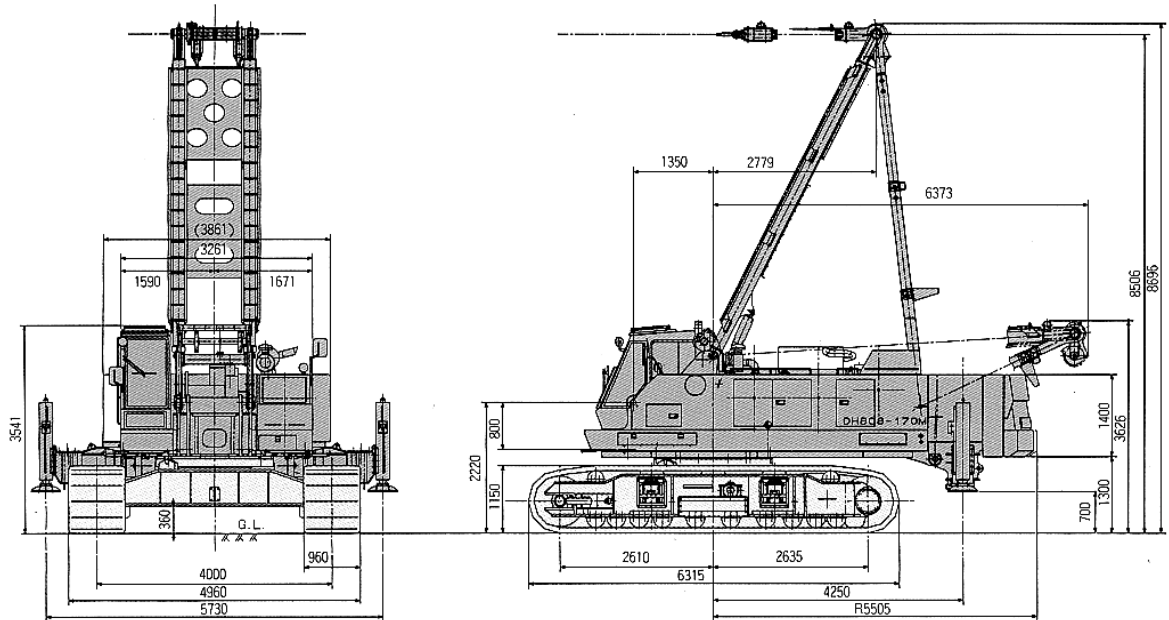
3.4 Diesel engine

- 1) MakerHINO MOTOR LTD.
 - 2) ModelEP100T diesel engine
 - 3)TypeWater cooled, 4-cycle, Overhead valve, in-line
6-cylinder, direct fuel injection, turbo-charged.
- Rated output 147 kW/2000rpm
(200PS/2000rpm)

3.5 Battery DC24V-120AH x 2 pcs.

3.6 Fuel tank capacity 250 liters

4. GENERAL VIEW OF BASIC MACHINE (DH808-170M)



5. STRUCTURE AND FUNCTIONS

5.1 Upper revolving superstructure

All welded, stress relieved and precision machined unit, specially designed for rigidity and durability.

5.2 Winch drums

- 1) Main, auxiliary, third, fourth (Option) and leader winch drums are of special alloy cast iron.
- 2) Grooved leader drum is mounted on a drum shaft and driven independently by a hydraulic motor.
- 3) Main drum is mounted on ball race bearings on single drum shaft and driven independently by one hydraulic motor.
Auxiliary and third drum are mounted opposite each other on ball race bearings on single drum shaft and driven by one hydraulic motor.
- 4) Fourth drum (Optional extra) is mounted on ball race bearings on single drum shaft and driven independently by one hydraulic motor.
- 5) Drum clutch system
Main, auxiliary, third and fourth drums are equipped with internal expanding friction clutch bands powered by respective hydraulic clutch cylinders and ensure both of power controlled lowering and free-fall lowering actions.
- 6) Drum brake system
Main, auxiliary, third and fourth (Option) drums are equipped with external contracting friction bands powered by treading respective brake pedals.
- 7) Leader hoisting/lowering mechanism
Completely independent operation from other winch functions.
Both of hydraulic brake and spring-loaded/hydraulic released band brake offer positive and safe stopping of leader action.
- 8) Drum pawl lock
Main, auxiliary, third, fourth (Option) and leader drums are equipped with electrically operated pawl locks for safe operation.

5.3 Swing mechanism

- 1) Swing motor
Axial piston motor with built-in planetary reduction gear.
- 2) Swing bearing
Sealed ball race bearing with a heat-treated internal gear.
- 3) Swing brake
Spring loaded and hydraulic released negative brake is installed.
- 4) Swing lock
Manually operated mechanical lock with a rod tip which is engaged in the hole of track frame during transportation and assembling, whenever needed.

5.4 Operator room

Roomy, completely independent operator's room has safety glass windshields giving super blighting and excellent all-round visibility.

- 1) Control levers and instruments are arranged in convenient trouping, reducing unnecessary moves for operator.
- 2) Comfortable reclining seat is adjustable.

5.5 Undercarriage

1)Track frame

All welded, stress relieved, precision machined unit, especially designed for rigidity and durability.

2)Side frame

Side frame of all-welded construction can be expanded for better stability of the machine during working and retracted for transportation by hydraulic cylinders equipped as standard.

3)Track shoes

Shoes are casting, heat-treated steel, flat and tapered surfaces and are connected by heat-treated steel pins.

4)Rollers

Life-lubricated lower rollers, upper rollers and drive tumblers are provided.

13 lower rollers and 2 upper rollers in each side frame, with double rolling surfaces.

5.6 Hydraulic system

A semi-closed circuit hydraulic system with double-plunger pump plus 3-gear pump assures both independent and simultaneous operations of all functions.

5.6.1 Main pump (Double-plunger pump)

1) Type	Plunger pump 1 Variable displacement Total power control	Plunger pump 2 Variable displacement Total power control
2) Setting pressure	314 bar (320 kgf/cm ²)	314 bar (320 kgf/cm ²)
3) Oil flow	214.3 lit./min.	214.3 lit./min.
4) Applications	Travel (L.H.) Leader drum Aux./third drum(low) Main drum(high)	Travel (R.H.) Main drum (low) Aux./third drum (high) Fourth drum(Option)

5.6.2 Gear pump

	Gear pump 1	Gear pump 2	Gear pump 3
1) Type			
2) Setting pressure	206 bar (210kgf/cm²)	172 bar (175kgf/cm²)	
3) Oil flow	166 lit./min.	72 lit./min.	
4) Applications	Swing Expansion of crawlers	Front-end attachments	Pilot circuit

5.6.3 Hydraulic motor

- 1) Swing motor** **1-fixed volume axial piston motor with brake.**
- 2) Winch(Main)** **1-fixed volume radial piston motor with counter balance valve**
- (Aux./ third)** **1-fixed volume radial piston motor with counter balance valve**
- (Fourth)** **1-fixed volume axial piston motor with counter balance valve**
- 3) Winch (Leader)** **1-fixed volume axial piston motor with counter balance valve**
- 4) Travel** **2-fixed volume axial piston motor with spring loaded/
hydraulic released negative brakes and relief valves.**

5.6.4 Hydraulic oil tank capacity : 390 liters

6. WORKING CAPACITY TABLR

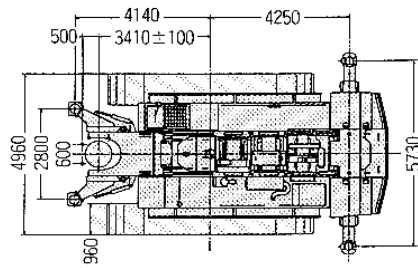
Working capacity table (DH808-170M,M110D)

Class	Hammer		Earth auger				Leader		Pile		Vertical drive Stability (with pile) (Degree)			Backward inclination (degree)		Total Operating weight (ton)	Average ground pressure (kg/cm ²)
	Weight (ton)	Cap weight (ton)	Auger drive		Screw		Length (m)	Weight (ton)	Length (m)	Weight (ton)	Angle		Stability	Side			
			Class	Weight (ton)	Length (m)	Weight (ton)					For/aft	Side					
NH-150B	33.5	4.5	-	-	-	-	30	24.5	20	10.0	5.1	12.0	-	-	163.5	1.62	
			MAC-240-3	12.0	32	19.5	36	27.8	-	-	7.1	11.9	-	-	167.2	1.63	
			D-240HP SMW	15.7	28	19.2	33	26.2	26	10.0	5.6	12.2	-	-	165.5	1.64	
			SMD-240HP	15.6	21	15.6	27	23.0	18	10.0	5.6	14.6	-	-	169.4	1.68	
NH-100	22.5	3.5	D-150HP	15.7	21	12.1	27	23.0	17	10.0	5.1	11.1	-	-	178.9	1.78	

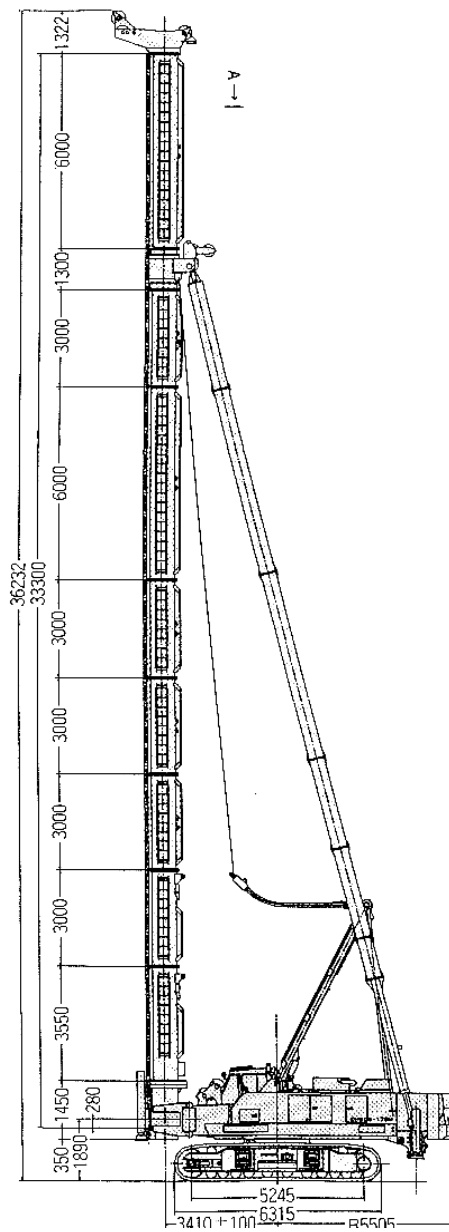
Note:

- The table above shows based on NIPPON SHARYO standard specifications. Consult us when special specifications are required. The weights of front jacks, outrigger jacks and back tensioner are included in the total operation weight shown in the table.
- The maximum leader length of self-erection is 24m with the front jack provided. A suitable assistant crane is required if a longer leader than 24m to be erected.
- The permissible lifting load of the pile suspension rope of 20 is 5 tons with single-part line and 10 tons with two-part line. Never allow to exceed the permissible lifting load. Consult us when using ropes having other specifications and 3 to 4-part line.
- Take the safety factor of 6 and more for the auger suspension rope.
- Guide pipe of the leader is 101.6 x 600mm in pitch.
- The maximum permissible operation weight is up to 180 tons.
- The maximum permissible extraction load on the top of the leader is 75tons with the leader length of 30m and the distance between the auger center and guide pipe center to be 1000mm. Provide the front jacks when the auger extraction force exceeds 60tons.

7. GENERAL VIEW OF DH808-170M, M110D, 33M LEADER



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8. STANDARD SCOPE OF SUPPLY

1) Basic machine : model DH808-170M 1 unit
equipped with

- 22 ton counter weight
- Four drums of main, auxiliary, third and leader
- Leader bracket
- A pair of self-erecting jack
- A pair of outrigger jacks
- Electric fan in operator’s cab
- Radio
- Electric fuel pump
- Ash tray and sight level gauge with a bubble

2) Pile driving front-end attachments 1 set

- Leader, Revolving type Model: M95D₂ 21m long
- Double guide pipe (Two pairs of 101.6 x pitch 600mm)

Composed of

- 0.35m lower leader 1pc.
- 1.45m revolver 1pc.
- 3.55m Lower leader 1pc.
- 3m lower leader 1pc.
- 3m middle leader 1pc.
- 3m upper leader 1pc.
- 1.3m holder 1pc.
- 6m upper leader..... 1pc.
- Top sheaves assembly.. 1set

3) Standard tool set 1 set

9. OPTIONAL EXTRA DEVICE

- **Inclinometer 1 set**
(Basic machine and leader)
- **Hydraulic P.T.O1 set**
- **Fourth drum 1 set**
- **Ultra-low speed control device 1 set**
- **Air conditioner in operator's cab 1 set**