Hi-Force®

HYDRAULIC TOOLS





Global Brand
Local Service









Jacks - Pumps - Cutters - Presses - Cylinders - Puller kits - Spreaders - Pipe benders
Torque tools - Bolt tensioners - Nut splitters - Hole punchers
Moving skates - Crimping tools - Hydrotest pumps - Toughlift jacking systems

HI-FORCE COMPANY INFORMATION

OUR MISSION STATEMENT

To support our valued customers through the design, manufacture and supply of first class products and services of exceptional quality, to assist them to gain competitive advantage in their markets.

To sustain our vision and mission by constantly seeking improvement via continuous education and learning, and the application of the best available technology and business practices.

To provide a pleasant, nurturing and growth orientated environment, which encourages our employees to be highly productive and to grow both personally and professionally.

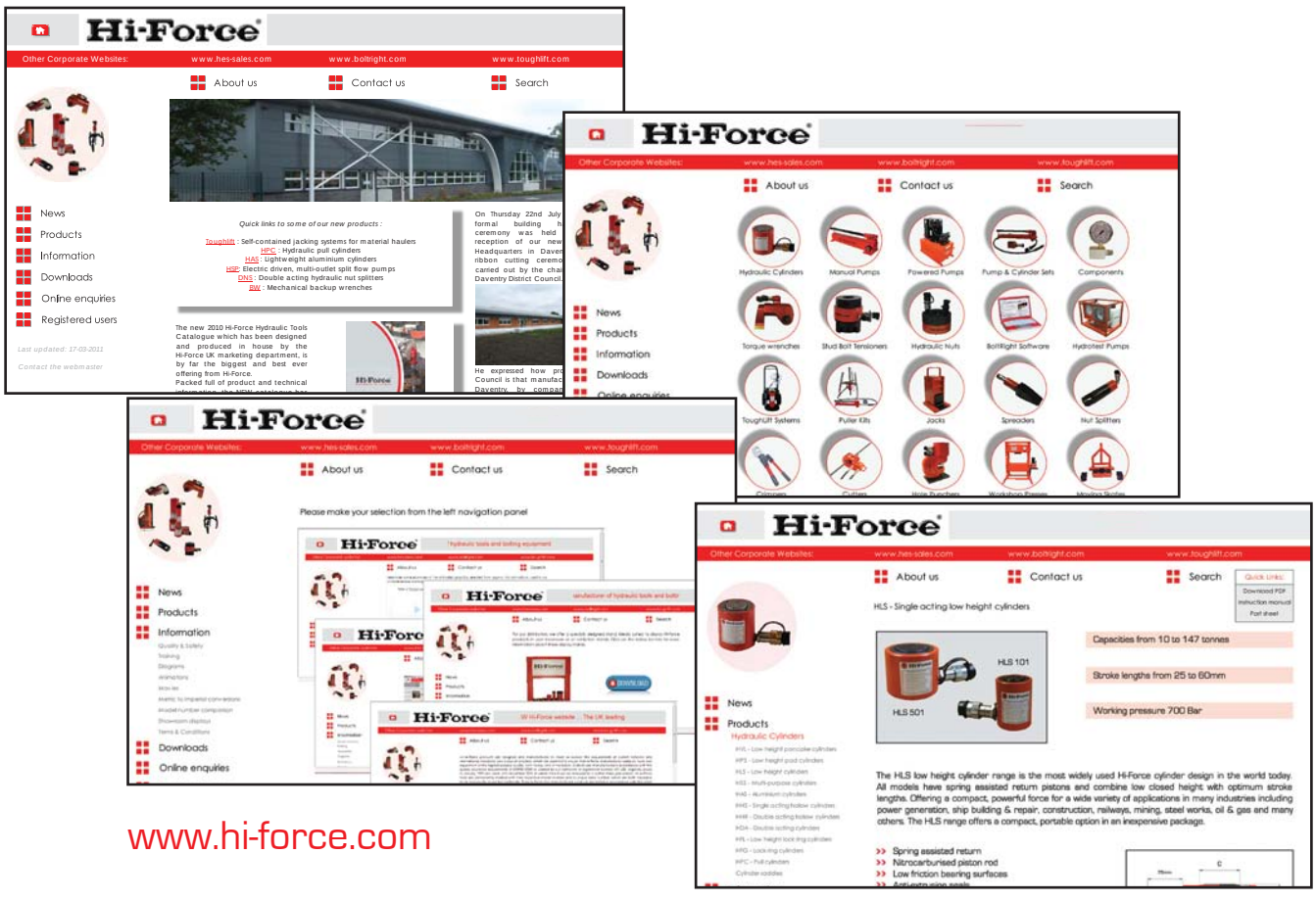
To develop diversified markets, that provide stability, and adequate financial returns and allow us to achieve our vision and provide opportunities for existing and future employees.

HI-FORCE CATALOGUES

In addition to this new 2012 catalogue, other product specific and condensed catalogues are available in several languages including Chinese, Dutch, English (both in imperial and metric), French, German, Italian, Norwegian, Portuguese, Russian, Slovakian and Spanish. To request copies of our catalogue(s) contact your local sales representative, or alternatively you can access our catalogues online! Simply go to www.hi-force.com.

HI-FORCE WEBSITE

Check out the Hi-Force Website for the latest company and product information.



www.hi-force.com

Hi-Force®

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System Components	Hoses, oil, pressure gauges, manifolds, couplers, fittings and control valves	Pages 49 - 56	D
Jacks	Industrial aluminium jacks, compact jacks, steel bottle jacks and machine lift low height jacks	Pages 57 - 62	E
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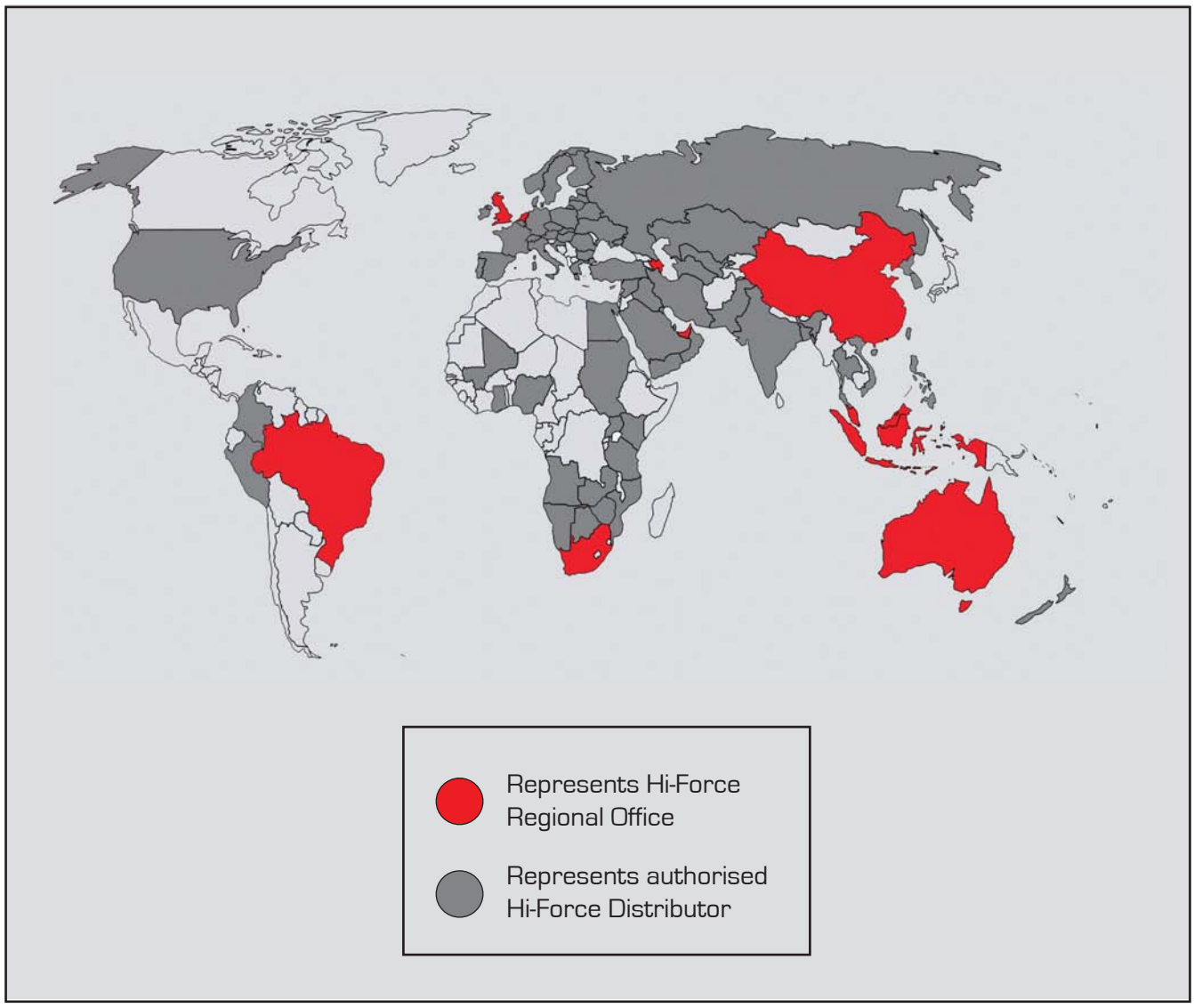
ABOUT HI-FORCE, PRODUCTS & MARKETS

A

Welcome to the Hi-Force 2012 catalogue comprising of 192 pages, packed full of product and technical information from the fastest growing hydraulic tools manufacturer in the world today. Our continually expanding Regional Office, Service Centre and Distribution network continue to fuel our desire to ensure that Hi-Force products and after sales service support are both available to hydraulic tool users anywhere in the world.

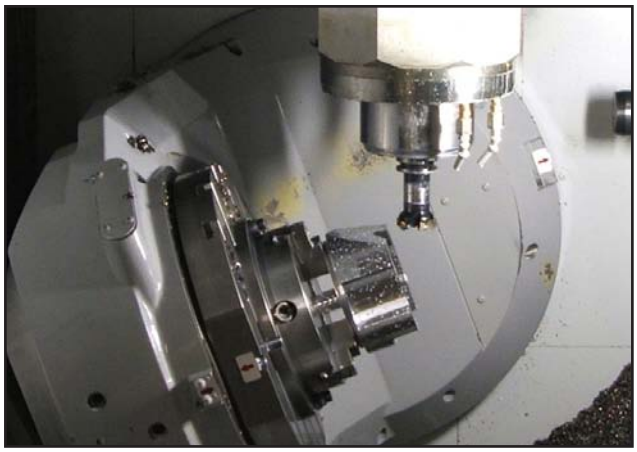
During the past 2 years we have continued to increase our stocks of product and spare parts and utilising our fully integrated Global Logistics Management (GLM) system, ensure that users of our products receive their Hi-Force tool requirements where they want them and most importantly when they need them!

Hi-Force is and will continue to be a fiercely independent Company, managed by hard working Shareholders & Directors, ably supported by a highly motivated and conscientious workforce, all of whom retain the same passion, for success, that helped Hi-Force to produce its first hydraulic tools nearly 30 years ago.



ABOUT HI-FORCE, PRODUCTS & MARKETS

During the past three years Hi-Force has invested a significant amount of money in several "state of the art" Mori Seiki CNC Machines. Our latest addition, a brand new 7 axis machine, capable of machining very complex and critical parts accurately and efficiently, with zero defects time after time, was received in mid 2010 along with two additional turning centres, bringing our total fleet of production machines to 12. Hi-Force is totally committed to manufacturing products of the highest quality, using the best machinery available, to ensure that our products meet the most stringent quality requirements possible, whilst also retaining a competitive price in the global market for hydraulic tools. Our research, development and design office is working hard and continuing to expand, ensuring that our products remain at the leading edge of currently available hydraulic tool technology.





In July 2010 our UK head office relocated to a brand new, state of the art facility in Daventry, UK. Our new home, which is almost three times as big as our previous facilities, has enabled us to combine all of our manufacturing and production facilities under one roof, alongside our sales, marketing, training, assembly, logistics and administration departments. There is no doubt that the huge investment in facilities, personnel, product design and manufacturing capabilities, that we are making today, will see Hi-Force continue to grow at a significant rate over the coming years. With almost 30 years of hydraulic tool manufacturing and technical sales experience in place, we believe that Hi-Force is certainly a company that can be trusted with your current and future demands for hydraulic tools, safe in the knowledge that when you need us we will be ready to support you worldwide, 24 hours a day, 7 days a week, 365 days per year.





ABOUT HI-FORCE, PRODUCTS & MARKETS

Hi-Force products are in use every day in a wide variety of industries including Oil & Gas, Petrochemical & Refining, Power Generation, Steel & Aluminium Plants, Paper Mills, Sugar Refineries, Railways, Mining, Construction, Ship Building & Ship Repair, Aerospace, Defence, Heavy Engineering and the many thousands of industrial service companies supporting these market sectors. Hi-Force hydraulic tools continually satisfy the demands of industry during construction, production, breakdown and routine shutdown repair and maintenance. Every year more and more companies continue to join the ever growing list of satisfied Hi-Force hydraulic tool users.









We are very proud of our latest edition of the Hi-Force hydraulic tools catalogue which now includes over 1800 products. In addition to the large number of new products introduced during 2010, this catalogue features tyre bead breakers, a pipe bender and additional models in the manual pump range. Furthermore, our innovative BoltRight software, designed to accurately calculate the correct torque and tension figures for a wide variety of bolted joints, is now available in multiple languages including Chinese, Dutch, French, Italian, Portuguese and Russian with the addition of further language options an ongoing process. The continuous expansion of the Hi-Force product range enables us to offer our valued customers a “one stop” solution for all of their hydraulic tool requirements.

ABOUT HI-FORCE, PRODUCTS & MARKETS

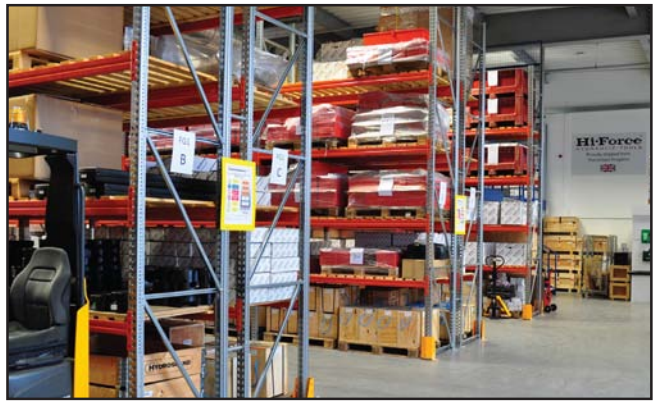
Hi-Force is fully committed to improving levels of technical capability, both within our own workforce and also throughout our distributor network, and we believe that training is a key element to help us in achieving our goals. Hi-Force continues to invest considerable time and money in the establishment of first class technical sales and service training courses for both our distributors and product users. Courses are held on a regular basis at our UK head office and at our regional offices worldwide. Please contact your local Hi-Force office for further information.

Our Sales & Marketing teams provide the essential link between Hi-Force and our customers, to ensure that our 30 years of expertise and experience continues to anticipate the needs of tomorrow's market today! Another key link with our customers is provided by our Regional Office service centres, each fully equipped with the latest "state of the art" service, repair, calibration and testing facilities ensuring that the after sales service provided for Hi-Force products is second to none in the industry. Additionally, over the past few years many of our authorised distributors have established their own accredited Hi-Force Service Centre, further enhancing the Hi-Force "Global Brand, Local Service" philosophy. The appointment of additional strategically placed service centres, authorised by and compliant with Hi-Force's strict levels of competence, is continuing year on year.









May I thank you on behalf of everyone at Hi-Force, for taking the time to read this section of our 2012 catalogue, which yet again has increased in size and product range compared to its predecessor. I am confident that the products and technical information, detailed on the following pages, will greatly assist you when selecting the most suitable Hi-Force tool for the application at hand. We are justifiably very proud of our achievements to date, none of which could have been realised without the continued support of our many customers and distributors worldwide. Be assured Hi-Force will continually strive to improve in everything we do.

Kevin P. Brown
Group Managing Director

QUALITY & SAFETY

A

All Hi-Force products are designed and manufactured to meet or exceed the requirements of current national and international standards and codes of practice, which are essential to ensure that Hi-Force manufactures hydraulic tools and equipment of the highest possible quality, both today, and in the future. All items are manufactured in accordance with the quality assurance requirements of ISO9001:2008 as verified by our certificate of registration number A21 438.1, originally issued in January 1998 and valid until November 2012 at which time it will be renewed for a further three year period.

All Hi-Force tools are permanently marked with their respective model number and a unique serial number, which are both traceable to an individually issued test certificate. Every Hi-Force tool manufactured is individually tested in accordance with the latest international test procedures, applicable to hydraulic tools and equipment.

All Hi-Force products are covered by a comprehensive warranty against material and/or workmanship defects. All warranty claims must, in the first instance, be registered via our website online warranty claim registration procedure at www.hi-force.com/warranty. The procedure is easy to complete and enables Hi-Force to provide an initial response, within 48 hours of registration of the warranty claim. Following a detailed evaluation of the online warranty claim by our technical department, claims can, in most cases, be approved immediately avoiding the need for costly and time consuming return shipment of the faulty items to Hi-Force. Dependant on whether the approval is to repair or replace, Hi-Force will authorise the warranty through your local authorised Hi-Force Distributor or Service Centre.

Hi-Force reserves the right to request the return of defective or faulty product for a more detailed evaluation and inspection should the information provided in the online warranty claim prove inconclusive. All warranty claim rejections will be supported by a report explaining the reasons why warranty has not been approved.

High pressure hydraulic power provides one of the simplest means of applying a high force in confined spaces, however respect for common sense safety precautions is essential at all times. Every Hi-Force employee is fully conversant with all Hi-Force safety procedures, applicable to the safe operation and use of our products and we feel it is our duty to ensure that all users of hydraulic tools are equally aware of these procedures. With every product that we supply, we provide operation and maintenance instructions to ensure that all operators are equally aware of these safety issues.



afaq

Certificate

Certificat

CERTIFICATE OF REGISTRATION

This is to certify that the Quality Management System of

Hi-Force Ltd

Prospect Way
Daventry
Northants
NN11 8PL
England
United Kingdom

For

The Design, Manufacture and Supply of a Wide Range of Hydraulic and Pneumatic Tools and Equipment

Has been assessed by AFNOR UK and complies with the Quality Management System requirements of

ISO 9001:2008

CERTIFICATE NO.	ORIGINAL DATE OF CERTIFICATION	DATE OF ISSUE	DATE OF EXPIRY
A2I 438.1 19 January 2011	01 January 1998	27 November 2009	26 November 2012

UKAS MANAGEMENT SYSTEMS
022

APPROVED BY

MYRIAM AUGEREAU-LANDAIS
MANAGING DIRECTOR, AFNOR UK LTD

This certificate is the property of AFNOR UK Ltd and issued subject to the conditions overleaf.
The use of the Accreditation Mark indicates accreditation in respect of those activities covered by the Certificate Number 022.

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AFNOR UK Ltd - registered in England NO. 2698859

afnor GROUPE

CYLINDERS

Hydraulic Cylinders	Selection table	Page 10
HVL Range	Single acting Very low height pancake cylinders	Page 11
HPS Range	Single acting Low height pad cylinders	Page 12
HLS Range	Single acting Low height cylinders	Page 13
HSS Range	Single acting Multi-purpose cylinders	Pages 14 - 15
HAS Range	Single acting lightweight Aluminium cylinders	Page 16
HPC Range	Single acting Pull cylinders	Page 17
HHS Range	Single acting Hollow piston cylinders	Page 18
HHR Range	Double acting Hollow piston cylinders	Page 19
HDA Range	Double acting High tonnage cylinders	Page 20
HFL Range	Single acting Low height failsafe lock ring cylinders	Page 21
HFG Range	Single acting Failsafe lock ring cylinders	Page 22
PCS Sets	Pump and cylinder sets and accessories	Pages 23 - 24
Saddles	Cylinder saddles and Piston rod thread specifications	Pages 25 - 26

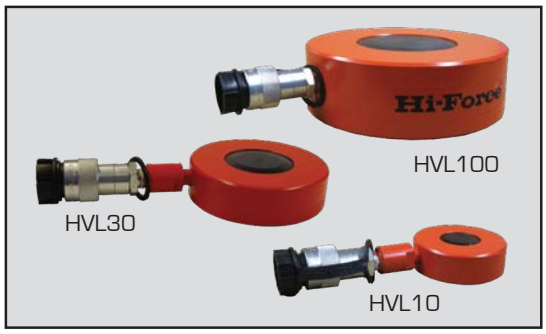
SELECTION TABLE FOR HI-FORCE STANDARD RANGE CYLINDERS

Choice of 110 standard cylinder models and unlimited specials made to order, Hi-Force will provide the best cylinder for the job !

Cylinder stroke in mm	Nominal lifting capacity of cylinder in tonnes												
	4.5	10 to 11	14.5	20 to 25	29 to 33	50 to 61	73 to 110	147 to 152	203	247 to 260	326	398	520
6	HPS50	HVL10		HVL20	HVL30	HVL50	HVL100						
10		HPS100											
11				HPS200									
12					HPS300								
15						HPS500							
16							HPS750						
16	HPS51						HPS1000	HPS1500					
25	HSS51	HSS101			HLS301	HLS501	HLS1001	HLS1501					
25		HHS101											
40		HLS101											
44				HLS201									
45								HFL1502		HFL2502			HFL5002
50	HSS52	HHS102	HSS152	HHS202	HHS302	HFL502	HFL1002	HLS1502	HFG2002				
51				HSS252	HHR302	HSS502							
56		HSS102											
60					HLS302	HLS502	HLS1002						
75	HSS53												
76						HHS603	HHS1003						
76						HHR603	HHR1003						
100	HSS54	HSS104	HSS154				HFG1004	HFG1504					
102				HSS254		HSS504	HSS1004						
102						HFG504							
125	HSS55												
150		HSS106	HSS156	HHS206	HHR306	HFG506	HHS1006	HFG1506			HFG3006		
150				HSS256		HHS606	HFG1006						
151												HFG4006	
152		HHS106		HDA256	HHS306	HSS506	HSS756	HDA1506	HDA2006		HDA3006	HDA4006	HDA5006
152					HAS306	HAS506	HAS1006		HFG2006				HFG5006
152						HDA506	HDA1006						
152						HHR606	HHR1006						
153							HSS1006						
176	HSS57												
203						HSS508		HHR1508		HHR2508			
205					HSS308								
206		HSS108											
228	HSS59												
250		HSS1010	HSS1510	HSS2510									
254						HHR6010	HSS10010						
305		HSS1012			HHR3012			HDA15012	HDA20012				
330						HDA5013	HDA10013						
330						HSS5013							
356				HSS2514									
457				HSS2518									

Cylinder Range	Page	Main characteristics of Hi-Force cylinder range				
		Cylinder principle	Return action	Piston feature	Saddle	Stroke limiting device
HVL	11	single acting	load/gravity return	solid piston	integrated	stop ring
HPS	12	single acting	spring assisted return	solid piston	integrated	stop ring
HLS	13	single acting	spring assisted return	solid piston	integrated	stop ring
HSS	14-15	single acting	spring assisted return	solid piston	several options available	stop ring
HAS	16	single acting	spring assisted return	solid piston	flat saddle	stop ring
HHS	18	single acting	spring assisted return	hollow piston	several options available	stop ring
HHR	19	double acting	hydraulic return	hollow piston	several options available	stop ring
HDA	20	double acting	hydraulic return	solid piston	several options available	stop ring
HFL	21	single acting	load/gravity return	threaded piston & lock ring	tilting saddle	restriction port
HFG	22	single acting	load/gravity return	threaded piston & lock ring	tilting saddle	restriction port

HVL - SINGLE ACTING VERY LOW HEIGHT PANCAKE CYLINDERS



Capacities from 10 to 104 tonnes

Stroke length 6mm

Working pressure 700 Bar

The HVL pancake cylinder range combines a very low closed height with a 6mm stroke, providing a precise adjusting and lifting force in very confined work areas. Ideally suited for applications requiring alignment of machinery, turbines, heavy structures etc. All models are single acting, load return design. The base of all HVL cylinders must be fully supported during use.

- Single acting load return
- Nitrocarburised piston rod
- Low friction bearing surfaces
- Anti-extrusion seals

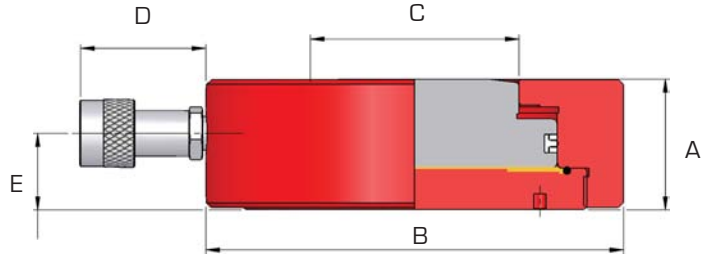




HVL10 also available with 400mm extension hose and coupling.
Please add suffix 'H' to model no.

Did you know.....

Hi-Force HVL pancake cylinders are the lowest closed height hydraulic cylinders available on the market.
If you don't have the space, we have the solution!



Note: All models, excluding HVL100, are fitted with extension nipple for required coupling clearance (drawing is without coupling extension nipple).

Model number	Capacity tonnes	Stroke mm	Oil cap. cm^3	Cyl. eff. area cm^2	Weight kg
HVL10	10	6	9	14.4	1.6
HVL20	20	6	17	28.6	2.6
HVL30	32	6	27	45.6	3.0
HVL50	50	6	43	71.3	7.2
HVL100	104	6	88	146.5	15.6

Dimensions in mm				
A	B	C	D	E
28	87	38	111	16.0
32	104	52	111	19.0
34	120	60	111	19.5
45	158	75	111	29.0
65	200	100	76	37.0

HPS - SINGLE ACTING LOW HEIGHT PAD CYLINDERS



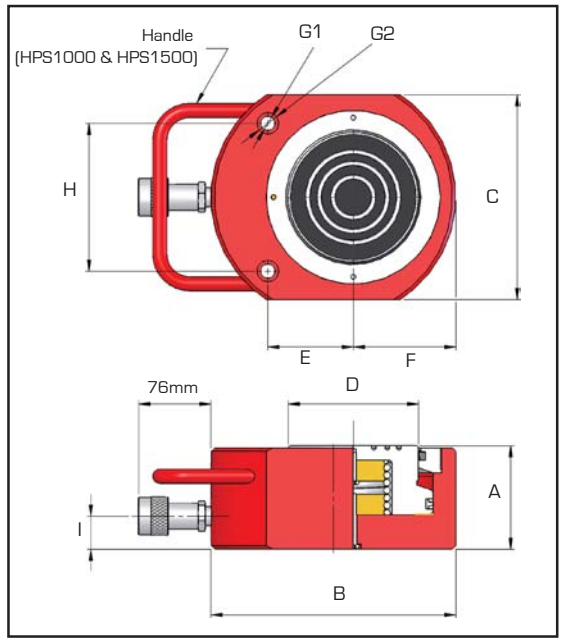
Capacities from 4.5 to 147 tonnes

Stroke lengths from 6 to 16mm

Working pressure 700 Bar

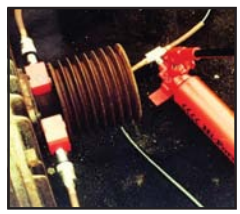
The HPS pad cylinder range offers the best capacity, closed height and stroke length combination, spring assisted return cylinders in the industry. Ideally suited for applications where a low closed height and maximum possible stroke is of prime importance, these highly versatile cylinders are extensively used for maintenance, structural weld positioning, rigging, flange separating and many other applications.

- Single acting, spring assisted return
- Nitrocarburised piston rod
- Low friction bearing surfaces
- Anti-extrusion seals









Model number	Capacity tonnes	Stroke mm	Oil cap. cm^3	Cyl. eff. area cm^2	Weight kg
HPS50	4.5	6	4	6.4	0.8
HPS51	4.5	16	10	6.4	0.9
HPS100	10	10	14	14.4	1.6
HPS200	20	11	31	28.6	2.6
HPS300	32	12	55	45.6	4.2
HPS500	50	15	107	71.3	6.6
HPS750	73	16	164	102.7	10.4
HPS1000	109	16	245	153.4	23.2
HPS1500	147	16	330	206.2	28.5

Dimensions in mm									
A	B	C	D	E	F	G1	G2	H	I
32	60	38	24	20	19	5.6	9.75	26	19
42	60	38	24	20	19	5.6	9.75	26	19
46	81	56	38	34	28	6.8	11.25	37	19
52	100	76	51	40	39	8.8	14.25	50	19
59	115	95	60	46	48	8.8	14.25	52	19
67	140	114	70	54	60	10.8	17.25	67	20
81	165	140	82	67	70	13.0	19.00	76	21
91	215	180	114	75	90	12.8	19.00	130	29
100	215	191	114	83	95	13.0	19.00	117	29

HLS - SINGLE ACTING LOW HEIGHT CYLINDERS



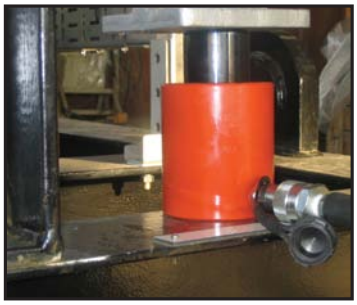
Capacities from 10 to 147 tonnes

Stroke lengths from 25 to 60mm

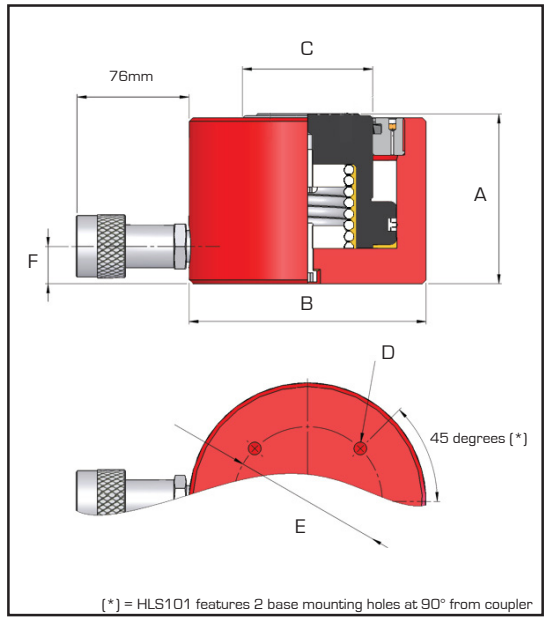
Working pressure 700 Bar

The HLS low height cylinder range is the most widely used Hi-Force cylinder design in the world today. All models have spring assisted return pistons and combine low closed height with optimum stroke lengths. Offering a compact, powerful force for a wide variety of applications in many industries including power generation, ship building & repair, construction, railways, mining, steel works, oil & gas and many others. The HLS range offers a compact, portable option in an inexpensive package.

- Spring assisted return
- Nitrocarburised piston rod
- Low friction bearing surfaces
- Anti-extrusion seals







Model number	Capacity tonnes	Stroke mm	Oil cap. cm^3	Cyl. eff. area cm^2	Weight kg
HLS101	10	40	58	14.4	2.4
HLS201	20	44	126	28.6	4.8
HLS301	32	25	114	45.6	5.0
HLS302	32	60	274	45.6	7.0
HLS501	50	25	178	71.3	8.4
HLS502	50	60	428	71.3	10.4
HLS1001	109	25	384	153.4	19.8
HLS1002	109	60	921	153.4	24.0
HLS1501	147	25	516	206.2	37.0
HLS1502	147	50	1031	206.2	42.0

Dimensions in mm					
A	B	C	D	E	F
95	70	38	M8	40	19
102	90	51	M8	60	19
83	102	60	M8	80	19
119	102	60	M8	80	19
91	127	70	M8	80	20
126	127	70	M8	80	20
108	178	114	M12	140	30
143	178	114	M12	140	30
130	216	114	M12	165	41
155	216	114	M12	165	41

HSS - SINGLE ACTING MULTI-PURPOSE CYLINDERS



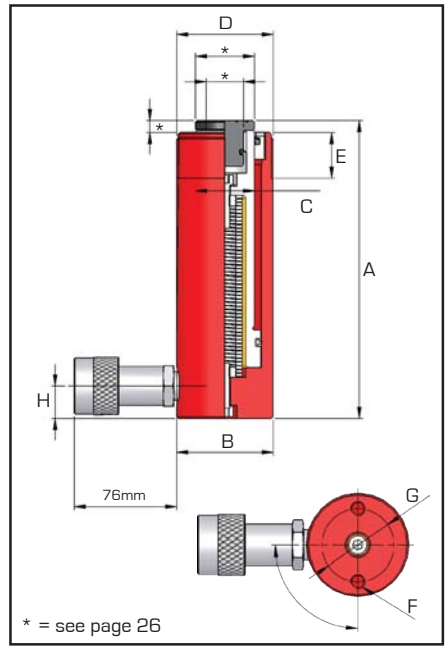
Capacities from 4.5 to 109 tonnes

Stroke lengths from 25 to 457mm

Working pressure 700 Bar

The HSS single acting multi-purpose cylinder range offers the widest choice of stroke lengths and lifting capacities available, and provides an excellent choice for maintenance, production, fabrication and construction applications. All models are provided with a collar thread and thread protector, cylinder base and piston rod mountings for easy fixturing, making the HSS range the most versatile and adaptable multi-purpose cylinders available. Major user industries include power generation, railways, steelworks, mining, shipyards and oil & gas.

- Spring assisted return
- Nitrocarburised piston rod
- Low friction bearing surfaces
- Anti-extrusion seals
- Collar threads withstand full load
- Piston rod thread on all models up to 30t
- Base mounting holes on all models (except HSS308)
- Optional piston rod saddles (see page 25)
- Collar thread protector supplied as standard



Lightweight aluminium alternatives available (see page 16)

Model number	Capacity tonnes	Stroke mm	Oil cap. cm^3	Cyl. eff. area cm^2	Weight kg
HSS51	4.5	25	16	6.4	1.0
HSS52	4.5	50	32	6.4	1.2
HSS53	4.5	75	48	6.4	1.4
HSS54	4.5	100	64	6.4	1.5
HSS55	4.5	125	80	6.4	1.8
HSS57	4.5	176	113	6.4	2.0
HSS59	4.5	227	146	6.4	2.4
HSS101	10	25	36	14.4	1.8
HSS102	10	56	81	14.4	2.4
HSS104	10	100	144	14.4	3.0
HSS106	10	150	217	14.4	4.2
HSS108	10	206	297	14.4	5.0
HSS1010	10	250	361	14.4	5.4
HSS1012	10	305	440	14.4	6.2

Dimensions in mm (unless otherwise stated)							
A	B	C	D	E	F	G	H
107	38	24	1 ½"-16un	28	M6	25	19
132	38	24	1 ½"-16un	28	M6	25	19
157	38	24	1 ½"-16un	28	M6	25	19
182	38	24	1 ½"-16un	28	M6	25	19
207	38	24	1 ½"-16un	28	M6	25	19
258	38	24	1 ½"-16un	28	M6	25	19
308	38	24	1 ½"-16un	28	M6	25	19
100	57	35	2 ¼"-14un	27	M8	40	19
131	57	35	2 ¼"-14un	27	M8	40	19
175	57	35	2 ¼"-14un	27	M8	40	19
225	57	35	2 ¼"-14un	27	M8	40	19
281	57	35	2 ¼"-14un	27	M8	40	19
325	57	35	2 ¼"-14un	27	M8	40	19
379	57	35	2 ¼"-14un	27	M8	40	16

HSS - SINGLE ACTING MULTI-PURPOSE CYLINDERS

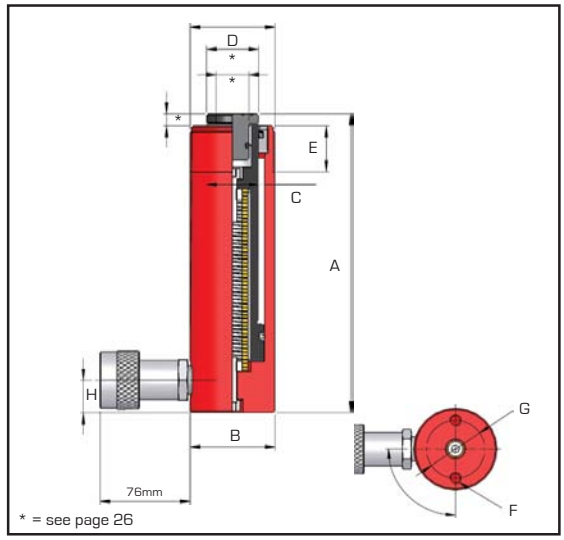


Spring assisted return

Nitrocarburised piston rod

Working pressure 700 Bar

- Capacities from 4.5 to 109 tonnes
- Stroke lengths from 25 to 457mm
- Low friction bearing surfaces
- Anti-extrusion seals
- Collar threads withstand full load
- Piston rod thread on all models up to 30t
- Base mounting holes on all models (except HSS308)
- Optional piston rod saddles (see page 25)
- Collar thread protector supplied as standard



* = see page 26

Model number	Capacity tonnes	Stroke mm	Oil cap. cm^3	Cyl. eff. area cm^2	Weight kg
HSS152	14.5	50	101	20.3	3.4
HSS154	14.5	100	203	20.3	5.0
HSS156	14.5	150	304	20.3	6.6
HSS1510	14.5	250	507	20.3	8.8
HSS252	25	51	178	34.9	6.5
HSS254	25	102	356	34.9	8.0
HSS256	25	150	524	34.9	9.6
HSS2510	25	250	874	34.9	12.6
HSS2514	25	356	1242	34.9	16.8
HSS2518	25	457	1597	34.9	21.4
HSS308	29	205	860	41.9	18.6
HSS502	50	51	364	71.3	13.0
HSS504	50	102	728	71.3	16.8
HSS506	50	152	1084	71.3	20.0
HSS508	50	203	1448	71.3	23.2
HSS5013	50	330	2354	71.3	33.6
HSS756	73	152	1561	102.7	31.0
HSS1004	109	102	1565	153.4	41.6
HSS1006	109	153	2347	153.4	49.8
HSS10010	109	254	3896	153.4	65.5

Dimensions in mm (unless otherwise stated)							
A	B	C	D	E	F	G	H
154	70	41	2 3/4"-16un	39	M10	48	19.0
204	70	41	2 3/4"-16un	39	M10	48	19.0
254	70	41	2 3/4"-16un	39	M10	48	19.0
354	70	41	2 3/4"-16un	39	M10	48	19.0
174	86	54	3 5/16"-12un	49	M12	60	25.0
225	86	54	3 5/16"-12un	49	M12	60	25.0
273	86	54	3 5/16"-12un	49	M12	60	25.0
374	86	54	3 5/16"-12un	49	M12	60	25.0
480	86	54	3 5/16"-12un	49	M12	60	25.0
611	86	54	3 5/16"-12un	49	M12	60	25.0
374	102	57	3 5/16"-12un	50	-	-	50.0
150	127	79	5"-12un	55	M12	85	20.0
201	127	79	5"-12un	55	M12	85	20.0
251	127	79	5"-12un	55	M12	85	20.0
302	127	79	5"-12un	55	M12	85	20.0
429	127	79	5"-12un	55	M12	85	20.0
272	146	95	5 3/4"-12un	45	M12	115	31.5
223	185	114	6 7/8"-12un	50	M12	146	32.0
274	185	114	6 7/8"-12un	50	M12	146	32.0
375	185	114	6 7/8"-12un	50	M12	146	32.0

HAS - SINGLE ACTING LIGHTWEIGHT ALUMINIUM CYLINDERS

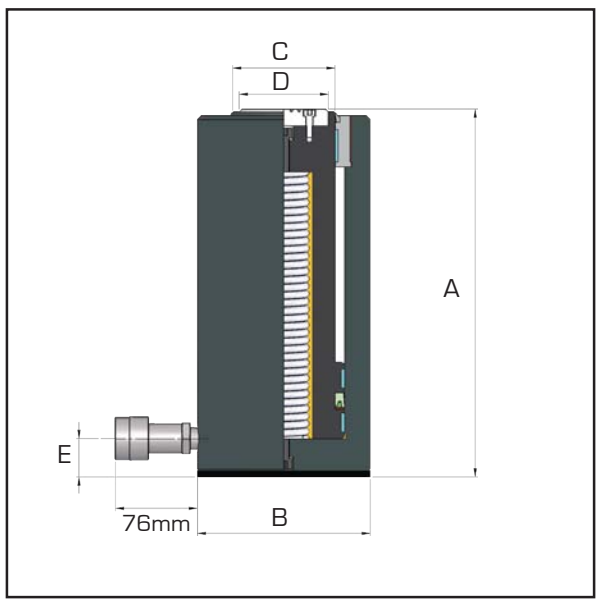


- Working pressure 700 Bar
- Capacities from 32 to 110 tonnes
- Stroke length 152mm

The HAS range of single acting, lightweight, aluminium cylinders is specifically designed for applications where weight and ease of positioning are features of prime importance. With an average weight of approximately 50% of comparable capacity steel construction cylinders, all models are supplied with a hard anodised, wear resistant, piston rod and cylinder body and a steel cylinder base protection plate. Available lifting capacities range from 32 to 110 tonnes capacity, at maximum working pressure of 700 Bar. All models are commonly used in a wide variety of industrial applications in shipyards, steel mills, construction and power plants. Other capacities and stroke length options available on request.

Please Note.....

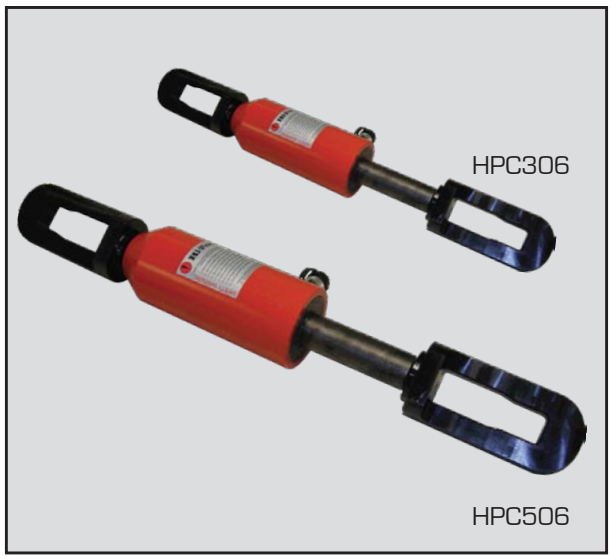
Aluminum cylinders offer the benefit of greatly reduced weight compared to conventional steel cylinders. However, due to the inherent nature of the material, are not recommended for use in high cycle production applications. The recommended life cycle is estimated at approximately 5000 operations at maximum pressure, which in most lifting and maintenance applications represents a more than acceptable period of usage.



Model number	Capacity tonnes	Stroke mm	Oil cap. cm^3	Cyl. eff. area cm^2	Weight kg
HAS306	32	152	672	44.2	6.0
HAS506	51	152	1077	70.9	9.0
HAS1006	110	152	2340	153.9	23.0

Dimensions in mm (unless otherwise stated)				
A	B	C	D	E
282	104	60	50	20
287	135	80	70	25
317	195	110	100	35

HPC - SINGLE ACTING PULL CYLINDERS



Working pressure 700 Bar

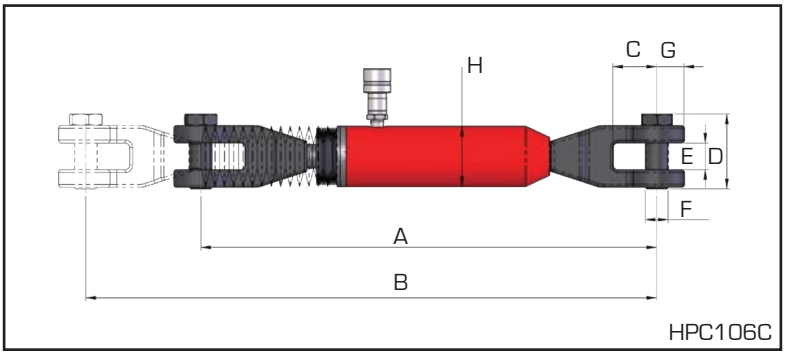
Capacities from 10 to 50 tonnes

Stroke length 152mm

Hand and powered pumps suitable for use with HPC range pull cylinders are detailed on pages 27 to 48.

The HPC pull cylinder range comprises of four models, with capacities ranging from 10 tonnes to 50 tonnes of pulling force. All models are 700 Bar maximum working pressure and feature a single acting, spring assisted return piston, with a 152mm stroke length. Fitted with easily replaceable machined pulling eyes on the piston rod and cylinder base, the 10 tonnes capacity version can also be supplied with clevis eye attachments. Typical applications for HPC pull cylinders are plate alignment prior to welding in shipyards, cable tensioning and heavy load moving using chains or wire ropes.

- Spring assisted return
- Surface treated piston rod
- Replaceable pulling and clevis eyes
- Piston wiper prevents contamination

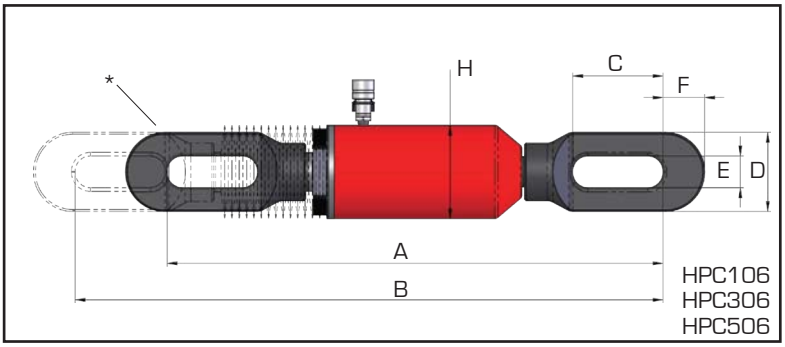


HPC106C

Protective bellows are available as optional extra



HPC106 c/w bellows



HPC106
HPC306
HPC506

* Eye bolt thickness: HPC106 = 22mm, HPC306 = 35mm, HPC506 = 40mm

Model number	Capacity tonnes	Stroke mm	Oil cap. cm^3	Cyl. eff. area cm^2	Weight kg	Dimensions in mm A	B	C	D	E	F	G	H
HPC106	10	152	228	15.0	12.0	600	752	114	67	32	33	-	80
HPC106C	10	152	228	15.0	15.5	602	754	58	99	35	30	36	80
HPC306	30	152	636	41.8	31.0	695	847	145	105	42	50	-	122
HPC506	50	152	1078	71.0	54.0	819	971	149	130	52	69	-	153

HHS - SINGLE ACTING HOLLOW PISTON CYLINDERS



HHS302 HHS202

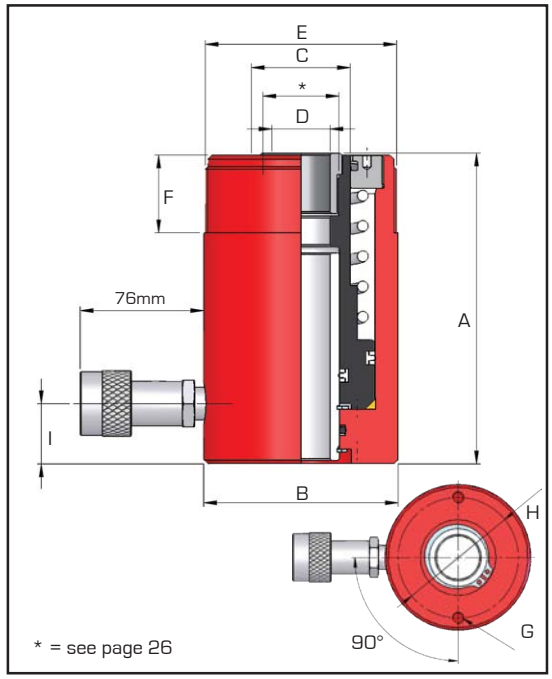
Capacities from 11 to 102 tonnes

Stroke lengths from 25 to 152mm

Working pressure 700 Bar

The HHS single acting hollow piston cylinder range is extremely versatile for use in tooling, maintenance and tensioning applications. Specifically designed with a hollow piston to enable a rod or cable to be passed through the entire cylinder length for applications where a pulling force is required, the HHS range is used extensively in post-tensioning and pre-stressing applications as well as testing of various bonded or mechanical anchoring systems. HHS cylinders can also be used for general lifting applications, when fitted with readily available interchangeable hardened steel piston rod saddles.

- Spring assisted return
- Nitrocarburised piston rod
- Low friction bearing surfaces
- Anti-extrusion seals
- Optional piston rod saddles (see page 25)
- Collar thread protector supplied as standard









Model number	Capacity tonnes	Stroke mm	Oil cap. cm^3	Cyl. eff. area cm^2	Weight kg
HHS101	11	25	39	15.8	2.8
HHS102	11	50	79	15.8	3.0
HHS106	11	152	240	15.8	10.2
HHS202	23	50	167	33.3	7.0
HHS206	23	150	500	33.3	13.8
HHS302	33	50	233	46.7	10.6
HHS306	33	152	710	46.7	19.2
HHS603	61	76	651	85.7	28.0
HHS606	61	150	1285	85.7	40.6
HHS1003	102	76	1088	143.1	64.0
HHS1006	102	150	2147	143.1	75.0

Dimensions in mm (unless otherwise stated)								
A	B	C	D	E	F	G	H	I
110	70	38	20	2 ¾"-16un	30	M8	51	19
140	70	38	20	2 ¾"-16un	30	M8	51	19
297	70	38	20	2 ¾"-16un	30	M8	51	19
160	100	51	30	3 ⅞"-12un	40	M8	82.5	31
306	100	51	30	3 ⅞"-12un	40	M8	82.5	31
165	115	60	35	4 ½"-12un	40	M8	92	31
320	115	60	35	4 ½"-12un	40	M8	92	31
226	160	92	55	6 ¼"-12un	59	M12	130	31
315	160	92	55	6 ¼"-12un	59	M12	130	31
276	213	127	81	8 ⅜"-12un	60	M16	178	45
350	213	127	81	8 ⅜"-12un	60	M16	178	45

HHR - DOUBLE ACTING HOLLOW PISTON CYLINDERS



Capacities from 33 to 247 tonnes

Stroke lengths from 50 to 305mm

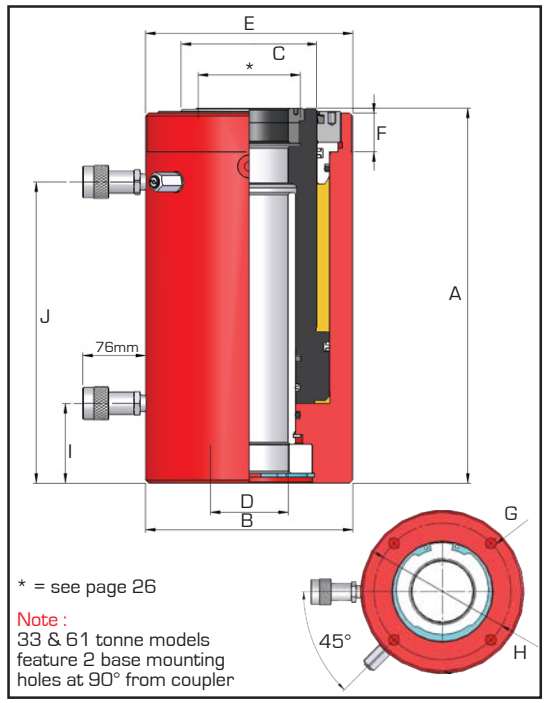
Working pressure 700 Bar

The HHR double acting hollow piston cylinder range incorporates all of the design features of the HHS range with the added benefit of double acting design, which greatly enhances speed of operation and performance particularly in the longer length stroke options. Additionally a substantial hydraulic pulling force is available in the piston retraction mode of operation. Standard range models are featured in this catalogue, however other stroke and tonnage options are available on request.

- Double acting design
- Nitrocarburised piston rod
- Annular area overload protection valve
- Low friction bearing surfaces
- Anti-extrusion seals
- Optional piston rod saddles (see page 25)
- Collar thread protector supplied as standard







* = see page 26

Note :
33 & 61 tonne models feature 2 base mounting holes at 90° from coupler

Model number	Capacity Push tonnes	Pull tonnes	Stroke mm	Oil cap. cm³	Cyl. eff. area cm²	Weight kg
HHR302	33	24	51	238	46.7	12.2
HHR306	33	24	150	701	46.7	17.6
HHR3012	33	24	305	1424	46.7	25.7
HHR603	61	38	76	652	85.7	30.6
HHR606	61	38	152	1304	85.7	41.6
HHR6010	61	38	254	2179	85.7	52.5
HHR1003	102	43	76	1087	143.1	68.5
HHR1006	102	43	152	2174	143.1	90.0
HHR1508	152	71	203	4320	212.8	170.0
HHR2508	247	76	203	7039	346.5	269.0

Dimensions in mm (unless otherwise stated)										
A	B	C	D	E	F	G	H	I	J
180	115	60.3	35	4 ½"-12un	40	M8	92	28	119
279	115	60.3	35	4 ½"-12un	40	M8	92	28	218
434	115	60.3	35	4 ½"-12un	40	M8	92	28	373
239	160	92	55	6 ¼"-12un	45	M12	130	31	166
315	160	92	55	6 ¼"-12un	45	M12	130	31	242
417	160	92	55	6 ¼"-12un	45	M12	130	31	344
310	213	140	80	8 ⅜"-12un	40	M16	178	82	234
386	213	140	80	8 ⅜"-12un	40	M16	178	82	310
503	270	184	102	n/a	n/a	n/a	n/a	98	389
505	350	254	150	n/a	n/a	n/a	n/a	98	389

HDA - DOUBLE ACTING HIGH TONNAGE CYLINDERS



Capacities from 25 to 520 tonnes

Stroke lengths from 152 to 330mm

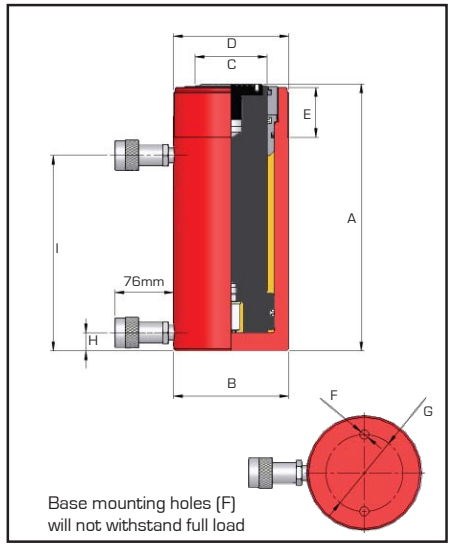
Working pressure 700 Bar

The HDA double acting cylinder range offers the utmost in versatility and durability. Specifically designed for heavy duty lifting, construction and maintenance applications as well as presswork and industrial production, the double acting design provides substantial pulling force in the piston retraction mode as well as providing fast, controlled retraction for continuous duty cycle operation. All models up to 203 tonnes are supplied with flat saddle, piston rod threads and collar threads as standard. Models from 326 tonnes and upwards are supplied without collar thread and piston rod thread, however include replaceable tilting saddle as standard. Standard range models are featured in this catalogue, however other stroke and tonnage options are available on request.

- Internal annular area overload protection valve
- Low friction bearing surfaces
- Nitrocarburised piston rod
- Anti-extrusion seals
- Lifting ring comes as standard on models from 50 to109 tonnes
- Eyebolts come as standard on models from152 to 520 tonnes
- Base mounting holes*

*Base mounting holes are for location of cylinder only. They are not designed to resist the full capacity of the cylinder

Optional piston rod saddles (see page 25)



Up to 203 tonnes :	From 326 tonnes :
Flat saddle	Tilting saddle
Piston rod thread	Piston without thread
Collar thread with protector	Excluding collar thread







Model number	Capacity Push tonnes	Pull tonnes	Stroke mm	Oil cap. litres	Cyl. eff. area cm²	Weight kg
HDA256	25	10	152	0.53	34.9	15.0
HDA506	50	15	152	1.08	71.3	28.4
HDA5013	50	15	330	2.35	71.3	42.6
HDA1006	109	36	152	2.33	153.3	64.5
HDA10013	109	36	330	5.06	153.3	89.0
HDA1506	152	79	152	3.26	214.2	90.0
HDA15012	152	79	305	6.53	214.2	120.5
HDA2006	203	94	152	4.33	285.2	129.8
HDA20012	203	94	305	8.69	285.2	167.4
HDA3006	326	-	152	6.95	457.4	193.0
HDA4006	398	-	152	8.49	558.9	286.0
HDA5006	520	-	152	11.09	729.9	372.0

Dimensions in mm (unless otherwise stated)								
A	B	C	D	E	F*	G	H	I
287	92	50	3 5/16"-12un	53	M10	60	30	212
295	127	79	5"-12un	55	M12	85	20	216
473	127	79	5"-12un	55	M12	85	20	394
304	178	114	6 7/8"-12un	51	M12	146	30	226
482	178	114	6 7/8"-12un	51	M12	146	30	404
310	210	114	8"-12un	55	M16	160	35	231
463	210	114	8"-12un	55	M16	160	35	384
327	254	140	9 3/4"-12un	65	M20	185	43	238
480	254	140	9 3/4"-12un	65	M20	185	43	391
409	312	165	Optional	Optional	M20	158	50	262
431	360	216	Optional	Optional	M24	203	55	277
470	397	203	Optional	Optional	M24	203	65	300

HFL - SINGLE ACTING LOW HEIGHT FAILSAFE LOCK RING CYLINDERS



Capacities from 50 to 520 tonnes

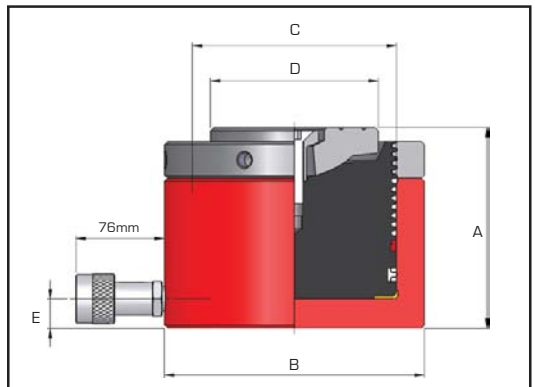
Stroke lengths from 45 to 51mm

Working pressure 700 Bar

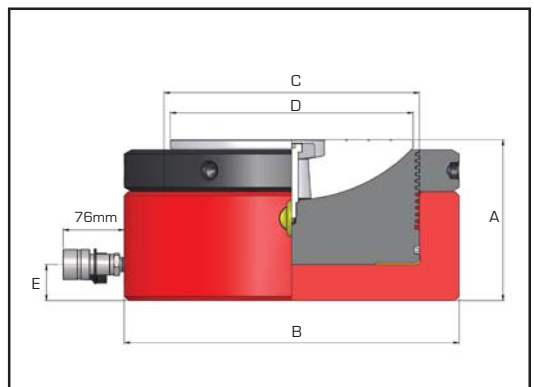
The HFL low height single acting failsafe lock ring cylinder range combines all the versatility and efficiency of hydraulic power with the safety of mechanical load support, offering a sustainable lifting force in very confined work areas. Ideally suited for applications requiring load holding for extended periods, such as bridge support work. The HFL range features a single acting load return piston, threaded throughout it's stroke length to suit the threaded mechanical load holding lock ring. All models are suitable for vertical lifting only and are supplied with tilting saddles as standard.

- Single acting load return design
- Nitrocarburised cylinder and piston rod for corrosion protection
- Low friction bearing surfaces
- Anti-extrusion seals
- Tilting saddle fitted as standard
- Overstroke restrictor port
- See pages 27 - 48 for pumps suitable for use with all Hi-Force cylinders





HFL502, HFL1002, HFL1502



HFL2502 & HFL5002

Model number	Capacity tonnes	Stroke mm	Oil cap. litres	Cyl. eff. area cm^2	Weight kg
HFL502	50	51	0.36	71.3	14.2
HFL1002	109	50	0.77	153.4	25.1
HFL1502	152	45	1.07	214.3	44.0
HFL2502	260	45	1.65	366.1	69.4
HFL5002	520	45	3.29	729.9	186.0

Dimensions in mm				
A	B	C	D	E
125	127	95	70	19
137	178	140	115	20
150	216	165	135	28
159	273	216	200	31
192	400	305	290	43

HFG - SINGLE ACTING FAILSAFE LOCK RING CYLINDERS

B



Capacities from 50 to 520 tonnes

Stroke lengths from 50 to 152mm

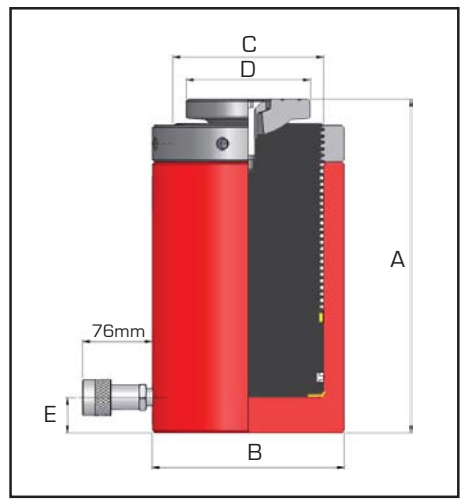
Working pressure 700 Bar

The HFG single acting failsafe lock ring cylinder range combines all the versatility and efficiency of hydraulic power with the safety of mechanical load support. Ideally suited for applications requiring sustained load holding for extended periods, such as bridge support work, the HFG range features a single acting, load return piston, threaded throughout it's stroke length to suit the threaded mechanical load holding lock ring. Simply jack up the load, wind down the mechanical lock ring until it comes into contact with the cylinder body, release the hydraulic pressure and sustain the load mechanically. All models are suitable for vertical lifting only and are supplied with tilting saddles as standard to reduce the risk of side loading the cylinder. Standard models are featured in this catalogue, however other stroke and tonnage options are available on request.

- Single acting load return design
- Nitrocarburised cylinder and piston rod for corrosion protection
- Low friction bearing surfaces
- Anti-extrusion seals
- Tilting saddle fitted as standard
- Overstroke restrictor port







Model number	Capacity tonnes	Stroke mm	Oil cap. litres	Cyl. eff. area cm^2	Weight kg
HFG504	50	102	0.73	71.3	20.6
HFG506	50	150	1.07	71.3	25.0
HFG1004	109	100	1.53	153.4	47.5
HFG1006	109	150	2.30	153.4	61.5
HFG1504	152	100	2.14	214.3	84.0
HFG1506	152	150	3.21	214.3	89.5
HFG2002	203	50	1.42	285.1	95.4
HFG2006	203	152	4.33	285.1	137.0
HFG3006	326	150	6.87	457.7	228.5
HFG4006	398	151	8.44	559.0	308.5
HFG5006	520	152	11.10	729.9	457.0

Dimensions in mm				
A	B	C	D	E
224	127	95	70	25.0
272	127	95	70	25.0
240	178	140	115	27.5
311	178	140	115	27.5
288	216	165	135	42.0
338	216	165	135	42.0
261	254	190	135	50.0
362	254	190	135	50.0
417	310	241	150	50.0
459	360	267	180	70.0
498	400	305	180	80.0

PCS - PUMP AND CYLINDER SETS



PCS200

Working pressure 700 Bar

Capacities from 4.5 to 109 tonnes

Stroke lengths from 10 to 153mm

Hi-Force PCS pump and cylinder sets provide the simplest and most cost effective way to start your job immediately. All sets comprise of a Hi-Force hydraulic cylinder (wide choice available), suitable Hi-Force manual pump and a two metre hose with high flow, quick release coupler.

- 18 standard sets
- Cylinders are spring assisted return design
- Manual pumps include factory set relief valve
- Optional piston rod (tilting) saddles are available for most cylinder models (see page 25)

For optional pressure gauges please refer to page 52 of this catalogue

Set		Pump		Cylinder			Hose		
Model number	Cylinder capacity tonnes	Model number	Capacity litres	Model number	Stroke mm	Closed height mm	Model number	Length metres	Weight kg
PCS50	4.5	HP110	1.0	HPS51	16	42	HC2	2.0	7.4
PCS53	4.5	HP110	1.0	HSS53	75	157	HC2	2.0	8.0
PCS100	10	HP110	1.0	HPS100	10	46	HC2	2.0	8.2
PCS101	10	HP110	1.0	HLS101	40	95	HC2	2.0	9.0
PCS102	10	HP110	1.0	HSS102	56	131	HC2	2.0	9.0
PCS106	10	HP110	1.0	HSS106	150	225	HC2	2.0	10.8
PCS200	20	HP110	1.0	HPS200	11	52	HC2	2.0	9.4
PCS201	20	HP110	1.0	HLS201	44	102	HC2	2.0	11.3
PCS256	25	HP110	1.0	HSS256	150	273	HC2	2.0	16.0
PCS300	32	HP110	1.0	HPS300	12	59	HC2	2.0	10.8
PCS302	32	HP110	1.0	HLS302	60	119	HC2	2.0	13.6
PCS502	50	HP110	1.0	HLS502	60	126	HC2	2.0	17.0
PCS506	50	HP232	2.0	HSS506	152	251	HC2	2.0	31.0
PCS1002	109	HP232	2.0	HLS1002	60	143	HC2	2.0	35.5
PCS1006	109	HP252	5.0	HSS1006	153	274	HC2	2.0	66.0
PCS202H	23	HP110	1.0	HHS202	50	160	HC2	2.0	13.9
PCS302H	33	HP110	1.0	HHS302	50	165	HC2	2.0	17.2
PCS603H	61	HP232	2.0	HHS603	76	226	HC2	2.0	34.6

Note : Models PCS202H, PCS302H & PCS603H are supplied with a hollow piston cylinder.

PCS OPTIONAL EXTRAS

Metal storage and transport box



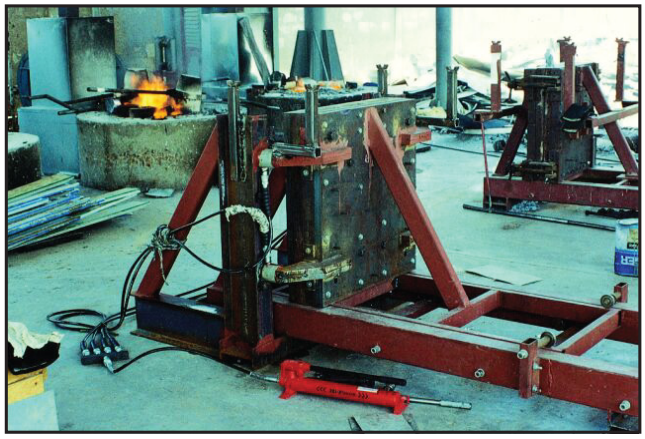
Dimensions in mm				
Model	Length	Width	Height	For set
FSB1	640	360	150	PCS50 to PCS502
MSB1	890	300	210	PCS506 to PCS603H

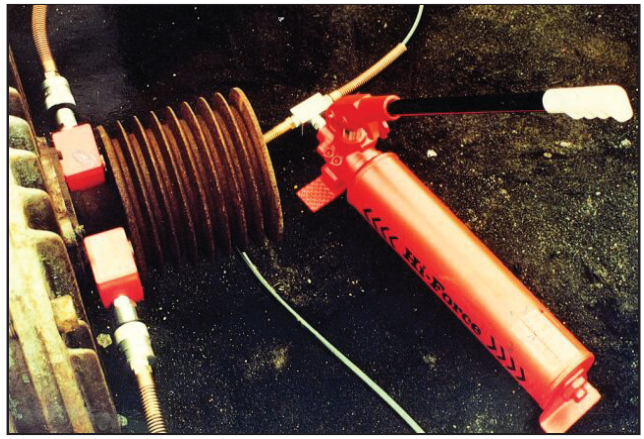
Gauge and gauge block kit



Model	Description
HG1K	100mm dry gauge 0-700 Bar / 0-10000 PSI and gauge mounting block
HG63K	63mm glycerine filled gauge 0-700 Bar / 0-10000 PSI and gauge mounting block

Substitute the manual hydraulic pump for an electric driven or air driven pump.
Contact your local dealer or regional office for more information.









CYLINDER SADDLES

Fitted as standard			
Cylinder range	Cylinder capacity	Saddle model No.	See figure
HAS	32	HA30	2
HAS	51	HA50	2
HAS	110	HA100	2
HSS	4.5	HA5	1
HSS	10	HA10	1
HSS	14.5	HA15	1
HSS	25	HA25	1
HSS	29	HA25	1
HSS	50	HA50	2
HSS	73	HA75	2
HSS	109	HA100	2
HHS	11	HA102	4
HHS	23	HA202	4
HHS/R	33	HA302	4
HHS/R	61	HA603	4
HHS/R	102	HA1003	4
HHR	152	HA1508	4
HHR	247	HA2508	4
HDA	25	HD25	3
HDA	50	HD50	3
HDA	109	HD100	3
HDA	152	HD150	3
HDA	203	HD200	3
HDA	326	HD300T	7
HDA	398	HD400T	7
HDA	520	HD500T	7
HFG	50	TS50	8
HFG	109	TS100	8
HFG	152	TS150	8
HFG	203	TS200	8
HFG	326	TS300	8
HFG	398	TS400	8
HFG	520	TS500	8
HFL	50	TS50	8
HFL	109	TS100	8
HFL	152	TS150	8
HFL	260	TS250	8
HFL	520	TS500	8

Fig. 1

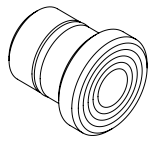


Fig. 2

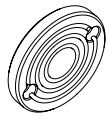


Fig. 3

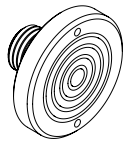


Fig. 4

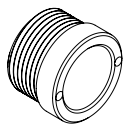


Fig. 5

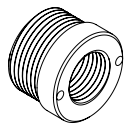


Fig. 6

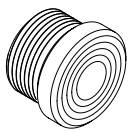


Fig. 7

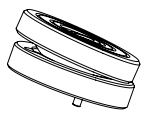


Fig. 8



Fig. 9



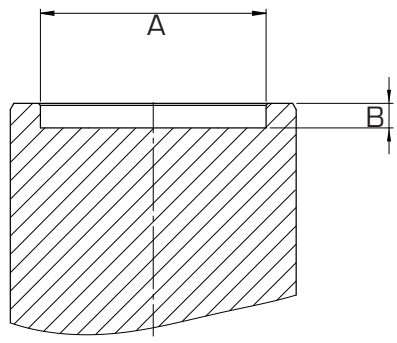
Available options			
Cylinder range	Cylinder capacity	Saddle model No.	See figure
HAS	32	HAT30	7
HAS	51	HAT50	7
HAS	110	HAT100	7
HSS	4.5	-	-
HSS	10	HAT10	9
HSS	14.5	HAT10	9
HSS	25	HAT25	9
HSS	29	HAT25	9
HSS	50	HAT50	7
HSS	73	HAT75	7
HSS	109	HAT100	7
HHS	11	HA102T	5
HHS	11	HA102G	6
HHS	23	HA202T	5
HHS	23	HA202G	6
HHS/R	33	HA302T	5
HHS/R	33	HA302G	6
HHS/R	61	HA603T	5
HHS/R	61	HA603G	6
HHS/R	102	HA1003T	5
HHS/R	102	HA1003G	6
HHR	152	HA1508T	5
HHR	152	HA1508G	6
HHR	247	HA2508T	5
HHR	247	HA2508G	6
HDA	25	HD25T	9
HDA	50	HD50T	9
HDA	109	HD100T	9
HDA	152	HD150T	9
HDA	203	HD200T	9
HDA	326	HD300	2
HDA	398	HD400	2
HDA	520	HD500	2

PISTON ROD THREAD SPECIFICATIONS

HSS Cylinder Range

Cylinder Range	Figure	Dimensions in mm A	B	C	Thread Size D
HSS5	3	-	-	20	¾"-16UNF
HSS10	3	-	-	14	1"-8UNC
HSS15	3	-	-	14	1"-8UNC
HSS25	3	-	-	30	1½"-16UN
HSS30	3	-	-	30	1½"-16UN
HSS50	1	70	11.0	-	-
HSS75	1	80	12.0	-	-
HSS100	1	100	12.0	-	-

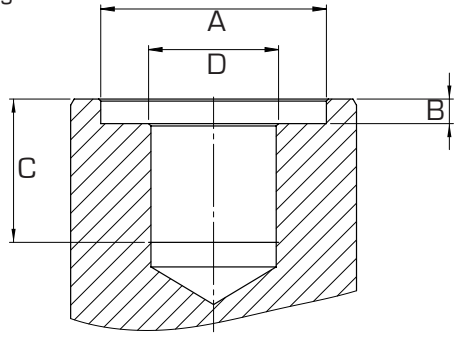
Fig. 1



HAS Cylinder Range

Cylinder Range	Figure	Dimensions in mm A	B	C	Thread Size D
HAS30	1	50	10.0	-	-
HAS50	1	70	11.0	-	-
HAS100	1	100	12.0	-	-

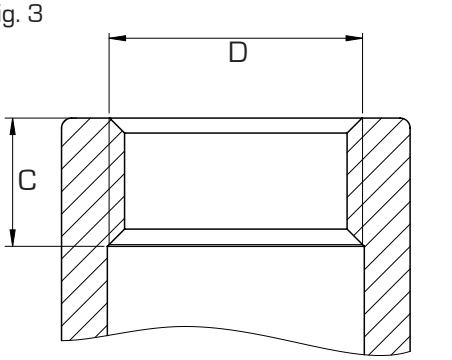
Fig. 2



HHS Cylinder Range

Cylinder Range	Figure	Dimensions in mm A	B	C	Thread Size D
HHS11	4	32	7.0	21	M28x1.5
HHS23	4	43	10.0	31	M39x1.5
HHS33	4	52	10.0	31	M48x1.5
HHS61	4	80	10.0	31	M70x1.5
HHS102	4	114	12.0	38	M105x2

Fig. 3



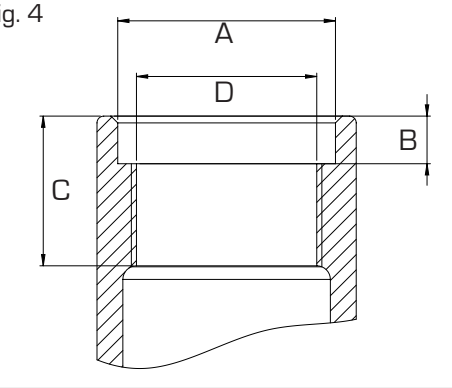
HHR Cylinder Range

Cylinder Range	Figure	Dimensions in mm A	B	C	Thread Size D
HHR33	4	52	10.0	32	M48x1.5
HHR61	4	80	10.0	32	M70x1.5
HHR102	4	114	12.0	38	M105x2
HHR1508	4	170	13.5	50	M150x3
HHR2508	4	242	13.5	74	M220x3

HDA Cylinder Range

Cylinder Range	Figure	Dimensions in mm A	B	C	Thread Size D
HDA25	2	45	9.0	35	1"-12UNF
HDA50	2	70	11.0	45	1"-12UNF
HDA100	2	100	12.0	55	1¾"-12UNF
HDA150	2	100	12.0	52	3⅜"-16UN
HDA200	2	110	12.0	70	2½"-12UN
HDA300	1	150	25.0	-	-
HDA400	1	180	25.0	-	-
HDA500	1	180	25.0	-	-

Fig. 4



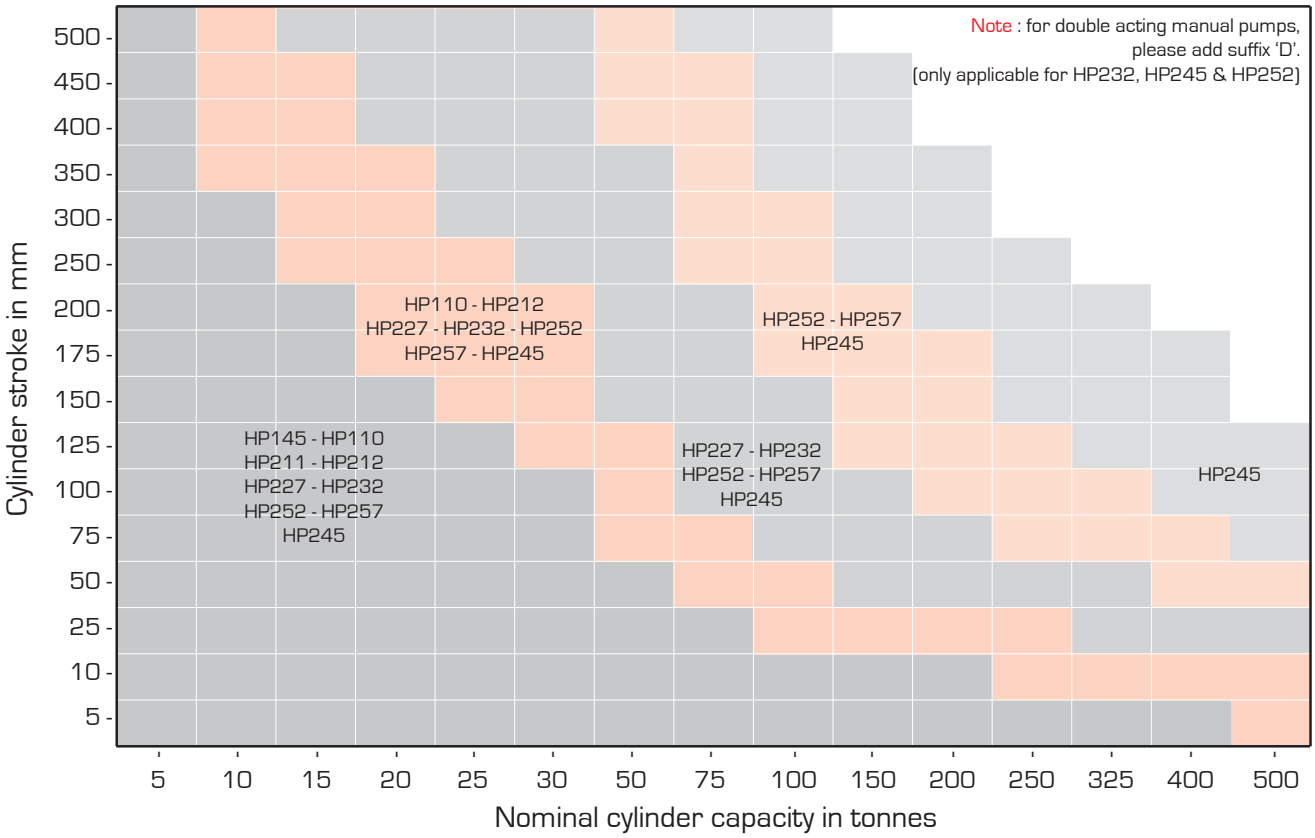
Hi-Force®

PUMPS

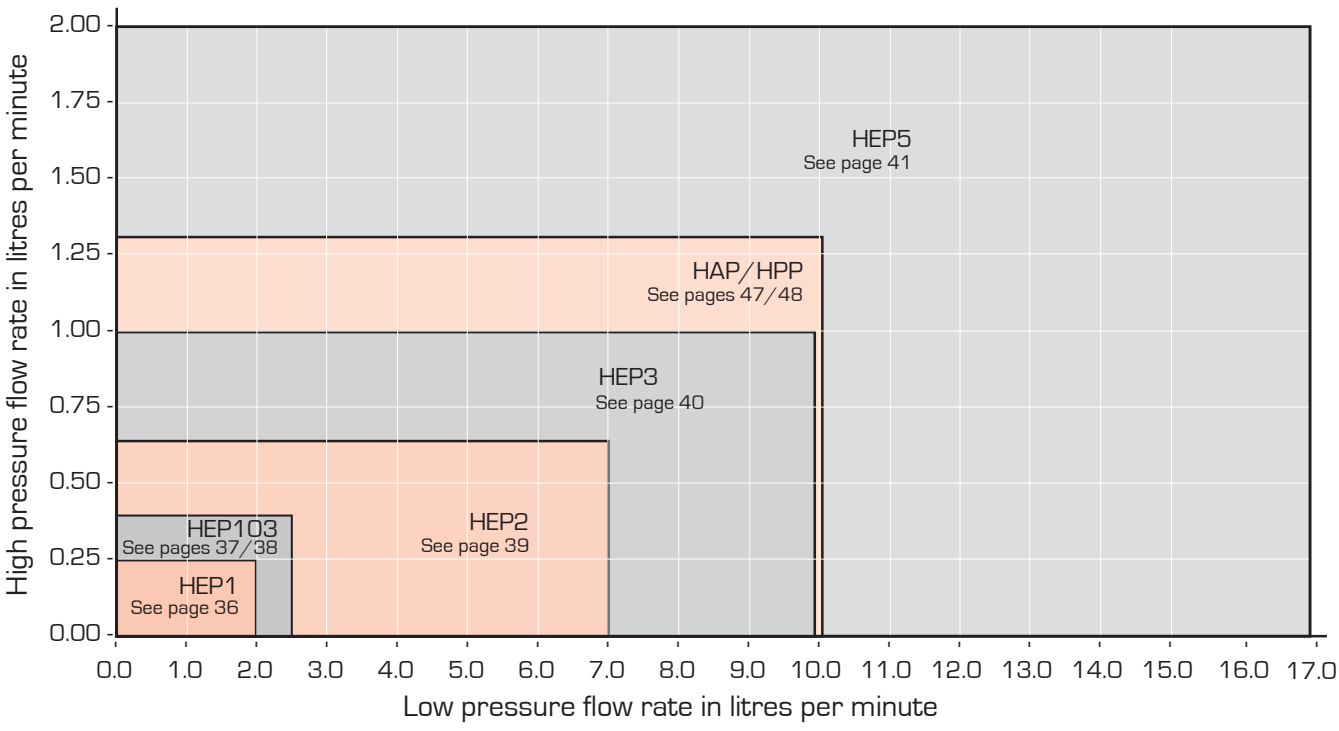
Hydraulic Pumps	Selection table	Page 28
HP & XHP Range	Manually operated pumps Steel, aluminium & Ultra high pressure	Pages 29 - 32
HP-FP Range	Foot operated pump Two stage operation	Page 33
Powered Pumps	General information Powered pumps	Page 34
Battery Powered Pumps	Battery powered pump Lightweight & portable	Page 35
HEP1 Range	Electric driven pumps Lightweight & portable with carrying strap	Page 36
HEP103 Range	Electric driven two stage Compact pumps	Pages 37 - 38
HEP2 Range	Electric driven pumps General duty medium flow	Page 39
HEP3 Range	Electric driven pumps General duty high flow	Page 40
HEP5 Range	Electric driven pumps Heavy duty high flow	Page 41
Accessories	Accessories for powered pumps Solenoid valves, trolleys, protection frames, etc.	Page 42
HSP Range	Electric driven pumps Split flow, multi outlet	Pages 43 - 44
AHP11 Range	Air driven pumps Single stage, hand and foot operated	Pages 45 - 46
HAP Range	Air driven pumps General duty high flow	Page 47
HPP Range	Petrol engine driven pumps General duty high flow	Page 48

SELECTION TABLE FOR HI-FORCE HYDRAULIC PUMPS

MANUAL PUMPS



POWERED PUMPS



HP - MANUALLY OPERATED PUMPS - STEEL



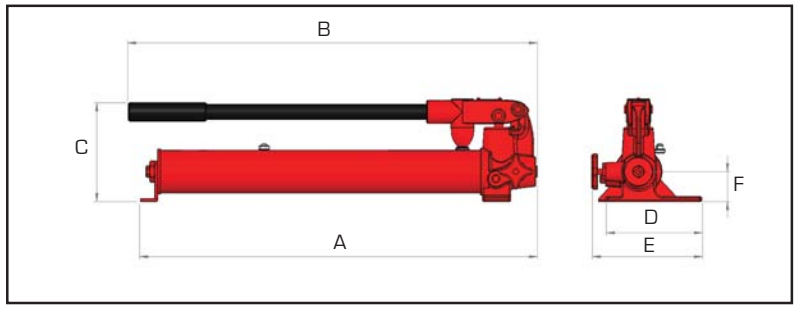
Single or two speed operation

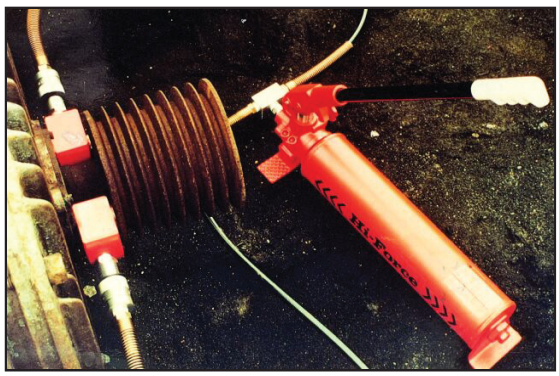
Choice of control valves

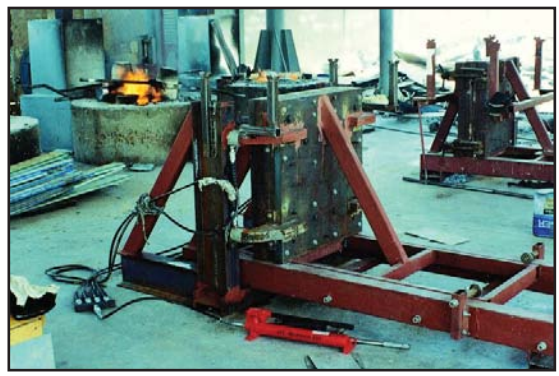
Working pressure 700 Bar

The HP manually operated pump range offers a choice of single or two speed operation and all models are supplied complete with a pre-filled oil reservoir, ready for immediate use. All models have a maximum working pressure of 700 Bar and the range includes pump models suitable for use with either single acting cylinders or tools. The HP range offers the ideal solution for applications where completely independent, portable hydraulic power is required. With low handle effort characteristics for easy operation, all models are of strong durable construction. Hi-Force HP manually operated pumps have a proven track record industry wide and offer excellent value for money in portable hydraulic power. A full range of system components suitable for use with HP manually operated pumps is detailed on pages 49 - 56.

- Oil reservoir capacity up to 5 litres
- Durable steel construction
- External pressure release valve
- Factory set safety relief valve
- Changeover pressure for two speed models is 14 Bar







Model number	Valve type	Displacement per stroke cm³ 1st stage	2nd stage	Usable oil cap. litres	Handle effort kg	Weight kg
Single speed hand operated pumps for single acting cylinders and tools						
HP145	2-way	2.9	-	0.45	45	4.6
HP110	2-way	2.9	-	1.0	45	5.6
Two speed hand operated pumps for single acting cylinders and tools						
HP227	2-way	12.9	2.3	2.3	38	10.5
HP257	2-way	12.9	2.3	5.0	38	15.2

Dimensions in mm A	B	C	D	E	F
310	566	128	134	145	40
558	566	128	134	145	40
544	597	168	135	145	53
545	597	168	135	150	53

HP - MANUALLY OPERATED PUMPS - ALUMINIUM

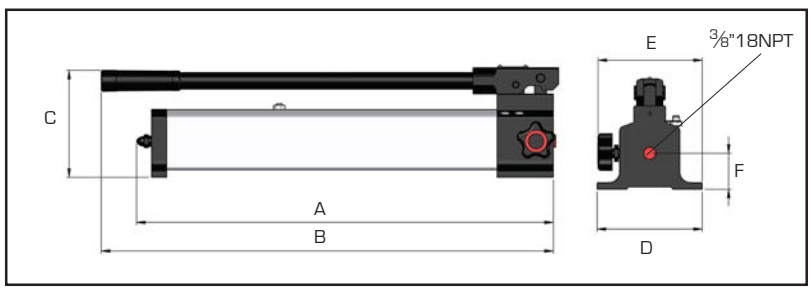


- Two speed operation
- Working pressure 700 Bar
- Six models with choice of control valve

The HP manually operated aluminium pump range offers two speed operation and all models are supplied complete with a pre-filled oil reservoir, ready for immediate use. All models have a maximum working pressure of 700 Bar and the range includes pump models suitable for use with either single or double acting cylinders and tools. The HP range offers the ideal solution for applications where completely independent, portable hydraulic power is required. With low handle effort characteristics for easy operation and lightweight design, all models are of strong durable construction. Hi-Force HP manually operated pumps have a proven track record industry wide and offer excellent value for money in portable hydraulic power.

- Oil reservoir capacity up to 5 litres
- Lightweight aluminium construction
- External pressure release valve
- Factory set safety relief valve
- Changeover pressure 14 Bar





Model number	Valve type	Displacement per stroke cm³ 1st stage	2nd stage	Usable oil cap. litres	Handle effort kg	Weight kg
Two speed hand operated pumps for single acting cylinders and tools						
HP211	2-way	12.9	1.0	0.5	27	2.0
HP212	2-way	12.9	2.3	1.0	40	4.0
HP232	2-way	12.9	2.3	2.0	40	6.9
HP252	2-way	12.9	2.3	5.0	40	9.6
Two speed hand operated pumps for double acting cylinders and tools						
HP232D	4-way	12.9	2.3	2.0	40	8.7
HP252D	4-way	12.9	2.3	5.0	40	13.6

Dimensions in mm A	B	C	D	E	F
315	388	135	100	143	40
540	611	142	100	143	40
540	611	160	140	140	50
585	611	160	140	168	50
555	627	160	140	182	50
605	627	160	140	196	50

HP - MANUALLY OPERATED PUMPS - HIGH FLOW



HP245D

High flow manual pump

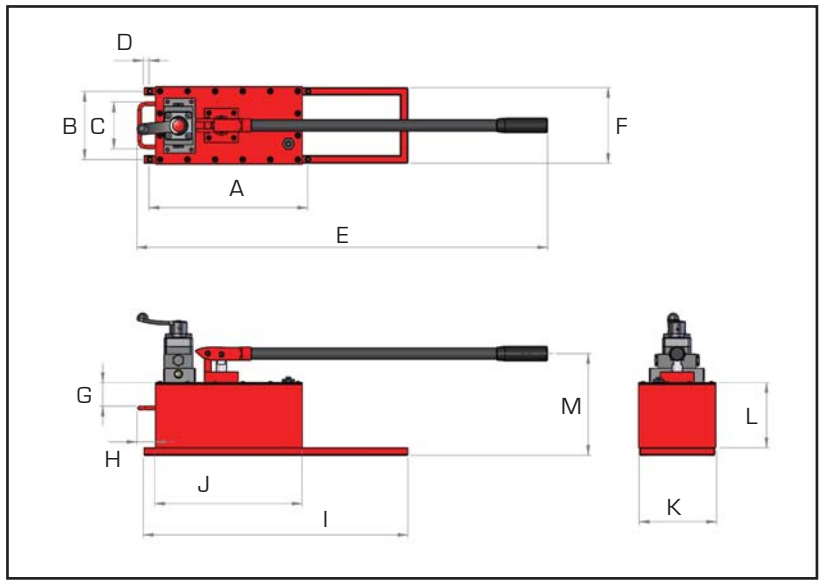
Working pressure 700 Bar

2 stage with semi automatic change-over

C

The HP245 range of high flow, two speed, manually operated pumps is ideally suited for applications where high tonnage cylinders are to be used on sites, without any available electric or compressed air power supply. Both models are suitable for working pressures up to 700 Bar and the very high, low pressure displacement (113 cm^3 per stroke), enables fast piston extension (and retraction) under no load. These high performance pumps are also ideally suited to multiple cylinder lifting applications where a larger volume of oil is required to complete the job. Available with a 2-way valve for single acting cylinders or a 4-way valve for double acting cylinders, both models are supplied with a pre-filled 10 litre oil reservoir and are ready for immediate use.

- Durable steel construction
- Factory set safety relief valve
- Changeover pressure 28 Bar
- Low handle effort characteristics
- 10 litres of usable oil capacity



Model number	Valve type	Displacement per stroke cm^3 1st stage	Displacement per stroke cm^3 2nd stage	Usable oil cap. litres	Handle effort kg	Material	Weight kg
Two speed hand operated pump for single acting cylinders and tools							
HP245	2-Way	113	4	10	40	Steel	29.5
Two speed hand operated pump for double acting cylinders and tools							
HP245D	4-Way	113	4	10	40	Steel	31.0

Model number	Dimensions in mm A	B	C	D	E	F	G	H	I	J	K	L	M
HP245	420	180	124	15	1050	200	63	47	700	390	205	173	270
HP245D	420	180	124	15	1050	200	63	47	700	390	205	173	270

XHP - MANUALLY OPERATED ULTRA HIGH PRESSURE PUMP



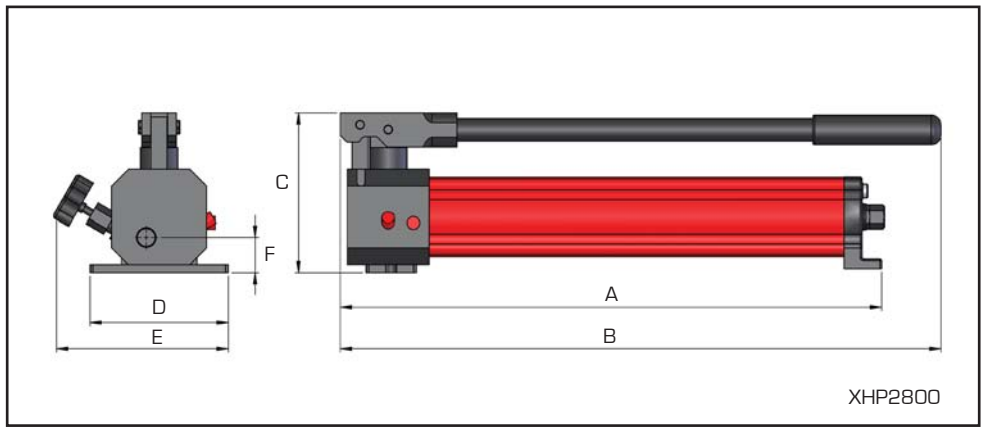
Compact design

Two speed operation

Working pressure up to 2800 Bar

- Lightweight aluminium construction
- Factory set safety relief valve
- External pressure release valve
- Low handle effort
- XHP1500 includes gauge as standard, optional gauge kit for XHP2800.

The XHP range of manually operated ultra high pressure hydraulic pumps is suitable for use in a wide range of high pressure applications, such as oil injection for bushing removal, valve testing, calibration work, laboratory burst and proof testing, etc. The two speed operation, with automatic changeover from low to high presssure at 14 Bar, provides easy and low handle effort operation. The XHP1500 features an integrated gauge as standard, the optional gauge kit for the XHP 2800 includes a three metre long high pressure hose with swivel fittings on both ends. Both gauges provide accurate and reliable pressure readings.



Pump specification :

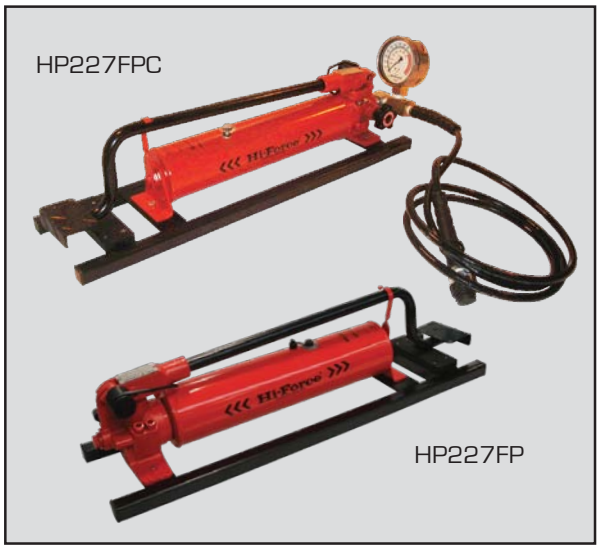
Model number	Working pressure bar	Usable oil capacity litres	Displacement per stroke (cm^3) 1st stage	2nd stage	Outlet port	Weight kg	Pump only Dimensions in mm A	B	C	D	E	F
XHP1500	1500	0.7	20.0	1.00	¼" BSP	7.0	575	620	170	84	110	90
XHP2800	2800	1.0	14.0	0.65	¾"-16 UNF	6.9	548	620	157	140	170	36

Optional gauge kit (for XHP2800 only) :

Model number	Inner scale reading PSI	Outer scale reading Bar	Inlet port	Outlet port	Weight kg	Pump incl. gauge kit Dimensions in mm A	B	C	D	E	F
XHP2800GK	0-45000	0-3000	9/16"-18 UNF	9/16"-18 UNF	1.5	548	738	237	140	170	36

Supplied including adaptor to fit ¾"-16 UNF pump outlet port and 3m hose assembly with swivel fittings on both ends

HP227FPC & HP227FP - MANUALLY OPERATED FOOT PUMPS

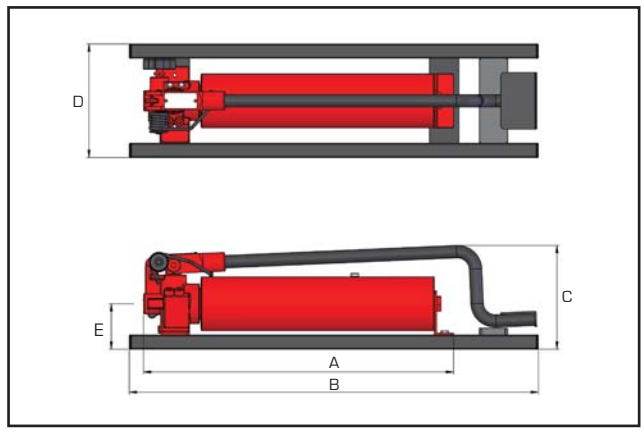


- Working pressure 700 Bar
- Two stage operation
- Complete with accessories

The HP227FPC manually operated foot pump is supplied complete with 100mm diameter pressure gauge, gauge mounting block and 3 metre length hydraulic hose with CM1 quick connect male coupler. Ideally suited for use with Hi-Force CH series crimper heads (see pages 123 & 124) and all other Hi-Force 700 Bar maximum working pressure, hydraulic tools that require a remote pump operation, the HP227FPC has a superb two speed low pressure displacement (12.9 cm^3 per stroke) with automatic changeover to high pressure displacement (2.3 cm^3 per stroke) up to 700 Bar. Supplied with a pre-filled oil reservoir offering a usable oil capacity of 2.3 litres, the HP227FPC is supplied ready for immediate use.

The HP227FP pump incorporates the same specification and features of the HP227FPC pump however is supplied without the pressure gauge, gauge mounting block and 3 metre hose assembly.





Model number	Valve type	Displacement per stroke cm^3 1st stage	Displacement per stroke cm^3 2nd stage	Usable oil cap. litres	Handle effort kg	Material	Weight kg
HP227FPC	2-way	12.9	2.3	2.3	39	Steel	14.5
HP227FP	2-way	12.9	2.3	2.3	39	Steel	12.5

Dimensions in mm A	B	C	D	E
544	763	227	200	78
544	715	185	200	78

POWERED PUMPS - GENERAL INFORMATION

Light - Battery		On page 35 the BPP107 series battery powered hydraulic pump is designed for operator convenience in terms of handling (only 6.6 kg) and is driven by a powerful 14.4V long life battery. The pump incorporates an automatic pressure relief and release valve meaning that the pressure automatically relieves once the pump reaches its maximum pressure of 700 Bar, making the pump ideal for use with Hi-Force CH series crimping tools, NS series Nut Splitters, HCH Cutters and HKP series knockout punchers.
Light		On page 36 the HEP1 series two stage electric driven hydraulic mini pump range offers a choice of 110 or 240 Volt motor, with both models being suitable for 700 Bar maximum working pressure. The two stage design offers a low pressure flow rate up to 2 litres/min with automatic changeover to high pressure, with a flow rate up to 0.25 litres/min. Incorporating a 2-way solenoid valve and internal safety overload valve, both models are extremely compact & lightweight, suitable for use with single acting Hi-Force cylinders or tools.
Standard		On pages 37 & 38 the HEP103 series two stage electric driven hydraulic pump range offers a choice of 110 or 240 Volt electric driven motors. All models are suitable for 700 Bar maximum working pressure. The two stage design offers a low pressure flow rate up to 2.5 litres/min with automatic changeover to high pressure, with a flow rate up to 0.35 litres/min. Available with manual or solenoid valve options, suitable for both single acting and double acting cylinders and tools in a wide variety of applications.
Intermediate		On page 39 the HEP2 series two stage electric driven hydraulic pump range offers a low pressure flow rate of 7 litres/min with automatic changeover to high pressure flow rate of 0.65 litres/min up to 700 Bar with a choice of 110, 240 or 380/440 Volt motor options. With 2, 3 or 4-way manual and electric solenoid valve options the HEP2 series is suitable for a wide range of applications and is the most commonly selected Hi-Force electric pump. All HEP2 series pumps are also fitted with an externally adjustable pressure relief valve for easy adjustment up to the maximum working pressure of 700 Bar.
Continuous		On page 40 the HEP3 series two stage electric driven hydraulic pump range has all the features of the HEP2 series, but with an increased flow of 10 litres/min at low pressure and 1 litre/min at high pressure (up to 700 Bar) these pumps are particularly useful when operating high tonnage or long stroke cylinders. Both HEP2 and HEP3 range of electric pumps are fitted with totally enclosed, fan cooled, low noise, electric motors, making them ideal for quiet in-works operation or outdoor site use in most environments.
Heavy duty		On page 41 the HEP5 series two stage electric driven hydraulic pump range offers the highest flow rate combination in the Hi-Force range. Offering a low pressure flow rate of 17 litres/min with automatic changeover to a superb high pressure flow rate of 2 litres/min. The HEP5 offers all the features of the HEP2 and HEP3 series with the addition of a 2.2 kW high speed, heavy duty motor, making it the ideal pump unit for all heavy duty applications, requiring a high flow and intensive usage over longer time periods.
Intermediate		On pages 43 & 44 the HSP series electric driven split flow hydraulic pump range offers users the opportunity to operate up to 12 independent hydraulic outlets from within a single pump assembly. With easy to operate controls HSP series pumps are ideally suited for synchronous lift applications particularly where there is uneven load distribution between the multiple jacking points. All models are 380/440 volt three phase electrical supply operation.
Light		On pages 45 & 46 the AHP11 series of air driven single stage pumps offer an economical and faster working alternative to basic hand operated pumps. Available with both 2-way and 4-way manually operated control valves AHP series pumps incorporate an ergonomically designed pedal offering the operator the choice of hand or foot operated control (excludes 4-way valve models). Remote air powered pendant control options also available.
Intermediate		On page 47 the HAP series two stage air driven hydraulic pump range offers a low pressure flow rate of 10 litres/min, with automatic changeover to high pressure flow rate, of 1.3 litres/min up to the 700 Bar maximum working pressure. The modular construction of these pumps ensures that many similar features to the HEP2 & HEP3 series are included with the air motor driven motive force being the principle design difference.
Intermediate		On page 48 the HPP series two stage petrol engine driven hydraulic pump range offers all the modular design and performance characteristics of the HAP series with the only principle difference being the change of motive force from air driven to petrol engine driven. HPP series pumps are ideally suited for job site locations where electrical or compressed air power supply are not readily available.

BPP - BATTERY POWERED HYDRAULIC PUMP


BPP107

- Working pressure 700 Bar
- Lightweight design
- 14.4V long life battery

The Hi-Force BPP107 battery powered hydraulic pump is designed for operator convenience in terms of handling and power supply. Driven by a powerful 14.4V long life battery the unit takes away the physical effort required by a manually operated hand or foot pump, whilst at the same time eliminating the need for an external power source. The pumps ergonomic lightweight design (6.6 kg) also makes the unit very portable and user friendly for the operator with a handy shoulder strap supplied with the pump. The pump incorporates an automatic pressure relief and release valve meaning that the pressure automatically relieves once the pump reaches its maximum pressure of 700 Bar, making the pump ideal for use with Hi-Force CH series crimping tools, NS series Nut Splitters, HCH Cutters and HKP series knockout punchers.

Model number	Max working pressure	Oil Cap litres	Oil Flow lit/min		Weight kg	Dimensions in mm		
			1st stage	2nd stage		Length	Width	Height
BPP107	700 Bar	0.7	0.5	0.15	6.6	355	160	260

ACCESSORIES


BP144

Model No	Description
BP144	Battery Pack 14.4V

Note: Charger supplied separately


CCU144

Model No	Description
CCU144	Car cigarette lighter charger unit

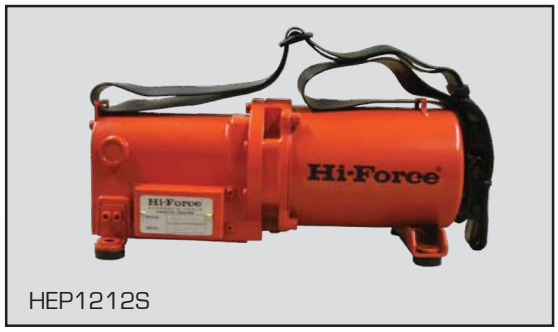

CU110

Model No	Description
CU110	Charger 110V
CU220	Charger 220/230V


MP220

Model No	Description
MP220	Power supply 220/230V to operate unit directly from mains

HEP1 - ELECTRIC DRIVEN LIGHTWEIGHT MINI PUMPS WITH CARRYING STRAP



HEP1212S

Working pressure 700 Bar

Two-stage design, changeover pressure 10 Bar

Extremely compact, lightweight & powerful

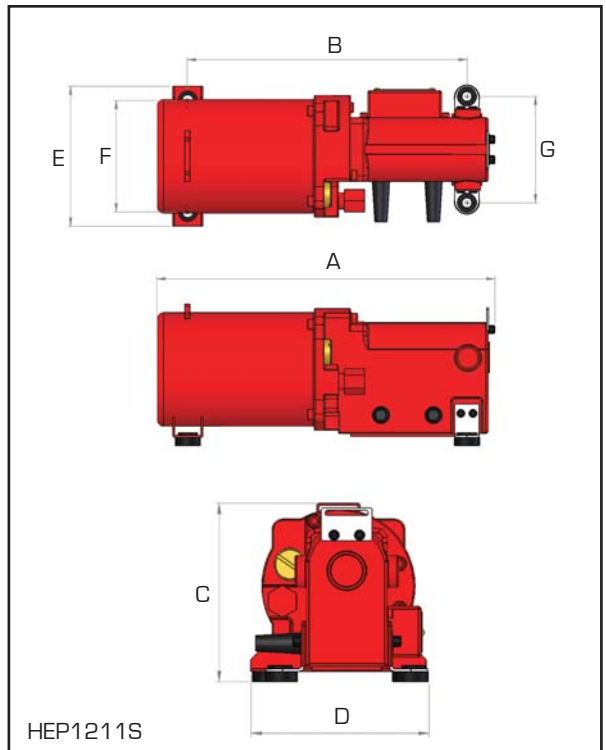
The HEP1 range of two stage electric driven hydraulic mini pumps, offers the smallest and lightest weight, electric powered pump in the Hi-Force product range. Available with a choice of 110 volt or 240 volt single phase electric motor, both models feature an electric solenoid operated valve, complete with remote hand pendant controller and 3 metre control cable as standard. The two stage design of these pumps incorporates an automatic changeover from low to high pressure ensuring that an optimum pressure and flow rate combination is achievable from an extremely compact pump.

- 110 or 240V single phase motor options
- Internal safety overload valve
- Supplied with carrying strap

Model number	Motor voltage	Maximum pressure bar	Maximum flow rate l/min 1st stage	2nd stage	Valve type	Usable oil cap. litres	Weight kg
HEP1211S	110 V - 1 Ph	700	2.00	0.2	2-way	0.8	7.5
HEP1212S	240 V - 1Ph	700	2.00	0.2	2-way	0.8	7.5



Model number	Dimensions in mm A	B	C	D	E	F	G
HEP1211S	333	269	140	139	138	110	105
HEP1212S	333	269	140	139	138	110	105



HEP1211S
HEP1212S

HEP103 - ELECTRIC DRIVEN TWO STAGE COMPACT PUMPS


HEP103442

- Working pressure 700 Bar
- Choice of valve options
- Compact, lightweight & powerful

The HEP103 range of two stage electric driven hydraulic pumps is suitable for a wide variety of applications and pumps are available in either 110 volt or 240 volt single phase electric motor options. Both voltage options also offer a choice of manual or electrically operated control valves, available as 2-way, 3-way or 4-way options with additional features like open centre, closed centre and locking valve designs available. Maximum working pressure is 700 Bar with automatic low to high pressure changeover fitted as standard. All models are supplied complete with a glycerine filled hydraulic pressure gauge, pre-filled 4 litre usable oil capacity reservoir with oil sight level gauge and an integral carrying handle for easy transportation of these lightweight, compact and versatile pumps to the job site.

Model number	Motor voltage	Maximum pressure Bar	Maximum flow rate l/min 1st stage	2nd stage	Changeover pressure Bar	Remote pendant functions	Usable oil capacity litres	Weight kg
Models featuring 2-way solenoid valve, normally closed (hold function), suitable for use with single acting cylinders and tools, requiring hold.								
HEP103241LS	110 V - 1 Ph	700	2.50	0.35	150	advance/retract	4	19.2
HEP103242LS	240 V - 1 Ph	700	2.50	0.35	150	advance/retract	4	19.2
Models featuring 2-way solenoid valve, normally open (auto retract function), suitable for use with single acting cylinders and tools, requiring auto retract.								
HEP103241S	110 V - 1Ph	700	2.50	0.35	150	advance/retract	4	20.5
HEP103242S	240 V - 1 Ph	700	2.50	0.35	150	advance/retract	4	20.5
Models featuring 3-way manually operated valve, suitable for use with single acting cylinders and tools.								
HEP103341	110 V - 1Ph	700	2.50	0.35	150	motor on/off	4	18.1
HEP103342	240 V - 1 Ph	700	2.50	0.35	150	motor on/off	4	18.1
Models featuring 4-way manually operated valve, suitable for use with double acting cylinders and tools.								
HEP103441	110 V - 1Ph	700	2.50	0.35	150	motor on/off	4	18.1
HEP103442	240 V - 1 Ph	700	2.50	0.35	150	motor on/off	4	18.1
Models featuring 4-way solenoid valve, locking feature on A and B port, suitable for use with double acting cylinders and tools, requiring hold.								
HEP103441LS	110 V - 1Ph	700	2.50	0.35	150	advance/retract	4	20.5
HEP103442LS	240 V - 1 Ph	700	2.50	0.35	150	advance/retract	4	20.5

Note: All motors are dual frequency (50/60 Hz)

HEP103 - ELECTRIC DRIVEN TWO STAGE COMPACT PUMPS



HEP103442LS

Working pressure 700 Bar

Choice of valve options

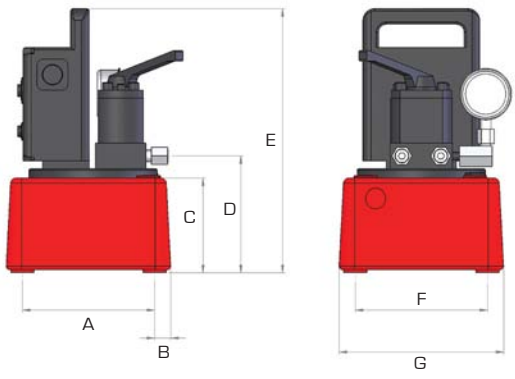
Compact, lightweight & powerful

- Integral carrying handle
- Pressure gauge and remote control fitted as standard
- Suitable for single and double acting cylinders and hydraulic tools
- All models are fitted with dual frequency (50/60 Hz) motor



Did you know .....

Hi-Force manufactures powered pumps with flow rates up to 17 litres per minute in low pressure and 2 litres per minute up to 700 Bar.
See pages 39 to 41 for more details



HEP103 Range

All models	Dimensions in mm
A	170.0
B	19.0
C	117.5
D	141.5
E	342.0
F	170.0
G	212.0

HEP2 - ELECTRIC DRIVEN PUMPS - GENERAL DUTY MEDIUM FLOW

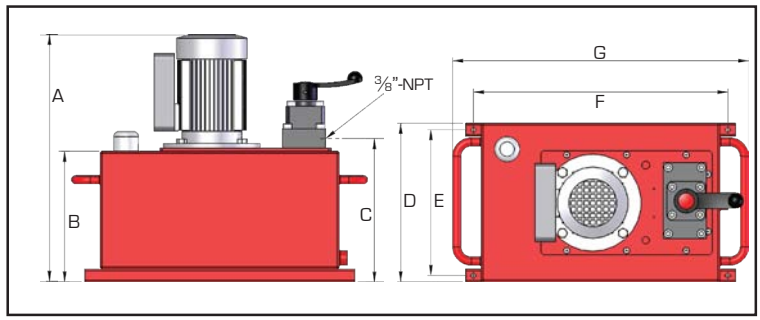


Low pressure flow rate 7 ltr/min. up to 70 Bar

High pressure flow rate 0.65 ltr/min. up to 700 Bar

Two stage hydraulic pump unit

- Externally adjustable pressure relief valve
- Manual valve with load holding feature fitted as standard
- Solenoid valve options available



Model number	Valve type	Oil cap. litres	Motor kW	Motor voltage	Weight kg	Dimensions in mm A	B	C	D	E	F	G
HEP207111	P-T Plate	10	1.5	110 / 115 V - 1Ph	47.0	498	198	230	246	221	368	438
HEP207112	P-T Plate	10	1.5	220 / 240 V - 1Ph	47.0	498	198	230	246	221	368	438
HEP207114	P-T Plate	10	1.5	380 / 440 V - 3Ph	47.0	498	198	230	246	221	368	438
HEP207121	P-T Plate	25	1.5	110 / 115 V - 1Ph	63.0	527	227	259	306	281	490	570
HEP207122	P-T Plate	25	1.5	220 / 240 V - 1Ph	63.0	527	227	259	306	281	490	570
HEP207124	P-T Plate	25	1.5	380 / 440 V - 3Ph	63.0	527	227	259	306	281	490	570
HEP207211	2-way	10	1.5	110 / 115 V - 1Ph	47.5	498	198	230	246	221	368	438
HEP207212	2-way	10	1.5	220 / 240 V - 1Ph	47.5	498	198	230	246	221	368	438
HEP207214	2-way	10	1.5	380 / 440 V - 3Ph	47.5	498	198	230	246	221	368	438
HEP207221	2-way	25	1.5	110 / 115 V - 1Ph	63.5	527	227	259	306	281	490	570
HEP207222	2-way	25	1.5	220 / 240 V - 1Ph	63.5	527	227	259	306	281	490	570
HEP207224	2-way	25	1.5	380 / 440 V - 3Ph	63.5	527	227	259	306	281	490	570
HEP207311	3-way	10	1.5	110 / 115 V - 1Ph	47.5	498	198	230	246	221	368	438
HEP207312	3-way	10	1.5	220 / 240 V - 1Ph	47.5	498	198	230	246	221	368	438
HEP207314	3-way	10	1.5	380 / 440 V - 3Ph	47.5	498	198	230	246	221	368	438
HEP207321	3-way	25	1.5	110 / 115 V - 1Ph	63.5	527	227	259	306	281	490	570
HEP207322	3-way	25	1.5	220 / 240 V - 1Ph	63.5	527	227	259	306	281	490	570
HEP207324	3-way	25	1.5	380 / 440 V - 3Ph	63.5	527	227	259	306	281	490	570
HEP207411	4-way	10	1.5	110 / 115 V - 1Ph	47.5	498	198	230	246	221	368	438
HEP207412	4-way	10	1.5	220 / 240 V - 1Ph	47.5	498	198	230	246	221	368	438
HEP207414	4-way	10	1.5	380 / 440 V - 3Ph	47.5	498	198	230	246	221	368	438
HEP207421	4-way	25	1.5	110 / 115 V - 1Ph	63.5	527	227	259	306	281	490	570
HEP207422	4-way	25	1.5	220 / 240 V - 1Ph	63.5	527	227	259	306	281	490	570
HEP207424	4-way	25	1.5	380 / 440 V - 3Ph	63.5	527	227	259	306	281	490	570

Note: For optional extras please see page 42

HEP3 - ELECTRIC DRIVEN PUMPS - GENERAL DUTY HIGH FLOW

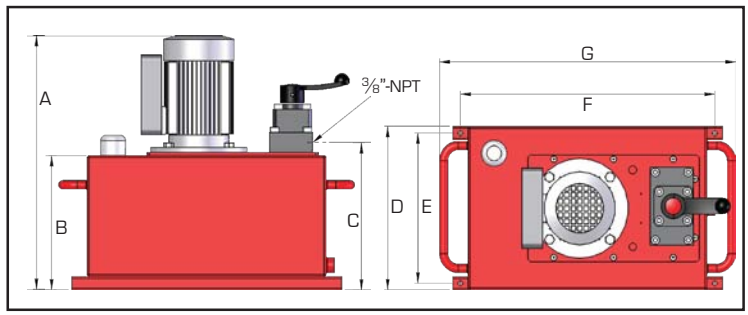


Low pressure flow rate 10 ltr/min. up to 70 Bar

High pressure flow rate 1 ltr/min. up to 700 Bar

Two stage hydraulic pump unit

- Externally adjustable pressure relief valve
- Manual valve with load holding feature fitted as standard
- Solenoid valve options available



Model number	Valve type	Oil cap. litres	Motor kW	Motor voltage	Weight kg
HEP310121	P-T Plate	25	2.2	110 / 115 V - 1Ph	63.5
HEP310122	P-T Plate	25	2.2	220 / 240 V - 1Ph	63.5
HEP310124	P-T Plate	25	2.2	380 / 440 V - 3Ph	63.5
HEP310141	P-T Plate	40	2.2	110 / 115 V - 1Ph	88.5
HEP310142	P-T Plate	40	2.2	220 / 240 V - 1Ph	88.5
HEP310144	P-T Plate	40	2.2	380 / 440 V - 3Ph	88.5
HEP310221	2-way	25	2.2	110 / 115 V - 1Ph	64.0
HEP310222	2-way	25	2.2	220 / 240 V - 1Ph	64.0
HEP310224	2-way	25	2.2	380 / 440 V - 3Ph	64.0
HEP310241	2-way	40	2.2	110 / 115 V - 1Ph	89.0
HEP310242	2-way	40	2.2	220 / 240 V - 1Ph	89.0
HEP310244	2-way	40	2.2	380 / 440 V - 3Ph	89.0
HEP310321	3-way	25	2.2	110 / 115 V - 1Ph	64.0
HEP310322	3-way	25	2.2	220 / 240 V - 1Ph	64.0
HEP310324	3-way	25	2.2	380 / 440 V - 3Ph	64.0
HEP310341	3-way	40	2.2	110 / 115 V - 1Ph	89.0
HEP310342	3-way	40	2.2	220 / 240 V - 1Ph	89.0
HEP310344	3-way	40	2.2	380 / 440 V - 3Ph	89.0
HEP310421	4-way	25	2.2	110 / 115 V - 1Ph	64.0
HEP310422	4-way	25	2.2	220 / 240 V - 1Ph	64.0
HEP310424	4-way	25	2.2	380 / 440 V - 3Ph	64.0
HEP310441	4-way	40	2.2	110 / 115 V - 1Ph	89.0
HEP310442	4-way	40	2.2	220 / 240 V - 1Ph	89.0
HEP310444	4-way	40	2.2	380 / 440 V - 3Ph	89.0

Dimensions in mm						
A	B	C	D	E	F	G
527	227	259	306	281	490	570
527	227	259	306	281	490	570
527	227	259	306	281	490	570
636	336	368	306	281	490	560
636	336	368	306	281	490	560
636	336	368	306	281	490	560
527	227	259	306	281	490	570
527	227	259	306	281	490	570
527	227	259	306	281	490	570
636	336	368	306	281	490	560
636	336	368	306	281	490	560
636	336	368	306	281	490	560
527	227	259	306	281	490	570
527	227	259	306	281	490	570
527	227	259	306	281	490	570
636	336	368	306	281	490	560
636	336	368	306	281	490	560
636	336	368	306	281	490	560
527	227	259	306	281	490	570
527	227	259	306	281	490	570
527	227	259	306	281	490	570
636	336	368	306	281	490	560
636	336	368	306	281	490	560

Note: For optional extras please see page 42

HEP5 - ELECTRIC DRIVEN PUMPS - HEAVY DUTY HIGH FLOW

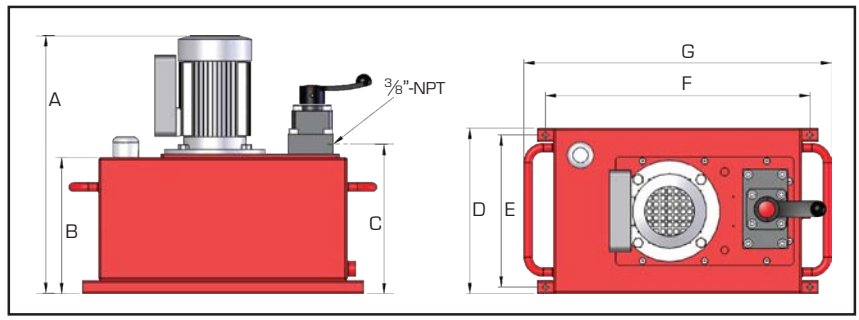


Low pressure flow rate 17 ltr/min up to 70 Bar

High pressure flow rate 2 ltr/min up to 700 Bar

Two stage hydraulic pump unit

- Manual valve with load holding feature fitted as standard
- Externally adjustable pressure relief valve
- Solenoid valve options available









Model number	Valve type	Oil cap. litres	Motor kW	Motor voltage	Weight kg
HEP517142	P-T Plate	40	2.2	220 / 240	88.5
HEP517144	P-T Plate	40	2.2	380 / 440	88.5
HEP517162	P-T Plate	60	2.2	220 / 240	120.0
HEP517164	P-T Plate	60	2.2	380 / 440	120.0
HEP517242	2-way	40	2.2	220 / 240	89.0
HEP517244	2-way	40	2.2	380 / 440	89.0
HEP517262	2-way	60	2.2	220 / 240	120.0
HEP517264	2-way	60	2.2	380 / 440	120.0
HEP517342	3-way	40	2.2	220 / 240	89.0
HEP517344	3-way	40	2.2	380 / 440	89.0
HEP517362	3-way	60	2.2	220 / 240	120.0
HEP517364	3-way	60	2.2	380 / 440	120.0
HEP517442	4-way	40	2.2	220 / 240	89.0
HEP517444	4-way	40	2.2	380 / 440	89.0
HEP517462	4-way	60	2.2	220 / 240	120.0
HEP517464	4-way	60	2.2	380 / 440	120.0

Dimensions in mm						
A	B	C	D	E	F	G
636	336	368	306	281	490	560
636	336	368	306	281	490	560
657	357	389	406	381	513	583
657	357	389	406	381	513	583
636	336	368	306	281	490	560
636	336	368	306	281	490	560
657	357	389	406	381	513	583
657	357	389	406	381	513	583
636	336	368	306	281	490	560
636	336	368	306	281	490	560
657	357	389	406	381	513	583
657	357	389	406	381	513	583
636	336	368	306	281	490	560
636	336	368	306	281	490	560
657	357	389	406	381	513	583
657	357	389	406	381	513	583

Note: For optional extras please see page 42

ACCESSORIES FOR POWERED PUMPS



Protective roll frame

Model number	For all HEP and HAP models
PPA10RF	All pumps with 10L tank
PPA25RF	All pumps with 25L tank
PPA40RF	All pumps with 40L tank
PPA60RF	All pumps with 60L tank

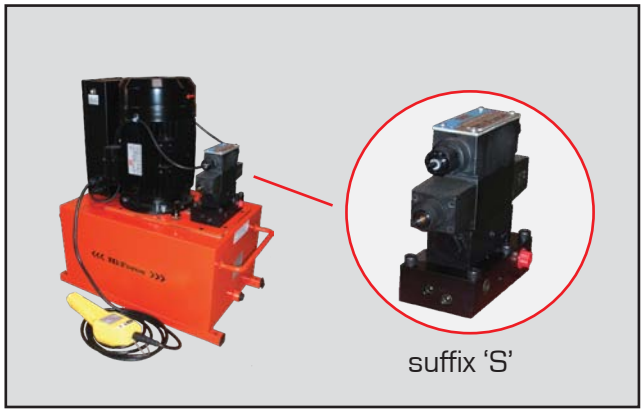
All pumps can be supplied with roll frame factory fitted.
Just suffix pump model number with 'P'.



Wheel trolley

Model number	For all HEP, HAP and HPP models
PPA40WT	Wheel trolley for all 25 and 40 litre model pumps.
PPA60WT	Wheel trolley for all 60 litre model pumps.

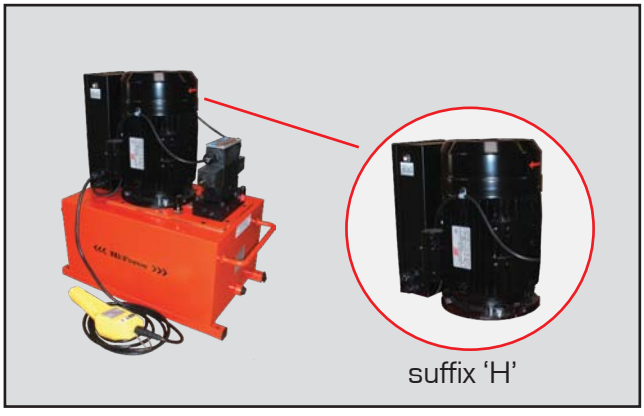
All pumps can be supplied with wheel trolley factory fitted.
Just suffix pump model number with 'WT'.



Low voltage solenoid valve with hand pendant controller

Suffix	Description
S	All HEP2, 3 and 5 series electric pumps can be supplied with low voltage (24V) solenoid valve, either in 3-way or 4-way versions, both featuring a locking feature and remote pendant control as standard

To order pump with solenoid valve,
just suffix pump model number with 'S'.



60Hz Electric Motor

Suffix	Description
H	All HEP2, 3 and 5 series electric pumps can be supplied with an electric motor suitable for 60 Hz.

To order pump with 60Hz motor,
just suffix pump model number with 'H'.

HSP - ELECTRIC DRIVEN SPLIT FLOW MULTI-OUTLET PUMPS



HSP44E104

- Working pressure 700 Bar
- Multiple outlet valve options
- Precise control to achieve synchronised lift

The HSP range of electric driven, split flow, hydraulic pumps is designed to deliver equal volumes of oil from each individual control valve regardless of any variations in the hydraulic pressure. The range offers a selection of outlet valve configurations ranging from a 2-outlet model with manually operated directional control valves, through to a 12-outlet model with electric solenoid operated valves. Each valve outlet is connected directly to an independent internal piston pump which is driven by a common electric motive force. This technology allows each internal piston pump to deliver an equal amount of oil flow per minute regardless of any variations in the required operating pressure at each control valve outlet. With HSP split flow pumps lifting and positioning large, unevenly weighted loads using multiple jacking points in a synchronised, level lift and controlled manner is easily achievable. Individual control of each valve on all electric valve versions, is via a specially made electric control box with easily identifiable on/off switches for each applicable valve plus a synchronised lift control button for all of the selected control valves. There is also a remote hand pendant control system supplied which can easily be wired to the pump mounted control box. Model HSP24M54 is fitted with two pump mounted, manually operated 4-way valves, which can easily be activated by a single operator. Maximum working pressure of all HSP pumps is 700 Bar with an externally adjustable pressure relief valve for easy pressure adjustment between 70 and 700 Bar. Electric motors are 380/440 volt three phase operation and individual oil outlet flows range from 0.6 to 1.8 litres per minute. A full range of system components is available and detailed on pages 49 to 56.

Model number	Valve configuration	Valve type	Oil Capacity Litres	Oil flow per outlet l/min	Motor voltage	Weight kg
Version with manual control valve						
HSP24M54	2 x 4-way	manual	50	0.9	380 / 440	178
Versions with low voltage (24 V) control valve, control box and pendant						
HSP24E54	2 x 4-way	electric	50	0.9	380 / 440	180
HSP34E104	3 x 4-way	electric	100	1.8	380 / 440	335
HSP44E104	4 x 4-way	electric	100	1.1	380 / 440	274
HSP64E104	6 x 4-way	electric	100	0.9	380 / 440	335
HSP84E104	8 x 4-way	electric	150	0.9	380 / 440	370
HSP104E104	10 x 4-way	electric	200	0.7	380 / 440	414
HSP124E104	12 x 4-way	electric	240	0.6	380 / 440	460

Note: 3-way valve options available on request

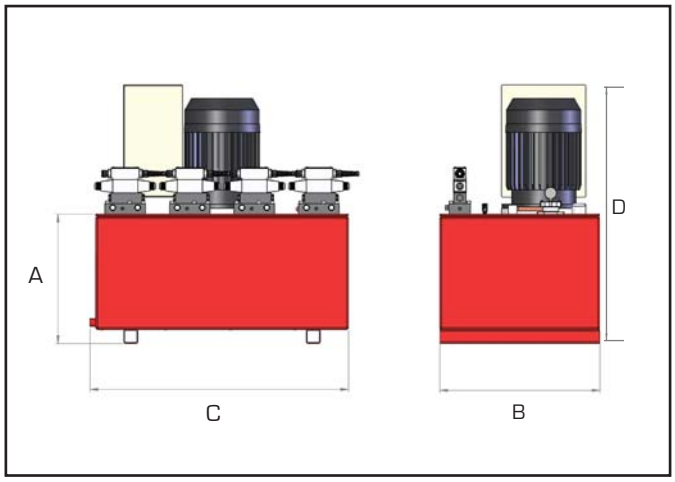
HSP - ELECTRIC DRIVEN SPLIT FLOW PUMPS

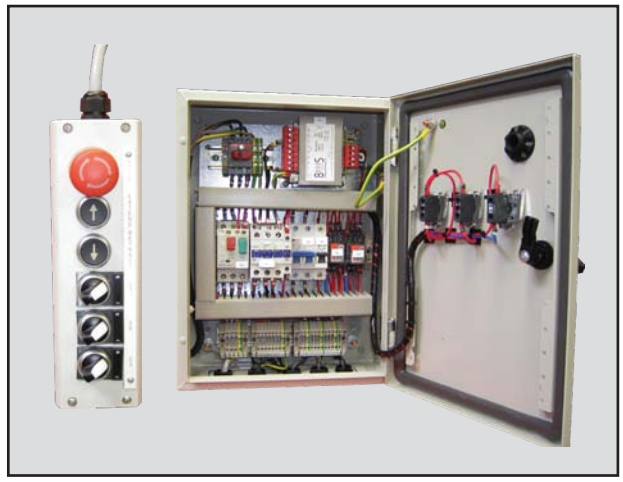


- Choice of manual or electric valve options
- Reservoir capacity 50 or 100 litres
- Consistent single speed flow rate

- Working pressure 700 Bar
- Equal output flow regardless of pressure
- Control panel with selector switches for each individual outlet, allowing for single or multiple (synchronised) operation
- Externally adjustable pressure relief valve for control of maximum system pressure

Hi-Force HSP series split flow pumps fitted with low voltage solenoid valves are complete with a low voltage control system, which allows the user to individually or simultaneously control each valve and the movement of the lifting cylinder pistons. Once the load is correctly supported, by the selected cylinder pistons, the synchronised lift operation can commence. The operation of the HSP Pump Unit can be entirely controlled form the remote control panel, which features individual valve on/off switches and a set of cylinder piston lift and lower buttons that can be individually selected for inclusion in the lift operation.





Model number	Oil capacity Litres	Dimensions in mm A	B	C	D
HSP24M54	50	460	570	500	817
HSP24E54	50	460	570	500	817
HSP34E104	100	460	570	920	920
HSP44E104	100	460	570	920	920
HSP64E104	100	470	800	750	920
HSP84E104	150	470	800	1010	1085
HSP104E104	200	470	800	1270	1085
HSP124E104	240	470	800	1530	1085

AHP11 - AIR DRIVEN SINGLE STAGE HAND OR FOOT OPERATED PUMPS



Working pressure 700 Bar

Operates from standard 7 Bar air supply

Compact, lightweight & powerful

The AHP11 single stage air powered hydraulic pump range provides an economical, portable alternative to manually operated hydraulic pumps. Designed to operate from a standard 7 Bar compressed air supply, these versatile compact pumps are ideally suited for use with Hi-Force hydraulic cylinders and tools in maintenance and construction applications. The ergonomically designed pump treadle can be operated by hand or foot for better versatility. With a choice of reservoir capacities, all models are supplied pre-filled with hydraulic oil ready for immediate use. A full range of system components suitable for use with AHP11 series pumps is detailed on pages 49 - 56.

- Choice of 2-way or 4-way control valves
- Internal safety overload valve
- Reservoir oil sight level gauge
- Standard oil reservoir capacities up to 10 litres



OPTIONAL REMOTE PENDANT:

Please suffix model number with 'R' for remote pendant options to suit AHP1120, AHP1121 and AHP1122.





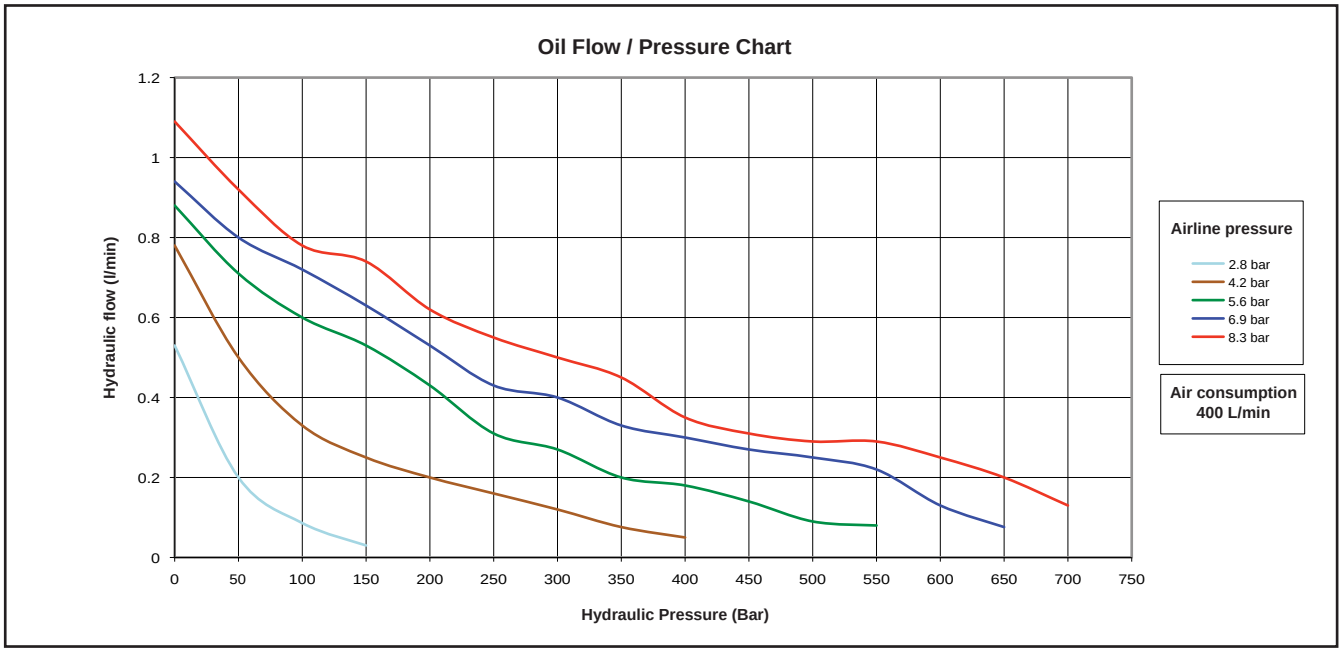
Filter, regulator & lubricator units for use in combination with air driven pump units are also available.
Please see page 86 for more details.

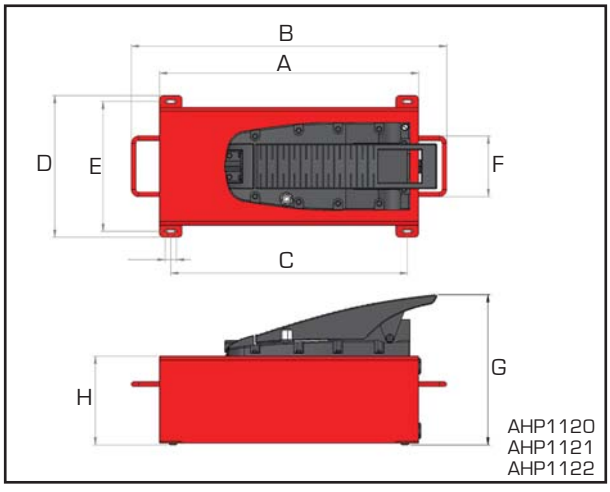
Model number	Maximum pressure bar	Maximum flow rate l/min	Valve type	Usable oil capacity litres	Air inlet connection G	Oil outlet connection NPTF	Weight kg
AHP1120	700	0.8	2-way	2.4	1/4"	3/8"	4.7
AHP1121	700	0.8	2-way	5.0	1/4"	3/8"	9.0
AHP1122	700	0.8	2-way	10.0	1/4"	3/8"	17.8
AHP1141	700	0.8	4-way	5.0	1/4"	3/8"	9.5
AHP1142	700	0.8	4-way	10.0	1/4"	3/8"	18.3

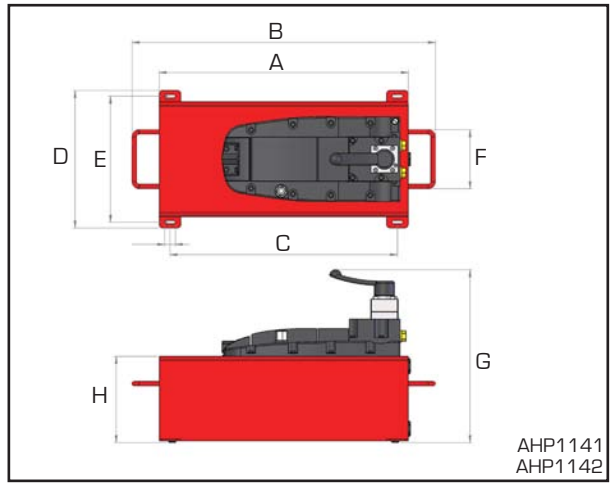
AHP11 - AIR DRIVEN SINGLE STAGE HAND OR FOOT OPERATED PUMPS



- Working pressure 700 Bar
- Operates from standard 7 Bar air supply
- Compact, lightweight & powerful







Model number	Dimensions in mm							
	A	B	C	D	E	F	G	H
AHP1120	365	*	237	157	66-90	*	210	125
AHP1121	420	*	380	240	220	*	223	114
AHP1122	464	560	*	210	*	108	274	158
AHP1141	420	*	380	240	220	*	265	114
AHP1142	464	560	*	210	*	*	315	158

* Not applicable

HAP - AIR DRIVEN PUMPS - GENERAL DUTY HIGH FLOW



HAP21026

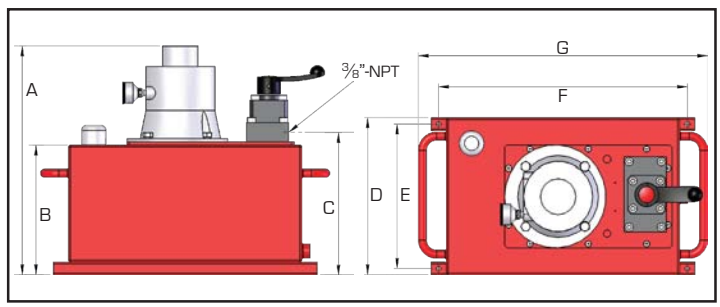
Low pressure flow rate 10 litres/min up to 70 Bar

High pressure flow rate 1.3 litres/min

Working pressure 700 Bar

The HAP two stage air powered hydraulic pump range offers a low pressure flow of 10 litres/min with automatic changeover to 700 Bar high pressure flow rate of 1.3 litres/min. Driven by a powerful 3 kW rotary air motor with a maximum air consumption of 2.4m^3 per minute at 7 Bar inlet air pressure, the HAP range offers a choice of pump mounted or remote control valves (page 55) and oil reservoirs all fitted with filler and drain plugs. A full range of system components suitable for use with HAP pump units is detailed on pages 49 - 56.

- Two stage hydraulic pump unit
- Powerful air motor
- Externally adjustable pressure relief valve
- Choice of control valves
- Manual valve with load holding feature fitted as standard



Model number	Valve type	Oil cap. litres	Motor kW	Weight kg
HAP21011	P-T Plate	10	3.0	41.5
HAP21012	P-T Plate	25	3.0	57.5
HAP21014	P-T Plate	40	3.0	71.5
HAP21016	P-T Plate	60	3.0	96.5
HAP21021	2-way	10	3.0	42.0
HAP21022	2-way	25	3.0	58.0
HAP21024	2-way	40	3.0	72.0
HAP21026	2-way	60	3.0	97.0
HAP21031	3-way	10	3.0	42.0
HAP21032	3-way	25	3.0	58.0
HAP21034	3-way	40	3.0	72.0
HAP21036	3-way	60	3.0	97.0
HAP21041	4-way	10	3.0	42.0
HAP21042	4-way	25	3.0	58.0
HAP21044	4-way	40	3.0	72.0
HAP21046	4-way	60	3.0	97.0

Dimensions in mm						
A	B	C	D	E	F	G
393	198	230	246	221	368	438
422	227	259	306	281	490	570
531	336	368	306	281	490	560
552	357	389	406	381	513	583
393	198	230	246	221	368	438
422	227	259	306	281	490	570
531	336	368	306	281	490	560
552	357	389	406	381	513	583
393	198	230	246	221	368	438
422	227	259	306	281	490	570
531	336	368	306	281	490	560
552	357	389	406	381	513	583
393	198	230	246	221	368	438
422	227	259	306	281	490	570
531	336	368	306	281	490	560
552	357	389	406	381	513	583

Note: For optional extras, please see page 42

HPP - PETROL ENGINE DRIVEN PUMPS - GENERAL DUTY HIGH FLOW


HPP21044

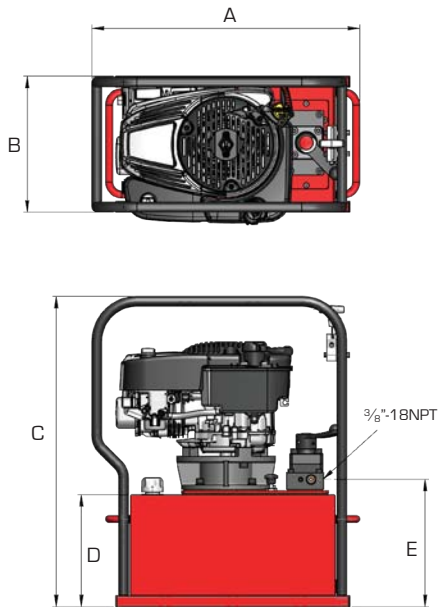
Low pressure flow rate 10 litres/min up to 70 Bar

High pressure flow rate 1.3 litres/min

Working pressure 700 Bar

The HPP range of two stage petrol engine driven hydraulic pumps is ideally suited for applications in locations where there is no electricity or compressed air supply available. The range has similar reservoir and valve options (excluding solenoid valves) as electric and air powered pumps. All models are 700 Bar maximum working pressure and offer a low pressure flow rate of 10 litres/min with automatic changeover to a high pressure flow rate of 1.3 litres/min. Powered by a 3.35 kW rated four stroke engine, the HPP range provides reliable, independent hydraulic power. All models are fitted with a protective roll bar carrying frame for easy transportation and handling. A full range of system components suitable for use with HPP pumps is detailed on pages 49 - 56.

- Two stage hydraulic pump unit
- Powerful 3.35 kW four stroke petrol engine
- Externally adjustable pressure relief valve
- Roll bar protection frame included
- Manual valve with load holding feature fitted as standard



Model number	Valve type	Oil cap. litres	Motor kW	Weight kg	Dimensions in mm A	B	C	D	E
HPP21012	P-T Plate	25	3.35	70.5	570	306	686	227	259
HPP21014	P-T Plate	40	3.35	85.5	570	306	795	336	368
HPP21016	P-T Plate	60	3.35	113.5	583	406	816	357	389
HPP21022	2-way	25	3.35	71.0	570	306	686	227	259
HPP21024	2-way	40	3.35	86.0	570	306	795	336	368
HPP21026	2-way	60	3.35	114.0	583	406	816	357	389
HPP21032	3-way	25	3.35	71.0	570	306	686	227	259
HPP21034	3-way	40	3.35	86.0	570	306	795	336	368
HPP21036	3-way	60	3.35	114.0	583	406	816	357	389
HPP21042	4-way	25	3.35	71.0	570	306	686	227	259
HPP21044	4-way	40	3.35	86.0	570	306	795	336	368
HPP21046	4-way	60	3.35	114.0	583	406	816	357	389

Hi-Force®

SYSTEM COMPONENTS

Hydraulic Hoses	High pressure hydraulic hoses	Pages 50 - 51
Hydraulic Oil	Premium grade hydraulic oil	Page 51
Pressure Gauges	Pressure gauges and gauge mounting blocks	Page 52
Manifolds	Distribution blocks, controlled manifolds and manifold stations with pressure gauges	Page 53
Couplers & Fittings	High pressure couplers, fittings and adaptors	Page 54
Control Valves	Directional and flow control valves	Pages 55 - 56

D









HIGH PRESSURE HYDRAULIC HOSES - BLACK


HC2

Working pressure 700 Bar

4:1 Factor of safety

Special lengths available on request

D

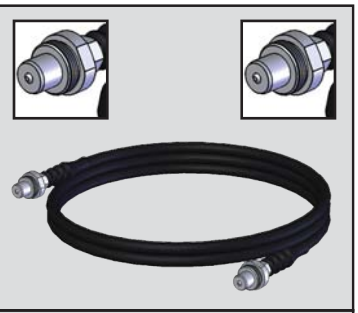
Hi-Force high pressure hydraulic hoses provide the vital, high quality, safe connection for your hydraulic equipment. Available in black and red and supplied complete with an ergonomically designed protective strain reliever at both ends, Hi-Force high pressure hoses are suitable for working pressures up to 700 Bar with a 4 : 1 factor of safety.

Tip for double acting systems ...

By using black hoses for the advance lines and red hoses (see next page) for the retract lines, identification is made easy and the possibility of incorrectly connected hoses is reduced.

Hose bore is 6.6mm and outside diameter is 12.7mm for all models:





Length Metres	No couplers 3/8" - 18 NPT male fittings both ends	3/8"- 18 NPT male fitting one end with CM1 coupler fitted one end	CM1 male couplers fitted both ends
0.5	HH0.5	HC0.5	HC0.5C
1.0	HH1	HC1	HC1C
2.0	HH2	HC2	HC2C
3.0	HH3	HC3	HC3C
4.0	HH4	HC4	HC4C
5.0	HH5	HC5	HC5C
6.0	HH6	HC6	HC6C
10.0	HH10	HC10	HC10C
12.0	HH12	HC12	HC12C
15.0	HH15	HC15	HC15C
20.0	HH20	HC20	HC20C
25.0	HH25	HC25	HC25C
30.0	HH30	HC30	HC30C

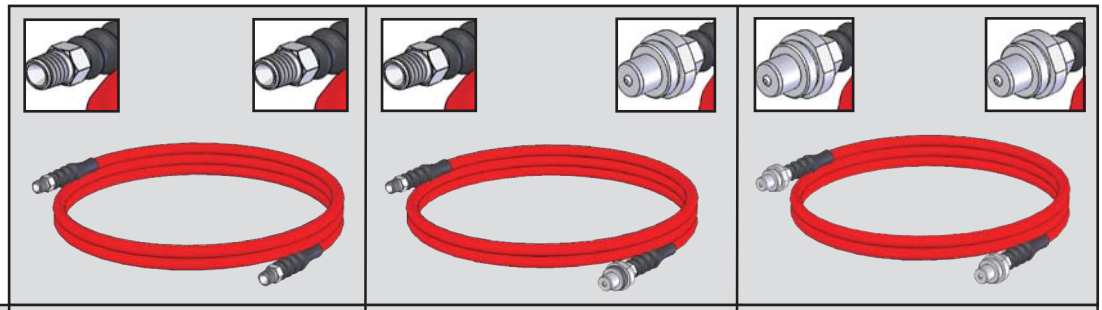
HIGH PRESSURE HYDRAULIC HOSES - RED


HC10R

- Choice of hose end combinations
- Hand grip protective strain relievers
- Plastic protective end caps included

D

Hose bore is 6.6mm and outside diameter is 12.7mm for all models:



Length Metres	No couplers 3/8" - 18 NPT male fittings both ends	3/8"- 18 NPT male fitting one end with CM1 coupler fitted one end	CM1 male couplers fitted both ends
0.5	HH0.5R	HC0.5R	HC0.5CR
1.0	HH1R	HC1R	HC1CR
2.0	HH2R	HC2R	HC2CR
3.0	HH3R	HC3R	HC3CR
4.0	HH4R	HC4R	HC4CR
5.0	HH5R	HC5R	HC5CR
6.0	HH6R	HC6R	HC6CR
10.0	HH10R	HC10R	HC10CR
12.0	HH12R	HC12R	HC12CR
15.0	HH15R	HC15R	HC15CR
20.0	HH20R	HC20R	HC20CR
25.0	HH25R	HC25R	HC25CR
30.0	HH30R	HC30R	HC30CR

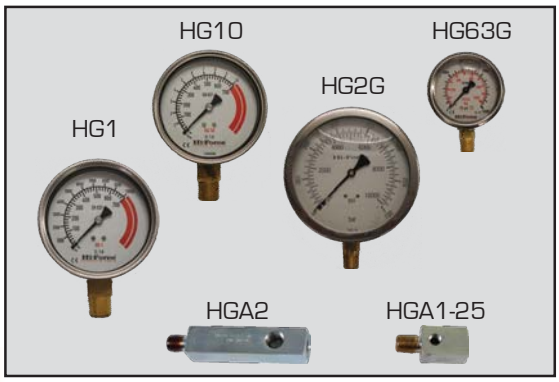
HYDRAULIC OIL


HF046-5 HF032-1

Hi-Force premium grade hydraulic oil is specially formulated for use with Hi-Force hydraulic tools, providing optimum performance throughout all working conditions.

Model number	Capacity litres	For use with
HF032-1	1	Manually operated pumps
HF032-5	5	Manually operated pumps
HF032-25	25	Manually operated pumps
HF046-1	1	Powered pumps
HF046-5	5	Powered pumps
HF046-25	25	Powered pumps

PRESSURE GAUGES & GAUGE MOUNTING BLOCKS



- Clear precise dual scale readings
- Manufactured to EN837-1
- Calibration certificates on request

D

Hi-Force hydraulic pressure gauges are your "window" to the system and are recommended for use within all hydraulic systems to allow the user to constantly monitor the system pressure. Hi-Force hydraulic pressure gauges are manufactured to EN837-1 and are accurate to +/- 1% of full scale. Standard range models up to 109 tonnes are featured in this catalogue, however gauges to suit Hi-Force high tonnage cylinders & digital pressure gauges are available on request. Always specify Hi-Force pressure gauges for use with your Hi-Force hydraulic tools.

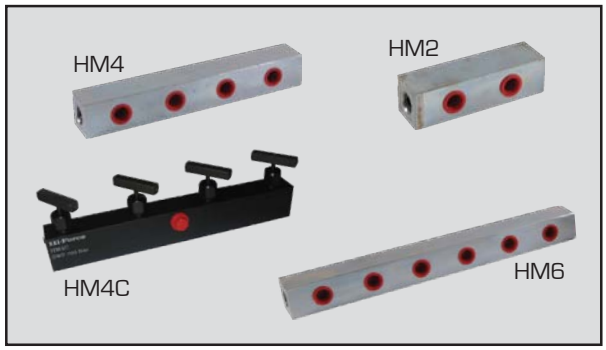
Gauges :

Model number	Gauge diameter mm	Gauge type	Reading Inner scale	Reading Outer scale	Inlet thread	Compatible Hi-Force cylinders	Weight kg
HG63G	63	glycerine	0-1.000 Bar	0-15.000 Psi	¼"-18NPT	All models	0.2
HG1	100	dry	0-700 Bar	0-10.000 Psi	½"-14NPT	All models	0.9
HG1G	100	glycerine	0-700 Bar	0-10.000 Psi	½"-14NPT	All models	1.0
HG5	100	dry	0-700 Bar	0-4.5 tonnes	½"-14NPT	All 4.5 tonnes models	0.9
HG10	100	dry	0-700 Bar	0-10 tonnes	½"-14NPT	All 10 tonnes models	0.9
HG11	100	dry	0-700 Bar	0-11 tonnes	½"-14NPT	All 11 tonnes models	0.9
HG20	100	dry	0-700 Bar	0-20 tonnes	½"-14NPT	All 20 tonnes models	0.9
HG23	100	dry	0-700 Bar	0-23 tonnes	½"-14NPT	All 23 tonnes models	0.9
HG25	100	dry	0-700 Bar	0-25 tonnes	½"-14NPT	All 25 tonnes models	0.9
HG32	100	dry	0-700 Bar	0-32 tonnes	½"-14NPT	All 32 tonnes models	0.9
HG33	100	dry	0-700 Bar	0-33 tonnes	½"-14NPT	All 33 tonnes models	0.9
HG50	100	dry	0-700 Bar	0-50 tonnes	½"-14NPT	All 50 tonnes models	0.9
HG61	100	dry	0-700 Bar	0-61 tonnes	½"-14NPT	All 61 tonnes models	0.9
HG102	100	dry	0-700 Bar	0-102 tonnes	½"-14NPT	All 102 tonnes models	0.9
HG109	100	dry	0-700 Bar	0-109 tonnes	½"-14NPT	All 109 tonnes models	0.9
HG2	150	dry	0-700 Bar	0-10.000 Psi	½"-14NPT	All models	1.6
HG2G	150	glycerine	0-700 Bar	0-10.000 Psi	½"-14NPT	All models	1.7

Gauge mounting blocks :

	Dimensions						
Model number	Length mm	Width mm	Height mm	Gauge thread	Inlet thread	Outlet thread	Weight kg
HGA1	75	32	32	½"-14NPT	⅜"-18NPT male	⅜"-18NPT female	0.25
HGA2	170	32	32	½"-14NPT	⅜"-18NPT male	⅜"-18NPT female	0.85
HGA1-25	75	32	32	¼"-18NPT	⅜"-18NPT male	⅜"-18NPT female	0.30
HGA2-25	170	32	32	¼"-18NPT	⅜"-18NPT male	⅜"-18NPT female	0.90

MANIFOLDS

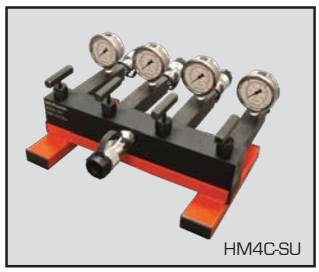


Working pressure 700 Bar

Choice of open or controlled manifolds

2, 4, 5, 6 or 8 outlet port models available

Hi-Force manifolds are designed specifically to allow easy control of the direction of flow of the hydraulic fluid within the system. Supplied either as open manifold blocks or with individual needle type shut off/throttle valves on each 3/8" NPT outlet, Hi-Force manifolds provide even greater versatility in your hydraulic system. The range offers 9 models with a choice of up to 8 outlets per manifold and all models are suitable for 700 Bar maximum working pressure.

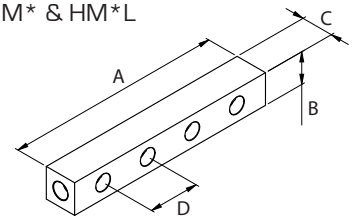

HM4C-SU

Model no.	Description
HM4C-SU	4-Way controlled manifold unit, suitable for single acting systems. Supplied complete with four pressure gauges, reading 0-700 Bar, female coupler on inlet port and four female couplers on outlet ports. All mounted on a sturdy framework.

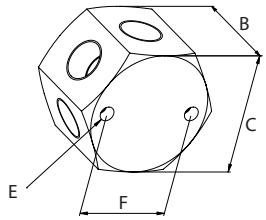

HM4C-DU

Model no.	Description
HM4C-DU	4-Way controlled manifold unit, suitable for double acting systems. Supplied complete with four pressure gauges, reading 0-700 Bar, female coupler on inlet port and four female couplers on outlet ports. Also included is a 4-way open manifold for return flow, again with female couplers on inlet and outlet ports. All mounted on a sturdy framework.

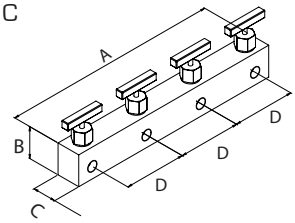
HM* & HM*L



HM5



HM*C



Model number	Type	Design	Number of outlets	Female Threads Inlet	Female Threads Outlet	Weight kg	Dimensions in mm A	B	C	D	E	F
HM2	manifold	parallel	2	3/8"-18NPT	2 x 3/8"-18NPT	1.0	114	32	32	50	-	-
HM4	manifold	parallel	4	3/8"-18NPT	4 x 3/8"-18NPT	1.5	214	32	32	50	-	-
HM5	manifold	hexagon	5	3/8"-18NPT	5 x 3/8"-18NPT	0.7	-	41	51	-	M6	38
HM6	manifold	parallel	6	3/8"-18NPT	6 x 3/8"-18NPT	2.0	314	32	32	50	-	-
HM8	manifold	parallel	8	3/8"-18NPT	8 x 3/8"-18NPT	2.5	414	32	32	50	-	-
HM4L	manifold	extended parallel	4	3/8"-18NPT	4 x 3/8"-18NPT	2.4	394	32	32	110	-	-
HM6L	manifold	extended parallel	6	3/8"-18NPT	6 x 3/8"-18NPT	3.7	614	32	32	110	-	-
HM2C	controlled manifold	parallel	2	3/8"-18NPT	2 x 3/8"-18NPT	2.0	150	51	38	100	-	-
HM4C	controlled manifold	parallel	4	3/8"-18NPT	4 x 3/8"-18NPT	3.5	350	51	38	100	-	-

HIGH PRESSURE COUPLERS AND FITTINGS

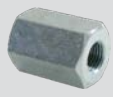
Hi-Force high pressure couplers and fittings are designed for easy system connection and assembly of your Hi-Force hydraulic equipment. All Hi-Force couplers and fittings are suitable for 700 Bar maximum working pressure. Hi-Force recommends the use of threaded dust caps with quick connect couplers to protect the thread of the coupler and at the same time prevent any contaminants entering your hydraulic system. Always specify Hi-Force couplers and fittings for use with your Hi-Force hydraulic tools.

1 

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Safety first !

Be sure to use genuine Hi-Force couplers and fittings which are designed to withstand the full 700 Bar working pressure.

Large selection of standard adaptors

Working pressure 700 Bar

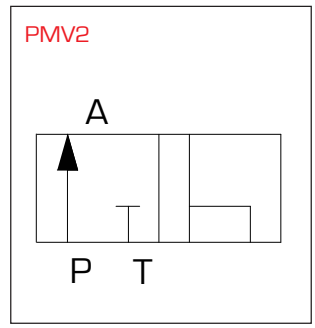
Model number	See picture	Description	Thread specification
HF7	1	Nipple	¼" NPT male to ¼" NPT male
HF8	5	Adaptor	¼" NPT female to ¼" NPT female
HF10	2	Elbow	⅜" NPT female to ⅜" NPT female
HF12	3	Equal tee	⅜" NPT female
HF13	4	Cross	⅜" NPT female
HF14	5	Adaptor	⅜" NPT female to ⅜" NPT female
HF15	5	Reducer	⅜" NPT female to ¼" NPT female
HF16	6	Elbow	⅜" NPT female to ⅜" NPT male
HF17	1	Nipple	⅜" NPT male to ⅜" NPT male
HF19	1	Long nipple	⅜" NPT male to ⅜" NPT male
HF24	7	Adaptor	⅜" NPT male to ⅜" BSP female
HF27	1	Nipple	¼" NPT male to ⅜" NPT male
HF30	7	Reducer	⅜" NPT male to ¼" NPT female
HF31	8	Tee	⅜" NPT female to ⅜" NPT male
HF33	7	Reducer	⅜" NPT male to ¼" BSPT female
HF55	7	Reducer	⅜" NPT female to ¼" NPT male
HF69	7	Adaptor	½" BSP male to ⅜" NPT female
CF1	9	Female coupler	⅜" NPT male
CM1	10	Male coupler	⅜" NPT female
CMF1	9 + 10	Complete coupler	⅜" NPT
CF2	9	Female coupler	¼" NPT male
CM2	10	Male coupler	¼" NPT female
CMF2	9 + 10	Complete coupler	¼" NPT
CFD1	11	Metal dust cap for CF1	
CMD1	12	Metal dust cap for CM1	
CFD2	11	Metal dust cap for CF2	
CMD2	12	Metal dust cap for CM2	
PPC1	13	Moulded universal dust cap to suit CF1 & CM1	

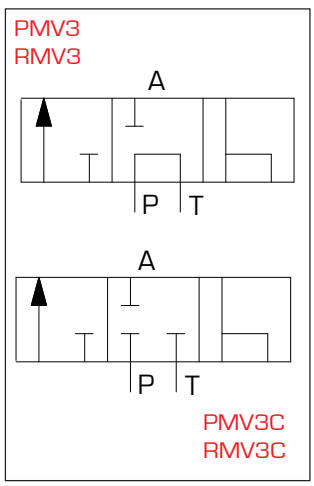
DIRECTIONAL CONTROL VALVES

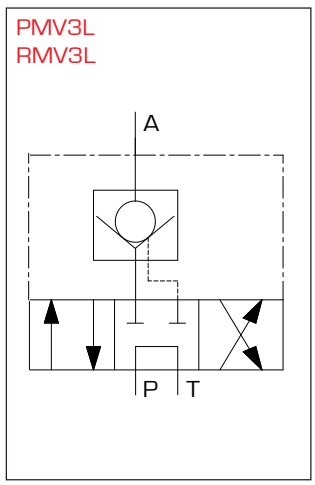


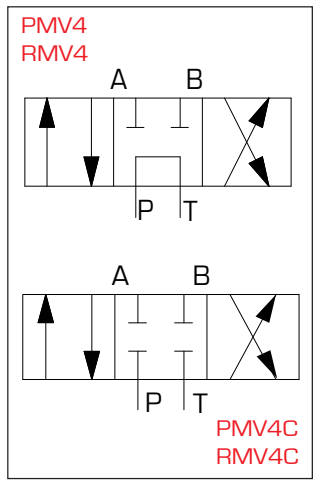
- Working pressure 700 Bar
- Pump or remote mounted design
- Manual or solenoid options available

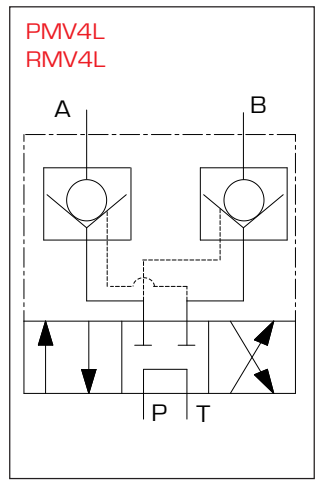
Hi-Force control valves are designed to provide precise control of the hydraulic system either by accurate pressure or directional flow control. The PMV range of pump mounted valves is identical to the valves fitted to the Hi-Force powered pumps featured on pages 39-41, 43-44, 47, 48 and can be easily interchanged, making your powered pump even more versatile. The RMV range allows for remote mounting away from the pump. Always specify Hi-Force control valves for use with your Hi-Force hydraulic tools. Flow control values are featured on the next page.







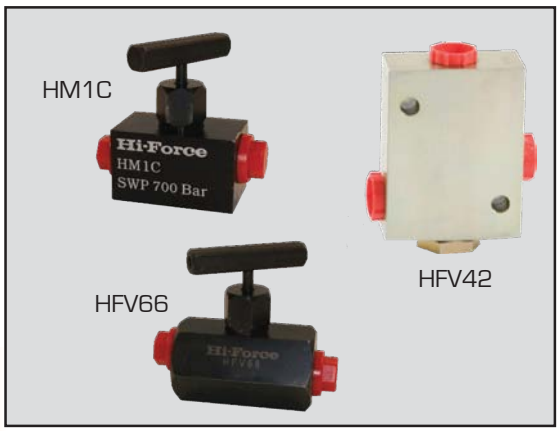




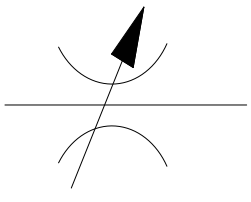
Directional control valves :

Description	Model number Manual valve no load holding	Manual valve with load holding	Solenoid valve 24V incl. control	Manual valve closed centre
Pump mounted, 2-way, 2 position valve	**PMV2**	-	-	-
Pump mounted, 3-way, 3 position valve	**PMV3**	**PMV3L**	**PMV3S**	**PMV3C**
Pump mounted, 4-way, 3 position valve	**PMV4**	**PMV4L**	**PMV4S**	**PMV4C**
Remote mounted, 3-way, 3 position valve	**RMV3**	**RMV3L**	**RMV3S**	**RMV3C**
Remote mounted, 4-way, 3 position valve	**RMV4**	**RMV4L**	**RMV4S**	**RMV4C**

FLOW CONTROL VALVES

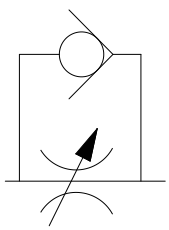


- Working pressure 700 Bar
- 3/8" 18 NPT connections
- Ensures system safety and control


HM1C

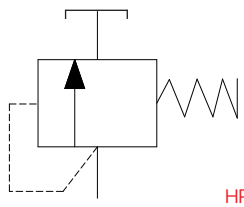
Manual shut off valve with needle type flow control. Used for load holding and throttling functions. Can also be used as a gauge isolator.

	Dimensions in mm		
Model Number	Height	Length	Width
HM1C	82	64	38


HFV66

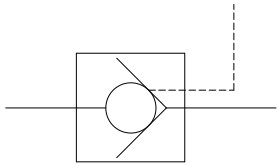
Manual check valve used for automatic load locking, with precise manual load lowering feature.

	Dimensions in mm		
Model Number	Height	Length	Width
HFV66	86	75	47


HPV152

Adjustable pressure relief valve, for pressure setting from 55 to 700 Bar. Supplied complete with return line hose.

	Dimensions in mm		
Model Number	Height	Length	Width
HPV152	102	64	32


HFV42

Pilot operated check valve used as a safety valve for double acting cylinders. Pilot port connects to cylinder retract line.

	Dimensions in mm		
Model Number	Height	Length	Width
HFV42	84	64	32

JACKS

JAH Range	Aluminium jacks Plain piston, claw jacks and locking ring design	Page 58
JAS Range	Aluminium jacks Compact multi-purpose design	Page 58
JCS Range	Steel & aluminium jacks Compact low height design	Page 59
JCH Range	Steel & aluminium jacks Compact low height hollow piston design	Page 59
JSS Range	Steel jacks Conventional bottle jack design	Page 60
HCJ Range	Steel jacks Combination head and toe lift design	Page 60
HMJ Range	Steel jacks Low height access machine lift design	Page 61

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JAH & JAS - ALUMINIUM JACKS



Capacities from 10 to 60 tonnes

Stroke lengths from 75 to 305mm

Internal safety overload device

The JAH and JAS ranges of lightweight aluminium jacks offers a wide variety of capacities and lift height options. Available as either plain ram lifting jacks, with or without "failsafe" mechanical lock ring, or optional low height claw lifting design, all models are constructed predominantly of lightweight aluminium alloy with all critical functioning parts manufactured from high quality steel. Used extensively in maintenance, construction, heavy plant and machinery applications, these high quality jacks are the proven industry standard.

- Lightweight construction
- Stroke limiting device
- Available as plain ram jack, claw jack or "failsafe" locking ring design

Model number	Jack capacity tonnes	Claw capacity tonnes	Stroke mm	Weight kg	Dimensions in mm Closed height	Toe height	Base length	Base width
Jack with plain piston								
JAS103	10	-	75	4.3	131	-	162	75
JAS105	10	-	125	5.7	181	-	162	75
JAH620	20	-	152	11	263	-	178	121
JAH1220	20	-	305	17	438	-	246	121
JAH630	30	-	152	16	263	-	203	140
JAH1230	30	-	305	24	451	-	273	140
JAH660	60	-	152	28	293	-	251	190
JAH1260	60	-	305	44	500	-	342	190
Jack with plain piston & lifting claw & with extended base								
JAH620C	20	8	152	15	280	67	246	121
JAH1220C	20	8	305	23	456	67	246	121
JAH630C	30	12	152	21	281	73	273	140
JAH1230C	30	12	305	32	472	73	273	140
JAH660C	60	24	152	44	327	73	342	190
JAH1260C	60	24	305	65	540	73	342	190
Jack with "failsafe" locking ring								
JAH620SR	20	-	152	13	289	-	178	121
JAH1220SR	20	-	305	19	464	-	246	121
JAH630SR	30	-	152	17	292	-	203	140
JAH1230SR	30	-	305	25	479	-	273	140
JAH660SR	60	-	152	30	330	-	251	190
JAH1260SR	60	-	305	46	536	-	342	190

Note: JAS103 and JAS105 feature spring assisted piston retraction.

JCS - COMPACT JACKS - SOLID PISTON



Capacities from 10 to 30 tonnes

Operate in any position

Lightweight and compact

The Hi-Force JCS range of compact jacks is ideally suited for applications requiring a lifting or positioning force in confined spaces. Lightweight, easy to operate and manufactured from high grade steel (JCS10) and aluminium (JCS20 & JCS30), all models incorporate a spring assisted return, wear coated piston. The pumping mechanism rotates through 360° providing maximum versatility in any application. With the removable operating handle measuring only 240mm in length, these compact lifting jacks will fit in any toolbox.

- Spring assisted return piston
- Multi-position pump mechanism
- Internal safety overload valve
- Nitrocarburised piston rod
- Sealed hydraulic system

Model number	Capacity tonnes	Material	Stroke mm	Weight kg	Dimensions in mm Length	Closed Height	Piston Dia.	Max handle height	Width
JCS10	10	Steel	35	4.5	240	76	38	266	70
JCS20	20	Aluminium	41	5.5	257	102	51	281	101.5
JCS30	30	Aluminium	45	8.0	281	112	60	285	125

JCH - COMPACT JACKS - HOLLOW PISTON



Capacity of 13 and 21 tonnes

Operate in any position

Lightweight and compact

The JCH range of compact jacks is of similar design to the JCS range detailed above, however JCH models feature a hollow piston design for even greater versatility. Suitable for use in tooling, maintenance and tensioning applications, the hollow piston centre hole design allows a rod or cable to be passed through the jack for applications where a pulling force is required. With many common parts to the JCS range these multi-purpose JCH jacks can also be used for general lifting applications.

Model number	Capacity tonnes	Material	Stroke mm	Weight kg	Dimensions in mm Length	Closed Height	Piston Dia.	Max handle height	Centre Hole	Width
JCH13	13	Aluminium	41	5.5	257	95	51	281	25	101.5
JCH21	21	Aluminium	45	8.0	281	114	60	285	35	125

JSS - STEEL BOTTLE JACKS



- Capacities from 3 to 100 tonnes
- Strong rigid steel construction
- Suitable for industrial and automotive use

The Hi-Force JSS range of steel bottle jacks offers capacities from 3 to 100 tonnes, with stroke lengths from 135 to 195mm. Models up to 16 tonnes capacity feature a screw extension to span the gap between the piston ram cap and the load. All models are supplied with a tubular operating lever.

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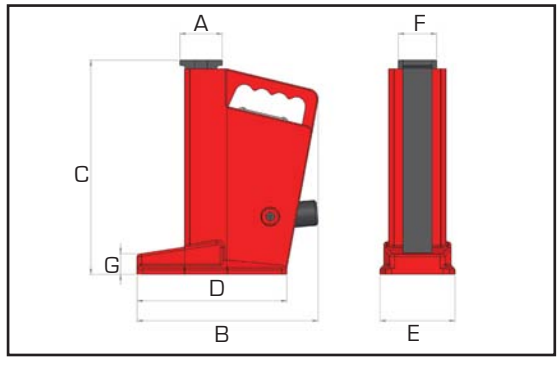
Model number	Capacity tonnes	Stroke mm	Screw extension mm	Weight kg	Dimensions in mm Closed height	Piston diameter	Base length	Base width
JSS35	3	135	70	3.0	195	28	100	100
JSS55	5	135	90	4.0	200	32	110	115
JSS106	10	174	90	7.0	243	43	135	130
JSS166	16	178	95	10.0	255	53	160	150
JSS207	20	190	-	15.0	280	56	127	165
JSS327	32	190	-	22.0	285	71	152	190
JSS507	50	195	-	32.0	300	85	177	217
JSS1007	100	195	-	69.0	340	117	265	240

HCJ - STEEL TOE JACK



- Capacity 5 tonnes
- Strong rigid steel construction
- Toe guided over full stroke length

The Hi-Force HCJ5 toe jack offers a full 5 tonnes capacity either on the piston head or the fully integrated toe. The low height toe is guided over the full stroke length of the jack, reducing the effects of side loading. The piston is enclosed within the toe and is not exposed during operation. These features make the HCJ5 a truly multi-purpose jack which can easily and safely be used in the most difficult conditions, including underground mining applications.



Model number	Jack capacity tonnes	Toe capacity tonnes	Stroke mm	Weight kg	Dimensions in mm A	B	C	D	E	F	G
HCJ5	5	5	175	18	64	255	327	219	114	57	41

HMJ - STEEL MACHINE LIFT JACKS



Capacities of 10 and 25 tonnes

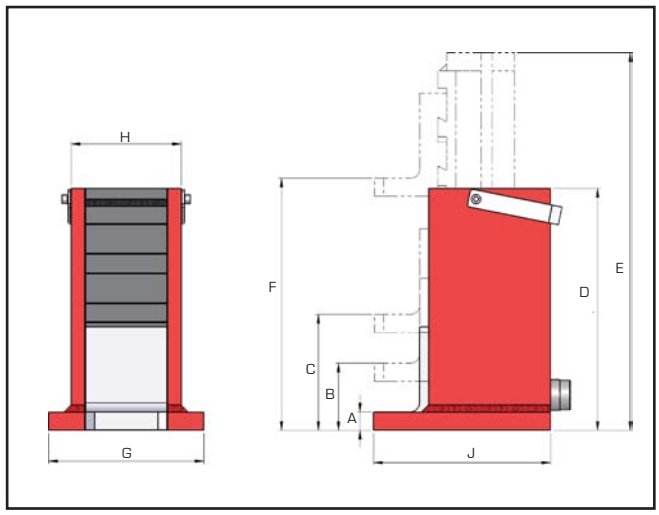
Working pressure 700 Bar

Minimum toe height as low as 21mm

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The HMJ range of hydraulic machine lifting jacks are designed specifically for lifting heavy equipment and machinery where a minimum low height lifting access point is available. The low height lifting toe is precision guided throughout its lifting stroke to reduce friction and prevent the hydraulic cylinder from potential side loading. Both models are 700 Bar maximum working pressure and incorporate a 150mm hydraulic lift with a lifting toe, which can be preset at three different initial lifting positions, for even greater flexibility. Suitable manual or powered pumps for use with HMJ jacks can be found on pages 27 to 48 of this catalogue.

- Multi-position lifting toe
- Remote operation gives improved operator safety
- Stroke length 150mm
- Can be used for simultaneous multiple lift point applications
- See pages 27 to 48 for compatible pumps
- See pages 49 to 56 for system components



Model number	Capacity Toe tonnes	Capacity Head tonnes	Stroke mm	Weight kg	Dimensions in mm A	B	C	D	E	F	G	H	J
HMJ10	8.5	10	150	29.2	25	79	133	272	422	283	202	122	187
HMJ25	20	25	150	55.1	35	117	199	330	480	349	292	152	211

HYDRAULIC JACK APPLICATIONS



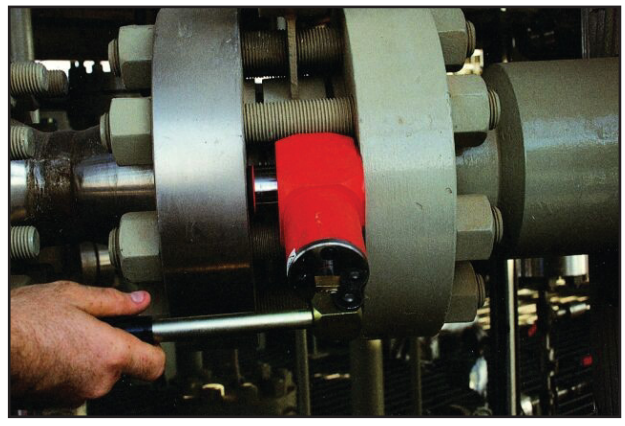


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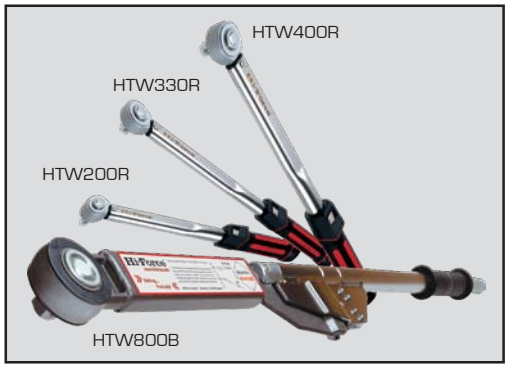
Hi-Force®

TORQUE TOOLS

HTW Range	Manual torque wrenches	Page 64
HT, SLT & HDT Range	Manual torque multipliers Standard, Slimline and Heavy duty versions	Pages 65 - 67
PG, SP & PT Range	Pneumatic torque multipliers Pistol grip, Slimline and Heavy duty versions	Pages 68 - 69
TWS-N Range	Hydraulic torque wrenches Reversible square drive design	Pages 70 - 71
TWS-N Accessories	Allen hexagon drive adaptors and extended reaction arms	Page 72
IS Range	Imperial hexagon AF size heavy duty sockets	Page 73
MS Range	Metric hexagon AF size heavy duty sockets	Page 74
TWH-N Range	Hydraulic torque wrenches Low profile female hexagon design	Pages 75 - 76
TWH-NRH Range	Hydraulic torque wrenches Female hexagon ratchet heads	Pages 77 - 78
TWH-N Accessories	Square drive conversion kits and extended reaction arms	Page 79
IB Range	Hexagon reducer bushes Imperial size range	Page 80
MB Range	Hexagon reducer bushes Metric size range	Page 81
BW Range	Backup wrenches	Page 82
HTWP Range	Torque wrench pumps and accessories Electric and pneumatic driven	Pages 83 & 84
IW & FRL Range	Pneumatic impact wrenches and filter, regulator, lubricator unit	Pages 85 & 86

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HTW - MANUAL TORQUE WRENCHES



Torque capacities up to 2000 Nm

Repeatable accuracy

Dual scale Nm & lbf. ft.

The HTW range of industrial manual torque wrenches offers 11 models with torque capacities from 8 to 2000 Nm (5 to 1500 lbf. ft) with square drive sizes from 3/8" to 1". All models are designed and manufactured to meet or exceed the highest demands of industry and are marked with a unique serial number and supplied with a calibration certificate. All models are ideally suited for applications requiring repeatable, accurate torquing of bolts and nuts. The push-through square drive allows the wrench to be used for torque control in both clockwise and anti-clockwise directions.

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The HTW-R models incorporate a soft feel grip and integrated locking mechanism to prevent accidental alteration of the torque setting during operation. The click system is activated immediately the required torque is achieved. The HTW-B break-back type models provide a large break angle, to prevent the possibility of over torquing. The cam control of the internal mechanism will ensure a controlled "break" which will reduce the risk of the operator losing balance. All wrenches automatically reset when the hand pressure is released.

- Heavy duty ratchet head
- Accuracy +/- 3% (HTW-R models)
- Accuracy +/- 4% (HTW-B models)
- Push-through square drive
- Supplied with calibration certificate
- Complete with carrying & storage case





Need a higher torque capacity .....

Please check our manual torque multipliers on pages 65 & 67. Alternatively see our pneumatic torque multipliers and hydraulic torque wrenches, as featured on pages 68 to 79.

Model number	Square drive	Torque range Nm	Torque range lbf. ft	Length mm	Ratchet head dia mm	Weight kg
HTW60R	3/8"	8 - 60	5 - 45	312	35	0.6
HTW100R	1/2"	20 - 100	15 - 80	359	40	0.8
HTW200R	1/2"	40 - 200	30 - 150	442	42	1.0
HTW330R	1/2"	60 - 330	45 - 250	683	49	1.5
HTW400R	3/4"	80 - 400	60 - 300	683	49	2.1
HTW500B	3/4"	100 - 500	70 - 350	910	70	5.2
HTW800B	3/4"	200 - 800	150 - 600	1250	70	6.4
HTW1000B	3/4"	300 - 1000	200 - 750	1475	70	7.3
HTW1500B	3/4"	700 - 1500	500 - 1000	1475	70	10.4
HTW1800B	1"	700 - 1500	500 - 1000	1475	70	10.4
HTW2000B	1"	900 - 2000	600 - 1500	1920	70	13.0

HT - MANUAL TORQUE MULTIPLIERS



Torque capacities up to 4500 Nm

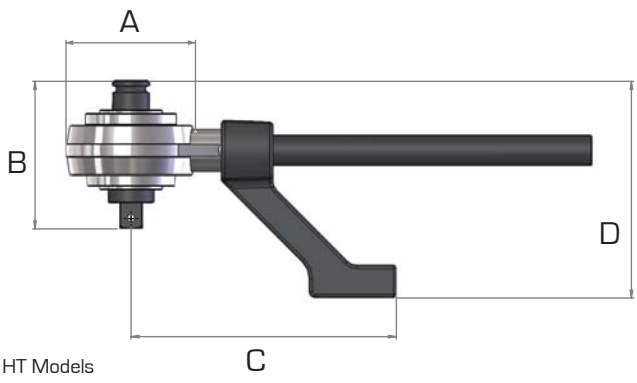
Compact design

Supplied complete with reaction foot

Hi-Force Handitorq (HT range) manual torque multipliers provide a true torque multiplication with repeatable accuracy of +/- 4%. A choice of four models, with output torque capacities of 1300 Nm and 4500 Nm are available, each supplied with two different reaction bar designs for maximum versatility. Supplied in a handy plastic storage case the Handitorq series multiplier is ideal for inclusion in the heavy vehicle tool kit.

- Compact with true torque multiplication
- Output square drives from ¾" to 1"

See page 64 for detailed specifications of the recommended Hi-Force manual torque wrenches for use with HT multipliers.

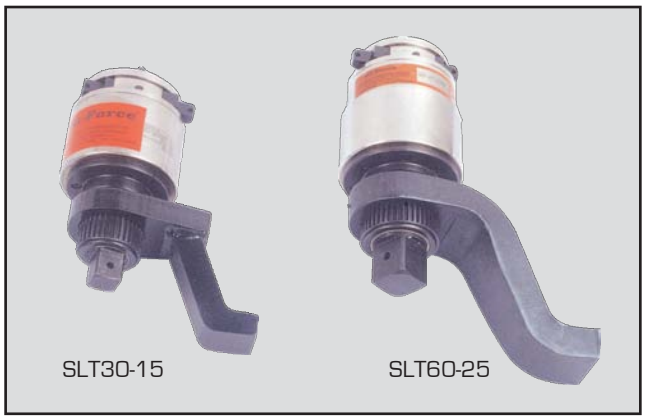


HT Models
Handitorq design

Model Number	Maximum torque capacity Nm	lbf.ft	Multi-plication ratio	Input square drive	Output square drive	Recom. torque wrench	Weight kg
HT1300	1300	960	5:1	½"	¾"	**HTW330R**	5.1
HT2700	2700	2000	5:1	¾"	1"	**HTW800B**	5.1
HT3000	3000	2200	15.5:1	½"	1"	**HTW200R**	8.0
HT4500	4500	3300	26:1	½"	1"	**HTW200R**	8.0

Dimensions in mm			
A	B	C	D
108	126	210	180
108	129	210	186
108	156	450	n/a
108	173	450	n/a

SLT - MANUAL TORQUE MULTIPLIERS



Torque capacities up to 6000 Nm

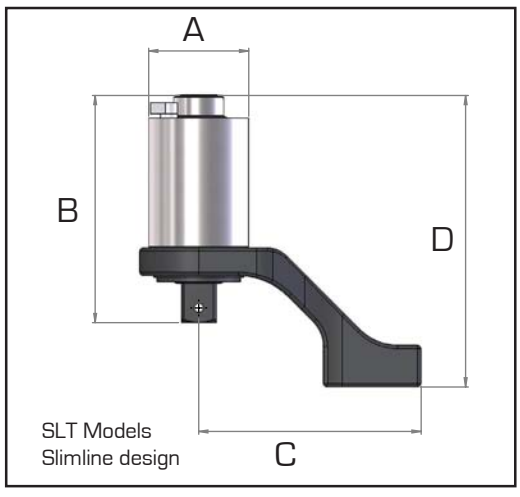
Slimline design

Supplied complete with reaction foot

Hi-Force Slimline (SLT range) manual torque multipliers offer comparable output torque capacities to standard diameter torque multipliers but with the added advantage of a slimline body design, particularly suited for bolt tightening applications on pipeline flanges. The range offers 5 models all with an adjustable spline type reaction foot which allows for various lengths of sockets to be used. All models have an anti-wind up ratchet fitted as standard, which retains all of the wind-up forces as they are created, providing a greater level of safety and ease of operation. Output torque capacities range from 2000 Nm to 6000 Nm with multiplication ratios of 15:1, 25:1 and 75:1 available. Recommended Hi-Force manual torque wrenches for use with Hi-Force manual torque multipliers are detailed on page 64 of this catalogue.

- Compact with true torque multiplication
- Output square drives from 1" to 1½"
- Anti-wind up ratchet

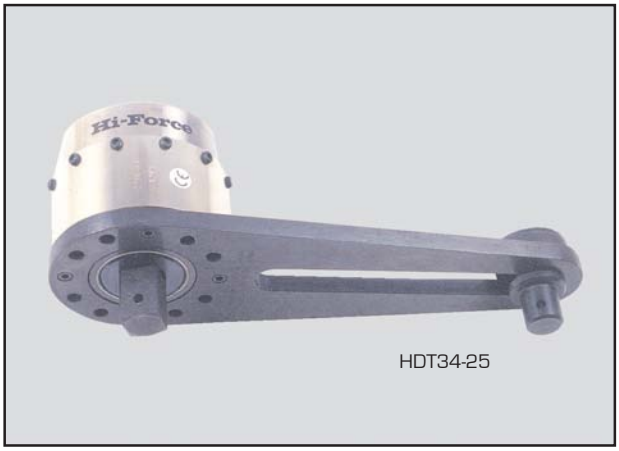




Model Number	Maximum torque capacity Nm	lbf.ft	Multi-plication ratio	Input square drive	Output square drive	Recom. torque wrench	Weight kg
SLT20-25	2000	1450	25:1	½"	1"	HTW200R	4.5
SLT30-15	3000	2200	15:1	½"	1"	HTW200R	9.0
SLT30-25	3000	2200	25:1	½"	1"	HTW200R	9.0
SLT60-25	6000	4400	25:1	½"	1½"	HTW330R	15.0
SLT60-75	6000	4400	75:1	½"	1½"	HTW200R	16.5

Dimensions in mm A	B	C	D
72	166	143	197
108	224	141	256-285
108	224	141	256-285
119	271	154	320-351
119	301	154	350-380

HDT - HEAVY DUTY MANUAL TORQUE MULTIPLIERS



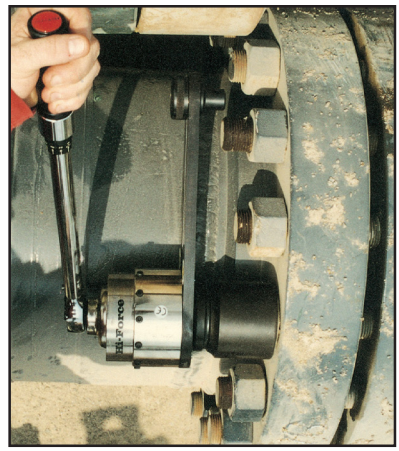
HDT34-25

Torque capacities up to 9500 Nm

Heavy duty design

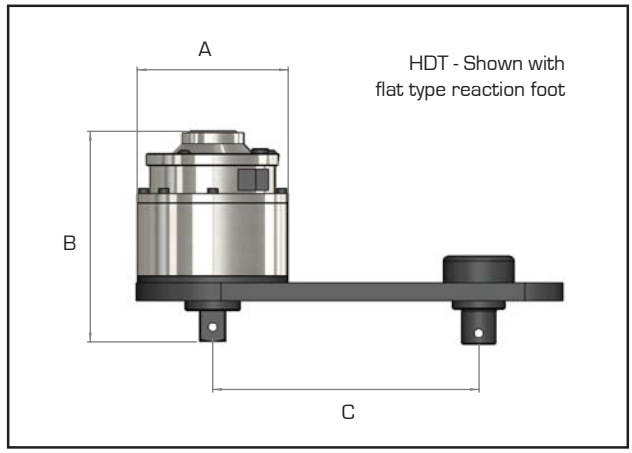
Supplied complete with reaction foot

The Hi-Force HDT range of heavy duty manual torque multipliers is available in a choice of 6 models with output capacities from 1700 to 9500 Nm and multiplication ratios of 25:1 and 125:1. All models are fitted with an anti-wind up ratchet, retaining all of the wind-up forces as they are created, providing a greater level of safety and ease of operation. Models HDT17-25 and HDT34-25 are fitted as standard with a flat type reaction foot as pictured above, all other models feature a box type reaction foot with special reaction plates available up on request.



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See page 64 for detailed specifications of the recommended Hi-Force manual torque wrenches for use with HDT multipliers.



- Compact with true torque multiplication
- Output square drives 1" and 1½"
- Anti-wind up ratchet on all models

Model number	Maximum torque capacity Nm	lbf.ft	Multiplication ratio	Input square drive	Output square drive	Recom. torque wrench	Weight kg
HDT17-25	1700	1250	25:1	½"	1"	**HTW200R**	7.8
HDT34-25	3400	2500	25:1	½"	1"	**HTW200R**	10.1
HDT60-25	6000	4400	25:1	½"	1½"	**HTW330R**	17.0
HDT95-25	9500	7000	25:1	¾"	1½"	**HTW400R**	25.7

Dimensions in mm A	B	C
108	156	83-217
119	187	86-264
144	226	146-333
184	209	171-351

PG - PISTOL GRIP PNEUMATIC TORQUE MULTIPLIERS


PG1500

Torque capacities up to 2000 Nm

Repeatable accuracy of +/- 5%

Choice of 5 models

The PG pistol grip pneumatic torque multiplier range is designed to provide smooth bolt tightening without impacting or pulsing. Offering a repeatable torque accuracy of +/- 5%, these low noise level tools reduce operator fatigue, increase safety and ensure fast, accurate tightening of bolted components. Incorporating a powerful, reversible air motor suitable for tightening and loosening operations, the non-impacting design of the planetary gears ensures minimum wear to sockets and bolted components. All models are supplied complete with an airline pressure and lubrication control unit in a handy carrying frame and a 3 metre length connecting hose. Accurate preset torque can easily be achieved by adjusting the airline input pressure in conjunction with the calibration graph supplied with each tool. Air consumption is 11 litres per second from a standard airline pressure of 5 Bar (23 cubic feet per minute @ 70 PSI).

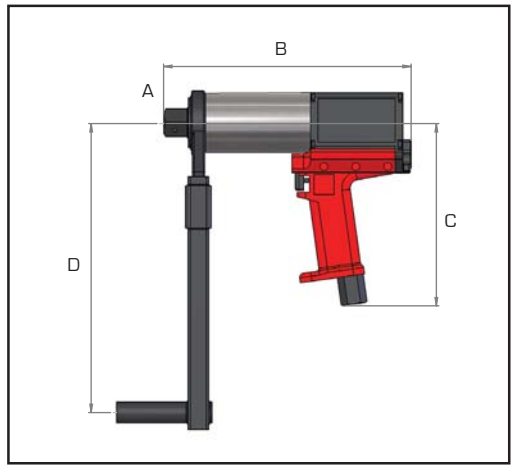
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- Slim 72mm diameter gear box allows excellent access
- Sensitive trigger control allows for easy reaction plate positioning
- Smooth, quiet, non-impacting design with reversible air motor
- Wide range of attachments and accessories available
- Two speed models available on request









Model number	Torque capacity Nm	Torque capacity lbf.ft	Square drive size	R.P.M. at max pressure	Weight kg
PG500	90-500	66-370	¾"	35	8.1
PG1075	190-1000	140-740	¾"	15	8.1
PG1000	190-1000	140-740	1"	15	8.1
PG1500	300-1500	220-1100	1"	9	8.1
PG2000	400-2000	300-1450	1"	6	8.1

Dimensions in mm			
A	B	C	D
72	301	223	334
72	301	223	334
72	301	223	334
72	301	223	334
72	301	223	334

SP & PT - PNEUMATIC TORQUE MULTIPLIERS


SP2700

Torque capacities up to 9500 Nm

Smooth, quiet, non-impacting design

Repeatable accuracy of +/- 5%

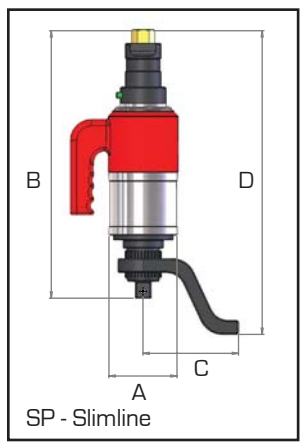
The SP & PT pneumatic torque multiplier range offers a choice of 9 models, suitable for almost every bolting application and all models are supplied with an airline pressure and lubrication control unit. Maximum torque output capacities range from 680 to 9500 Nm with a choice of square drives from ¾" to 1½". As with all Hi-Force pneumatic torque multipliers a repeatable, accurate torque of +/- 5% can be easily achieved using the calibration graph supplied with each tool. Both SP models are designed with a reduced body diameter, particularly suited where a limitation of space exists and are fitted with an adjustable spline type reaction foot which allows for use with various length sockets. The PT models are supplied with a flat type reaction plate, with the exception of the PT6000 and PT9500 which incorporate a box type reaction foot. Optional specially designed reaction plates can be supplied on request. The smooth and continuous torque output of Hi-Force pneumatic torque multipliers make them suitable for a wide range of bolting applications including wheel nuts on trucks and large machinery, structural steelwork, high pressure joints e.g. pipelines, boiler feed pumps and pressure vessels, heat exchangers and many other applications.

- Powerful reversible air motor with safety trigger
- Adjustable spline type reaction foot (SP models only)
- Wide range of attachments and accessories available
- Two speed models available on request

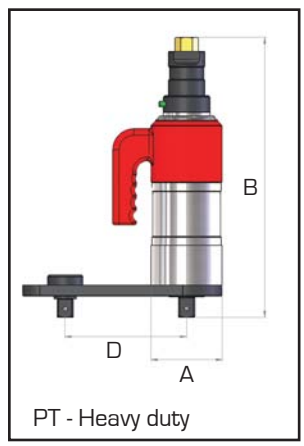








SP - Slimline



PT - Heavy duty

Model number	Torque capacity Nm	Torque capacity lbf.ft	Square drive size	R.P.M. at max pressure	Weight kg
SP2700	880-2700	650-2000	1"	5.0	16.5
SP5500	1200-5500	885-4060	1½"	2.5	21.9
PT680 - ¾	160-680	120-500	¾"	30.0	12.8
PT680 - 1	160-680	120-500	1"	30.0	12.8
PT1200	270-1200	200-900	1"	15.0	13.3
PT1700	515-1700	380-1250	1"	9.0	13.3
PT3400	880-3400	650-2500	1"	5.0	16.5
PT6000	1762-6000	1300-4500	1½"	2.5	26.0
PT9500	2710-9500	2000-7000	1½"	1.8	32.7

Dimensions in mm A	B	C	D min	D max
108	437	140	469	498
119	512	154	566	592
108	378	-	83	217
108	368	-	83	217
108	373	-	83	217
108	373	-	83	217
119	424	-	86	264
144	457	-	146	333
184	452	-	169	351

TWS-N - HYDRAULIC TORQUE WRENCHES - SQUARE DRIVE



Working pressure 700 Bar

Compact, lightweight, aluminium construction

Fitted with 360° Uni-Swivel quick release couplings

Hi-Force TWS-N series lightweight aluminium hydraulic torque wrenches are designed to handle the toughest bolting jobs accurately and quickly. All models provide a torque accuracy of +/- 3%. The internal reaction arm spline allows the operator to easily position the tool and, if necessary, react directly off the tool body in very confined access applications. All models incorporate an easily reversible high grade alloy steel square drive enabling the operator to quickly switch from tightening to loosening applications. Uni-Swivel quick release couplers are fitted as standard to all models enabling easy positioning of the hydraulic hoses away from any possible "pinch points". Optional allen hex drives are available (see page 72) along with a comprehensive range of high quality torque wrench sockets. (See pages 73 & 74).

F

- Accurate to +/- 3% with calibration chart supplied
- Multi-position reaction foot with safety lock feature
- Reversible square drive for tightening and loosening applications
- Suitable for continuous operation at maximum pressure



Allen hex drive adaptors
(see page 72)



Did you know.....

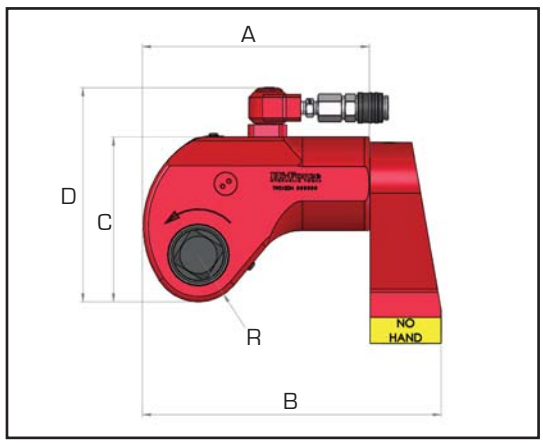
Hi-Force hydraulic torque tools are manufactured on the latest "State of the art" CNC machining centres, guaranteed to manufacture components to the highest quality standards available.

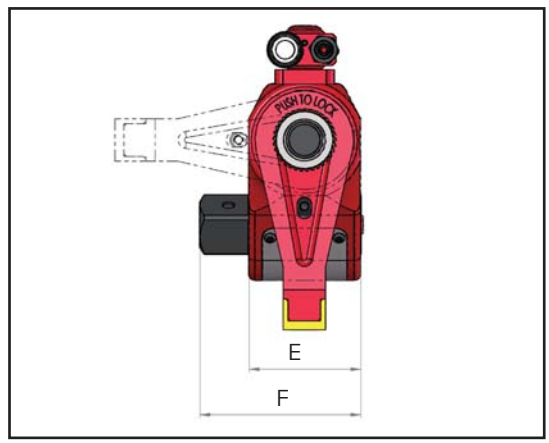
TWS-N - HYDRAULIC TORQUE WRENCHES - SQUARE DRIVE



TWS100N

- Designed for tightening and loosening
- Internal reaction arm spline
- Accurate to +/- 3%









Model number	Torque Capacity Nm at 700 Bar	Torque Capacity lbf.ft at 10,000 PSI	Square drive size	Weight incl. reaction foot kg
TWS17N	1727	1254	¾"	1.9
TWS45N	4529	3289	1"	4.8
TWS100N	10064	7308	1 ½"	9.0
TWS150N	14974	10873	1 ½"	15.0
TWS370N	36992	26860	2 ½"	32.5

Dimensions in mm						
A	B	C	D	E	F	R
129	167	90	131	51	73	25
167	218	121	170	68	98	34
223	293	163	211	92	135	46
247	323	192	236	100	141	54
329	432	240	288	137	204	66

TWS-N - ACCESSORIES



TWS17N with hexagon drive fitted



Hexagon drive adaptor

Sizes available for all TWS-N wrenches

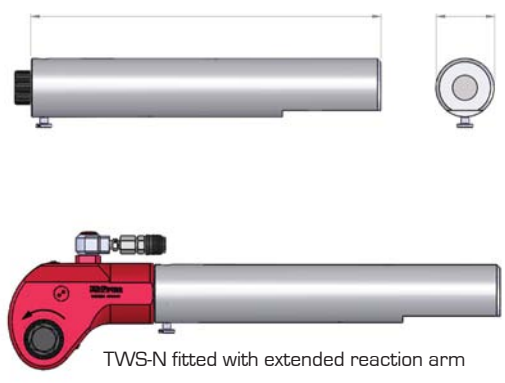
Limitations on applied torque (check before use)

Suitable for tightening & loosening applications

For tool Model number	Imperial Allen Hexagon Drive Adaptors			Metric Allen Hexagon Drive Adaptors		
	Model Number	Hexagon Size	Maximum Torque load Nm	Model Number	Hexagon Size	Maximum Torque load Nm
TWS17N	IH17N-008	½"	470	MH17N-14	14mm	740
	IH17N-010	⅝"	930	MH17N-17	17mm	1350
	IH17N-012	¾"	1600	MH17N-19	19mm	1612
	IH17N-014	⅞"	1700	MH17N-22	22mm	1700
	IH17N-100	1"	1700	MH17N-24	24mm	1700
TWS45N	IH45N-010	⅝"	930	MH45N-17	17mm	1100
	IH45N-012	¾"	1600	MH45N-19	19mm	1600
	IH45N-014	⅞"	2550	MH45N-22	22mm	2550
	IH45N-100	1"	3800	MH45N-24	24mm	3700
	IH45N-102	1⅛"	4500	MH45N-27	27mm	4500
	IH45N-104	1¼"	4500	MH45N-32	32mm	4500
TWS100N	IH100N-014	⅞"	1890	MH100N-22	22mm	2480
	IH100N-100	1"	3800	MH100N-24	24mm	3700
	IH100N-102	1⅛"	5440	MH100N-27	27mm	4650
	IH100N-104	1¼"	7480	MH100N-30	30mm	6380
	IH100N-106	1⅜"	9920	MH100N-32	32mm	7625
	IH100N-108	1½"	10000	MH100N-36	36mm	10000
TWS150N	IH150N-104	1¼"	7400	MH150N-30	30mm	7000
	IH150N-106	1⅜"	9900	MH150N-32	32mm	7500
	IH150N-108	1½"	15000	MH150N-36	36mm	10900
	IH150N-110	1⅝"	15000	MH150N-41	41mm	15000
	IH150N-112	1¾"	15000	MH150N-46	46mm	15000
TWS370N	IH370N-108	1½"	12900	MH370N-36	36mm	10000
	IH370N-110	1⅝"	16300	MH370N-41	41mm	16300
	IH370N-112	1¾"	20400	MH370N-46	46mm	22500
	IH370N-114	1⅞"	25100	MH370N-50	50mm	30600
	IH370N-200	2"	30600	MH370N-55	55mm	37000
	IH370N-204	2¼"	37000	MH370N-60	60mm	37000

Extended Reaction Arms

For tool Model number	Model Number	Length A		Diameter B	
		Inch	mm	Inch	mm
TWS17N	ERA17-21	21"	533	1 ¾"	44.5
	ERA17-24	24"	610	1 ¾"	44.5
	ERA17-36	36"	914	1 ¾"	44.5
TWS45N	ERA45-21	21"	533	2 ½"	63.5
	ERA45-24	24"	610	2 ½"	63.5
	ERA45-36	36"	914	2 ½"	63.5
TWS100N	ERA100-21	21"	533	3 ½"	88.9
	ERA100-24	24"	610	3 ½"	88.9
	ERA100-36	36"	914	3 ½"	88.9
TWS150N	ERA150-21	21"	533	3 ½"	88.9
	ERA150-24	24"	610	3 ½"	88.9
	ERA150-36	36"	914	3 ½"	88.9
TWS370N	ERA370-21	21"	533	4 ¾"	120.6
	ERA370-24	24"	610	4 ¾"	120.6
	ERA370-36	36"	914	4 ¾"	120.6



TWS-N fitted with extended reaction arm

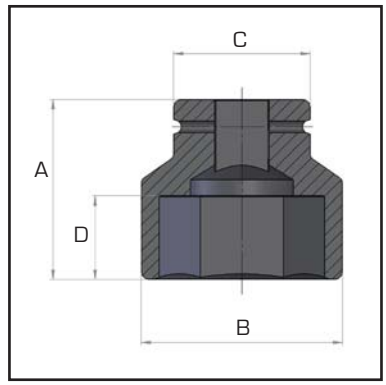
IS - IMPERIAL HEXAGON AF SIZE HEAVY DUTY SOCKETS



Square drives from ¾" to 2½"

Across flat sizes up to 6⅞"

Supplied complete with retaining ring and pin



Hi-Force high quality imperial size heavy duty sockets are designed and manufactured for use with all Hi-Force bolting products, including hydraulic torque wrenches and impact wrenches. The IS range of imperial impact sockets offers 47 models, with square drives from ¾" to 2½" and across flat sizes up to 6⅞". Long length, bi-hexagonal and special sockets are available on request.

Model number	Square drive	Nut AF inches	Dimensions in mm A	B	C	D
IS2-101	¾"	1 1/16"	52	40	38	16
IS2-104	¾"	1 1/4"	52	44	44	20
IS2-107	¾"	1 7/16"	56	51	44	23
IS2-110	¾"	1 5/8"	62	58	44	27
IS2-113	¾"	1 13/16"	68	67	44	32
IS2-200	¾"	2"	72	71	54	35
IS2-203	¾"	2 3/16"	74	77	54	35
IS2-206	¾"	2 3/8"	75	84	54	35
IS9-101	1"	1 1/16"	58	44	51	17
IS9-104	1"	1 1/4"	60	51	51	21
IS9-107	1"	1 7/16"	62	56	52	26
IS9-110	1"	1 5/8"	62	62	52	26
IS9-113	1"	1 13/16"	64	68	58	27
IS9-200	1"	2"	70	74	58	31
IS9-203	1"	2 3/16"	72	80	62	32
IS9-206	1"	2 3/8"	78	87	62	35
IS9-209	1"	2 9/16"	80	93	62	36
IS9-212	1"	2 3/4"	85	98	62	40
IS9-215	1"	2 15/16"	95	104	86	48
IS9-302	1"	3 1/8"	100	109	86	52
IS9-308	1"	3 1/2"	105	125	86	52
IS9-314	1"	3 7/8"	105	136	95	52
IS5-113	1 1/2"	1 13/16"	84	76	86	27
IS5-200	1 1/2"	2"	87	82	86	29

Model number	Square drive	Nut AF inches	Dimensions in mm A	B	C	D
IS5-203	1 1/2"	2 3/16"	90	86	86	36
IS5-206	1 1/2"	2 3/8"	92	93	86	38
IS5-209	1 1/2"	2 9/16"	95	97	86	40
IS5-212	1 1/2"	2 3/4"	100	105	86	43
IS5-215	1 1/2"	2 15/16"	103	110	86	45
IS5-302	1 1/2"	3 1/8"	110	116	86	50
IS5-308	1 1/2"	3 1/2"	118	130	86	55
IS5-314	1 1/2"	3 7/8"	125	140	95	58
IS5-404	1 1/2"	4 1/4"	125	150	95	58
IS5-410	1 1/2"	4 5/8"	135	165	95	65
IS5-500	1 1/2"	5"	140	179	127	70
IS5-506	1 1/2"	5 3/8"	150	195	127	75
IS6-302	2 1/2"	3 1/8"	140	124	127	51
IS6-308	2 1/2"	3 1/2"	140	135	127	51
IS6-314	2 1/2"	3 7/8"	150	147	127	57
IS6-404	2 1/2"	4 1/4"	160	159	127	64
IS6-410	2 1/2"	4 5/8"	170	172	127	71
IS6-500	2 1/2"	5"	175	185	127	75
IS6-506	2 1/2"	5 3/8"	180	197	127	79
IS6-512	2 1/2"	5 3/4"	185	210	127	83
IS6-602	2 1/2"	6 1/8"	190	223	127	91
IS6-608	2 1/2"	6 1/2"	195	235	127	95
IS6-614	2 1/2"	6 7/8"	200	248	127	105

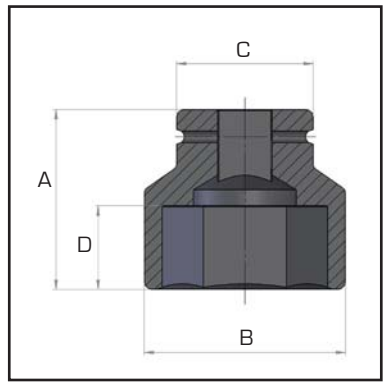
MS - METRIC HEXAGON AF SIZE HEAVY DUTY SOCKETS



Square drives from ¾" to 2½"

Across flat sizes up to 145mm

Supplied complete with retaining ring and pin



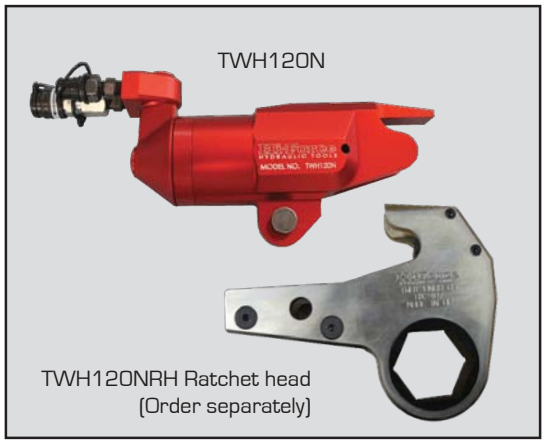
Hi-Force high quality metric size heavy duty sockets are designed and manufactured for use with all Hi-Force bolting products, including hydraulic torque wrenches and impact wrenches. The MS range of metric impact sockets offers 56 models, with square drives from ¾" to 2½" and across flat sizes up to 145mm. Long length, bi-hexagonal and special sockets are available on request.

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Model number	Square drive	Nut AF mm	Dimensions in mm A	B	C	D
MS2-24	¾"	24	50	39	44	16
MS2-27	¾"	27	54	43	44	16
MS2-30	¾"	30	54	47	44	23
MS2-32	¾"	32	56	49	44	23
MS2-36	¾"	36	56	54	44	23
MS2-41	¾"	41	58	60	44	24
MS2-46	¾"	46	63	67	44	30
MS2-50	¾"	50	72	71	54	32
MS2-55	¾"	55	74	78	54	35
MS2-60	¾"	60	75	84	54	37
MS9-24	1"	24	58	42	54	17
MS9-27	1"	27	58	46	54	17
MS9-30	1"	30	60	50	54	21
MS9-32	1"	32	60	51	54	21
MS9-36	1"	36	65	56	54	30
MS9-41	1"	41	67	63	54	31
MS9-46	1"	46	74	69	54	36
MS9-50	1"	50	80	74	54	42
MS9-55	1"	55	84	80	54	44
MS9-60	1"	60	87	86	54	44
MS9-65	1"	65	90	92	54	46
MS9-70	1"	70	96	99	54	51
MS9-75	1"	75	98	106	86	45
MS9-80	1"	80	100	112	86	48
MS9-85	1"	85	105	118	86	52
MS9-90	1"	90	105	125	86	52
MS9-95	1"	95	115	131	86	52
MS9-100	1"	100	115	137	95	58

Model number	Square drive	Nut AF mm	Dimensions in mm A	B	C	D
MS5-36	1 ½"	36	78	64	86	23
MS5-41	1 ½"	41	80	70	86	26
MS5-46	1 ½"	46	84	76	86	27
MS5-50	1 ½"	50	87	81	86	29
MS5-55	1 ½"	55	90	86	86	36
MS5-60	1 ½"	60	92	93	86	38
MS5-65	1 ½"	65	95	97	86	40
MS5-70	1 ½"	70	100	105	86	43
MS5-75	1 ½"	75	103	110	86	45
MS5-80	1 ½"	80	110	116	86	50
MS5-85	1 ½"	85	118	125	86	55
MS5-90	1 ½"	90	118	130	86	55
MS5-95	1 ½"	95	118	137	95	55
MS5-100	1 ½"	100	125	140	95	58
MS5-105	1 ½"	105	125	150	95	58
MS5-110	1 ½"	110	125	156	95	58
MS5-115	1 ½"	115	135	160	95	65
MS5-130	1 ½"	130	140	185	127	70
MS6-80	2 ½"	80	140	124	127	51
MS6-85	2 ½"	85	140	130	127	51
MS6-90	2 ½"	90	145	136	127	54
MS6-95	2 ½"	95	145	143	127	54
MS6-100	2 ½"	100	150	149	127	57
MS6-105	2 ½"	105	155	155	127	61
MS6-110	2 ½"	110	160	161	127	64
MS6-115	2 ½"	115	165	167	127	67
MS6-130	2 ½"	130	175	188	127	75
MS6-145	2 ½"	145	185	208	127	83

TWH-N - HYDRAULIC TORQUE WRENCH - DRIVE CYLINDERS



Working pressure 700 Bar

Powerful with low clearance design

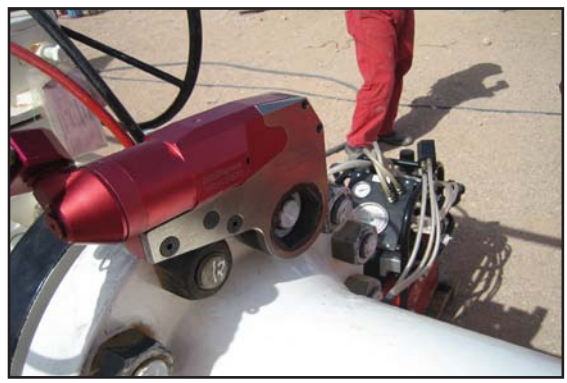
Fitted with 360° x 360° Uni-Swivel couplings

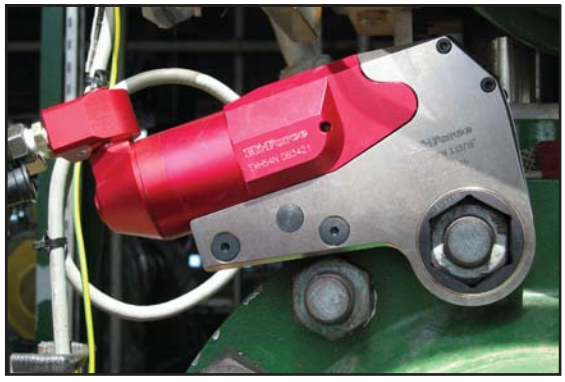
Hi-Force TWH-N series female hexagon cassette head hydraulic torque wrenches offer a choice of 5 models with output torque capacities from 2625 Nm to 48181 Nm (1906 to 34985 lbf.ft). Manufactured from high grade aluminium (except TWH430N), all models provide direct in-line reaction and a minimal radius clearance for easy fitment in confined spaces. The user friendly design of the tool simply requires the operator to withdraw/insert a single pin to change the ratchet head. Ratchet heads are available in all standard metric and imperial AF sizes from 24 to 175mm (1 1/16" to 6 7/8") with low cost hexagon reducer bushes also available (see pages 80 - 81). Uni-Swivel quick release couplers are fitted as standard to all models, enabling easy positioning of the hydraulic hoses.

F

- Compact, lightweight, aluminium drive unit (except TWH430N)
- Accurate to +/- 3% with standard torque chart supplied
- Low profile design for limited access applications
- Minimum radius cassette head for fitment in confined spaces
- Suitable for continuous operation at maximum pressure









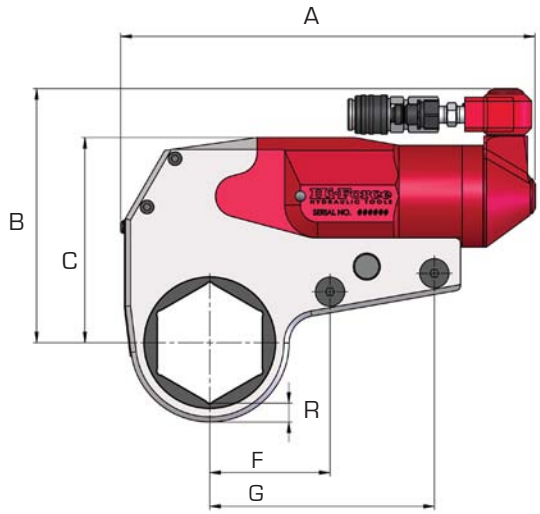
Note: Model TWH430N manufactured from high grade alloy steel

TWH-N - HYDRAULIC TORQUE WRENCH - DRIVE CYLINDERS



- Designed for tightening and loosening applications
- Easily assembled to selected ratchet head
- Minimal nose radius for fitment in confined spaces

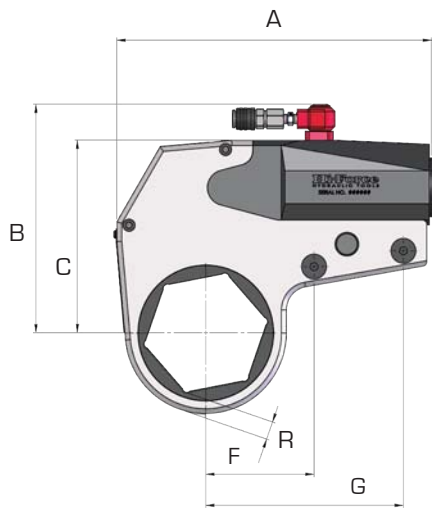
TWH27N, TWH54N,
TWH120N, TWH210N



All Models



TWH430N



Note: Drawing shows drive cylinder, including ratchet head as detailed on pages 77-78.
Drive cylinder and ratchet head are separate items and must be ordered separately

Model number (drive cyl.)	Torque capacity Nm at 700 Bar	Torque capacity lbf. ft at 10,000PSI	Hexagon AF size Metric min	Metric max	Imperial min	Imperial max	Weight kg
TWH27N	2625	1906	24	46	1 1/16"	1 13/16"	1.4
	3068	2228	50	60	2"	2 3/8"	1.4
TWH54N	5372	3901	36	65	1 7/16"	2 9/16"	2.3
	6037	4384	70	80	2 3/4"	3 1/8"	2.3
TWH120N	11737	8522	50	80	2 3/16"	3 1/8"	3.8
	14349	10419	85	100	3 1/2"	3 7/8"	3.8
TWH210N	21216	15405	70	100	2 3/4"	3 7/8"	6.4
	23124	16791	105	115	4 1/4"	4 5/8"	6.4
TWH430N	43792	31798	80	115	3 1/8"	4 5/8"	16.1
	48181	34985	130	175	5"	6 7/8"	16.1

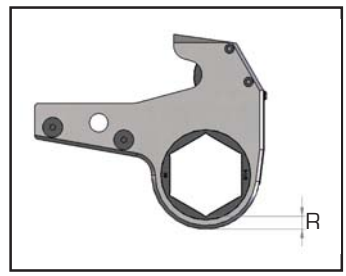
Dimensions in mm A max	B max	C max	D	E	F	G	R min - max
193	125	97	32	51	54	109	9.5 - 12.2
193	136	108	32	51	54	109	10.1 - 10.5
250	158	125	41	64	73	137	10.7 - 13.8
250	169	136	41	64	73	137	11.7 - 14.6
310	189	157	52	78	92	112	14.7 - 15.2
310	214	182	52	78	92	112	15.9 - 18.7
378	223	191	64	97	114	213	18.1 - 18.6
378	236	204	64	97	114	213	18.3 - 20.7
405	291	242	83	93	146	267	25.6 - 31.3
425	309	260	83	93	146	267	24.8 - 27.3

Note: Above selection table is for drive unit only. Ratchet head(s) to be ordered separately - see pages 77 - 78.
Weight as stated is drive cylinder only, exact radius size (R) varies according to ratchet AF size selected.

TWH-NRH - IMPERIAL SIZE RATCHET HEADS


TWH120NRH3.1/2

- Choice of standard imperial sizes
- Easily fitted to TWH-N drive units
- Strong steel construction
- Non standard and special design ratchet heads can be made to order



The TWH-NRH range of imperial hexagon ratchet heads, suitable for use with TWH-N series low profile hydraulic torque wrenches (see pages 75-76), provide exceptional flexibility with across flats (AF) sizes from 1 1/16" to 6 7/8" available as standard. All models feature extremely low profile design combined with a minimum nose radius (R) that enables fitment in very confined limited access places. For even greater versatility a comprehensive range of imperial hexagon reducer bushes (see page 80) and square drive conversion kits (see page 79) to suit TWH-NRH imperial ratchet heads are also available.





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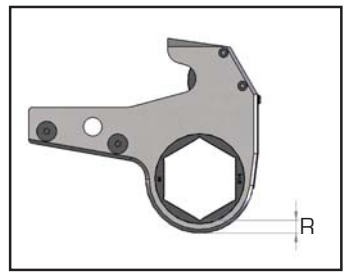
IMPERIAL RATCHET HEAD SELECTION TABLE:

Bolt size	Nut AF size	For TWH27N			For TWH54N			For TWH120N			For TWH210N			For TWH430N		
		Model number	R mm	Wt kg	Model number	R mm	Wt kg	Model number	R mm	Wt kg	Model number	R mm	Wt kg	Model number	R mm	Wt kg
5/8"	1 1/16"	TWH27NRH1.1/16	10.4	1.5												
3/4"	1 1/4"	TWH27NRH1.1/4	9.7	1.6												
7/8"	1 7/16"	TWH27NRH1.7/16	9.8	1.6	TWH54NRH1.7/16	13.5	2.9									
1"	1 5/8"	TWH27NRH1.5/8	10.0	1.6	TWH54NRH1.5/8	10.8	2.8									
1 1/8"	1 13/16"	TWH27NRH1.13/16	10.5	1.7	TWH54NRH1.13/16	10.7	2.9									
1 1/4"	2"	TWH27NRH2	10.5	1.7	TWH54NRH2	11.7	3.0									
1 3/8"	2 3/16"	TWH27NRH2.3/16	10.3	1.8	TWH54NRH2.3/16	11.8	3.1	TWH120NRH2.3/16	14.7	6.1						
1 1/2"	2 3/8"	TWH27NRH2.3/8	10.5	1.8	TWH54NRH2.3/8	11.8	3.2	TWH120NRH2.3/8	14.8	6.4						
1 5/8"	2 9/16"				TWH54NRH2.9/16	11.6	3.3	TWH120NRH2.9/16	14.8	6.4						
1 3/4"	2 3/4"				TWH54NRH2.3/4	11.8	3.4	TWH120NRH2.3/4	14.9	6.5	TWH210NRH2.3/4	18.3	12.1			
1 7/8"	2 15/16"				TWH54NRH2.15/16	14.8	3.5	TWH120NRH2.15/16	14.9	6.5	TWH210NRH2.15/16	18.3	12.2			
2"	3 1/8"				TWH54NRH3.1/8	12.1	3.5	TWH120NRH3.1/8	15.1	6.5	TWH210NRH3.1/8	18.5	12.3	TWH430NRH3.1/8	26.0	23.2
2 1/4"	3 1/2"							TWH120NRH3.1/2	16.9	7.9	TWH210NRH3.1/2	19.3	12.4	TWH430NRH3.1/2	26.8	23.9
2 1/2"	3 7/8"							TWH120NRH3.7/8	19.6	8.5	TWH210NRH3.7/8	19.5	12.5	TWH430NRH3.7/8	26.5	25.7
2 3/4"	4 1/4"										TWH210NRH4.1/4	19.5	13.3	TWH430NRH4.1/4	26.9	26.1
3"	4 5/8"										TWH210NRH4.5/8	19.3	13.8	TWH430NRH4.5/8	25.9	26.3
3 1/4"	5"													TWH430NRH5	27.4	27.9
3 1/2"	5 3/8"													TWH430NRH5.3/8	25.8	28.3
3 3/4"	5 3/4"													TWH430NRH5.3/4	24.8	29.3
4"	6 1/8"													TWH430NRH6.1/8	25.0	30.1
4 1/4"	6 1/2"													TWH430NRH6.1/2	25.0	31.0
4 1/2"	6 7/8"													TWH430NRH6.7/8	27.3	31.8

TWH-NRH - METRIC SIZE RATCHET HEADS


TWH120NRH-65

- Choice of standard metric sizes
- Easily fitted to TWH-N drive units
- Strong steel construction
- Non standard and special design ratchet heads can be made to order



The TWH-NRH range of metric hexagon ratchet heads, suitable for use with TWH-N series low profile hydraulic torque wrenches (see pages 75-76), provide exceptional flexibility with across flats (AF) sizes from 24mm to 175mm available as standard. All models feature extremely low profile design combined with a minimum nose radius (R) that enables fitment in very confined limited access places. For even greater versatility a comprehensive range of metric hexagon reducer bushes (see page 81) and square drive conversion kits (see page 79) to suit TWH-NRH metric ratchet heads are also available.





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Bolt size	Nut AF size	For TWH27N			For TWH54N			For TWH120N			For TWH210N			For TWH430N		
		Model number	R mm	Wt kg	Model number	R mm	Wt kg	Model number	R mm	Wt kg	Model number	R mm	Wt kg	Model number	R mm	Wt kg
16	24	TWH27NRH-24	12.1	1.5												
18	27	TWH27NRH-27	10.4	1.5												
20	30	TWH27NRH-30	10.7	1.6												
22	32	TWH27NRH-32	9.5	1.6												
24	36	TWH27NRH-36	10.1	1.6	TWH54NRH-36	13.8	2.9									
27	41	TWH27NRH-41	10.1	1.6	TWH54NRH-41	10.9	2.8									
30	46	TWH27NRH-46	10.5	1.7	TWH54NRH-46	10.7	2.9									
33	50	TWH27NRH-50	10.4	1.7	TWH54NRH-50	12.1	3.0	TWH120NRH-50	15.2	5.8						
36	55	TWH27NRH-55	10.1	1.8	TWH54NRH-55	12.1	3.1	TWH120NRH-55	15.0	6.1						
39	60	TWH27NRH-60	10.5	1.8	TWH54NRH-60	12.0	3.2	TWH120NRH-60	15.0	6.4						
42	65				TWH54NRH-65	11.7	3.3	TWH120NRH-65	14.9	6.4						
45	70				TWH54NRH-70	11.7	3.4	TWH120NRH-70	14.8	6.5	TWH210NRH-70	18.2	12.1			
48	75				TWH54NRH-75	14.6	3.5	TWH120NRH-75	14.7	6.5	TWH210NRH-75	18.1	12.2			
52	80				TWH54NRH-80	11.7	3.5	TWH120NRH-80	14.7	6.5	TWH210NRH-80	18.1	12.3	TWH430NRH-80	25.6	23.2
56	85							TWH120NRH-85	16.4	7.8	TWH210NRH-85	18.2	12.4	TWH430NRH-85	29.0	24.0
60	90							TWH120NRH-90	16.2	7.9	TWH210NRH-90	18.6	12.4	TWH430NRH-90	31.3	26.0
64	95							TWH120NRH-95	15.9	7.9	TWH210NRH-95	18.6	12.5	TWH430NRH-95	28.5	25.8
68	100							TWH120NRH-100	18.7	8.5	TWH210NRH-100	18.6	12.5	TWH430NRH-100	25.6	25.6
72	105										TWH210NRH-105	18.4	12.9	TWH430NRH-105	28.6	26.5
76	110										TWH210NRH-110	18.3	13.3	TWH430NRH-110	25.7	26.2
80	115										TWH210NRH-115	20.7	13.8	TWH430NRH-115	27.3	26.4
90	130													TWH430NRH-130	25.6	27.3
100	145													TWH430NRH-145	25.4	29.4
110	155													TWH430NRH-155	25.0	30.1
115	165													TWH430NRH-165	25.0	31.0
n/a	175													TWH430NRH-175	27.3	31.8

TWH-N ACCESSORIES



Suitable for TWH-N range up to 23124 Nm

Square drive sizes from 1" to 2½"

Easily fitted, no special tools required

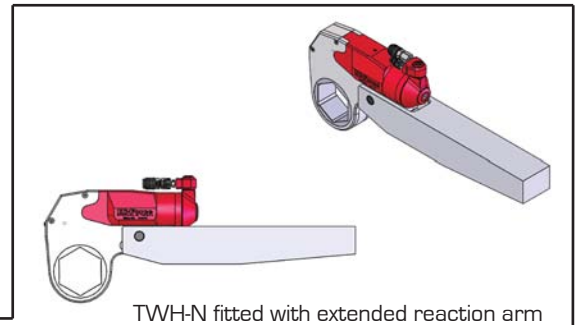
- Supplied complete with reaction foot
- Makes your hexagon drive torque wrench even more versatile
- Full range of heavy duty sockets available (see pages 73 & 74)

Hi-Force SDC square drive conversion kits, suitable for Hi-Force TWH-N hexagon drive hydraulic torque wrenches (see pages 75-78) are available for all models, excluding TWH430N. All models are supplied complete with an easily attachable reaction foot and a standard hexagon AF size adaptor, suitable for fitment to a commonly used size of imperial or metric ratchet head, per tool type (see table for more details). These SDC square drive conversion kits provide the most flexible and cost effective method of converting a female hexagon drive hydraulic torque wrench into a square drive wrench.

Model number	Square drive	Hexagon AF Size	Maximum torque Nm	Maximum torque lbf.ft	Suitable for drive cylinder incl. ratchet head		Weight kg
SDC27-I	1"	1 13/16"	3068	2263	TWH27N	TWH27NRH-1 13/16	1.1
SDC27-M	1"	46mm	3068	2263	TWH27N	TWH27NRH-46	1.1
SDC54-I	1½"	2 9/16"	6037	4453	TWH54N	TWH54NRH-2 9/16	3.0
SDC54-M	1½"	65mm	6037	4453	TWH54N	TWH54NRH-65	3.0
SDC120-I	1½"	3 1/8"	14349	10583	TWH120N	TWH120NRH-3 1/8	4.4
SDC120-M	1½"	80mm	14349	10583	TWH120N	TWH120NRH-80	4.4
SDC210-I	2½"	3 7/8"	23124	17055	TWH210N	TWH210NRH-3 7/8	9.1
SDC210-M	2½"	100mm	23124	17055	TWH210N	TWH210NRH-100	9.1

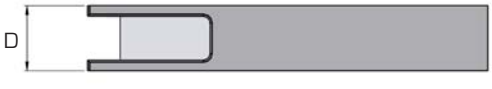
Extended Reaction Arms

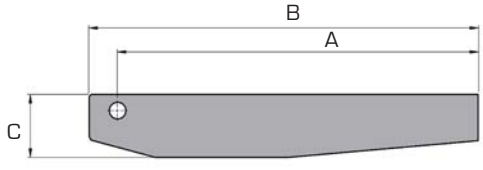
Model Number	Length A		Length B		Height (C)		Width (D)	
	Inch	mm	Inch	mm	Inch	mm	Inch	mm
ERA27-20	19.6"	499	20.7"	525	1.8"	45	2.0"	50
ERA54-20	20.2"	513	21.1"	535	2.2"	55	2.5"	65
ERA120-21	20.8"	527	21.7"	550	3.0"	75	3.4"	85
ERA210-21	21.5"	545	23.2"	588	3.7"	95	3.7"	95
ERA430-22	22.2"	565	24.7"	628	4.7"	120	4.7"	120



TWH-N fitted with extended reaction arm

Extended reaction arm





IB - IMPERIAL HEXAGON REDUCER BUSHES



To reduce the female hexagon AF size of the TWH-NRH imperial ratchet heads (see page 77), these Hi-Force hexagon reducer bushes offer an easy and economical solution. Just select your outside AF size (i.e ratchet head AF size) and the required inside AF size to determine the model number. Please note that wall thickness (specified below as 'W' dimension) must be added to the minimum radius dimension of your ratchet head when using a reducer bush.

Outside AF size	Inside AF size	For TWH27NRH		For TWH54NRH		For TWH120NRH		For TWH210NRH		For TWH430NRH	
		Model number	W mm	Model number	W mm	Model number	W mm	Model number	W mm	Model number	W mm
1 1/4"	1 1/16"	IB27-104-101	2.4								
1 7/16"	1 1/16"	IB27-107-101	4.8								
1 7/16"	1 1/4"	IB27-107-104	2.4								
1 5/8"	1 1/4"	IB27-110-104	4.8	IB54-110-104	4.8						
1 5/8"	1 7/16"	IB27-110-107	2.4	IB54-110-107	2.4						
1 13/16"	1 7/16"	IB27-113-107	4.8	IB54-113-107	4.8						
1 13/16"	1 5/8"	IB27-113-110	2.4	IB54-113-110	2.4						
2"	1 5/8"	IB27-200-110	4.8	IB54-200-110	4.8						
2"	1 13/16"	IB27-200-113	2.4	IB54-200-113	2.4						
2 3/16"	1 5/8"	IB27-203-110	7.2	IB54-203-110	7.2						
2 3/16"	1 13/16"	IB27-203-113	4.8	IB54-203-113	4.8						
2 3/16"	2"	IB27-203-200	2.4	IB54-203-200	2.4						
2 3/8"	1 13/16"	IB27-206-113	7.2	IB54-206-113	7.2						
2 3/8"	2"	IB27-206-200	4.8	IB54-206-200	4.8						
2 3/8"	2 3/16"	IB27-206-203	2.4	IB54-206-203	2.4	IB120-206-203	2.4				
2 9/16"	2"			IB54-209-200	7.2	not available	-				
2 9/16"	2 3/16"			IB54-209-203	4.8	IB120-209-203	4.8				
2 9/16"	2 3/8"			IB54-209-206	2.4	IB120-209-206	2.4				
2 3/4"	2 3/16"			IB54-212-203	7.2	IB120-212-203	7.2				
2 3/4"	2 3/8"			IB54-212-206	4.8	IB120-212-206	4.8				
2 3/4"	2 9/16"			IB54-212-209	2.4	IB120-212-209	2.4				
2 15/16"	2 3/8"			IB54-215-206	7.2	IB120-215-206	7.2				
2 15/16"	2 9/16"			IB54-215-209	4.8	IB120-215-209	4.8				
2 15/16"	2 3/4"			IB54-215-212	2.4	IB120-215-212	2.4	IB210-215-212	2.4		
3 1/8"	2 9/16"			IB54-302-209	7.2	IB120-302-209	7.2	not available	-		
3 1/8"	2 3/4"			IB54-302-212	4.8	IB120-302-212	4.8	IB210-302-212	4.8		
3 1/8"	2 15/16"			IB54-302-215	2.4	IB120-302-215	2.4	IB210-302-215	2.4		
3 1/2"	2 15/16"					IB120-308-215	7.2	IB210-308-215	7.2		
3 1/2"	3 1/8"					IB120-308-302	4.8	IB210-308-302	4.8	IB430-308-302	4.8
3 7/8"	3 1/8"					IB120-314-302	9.5	IB210-314-302	9.5	IB430-314-302	9.5
3 7/8"	3 1/2"					IB120-314-308	4.8	IB210-314-308	4.8	IB430-314-308	4.8
4 1/4"	3 1/2"							IB210-404-308	9.5	IB430-404-308	9.5
4 1/4"	3 7/8"							IB210-404-314	4.8	IB430-404-314	4.8
4 5/8"	3 7/8"							IB210-410-314	9.5	IB430-410-314	9.5
4 5/8"	4 1/4"							IB210-410-404	4.8	IB430-410-404	4.8
5"	4 1/4"									IB430-500-404	9.5
5"	4 5/8"									IB430-500-410	4.8
5 3/8"	4 5/8"									IB430-506-410	9.5
5 3/8"	5"									IB430-506-500	4.8
5 3/4"	5"									IB430-512-500	9.5
5 3/4"	5 3/8"									IB430-512-506	4.8
6 1/8"	5 3/8"									IB430-602-506	9.5
6 1/8"	5 3/4"									IB430-602-512	4.8
6 1/2"	5 3/4"									IB430-608-512	9.5
6 1/2"	6 1/8"									IB430-608-602	4.8
6 7/8"	6 1/8"									IB430-614-602	9.5
6 7/8"	6 1/2"									IB430-614-608	4.8

MB - METRIC HEXAGON REDUCER BUSHES



To reduce the female hexagon AF size of the TWH-NRH metric ratchet heads (see page 78), these Hi-Force hexagon reducer bushes offer an easy and economical solution. Just select your outside AF size (i.e ratchet head AF size) and the required inside AF size to determine the model number. Please note that wall thickness (specified below as 'W' dimension) must be added to the minimum radius dimension of your ratchet head when using a reducer bush.

Outside AF size	Inside AF size	For TWH27NRH		For TWH54NRH		For TWH120NRH		For TWH210NRH		For TWH430NRH	
		Model number	W mm	Model number	W mm	Model number	W mm	Model number	W mm	Model number	W mm
30	24	MB27-30-24	3.0								
32	24	MB27-32-24	3.0								
32	27	MB27-32-27	3.0								
36	30	MB27-36-30	3.0	MB54-36-30	3.0						
41	36	MB27-41-36	2.5	MB54-41-36	2.5						
46	36	MB27-46-36	5.0	MB54-46-36	5.0						
46	41	MB27-46-41	2.5	MB54-46-41	2.5						
50	41	MB27-50-41	4.5	MB54-50-41	4.5						
50	46	MB27-50-46	2.0	MB54-50-46	2.0						
55	41	MB27-55-41	7.0	MB54-55-41	7.0						
55	46	MB27-55-46	4.5	MB54-55-46	4.5						
55	50	MB27-55-50	2.5	MB54-55-50	2.5	MB120-55-50	2.5				
60	46	MB27-60-46	7.0	MB54-60-46	7.0	not available					
60	50	MB27-60-50	5.0	MB54-60-50	5.0	MB120-60-50	5.0				
60	55	MB27-60-55	2.5	MB54-60-55	2.5	MB120-60-55	2.5				
65	50			MB54-65-50	7.5	MB120-65-50	7.5				
65	55			MB54-65-55	5.0	MB120-65-55	5.0				
65	60			MB54-65-60	2.5	MB120-65-60	2.5				
70	55			MB54-70-55	7.5	MB120-70-55	7.5				
70	60			MB54-70-60	5.0	MB120-70-60	5.0				
70	65			MB54-70-65	2.5	MB120-70-65	2.5				
75	60			MB54-75-60	7.5	MB120-75-60	7.5				
75	65			MB54-75-65	5.0	MB120-75-65	5.0				
75	70			MB54-75-70	2.5	MB120-75-70	2.5	MB210-75-70	2.5		
80	65			MB54-80-65	7.5	MB120-80-65	7.5	not available	-		
80	70			MB54-80-70	5.0	MB120-80-70	5.0	MB210-80-70	5.0		
80	75			MB54-80-75	2.5	MB120-80-75	2.5	MB210-80-75	2.5		
85	70					MB120-85-70	7.5	MB210-85-70	7.5		
85	75					MB120-85-75	5.0	MB210-85-75	5.0		
85	80					MB120-85-80	2.5	MB210-85-80	2.5	MB430-85-80	2.5
90	75					MB120-90-75	7.5	MB210-90-75	7.5	not available	-
90	80					MB120-90-80	5.0	MB210-90-80	5.0	MB430-90-80	5.0
90	85					MB120-90-85	2.5	MB210-90-85	2.5	MB430-90-85	2.5
95	80					MB120-95-80	7.5	MB210-95-80	7.5	MB430-95-80	7.5
95	85					MB120-95-85	5.0	MB210-95-85	5.0	MB430-95-85	5.0
95	90					MB120-95-90	2.5	MB210-95-90	2.5	MB430-95-90	2.5
100	85					MB120-100-85	7.5	MB210-100-85	7.5	MB430-100-85	7.5
100	90					MB120-100-90	5.0	MB210-100-90	5.0	MB430-100-90	5.0
100	95					MB120-100-95	2.5	MB210-100-95	2.5	MB430-100-95	2.5
105	90							MB210-105-90	7.5	MB430-105-90	7.5
105	95							MB210-105-95	5.0	MB430-105-95	5.0
105	100							MB210-105-100	2.5	MB430-105-100	2.5
110	95							MB210-110-95	7.5	MB430-110-95	7.5
110	100							MB210-110-100	5.0	MB430-110-100	5.0
110	105							MB210-110-105	2.5	MB430-110-105	2.5
115	100							MB210-115-100	7.5	MB430-115-100	7.5
115	105							MB210-115-105	5.0	MB430-115-105	5.0
115	110							MB210-115-110	2.5	MB430-115-110	2.5
130	105									MB430-130-105	12.5
130	110									MB430-130-110	10.0
130	115									MB430-130-115	7.5
145	110									MB430-145-110	17.5
145	115									MB430-145-115	15.0
145	130									MB430-145-130	7.5

BWH - BACKUP WRENCHES



BWH with BWM-90

- Suitable for use with TWS-N & TWH-N Wrenches
- Interchangeable hexagon links
- Positive release mechanism

The Hi-Force BW series of back up wrenches provide an easily fitted and easily removable back nut reaction arm to prevent both nuts rotating during tightening applications. The 'T-Bar' design adjustable reaction point prevents lock up once tightening is completed.

Complete set:

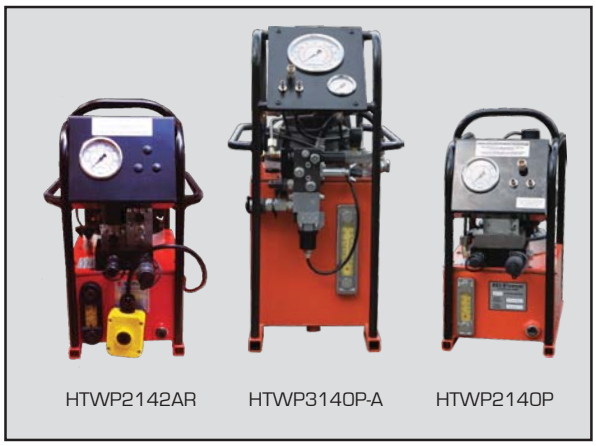
F

Model Number	Description	Backup wrench holder incl. set of links:			
		From		To	
		Imperial	Metric	Imperial	Metric
BWI-SET	Holder complete with imperial link set (12 pcs)	1 7/16"	-	3 7/8"	-
BWM-SET	Holder complete with metric link set (14 pcs)	-	36mm	-	100mm

Individual components:

Model Number	Description	Hexagon AF size	
		Imperial	Metric
Holder			
BWH	Backup wrench holder	-	-
Hexagon links			
BWI-107	Female hexagon link for backup wrench (imperial)	1 7/16"	-
BWI-110	Female hexagon link for backup wrench (imperial)	1 5/8"	-
BWI-113	Female hexagon link for backup wrench (imperial)	1 13/16"	-
BWI-200	Female hexagon link for backup wrench (imperial)	2"	-
BWI-203	Female hexagon link for backup wrench (imperial)	2 3/16"	-
BWI-206	Female hexagon link for backup wrench (imperial)	2 3/8"	-
BWI-209	Female hexagon link for backup wrench (imperial)	2 9/16"	-
BWI-212	Female hexagon link for backup wrench (imperial)	2 3/4"	-
BWI-215	Female hexagon link for backup wrench (imperial)	2 15/16"	-
BWI-302	Female hexagon link for backup wrench (imperial)	3 1/8"	-
BWI-308	Female hexagon link for backup wrench (imperial)	3 1/2"	-
BWI-314	Female hexagon link for backup wrench (imperial)	3 7/8"	-
BWM-36	Female hexagon link for backup wrench (metric)	-	36 mm
BWM-41	Female hexagon link for backup wrench (metric)	-	41 mm
BWM-46	Female hexagon link for backup wrench (metric)	-	46 mm
BWM-50	Female hexagon link for backup wrench (metric)	-	50 mm
BWM-55	Female hexagon link for backup wrench (metric)	-	55 mm
BWM-60	Female hexagon link for backup wrench (metric)	-	60 mm
BWM-65	Female hexagon link for backup wrench (metric)	-	65 mm
BWM-70	Female hexagon link for backup wrench (metric)	-	70 mm
BWM-75	Female hexagon link for backup wrench (metric)	-	75 mm
BWM-80	Female hexagon link for backup wrench (metric)	-	80 mm
BWM-85	Female hexagon link for backup wrench (metric)	-	85 mm
BWM-90	Female hexagon link for backup wrench (metric)	-	90 mm
BWM-95	Female hexagon link for backup wrench (metric)	-	95 mm
BWM-100	Female hexagon link for backup wrench (metric)	-	100 mm

HTWP - TORQUE WRENCH PUMPS



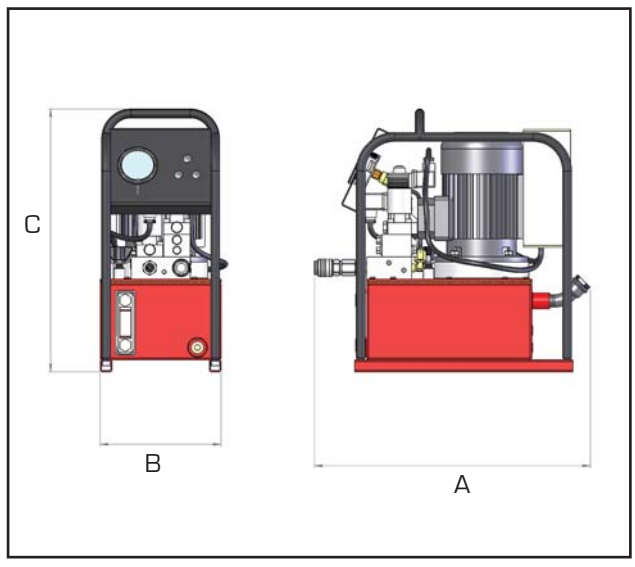
Working pressure 700 Bar

Choice of air or electric power options

Supplied complete with hand pendant controller

Hi-Force hydraulic torque wrench pumps are compatible for use with all Hi-Force hydraulic torque wrenches. All models are 700 Bar maximum working pressure, fitted with an easily accessible and adjustable torque setting pressure relief valve, and are available as air driven or electric driven pump units. All pumps are supplied with a remote operation, push button hand pendant controller with three metres of control line cable. Glycerine filled, easy to read, dual scale (0-700 Bar/0-10,000 PSI) hydraulic pressure gauges are fitted as standard to all models. Air driven versions also include an integral inline filter, regulator, lubricator system with airline pressure gauge and an exhaust air cooling system.

- Dual scale glycerine filled pressure gauge fitted as standard
- Two speed operation with choice of standard length hoses available
- Externally adjustable torque setting pressure relief valve fitted as standard
- Protective carrying frame and oil sight level gauge
- Air pressure gauge and filter-regulator-lubricator unit (air powered pumps only)
- Integral oil cooling system (air powered pumps only)
- HTWP2141/2AR are fitted with auto retract function as standard



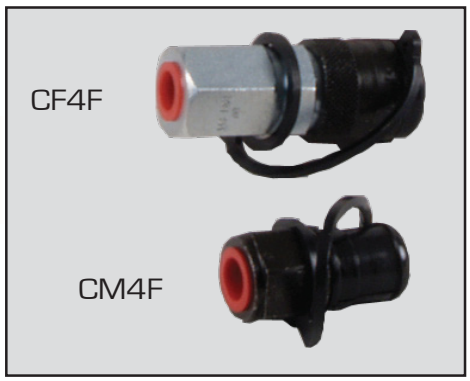
Model number	Max pressure bar	Power supply	Motor rating kW	Displacement l/min low pressure	high pressure	Changeover pressure bar	Weight kg	Dimensions in mm A	B	C
HTWP2140P	700	7 Bar	1.50	6.1	0.51	60	28.0	468	205	445
HTWP2141AR	700	110 volt	0.55	3.9	0.36	60	34.0	468	205	445
HTWP2142AR	700	240 volt	0.55	3.9	0.36	60	34.0	468	205	445
HTWP3140P-A	700	7 Bar	3.70	13.5	1.90	100	60.0	547	246	589
HTWP3141P-A	700	110 volt	2.20	6.3	0.90	100	72.0	547	246	653
HTWP3142P-A	700	240 volt	2.20	6.3	0.90	100	72.0	547	246	653

HTWP - TORQUE WRENCH PUMP ACCESSORIES



4-WAY MULTI SPLIT BLOCK

Model number	Description
HTWM4	Multi-split block complete with quick connect couplers. Suitable for use with up to 4 hydraulic wrenches from one pump unit



F

QUICK CONNECT COUPLINGS

Model number	Thread type	Description
CF4F	1/4" NPT Female	Female half coupler
CM4F	1/4" NPT Female	Male half coupler

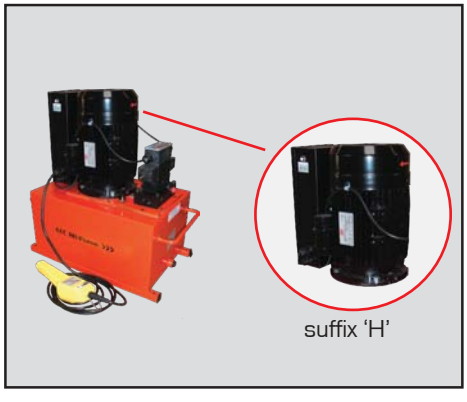
Note: Always check for the required thread size when ordering spare or replacement couplings. If different thread size is required, please check available reducers and adaptors on page 54 of this catalogue.



HYDRAULIC HOSES

Model number	Length metres	Description
HTWH4	4	Twin hose set with hose clips and quick connect couplers on both ends.
HTWH5	5	
HTWH6	6	
HTWH8	8	
HTWH10	10	

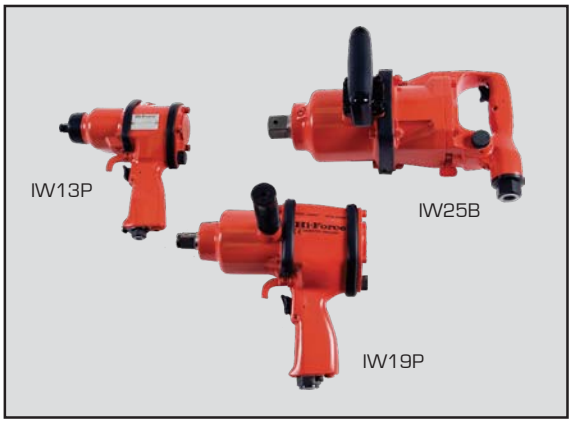
Note: Alternative length hoses available on request.



60 HZ ELECTRIC MOTOR

Suffix	
H	Please suffix your pump model with 'H' for 60Hz version

IW - PNEUMATIC IMPACT WRENCHES



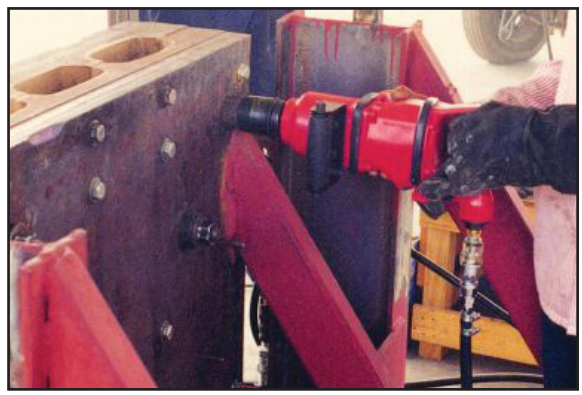
Industrial heavy duty design

Square drive sizes from ½" to 1½"

Excellent power to weight ratio

The IW range of heavy duty pneumatic impact wrenches is designed for high volume production, heavy maintenance and construction work. A choice of four models in square drive sizes ½", ¾", 1" or 1½" is available all offering an excellent power to weight ratio, compact design and low vibration. Available with pistol grip (models IW13P and IW19P) and back handle grip (models IW25B and IW38B) these high quality tools offer increased durability, low noise level and reduced operator fatigue. All models can be used for tightening and loosening applications and incorporate a four position adjustable power output device.

- Choice of four models
- Minimal noise and vibration features
- Operates from standard 6 Bar air pressure



A full range of impact quality sockets, in both imperial and metric sizes, for use with Hi-Force impact wrenches is detailed on pages 73 and 74.

Model number	Square drive size	Bolt capacity mm	Bolt capacity inch	Free speed R.P.M.	Free speed I.P.M.	Max. torque Nm	Max. torque lbf.ft	Recommended torque Nm	Recommended torque lbf.ft	Air Consumption m^3/min	Air Consumption cfm	Weight kg
Pistol grip versions												
IW13P	½"	16	⅝"	6300	1200	500	369	90-400	65-295	0.35	12.5	2.8
IW19P	¾"	22	⅞"	3800	1100	1100	812	250-870	180-630	0.60	21.4	6.2
Back handle grip versions												
IW25B	1"	45	1¾"	3700	700	2340	1727	700-2000	517-1476	0.75	26.7	10.7
IW38B	1½"	50	2"	3000	600	3200	2361	800-2800	590-2066	0.82	29.2	16.0

FRL - FILTER REGULATOR LUBRICATOR UNIT



FRL11

- Protective carrying frame
- Complete with air inlet hose
- Air pressure gauge fitted as standard

The Hi-Force FRL filter regulator lubricator unit is designed to be used in conjunction with air operated tools and air driven pump units. The unit allows the air pressure to be adjusted to suit the requirements of the tool. The unit will also remove dust and water from the air supply and inject lubricant to the tool to ensure smooth operation. Supplied in a robust steel carrying and protective frame as standard, the unit comes complete with air inlet pressure gauge and 3 meter air hose with end fittings.

The FRL filter regulator lubricator unit is supplied as standard with all pneumatic torque multipliers, series PG, SP and PT (see pages 68 & 69) and is fitted to all HTWP air driven hydraulic torque wrench pumps as detailed on page 83 of this catalogue.

The Hi-Force AHP1 and AHP2 air driven Hydrotest pump units are supplied complete with similar filter regulator lubricator units as an integrated part of the pump units.



FRL11 as part of the
PG series pneumatic torque multiplier

We strongly advise to use this unit also with all other air operated tools and air driven pumps, such as IW series of pneumatic impact wrenches (see page 85), the AHP series foot operated air driven pumps (see page 45 - 46) and similar products.

Model number	Air inlet connection	Air outlet connection	Weight kg	Dimensions in mm		
				Length	Width	Height
FRL11	½" BSP	½" BSP	3.0	200	200	310

Hi-Force®

BOLT TENSIONERS

STS Imperial Range	Topside bolt tensioners Imperial range	Pages 88 - 89
STS Imperial Range	Bolt tensioner components Imperial range	Pages 90 - 91
STS Metric Range	Topside bolt tensioners Metric range	Pages 92 - 93
STS Metric Range	Bolt tensioner components Metric range	Pages 94 - 95
STS-SR Imperial Range	Spring return topside bolt tensioners Imperial range	Page 96
STS-SR Metric Range	Spring return topside bolt tensioners Metric range	Page 97
STS Specials	Topside bolt tensioners Purpose built special design	Page 98
STU Imperial Range	Sub-sea bolt tensioners Imperial range	Page 99
STU Metric Range	Sub-sea bolt tensioners Metric range	Page 100
HTN Imperial Range	Hydraulic tensioner nuts Imperial range	Page 101
HTN Metric Range	Hydraulic tensioner nuts Metric range	Page 102
AHP & XHP Pumps	Hydraulic pumps for all Hi-Force bolt tensioners	Page 103
Accessories	Bolt tensioner hoses, couplers and hose reels	Page 104
BoltRight	The ultimate software package for calculation of the correct torque and tension values	Pages 105 - 106

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STS - TOPSIDE BOLT TENSIONERS - IMPERIAL RANGE



Capacities from 234 to 2649 kN

Working pressure 1500 Bar

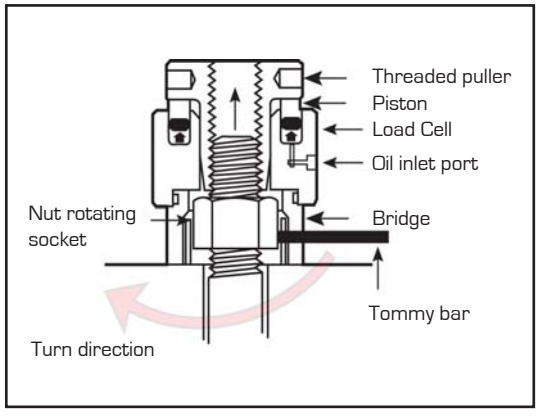
Single acting design

- Nitrocarburised piston
- Maximum piston stroke indicator
- Suitable for single or multi-tensioning applications
- Specially designed tensioners available on request (see page 98)
- User friendly operating and maintenance procedure
- Choice of manually operated or air powered pumps available (see page 103)



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The STS imperial bolt tensioner range is designed for topside operation in a wide variety of applications including pipeline flanges, heat exchangers, pressure vessels, compressor covers, boiler feed pumps, anchor bolts and many others. The range comprises of 26 imperial size options ranging from ¾" to 4" thread size and all models are suitable for working pressures up to 1500 Bar. Each of the 6 models of hydraulic tensioning cylinder can be operated with a variety of threaded pullers and nut rotating sockets ensuring that the maximum possible range of bolt sizes can be accommodated using the minimum number of hydraulic cylinders. Threaded pullers, bridges and nut rotating sockets are available as individual components (see pages 90 & 91 for detailed information).
All Hi-Force hydraulic bolt tensioners are designed and manufactured to include a wear coated piston, maximum piston stroke indicator, self-energising high pressure seals, dual quick connect couplings for easy multiple tensioner connection and a user friendly operation and maintenance procedure. Suitable manual and air driven hydraulic pumps, high pressure hoses and couplings for use with Hi-Force bolt tensioners are detailed on pages 103 & 104.





STS - TOPSIDE BOLT TENSIONERS - IMPERIAL RANGE

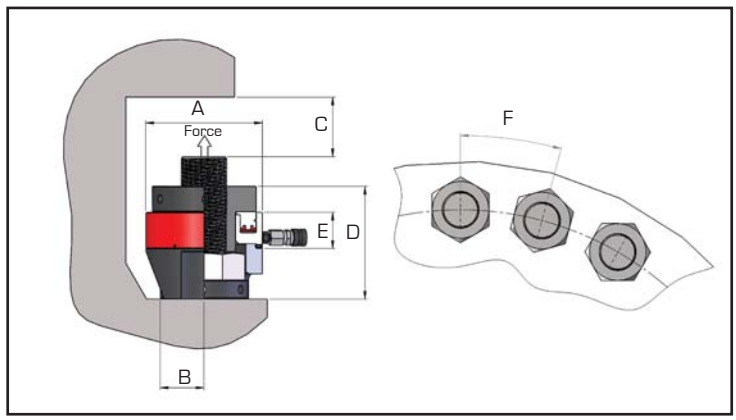


Bolt sizes from ¾" to 4"

Modular design for optimum versatility

Dual quick connect couplings for easy connection



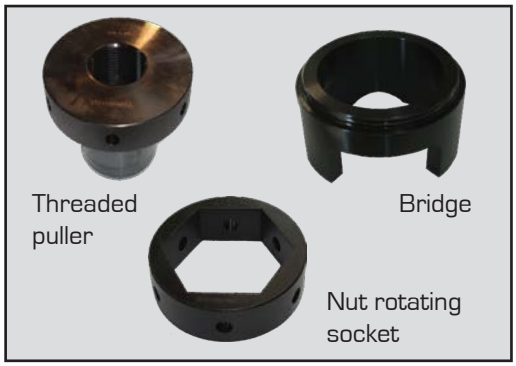


Model number	Bolt thread size	Threads per inch	Capacity kN	Capacity tonnes	Effective area cm²	Stroke mm	Weight kg
STS1-075B1	¾"	10	234	23.9	15.6	10	1.7
STS1-087B1	⅞"	9	234	23.9	15.6	10	1.7
STS1-100B2	1"	8	234	23.9	15.6	10	1.7
STS1-112B2	1 ⅛"	8	234	23.9	15.6	10	1.7
STS2-125B1	1 ¼"	8	457	46.6	30.5	15	3.5
STS2-137B1	1 ⅜"	8	457	46.6	30.5	15	3.5
STS2-150B1	1 ½"	8	457	46.6	30.5	15	3.5
STS3-162B1	1 ⅝"	8	822	83.8	54.8	15	6.1
STS3-175B1	1 ¾"	8	822	83.8	54.8	15	6.1
STS3-175B2	1 ¾"	8	822	83.8	54.8	15	6.1
STS3-187B1	1 ⅞"	8	822	83.8	54.8	15	6.1
STS3-187B2	1 ⅞"	8	822	83.8	54.8	15	6.1
STS3-200B2	2"	8	822	83.8	54.8	15	6.1
STS4-187B1	1 ⅞"	8	1264	128.9	84.3	15	10.6
STS4-200B1	2"	8	1264	128.9	84.3	15	10.6
STS4-200B2	2"	8	1264	128.9	84.3	15	10.6
STS4-225B2	2 ¼"	8	1264	128.9	84.3	15	10.6
STS4-250B2	2 ½"	8	1264	128.9	84.3	15	10.6
STS5-250B1	2 ½"	8	1833	186.9	122.2	15	16.0
STS5-275B1	2 ¾"	8	1833	186.9	122.2	15	16.0
STS5-300B1	3"	8	1833	186.9	122.2	15	16.0
STS6-300B1	3"	8	2649	270.0	176.6	15	23.5
STS6-325B1	3 ¼"	8	2649	270.0	176.6	15	23.5
STS6-350B1	3 ½"	8	2649	270.0	176.6	15	23.5
STS6-375B3	3 ¾"	8	2649	270.0	176.6	15	23.5
STS6-400B3	4"	8	2649	270.0	176.6	15	23.5

Dimensions in mm					
A	B	C min	D	E	F
74	28	74	90	45	51
74	28	74	90	45	54
74	30	80	98	45	61
74	30	80	98	45	64
102	39	103	128	54	74
102	39	103	128	54	77
102	39	103	128	54	80
133	47	115	150	56	92
133	47	115	150	56	93
133	50	117	155	56	104
133	47	115	150	56	97
133	50	117	155	56	104
133	50	117	155	56	104
163	50	119	149	57	104
163	50	119	149	57	104
163	62	119	149	57	106
163	62	135	165	57	121
163	62	135	165	57	127
193	73	145	187	60	134
193	73	145	187	60	140
193	73	145	187	60	147
233	84	178	216	64	161
233	84	178	216	64	167
233	84	178	216	64	172
233	105	205	257	64	191
233	105	205	257	64	196

Note: Weight is for load cell and bridge only. Total weight of complete assembly depends on size of puller and nut rotating socket selected.

STS - BOLT TENSIONER COMPONENTS - IMPERIAL



For use with STS Imperial Tensioners

Modular design

Offers greater versatility

The modular design of Hi-Force STS series topside hydraulic bolt tensioners enables the user to adapt an existing STS tensioner assembly to another thread size, within the tensioner range, by purchasing individual components or a simple conversion kit. By changing the required components (see drawing and table on the next page), Hi-Force STS bolt tensioners offer the user even greater versatility at an economical cost.

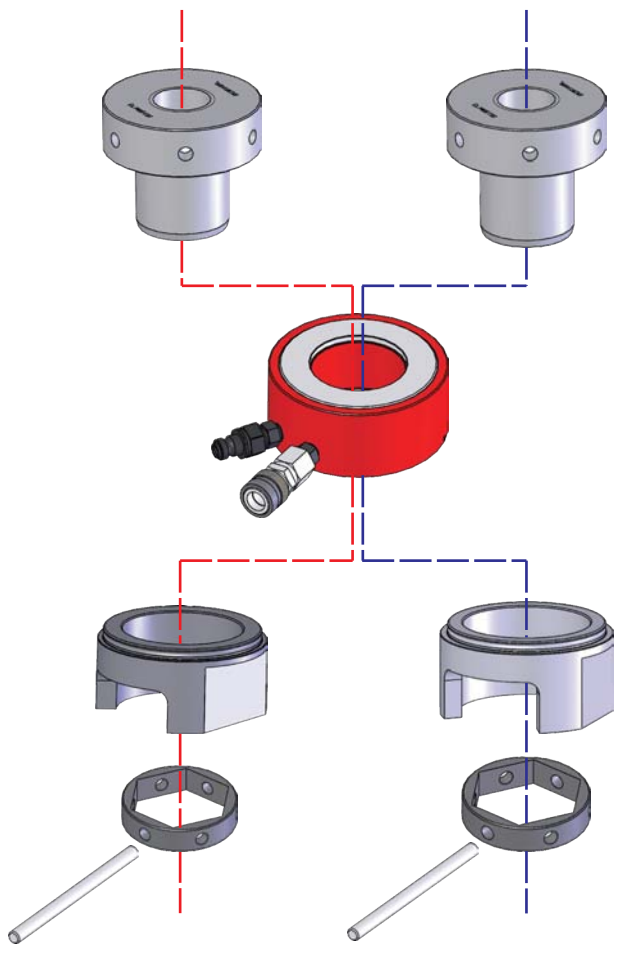
Tensioner models STS1, STS3, STS4 & STS6 are available with two different bridge sizes, hence always check whether or not the required thread change is possible within the bridge size (please follow coloured lines in below drawing). Make sure that all components match up. DO NOT mix components from different colour lines. A large bridge will require the usage of a long threaded puller to ensure sufficient thread engagement, as well as a large size nut rotating socket.

G

Changes within the same colour code DO NOT require a bridge change however, changes from the red to blue line (or vice versa) MUST include a relative bridge also.

The next page will provide part numbers for all the tensioner components, for which the same colour coding is used, i.e. red represents the smaller bolt sizes within the tensioner range, comprising of short threaded adapter, load cell, small bridge, small nut rotating socket and tommy bar. The blue line represents the larger bolt sizes within the tensioner range, in which case the tensioner is built from the long threaded adaptor, load cell, large bridge, large nut rotating socket and tommy bar.

Don't forget to order your tommy bars when purchasing Hi-Force Bolt tensioners, Hi-Force recommends the purchase of one tommy bar for every four tensioners.

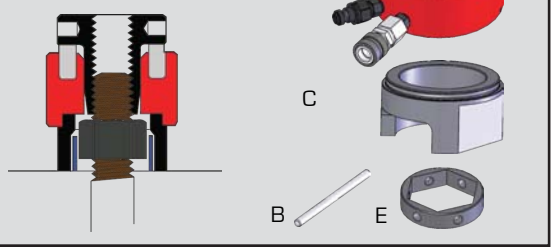


Note: STS2 & STS5 models both have only one tensioner bridge available.

STS - BOLT TENSIONER COMPONENTS - IMPERIAL

Principle of STS bolt tensioner

A = Load cell
B = Tommy bar
C = Bridge
D = Threaded puller
E = Nut rotating socket



This table provides all the information to select the components to modify your existing tensioner to suit another bolt size. Changes are only possible within the same tensioner size. It is essential that all the components or selected conversion kits have the same suffix as the target tensioner size (i.e. B1, B2 or B3).

Examples:
To change from STS3-162B1 to STS3-187B1 would require conversion kit CK3-187B1 only.
To change from STS3-187B1 to STS3-200B2 would require conversion kit CK3-200B2 and bridge STS3-B2.

- Denotes smaller bridge size within tensioner range
- Denotes larger bridge size within tensioner range
- Denotes one bridge size within tensioner range

Complete tensioner		Individual components					D & E
Model number	Bolt Thread	A Load cell	B Tommy bar	C Bridge	Available as conversion kit D - Threaded puller	Available as conversion kit E - Rotating socket	Complete conversion kit
For tensioner range STS1:							
STS1-075B1	3/4"	STS1-LC	TTB06	STS1-B1	TP1-075B1	RS1-32B1	CK1-075B1
STS1-087B1	7/8"				TP1-087B1	RS1-37B1	CK1-087B1
STS1-100B2	1"			STS1-B2	TP1-100B2	RS1-41B2	CK1-100B2
STS1-112B2	1 1/8"				TP1-112B2	RS1-46B2	CK1-112B2
For tensioner range STS2:							
STS2-125B1	1 1/4"	STS2-LC	TTB08	STS2-B1	TP2-125B1	RS2-51B1	CK2-125B1
STS2-137B1	1 3/8"				TP2-137B1	RS2-56B1	CK2-137B1
STS2-150B1	1 1/2"				TP2-150B1	RS2-60B1	CK2-150B1
For tensioner range STS3:							
STS3-162B1	1 5/8"	STS3-LC	TTB10	STS3-B1	TP3-162B1	RS3-65B1	CK3-162B1
STS3-175B1	1 3/4"				TP3-175B1	RS3-70B1	CK3-175B1
STS3-187B1	1 7/8"				TP3-187B1	RS3-75B1	CK3-187B1
STS3-175B2	1 3/4"			STS3-B2	TP3-175B2	RS3-70B2	CK3-175B2
STS3-187B2	1 7/8"				TP3-187B2	RS3-75B2	CK3-187B2
STS3-200B2	2"				TP3-200B2	RS3-80B2	CK3-200B2
For tensioner range STS4:							
STS4-187B1	1 7/8"	STS4-LC	TTB10	STS4-B1	TP4-187B1	RS4-75B1	CK4-187B1
STS4-200B1	2"				TP4-200B1	RS4-80B1	CK4-200B1
STS4-200B2	2"			STS4-B2	TP4-200B2	RS4-80B2	CK4-200B2
STS4-225B2	2 1/4"				TP4-225B2	RS4-90B2	CK4-225B2
STS4-250B2	2 1/2"				TP4-250B2	RS4-98B2	CK4-250B2
For tensioner range STS5:							
STS5-250B1	2 1/2"	STS5-LC	TTB14	STS5-B1	TP5-250B1	RS5-100B1	CK5-250B1
STS5-275B1	2 3/4"				TP5-275B1	RS5-108B1	CK5-275B1
STS5-300B1	3"				TP5-300B1	RS5-118B1	CK5-300B1
For tensioner range STS6:							
STS6-300B1	3"	STS6-LC	TTB14	STS6-B1	TP6-300B1	RS6-118B1	CK6-300B1
STS6-325B1	3 1/4"				TP6-325B1	RS6-127B1	CK6-325B1
STS6-350B1	3 1/2"				TP6-350B1	RS6-137B1	CK6-350B1
STS6-375B3	3 3/4"			STS6-B3	TP6-375B3	RS6-146B3	CK6-375B3
STS6-400B3	4"				TP6-400B3	RS6-156B3	CK6-400B3

Note: Remember to check bridge compatibility for STS1, STS3, STS4 and STS6 models when ordering components.

STS - TOPSIDE BOLT TENSIONERS - METRIC RANGE



STS3-M52

Capacities from 234 to 2649 kN

Working pressure 1500 Bar

Single acting design

- Nitrocarburised piston
- Maximum piston stroke indicator
- Suitable for single or multi-tensioning applications
- Specially designed tensioners available on request (see page 98)
- User friendly operating and maintenance procedure
- Choice of manually operated or air powered pumps available (see page 103)

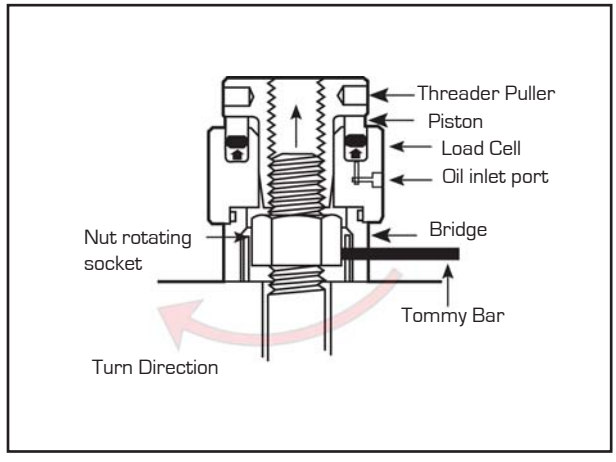


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The STS metric bolt tensioner range is designed for topside operation in a wide variety of applications including pipeline flanges, heat exchangers, pressure vessels, compressor covers, boiler feed pumps, anchor bolts and many others. The range comprises of 26 metric size options ranging from M16 to M100 thread size and all models are suitable for working pressures up to 1500 Bar. Each of the 6 models of hydraulic tensioning cylinder can be operated with a variety of threaded pullers and nut rotating sockets ensuring that the maximum possible range of bolt sizes can be accommodated using the minimum number of hydraulic cylinders. Threaded pullers and nut rotating sockets are available as individual components (see pages 94 & 95 for detailed information).

All Hi-Force hydraulic bolt tensioners are designed and manufactured to include a wear coated piston, maximum piston stroke indicator, self-energising high pressure seals, dual quick connect couplings for easy multiple tensioner connection and a user friendly operation and maintenance procedure. Suitable manual and air driven hydraulic pumps, high pressure hoses and couplings for use with Hi-Force bolt tensioners are detailed on pages 103 & 104.



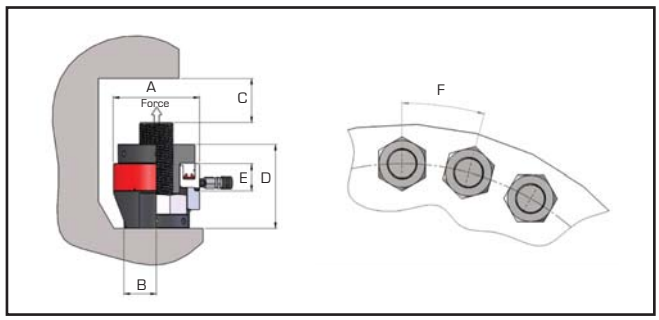


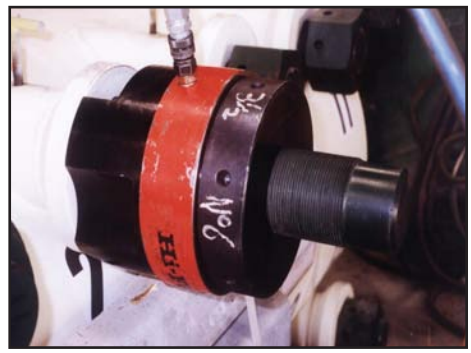
STS - TOPSIDE BOLT TENSIONERS - METRIC RANGE



STS3-M52

- Bolt sizes from M16 to M100
- Modular design for optimum versatility
- Dual quick couplings for easy connection



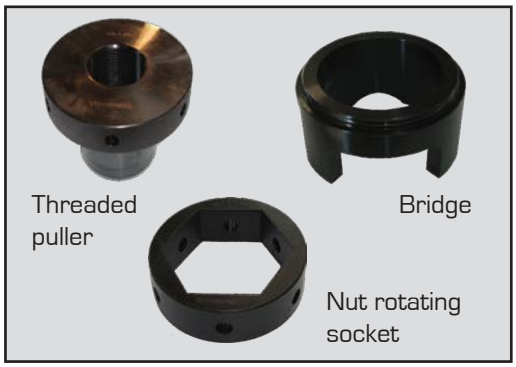


Model number	Bolt thread size	Thread pitch	Capacity kN	Capacity tonnes	Effective area cm²	Stroke mm	Weight kg
STS1-M16B1	M16	2	234	23.9	15.6	10	1.7
STS1-M18B1	M18	2.5	234	23.9	15.6	10	1.7
STS1-M20B1	M20	2.5	234	23.9	15.6	10	1.7
STS1-M22B2	M22	2.5	234	23.9	15.6	10	1.7
STS1-M24B2	M24	3	234	23.9	15.6	10	1.7
STS1-M27B2	M27	3	234	23.9	15.6	10	1.7
STS2-M30B1	M30	3.5	457	46.6	30.5	15	3.5
STS2-M33B1	M33	3.5	457	46.6	30.5	15	3.5
STS2-M36B1	M36	4	457	46.6	30.5	15	3.5
STS2-M39B1	M39	4	457	46.6	30.5	15	3.5
STS3-M42B1	M42	4.5	822	83.8	54.8	15	6.1
STS3-M45B1	M45	4.5	822	83.8	54.8	15	6.1
STS3-M45B2	M45	4.5	822	83.8	54.8	15	6.1
STS3-M48B1	M48	5	822	83.8	54.8	15	6.1
STS3-M48B2	M48	5	822	83.8	54.8	15	6.1
STS3-M52B2	M52	5	822	83.8	54.8	15	6.1
STS4-M48B1	M48	5	1264	128.9	84.3	15	10.6
STS4-M52B1	M52	5	1264	128.9	84.3	15	10.6
STS4-M52B2	M52	5	1264	128.9	84.3	15	10.6
STS4-M56B2	M56	5.5	1264	128.9	84.3	15	10.6
STS4-M60B2	M60	5.5	1264	128.9	84.3	15	10.6
STS4-M64B2	M64	6	1264	128.9	84.3	15	10.6
STS5-M64B1	M64	6	1833	186.9	122.2	15	16.0
STS5-M68B1	M68	6	1833	186.9	122.2	15	16.0
STS5-M72B1	M72	6	1833	186.9	122.2	15	16.0
STS5-M76B1	M76	6	1833	186.9	122.2	15	16.0
STS6-M76B1	M76	6	2649	270.0	176.6	15	23.5
STS6-M80B1	M80	6	2649	270.0	176.6	15	23.5
STS6-M85B1	M85	6	2649	270.0	176.6	15	23.5
STS6-M90B1	M90	6	2649	270.0	176.6	15	23.5
STS6-M95B3	M95	6	2649	270.0	176.6	15	23.5
STS6-M100B3	M100	6	2649	270.0	176.6	15	23.5

Dimensions in mm A	B	C	D	E	F
74	28	74	90	45	47
74	28	74	90	45	49
74	28	74	90	45	51
74	30	80	98	45	56
74	30	80	98	45	59
74	30	80	98	45	61
102	39	103	128	54	71
102	39	103	128	54	74
102	39	103	128	54	77
102	39	103	128	54	80
133	47	115	150	56	91
133	47	115	150	56	94
133	50	117	155	56	105
133	47	115	150	56	97
133	50	117	155	56	105
133	50	117	155	56	105
163	50	119	149	57	105
163	50	119	149	57	108
163	62	135	165	57	120
163	62	135	165	57	120
163	62	135	165	57	124
163	62	135	165	57	126
193	73	145	187	60	134
193	73	145	187	60	136
193	73	145	187	60	139
193	73	145	187	60	142
233	84	178	216	64	158
233	84	178	216	64	160
233	84	178	216	64	162
233	84	178	216	64	170
233	105	205	257	64	184
233	105	205	257	64	190

Note: Weight is for load cell and bridge only. Total weight of complete assembly depends on size of puller and nut rotating socket selected.

STS-CK - BOLT TENSIONER COMPONENTS - METRIC



Cost saving option

Easily fitted to existing tensioner assembly

Offers greater versatility

Similar to the imperial tensioner components (pages 90 & 91), the Hi-Force metric topside hydraulic bolt tensioners are also modular in design and can be adapted to another thread size, within the tensioner range, by purchasing individual components or a simple conversion kit. By changing the required components (see drawing and table on the next page), Hi-Force STS bolt tensioners offer the user even greater versatility at an economical cost.

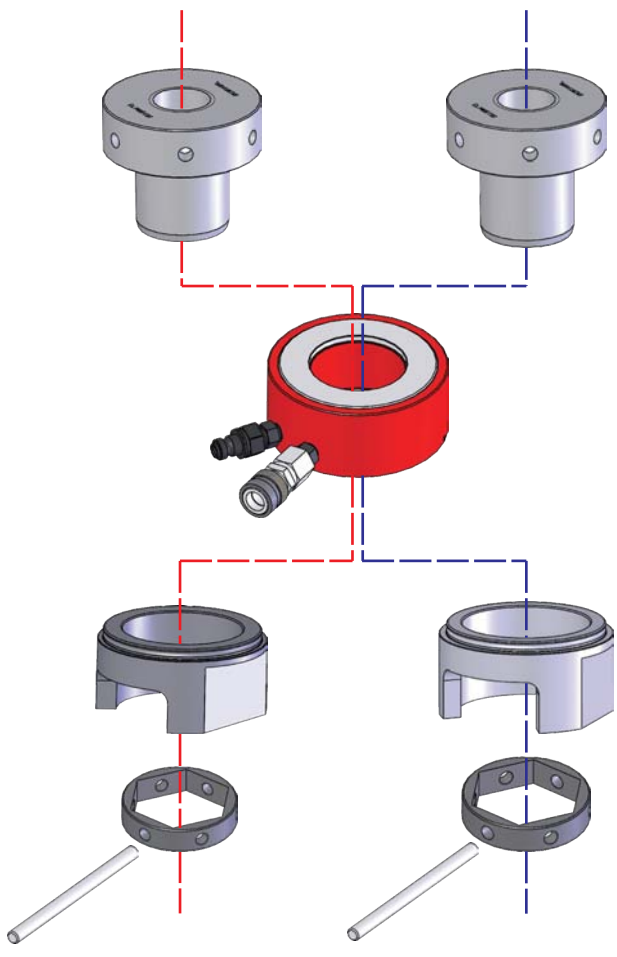
Tensioner models STS1, STS3, STS4 & STS6 are available with two different bridge sizes, hence always check whether or not the required thread change is possible within the bridge size (please follow coloured lines in below drawing). Make sure that all components match up. DO NOT mix components from different colour lines. A large bridge will require the usage of a long threaded puller to ensure sufficient thread engagement, as well as a large size nut rotating socket.

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Changes within the same colour code DO NOT require a bridge change however, changes from the red to blue line (or vice versa) MUST include a relative bridge also.

The next page will provide part numbers for all the tensioner components, for which the same colour coding is used, i.e.
Red represents the smaller bolt sizes within the tensioner range, comprising of short threaded adapter, load cell, small bridge, small nut rotating socket and tommy bar. The blue line represents the larger bolt sizes within the tensioner range, in which case the tensioner is built from the long threaded adaptor, load cell, large bridge, large nut rotating socket and tommy bar.

Don't forget to order your tommy bars when purchasing Hi-Force Bolt tensioners, Hi-Force recommends the purchase of one tommy bar for every four tensioners.

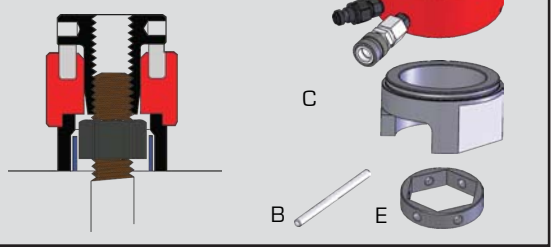


Note: STS2 & STS5 models both have only one tensioner bridge available.

STS - BOLT TENSIONER COMPONENTS - METRIC

Principle of STS bolt tensioner

A = Load cell
B = Tommy bar
C = Bridge
D = Threaded puller
E = Nut rotating socket



This table provides all the information to select the components to modify your existing tensioner to suit another bolt size. Changes are only possible within the same tensioner size. It is essential that all the components or selected conversion kits have the same suffix as the target tensioner size (i.e.B1, B2 or B3).

Examples:
To change from STS3-M42B1 to STS3-M48B1 would require conversion kit CK3-M48B1 only.
To change from STS3-M48B1 to STS3-M52B2 would require conversion kit CK3-M52B2 and bridge STS3-B2.

- Denotes smaller bridge size within tensioner range
- Denotes larger bridge size within tensioner range
- Denotes one bridge size within tensioner range

Complete tensioner		Individual components					D & E
		A	B	C	Available as conversion kit		
Model number	Bolt Thread	Load cell	Tommy bar	Bridge	D - Threaded puller	E - Rotating socket	Complete conversion kit
For tensioner range STS1:							
STS1-M16B1	M16	STS1-LC	TTB06	STS1-B1	TP1-M16B1	RS1-24B1	CK1-M16B1
STS1-M18B1	M18				TP1-M18B1	RS1-27B1	CK1-M18B1
STS1-M20B1	M20				TP1-M20B1	RS1-30B1	CK1-M20B1
STS1-M22B2	M22			STS1-B2	TP1-M22B2	RS1-32B2	CK1-M22B2
STS1-M24B2	M24				TP1-M24B2	RS1-37B2	CK1-M24B2
STS1-M27B2	M27				TP1-M27B2	RS1-41B2	CK1-M27B2
For tensioner range STS2:							
STS2-M30B1	M30	STS2-LC	TTB08	STS2-B1	TP2-M30B1	RS2-46B1	CK2-M30B1
STS2-M33B1	M33				TP2-M33B1	RS2-51B1	CK2-M33B1
STS2-M36B1	M36				TP2-M36B1	RS2-56B1	CK2-M36B1
STS2-M39B1	M39				TP2-M39B1	RS2-60B1	CK2-M39B1
For tensioner range STS3:							
STS3-M42B1	M42	STS3-LC	TTB10	STS3-B1	TP3-M42B1	RS3-65B1	CK3-M42B1
STS3-M45B1	M45				TP3-M45B1	RS3-70B1	CK3-M45B1
STS3-M48B1	M48				TP3-M48B1	RS3-75B1	CK3-M48B1
STS3-M45B2	M45			STS3-B2	TP3-M45B2	RS3-70B2	CK3-M45B2
STS3-M48B2	M48				TP3-M48B2	RS3-75B2	CK3-M48B2
STS3-M52B2	M52				TP3-M52B2	RS3-80B2	CK3-M52B2
For tensioner range STS4:							
STS4-M48B1	M48	STS4-LC	TTB10	STS4-B1	TP4-M48B1	RS4-75B1	CK4-M48B1
STS4-M52B1	M52				TP4-M52B1	RS4-80B1	CK4-M52B1
STS4-M52B2	M52			STS4-B2	TP4-M52B2	RS4-80B2	CK4-M52B2
STS4-M56B2	M56				TP4-M56B2	RS4-85B2	CK4-M56B2
STS4-M60B2	M60				TP4-M60B2	RS4-90B2	CK4-M60B2
STS4-M64B2	M64				TP4-M64B2	RS4-95B2	CK4-M64B2
For tensioner range STS5:							
STS5-M64B1	M64	STS5-LC	TTB14	STS5-B1	TP5-M64B1	RS5-95B1	CK5-M64B1
STS5-M68B1	M68				TP5-M68B1	RS5-100B1	CK5-M68B1
STS5-M72B1	M72				TP5-M72B1	RS5-105B1	CK5-M72B1
STS5-M76B1	M76				TP5-M76B1	RS5-110B1	CK5-M76B1
For tensioner range STS6:							
STS6-M76B1	M76	STS6-LC	TTB14	STS6-B1	TP6-M76B1	RS6-110B1	CK6-M76B1
STS6-M80B1	M80				TP6-M80B1	RS6-115B1	CK6-M80B1
STS6-M85B1	M85				TP6-M85B1	RS6-120B1	CK6-M85B1
STS6-M90B1	M90				TP6-M90B1	RS6-130B1	CK6-M90B1
STS6-M95B3	M95			STS6-B3	TP6-M95B3	RS6-135B3	CK6-M95B3
STS6-M100B3	M100				TP6-M100B3	RS6-146B3	CK6-M100B3

Note: Remember to check bridge compatibility for STS1, STS3, STS4 and STS6 models when ordering components.

STS-SR - SPRING RETURN BOLT TENSIONERS - IMPERIAL

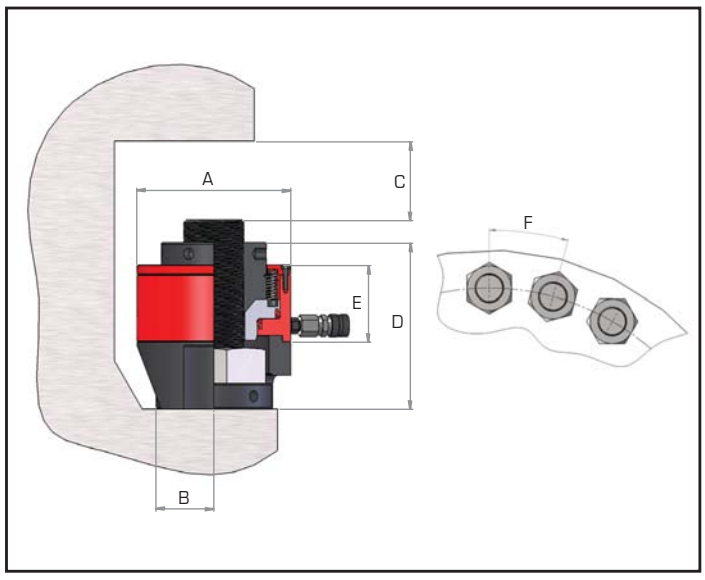


STS5-300SR

- Imperial bolt size range from 2 ½" to 4 "
- Maximum working pressure 1500 Bar
- Spring assisted piston retraction

The STS-SR imperial range of hydraulic bolt tensioners, offers all of the features and benefits of our standard STS range (see pages 88-91), but with the added feature of spring assisted return hydraulic pistons. Designed primarily for topside operation, this additional spring return piston feature will reduce bolt tensioning cycle times considerably, as the tensioner piston will automatically retract immediately after the hydraulic pressure is released. The range currently comprises of 8 models, suitable for standard size bolts from 2 ½" to 4 ½" diameter. For bolt sizes less than 2 ½" diameter, where manually retracting the tensioner piston is much easier and faster, please refer to our standard STS range on pages 88-91. We can, if necessary, design and manufacture spring return piston versions, for bolt sizes less than 2 ½" diameter, to special order.

The versatility of the STS-SR bolt tensioner range, is identical to our standard STS range, with a variety of interchangeable threaded pullers and nut rotating sockets available, either as bolt size conversion kits or individual parts. Further details on STS-SR conversion kits are available on request. All STS-SR bolt tensioners are designed and manufactured with a wear coated piston, maximum stroke indicator, self energising high pressure seals, dual quick connect couplers, for easy multiple tensioner hook up and operate at pressures up to 1500 Bar maximum.
Suitable hydraulic pumps and high pressure hydraulic hose assemblies for use with STS-SR tensioners are detailed on pages 103 & 104.



Model number	Bolt thread size	Thread Pitch	Capacity Kn	Capacity Tonnes	Effective Area cm^2	Stroke	Weight	Dimensions in mm A	B	C	D	E	F
STS5-250SR	2 ½"	8	1846	188.2	123.1	15	23.2	193	73	96	208	96	134
STS5-275SR	2 ¾"	8	1846	188.2	123.1	15	23.2	193	73	96	208	96	140
STS5-300SR	3 "	8	1846	188.2	123.1	15	23.2	193	73	96	208	96	147
STS6-300SR	3 "	8	2657	270.8	177.1	15	35.9	233	84	97	229	97	161
STS6-325SR	3 ¼"	8	2657	270.8	177.1	15	35.9	233	84	97	229	97	167
STS6-350SR	3 ½"	8	2657	270.8	177.1	15	35.9	233	84	97	229	97	172
STS6-375SR	3 ¾"	8	2657	270.8	177.1	15	41.1	233	105	97	270	97	191
STS6-400SR	4"	8	2657	270.8	177.1	15	41.1	233	105	97	270	97	196

STS-SR - SPRING RETURN BOLT TENSIONERS - METRIC



STS5-M76SR

- Metric bolt size range from M64 to M100
- Maximum working pressure 1500 Bar
- Spring assisted piston retraction

The STS-SR metric range of hydraulic bolt tensioners offers all of the features and benefits of our standard STS range (see pages 92-95), but with the added feature of spring assisted return hydraulic pistons. Designed primarily for topside operation, this additional spring return piston feature, will reduce bolt tensioning cycle times considerably, as the tensioner piston will automatically retract, immediately after the hydraulic pressure is released. The range currently comprises of 10 models, suitable for standard size bolts from M64 to M100 diameter. For bolt sizes below M64 diameter, where manually retracting the tensioner piston is much faster, please refer to our standard STS range on pages 92-95. We can, if necessary, design and manufacture spring return piston versions for bolt sizes less than M64 diameter, to special order.

The versatility of the STS-SR bolt tensioner range, is identical to our standard STS range, with a variety of interchangeable threaded pullers and nut rotating sockets available, either as bolt size conversion kits or individual parts. All STS-SR bolt tensioners are designed and manufactured with a wear coated piston, maximum stroke indicator, self energising high pressure seals, dual quick connect couplers, for easy multiple tensioner hook up and operate at pressures up to 1500 Bar maximum. Suitable hydraulic pumps and high pressure hydraulic hose assemblies for use with STS-SR tensioners are detailed on pages 103 - 104.

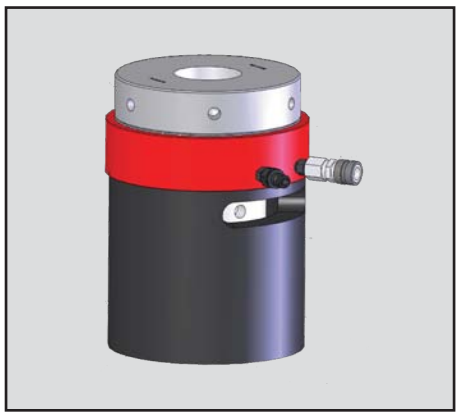
Note ...

Standard STS conversion kits are NOT compatible for use with STS-SR tensioners. STS-SR conversion kits are available to special order.

Model number	Bolt thread size	Thread Pitch	Capacity Kn	Capacity Tonnes	Effective Area cm^2	Stroke	Weight	Dimensions in mm A	B	C	D	E	F
STS5-M64SR	M64	6	1846	188.2	123.1	15	23.2	193	73	96	208	96	134
STS5-M68SR	M68	6	1846	188.2	123.1	15	23.2	193	73	96	208	96	136
STS5-M72SR	M72	6	1846	188.2	123.1	15	23.2	193	73	96	208	96	139
STS5-M76SR	M76	6	1846	188.2	123.1	15	23.2	193	73	96	208	96	142
STS6-M76SR	M76	4	2657	270.8	177.1	15	35.9	233	84	107	229	97	158
STS6-M76SR	M76	6	2657	270.8	177.1	15	35.9	233	84	107	229	97	158
STS6-M80SR	M80	6	2657	270.8	177.1	15	35.9	233	84	107	229	97	160
STS6-M85SR	M85	6	2657	270.8	177.1	15	35.9	233	84	107	229	97	162
STS6-M90SR	M90	4	2657	270.8	177.1	15	35.9	233	84	107	229	97	170
STS6-M90SR	M90	6	2657	270.8	177.1	15	35.9	233	84	107	229	97	170
STS6-M95SR	M95	4	2657	270.8	177.1	15	41.1	233	105	107	270	97	184
STS6-M95SR	M95	6	2657	270.8	177.1	15	41.1	233	105	107	270	97	184
STS6-M100SR	M100	6	2657	270.8	177.1	15	41.1	233	105	107	270	97	190

Note: For dimensional drawing, please see page 96.

STS - SPECIAL DESIGN TOPSIDE BOLT TENSIONERS



Custom built to your requirements

Working pressure up to 1500 Bar

Short delivery lead time

In addition to the large range of standard topside bolt tensioners available, Hi-Force has the capability to manufacture tensioners to suit special requirements. Our product designs incorporate the latest Solid Works computer technology and together with our 'state of the art' CNC production machinery, we have the capability to offer a solution to meet your needs.

Example of situations where Hi-Force have been able to offer bespoke solutions include:

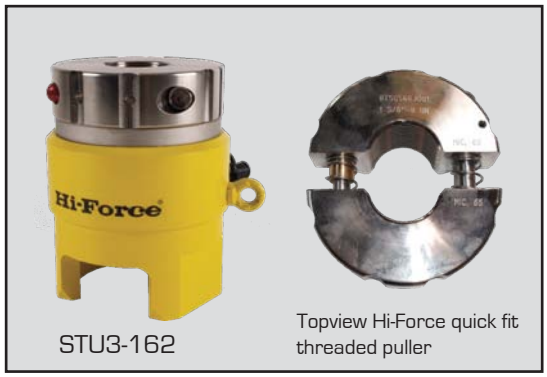
- Non standard sizes and shapes of nut requiring special bridges
- Nuts recessed into holes requiring special sockets
- Studs with two different thread sizes
- Larger size bolts
- Applications with restricted space requirements
- Systems with different operating pressures
- Bridges with increased load bearing area







STU - SUB SEA BOLT TENSIONERS - IMPERIAL



STU3-162

Topview Hi-Force quick fit threaded puller

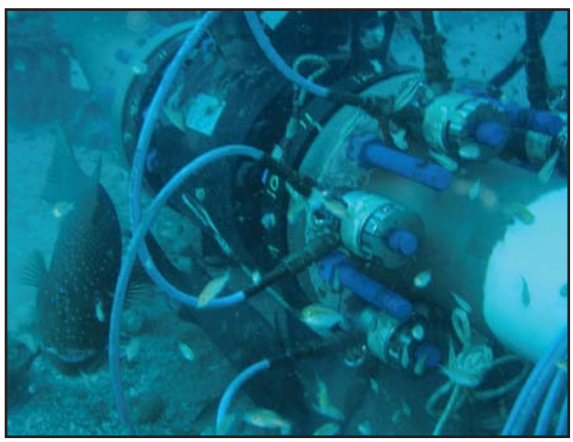
Working pressure 1500 Bar

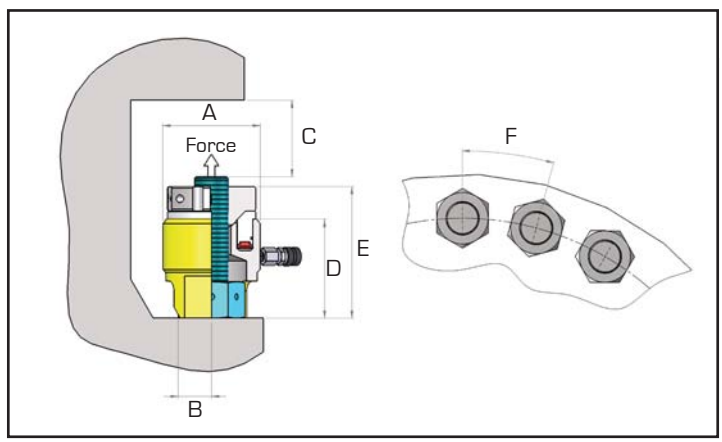
Interchangeable quickfit/release pullers

Load cell with integral bridge

Don't forget to order your tommy bars when purchasing Hi-Force Bolt tensioners, Hi-Force recommends the purchase of one tommy bar for every four tensioners. Please note that tommy bar listed will fit related quick fit puller, a different size may be required for the hexagon nut.

Hi-Force STU series sub-sea bolt tensioners are designed and manufactured to suit the demanding requirements of divers operating in harsh sub-sea environments. With an easy to operate two piece design comprising of a quick fit/release threaded puller and a hydraulic load cell with integral bridge and an extra long 30mm piston stroke to reduce re-setting operations. Hi-Force STU series sub-sea bolt tensioners offer a consistent, reliable and cost effective method of tensioning sub-sea bolted joints. All hydraulic load cells are suitable for different thread sizes (see table below and on page 100) and interchangeable quick fit/release pullers can be ordered separately, as required, resulting in even greater flexibility and cost savings.





Model number	Bolt thread size	Capacity kN	Capacity Tonnes	Effective area cm²	Stroke mm	Weight kg	Tommy bar number
STU1-100	1" - 8UN	256.04	26.10	17.07	20	3.4	TTB06
STU1-112	1 1/8" - 8UN	256.04	26.10	17.07	20	3.4	TTB06
STU2-125	1 1/4" - 8UN	430.36	43.87	28.69	30	6.0	TTB08
STU2-137	1 3/8" - 8UN	430.36	43.87	28.69	30	6.0	TTB08
STU3-150	1 1/2" - 8UN	533.39	56.41	36.89	30	7.5	TTB10
STU3-162	1 5/8" - 8UN	533.39	56.41	36.89	30	7.5	TTB10
STU4-175	1 3/4" - 8UN	756.30	77.09	50.42	30	9.8	TTB10
STU4-187	1 7/8" - 8UN	756.30	77.09	50.42	30	9.8	TTB10
STU5-200	2" - 8UN	1168.19	119.08	77.88	30	14.5	TTB12
STU5-225	2 1/4" - 8UN	1168.19	119.08	77.88	30	14.5	TTB12
STU6-250	2 1/2" - 8UN	1649.12	168.11	109.94	30	22.8	TTB14
STU6-275	2 3/4" - 8UN	1649.12	168.11	109.94	30	22.8	TTB14
STU7-300	3" - 8UN	2483.44	253.15	165.56	30	35.6	TTB16
STU7-325	3 1/4" - 8UN	2483.44	253.15	165.56	30	35.6	TTB16
STU7-350	3 1/2" - 8UN	2483.44	253.15	165.56	30	35.6	TTB16

Dimensions in mm					
A	B	C	D	E	F
82	22	129	129	150	61
82	22	129	129	150	64
102	30	140	140	164	73
102	30	140	140	164	75
114	35	142	142	169	82
114	35	142	142	169	85
128	41	151	151	181	94
128	41	151	151	181	98
148	48	164	164	202	112
148	48	164	164	202	116
176	60	183	183	231	136
176	60	183	183	231	141
215	89	215	215	260	162
215	89	215	215	260	173
215	89	215	215	260	175

STU - SUB-SEA BOLT TENSIONERS - METRIC



STU3-42



Topview Hi-Force quick fit threaded puller

Working pressure 1500 Bar

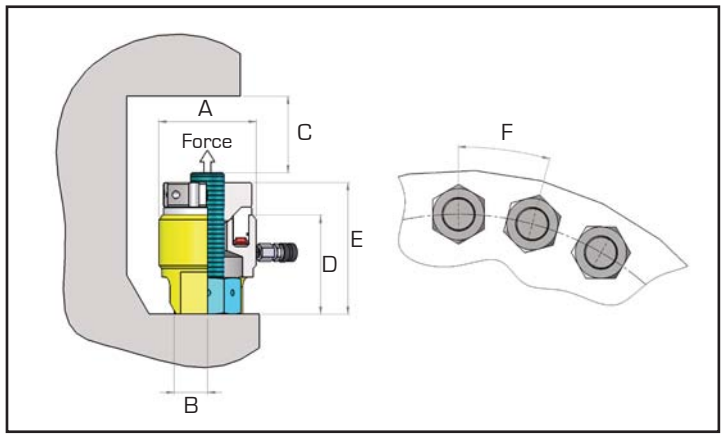
Interchangeable quickfit/release pullers

Load cell with integral bridge

- Dual hose connection for easy hook up
- Extra long 30mm piston stroke to reduce re-setting time
- Maximum piston stroke indicator
- Corrosion protected for operation in harsh sub-sea environments

Don't forget to order your tommy bars when purchasing Hi-Force Bolt tensioners, Hi-Force recommends the purchase of one tommy bar for every four tensioners. Please note that tommy bar listed will fit related quick fit puller, a different size may be required for the hexagon nut.





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Model number	Bolt thread size	Capacity kN	Capacity Tonnes	Effective area cm²	Stroke mm	Weight kg	Tommy bar number
STU1-24	M24 x 3	256.04	26.10	17.07	20	3.4	TTB06
STU1-27	M27 x 3	256.04	26.10	17.07	20	3.4	TTB06
STU2-30	M30 x 3.5	430.36	43.87	28.69	30	6.0	TTB08
STU2-33	M33 x 3.5	430.36	43.87	28.69	30	6.0	TTB08
STU2-36	M36 x 4	430.36	43.87	28.69	30	6.0	TTB10
STU3-39	M39 x 4	553.39	56.41	36.89	30	7.5	TTB10
STU3-42	M42 x 4.5	553.39	56.41	36.89	30	7.5	TTB10
STU4-45	M45 x 4.5	756.30	77.09	50.42	30	9.8	TTB10
STU4-48	M48 x 5	756.30	77.09	50.42	30	9.8	TTB12
STU5-52	M52 x 5	1168.19	119.08	77.88	30	14.5	TTB12
STU5-56	M56 x 5.5	1168.19	119.08	77.88	30	14.5	TTB14
STU6-60	M60 x 5.5	1649.12	168.11	109.94	30	22.8	TTB14
STU6-64	M64 x 6	1649.12	168.11	109.94	30	22.8	TTB16
STU6-68	M68 x 6	1649.12	168.11	109.94	30	22.8	TTB16
STU6-72	M72 x 6	1649.12	168.11	109.94	30	22.8	TTB16
STU7-76	M76 x 6	2483.44	253.15	165.56	30	35.6	TTB16
STU7-80	M80 x 6	2483.44	253.15	165.56	30	35.6	TTB16
STU7-85	M85 x 6	2483.44	253.15	165.56	30	35.6	TTB16
STU7-90	M90 x 6	2483.44	253.15	165.56	30	35.6	TTB16

Dimensions in mm					
A	B	C	D	E	F
82	22	129	129	150	61
82	22	129	129	150	64
102	30	140	140	164	73
102	30	140	140	164	75
102	30	140	140	164	78
114	35	142	142	169	82
114	35	142	142	169	85
128	41	151	151	181	94
128	41	151	151	181	98
148	48	164	164	202	112
148	48	164	164	202	116
176	60	183	183	231	136
176	60	183	183	231	136
176	60	183	183	231	136
176	60	183	183	231	141
215	94	215	215	260	164
215	94	215	215	260	164
215	94	215	215	260	175
215	94	215	215	260	175

HTN - HYDRAULIC TENSIONER NUTS - IMPERIAL



HTN9-200 HTN7-175 HTN10-225

- Integral mechanical load retaining collar
- Working pressure 1500 Bar
- Imperial thread sizes from 1" to 4"

The Hi-Force HTN range of imperial top collar hydraulic nuts is specifically designed and manufactured for applications where regular, periodic opening of the joint, for inspection and maintenance purposes is required. Unlike conventional hydraulic bolt tensioners, Hi-Force HTN series hydraulic nuts are designed to permanently replace standard hexagon nuts, on one side of the bolted joint. Initially the bolt tension/elongation is applied hydraulically and once achieved, it is permanently retained via the integral mechanical load retaining collar.

Whilst initial investment in Hi-Force HTN series hydraulic nuts is significantly higher than the cost of standard hexagon nuts, this investment is quickly and easily recovered, if the user considers the huge time savings achieved, during joint opening and closing, when compared to using conventional hydraulic bolt tensioners or hydraulic torque wrenches. Standard range models are available for imperial bolt sizes from 1" to 4", with other sizes available to special order.

All models are 1500 Bar maximum working pressure and supplied with quick connect hydraulic couplings, compatible for use with Hi-Force air or manually operated hydraulic bolt tensioner pumps and hoses (see page 103 & 104).

Model No	Bolt Size	Capacity kN	Capacity tonnes	Effective area cm^2	Stroke mm	Diameter mm	Height mm	Weight kg
HTN1-100	1" - 8 UN	198.27	20.21	13.22	5	72	55	1.9
HTN2-112	1 1/8" - 8 UN	216.30	22.05	14.42	5	75	55	2.0
HTN3-125	1 1/4" - 8 UN	252.94	25.78	16.86	5	82	57	2.4
HTN4-137	1 3/8" - 8 UN	305.83	31.18	20.39	5	88	57	2.7
HTN5-150	1 1/2" - 8 UN	344.12	35.08	22.94	6	93	58	2.9
HTN6-162	1 5/8" - 8 UN	397.61	40.53	26.51	6	100	62	3.5
HTN7-175	1 3/4" - 8 UN	475.01	48.42	31.67	6	106	64	4.0
HTN8-187	1 7/8" - 8 UN	501.40	51.11	33.43	6	110	64	4.2
HTN9-200	2" - 8 UN	563.72	57.46	37.58	6	117	67	4.9
HTN10-225	2 1/4" - 8 UN	746.44	76.09	49.76	8	128	74	6.4
HTN11-250	2 1/2" - 8 UN	905.13	92.27	60.34	8	141	77	8.0
HTN12-275	2 3/4" - 8 UN	999.85	101.92	66.66	8	150	78	8.8
HTN13-300	3"- 8 UN	1203.43	122.67	80.23	8	162	81	10.6
HTN14-325	3 1/4" - 8 UN	1413.72	144.11	94.25	10	174	87	12.9
HTN15-350	3 1/2" - 8 UN	1605.04	163.61	107.00	10	187	95	16.2
HTN16-375	3 3/4" - 8 UN	1704.59	173.76	113.64	10	194	102	18.3
HTN17-400	4" - 8 UN	1911.46	194.85	127.43	10	205	110	21.9

HTN - HYDRAULIC TENSIONER NUTS - METRIC



HTN8-M48

- Integral mechanical load retaining collar
- Working pressure 1500 Bar
- Metric thread sizes from M24 to M100

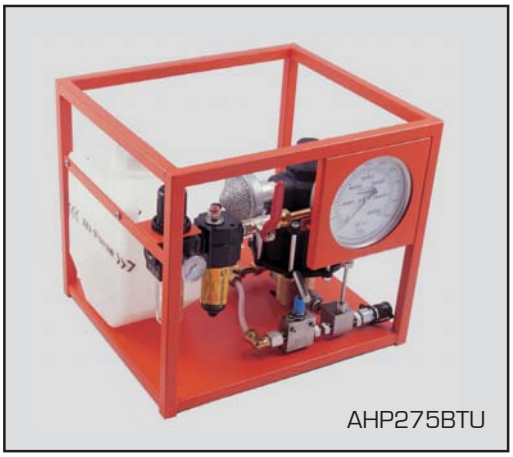
The Hi-Force HTN range of metric top collar hydraulic nuts is specifically designed and manufactured for applications where regular, periodic opening of the joint for inspection and maintenance purposes is required. Unlike conventional hydraulic bolt tensioners, Hi-Force HTN series hydraulic nuts are designed to permanently replace standard hexagon nuts on one side of the bolted joint. Initially the bolt tension/elongation is applied hydraulically and once achieved, it is permanently retained via the integral mechanical load retaining collar. Whilst initial investment in Hi-Force HTN series hydraulic nuts is significantly higher than the cost of standard hexagon nuts, this investment is quickly and easily recovered, when the user considers the huge time savings achieved, during joint opening and closing, when compared to using conventional hydraulic bolt tensioners or hydraulic torque wrenches. Standard range models are available for bolt sizes from M24 to M100, with other sizes available to special order.

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All models are 1500 Bar maximum working pressure and supplied with quick connect hydraulic couplings, compatible for use with Hi-Force air or manually operated hydraulic bolt tensioner pumps and hoses (see page 103 & 104).

Model number	Bolt size	Capacity kN	Capacity tonnes	Effective area cm^2	Stroke mm	Diameter mm	Height mm	Weight Kg
HTN1-M24	M24 x 3	198.27	20.21	13.22	5	72	55	1.9
HTN2-M27	M27 x 3	216.30	22.05	14.42	5	75	55	2.0
HTN3-M30	M30 x 3.5	252.94	25.78	16.86	5	82	57	2.4
HTN3-M33	M33 x 3.5	252.94	25.78	16.86	5	82	57	2.4
HTN4-M36	M36 x 4	305.83	31.18	20.39	5	88	57	2.7
HTN5-M39	M39 x 4	344.12	35.08	22.94	6	93	58	2.9
HTN6-M42	M42 x 4.5	397.61	40.53	26.51	6	100	62	3.5
HTN7-M45	M45 x 4.5	475.01	48.42	31.67	6	106	64	4.0
HTN8-M48	M48 x 5	501.40	51.11	33.43	6	110	64	4.2
HTN9-M52	M52 x 5	563.72	57.46	37.58	6	117	67	4.9
HTN10-M56	M56 x 5.5	746.44	76.09	49.76	8	128	74	6.4
HTN11-M60	M60 x 5.5	905.13	92.27	60.34	8	141	77	8.0
HTN11-M64	M64 x 6	905.13	92.27	60.34	8	141	77	8.0
HTN12-M68	M68 x 6	999.85	101.92	66.66	8	150	78	8.8
HTN13-M72	M72 x 6	1203.43	122.67	80.23	8	162	81	10.6
HTN13-M76	M76 x 6	1203.43	122.67	80.23	8	162	81	10.6
HTN14-M80	M80 x 6	1413.72	144.11	94.25	10	174	87	12.9
HTN15-M85	M85 x 6	1605.04	163.61	107.00	10	187	95	16.2
HTN15-M90	M90 x 6	1605.04	163.61	107.00	10	187	95	16.2
HTN16-M95	M95 x 6	1704.59	173.76	113.64	10	194	102	18.3
HTN17-M100	M100 x 6	1911.46	194.85	127.43	10	205	110	21.9

AHP-BTU - AIR DRIVEN PUMP FOR BOLT TENSIONERS


AHP275BTU

- Operates from standard 7 Bar air supply
- Air consumption 28 scfm (0.79 m^3/minute)
- Working pressure 1500 Bar

The Hi-Force AHP-BTU range of air driven hydraulic pumps are compatible for use with Hi-Force STS, STS-SR and STU bolt tensioners as well as HTN hydraulic nuts. The pump unit is easy to operate and is supplied complete with a glycerine filled vibra-gauge and quick release outlet coupling. The complete system, including an air inlet filter, regulator and lubricator unit is fitted in a robust stainless steel frame. See page 104 for compatible high pressure hydraulic hoses and couplings.

Model number	Working pressure Bar	Usable oil capacity litres	Oil flow per stroke cm^3	Outlet coupler	Weight kg	Dimensions in mm Length	Width	Height
AHP275BTU	1500	7	1.6	STFC4	20	450	395	395
AHP2-237BTU	1500	7	6.1	STFC4	24	450	390	465

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XHP-BTU - MANUALLY OPERATED PUMP FOR BOLT TENSIONERS


XHP1500BTU

- Compact & lightweight design
- Complete with pressure gauge
- Working pressure 1500 Bar

Hi-Force XHP1500BTU manually operated high pressure hydraulic pump is compatible for use with Hi-Force STS, STS-SR and STU bolt tensioners as well as HTN hydraulic nuts. Lightweight, compact and independent from any required power source, it is suitable for all tensioning applications on-site requiring reliable hydraulic power. The pump is easy to operate and supplied complete with a pressure gauge and quick release outlet coupling. See page 104 for compatible high pressure hydraulic hoses.

Model number	Working pressure Bar	Usable oil capacity litres	Displacement per stroke (cm^3) 1st stage	2nd stage	Outlet coupler	Weight kg	Dimensions in mm Length	Width	Height
XHP1500BTU	1500	0.7	12.5	0.75	STFC4	7.0	610	170	180

BOLT TENSIONER HOSES, COUPLERS & HOSE REELS

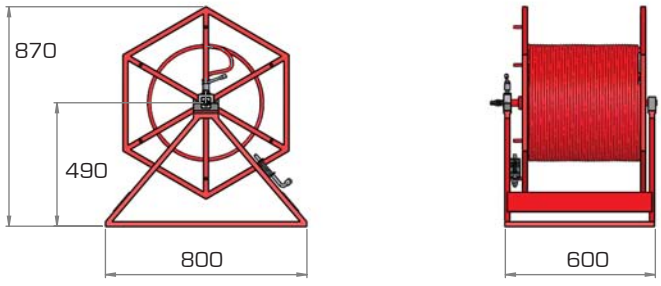


Safety factor 3 : 1

Working pressure up to 1500 Bar

Supplied with quick connect couplings

Hi-Force ultra-high pressure hoses are compatible for use with all Hi-Force bolt tensioning products up to a maximum of 1500 Bar working pressure. Each hose is supplied complete with quick connect couplings on each end (male/female) and has a safety factor of 3:1 on maximum working pressure. Ten standard lengths are available with special lengths available on request.



Designed for sub-sea main line hose connection between the pump and the first tensioner, the reel above is suitable for off-shore use and can accommodate up to 300 meters of Hi-Force XHC hydraulic hose. The reel comes complete with quick connect couplings, integrated brake and a spring loaded locking bolt.



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Model number	Maximum pressure Bar	Description
XHC1.5B	1500	Link hose complete with quick connect couplings, length 1.5 metres
XHC3B	1500	Link hose complete with quick connect couplings, length 3.0 metres
XHC5B	1500	Mainline hose complete with quick connect couplings, length 5.0 metres
XHC10B	1500	Mainline hose complete with quick connect couplings, length 10.0 metres
XHC50B	1500	Mainline hose complete with quick connect couplings, length 50.0 metres
XHC100B	1500	Mainline hose complete with quick connect couplings, length 100.0 metres
XHC150B	1500	Mainline hose complete with quick connect couplings, length 150.0 metres
XHC200B	1500	Mainline hose complete with quick connect couplings, length 200.0 metres
XHC250B	1500	Mainline hose complete with quick connect couplings, length 250.0 metres
XHC300B	1500	Mainline hose complete with quick connect couplings, length 300.0 metres
XHR1	1500	Hose reel, suitable for up to 300 meters of XHC high pressure hose
STFC4	1500	Female coupling
STMC4	1500	Male coupling
STN1P2	1500	⅛" x ¼" BSP nipple for current model STS1 only
STN1P4	1500	¼" BSP nipple c/w bonded sealing washer (old design - not for STS1)
STN1P4-C	1500	¼" BSP nipple with cone seat seal (current design - not for STS1)

BOLTRIGHT SOFTWARE - THE EASY ANSWER !



Available as download only

Multi-Language Interface

Easy to use, minimal computer knowledge required

Designed for : Windows

The Hi-Force BoltRight software programme is designed to assist engineers in the Oil & Gas, Petrochemical, Power Generation and a wide variety of other Engineering Industries where accurate and consistent "bolt up" of components is required. The programme allows the user to input key joint data related to flange size and class, for all ANSI/ASME, API and ISO type flanges along with the applicable bolt material, gasket material and type, operating temperature, preferred or specified method of bolt tightening (torque or direct tension), friction reducing lubricant to be applied, or the applicable value of friction coefficient necessary for torque tightening applications. Based on the information entered, the BoltRight programme will analyse all of the data and produce a comprehensive calculation sheet along with the required torque or tension figures to ensure an accurate and correctly bolted joint is achieved.

BoltRight will also create an individual tightening procedure for each bolted joint, which can include specific information such as plant owner name, bolting contractor company name, joint tag reference number and any special remarks all of which can be easily entered into the procedure by the user. These individually produced tightening procedures can also be added to a master joint register, allowing the contractor and/or plant operator to implement a comprehensive on-site Flange Management System. Both the individual tightening procedures and the master joint register can be either printed or stored electronically to ensure full traceability.

Whilst calculating the applicable torque or direct tension figures the BoltRight programme will also calculate the required pump pressure settings for the selected Hi-Force hydraulic wrench or bolt tensioner to be used. In most cases the programme will offer a multiple choice of suitable Hi-Force tools based on the applicable torque or tension figures and the design output capacity of the tools recommended. For ease of use BoltRight also includes detailed technical information on all of the Hi-Force tools that it recommends for the respective application.

For bolt tensioning applications BoltRight also offers the user a choice of 25%, 33%, 50% and 100% simultaneous bolt tensioning options along with the applicable A and B pump pressure settings for all options, excluding 100% simultaneous tensioning, where only one pump pressure setting is required. For torque wrench applications the BoltRight programme will calculate the required pump pressure settings for a 25%, 50% and 100% applied output torque figure, which is the recommended three stage procedure when using a single hydraulic torque wrench to tighten a multiple bolt flange in a diametrically opposed manner. The tightening procedure will also provide the necessary bolt numbering sequence to ensure that the bolts are tightened in the correct numerical order.

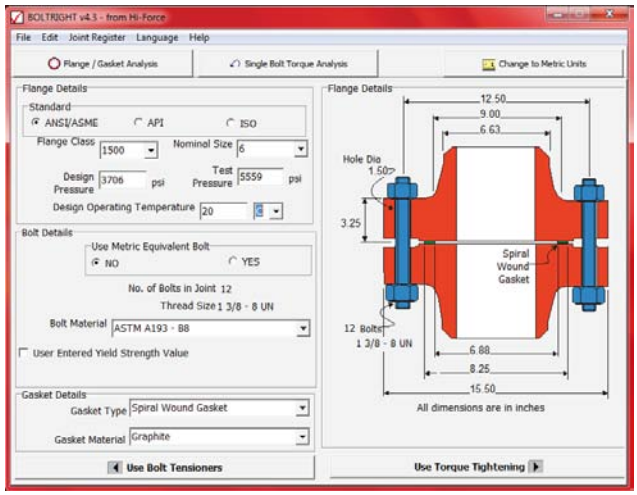
BOLTRIGHT SOFTWARE - THE EASY ANSWER !

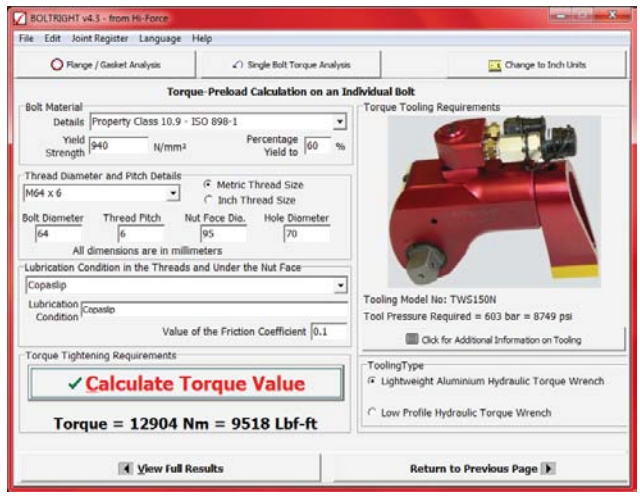
Currently the BoltRight programme is available in English, Dutch, Portuguese, French, Chinese, Russian and Italian with the addition of further languages an ongoing process. The BoltRight programme is Windows compatible and only available by download from www.hi-force.com and www.boltright.com using an authorised password issued by Hi-Force. Applications for the password can be made via the website.

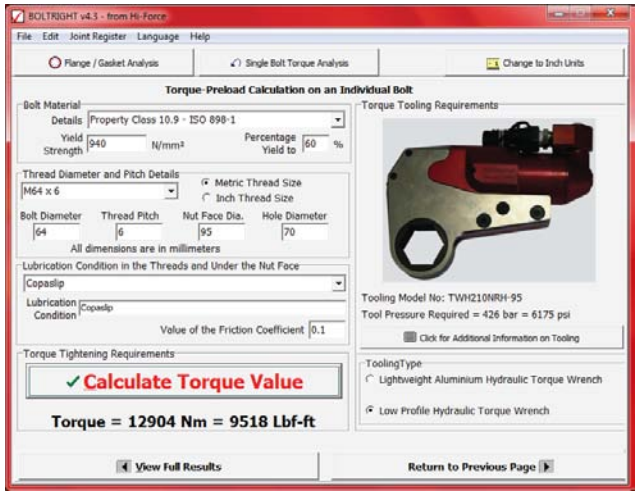
Since the introduction of the Hi-Force BoltRight software programme in early 2005, the programme has continued to evolve and develop into what we believe is the best and most user friendly bolting programme available in the world today. As further development of the programme is an ongoing process, mainly driven by customer requests for additional features and benefits, we have designed the website download in such a way that the programme expires every 90 days, to allow for ongoing programme upgrades to be made. Authorised users can easily obtain an upgraded version by requesting a new password via the Hi-Force or Boltright website.

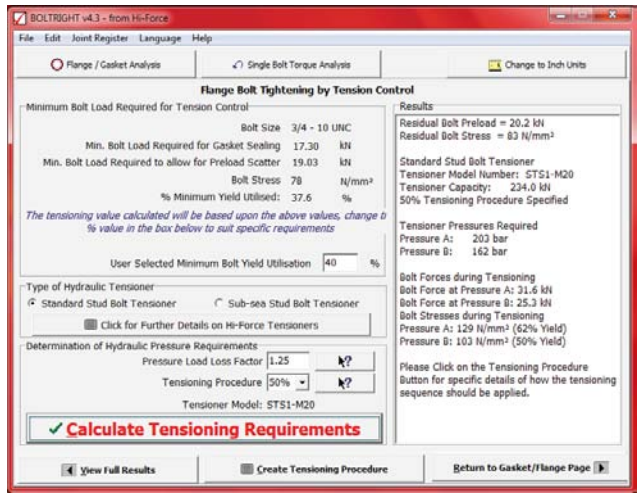
Model number	Description
BR-V4	BoltRight Multi-language - Including register system (free trial version)
BR-V5	BoltRight Multi-language - Including register system & non standard bolt / flange calculations (full version)

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Hi-Force®

HYDROTEST PUMPS

HTP Range	Hydrotest pumps & accessories Manually operated	Pages 108 -109
AHP Range	Hydrotest pumps - air driven Standard flow	Page 110
AHP-CR Range	Hydrotest pumps - air driven Standard flow - with chart recorder	Page 111
AHP2 Range	Hydrotest pumps - air driven Medium flow	Page 112
AHP2-CR Range	Hydrotest pumps - air driven Medium flow - with chart recorder	Page 113
AHP3 Range	Hydrotest pumps - air driven High flow	Page 114
ATDP Range	Hydrotest pumps - air driven High flow - twin double acting design	Page 115
AHP-CR Accessories	Spare recorder charts & Pens for chart recorder	Page 116

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HTP - MANUALLY OPERATED HYDROTEST PUMPS


HTP700

Up to 1000 Bar working pressure

Suitable for use with a wide variety of fluids

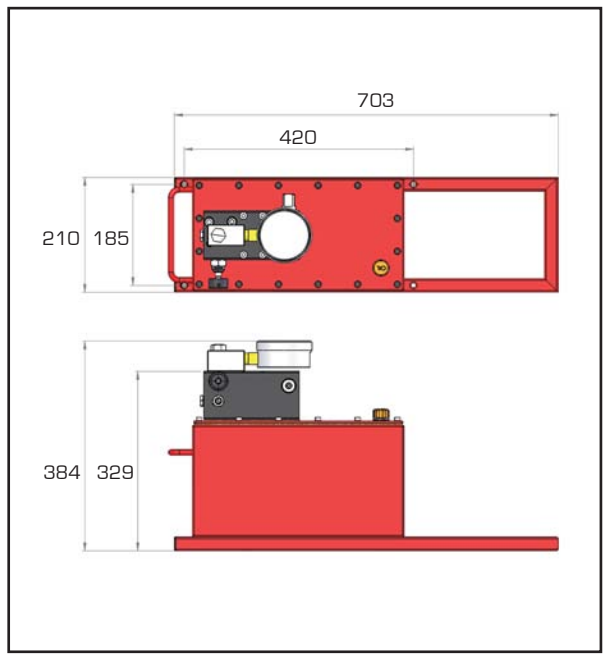
Two stage with semi automatic pressure changeover

The Hi-Force HTP series of manually operated two speed hydraulic pumps is suitable for use with a wide variety of fluids including water. Manufactured predominantly from high quality aluminium alloy, the HTP series are lightweight and extremely versatile. The pump's two stage piston design offers a superb 49 cm^3 delivery per stroke at low pressure (up to 20 Bar) with an semi automatic changeover valve for operating the high pressure piston. The pump unit is available with a choice of 5 high pressure capacities ranging from 100 to 1000 Bar with all models incorporating a factory set pressure relief valve and a 610mm long operating lever. Major applications for Hi-Force HTP series pumps include hydrotesting of piping, pressure vessels, valves and many other items of pressure retaining equipment, prior to commissioning.

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- Lightweight aluminium design with stainless steel pistons
- Needle type design release valve for precise pressure control
- Low cost replaceable valve seats
- Standard 15 litre capacity stainless steel fluid reservoir
- Optional pressure gauges available (see page 109)





Model number (with tank)	Model number (pump only)	Working pressure Bar	Valve type	Displacement per stroke cm^3 1st stage	Displacement per stroke cm^3 2nd stage	Changeover pressure Bar	Outlet port	Suction port	Weight kg
HTP100	HTP100PU	100	2-way	49	20	20	3/8" NPT	3/8" BSP	20
HTP300	HTP300PU	300	2-way	49	7	20	3/8" NPT	3/8" BSP	20
HTP500	HTP500PU	500	2-way	49	4	20	3/8" NPT	3/8" BSP	20
HTP700	HTP700PU	700	2-way	49	3	20	3/8" NPT	3/8" BSP	20
HTP1000	HTP1000PU	1000	2-way	49	2	20	3/8" BSP	3/8" BSP	20

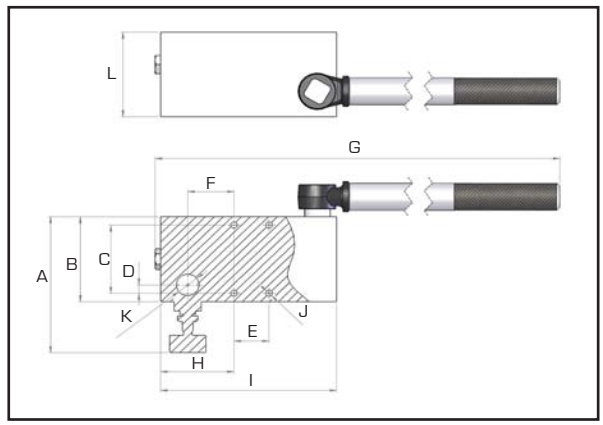
HTP-PU - MANUALLY OPERATED HYDROTEST PUMPS



HTP300PU

- Choice of 5 different models
- Supplied complete with fixing kit
- Compact, lightweight and easy to operate

The Hi-Force HTP-PU series offers the same features as the HTP range on page 108 however these are supplied as a pump unit only without a fluid reservoir. The pump unit is supplied complete with a mounting kit for easy attachment to any specially designed fluid reservoir and an operating lever.



Weight kg	Dimensions in mm (all models)											
	A	B	C	D	E	F	G	H	I	J	K	L
5.9	143.0	88.9	71.4	8.7	34.9	46.0	772.5	73.0	175.0	4 X M8	23.0	88.5

H

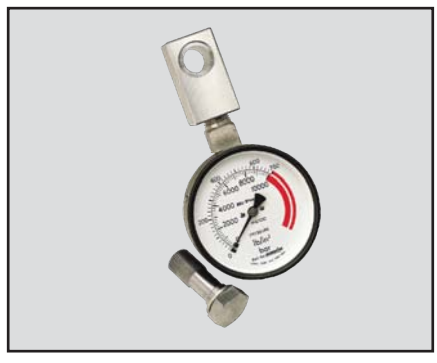
RESERVOIRS

Model number	Description
HRS15	15 litre standard reservoir



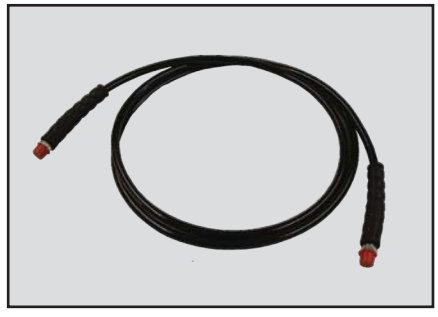
PRESSURE GAUGES

Model number	Pressure range Bar
HTP100GK	110
HTP300GK	310
HTP500GK	552
HTP700GK	700
HTP1000GK	1000



HOSES

Model Number	Max W.P Bar	Length (metres)	End Fitting	For model number
HH3-6NMS-1	up to 300	3	3/8" NPT Male Swivel	HTP100 & HTP300
HH3-6NMS-2	up to 700	3	3/8" NPT Male Swivel	HTP500 & HTP700
HH3-6NMS-3	1000	3	3/8" NPT Male Swivel	HTP1000



AHP - AIR DRIVEN HYDROTEST PUMPS - STANDARD FLOW


AHP58

Output pressures up to 2931 Bar

Suitable for use with various fluids.

150mm dual scale vibra pressure gauge

- Air consumption 28 scfm (0.79m³/minute)
- Infinitely variable output pressure and flow
- 7 litre reservoir capacity

The Hi-Force AHP series of air driven hydrostatic pressure testing pumps offers a choice of eight models with output pressure capacities ranging from 6 Bar (87 PSI) to 2931 Bar (42500 PSI). All models are suitable for use with various fluids, including water and are supplied with a 150mm diameter glycerine filled hydraulic pressure gauge (calibrated on request), inlet airline filter, lubricator and pressure regulator unit, lightweight fluid reservoir, pump start/stop valve and a robust stainless steel skid mounted framework. Optional extras include stainless steel reservoir, stroke counter system and pressure isolation valve. All units are of compact design with a maximum weight of 23 kg.

H

Model number	Max. output pressure (Bar) at airline input pressure 10 PSI 0.69 Bar	50 PSI 3.45 Bar	100 PSI 6.9 Bar	Fluid volume displacement per stroke (cm³)	Outlet port thread	Weight kg	Dimensions in mm Length	Width	Height
AHP10	6	34	69	42.3	½" NPT	23	450	395	395
AHP26	14	90	181	16.0	½" NPT	21	450	395	395
AHP36	17	122	250	12.3	½" NPT	20	450	395	395
AHP58	28	200	400	7.6	½" NPT	20	450	395	395
AHP107	62	373	738	4.0	½" NPT	20	450	395	395
AHP187	97	638	1293	2.2	9/16"-18UNF	20	450	395	395
AHP275	155	931	1897	1.6	9/16"-18UNF	20	450	395	395
AHP425	345	1448	2931	1.0	9/16"-18UNF	20	450	395	395

Hydraulic pressure PSI	Bar	Approximate rate of discharge (litres/min) at air input pressure 100 PSI (7 Bar) AHP10	AHP26	AHP36	AHP58	AHP107	AHP187	AHP275	AHP425
0	0	23.10	8.80	6.00	3.56	1.97	1.15	0.72	0.43
500	35	12.00	5.85	4.39	3.05	1.50	1.05	0.68	0.40
1000	69	*	4.72	3.80	2.51	1.28	1.00	0.65	0.38
1500	104	*	3.90	3.34	2.38	1.25	0.90	0.60	0.36
2000	138	*	3.00	3.00	2.25	1.21	0.78	0.55	0.34
2500	173	*	1.21	2.56	2.05	1.18	0.75	0.50	0.33
3000	207	*	*	1.95	1.85	1.16	0.73	0.48	0.31
4000	276	*	*	*	1.56	1.02	0.70	0.45	0.29
5000	345	*	*	*	1.02	0.95	0.67	0.42	0.26
7500	517	*	*	*	*	0.76	0.60	0.40	0.25
10000	690	*	*	*	*	0.44	0.52	0.37	0.24
15000	1034	*	*	*	*	*	0.39	0.33	0.21
20000	1379	*	*	*	*	*	*	0.30	0.20
25000	1724	*	*	*	*	*	*	0.21	0.16
30000	2069	*	*	*	*	*	*	*	0.13
40000	2760	*	*	*	*	*	*	*	0.05

* Pressure exceeds pump capacity.

AHP-CR AIR DRIVEN HYDROTEST PUMPS - WITH CHART RECORDER


AHP187-CR

Output pressures up to 2931 Bar

Suitable for use with various fluids.

150mm dual scale vibra pressure gauge

- Air consumption 28 scfm (0.79m³/minute)
- Infinitely variable output pressure and flow
- 7 litre reservoir capacity
- Supplied with 50 recorder charts and one black chart pen, for additional charts and pens, please see page 114.

The Hi-Force AHP-CR series of air driven hydrostatic pressure testing pumps offers a choice of 8 models with output pressure capacities ranging from 6 Bar (87 PSI) to 2931 Bar (42500 PSI) all fitted with on board, 4 hour, single pen chart recorder as standard. All models are suitable for use with various fluids including water and are supplied with a 150mm diameter glycerine filled hydraulic pressure gauge (calibrated on request), inlet airline filter, lubricator and pressure regulator unit, lightweight fluid reservoir, pump start/stop valve and a robust stainless steel skid mounted framework. Recorder isolation valve and pressure release valve are fitted as standard. Optional extras include stainless steel reservoir, pressure isolation valve, stroke counter system, gauge calibration certificate and varying recorder clock speeds. All units are of compact design with a maximum weight of 31 kg.

Model number	Max. output pressure (Bar) at airline input pressure 10 PSI 0.69 Bar	50 PSI 3.45 Bar	100 PSI 6.9 Bar	Fluid volume displacement per stroke (cm³)	Outlet port thread	Weight kg	Dimensions in mm Length	Width	Height
AHP10-CR	6	34	69	42.3	½" NPT	31	530	390	390
AHP26-CR	14	90	181	16.0	½" NPT	29	530	390	390
AHP36-CR	17	122	250	12.3	½" NPT	28	530	390	390
AHP58-CR	28	200	400	7.6	½" NPT	28	530	390	390
AHP107-CR	62	373	738	4.0	½" NPT	28	530	390	390
AHP187-CR	97	638	1293	2.2	9/16"-18UNF	28	530	390	390
AHP275-CR	155	931	1897	1.6	9/16"-18UNF	28	530	390	390
AHP425-CR	345	1448	2931	1.0	9/16"-18UNF	28	530	390	390

Hydraulic pressure PSI	Bar	Approximate rate of discharge (litres/min) at air input pressure 100 PSI (7 Bar) AHP10-CR	AHP26-CR	AHP36-CR	AHP58-CR	AHP107-CR	AHP187-CR	AHP275-CR	AHP425-CR
0	0	23.10	8.80	6.00	3.56	1.97	1.15	0.72	0.43
500	35	12.00	5.85	4.39	3.05	1.50	1.05	0.68	0.40
1000	69	*	4.72	3.80	2.51	1.28	1.00	0.65	0.38
1500	104	*	3.90	3.34	2.38	1.25	0.90	0.60	0.36
2000	138	*	3.00	3.00	2.25	1.21	0.78	0.55	0.34
2500	173	*	1.21	2.56	2.05	1.18	0.75	0.50	0.33
3000	207	*	*	1.95	1.85	1.16	0.73	0.48	0.31
4000	276	*	*	*	1.56	1.02	0.70	0.45	0.29
5000	345	*	*	*	1.02	0.95	0.67	0.42	0.26
7500	517	*	*	*	*	0.76	0.60	0.40	0.25
10000	690	*	*	*	*	0.44	0.52	0.37	0.24
15000	1034	*	*	*	*	*	0.39	0.33	0.21
20000	1379	*	*	*	*	*	*	0.30	0.20
25000	1724	*	*	*	*	*	*	0.21	0.16
30000	2069	*	*	*	*	*	*	*	0.13
40000	2760	*	*	*	*	*	*	*	0.05

* Pressure exceeds pump capacity.

AHP2 - AIR DRIVEN HYDROTEST PUMPS - MEDIUM FLOW


AHP2-036

Output pressures up to 1634 Bar

Suitable for use with various fluids.

150mm dual scale vibra pressure gauge

- Air consumption 56 scfm (1.59m³/minute)
- Infinitely variable output pressure and flow
- 7 litre reservoir capacity

The Hi-Force AHP2 series of air driven hydrostatic pressure testing pumps offers a choice of 5 models with output pressure capacities ranging from 17 Bar (246 PSI) to 1634 Bar (23700 PSI). All models are compact design and suitable for use with various fluids including water and are supplied with a 150mm diameter glycerine filled hydraulic pressure gauge (calibrated on request), inlet airline filter, lubricator and pressure regulator unit, lightweight fluid reservoir, pump start/stop valve and a robust stainless steel skid mounted framework. Optional extras include stainless steel reservoir, stroke counter system and pressure isolation valve.

H

Model number	Max. output pressure (Bar) at airline input pressure 10 PSI 0.69 Bar	50 PSI 3.45 Bar	100 PSI 6.9 Bar	Fluid volume displacement per stroke (cm³)	Outlet port thread	Weight kg
AHP2-036	17.2	124.1	248.2	40.8	½" NPT	24
AHP2-060	31.0	199.9	413.7	24.6	½" NPT	24
AHP2-097	51.7	327.5	668.8	15.2	½" NPT	24
AHP2-144	75.8	489.5	992.8	10.2	½" NPT	24
AHP2-237	131.0	799.8	1634.1	6.1	9/16"-18UNF	24

Dimensions in mm Length	Width	Height
450	390	465
450	390	465
450	390	465
450	390	465
450	390	465

Hydraulic pressure PSI	Bar	Approximate rate of discharge (litres/min) at air input pressure 100 PSI (7 Bar) AHP2-036	AHP2-060	AHP2-097	AHP2-144	AHP2-237
0	0	10.20	6.20	3.90	2.70	1.57
500	35	8.60	5.50	3.55	2.50	1.52
1000	69	7.25	4.80	3.19	2.35	1.47
1500	104	6.15	4.50	3.00	2.16	1.42
2000	138	5.40	4.20	2.87	2.15	1.38
3000	207	3.05	3.50	2.55	1.88	1.29
4000	276	*	2.75	2.28	1.75	1.22
5000	345	*	2.16	2.10	1.64	1.20
7500	517	*	*	1.45	1.35	1.10
10000	690	*	*	*	1.15	0.98
15000	1034	*	*	*	*	0.78
20000	1379	*	*	*	*	0.51
23700	1634	*	*	*	*	0.34

* Pressure exceeds pump capacity.

AHP2-CR AIR DRIVEN HYDROTEST PUMPS - WITH CHART RECORDER



AHP2-237CR

Output pressures up to 1634 Bar

Suitable for use with various fluids.

150mm dual scale vibra pressure gauge

- Air consumption 56 scfm (1.59m³/minute)
- Infinitely variable output pressure and flow
- 7 litre reservoir capacity
- Supplied with 50 recorder charts and one black chart pen, for additional charts and pens, please see page 116.

The Hi-Force AHP2-CR series of air driven hydrostatic pressure testing pumps offers a choice of 5 models with output pressure capacities ranging from 17 Bar (246 PSI) to 1634 Bar (23700 PSI) all fitted with on board, 4 hour, single pen chart recorder as standard. All models are compact design and suitable for use with various fluids including water and are supplied with a 150mm diameter glycerine filled hydraulic pressure gauge (calibrated on request), inlet airline filter, lubricator and pressure regulator unit, lightweight fluid reservoir, pump start/stop valve and a robust stainless steel skid mounted framework. Recorder isolation valve and pressure release valve are fitted as standard. Optional extras include stainless steel reservoir, pressure isolation valve, stroke counter system, gauge calibration certificate and varying recorder clock speeds.

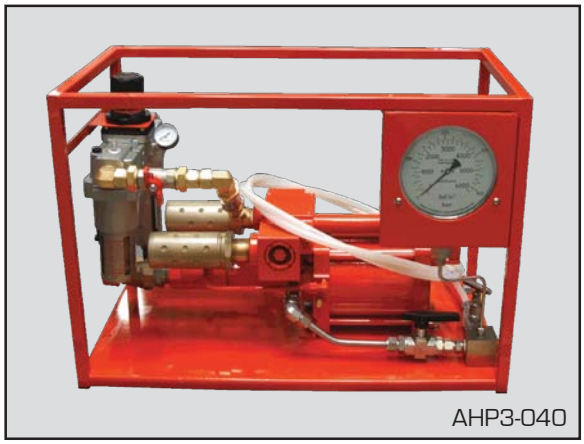
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Model number	Max. output pressure (Bar) at airline input pressure 10 PSI 0.69 Bar	50 PSI 3.45 Bar	100 PSI 6.9 Bar	Fluid volume displacement per stroke (cm³)	Outlet port thread	Weight kg	Dimensions in mm Length	Width	Height
AHP2-036CR	17.2	124.1	248.2	40.8	½" NPT	32	555	390	465
AHP2-060CR	31.0	199.9	413.7	24.6	½" NPT	32	555	390	465
AHP2-097CR	51.7	327.5	668.8	15.2	½" NPT	32	555	390	465
AHP2-144CR	75.8	489.5	992.8	10.2	½" NPT	32	555	390	465
AHP2-237CR	131.0	799.8	1634.1	6.1	9/16"-18UNF	32	555	390	465

Hydraulic pressure PSI	Bar	Approximate rate of discharge (litres/min) at air input pressure 100 PSI (7 Bar) AHP2-036CR	AHP2-060CR	AHP2-097CR	AHP2-144CR	AHP2-237CR
0	0	10.20	6.20	3.90	2.70	1.57
500	35	8.60	5.50	3.55	2.50	1.52
1000	69	7.25	4.80	3.19	2.35	1.47
1500	104	6.15	4.50	3.00	2.16	1.42
2000	138	5.40	4.20	2.87	2.15	1.38
3000	207	3.05	3.50	2.55	1.88	1.29
4000	276	*	2.75	2.28	1.75	1.22
5000	345	*	2.16	2.10	1.64	1.20
7500	517	*	*	1.45	1.35	1.10
10000	690	*	*	*	1.15	0.98
15000	1034	*	*	*	*	0.78
20000	1379	*	*	*	*	0.51
23700	1634	*	*	*	*	0.34

* Pressure exceeds pump capacity.

AHP3 - AIR DRIVEN HYDROTEST PUMPS - HIGH FLOW



AHP3-040

Output pressures up to 700 Bar

Suitable for use with various fluids.

150mm dual scale vibra pressure gauge

- Air consumption 175 scfm (4.96 m^3/minute)
- Infinitely variable output pressure and flow
- Fluid inlet 1.1/4" BSPF

The Hi-Force AHP3 series of air driven hydrostatic pressure testing pumps offers a choice of 3 models with output pressure capacities ranging from 42 Bar (609 PSI) to 700 Bar (10000 PSI). All models are compact design and suitable for use with various fluids including water and are supplied with a 150mm diameter glycerine filled hydraulic pressure gauge (calibrated on request), inlet airline filter, lubricator and pressure regulator unit, pressure isolation valve, pressure release valve, fluid inlet via Y-type fluid strainer, pump start/stop valve and a robust stainless steel skid mounted framework. Optional extras include stainless steel reservoir, stroke counter system, distance piece for chemical duty and chart recorder.

H

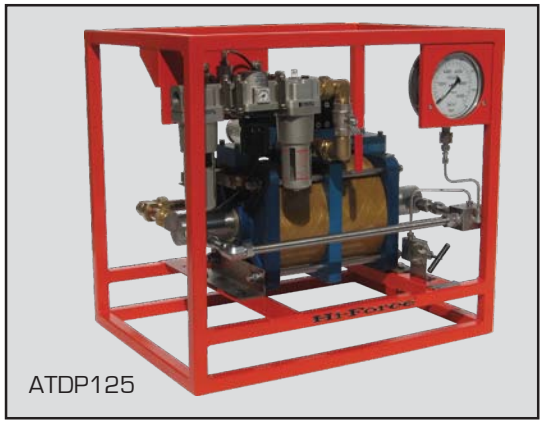
Model number	Max. output pressure (Bar) at airline input pressure 15 PSI 1.04 Bar	50 PSI 3.45 Bar	100 PSI 6.9 Bar	Fluid volume displacement per stroke (cm^3)	Outlet port thread	Weight kg
AHP3-040	41.4	137.9	275.8	98.3	½" NPTF	40
AHP3-060	62.1	206.9	413.7	57.4	½" NPTF	40
AHP3-100	103.4	344.8	689.5	34.4	½" NPTF	40

Dimensions in mm Length	Width	Height
715	390	490
715	390	490
715	390	490

Hydraulic pressure PSI	Bar	Approximate rate of discharge (litres/min) at air input pressure 100 PSI (7 Bar) AHP3-040	AHP3-060	AHP3-100
0	0	18.35	15.63	11.96
500	34.5	14.42	12.85	10.49
1000	68.9	10.81	10.51	8.69
1500	103.4	7.21	8.57	7.05
2000	137.9	5.90	6.97	5.65
2500	172.4	4.26	5.66	4.83
3000	206.8	2.62	4.60	4.18
3500	241.3	1.31	3.74	3.85
4000	275.8	0	3.02	3.52
4500	310.3	*	2.40	3.03
5000	344.8	*	1.84	2.79
5500	379.2	*	1.27	2.62
6000	413.7	*	0.65	2.46
6500	448.2	*	*	1.88
7000	482.6	*	*	1.39
7500	517.1	*	*	1.15
8000	551.6	*	*	0.90
8500	586.1	*	*	0.66
9000	620.5	*	*	0.49
9500	655.0	*	*	0.33
10000	689.5	*	*	0.16

* Pressure exceeds pump capacity.

ATDP - AIR DRIVEN TWIN DOUBLE ACTING HYDROTEST PUMPS


ATDP125

Output pressures up to 1489 Bar

Suitable for use with various fluids.

Twin double acting design offering high volume flow

The Hi-Force ATDP series of twin double acting air driven hydrostatic pressure testing pumps offers a choice of 3 models with output pressure capacities ranging from 87 Bar (1260 PSI) to 1489 Bar (21600 PSI). The twin double acting design offers a much higher displacement volume per stroke than the smaller AHP & AHP2 series, making it ideal for prefill as well as pressure testing. All models are supplied with a 150mm diameter glycerine filled vibra-gauge, inlet airline filter, lubricator and regulator unit, pump start/stop valve and fluid strainer. Viton and ethylene propylene seals for handling special fluids or chemicals can be factory fitted prior to delivery if required. Other seal materials are available on request.

- Air consumption 212 scfm (6m^3/minute)
- Suitable for use with various fluids including water
- 150mm dual scale glycerine filled gauge
- Infinitely variable output pressure and flow
- Fitted with inlet air filter, regulator & lubricator
- Optional extras include stainless steel frame work, pneumatic or LCD stroke counter system, onboard chart recorder, pressure isolation valve and wheel mounting.

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Model number	Max. output pressure (Bar) at airline input pressure 20 PSI 1.38 Bar	60 PSI 4.14 Bar	100 PSI 6.9 Bar	Fluid volume displacement per stroke (cm^3)	Outlet port thread	Weight kg
ATDP63	87	260	434	275	½" NPT	96
ATDP125	172	517	862	140	½" NPT	96
ATDP216	298	894	1489	79	1⅛"-12UNF	96

Dimensions in mm Length	Width	Height
765	570	700
765	570	700
765	570	700

Hydraulic pressure PSI	Bar	Approximate rate of discharge (litres/min) at air input pressure 100 PSI (7 Bar) ATDP63	ATDP125	ATDP216
0	0	32.2	16.9	9.5
1000	69	25.7	14.0	8.8
2000	138	20.5	12.3	8.0
3000	207	16.2	10.6	7.4
4000	276	12.5	9.4	6.9
5000	345	8.0	8.3	6.4
6000	414	2.8	7.3	6.1
8000	552	*	4.8	5.5
10000	690	*	3.0	4.9
12000	828	*	0.4	4.3
16000	1103	*	*	3.2
20000	1379	*	*	1.6

* Pressure exceeds pump capacity

HYDROTEST PUMP ACCESSORIES AND APPLICATIONS

Pack of 100 spare charts, diameter 163mm, 4 hour time scale

Model No	Chart Reading PSI	Suitable for Hydrotest Pump unit
AHP-C01	0 - 1.500	AHP10-CR
AHP-C03	0 - 3.000	AHP26-CR
AHP-C05	0 - 5.000	AHP36-CR - AHP2-036CR
AHP-C10	0 - 10.000	AHP58-CR - AHP2-060CR
AHP-C15	0 - 15.000	AHP107-CR - AHP2-097CR
AHP-C20	0 - 20.000	AHP187-CR - AHP2-144CR
AHP-C30	0 - 30.000	AHP275-CR - AHP2-237CR
AHP-C45	0 - 45.000	AHP425-CR

Replacement pen for chart recorder

Model No	Colour	Description
AHP-PB	Black	Suitable for pressure reading on all Hi-Force AHP pumps with chart recorder



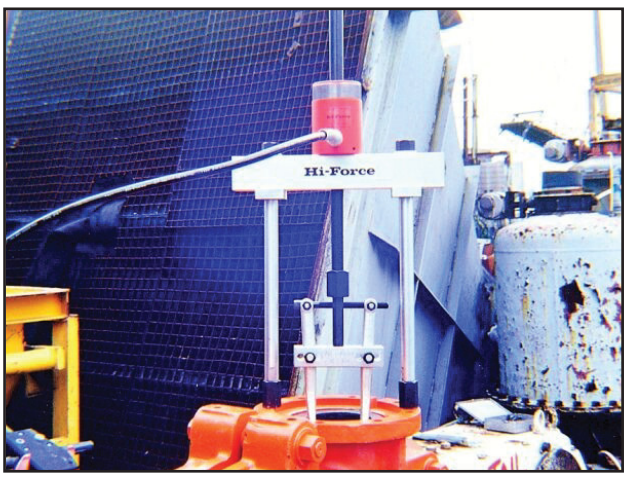
Did you know .....

Hi-Force can also supply chart recorders with multiple reading functions

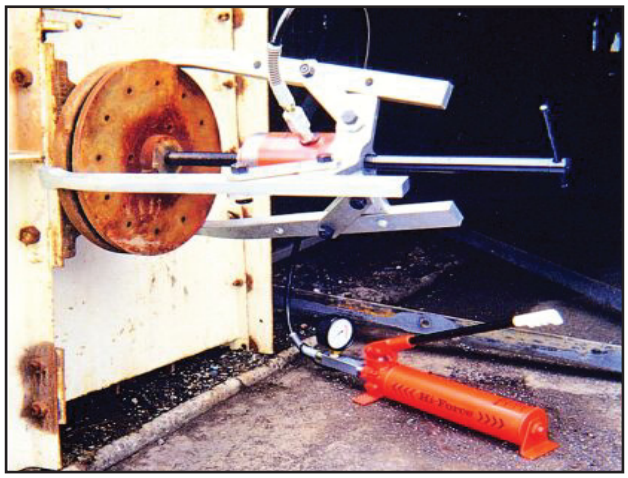


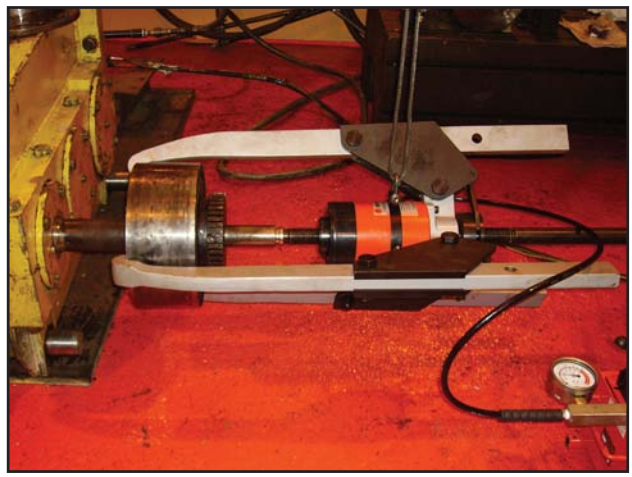
PULLER KITS

SCP Range	Self-contained hydraulic pullers	Page 118
ACP Range	Auto-centre hydraulic puller kits	Page 118
PKS Range	Hydraulic 2 & 3 way puller kits	Page 119
PKC Range	Comprehensive hydraulic puller kits	Page 120









SCP - SELF-CONTAINED HYDRAULIC PULLERS



- Capacities from 10 to 30 tonnes
- Sealed hydraulic system
- Operates in any position



The SCP range of self-contained hydraulic pullers offers a choice of 3 models, each with integral manually operated hydraulic pump and multi-position operating handle. The completely sealed hydraulic system of the SCP pullers enables use of the tool in any position and all models are easy to operate and provide an efficient solution for many pulling applications.

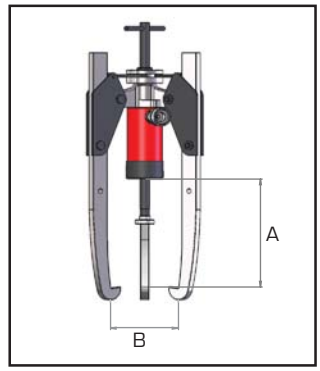
Model number	Capacity tonnes	Type of puller	Hydraulic stroke mm	Piston Ext. mm	Weight kg
SCP103	10	3-way jaw	82	50	11.6
SCP203	20	3-way jaw	82	100	23.7
SCP303	30	3-way jaw	110	150	50.0

Dimensions in mm				
Reach	Dia min.	Dia max.	Tip depth	Tip height
195	30	250	22	6
275	50	360	29	10
405	100	410	38	36

ACP - AUTO-CENTRE HYDRAULIC PULLER KITS



- Capacities from 10 to 50 tonnes
- Quick set-up time, easy to use
- High quality, drop forged steel components



The ACP heavy duty, auto-centering hydraulic puller kit range offers a choice of 4 models, with capacities from 10 to 50 tonnes. All models are supplied complete with a detachable hollow ram cylinder, manually operated pump, hydraulic hose and a 100mm diameter pressure gauge. All models are easy to set up and are the ideal tool for all pulling, pushing, installing and removing applications required for press fitted or heat fitted parts, including wheels, sprockets, flywheels, gears and bearings.

Model number	Capacity tonnes	Type of puller	Cylinder model no.	Pump model no.	Weight kg
ACP10	10	2 & 3 jaw	HHS102	HP110	24.5
ACP20	20	3 jaw	HHS202	HP110	44.0
ACP30	30	3 jaw	HHS302	HP110	76.5
ACP50	50	3 jaw	HHS603	HP227	181.0

Dimensions in mm		
A	B (Min)	B (Max)
296	50	350
320	70	480
407	90	580
727	120	920

PKS - HYDRAULIC 2 & 3 WAY PULLER KITS



Capacities from 4.5 to 50 tonnes

Quick set-up time, easy to use

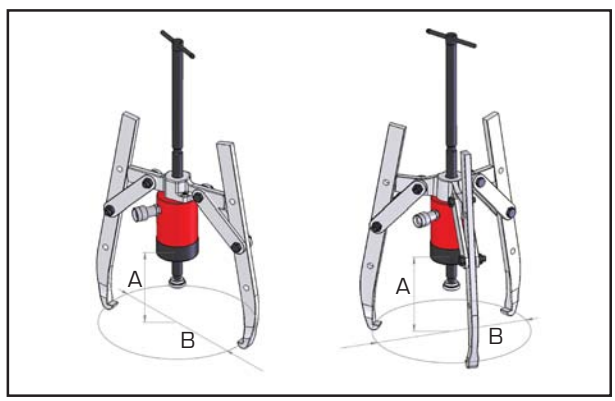
High quality, drop forged steel components

The PKS heavy duty hydraulic puller range is designed for removing stubborn parts such as wheels, gears, sprockets, sleeves, pulleys and other similar items. The range offers a selection of 8 models with pulling capacities up to 50 tonnes. All models are supplied complete with a full set of versatile detachable hydraulic components. All models are safe and easy to operate and avoid the need for heating and hammering.

- Working pressure 700 Bar
- Multi-purpose hollow piston cylinder (excl. PKS5-2-3)
- Complete with all hydraulic components (pump, cylinder, hose, gauge, etc.)
- Supplied complete with carrying case







Model number	Capacity tonnes	Type of puller	Cylinder model no.	Pump model no.	Weight kg	Dimensions in mm A	Dimensions in mm B
PKS5-2-3	4.5	2 & 3 jaw	HSS53	HP110	24	225	240
PKS10-2-3	10	2 & 3 jaw	HHS102	HP110	34	296	350
PKS20-2	20	2 jaw	HHS202	HP110	29	320	480
PKS20-3	20	3 jaw	HHS202	HP110	37	320	480
PKS30-2	30	2 jaw	HHS302	HP110	49	407	580
PKS30-3	30	3 jaw	HHS302	HP110	58	407	580
PKS50-2	50	2 jaw	HHS603	HP227	105	727	920
PKS50-3	50	3 jaw	HHS603	HP227	130	727	920
PK202	20	2 jaw beam	*	*	3	*	*
PK302	30	2 jaw beam	*	*	4	*	*
PK502	50	2 jaw beam	*	*	7	*	*

Note: PK202, PK302 & PK502 are 2-jaw beam only (not complete kit). Dimensions calculated with 15° outward angled puller legs.

PKC - COMPREHENSIVE HYDRAULIC PULLER KITS



Capacities from 10 to 50 tonnes

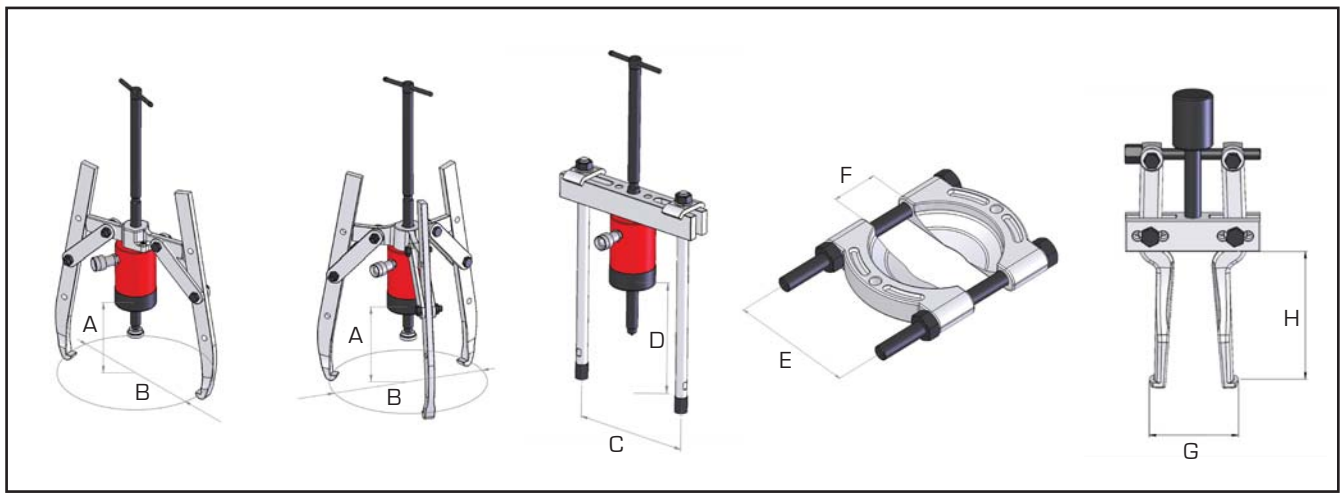
Combination of 4 different pullers in one set

Quick set-up time, easy to use

The PKC heavy duty, multi-purpose hydraulic puller kit range is extremely versatile and includes 2-way and 3-way grip pullers (as detailed on page 119), bearing pullers, bearing cup pullers and cross head pullers. All models are designed for pulling, pushing, installing and removing all press fitted or heat fitted parts such as gears, bearings, sleeves, cogs, internal bearings, wheels, sprockets, flywheels, etc. The range offers a selection of 4 models with pulling capacities up to 50 tonnes, all supplied complete with a full set of versatile, detachable hydraulic components.



- Working pressure 700 Bar
- Complete hydraulic system supplied, including gauge
- High quality, drop-forged steel components
- Supplied complete with carrying case



Model number	Capacity tonnes	Cylinder model no.	Pump model no.	Weight kg
PKC10	10	HHS102	HP110	25
PKC20	20	HHS202	HP110	60
PKC30	30	HHS302	HP110	116
PKC50	50	HHS603	HP227	268

Dimensions in mm										
A	B	C Min	C Max	D	E	F Min	F Max	G Min	G Max	H
296	350	115	260	300	110	10	110	40	145	115
320	480	135	345	265	152	11	134	40	145	115
407	580	180	440	284	260	15	250	60	240	150
727	920	230	580	447	260	15	250	60	240	150

Dimensions A & B calculated with 15° outward angled puller legs.

Hi-Force®

CRIMPERS AND CUTTERS

Information	General information on crimping tools	Page 122
CH Range	Cable crimping heads	Pages 123 - 124
SC Range	Self-contained cable crimping tools	Pages 125 - 126
BC Range	Battery operated cable crimping tools	Page 127
BC Accessories	Battery powered pump & accessories	Page 128
HCH Range	Cutter heads	Page 129
CT Range	Self-contained cutters	Page 130
HWC Range	Hammer blow cutters	Page 131
HSWC Range	Self-contained wire rope cutters	Page 132
HWRC Range	Double acting wire rope cutters	Page 133
HCC Range	Chain cutters	Page 134

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CRIMPING TOOLS - GENERAL INFORMATION

Hi-Force hydraulic cable crimping tools are designed and manufactured for crimping un-insulated compression and mechanical connectors, in copper and aluminium, to a wide range of electrical power cables including distribution and transmission lines. Offering a choice of self-contained operation, with inbuilt manually operated hydraulic pump mechanism, separate remote operation, crimping head for use with a separate hydraulic pump and hose assembly, or battery operated, which offers all the versatility of our self-contained, manually operated tools but with the added speed and ease of use associated with a battery powered tool.

The Hi-Force hydraulic crimping tools range offers the most optimum choice to suit the widest range of electrical cable crimping applications. All models are designed and manufactured for use at 700 Bar maximum working pressure, supplied complete with all applicable die sets, compatible for use with the selected tool and include a handy carrying and storage case. Self contained manually operated and battery powered crimper tools are fitted with an automatic pump pressure relief valve, which activates and releases the hydraulic pressure immediately the compression (crimping) process has been successfully achieved. All remote operation crimper heads must be operated with a compatible Hi-Force 700 Bar hydraulic pump unit, fitted with an inbuilt pump safety overload, pressure relief valve, 700 Bar pressure gauge and 700 Bar rated hydraulic hose assembly.

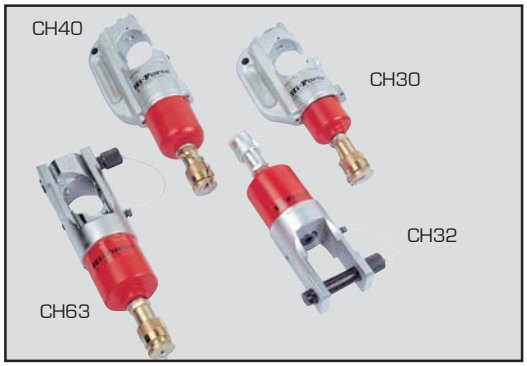








CH - CABLE CRIMPING HEADS



Choice of 7 models available

Supplied complete with die sets

Working pressure 700 Bar

The CH hydraulic cable crimping tool range offers 7 models with a choice of open "C" jaw or parallel guide design. All models are supplied complete with standard die sets and a carrying case. Models with 180° rotating head are designed for easy access into confined spaces. Suitable pump units include HP227FPC foot operated pump set which includes elbow fitting, gauge, gauge block, 3 metre hose and male coupler, as shown below. Standard hand operated pumps suitable for use with CH crimper heads can be found on pages 29-31. All models, excluding CH1000, are available as a complete kit, comprising of HP227FPC, CSB1 metal storage case and selected crimping tool with die sets.

- Model CH21 is suitable for crimping non-insulated terminals up to 240mm²
- Models CH30, CH32 & CH40 are suitable for crimping connectors up to 400mm²
- Models CH63 & CH80 are suitable for crimping connectors up to 630mm²
- Model CH1000 is suitable for crimping distribution and transmission lines up to 1000mm²

HP227FPC manually operated foot pump unit complete with accessories, see page 33.



Crimping tools complete with die set:

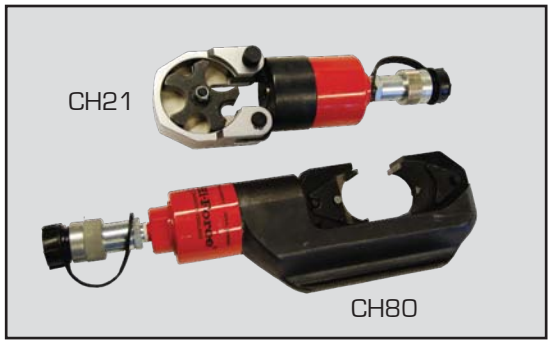
Model number	Output tonnes	C-Jaw opening	Applicable range DIN mm²	Standard dies mm²		Length mm	Weight kg
CH21	10	not applicable	16-240	With die Female die	(4pcs) 16-25, 35-70, 70-185, 240 (1pc) 25-35, 50-70, 95-120, 150-185, 240	210	3.0
CH30	12	30 mm	35-400	With die	35, 50, 70, 95, 120, 150, 185, 240, 300, 400	220	4.0
CH32	18	not applicable	16-400	With die Female die	(4pcs) 16, 25-35, 50-120, 150-400 (8pcs) 16-25, 35-70, 95-120, 150, 185, 240, 300, 400	210	3.6
CH40	12	38 mm	35-400	With die	35, 50, 70, 95, 120, 150, 185, 240, 300, 400	245	4.8
CH63	18	not applicable	35-630	With die	35, 50, 70, 95, 120, 150, 185, 240, 300, 400, 500, 630	240	4.8
CH80	15	50 mm	35-630	With die	35, 50, 70, 95, 120, 150, 185, 240, 300, 400, 500, 630	300	7.0
CH1000	50	not applicable	500-1000	With die	500, 630, 800, 1000	420	38.0

Complete set:

Model number	Description
CHP21	Comprehensive kit, comprising of crimper CH21, manual operated foot pump HP227FPC and steel box CSB1
CHP30	Comprehensive kit, comprising of crimper CH30, manual operated foot pump HP227FPC and steel box CSB1
CHP32	Comprehensive kit, comprising of crimper CH32, manual operated foot pump HP227FPC and steel box CSB1
CHP40	Comprehensive kit, comprising of crimper CH40, manual operated foot pump HP227FPC and steel box CSB1
CHP63	Comprehensive kit, comprising of crimper CH63, manual operated foot pump HP227FPC and steel box CSB1
CHP80	Comprehensive kit, comprising of crimper CH80, manual operated foot pump HP227FPC and steel box CSB1

Note : Models CH21 & CH32 supplied with single indent dies, all other models supplied with hexagon dies.

CH - CABLE CRIMPING HEADS

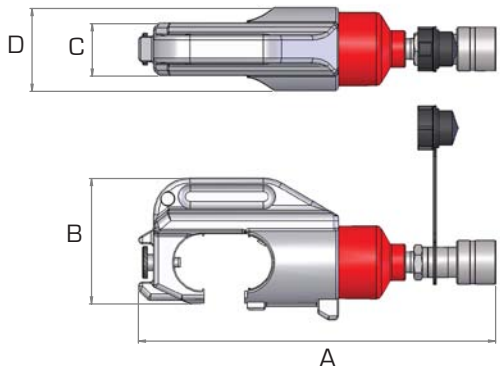


All fitted with standard quick connect coupler

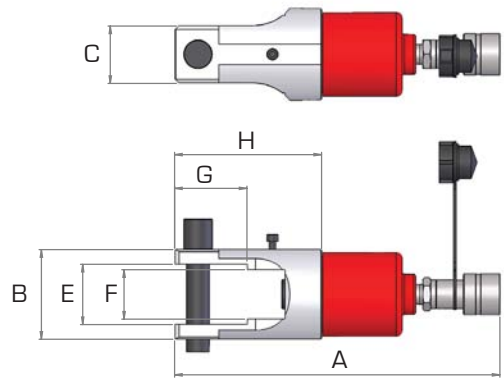
Choice of 'C' jaw or parallel guide design

Designed for easy access in confined spaces

CH30/CH40/CH80



CH32/CH63



Model Number	Dimensions in mm							
	A	B	C	D	E	F	G	H
CH21	278	88	28	-	-	-	-	-
CH30	294	105	43	68	-	-	-	-
CH32	284	78	50	-	53	43	63	96
CH40	326	113	43	74	-	-	-	-
CH63	319	78	50	-	49	-	163	-
CH80	370	106	63	-	-	-	-	-
CH1000	455	210	60	-	100	-	285	-

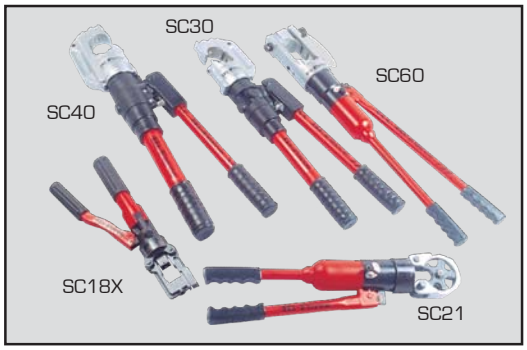
Note : CH21 and CH1000 dimensional drawings are not shown.

OPTIONAL DIE SETS

In addition to the standard die sets, which are supplied with each of the crimping tools as specified on the previous page, optional die sets are available as per the below table.

Model Number	Description
CD10	Die set 10mm^2, suitable for crimping tool CH30, CH40 & CH63
CD16	Die set 16mm^2, suitable for crimping tool CH30, CH40 & CH63
CD25	Die set 25mm^2, suitable for crimping tool CH30, CH40 & CH63

SC - SELF-CONTAINED CABLE CRIMPING TOOLS



Choice of 6 models available

Supplied complete with die sets

Automatic pressure release valve

The SC self-contained hydraulic cable crimping tool range offers 6 models with a choice of open "C" jaw or parallel guide design. All models are fitted with an automatic pressure release valve and are supplied complete with standard die sets and a carrying case. Models with 180° rotating head are designed for easy access into confined spaces.

- Model SC21 is suitable for crimping connectors up to 240mm²
- Models SC30, SC32 & SC40 are suitable for crimping connectors up to 400mm²
- Model SC60 is suitable for crimping non-insulated terminals up to 630mm²
- Model SC18X is suitable for crimping non-insulated terminals up to 185mm²

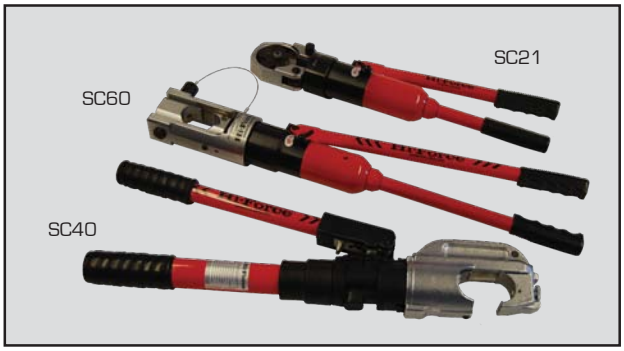


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Model number	Output tonnes	C - Jaw opening	Applicable range DIN mm²	Standard dies mm²	Length mm	Weight kg
SC21	10	not applicable	25-240	With die (4pcs) 25, 35-50, 70-185, 240 Female die (1pc) 25-35, 50-70, 95-120, 150-185, 240	528	5.2
SC30	12	30 mm	35-400	With die 35, 50, 70, 95, 120, 150, 185, 240, 300, 400	610	6.3
SC32	18	not applicable	16-400	With die (4pcs) 16, 25-35, 50-120, 150-400 Female die (8pcs) 16-25, 35-70, 95-120, 150, 185, 240, 300, 400	650	6.2
SC40	12	38 mm	35-400	With die 35, 50, 70, 95, 120, 150, 185, 240, 300, 400	636	7.7
SC60	18	not applicable	35-630	With die 35, 50, 70, 95, 120, 150, 185, 240, 300, 400, 500, 630	650	6.5
SC18X	6	not applicable	10-185	With die 10-16, 25-35, 50-70, 95-120, 150, 185	370	2.0

Note : Models SC21 & SC32 are supplied with single indent dies, all other models are supplied with hexagonal dies.

SC - SELF-CONTAINED CABLE CRIMPING TOOLS

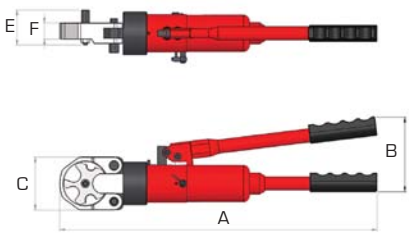


Supplied in handy carrying & storage case

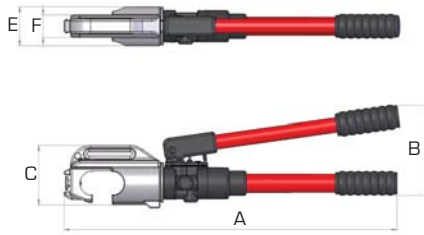
Easy to operate, self-contained design

Choice of open 'C' jaw or parallel guide design

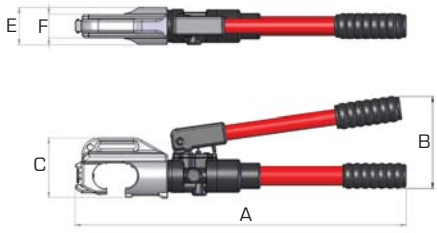
SC21



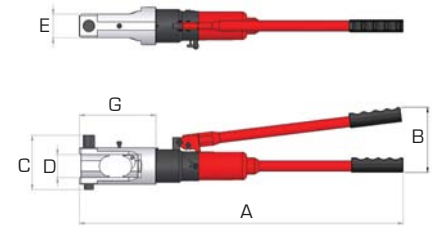
SC40



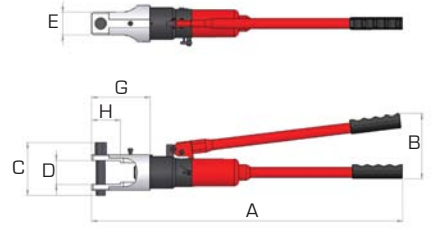
SC30



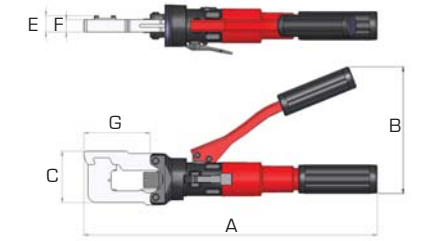
SC60



SC32



SC18X



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Model Number	Dimensions in mm A	B	C	D	E	F	G	H
SC21	520	122	86	-	57	27	-	-
SC30	602	166	116	-	68	43	-	-
SC32	680	137	116	52	50	-	128	63
SC40	630	166	113	-	74	48	-	-
SC60	690	140	116	52	50	-	163	-
SC18X	380	142	70	-	21	16	86	-

OPTIONAL DIE SETS

In addition to the standard die sets, which are supplied with each of the crimping tools as specified on the previous page, optional die sets are available as per the below table.

Model Number	Description
CD10	Die set 10mm², suitable for crimping tool SC30, SC40 & SC60
CD16	Die set 16mm², suitable for crimping tool SC30, SC40 & SC60
CD25	Die set 25mm², suitable for crimping tool SC30, SC40 & SC60

BC - BATTERY OPERATED CABLE CRIMPING TOOLS



BC30

- Supplied complete with standard set of dies
- Battery power warning light
- Efficient and quick battery recharger

The BC range of battery powered crimping tools consists of 4 models with a choice of 'C' jaw or parallel guide design.

The range offers all the versatility of the manually operated CH and SC range but with the added speed and ease of use associated with a battery powered tool. All models are supplied with battery, battery charger, shoulder strap and tool box storage case.

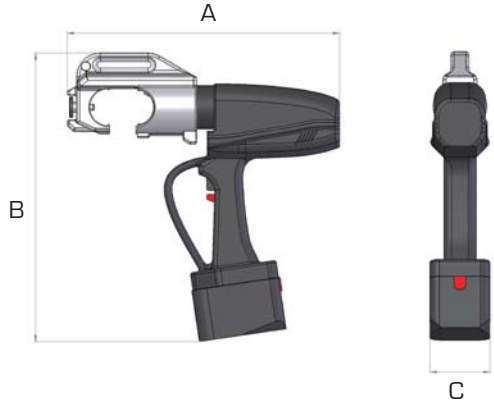
Model number	Output tonnes	C - Jaw opening	Applicable range DIN mm²	Standard dies mm²		Dimensions in mm A	B	C	Weight kg
BC18X	6	not applicable	10-185	With die	10-16, 25-35, 50-70, 95-120, 150, 185	320	310	75	3.0
BC30	12	30 mm	35-400	With die	35, 50, 70, 95, 120, 150, 185 240, 300, 400	350	300	78	7.0
BC40	12	38 mm	35-400	With die	35, 50, 70, 95, 120, 150, 185 240, 300, 400	380	300	78	8.0
BC63	18	not applicable	35-630	With die	35, 50, 70, 95, 120, 150, 185 240, 300, 400, 500, 630	420	300	78	7.0

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OPTIONAL DIE SETS

In addition to the standard die sets, which are supplied with each of the crimping tools as specified, optional dies sets are available as per the below table.

Model Number	Description
CD10	Die set 10mm², suitable for crimping tool BC30, BC40 & BC63
CD16	Die set 16mm², suitable for crimping tool BC30, BC40 & BC63
CD25	Die set 25mm², suitable for crimping tool BC30, BC40 & BC63



BC - ACCESSORIES



Model No	Description
BP144	Battery Pack 14.4V
Note: Charger supplied separately	



Model No	Description
CCU144	Car cigarette lighter charger unit



Model No	Description
CU110	Charger 110V
CU220	Charger 220/230V



Model No	Description
MP220	Power supply 220/230V to operate unit directly from mains

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HCH - HYDRAULIC CUTTER HEADS

HCH40



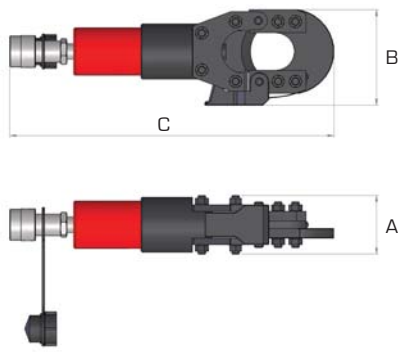
- Cutting capacity up to 125mm diameter
- Working pressure 700 Bar
- Compact and lightweight

The HCH cutter head range cuts a wide range of materials and offers 2 models with similar features to the CT range of self-contained cutters. A comprehensive range of suitable manually operated and powered hydraulic pumps suitable for use with Hi-Force HCH cutters is detailed on pages 27 to 48.

Model number	Cutting force tonnes	Weight kg	Dimensions in mm A	B	C
HCH40	6	2.8	62	101	247
HCH120	15	14.5	76	250	600

Did you know .....

HCH cutters can be operated with battery powered pumps, see page 35.



Material	Description	Maximum diameter cutting capacity in mm : HCH40	HCH120
Steel Wire Rope	6x7 Hempcore	20	-
	6x12 Hempcore	25	-
	6x19 Hempcore	25	-
Round Bar	Soft copper bar	25	-
	Soft aluminum bar	22	-
	Soft steel bar	16	-
	Reinforcing bar	13	-
Wire Strands	Bare copper strands	32	-
	Bare aluminum strands	32	-
	1x7 Guy steel wire strands	20	-
	1x19 Guy steel wire strands	25	-
Cable	Telephone cable CCP	40	125
	Lead sheathed telephone cable	40	125
	Underground cable	40	75

CT - SELF-CONTAINED HYDRAULIC CUTTERS

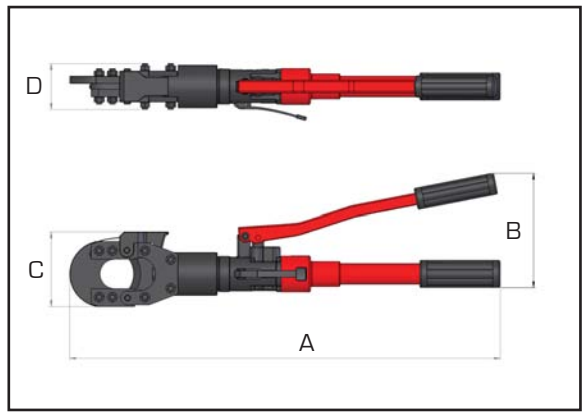
CT40



- Cutting capacity up to 40mm diameter
- Cuts a wide variety of materials
- Self-contained operation

The CT self-contained hydraulic cutter range offers a choice of 2 models with cutting capacities up to 25mm steel wire rope and 40mm cable. These versatile cutters are suitable for cutting wire rope, round bar, wire strands and electrical cable.

Model number	Cutting force tonnes	Weight kg	Dimensions in mm A	B	C	D
CT20	6	2.8	390	145	76	40
CT40	6	6.0	630	155	103	65



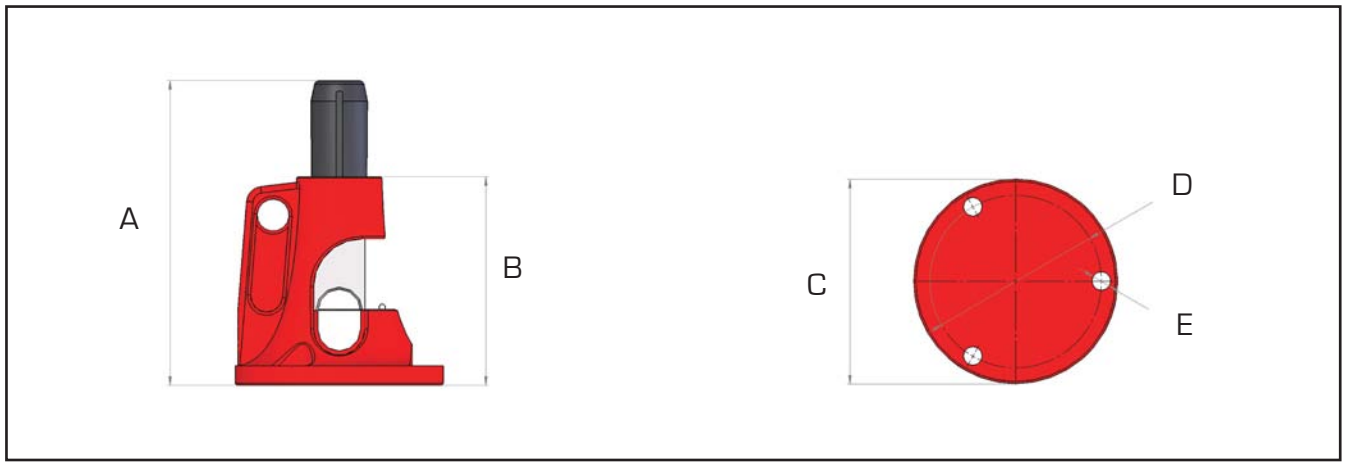
Material	Description	Maximum diameter cutting capacity in mm CT20	CT40
Steel Wire Rope	6x7 Hempcore	20	22
	6x12 Hempcore	20	25
	6x19 Hempcore	20	25
Round Bar	Soft copper bar	20	25
	Soft aluminum bar	20	22
	Soft steel bar	16	16
	Reinforcing bar	13	13
Wire Strands	Bare copper strands	20	32
	Bare aluminum strands	20	32
	ACSR	20	-
	1x7 Guy steel wire strands	15	20
	1x19 Guy steel wire strands	16	25
Cable	Telephone cable CCP	20	40
	Lead sheathed telephone cable	20	40
	Underground cable	20	40

HWC - HAMMER BLOW WIRE ROPE AND CABLE CUTTERS



- Highly cost efficient impact design
- Cutting capacity up to 38mm diameter wire rope
- Portable and lightweight

The Hi-Force HWC range of highly cost effective hammer blow cutters are manufactured from high quality, shock resistant, ductile iron and are fitted with replaceable cutting blades made from tool steel. The cutting blades are retained in the housing at the moment of impact, ensuring absolute safety. These cutters offer a considerable time saving over conventional axe, chisel and hacksaw methods.







Model number	Cutting capacity Wire rope Ø mm	Electric cable mcm*	Electric cable mm²	Weight kg
HWC90	19	250	127	3.2
HWC91	27	300	152	7.0
HWC92	38	750	380	13.0

*mcm = 1,000 circular mils

Dimensions in mm A	B	C	D	E
225	140	88	N/A	N/A
245	154	160	148	14
285	195	195	164	18

HSWC - SELF-CONTAINED HYDRAULIC WIRE ROPE CUTTERS



HSWC44

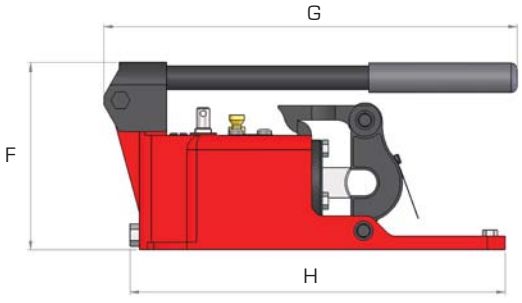
- Cutting capacities up to 44mm diameter
- Strong rigid steel construction
- Easy to use with minimum operator effort

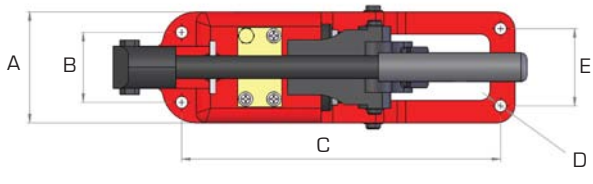
The Hi-Force range of self-contained portable hydraulic wire rope and cable cutters comprises of 3 models with cutting capacities up to 44mm diameter. Approved and specified by many major industries throughout the world, these high quality cutters are precision engineered to give a good, clean cut with minimum effort, time after time. The self-contained design of the cutter enables easy transportation to the job site with minimum of fuss.

The shear blades are manufactured using high quality tool steel, which is heat treated and ground to very tight tolerances, ensuring superior performance and long-life. Users include wire rope manufacturers, earthmoving and construction contractors, rigging shops, elevator manufacturers and repairers and many others.



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Model number	Cutting capacity wire rope mm Ø	Weight kg
HSWC19	19	9.5
HSWC28	28	15.5
HSWC44	44	30.0

Dimensions in mm							
A	B	C	D	E	F	G	H
93	58	265	10.2	64	154	345	315
105	64	294	10.2	67	174	374	357
125	70	393	10.2	84	203	490	460

HWRC - DOUBLE ACTING WIRE ROPE CUTTERS



Working pressure 700 Bar

Double acting design

Smooth guillotine cutting action

Hand and powered pumps suitable for these cutters are detailed on pages 27 to 48.

- Cuts high tensile locked coil wire rope and steel bar
- Cutting capacities up to 114mm diameter wire rope
- Cutting capacities up to 40mm diameter steel bar

The HWRC range of hydraulic cutters is specifically designed and manufactured for cutting high tensile locked coil wire rope and solid steel bar. Maximum cutting capacities up to 114mm diameter wire rope and up to 40mm diameter 28 tonnes tensile solid steel bar. All models incorporate a double acting hydraulic cylinder, suitable for working pressures up to 700 Bar and an open jaw design cutting head (see pictures below) for easy access to the material to be cut. Cutting blades and jaws are manufactured from specially toughened high tensile steel and the smooth guillotine action of the cutter greatly reduces the risk of blade jamming.



Step 1:

To open the cutter, swivel cutting head forward.



Step 2:

Position material to be cut in the cutting head slot.

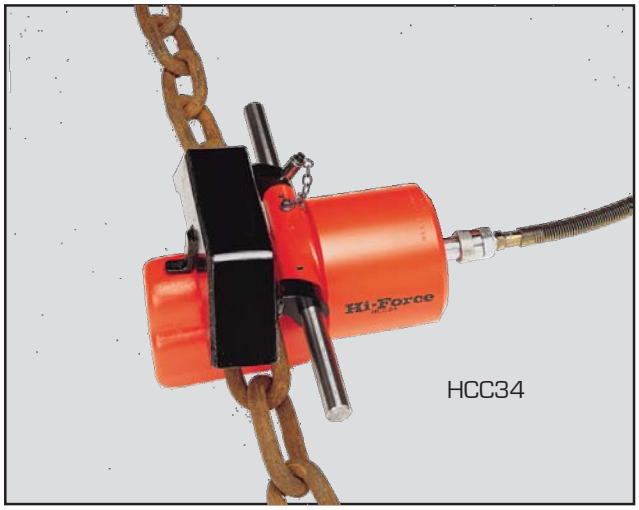


Step 3:

Close the cutting head by swivelling it back to its original position and secure behind the latch.

Model number	Output tonnes	Cutting capacity in mm			Oil capacity litres	Weight kg	Dimensions in mm		
		Wire rope mm Ø	Cable	Reinforcing Bar			Length	Width	Height
HWRC1115	36	38	38	20	0.35	30	400	155	270
HWRC1125	80	63	63	32	0.90	60	450	200	390
HWRC1136	80	90	90	32	1.20	70	515	200	390
HWRC1145	120	114	114	40	2.40	95	570	280	445

HCC - CHAIN CUTTERS



Working pressure 700 Bar

Single acting design

Fitted with locking guard

- Standard blades suitable for high tensile up to grade 100 chain
- Capable of cutting reinforcing bar, maximum hardness 47 Rockwell C
- Cutting capacities up to 46mm diameter

The HCC range of hydraulic cutters is specifically designed and manufactured for cutting high tensile chain and reinforcing bar. The easily replaceable cutter blades are manufactured from specially toughened high tensile steel and the choice of models available offer maximum cutting capacities up to 46mm diameter. All models are suitable for working pressures up to 700 Bar and incorporate a single acting cylinder fitted with a powerful piston retraction spring. The swivel action design of the locking safety guard (see pictures below) allows easy access for the material to be cut.



Picture 1:

HCC26 cutter shown with swivel action safety guard opened.



Picture 2:

HCC26 cutter shown with swivel action safety guard closed.

Hand and powered pumps suitable for these cutters are detailed on pages 27 to 48.

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Model number	Cutting capacity mm Ø	Cutting force tonnes	Max. allowed chain grade	steel hardness	Oil capacity cm^3	Weight kg	Dimensions in mm Length	Width	Height
HCC26	26	70	80	44 HRC	276	23	440	180	180
HCC26-100	26	70	100	47 HRC	276	23	440	180	180
HCC34	34	100	80	44 HRC	492	40	410	460	250
HCC34-100	34	100	100	47 HRC	492	40	410	460	250
HCC46	46	140	80	44 HRC	980	72	565	635	345
HCC46-100	46	140	100	47 HRC	980	72	565	635	345

Hi-Force®

TOOLS

HHP Range	Hole punchers	Page 136
HKP & SKP Range	Knock-out punchers	Page 137
NS Range	Nut splitters	Page 138
HMNS Range	Self-contained nut splitters	Page 139
DNS Range	Double acting nut splitters	Page 140
HFS-H Range	Hydraulic flange spreaders	Page 141
HFS & HFS-TK Range	Hydraulic flange spreader kits	Page 142
MFS & JS Range	Mechanical flange spreaders & jaw spreaders	Page 143
SJS Range	Stepped jaw spreaders	Page 144
PB Range	Hydraulic pipe bender & accessories	Page 145
HPF Range	Workshop presses, V-blocks & bed winches	Pages 146-147
RSM Range	Nylon multi-roller steerable moving skates	Page 148
RSC, RSS & RSH Range	Multi-purpose moving skates	Page 149
REX & RSX Range	Heavy duty moving skates	Page 150

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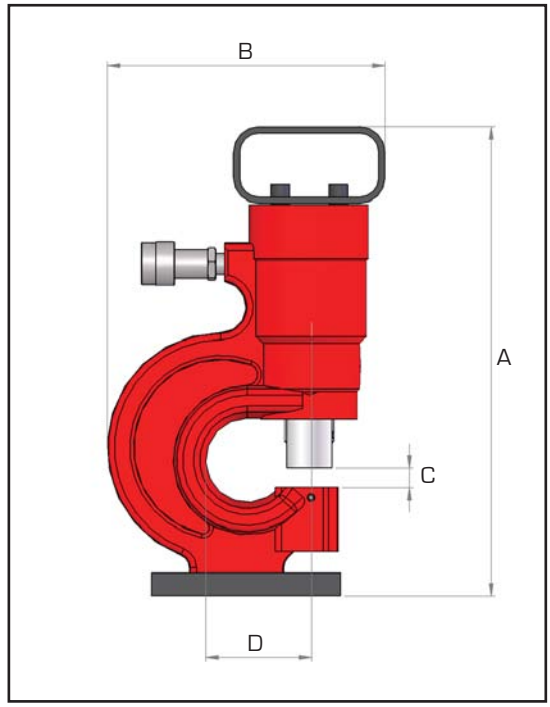
HHP - HOLE PUNCHERS



- Punching force up to 50 tonnes
- Throat depth 70mm
- Working pressure 700 Bar

The Hi-Force HHP series hydraulic hole puncher range offers a choice of two models comprising of the HHP30, 30 tonnes capacity single acting version, and the HHP50, 50 tonnes capacity double acting version. Both models are suitable for punching holes in steel plate as per the respective capacity of each model and are supplied complete with standard punch and die sets and an integral positioning and carrying handle. See pages 27-48 for detailed information of suitable pumps for use with HHP series punchers.





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Model number	Maximum force tonnes	Throat depth mm	Punch capacity (mm) Steel plate	Hole punch diameter	Standard punch/die sets included mm	Recommended pump & hose Manually operated	Pneumatically operated	Weight excl. pump kg
HHP30	30	70	10.0	up to 20.5	10.5, 13.5 17.5, 20.5	HP232 complete with HC3 3m hose	AHP1120 complete with HC3 3m hose	19.8
HHP50	50	70	15.0	up to 25.0	10.5, 13.5 17.5, 20.5, 25.0	HP232D c/w 2 x HC3	AHP1141 c/w 2 x HC3	42.0

Note: pump supplied separately

Model number	Dimensions in mm A	B	C	D
HHP30	372	216	15	78
HHP50	412	281	15	71

The HHP30 is single acting operation, the HHP50 is double acting operation

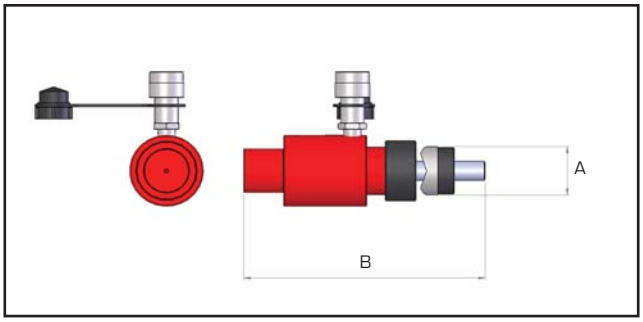
HKP & SKP - KNOCK OUT PUNCHERS


HKP10-4

- Capacity up to 10 tonnes
- Spring return hydraulic cylinder
- Working pressure 700 Bar

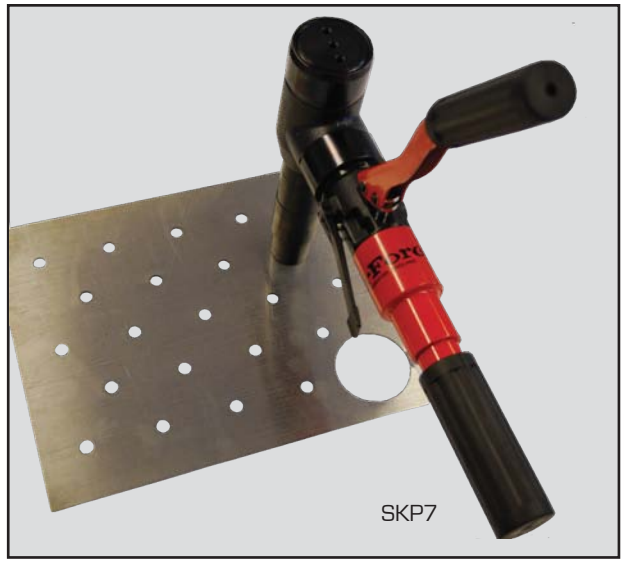
The Hi–Force HKP and SKP knock out puncher range is supplied as a complete set, including all standard sizes of punches/dies as specified below. Ideal for on-site hole punching in electric control panels and metal plates.

Model number	Maximum force tonnes	Plate capacity (mm) Stainless steel	Mild steel	Pump Included	Hose Included	Complete set weight kg
HKP10-2	10	1.6	3.2	HP110	HC2	14.6
HKP10-4	10	1.6	3.2	HP110	HC2	26.1
HKP10-2H	10	1.6	3.2	Not included	Not included	7.0
HKP10-4H	10	1.6	3.2	Not included	Not included	18.5
SKP7	7	1.6	3.2	Self contained unit with integral pump		9.0



Did you know.....

Hi-Force knock-out punchers are supplied complete with a carrying case


SKP7

Model number	Description	Punches/dies included									
HKP10-2	Std.punch/die A	21.8	27.6	34.1	42.7	48.7	60.5				
	Conduit Size	½"	¾"	1"	1¼"	1½"	2"				
	Length B	306	240	240	240	240	240				
HKP10-4	Std.punch/die A	21.8	27.6	34.1	42.7	48.7	60.5	76.1	88.9	102.8	115.5
	Conduit Size	½"	¾"	1"	1¼"	1½"	2"	2½"	3"	3½"	4"
	Length B	306	240	240	240	240	240	253	253	253	253
SKP7	Std.punch/die A	21.8	27.6	34.1	42.7	48.7	60.5				
	Conduit Size	½"	¾"	1"	1¼"	1½"	2"				
	Length B	306	240	240	240	240	240				

NS - NUT SPLITTERS


NS110

Capacities from 17 to 75mm AF

Working pressure 700 Bar

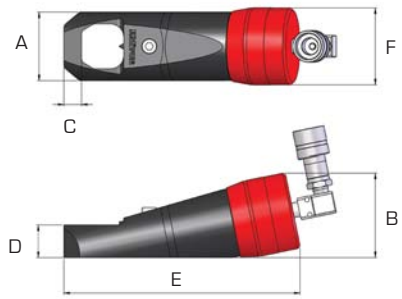
Compact & easy to use

The improved NS range of hydraulic nut splitters offers a choice of 5 models suitable for hexagon nut AF sizes from 17 to 75mm (M10 to M48 bolt sizes). The revolutionary design incorporates a hardened steel linkage that ensures the blade cutting edge is kept parallel to the nut throughout the splitting process which improves operational efficiency and more importantly, blade life. Designed to easily split corroded nuts up to RC44 hardness, Hi-Force nut splitters offer the ideal 'cold cut' solution for removing worn or corroded fasteners, especially in applications where 'hot work' permits are not allowed. Models NS104 and NS110 are supplied fitted with a unique 360° positional swivel coupling for easy adjustment and fitment in confined spaces. Suitable pumps are detailed on pages 27 to 48.

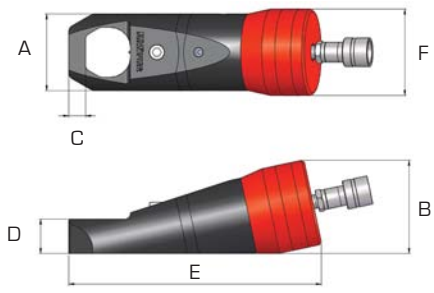
- Angled body design on all models
- Provides necessary clearance on flanges and flat surfaces
- Manufactured from high quality steel



NS104
NS110



NS200
NS206
NS215



*Swivel not fitted to models NS200, NS206 and NS215

Model number	Hexagon AF sizes mm	Bolt sizes mm	Weight kg
NS104	17 - 32	M10 - M22	4.0
NS110	32 - 41	M22 - M27	7.4
NS200	41 - 50	M27 - M33	10.6
NS206	50 - 60	M33 - M39	15.8
NS215	60 - 75	M39 - M48	39.3

Dimensions in mm					
A	B	C	D	E	F
64	77	12.5	30.0	210	67
78	96	20.0	37.0	268	88
96	116	21.0	43.0	315	108
115	138	24.0	52.0	336	126
156	175	27.0	75.0	426	162

HMNS - SELF CONTAINED NUT SPLITTERS


HMNS110

Capacities from 17 to 50mm AF

Choice of 3 models

Compact & easy to use

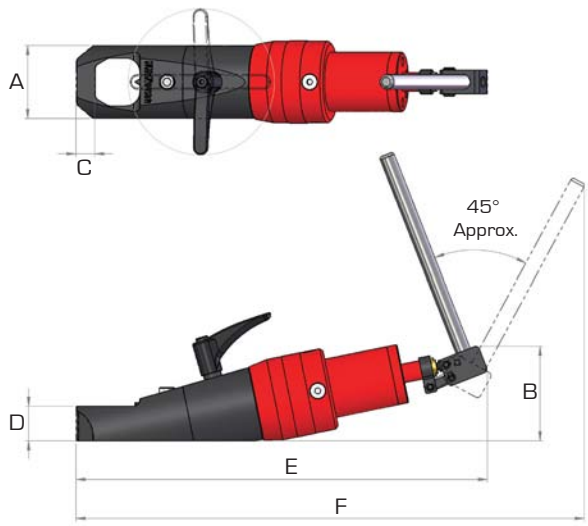
The HMNS range of hydraulic nut splitters offers a choice of 3 models suitable for hexagon nut AF sizes from 17 to 50mm (M10 to M33 bolt sizes). All models have an angled body design to provide the necessary clearance on flanges and flat surfaces. The revolutionary design incorporates a hardened steel linkage that ensures the blades cutting edge is kept parallel to the nut throughout the splitting process which improves operational efficiency and more importantly, blade life. Designed to easily split corroded nuts up to RC44 hardness, Hi-Force nut splitters offer the ideal 'cold cut' solution for removing worn or corroded fasteners, especially in applications where 'hot work' permits are not allowed. All models incorporate an integral hydraulic pump with multi-positional lever for even greater versatility.

- Angled body design on all models
- Provides necessary clearance on flanges and flat surfaces
- Manufactured from high quality steel



HMNS Models

Handle rotates freely through 360° and is removable



Model number	Hexagon AF sizes mm	Bolt sizes mm	Weight kg
HMNS104	17 - 32	M10 - M22	5.8
HMNS110	32 - 41	M22 - M27	7.9
HMNS200	41 - 50	M27 - M33	13.6

Dimensions in mm					
A	B	C	D	E	F
64	88	12.5	30.0	380	455
78	101	20.0	37.0	440	540
94	112	21.0	43.0	471	566

DNS - DOUBLE ACTING NUT SPLITTERS



DNS506

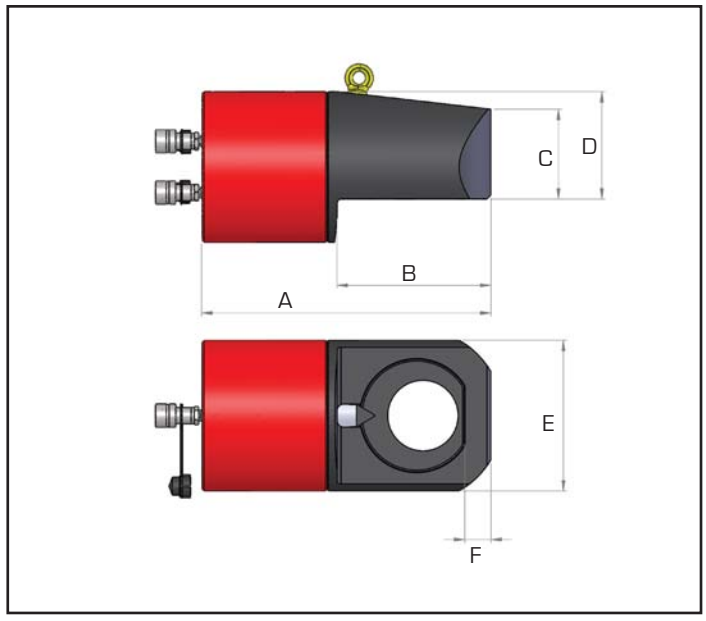
- Choice of 2 models
- Working pressure 700 Bar
- Double acting design

The Hi-Force DNS range of double acting, hydraulic nut splitters offers a choice of 2 models suitable for splitting nuts of across flats (AF) sizes from 2.15/16" to 5.3/8" (74mm to 136mm). Both models are 700 bar maximum working pressure and feature a double acting hydraulic piston for easy extension and retraction of the toughened steel splitting blade. Suitable manual and powered pumps for use with DNS range nut splitters can be found on pages 27-48 of this catalogue. Hi-Force DNS range hydraulic nut splitters are easy to set up and capable of safely splitting nuts quickly without any sparks, flames or flying debris usually associated with cutting torches.

The DNS range nut splitter heads are designed to fit on all API and ANSI flanges and capable of splitting the hardest nuts with minimal damage to the stud bolt threads.

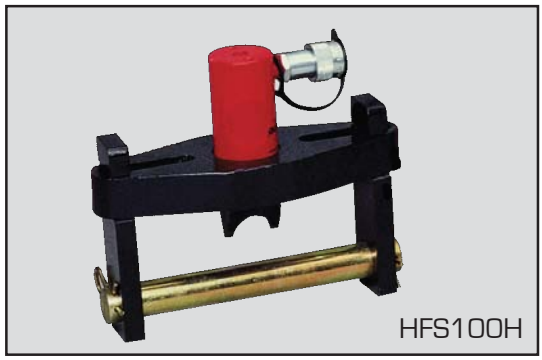
Splitting blades are easy to remove and re-install after re-sharpening or when a replacement blade is required.





Model number	Hexagon AF sizes inch	Hexagon AF sizes mm	Stud bolt thread sizes imperial	Stud bolt thread sizes metric	Weight kg	Dimensions in mm A	B	C	D	E	F
DNS404	2 15/16" - 4 1/4"	75 - 105	1 7/8" - 2 3/4"	M48 - M72	50	379.5	192	99.5	130.5	183	34
DNS506	4 1/4" - 5 3/8"	105 - 135	2 3/4" - 3 1/2"	M72 - M95	96	451	240	140	167.5	235	41

HFS-H - HYDRAULIC FLANGE SPREADERS


HFS100H

Capacities from 4.5 to 10 tonnes

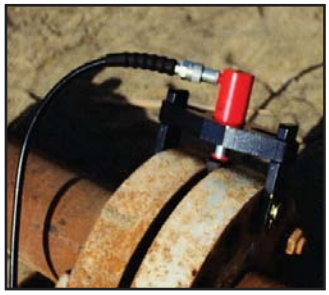
Working pressure 700 Bar

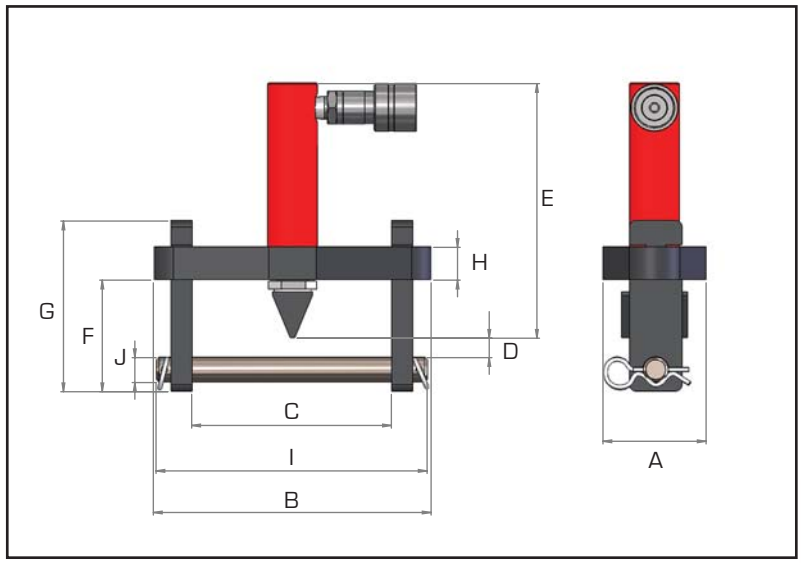
Quick and easy to assemble on flange

HFS-H hydraulic flange spreaders provide the ideal solution for safely opening pipe flanges in the marine and oil & gas industry. Available in capacities from 0 - 4.5 tonnes and 0 - 10 tonnes, these models offer the user the capability of opening flanges up to 2 x 57mm or 2 x 92mm thick respectively. Hi-Force flange spreaders can be operated individually, or as a pair when opening large flanges using a standard pump (see pages 29 to 31) and connecting hose (see page 50). With Hi-Force flange spreaders you are only minutes away from safely opening the toughest flanges without the risk of sparks caused by hammer blows, chisels and flying wedges.

›› Suitable for fitment onto flanges with a maximum stud bolt size of 1⅝" (41 mm)

Pump and hose not included!
See page 142 for complete kits.





Model number	Capacity tonnes	Stroke mm	Oil capacity cm^3	Max. flange thickness mm	Stud size mm	Standard wedge mm	Weight kg
HFS50H	4.5	75	48	2 x 57	19 - 29	3 - 29	5.0
HFS100H	10	56	81	2 x 92	32 - 41	3 - 29	11.6

	Dimensions in mm										
Model number	A	B	C min	C max	D	E	F	G	H	I	J
HFS50H	76	210	61	155	10	192	69	129	25	206	18
HFS100H	108	290	61	224	30	165	89	178	38	273	31

HFS & HFS-TK - HYDRAULIC FLANGE SPREADER KITS



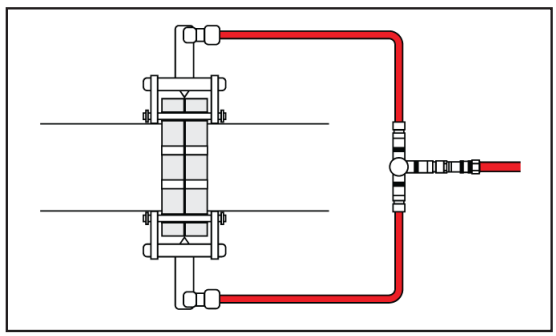
Capacities from 4.5 to 10 tonnes

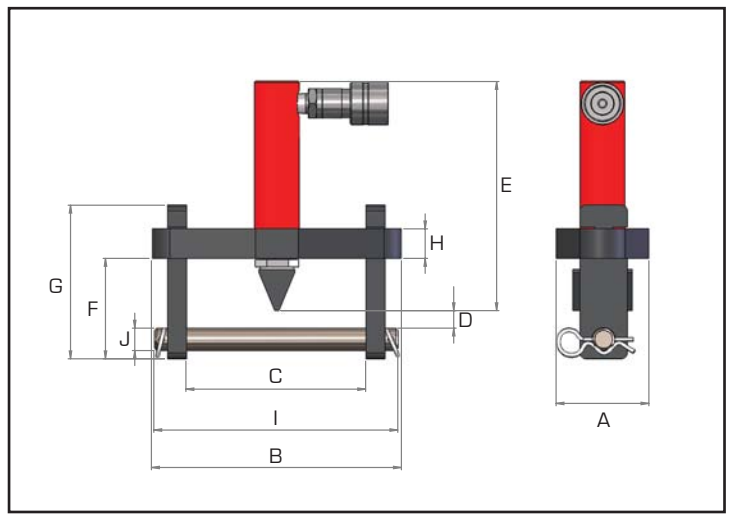
Working pressure 700 Bar

Complete with manual pump

HFS and HFS-TK hydraulic flange spreader kits offer a choice of either single spreader complete with pump and accessories (HFS) or a twin spreader arrangement incorporating two flange spreaders operated from a single pump with a T-piece and twin hose connection (HFS-TK). For flange separation in applications where long lengths of heavy pipe work are involved, the HFS-TK twin spreader kit enables the operator to achieve parallel flange separation all around the joint. Hi-Force HP110 hand pump is supplied as standard to HFS & HFS-TK flange spreader kits and details can be found on page 29 of this catalogue.

- Supplied complete with manually operated pump and hose assembly
- Suitable for fitment onto flanges with a maximum stud bolt size of 1 5/8" (41 mm)





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Specifications :

Model number	Capacity tonnes	Stroke mm	Oil capacity cm^3	Max. flange thickness mm	Stud size mm	Standard wedge mm	Weight kg
HFS50	4.5	75	48	2 x 57	19 - 29	3 - 29	22.5
HFS100	10	56	81	2 x 92	32 - 41	3 - 29	29.1
HFS50-TK	2 x 4.5	75	2 x 48	2 x 57	19 - 29	3 - 29	27.5
HFS100-TK	2 x 10	56	2 x 81	2 x 92	32 - 41	3 - 29	35.7

Dimensions in mm :

Model number	A	B	C min	C max	D	E	F	G	H	I	J
HFS-50	76	210	61	155	10	192	69	129	25	206	18
HFS-100	108	290	61	224	30	165	89	178	38	273	31
HFS50-TK	76	210	61	155	10	192	69	129	25	206	18
HFS100-TK	108	290	61	224	30	165	89	178	38	273	31

MFS - MECHANICAL FLANGE SPREADERS

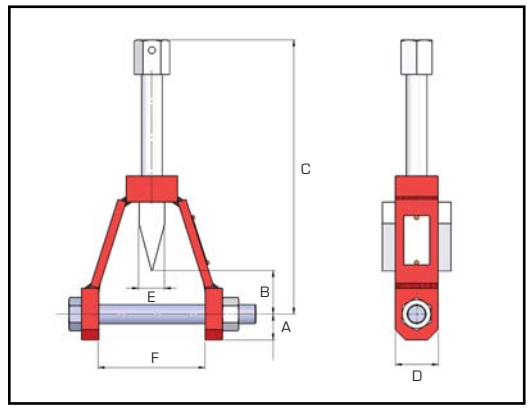


Suitable for bolt diameters up to 31mm

Maximum spread 231mm

No external power source required

The MFS range of mechanical flange spreaders comprises of 6 models, each offering a safe and economical way to open flanges without the risk of sparks. The threaded spindle can be operated using a standard spanner, allowing the user to apply a controlled force without damaging the flange. Due to the mechanical design of these flange spreaders, no external power source is needed and therefore, they can be used anywhere on-site.



- Choice of six models available
- High grade steel construction with high tensile cross bolt
- Case hardened spreading wedge

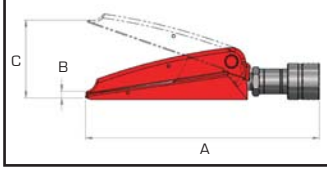
Model number	Pin diameter mm	Pin diameter inch	Min flange bolt hole diameter	Maximum flange thickness mm	Maximum flange thickness inch	Weight kg	A	B max.	C min.	C max.	D	E	F
MFS16	16	5/8"	17	2 x 22	2 x 7/8"	2.2	25	28	185	232	40	25	70
MFS19	19	3/4"	20	2 x 35	2 x 1 3/8"	2.7	30	50	185	254	50	25	95
MFS22	22	7/8"	23	2 x 47	2 x 1 13/16"	4.1	30	50	247	318	50	30	124
MFS25	25	1	26	2 x 62	2 x 2 7/16"	6.4	30	85	247	353	50	30	155
MFS28	28	1 1/8"	29	2 x 70	2 x 2 3/4"	8.2	30	80	275	382	60	40	181
MFS31	31	1 1/4"	32	2 x 95	2 x 3 3/4"	9.6	32	84	275	385	60	40	231

JS - JAW SPREADER



The JS4 hydraulic spreader is the ideal solution for spreading, wedging and prising operations in a wide variety of industrial applications. The compact, low weight, spring assisted return design enables the tool to fit into a gap of 9.7mm and offers a maximum spread of 94mm. Manufactured from high strength steel, with a maximum pressure of 700 Bar, the JS4 is supplied fitted with a quick connect female half coupler, and can be used with HP110 manual hand pump and HC hose.

JS4



Model number	Capacity tonnes	Oil capacity cm^3	Weight kg
JS4	0.9	10.0	2.2

Dimensions in mm		
A	B	C
223	9.7	94

SJS - STEPPED JAW SPREADERS

SJS10



SJS10-M

Capacity up to 13 tonnes

Supplied with safety block & stepped blocks

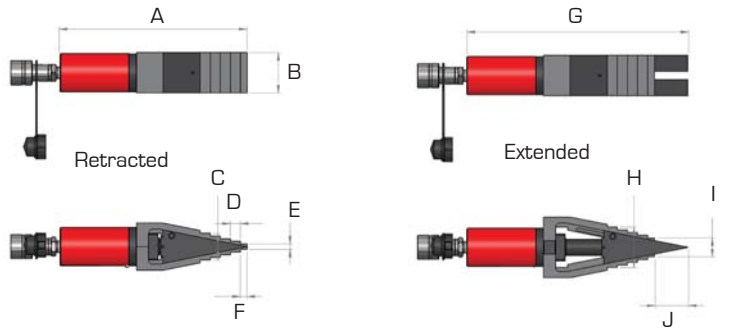
Maximum spread 60mm

- Single acting, spring assisted return
- Compact & lightweight design

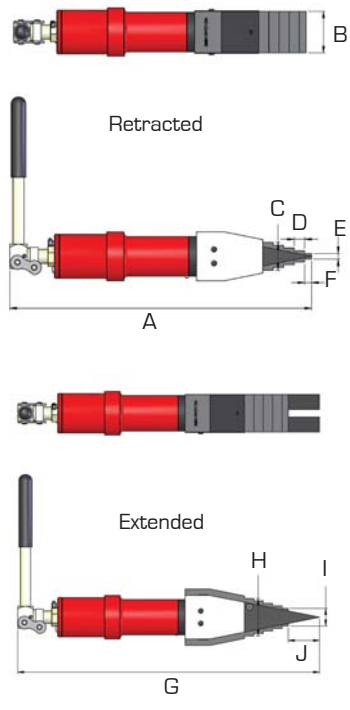
The Hi-Force SJS10 hydraulic spreader offers the ideal solution for spreading, wedging and prising operations in a wide variety of industrial applications. The compact, low weight, spring assisted, piston retract design of the SJS10 offers the user a powerful 13 tonnes of spreading capacity. Manufactured from high strength steel, the low height jaw tips can easily fit within an 8mm gap and can provide a total spreading distance of 60mm in 5 operations, using the step blocks provided with the tool. Suitable for operation up to 700 Bar maximum working pressure, and supplied complete with a female half quick connect coupler for easy attachment to a Hi-Force manually operated or powered hydraulic pump (see pages 27-48).

The SJS10-M has all the features of the SJS10, but with the added benefit of an in built manually operated hand pump.

SJS10

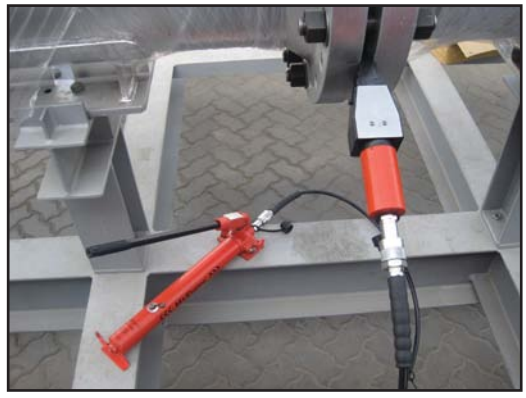


SJS10-M





Safety block supplied as standard



K

Model number	Capacity tonnes	Oil capacity cm^3	Weight kg
SJS10	13	74	5.5
SJS10-M	13	74	7.5

Dimensions in mm									
A	B	C	D	E	F	G	H	I	J
279	60	40	15	8	10	328	60	28	49
433	60	40	15	8	10	483	60	28	49

PB - HYDRAULIC PIPE BENDER



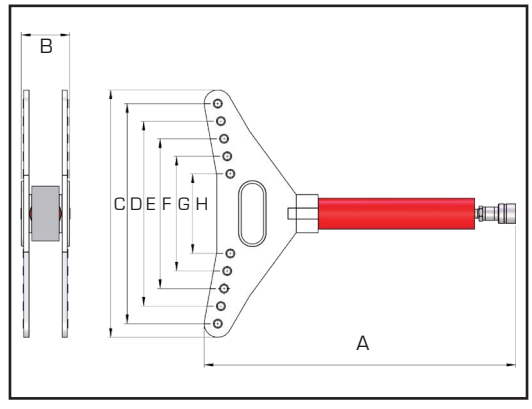
- Working pressure 700 Bar
- Bends up to 90 degrees
- For use with hydraulic pumps

The Hi-Force PB10 hydraulic pipe bender is designed to bend various sizes and thicknesses of JIS standardised conduit pipe and gas pipe ranging from 15mm-82mm (1/2" to 3"). Made of aluminium, the bending frame and pivot shoes are lightweight so that it can be easily carried on and off site, and can be operated by any manual or powered pump up to 700 Bar. Available as single pipe bender unit (PB10) or as convenient set including all available bending shoes, suitable for either thin steel conduit (PB10A), thick steel conduit (PB10B) or standard gas pipe (PB10C). For a range of suitable Hi-Force pumps see pages 27-48 of this catalogue.

Model number	Max capacity tonnes	Stroke mm	Oil capacity litres	Weight kg	Applicable range / included bending shoes
PB10	10	250	0.4	18.6	PB10 does not include bending shoes
PB10A	10	250	0.4	62.5	Thin steel conduit from 15mm (5/8") to 75mm (3")
PB10B	10	250	0.4	62.5	Thick steel conduit from 16mm (1/2") to 82mm (3")
PB10C	10	250	0.4	60.0	Standard gas pipe from 15mm (1/2") to 65mm (2.1/2")

*Weight for PB10A, PB10B, & PB10C includes metal storage box

Dimensions in mm							
A	B	C	D	E	F	G	H
720	147	755	695	595	495	395	295



BENDING SHOES

A range of bending shoes, compatible with the pipe bender PB10, are available as an optional extra to ensure a smooth, wrinkle free bend.

Note: PB10A includes all BS-A bending shoes (8 pcs)
PB10B includes all BS-B bending shoes (8 pcs)
PB10C includes all BS-SGP bending shoes (7 pcs)

For thin conduit					For thick conduit					For standard gas pipe				
Model number	Pipe size (inch)	Pipe outer dia (mm)	Pipe inner dia (mm)	Bending radius (mm)	Model number	Pipe size (inch)	Pipe outer dia (mm)	Pipe inner dia (mm)	Bending radius (mm)	Model number	Pipe size (inch)	Pipe outer dia (mm)	Pipe inner dia (mm)	Bending radius (mm)
BS-A15	5/8"	15.9	13.5	80	**BS-B16**	1/2"	21.0	16.4	75	**BS-SGP15**	1/2"	21.7	16.1	60
BS-A19	3/4"	19.1	15.9	100	**BS-B22**	3/4"	26.5	21.9	90	**BS-SGP20**	3/4"	27.2	21.6	80
BS-A25	1"	25.4	22.2	137	**BS-B28**	1"	33.3	28.3	130	**BS-SGP25**	1"	34.0	27.6	100
BS-A31	1 1/4"	31.8	28.6	200	**BS-B36**	1 1/4"	41.9	36.9	195	**BS-SGP32**	1 1/4"	42.7	35.7	130
BS-A39	1 1/2"	38.1	34.9	220	**BS-B42**	1 1/2"	47.8	42.8	230	**BS-SGP40**	1 1/2"	48.6	41.6	160
BS-A51	2"	50.8	47.6	365	**BS-B54**	2"	59.6	54.0	270	**BS-SGP50**	2"	60.5	52.9	220
BS-A63	2 1/2"	63.5	59.5	420	**BS-B70**	2 1/2"	75.2	69.6	450	**BS-SGP65**	2 1/2"	76.3	67.9	320
BS-A75	3"	76.2	72.2	530	**BS-B82**	3"	87.9	82.3	500					

HPF - WORKSHOP PRESSES


HPF10042

Capacities from 10 to 200 tonnes

Stroke lengths from 150 to 330mm

Working pressure 700 Bar

- Choice of manual, air or electric powered pumps
- Supplied complete with pressure gauge
- Other configurations available on request

The HPB and HPF range of workshop presses offers a choice of 25 models with either single acting or double acting cylinders and manually operated, air powered or electric powered pumps. Floor presses incorporate an adjustable work table and dual scale pressure gauge.

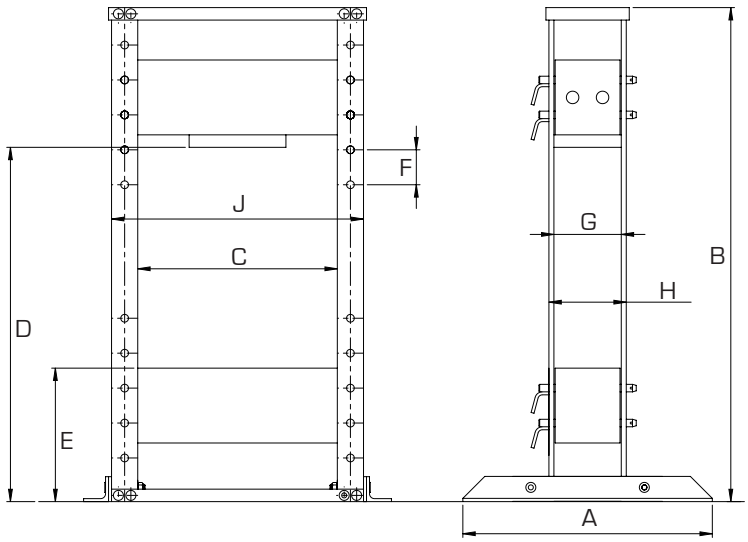
Model number	Capacity tonnes	Stroke mm	Cylinder model no. [1]	Cylinder principle	Pump model no. [2]	Pump operation	Weight kg
HPF1020	10	250	HSS1010	single acting	HP110	hand operated	95
HPF1030	10	250	HSS1010	single acting	AHP1120	air powered	85
HPF2520	25	250	HSS2510	single acting	HP227	hand operated	145
HPF2530	25	250	HSS2510	single acting	AHP1120	air powered	138
HPF2541	25	250	HSS2510	single acting	HEP103341	electric driven 110 V	160
HPF2542	25	250	HSS2510	single acting	HEP103342	electric driven 240 V	160
HPF2544	25	250	HSS2510	single acting	HEP207314	electric driven 415 V	160
HPF5020S	50	330	HSS5013	single acting	HP257	hand operated	470
HPF5020D	50	330	HDA5013	double acting	HP252D	hand operated	500
HPF5030S	50	330	HSS5013	single acting	AHP1121	air powered	505
HPF5030D	50	330	HDA5013	double acting	AHP1141	air powered	505
HPF5041S	50	330	HSS5013	single acting	HEP207311	electric driven 110 V	505
HPF5041D	50	330	HDA5013	double acting	HEP207411	electric driven 110 V	481
HPF5042S	50	330	HSS5013	single acting	HEP207312	electric driven 240 V	512
HPF5042D	50	330	HDA5013	double acting	HEP207412	electric driven 240 V	518
HPF5044S	50	330	HSS5013	single acting	HEP207314	electric driven 415 V	518
HPF5044D	50	330	HDA5013	double acting	HEP207414	electric driven 415 V	518
HPF10020	100	330	HDA10013	double acting	HP245D	hand operated	1011
HPF10030	100	330	HDA10013	double acting	HAP21042	air powered	1029
HPF10041	100	330	HDA10013	double acting	HEP207421	electric driven 110 V	1043
HPF10042	100	330	HDA10013	double acting	HEP207422	electric driven 240 V	1043
HPF10044	100	330	HDA10013	double acting	HEP207424	electric driven 415 V	1043
HPF20041	200	305	HDA20012	double acting	HEP310421	electric driven 110 V	3250
HPF20042	200	305	HDA20012	double acting	HEP310422	electric driven 240 V	3250
HPF20044	200	305	HDA20012	double acting	HEP310424	electric driven 415 V	3250

Notes: [1] For detailed specification on applicable cylinders, see pages 14 & 15 for HSS range and page 20 for HDA range. [2] For detailed specification on applicable pumps, see pages 29 - 31 for HP range, page 37-41 for HEP range, page 45-46 for AHP range and page 47 for HAP range.

HPF - WORKSHOP PRESSES

Factory mounted optional accessories include a mechanical bed winch for easy adjustment of the work table and multi-position V-blocks. All presses are supplied completely assembled, ready for use. Hi-Force workshop presses are manufactured to the highest quality standards, and are suitable for the most demanding jobs.

In order to fully comply with CE regulations, some presses must be equipped with specific safety components, such as spring centered valves, two-hand control devices or others.



Note: Press bed and press head are adjustable in steps of 'F',
50 tonne has 4 positions, 100 tonne has 3 positions, 200 tonne has 7 positions.
10 and 25 tonne press frame has fixed press head and adjustable press bed.

Press Range	Capacity tonnes
HPF1000	10
HPF2500	25
HPF5000	50
HPF10000	100
HPF20000	200

Frame dimensions in mm										
A	B	C	D (min)	D (max)	E (min)	E (max)	F	G	H	J
742	1448	508	1258		260	1010	150	-	152	660
742	1448	508	1258		260	1010	150	-	152	660
1000	2055	800	1140	1560	395	815	140	258	298	1000
1000	1980	1000	1090	1370	550	830	140	338	388	1240
1200	2500	1250	2115	1815	610	1510	150	330	410	1750

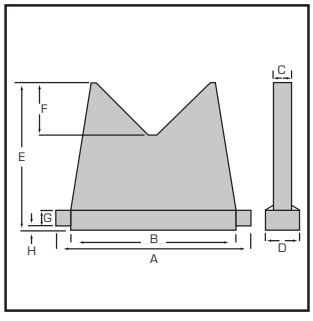
OPTIONAL EXTRAS



Multi-position V-blocks

- Only available factory fitted option
- Lifts and lowers work table
- Available for 50 and 100 tonne presses

Suffix	Description
BW	Bed winch, suitable for 50 and 100 tonne models



- With flat bed and V-shape press surfaces
- Available for 10, 25, 50 and 100 tonne presses

Model number	Cap. per set tonnes	Dimensions in mm A	B	C	D	E	F	G	H
HVB2500	10 - 25	204	154	20	45	155	45	20	8
HVB5000	50	365	265	25	50	190	60	25	10
HVB10000	100	425	325	35	60	265	85	35	10

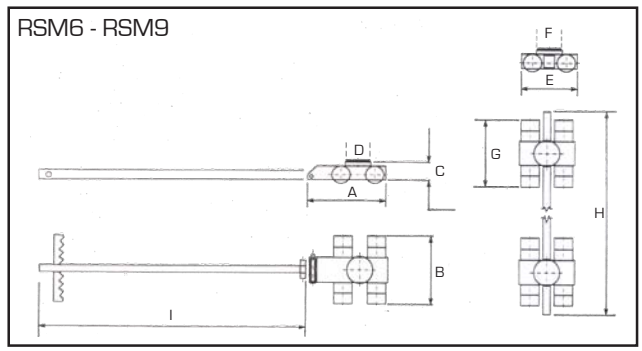
RSM - NYLON MULTI-ROLLER STEERABLE SKATES

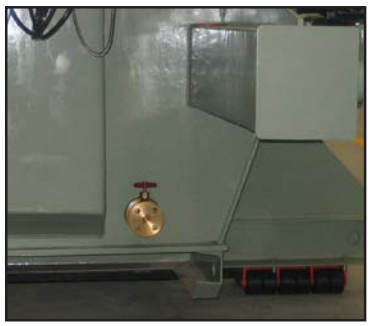


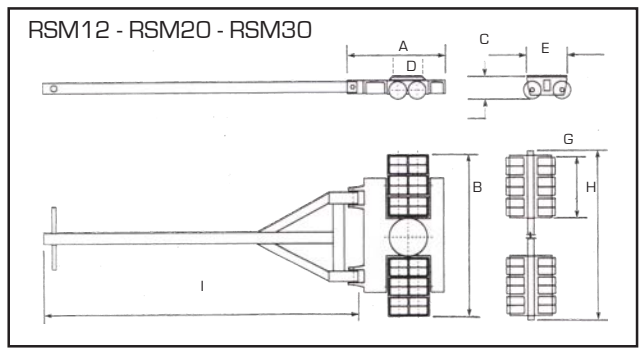
- Capacities from 6 to 30 tonnes
- Steerable front skate for total control
- Low weight, compact size

The RSM nylon multi-roller steerable skate range is ideal for use on tiled floors and is available with capacities from 6 to 30 tonnes. These skates consist of 3 major parts: 1 steerable turntable front skate and 2 adjustable rear skates. This modular design allows the system to be easily assembled and dismantled without the use of tools. All models are fitted with low rolling resistance wheels with ball bearings and non-slip Neoprene pads on each load surface.









Model number	Capacity per skate set tonnes	No. of wheels front steerable	No. of wheels twin rear skate	Weight incl. box kg
RSM6	6	4 no. 82 mm x 48 mm	8 no. 82 mm x 48 mm	51
RSM9	9	8 no. 82 mm x 48 mm	16 no. 82 mm x 48 mm	64
RSM12	12	8 no. 82 mm x 48 mm	8 no. 82 mm x 48 mm	95
RSM20	20	16 no. 82 mm x 48 mm	16 no. 82 mm x 48 mm	118
RSM30	30	24 no. 82 mm x 48 mm	24 no. 82 mm x 48 mm	135

Dimensions in mm								
A	B	C	D	E	F	G	H max	I
330	210	109	110	240	110	210	1500	1150
330	310	109	160	240	160	310	1500	1150
413	614	110	190	180	-	130	1500	1500
413	673	110	190	180	-	242	1500	1500
413	990	110	190	188	-	354	1500	1500

RSC & RSS - MULTI-PURPOSE SKATES



Capacities from 5 to 37.5 tonnes

Available as complete kit or as individual skates

Endless hardened roller chain

The RSC and RSS range of industrial, low profile skates offer the safest, fastest and most economical method of moving heavy equipment. The range comprises of 4 models available with capacities of up to 37.5 tonnes per skate. Designed with an endless hardened roller chain which revolves around the skate, at least 5 rollers remain in contact with the floor at any one time, ensuring smooth travel even over cracked concrete floors. With a range of turntables, stabilisers, spacer bars and steering handles available, Hi-Force skates can move and position heavy and irregular shaped loads easily and more economically than other lifting devices. Hi-Force skates are also ideal for use in confined spaces and typical applications include bridge building, transformers, generators, turbines, heavy machinery and many others.

Complete kits :

Model number	Cap. per set tonnes	Skates Qty: 4	Turntables Qty: 2	Stabilisers Qty: 2	Spacer bars Qty: 4	Handles Qty: 2	Wooden box Qty: 1	Weight kg
RSC20	20	**RSS20**	**RT20**	**RS20**	**RB20**	**RH20**	**WB1**	41
RSC50	50	**RSS50**	**RT50**	**RS50**	**RB50**	**RH50**	**WB2**	94

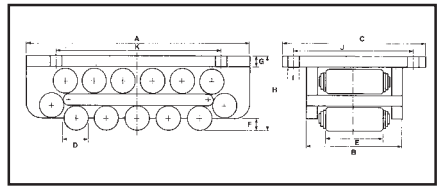
Individual skate selection chart :

Model number	Cap. per skate tonnes	Weight kg	Dimensions in mm Length	Width	Height less t/table	Height incl. t/table	Roller width	Roller dia
RSS20	5.0	4	210	102	59	94	51	18
RSS50	12.5	11	271	125	95	143	87	30
RSS100	25.0	27	370	175	130	179	90	42
RSS150	37.5	42	502	186	152	206	90	42

Note : Turntables for RSS100 (RT100) and RSS150 (RT150) are available on request.

RSH - HEAVY DUTY SKATES

The RSH heavy duty range of moving skates are ideal for movement of heavy loads such as transformers, generators, turbines and machinery. Available with capacities ranging from 15 to 100 tonnes each skate.

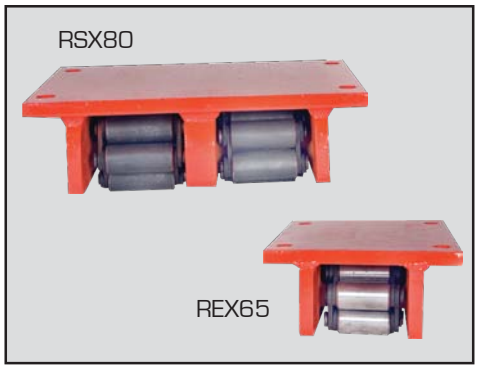




Model number	Capacity tonnes	Rollers in contact	Rollers total	Weight kg
RSH15	15	5	15	9
RSH20	20	4	13	12
RSH40	40	4	13	19
RSH50	50	6	17	29
RSH65	65	4	13	51
RSH100	100	6	17	92

Dimensions in mm A	B	C	D	E	F	G	H	I	J	K
210	100	175	18	51	6	13	76	14	140	150
220	113	190	24	60	10	14	87	14	155	150
270	130	210	30	68	10	14	104	18	175	190
320	140	220	30	68	10	18	115	18	180	240
380	168	270	42	76	19	19	145	22	220	280
530	182	300	50	86	19	19	165	22	240	410

REX & RSX - HEAVY DUTY SKATES WITH GROOVED GUIDE

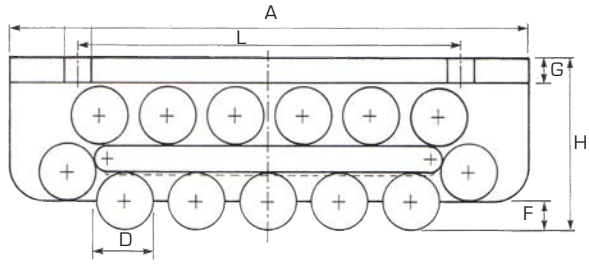


- Capacities from 40 to 400 tonnes
- Heat treated load bearing centre plate
- Heat treated, special chrome alloy chains

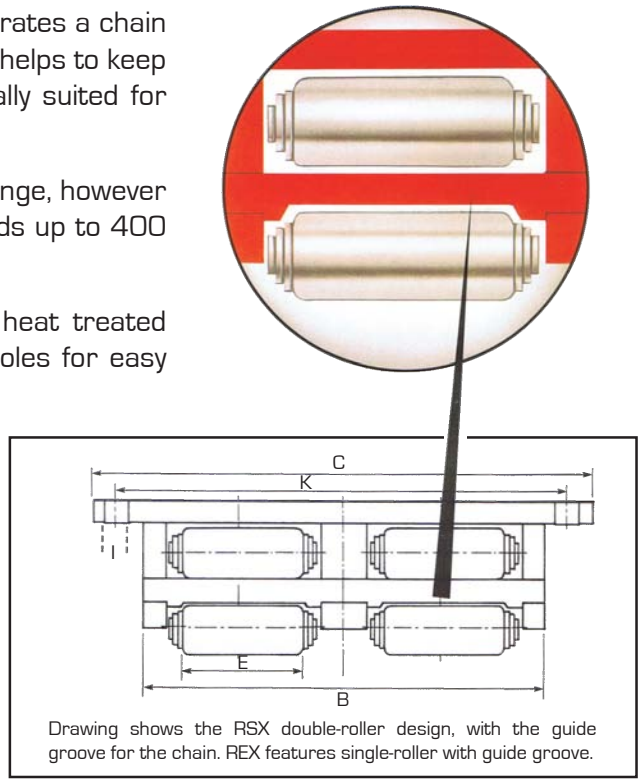
Available with capacities up to 200 tonnes each skate, the REX heavy duty range of single roller moving skates incorporates a chain groove cut into the centre member of the skate, which helps to keep the chain running parallel with the body and is specially suited for moving loads over long distances.

The RSX range offers the same features as the REX range, however has a double roller design, capable of transporting loads up to 400 tonnes per skate.

Both the REX and RSX models feature high quality, heat treated components and are supplied with 4 mounting bolt holes for easy attachment to the load.



Side view REX and RSX models



Drawing shows the RSX double-roller design, with the guide groove for the chain. REX features single-roller with guide groove.

K

Model number	Capacity tonnes	Rollers in contact	Rollers total	Weight kg	Dimensions in mm A	B	C	D	E	F	G	H	I	K	L
REX Range - Single-roller design															
REX40	40	4	13	20	270	130	210	30	68	10	14	104	18	175	190
REX50	50	6	17	29	320	140	220	30	68	10	18	115	18	180	240
REX65	65	4	13	52	380	168	270	42	76	19	19	145	22	220	280
REX100	100	6	17	93	530	182	300	50	86	19	19	165	22	240	410
REX150	150	9	23	162	600	205	350	50	100	20	28	190	26	280	480
REX200	200	13	31	266	900	205	380	50	100	20	38	200	33	300	720
RSX Range - Double-roller design															
RSX80	80	2 x 4	2 x 13	36	270	260	340	30	68	10	14	104	18	305	190
RSX100	100	2 x 6	2 x 17	57	320	280	360	30	68	10	18	115	18	325	240
RSX130	130	2 x 4	2 x 13	96	380	336	440	42	76	19	19	145	22	390	300
RSX200	200	2 x 6	2 x 17	175	530	364	480	50	86	19	19	165	22	430	420
RSX300	300	2 x 9	2 x 23	305	600	410	560	50	100	20	28	190	26	490	480
RSX400	400	2 x 13	2 x 31	485	900	410	590	50	100	20	38	200	33	500	720

TOUGHLIFT

TL Range	ToughLift Jacking Systems	Page 152 - 154
TL Accessories	ToughLift Accessories	Page 155 - 156
GTB & PTB Range	Tyre Bead Breakers	Page 157
TL Applications	ToughLifts in use	Page 158
GTB & PTB Applications	Tyre Bead Breakers in use	Page 158







TL - TOUGHLIFT JACKING SYSTEMS

The Hi-Force ToughLift jacking system offers users the easiest and safest method of lifting material haulers in the mining and construction industry and locomotives in the railway industry, when critical maintenance and breakdown repair work requires completion.

Suitable for lifting even the largest earth haulers in the world, the Hi-Force ToughLift is available in 50, 100, 150 and 200 tonnes lifting capacities. All models are available with either a 110 volt or 240 volt single phase electric driven pump unit or a 6 Bar compressed air driven pump version. All models are operated via a remote, push button hand pendant controller with a 6 metre length control cable to ensure the operator has precise control over the lifting operation from a safe distance away from the load.

Hi-Force ToughLift jacking systems are supplied fitted as standard with a hardened steel lifting saddle, patented "snap latch" handle assembly for easy positioning and transportation and a patented jacking system design for increased safety, enabling them to be easily positioned, in the tightest of spaces, to ensure location into the correct and exact lifting and jacking position.

Fitted with large diameter wheels and heavy duty tyres as standard, all ToughLift models are narrow in width and have the smallest footprint area in the industry.

A wide variety of optional extras are also available which include load holding blocks, swivel load caps, locking, load block extensions, slip lock extensions and accessory tool boxes. Further details can be found on pages 154 to 156.

With the Hi-Force ToughLift, plant operators in mining, construction and railway industries are assured of minimal maintenance and repair downtime, of their capital intensive equipment, from the strongest and most versatile lifting jack in the world!



TL - TOUGHLIFT JACKING SYSTEMS



TL150A520 TL200A380

Working pressure 700 Bar

Choice of 12 models with a range of accessories

Used in mining, construction & railway industries

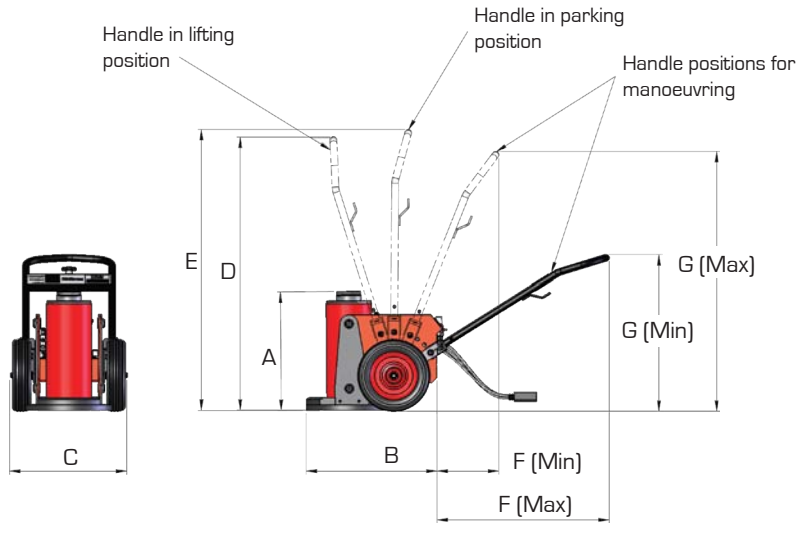
For more information take a look at the ToughLift website www.toughlift.com

- Choice of 50, 100, 150 or 200 tonne lifting capacities
- Patented multi-positional lifting handle for easy transportation and positioning
- Available with choice of electric or air driven hydraulic pump unit
- Push button remote hand pendant controller with 6 metre control cable
- Patented jacking system for safe and correct positioning prior to load lift
- Wide range of accessories available for even greater versatility (see pages 154 to 156)
- Narrow width, with small footprint for easy access into confined spaces
- Integral airline filter, lubricator and pressure regulator unit (air driven models only)
- User friendly design with easily accessible maintenance features
- Large diameter, heavy duty wheels for easy positioning underneath the load

Model number	Capacity tonnes	Power Supply	Stroke mm	Weight kg	Max additional stack in mm
TL050A255	50	6-Bar air driven	254	160	680
TL050E255	50	240V electric	254	168	680
TL100A405	100	6-Bar air driven	405	288	480
TL100A530	100	6-Bar air driven	530	318	180
TL100E405	100	240V electric	405	296	480
TL100E530	100	240V electric	530	326	180
TL150A390	150	6-Bar air driven	390	312	485
TL150A520	150	6-Bar air driven	520	348	180
TL150E390	150	240V electric	390	320	485
TL150E520	150	240V electric	520	356	180
TL200A380	200	6-Bar air driven	381	372	500
TL200E380	200	240V electric	381	380	500

Note: All electric driven ToughLift jacking systems are available in 110V and 240V single phase, power supply options. For 110V version, please suffix model number with 110, i.e TL050E255-110 for 110V version.

TL - TOUGHLIFT JACKING SYSTEMS



Note: The 50 tonne models have a combined lifting and parking position.

Model Number	Dimensions in mm A	B	C	D	E	F MIN - MAX	G MIN - MAX
TL050A255	455	660	560	1440		380-1000	700-1300
TL050E255	455	660	560	1440		380-1000	700-1300
TL100A405	665	730	660	1520	1560	360-960	860-1440
TL100A530	843	730	660	1520	1560	360-960	860-1440
TL100E405	665	730	660	1520	1560	360-960	860-1440
TL100E530	843	730	660	1520	1560	360-960	860-1440
TL150A390	665	730	660	1520	1560	360-960	860-1440
TL150A520	843	730	660	1520	1560	360-960	860-1440
TL150E390	665	730	660	1520	1560	360-960	860-1440
TL150E520	843	730	660	1520	1560	360-960	860-1440
TL200A380	660	730	660	1520	1560	360-960	860-1440
TL200E380	660	730	660	1520	1560	360-960	860-1440

SADDLES

Tilting saddles are fitted as standard to all ToughLift jacks, however flat saddles can also be supplied as an optional extra. Both types of saddle (flat or tilting swivel) can be easily fitted to all slip lock and load lock extensions.

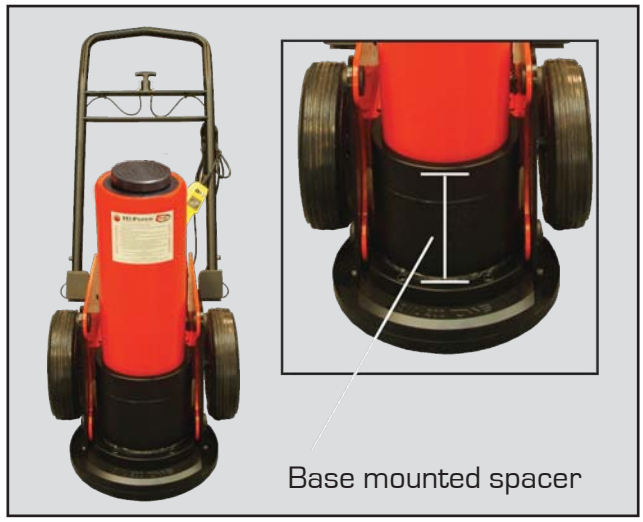
EXTENSIONS

Hi-Force also offers a range of extensions for use with ToughLift jacking systems. Slip lock extensions can be used in multiples up to the maximum height specified on page 155. Load lock extensions can only be used one at a time, however, they can be used in conjunction with slip lock extensions.

Both extension options must terminate with a flat or swivel tilting saddle on the top of the extension stack.

SPACERS

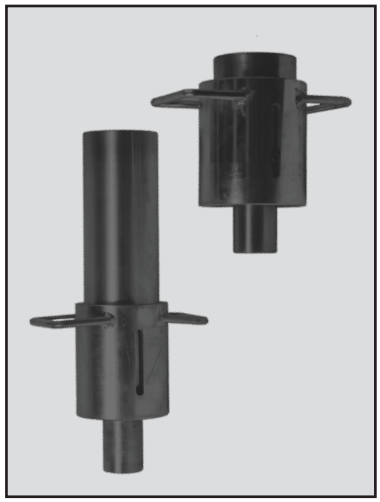
Base mounted spacers for increased closed height are available for 200 tonne models only. Please suffix model number with “E” when ordering.



Base mounted spacer

TL - TOUGHLIFT JACKING SYSTEMS

SLIP LOCK EXTENSIONS



Length 175mm	Length 200mm	Length 300mm	Length 400mm	Length 500mm	To suit jack model	Recommended max. extension height in mm
SLE-175-50	SLE200-50	SLE300-50	SLE400-50	SLE500-50	TL050A255	680
SLE175-50	SLE200-50	SLE300-50	SLE400-50	SLE500-50	TL050E255	680
SLE175-100	SLE200-100	SLE300-100	SLE400-100	*	TL100A405	480
SLE175-100	*	*	*	*	TL100A530	180
SLE175-100	SLE200-100	SLE300-100	SLE400-100	*	TL100E405	480
SLE175-100	*	*	*	*	TL100E530	180
SLE175-150	SLE200-150	SLE300-150	SLE400-150	*	TL150A390	485
SLE175-150	*	*	*	*	TL150A520	180
SLE175-150	SLE200-150	SLE300-150	SLE400-150	*	TL150E390	485
SLE175-150	*	*	*	*	TL150E520	180
SLE175-200	SLE200-200	SLE300-200	SLE400-200	SLE500-200	TL200A380	500
SLE175-200	SLE200-200	SLE300-200	SLE400-200	SLE500-200	TL200E380	500

* = Exceeds recommended maximum extension height

LOAD LOCK EXTENSIONS



Length 175mm	Length 200mm	Length 300mm	Length 400mm	Length 500mm	To suit jack model	Recommended max. extension height in mm
LLE-175-50	LLE200-50	LLE300-50	LLE400-50	LLE500-50	TL050A255	680
LLE175-50	LLE200-50	LLE300-50	LLE400-50	LLE500-50	TL050E255	680
LLE175-100	LLE200-100	LLE300-100	LLE400-100	*	TL100A405	480
LLE175-100	*	*	*	*	TL100A530	180
LLE175-100	LLE200-100	LLE300-100	LLE400-100	*	TL100E405	480
LLE175-100	*	*	*	*	TL100E530	180
LLE175-150	LLE200-150	LLE300-150	LLE400-150	*	TL150A390	485
LLE175-150	*	*	*	*	TL150A520	180
LLE175-150	LLE200-150	LLE300-150	LLE400-150	*	TL150E390	485
LLE175-150	*	*	*	*	TL150E520	180
LLE175-200	LLE200-200	LLE300-200	LLE400-200	LLE500-200	TL200A380	500
LLE175-200	LLE200-200	LLE300-200	LLE400-200	LLE500-200	TL200E380	500

* = Exceeds recommended maximum extension height

LOAD BLOCK SETS



Load block sets Model number	Capacity tonnes	Lock out Height (mm)	Load Blocks	Adaptor	To suit jack model
TLB50-250	50	250	3	1	TL050A255
TLB50-250	50	250	3	1	TL050E255
TLB100-405	100	400	5	1	TL100A405
TLB100-530	100	525	7	1	TL100A530
TLB100-405	100	400	5	1	TL100E405
TLB100-530	100	525	7	1	TL100E530
TLB150-390	150	385	5	1	TL150A390
TLB150-520	150	515	7	1	TL150A520
TLB150-390	150	385	5	1	TL150E390
TLB150-520	150	515	7	1	TL150E520
TLB200-380	200	375	5	1	TL200A380
TLB200-380	200	375	5	1	TL200E380

TL - TOUGHLIFT JACKING SYSTEMS

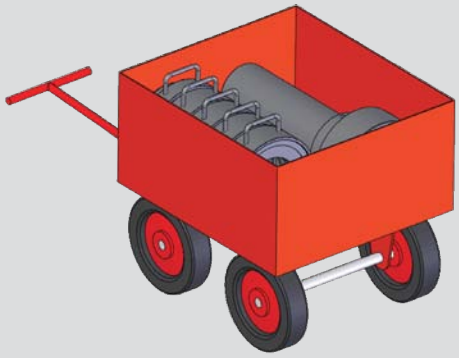
FLAT SADDLES



TLF150

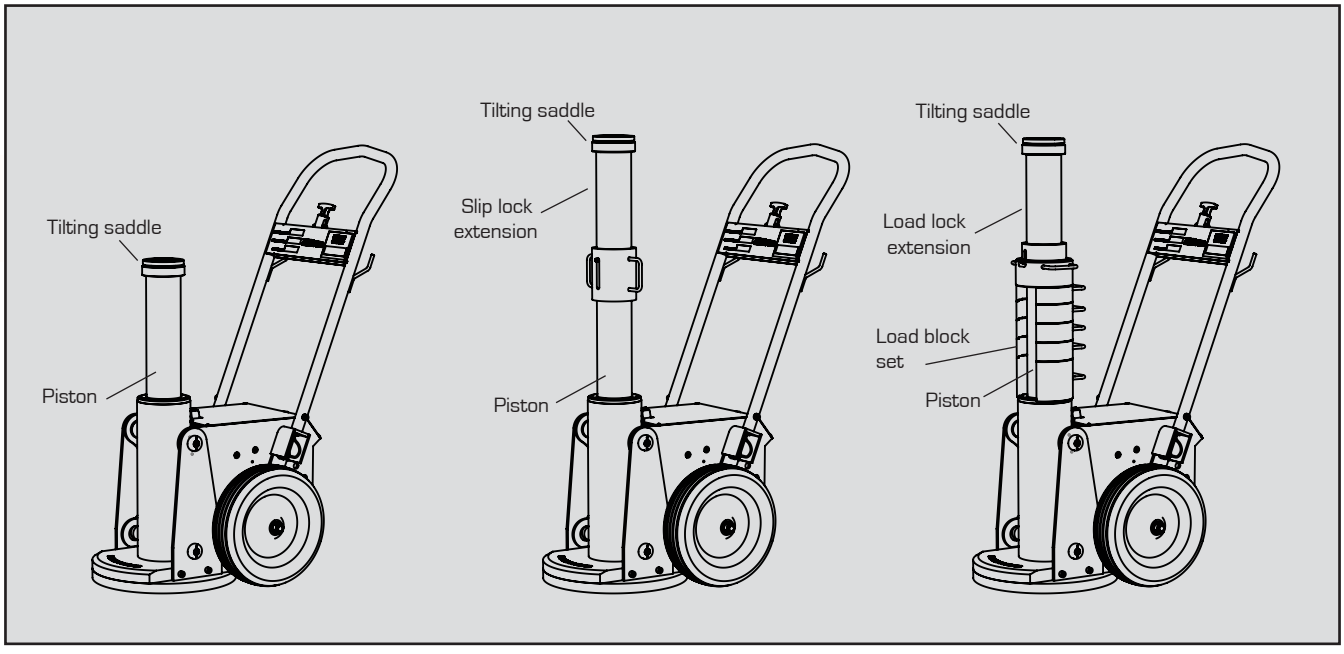
Flat saddle Model number	Capacity tonnes	To Suit Jack Model
TLF50	50	TL050A255
TLF50	50	TL050E255
TLF150	100	TL100A405
TLF150	100	TL100A530
TLF150	100	TL100E405
TLF150	100	TL100E530
TLF150	150	TL150A390
TLF150	150	TL150A520
TLF150	150	TL150E390
TLF150	150	TL150E520
TLF200	200	TL200A380
TLF200	200	TL200E380

TOOL BOXES



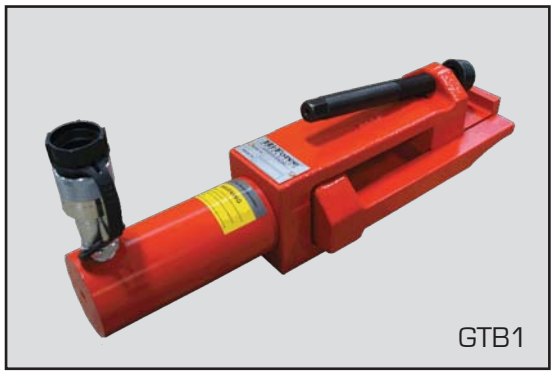
To store your ToughLift accessories safely why not consider ordering a tool box made specifically to suit your accessory set. Hi-Force offers ToughLift accessory tool boxes made to special order with a fast delivery time to help maintain the working condition and integrity of your ToughLift system.

TOUGHLIFT CONFIGURATION EXAMPLES



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GTB - GIANT BEAD BREAKER

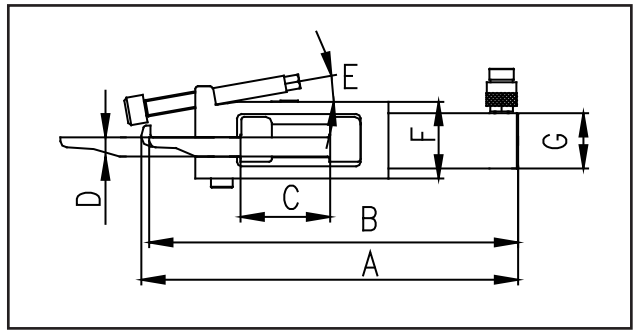


Working pressure 700 Bar

Used to break beads on earth movers etc

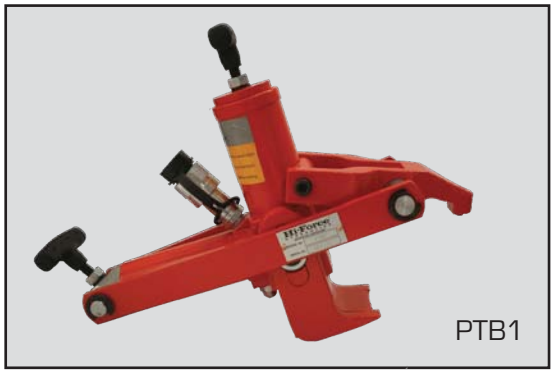
Compatible for use with Hi-Force manual pumps

The Hi-Force Giant Bead Breaker is used for breaking tyre beads and suitable for use on 5 piece rims 25" to 51" (635 to 1295 mm). With this model you can remove larger tyres with ease using a powerful 14 tonnes capacity, 700 Bar hydraulic cylinder which has a nett weight of 12.5kgs The Giant bead breaker is compatible for use with Hi-Force 700 Bar hand and powered pumps (see pages 27 - 48).



Model Number	Capacity tonnes	Stroke mm	Working Pressure (Bar)	Weight Kg	Dimensions in mm A	B	C	D	E	F	G
GTB1	14	102	700	12.5	433	422.8	102	22	100	88	64

PTB - COMBI BEAD BREAKER

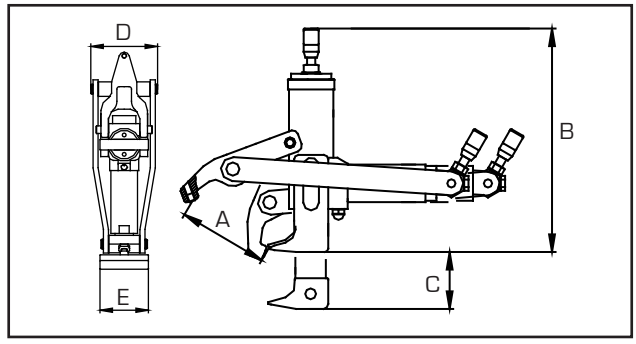


Working pressure 700 Bar

Breaks beads in seconds with no rim damage

Compatible for use with Hi-Force manual pumps

The Hi-Force Combi Bead Breaker is used for breaking tyre beads and suitable for use on all single, two and three-piece 2-5-10 hole budd, 7.50 x 16s and all tubeless truck tyres and rims. It can break beads in seconds using a powerful 11 tonnes capacity, 700 Bar hydraulic cylinder leaving no rim damage. With a nett weight of 15.5kgs, it is portable and light and is compatible for use with Hi-Force 700 Bar rated hand and powered pumps (see pages 27 - 48).



Model Number	Capacity tonnes	Working Range	Stroke mm	Working Pressure (Bar)	Weight Kg	Dimensions in mm A	B	C	D	E
PTB1	11	up to 127mm	95	700	15.5	130	330	95	138	100

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TL - TOUGHLIFT APPLICATIONS









GTB & PTB - BEAD BREAKER APPLICATIONS





SERVICES

Rental	Rental Services	Page 160
On-Site	On-Site services	Page 161
Maintenance	Repair services	Page 162
Calibration	Torque tool calibration	Page 163
Contracts	Testing & service contracts	Page 164
Product Training	Hydraulic tools Product and service training	Pages 165 - 168









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RENTAL SERVICES

The Hi-Force philosophy of offering a complete service package to support our valued customers needs and requirements also extends to tool rental services. With such an extensive array of products available within the Hi-Force range, it is sometimes difficult for our customers to decide on the most suitable tool in which to invest their money. Additionally, with our higher value products like high tonnage cylinders, powered pumps, hydraulic wrenches, stud bolt tensioners and hydrotest pumps, many clients simply cannot justify the high capital outlay to purchase, especially in cases where their needs for the product are relatively short term or even simply for a one off job. In some cases annual budget restraints also make it difficult to get purchase expenditure approval even though there is a definite requirement for the tools.

Hi-Force actively encourages and promotes its tool rental services package, both at Regional Offices and at participating distributors worldwide. Unlike our competitors who believe that tool rental business reduces product sales, we at Hi-Force believe it actually increases them!

Many of our customers worldwide who have purchased Hi-Force products, initially took the opportunity to "try out" both our product quality and our level of service support via tool rental. Once satisfied, these same customers became, brand loyal purchasers of Hi-Force products on a regular basis.

An additional benefit of maintaining a comprehensive fleet of rental tools at our Regional Offices and participating distributors is that users can easily request on-site demonstrations, using rental tools at short notice, or even utilise our rental services whilst having their own equipment serviced or repaired. In most industries the biggest drain on profits is the cost to the company of maintenance and shutdown activities. Hi-Force tool rental is available at very short notice and helps ensure that production recommences as quickly as possible without any unnecessary delays.



All Hi-Force rental equipment is proof-tested prior to release for rental. All tests are documented and all equipment is supplied with a test certificate.



Additionally, torque equipment is calibrated, using the latest technology. Test & calibration results are automatically transferred to purpose-written software for producing unique and traceable certificates.

Hi-Force tool rental is available on both short and long term basis and all equipment provided is guaranteed, tested and certified prior to mobilisation to site.

Hi-Force tool rental offers an economical alternative to purchasing capital intensive specialised equipment at short notice. Give it a try, you will be pleasantly surprised!

ON-SITE SERVICES

In addition to the tool rental services offered by Hi-Force and detailed on page 160, we also offer a first class on-site services package. Utilising Hi-Force tools drawn from our extensive global rental tool inventory, Hi-Force is also able to offer a first class on-site bolting and jacking service. Available globally via Hi-Force Regional Offices and participating distributors, the Hi-Force on-site services package combines the expertise of our highly trained and experienced crews with the high quality reputation of Hi-Force products.



For on-site bolting services we are able to carry out jobs ranging from a simple bolt up of a single flange joint to major construction and maintenance shut down projects. Our record and past experience of working with many major multi-national companies is second to none and our crews have established an excellent reputation for meeting and beating critical time deadlines, even in the most demanding conditions. Major customer industries include oil & gas, power generation, cement plants, civil and mechanical construction and maintenance.



We also offer on-site lifting and jacking services usually related to heavy lift applications involving multiple numbers of Hi-Force high tonnage cylinders, pumps, hoses and accessories. Past jobs undertaken and successfully completed include bridge lifting, cantilever and steel structure weighing and a variety of lift and shift applications.

Our crews have received many verbal and written testimonials for their excellent performance and copies of these are available on request.



Hi-Force is very proud of its excellent reputation for carrying out efficient, safe, competitively priced on-site jobs, within client specified time periods. Please do not hesitate to contact us if you have a requirement for Hi-Force on-site services.





REPAIR SERVICES

Every year huge amounts of money are lost to industries worldwide due to the breakdown of capital intensive hydraulic and pneumatic tools. This extensive loss of revenue could be drastically reduced if users and owners were always in a position to call upon specialist repairers, at short notice, to identify the faults and carry out fast, reliable, guaranteed repairs.

Hi-Force is at your service!! We have built our success on our "service first philosophy" and a long history of providing customers with a comprehensive repair service for a wide range of hydraulic and pneumatic tools.

All Hi-Force offices worldwide, along with participating Hi-Force Distributors operate a fully equipped workshop repair facility, using the latest "state of the art" repair and testing equipment and techniques, carried out by trained and qualified workshop technicians. Our global network of Hi-Force service centres is modelled on our highly successful and wholly owned UK Distributor company, H.E.S. Sales Limited, who have been offering repair services, along with the other services detailed in this section of the catalogue, from two strategically placed locations in England, since the early 1970's.

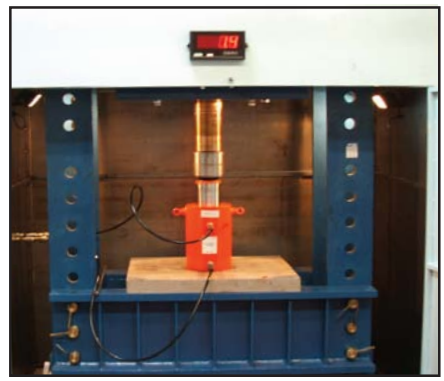
All Hi-Force service centres carry good stocks of commonly used spare parts and are able to offer a first class guaranteed repair service for all Hi-Force products as well as most international competitor brands. All items repaired carry a 90 day warranty against faulty materials or workmanship and each item is returned to the customer with an individual test/calibration certificate.

Make the most of your investment in tools through regular servicing and repair, at an economical cost, through the Hi-Force service network.

Hi-Force Dubai workshop



Hi-Force UK Test and Repair facilities









CALIBRATION SERVICES

As part of our ever improving after sales and service support facilities, Hi-Force offers a comprehensive calibration service for all makes of hand, pneumatic and hydraulic torque tools to our services portfolio. Available from selected Hi-Force Regional Offices and distributors worldwide, this fast expanding activity is currently receiving considerable attention from our customer base.

All of our in house calibration equipment has valid, independently approved "NAMAS" calibration certificates which are renewed annually. All items calibrated are returned with an individual test and calibration certificate traceable to our "NAMAS" certification.

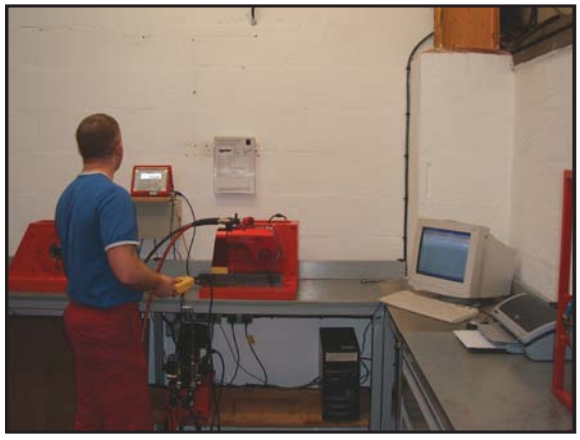
This service is particularly focused on tools used for accurate bolt tightening, which according to industry standards, recommends that they are calibrated, at least once per year and in some cases more often if used extensively. When did you last have your critical bolt tightening tools calibrated? Check and contact Hi-Force for a first class calibration service at a competitive price.

Hi-Force is also able to offer a limited calibration service for other hydraulic and pneumatic tools. Contact your local Hi-Force Regional Office or distributor for more information.

Calibration of a hand torque wrench



Hydraulic torque wrench calibration



Hi-Force®

High Pressure Hydraulic Tools www.hi-force.com

Certificate of Calibration

Certificate No AZ3510

Hi-Force Limited
Prospect Way, Daventry
Northamptonshire
NN11 8RL England
Tel: +44 1327 301 000
Fax: +44 1327 706 555
Email: daventry@hi-force.com

Model Description: **Hi-Force Hydraulic Torque Wrench**
Model Number: **TWS45N**
Serial Number: **AZ3510**
Date of Calibration: **17th November 2011**
Customer:
Maximum Torque Capacity (lbf.ft) **3289**
Maximum oil Pressure (Bar) **700**

Set oil Pressure (Bar)	Nominal Torque (Lbf.ft)	Tolerance +/- 3% Min	Tolerance +/- 3% Max	Actual Readings			Actual % Tolerance		
100	470	456	484	462	465	472	-1.7%	-1%	0.42%
320	1503.5	1458.3	1548.4	1482	1496	1499	-1.5%	-1%	-0.30%
700	3289	3190	3387	3270	3280	3280	-0.6%	0%	-0.27%

Maximum Torque Capacity (N.m) **4529**
Maximum oil Pressure (Bar) **700**

Set oil Pressure (bar)	Nominal Torque (N.m)	Tolerance +/- 3% Min	Tolerance +/- 3% Max	Actual Readings			Actual % Tolerance		
100	647	627.5	666.4	636	640	649.7	-1.7%	-1%	0.42%
320	2070.4	2008.2	21232.5	2069	2068	2071	-0.1%	0%	0.03%
700	4529	2565	4664	4502	4544	4517	-0.6%	0%	-0.27%

The test equipment used in the performance of the above calibration has international traceability through the following calibration laboratory which is UKAS accredited to BS 7882:2008

UKAS Laboratory No: 0256 Torque Transducer
UKAS Laboratory No: 2458 Oil Pressure Transducer

	Display	Torque Transducer	Oil Transducer
Serial No:	58506	50630	0.7.031770.1009

Registered No 5835528. Hi-Force is a registered trade mark.

Sample calibration certificate

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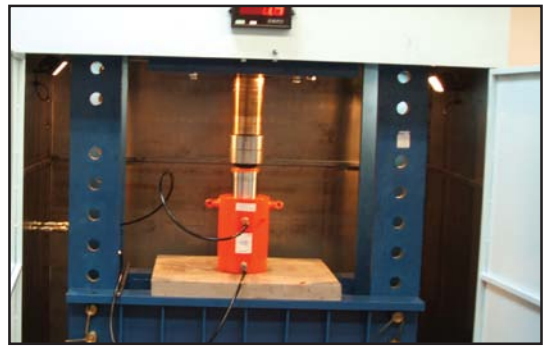
TESTING & SERVICE CONTRACTS

Targeted at companies with a wide variety or a considerable number of hydraulic and pneumatic tools, Hi-Force is able to negotiate and offer a regular on-site testing and service facility to customers, which ensures that their tool inventory is kept in first class working condition, fully tested and certified. This is particularly beneficial to tool users that are required to carry out planned plant maintenance shutdowns at their facilities, as this unique service, from Hi-Force, can be planned to coincide within a reasonable time period, prior to an upcoming shutdown.



Hi-Force workshop

Within the UK, Hi-Force testing and service contracts are managed by our wholly owned distributor, H.E.S Sales Limited, who operate a fleet of dedicated, fully equipped, on-site mobile test vehicles ably supported by two strategically placed workshop service centres. All test vehicles are managed by a trained and qualified test engineer, who is fully conversant with all of the latest safety regulations related to hydraulic and pneumatic tools. Site visits are planned and pre-booked for mutually agreed date(s) so that clients can arrange to gather all of their tools, requiring test and inspection, to a central point, at their facilities, for our test inspector to carry out the testing.



Hi-Force Daventry test facilities

A comprehensive test report is prepared by our test engineer, detailing all of the tools examined and tested, along with a report on all tools that fail the test. A copy of the report is handed over by our test engineer, prior to leaving site, for the client to assess and give any necessary authorisation for the tools to be removed from site for detailed examination and estimate for repair. Subject to client approval, our test engineer will deliver the tools to the nearest H.E.S. Sales Limited service centre, from where a comprehensive strip down, inspection, report and repair quotation will be promptly prepared and sent to the client in writing. Subject to approval of the repair costs, the client's tools will then receive the "first class" repair service, as detailed on page 162.



Hi-Force service vehicle

Alongside the testing service many of our clients also negotiate a period contract covering both the on-site testing and repair service which usually results in more advantageous and competitive rates. For further information on our global testing and service capabilities please contact Hi-Force UK or one of our Regional Offices and Service Centres.



Interior of Hi-Force test & service vehicle



Hi-Force
HYDRAULIC TOOLS

Training Certificate

This certificate is awarded to: *Rajesh Menon*

Company name: International Heavy Equipment

For successfully completing a training course on:

Hi-Force Hydraulic Tools - Level 1

Achieved scores per training session :
1) Principles of hydraulics: 15/21
2) Hydraulic Tools: 17/25
3) Bolting Equipment: 49/55

Date of Course: 08-11-2011
Overall result: 81/101

Course leader comments:

Power... Precisely!

Course Leader: Craig Brown
Signature: _____ Date: 12-11-2011

With our ever expanding network of Hi-Force regional offices and authorised distributors worldwide (today we are active in over 100 countries), Hi-Force has identified technical product and application training, as an essential core competency, for us to maintain our continued growth in the global market for hydraulic tools.

Hi-Force is totally committed to ensuring that all of our own sales personnel, as well as those of our distributors, are fully trained and totally competent to offer end users, of our products, the correct and proper technical advice, whilst discussing individual customer specific applications and requirements for hydraulic tools.

In September 2010, Hi-Force introduced a new and updated version of the Training Programme which covers all aspects of technical sales, industry specific application selling, special product design, practical and theoretical operation and maintenance, health & safety and service and repair of our entire product range. We believe that our training programme is now, along with our extensive product range, at the leading edge of the hydraulic tools industry world wide.



Hi-Force
HYDRAULIC TOOLS

Training Certificate

This certificate is awarded to: *James Smith*

Company name: Hydraulics & Trading Ltd

For successfully completing a training course on:

Hi-Force Hydraulic Tools - Level 1

Achieved scores per training session :
1) Principles of hydraulics: 14/21
2) Hydraulic Tools: 18/25
3) Bolting Equipment: 40/55

Date of Course: 08-11-2011
Overall result: 72/101

Course leader comments:

Power... Precisely!

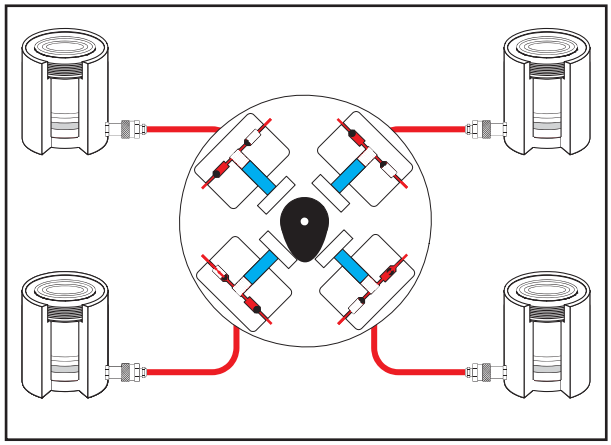
Course Leader: Steve Wakelin
Signature: _____ Date: 12-11-2011

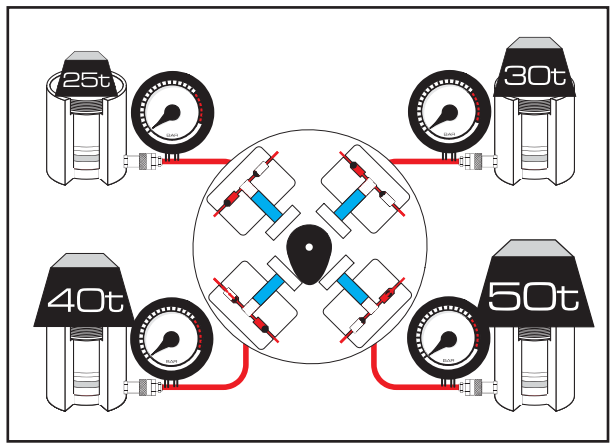
PRODUCT TRAINING

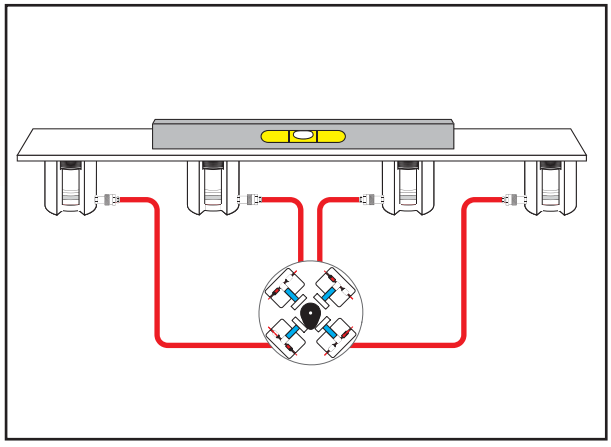
To cater for the large number of different countries in which our products are now distributed and sold, we have designed and produced our training programme in such a way that moving graphics and pictorial examples are used wherever possible, thus minimising the need for sometimes difficult to understand written words. This enables us to easily translate the various modules of our training into different languages to suit local market requirements.

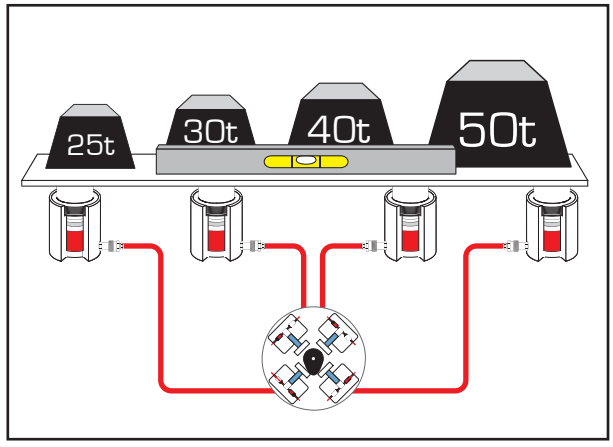
From basic moving graphics of a simple hand pump and cylinder through to complex multiple lifting applications using split flow pumps, hydraulic torque wrenches and hydraulic stud bolt tensioners, our easy to understand moving graphics easily demonstrate how our products operate and show the many benefits that they bring to Hi-Force product users. The training also covers key areas like industry specific applications of our products in Power Stations, Cement Plants, Refineries, Oil Platforms, Mines, Railways etc. all of which are of great assistance to our global sales teams as they search the market place for new customers and applications for our products.

Example images below show typical set-up of split-flow lifting system:-









PRODUCT TRAINING



Above: Classroom training in progress at Hi-Force UK headquarters.





Left and above: Practical bolting training in progress at Hi-Force UK headquarters.

Below: Practical bolting training in progress at Hi-Force Dubai.





Above: Classroom training in support of the practical 'hands on' training held at Hi-Force Dubai.

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PRODUCT TRAINING

Hi-Force is also able to offer training to users of our products in selected, specific areas of the training programme. For example the use of Hi-Force bolting tools and the application of our unique Hi-Force BoltRight software programme (see pages 105 & 106) designed to accurately calculate bolt tension requirements in a wide range of bolted joint applications. Hi-Force is committed to investment in the training of people and further information on the best available training courses in the hydraulic tools industry today, can be obtained from your nearest Hi-Force regional office, or your local Hi-Force distributor.



Practical training in Malaysia



Classroom training in Thailand

All Hi-Force training courses can be held at Hi-Force UK head office, overseas regional offices or at distributor and end user locations.



Practical training in U.K



Practical training in Dubai, U.A.E

THE INFORMATION PAGES

	ADDITIONAL INFORMATION	
Basic principles	Information on basic principles of hydraulics	Pages 170 - 173
Basic bolting principles	Information on basic principles of bolting tools and equipment	Pages 174 - 181
Tightening procedure	Tightening sequence and bolting procedure for flange bolts	Pages 182 - 183
Conversions	Metric to imperial conversion chart	Page 184
Torque Chart	Recommended Torque Value Chart	Page 185
	REPLACEMENT PARTS	
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Introduction

The basic principles of hydraulics are not difficult to understand, knowing how and why hydraulic tools work will help the user to select the most suitable Hi-Force tools for the job, ensuring maximum performance at the most economical cost.

If the "Basic Principles of Hydraulics" detailed in this section of the catalogue are of assistance to the reader, then its purpose of helping with the selection of the correct Hi-Force tool for the job has been achieved.

Using hydraulic fluid pressure to generate a force

a) Hydraulic Pressure

Hydraulic power provides one of the simplest and most powerful forms of producing considerable amounts of force within a confined space using hydraulic fluid pressure to generate a force. Since the early inventions of low pressure, heavy hydraulic lifting jacks through to the latest state of the art high pressure hydraulic systems of today, hydraulic power remains an extensively used and widely respected assistant to mankind's drive for even greater power and knowledge.

Pascal's law states that pressure applied at any point upon a confined fluid (liquid) is transmitted undiminished in all directions within the fluid (see figure 1 & 2). This means that by using hydraulic pressure as a medium a small force can be converted into an appreciable multiple of itself.

The actual fluid pressure involved plays a very important role in this "Multiplication of Force" and in this context there are two features of hydraulic pressure which are important to remember.

1. Hydraulic pressure is measured as a force per unit of area e.g. Bar (kg/cm²) or PSI (Pounds per Square Inch).
2. The hydraulic pressure at any point within the fluid is the same in all directions provided of course that the fluid is static (non moving) - see figure 1 & 2.

Figure 1

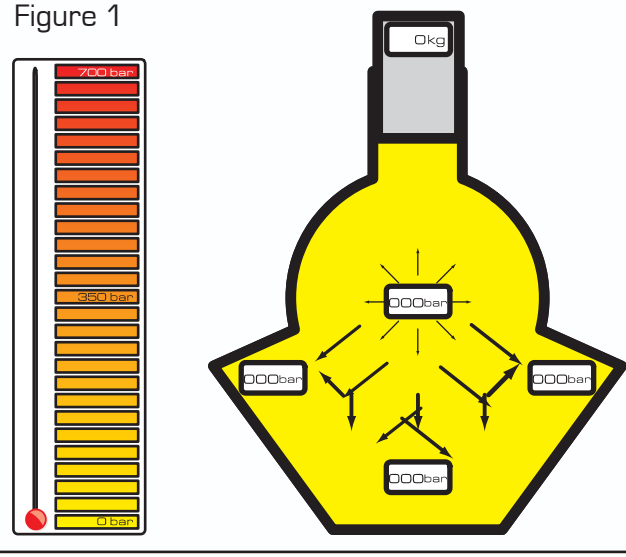
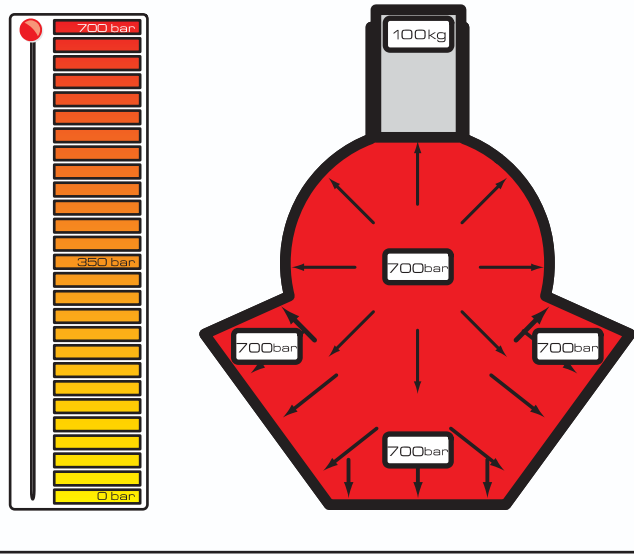


Figure 2



b) The Industry Standard

The accepted International Standard for maximum working pressure in the high pressure hydraulic tools industry is 700 Bar (10,000 PSI) and the majority of the products detailed in this catalogue have a maximum working pressure of 700 Bar (10,000 PSI). Therefore where a particular cylinder is specified in this catalogue as having a 10 tonnes maximum capacity, it must be noted that the maximum capacity is calculated at the maximum working pressure.



c) Pressure and Force

The criteria for establishing the maximum output force of a hydraulic cylinder at 700 Bar pressure is the size of the effective area of the cylinder bore, i.e. the area to which the hydraulic fluid at a pressure of 700 Bar is being applied. Because of this simple criteria it is possible to manufacture cylinders in the Hi-Force range from 4.5 tonnes up to in excess of 500 tonnes capacity.

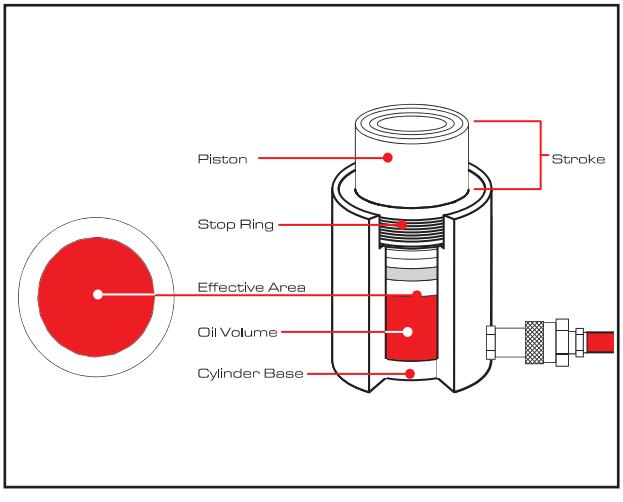
The equation for calculating the output force of a hydraulic cylinder, given that the effective area and design maximum working pressure are known, is simply : -

$$\frac{\text{Effective area (cm}^2\text{) x Pressure (Bar)}}{981} = \text{Output Force (Tonnes)}$$

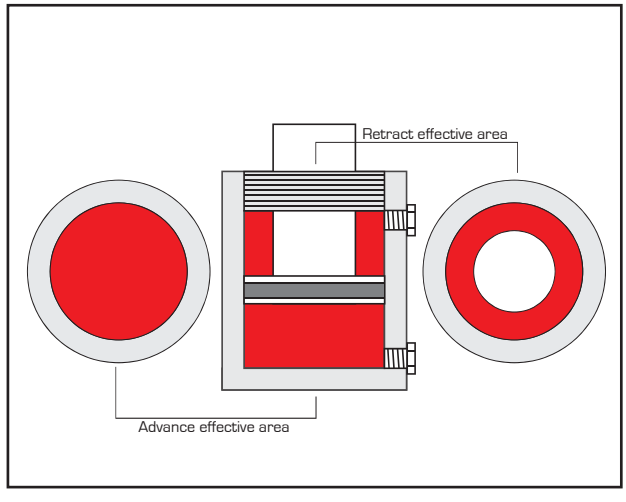
For example Hi-Force model reference HLS502 (page 13) has an effective area of 71.3 cm^2 and therefore a maximum working pressure of 700 Bar : -

$$\frac{71.3\ (\text{cm}^2) \times 700\ (\text{Bar})}{981} = 50.88\ \text{Tonnes}$$

Single acting cylinder



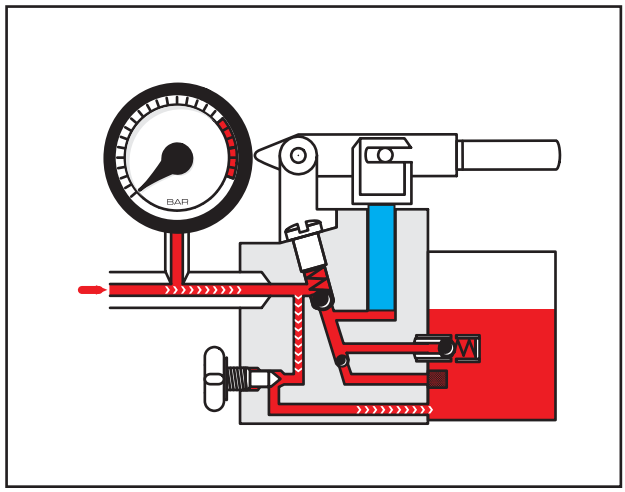
Double acting cylinder



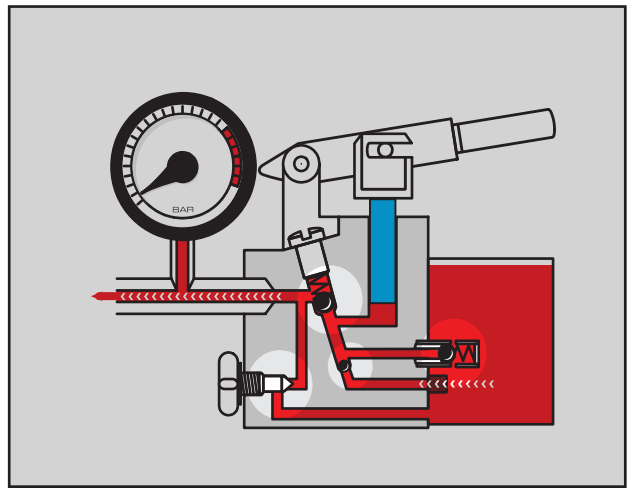
d) The Pump

Hydraulic pressure is provided by a hydraulic pump (manual or powered operation) that pumps the hydraulic fluid into the cylinder bore via a flexible hydraulic hose connected to the cylinder quick connect inlet coupling.

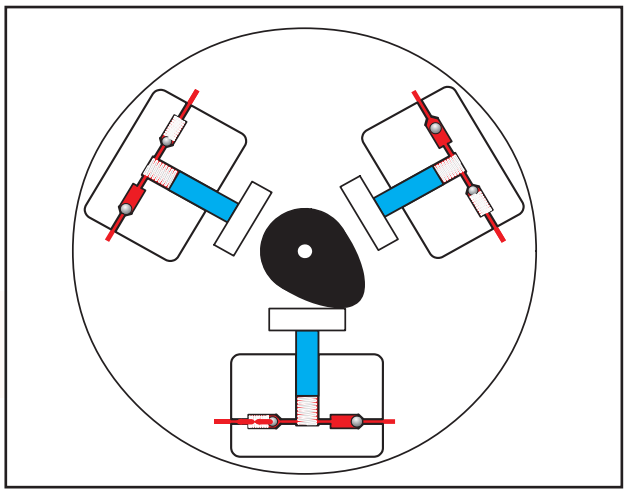
Hand operated pumps are the simplest form of pump and consist of a pumping piston, release valve, and suction and delivery check valves. The pump is operated by closing the valve and then raising and lowering the handle to pump fluid from the reservoir to the pump outlet connection. This action produces a steadily increasing fluid pressure generated by the downward leverage of the pump handle in conjunction with the opening and closing of the suction and delivery check valves. Power pumps replace hand leverage with a motive driven rotational force, i.e., electric, air or petrol engine driven motor.

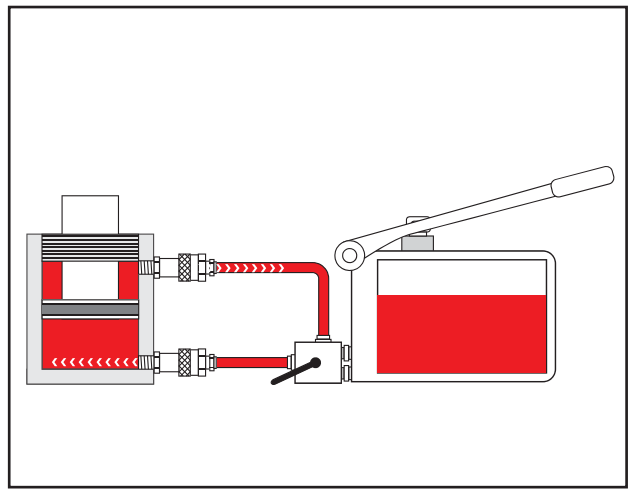


Single speed hand pump



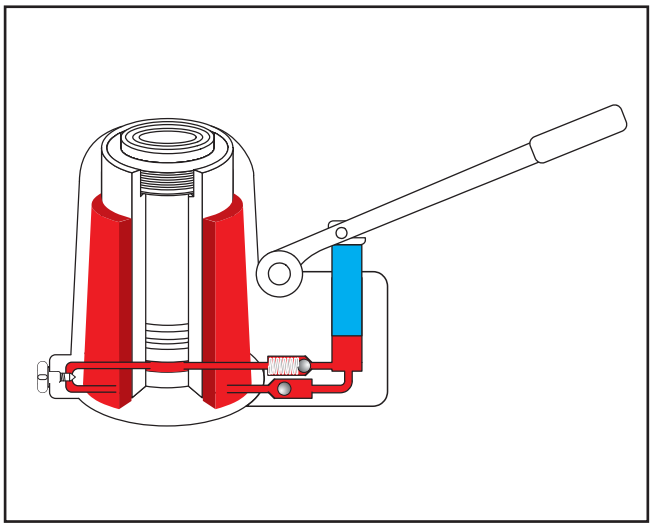
Suction, delivery & release valve highlighted


Multiple piston block powered pump

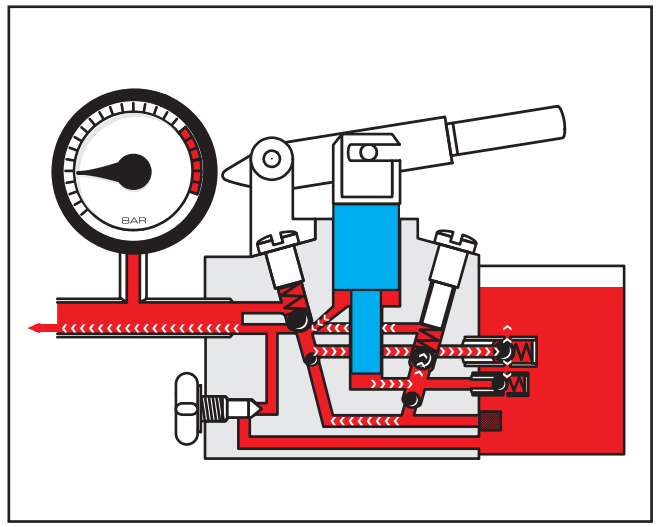

Double acting cylinder & hand pump combination

BASIC PRINCIPLES OF HYDRAULICS

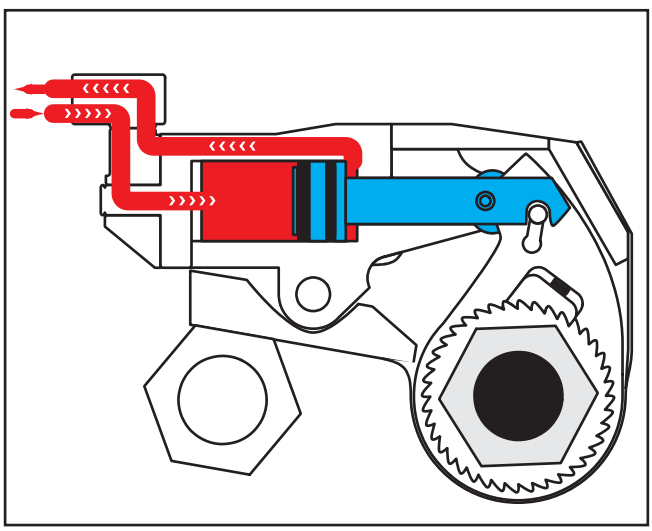
As the hydraulic fluid enters into the bore of the cylinder it forces the cylinder piston to move upwards. Any resistance to the upward movement of the piston, e.g. a load, will result in the fluid pressure increasing as the operator continues to actuate the pump lever up and down. The fluid pressure will continue to increase either until the piston overcomes the resistance (load) and moves upwards until it reaches the end of its designed stroke length or the fluid pressure reaches the maximum permissible pressure of 700 Bar and the pump safety pressure relief valve is activated preventing over pressurisation above 700 Bar.



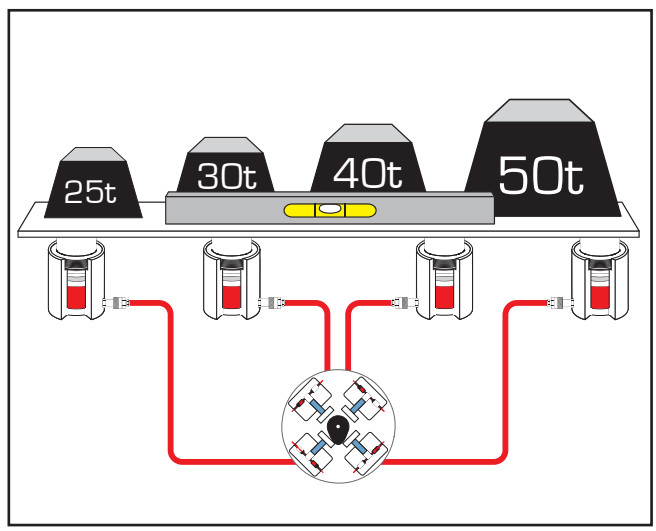
The internal workings of a hydraulic jack



A two speed hand pump circuit



The internal workings of a TWH-N hydraulic wrench



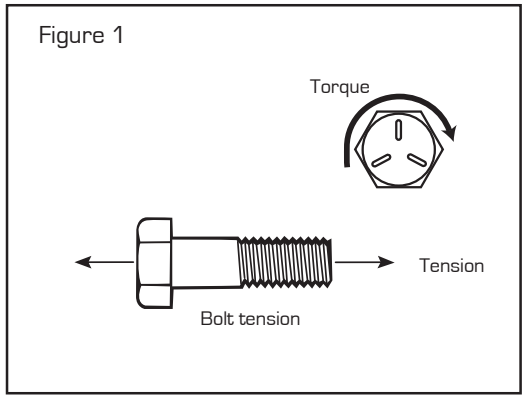
A split flow synchronised lift schematic

BASIC PRINCIPLES OF BOLTING TOOLS AND EQUIPMENT

Since the invention of using threaded bolts and nuts to join various components together was introduced centuries ago, the methods of bolt tensioning and the tool design technology have improved tremendously to the extent that Hi-Force offers the most comprehensive range of bolting products available from a single source anywhere in the world!

From basic high quality, calibrated hand torque wrenches to the latest "State of the Art" hydraulic torque wrenches and bolt tensioners, Hi-Force can deliver the right tool for the job on time, every time!

Figure 1



This section of the catalogue provides basic information about the methods of applying tension to a bolted connection. There are three possible methods to tighten threaded fasteners, by torque which is rotation of the nut or bolt head, by direct tension to stretch the fastener, or by heat to expand the fastener.

Torque and tensioning (see figure 1) probably covers 99% of bolting applications, and it is these two methods that are detailed in this catalogue.

What is tension and how does it affect a bolted fastener ?

As with most materials, steel which is predominantly used in the manufacture of bolts and nuts, has an inherent "elasticity" i.e. it can be stretched between two points. The tension that is imparted into the bolt acts as a clamping force to hold the bolted components together. Care must always be taken when stretching the bolt to ensure that its "yield point" is not exceeded which will cause the bolt to lose its physical properties of elasticity.

Hooke's law states that the amount of distortion (lengthening, shortening, bending or twisting) applied will be directly proportional to the applied force, provided the applied force is kept within the material's elastic limits. For most industrial applications, a fastener should be tightened until it has a retained tension of 40 to 60 percent of its elastic limit.

For a threaded fastener to correctly hold (clamp) components together it must be "stretched" (tensioned) to a known accurate amount. A threaded fastener that is under-tightened could work loose and come apart, resulting in a "shearing force" developing between the mating parts which could cut the bolt in two. A loose fastener may also lead to further mechanical looseness of surrounding machinery parts causing unnecessary vibration and wear. Fluid and gas leaks could also occur due to incorrect sealing in pressure joints, which could be extremely dangerous if any of the materials to be sealed are toxic, flammable or explosive.

An over-tightened fastener could cause damage to the bolted components, excessive over-tightening will cause the bolt and/or nut to deform causing loss of tension in the fastener as it exceeds its elastic limit (yield point).

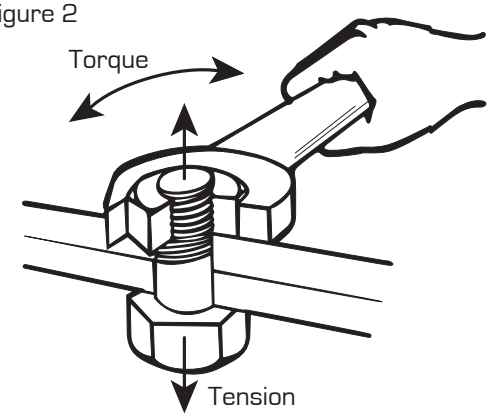
For most industrial applications, the equipment manufacturers, as well as structural and piping component designers, will provide the torque or tension specifications for the relevant fastener(s) to be used to connect the component parts. It is vitally important to adhere to these specifications to ensure a correctly tensioned joint is achieved.

How do we generate tension in the bolt ?

As mentioned earlier the two most common methods to impart tension into a threaded fastener are by torque (see figure 2) or by direct tension (see figure 3).

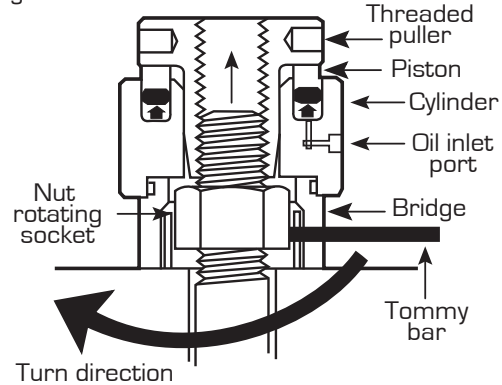
Torque is defined as the turning or twisting force exerted on a nut or bolt head and it is the product of two measurements i.e. force and distance (see figure 4). Force is measured in units of Pounds or Newtons and is quite simply the amount of force applied at a given distance from the centre of the item being turned or twisted. Distance is measured in units of length i.e. inches, feet, centimetres or metres. Torque is expressed as a combination of the relevant units of force and distance i.e. pounds feet (lbf.ft) in the imperial measurement system or Newton metres (Nm) in the metric system. Torque is applied to a threaded fastener by a variety of manual and power driven types of torque wrenches.

Figure 2



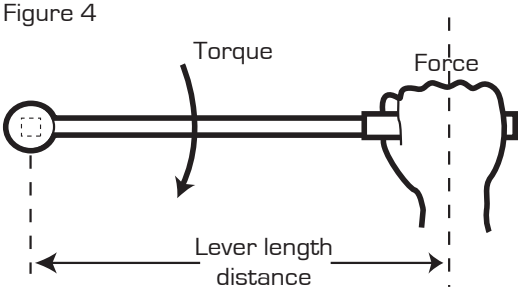
Newton's law states that for every applied force there is an equal and opposite reactive force. Therefore as the torque is applied to the nut, by turning it increases, it will create a tension in the bolt which will act as a "clamping force" within the effective thread length. Initially this clamping force will pull the two bolted components together and subsequently it will build up and retain a known tension (load) within the fastener to maintain the joint integrity.

Figure 3



The amount of torque to be applied to a threaded fastener will depend on several factors including the design application, type of joint, size, length and quantity of fasteners to be used and the type of thread lubricant. Ordinarily the torque applied should not be outside of the 40-60% of minimum yield range. Hi-Force BoltRight software programme (see pages 105-106) assists the user to accurately calculate the required torque/tension to achieve a successful joint bolt up.

Figure 4



Direct tension is applied to the fastener using a hydraulic tensioning device commonly known as a hydraulic bolt tensioner (see figure 3). This is a high pressure hydraulic cylinder, with accessories, designed to seat against the joint, grip the fastener thread using a compatible threaded puller, and via applied hydraulic pressure extend the cylinder piston against the puller, to pull (stretch) the bolt or stud to a known tension in tonnes or kN. When the pull force equals the desired bolt preload, plus an additional amount to compensate for bolt relaxation, the nut is run down the thread using a short tommy bar until it is tight against the joint face. The hydraulic pressure is then released and the threaded fastener is prevented from returning to it's original length, by the tightened nut, subsequently leaving the required tension retained in the fastener.

Hydraulic bolt tensioners are commonly used in multiples linked to a single hydraulic pump unit particularly in applications where reliable leak free joints are required. By using a number of tensioners simultaneously the operator is able to ensure an even pull down of the joint components, resulting in uniformity of gasket compression and consistent leak free joints. As with torque, the actual amount of tension to be directly applied to the threaded fastener by the hydraulic bolt tensioner, should be confirmed by the equipment manufacturer or designer. The majority of hydraulic bolt tensioners operate at a maximum hydraulic pressure of 1500 Bar and certainly this maximum pressure/tension load should never be exceeded.

Correct Tool Selection

Having now understood the two most common methods of applying tension to the fastener (torque or direct tension) let us now look at the various types of tools available to accurately and successfully complete the given task, along with other bolting products available from Hi-Force.

Hand Torque Wrenches

Probably the most commonly used tool, for accurately tightening threaded fasteners in the world!! Hand torque wrenches are designed and manufactured on the basis of Hooke's Law i.e. force x distance. Hi-Force hand torque wrenches incorporate a reversible ratchet design drive head and a clear, easily adjustable torque setting scale. All Hi-Force hand torque wrenches are designed and manufactured to International Standard ISO 6789:2003. Each model is supplied marked with a unique serial number, traceable to an individual test and calibration certificate, and provides a repeatable accuracy of +/- 3% for HTW-R models and +/- 4% for the HTW-B models. Full technical specification on the Hi-Force range of hand torque wrenches can be found on page 64 of this catalogue.

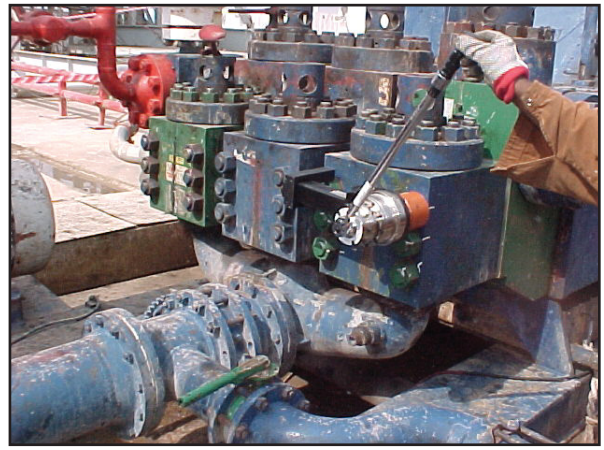


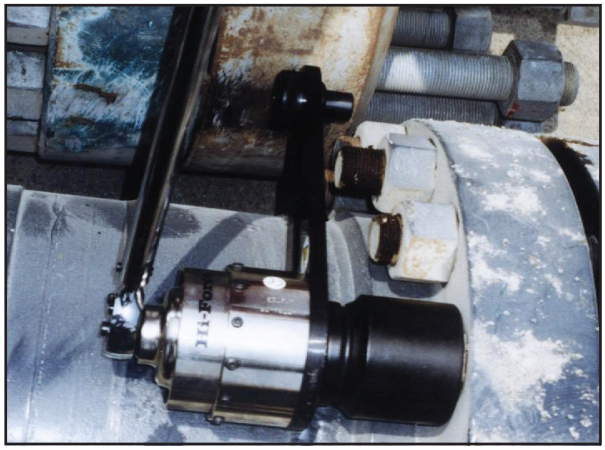


Hand Torque Multipliers

A hand torque multiplier is a mechanical device that multiplies the preset amount of input torque applied by the operator using a calibrated hand torque wrench. Hi-Force hand torque multipliers incorporate a "planetary" gear train which has one or more stages, each of which increases the input torque applied by a factor of 5. The greater the number of stages within the planetary gear train, the higher the output torque achieved, relative to the input torque applied. Due to the greater output torque produced using hand torque multipliers, it is necessary to incorporate an integral reaction foot to absorb the opposing reactive force generated (Hooke's Law). Great care must be taken to ensure that the reaction foot is correctly located against a suitably strong reaction point prior to operating the tool. Because the power output cannot exceed the power input, the number of output rotations will be lower than the number of input rotations. Hi-Force hand torque multipliers are available with multiplication ratios of 5:1, 25:1, 75:1 and 125:1 and full technical details can be found on pages 65-67 of this catalogue.



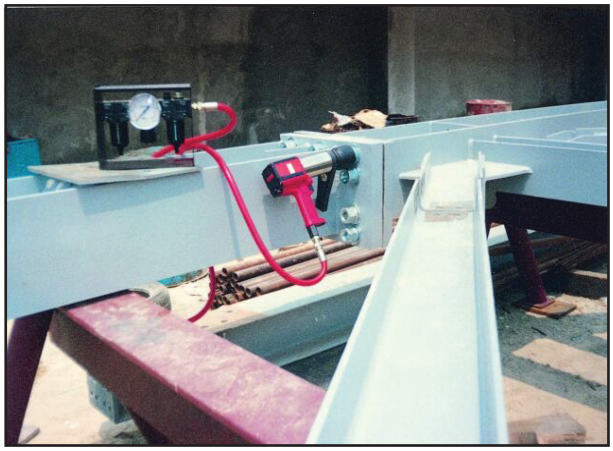






Pneumatic Torque Multipliers

A pneumatic torque multiplier operates in the same way as a hand torque multiplier except that the input motive force is provided by a pneumatically driven air motor instead of a manually operated hand torque wrench, making the tool both faster and easier to operate. Torque output is preset and adjusted by regulating the input air pressure, supplied to the pneumatic motor, which will control the amount of input torque applied to the planetary gear train. As the torque output increases the air motor will gradually slow down, until it eventually stalls i.e. the opposite reactive force generated becomes equivalent to the input torque of the air motor. Each tool is supplied with an airline filter, regulator, lubricator unit in a handy carrying frame with integral air line pressure gauge and 3 metre connecting hose. Repeatable accuracy of +/- 5% can easily be achieved in conjunction with the individual torque calibration chart supplied with each tool. Full technical details can be found on pages 68 - 69 of this catalogue.









Hydraulic Torque Wrenches

Hydraulic torque wrenches are specifically designed for applications where limitation of space and/or particularly high output torque is required. The design of a hydraulic torque wrench utilises the far higher leverage forces generated from a hydraulic piston, using high pressure hydraulic power supplied from an air or electric driven pump. The hydraulic piston is connected to a ratchet via a reaction pawl assembly which allows it to engage the ratchet teeth in the advance mode to rotate the nut or bolt head, and subsequently release during piston retraction to re-engage in the next forward push position. All Hi-Force hydraulic torque wrenches operate at 700 Bar maximum hydraulic pressure, incorporate a double acting heavy duty hydraulic piston for fast and easy operation, and can be used for accurately tightening or loosening nuts/bolts. A choice of standard square drive tools, suitable for use with a variety of sizes of torque wrench sockets, or hexagon drive cassette head tools that locate directly on to the nut/bolt are available. Full technical specifications can be found on pages 70 to 81 of this catalogue.







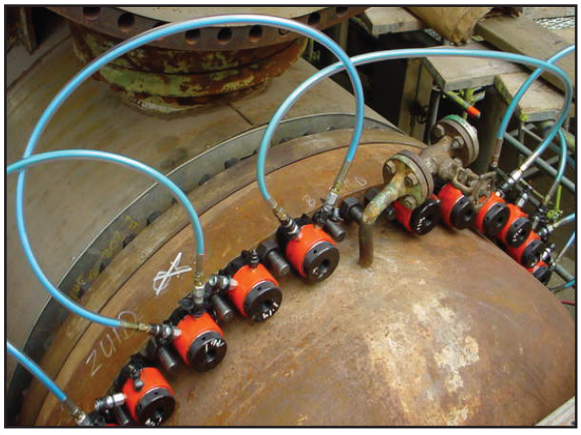


Hydraulic Bolt Tensioners

Hydraulic bolt tensioners provide the most consistent and accurate method of applying tension to bolted connections. Comprising of four component parts, i.e. bridge, nut rotating socket, threaded puller and load cell, hydraulic bolt tensioners offer a safe, accurate method of ensuring consistent joint integrity. Sub sea tensioners consists of only two parts, i.e a bridge mounted load cell and a quick fit threaded puller. Designed to directly stretch the bolt by applying a known load to the fastener using a hydraulic load cell and threaded puller, the securing nut is rotated using a short tommy bar, whilst the thread is being stretched, until it is firmly tightened against the joint face. Immediately after the hydraulic pressure (load) is released, the bolt tension is retained because the threaded fastener is prevented from returning to its original length by the tightened nut. Hydraulic bolt tensioners can be linked together in multiples to ensure an even "pull down" or tension is applied to all bolts simultaneously. This is particularly critical in applications where a sealing gasket is used and consistent leak free connections are required. Full technical specification can be found on pages 87 to 104 of this catalogue.









Nut splitters



Hydraulic nut splitters provide the perfect answer for removal of worn, damaged or corroded fasteners that cannot be opened using torque or tensioning tools. The nut splitter design incorporates a powerful hydraulic piston to drive a precision engineered, angled splitting wedge into the flat face of the nut. The splitting wedge is manufactured from high grade tool steel for maximum life and can be easily removed for re-sharpening or replacement. The angled design of the splitting wedge allows the nut to be split with minimal damage to the threads on the bolt or stud. Full details can be found on pages 138 - 140 of this catalogue.

Impact Wrenches



Air driven (pneumatic) impact wrenches are probably one of the most commonly used tools in the bolting industry today. Ideally suited for run down or fast removal of bolted connections, all models operate using a standard 6 Bar air line pressure. Hi-Force industrial quality impact wrenches have a 4 position adjustable power output device, however torque accuracy cannot be measured or guaranteed due to the impact design of these tools. Full technical details can be found on page 85 of this catalogue.

Flange Spreaders



Flange spreaders provide the perfect answer for separating flange joints for maintenance etc..... after bolt removal. Hi-Force flange spreaders are available in both mechanical and hydraulic options. Full technical details can be found on pages 141 to 144 of this catalogue.

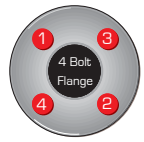
Sockets and Accessories



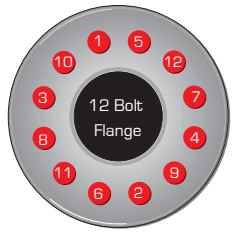
Most of the bolting products detailed in this catalogue will also require a selection of accessories to assist with the relevant bolting application. Hi-Force offers an extensive range of sockets, hexagon drives, hexagon reducer bushes and backup wrenches suitable for use with Hi-Force bolting tools. Full specifications and available options in both imperial and metric standard sizes are detailed on pages 72, 73, 74, 79, 80, 81 and 82 of this catalogue.

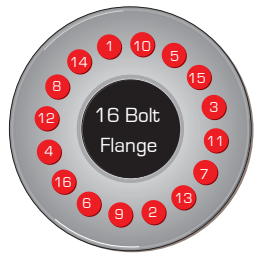
TIGHTENING SEQUENCE & BOLTING PROCEDURE FOR FLANGE BOLTS

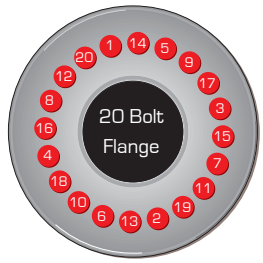
As explained on page 175, the two most common methods for tightening of bolted flange joints are either by torque using torque wrenches or by direct tension using hydraulic bolt tensioners. Regardless of the method selected a pre-bolting inspection is essential if an accurate and leak free joint is to be achieved first time, every time. The inspection must include checking for any damage to the gasket and sealing surfaces, ensuring that the bolts and nuts are the correct size and material, are not damaged in any way and that the correct lubricant is to be used. In addition, it is vitally important that the two flanges are correctly aligned to each other and that the bolts can be easily fitted through the bolt holes. If any of the above checks are not satisfactory immediate remedial action must take place before starting to bolt up the joint.

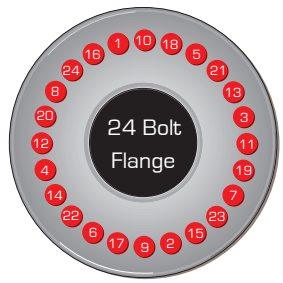


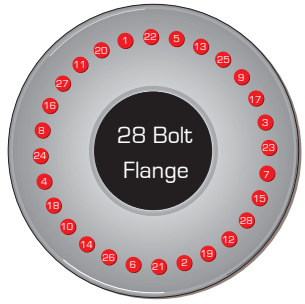












Tightening using torque wrenches

Insert the bolts through both flanges and hand tighten the nuts on both sides ensuring that there is full thread engagement on both nuts of every bolt. Square up the joint and ensure that all bolts are freely moving through the bolt holes and that the nuts are hand tightened against the outer flange faces. Number all bolts sequentially in a diametrically opposed fashion as shown in the illustrations on the right. Commence tightening of the bolts sequentially starting with a first pass at 25% of the final specified and required torque figure, a second pass at 50% and then a third pass at 100%. Finally a check pass should be carried out in either a clockwise or anti-clockwise direction at 100% of the required torque to ensure all bolts are uniformly tightened.

Tensioning procedure using hydraulic bolt tensioners

Insert the bolts through both flanges and hand tighten the nuts on both sides ensuring that there is full thread engagement on both sides. Take care to ensure that on the selected flange face, to which the tensioners are to be affixed, that there is at least 1 x diameter (*) of the bolt thread protruding above the nut face. This is required for the tensioner puller to attach correctly and if insufficient thread is exposed then the tensioning procedure must not proceed. The exact number and positioning of the hydraulic bolt tensioners must then be ascertained i.e. 25%, 33%, 50% or 100% simultaneous tensioning of all the bolts in the respective joint. After deciding the number of bolt tensioners to be used simultaneously, affix them to the exposed thread end of the bolts, equally spaced around the flange for 25%, 33% or 50% simultaneous tensioning, or on every bolt in the case of 100% simultaneous tensioning. Please refer to page 183 and to the comprehensive Hi-Force operating manual for bolt tensioners for more detailed instructions. After correctly assembling all of the bolt tensioners on to the flange, hook up the interconnecting hydraulic hoses and the mainline hose to the air driven pump unit and apply the applicable hydraulic pressure, as specified by either the joint equipment manufacturer or the BoltRight software (see pages 105 & 106). In cases other than 100% simultaneous tensioning there will be two different hydraulic pump pressures to be applied to the bolt tensioners and these should be strictly adhered to. Once all of the bolts have been tensioned using the Hi-Force bolt tensioners the joint is ready for testing. Take note that it is normal to have to make 2 or 3 passes around the bolts when tensioning at 50% or less and usually the lower the number of tensioners being used simultaneously, the more passes that will need to be done and hence it will take more time to complete the joint tightening.

Whether tightening the bolts using a torque wrench or bolt tensioners it is a good idea to carry out a final check for tightness of all the bolts by simply tapping each nut with a hammer and listen to see if a high pitched ringing sound is achieved. A dull sound indicates that the respective bolt is still loose.

(*) For sub-sea tensioners, please see note on page 183.

TIGHTENING SEQUENCE & BOLTING PROCEDURE FOR FLANGE BOLTS

Hi-Force hydraulic bolt tensioners offer the quickest, safest and most accurate means of applying a specific residual load to bolts. Bolt tensioners can be used to easily achieve an accurate and pre-determined bolt loading in a single, simultaneous operation, providing the uniform gasket compression, essential for the integrity of critical bolted connections. Ideally all bolts in the joint should be tensioned simultaneously (100%), however 50%, 33% or even 25% simultaneous tensioning can be carried out, which then requires the operator to make two, three or four tensioning operations by moving around the bolts in diametrically opposed fashion. Whilst partial tensioning will take longer to complete the task, it enables the user to optimise between the cost of the equipment and the available time.

Hi-Force hydraulic bolt tensioners are designed to directly stretch the bolt by applying a known load to the fastener using a hydraulic cylinder and threaded puller. The securing nut is then rotated using a short tommy bar, whilst the thread is being stretched, until it is firmly tightened against the joint face. Immediately the hydraulic pressure (load) is released the bolt tension (residual load) is retained, within the clamp length of the bolt, because it is prevented from returning to its original length by the tightened nut.

To operate hydraulic bolt tensioners on bolted connections safely, an extra length of threaded stud above the nut, of at least 1x bolt diameter (*), is required to facilitate easy fitment of the equipment (see figure 1).
Assembly of the tensioners to the bolt is quick and easy, provided of course that the bolts and nuts are clean, lubricated and in good condition (see figures 2-5).

Hi-Force has considerable experience in providing precise calculations of the correct bolt load to be applied to ensure an accurate residual load is imparted into the bolts, whether they be tightened using a 100%, 50%, 33% or 25% simultaneous tensioning procedure (see figures 6-9).

Please refer to page 105 -106 for further details on the Hi-Force BoltRight software programme.

(*) Depending on the bolt size, sub-sea tensioners (STU Range) may require an extra length of threaded stud above the nut, up to 4.8 x the diameter.

Figure 1

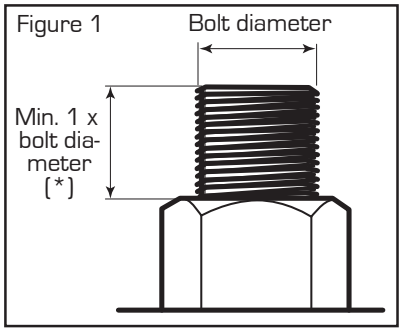


Figure 2

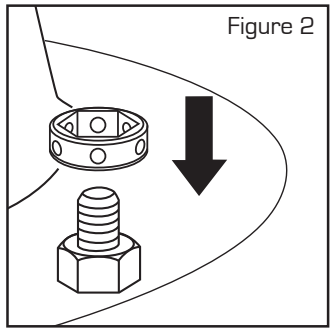


Figure 3

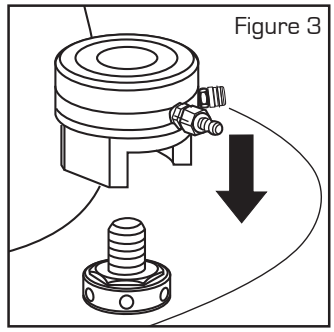


Figure 4

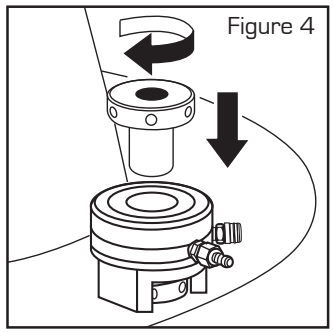


Figure 5

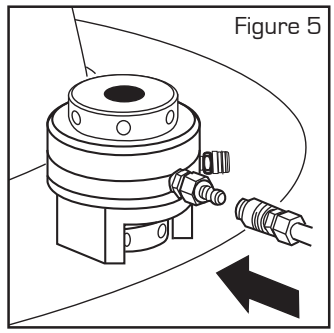


Figure 6

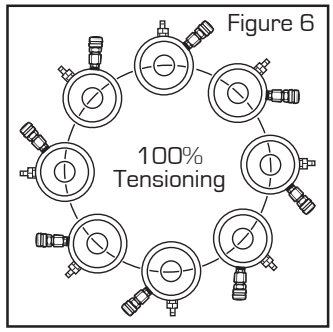


Figure 7

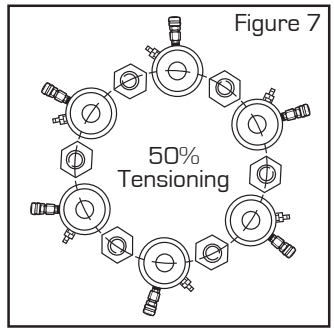


Figure 8

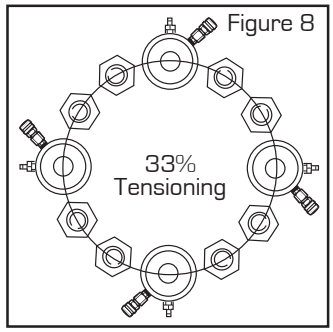
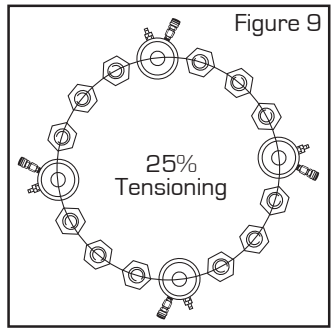


Figure 9



Note: If 100% tensioning cannot be achieved by attaching all bolt tensioners to one side of the flange, due to a lack of space, then alternate the tensioners on opposite sides of the flange.

METRIC TO IMPERIAL CONVERSION CHART

SI Unit System International	Conversion Factor	Imperial Equivalent	Conversion Factor	SI Unit System International
Pressure				
Bar	x 14.5	PSI	x 0.069	Bar
Bar	x 14.5	lbf.in²	x 0.069	Bar
kPA	x 0.145	PSI	x 6.89	kPa
mPA	x 145	PSI	x .00689	mPa
Volume				
cm³	x 0.061	inch³	x 16.4	cm³
litre	x 61	inch³	x 0.016	litre
litre	x 0.22	gallon	x 4.54	litre
m³	x 1.3	yard³	x 0.76	m³
Area				
mm²	x 0.00155	inch²	x 645	mm²
cm²	x 0.155	inch²	x 6.45	cm²
m²	x 10.8	foot²	x 0.0929	m²
Length				
mm	x 0.03937	inch	x 25.4	mm
cm	x 0.3937	inch	x 2.54	cm
m	x 3.28	foot	x 0.305	m
Force				
N	x 0.225	pound	x 4.45	N
kN	x 225	pound	x 0.00445	kN
Torque				
Nm	x 0.738	lbf.ft	x 1.356	Nm
Nm	x 8.9	lbf.in	x 0.113	Nm
kgf.m	x 7.2345	lbf.ft	x 0.1382	kgf.m
Mass				
g	x 0.035	ounce	x 28.3	g
kg	x 2.2046	pound	x 0.4536	kg
t	x 1.1	ton (short)	x 0.907	t
Flow				
cm³/min	x 0.61	inch³/min	x 16.4	cm³/min
litres/min	x .2642	gallon/min	x 3.785	litres/min
Power				
kw	x 1.34	hp	x 0.746	kw
kw	x 0.948	Btu/s	x 1.055	kw
w	x 0.74	ft lb/s	x 1.36	w

N

Temperature

To calculate Celsius to Fahrenheit :	(°C x 1.8) + 32 = °F
To calculate Fahrenheit to Celsius :	(°F - 32) / 1.8 = °C

RECOMMENDED TORQUE VALUE CHART

Use this chart as a guideline for the correct torque to be applied to standard size metric and imperial bolts in grades 8.8 (metric) and ASTM A193 grade B7 (imperial) or similar. The torque figures are calculated in both metric (Nm) and imperial (lbf.ft) values using a choice of three commonly used bolt thread lubricants. Always consider the coefficient of friction applicable for the chosen bolt lubricant. For grade 10.9 bolts add 47% and grade 12.9 bolts add 72% to the figure detailed against the relevant 8.8 grade metric bolt size.

Remember these torque values are for guidance purposes only! Always check the equipment/bolt manufacturer for the actual torque required and specified for bolted components within the particular equipment design.

ALL VALUES ARE BASED ON 60% OF THE BOLT YIELD STRESS

Bolt diameter (see note1)	Nut AF Size (see note 2)	Bolt tension (for grade ASTM A193 B7) (see note 3)		Torque value (for grade B7 bolt) for specified lubricant Moly: f = 0.06 see note 4		Copper: f = 0.10 see note 4		Machine Oil: f = 0.15 see note 4	
		kN	(lbs.force)	Nm	lbf.ft	Nm	lbf.ft	Nm	lbf.ft
5/8"	1 1/16"	57	13044	99	73	149	110	211	156
3/4"	1 1/4"	82	18559	170	126	259	191	369	272
7/8"	1 7/16"	115	25830	270	199	411	303	587	433
1"	1 5/8"	171	38555	401	296	611	451	874	644
1 1/8"	1 13/16"	224	50247	574	423	882	650	1267	934
1 1/4"	2"	282	63487	790	583	1222	901	1762	1300
1 3/8"	2 3/16"	349	78271	1054	777	1640	1210	2373	1750
1 1/2"	2 3/8"	422	94602	1370	1011	2143	1581	3109	2293
1 5/8"	2 9/16"	501	112479	1744	1286	2739	2020	3983	2938
1 3/4"	2 3/4"	586	131904	2180	1608	3436	2535	5007	3693
1 7/8"	2 15/16"	680	152874	2682	1978	4243	3129	6193	4568
2"	3 1/8"	780	175389	3256	2402	5166	3810	7552	5570
2 1/4"	3 1/2"	1001	225061	4638	3420	7393	5453	10838	7994
2 1/2"	3 7/8"	1250	280917	6361	4692	10183	7510	14960	11034
2 3/4"	4 1/4"	1381	310296	8465	6244	13597	10029	20011	14760
3"	4 5/8"	1655	372024	10988	8104	17699	13054	26088	19241
3 1/4"	5"	1954	439349	13966	10301	22551	16633	33283	24548
3 1/2"	5 3/8"	2279	512269	17438	12862	28218	20812	41692	30750
3 3/4"	5 3/4"	2628	590785	21442	15815	34761	25638	51409	37917
4"	6 1/8"	3003	674898	26015	19188	42244	31157	62529	46119

ALL VALUES ARE BASED ON 60% OF THE BOLT YIELD STRESS

Bolt diameter (see note1)	Nut AF Size (see note 2)	Bolt tension (for grade 8.8) (see note 3)		Torque value (for grade 8.8 bolt) for specified lubricant Moly: f = 0.06 see note 4		Copper: f = 0.10 see note 4		Machine Oil: f = 0.15 see note 4	
		kN	(lbs.force)	Nm	lbf.ft	Nm	lbf.ft	Nm	lbf.ft
M16	24	51	13509	87	64	133	98	189	140
M20	30	85	21197	171	126	259	191	370	273
M24	36	136	30543	294	217	447	330	638	470
M27	41	180	40417	425	314	653	481	937	691
M30	46	219	49116	582	429	890	656	1275	940
M33	50	273	61453	775	572	1193	880	1716	1266
M36	55	321	72075	1005	741	1541	1137	2212	1632
M39	60	387	86874	1284	947	1981	1461	2853	2104
M42	65	443	99617	1601	1181	2463	1817	3540	2611
M45	70	519	116703	1978	1459	3057	2255	4406	3250
M48	75	583	131157	2405	1774	3708	2735	5337	3936
M52	80	702	157758	3054	2253	4732	3490	6830	5037
M56	85	809	181917	3817	2815	5907	4357	8519	6283
M60	90	947	221649	4689	3459	7286	5374	10532	7768
M64	95	1071	240948	5664	4178	8786	6480	12688	9358
M68	100	1230	276631	6788	5006	10566	7793	15289	11276
M72	105	1400	314641	8050	5937	12570	9271	18221	13439
M76	110	1502	337437	9458	6976	14812	10925	21505	15861
M80	115	1603	360234	11020	8128	17305	12763	25160	18557
M90	130	2078	467173	15731	11603	24852	18330	36253	26739
M100	145	2614	587739	21660	15975	34389	25364	50301	37100

Notes:
1 = Bolt Material Grades 8.8 (Metric) and ASTM A193/BS4882 Grade B7 (Imperial) or similar
2 = AF size based on heavy series nuts
3 = Bolt tension equates to a bolt stress of 60% of the minimum yield strength
4 = Torque figures detailed are based on 60% of the minimum bolt yield stress

REPLACEMENT PARTS



Hi-Force supplies comprehensive service kits, containing all of the "wear and tear" parts necessary to guarantee the correct performance and integrity of your Hi-Force equipment. Always specify and order genuine Hi-Force service kits and spare parts. Please provide product serial number when ordering to ensure correct parts are supplied. Complete spare parts information including exploded view part sheets can be found on our website : www.hi-force.com



REPLACEMENT BLADES	
For model number	Blade part no.
CT20 moving	CT20-04
CT20 static	CT20-05
CT40 moving	CT40-11
CT40 static	CT40-05
DNS404	DNS404-B
DNS506	DNS506-B
HCC26 Gr 80 static	HCC26-4S
HCC26 Gr 80 moving	HCC26-4M
HCC26 Gr 100 static	HCC26-4S100
HCC26 Gr 100 moving	HCC26-4M100
HCC34 Gr 80 static	HCC34-5S
HCC34 Gr 80 moving	HCC34-5M
HCC34 Gr 100 static	HCC34-5S100
HCC34 Gr 100 moving	HCC34-5M100
HCC46 Gr 80 static	HCC46-11S
HCC46 Gr 80 moving	HCC46-11M
HCC46 Gr 100 static	HCC46-11S100
HCC46 Gr 100 moving	HCC46-11M100
HCH40 moving	CT40-11
HCH40 static	CT40-05
HCH120 moving	HCH120-01
HCH120 static	HCH120-02
HMNS104	NS104-B
HMNS110	NS110-B
HMNS200	NS200-B
HWRC1115	HWRC1115-B
HWRC1125	HWRC1125-B
HWRC1136	HWRC1136-B
HWRC1145	HWRC1145-B
HSWC19	HSWC19-4
HSWC28	HSWC28-4
HSWC44	HSWC44-4
NS104	NS104-B
NS110	NS110-B
NS200	NS200-B
NS206	NS206-B
NS215	NS215-B

COMPREHENSIVE SERVICE KITS	
For model number	Service kit part no.
AHP112	AHP112TP2-K
AHP114	AHP114TP2-K
AHP10	AHP10TP1-K
AHP26	AHP26TP1-K
AHP36	AHP36TP1-K
AHP58	AHP58TP1-K
AHP107	AHP107TP1-K
AHP187	AHP187TP1-K
AHP275	AHP275TP1-K
AHP425	AHP425TP1-K
AHP2-036	AHP2-036TP1-K
AHP2-060	AHP2-060TP1-K
AHP2-097	AHP2-097TP1-K
AHP2-144	AHP2-144TP1-K
AHP2-237	AHP2-237TP1-K
AHP275BTU	AHP275TP1-K
ATDP63	ATDP63TP1-K
ATDP125	ATDP125TP1-K
ATDP216	ATDP216TP1-K
BC18X	BC18TP1-K
BC30	BC30TP1-K
BC40	BC40TP1-K
BC63	BC63TP1-K
CH21	CH21TP1-K
CH30	CH30TP1-K
CH32	CH32TP1-K
CH40	CH40TP1-K
CH63	CH63TP1-K
CH80	CH80TP1-K
CH1000	CH1000TP1-K
CT20	CT20TP1-K
CT40	CT40TP1-K
DNS404	DNS404TP1-K
DNS506	DNS506TP1-K
HAP210	HEP207TP1-K

COMPREHENSIVE SERVICE KITS	
For model number	Service kit part no.
HAS306	HAS30TP1-K
HAS506	HAS50TP1-K
HAS1006	HAS100TP1-K
HCC26	HCC26TP1-K
HCC34	HCC34TP1-K
HCC46	HCC46TP1-K
HCH40	HCH40TP1-K
HCH120	HCH120TP1-K
HDA 25 tonnes	HDA25TP1-K
HDA 50 tonnes	HDA50TP1-K
HDA 109 tonnes	HDA100TP1-K
HDA 152 tonnes	HDA150TP1-K
HDA 203 tonnes	HDA200TP1-K
HDA 326 tonnes	HDA300TP1-K
HDA 398 tonnes	HDA400TP1-K
HDA 520 tonnes	HDA500TP1-K
HEP12	HEP121TP1-K
HEP103	HEP103TP1-K
HEP207	HEP207TP1-K
HEP310	HEP310TP1-K
HEP517	HEP310TP1-K
HFG 50 tonnes	HFG50TP1-K
HFG 109 tonnes	HFG100TP1-K
HFG 152 tonnes	HFG150TP1-K
HFG 203 tonnes	HFG200TP1-K
HFG 326 tonnes	HFG300TP1-K
HFG 398 tonnes	HFG400TP1-K
HFG 520 tonnes	HFG500TP1-K
HFL 50 tonnes	HFL50TP1-K
HFL 109 tonnes	HFL100TP1-K
HFL 152 tonnes	HFL150TP1-K
HFL 260 tonnes	HFL250TP1-K
HFL 520 tonnes	HFL500TP1-K
HHP30	HHP30TP1-K
HHP50	HHP50TP1-K

Note: all service kits and spare parts detailed on pages 186 and 187 are latest model versions. Always check serial number of your product when ordering parts to ensure correct Hi-Force part supply.

COMPREHENSIVE SERVICE KITS	
For model number	Service kit part no.
HHR 33 tonnes	HHR30TP1-K
HHR 61 tonnes	HHR60TP1-K
HHR 102 tonnes	HHR100TP1-K
HHR 152 tonnes	HHR150TP1-K
HHR 247 tonnes	HHR250TP2-K
HHS 11 tonnes	HHS10TP2-K
HHS 23 tonnes	HHS20TP2-K
HHS 33 tonnes	HHS30TP2-K
HHS 61 tonnes	HHS60TP2-K
HHS 102 tonnes	HHS100TP2-K
HKP10	HKP10HTP1-K
HLS 10 tonnes	HLS10TP2-K
HLS 20 tonnes	HLS20TP2-K
HLS 32 tonnes	HLS30TP2-K
HLS 50 tonnes	HLS50TP2-K
HLS 109 tonnes	HLS100TP2-K
HLS 147 tonnes	HLS150TP2-K
HMJ10	HSS10TP2-K
HMJ25	HSS25TP2-K
HMNS104	HMNS104TP1-K
HMNS110	HMNS110TP1-K
HMNS200	HMNS200TP1-K
HP110	HP110TP2-K
HP145	HP110TP2-K
HP211	HP212TP1-K
HP212	HP212TP1-K
HP227	HP227TP2-K
HP232	HP232TP1-K
HP245	HP245TP1-K
HP252	HP252TP1-K
HP257	HP227TP2-K
HP232D	HP232DTP1-K
HP245D	HP245TP1-K
HP252D	HP252DTP1-K
HP227FP	HP227FPTP2-K
HP227FPC	HP227FPTP2-K
HPC 10 tonnes	HPC10TP1-K
HPC 30 tonnes	HPC30TP1-K
HPC 50 tonnes	HPC50TP1-K
HPP210	HEP207TP1-K
HPS 4.5 tonnes	HPS5TP1-K
HPS 10 tonnes	HPS10TP2-K
HPS 20 tonnes	HPS20TP2-K
HPS 32 tonnes	HPS30TP2-K
HPS 50 tonnes	HPS50TP2-K
HPS 73 tonnes	HPS75TP2-K
HPS 109 tonnes	HPS100TP2-K
HPS 147 tonnes	HPS150TP2-K

COMPREHENSIVE SERVICE KITS	
For model number	Service kit part no.
HSS 4.5 tonnes	HSS5TP1-K
HSS 10 tonnes	HSS10TP2-K
HSS 14.5 tonnes	HSS15TP2-K
HSS 25 tonnes	HSS25TP2-K
HSS 29 tonnes	HSS30TP2-K
HSS 50 tonnes	HSS50TP2-K
HSS 73 tonnes	HSS75TP2-K
HSS 109 tonnes	HSS100TP2-K
HSWC19	HSWC19TP1-K
HSWC28	HSWC28TP1-K
HSWC44	HSWC44TP1-K
HTWP2140P	HTWP2140P-K
HTWP2141AR	HTWP2141/2-K
HTWP2142AR	HTWP2141/2-K
HTWP3140P	HTWP3140TP2-K
HTWP3141PA	HTWP3141/2TP2-K
HTWP3142PA	HTWP3141/2TP2-K
HVL 10 tonnes	HVL10TP1-K
HVL 20 tonnes	HVL20TP1-K
HVL 32 tonnes	HVL30TP1-K
HVL 50 tonnes	HVL50TP1-K
HVL 104 tonnes	HVL100TP1-K
HWRC1115	HWRC1115TP1-K
HWRC1125	HWRC1125TP1-K
HWRC1136	HWRC1136TP1-K
HWRC1145	HWRC1145TP1-K
IW13P	IW13PTP1-K
IW19P	IW19PTP1-K
IW25B	IW25BTP1-K
IW38B	IW38BTP1-K
JAH 20 tonnes	122059
JAH 30 tonnes	123059
JAH 60 tonnes	126059
JAS 10 tonnes	JAS10TP1-K
JCH13	JCH13TP1-K
JCH21	JCH21TP1-K
JCS10	JCS10TP1-K
JCS20	JCS20TP1-K
JCS30	JCS30TP1-K
JS4	JS4TP1-K
JSS35	JSS35TP1-K
JSS55	JSS55TP1-K
JSS106	JSS106TP1-K
JSS166	JSS166TP1-K
JSS207	JSS207TP1-K
JSS327	JSS327TP1-K
JSS507	JSS507TP1-K
JSS1007	JSS1007TP1-K

COMPREHENSIVE SERVICE KITS	
For model number	Service kit part no.
NS104	NS104TP1-K
NS110	NS110TP1-K
NS200	NS200TP1-K
NS206	NS206TP1-K
NS215	NS215TP1-K
PMV2	PMV2TP1-K
PMV3	PMV4TP1-K
PMV3	PMV4TP1-K
SC18X	SC18TP1-K
SC21	SC21TP1-K
SC30	SC30TP1-K
SC32	SC32TP1-K
SC40	SC40TP1-K
SC60	SC60TP1-K
SCP103	SCP103TP1-K
SCP203	SCP203TP1-K
SCP303	SCP303TP1-K
SJS10	SJS10TP1-K
SKP7	SKP7TP1-K
STS1	STS1LCTP1-K
STS2	STS2LCTP1-K
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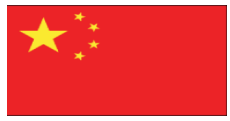


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