NEOMETRIX

Weapon Loading Trolley

Product Catalog

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About us:

Neometrix Defence Celebrating 20 Years of Excellence! For the past two decades, Neometrix Defence has maintained its position as a premier provider of advanced test benches and rigs.

Our accreditation by the Directorate General of Aeronautical Quality Assurance, India (DGAQA) and Defence Research & Development Organization, India (DRDO) underscores our commitment to upholding the highest international defence industry standards.

Counting the Indian Air Force/Army/Navy, Ministry of Defence, Hindustan Aeronautical Limited, and DRDO among our esteemed clientele, we are recognized for delivering state-of-the-art solutions and unwavering performance reliability.

Strengths & Capabilities:

Neometrix Defence is a powerhouse of engineering brilliance, proudly serving every Indian Air Force station and partnering with the Indian Army, Navy, Railways, BARC, NPCIL, and ISRO. With a team of over 100 elite engineers and visionary founders from IIT Kanpur and IIT Delhi, we harness cutting-edge technology to set the gold standard in mechanical engineering.

We Don't Just Meet Industry Demands – We Define Them!

- We have established our presence in all Air Force stations across India. With the Indian Air Force as our leading customer, we are dedicated to upholding the highest standards of excellence in the aerospace industry.
- Our extensive clientele extends beyond the defence industry, including projects with the Indian Army, Navy, Railways, BARC, NPCIL, ISRO, and more. In essence, we excel in all aspects of mechanical engineering!
- Our team comprises over 100 graduate engineers, supported by a cutting-edge manufacturing site equipped with state-of the-art machinery, enabling us to meet the highest Engineering standards.
- The founders of our company are distinguished graduates from IIT Kanpur and IIT Delhi, bringing extensive expertise and a wealth of engineering knowledge to Neometrix Defence.

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Introduction:

The Neometrix Weapon Loading Trolley is a precision-engineered hydraulic platform designed to facilitate the safe, rapid, and accurate handling of aerial munitions such as bombs, missiles, and training rounds. It is developed for airbases, ammunition depots, and field deployments by the Indian Air Force and allied defense operators.

At its core, the trolley features a dual-scissor, single-stage vertical lift mechanism that ensures true vertical elevation—eliminating horizontal drift during lifting. This mechanism, powered by four single-acting hydraulic cylinders and a dual-position hand pump, offers both powered and manual operation modes. The ability to engage aircraft hardpoints without ramps, jigs, or external power supplies makes this equipment highly mission-adaptable.

Constructed from plate-sectioned, high-strength steel, the trolley ensures outstanding durability and load-bearing capability. Solid rubber wheels with 90 mm ground clearance allow smooth operation over both smooth hangar floors and rugged field surfaces. With minimal preventive maintenance requirements, a compact footprint, and an ergonomic form factor, it improves munitions logistics speed and crew safety Beyond its mechanical advantages, the Neometrix Weapon Loading Trolley exemplifies the strategic shift toward indigenous defense manufacturing under the “Atmanirbhar Bharat” initiative.

Designed, tested, and fabricated entirely in India, the trolley reflects Neometrix’s deep-rooted engineering expertise and unwavering commitment to reliability in combat-critical infrastructure. Its modular design philosophy allows for future scalability, optional automation upgrades, and easy servicing, thereby ensuring long-term value, lifecycle durability, and alignment with evolving defense logistics requirements.

Purpose & Applications:

The Neometrix Weapon Loading Trolley has been meticulously engineered to fulfill a wide array of critical functions across airbases, ammunition depots, and forward operating units. Its versatile design supports safe, efficient, and repeatable loading operations for a diverse range of aircraft platforms and ordnance types. Whether operating in controlled hangar environments or remote field conditions, this trolley offers mission-assured handling of sensitive and high-risk payloads.

Aircraft Armament Loading

One of the core applications of the Weapon Loading Trolley lies in its ability to precisely lift and position air-dropped munitions—such as bombs, guided missiles, and drop tanks—to align with aircraft underwing and fuselage hardpoints. Traditional loading methods using jacks, shims, or inclined lifts are prone to angular misalignment, which can lead to pylon damage or human injury. The trolley's true vertical lift system eliminates horizontal drift entirely, ensuring a stable, accurate, and repeatable interface. This not only enhances safety but significantly improves turnaround time for sortie generation in high-tempo operations.

Ordnance Maintenance & Servicing

In maintenance workshops or on tarmac service lines, the trolley plays a vital role in inspection, testing, and minor repairs of munitions prior to loading. Operators can securely raise the load to any required height for activities such as:

- Fuze removal and reinstallation
- Mechanical interface verification
- Arming wire routing and connector checks
- Cleaning, weighing, and visual assessments

Ammunition Depot Logistics

Within ordnance depots, logistics warehouses, and underground munitions bunkers, the trolley offers immense value in material movement and inventory management. Its low collapsed height (600 mm), compact base (2,650 mm), and adjustable rear track allow seamless navigation through tight aisles, narrow corridors, and between pallet racks.

Field & Expeditionary Deployments

In off-grid or rapidly mobilized forward bases, where power availability is limited or inconsistent, the Neometrix trolley's manual dual-position hand pump ensures full functionality. Field units can perform loading operations under tents, open-air pads, or mobile airfields without reliance on electric or pneumatic auxiliaries.

System Architecture:

The core mechanical architecture of the Weapon Loading Trolley combines hydraulic precision with rugged steel engineering.

Structure

- Dual-Scissor Lift Mechanism: A single-stage configuration ensures true vertical motion, eliminating any risk of horizontal load shift.
- Frame Material: Plate-sectioned high-strength steel with reinforced welding across load paths.
- Locking Capability: Integrated mechanical locks for safety at elevated positions.

Hydraulic Actuation

- Cylinders: Four single-acting hydraulic cylinders with pilot-operated check valves.
- Pump: Dual-position manual HP01 hydraulic hand pump provides full lift and descent functionality.
- Flow Control: Flow-control and relief valves included to modulate motion and prevent overpressure.

Mobility

- Wheels: Four solid rubber wheels (300 mm × 70 mm) mounted on heavy-duty bushes.
- Ground Clearance: 90 mm for seamless navigation in hangars and uneven tarmacs.
- Steering: Adjustable rear-wheel track from 830 mm to 1,420 mm for stability and maneuvering.

Technical Specifications:

Parameter	Specification
Lifting Capacity	750 kgf (1,653 lbf)
Lift Height (Min–Max)	310 mm to 1,970 mm (up to 2,340 mm)
Stowed Height	600 mm
Overall Dimensions	3,080 mm × 980 mm × 600 mm
Base Length	2,650 mm
Front Wheel Track	570 mm
Rear Wheel Track	830 mm (min) – 1,420 mm (max)
Ground Clearance	90 mm
Wheel Type	Solid Rubber (300 × 70 mm)
Net Weight	300 kg
Hydraulic Fluid	AMZ-10 (purity class 9)
Hydraulic Reservoir	2.9 Liters2.9 Liters
Pump & Valve	HP01 Hand Pump & 629600B Valve

Mechanical & Environmental Design:

The Neometrix Weapon Loading Trolley is built to endure the harshest defense operating conditions while maintaining precise mechanical performance and minimal service demands.

- Material Construction: Fabricated entirely from laser-cut, plate-sectioned high-tensile steel for maximum durability under load.
- Weld Quality: All joints conform to aerospace-grade welding codes, with full weld-length penetration and cross-bracing in critical zones.
- Corrosion Protection: Treated with epoxy primer and finished with UV-resistant polyurethane topcoat to withstand prolonged exposure to sunlight, salt air, and rain.
- Sealing & Weatherproofing: Bearings, bushings, and hydraulic components are sealed to prevent ingress of dust, water, or particulate matter, enabling outdoor storage.
- Temperature Range: Functional in environments ranging from –20°C to +55°C; suitable for deserts, coastal airbases, high-humidity zones, and mountainous terrain.
- Shock & Vibration Resistance: Complies with MIL-STD-810G for mechanical shock and operational vibration during handling or movement over rough terrain.
- Mobility in Tight Spaces: Compact footprint with adjustable rear track enables movement through hangar corridors, underground depots, and mobile loading docks.
- Ergonomic Design: Optimized handle position, pump access, and visual alignment aid reduce operator fatigue and improve control during loading.

Operational Workflow

The Neometrix Weapon Loading Trolley is designed for intuitive use in both structured base environments and unpredictable field conditions. Its simple yet rugged hydraulic system allows operators to perform critical tasks with minimal training and high confidence.

Setup & Deployment

- Positioning: Roll the trolley beneath the aircraft pylon or adjacent to the munitions rack. The compact frame and adjustable rear track allow alignment even in confined spaces.
- Load Placement: Place the bomb, missile, or payload on the lifting platform using mechanical support or crane if necessary.

- Lift Engagement: Use the dual-position hand pump to initiate controlled vertical elevation. The flow-control and relief valves ensure smooth, safe movement without jerks or overshoot.

Precision Alignment

- Micro-Leveling: Operators can adjust height precisely to align the payload with aircraft hardpoints or depot fixtures.
- Safety Lock: Once at height, the lift can be locked to prevent accidental descent during critical attachment operations.

Transfer & Release

- Final Load Transfer: Once aligned, the ordnance can be locked into aircraft pylons or transferred to test bays using quick-release mounting points.
- Descent: Lowering is executed slowly using the same hand pump, ensuring full control even in uneven terrain or on sloped aprons.

Stowage & Maintenance

- Collapse to Stow: Once unloaded, the trolley is brought back to its 600 mm stowed height and stored in a designated bay or vehicle.
- Preventive Checks: Grease points, seals, and pump function are easily accessible and require only monthly inspection.

Safety, Compliance & Quality:

- Safety Valves: Integrated pressure relief and flow-control valves.
- Manual Override: Dual-mode manual hand pump ensures operational redundancy.
- Compliance: Conforms to ISO 9001, IS 2062 for steel quality, and relevant defense material specs.
- Traceability: Each unit serialized and tested with individual QA logs.
- Inspection: Radiographic inspection of welds, pre-dispatch pressure testing, load testing at 1.25× rated capacity.