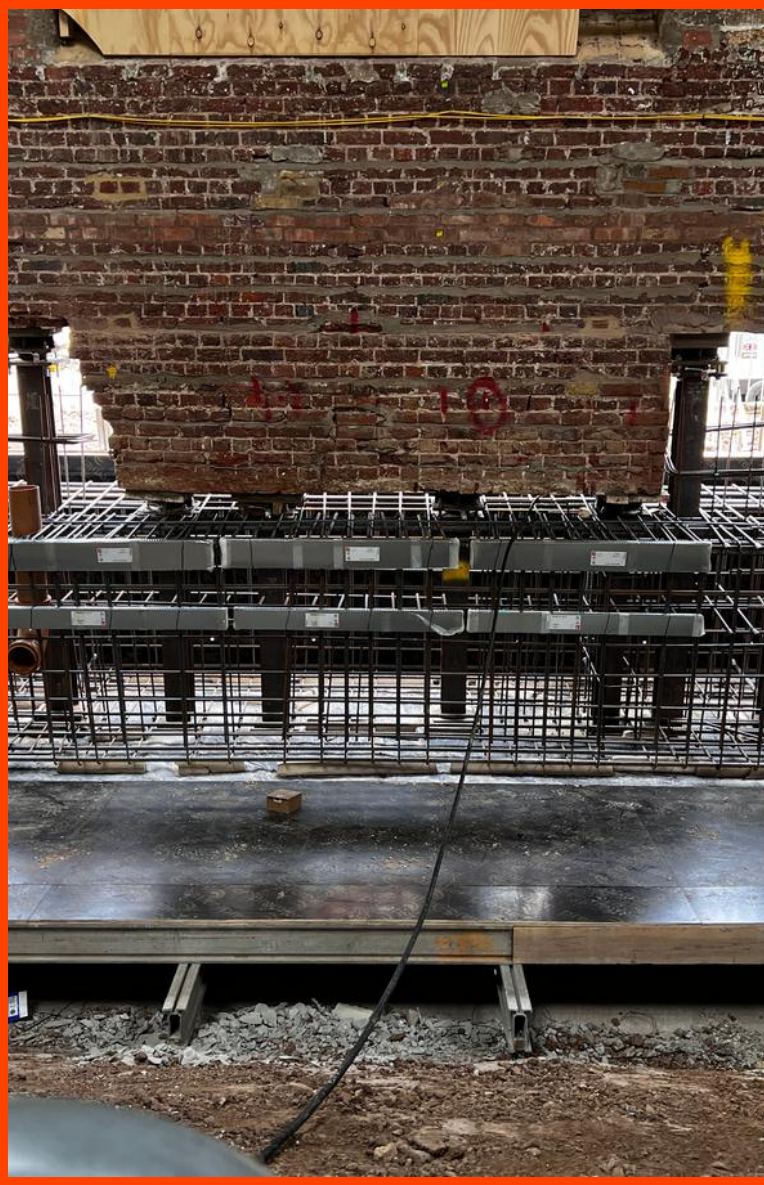
HYDRA-CAPSULE

HYDRA CAPSULE LIMITED

MECHANICAL WEDGE & HARJAK TECHNICAL LITERATURE



OUR SERVICES

- Pre-loading & Deflection Services
- Structure Lifting & Lowering
- Mechanical Locking Device
- Temporary or Permanent Solutions
- 5 to 200 tonnes Capacity

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HYDRA-CAPSULE LIMITED - GIVING CONSTRUCTION OUR SUPPORT

CONTENTS

01 MECHANICAL WEDGE JACK OVERVIEW

The Mechanical Wedge and Har-Jak is a precision-engineered screw jack designed for controlled lifting, levelling, and load transfer in construction and civil engineering applications.

Operating via a simple torque wrench mechanism, HarJaks provide accurate load application without the need for hydraulic power packs or electrical supply.

KEY CAPABILITIES

5-200
TONNES CAPACITY

Secure
SELF-LOCKING MECHANISM

Multi-Use
FOR TEMPORARY & PERMANENT USES

7 Units
RANGE OF MODELS AVAILABLE

ADVANTAGES

- ✓ Known force measurement and low height for restricted access
- ✓ Largest stocks of all models - offering supply only or contract services
- ✓ Ideal for pre-loading, deflection & temporary or permanent applications
- ✓ Available in 7 models from 5 to 200 tonnes capacity
- ✓ No hydraulic power required - simple torque wrench operation
- ✓ UK manufactured with over 40 years proven track record

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01 MECHANICAL WEDGE OVERVIEW CONTINUED

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The Mechanical Wedge Jack (also known as Titan Jack, Harjak, Locking-Wedge) is a compact high-capacity lifting and pre-loading device designed for controlled lifting, alignment and support of structures where hydraulic equipment may be impractical.

The system uses a high-strength draw bolt to drive an internal wedge assembly, converting torque into vertical lifting force with precise control and minimal maintenance requirements.

HOW IT WORKS

01
POSITION
Place centrally beneath the structure or load

02
PRELOAD
Apply nominal load for full bearing contact

03
ENGAGE LOAD
Rotate draw bolt using torque wrench

04
SUPPORT
Leave in-situ and/or install packers or grout

KEY ADVANTAGES

- ✓ No hydraulic power required - Low maintenance
- ✓ Compact and lightweight
- ✓ Precise load control via torque
- ✓ Permanent or temporary installation
- ✓ Self-locking mechanism
- ✓ Available in capacities from 15 to 200 tonnes
- ✓ Reusable and low maintenance

PERFORMANCE AT A GLANCE

15-200 T
CAPACITY RANGE

10-20mm
LIFT RANGE

Mechanical
SCREW/WEDGE OPERATION

No Hydraulics
SIMPLE DESIGN

Compact
LIGHTWEIGHT UNITS

Reusable
COST EFFECTIVE

02 SPECIFICATIONS & FEATURES

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The Mechanical HarJak range covers capacities from 5 to 200 tonnes, with stroke lengths of 10-20mm. All models are manufactured from mild steel and operate via a precision draw-bolt mechanism.

Model	Load	Stroke	Block L	Width	H (C/O)	Bolt	Weight
5/10	5 t	10 mm	75 mm	75 mm	30/40 mm	M12, 19AF	2.5 kg
15/10	15 t	10 mm	100 mm	100 mm	40/50 mm	M16, 24AF	4 kg
20/20	20 t	20 mm	135 mm	100 mm	50/70 mm	M20, 30AF	4.5 kg
35/20	35 t	20 mm	150 mm	100 mm	60/80 mm	M24, 36AF	7.6 kg
75/20	75 t	20 mm	200 mm	152 mm	80/100 mm	M30, 46AF	17 kg
120/20	120 t	20 mm	250 mm	190 mm	100/120 mm	M42, 65AF	38 kg
200/20	200 t	20 mm	325 mm	245 mm	130/150 mm	M48, 75AF	80 kg

KEY FEATURES

- ✓ Self-locking screw mechanism - load held without continuous torque
- ✓ Compact design fits into restricted access areas
- ✓ Operates with standard torque wrench - no hydraulic power needed
- ✓ Mild steel construction for durability and corrosion resistance
- ✓ Precise load/torque relationship for accurate load application
- ✓ Reusable - clean, re-grease, and re-deployment

MECHANICAL OPERATION
No hydraulic power required - operates with standard torque wrench

SELF-LOCKING
Load held permanently without continuous torque application

PRECISION LIFT
Controlled load via calibrated torque/load relationship

REUSABLE
Clean, re-grease and redeploy across multiple projects

COMPACT DESIGN
Fits restricted access areas where hydraulics cannot reach

DURABLE BUILD
Mild steel construction with zinc/paint protection as standard

02.1 TECHNICAL DATA
DIMENSIONS & SPEC.

HYDRA-CAPSULE

HARJAK 5/10
5 Tonnes | 10mm Lift | M12 Bolt

HARJAK 15/10
15 Tonnes | 10mm Lift | M16 Bolt

HARJAK 20/20
20 Tonnes | 20mm Lift | M20 Bolt

HARJAK 35/20
35 Tonnes | 20mm Lift | M24 Bolt

HARJAK 75/20
75 Tonnes | 20mm Lift | M30 Bolt

HARJAK 120/20
120 Tonnes | 20mm Lift | M42 Bolt

HARJAK 200/20
200 Tonnes | 20mm Lift | M48 Bolt

MEGASHOR SJ
Screw Jack | Adjustable | Heavy Duty Upto 100 Tonnes

TITAN WEDGE JACK
Wedge Jack | High Capacity | Upto 50 - 100 Precision

TECHNICAL FEATURES

Construction	High Strength Steel	Installation	Temporary or Permanent
Operation	Mechanical Wedge Drive	Maintenance	Minimal
Lift Accuracy	Controlled by Applied Torque	Finish	Painted / Self-Colour Protected

DIMENSION KEY

A = Closed Height B = Outside Width C = Main Block Length

STANDARD RANGE

Model	Capacity (T)	Lift (mm)	A Closed (mm)	B Width (mm)	C Length (mm)	Bolt
HWJ15/10	15	10	40	100	100	M16
HWJ20/20	20	20	50	100	135	M20
HWJ35/20	35	20	60	100	150	M24
HWJ75/20	75	20	80	152	200	M30

HEAVY DUTY RANGE

Model	Capacity (T)	Lift (mm)	A Closed (mm)	B Width (mm)	C Length (mm)	Bolt
HWJ120/20	120	20	100	190	250	M42
HWJ200/20	200	20	130	245	325	M48

MANUAL MECHANICAL SCREW JACK

Model	Capacity (T)	Lift (mm)	A Closed (mm)	B Width (mm)	C Length (mm)	Use Type
SJ-15	20	150	365	120	150	Handle
SJ-35	35	210	420	290 x 290	180	Spanner
SJ-75	75	210	420	290 x 290	180	Hammer Strike

TITAN WEDGE JACK

Model	Capacity (T)	Lift (mm)	A Closed (mm)	B Width (mm)	C Length (mm)	Bolt
TW-50	050	15	55	150	200	M24
TW-100	100	15	70	180	250	M30

02.2 APPLICATIONS

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- Striking system for bridge & formwork support structures
- Support bridge deck during bearing replacement works
- Controlled lifting of buildings, beams & heavy structures
- Settlement control & excavation strut prop loading
- Construction support, levelling & maintenance operations.
- Fine adjustment & deflection of steelwork

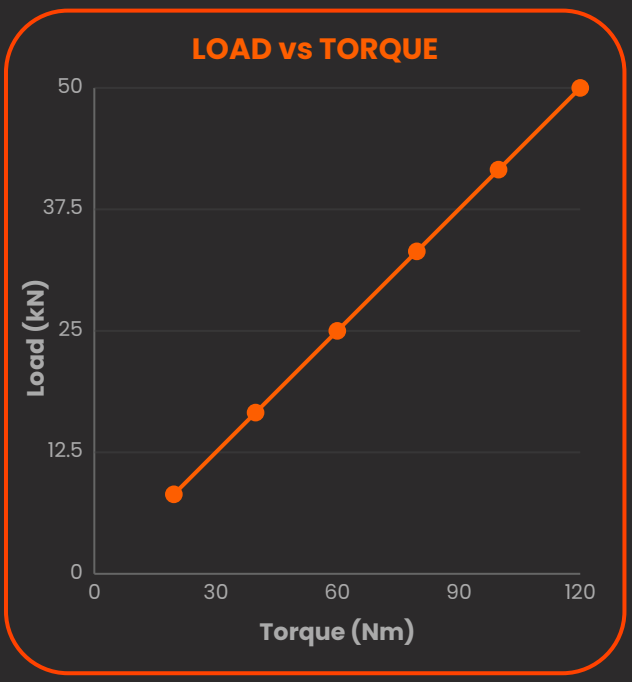
CASE STUDY: HS2 / CROSSRAIL, LONDON

Multiple HarJak mechanical wedges (35/20 and 75/20 models) were used to preload temporary steelwork connections during tunnel portal construction. The self-locking mechanism allowed permanent load transfer without hydraulic systems, reducing maintenance requirements and providing a reliable long-term solution in confined spaces.

03 HARJAK 5/10

SPECIFICATION

Max Jack Load	5 t (50 kN)
Stroke	10 mm
Main Block Length	80 mm
Length incl. Bolt Head	120 mm
Width	80 mm
Height (Closed)	30 mm
Height (Open)	40 mm
Bolt Size	M12, 19 mm AF
Weight (approx.)	2.5 kg
Max Torque	120 Nm
Material	Mild Steel



TYPICAL EQUIPMENT REQUIRED

- Torque Wrench: Norbar SL (or similar); 10-50 Nm, 3/8" drive
- Socket: 19 mm AF
- Torque Multiplier: Not typically required

OPERATING NOTES

1. Remove travelling bolts before installation and jacking.
2. Ensure jack is positioned centrally under load point with minimal clearance.
3. Apply torque gradually using calibrated wrench - do not exceed 120 Nm.
4. Jack is self-locking; load is held without continuous torque application.
5. To release, reverse torque direction on draw-bolt.
6. Clean and re-grease draw-bolt thread after each use before storage.

LOAD / TORQUE RELATIONSHIP

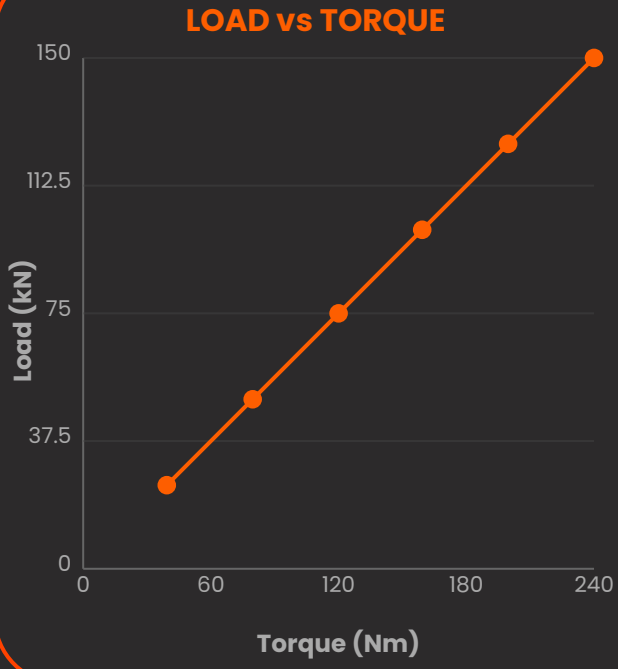
Torque (Nm)	Load (kN)	Load (Tonnes)	% Max Load	Status
20	8.3	0.83	16%	OK
40	16.7	1.67	33%	OK
60	25.0	2.50	50%	OK
80	33.3	3.33	66%	OK
100	41.7	4.17	83%	OK
120	50.0	5.00	100%	MAX

Linear relationship: Load (kN) = Torque (Nm) x 0.417 | Do not exceed maximum torque rating.

04 HARJAK 15/10

SPECIFICATION

Max Jack Load	15 t (150 kN)
Stroke	10 mm
Main Block Length	100 mm
Length incl. Bolt Head	150 mm
Width	100 mm
Height (Closed)	40 mm
Height (Open)	50 mm
Bolt Size	M16, 24 mm AF
Weight (approx.)	4 kg
Max Torque	240 Nm
Material	Mild Steel



TYPICAL EQUIPMENT REQUIRED

- Torque Wrench: Norbar SL 20-100 Nm; 1/2" drive
- Socket: 24 mm AF
- Torque Multiplier: Not typically required

OPERATING NOTES

1. Remove travelling bolts before installation and jacking.
2. Ensure jack is positioned centrally under load point with minimal clearance.
3. Apply torque gradually using calibrated wrench - do not exceed 120 Nm.
4. Jack is self-locking; load is held without continuous torque application.
5. To release, reverse torque direction on draw-bolt.
6. Clean and re-grease draw-bolt thread after each use before storage.

LOAD / TORQUE RELATIONSHIP

Torque (Nm)	Load (kN)	Load (Tonnes)	% Max Load	Status
40	25.0	2.5	17%	OK
80	50.0	5.0	33%	OK
120	75.0	7.5	50%	OK
160	100.0	10.0	67%	OK
200	125.0	12.5	83%	OK
240	150.0	15.0	100%	MAX

Linear relationship: Load (kN) = Torque (Nm) x 0.625 | Do not exceed maximum torque rating.

05 HARJAK 20/20

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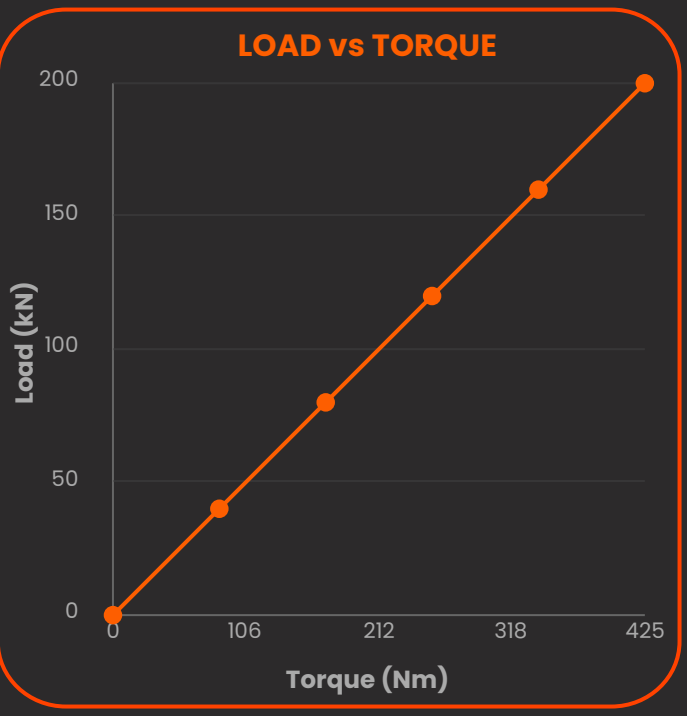
SPECIFICATION

Max Jack Load	20 t (200 kN)
Stroke	20 mm
Main Block Length	135 mm
Length incl. Bolt Head	195 mm
Width	100 mm
Height (Closed)	50 mm
Height (Open)	70 mm
Bolt Size	M20, 30 mm AF
Weight (approx.)	4.5 kg
Max Torque	425 Nm
Material	Mild Steel



TYPICAL EQUIPMENT REQUIRED

- Torque Wrench: Norbar SL 60-340 Nm, 1/2" drive
- Socket: 30 mm AF
- Torque Multiplier: Norbar HT3 (if required), 3/4" drive

OPERATING NOTES

1. Remove travelling bolts before installation and jacking.
2. Ensure jack is positioned centrally under load point with minimal clearance.
3. Apply torque gradually using calibrated wrench - do not exceed 425 Nm.
4. Jack is self-locking; load is held without continuous torque application.
5. To release, reverse torque direction on draw-bolt.
6. Clean and re-grease draw-bolt thread after each use before storage.

LOAD / TORQUE RELATIONSHIP

Torque (Nm)	Load (kN)	Load (Tonnes)	% Max Load	Status
70	32.9	3.29	16%	OK
140	65.9	6.59	33%	OK
210	98.8	9.88	49%	OK
285	134.1	13.41	67%	OK
355	167.1	16.71	84%	OK
425	200.0	20.0	100%	MAX

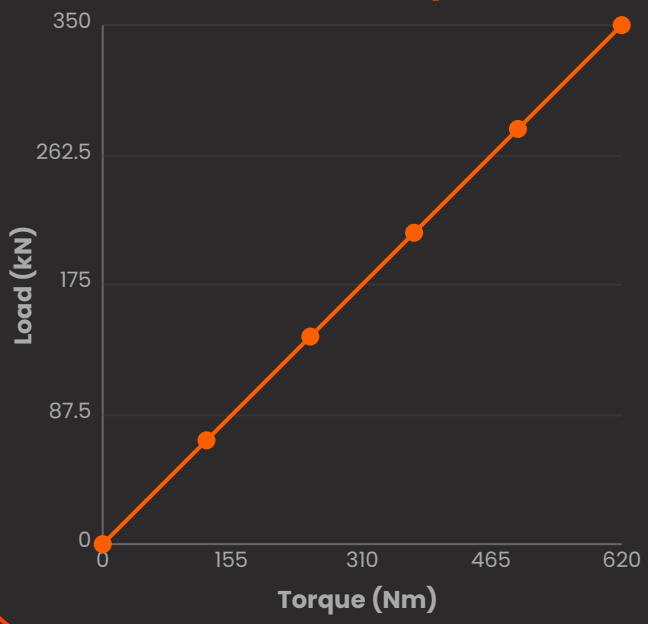
Linear relationship: Load (kN) = Torque (Nm) x 0.471 | Do not exceed maximum torque rating.

06 HARJAK 35/20

HYDRA-CAPSULE

SPECIFICATION

Max Jack Load	35 t (350 kN)
Stroke	20 mm
Main Block Length	150 mm
Length incl. Bolt Head	225 mm
Width	100 mm
Height (Closed)	60 mm
Height (Open)	80 mm
Bolt Size	M24, 36 mm AF
Weight (approx.)	7.6 kg
Max Torque	620 Nm
Material	Mild Steel



TYPICAL EQUIPMENT REQUIRED

- Torque Wrench: Norbar SL 200-750 Nm, 3/4" drive
- Socket: 36 mm AF
- Torque Multiplier: Norbar HT3, 3/4" drive

OPERATING NOTES

1. Remove travelling bolts before installation and jacking.
2. Ensure jack is positioned centrally under load point with minimal clearance.
3. Apply torque gradually using calibrated wrench - do not exceed 425 Nm.
4. Jack is self-locking; load is held without continuous torque application.
5. To release, reverse torque direction on draw-bolt.
6. Clean and re-grease draw-bolt thread after each use before storage.

LOAD / TORQUE RELATIONSHIP

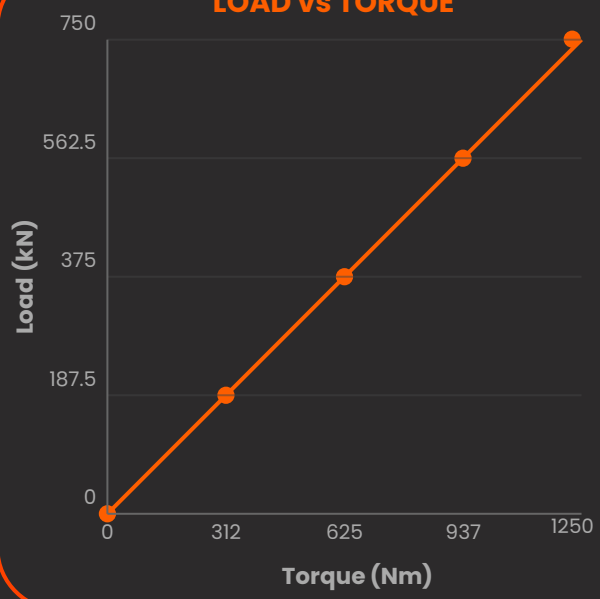
Torque (Nm)	Load (kN)	Load (Tonnes)	% Max Load	Status
70	32.9	3.29	16%	OK
140	65.9	6.59	33%	OK
210	98.8	9.88	49%	OK
285	134.1	13.41	67%	OK
355	167.1	16.71	84%	OK
425	200.0	20.0	100%	MAX

Linear relationship: Load (kN) = Torque (Nm) x 0.471 | Do not exceed maximum torque rating.

07 HARJAK 75/20

SPECIFICATION

Max Jack Load	75 t (750 kN)
Stroke	20 mm
Main Block Length	200 mm
Length incl. Bolt Head	288 mm
Width	152 mm
Height (Closed)	80 mm
Height (Open)	100 mm
Bolt Size	M30, 46 mm AF
Weight (approx.)	17 kg
Max Torque	1,250 Nm
Material	Mild Steel



TYPICAL EQUIPMENT REQUIRED

- Torque Wrench: Norbar SL 200-1000 Nm, 3/4" drive
- Socket: 46 mm AF
- Torque Multiplier: Norbar HT3, 3/4" drive

OPERATING NOTES

1. Remove travelling bolts before installation and jacking.
2. Ensure jack is positioned centrally under load point with minimal clearance.
3. Apply torque gradually using calibrated wrench - do not exceed 425 Nm.
4. Jack is self-locking; load is held without continuous torque application.
5. To release, reverse torque direction on draw-bolt.
6. Clean and re-grease draw-bolt thread after each use before storage.

LOAD / TORQUE RELATIONSHIP

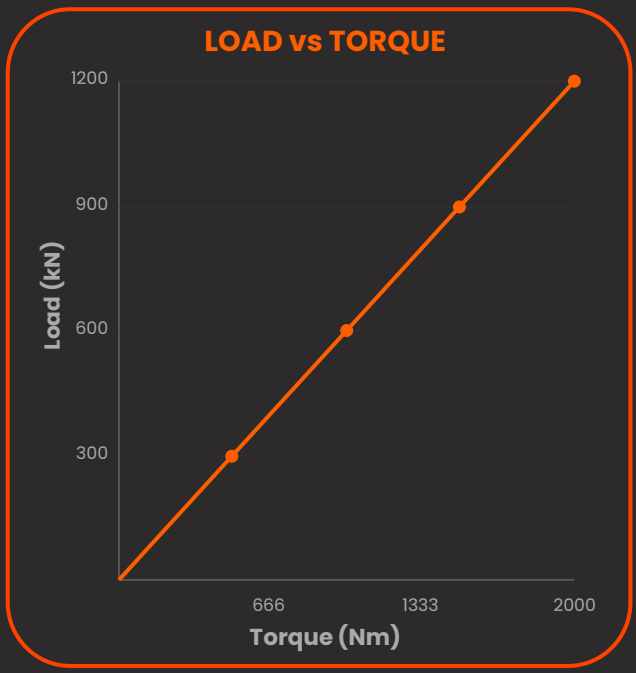
Torque (Nm)	Load (kN)	Load (Tonnes)	% Max Load	Status
70	32.9	3.29	16%	OK
140	65.9	6.59	33%	OK
210	98.8	9.88	49%	OK
285	134.1	13.41	67%	OK
355	167.1	16.71	84%	OK
425	200.0	20.0	100%	MAX

Linear relationship: Load (kN) = Torque (Nm) x 0.471 | Do not exceed maximum torque rating.

08 HARJAK 120/20

SPECIFICATION

Max Jack Load	120 t (1200 kN)
Stroke	20 mm
Main Block Length	250 mm
Length incl. Bolt Head	360 mm
Width	190 mm
Height (Closed)	100 mm
Height (Open)	120 mm
Bolt Size	M42, 65 mm AF
Weight (approx.)	35-40 kg
Max Torque	2,000 Nm (est.)
Material	Mild Steel



TYPICAL EQUIPMENT REQUIRED

- Torque Wrench: Norbar SL 200-1000 Nm, 3/4" drive
- Socket: 65 mm AF
- Torque Multiplier: Norbar HT3 x2 (series), 1" drive

OPERATING NOTES

1. Remove travelling bolts before installation and jacking.
2. Ensure jack is positioned centrally under load point with minimal clearance.
3. Apply torque gradually using calibrated wrench - do not exceed 425 Nm.
4. Jack is self-locking; load is held without continuous torque application.
5. To release, reverse torque direction on draw-bolt.
6. Clean and re-grease draw-bolt thread after each use before storage.

LOAD / TORQUE RELATIONSHIP

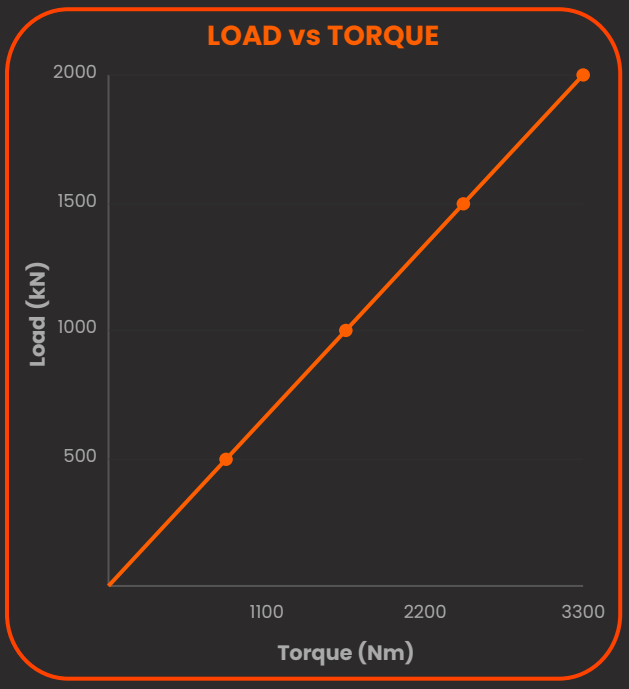
Torque (Nm)	Load (kN)	Load (Tonnes)	% Max Load	Status
70	32.9	3.29	16%	OK
140	65.9	6.59	33%	OK
210	98.8	9.88	49%	OK
285	134.1	13.41	67%	OK
355	167.1	16.71	84%	OK
425	200.0	20.0	100%	MAX

Linear relationship: Load (kN) = Torque (Nm) x 0.471 | Do not exceed maximum torque rating.

09 HARJAK 200/20

SPECIFICATION

Max Jack Load	200 t (2000 kN)
Stroke	20 mm
Main Block Length	325 mm
Length incl. Bolt Head	465 mm
Width	245 mm
Height (Closed)	130 mm
Height (Open)	150 mm
Bolt Size	M48, 75 mm AF
Weight (approx.)	75-85 kg
Max Torque	3,300 Nm (est.)
Material	Mild Steel



TYPICAL EQUIPMENT REQUIRED

- Torque Wrench: Norbar SL 500-2000 Nm, 1" drive
- Socket: 75 mm AF
- Torque Multiplier: Norbar HT3 x2 (series), 1" drive

OPERATING NOTES

1. Remove travelling bolts before installation and jacking.
2. Ensure jack is positioned centrally under load point with minimal clearance.
3. Apply torque gradually using calibrated wrench - do not exceed 3,300 Nm.
4. Jack is self-locking; load is held without continuous torque application.
5. To release, reverse torque direction on draw-bolt.
6. Clean and re-grease draw-bolt thread after each use before storage.

LOAD / TORQUE RELATIONSHIP

Torque (Nm)	Load (kN)	Load (Tonnes)	% Max Load	Status
825	500.0	50.0	25%	OK
1650	1000.0	100.0	50%	OK
2475	1500.0	150.0	75%	OK
3300	2000.0	200.0	100%	MAX

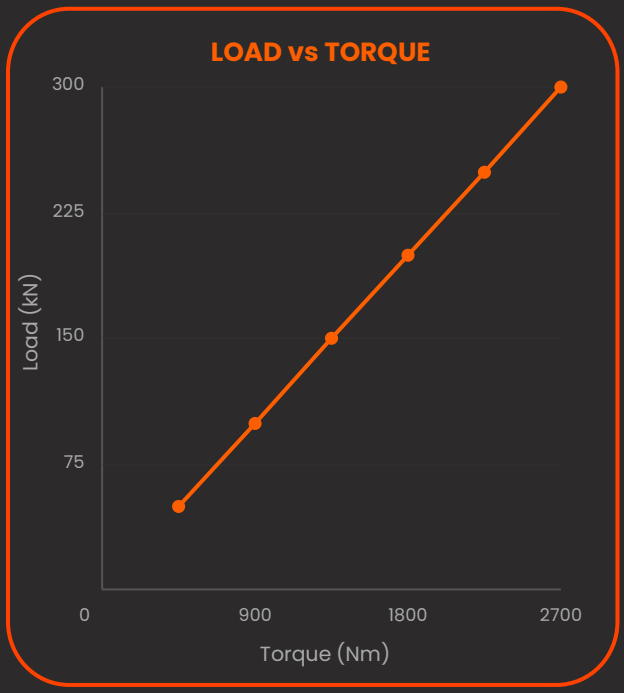
Max torque: 3,300 Nm | Torque multiplier required | Do not exceed rated capacity

10 MEGASHOR SCREW MACHANICAL JACK

HYDRA-CAPSULE

SPECIFICATION

Axial Working Load (AWL)	200 kN (20 t)
Max Compressive Load	1000 kN
Adjustment Range	410 - 620 mm
Weight	65.9 kg
Hole Diameter	26 mm
Torque Formula	Tp = 9W (Nm)
Max Controlled Load	300 kN
Part Number	MSX10011
Material	High-Strength Steel



TYPICAL EQUIPMENT REQUIRED

- Torque Wrench: Megashor Jack Spanner
- Max Controlled Torque: 2700 Nm (for 300 kN)
- Unloading: Spanner (500 kN) / Sledgehammer (650 kN) / Full strike (1000 kN)
- Use of hydraulic jacks or flat jacks to provide accurate 'known force' and preloading

OPERATING NOTES

1. Ensure both ends are equally extended for maximum load capacity.
2. Apply controlled torque using Megashor Jack Spanner (MSX10022).
3. Torque formula: Tp = 9W (where Tp = torque in Nm, W = load in kN).
4. Do not exceed 300 kN when loading via torque control.
5. For unloading above 500 kN, dismantle and grease threads first.
6. AWL reduces with increased jack height - refer to capacity chart.

LOAD / TORQUE RELATIONSHIP (Tp = 9W)

Torque (Nm)	Load (kN)	Load (Tonnes)	% AWL	Status
450	50.0	5.0	25%	OK
900	100.0	10.0	50%	OK
1350	150.0	15.0	75%	OK
1800	200.0	20.0	100%	OK
2250	250.0	25.0	125%	OK
2700	300.0	30.0	150%	MAX

Formula: Tp = 9W | Where Tp = Torque (Nm), W = Load (kN) | AWL = 200 kN | Max controlled load = 300 kN

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11 TITAN WEDGE JACKS

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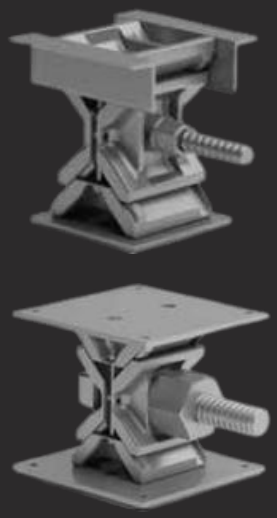
SPECIFICATION

TITAN 500	
Max Vertical Load	420 kN (42 t)
Adjustment Range	168 - 268 mm
Weight	29.5 kg
Part Number	0120350001
Spanner Size	AF 46
Material	High-Strength Steel

TITAN 1000	
Max Vertical Load	1000 kN (100 t)
Adjustment Range	192 - 272 mm
Weight	53.3 kg
Part Number	0120350003
Spanner Size	AF 80
Material	High-Strength Steel

KEY ADVANTAGES

1. Alternative to hydraulic jacks - no power pack or hoses required.
2. Exact height adjustment with low settlement under load.
3. Corrosion-protected and unaffected by water ingress.
4. Suitable for horizontal and eccentric loads (per DIN EN 12812).
5. Quarter-turn relieving method for multiple jacks in sequence.
6. Compatible with torque multipliers for high-load applications.



TITAN 500 - LOAD / TORQUE RELATIONSHIP

Torque (Nm)	Load (kN)	Load (Tonnes)	% Max Load	Status
175	70.0	7.0	17%	OK
350	140.0	14.0	33%	OK
525	210.0	21.0	50%	OK
700	280.0	28.0	67%	OK
875	350.0	35.0	83%	OK
1050	420.0	42.0	100%	MAX

TITAN 1000 - LOAD / TORQUE RELATIONSHIP

Torque (Nm)	Load (kN)	Load (Tonnes)	% Max Load	Status
420	167.0	16.7	17%	OK
835	334.0	33.4	33%	OK
1250	500.0	50.0	50%	OK
1670	668.0	66.8	67%	OK
2085	834.0	83.4	83%	OK
2500	1000.0	100.0	100%	MAX

Permissible loads per DIN EN 12812 & DIN EN 1993 | Horizontal load: 0.11-0.15 x Fz | Eccentricity: 10-30 mm

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12 CONTACT US

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OUR SERVICES

- ✓ Hydraulic Jacking & Flat Jacking to Stressing Systems
- ✓ Mechanical Wedges - for pre-loading, deflection and permanent works
- ✓ Temporary Bridge Propping, Lifting & Pre-loading
- ✓ Hydraulic Sliding, Skidding & Skating Systems
- ✓ Bridge Bearing Replacement
- ✓ Contractual Service + Equipment Hire & Sales