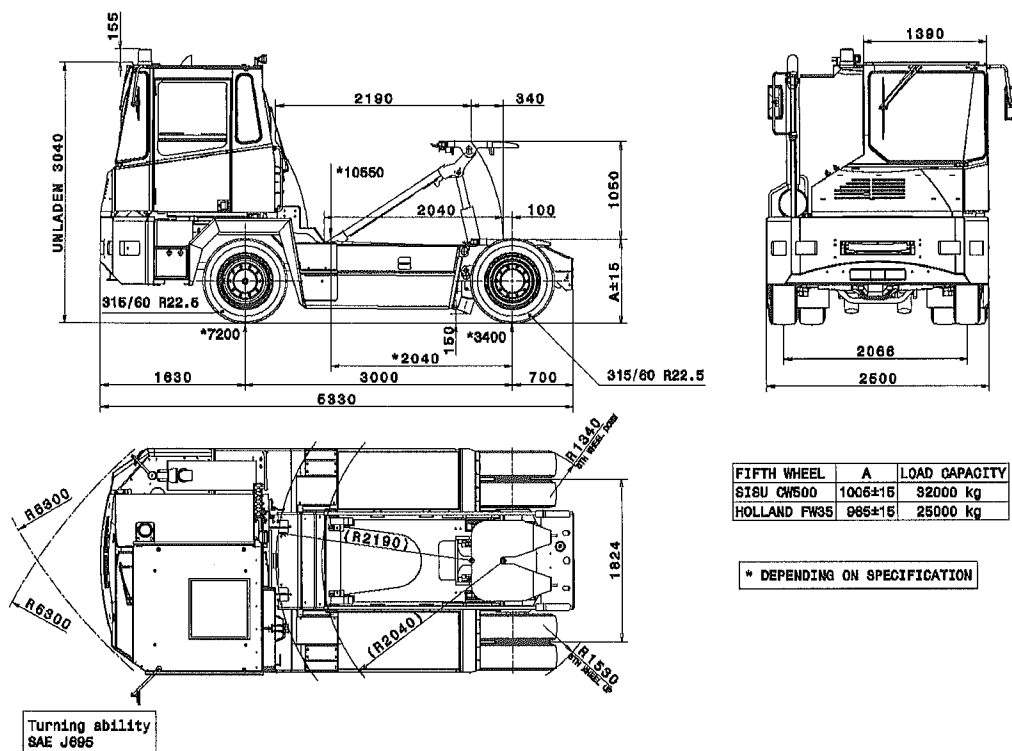


TECHNICAL SPECIFICATION

KALMAR TRL-182 LHD, 4-wheel Drive Terminal Tractor

The all new KALMAR TRL-tractors are designed and constructed to fulfil the highest demands of Ro-Ro and terminal operations from arctic circle to tropical conditions. The main features of KALMAR-tractors are high tractive effort, good manoeuvrability and reliability based on first class components, long experience and close collaboration with our customers.



| FIFTH WHEEL | A | LOAD CAPACITY |
|--------------|---------|---------------|
| S18U CW500 | 1006±15 | 32000 kg |
| HOLLAND FW35 | 985±15 | 25000 kg |

* DEPENDING ON SPECIFICATION

Turning radius (m) - - Front fender, left 6.30
- Front fender, right 6.30

Unloaded weight approx. (kg)

- Front axle 7 140
- Rear axle 3 360
- Total 10 500

Note: Weights depending on specifications

Maximum permissible weight (kg, 5 km/h)

| | | | |
|------------|-----------|-------------|--------|
| Front axle | Rear axle | Fifth wheel | GCW |
| 19000 | 40000 | 25000 | 75 000 |

* max. angle 5 %

Note ! Drawing shows standard TRL- 182, dimensions and weights depending on specifications

TRL-182 LHD, 4-wheel Drive Terminal Tractor

POWER TRAIN

VOLVO TAD 720 VE Diesel Engine

1. Technical Data

VOLVO TAD 720 VE is a six cylinder, four stroke, direct injection, and turbocharged diesel engine with heavy duty radiator including transmission oil cooler. The engine is built with high degree of precision to withstand high outputs and at the same time correspond to high demands on operational safety and service life. Smoke control through effective smoke limiter. Low fuel consumption and low noise level.

| | |
|--------------------|------------|
| Engine : | TAD 720 VE |
| Power : | 174,0 kW |
| Power definition : | ISO 3046 |
| Engine Speed: | 2300 1/min |

| | |
|---------------|------------|
| Max. torque: | 854 Nm |
| Engine Speed: | 1400 1/min |
| Voltage : | 24 V |

| | |
|-----------------|----------------------|
| Cylinders: | 6 in-line |
| Bore / Stroke : | 108 / 130 mm |
| Swept volume : | 7146 cm ³ |

| | |
|--------------------|------------|
| Turbocharged: | Yes |
| Charge air cooler: | Air to air |

| | |
|-------------|-----------|
| Alternator: | 80A / 28V |
|-------------|-----------|

2. Emission level

Volvo TAD 720 VE complies with stage 2 EU/EPA/CARB emission levels (Off-road)

- mechanical throttle lever
- air filter with mechanical clog indicator
- exhaust pipe with muffler, heat shield and 45° angle on pipe end
- engine oil dipstick and fill-up extended to front fender for easy reach from ground level
- water separator in the fuel line

Torque converter, C5432 (offset)

Clark C5432 is an offset drive type converter. It makes low chassis profile height possible in TRL model. The torque converter is flex plate mounted to engine and has three pump drives: one for the charging pump and the others for mounting additional accessory pump(s). Since each pump is engine driven, maximum oil flow can be achieved even when operation of the tractor reduces torque converter speed. The Clark circuit design delivers optimum engine power through a wide operating range, providing the highest output levels.

Transmission, 8+8, Clark R 32822

CLARK R32822 is a remote-mounted transmission with an engine-mounted converter. This long drop power-shift transmission with range selector provides 8 speeds in both directions and drive to front and rear axles. Electrically operated gearshift mechanism incorporated for ease of control.

Technical info:

Gear ratios forward/reverse:

| LOW RANGE | | HIGH RANGE | |
|-----------|-------|------------|-------|
| Gear | Ratio | Gear | Ratio |
| 1 | 10.82 | 1 | 4.38 |
| 2 | 5.12 | 2 | 2.07 |
| 3 | 2.95 | 3 | 1.19 |
| 4 | 1.82 | 4 | 0.74 |

Drive shafts are balanced and the joints are dust tight, fitted with needle bearings.

AXLES AND WHEELS

Front axle SISU SSDP 16.41:1, steering angle 48 degrees, hub-reduction with 5 planet pinions, pneumatic s-cam brakes with asbestos free brake linings. Suspension in front with parabolic leaf springs and double effect hydraulic shock absorbers.

Rear axle SISU SRDP 16.41:1, hub-reduction with 4 planet pinions, pneumatic s-cam brakes with asbestos free brake linings, spring loaded parking brakes on rear axle. Rear axle is rigidly mounted to chassis frame.

Tyres: 315/60

Rims: R22.5 steel, colour silver-metal

FIFTH WHEEL AND LIFT BOOM

TRL-182 is as standard equipped with a 100 mm extended lift boom, that allows a $\pm 3^\circ$ lateral inclination of the 5th wheel. The lifting height is 1000 mm, by two single acting lifting cylinders, and the standard lifting capacity is 25 ton load. The king-pin is unlocked by air operated cylinder, controlled from the cabin and with indicator lights.

Freely oscillating mounting of the lifting cylinders ensures proper cylinder rod and barrel alignment providing long barrel and seal life. The pivot contains greasable spherical bearings with large bearing surface for long life and low maintenance. Lift boom, 5th wheel and lifting cylinders are always black.

Fifth wheel, HOLLAND FW 35, for king pin size of 2 inch (50,8 mm)
Max. vertical imposed load 25 ton.

The Holland FW 35 has steel jaws which are heat treated for maximum toughness. The main plate is of cast steel with integrally cast grease grooving and lubrication points assist servicing.

CABIN

One man, left hand drive safety cabin of welded steel mounted on effective anti-vibration rubber mountings. The cabin is designed and tested according to the strict ISO 3471:1994 safety standard (ROPS), with 360° visibility, low noise level and superb comfort and ergonomics for the driver.

Outside corner of the cabin and bumper is angled for maximum visibility to prevent damage on small restricted working areas. Cabin design provides excellent visibility to both front corners. It allows all around visibility of a 1,2 m high object in 1,2 m distance from the tractor.

For easy servicing the cabin is 60° tiltable with hydraulic manual pump. Standard colour RAL 3000 (Kalmar red).

Noise level in the cabin max. 80 dB(A), measured in the distance of 200 mm from a driver's right ear at maximum revs.

Noise level outside the cabin max. 85 dB(A), measured in the distance of 7,5 m from the side of the tractor at stall speed revs.

Terminal tractor SM 3.3

Standard equipment:

- swivelling seat arrangement with steering and full light logic, locking positions 0° and 180°
 - mechanically suspended seat (KAB 301), completely adjustable with pelvic type safety belt
 - wiper / washer on front and rear windscreens
 - cabin heater with 3-speed fan
 - air filter for cabin ventilation
 - side door (lockable) with large vertically sliding window, tinted green
 - sliding (lockable) rear door
 - arm rest on driver's side window
 - laminated front and rear windshields, tinted green
 - side windows are toughened safety glass, tinted green
 - roll sun visors, front and rear
 - wide rear view mirrors on both sides of the cabin
 - tool kit
 - accelerator pedal (mechanical) on right foot / break pedal on left foot, front and rear
 - steering wheel with boss
 - installation railings for additional equipment, e.g data terminals, etc.
 - tool kit
- instruments:
- tachometer, hour counter, fuel gauge, voltmeter
- warning / indicator lights for:
- low engine oil pressure
 - high coolant temperature
 - low transmission oil pressure
 - high transmission oil temperature
 - low charging
 - low air pressure
 - king pin locked / released
 - parking brake
 - emergency steering
 - high beam
 - inlet air pre-heater
 - low engine coolant level
 - clog indicator for hydraulic return line filter
- switches and controls for:
- horn
 - windscreen wipers + washers, front and rear
 - lights (traffic- and indicator lights)
 - heating
 - fan, 3-speed
 - beacon
 - working light

- hazard
- gear shift selector
- 4-wheel drive
- 5th wheel lifting / lowering
- hydraulic lock for 5th wheel tilting
- king pin release, protected
- parking brake (electrically controlled)
- ignition key
- transmission range change

CHASSIS

The all welded steel chassis has been designed to withstand the toughest of applications. To minimise the turning radius and damages both front corners of the chassis have been angled. Sturdy bumpers at front and at rear as well as at both sides to give full protection to the chassis and side fittings such as air reservoir, fuel and hydraulic oil tanks. Stairways to rear deck are on both sides of the chassis. The rear deck and the steps with anti-slip surface. Chassis with 50 mm towing pins on both ends. Standard colour RAL 7021 (Kalmar black) for main chassis. Side covers are always black. Fender marker on outer front corner.

PNEUMATIC SYSTEM

Brakes, 4-wheel drive engagement and opening of king-pin are pneumatically operated. The brake system has an air dryer and system is divided into two circuits with independent air-lines for front and rear brakes. Fixed clad hand connections, double line system (red and yellow) for trailer connections according to ISO 1728 standard on rear edge of engine hood. Hose coupling support arm, four positions, at cabin roof level. Parking brake is electrically controlled and is automatically engaged when power is switched off.

HYDRAULIC SYSTEM

Heavy duty hydraulic system for steering and lifting consisting the following components:

- high capacity, variable displacement piston type hydraulic pump
- hydraulic control valves of mobile type, integrated to one hydraulic block
- single acting telescopic three stage hydraulic cylinders for lifting
- double acting hydraulic steering cylinders, dynamic steering valve with emergency steering function
- clog indicator light for blocked return line filter.

Terminal tractor SM 3.3

Standard lifting capacity 25 ton.

| | |
|-------------------------------------|--------------------------|
| Pump max. capacity | 150 dm ³ /min |
| Working pressure | 19 MPa (190 bar) |
| Oil tank capacity | 190 dm ³ |
| Full flow oil filter in return line | 10 µm abs |

ELECTRIC SYSTEM

24 V, negative ground, batteries 2 x 170 Ah with main switch.

Standard features:

- headlights and lights for braking, parking, turning indicator in front bumper
- rear lights (lights for braking, parking, turning indicator) at rear bumper
- two reversing lights in rear bumper
- full light logics, front and rear lights follow swivelling seat position
- working light on high mounted support at cabin roof
- rotating beacon, mechanical
- 7-pole trailer socket DIN/ISO 1185, 24 V at rear wall of cabin
- 24 V/10 A socket inside the cabin on roof level
- cabin interior light
- warning horn, electric
- fuses and relays mounted in central box in the cabin out of dust and moisture and for easy access
- reverse warning alarm, outside

MANUALS AND MISCELLANEOUS

| Manuals | Language | Copies / Order |
|---|-----------------------------|----------------|
| Operators manual and maintenance manual | English | |
| Spare parts manual | English / Finnish / Swedish | |