

TECHNICAL SPECIFICATION

TREPEL 7 TON PALLET/CONTAINER LOADER

CHAMP 70

type CHAMP 70 S
type CHAMP 70W
type CHAMP 70U

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1. Application

The **CHAMP 70** is designed for fast, safe, flexible and economical handling of LD containers up to 10 ft. pallet/containers on the lower decks of wide-body (main deck of wide-body with the "U" version) as well as on the main deck of narrow-body aircraft. Please review the Aircraft Handling Chart on page 4.

The **CHAMP 70** is designed to handle pallets/containers up to a max. payload of 7.000 kg (15,680 lb.) whereby highest standards, complying with world-wide safety requirements, have been applied for the structural calculation.

The size of the main platform allows handling of either one 10 ft. pallet or of two of and each LD-1, LD-2, LD-3 containers.

The easy understandable and failsafe controls of the **CHAMP 70** guarantee a one-man operation.

TREPEL ground support equipment are renowned for their excellent performance under most severe and also extreme climatic conditions

Parts and components are designed and have been selected to withstand the roughest handling operation at today's modern airports.

TREPEL loaders are known for their high reliability as well as lowest operational and maintenance costs (statistics available upon request).

2. Design

2.1 General description main components

The **CHAMP 70** is equipped with two separate vertically operating platforms. The front platform serves as a loading bridge in front of the aircraft's door, fully stable without any mechanical connection to the aircraft. The main platform accepts the freight from either dollies or transporters and lifts the freight up to the front platform's level. Due to the excellent concept of the lifting system with two vertical operating cylinders, the main platform moves in a smooth motion as the cylinders move in total unison.

The standard configuration of the **CHAMP 70** allows the front platform to tilt laterally by +/- 2° to compensate the aircraft's' movements.

Six vertically operating stabiliser cylinders ensure full stability during handling.

In order to guarantee max. safety during final approach to the aircraft, the **CHAMP 70** can be driven with the front platform lifted. As an additional safety feature, the drive speed is decelerated automatically to max. 6 km/h (3.7 mph).

The front platform adapters allow flexible servicing of different aircraft cargo door sizes. For operator's comfort and faster handling, the adapters can be lifted and lowered hydraulically. A further safety and comfort feature is the hydraulically extendable/retractable part in front of the driver's stand. The aircraft's control system can be reached without any problems from the operators platform.

2.2 **Drive System**

The **CHAMP 70** is powered by a diesel engine of latest design, guaranteeing low fuel consumption and low emission values.

Standard engine:

- DEUTZ AG F4 L1011F oil-air cooled, acc. to COM I requirements.

Alternative engines:

- DEUTZ AG BF4 M1012 liquid cooled, acc. to COM I requirements.
- DEUTZ AG BF4 L1011F oil-air cooled, acc. to COM I requirements

Both engines are recommended for airports located at high altitude or high temperatures.

DEUTZ AG is a leading manufacturer of equipment-installed engines with a world-wide service and after-sales network.

Due to the well designed combination of diesel engine and hydraulic system, all functions except lifting of main platform and driving procedure are carried out with the engine in idle position or in increased idle speed. Therefore, noise level and fuel consumption are reduced to a minimum.

The fuel tank capacity of 150 l (39 US Gal.) guarantees an operation time of approx. 16 hours without having to refuel. (Depending on type of engine used)

Driving and exact positioning of the **CHAMP 70** is effected by a hydrostatic drive system. A variable displacement piston pump is supplying power to a hydraulic motor mounted on the drive axle. The planetary axle is selected from the standard programme of a reputable axle manufacturer.

2.3 **Steering System**

For comfort of the operator and exact positioning of the loader, the **CHAMP 70** is equipped with power steering. Emergency steering is provided.

2.4 **Brake System**

The **CHAMP 70** is equipped with dual circuit hydraulic brakes acting on the front wheels. The brakes are multiple wet disks running in a fully enclosed oil chamber. Due to the design, the oil only has to be changed after 5,000 operation hours, the brake disks last for at least 10,000 operation hours, this making the system virtually maintenance-free.

The **CHAMP 70** provides maximum safety with the following features of the brake system:

- hydraulic powered servo-brakes allow exact control and positioning
- multiple wet disk brakes provide unbeatable braking efficiency
- dual-circuit brake system provides maximum safety, braking power is provided even in case of loss of one circuit
- safety brake pressure reservoirs guarantee emergency braking
- a red warning light on the driver's stand ensures immediate warning in case of loss of brake pressure
- the fail-safe emergency and parking brake offers maximum safety in case of loss of brake pressure

2.5 **Operation**

The operators/driver stand on the **CHAMP 70** is located on the right hand side of the front platform. For safety and comfort, all Trepel loaders are supplied with a back-rest for drivers in standing position. With the standard ladder, the drive and operation areas are easily accessible from ground level up to front platform highest lifting heights. An ergonomically designed driver/operator stand offers easy and safe operation.

The stand is equipped as follows:

- steering wheel with horn button
- fuel gauge
- Switches:
 - engine start/stop switch (key type)
 - lever switch for: drive operation / lift operation
 - lever switch for: forward drive / reverse drive / parking brake
 - switch for vehicle lighting
 - switch for direction indicators
 - EMERGENCY STOP button

- lever switch for front platform: lift / lower
- switch operators platform extension: extend / retract
- switch for guiding rails: left / right
- switches for adapters operation: down / up

Control and warning lights for:

- loading function alternator
- low engine oil pressure
- low brake pressure
- high engine temperature
- parking brake engaged
- direction indicators on
- stabilisers extended
- stabilisers retracted
- engine preheating
- emergency stop activated

Additional control and warning lights are available upon customer's request.

In today's working environment at airports, one-man operation is a necessity with most ground support equipment. The front platform design of the **CHAMP 70** offers a hydraulically extendable/retractable operation platform, closing the gap between the loader and the aircraft operation panels. A low hydraulic pressure setting will protect the aircraft from being damaged. This configuration offers a safe and simultaneous operation of both the **CHAMP 70** and the aircraft.

The operation control panel is detachable and can be placed around the operation area - one more feature to guarantee safe and simultaneous operation of the **CHAMP 70** and the aircraft. The operation control panel includes all necessary controls for platform lifting/lowering systems, platform transfer and turning systems, main platform stops as well as an emergency stop. Further operation controls are available, upon special request.

2.6 ***Lifting and stabilising systems***

TREPEL is the leading manufacturer of scissors lifting systems world-wide, producing lifting capacities from 100 kg to 500 tons with know-how unequalled by any other manufacturer. The structural designs of scissors lifting systems have been calculated with maximum safety and stability factors. Special attention has been given to the design of the main platform which is lifted by two vertically operating cylinders guaranteeing a synchronised lifting and lowering of the platform.

Distribution of the forces of the total loader system has been carefully calculated, resulting in the present location of the six stabilisers which provide maximum stability for the **CHAMP 70**.

2.7 ***Loading platforms***

General:

The longitudinal transfer of pallets/containers on both platforms is provided by zinc-plated steel rollers positioned in the centre of the platforms and powered by hydro-motors.

The front platform at the front part is equipped with hydraulically foldable adapters. One adapter is equipped with a powered roller.

Hydraulically operated guide rails for proper adjustment at the front side of platform.

Two gravity stops at the end of front platform

For compensation of the aircraft's roll and pitch movements the front platform can be tilted by +/- 2°.

The main platform is equipped with a powered end roller.

CHAMP 70S

With the platform width of 96" all ULDs up to 10 ft. can be handled (lengthwise).

Lateral guiding on main platform is provided by fixed guide rails.

Gravity stops at the rear end of main platform.

The CHAMP 70 S is available with the following platform configurations:

- a) For side shifting of LD containers the front platform is equipped with 2 hydraulically lifted and powered transversal drive units.
- b) For side shifting of LD containers and 88" pallets, the front platform is equipped with 3 hydraulically lifted and powered transversal drive units.
- c) For main platform side loading and rotation of LD Containers, the rear part of main platform is equipped with hydraulically lifted and powered transversal drive unit's and powered side rollers in addition with hydraulically operated guide rails and hydraulically operated stops at the rear end of main platform.
- d) For side loading of a 10 ft. ULD lengthwise, the front part of main platform is equipped in addition to item c) with 2 hydraulically lifted and powered transversal drive units and side rollers.

CHAMP 70W

With the platform width of 125" all ULD's up to 10 ft. can be handled (length and crosswise).

For side shifting of LD Containers and 10 ft. unit's, the front platform is equipped with 3 hydraulically lifted and powered transversal drive unit's.

For side loading and rotation of LD Containers and 10 ft. unit's, the rear part of main platform is equipped with hydraulically lifted and powered transversal drive unit's and powered side rollers.

Additional for transversal drive, in both sides of main platform powered multirollers are mounted.

Lateral guiding on main platform is provided by hydraulically operated guide rails. Hydraulically operated stops at the rear end of main platform.

CHAMP 70U

Configuration as "**W**" version, but with front platform Main Deck capability.

All **CHAMP 70** versions are equipped with the front platform configuration as described in Section 3.5 - Operation - (extendable/retractable operation area). Additionally, the platform is fitted with two ("**W**" and "**U**" versions with three) adapters in order to fit the platform into the different cargo door sizes: 61 inches, 96 inches and 125 inches ("**W**" and "**U**" versions only).

For operator's maximum comfort as well as for safety reasons, the adapters can be lifted/lowered hydraulically, controlled from the drive control panel.

2.8 Hydraulics System

The hydraulics system of the **CHAMP 70** has been designed in co-operation with a leading manufacturer of hydraulic components. The hydraulic operation (lift, transfer, control) as well as drive circuits are supplied with hydraulic oil pressure by a "controlled flow" variable displacement axial piston pump. The brake/steering systems are powered by a gear pump. The design of the hydraulic system allows all functions to be carried out with the engine in idle position, or in increased idle speed, except driving and lifting of main platform. Therefore noise disturbance and fuel consumption are reduced to a minimum.

For easier maintenance, all hydraulic valves are centralised in block design and are equipped with indicator lamps and manual emergency controls.

Wherever possible, high pressure hydraulic steel pipes are used to minimise hydraulic hoses used. All hydraulic fittings and pipes are cadmium-plated = **corrosion-protected**.

All **CHAMP 70** loaders are equipped with an manual hydraulic emergency system, to lift the stabilisers, release the emergency brake and lower the platforms.

2.9 **Electrical system**

All electric controls are centralised in the main switchboard. Controls have been kept easy to operate and to understand, i.e. commercially available standard relays and fuses are used. Controls have been proven to be unbeatably reliable under all weather conditions with highest humidity, lowest and maximum temperature changes. Trepel's philosophy is that controls and systems have to be easily understandable, adjustable with maximum reliability.

The Trepel **CHAMP 70** is equipped with standard lighting, including

- 2 front lights
- 2 rear lights
- 4 indicator lights
- 2 brake lights
- 2 reverse drive lights

The 24 Volt electrical system is powered by two 12 Volt 88 Ah batteries.

For easy maintenance, all electrical wiring is coded and corresponds to electrical diagrams.

3. Performance, Technical Data

Dimensions

Length	9.200 mm	(30' 2")
Width (CHAMP 70S)	3.600 mm	(11' 9")
Width (CHAMP 70W and U)	4.300 mm	(14' 1")
Height incl. handrails (CHAMP 70S and W)	3.100 mm	(10' 2")
Height incl. handrails (CHAMP 70U)	3.200 mm	(10' 6")
Wheel base	3.900 mm	(153.5")
Width of track of drive axle	1.890 mm	(74.4")
Width of track of rear axle	2.820 mm	(111")
Turning radius (most forward edge of front platform with adapter folded down) (CHAMP 70S)	9,2 m	(326.2")
Turning radius (most forward edge of front platform with adapter folded down) (CHAMP 70W and U)	9,6 m	(377.9")
Dead weight (equipped with all possible options):		
CHAMP 70S approx.	14.000 kg	(30,856 lb.)
CHAMP 70W approx.	17.000 kg	(37,468 lb.)
CHAMP 70U approx.	17.700 kg	(39,648 lb.)

Lifting heights

Front platform from/to (CHAMP 70S and W)	1.800 / 3.700 mm (70.8" / 145.7")
Front platform from/to (CHAMP 70U)	1.900 / 5.600 mm (74.8" / 220.5")
Main platform from/to	490/ 3.700 mm (19.3" / 145.7")
Tilting of front platform	+/- 2 degrees

Lifting capacity

Front and main platform	7.000 kg	(15,680 lb.)
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Performance data

Lifting time of main platform with max. load	17 sec.
Lowering time main platform with useful load	17 sec.
Lifting time front platform (CHAMP 70S and W)	25 sec.
Lifting time front platform (CHAMP 70U)	35 sec.
Level main platform to highest level	25 sec.
Lowering time front platform (CHAMP 70S and W)	25 sec.
Lowering time front platform (CHAMP 70U)	35 sec.
Maximum driving speed	15 km/h (9.3 mph)
Approach speed with lifted front platform and towing speed max.	6 km/h (3.7 mph)
Slope gradient	5 %
Transfer speed longitudinal and lateral (adjustable)	18 m/min. (59 ft/min)
Brake deceleration min.	30 %

Tyres

Front axle: pneumatic tyre	305/70 R 22,5
Rear axle: solid-rubber profile tyres	18 x 9 x 12 1/8 ZST

1'=304.8mm; 1"=25.4mm; 1 lb.= 0.453 kg; 1 US Gal.= 3.785 l ; 1 mile = 1,609 km

4. Safety Features

Standard safety features that make the **CHAMP 70** part of a safe working environment.

Electric

- with drive system engaged it is not possible to extend the stabilisers
- if stabilisers are not fully retracted it is not possible to activate the lifting and transfer system (except front platform lifting system)
- with extended stabilisers the drive system is blocked
- if the brake pressure is not sufficient, the drive system is blocked
- when raising the front platform, the drive speed is automatically limited to max. 6 km/h (3.7 mph)
- the main platform automatically follows the height changes of the front platform
- all control switches (except lever for drive/lifting operation and lever for driving direction) are in "deadman" design
- if emergency stop buttons are activated, all movements are stopped automatically

Hydraulics

- all lifting cylinders are equipped with pilot-controlled check valves mounted directly on the cylinders
- all stabilising cylinders are equipped with pilot-controlled check valves
- each hydraulic circuit is equipped with its own pressure security system
- the brake system consists of two circuits as well as pressure reservoirs for emergency braking
- in case of a loss of brake pressure, the spring-loaded disk brake stops the loader immediately
- in case of engine shutdown, emergency operations can be carried out with an manually powered emergency pump
- the loader is provided with an emergency steering system

Mechanics

- all accessible areas on the front platform are covered with an anti-skid coating
- all tread areas and grids are non-skid design
- the front platform can be reached at any raised height by a ladder
- extendable operation area for closing the gap to the aircraft
- handrails on right hand side of front platform extend/retract automatically with the operation area

5. Paint work and corrosion protection

Special attention has been given to the corrosion protection of the **CHAMP 70**. Based on years of experience with Trepel loaders operating at airports at high altitudes, with extreme humidity, extensive rain seasons, extreme winter conditions, sandstorms, etc., the following corrosion protection is part of the Trepel standard.

All hydraulic tubes are cadmium-plated and therefore corrosion protected!
All joints, corners and hollow spaces are sealed with a special filler!
The **CHAMP 70** is painted with one coat of anti-rust polyurethane primer!
The **CHAMP 70** is painted with two coats of acrylic-lacquer top paint,
colour according to customer's choice!

6. Rules, Guidelines, Documentation

The criteria for design and technical layout comply in general with the following rules and guidelines:

IATA AHM 909 / 910 / 911 / 913 / 931
CEN Equipment Directive / EN 1915, Part 1+2 / PR EN 12319 -9
as well as other international and local standards, rules and regulations.

One complete set of technical documentation (in German or English) will be supplied with each unit :

- * Adjustment protocol and brake examination protocol
- * Function description
- * Operating instructions
- * Maintenance instructions
- * Hydraulic and brake systems' diagrams
- * Electrical diagrams
- * Adjustment instructions
- * Trouble-shooting instructions
- * Illustrated parts list
- * Sub-suppliers information

7. Summary, Highlights

- The **CHAMP 70** offers **fast, safe, flexible** and **economical** service of LD containers up to 10 ft. ULDs
- The static calculation of the **CHAMP 70** fulfils **highest safety standards**
- The **CHAMP 70** offers the **highest reliability** factor in this field
- Due to the **modular concept** of the **CHAMP 70**, **shortest delivery times** for the three different versions are possible
- The **CHAMP 70** is equipped with engines of the **latest generation**, complying with **COM I** requirements
- The **CHAMP 70** is equipped with a **dual circuit multiple disk oil immersed** operating brake and a **fail-safe spring applied, pressure released** parking/emergency brake

- The **CHAMP 70** is equipped with the **new hydraulically extendable operation area**, providing **more comfort** and **safety** for the operator
- The front platform of the **CHAMP 70** is provided with **hydraulically powered adapters** which provide **more safety** and **comfort** for the operator, equipment and aircraft
- The **CHAMP 70** is provided with **maximum corrosion protection**, such as **cadmium-plated hydraulic pipes**, **special primer** and **top paint**, **special seal fillers** for joints, corners and hollow spaces, etc.

***We reserve the right of technical alterations
All dimensions with tolerance of +/- 3%***

8. Options

Engine / Chassis

- Engine DEUTZ AG BF4 M1012
4-cylinder liquid-cooled according to COM I
- Engine DEUTZ AG BF4 M1011-F (COM I)
4-cylinder air-cooled, turbo charged (recommended for airports located at high altitudes)

Front Platform

- Rear mirror on left hand side
- Rear mirror on right hand side
- Drivers seat instant off back-rest.
- Cover for drive control panel and driver's seat

Main Platform

Infrared sensor stop at front of main platform for LD-containers

Hydraulic system

- Additional pressure-line filter for hydraulic system
- Electro-hydraulic Emergency System
- Hydraulic tank fitted with fuel shut-off valve
- Anti-moisture filter for hydraulic system
("Blue Gel" moisture absorber recommended for operation in extreme humidity)

Electrical System

- Working floodlight
- Rotating beacon located on handrails of platform
- Obstruction lights
- Intermittent horn during reverse drive and/or lowering of main platform
- Additional engine start/stop fitted on customer's request
- Additional emergency stop fitted on customer's request
- External power socket connection (socket to be provided by the customer himself)
- External power sockets
- Additional connection for operation control panel, location acc. to customer's request

Mechanical Options

- Fire extinguisher mounted near to drive control area
- Two wheel chocks mounted to the chassis
- Chassis fitted with rubber bumper on front part
- Finish / paint with two and more colours
- Main lifting system with double chain and electrical control.

<http://www.trepel.com>