

# FLAT JACKS

Hydra-Capsule low height flat jacks range from 8 to 1000 tons in capacity. The ultra compact jack is capable of exerting extremely high thrust forces. They are normally used by the civil and construction industry for a multitude of applications, such as heavy lifting of structures, stressing operations, transferring existing loads to temporary or permanent supports and permanently pre-loading operations for buildings, steelworks or bridge bearings.

All our Hydra-Capsule flat jacks are designed, fully tested and manufactured in-house within our special facility.

## PERMANENT FLAT JACKS

Where a permanent force / load is required to a structure, flat jacks are installed in-situ and inflated using a high pressure injection system, epoxy resin or cementitious grout can be precisely injected.

This process is primarily implemented whilst carrying out works for pre-loading of structural steelworks or part of other alterations, such as, underpinning or bridge bearing replacement operations.

The benefits of permanent flat jacks are:

- Permanently induced force.
- Known and precise load induction.
- Balanced loading of multiple sets.
- Very low crushing forces, 14 N/mm<sup>2</sup>
- Jacks can be pre-cast into concrete blocks.

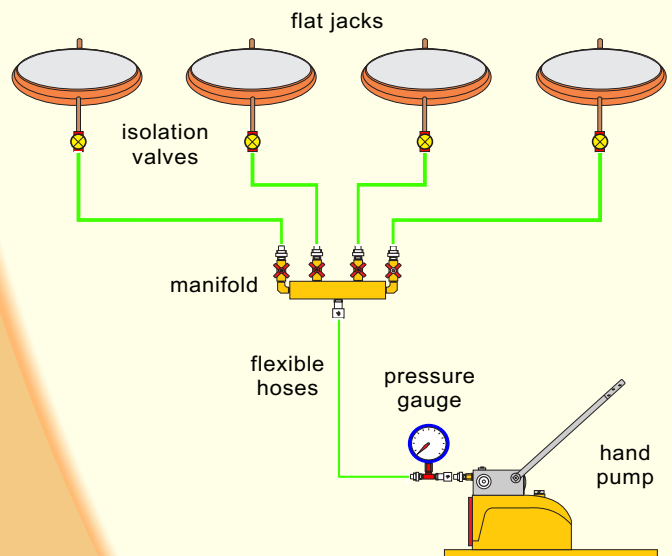
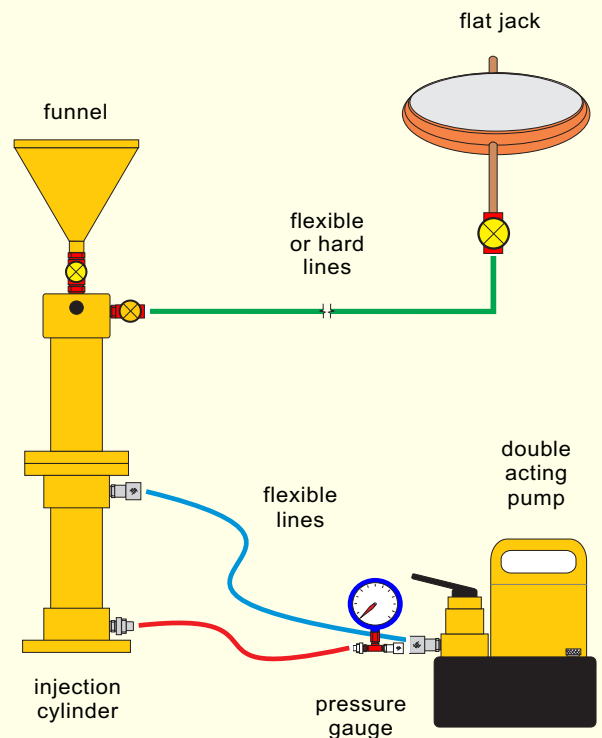
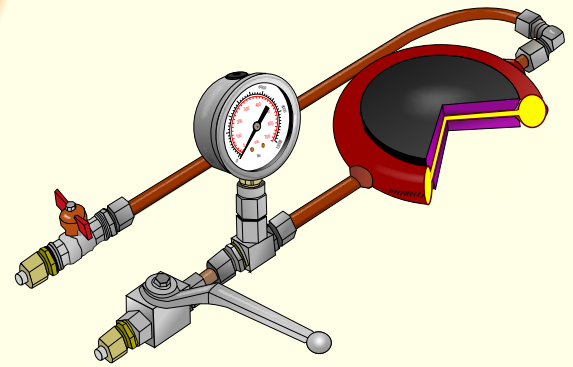
Hydra-Capsule Ltd provide a full design, in-house manufacturing for bespoke units and installation service offered throughout the UK, Ireland and Europe using our specially trained and qualified Engineers.

## TEMPORARY FLAT JACKS

When flat jacks are required for a temporary duration and subsequently removed, the operation is normally executed by inflating the jacks with either water or hydraulic oil.

The benefits of temporary flat jacks are:

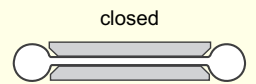
- Used as load cells when connected to pressure transducers with calibrated digital readout displays.
- Continuous load monitoring and adjustment possible.
- Uniform loading of multiple sets.
- Ability to transfuse jack fluid from temporary to permanent grout.



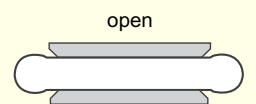


## from 8 to 1000 tons capacity

JACK CODE	CAPACITY (tons)	CLOSED HEIGHT	OUTSIDE DIAMETER	THRUST DIAMETER	MAXIMUM STROKE	MAXIMUM PRESSURE	FLUID LITRES	WEIGHT (KGS)
FJ-12	8	28	120	75	25	150 bar	0.3	4
FJ-15	15	29	150	105	25	150 bar	0.5	8
FJ-17	20	29	170	125	25	150 bar	0.8	9
FJ-19	25	30	190	145	25	150 bar	1.1	10
FJ-22	40	30	220	175	25	150 bar	1.2	16
FJ-25	50	30	250	205	25	150 bar	1.3	19
FJ-27	60	31	270	225	25	150 bar	1.6	20
FJ-30	80	32	300	254	25	150 bar	1.9	23
FJ-35	100	34	350	304	25	150 bar	2.6	26
FJ-38	130	34	380	334	25	150 bar	3.1	28
FJ-42	160	35	420	373	25	150 bar	3.6	29
FJ-45	180	36	450	403	25	150 bar	4.1	30
FJ-48	210	36	480	433	25	150 bar	4.7	32
FJ-50	235	36	500	453	25	150 bar	5.1	34
FJ-52	265	36	520	473	25	150 bar	5.7	36
FJ-54	280	37	540	493	25	150 bar	5.9	37
FJ-56	300	37	560	512	26	150 bar	6.2	38
FJ-60	345	38	600	553	27	150 bar	7.4	43
FJ-69	480	38	690	640	28	150 bar	10.5	67
FJ-75	600	39	750	700	32	150 bar	12.4	89
FJ-87	760	39	870	820	35	150 bar	16.8	111
FJ-92	870	42	920	895	36	150 bar	18.7	126
FJ-102	1000	55	1020	940	40	150 bar	24.5	172

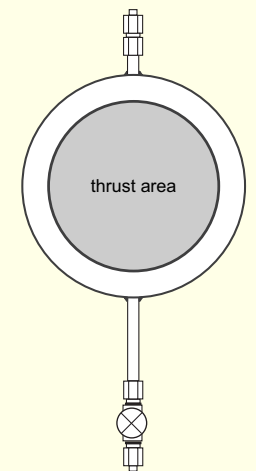


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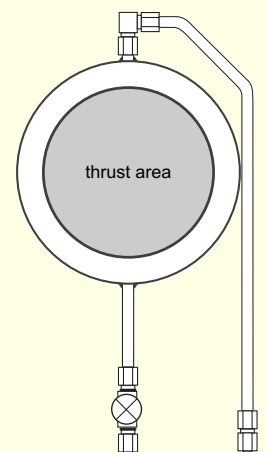


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TYPE 'A'



TYPE 'B'



When selecting a flat jack the ideal working range should be 25% to 75% of the jacks capacity.

Shown below are just a few examples of flat jack applications. Hydra-Capsule flat jacking systems have been successfully used on a multitude of major projects worldwide for over 25 years.

## Excavation Strut Pre-Loading

Flat jacks are commonly used for pre-loading horizontal struts for major ground work projects prior to excavation taking place, ensuring unwanted settlements or excessive deflections do not occur. The strut is normally supported by angle brackets, one end is grouted and the flat jack is placed at the opposite end. The grout filled flat jack is then loaded to 90% of the calculated imposed force thus providing safe excavation.

## Ground Settlement Compensation

Flat jacks are ideal for dealing with unwanted foundation settlements occurring during construction works or building alterations. The jacks are initially inflated with water and then at a later stage after settlement transfused to grout to make them permanent.

## Lifting Heavy Structures

Flat jacks can be set-up in multiple groups to enable the lifting of very heavy structures, such as, bridges to change existing defective elastomeric bearings. The loads and movements of each group can be precisely monitored and controlled using our fully synchronised electronic pumping systems.

## Pre-Loading of New Steelworks

Flat jacks are commonly used for pre-loading new steelworks to enable the formation of openings within load bearing walls with zero deflection. The stressing operation is normally carried-out using grout filled units and electronic movement sensors to determine the exact lifting point during loading. The arrangement can also be used for pre-stressing new strengthening beams fitted below a weak structure.

## Pre-Loading of Bridge Bearings

Using grout filled or transfusion flat jacks to pre-load replacement bridge bearings provides an effective method of loading individual bearings to a specific load or deflection. Once installed and loaded the flat jacks are normally encased within the bearings grout plinth.

