

SPEC. F5-2691-E

Date: May, 2000

# ***SPECIFICATION***

## **“NISSHA”**

### **GEOMATE Series**

### **Soil Stabilizing Rig**

**Model : DHJ-12**

**(Cement slurry + soil-in place mixing version )**

**Quantity:            unit**

**May , 2000**

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## **1. GENERAL CONDITIONS**

This specification shall cover the standard specification of NISSHA, GEOMATE series soil stabilizing rig; model DHJ-12 (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 °C or higher and 40 °C 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 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 be 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 mixing performance**

- A wide and step-less speed range from 18 to 110 r.p.m. of its mixing rod provides the most suitable mixing condition to meet with the geological conditions to be stabilized.
- A powerful drilling torque of 27.4kN (2.8ton-m) allows it to perform the maximum drilling depth of 11m with a mixing fin of  $\varphi$  1000.

### **2) Compact design**

The rear end radius of the machine is so compact as 1980mm at the end of its counter weight which allows it to work in confined area.

### **3) Clean exhaust gas emission yet high power diesel engine**

A powerful diesel engine having 71.3kW(97PS) allows the machine to maneuver simultaneous operations and assures it to operate efficiently with low exhaust gas emission.

### **4) Job execution monitor/recorder**

A touch panel type computer-controlled job execution monitor/recorder allows it to monitor every data timely as [Mixing depth, mixing speed, torque, cement slurry flow rate, total amount of cement slurry to be supplied, etc.] , and to record them.

### **5) Low sound level operation**

Fully covered power compartment with thick steel panels coated by insulation materials minimizes its sound level.

(Registered as a low noise level equipment by Ministry of Construction in Japan).

### **6) Ultra-slow speed control**

Its traveling speed can be controlled to 1/4 of its rating by a switch for safe loading/unloading work to a trailer.

### 3. SPECIFICATIONS

3.1	Model	NISSHA DHJ-12
3.2	Dimensions	(Unit : mm)
	Overall width	2,415
	Crawler center to center distance	1,870
	Shoe width (Steel made)	450
	Tumblers center to center distance	2,234
	Ground clearance	380
	Rear end radius	1,980
	Overall length in transportation	8,567
	Overall height in transportation	2,714
3.3	Performance	
	1) Rotary drive	
	Torque	9.1~27.4 kN-m (932~2,790kgf-m)
	Speed	18~110 min <sup>-1</sup> (18~110 rpm)
	Drive/extraction force	59.8 kN (6.1 ton)
	Elevation speed	0.5 ~ 8.6m/min.
	Rod chucking system	Spring loaded/ hydraulic released
	2) Leader	
	Leader inclination range	Forward : 3° , rear : 90° Both side : 3°
	Elevation stroke	6,300mm
	3) Mixing rod	Length
		Hexagon
		Rod
	4) Maximum drilling depth	6.6m + 2 ~ 5m 132mm φ 130
	5) Grouting pipe	11m
	6) Winch drum	1-1/2 inches
	Maximum line pull	6.86kN (700kgf)
	Winding/rewinding line speed	21 m/min
	Rope capacity ( Rope diameter:φ 8)	20 m
	7) Maximum operating radius	2.7 m
	8) Swing speed	3.5 min <sup>-1</sup> (3.5 rpm)
	9) Travel speed (Ultra-slow speed)	3.0 km/hr (0.7 km/hr)
	Ultra-slow speed	
	10) Gradeability	40%
3.4	Mass (Weight)	
	Operating weight (with 6.6 + 5m rod)	13,360kg
	Weight in transportation	13,074kg
	Counterweight	1,740kg
	Ground contacting area	22,030 cm <sup>2</sup>
	Average bearing pressure	59.3 kPa (0.61 kgf/cm <sup>2</sup> )

### 3.5 Diesel engine

Type	HINO W04C-TS diesel engine 4-cycle, water-cooled, direct fuel injection.
Displacement	3.839 L (3,839 CC)
Output	71.3kw /2100min <sup>-1</sup> 97PS /2100rpm
Torque	353kN-m /1800 min <sup>-1</sup> (36 kgf-m /1800rpm)
Fuel consumption rate	234g/kW-h (172g/PS-h)
Fuel tank capacity	190 liters

## 4. STRUCTURE AND FUNCTIONS

### 4.1 Winch mechanism

A winch drum is powered directly through a hydraulic winch motor with a multi-disk brake.

The winch can wind and rewind a wire rope by moving a winch control lever in the operator's room, and it is braked automatically when the control lever is returned to neutral position.

### 4.2 Swing mechanism

Swing motion of the superstructure is made by an independent hydraulic mechanism with a hydro-electrically controlled multi-disk brake.

Swing bearing: Sealed ball race bearing with heat-treated internal ring gears.

Swing brake : Disk brake is hydro-electrically controlled by a switch on the swing lever grip.

Swing lock: Lock pin is manually inserted into a hole on the track frame during transportation.

Swing positioning: The superstructure can be positioned at the desired location

in 360 degrees with a spring loaded-hydraulically released locking device.

### 4.3 Under carriage

Left and right crawlers are independently driven by respective hydraulic motors assuring smooth steerability.

Spring-loaded and hydraulically released disk brake are built-in each drive motor.

One upper roller and five lower rollers, and drive/take-up tumblers are provided to each L.H. and R.H. crawler.

A straight dozer blade provided at the front of the crawlers can be lifted/lowered

by a dozer cylinder.

#### **4.4 Leader mechanism**

A square box type leader made of steel plates is connected to the superstructure at its lower end with a pin.

The leader can be inclined both sides by extending and retracting a hydraulic cylinder provided at its lower end.

And the leader is erected and stored over the superstructure by a hydraulic cylinder located at its back.

A roller chain belt is provided along the whole length of the leader for elevating the rotary drive.

This chain belt is wound by a sprocket of the hydraulic motor provided at the lower end of the leader. The rotary drive is elevated along the leader through this hydraulic motor.

#### **4.5 Rotary drive**

The mixing rod can be chucked at its desired position with a chucking device and rotated by the rotary drive powered with a hydraulic motor.

#### **4.6 Monitor/recorder (SEKO-MASTER)**

The device can control the elevation speed of the rotary drive at the desired set-up speed and job execution data to be printed out.

- Speed control range: 0.5 to 5.0 m/min.

- Monitor data;

Mixing depth, mixing speed, torque, Maximum set-up torque, Slurry flow rate,

total amount of slurry to be supplied.

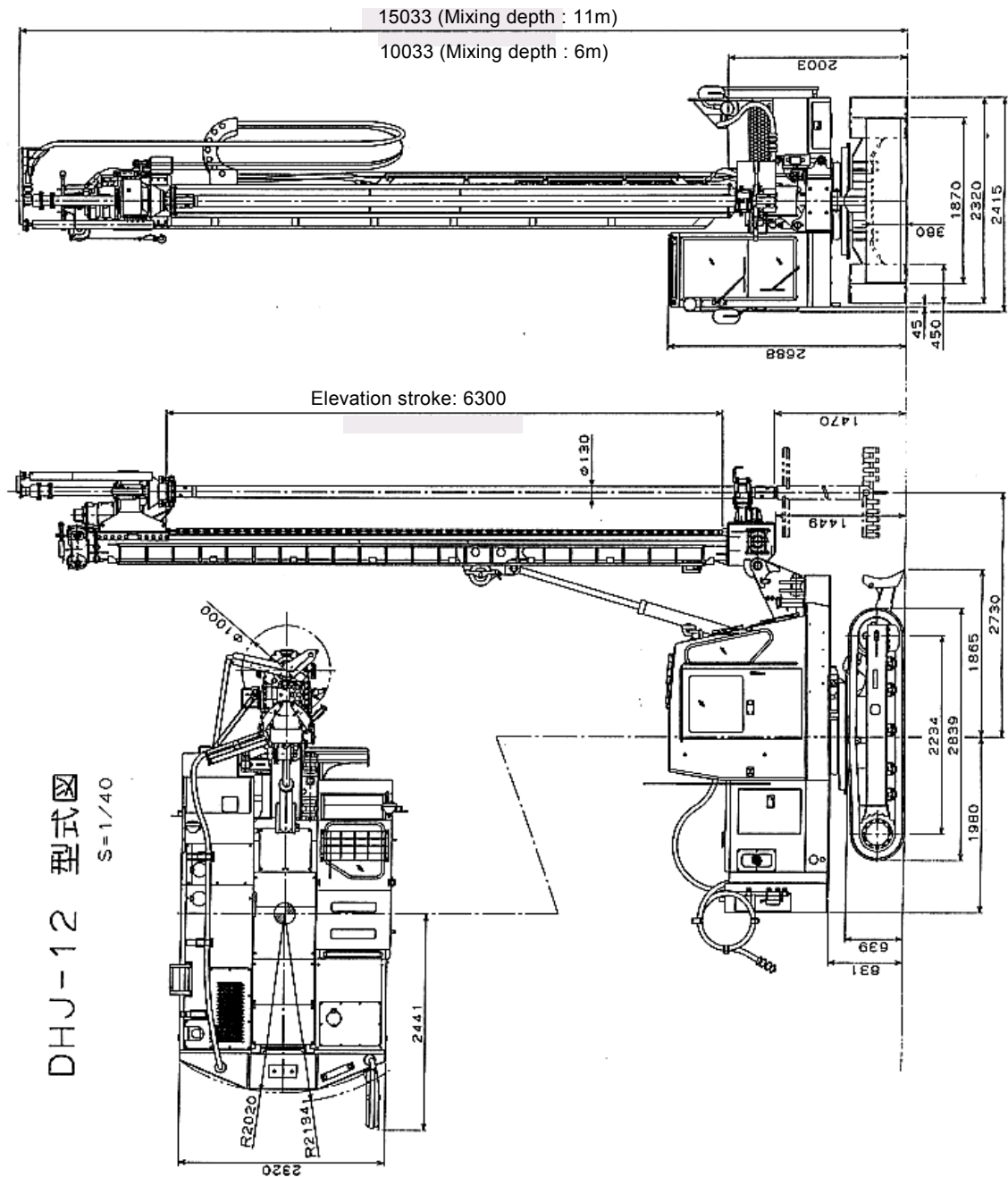
- Printed out data:

Mixing depth, mixing speed, torque, Slurry flow rate,  
total amount of slurry to be supplied.

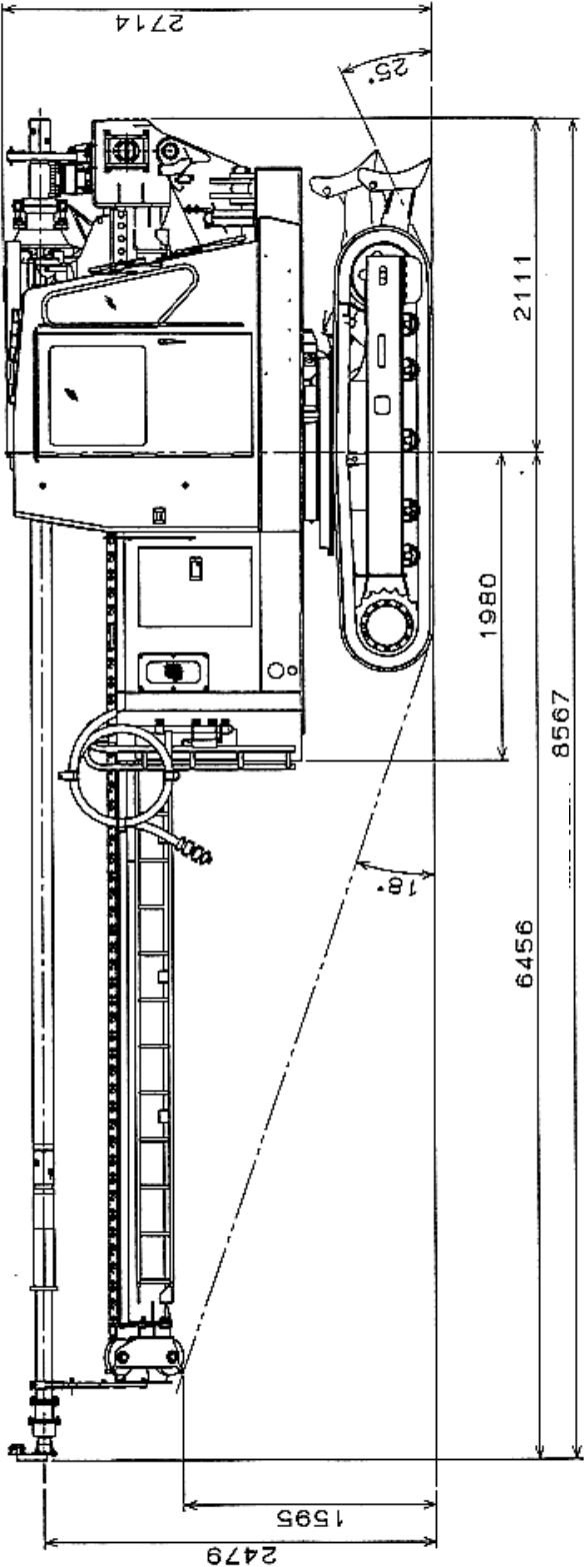


## 5. GENERAL VIEW OF DHJ-12

### 5.1 DHJ-12 ( Soil stabilizing version )



5.2 DHJ-12 (Transportation)



## **6. STANDARD ACCESSORIES**

- **Wire rope (  $\varphi$  8 x 20m ) , Hook block**
- **Standard mixing rod ( 6.6m)**
- **Monitor/recorder**
- **Grouting piping ( Hose/swivel )**
- **Magnetic flow meter ( Measuring range 10 ~ 270L/min )**
- **Electric inclinometer**
- **Front lights**
- **Radio**
- **Electric fan in operator's room**
- **Heater in operator's room**

## **7. OPTIONAL EXTRA**

- **2 ~ 5m extension rod**
- **Data memory card (IC card)**
- **Analog printer**
- **Hydraulic rod guide**
- **Air conditioner**
- **Window washer**
- **Fuel pump**