AIRBUS A350 EQUIPMENT CATALOGUE

A350 – 900 / – 1000

IN SAFE HANDS

Dear Madam or Sir,

One of the key success factors of managing a medium sized Group like HYDRO has always been the direct involvement and accessibility of top management to what we call the voice of the customer. My personal view is that there is simply no better way than the direct contact with customers. In many cases it has proven the right way to just get down into the trenches to really comprehend what is going on and what needs immediate attention. Additionally I can assure you that this spirit is flown down from all of us in management and ownership to all of our employees.

With HYDRO I can personally assure you, you will have a strong partner who is not seeking short-term objectives, but who will be there to support you for decades to come. HYDRO started up in 1965 as a small engineering business in Biberach, a picturesque village in Germany's Black Forest. Today about 700 employees worldwide are always near to our customers.

We stand for innovation, experience and reliability. In 2015 we repurchased one of our axle-jacks from Helvetic Airways. It was in service for nearly 50 years. You see — our product promise is truly unique.

A constant quest for improvement and close cooperation with our customers are important parts of our culture. HYDRO employees are people with a strong passion for customer satisfaction and entrepreneurial genes.

Yours sincerely

Peter Prinz

Managing Director

Speaker of the Executive Board

WITH HYDRO YOU ARE IN SAFE HANDS!

With over half a century of experience in the aircraft industry and a strong passion for precision, we are the single source that can meet all of your requirements.
Our whole life cycle solutions are designed to perfectly fit your needs, from the development of turn-key systems, the manufacturing of Ground Support Equipment and Tooling, and a diverse range of services. We measure our success based on the complete satisfaction of our customers.

Privately owned and financially strong, our global presence makes us always available at your site. We foster an atmosphere of operational excellence, so all of our employees, processes and products are strictly focused on supporting you and your safety.

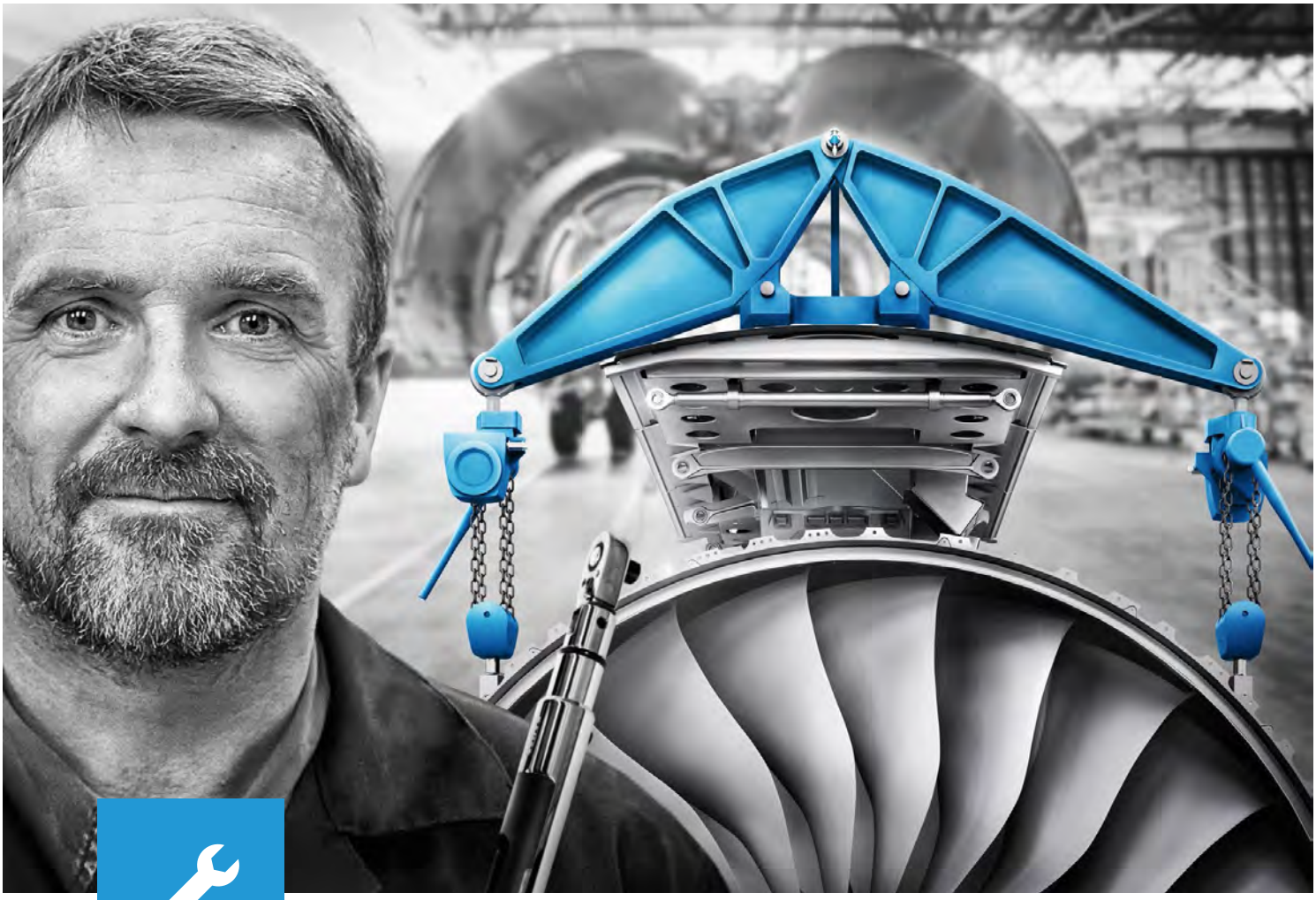
Our business units include:

GROUND SUPPORT EQUIPMENT

HYDRO stands for ultimate precision in GSE support. Our passion for precision doesn't just refer to precision in every detail, it means that we precisely provide products that are fully aligned to the needs of OEMs, airlines and maintenance facilities around the world. Before we launch a new product, it has been rigorously tested in harsh operation conditions. We set standards with uncompromising safety, total functionality, reliability, longevity and user-friendliness. That's why professionals trust in our products.

PRECISELY THE PROFESSIONAL CHOICE

AIRFRAME AND ENGINE TOOLING



We understand and accompany every tool throughout its life cycle, supporting it to perfection from cradle to grave. Every tool has a life, and we create, manage and support this life. Our well-known design capabilities, global supply chain presence, and project management experience in supporting OEMs from requirement capture to operation readiness and validation make this possible. We not only make tools to fit for function, we go the extra mile so you don't have to.

IT'S NEVER JUST A TOOL

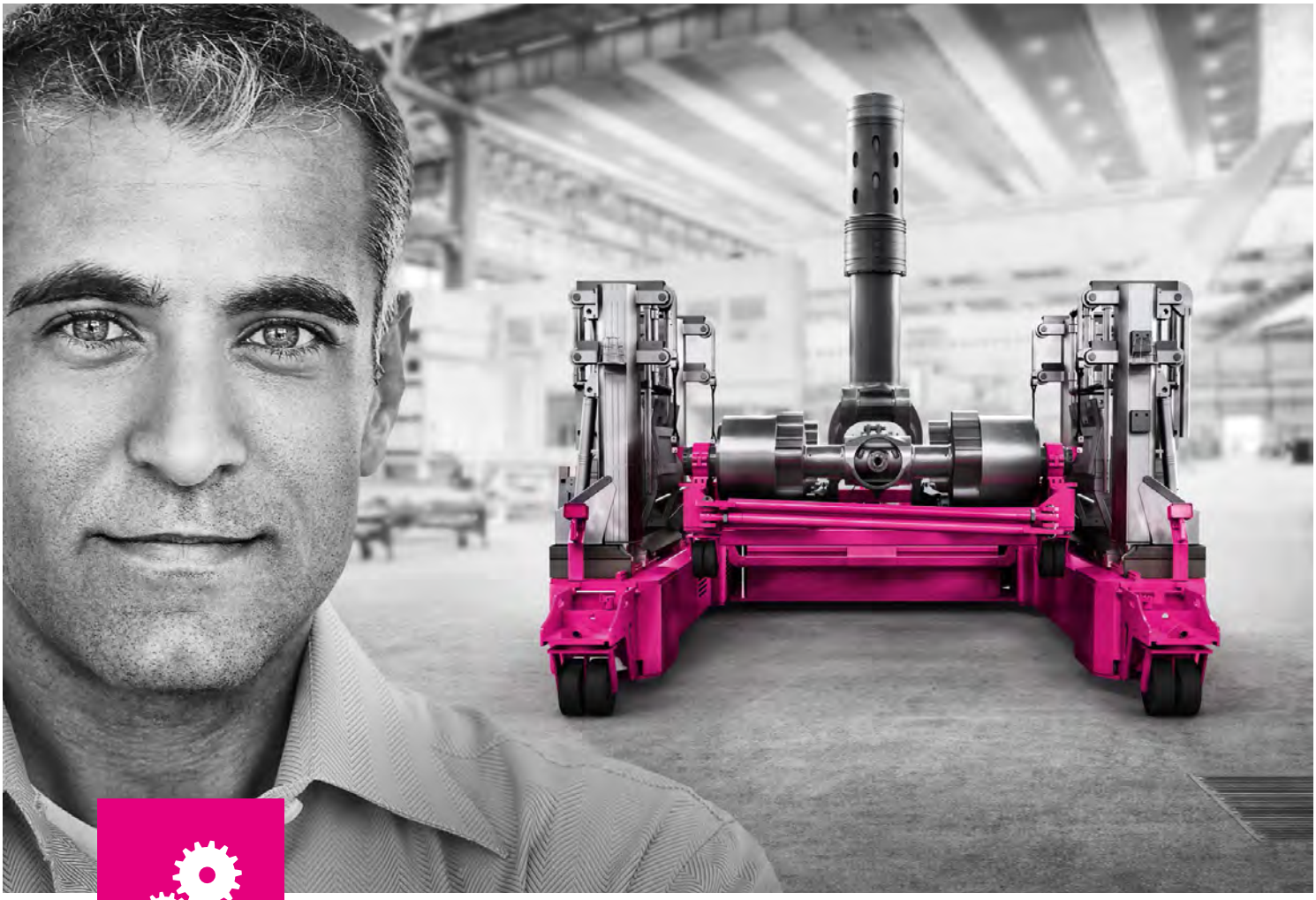
ENGINE TRANSPORTATION

Safeguarding your valuable Engine assets requires a whole chain of events to be carefully managed, which is simplest with a HYDRO engine transport system at the very heart of your operation.
Over the years, HYDRO has set the standard for safe engine transportation. Our products stand between your engine and potential harm. We ensure every detail delivers simple operation and total safety, paired with extreme robustness for the harshest conditions.

State-of-the-art lean production ensures world-class on-time delivery of new stands to our customers. Robotic-welding, laser-tracked inspection and dedicated assembly technicians help ensure complete reliability.
Our Engine Transportation stands are supported by ten strategically located service stations around the world. Why accept any risk?

SIMPLY THE SAFEST WAY FOR YOUR ENGINE

ENGINEERED SOLUTIONS



Your future relies on your actions today. HYDRO is a competent partner that can accompany you on your path forward. For several decades, we have supported the aviation world with future leading solutions. We are the experts for even the most complex installation challenges, and our products are found in nearly all assembly lines and maintenance facilities around the world. With the support of our excellent, certified project management, you can be confident knowing that your projects will proceed properly, 100 % on time and on budget. Be assured, we will always integrate state of the art technologies to provide solutions tailored exactly to your needs.

FACILITATING YOUR FUTURE

SERVICE

With over 50 years of OEM service experience and more than 10 service stations worldwide, we are always available to take care of your issues. From proof load testing to complete full service management, we provide you with a customized care solution that ensures the ongoing operation readiness of your equipment. We deliver total reliability. With the comprehensive know-how that only the true expert can supply, we maintain, repair, train and optimize, so that you can take full advantage of the safety and efficiency of your products.

TRUSTED CARE FAR BEYOND

1_INDEX

A

ACU — Aircraft Control Unit A unit with facilities and personnel, including controllers, for conducting aircraft control and which exercises tactical control of aircraft or a unit(s).

APU — Auxilliary Power Unit The APU is a small jet engine that is used to start the larger jet engines. In airliners it's usually at the very rear of the aircraft, below the tail.

AVAD — Automatic Vertical Adjustment Device The Automatic Vertical Adjustment Device allows automatic fast and precise vertical alignment of tripod-jack at any time during the tripod positioning process.

B

BS EN — British Standard European Norm

C

CSD — Constant Speed Drive A constant speed drive is a mechanical gearbox that takes an input shaft rotating at a wide range of speeds, delivering this power to an output shaft that rotates at a constant speed, despite the varying input. It is used to drive mechanisms, typically electrical generators, that require a constant input speed.

E

EJAL — Electronic Jacking And Levelling The EJAL system is a fully automated system for synchronized aircraft lifting and lowering with a tripod-jack set.

EPS — Engine Pedestal Sets Engine Pedestal Sets (EPS) are multi-purpose systems which can be used for various engine types from different engine manufacturers for engine storage and maintenance tasks.

F

Fly-away version Shorter and lighter version of a product, to be stored in an aircraft. This version is not intended to be used in everyday application.

H

HGPU — Hydraulic Ground Power Unit The Hydraulic Ground Power Unit is used for maintenance and testing of mainline aircraft hydraulic systems.

I

IDG — Integrated Drive Generator The IDG is the world standard for constant frequency power in aircrafts. It is part of the engine.

L

LTS — Laser Target System The mobile laser target system allows faster positioning of tripod-jacks for aircraft jacking. It can be universally used on all tall HYDRO tripod-jacks.

1_INDEX

M

MLG — Main Landing Gear The main landing gear is the undercarriage of an aircraft and will be used for either takeoff or landing. The main landing gear is located under the wing or next to the body structure.

N

NB — Narrow Body A narrow-body aircraft or single-aisle aircraft is an airliner arranged along a single aisle permitting up to 6-abreast seating in a cabin below 4 metres (13 ft) of width.

NLG — Nose Landing Gear The nose landing gear is the undercarriage of an aircraft and will be used for either taxiing, towing, takeoff or landing. The nose landing gear is located under the nose of an aircraft.

R

RC-Design Compact axle-jack design. This fly-awy axle-jack has been specially designed for removal and installation of aircraft wheels.

RL-Design The RL axle-jack has been designed for removing and installation of wheels and brakes in recovery conditions.

S

SCS — Supplemental Cooling System

SES — Split Engine Stand Engine transportation stand for Trent XWB engine. It can be used for road transport, air transport and engine storage. The engine is transported in a split configuration (fancase & core separately) and therefore the stand consists of 2 separate stands for fancase and core transport plus one storage container for removed engine parts.

SPTE — Special to product test equipment

Standard version Special designed tool for one aircraft application.

U

Universal version Special designed tool for a various range of aircraft application.

V

VCRU — Vapor Cycle Refrigeration Unit A compressor unit for the cooling system.

W

WB — Wide Body A wide-body aircraft is a larger airliner usually configured with multiple aisles and a fuselage diameter of more than 5 metres (16 ft) allowing at least seven-abreast seating and often more travel classes.

WES — Whole Engine Stand Engine transportation stand for Rolls-Royce Trent XWB engine. The WES is used for road transport and engine storage, but can not be used for air transport in freighter aircrafts due to its size.

2_EQUIPMENT LIST

Equipment	Version	Location / Designation	Model-No.
ATA Chapter 07 — Lifting & Shoring			
STANDARD PORTFOLIO			
Tripod-Jacks	Standard Set A350 – 900	Wing	TJ1S08504
		Nose	TJ1S02507
		Tail	HS1009
	Standard Set A350 – 1000	Wing	TJ1S10001
		Nose	TJ1S02507
		Tail	HS1009
	Universal Airbus WB Set	Wing	TJ1S10001
		Nose	TJ2S02001
		Tail	HS1009
	Universal Airbus / Boeing WB Set	Wing	TJ1S11001
		Nose	TJ2S03001
		Tail	TJ1S05501
Axle-Jacks	Standard	MLG & NLG	RT9050 RC9002
		NLG	RT4550 RC4509
	Fly-away	MLG & NLG	SG255-001
	Recovery	MLG & NLG	RL9004
		NLG	RL4014
	Steering Test	NLG	SG244 + SG245

Equipment	Version	Location / Designation	Model-No.

ATA Chapter 09 — Towing & Taxing

STANDARD PORTFOLIO

Tow-bars	Universal	NLG	TOWUNIV4S
	Fly-away	NLG	TOWA350F

ATA Chapter 12 — Servicing

STANDARD PORTFOLIO

Service Carts	Standard	Nitrogen Service Cart	NBNT
		Oxygen Service Cart	NBOT
		Service Support Trailer	NBWBCT
Fluid Dispenser	Standard	Fluid Dispenser	BOB

ATA Chapter 21 — Supplement Cooling

STANDARD PORTFOLIO

Device-Fill / Drain	Standard	SCST1-FD
Handpump-Topup	Standard	SCST1-TU

2_EQUIPMENT LIST

Equipment	Version	Location / Designation	Model-No.
ATA Chapter 29 — Hydraulic Power			
STANDARD PORTFOLIO			
Hydraulic Power	Standard		HGPU
ATA Chapter 32 — Landing Gear			
STANDARD PORTFOLIO			
Wheel/Brake Change Dolly	Standard	NLG / MLG	MH12-005
	Universal	NLG / MLG	WTA500
Landing Gear Dolly	Standard	MLG	LGD08-001
MLG R/I Trolley	Standard	MLG	MLGT57-001
ATA Chapter 35 — Oxygen System			
STANDARD PORTFOLIO			
Service Cart	Oxygen Service Cart		NBOT

Equipment	Version	Location / Designation	Model-No.

ATA Chapter 38 — Waste Line Cleaning

STANDARD PORTFOLIO

Waste Line Cleaning System	Standard		WLC1

ATA Chapter 71 — Power Plant

STANDARD PORTFOLIO

Engine Change System "COBRA"	All Engines	Engine	TP91G
Lift Adapter	Trent XWB SES-Stand	Engine	TPAA1A2A0A0B0
Engine Pedestal Set	Trent XWB	Engine	EPS002-002 + 47001-026-000
Engine Transportation	Trent XWB	Engine	RRT057891
	Trent XWB	Engine	RRT056471

3

LIFTING & SHORING

ATA CHAPTER 07

3.1 TRIPOD-JACKS

DESCRIPTION

HYDRO tripod-jacks have been engineered primarily for use in aircraft maintenance. The consistent modularity allows it to be configured according to your specific requirements. Various configuration options, from the basic to the high-end versions, are available in combination with central Electronic Jacking And Levelling (EJAL) control system for safe operation.
HYDRO products are built to withstand harsh environmental conditions and rugged use. Furthermore safety and "Made in Germany" quality have the highest priority.

HYDRO TRIPOD-JACKS INCLUDE

- Tripod structure
- Hand pump with high- and low-pressure unit
- Overload relief valve for protection against overload
- Double scale indicator, e.g. bar / psi, kN / bar, t / bar
- Manually operated safety lock nut against unintended pressure relief
- Bubble level indicator for vertical alignment verification
- Height-adjustable ground plates
- Spring-loaded castors with locking mechanism
- Hard-chromium-plated cylinder tube for long and trouble free service life
- Secondary cylinder seal for protection against contaminants and to prolong life of primary seal
- Low-friction seal for uniform piston return
- Skydrol-resistant paint and galvanized plating for corrosion protection
- Movable tow-bars
- Ladder with platform or pedestal (according to jack height)
- Rain hat
- Interface for HYDRO proof load equipment
- Factory proof load with 150 % of nominal capacity incl. proof load certificate

BENEFITS

- High Quality made in Germany
- Airbus validated
- Long life-cycle
- CE-marked
- Robust and proven design
- Secondary cylinder seal for protection against contaminants and to prolong life of primary seal
- At least 10 years spare part availability
- On-site service

TECHNICAL SPECIFICATION

STANDARD TRIPOD-JACK SET A350 – 900

	Wing	Nose	Tail
Model-No.	TJ1S08504	TJ1S02507	HS1009
Capacity	85 t 93.6 tons	25 t 27.5 tons	10 t 11 tons
Min. height	3,950 mm 155.5 inch	2,950 mm 116.1 inch	4,900 mm 192.9 inch
Hydr. lift	2,550 mm 100 inch	2,200 mm 86.6 inch	2,100 mm 82.7 inch
Screw ext.	–	–	250 mm 9.9 inch
Max. height	6,500 mm 255.9 inch	5,150 mm 202.7 inch	7,250 mm 285.6 inch
Application	A330 A340 – 200 / – 300 **A350 – 900**	**A350 – 900 / – 1000**	A300 – B2 / – B4 A330 A340 – 200 / – 300 / – 500 / – 600 **A350 – 900 / – 1000**

STANDARD TRIPOD-JACK SET A350 – 1000

	Wing	Nose	Tail
Model-No.	TJ1S10001	TJ1S02507	HS1009
Capacity	100 t 100.2 tons	25 t 27.5 tons	10 t 11 tons
Min. height	3,790 mm 149.2 inch	2,950 mm 116.1 inch	4,900 mm 192.9 inch
Hydr. lift	2,750 mm 108,2 inch	2,200 mm 86.6 inch	2,100 mm 82.7 inch
Screw ext.	–	–	250 mm 9.9 inch
Max. height	6,540 mm 257.4 inch	5,150 mm 202.7 inch	7,250 mm 285.6 inch
Application	A300 – 600 A300 – B2 / – B4 A310 A330 A340 – 200 / – 300 / – 500 / – 600 **A350 – 900 / – 1000**	**A350 – 1000**	A300 – B2 / – B4 A330 A340 – 200 / – 300 / – 500 / – 600 **A350 – 1000**

TECHNICAL SPECIFICATION

STANDARD UNIVERSAL AIRBUS WIDE BODY TRIPOD-JACK SET

	Wing	Nose	Tail
Model-No.	TJ1S10001	TJ2S02001	HS1009
Capacity	100 t 110.2 tons	20 t 22 tons	10 t 11 tons
Min. height	3,790 mm 149.2 inch	2,150 mm 84.6 inch	4,900 mm 192.9 inch
Hydr. lift	2,750 mm 108.2 inch	3,000 mm 118.1 inch	2,100 mm 82.7 inch
Screw ext.	–	–	250 mm 9.9 inch
Max. height	6,540 mm 257.4 inch	5,150 mm 202.7 inch	7,250 mm 285.6 inch
Application	A300 – 600 A300 – B2 / – B4 A310 A330 A340 – 200 / – 300 / - 500 / – 600 **A350 – 900 / 1000**	A330 A340 – 200 / – 300 / - 500 / – 600 **A350 – 900 / 1000**	A300 – B2 / – B4 A330 A340 – 200 / – 300 / – 500 / – 600 **A350 – 900 / – 1000**

UNIVERSAL AIRBUS / BOEING WIDE BODY TRIPOD-JACK SET

	Wing	Nose	Tail
Model-No.	TJ1S11001	TJ2S03001	TJ1S05501
Capacity	110 t 121.2 tons	30 t 33 tons	55 t 60.6 tons
Min. height	2,440 mm 96 inch	2,150 mm 84.6 inch	3,700 mm 145.6 inch
Hydr. lift	3,295 mm 129.7 inch	3,000 mm 118.1 inch	3,000 mm 118.1 inch
Screw ext.	765 mm 30.1 inch	300 mm 11.8 inch	1,070 mm 42.1 inch
Max. height	6,500 mm 255.9 inch	5,450 mm 214.5 inch	7,770 mm 305.9 inch
Application	A330 A340 – 200 / – 300 / – 500 / – 600 **A350 – 900 / – 1000**	A300 – 600 A300 – B2 / – B4 A310 A340 – 200 / – 300 / – 500 / – 600 **A350 – 900 / – 1000**	A330 A340 – 200 / – 300 / – 500 / – 600 **A350 – 900 / – 1000**

Available options

Overview

Drive Units	▪ Air-hydraulic pump ▪ Electro-hydraulic pump
Safety lock nut	▪ Manually operated safety lock nut ▪ Automatically operated safety lock nut*
Castors	▪ Spring-loaded swivel castors ▪ Hydraulically height-adjustable swivel castors ▪ Hydraulically height-adjustable high speed outdoor castors
Transportation	▪ Forklift adapter ▪ PowerCat (electrical towing unit) interface
Positioning	▪ Fixed mounted laser target system ▪ Mobile laser target system
Levelling	▪ Automatic Vertical Adjustment Device (AVAD)
Lifting & Lowering	▪ Mechanical stroke measuring system ▪ Electronical stroke measuring system* ▪ Fast lowering system* ▪ Electronic jacking and levelling system (EJAL) — synchronized aircraft jacking*
Corrosion Protection	▪ Hard-chromium-plated piston
Load Cell System	▪ Load indication ▪ Overload warning system ▪ A/C weighing — upon request

*only in combination with electro-hydraulic pump

ELECTRONIC-HYDRAULIC PUMP

DESCRIPTION OF OPTIONS

DESCRIPTION

Electrically driven hydraulic pump unit for HYDRO tripod-jack use.

PRODUCT FEATURES

- Electrically driven
- Robust design
- Maximum user comfort and best view to the jacking point area during jacking operation due to the cable connected hand held controller

AVAILABILITY

- Available for all electric narrow and wide body HYDRO tripod-jacks

BENEFITS

- Increased operational performance
- Prepared for later update with our EJAL system and automatically operated safety lock nut
- Hand held controller

AUTOMATICALLY OPERATED SAFETY LOCK NUT

DESCRIPTION OF OPTIONS

DESCRIPTION

Electrically driven safety lock nut; specially designed for HYDRO tripod-jacks.

PRODUCT FEATURES

- Automatically operated safety lock nut during aircraft lifting and lowering operation
- Product requirement: electric driven hydraulic jack
- Electrically driven
- Robust design

AVAILABILITY

- Available for all narrow and wide body HYDRO tripod-jacks

BENEFITS

- Cost-efficient
- Reduction of man power
- Increased operational performance
- Especially useful for tall tripod-jacks
- Absolutely recommended for tripod-jack systems with a high level of automation
- One-man operation

HYDRAULICALLY HEIGHT-ADJUSTABLE SWIVEL CASTORS

DESCRIPTION OF OPTIONS

DESCRIPTION

Hydraulically height-adjustable swivel castors with central operation unit.

PRODUCT FEATURES

- Simple application
- Central operation of all three castors with hand pumps — close to the bubble level
- Heavy duty swivel casters with brakes for storage and swivel locks for improved towing

AVAILABILITY

- Available for all electric driven narrow and wide body HYDRO tripod-jacks
- Recommended for all bigger narrow and wide body tripod-jack models from a total weight of 700 kg upwards

BENEFITS

- Increased operational performance — time reduction for jack levelling and positioning
- Higher precision in jack levelling
- Especially useful for big and heavy tripod-jacks
- Increased ground clearance during towing

HYDRAULICALLY HEIGHT-ADJUSTABLE HIGH SPEED OUTDOOR CASTORS

DESCRIPTION OF OPTIONS

DESCRIPTION

Hydraulically height-adjustable swivel castors with central operation unit, specially designed for outdoor usage and improved towing speed up to 25 km/h / 15 mph.

PRODUCT FEATURES

- Robust design
- Simple application
- Hydraulic height-adjustable via hand pumps
- Heavy duty casters; two fixed castors and one castor steerable via tow-bar

AVAILABILITY

- Available for nearly all HYDRO narrow and wide body jacks

BENEFITS

- Solid rubber wheels — maintenance free
- Greater moving speed over longer distances up to 25 km/h / 15 mph possible
- Tripod-jack towing also on bad surfaces or over gaps and cracks/snow
- Increased operational performance — time reduction for jack moving, levelling and positioning
- Higher precision in jack levelling
- Especially useful for big and heavy tripod-jacks
- Increased ground clearance during towing

FORKLIFT ADAPTER

DESCRIPTION OF OPTIONS

DESCRIPTION

Fork lift adapters allow easy movement of tripod-jacks with a forklift even on bad surfaces or over gaps and cracks.

PRODUCT FEATURES

- Fast and cost-saving way for moving big and heavy tripod-jacks over long distances or onto a truck with a forklift
- Robust welded steel frame
- Simple application

AVAILABILITY

- Available for nearly all narrow and wide body HYDRO tripod-jack models

BENEFITS

- Movement of tripod-jack with fork lift also on bad surfaces or over gaps and cracks possible
- Increased operational performance

POWERCAT (ELECTRICAL TOWING UNIT) INTERFACE

DESCRIPTION OF OPTIONS

DESCRIPTION

Fast and cost-saving way for moving and positioning of big heavy tripod-jacks or other equipment

Product features

- Max. towing capacity 14,000 kg (30,800 lbs)
- All operating elements integrated in the handle/tow-bar (similar to electric powered pallet trucks)
- Battery driven (24 V – 240 Ah)
- Battery charger (option — not part of delivery)
- Different jack adapters available
- Heavy duty rollers
- Simple application

AVAILABILITY

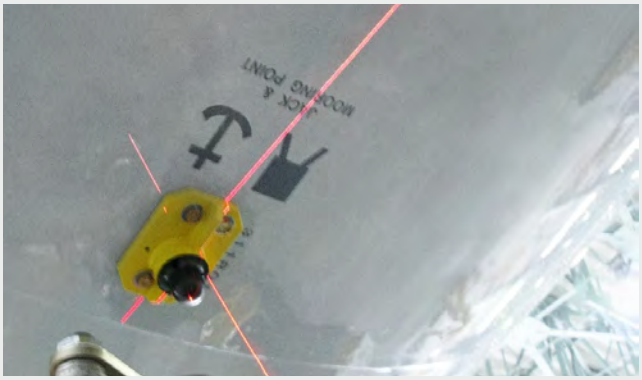
- Developed and recommended for A380 Main Jacks
- Applicable and adaptive for all other big and heavy HYDRO tripod-jacks

BENEFITS

- Significant reduction of man power
- Master Mover
- Increased operational performance — time reduction for jack positioning
- Higher precision in jack positioning
- Useful for all heavy tripod-jacks

FIXED MOUNTED LASER TARGET SYSTEM

DESCRIPTION OF OPTIONS



DESCRIPTION

The fixed mounted laser target system allows precise and faster positioning of tripod-jacks for aircraft jacking.

PRODUCT FEATURES

- The system projects a red laser cross for easy positioning of the jack under the aircraft jacking point
- Simple application: activation by push button on jacks handheld controller

AVAILABILITY

- Laser system is available for all HYDRO narrow and wide body tripod-jack models
- Available only for electric powered HYDRO tripod-jack models

BENEFITS

- Increased operational performance — time reduction for aircraft jacking
- Higher precision in jack positioning
- Useful for tall tripod-jacks
- Installed on each tripod-jack

MOBILE LASER TARGET SYSTEM LTS01

DESCRIPTION OF OPTIONS

DESCRIPTION

The mobile laser target system allows precise and faster positioning of tripod-jacks for aircraft jacking. It can be universally used on all tall HYDRO tripod-jacks.

PRODUCT FEATURES

- The unit projects a laser cross for easy positioning of the jack under the aircraft jacking point
- Simple application: remove jacking adapter from the jack and replace it with LTS adapter, turn on the laser, level and position the jack under the jacking point. Universal use — system includes two adapters which cover all HYDRO narrow and wide body tripod-jack models (excluded optional A380 main jack adapter)
- Battery driven
- Plastic storage and carrying case with foam cushioning (includes space for optional A380 adapter)

AVAILABILITY

- System can be used in combination with all HYDRO narrow and wide body tripod-jack models (excluded A380 main jack — optional adapter is available)

BENEFITS

- Increased operational performance — time reduction for jack levelling and positioning
- Higher precision in jack positioning
- Reduction of man power
- Useful for tall tripod-jacks
- Universal use on all tall HYDRO tripod-jacks possible

AVAD (AUTOMATIC VERTICAL ADJUSTMENT DEVICE)

DESCRIPTION OF OPTIONS

DESCRIPTION

The Automatic Vertical Adjustment Device allows automatic fast and precise vertical alignment of tripod-jack at any time during the tripod positioning process.

PRODUCT FEATURES

- Fully automated vertical alignment device for the individual tripod-jacks
- Inclination sensor
- Proportional hydraulic valves
- Simple application: activation by push button on jacks handheld controller
- Robust design

AVAILABILITY

- Available for all narrow and wide body electric powered HYDRO tripod-jacks which are equipped with hydraulic height adjustable wheels

BENEFITS

- Automatic fast and precise vertical alignment of tripod-jack at any time during tripod positioning process
- Cost-efficient
- Increased operational performance
- Faster jack positioning
- Absolutely recommended for tripod-jack sets on a high level of automation
- Universal use on all tall HYDRO tripods possible

MECHANICAL STROKE MEASURING SYSTEM

DESCRIPTION OF OPTIONS

DESCRIPTION

The mechanical stroke measurement system monitors the working stroke of the hydraulic cylinders of tripod-jacks.

PRODUCT FEATURES

- Mounted outside of the cylinder
- Main components made of aluminum
- Robust and proven design

AVAILABILITY

- Available for all narrow and wide body HYDRO tripod-jacks

BENEFITS

- Different jacking levels can be reached repeatable
- Robust and proven design
- Failsafe
- Maintenance free
- Pure mechanical system
- Also usable as a simple synchronous lifting system

ELECTRONICAL STROKE MEASURING SYSTEM

DESCRIPTION OF OPTIONS

DESCRIPTION

The electrical stroke measurement system monitors the working stroke of tripod-jacks hydraulic cylinder. The measured stroke will be shown on a display.

PRODUCT FEATURES

- Electrical stroke measurement system — monitors the working stroke of jacks hydraulic cylinder
- Measured stroke will be shown on display (if tripod-jack is equipped with) or on EJAL control desk
- Mounted outside of the cylinder
- Robust and proven design
- Only recommended for EJAL systems

AVAILABILITY

- Available for all electric narrow and wide body HYDRO tripod-jack

BENEFITS

- Different aircraft jacking levels can be reached repeatable
- In conjunction with the EJAL system: measured stroke of each tripod-jack will be transmitted to the control desk. This enables precise synchronous control of all tripod-jacks during aircraft lifting and lowering
- Can also be used for limitation of hydraulic lift to prevent aircraft damage

FAST LOWERING SYSTEM

DESCRIPTION OF OPTIONS

DESCRIPTION

The Fast Lowering System increases the lowering speed of the hydraulic cylinder of tripod-jacks without load.

PRODUCT FEATURES

- Pressure sensor integrated in the hydraulic system (can also be used for limitation of jacks lifting capacity)
- The fast lowering function is automatically activated when lowering movement is activated and the cylinder-/system- pressure drops under the limit value
- Fast lowering function is automatically deactivated during movement operations of loaded cylinder
- Hydraulic system pressure will be shown on display (if tripod-jack is equipped with)
- Only recommended for tripod-jacks with automatically operated safety lock nuts

AVAILABILITY

- Available for all narrow and wide body HYDRO tripod-jacks

BENEFITS

- Increased lowering speed of the hydraulic cylinder without load
- Reduction of process time
- Can also be used for limitation of tripod jacks lifting capacity (maintenance panel required)

ELECTRONIC JACKING AND LEVELLING SYSTEM (EJAL)

DESCRIPTION OF OPTIONS

DESCRIPTION

The EJAL system is a fully automated system for synchronized aircraft lifting and lowering with a tripod-jack set.

PRODUCT FEATURES

- Fully automated system for aircraft lifting and lowering with a tripod-jack set
- Individual operation of jacks also possible
- Electrical system — universal useable for different tripod-jack sets
- Aircraft inclination sensor
- Touch panel display
- Cable drums with spring return for power supply of tripod-jacks and for main power supply
- Heavy duty casters with brakes
- Robust design
- Simple application

BENEFITS

- Reduction of man power
- Cost-efficient
- Increased operational performance
- Faster jacking operation
- Permanent control of aircraft inclination
- Minimized risk for the operator and aircraft through synchronized lifting and lowering operation
- Maximum safety
- High level of automation for aircraft lifting and lowering process

AVAILABILITY

- Available for all narrow and wide body electric powered HYDRO tripod-jack sets.

3.2 AXLE-JACKS | STANDARD AXLE-JACKS (RT-DESIGN)

DESCRIPTION

HYDRO RT axle-jacks have been engineered primarily for use in aircraft maintenance. The consistent modularity allows it to be configured according to your specific requirements. HYDRO products are built to withstand harsh environmental conditions and rugged use. Furthermore safety and "Made in Germany" quality have the highest priority.

The HYDRO RT axle-jacks offer an optimum performance for professional use.

PRODUCT FEATURES

- Integrated pneumatically-driven hydraulic pump with maintenance unit
- Integrated automatic retraction system for a quick removal of the axle-jack
- Very short extension time to jacking point (full extension in less than 1 minute)
- Manual hand pump (operated by the tow-bar)
- Optimized undercarriage for easy maneuvering
- All functional parts protected by a stainless steel cover against damage during rough operation and weather
- Cover for cylinder
- Tow-bar for operating the jack
- Stainless steel cover: all other parts are Skydrol-resistant painted
- Label with A/C applications

BENEFITS

- High quality made in Germany
- Long life-cycle
- CE-marked
- Robust and proven design
- Easy maneuvering due to optimized undercarriage
- Best handling and extreme repair-friendly due to modular design and available spare parts
- Leak-proof operation because of into the oil tank integrated elements
- Stainless steel cover — all parts are protected against dirt, harsh environment and UV-radiation
- Worldwide unique manufacturing process for the high stressed components of the hydraulic cylinder
- Documented verification for each step of manufacturing for each part
- At least 10 years spare part availability
- On-site service

3.2 AXLE-JACKS | STANDARD AXLE-JACKS (RT-DESIGN)

AVAILABLE ACCESSORIES

Transport Trolley

Single Transport Trolley SG158

Twin Transport Trolley SG169
(Only for 3 axis landing gears required)

Wheel Refill Unit

Hose lines:

- for small tire valves VG8 - NB A/C's
- for tire big valves VG12 - WB A/C's

Fly-Away Version

- Shorter and lighter version of the standard RT-Axle Jack model

Maintenance

- Interface for HYDRO proof load equipment

TECHNICAL SPECIFICATION

STANDARD AXLE-JACK (RT-DESIGN)

Model-No.	RT9050	RT4550
Capacity	90 t 99 tons	45 t 50 tons
Min. height	260 mm 10.2 inch	190 mm 7.5 inch
Hydr. lift	324 mm 12.7 inch	313 mm 12.3 inch
Screw ext.	114 mm 4.49 inch	70 mm 2.8 inch
Max. height	698 mm 27.5 inch	573 mm 22.6 inch
Application	A300 / A310 (MLG) A320 Family (MLG) A330 (NLG) A340 (NLG, MLG & CLG) **A350 – 900 (NLG & MLG) / – 1000 (MLG)** B707 (MLG) / B727 (NLG & MLG) B737 (MLG) B747 (NLG & MLG) B767 (NLG & MLG) B777 (NLG & MLG) B787 (NLG & MLG) DC10 (MLG) MD11 (MLG) L1011 (MLG)	A300 / A310 (MLG) A320 Family incl. NEO (NLG & MLG) A330 – 200 / – 300 (NLG) A340 – 200 / – 300 / – 500 / – 600 (NLG) **A350 – 900 / – 1000 (NLG)** B707 / B727 (NLG & MLG) B717 (MLG) B737 – 100 to – 300 (MLG) B737 – 300 to – 900 incl. MAX (NLG & MLG) B757 – 200 / – 300 (NLG & MLG) B767 – 200 / – 300 / – 400 (NLG) B777 – 200 / – 200ER / – 200LR / – 300 / – 300ER (NLG) B787 – 8 / – 9 (NLG) Embraer 170 / – 175 / 190 / – 195 (NLG & MLG) DC10 / MD11 (NLG) MD80 / MD90 (MLG) L-1011 (NLG) CS – 100 / – 300 (NLG) MS – 21 (NLG & MLG)

3.2 AXLE-JACKS | STANDARD AXLE-JACKS (RC-DESIGN)

DESCRIPTION

HYDRO RC axle-jacks have been engineered primarily for use in aircraft maintenance. The consistent modularity allows it to be configured according to your specific requirements. HYDRO products are built to withstand harsh environmental conditions and rugged use. Furthermore safety and "Made in Germany" quality have the highest priority.

The HYDRO RC axle-jacks offer an optimum performance for professional use.

PRODUCT FEATURES

- Hand pump with low and high pressure unit
- Fixed undercarriage for easy maneuvering
- Tow-bar for movement and transportation
- Skydrol-resistant paint; all other parts are plated for corrosion protection
- Label with A/C applications

AVAILABLE ACCESSORIES

Drive Units

- Air-hydraulic pump

Safety Lock Nut

- Manually operated safety lock nut

Maintenance

- Interface for HYDRO proof load equipment

Castors

- Spring loaded castors with tow-bar
- Spring loaded castors with dampened tow-bar

Transportation Transportation

- Wooden box
- Aluminum box

BENEFITS

- High quality made in Germany
- Long life-cycle
- CE-marked
- Robust and proven design
- Easy maneuvering due to optimized undercarriage
- At least 10 years spare part availability
- On-site service

TECHNICAL SPECIFICATION

COMPACT AXLE-JACK (RC-DESIGN)

Model-No.	RC9002	RC4509
Capacity	90 t 99 tons	45 t 50 tons
Min. height	261 mm 10.2 inch	190 mm 7.5 inch
Hydr. lift	324 mm 12.7 inch	313 mm 12.3 inch
Screw ext.	112 mm 4.4 inch	70 mm 2.8 inch
Max. height	697 mm 27.4 inch	573 mm 22.6 inch
Application	A300 / A310 (MLG) A320 Family incl. NEO (MLG) A330 – 200 / – 300 (NLG & MLG) A340 – 200 / – 300 / – 500 / – 600 (NLG, MLG & CLG) **A350 – 900 / – 1000 (MLG & NLG)** B707 (MLG) B727 (NLG & MLG) B737 – 100 to – 900 incl. MAX (MLG) B747 – 100 / – 200 / – 300 / – 400 / – 400ER / – 8 (NLG & MLG) B767 – 200 / – 300 / – 400ER (NLG & MLG) B777 – 200 / – 200ER / –300 / –200ER / – 300ER (NLG & MLG) B787 – 8 / – 9 (NLG & MLG) CS – 100 / – 300 (NLG & MLG) DC – 10 / MS – 21 (MLG) L – 1011 / MD11 (MLG)	A300 / A310 (NLG & MLG) A320 Family incl. NEO (NLG & MLG) A330 – 200 / – 300 (NLG) A340 – 200 / – 300 / – 500 / – 600 (NLG) **A350 – 900 / – 1000 (NLG)** B707 (NLG & MLG) B717 (MLG) B727 (NLG & MLG) B737 – 300 to – 900 incl. MAX (NLG & MLG) B757 – 200 / – 300 (NLG & MLG) B767 – 200 / – 300 / – 400ER (NLG) B777 – 200 / – 200ER / – 200LR / – 300 / – 300ER (NLG) B787 – 8 / – 9 (NLG) Embaer 170 / 175/ 190 / 195 (NLG & MLG) DC – 10 / MD11 (NLG) L1011 (NLG) MD80/ MD90 (MLG) MS – 21 (MLG)

3.2 AXLE-JACKS | FLY-AWAY AXLE-JACK SET

DESCRIPTION

The HYDRO axle-jack set has been designed for fly-away option. HYDRO products are built to withstand harsh environmental conditions and rugged use. Furthermore safety and "Made in Germany" quality have the highest priority.

PRODUCT FEATURES

- One 80 t (88 tons) MLG-jack
- Two 10 t (11 tons) NLG-jacks
- Lifting beam for NLG lifting with two flat tires
- Hydraulic unit with oil reservoir, hand pump and air driven hydraulic pump
- High pressure hoses with quick connecting couplings
- Valve unit for operation of the NLG axle-jacks
- Wooden transport box
- Skydrol-resistant paint; all other parts are plated for corrosion protection
- Label with A/C applications

BENEFITS

- High quality made in Germany
- Long life-cycle
- CE-marked
- Robust and proven design
- Easy maneuvering due to optimized undercarriage
- At least 10 years spare part availability

TECHNICAL SPECIFICATION

FLY AWAY AXLE-JACK SET

Model-No.	SG255-001
Application	A350 – 900 (MLG & NLG)

3.2 AXLE-JACKS | RECOVERY AXLE-JACK (RL-DESIGN)

DESCRIPTION

HYDRO RL axle-jacks have been engineered primarily for use in aircraft maintenance. The consistent modularity allows it to be configured according to your specific requirements.

HYDRO products are built to withstand harsh environmental conditions and rugged use. Furthermore safety and "Made in Germany" quality have the highest priority. The HYDRO RL Recovery Jacks offer an optimum performance for professional use.

PRODUCT FEATURES

- Hand pump with low and high pressure unit
- Ram set salt-bath nitrided and polished
- Manually operated safety lock nut
- Force indicator, e.g. bar/kN, bar, psi, ...
- Tow-bar
- Interface for HYDRO proof load equipment
- Hydraulic undercarriage
- Skydrol-resistant paint
- Label with A/C applications

BENEFITS

- High quality made in Germany
- Long life-cycle
- CE-marked
- Robust and proven design
- Easy maneuvering due to optimized undercarriage
- At least 10 year spare part availability

TECHNICAL SPECIFICATION

RECOVERY AXLE-JACK (RL-DESIGN)

Model-No.	RL9004	RL4014
Capacity	90 t 99 tons	40 t 44 tons
Min. height	100 mm 3.9 inch	70 mm 2.7 inch
Hydr. lift	560 mm 22.0 inch	500 mm 19.7 inch
Max. height	660 mm 26.0 inch	570 mm 22.4 inch
Application	A300 (MLG) A310 (MLG) A330 (NLG & MLG) A340 (NLG & MLG) A340 – 500 / – 600 (CLG) **A350 – 900 / – 1000 (NLG & MLG)** A380 (NLG & WLG) B707 (MLG) B727 (NLG & MLG) B737 (MLG) B747 (NLG, MLG & WLG) B767 (NLG & MLG) B777 (MLG) B787 (NLG & MLG) MD11 (MLG)	A330 – 600 / – B2 / – B4 (NLG & MLG) A300F4 – 600 (NLG & MLG) A310 (NLG & MLG) A320 Family (NLG & MLG) **A350 – 900 / – 1000 (NLG)** B737 – 300 / – 400 / – 500 (MLG) B737 – 600 / – 700 / – 800 / – 900 (NLG & MLG) B757 (MLG) B777 (NLG) B787 (NLG)

3.3 STEERING TEST EQUIPMENT

DESCRIPTION

This special jack has been engineered primarily for steering tests.

PRODUCT FEATURES

- Hydraulically height-adjustable via hand pump and hydraulic cylinder
- Max. load of 6.5t (7.2 short tons)
- Rotation adapter interface with special axial cylindrical roller bearing
- Undercarriage (3 roller bearings) for fine positioning
- Forklift slots
- Skydrol-resistant paint

AVAILABLE ACCESSORIES

SG245 NLG Adapter

Rotating adapter with special axial cylindrical roller bearing.

BENEFITS

- High quality made in Germany
- Long life-cycle
- CE-marked
- Robust and proven design
- Easy maneuvering due to optimized undercarriage
- Best handling and extreme repair-friendly due to modular design and available spare parts
- At least 10 year spare part availability
- On-site service

TECHNICAL SPECIFICATION

STEERING TEST EQUIPMENT

Model-No.	SG244
Capacity	6.5 t 7.2 short tons
Application	A350 – 900 (MLG & NLG)

4

TOWING & TAXING
ATA CHAPTER 09

4.1 TOW BAR (STANDARD)

DESCRIPTION

HYDRO tow-bars are designed in accordance to the requirements from aircraft manufacturers and the applicable norms and standards.

PRODUCT FEATURES

- Rigid tow head, clamp type
- Rigid tow eye diameter 3" (76.2 mm)
- Main tube made of high strength steel
- Maintenance free hand pump with integrated spring and dead man circuit for high safety
- Shear pin for push/pull and torque and retaining pin for maximum safety
- Hydraulically height adjustable undercarriage with floating axle system and pneumatic tires
- Tube-mounted spare shear pin holder incl. 4x spare shear pins and 2x retaining pins
- Skydrol-resistant paint
- Label with A/C applications

OPTIONS

Tow Head

- Revolving tow head

Tow Eye

- Revolving tow eye

Undercarriage

- Height-adjustable undercarriage with solid rubber tires

BENEFITS

- High quality made in Germany
- Designed to norms
- Long life-cycle
- CE-marked
- Ergonomic design
- Maintenance free worldwide unique new hand pump system
  - All in one system (integrated cylinder, hand pump, oil reservoir and return spring)
  - Encapsulated hydraulic system (no rubber hoses, no fittings)
  - Death man circuit
  - Maintenance free
  - Fast and easy replacement of the hand pump
- Wide range of available options
- Easy maneuvering due to optimized undercarriage with integrated floating axle system
- Tow head design integrated shear pins and retaining pin
- At least 10 year spare part availability
- On-site service

TECHNICAL SPECIFICATION

TOW-BAR (STANDARD)

Model-No.	TOWUNIV4
Length	4,418 mm 173.9 inch
Weight	305 kg 672.4 lbs
Application	A330 A340 – 200 / – 300 B767 IL – 96 L – 1011 **A350 – 900 / – 1000**

4.2 TOW-BAR (FLY-AWAY)

DESCRIPTION

HYDRO tow-bars are designed in accordance to the requirements from aircraft manufacturers and the applicable norms and standards.

PRODUCT FEATURES

- Rigid tow head, clamp type
- Rigid tow eye diameter 3" (76.2 mm)
- Main tube made of high strength steel
- Shear pin for push/pull and torque and retaining pin for maximum safety
- Convertible undercarriage for easy handling
- Skydrol-resistant paint
- Label with A/C applications

AVAILABLE ACCESSORIES

Transportation Box

Wooden box (33184-004-000)

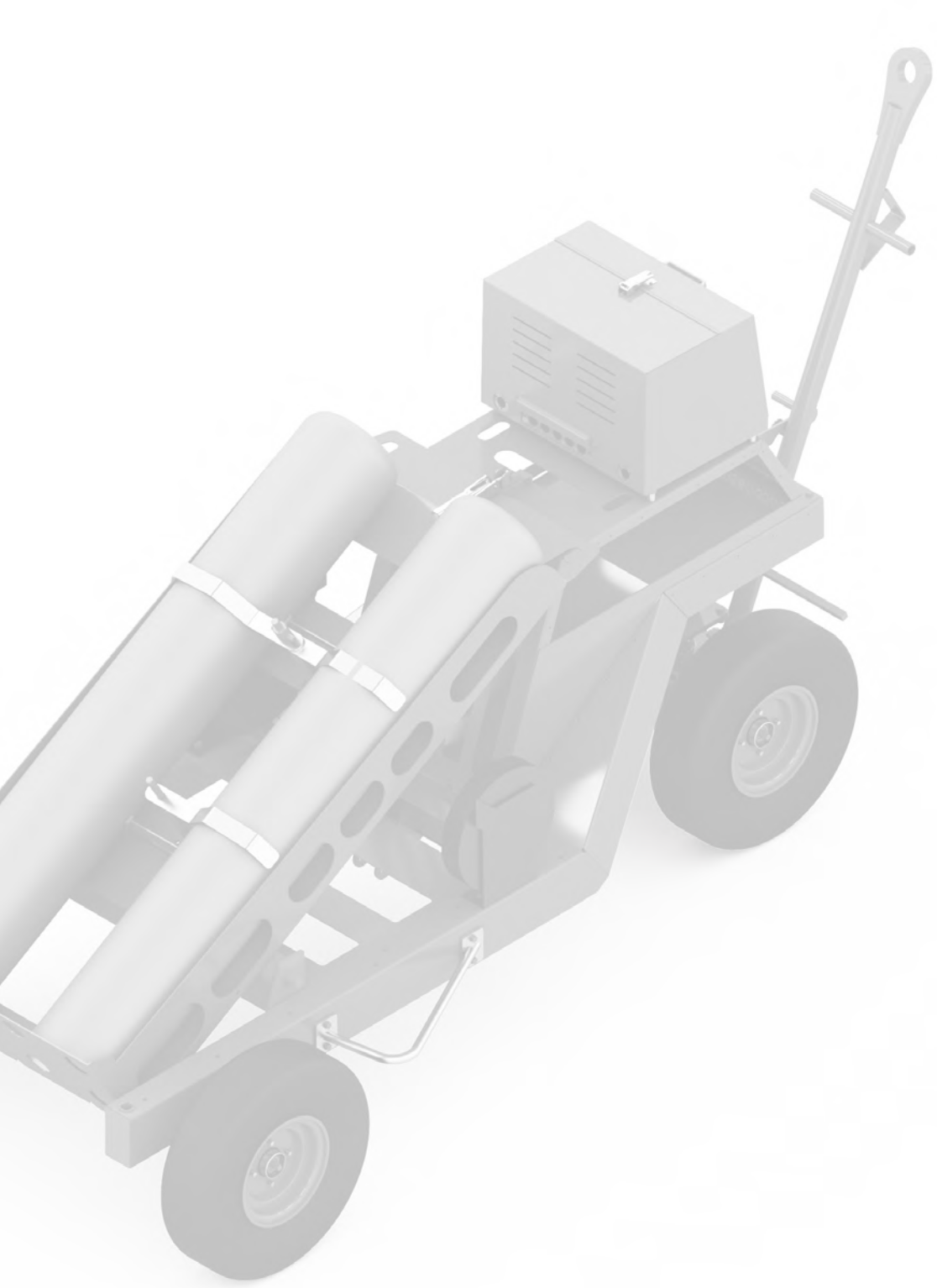
BENEFITS

- High quality made in Germany
- Designed to norms
- Long life-cycle
- CE-marked
- Ergonomic and light design
- Easy maneuvering due to convertible undercarriage
- Tow head design integrated shear pins and retaining pin
- At least 10 year spare part availability
- On-site service

TECHNICAL SPECIFICATION

TOW-BAR (FLY-AWAY)

Model-No.	TOWA350-C-8
Length	2,500 mm 98,4 inch
Weight	103 kg 227.1 lbs
Application	A330 A340 – 200 / – 300 **A350 – 900 / – 1000**



5

SERVICING
ATA CHAPTER 12

5.1 NITROGEN SERVICE CART

DESCRIPTION

The 'easy-load' Nitrogen Service cart range of nitrogen service carts offers unrivalled quality, performance, safety and reliability.

Available as two or four bottle variants, the unique design allows all nitrogen cylinders to be loaded or off-loaded simultaneously by a single person. This specific design incorporates all relevant occupational health and safety requirements for manual handling and allows operators to undertake their desired tasks safely and efficiently.

The dual use, color coded low and high pressure certified charging panel is housed within a waist-height weatherproof cabinet and features one calibrated inlet pressure gauge and two calibrated outlet pressure gauges. The low pressure (330 psi) and high-pressure (3,300 psi) charging configuration is operated by self-venting regulators which will automatically vent line gas when closed, secondary isolation valves allow the operator to accurately adjust inflation gas flow and built-in excess pressure relief valves offer added safety. These standard features ensure optimum pressure settings are achieved whilst maintaining a high level of operator safety.

The Nitrogen carts have been primarily designed to allow a wide range of quick and easy bolt-on options and in-service upgrades to be added if desired. In addition, fully customized and bespoke requested solutions can be integrated into each standard service cart. Global re-calibration, service, repair and overhaul of the nitrogen cart is offered along with a charging system exchange scheme.

PRODUCT FEATURES

- Dual use low & high pressure charging system (calibrated)
- Self-venting regulators and secondary isolation valves
- Low & high pressure auto retractable hose reels each with 9 meter length hose
- Easy load cylinder stowage tray, one person operation
- Integrated towing arm and parking brake (Lift and lock system)
- Zinc phosphate primer with top layer powder coat finish
- Ground Support Equipment BS EN Compliant
- Certified
- Serviceable
- Fully traceable
- Accurate, reliable, robust and safe

BENEFITS

- Modular charging system
- Dual use charging system; Low pressure and high pressure charging systems are integrated inside a single box
- Easy-load system
- Pressure relief and isolation valves
- Safety and reliability
- Unrivalled quality
- CE-marked
- Ergonomic design
- On-site service

5.1 NITROGEN SERVICE CART

OPTIONS

- Fully fitted gas booster / intensifier
- In-situ gas cylinder re-fill port
- Any color paint finish
- Different size towing eye
- Rear towing attachment for multi-cart towing
- Rear wheel mud / splash guards
- Heavy-duty weather-proof cover
- Foam filled tires
- Nitrogen carts can be customized to customer specific requirements

AVAILABLE ACCESSORIES

Country compatible cylinder connectors

- UK Nitrogen bottle connection
- German Nitrogen bottle connection
- French Nitrogen bottle connection
- USA / North America / Singapore bottle connection

TECHNICAL SPECIFICATION

NITROGEN SERVICE CART

Model-No.	NBNT-2 (two bottle cart)	NBNT-4 (four bottle cart)
Lenght	2,700 mm 106.3 inch	2,700 mm 106.3 inch
Width	1,324 mm 52.1 inch	1,324 mm 52.1 inch
Height	1,441 mm 56.7 inch	1,441 mm 56.7 inch

5.2 OXYGEN SERVICE CART

DESCRIPTION

The Oxygen service cart is available as two or four bottle variants, the unique design allows all oxygen cylinders to be loaded or off-loaded simultaneously by a single person. This specific design incorporates all relevant occupational health and safety requirements for manual handling and allows operators to undertake their desired tasks safely and efficiently.

The certified charging panel is housed within a waist-height weatherproof cabinet and features one cali-brated inlet pressure gauge and one calibrated outlet pressure gauge. To minimize static and heat-build up from fast flowing oxygen bottle gas, the charging panel inlet features heavy-duty brass heat-soak stems along with oxygen grade hose and piping.

The charging configuration (2,400 psi) is operated by a self-venting regulator, secondary isolation valve and features a built-in excess pressure relief valve allowing optimum pressure settings to be achieved. All components associated with the oxygen service cart are oxygen cleaned, certified and traceable. The 4-bottle easy load oxygen cart features inert, oxygen safe fluid within the hydraulic cylinder tray operating system.

PRODUCT FEATURES

- Self-venting regulator and secondary isolation valve
- Auto retractable hose reel with 9-metre hose
- Easy load cylinder stowage tray (manually operation for 2-bottle variant and hydraulic operation for 4-bottle variant)
- Earth grounding reel and cable
- NATO towing eye (ø 76 mm)
- Ground Support Equipment BS EN Compliant and CE Marked
- Calibrated and certified
- Spare parts and components readily available
- Finish; Zinc phosphate primer with top layer powder-coat finish

BENEFITS

- Modular charging system
- Self-venting regulator
- Easy-load system
- Pressure relief and isolation valves
- Heat soak
- Safety and reliability
- Unrivalled quality
- CE-marked
- Ergonomic design
- On-site service

5.2 OXYGEN SERVICE CART

OPTIONS

- Fully fitted gas booster
- Allows intensified outlet pressure & full cylinder consumption
- In-situ cylinder re-fill port
- Integrated re-fill port allows cylinder refill without removing cylinders
- Any color paint finish
- RAL code is required to allow for different paint color
- Different size towing eye
- 50 mm is standard supply / 76 mm is standard supply for HYDRO
- Rear towing coupling
- Detachable rear towing coupling (NATO style hitch)
- Rear wheel splash guards
- Reduces water spray during extreme weather (sold as a pair)
- Weather-proof cover
- Covers the complete cart and offers protection during storage
- Powder fire extinguisher
- 3 kg powder fire extinguisher and retaining bracket

AVAILABLE ACCESSORIES

Country compatible cylinder connectors

- UK Oxygen bottle connection
- German Oxygen bottle connection
- French Oxygen bottle connection
- USA / North America / Singapore bottle connection

TECHNICAL SPECIFICATION

OXYGEN SERVICE CART

Model-No.	NBOT-2 (two bottle cart)	NBOT-4 (four bottle cart)
Lenght	2,700 mm 106.3 inch	2,700 mm 106.3 inch
Width	1,324 mm 52.1 inch	1,324 mm 52.1 inch
Height	1,441 mm 56.7 inch	1,441 mm 56.7 inch

5.3 SERVICE SUPPORT TRAILER

DESCRIPTION

The aircraft wheel and brake change service support trailers have been primarily designed to aid with fast, safe and effective wheel and brake change operations on the ramp, around the airport and even within the hangar.

Designed to accommodate any two aircraft wheels (up to A380 size), one wheel and brake change dolly, one axle-jack and a multitude of aircraft tooling, the wheel and brake change trailer is the ultimate aviation mobile service support center. The trailer is accessed via the spring balanced rear ramp door that offers a minimal gradient, which allows one person to easily load and off-load large aircraft wheels and the axle-jack. Inside the trailer is a centrally mounted (removable) workbench that allows operators to undertake any additional tasks.

The front mounted towing arm features an integrated double acting parking brake. The operator can manually engage the parking brake when pushing the towing arm to the vertical position or automatic engagement when towing arm is free hanging in the horizontal position.

The complete trailer consists of a primer and 2-pack paint finish, offering skydrol resilience and added longevity. For optimum efficiency during aircraft turnaround and maintenance cycles, the aircraft wheel and brake change trailer can be offered with a fully certified nitrogen charging system which is externally located at the front of the trailer.

The nitrogen system consists of a modular weather-proof charging cabinet featuring a calibrated low and high pressure configuration, two auto-retractable hose reels, a cylinder connection manifold and two gas cylinder stowage points and restraints. In addition, the aircraft wheel and brake change trailers can be fully customized ahead of manufacture to meet any individual and operator requirements.

In association with our strategic partner network, global re-calibration, service, repair and overhaul of the nitrogen cabinet is offered along with a charging system exchange scheme.

BENEFITS

- Modular charging system
- CE-marked
- Ergonomic design
- On-site service

5.3 SERVICE SUPPORT TRAILER

PRODUCT FEATURES

- Fully enclosed
- Spring assisted low gradient rear ramp door (ease of loading & off-loading)
- Towing arm with integrated double acting parking brake
- Front axle and enclosed turntable assembly
- 2-pack paint finish, skydrol-resilient
- Operational payload 1000 kg as standard
- Stowage for 2x wheels, 1x axle-jacks, 1x brake pack, 1x wheel dolly & tooling
- Front mounted tool box or nitrogen charging system
- Internal workbench (removable)
- Ground Support Equipment BS EN and H&S Compliant
- Certified
- Serviceable
- Fully traceable
- Reliable, robust and safe

OPTIONS

- Standard or Nitrogen configuration
- Any color paint finish
- Customer corporate logos
- Fully customized solutions available

AVAILABLE ACCESSORIES

Country compatible cylinder connectors

- UK Nitrogen bottle connection
- German Nitrogen bottle connection
- French Nitrogen bottle connection
- USA/North America/Singapore bottle connection

TECHNICAL SPECIFICATION

SERVICE SUPPORT TRAILER

Model-No.	NBWBCT
Lenght	3,486 mm 137,244 inch
Width	2,336 mm 91,96 inch
Height	1,997 mm 78,62 inch

5.4 FLUID DISPENSER

DESCRIPTION

The fluid dispenser allows serving aircraft hydraulic reservoirs, engines, APU, IDG, CSD, landing gear struts, thrust reversers, actuators and many more.

PRODUCT FEATURES

- Translucent specially formulated polyethylene reservoir, compatible, for all fluids
  - Easy fluid level control
- Screwed filler cap, big size
- Colored fluid placard
- Galvanized steel handle
- Hand pump, stainless steel shaft and laminated aluminum handle
  - Double sealed with relief valve

OPTIONS

Dispenser sizes

- 2 US gallon (7.6 litres)

Fluid Designation & Placard

- A - EXXON 2380
- B - ENGINE OIL
- C - MOBIL 254
- D - 5606
- E - MOBIL JET II
- F - 2197
- G - SKYDROL
- H - HYDRAULIC OIL
- K - HYJET IV
- L - CSD/IDG

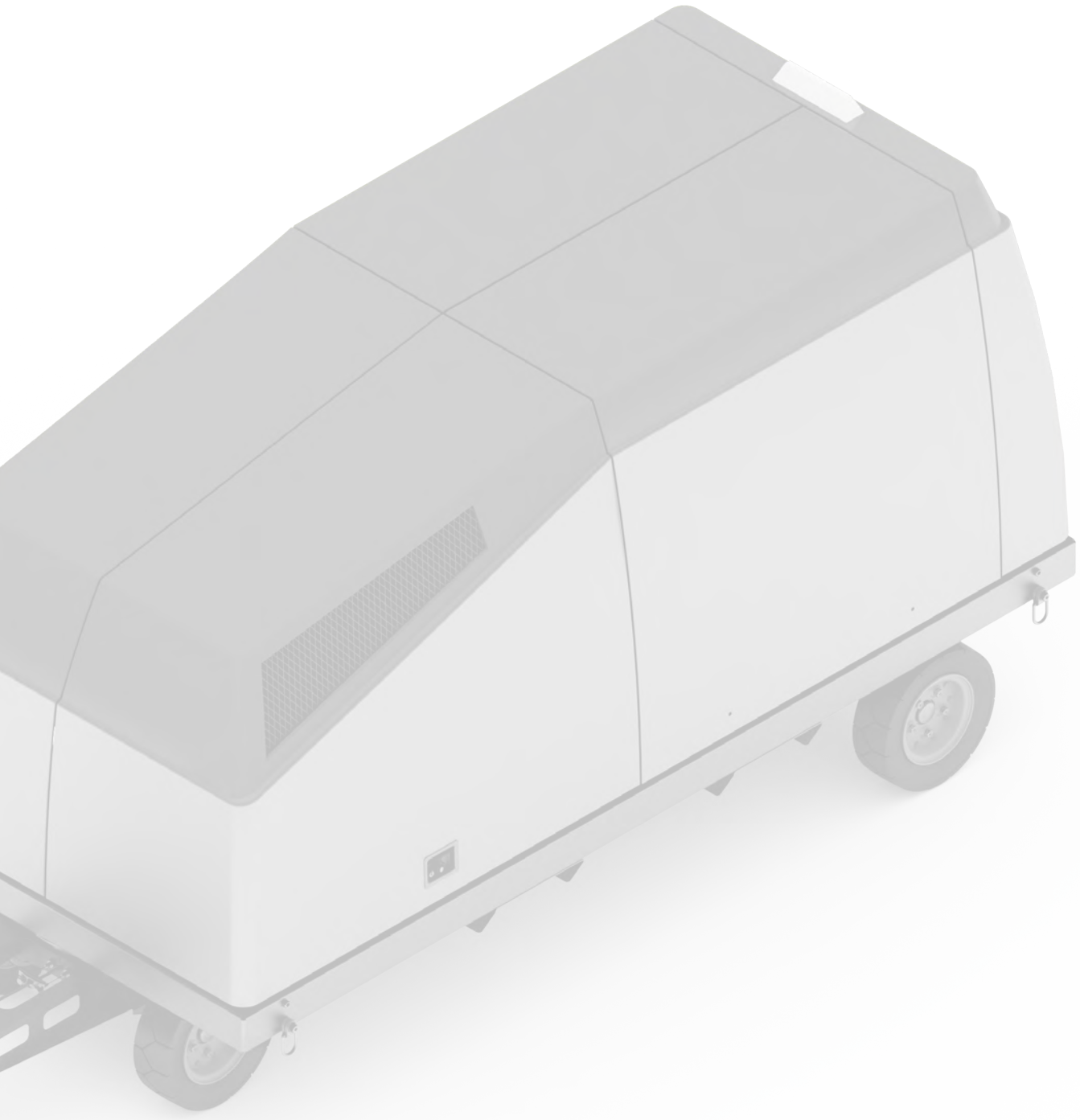
BENEFITS

- CE-marked
- Ergonomic design
- On-site service

TECHNICAL SPECIFICATION

FLUID DISPENSER

Model-No.	BOB02	BOB05
Reservoir capacity	7.6 litres (2 US gallon)	19 litres (5 US gallon)
Pump outlet pressure	175 psi 79 – 83 kPA	175 psi 79 – 83 kPA
Volume per stroke	7.2 cubic in. / 120 cc	7.2 cubic in. / 120 cc
Hose lenght	7' / 2.2 m	15' / 4.5 m
Net weight (empty)	14 lbs / 6.36 kg	48 lbs / 21.77 kg
Filter rating	10 Micron (nominal)	10 Micron (nominal)
Dimensions	total height: 428 mm (16.82'') total length: 314 mm (12.36'') width: 267 mm (10.50'')	total height: 1,028 mm (40 1/2'') total length: 603 mm (23 3/4'') width: 464 mm (18 1/4'')



6

SUPPLEMENT COOLING
ATA CHAPTER 21

6.1 DEVICE-FILL/DRAIN

DESCRIPTION

For fully-automatic filling, draining, bleeding, replenishing and emptying of the Supplemental Cooling System (SCS).

The equipment has been developed for the following purposes:

- Fill of whole system
- Drainage of whole system
- Top up of accumulator
- Top up and drainage of small ACU, SCS Chiller and VCRU

PRODUCT FEATURES

- All preparation tasks for the Device-Fill/Drain, SCS can be carried out before the actual application on the A/C
- Easy maintenance via hinged or removable covers
- Compact and robust design — double-axis-chassis with steering axle and towing-bar
- Spring-loaded chassis available as an option, recommended for long towing distances
- Mechanic safety brake, also for use without towing vehicle
- 2 EA hoses 15 m (49 ft) for the connection to the aircraft (1x FILL, 1x DRAIN)
- 1 EA AC/GSE interconnection cable 15 m (49 ft)
- 1 EA grounding cable to establish potential equalization
- 1 EA current supply cable 20 m (66 ft) with CE-plug for operation by the external electrical supply
- 1 set of nitrogen connections for world-wide application
- Equipped for the transport by forklift

BENEFITS

- Airbus certified
- User friendly ergonomic setup and operation
- World-wide universal connection (compatible with multiple voltages)
- For hangar and outdoor usage
- Minimized service time
- On-site service

6.1 DEVICE-FILL/DRAIN

AVAILABLE ACCESSORIES

- Diesel engine operated unit
- Option: Spring-loaded chassis
- In case of long towing distances, the device must be prevented from damage by integrating spring-loaded axes into the chassis
- Cover paint alternative to standard
- Paint is skydrol-resistant
- Standard-cover paint: light grey (RAL 7035)/yellow orange (RAL 2000)

OPTIONS

- Drum pump: with the drum pump, the medium can easily be pumped off the canister or off a barrel into the Main-Reservoir
- PH-Meter: to determine the pH-value of the medium according to AMM
- Sampling glass: measuring glass for sample taking of the medium during pH-value measurement
- Dust Cover: for protection from climatic influences and contamination during storage
- Kit-Adapter GSP, SCS350 for top up accumulator, filling of whole system and draining of whole system
- Kit-Adapter CU, SCS240 for top up and drainage of small ACU, SCS chiller and VCRU

TECHNICAL SPECIFICATION

DEVICE-FILL / DRAIN

Model No.		SCST1-FD
Electrical supply (requirements)	Mains connection	3 / PE AC 50 / 60 Hz 380 – 480 V
	Nominal current	32.8 A
	Performance	16.5 kVA
	Back-up fuse	32 A gG
Medium	Propylen Glycol Water (according to Airbus specification and not included in delivery)	
Reservoir volume	Main-Reservoir	approx. 180 l (47 gal)
	Drain-Reservoir	approx. 190 l (50 gal)
	Sub-Reservoir	approx. 25 l (6.6 gal)
Operating conditions	Ambient temperature	–30 to +50 °C (–22 to +122 °F)
	Storage temperature	–30 to +60 °C (–22 to +140 °F)
Nitrogen supply (requirements)	Input: min. 20 bar (min. 290 psi) (external supply)	
Nitrogen connectors	AN4; 8S; AN6 or Schrader	
Dimensions	Length	3,400 mm (133.8 in) (tow-bar folded up)
		4,400 mm (173.2 in) (tow-bar folded up)
	Width	1,350 mm (53.2 in)
	Height	1,600 mm (63.0 in)

6.2 HANDPUMP-TOPUP

DESCRIPTION

For fully-automatic filling, draining, bleeding, replenishing and emptying of the Supplemental Cooling System (SCS).

The equipment has been developed for the following purposes:

- Top up of accumulator
- Top up and drainage of small ACU, SCS chiller and VCRU

PRODUCT FEATURES

- Simple manual operation, filling procedure via integrated hand pump
- No electrical supply required

AVAILABLE ACCESSORIES

- Kit-Adapter GSP, SCS350 for top up accumulator, filling of whole system and draining of whole system
- Kit-Adapter CU, SCS240 for top up and drainage of small ACU, SCS Chiller and VCRU
- Tank with filling point, venting deaeration filter, drain plug and sight glass for fill level control
- Pressure indication via pressure gauge on the operating plate, integrated hydraulic filter to clean the medium
- Connection to the A/C or its components in combination with the adapter kits >SCST1-AK350CU< and >SCST1-AK350GSP<
- Laterally mounted retainers for the storage of the fill or drain hose
- Removable collecting reservoir to catch used medium
- Tow-bar with grip and towing eye for manual maneuvering or transporting the device with an appropriate towing vehicle

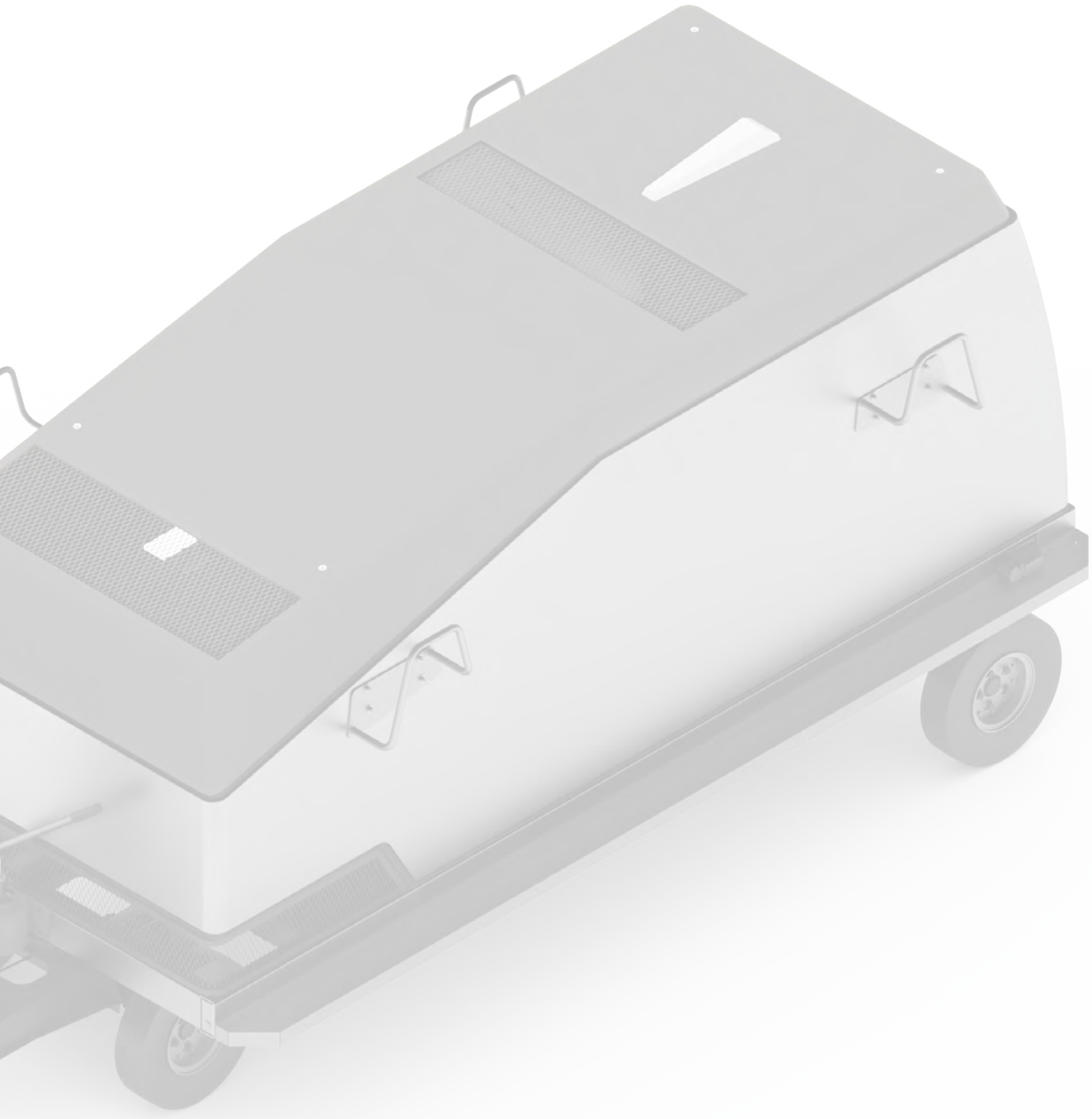
BENEFITS

- Airbus certified
- User friendly ergonomic setup and operation
- World-wide universal connection (compatible with multiple voltages)
- For hangar and outdoor usage
- Minimized service time
- On-site service

TECHNICAL SPECIFICATION

HANDPUMP-TOPUP

Model-No.		SCST1-TU
Nitrogen supply (requirements)	Pressure	Min. 6 bar (87 psi)
		Max. 200 bar (2.900 psi)
Main reservoir	Volume	30 l (7.9 gal)
	Usable Volume	18 l (4.8 gal)
	Propylen Glycol Water (according to AIRBUS specification and not included in delivery)	
Operating conditions	Ambient temperature	–30 to +50 °C (–22 to +122 °F)
	Storage temperature	–30 to +60 °C (–22 to +140 °F)
	Rel. air humidity	5 to 90 % (non-condensing)



7

HYDRAULIC POWER
ATA CHAPTER 29

7. HYDRAULIC POWER

DESCRIPTION

Hydraulic Ground Power Unit used for maintenance and testing of mainline aircraft hydraulic systems.

Designed for all aircraft types with 3000psi or 5000psi hydraulic systems and a flow rate of up to 60USgpm.

PRODUCT FEATURES

- Single system or dual independent systems (two motors and two pumps)
- Easy pressure control using the 0psi, 3000 psi / 5000 psi push buttons as applicable
- Automatic over temperature shutoff feature at 160 °F (70 °C)
- Ramp function for soft pressure build-up
- Pressure and flow rates are infinitely variable and limitable
- The costumer can choose whatever matches his requirements:
  - A wide range of options and accessories are available
  - In addition, any customer special wishes will be respected

BENEFITS

- Airbus certified
- User friendly ergonomic setup and operation
- World-wide universal connection (compatible with multiple voltages)
- For hangar and outdoor usage

7. HYDRAULIC POWER

OPTIONS

Flow measurement with digital indicator

- Single system 2 to 66USgpm (10 to 250 l/min), ±1 % of full scale
- Dual System (independent) 1.3 to 42 gpm (5 to 160 l/min), ±1 % of full scale

Leakage measurement

- 0.08 to 5.3 USgpm (0.32 to 20 l/min), ±1 % of full scale
- 0.11 to 10.6 USgpm (0.40 to 40 l/min), ±1 % of full scale

Others

- Flushing circuit with loading system
- Filter (25 micron) in the return line
- Required hose lengths differing from the standard 33 ft (10 m) for Single System and 39 ft (12 m) for dual system must be specified by costumer
- Electrical soft start
- Sampling points
- Connected Mode for >HGPU< with dual system. The hose lengths will be 33 ft long
- Cover color change from standard blue (RAL 5007) /white (RAL 9003)
- The required color combination must be specified by the costumer including the RAL standard
- Changes to the standard languages German, English, Russian, Spanish for front panel markings must be clearly defined by the costumer as an additional requirement
- Dual Output Kit for >HGPU< with single system

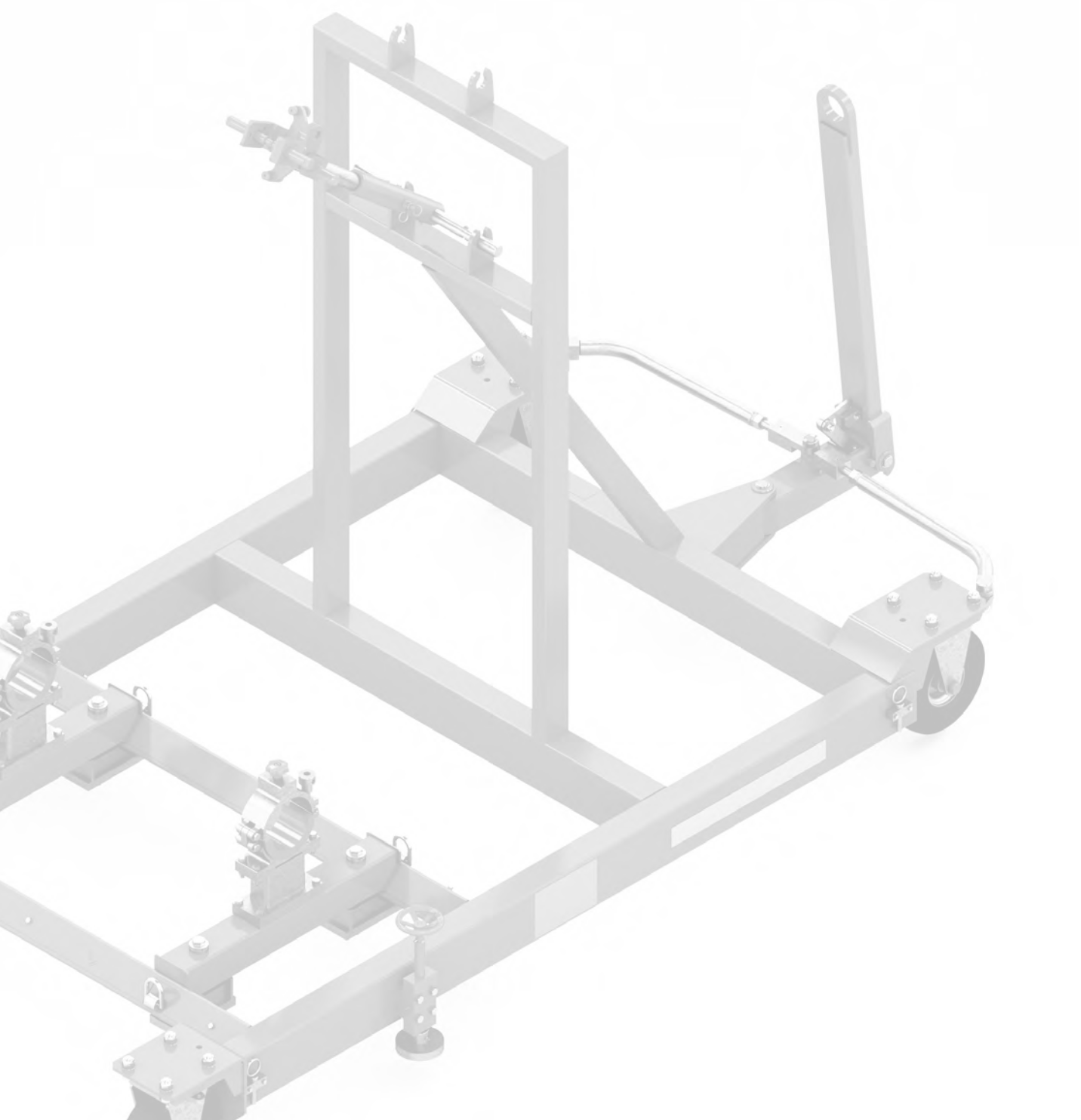
AVAILABLE ACCESSORIES

- Weatherproof cover for control panel
- Coupling kits

TECHNICAL SPECIFICATION

HYDRAULIC POWER

Model-No.		HGPU
Operating conditions	Ambient temperature	–30 to +45 °C (–13 to +113 °F)



8

LANDING GEAR
ATA CHAPTER 32

8.1 WHEEL AND BRAKE CHANGE EQUIPMENT (UNIVERSAL)

DESCRIPTION

Hydraulic wheel trolley for removal of wheels and brake drums on aircraft.

PRODUCT FEATURES

- Flexible and ergonomic wheel trolley for the easy removal of wheels and brake drums
- High lifting height (710 mm) makes it ideal for lifting e.g. wheels and brake drums off a transport wagon
- Adjustable lifting arms for wheel sizes ø 270 – 1300 mm
- Lifting arms with roller bearings for easy rotation of wheel into correct position
- Pedal operated pump leaving both hands free for working
- Hand operated dead man's release for optimum safety whilst lowering
- 2 swivel castors and 2 360° revolving castors
- Skydrol-resistant paint; standard color: yellow RAL 1028

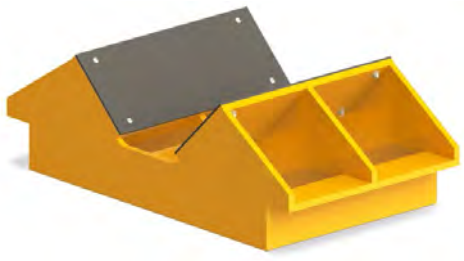
BENEFITS

- User friendly ergonomic setup and operation
- Universal application
- On-site service

8.1 WHEEL AND BRAKE CHANGE EQUIPMENT (UNIVERSAL)

AVAILABLE ACCESSORIES

Crane boom (WTK)



Bracket support assembly (24010-031-000)

TECHNICAL SPECIFICATION

WHEEL AND BRAKE CHANGE EQUIPMENT (UNIVERSAL)

Model-No.	WTA500
Nominal load	350 kg
Max. height	1,897 mm
Min. height	1,180 mm
Wheel diameter	270 – 1,420 mm
Application	Most of all narrow and wide body aircrafts, except B737

8.2 WHEEL AND BRAKE CHANGE EQUIPMENT

DESCRIPTION

Hydraulic wheel trolley for removal of wheels and brake drums on aircraft.

PRODUCT FEATURES

- Flexible and ergonomic wheel trolley for the easy removal of wheels and brake drums
- Fixed lifting arms
- Chain for easy securing of wheel during handling and transportation
- Hand operated lifting spindle
- 4 swivel castors
- Skydrol-resistant paint;
  standard color: yellow RAL 1028

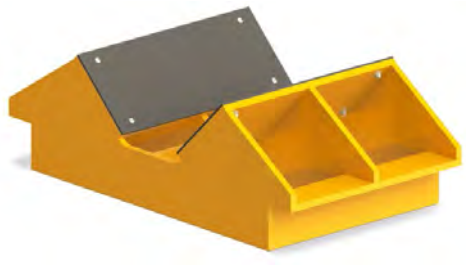
BENEFITS

- User friendly ergonomic setup and operation
- Universal application
- On-site service

8.2 WHEEL AND BRAKE CHANGE EQUIPMENT

AVAILABLE ACCESSORIES

- Tow-bar
- Crane boom



Bracket support assembly (24010-031-000)

TECHNICAL SPECIFICATION

WHEEL AND BRAKE CHANGE EQUIPMENT

Model-No.	MH12-005
Nominal load	260 kg
Max. height	1,350 mm
Min. height	600 mm
Wheel diameter	950 – 1,500 mm
Application	A300/A310 A320 family A330 A340 – 200/ – 300/ – 500/ – 600 B707/B727/B757/B767 B777/B787 DC – 10 MD – 11 L – 1011 IL – 96 **A350 – 9000/ – 1000**

8.3 LANDING GEAR TRANSPORTATION TROLLEY

DESCRIPTION

HYDRO Landing Gear Dolly has been specially designed for transportation and storage of A350-800/-900 main landing gears.

PRODUCT FEATURES

- Rigid steel frame
- Tow-bar for easy towing and moving
- 2 swivel and 2 fixed castors
- 4 landing gear clamps
- Skydrol-resistant paint

AVAILABLE ACCESSORIES

- Frame for MLG transportation with brakes and wheels

BENEFITS

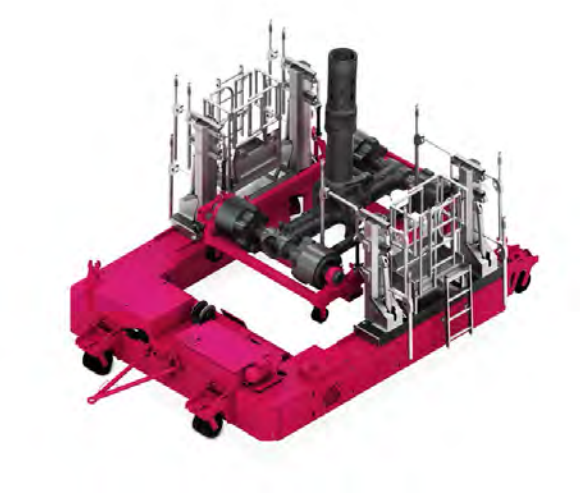
- User friendly ergonomic setup and operation
- Universal application
- On-site service

TECHNICAL SPECIFICATION

LANDING GEAR TRANSPORTATION TROLLEY

Model-No.	LGD08-001
Nominal load	4,500 kg
Max. capacity	2,900 mm
Max. height	690 mm
Max. width	2,300 mm
Application	A350 – 800/– 900

8.4 MAIN LANDING GEAR INSTALLATION TROLLEY



DESCRIPTION

HYDRO Main Landing Gear Trolley has been specially designed for removal and installation of the main landing gear. Due to the u-shaped base, the installation pallet is picked up directly from the floor without the requirement of using of an overhead crane. To save time during assembly of the A350, the rivet process of the wing and the assembly of the landing gear are handled simultaneously. This required precise installation movements during the assembly. The fitting of the landing gear hence can be performed without additional load application.

PRODUCT FEATURES

- Flexible and ergonomic wheel trolley for the easy removal of wheels and brake drums
- Skydrol-resistant paint

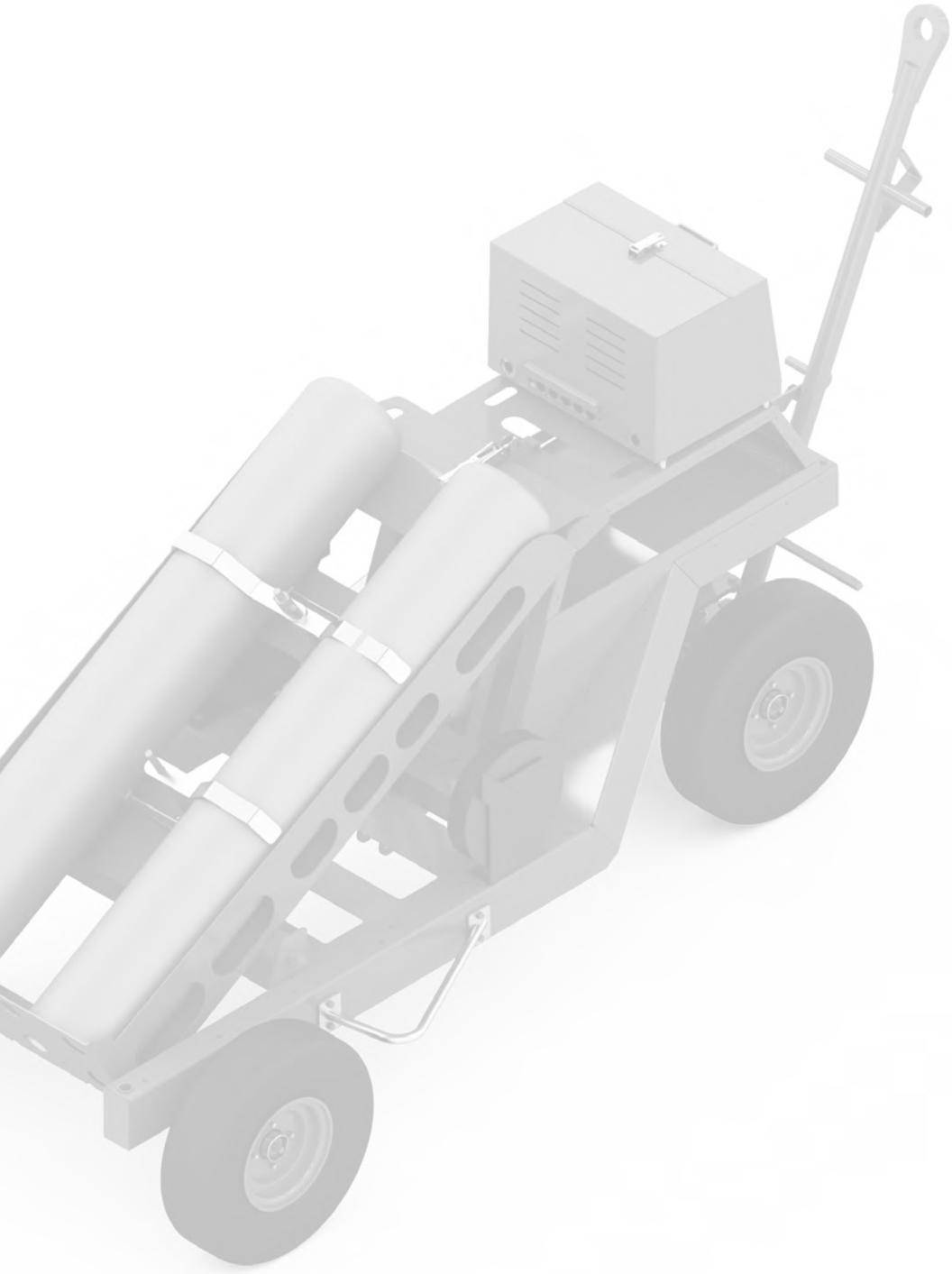
BENEFITS

- User friendly ergonomic setup and operation
- Universal application
- Time and cost saving
- On-site service

TECHNICAL SPECIFICATION

MAIN LANDING GEAR TROLLEY

Model-No.	MLGT57-001
Nominal load	6 t
Max. height	2,260 mm
Max. length	5,252 mm
Max. width	3,760 mm
Application	A350 – 900 / – 1000



9

OXYGEN SYSTEM
ATA CHAPTER 35

9. OXYGEN SYSTEM

DESCRIPTION

The Oxygen service cart is available as two or four bottle variants, the unique design allows all oxygen cylinders to be loaded or off-loaded simultaneously by a single person. This specific design incorporates all relevant occupational health and safety requirements for manual handling and allows operators to undertake their desired tasks safely and efficiently.

The certified charging panel is housed within a waist-height weatherproof cabinet and features one calibrated inlet pressure gauge and one calibrated outlet pressure gauge. To minimize static and heat-build up from fast flowing oxygen bottle gas, the charging panel inlet features heavy-duty brass heat-soak stems along with oxygen grade hose and piping.

The charging configuration (2,400 psi) is operated by a self-venting regulator, secondary isolation valve and features a built-in excess pressure relief valve allowing optimum pressure settings to be achieved. All components associated with the oxygen service cart are oxygen cleaned, certified and traceable. The 4-bottle easy load oxygen cart features inert, oxygen safe fluid within the hydraulic cylinder tray operating system.

PRODUCT FEATURES

- Self-venting regulator and secondary isolation valve
- Auto retractable hose reel with 9-metre hose
- Easy load cylinder stowage tray (manually operation for 2-bottle variant and hydraulic operation for 4-bottle variant)
- Earth grounding reel and cable
- NATO towing eye (ø 76 mm)
- Ground Support Equipment BS EN Compliant and CE Marked
- Calibrated and certified
- Spare parts and components readily available
- Finish; Zinc phosphate primer with top layer powder-coat finish

BENEFITS

- Modular charging system
- Self-venting regulator
- Easy-load system
- Pressure relief and isolation valves
- Heat soak
- Safety and reliability
- Unrivalled quality
- CE-marked
- Ergonomic design
- On-site service

9. OXYGEN SYSTEM

OPTIONS

- Fully fitted gas booster
- Allows intensified outlet pressure & full cylinder consumption
- In-situ cylinder re-fill port
- Integrated re-fill port allows cylinder refill without removing cylinders
- Any color paint finish
- RAL code is required to allow for different paint color
- Different size towing eye
- 50 mm is standard supply / 76 mm is standard supply for HYDRO
- Rear Towing Coupling
- Detachable rear towing coupling (NATO style hitch)
- Rear wheel splash guards
- Reduces water spray during extreme weather (sold as a pair)
- Weather-proof cover
- Covers the complete cart and offers protection during storage
- Powder fire extinguisher
- 3 kg powder fire extinguisher and retaining bracket

AVAILABLE ACCESSORIES

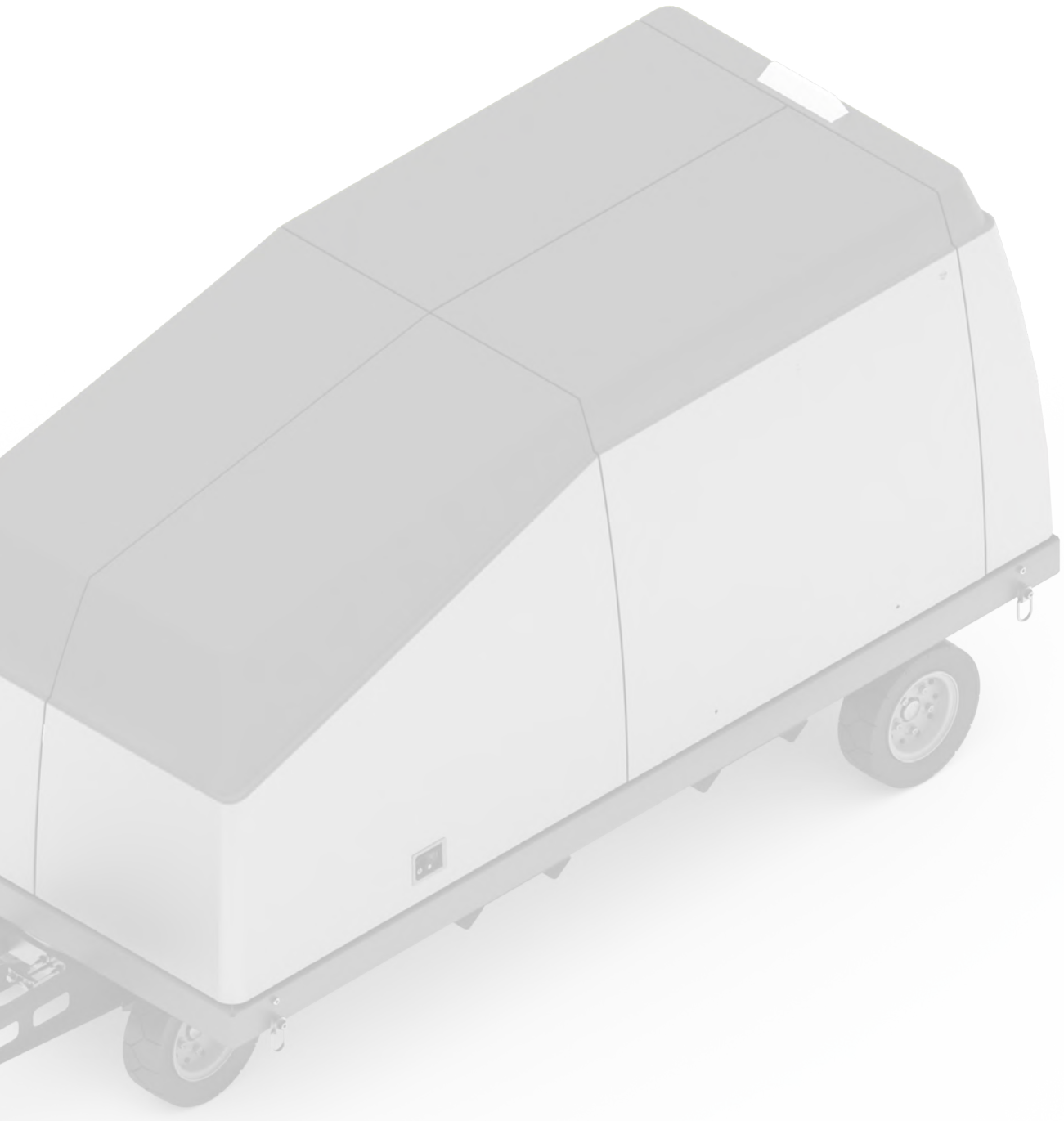
Country compatible cylinder connectors

- UK Nitrogen bottle connection
- German Nitrogen bottle connection
- French Nitrogen bottle connection
- USA / North America / Singapore bottle connection

TECHNICAL SPECIFICATION

OXYGEN SYSTEM

Model-No.	NBOT-2 (two bottle cart)	NBOT-4 (four bottle cart)
Length	2,700 mm 106.3 inch	2,700 mm 106.3 inch
Width	1,324 mm 52.1 inch	1,324 mm 52.1 inch
Height	1,441 mm 56.7 inch	1,441 mm 56.7 inch



10

WASTE LINE CLEANING

ATA CHAPTER 38

10. WASTE LINE CLEANING

DESCRIPTION

The Waliclean has been developed for cleaning vacuum waste line systems of different aircraft types.

PRODUCT FEATURES

- 1 EA water supply hose, 20 m (65 ft), on hose reel with standard claw coupling (GEKA)
- 3 EA cleaning hose, 20 m (65 ft) each, on hose reel with couplings
- 2 EA blanking caps for cleaning hose
- 2 EA A/C sensor head each with a sensor cable (40 m (130 ft)) on cable reel for measurement and monitoring
- 1 EA A/C adapter 0,4 m 0° to connect cleaning hoses to the vacuum waste line system
- 1 EA A/C adapter 0,4 m 90° to connect cleaning hoses to the vacuum waste line system
- 1 EA electrical connection cable, 20 m (65 ft), with CEE-plug (32 A)
- 1 EA rope, 20 m (65 ft), with carabiner to lift the cleaning hoses up to cabin height and bag for storage
- 2 EA strain relief for cleaning hoses
- 3 EA blanking caps A/C Waste Line (in case, leaking toilets can be repaired and pipes can be blanked off)
- 1 EA waste water hose, 10 m (33 ft), with couplings and caps, stored in an extractable drawer
- 1 EA ball valve "SUPPLY" (to avoid leaking of cleaning fluid in the A/C while connecting or disconnecting)
- 1 EA ball valve "RETURN" (to avoid leaking of cleaning fluid in the A/C while connecting or discecting)
- 2 bags of citric acid (25 kg each) for inonnitial cleaning

BENEFITS

- Airbus certified
- User friendly ergonomic setup and operation
- Environmental friendliness
- Fully automatic cleaning process
- Minimized service time
- On-site service

10. WASTE LINE CLEANING

OPTIONS

- Extended functionality for upper deck and simultaneous cleaning of two systems
- Continuous-flow heater
- Motor drive for hose reel
- Tool box with drawer and storage shelf for citric acid
- Spring-loaded chassis
- Cover paint alternative to standard

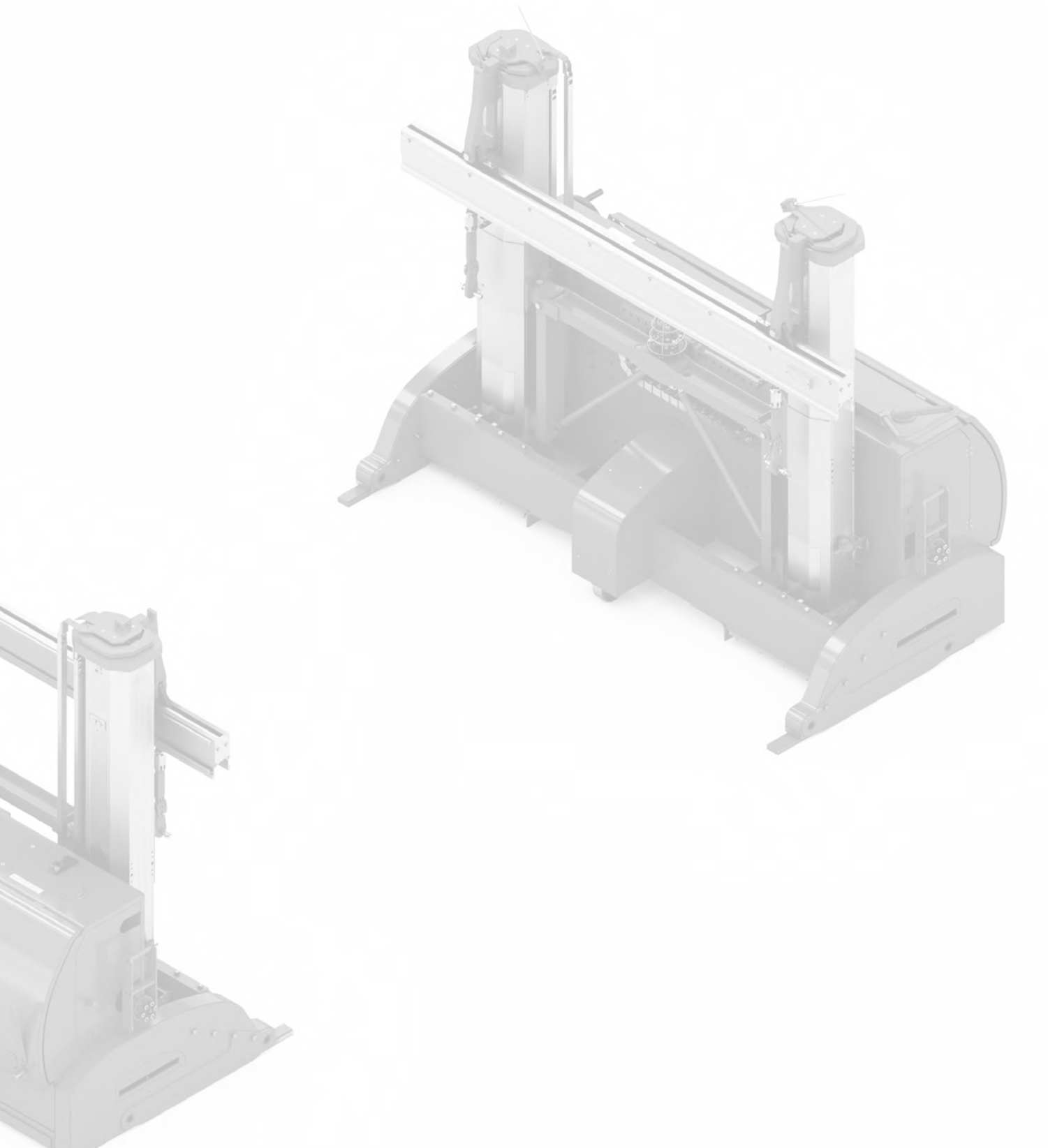
AVAILABLE ACCESSORIES

- Dust cover
- Additional waste water hose 10 m (33 ft) with couplings and caps, stored in a separate shelf between the fork lift access points

TECHNICAL SPECIFICATION

WASTE LINE CLEANING

Model-No.		WLC1
Operating conditions	Ambient temperature	5 to 50 °C (41 to +104 °F)
	Storage temperature	0 to 60 °C (32 to +140 °F)
	Noise emission	max. 63 dB(A) in 1 m distance
Electrical supply	Mains supply	3/PE AC 50/60 Hz 380 – 480 V
	Nominal current	max. 21 A (max. 32 A with option B)
	Power	14.6 kVA (max. 22.1 kVA with option B)
	Preliminary fuse (electricity- and performance characteristcis at 400 V 50 Hz)	25 A gL (max. 32 A gL with option B)
Dimensions and weight	Length	2,850 mm (112.2 in)
	Width	1,600 mm (63.0 in)
	Height	1,500 mm (59.1 in)
	Weight	approx. 1,200 kg (approx. 2,645.5 lb)



11

POWER PLANT
ATA CHAPTER 71

11.1 ENGINE CHANGE SYSTEM

DESCRIPTION

The COBRA Engine Change System has been designed to ensure a fast engine change and to minimize operational failure and technical risks.

This offers you tremendous benefits by reducing your costs through minimal aircraft downtimes.

Your maintenance team has been waiting for this technology — now it is here at HYDRO.

STANDARD CHARACTERISTICS

- Universal, innovative engine change system
- Applicable to aircraft with wing-mounted engines
- Interchangeable adapters for flexible and universal handling of engine dollies, cradles and shipping stands
- Accessories available for multi-purpose applications
- Suitable for a wide range of aircraft

PRODUCT FEATURES

- Consists of master and slave unit
- Semi-automatic lifting of engine, dolly and cradle or shipping stand
- 4 pillars: each pillar can be controlled independently
- Movement possible in 3 axes

BENEFITS

- OEM approved
- Up to 70 % time saving for engine changes (compared to bootstrap)
- Short amortization period on investment cost
- Protects the aircraft, engine and operator with various safety features
- Easy operation
- On-site service

11.1 ENGINE CHANGE SYSTEM

AVAILABLE ACCESSORIES

- Transportation trailer with or without diesel power unit
- Spare part kit
- Load cell calibration kit
- Diesel power unit
- Lift adapters for a wide range of aircraft, e.g. TPAA1A2A0A0B0 for A350 XWB with RRT089139 stand

TECHNICAL SPECIFICATION

ENGINE CHANGE SYSTEM

Model-No.			TP91G
Performance	Nominal capacity		16.3 t (36,000 lbs)
	Max. lift stroke		
		Long pillar	2,800 mm (110 inch)
		Short pillar	2,200 mm (86 inch)
	Lifting speed		5 mm/sec or 10 mm/sec [fast mode]
			(0.2 inch/sec or 0.5 inch/sec [fast mode])
	Power supply		200 – 480 V; 50 – 60 Hz
Movability	Max. horizontal movement		± 120 mm (4'')
	Max. transversal movement		± 150 mm (6'')
	Max. inclination longitudinal		10°
Weight	Weight master		1,200 kg (2,645 lbs)
	Weight Slave		1,048 kg (2,310 lbs)

11.2 ENGINE PEDESTAL SET

DESCRIPTION

HYDRO Engine Pedestal Sets (EPS) are multi-purpose systems which can be used for various engine types from different engine manufacturers.

For each new engine combination only a new adapter set is required while the pedestals are universal and used for any combination.

The basic set consists of 2 pedestals used at the front and 2 pedestals used at the rear of the engine. Due to the universal application of the basic set less storage space is required.

PRODUCT FEATURES

- Consists of 2 pedestals used at the front and 2 pedestals used at the rear engine

AVAILABLE ACCESSORIES

- Spring loaded ball castors for easy positioning of pedestals

OPTIONS

Engine Adapter Kit

Engine adapter kits are available separately for each engine type and are attached to the basic set. Each engine adapter kit includes 2 rear adaptors and 2 front adaptors. E.g. 47001-026-000 for A350 — Trent XWB (Please note that additionally 1 x RRT059450-1 is required).

BENEFITS

- Universal application
- Cost savings
- Space savings
- On-site service

TECHNICAL SPECIFICATION

ENGINE PEDESTAL SET

Model-No.	EPS002-002
Nominal capacity	9 t
Weight basic set	1,270 kg

11.3 XWB — SES CORE STAND

DESCRIPTION

The Split Engine Stand (SES) is essential in supporting the split and reconfiguration of the Rolls-Royce Trent XWB engine. HYDRO is the original designer and licensed manufacturer of this engine transportation stand.

The Split Engine Stand consists of

- Fan Case Stand: P/N RRT057892
- Core Stand: P/N RRT057891
- Storage container: P/N RRT070226

PRODUCT FEATURES

- Retractable, swivel castors, storable during transportation
- Shock attenuation system to prevent engine damage during road transportation
- Blocking mechanism of shock attenuation system: for use during airfreight transportation and split process
- Adjustable frames for proper alignment during split/reassembly process and handling of the engine/core including:
  1.) Longitudinal movement in X — axis (engine/core) of the intermediate frame, actuated by hand wheel/lever
  2.) Vertical movement in Z-axis (engine/core) of upper frame, actuated by power drill or hand wheel/lever
- Guiding and fixing features for proper orientation of core stand and fan case stand
- Towing bar for local site movements, attachable on the front and the rear side
- Provisions for fork lifting
- Hoisting points
- Lashing points

BENEFITS

- Low risk option
- HYDRO is a 'Rolls-Royce Preferred Supplier of Trent XWB Transportation Equipment'
- To date we have supported many Trent XWB Entry Into Services with the SES product range, and have provided many SES directly to Rolls-Royce plc
- The HYDRO facility in the US is designed and productionized to support the high volume manufacture of the Split Engine Stand
- Our experience allows HYDRO to offer an extremely high quality SES, at a competitive price
- COBRA Compatibility
- Air, sea and road transportability
- On-site service

11.3 XWB — SES CORE STAND

AVAILABLE ACCESSORIES

- Storage kit

TECHNICAL SPECIFICATION

XWB — SES CORE STAND

Model-No.	RRT057891
Application	A350 – 900 XWB

11.4 XWB — BASIC STAND

DESCRIPTION

The Basic Engine Stand is a modular system to allow storage and local-site movement of a TRENT XWB engine. It is available in two different configurations. Various additional tools are required for usage.

Bootstrapping & Local Transportation

- 1x RRT089139 Basic Stand XWB — MANDATORY
- 1x RRT089143 Castor Kit — MANDATORY
- 1x RRT061134-3 Bootstrap Adaptor — MANDATORY
- 1x RRT089162 Support frame — MANDATORY
- 1x RRT089158 Towing Kit — RECOMMENDED
- 1x RRT089154 Lift Adaptors — RECOMMENDED
- 1x RRT089147 MVP Bag — OPTIONAL
- 1x RRT089163 MasterMover Interface — RR USE ONLY

PRODUCT FEATURES

- Essential for the Trent XWB Engine transportation
- Used for Bootstrapping of XWB engine
- Stands (either empty or with engine installed) are transportable by fork-lift truck
- A lot of different options, features are available and easily retrofittable

BENEFITS

- To allow storage and local-site movement of a TRENT XWB engine
- Sea and road transportability
- Easy handling

TECHNICAL SPECIFICATION

XWB — BASIC STAND

Model-No.	RRT089139
Application	A350 – 900 XWB

11.5 XWB — WES ENGINE STAND

DESCRIPTION

The XWB WES (Whole Engine Stand) Engine Stand has been designed for storage, roas, sea and air transport. Furthermore it will withstand local site movements.

PRODUCT FEATURES

- Road transportation of a TRENT XWB engine
- Air transport of a TRENT XWB engine in large freighters e.g. Antonov (B747F / B777F is not possible, Split-Engine-Stand SES is required)
- Air transport of empty stand possible in B747F / B777F
- Storage and local on-site movement of a TRENT XWB engine
- Integrated hydraulic rolling mechanism for lowering of the engine
- Shock absorbers to protect the engine
- Shock-absorbing and retractable castors
- Hydraulic leveling system
- Tow-bar
- Integrated forklift tubes plus forklift limiter to avoid engine damage during forklifting
- Integrated box for storage of loose parts etc.
- Rigging points for securing of stand
- Lifting of stand with / without engine possible with optional lifting adaptor and sling

BENEFITS

- Air, sea and road transportability
- Shock absorbed
- Easy handling
- On-site service

TECHNICAL SPECIFICATION

XWB — WES ENGINE STAND

Model-No.	RRT089140
Application	A350-900 Trent XWB-84/-97

11.6 ENGINE TOOLING

DESCRIPTION

Since 2007 HYDRO is a preferred supplier to Rolls-Royce for products and services relating to Engine Tooling and Ground Support Equipment. We provide our products and services to Rolls-Royce and its after-market Customers.

OUR COPE OF SUPPLY

Products

- Build and strip tooling
- Line maintenance tooling
- Component repair tooling
- Electrical test equipment
- Moisture and vapor protection equipment
- Engine blanks
- Special to product test equipment (SPTE)
- Engine transportation stands
- Make to Print
- Design and make
- Repair and refurbishment
- Calibration
- Tool management
- Packing and shipping
- Customer Technical Support

BENEFITS

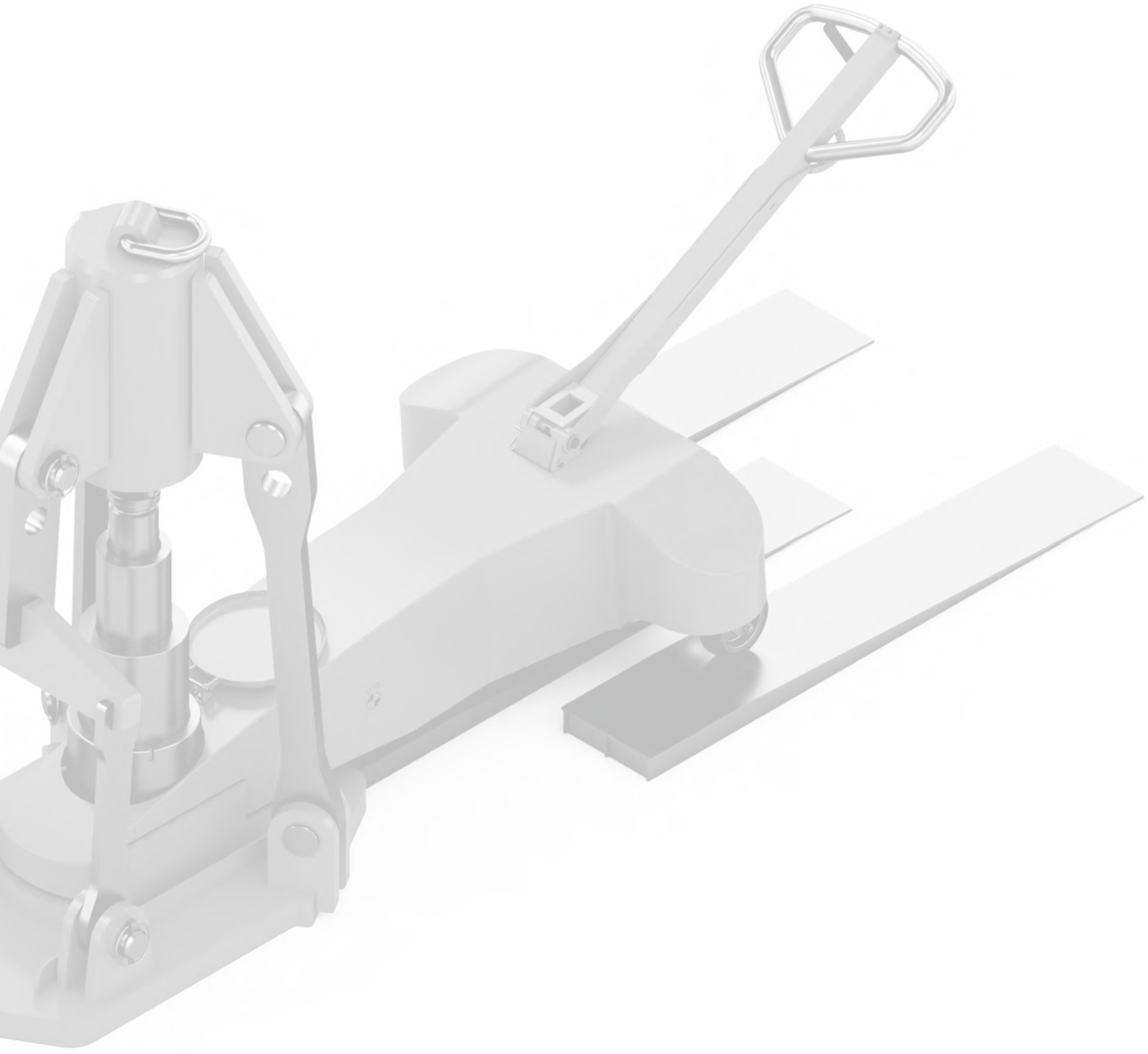
- Extensive experience in tooling design and manufacturing
- Outstanding quality and cost reduction by using HYDRO and its global supply chain
- Experienced project management, design and project engineering teams
- Well-proven tooling design process
- Extensive base of external suppliers for engineering design services Specialized project engineers for balancing tooling, multi-product-tooling and value engineering
- Comprehensive knowledge in aero engine design and build and strip of engines
- We turn your tooling activities around into a profitmaking business!

11.6 ENGINE TOOLING

TOOLING AVAILABLE FOR THE FOLLOWING ENGINE PROGRAM

Engine	Aircraft
Trent XWB	Airbus A350

HYDRO supports engine tools also for other engine programs, including Trent 1000, Trent 900, Trent 800, Trent 700, and many more.



12
OTHERS

12.1 PROOF LOAD TEST FIXTURE

DESCRIPTION

The HYDRO proof load test fixture has been designed for testing of lifting devices.

The HYDRO proof load test fixtures are used for

- Checking: the hydraulic lift cylinder and hydraulic circuit of tripod- and axle-jacks for leakage
- Controlling: the preciseness of the load indicator of tripod- and axle-jacks Testing: the adjustment of pressure relief valves of the hydraulic circuit of tripod- and axle-jacks

Standard characteristics of PV165 and PV250

- Load cell
- Adapter pieces (male ø 19 mm and ø 32 mm, female ø 44.5 mm)
- Laptop with testing software "HyCat" and case
- Color printer for test certificates with case
- Measuring cable
- Storage box
- Power supply AC 240V/0.04 kVA/50Hz

Standard characteristics of PV050

- Hydraulic load cell (PV165 load cell also usable)
- Adapter pieces (male ø 19 mm and ø 32 mm)
- Storage box

AVAILABLE OPTIONS

- Individual braces for each tripod-jack
- Measuring amplifier and LED-display (instead of laptop with testing software)
- Roll-paper printer for documentation of the measuring points

TECHNICAL SPECIFICATION

PROOF LOAD TEST FIXTURE

Model-No.	PV050	PV165	PV250
Max. test force	50 t 55.0 tons	165 t 181.5 tons	250 t 275.0 tons
Application	For all HYDRO tripods and axle-jacks with a test capacity up to 50 t	For all HYDRO tripods and axle-jacks with a test capacity up to 165 t	For all HYDRO tripods and axle-jacks with a test capacity up to 250 t

WORLDWIDE FOOTPRINT

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