

MOL

TRANSPORT SOLUTIONS



RR1844

TECHNICAL SPECIFICATION OF MOL RAIL-ROAD VEHICLE
TYPE RR1844

CONFIGURATION	4 wheel drive
DIMENSIONS	Drawing T0712
CHASSIS	<ul style="list-style-type: none"> - Complete welded construction - Made of two longitudinal members, joined by crossmembers. - Front and rear area reinforced to receive hooks and buffers. - Withstands: <ul style="list-style-type: none"> - 120.000 daN symmetrical bufferload. - 40.000 daN diagonal bufferload. - 100.00 daN pull load - Front and rear: on both sides non-skid steps and shunting treads integrated in the chassis, provided with lightning - Non skid, demountable walkways all around - Demountable railing all around - Equipped with 4 lift and 4 jacking points
ENGINE	<p>DEUTZ TCD 6,1 L6 T4 6 cylinders in line, 4 cycle Power : 129 kW @ 2.200 rpm Torque : 750 Nm @ 1.450 t/min Bore/stroke : 110/136 mm Displacement : 6.100 cm³ Cooling : water Emission : EU Stage V With selective catalytic reduction (<i>Adblue necessary</i>) and particulate filter.</p> <ul style="list-style-type: none"> - Vertical mounted exhaust pipe equipped with rain flapper - The air filter is with double cartridges, designed for extremely dusty and sandy atmosphere. - <u>Engine security:</u> <ul style="list-style-type: none"> - The engine controller gives an error and deactivates the engine in some particular cases: <ul style="list-style-type: none"> o Coolant temperature too high o Water lever too low o Oil pressure too low - Automatic braking when the engine rpm goes into a critical level (ex. the load pushes the machine while going downhill)
TRANSMISSION	<p>DANA Full automatic Powershift transmission series TE14 with torque convertor. Stall torque ratio: 1,88 Torque convertor with lock-up clutch 4 gears forward and 4 reverse Integrated transfer box</p>

AXLES

KESSLER, 4x4 driven axles

Steered wheels on the front axle, optional on the rear axle
 Double reduction, with planetary reduction in the wheelends.
 Lockable differential by pneumatic control, automatically
 locked during rail operation.

The vehicle has four-wheel drive and in rail mode the differential of each axle is locked. This guarantees the best transmission of the tractive effort created by the drive line onto the rails. Each wheel is mandatory solidarity with the other wheels, independent of its adhesion.

GUIDING AXLES

- Guiding device by means of 2 axles each with 2 rail wheels under constant pressure.
- Torque-free load balancing between left and right wheel by central pivot in the axle (swivel axle)
- Axles can be lowered independently.
- Lifting and lowering of the guiding axles by means of 2 cylinders/axle.
- Stabilisation of the hydraulic pressure in these cylinders by means of high volume accumulators.
- Hydraulic distributor valve with 2 proportional elements, continuous surveillance of the pressure on the guiding wheels.
- Load holding valve on each cylinder
- Manual pump to raise the guiding axles in case of emergency

RE- & DE-RAILING

- Optic surveillance on each guiding axle by means of an infrared camera with lightning for easy re-railing
- Re-railing semi-automatic: after the correct positioning of the guiding wheels, with a command on a button, following functions are adjusted automatically:
 - Road wheels are brought in the straight ahead position
 - The steering system is mechanically locked
 - The guiding wheels are put under pressure
- De-railing semi-automatic: with a command on a button, the guiding wheels are lifted and mechanically locked in their upper position

VEHICLE BRAKES

- Drum brakes
- Service brakes: full air brakes on front and rear wheels, 2 separate circuits.
- Parking and emergency brakes: by means of spring loaded brake chambers on the rear axle, operating automatically in case of failure in the piping or loss of air-pressure.
- Compressor, directly driven by the vehicle engine
- Capacity: 360l/min at 8 bar
- Equipped with an air dryer

WAGON BRAKES

Air production:

- Cylinder compressor, hydrostatic driven, speed dependent of engine rev's
- Delivery: 3,6 m³ at 10 bar
- Air reservoir of 500 l filled at 10 bar
- Main line with 1" internal diameter, made in steel pipe.
- Equipped with an air dryer

Mechanics valve:

- KNORR-BREMSE Type BP-Compact, mechanics valve controlled by impulses, finely adjustable
- Provides various functions defined in UIC leaflet 541-03

Graduated brake application, with the «Automatic first braking» function

With the first pulse of the driver's brake valve, the air pressure is lowered into the ABP line to a proper defined value and the wagon brake applies, from now on, the air pressure can be lowered continuously by touching or holding the control lever in the application position. As a result, sensitive operation is possible

Running position: In this position, the pressure in the HL line is kept constant at the nominal working pressure and when required a slow air feed is provided to counteract any small leaks or losses in the brake pipe, connections and hoses.

Graduated brake release with the «Automatic depression» function

Continuously releasing the wagon brakes. Upon reaching 4.85 bar, the brake is automatically fully released.

Quick braking – said emergency brake

The driver's brake valve is placed in the rearmost position and locks. The ABP line is this completely vented

Assimilation: raise of the pressure in the ABP up to 5,4 bar.

Linear elimination with small pressure drop

The nominal working pressure is exceeded in a controlled way to a higher value. It enables to release the brakes of a system which has be pumped up at a too high pressure. Afterwards, the pressure in the ABP line can be automatically gradually reduced to the nominal working pressure.

“Neutre”: cut off of the supply to the ABP.

Function which allows to make a leakage test of the ABP.

Quick release: fast filling of the train

Emergency brake:

- By means of red mushroom buttons
- Venting of the ABP by an orifice with huge flow

BRAKE HOSES	<ul style="list-style-type: none">- 2x brake hoses at both sides- Attached with brackets- Other variants are available as an option
STEERING	<ul style="list-style-type: none">- Hydraulic system with priority valve.- 2 cylinders acting directly on the arms of the swivel pins.- In rail mode the steering system is locked mechanically in its middle position.- During the change-over from road to rail the wheels are brought automatically in the straight ahead position by means of 1 button command.
SUSPENSION	<ul style="list-style-type: none">- <u>Front</u>: Parabolic springs and double acting shock absorbers, maintenance free- <u>Rear</u>: Rigid connected to the chassis
RAIL WHEELS	<ul style="list-style-type: none">- Ø 400 mm on the running surface- Ø 465 mm on the border- Each wheel is equipped with a rail guard
TYRES	<ul style="list-style-type: none">- 4 wheels equipped with 12.00R24- A pressure connection to inflate the tyres is available on the vehicle- The offset of the rims is chosen in such a way that the tires pass besides the check rails in switches.
ANTI-SPINNING DEVICE	<ul style="list-style-type: none">- The device is based on the measurement of the speed of the tires and the guiding wheels.- The slip of the tires is equal to the speed difference between the tires and the guiding wheels.- When the slip limit is passed, the engine power is reduced until the slip is lower than the slip limit. Thus, the vehicle adjusts itself, independent from the driver, on the prevailing weather and load conditions.
ELECTRICAL SYSTEM	<ul style="list-style-type: none">- 24VDC- 2 batteries 24V – 180 Ah- Alternator: 24V / 100 A- Battery master switch- Central fuse box in the cabin, accessible from three sides
LIGHTING	<ul style="list-style-type: none">- Lighting in road operation: according road regulations. (LED)- Automatic switch over from road lights to rail lights when re-railing (and vice-versa).- Lighting in rail operation : 2 white (head-end signal) and 2 red lights (rear-end signal) on each side. (LED)- Automatic change-over when changing driving direction.

VEHICLE CONTROL	<ul style="list-style-type: none"> - A PLC controls and guards the functional sequence of the vehicle functions. <ul style="list-style-type: none"> - Type : IFM CR0232 enlarged with powerful in- and output modules. Built for mobile applications. - Withstands extreme cold (- 40° C) and extreme high (+ 80° C) temperatures. - Application software built according customers demands. - Display IFM PDM 360 as dialogue module for: <ul style="list-style-type: none"> - Visualization of vehicle states - Operator inputs - Access to the vehicle for service and maintenance personnel <p><i>Special screens, password protected to directly change vehicle parameters or read the operating data</i></p>
HYDRAULIC SYSTEM	<ul style="list-style-type: none"> - Steel tank, capacity 230 l - Return line filter with clogging indicator <p>Working hydraulics for:</p> <ul style="list-style-type: none"> - To lift and lower the guiding system - Steering system - Compressor drive <ul style="list-style-type: none"> - Control valves of the hydraulic and pneumatic system in a large spacious cabinet integrated in the vehicle frame accessible without tools
FUEL TANK	<ul style="list-style-type: none"> - Steel tank, capacity 320 l - Lockable cap
TRACK GAUGE	1435 mm
GAUGE	<ul style="list-style-type: none"> - According to the UIC leaflet 505-1 - For the lower part according §5.3, with exception for the tires.
COUPLING AND BUFFERS	<p>At both sides:</p> <ul style="list-style-type: none"> - Hook according UIC specifications - Two buffers with stroke 105 mm according UIC 526-1 class A <p>Camera for view on rear hook.</p>

CABIN

- Comfortable operator's cabin
- Extra heavy duty steel construction.
- Installation on the left side of the vehicle on 4 elastic rubbers.
- One lockable turning door on the right hand side, opens through 180° with safety restraint
- Two fixed windows in the door
- Windscreen and rear window in laminated glass.
- Side windows in safety glass
- Sliding windows on drivers side.
- Electric windscreen sweeper on the windscreen and the rear window with 3 speeds.
- Heating and defrosting.
- Full floor rubber mat
- Air suspended and adjustable seat for driver and rigid seat for co-driver, both equipped with 2 point seat belts
- Total visibility over 360°.
- 2 outside heated mirrors.
- 2 sun visors.
- Interior cab lighting
- Internal height of the cabine : ±1.900 mm
- Fire extinguisher 5 kg
- First aid kit

DASHBOARD

Ergonomic dashboard with all necessary instruments a.o:

- Speedometer (*km/h*)
- Air pressure gauges (*bar*)
- Fuel level gauge
- Engine coolant and transmission temperature gauge
- Volt meter
- Engine hours counter
- Operation and warning lamps
- All necessary controls for all of the vehicle functions, ergonomically arranged

EQUIPMENT

- 1 electric horn (*road use*)
- 1 air horn (*rail use*)
- 1 orange beacon light on the cabin roof
- 1 fire extinguisher 5 kg ABC powder
- 1 First aid kit
- 2 worklights in each buffer plate
- 2 brackets for wheel shocks
- Lighting on each step
- Greasing point centralized

SECURITY ELEMENTS

- 4 emergency stop buttons, one on each corner.
These buttons work independent from the PLC.
- Before the vehicle can be moved, an enable switch(spring return type) needs to be pushed.
- Dead man vigilance device during rail use
- Starting of the engine only in the neutral position of the transmission
- Traction cut off when parking brake is on
- Reversing hazard warning during road operation

PAINTING	<ul style="list-style-type: none"> - Two-pack, transparent, self etching washprimer with superior corrosion resistance on warmrolled raw materials after steelblasting. - High build two pack epoxy-acrylic primer/surfacer with high protection against corrosion. - High build two-pack acrylic lacquer with outstanding Weather resistance. - Cabin: Yellow RAL 1028 (other colour possible on request) - Bodywork en chassis: black/grey RAL 7021 (other colour possible on request) - Front and rear area: striped yellow RAL 1028 – black RAL 9005
WEIGHT	- 18.000 kg (basic vehicle without options)
MAXIMUM SPEED	<ul style="list-style-type: none"> - 1st gear : 7 km/h - 2nd gear : 10 km/h - 3rd gear : 18 km/h - 4th gear : 30 km/h <p data-bbox="638 981 1385 1048"><i>(The abovementioned values are maximum values. The real speed will depend on the load and the track conditions).</i></p> <p data-bbox="638 1075 1385 1173">The maximum speed can be limited if desired. Individual limitation possible for road use, rail use and rail use with remote control.</p>
DRAWBAR PULL ON THE HOOK	<p data-bbox="638 1267 790 1299">± 9.500 daN</p> <p data-bbox="638 1326 1385 1402">(with friction coefficient $\mu = 0,7$ and 25% of the weight on the guiding wheels)</p>
GROUND CLEARANCE	<p data-bbox="638 1491 1029 1523">± 375 mm under the drive shafts.</p> <p data-bbox="638 1527 1061 1559">± 230 mm under the guiding wheels</p>
TURNING RADIUS	<p data-bbox="638 1648 1005 1680">2-wheel steering: ± 13.000 mm</p> <p data-bbox="638 1684 1149 1720">4-wheel steering: ± 7.800 mm in (optional)</p>

OPTIONS

1) Adjustable rims

The flange in the rim can be installed in two different positions. This enables to rotate the tire (doubling of the lifespan) without dismantling it from the rim.

2) All-wheel steering with the possibility to steer in:

- Front wheel steer
- Four wheel - counter steer
- Four wheel - crab steer

3) Automatic coupler for shunting type BSI RK900

- For vehicles with UIC hook
- Integrated swing-up device
- Automatic coupling
- Uncoupling from driver cabin or remote control
- Manual uncoupling possibility in emergency cases

4) Automatic coupler type MOL – shackle commanded from inside the cabin

5) Remote control Cattron Type EC/LO Pro with security level SIL III, consists of :

- Emitter with carrier bag
- Receiver
- Antenna
- 2 batteries
- Battery loader 230 VAC

Following functions are controllable:

- Engine start/stop (option)
- Parking brake release/apply
- Wagon brakes release/apply/brake pulse/elimination
- Vehicle brakes release/apply
- Drive direction D – N – R
- Acceleration up/down
- Signal horn
- Uncouple automatic coupler (two hand control)
- Emergency stop

Following safety functions are foreseen:

- Tilt monitor + extending tilt time possibility
- Alertness Monitor (Dead man switch)
- Automatic stop with stillstand monitoring.
- Automatic stop at interruption of radio communication.

6) Derailment sensors

7) Air knives to dry rails (better traction)

8) Cabin foreseen with a swivel seat and a second dashboard (*Rail use*)

9) Airconditioning

10) Spare wheel

Other options available on request

We reserve the right to make changes as a result of the continuous development of our products.