PUM

GEISMAR

SWITCH & TRACK PANEL RELAYING SYSTEM

PUM

For the removal and installation of prefabricated switch and crossing or plain line track panels without distortion, cutting into sections or dismantling.

- whatever their length because of its **MODULAR DESIGN**,
- whatever their mass (timber, concrete or steel sleepers) because of its **POWER**,
- on single or double track line, as **IT DOES NOT INFRINGE ON THE LOADING GAUGE** of the neighbouring track.

APPLICATION

- Switch and crossing installation on new track.
- Track panel installation on new track.
- Switch and crossing substitution.
- Temporary removal of conventional track sections for reballasting operation, including on electrified lines, in tunnel or on viaduct.
- Slewing of existing track.

Laying of a concrete sleepers turnout of 45 metres (55 t).

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ADVANTAGES

- Reduced possession time for the installation of S & C or plain line sections.
- Prefabrication of S & C or panels outside possession gives higher quality, with work being carried out during daylight and without interruption of traffic.
- Reduced uncertainty in programming possession time due to the prefabrication of track panels.
- Higher hand back speed than with conventional methods.
- No distortion of the track panel during transport.
- Reduction in traffic disruption as work can be carried out without fouling an adjacent line.
- Safety resulting from high lifting capacity.
- Versatility of application according to the various site conditions (stations, side obstacles...).
- Can be easily and quickly put into service, thanks to its self-propelled gantries.
- Easy maintenance.

Laying of a concrete sleepers prefabricated crossover of 150 metres (200 t).

COMPOSITION

A PUM unit is composed of :

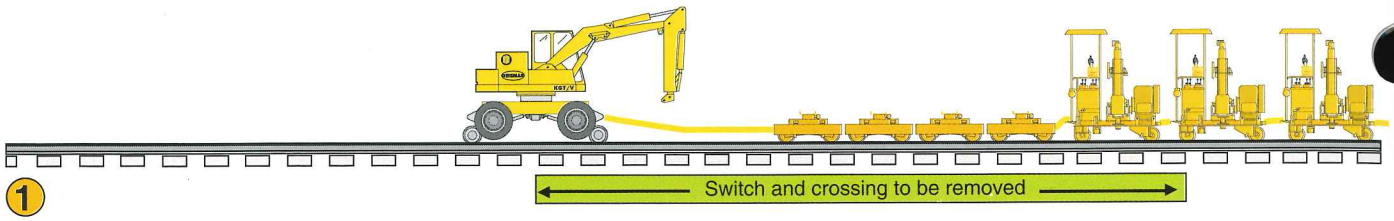
- PUM self-propelled Lifting Gantry. } in variable quantity
- MWT Transport Trolley.
- A CRA Temporary Track.

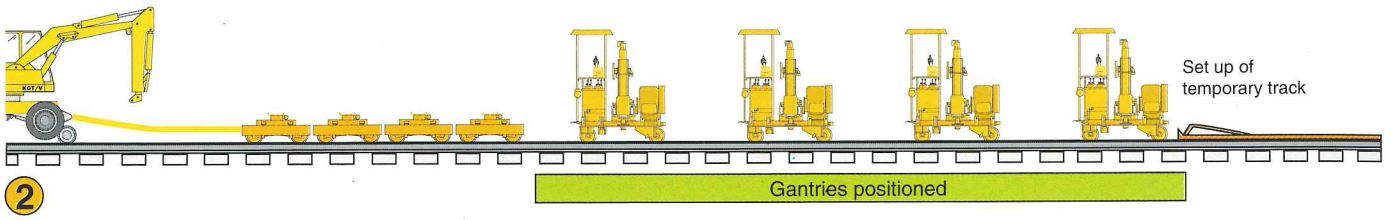
It allows the handling of S & C or plain line panels in three directions :

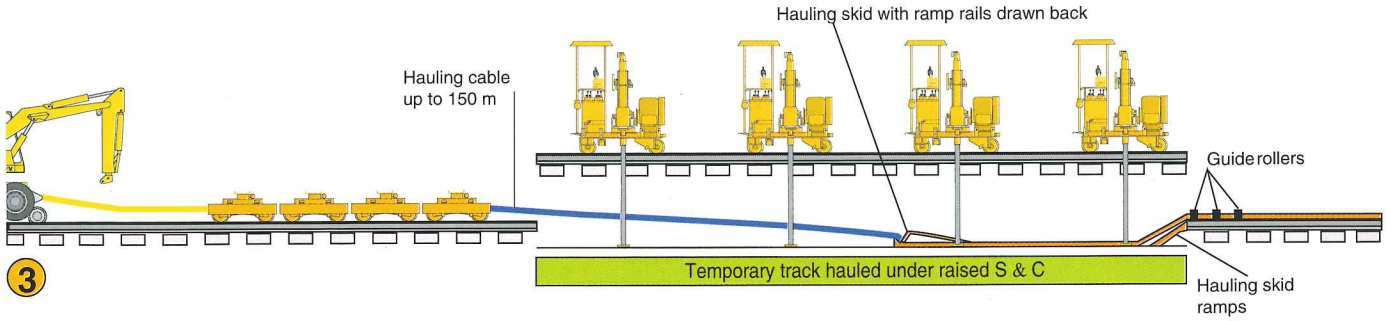
- **lengthwise :** MWT transport trolleys running on the track,
- **vertically :** lifting rams of the PUM lifting gantries,
- **laterally :** transverse movement along the beam of the PUM lifting gantries.

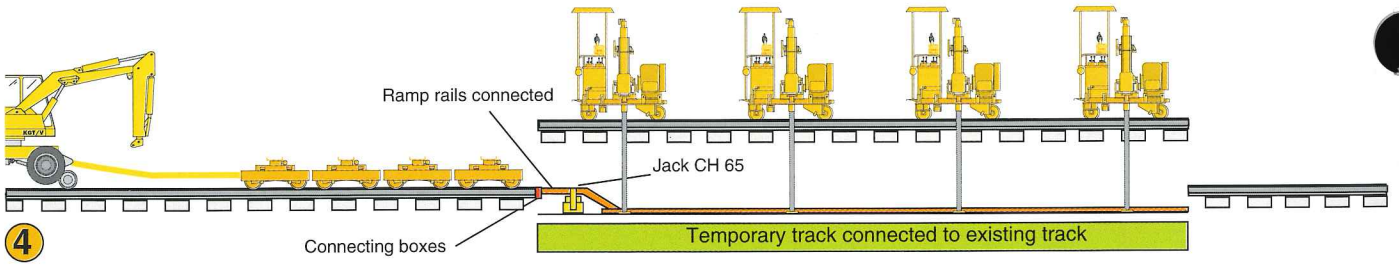
Reballasting and reblanketing works

PUM SEQUENCE OF

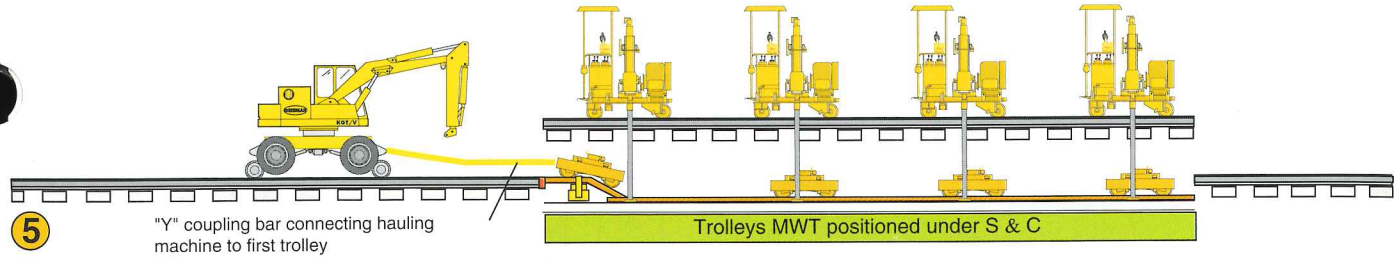


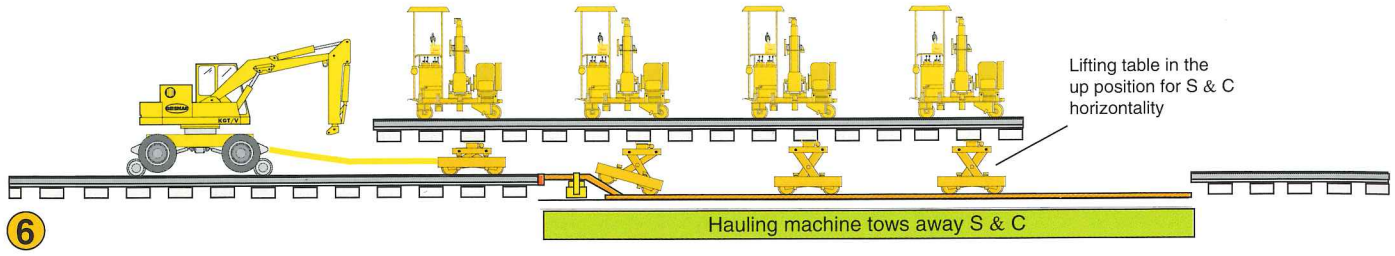


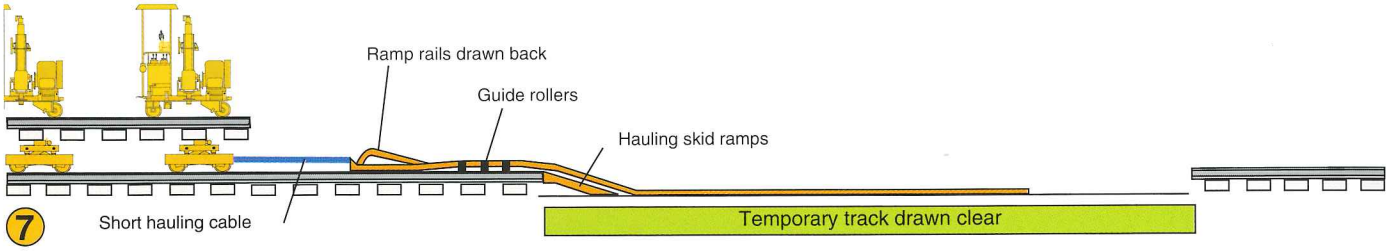


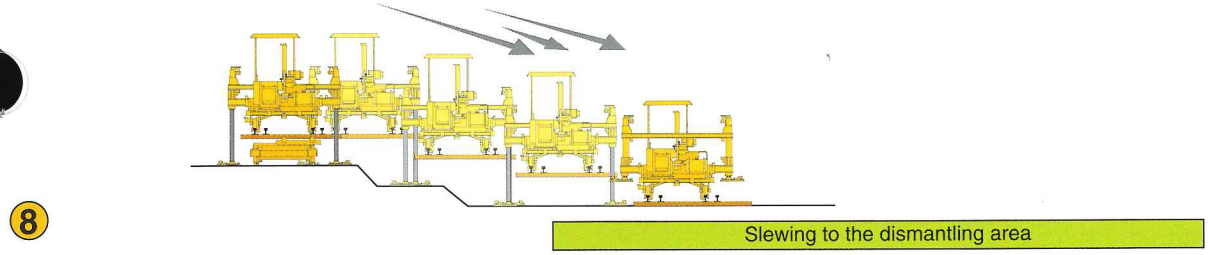


OPERATIONS DIAGRAMS









WORKING PROCESS

For the removal of a track section (S & C or plain line).

① The PUM lifting gantries and the MWT transport trolleys are towed or self-propelled to the worksite.

② The gantries are positioned on the panel to be changed.

③ The gantries lift the panel. The temporary track, assembled on the same track behind the panel to be changed, is towed underneath the panel.

④ The temporary track is connected to the existing track by ramps.

⑤ The transport trolleys are pushed on the temporary track and positioned under the panel.

⑥ The gantries lay the panel on these transport trolleys and the whole unit is towed to the dismantling area.

⑦ The temporary track is pulled out to allow for re-ballasting cleaning and levelling operations.

⑧ On arrival at the dismantling area, the gantries move the panel laterally to this area by means of their slewing device.

The positioning of the new section involves the same operations, but in the reverse order :

⑧ The new panel has been prefabricated in an area near the track. The gantries are positioned on the new panel, they lift it and, by successive slewing operations, carry it and lay it on the transport trolleys already on the track.

⑦ The temporary track is pulled back into position where the new panel will be laid.

⑥ The new panel and the gantries, placed on the transport trolleys, are then pushed to the renewal site and into position on the temporary track. Through the ramps, the lifting tables of the trolleys are used to keep the panel level and avoid any distortion.

⑤ The gantries lift the new panel and thus clear the transport trolleys.

④ The transport trolleys are then towed from the temporary track.

③ The temporary track is towed out from beneath the panel.

② The gantries lower the new panel into its final position.

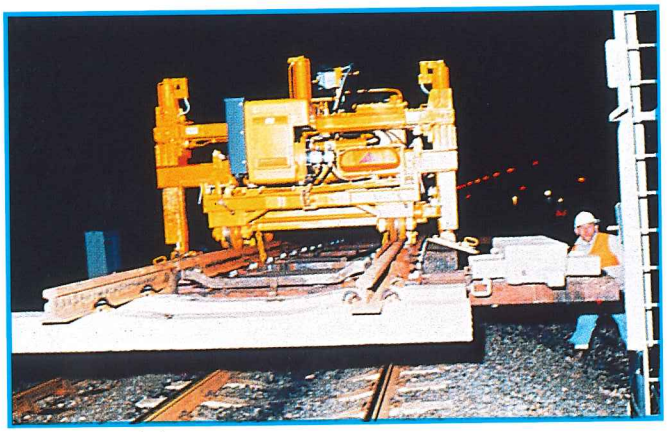
① The gantries are coupled one to the other and to the transport trolleys. The whole unit is then

SPECIAL APPLICATIONS

180 m track panel laying with concrete sleepers (100 t).

Travel through a station.

Worksite on double track with traffic on adjacent line.



Clearance of obstruction

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TECHNICAL CHARACTERISTICS

PUM lifting gantry

Nominal lifting capacity : ..... 160 kN (≈16 t)

Lifting speed : ..... 2.5 m/min (8'-2 1/2" pmin)

Travelling speed on the level:

. self propelled ..... 0-5 km/h (0-3 mph)

. towed ..... 20 km/h (12 mph)

Lifting ram stroke : ..... 1 500 mm (4' 11")

Slewing stroke :(*) ..... ± 250 mm (9-3/4")

Frame elevation ..... 500 mm (1'-7 5/8")

Distance between centres of lifting rams :(*) ..... 2 800 mm (9'-2 1/4")

Frame pivoting angle : ..... ± 3°

Dimensions : (*) ..... 2 225 x 3 050 x 2 365 mm (7'-3 5/8" x 10'-1/8" x 7'-9 1/8")

Mass : ..... 3 600 kg (7 937 lbs)

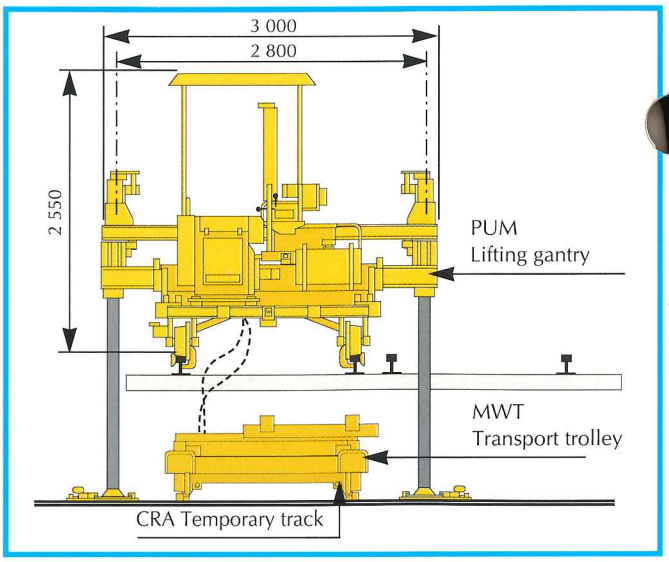
(*) Gauge 1 435 mm (4'- 8 1/2")

Frame :

Welded steel construction.
4 forged steel wheels Ø 280 mm (11"), including 2 driving wheels.

Electrical equipment :

- Alternator 12 V.
- Night work lighting.
- Engine electric start.
- Hooter.



Hydraulic system :

- 2 hydraulic pumps 32 l/min (7 Gal UK - 8 Gal US).
- 1 hydraulic motor.
- 1 hydraulic oil tank 150 l capacity (33 Gal UK - 40 Gal US).
- 1 emergency hand pump.
- 1 hydraulic engine brake.
- 1 parking brake.
- 2 rail clamps, rotation 180° with possible longitudinal movement (100 mm) (4").

Engine :

Diesel, air cooled.
Power : 18.4 kW (25 hp) at 2 000 rpm.

MWT transport trolley

Hydraulically controlled from the PUM.

Nominal loading capacity : ..... 160 kN (≈16 t)

Travelling speed (towed) : .....

without load : ..... 20 km/h (12 mph)

under load : ..... 6 km/h (4 mph)

Table lifting stroke : ..... 350 mm (1'-1 3/4")

Sliding platform slewing stroke : ..... ± 440 mm (1'-5 5/16")

Platform pivoting angle : ..... ± 9°

Dimensions (*) : ..... 1 600 x 1 840 x 735 mm (5' 3" x 6' 1/2" x 2' 5")

Height under load

(table in lowered position) : ..... 696 mm (2'-3 3/8")

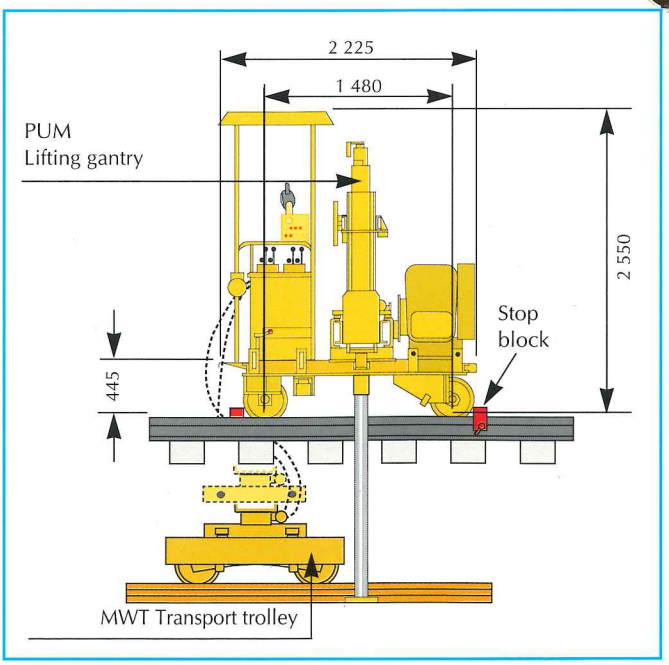
(table in raised position) : ..... 1 046 mm (3'-5 3/16")

Mass (*) : ..... 2 400 kg (5 291 lbs)

(*) or 1435 mm track gauge

Frame :

Welded steel construction.
4 forged steel wheels Ø 280 mm (11").



Illustrations may include optional equipment. Actual performance depends on temperature, elevation and other factors. The descriptions herein are for the purpose of identification of the equipment. Masses, dimensions, forces, etc., are approximate. We reserve the right to modify design and specification in the light of continuing development.

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PEM-LEM

TRACK AND SWITCH PANEL INSTALLATION SYSTEM

The PEM and LEM units may be used independently or as a combined unit for track and switch renewal projects . One operator via remote control.

The PEM Telescopic Switch Handling Gantry is a 20 ton capacity unit for handling all track and switch panels. Operated via remote control.

The LEM Motorized Lifting & Slewing Transportation Trolley permits the movement of switches and track panels.

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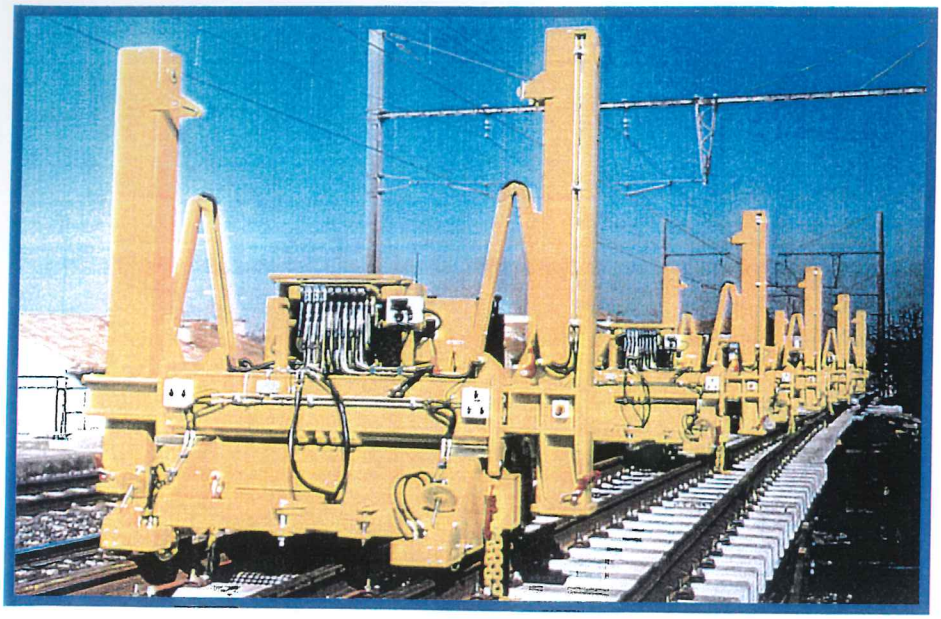
GEISMAR

PEM Telescopic Switch Handling Machine



SPECIFICATIONS:

Designed to handle all switch changing applications; the PEM 807 is the ideal solution for the laying of switches and track panels for both renewal or new construction projects.

The framework is composed of one wheelset element and two independent sliding beams. Each beam supports one hydraulic lifting cylinder and moves independently on from the other. Thanks to its design the machine has a slewing stroke of ± 54". The maximum extension is 195" between the cylinder's feet. The lifting cylinder's feet have a square section and are actuated by cylinders incorporated in the frame.

The PEM is equipped with hydraulic clamps along with security chains. The clamps can be moved 19-1/2" laterally in order to fasten the switch at any point. This permits fastening the rail either by the head or the rail base.

This method of fastening permits a longitudinal slewing of the load to precisely position the track panel. Slewing is done by two cylinders with a 4" stroke without pulling it to the extreme.

The machine is equipped with a Diesel engine and a hydraulic motor for travel at the worksite. It is also equipped with a security brake and an emergency manual pump so the machine can be pushed if necessary.

Radio Remote Control

The PEMs are equipped with radio remote control to synchronize lifting, lowering, and slewing movements. The standard equipment includes one transmitter for 8 receivers with the possibility to operate 1 to 8 machines according to the needs.

The PEM can be positioned in any order but must always be position in the same direction (never facing each other). Each PEM is equipped with a receiver box with 8 electric switches to facilitate their ordering from 1 to 8 and this is done when the PEMS are placed on the switches.

The transmitter, operated by only one operator can control a lone machine or several PEMS at a time. Each PEM is fitted with an inclination estimator that keeps the load horizontal during lifting and lowering operations.

Technical Data:

- Lombardini diesel engine
  - Power 15 hp at 2400 rpm
  - Water-cooled
  - Electric start
  - Noise level: 68 dB(A) at 23 ft.
- Lifting Capacity: 20 t
- Anti return security valves on the lifting rams
- Oil tank capacity: 13 gal
- Lifting stroke: 72 ½ "
- Lifting ram extensions: 19 ½ "
- Slewing stroke: 54 "
- Longitudinal stroke: 4 "
- Traffic dimensions: 112 " x 79 " x 110 "
- Maximum widening of feet (inside): 195 "
- Weight: 8380 lbs
- Traveling speed of 3 mph
- Fastening to the rails with hydraulic clamps with lateral slewing of 19 ½ "
- Towing bar
- Platform for driver
- Hydraulic braking and security brake
- Lighting: 4 floodlights of 50 W

LEM Motorized Lifting Transportation Trolley

SPECIFICATIONS:

The LEM motorized lifting trolley allows the movement of switches and track panels without any other means of transport. The LEM is composed of a strong welded frame and a lifting table with 2 sliding plates rotating around a central axle. It can travel at a speed of 3.5 mph with a 20 ton load. The motor can be disengaged to permit towing at a speed of 12 mph.

The advantage of having a lifting table is the possibility to avoid obstacles along the track by combined slewing and lifting movements, but mainly it maintains the panel in a horizontal position during single track installation/ removal.

The slewing function of the table can be put in floating position allowing the trolleys to absorb the lateral stress when transporting the track panels in curves.

The trolley is equipped with a diesel engine coupled to a hydrostatic transmission which allows maximum power at any moment. The trolleys are also equipped with an emergency manual pump so the machine can be pushed if necessary.

Four wheels driving mounted on hinged arms to absorb the geometry defects particularly on the temporary track. The trolley is air-braked.

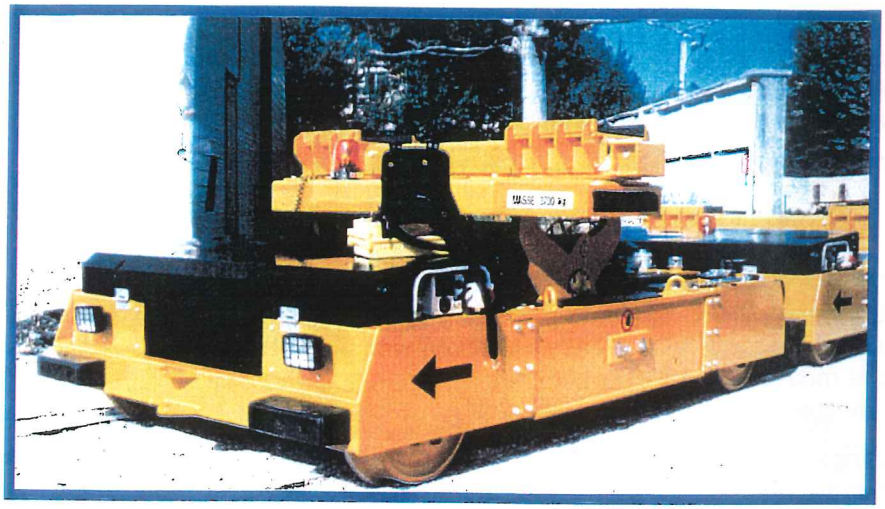
Radio Remote Control

The LEMS are equipped with radio remote control steering to synchronize the movements of the lifting table (lifting, slewing). The standard equipment includes one transmitter, controlled by one operator, for 8 receivers with the possibility to operate 1 to 8 units according to the needs.

The LEM can be positioned in any order but must always in the same direction (never facing each other). Each unit is equipped with a receiver box with 8 electric switches to facilitate their ordering from 1 to 8.

The radio remote controls the speed and also operates the hydrostatic braking.

The negative braking system stops the trolley as soon as the control is released, or in the case of any mechanical failure.



Technical Data:

- Lombardini Diesel engine
  - Power 36 hp at 2800 rpm
  - Water-cooled
  - Noise level at 23 ft. 72 dB (A)
  - Electric start
- Hydraulic double pump
- Oil tank capacity 31 gal.
- Motorized by hydrostatic transmission
  - Traveling speed loaded: 3 ½ mph
  - Towing speed loaded: 12 mph
- Lighting: 4 projectors of 50 W
- Anti-slipping circuit by serial motor feed
- Air-braked when towed
- Braking by hydrostatic transmission
  - Parking brake coupled to the hydraulic engine by pressure drop (negative brake)
  - Mechanic manual device to unlock the parking brake when towing
  - Security avoiding the starting of the engine if the parking brake is locked
- Hydraulic lifting table
- Lifting capacity: 20 t
- Lifting stroke: 13-3/4 "
- Table slewing: ± 15-3/4" "
- Overall dimensions: 130 " x 75 " x 33 "/36 "
- Weight: 7500 lbs.

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