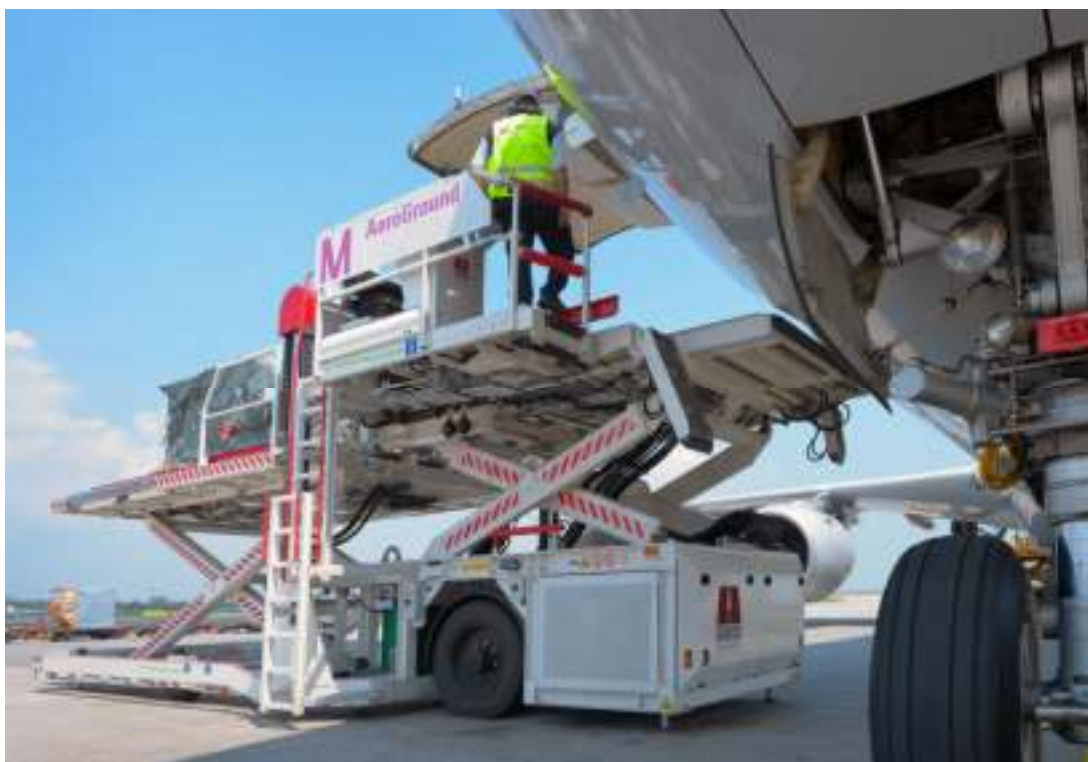


TECHNICAL SPECIFICATION
Cargo Master Loader CML 7-3.7 Wide
Green Line



Edition 01/2020

LAWECO reserves the right for changes without further notification due to technical development.

Application

The CARGO MASTER Loader CML 7 - 3.7 SW (B 767) is an automotive Electric-powered equipment which can be applied for aircraft handling in the lower deck and main deck area. Loads of up to 7.000 kg can be transferred. Maximum lifting height is 3.700 mm.

The asymmetrical adapter system of the bridge platform in combination with the large angle of steering lock of the front axle based on a four wheeler system allows for easy, quick and safe approach to the corresponding aircraft, refer to layout drawing.

Design of the vehicle is based on one man operation; particular attention to implementation of simple operation as well as quick and efficient maintainability of all modules.

Loader's main platform is capable to receive simultaneously 2ea. LD3 containers or 1ea. LD8 cntr / or 1ea. pallet 96"x125" (longitudinal and transversal direction) .

A powered system is provided to enable rotation of all kinds of standard containers or pallets with the base dimension up to 96"x125" on the end of rear platform.

CARGO MASTER LOADER CML 7-3.7 SW (B 767) is suitable for handling the following types of aircrafts (examples):

In main deck area:

DC 8

DC 9

B 707

B 727

B 737

CL 44 (Canada Air)

Fokker 28 cargo model

BAE 146-200

321

TU 154 cargo model

In lower deck area:

B 747

B 767

B 777

DC 10

TRI STAR 1011

A 300

A 310

A 320

A

A 340

A 380 front and rear

Ilyushin 86

Technical Data

Dimensions and Weights (approximately)

Length:	9,720 mm
Width:	4,300 mm
Height:	3,150 mm
Floor clearance:	120 mm
Wheelbase	3.600 mm
Lifting range bridge platform:	1.880 mm - 3.700 mm
Tilting bridge platform:	± 2,0°
Lifting range main platform:	480 mm - 3.700 mm
Working area <u>bridge</u> platform:	3.840 mm x 3.265 mm
Working area <u>main</u> platform:	4.670 mm x 3.265 mm
Turning radius:	8.500 mm

Performance

Useful load in lifting operation:

- bridge platform:	7.000 kg
- main platform:	7.000 kg

Loading capacity (main platform):	1 ea. cargo pallet 96" x 125" (lengthwise / crosswise) 2 ea. cargo containers LD 3
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Rotating device (main platform):	Pallets/containers (LD 3-container +)
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Travelling speed:	max. 12 km/h 3 km/h (creep speed)
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Gradeability:	min. 5 %
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Transfer speed (longitudinal / lateral)	18 m/ min (adjustable)
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Vehicle Equipment

Steel Construction

Chassis

The chassis consists of a sturdy sectional steel structure, jet blasted before machining.

Longitudinal beams and crossbeams are connected and reinforced at the corresponding points featuring horizontal impacts in case of lateral or frontal hits through container transporters / dollies do not cause any deformation.

During cargo mode the chassis is supported by 6 ea. hydraulic stabilizers. Once pressure is achieved cargo operations are released based on pressure monitoring.

Towing attachments are provided both at front and rear of the chassis.

Front Platform

The front platform is raised and lowered by a system of combined scissors and hydraulic cylinders, which permits very precise control and the ability to interface accurately with aircraft cargo doors.

Lifting and lowering of the front platform is possible with "travel" selected. For safety and accuracy when operating in close vicinity to an aircraft, the loader will only travel in creep speed when the front platform will be raised.

Working area is 3,264 x 3,840 mm.

The front platform is used to load cargo into and out of the aircraft. Cargo movement is effected by zinc-coated chain-driven transport rollers positioned along the complete length of the platform. The front platform also has the capability of being aligned to the aircraft doors by adjustments to the platform height and slope.

The lateral slope adjustment available provides compensation for differences of slope between aircraft and loader of up to $\pm 2^\circ$.

At the front of the platform easily operated adapters are provided to adjust the width of the platform to suit the aircraft door. The right side adapter segments can be extendible to provide optimum versatility.

Transverse transport rollers facilitate lateral movement of cargo to align it to the loading door.

The safety rails are securely connected to the frame of the front platform. Front telescopic extensions are provided to close any possible gap between loader and the aircraft body. Front end of telescopic extension equipped with rubber protection for providing additional safety for the aircraft.

The open driver's operating position is located at the right side of the platform, and can be reached safely and easily at any lifting height via ladder.

All necessary operating controls and indicator lamps are clearly arranged in the driver's and operators control panel. Lifting and cargo handling operations are controlled from the opposite side of the driver stand. The ergonomically arranged control console is optimally arranged for the dispatching procedures, the operator can operate - without heavy remote control - all movements.

Auto-follow-system provides automatic height adjustment between front and main platform (up to a platform height of 3,700mm)

Main Platform

The main platform is raised and lowered by two hydraulic cylinders acting through the medium of robust chains. Vertical guidance of the platform is achieved by means of a scissor arm system.

The lifting systems described above ensure safe and reliable lifting and lowering.

Working area is 3,264 x 4,670 mm.

The main platform is used to raise loads and transfer them to the bridge platform. The longitudinal movement of cargo is effected by zinc coated chain-driven transport rollers located along the complete length of the platform roller bed.

To permit pallet rotating as well as transverse loading/unloading of cargo, the guide rails in the area of the transverse drive rollers are retractable hydraulically. In other areas the rails are secured by screws, but are easily removed if repairs are required.

Transverse transport rollers facilitate lateral movement of cargo to align it to the dolly.

The platform longitudinal transport system is divided into 2 segments.

To facilitate lateral movement of 10' (125" x 96") pallets (eg, B767F or B747 Combi), the loaders main platform is equipped with a rotation device.

Drive for rotating the cargo is provided by 4 hydraulically driven rubber drive rollers which raise the pallet above the normal drive rollers when "rotation" is selected on the driver's control panel. The rubber drive rollers are positioned oblique around the centre of rotation, and can rotate the pallet in either clockwise or anticlockwise direction. Multi-Rollers are used for support of the rotating devices and also for the side loading.

Pallet Stops

Between the main and bridge platforms automatically operating pallet stops are provided to safely restrain cargo during platform movement. At the rear of the main platform pallet stops are also provided. These stops can be designed with locking and unlocking devices for truck handling. When the platform is lowered onto the frame the stops unlock automatically, avoiding operator error.

Pallet stops also provide protection when cargo is moved laterally.

Chassis Support

During loading and unloading operations 6 hydraulic stabilizers support the chassis. The stabilizers also compensate for any unevenness of the ground surface.

Painting

All steel structures are shot-blasted and treated with an anti-corrosion coating. The top coat color is in accordance with the customers specification.

Running Gear

Front Wheels

Robust steer-drive axle with pneumatic tires 275/70 R22,5.

Rear Wheels

2 wheels solid rubber tires MH-20-457/203-308 running on axles located in the chassis.

Steering

Hydrostatic power steering with emergency steering characteristics, steering angle 41°. Turning radius is left 8,709 mm, right 8,685 mm.

Braking Systems

Service Brake

The brake system is designed as dual-circuit hydraulic brake acting on wet mult-disc brakes, which are incorporated in front axle via brake pedal and brake caliper. Braking output of the moved vehicle is at least 25 %.

Locking Brake

The locking brake acts on the disc brake by hydraulic pressure via the brake caliper and achieves a braking output of at least 15 %. This way it allows for safe stopping of the vehicle on a slope of 7 %.

Due to the pressure accumulator existing for both hydraulic brake system, the required brake pressure for safe stopping of vehicle is available at any time, even in case of failure of hydraulic supply.

Hydraulic System

The LAWECO loader-range has been fully redesigned regarding the hydraulic system: The drive system features automotive propulsion control at variable Electric-motor speed. This guarantees an optimal energy-gain. The new loader generation is one of the first vehicle series in the market using a real MOBILE HYDRAULIC SYSTEM

Additionally, the main working hydraulics has been improved, too. The motor rpm and hydraulic oil flow is automatically adjusted to the demands from the system, instead of running at full speed.

Thus noise emission level as well as energy consumption are minimised with a positive effect on the environment. Moreover, lifetime of costly components will be increased, e.g. cold starts during the winter period will be performed at low motor rpm and automatically adjusted timer, equally to several working hydraulic functions. For this a temperature sensor is installed.

The two pump hydraulic system provides hydraulic pressure to all functions. The regulated maximum operating pressure is 250 bar.

Easy access is provided to all components for maintenance, thus ensuring high vehicle availability.

Electric motors

The MASTER CARGO LOADER CML 7 - 3.7 SW Green Line has two individual controlled 80 V - 20 kW electric motors, each rated output and flanged hydraulic pump. The engine management is associated with a separate controller, which communicates with the LAWECO CANbus. In used is advanced technology from Linde company.

Batteries

The CML 7 is equipped with a 930AH battery and "on-board charger", as controlled high frequency charger for 5.5 hours to recharge, incl. air-track-system made by Hoppecke/Germany.

Recuperation

The drive motors works when lowering the main platform as a generator and recuperates back to the battery. This feedback extends the battery life considerably and leads to a further reduction of operating costs.

Emergency Operation

The CML 7 Series have a standard emergency system:
An easily accessible hand pump is provided for use in event of engine or hydraulic pump failure. The functions of lowering the main and bridge platform, and retracting the support cylinders can be operated by the hand pump.

Electric Equipment

The LAWECO loader-range provides fully CAN-open electronic control of the electric motors and main hydraulics as well as electrical control featuring instant visual LED-based monitoring of functions. The CAN-open system, connected with the motor controllers and the hydraulic system allows the controls and adjustments of all functions, also driving speed and lifting speed. The CAN-open system reduces electrical connection points from approx. 3000 down to 300. The number of relays is reduced from approx 90 down to 8.

The CAN-open system is an industrial product, intended for heavy-duty professional use. With its rich set of features, it functions as the central component in a totally integrated mobile system. It is designed to operate in harsh environments with extreme temperatures, vibrations, and exposure to dust and water

Technical Standards, Guidelines

In general layout and design of the machinery is based on following standards and guidelines as far as applicable:

- IATA AHM 909 / 910 / 911 / 913 / 931
- CEN Equipment Directive / EN 1915 (part 1 and 2) / EN 12312-9:2012
- Other German standards, rules and regulations

Optional Equipment and conditions

- **Winter Kit**
 - ➔ Winter kit for operation down to -35°C
 - ➔ Hydraulic-oil preheating
 - ➔ Heated, foldable driver's seat (make KAB P-3)
 - ➔ Foldable windshield (height ca.600mm) protecting also driver's control panel if tilted over steering wheel
 - ➔ Right hand side of driver's stand closed with steel plate on lower side and polycarbonate plate on upper side of safety rails, rear side with steel plate.
 - ➔ Heated Mirror

 - ➔ Step on front side of driver's control panel for opening aircraft door (height 300mm)
 - ➔ rubber rollers at front and at rear (one each)

Standard Equipment and conditions

- **Driver's Stand**
 - ➔ All written descriptions on driver's control panel and operator's control panel in English language
 - ➔ Cover of driver's stand and seat accommodated in a metal box
 - ➔ Hour meter located near the battery charging device

- **Electric Equipment**
 - ➔ All electric cabling by using silicon isolated cables make LAPP where necessary
 - ➔ Working lights on front platform ➔ 1 x illuminating front (aircraft door working area) and 1x illuminating main platform working area
 - ➔ Emergency stop on units left and right hand rear end sides, well protected

- **Hydraulic Equipment**
 - ➔ Shut-off valve between hydraulic oil tank and hydraulic oil pump
 - ➔ Lifting and stabilising cylinders are equipped with ice scrapers
 - ➔ Lifting cylinders equipped with inline permanent sensors for measuring platform heights and levelling "Auto-Follow-System"
 - ➔ Soft function for cargo transport on front and main platform

- **Steering**
 - ➔ Steering wheel diameter ➔ 350mm, steering wheel with turning knob

- **Front and main platform**
 - ➔ Reinforced P/C stops (material St 52)
 - ➔ Ball rollers on both outer sides of front platform fixed part
 - ➔ Lateral slope adjustment of front platform $\pm 2^\circ$ due to two hydraulic cylinder, one on each side of front platform
 - ➔ Hydraulically operated rear end stop on main platform rear end moves up automatically when the rear platform reaches height of 615mm, lorry loading application is provided up to 1.600 mm
 - ➔ Rear P/C stop sensor enables transport direction reverse above 1.600 mm.

- **Emergency**
 - ➔ Manual Emergency pump

➤ **Steel Structure**

- ➔ Closed profiles of steel structure with drainage wholes as well as inside protected against corrosion
- ➔ All safety rails are provided with rounded edges
- ➔ Rear platform front part will be provided with removable hand rails with rounded edges
- ➔ All bearings assembled in scissor systems as well as P/C stops are equipped with grease nipples
- ➔ All steel construction as heavy duty execution

Finishing:

cadmium-plated hydraulic piping
all steel structures are shot-blasted and treated with an anti-corrosion coating
top coat colour RAL
descriptions and lables in pictograms according to IATA norms

Country of Origin

The equipment is made in Germany.

Manufacturing plant:

LAWECO Maschinen- und Apparatebau GmbH
In der Tütenbeke 23
32339 Espelkamp – Germany

Delivery Time (subject to final negotiations):

5 – 6 months after receipt of order, ex works, earlier deliveries are allowed.

Warranty Conditions:

24 months respectively max. 2000 operating hours after start-up, max. 25 months from date of shipment for faults arising from defective construction, faulty material or faulty finish.

Use of first class quality material and unobjectionable function of equipment will be guaranteed.

Equipment will be manufactured in accordance with the International Standards so far as applicable.

After Sales Service:

LAWECO premium spare parts service provides prompt spare parts quotations and order processing for reduced down times. Original quality spare parts supply is **guaranteed for 10 years** after arrival of the purchased equipment on site.

Technical Literature:

Following technical literature (one sets per unit) will be provided together with the despatch of the equipment:

- pre-delivery test report with certificate of warranty
- operation manual (English)
- maintenance manual (English)
- Spare part catalogue (English)

Training & Commissioning

Included to the price is an operator and workshop personnel training course in the factory as well as the final / factory inspection of the units. Travelling costs and accommodation have to borne by the customer. Transportation from the hotel to factory and training costs will be borne by LAWECO.

Training includes

- Instruction of your technicians for maintenance and repair
- Training of your operators in handling the machine.

Operator Training at site

A LAWECO super-visor for operator training and commissioning of the vehicle after arrival at site can be ordered separately.