·GH·
CRANES & COMPONENTS

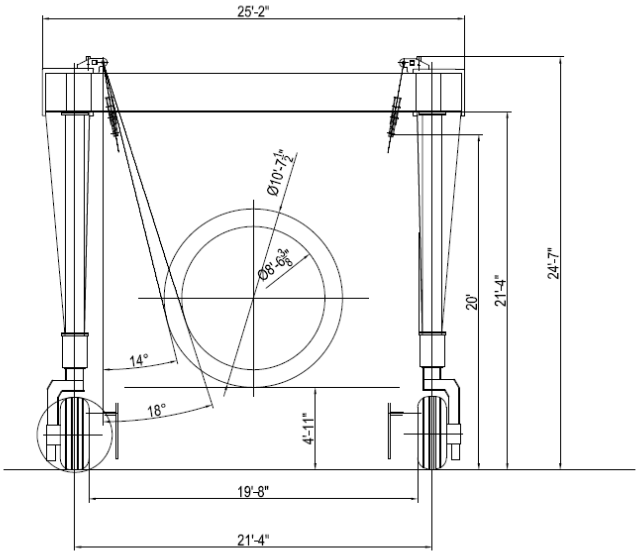
Industrias Electromecánicas GH S.A
Barrio Salbatore s/n
BEASAIN (Gipuzkoa) 20200

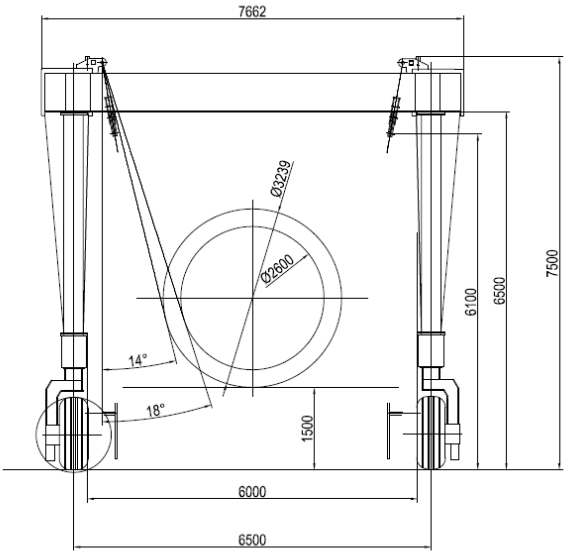
TEL: +34 943 805660
FAX: +34 943 888721
ghsa@ghsa.com
www.ghsa.com

1. MAIN TECHNICAL CHARACTERISTICS

GH 88I – 175,000 lbs (80t) INDUSTRIAL RUBBER TYRED GRANTRY (RTG)

Lifting capacity	175,000 lbs (80t)
Max Height	24'7" (7,500 mm)
Lifting useful height	**20'0" (6,100 mm)**
Inside clearance	**19'8" (6,000 mm)**
Gauge	21'4" (6,500 mm)
Max Width	25'2" (7,662 mm)
Wheels distance	**22'4" (6,800 mm)**
Lifting speed loaded	2 m/min
Lifting speed unloaded	4 m/min
Travelling speed	0-40 m/min
Max gradient (full load)	2%
Ground wheel pressure	9 kg/cm2
Motorized wheels	2
Trolleys Qty	2





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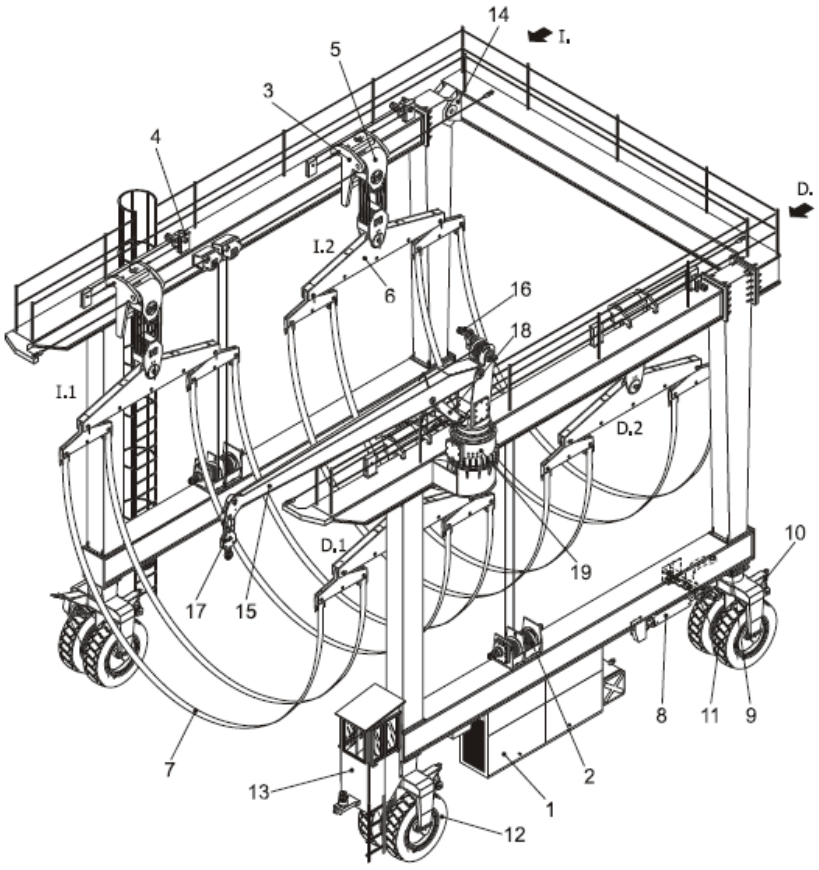
5. COMPLETE TECHNICAL CHARACTERISTICS

1. Propeller unit
2. Lifters
3. Shift crab
4. Shifting mechanism
5. Upper sliding block
6. Lower block (rocking beam)
7. Slings
8. Wheel steering mechanism
9. Turning system
10. Gantry travel
11. Front wheel steering and traction
12. Rear wheel
13. Cabin
14. Beam articulation
15. Jib
16. Jib lifter
17. Jib block
18. Jib arm lifting cylinder
19. Jib slewing mechanism

I. Left
D. Right



Remote control included. Cabin and jib not included.

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1. GENERAL

Included in the following pages is a construction study, delivery and commissioning of a GH automotive gantry (RTG), for industrial use purpose.

2. CHARACTERISTICS

2.1 Functional characteristics

The GH automotive gantry will assure the industrial job forecasted.

The GH automotive gantry allows a quick adaptation to different sizes of plates/blocks to be moved.

2.2 Dynamic characteristics: The machinery will have the following characteristics:

GH88I (80t):

- Max. travelling speed: 40 m/min
- Full load lifting speed: 2 m/min
- Unloaded lifting speed: 4 m/min

3. DUTIES AND STANDARDS

All calculations are made according to the regulations of FEM for hoisting machinery, with these specific sections:

Structure:	Class of use:	A
	Load state:	2
	Group class:	3
Machinery:	Work type:	V 0.5
	State	2
	Group class:	1 Bm

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4. STRUCTURAL DESIGN

4.1 The structure: is generally composed in three modules:

- The interior structure is composed of 2 lateral beams with wheels.
- Four vertical legs.
- The upper structure is composed of 2 beams joined to another beam in the upper front, which forms a 'U' shaped structure. This upper structure has one joint to absorb the rated torques and to stabilise the machine.

2 steerable wheels are optimum for required operation, being a robust solution, as it is our standard and tested in many installations all over the world.

All beams are box girder type, rigid and welded.

The joints between the girders to consolidate the structure are made by high resistance bolts.

4.2 Additional manufacturing points: Any load bearing parts of the structure are manufactured with a min. width of 6 mm such as plate or profile.

GH always avoids large discontinuities in sections and shapes.

All the different sections of a GH automotive gantry (lifting mechanisms, drive systems, hydraulic systems, etc.) are totally accessible for maintenance purposes.

All bolted joints have a min. diameter of 14 mm., except with regard to the items in section 4.2.

All bolted joints are watertight to protect against corrosion.

4 emergency push buttons, one on each corner of the machine in order to stop the machine in case of an emergency.

4 flashing lights and acoustic signal to indicate that translation in the machine is in motion.

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5. MACHINERY

5.1. Gearboxes: The gears are enclosed in rigid, robust and watertight boxes, which are easily disassembled and require minimal maintenance.

The shaft openings are protected with watertight seals. All shafts are supported by bearings, either ball or roller.

The gearboxes are equipped with:
- a lubrication level indicator.
- a ventilator/breather plug.
- a lubrication drainage plug.

All gearboxes are filled with fluid grease lubrication. The fluid grease ensures that all gears have a lubricant coating, even after the gearboxes have been out of service for long periods of time.

5.2. Lifting drums: The drums are manufactured from a welded steel tube.

The external flange for shaft connection is machined from solid steel.

The gearbox shaft is splinted and is connected to the drum via a splinted flange.

The drum rope grooves allow the wire rope to lay in position correctly and have a minimum diameter, two and a half times, the overall wire rope diameter.

The drum always has three spare wire rope grooves after the rope has been wound on it.

5.3 Brakes: For all travelling movements we have multi-disc security brakes.

The brakes are hydraulically operated and actuate automatically via a direct connection to the engine electrics and are actuated by oil pressure loss.

5.4 Sheaves: The sheaves are manufactured from laminated steel.

The sheave diameter is according to the FEM specifications.

5.5 Wire ropes: The wire ropes are very flexible, complete with internal greasing.

The wire ropes are calculated according to FEM and directive of machines' specifications.

Their safety factor is equal to or bigger than 5 times the resulting nominal load.

They are complying with European standards.

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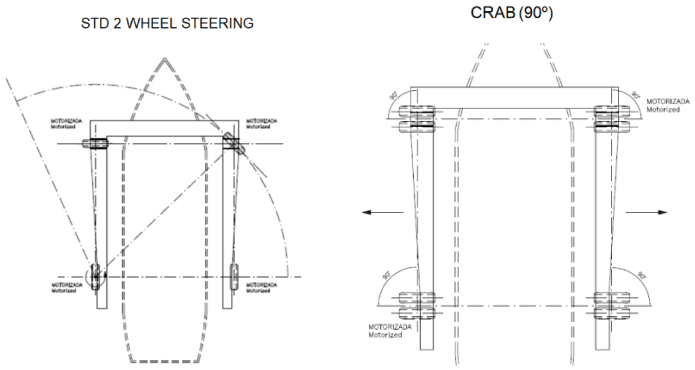
5.6 Tires:

There are 4 wheels in total, 2 steerable and 2 fixed.

Steering is made by means of rollers, actuated by hydraulic cylinders.

OPTIONAL: 90º mechanical steering: 4 wheels mechanically adjusted to obtain 90º turning (by 4 extra hydraulic cylinders, one on each wheel).



5.7 Diesel engine: The diesel engine is the autonomous part of the GH automotive gantry.

Water-cooled diesel engine, Volvo or Perkins brand. It has a large fuel tank capacity of 180 l and an acoustically isolated chassis engine.

The engine is installed in the lateral low part of the automotive gantry, in a specially adapted closed compartment, which is accessible for maintenance purposes.

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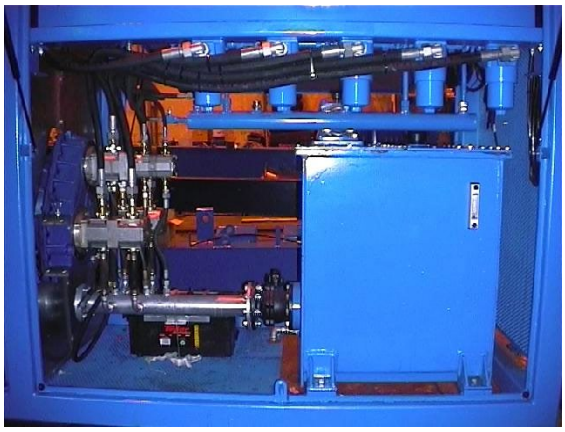
6. HYDRAULIC EQUIPMENT



6.1 General: The hydraulic system is a low pressure open circuit type and has been made simple, yet totally functional. The oil tank capacity is 250l.

All features allowing the safe, secure and full manoeuvrability of the equipment are incorporated into the system design.

Pressure loss is kept to a minimum due to the specific calculations of the hydraulic circuit.

6.2 Hydraulic pumps: The pumps are connected to the engine through hydraulic distributors.

The pumps have a fixed flow; taking oil from the oil reservoir tank and sending it directly to the distributors, through which the required movements are actuated.

6.3 Distributors: The distribution parts are regrouped in blocks of two or three elements. From these the pipes are distributed to the several hydraulic motors which actuate the equipment required movements. The distributors are manual and progressive.

6.4 Piping: All pipes are neatly packed into blocks that are easy to access.

The pipes are made of steel of 316 specifications and are not welded in anyway, according to the requirements of the DIN-3291 standard. All flexible pipes assembled in hydraulic pressure circuits are protected with double braiding.

All pipe connections and fittings are of high quality and the distance between two consecutive supports is large enough to prevent harmful vibrations.

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The entire terminal nut and the sleeve head assembly is made by using stainless steel of 204 specifications. Soft rubber pipe surface is covered with a fibrous material that can prevent aging caused by UV light.

6.5 Hydraulic cylinders: The cylinders actuate the unit's steering and are generally activated through a hydraulic system.

The cylinders are manufactured from high quality materials and the plunger rods are protected with a hard chrome coating.

6.6 Hydraulic motors: These are of high quality manufacture and allow the movement of the slings in all motions.

6.6.1 *Lifting*: There are four motors for the lifting movement, one for each lifting operation and these are activated by individual commands (Danfoss brand servo motors).

6.6.2 *Travelling*: For the travelling movements there are two motors, one for each drive wheel and these are activated by a unique command (Perkings brand motor).

6.7 Valves: All the motors are protected by special hydraulic safety valves.

6.8 Oil reservoir tank: The oil tank has a minimum capacity of 250 litres (To be checked with technical office for each automotive gantry)

It has a return filter (with 10 microns filtration) for a filtration capacity of twice the nominal flow, with a visual dirt indicator.

All returning oil is piped to a special trap which then passes the oil through special filters and then back to the reservoir.

The reservoir has a filter-cap, a drainage plug and a pump intake point.

7. ELECTRICAL EQUIPMENT

7.1 Electrical cabinet: The electrical cabinet is located next to the motor and has control over the following components:

- Emergency lights button.
- Battery charge indicator.
- Clock.
- Oil pressure indicator.
- Motor temperature indicator.
- Start heater indicator.
- Horn.
- Petrol indicator.

7.2 Battery: There is 24 v. battery, for engine starting and electrical services.

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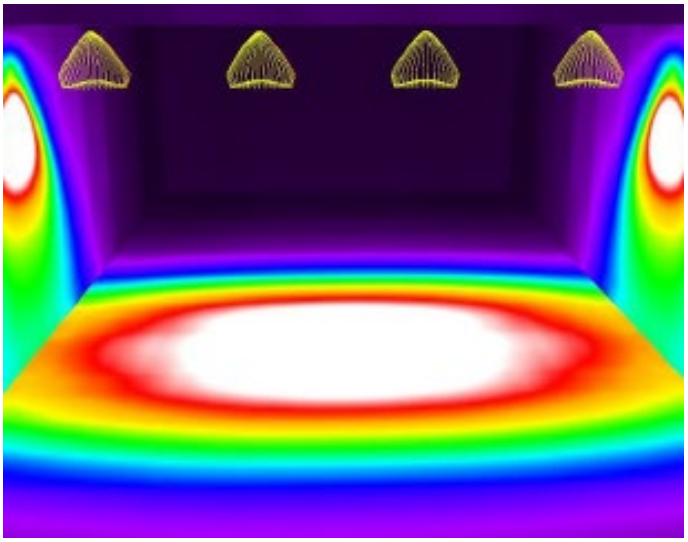
It is located close to the diesel engine and has easy access for maintenance.

7.3 Work lights: The GH automotive gantry has LED TYPE 50W lights (4000 lm) that illuminate the complete working area and allow working at night. The number of lights needed will be studied.



Study example (4 lights)

7.4 Electric installation: All cables are protected by watertight steel conduit and watertight connection boxes.

7.5 Two Hydraulic load indicators: Mounted in the lifting wire rope terminals, with the resultant measurements displayed on indicator clocks in the control cabin. They perform as load limit switches as well.

8. CONTROL

8.1 Radio remote control + 1 spare transmitter ***included:***

Remote radio control IKUSI Mod IK4 to facilitate the handling of the machine.

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9. SANDBLASTING AND PAINTING

9.1 Sand blasting: All structure surfaces are sandblasted to S.A. 2.5, prior to painting.

9.2 Painting: Painting is made with high quality paints as follows:

a) A primer coat with minimum thickness of 40 microns.
b) An intermediate coat with minimum thickness of 80 microns.
c) A rellow and grey (or customer choice) final coat with minimum thickness of 80 microns.

10. WEIGHT DISPLAY

There will be two weight display installed in the travel lift, one for the front weight and other one for the back weight. The screens will be located close to the motor.

Weight Control with load cell and display ***(included).***