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# Information sheet

## Rail assembly kit, ZM1 type





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### NOTE:

The ZM1 rail assembly kit is an integral and inseparable part of the Z1 transport system and is delivered fully assembled by the manufacturer. Assembly or disassembly of the ZM1 type rail assembly kit with the type Z1 transport system may be undertaken by an authorised service only, with an approval of the manufacturer.



## 2 Kit description.

The ZM1 rail assembly kit is a device with a hydraulic drive, intended for lifting persons working during assembly, removal, maintenance and repairs of a suspended trolley system.

Devices used to power the rail assembly kit must be compatible in terms of connections and specification of the power supply of the hydraulic system, be provided with an emergency stop system and a system controlling functional parameters.

The ZM1 rail assembly kit may be used in underground mines, in methane fields, in mining longwalls of “a”, “b” and “c” classes in terms of methane explosion hazards and of classes A and B of coal dust explosion hazard.

Use of the rail assembly kit other than that specified above, shall be considered as unintended use. In such cases, the manufacturer shall not be liable for any damage caused by such use.

## 3 Technical specifications.

No.	Details	Unit	APP
1	maximum load capacity of the assembly kit	kg	640
2	maximum load capacity of the assembly kit with extension	kg	440
3	maximum working platform lifting rate	m/s	0.04
4	maximum working platform tilting rate	m/s	0.02
5	maximum travel speed of the unit in the transport system	m/s	2.0
6	permitted supply pressure	bar	190
7	required capacity of the supply system	l/min	26
8	hydraulic agent	-	HLP, HFC
9	attachment socket pin diameter	mm	40
10	ZM1 + Z1 unit weight	kg	1080

Side view

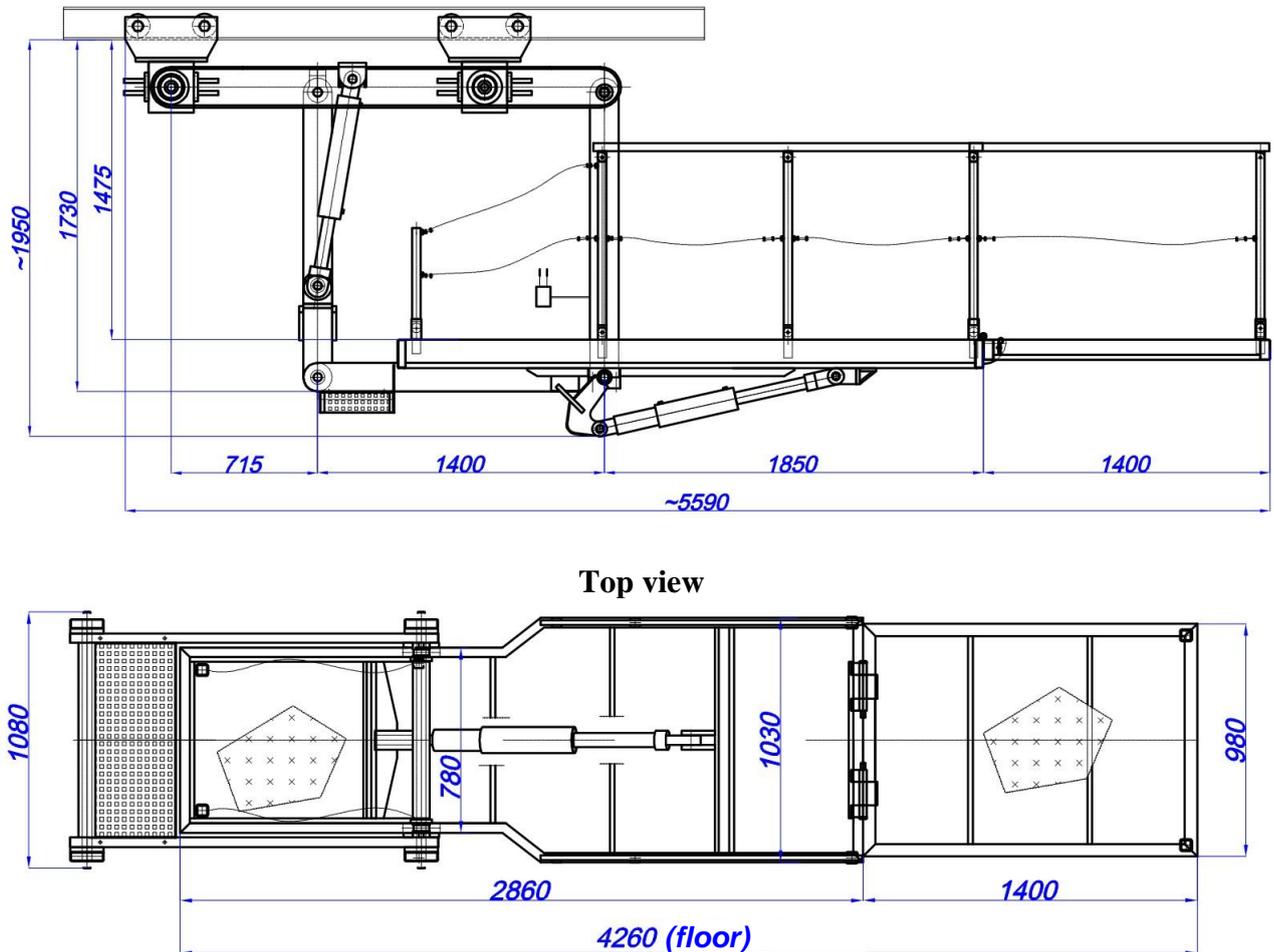


Fig. 2. Dimensions of the rail assembly kit.

### 3.1 Conditions of use.

The rail assembly kit may be used under the following conditions:

- a) **The ZM1 rail assembly kit is an integral part of the Z1 transport system.**
- b) the driven rail shall be characterised by:
  - rail profil I 155, I 140 (acc. DIN) or equivalent,
  - the height profile of the bottom rail connector does not exceed 40 mm;
  - the maximum rail connector bend angle along the route  $\pm 6^\circ$  vertically;
  - the maximum rail connector bend angle along the route  $\pm 2^\circ$  horizontally;
  - curvature in the horizontal plane  $R \geq 4$  m;
  - curvature in the vertical plane  $R \geq 8$  m;
  - rail connector load capacity in the suspension direction 40 kN;
  - connector load capacity along the rail min. 63 kN;
- c) the maximum route inclination shall not exceed  $30^\circ$ ;



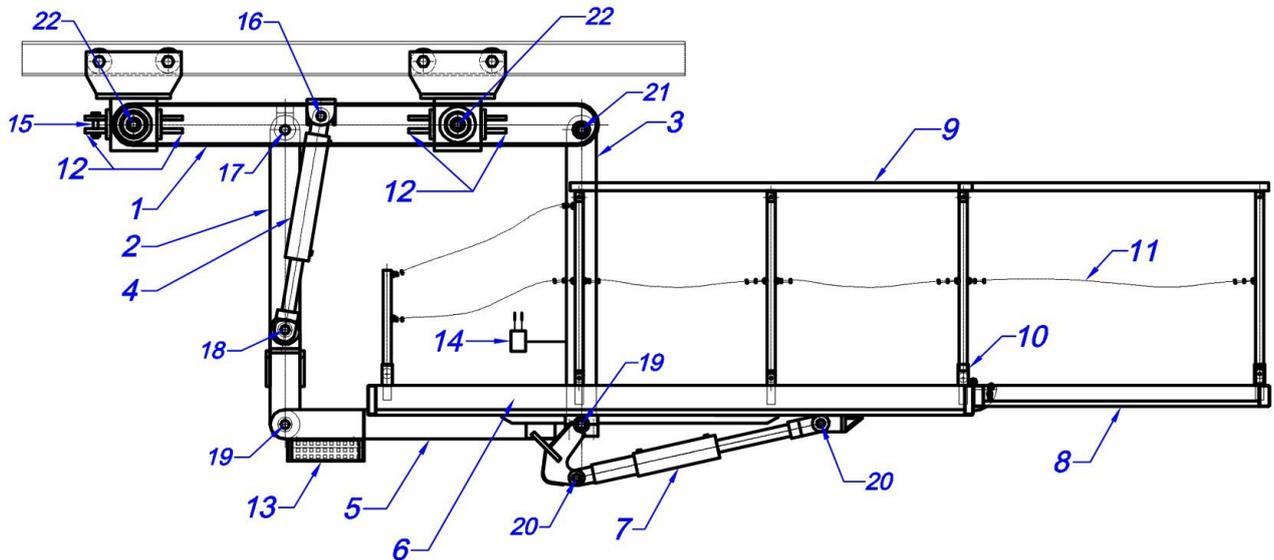
- d) the rail assembly kit shall be operated by persons trained by the manufacturer and who have read the user manual.

#### 4 Device design.

The ZM1 rail assembly kit (Fig. 3) includes the following units:

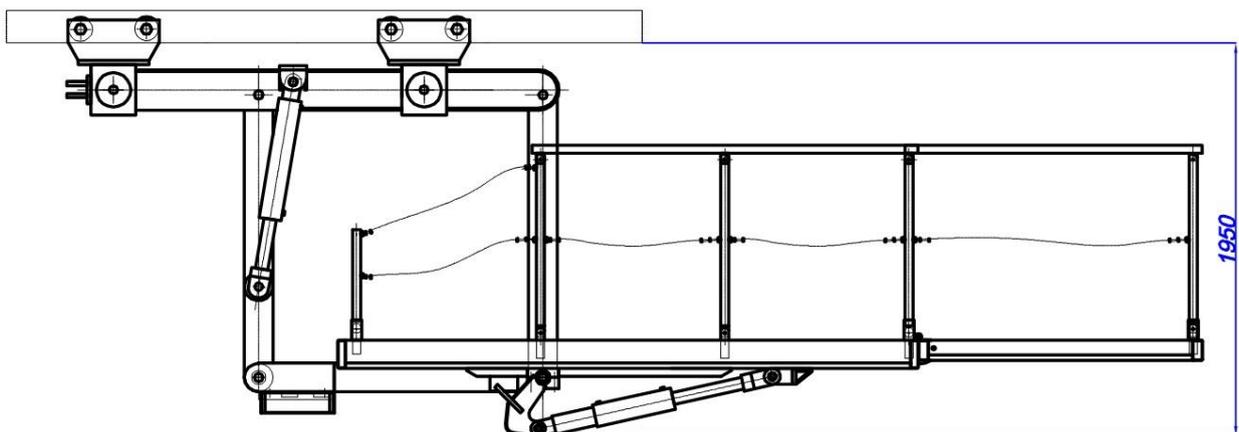
1. type Z1 transport system (item 1),
2. swivelling load bearing arms (item 2, 3),
3. hydraulic actuators of the load bearing arms (item 4),
4. load bearing arm connectors (item 5),
5. working platform (item 6),
6. hydraulic actuator of the working platform (item 7),
7. folding extension of the working platform (item 8),
8. handrail securing the platform (item 9) with a lock (item 10),
9. steel securing ropes (item 11),
10. connecting couplings of the rail assembly kit (item 12),
11. toolbox (item 13)
12. control box (item 14),
13. connecting pins and bolts listed in the description below the drawing.

Swivelling load bearing arms (items 2 and 3) are installed on the load bearing frame of the transport system (item 1). Arm connectors (item 5) are attached to the ends of the arms. The arms are lowered or raised using hydraulic actuators (item 4) attached to the hitches of the transport system on one end and to one of the load bearing arms (item 2) on the other end. Protraction or retraction of the cylinder rod results in the load bearing arm being raised or lowered, and the other load bearing arm (item 3) being raised or lowered via the load bearing arm connector (item 5). The working platform (item 6) and the hydraulic actuator of the platform (item 7) stabilising the platform in the pre-set position are connected to the axle connecting the load bearing arms (item 3). Ropes and folding handrails (item 9) protecting against falling are installed on the platform, locked in their unfolded position with a lock (item 10). The rail assembly kit is connected to the power supply and the transporting unit using a tie installed in the attachment hitch (item 11). The rail assembly kit is controlled using the control box (item 14) connected to the hydraulic system. Numbers 15÷22 are related to connectors listed in the description under the drawing.



1.- Z1 type transport system, 2.- load bearing arm, 3.- load bearing arm, 4.- bearing arm actuator, 5.- bottom frame, 6.- working platform, 7.- working platform actuator, 8.- folding extension of the working platform, 9.- protective railing, 10.- protective railing lock, 11.- securing rope, 12.- connecting couplings, 13.- toolbox, 14.- control box, 15.- pin Ø40x85, 16.- pin Ø40x145, 17.- pin Ø40x110, 18.- pin Ø40x200, 19.- pin M30x1065, 20.- pin Ø30x75, 21.- bolt M30x1055, 22.- bolt M30x920.

**Fig. 3. Rail assembly kit, ZM1 type – list of main elements.**



**Fig. 4. Rail assembly kit, ZM1 type – working platform in the horizontal position.**

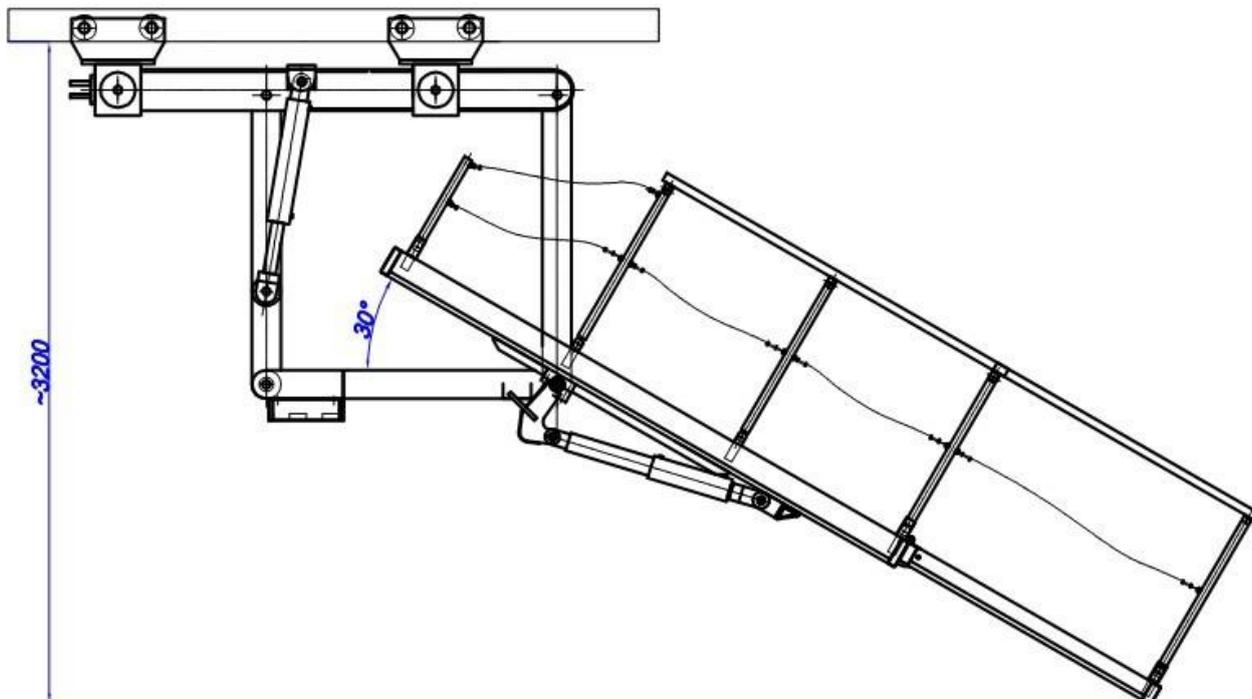


Fig. 5. Rail assembly kit, ZM1 type – working platform in the lowered position.

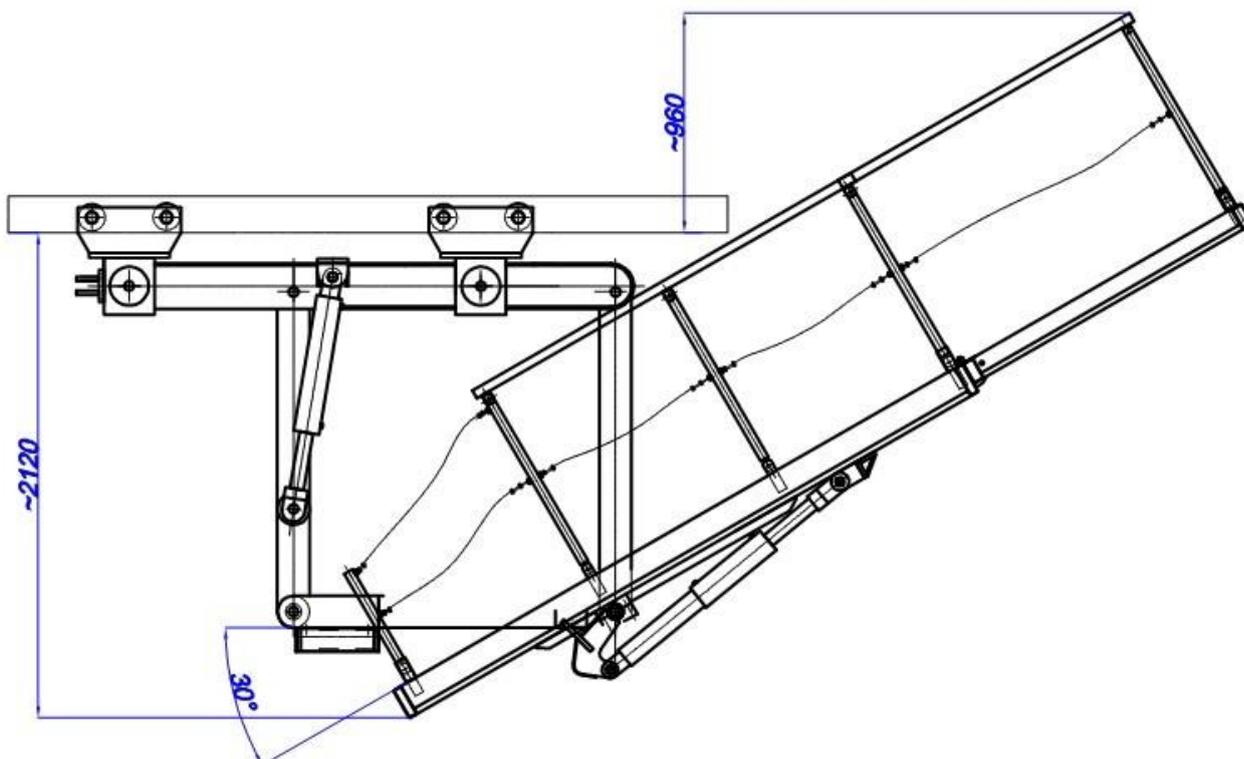


Fig. 6. Rail assembly kit, ZM1 type – working platform in the raised position.

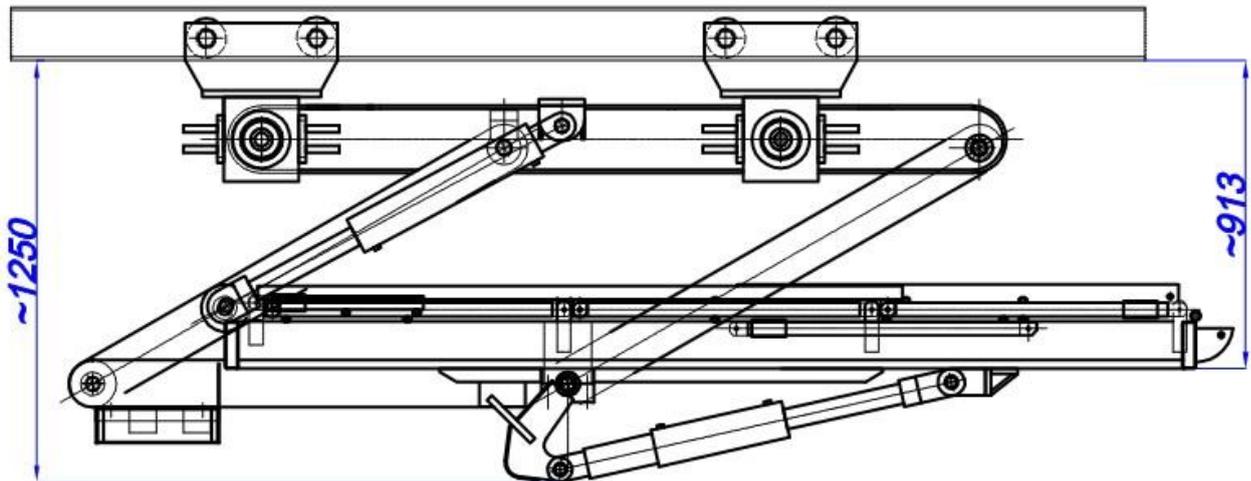


Fig. 7. Rail assembly kit, ZM1 type

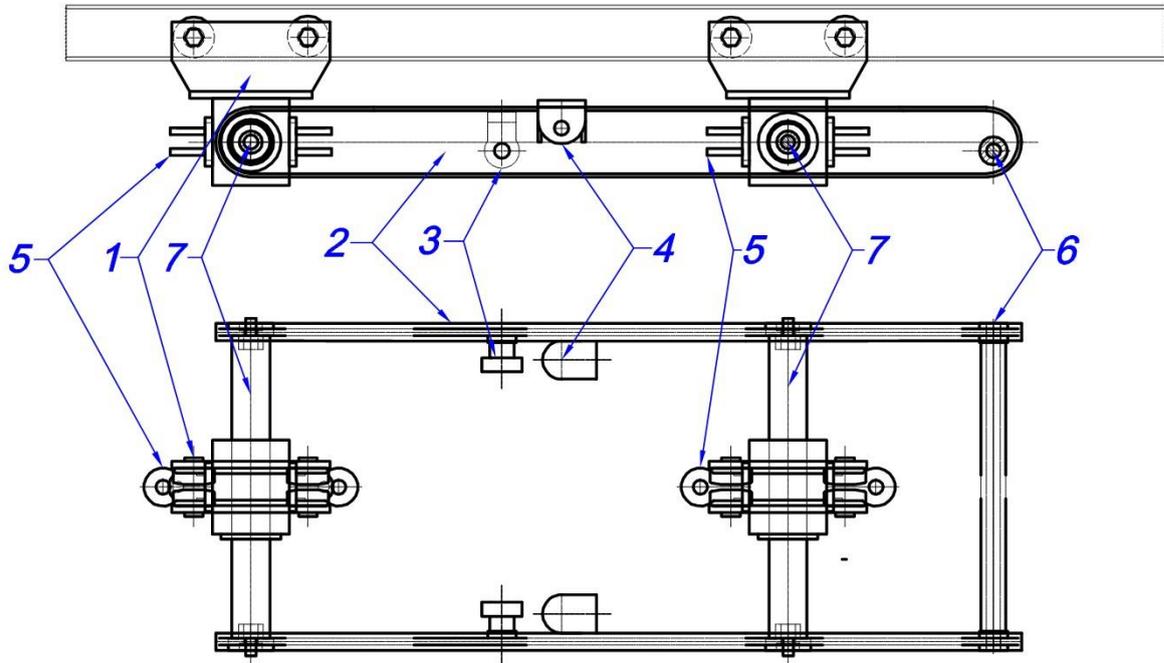
– working platform in the transport (folded) position.

## 5 Transport system.

The Z1 type transport system (Fig. 8) is made out of two load bearing carriages **WNR 3** installed on a track (item 1). The load bearing frame (item 2) is suspended on the load bearing carriages using bearing axles (item 7). The connection between the axles and the carriages is mobile, enabling traversing horizontal and vertical arcs of the driven rail. Hitches of the first load bearing arms (item 3) and hitches of load bearing arm actuators (item 4) are welded on both sides of the load bearing frame. The axle (item 6) is installed at the end of the load bearing frame, behind the load bearing carriage, with the second load bearing arms installed on both ends of the axle. **The ZM1 rail assembly kit is an integral part of the Z1 transport system.**

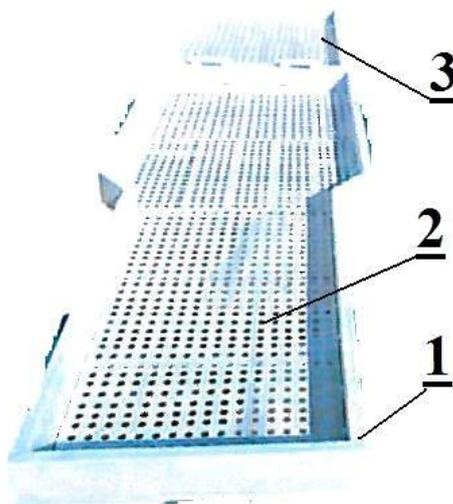
The working platform (Fig. 9) is made out of a frame (item 1) constructed using U-shaped profiles with a perforated floor (item 2) attached to said profiles, protecting persons present on the platform against slipping. A folding platform extension folded inside during transport, onto the platform, is attached to the wider end of the platform. A railing protecting persons working on the platform is attached on top of the platform.

The hydraulic system of the rail assembly kit (Fig. 10) is supplied via hydraulic (supply and return) lines connected to the control box. The hydraulic circuit of the load bearing arm actuators and of the working platform hydraulic actuator is protected using independent, hydraulic locks. Depending on the lever of the control box (Fig. 11) being pushed, pressure is supplied to the load bearing arm actuators or to the hydraulic actuator of the working platform.



1.- load bearing carriage 2.- load bearing frame, 3.- load bearing arm socket,  
4.- load bearing arm actuator socket, 5.- connecting coupling, 6.- load  
bearing arm axle, 7.- load bearing axles.

**Fig. 8. Z1 type transport system.**

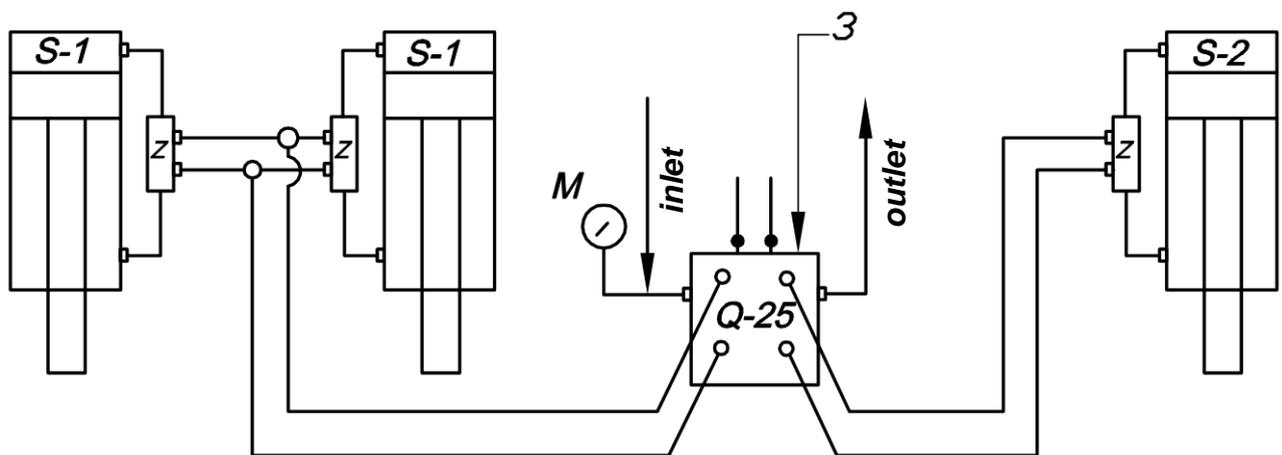


1.- platform frame, 2.- perforated floor, 3.-  
folding extension of the working platform,

**Fig. 9. Working platform of the rail assembly kit.**

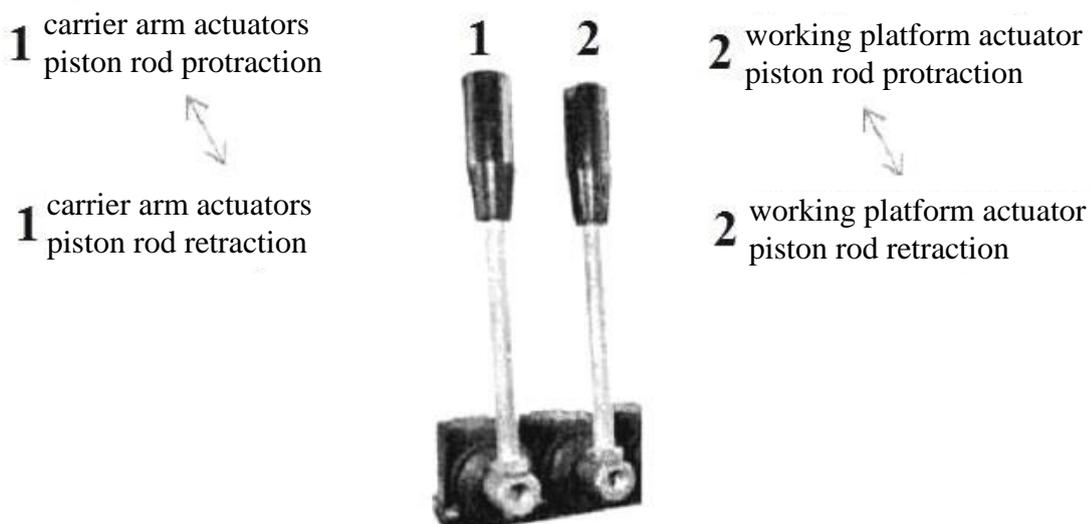


The rail assembly kit may be supplied from the hydraulic system of any tractor or an individual pump unit. Devices used to power the rail assembly kit must be compatible in terms of connections and specification of the power supply of the hydraulic system, be provided with an emergency stop system and a system controlling functional parameters.



S-1.- load bearing arm actuators, S-2.- working platform actuator, 3.- control box.

**Fig. 10. Hydraulic system of the rail assembly kit.**



**Fig. 11. Control box of the rail assembly kit.**



**NOTE:**

**The rail assembly kit is not provided with driving brakes, a speed monitoring control system or with a speed limiter, thus every rail assembly kit may only be used connected e.g. to a braking carriage, a manoeuvring engine or a railway engine.**

## **6 Device repairs.**

Repairs of the type ZM1 rail assembly kit may be performed by the user within the scope of spare part replacement (see spare parts tables). It is prohibited to use parts and units of other manufacturers or homemade parts during repairs. If the rail assembly kit loses operational parameters specified in this manual, perform an overhaul. The overhaul includes repairs or replacement of worn units and parts, restoring the original technical condition of the rail assembly kit.

**Overhauls of the rail assembly kit may be performed only by the manufacturer or by repair stations authorised by the manufacturer.**

## **7 Scope of delivery.**

The delivery includes:

- Rail assembly kit, ZM1 type, complete
- The original copy of the user manual,
- The warranty card and the Quality Control acceptance certificate,
- EC/EU Declarations of conformity.
- Annex: Operation and maintenance documentation, Z1 type transport system

## **8 CONTACT DATA.**

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