

**Model: 06-5074-0800
Hydraulic Service Unit**



07/2015 – Rev. 02

REVISION

01
02

DATE

06/2012
07/2015

TEXT AFFECTED

Original Release
Major revision

TABLE OF CONTENTS

	<u>PAGE</u>
1.0 PRODUCT INFORMATION	1
1.1 DESCRIPTION	1
1.2 MODEL & SERIAL NUMBER	1
1.3 MANUFACTURER	1
1.4 FUNCTION	1
1.5 SPECIFICATIONS	1
1.6 FEATURES	1
2.0 PREPARATION FOR USE	1
3.0 TRAINING	1
3.1 TRAINING REQUIREMENTS	1
3.2 OPERATOR TRAINING	1
4.0 OPERATION	1
5.0 PROVISION OF SPARES	2
5.1 SOURCE OF SPARE PARTS	2
5.2 RECOMMENDED SPARE PARTS LISTS	2
6.0 IN SERVICE SUPPORT	2
7.0 GUARANTEES/LIMITATION OF LIABILITY	2
8.0 APPENDICES	2

This product can not be modified without the written approval of Tronair, Inc. Any modifications done without written approval voids all warranties and releases Tronair, Inc., its suppliers, distributors, employees, or financial institutions from any liability from consequences that may occur. Only Tronair OEM replacement parts shall be used.

1.0 PRODUCT INFORMATION

1.1 DESCRIPTION

Hydraulic Service Unit (HSU)

1.2 MODEL & SERIAL NUMBER

Reference nameplate on unit

1.3 MANUFACTURER

TRONAIR, Inc.
1740 Eber Road
Holland, Ohio 43528-9794 USA

Telephone: (419) 866-6301 or 800-426-6301
Fax: (419) 867-0634
E-mail: sales@tronair.com
Website: www.tronair.com

1.4 FUNCTION

The Tronair Hydraulic Service Unit (HSU) is a compact unit designed to provide a source of clean, pressurized fluid for filling reservoirs, bleeding brakes and other maintenance functions.

1.5 SPECIFICATIONS

Tank Capacity8 gallon
Max. Pressure5000 psig
FluidMIL-L-23699, MIL-PRF-87257
Filtration3 Micron
Weight65 lbs.

1.6 FEATURES

- 15 foot hose
- Calibrated digital pressure gauge
- Pump provides high flow and high pressure capability
- 4 way valve for testing double acting cylinder
- Air drive relief pre-set 90 psi relief valve

2.0 PREPARATION FOR USE

The HSU is shipped fully assembled, and only the following steps are required to make the unit operational.

- Service reservoir - fill reservoir with appropriate clean fluid.
- Adjust handle height to suitable height.

Remove Air From HSU System By:

- Flow fluid by regulating input shop air to the hydraulic pump.

3.0 TRAINING

3.1 TRAINING REQUIREMENTS

The employer of the operator is responsible for providing a training program sufficient for the safe operation of the unit.

3.2 OPERATOR TRAINING

The operator training should provide the required training for safe operation of the unit.

NOTE: Maintenance and Trouble Shooting are to be performed by a skilled and trained technician.

4.0 OPERATION

To use your HSU, follow the steps below:

1. Securely attach hose(s) to the aircraft.
2. Select output hose #1 or #2 by rotating handle pointer to selected hose.
3. Transfer hydraulic fluid by actuating the hydraulic pump by applying regulated shop air.

When Service Has Been Completed:

1. Close air shutoff valve.
2. Move selector valve to appropriate position to relieve pressure in both hoses.
3. Disconnect hose(s) from aircraft.
4. Install hose end dust plug.

5.0 PROVISION OF SPARES

5.1 SOURCE OF SPARE PARTS

Spare parts may be obtained from the manufacturer:

TRONAIR, Inc.

1740 Eber Road

Holland, Ohio 43528-9794 USA

Telephone: (419) 866-6301 or 800-426-6301

Fax: (419) 867-0634

E-mail: sales@tronair.com

Website: www.tronair.com

5.2 RECOMMENDED SPARE PARTS LISTS

Reference the following page(s) for Replacement Parts and Kits available.

6.0 IN SERVICE SUPPORT

Contact Tronair, Inc. for technical services and information. See Section 1.3 – Manufacturer.

7.0 GUARANTEES/LIMITATION OF LIABILITY

Tronair products are warranted to be free of manufacturing or material defects for a period of one year after shipment to the original customer. This is solely limited to the repair or replacement of defective components. This warranty does not cover the following items:

- a) Parts required for normal maintenance
- b) Parts covered by a component manufacturers warranty
- c) Replacement parts have a 90-day warranty from date of shipment

If you have a problem that may require service, contact Tronair immediately. Do not attempt to repair or disassemble a product without first contacting Tronair, any action may affect warranty coverage. When you contact Tronair be prepared to provide the following information:

- a) Product Model Number
- b) Product Serial Number
- c) Description of the problem

If warranty coverage is approved, either replacement parts will be sent or the product will have to be returned to Tronair for repairs. If the product is to be returned, a Return Material Authorization (RMA) number will be issued for reference purposes on any shipping documents. Failure to obtain a RMA in advance of returning an item will result in a service fee. A decision on the extent of warranty coverage on returned products is reserved pending inspection at Tronair. Any shipments to Tronair must be shipped freight prepaid. Freight costs on shipments to customers will be paid by Tronair on any warranty claims only. Any unauthorized modification of the Tronair products or use of the Tronair products in violation of cautions and warnings in any manual (including updates) or safety bulletins published or delivered by Tronair will immediately void any warranty, express or implied.

The obligations of Tronair expressly stated herein are in lieu of all other warranties or conditions expressed or implied. **Any unauthorized modification of the Tronair products or use of the Tronair products in violations of cautions and warnings in any manual (including updates) or safety bulletins published or delivered by Tronair will immediately void any warranty, express or implied and Tronair disclaims any and all liability for injury (WITHOUT LIMITATION and including DEATH), loss or damage arising from or relating to such misuse.**

8.0 APPENDICES

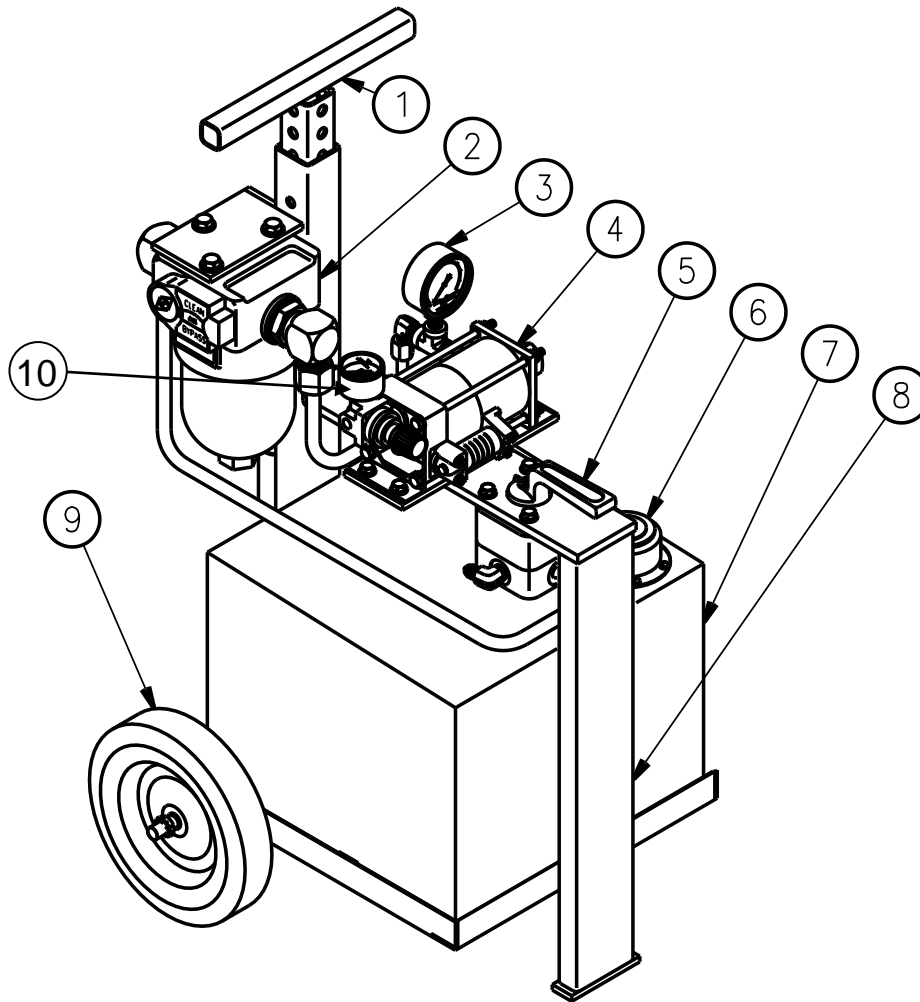
APPENDIX I Instrument Certification Notice

APPENDIX II Haskel MLP-20/46D Technical Specifications & Performance Data

APPENDIX III Declaration Of Conformity

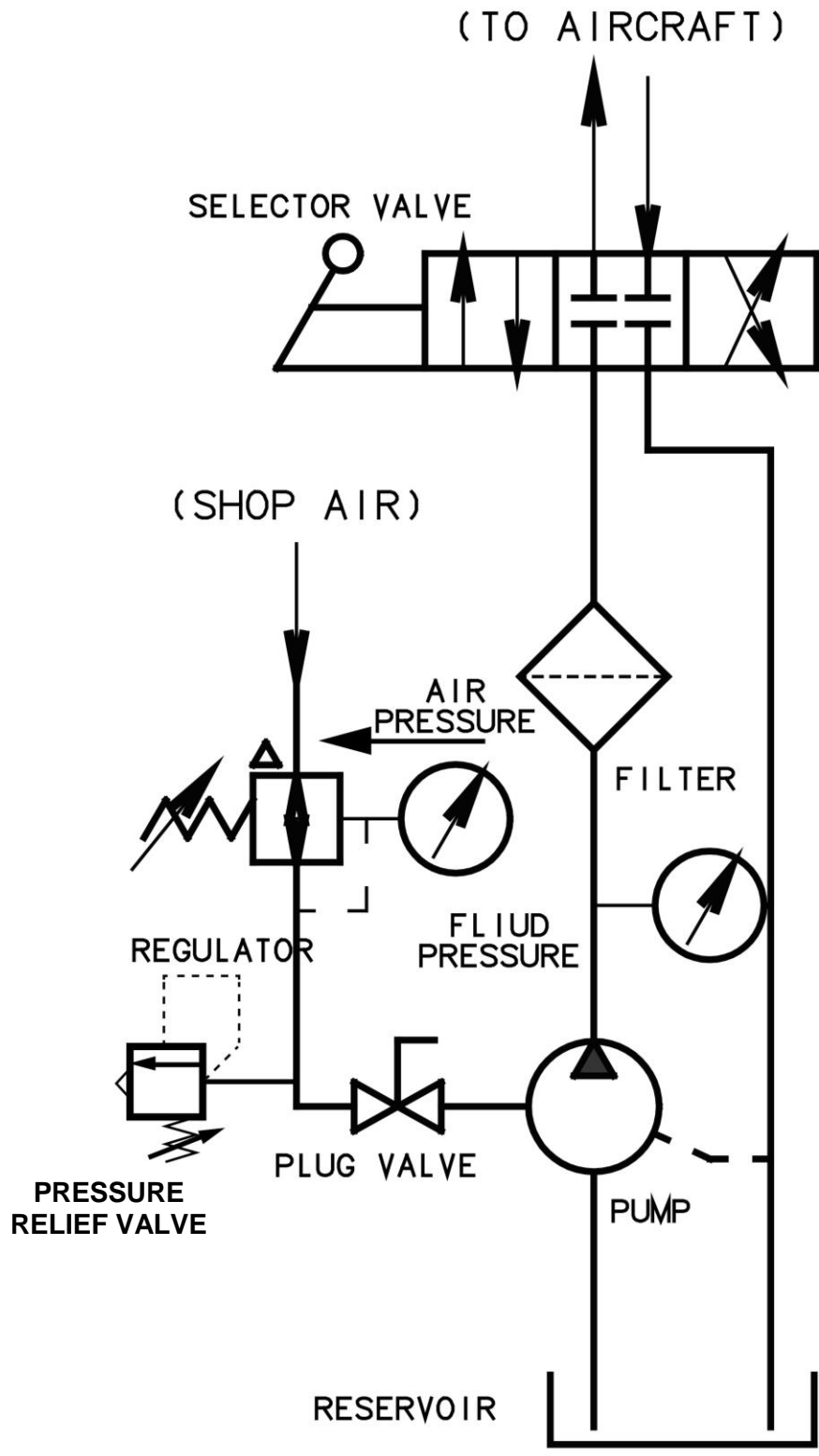
Parts List

When ordering replacement parts/kits, please specify Model, Serial Number & color of your product.



Item	Part Number	Description	Qty
1	Z-1083-01	Handle, Unit	1
2	HC-1675	Filter Assembly	1
	K-2318	Kit, Element	1
3	H-2604	Pressure Gauge	1
4	H-3525	Pump, Air	1
5	HC-2257	Selector Valve	1
6	HC-1030	Breather	1
7	H-1802-A1	Tank	1
8	Z-1201-A1	Frame	1
9	U-1001-01	Wheel	2
10	PC-1017-02-90	Pressure Relief Valve	1
NS	TF-1105-06*07.5	Hose, Pump Suction	1
NS	TF-1105-04*10.0	Hose, Bleed	1
	K-4665	Kit, Hose Assembly; consists of:	2
	TF-1038-14*180	Hose, Assembly	1
	N-2055-01-S	Reducer, Tube	1
	N-2082-06-S	Adapter, Union	1
	N-2801-04-S	Cap, Flareless	1

Hydraulic Schematic





APPENDIX I

Instrument Certification Notice



Instrument Certification Notice

The gauge Certificates of Calibration supplied for the gauge(s) on this unit contain the calibration data for the actual instrument calibrated, along with the calibration date of the **STANDARD** used to perform the calibration check.

The due date for re-calibration of the instrument should be based upon the date the instrument was placed in service in your facility. Re-calibration should be done on a periodic basis as dictated by the end user's quality system or other overriding requirements.

Note that Tronair, Inc. does not supply certificates of calibration on flow meters or pyrometers unless requested at the time of placed order. These instruments are considered reference indicators only and are not critical to the test(s) being performed on the aircraft.



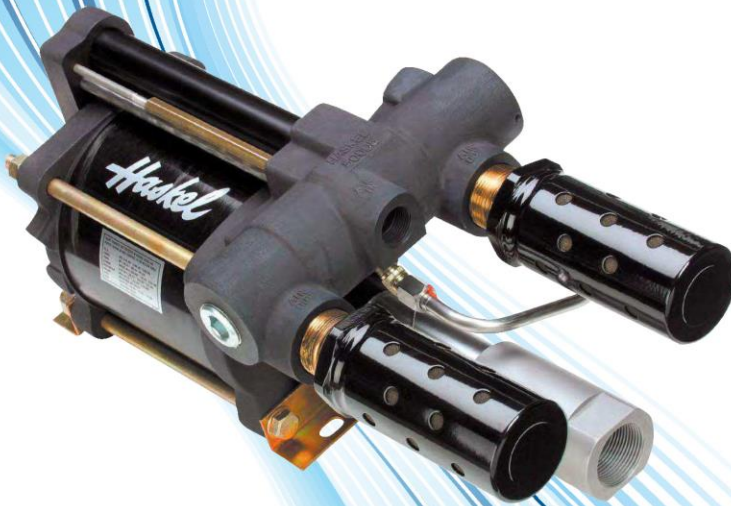
APPENDIX II

Air Pump Manufacturer Data

Haskel
an Accudyne Industries brand

Pressure on Demand

Pneumatic Driven Liquid Pumps



LP-GL 04/17



High Pressure

Haskel pneumatic driven liquid pumps are designed to provide a safe, reliable and economical, source of hydraulic pressure.

This brochure introduces our pneumatic driven liquid pump range. Visit our website at www.haskel.com for more information or to locate a distributor.

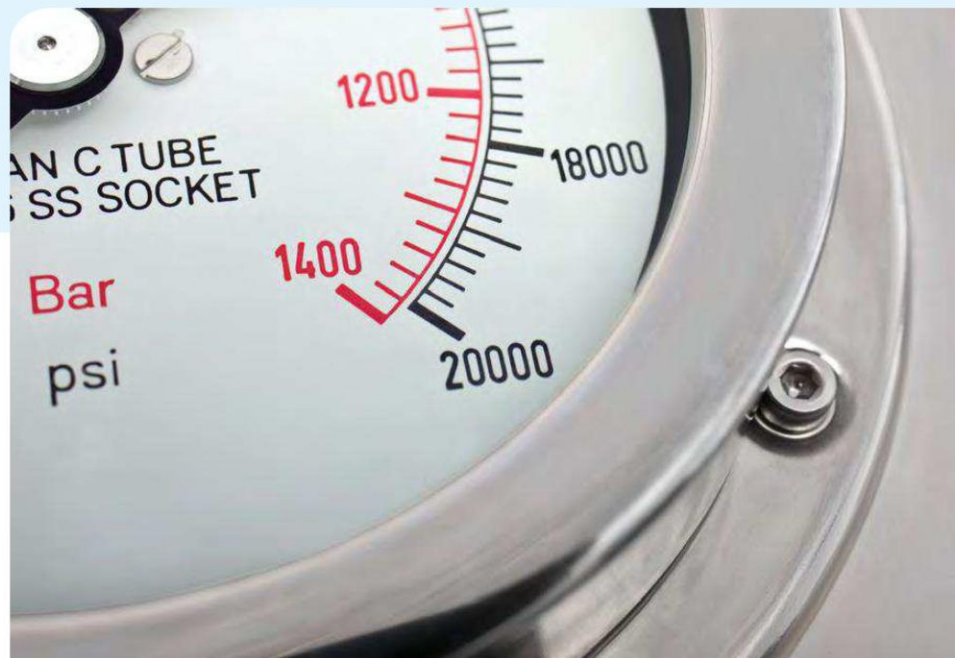
Why Use Haskel Pneumatic Driven Pumps?

Our pumps offer many advantages over electrically driven pumps:

- Safe pneumatic operation – no heat, flame or spark risk
- Up to 100,000 psi (7000 bar) capability
- Infinitely variable cycling speed
- Stall feature at pre-determined pressure to hold that pressure without consuming power
- Problem-free stop/start applications
- Easily automated – many modification and control options
- Suitable for most liquids and liquefied gases
- Alternative gas drive options – sour gas, natural gas, boil off gases, nitrogen
- No need for air line lubrication – saves costs and prevents contamination
- Robust, reliable, compact and easy to maintain proven design
- Unbalanced cycling spool provides immediate response to pressure changes
- Also available in standard, or custom built power pac configurations
- Excellent worldwide service for spares and repairs
- ATEX approved
- CE certified

Applications include:

- Pressure testing
- Work holding/power clamping
- Jacking/lifting
- Valve actuator control
- Hydraulic cylinder actuation
- Press safety overload devices
- Roller tensioning
- Metering
- Precision lubrication and spraying
- Liquefied gas transfer



Pressure and Flow on Demand

This guide will help you to pre-select the pump ideally suited for your application. If you have specific questions, however, we urge you to provide Haskel with the operational details of your application. We will recommend a model and any corresponding accessories.

Output Horsepower Ratings

The pumps are categorized on their horsepower ratings (see pages 6-7). These are approximate and peak at 100 psi (7 bar), assuming adequate drive, pressure and volume. Peak horsepower is at about 75% nominal ratio x drive pressure, i.e. 100:1 pump @ 100 psi air drive peaks at $100 \times 100 = 10000 \times 0.75$ psi = 7500 psi (517 bar) hydraulic pressure.

Operation

The pumps automatically reciprocate on a differential piston principle. A large piston driven by relatively low pressure drive acts directly upon a smaller hydraulic piston.

The nominal ratio between piston sizes is indicated in the model coding and approximates to the maximum working pressure. The actual ratio is about 15% above nominal so that the pump continues to cycle when drive pressure equals nominal ratio. Initially, the pump will cycle at maximum speed acting as a transfer pump to pressurize downstream.

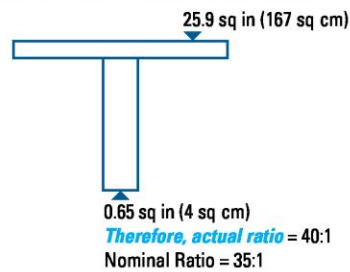
It will cycle at a slower rate as the fluid meets resistance until it stalls at maximum output pressure. When a pressure drop downstream occurs, it will recycle as necessary in an effort to maintain maximum pressure. Stall pressure is achieved when the outlet pressure rises and offers more resistance to the reciprocating differential piston assembly. The piston assembly then stalls when the forces balance, e.g. when drive pressure x drive piston area equals outlet (stall) pressure x driven hydraulic plunger area. The pump design is sensitive to very small pressure drops due to the low frictional resistance of the large diameter drive piston and hydraulic piston seals.

Double and Triple Air Head Pumps

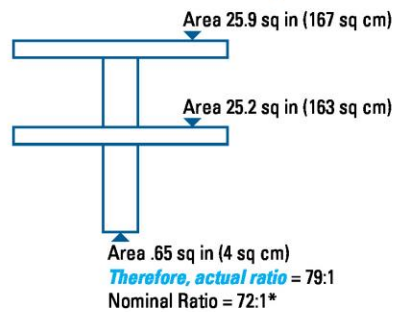
Performance can be extended for the 1.5 hp pumps by stacking air pistons without changing the hydraulic piston. Haskel multi-head pumps consume less air than competitive single head pumps of the same area, as only one head is pressurized on the return stroke; e.g., on a 1.5 hp pump additional heads can raise performance to 2 hp.

Double air head pumps are identified by the last digit 2 in the pump model number. Thus, a nominal 50:1 ratio pump with two air heads is described as a 52. Similarly, a triple air head pump is identified with a last digit 3. Thus, a 900 ratio pump with three air heads is described as a 903.

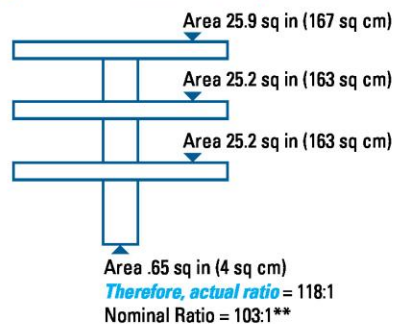
Single Drive Head Pump



Double Air Head Pump



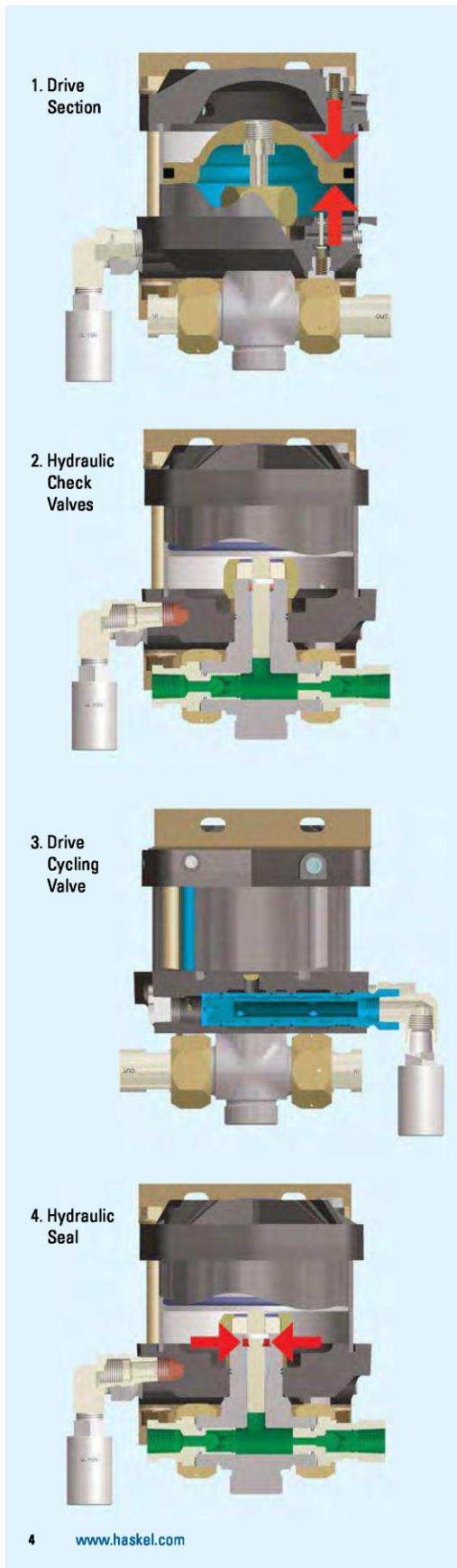
Triple Air Head Pump



Nominal Ratio

* (2) Indicates Double Drive Piston

** (3) Indicates Triple Drive Piston



Anatomy of a Pneumatic Driven Pump

1. Drive Section

The piston, complete with "O" ring seal, operates in an epoxy filled, fiberglass wound barrel, the diameter of which is constant throughout a given series of pumps. Drive media forces the piston down on the compression stroke and raises it on the suction stroke (M series have a spring return). The piston is pre-lubricated during assembly and therefore no air line lubricator is necessary.

2. Hydraulic Section/Check Valves

The drive piston is linked and connected to the hydraulic plunger/piston in the hydraulic section. Outlet flow and pressure are determined by the area of the hydraulic piston head, its nominal ratio with the drive piston head, and drive pressure. On the down stroke, liquid in the hydraulic section is forced under compression through the outlet check valve. Fresh liquid is induced via the inlet check valve on the return stroke. These check valves control the flow of liquid through the hydraulic section. They are spring-loaded and have a very low cracking pressure, allowing maximum opening on the induction stroke. The pressure of hydraulic fluid on the down stroke closes the inlet check valve and acts against the spring to open the outlet check valve.

3. Drive Cycling Valve

This is a pilot-operated, unbalanced, lightweight spool, which directs drive pressure, first to the top of the drive piston, and then to the underside to reciprocate the piston (cycle). It actuates via pilot valves at the top and the bottom of the stroke, which causes the unbalanced spool to shift and reciprocate the piston.

4. Hydraulic Seal/Check Valves

This is one of the few wear parts. Its function is to allow the hydraulic piston to reciprocate without passing fluid into the drive section. The liquid, its pressure and its temperature determine seal specification. A distance piece can be incorporated between drive and hydraulic sections for complete contamination-free operation on most Haskel pumps.



WETTED MATERIALS OF CONSTRUCTION AND SERVICES

	MODEL	SERVICES (refer to pg. 17)	WETTED MATERIALS		NON METALLICS
			PUMP SECTION	PLUNGERS	
.33 hp	M	1	Cad plated steel, Aluminum & SS	416 SS	Urethane, PTFE, Buna
	MS	1,2	All SS	316 SS	UHMWPE, PTFE, Buna
	29723	1, 2, 3, 5, 6	Separation - All SS	Hard Chrome Plated 15.5PH SS + Dichronite	UHMWPE, PTFE, Ryton
	MDSTV	1, 2, 3, 4, 5, 6	Stainless Steel and Aluminum	303 Stainless Steel	Viton, PTFE
.75hp	4B-14 thru -37	1,2	Aluminum	Aluminum(Hard coated)	UHMWPE, Buna
	4B-55 thru -100	1,2	303 SS	440 C. SS	UHMWPE, Buna
1.5 hp	AW	1	Nickel Plated Steel & SS	440C SS	Urethane, Buna N, PTFE
	ASF	1,2	All SS	440C SS	UHMWPE, Buna, PTFE, Ryton
	DSF	1, 2, 3, 5, 6	Separation - All SS	4400C SS Hard Chrome Plated	UHMWPE, Viton, PTFE, Ryton
	HF	1	Nickel Plated Steel & SS	Stellite 15-5PH SS	UHMWPE, Buna N
	HSF	1,2	All SS	Stellite 15-5PH SS	UHMWPE, Buna N
	DSHF	1, 2, 5, 6	Separation - All SS	Stellite 15-5PH SS	UHMWPE, Buna N
	ATV	1, 2	Aluminum, Bronze & SS	15.5PH SS	PTFE, Viton
	DTV	1, 2, 5	Separation - Aluminum, Bronze & SS	15.5PH SS	PTFE, Viton
	DSTV-1.5	1, 2, 3, 4, 5, 6	Separation - All SS	17.4PH SS	PTFE, Viton
	DSTV	1, 2, 3, 4, 5	Separation - All SS	440C SS Hard Chrome Plated	PTFE, Viton
	DTN	1, 2, 5	Stainless Steel, Aluminum	300 Series SS	Neopreen, PTFE
2 thru 3hp	AW	1	Nickel Plated Steel & SS	440C SS	Urethane, Buna N, PTFE
	AFD	1	Nickel Plated Steel & SS	416 SS	UHMWPE, Buna, PTFE, Ryton
	DFD	1,3,5	Nickel Plated Steel & SS	416 SS	UHMWPE, Viton, PTFE, Ryton
	ASFD	1,2	All SS	15.5PH SS	UHMWPE, Viton, PTFE, Ryton
	ASF	1,2	All SS	440C SS	UHMWPE, Viton, PTFE, Ryton
	DSFD	1, 2, 3, 5, 6	Separation - All SS	15.5PH SS	UHMWPE, Viton, PTFE, Ryton
	DSF	1, 2, 3, 5, 6	Separation - All SS	440C SS Hard chrome plated	UHMWPE, Viton, PTFE, Ryton
	HF	1	Nickel Plated Steel & SS	Stellite 15-5PH SS*	UHMWPE, Buna N
	HSF	1,2	All SS	Stellite 15-5PH SS*	UHMWPE, Buna N
	DSHF	1, 2, 5, 6	Separation - All SS	Stellite 15-5PH SS*	UHMWPE, Buna N
	DSXHF	1, 2, 5, 6	Separation - All SS	Stellite 15-5PH SS	UHMWPE, Buna N
	DSXHW	1, 2	Separation - All SS	Stellite 15-5PH SS	Urethane, PTFE
	DSTV-1.5	1, 2, 3, 4, 5, 6	Separation - All SS	17.4PH SS	PTFE, Viton
	DSTV	1, 2, 3, 4, 5	Separation - All SS	440C SS Hard chrome plated	PTFE, Viton
	*Except -202 ratio is chrome plated 440 SS				
6 hp	GW	1	Nickel Plated Steel, SS & Bronze	Hard chrome plated 15.5PH SS	Urethane, Buna N, PTFE
	GSF	1, 2	All SS & Bronze	Hard chrome plated 15.5PH SS	UHMWPE, Viton, PTFE, Ryton
	DGSF	1, 2, 3, 5, 6	Separation- All SS & Bronze	Hard chrome plated 15.5PH SS	UHMWPE, Viton, PTFE, Ryton
	DGSTV	1, 2, 3, 4, 5	Separation- All SS & Bronze	Hard chrome plated 15.5PH SS	Viton, PTFE, Ryton
	GWD	1	Nickel Plated Steel & SS	15.5PH SS Hard chrome plate optional	Urethane, Buna N, PTFE
	GSFD	1, 2	All SS & Bronze	15.5PH SS Hard chrome plate optional	UHMWPE, Buna N, PTFE, Ryton
	DGFD	1, 3, 5	Separation- Nickel Plated Steel & SS	15.5PH SS hard chrome plate optional	UHMWPE, Viton, PTFE, Ryton
	DGSFD	1, 2, 3, 4, 5, 6	Separation- All SS & Bronze	15.5PH SS Hard chrome plate optional	UHMWPE, Viton, PTFE, Ryton
	DGSTVD	1, 2, 3, 4, 5	Separation- All SS & Bronze	17.4PH SS Hard chrome plate optional	PTFE, Viton
8 hp	8SFD	1, 2	All SS & Bronze*	Hard chrome plated 15.5PH SS	UHMWPE, Viton, PTFE, Ryton
	8DSFD	1, 2, 3, 5, 6	Separation- All SS & Bronze	15.5PH SS Hard chrome	UHMWPE, Viton, PTFE, Ryton
	8DTV	1, 2, 3, 4, 5, 6	Separation- All SS & Bronze	15.5PH SS Hard chrome	PTFE, Viton
	8HSFD	1, 2	All SS & Bronze*	17.4PH SS	UHMWPE, Viton, PTFE, Ryton
	8DSTVD	1, 2, 3, 5, 6	All SS & Bronze*	15-5 PH SS Hard chrome	Viton, PTFE
	8SFD2	1, 2, 6	All SS & Bronze*	15-5 PH SS Hard chrome	PTFE, Viton, UHMWPE
10 hp	D14STD-125	1, 2, 3, 4, 5A	All SS & Bronze	Hard chrome plated 440C SS	PTFE, Viton
	D14STD-315	1, 2, 3, 4, 5A	All SS & Bronze	Hard chrome plated 440C SS	PTFE, Viton
	D14SFD-125	1, 2, 3, 5A, 6	All SS & Bronze	Tungston Carbide Coated 15.5PH SS	UHMWPE, Viton, PTFE, Ryton
	D14SFD-315	1, 2, 3, 5A, 6	All SS & Bronze	Tungston Carbide Coated 15.5PH SS	UHMWPE, Viton, PTFE, Ryton

Performance and Specification Overview

Max Air Air Head Power	Pump Model Code	Ratio Dash no.	Actual Area Ratio	Maximum Rated Output Pressure				Displacement/Cycle		Maximum Flow				
				Continuous		Intermittent		cu in	ml	cu in/min	l/min			
				psi	bar	psi	bar							
125 psi/8.6 bar	Single 0.33 hp	M, MDSTV	-5	5.6	625	43	625	43	0.83	13.6	506	8.30		
		M, MS	-7	7.8	900	62	900	62	0.60	9.8	366	6.00		
			-12	14	1500	103	1500	103	0.36	5.9	234	3.83		
		M, MS, 29723	-21	25	2600	179	2600	179	0.20	3.3	130	2.13		
			-36	41	4500	310	4500	310	0.12	2.0	78	1.28		
			-71	82	8800	607	8800	607	0.06	1.0	39	0.64		
			-110	126	13500	931	13500	931	0.039	0.60	25	0.42		
		M, MS	-188	217	15000	1034	15000	1034	0.023	0.40	18	0.29		
		29723	-188	217	10000	1034	10000	1034	0.023	0.40	18	0.29		
MS	-220	220	20000	1380	25000	1723	0.021	0.34	14	0.22				
100 psi/7 bar	Single 0.75 hp		-14	16	1500	103	1500	103	0.9	14.7	428	7.01		
			-30	34	3200	221	3200	221	0.43	7.0	204	3.35		
			-37	42	3800	262	3800	262	0.35	5.7	166	2.72		
			-55	63	6000	414	6000	414	0.22	3.6	105	1.71		
			-100	114	10600	731	10600	731	0.13	2.0	62	1.01		
150 psi/10.5 bar	Single 1.5 hp	DSTV	-1.5	1.6	240	17	300	21	31.90	513	5104	83.6		
		ATV, DTN, DTV	-4	4.6	690	48	1200	83	20.00	328	3200	52.4		
		AW, ASF, DSF, DSTV	-810	11.5	1600	110	1600	110	4.05	66.4	1215	19.9		
			-815	17	2400	165	2400	165	2.70	44.3	810	13.3		
			-25	29	4000	276	4000	276	1.62	26.6	486	8.0		
			-35	40	5700	393	5700	393	1.16	19.0	348	5.7		
			-60	69	9800	676	9800	676	0.67	11.0	201	3.3		
			-100	115	15000	1034	16500	1138	0.41	6.7	123	2.0		
			-150	173	15000	1034	20000	1379	0.27	4.5	81	1.3		
			-151	173	25000	1724	25000	1724	0.27	4.5	81	1.3		
		HF, HSF, DSHF	-225	260	30000	2069	37000	2552	0.18	3.0	41	0.7		
			-300	345	30000	2069	50000	3448	0.14	2.3	32	0.5		
			-450	533	45000	3103	45000	3103	0.0	1.5	20	0.3		
		150 psi/10.5 bar	Double 2 hp	ATV	-8	9.2	850	59	1200	83	20	328	3200	52.4
					-822	23	3200	221	3200	221	4.05	66.4	1215	19.9
	-832			34	4800	331	4800	331	2.70	44.3	810	13.3		
AW, ASF, DSF, DSTV	-52			57	5000	345	8000	552	1.62	26.6	486	8.0		
	-72			80	11000	759	11000	759	1.16	19.0	348	5.7		
	-122			138	15000	1034	19000	1310	0.67	11.0	201	3.3		
HF, HSF, DSHF	-202			230	30000	2069	33000	2276	0.41	6.7	92	1.5		
	-302			346	30000	2069	50000	3448	0.27	4.5	61	1.0		
	-452			520	30000	2069	70000	4828	0.18	3.0	41	0.7		
DSXHF	-602			690	30000	2069	75000	5172	0.14	2.3	32	0.5		
100 psi/7 bar	Triple 2 hp	DXHF, DSXHF	-683	780	30000	2069	70000	4828	0.18	3.0	25	0.41		
			-903	1038	30000	2069	75000	5172	0.14	2.3	20	0.33		
		DSXHW	-1373	1575	30000	2069	100000	6897	0.086	1.4	12	0.197		
150 psi/10.5 bar	3 hp	AFD-DFD-ASFD-DSFD	-860	69	6500	448	6500	448	1.34	2.2	369	6.0		
		ASFD	-10	11.5	1600	110	1600	110	8.10	133	1823	29.9		
			-15	17	2400	165	2400	165	5.40	89	1215	19.9		
			-25	29	4000	276	4000	276	3.24	53.6	729	11.9		
			-35	40	5700	393	5700	393	2.32	38.0	522	8.6		
			-60	69	9800	676	9800	676	1.34	22.0	302	4.9		
			-100	115	15000	1034	16500	1138	0.82	13.4	185	3.0		
			-150	173	15000	1034	20000	1379	0.54	9.0	122	2.0		
			-202	230	30000	2069	33000	2276	0.82	13.4	144	2.4		
		GWD, GSFD, DGSFD, DGSTVD	-12	14.8	1850	128	4000	276	15.9	260	5009	82.1		
			-35	40.3	4375	302	4375	302	6.0	98	1890	31.0		
			-60	69	7500	517	7500	517	3.5	57	1103	18.1		
-100	115		8000	552	10000	690	2.1	34	662	10.8				
125 psi/8.6 bar	8 hp	8SFD, 8DSFD, 8DSTVD	-25	27.5	3575	246	4000	276	14.0	229	2660	43.5		
		8SFD	-40	43.5	6000	414	6000	414	8.90	145	1691	28.0		
			-65	73	10000	690	10000	690	5.40	88	1026	17.0		
		8DSFD	-100	112	10000	690	10000	690	3.52	58	669	11.0		
		8HSFD	-225	253	25000	1724	25000	1724	1.56	26	296	5.0		
		8SFD2 (Double Air Drive Piston Models)	-55	55	5500	379	7200	497	14.14	232	1900	31.1		
			-88	88	8800	607	10000	690	8.84	145	1182	19.36		
			-224	225	25000	1724	25000	1724	3.53	58	476	7.6		
10 hp	D14STD, D14SFD	-125	138	16000	1103	16000	1103	8.80	144.2	704	11.5			
		-315	347	36000	2483	36000	2483	3.50	57.4	280	4.6			

Typical Performance using 100 psi (7 bar) Air drive							
Outlet Pressure		Outlet Flow		Outlet Pressure		Outlet Flow	
psi	bar	cu in/min	l/min	psi	bar	cu in/min	l/min
225	15.5	500	8.20	415	29	249	4.09
300	21	350	5.70	600	41	160	2.6
700	48	200	3.28	1125	78	100	1.64
1500	103	90	1.48	2000	138	48.9	0.8
1700	117	70	1.15	3100	214	39.6	0.65
2450	169	tbd	tbd	4500	310	tbd	tbd
3000	207	40	0.64	6000	414	19	0.31
7500	517	20	0.33	10000	690	8.5	0.14
5000	345	18	0.30	10000	690	14	0.23
5000	345	18	0.30	10000	690	14	0.23
7500	517	15	0.24	15000	1034	12	0.2
700	48	400	6.55	1450	100	61	1.00
1500	103	200	3.28	3000	207	62	1.00
1750	121	170	2.78	3500	241	82	1.33
2000	138	110	1.80	5000	345	66	1.08
5000	345	57	0.93	10000	690	26	0.43
50	3	5000	81.9	150	10	1000	16.4
100	7	1953	32	400	28	750	12.3
400	28	1000	16.4	990	68	500	8.19
750	52	598	9.8	1600	110	200	3.28
1000	69	403	6.5	2500	172	195	3.2
2000	138	350	4.1	3600	248	98	1.6
3000	207	152	2.5	6200	427	50	0.82
4000	276	100	1.64	10000	690	24.4	0.4
7000	483	59.7	0.98	15000	1034	29.9	0.49
7000	483	59.7	0.98	15000	1034	29.9	0.49
7500	517	39.6	0.65	24000	1655	9.8	0.16
15000	1034	29.9	0.49	27000	1862	20.1	0.33
36000	2483	14.6	0.24	45000	3103	9.2	0.15
200	14	1953	32	800	28	750	12.3
400	28	799	13.1	2100	145	200	3.28
700	48	500	8.2	3000	207	152	2.50
1900	131	299	4.9	5000	345	98	1.60
2000	138	226	3.7	7500	517	50	0.82
4000	276	122	2.0	12000	828	40.2	0.66
7000	483	91.5	1.5	20000	1379	20.1	0.33
10000	690	45.2	0.7	30000	2069	15.2	0.25
10000	690	34.8	0.6	40000	2759	15.2	0.25
15000	1034	24.4	0.4	50000	3448	12.2	0.2
15000	1034	19.5	0.32	60000	4138	4.9	0.08
15000	1034	15.9	0.26	70000	4828	5.5	0.09
16000	1103	9.2	0.15	90000	6207	3.1	0.05
1000	69	348	5.7	5500	379	152	2.5
500	34	1520	24.9	1000	69	380	6.22
750	52	1030	16.9	1500	103	260	4.26
1000	69	662	10.9	2500	172	162	2.66
1500	1034	465	7.6	3500	248	100	1.64
3000	138	248	4.1	6000	414	56	0.92
5000	345	151	2.5	10000	690	41	0.67
7500	517	103	2.0	15000	1034	27	0.44
10000	690	63	1.0	20000	1379	47	0.77
200	14	5004	82	1200	83	1454	24
1000	69	1770	29	3500	241	600	9.8
2000	138	976	16	5500	379	397	6.5
2000	138	573	9.4	10000	690	195	3.2
1000	69	2400	39.3	2500	172	280	4.6
2000	138	1420	23.2	4000	276	200	3.27
3000	207	880	14.4	6000	414	310	5.08
5000	345	555	9.1	10000	690	163	2.67
10000	690	270	4.4	20000	1379	144	2.36
2500	172	1230	20.1	4000	276	675	11
4000	276	850	13.9	5000	345	800	13.1
10000	690	315	5.2	18500	1276	140	2.3
8000	552	488	8.0	12000	828	195	3.2
15000	1034	238	3.9	30000	2069	79.3	1.3

Pump Selection Information

All Haskel pumps are identified by letters coding the type of pump, followed by a number indicating the practical working ratio of the drive area to the hydraulic plunger area. These letters are explained in the chart below.

Pump Model Letter Coding

M	.875" stroke .33 hp miniature pump series
S	Stainless steel hydraulic piston and body
29723	.33 hp Chemical Pump
D (Prefix)	Pump incorporates a Distance Piece
D (Suffix)	Double Acting pump
4B	1" stroke .75 hp pump series (bottom inlet only)
A	2" stroke 1.5 + 2 hp pump series
H	2" stroke 1.5 + 2 hp High Pressure pump series
XH	2" stroke 1.5 + 2 hp Extreme High Pressure pump series
G	4.5" stroke 6 hp pump series
B	4.5" stroke 8 hp pump or booster series
14	4" stroke 10 hp pump series
W	Polyurethane U-cup dynamic seal
F	UHMWPE (Ultra-high Molecular Weight Polyethylene Dynamic Seal
T	Reinforced Teflon® dynamic seal
V	Viton® o-ring static seal



Guidelines for 24/7 Continuous Duty Applications for Maximizing Seal Life Performance

Pump Series	Maximum Cycles per Minute
0.3 hp	90 cpm
0.75 hp	80 cpm
1.5, 2.0 and 2.2 hp (Single and Double Drive Piston)	60 cpm
2.0 hp (Triple Drive Piston)	60 cpm
3.0 hp	60 cpm
6.0 hp	40 cpm
8.0 hp	40 cpm
10.0 hp	40 cpm

.33 hp (.25 kW) M Series Pump Models



Key Features

- Choice of 6 models, 9 ratios, 27 possible combinations
- Flows to 2 gpm (7.5 l/min)
- Choice of wetted materials
- Single air head
- Drive pressure 25 to 125 psi (1.8 to 9 bar)
- Pressures to 25,000 psi (1724 bar)
- All Hydraulic fluids, water (plain or DI), solvents, mild chemicals, liquefied gases

Optional Modifications

Number	Description
-HP	Hand pump attachment (with handle). Provides manual operation of pump for precision pressure control or use without air power
26220-2	Hand pump attachment kit.
29002	Viton air drive.
51331	EPR seals for liquid section for 29723-XX ratio pumps.
51788	Piped exhaust – standard. Provides connection ports for drive and pilot exhausts. Enables under tank top mounting and/or natural gas drive.
51794	Piped exhaust – sour gas. With hand pump (HP).
51794-2	Piped exhaust – sour gas. Without hand pump (HP).
53175	Level II cleaning.
53304	High pressure outlet port. Fits ¼" O.D. high pressure threaded and coned tube.
53935	Low temperature drive. Enables operation down to 5°F. Some sacrifice of seal life at normal temperature. M or MS series.
57905	No return spring. Provides improved fill on suction stroke pumping liquefied gases by utilizing the inlet pressure. Only available on M and MS series.
59888	Cycle timer installed.
80103	Noise reduction kit fitted.
82367	SS trim for 1/3 hp drive

Model	Nominal Ratio	Maximum Working Pressure <small>Consult chart on page 6 for more information regarding continuous/intermittent pressures.</small>	Displacement per Cycle
M, MDSTV	-5	625 psi (43 bar)	.83 cu in (13.6 ml)
M, MS	-7	900 psi (62 bar)	.6 cu in (9.8 ml)
	-12	1500 psi (103 bar)	.36 cu in (5.9 ml)
M, MS, 29723*	-21	2600 psi (179 bar)	.2 cu in (3.3 ml)
	-36	4500 psi (310 bar)	.12 cu in (2.0 ml)
	-71	8800 psi (607 bar)	.06 cu in (1.0 ml)
	-110	13500 psi (931 bar)	.039 cu in (0.6 ml)
	-188	15000 psi (1034 bar)	.023 cu in (.4 ml)
MS	-220	25000 psi (1723 bar)	.021 cu in (.34 ml)

*Note: 29723 series rated to 10,000 psi (690 bar) maximum (ratios -110 and -188)

For service codes, see page 17.
For weights and dimensions, see page 18.

.75 hp (.56 kW) Pump Models



Model	Nominal Ratio	Maximum Working Pressure <small>Consult chart on page 6 for more information regarding continuous/intermittent pressures.</small>	Displacement per Cycle
4B	-14	1500 psi (103 bar)	.9 cu in (14.8 ml)
	-30	3200 psi (221 bar)	.43 cu in (7.1 ml)
	-37	3800 psi (262 bar)	.35 cu in (5.7 ml)
	-55	6000 psi (414 bar)	.22 cu in (3.6 ml)
	-100	10600 psi (731 bar)	.13 cu in (2.1 ml)

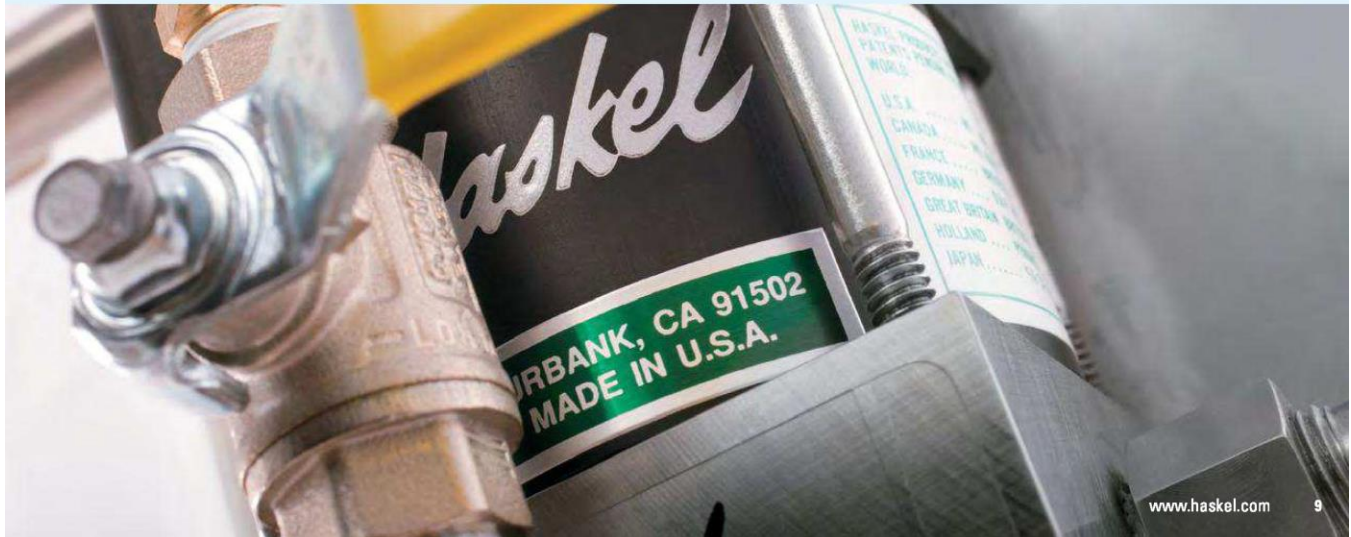
*For service codes, see page 17.
For weights and dimensions, see page 18.*

Key Features

- One model available in 5 ratios
- Output pressures to 10,000 psi (690 bar)
- Flows to 1.5 gpm (5.7 l/min)
- Choice of wetted materials
- Single air head
- Drive pressure 3 psi to 100 psi (.2 to 7 bar)

Optional Modifications

Number	Description
57639	Low drive air pressure. Allows user to regulate drive air to as low as 3 psi (2 bar).
59354	Noise reduction kit fitted.
81575	Changes the "F" seal to a "W" seal. Recommend for use with water.
82104	Viton air drive.



1.5 hp (1.12 kW) Pump Models



Key Features

- Choice of 10 models, 13 ratios, 50 possible combinations
- Output pressures to 50,000 psi (3448 bar)
- Flows to 22 gpm (83.0 l/min)
- Choice of wetted materials
- Single air head
- Drive pressure 3 to 150 ps (.2 to 10 bar)

Optional Modifications

Number	Description
16821	Low air pressure control feature. For operating at air pressures as low as 3 to 4 psi (.2 to .3 bar). Includes 28881 modification. 45 psi minimum pilot air required.
16831	Low temperature modification. For special sealing in air drive for operating temperatures from as low as -20°F up to normal +120°F.
16834	Exhaust adapter. With back pressure balance piston.
27964	Interconnecting inlet-outlet tubing. 1/2" female for 4:1 ratio series pumps (ATV-4 or DTV-4).
28000	Threaded vent (or purge) ports on standard distance piece. Except 1.5:1 ratio.
28881	Air pilot modification. 1/8" NPT. Allows remote start/stop of pump.
29376	Three-way cycling spool. For 1.5 hp and 2 hp single acting pumps, for use with CO2
29702	Single stroke modification.
51050	Extreme service cycling modification. Not recommended for long stall periods.
51056	Exhaust/pilot vent combination.
51331	EPR (Ethylene propylene) static seals in wetted section. Applies to distance piece pumps only.
51345	Sour gas drive provision to N.A.C.E. specifications. 1.5 hp to 2.2 hp distance piece pumps only, single air head and double air head.
52788	Viton seals air drive.
53925	Severe Arctic low temperature service. -25, -35, -60, -100, -150, -151, -225, -300, -450 ratios.
54885	Rotate pump body 90° from standard.
54935	SS trim for 5/3 air drive.
55516	Polyurethane ("W") seal. For F or TV series pumps, except high output models.
59353	Noise reduction kit fitted. Not available on AFD, DFD, ASFD or DSFD.
82460	HNBR seals in air drive section.

Model	Nominal Ratio	Maximum Working Pressure <small>Consult chart on page 6 for more information regarding continuous/intermittent pressures.</small>	Displacement per Cycle
DSTV ⁽¹⁾	-1.5	160 psi (11 bar)	31.9 cu in (513.0 ml)
ATV, DTV ⁽¹⁾⁽²⁾ DTN ⁽¹⁾	-4	1200 psi (83 bar)	20.0 cu in (328.0 ml)
AW, ASF, DSF, DSTV	-B10	1600 psi (110 bar)	4 cu in (66.4 ml)
	-B15	2400 psi (165 bar)	2.7 cu in (44.3 ml)
	-25	4000 psi (276 bar)	1.6 cu in (26.6 ml)
	-35	5700 psi (393 bar)	1.2 cu in (19 ml)
	-60	9800 psi (676 bar)	.7 cu in (11 ml)
ATV	-8	850 psi (59 bar)	20 cu in (328.0 ml)
AW, ASF, DSF, DSTV	-100	16500 psi (1138 bar)	.4 cu in (6.7 ml)
	-150	20000 psi (1375 bar)	.28 cu in (4.5 ml)
HF, HSF, DSHF	-151	25000 psi (1724 bar)	.28 cu in (4.5 ml)
	-225	37000 psi (2551 bar)	.18 cu in (3.0 ml)
	-300	50000 psi (3448 bar)	.14 cu in (2.3 ml)
HF	-450	45000 psi (3403 bar)	.09 cu in (1.5 ml)

(1) These series are "Lift" pumps and maximum outlet pressure is (air drive x pump ratio) + inlet pressure
(2) DTV has poppet checks

*For service codes, see page 17.
For weights and dimensions, see page 20.*

1.5 hp (1.12 kW) High Output Flow Pumps

Available in a choice of 4 models, these high output, low ratio pumps are capable of pressures to 1200 psi (82 bar) and flow rates of up to 22 gpm (83 l/min). These are "lift" pumps whereby the outlet pressure equals the air drive x the pump ratio plus the inlet pressure.

Model DSTV-1.5 has a maximum air drive of 150 psi (10 bar) and is capable of pressures up to 160 psi (11 bar). The model ATV, DTN-4 and DTV-4 work on a maximum air drive of 150 psi (10 bar) and have a maximum intermittent pressure rating of 1200 psi (83 bar). A noise reduction modification is available for applications where noise level is an issue.

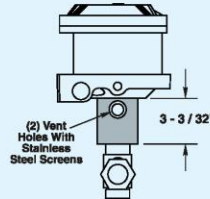
Distance Piece (Separation)

Pumps with prefix "D" in the model number have aluminum distance piece between the air drive and pump section (except DSTV-1.5).

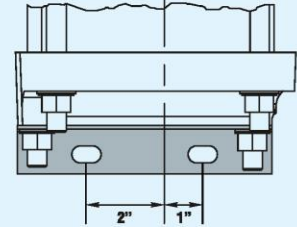
Mounting Brackets

All series mounting brackets have 7/16" holes (slots) for 3/8" bolts. Upper mounting brackets are not furnished as standard on single air head non-distance piece units.

Dimensional Data



Mounting Brackets



2 & 2.2 hp (1.49 & 1.64 kW) Pump Models



Key Features

- Choice of 16 models, 13 ratios, 46 possible combinations
- Choice of wetted materials
- Output pressures to 100000 psi (7000 bar)
- Flows to 5 gpm (15 l/min)
- Double and triple air heads
- Drive pressure 3 to 100 psi (.2 to 7 bar)

When using high pressure ratio pumps the reliability of the XH models (-452 through -1373) will be improved with an air driven supercharge pump, not only to simplify priming but to reduce fatigue stresses. The higher the supercharge, the better the results. Also install a relief valve to protect the lower pressure pump from potential back pressure. Supercharging of the -1373 model is recommended. This approach will ensure a reasonable life for the seals and other wear components.

Model	Nominal Ratio	Maximum Working Pressure <small>Consult chart on page 6 for more information regarding continuous/intermittent pressures.</small>	Displacement per Cycle
AW, ASF, DSF, DSTV	-B22	3200 psi (221 bar)	4 cu in (66.4 ml)
	-B32	4800 psi (331 bar)	2.7 cu in (44.3 ml)
	-52	8000 psi (552 bar)	1.6 cu in (26.6 ml)
	-72	11000 psi (758 bar)	1.2 cu in (19 ml)
	-122	19000 psi (1310 bar)	.7 cu in (11 ml)
HF, HSF, DSHF	-202	33000 psi (2275 bar)	.4 cu in (6.7 ml)
	-302	50000 psi (3448 bar)	.28 cu in (4.5 ml)
DSXHF	-452	70000 psi (4827 bar)	.18 cu in (3.0 ml)
	-602	75000 psi (5171 bar)	.14 cu in (2.3 ml)
DSXHF	-683	70000 psi (4827 bar)	.18 cu in (3.0 ml)
	-903	75000 psi (5171 bar)	.14 cu in (2.3 ml)
DSXHW	-1373	100000 psi (6895 bar)	.09 cu in (1.4 ml)
AFD, DSFD, DFD, ASFD	-B60	6500 psi (448 bar)	1.3 cu in (22 ml)

For service codes, see page 17.
For weights and dimensions, see page 20.

3 hp (2.24 kW) Pump Models



Key Features

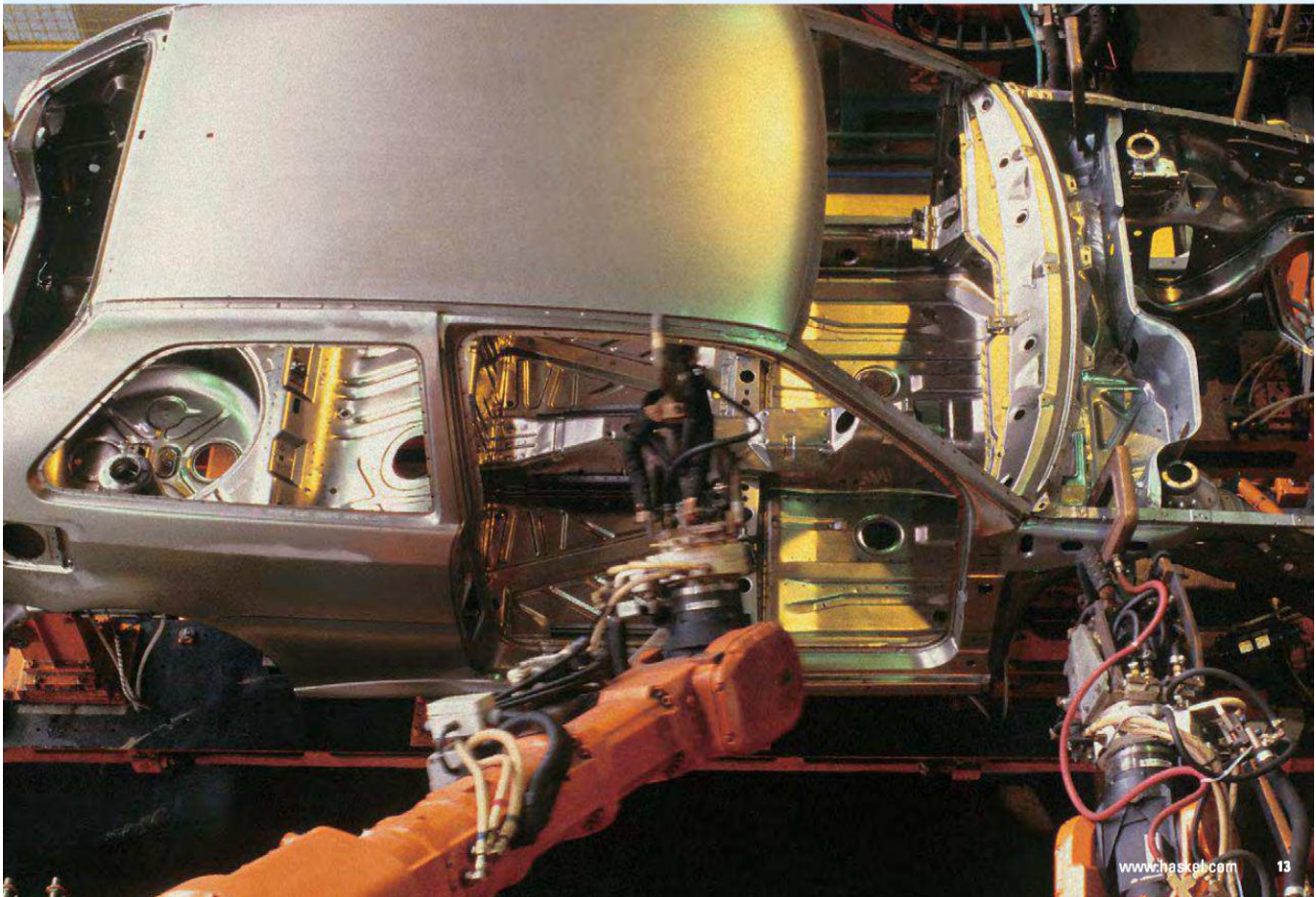
- One model available in 8 ratios
- Output pressures to 33000 psi (2275 bar)
- Flow rates to 8 gpm (30 l/min)
- Single air head
- Drive pressure 3 to 150 psi (.2 to 10 bar)

Model	Nominal Ratio	Maximum Working Pressure <small>Consult chart on page 6 for more information regarding continuous/intermittent pressures.</small>	Displacement per Cycle
ASFD	10	1600 psi (110 bar)	8.1 cu in (132.8 ml)
	15	2400 psi (165 bar)	5.4 cu in (88.6 ml)
	25	4000 psi (276 bar)	3.3 cu in (53.2 ml)
	35	5700 psi (393 bar)	2.3 cu in (38 ml)
	60	9800 psi (676 bar)	1.3 cu in (22 ml)
	100	16500 psi (1138 bar)	.8 cu in (13.4 ml)
	150	20000 psi (1379 bar)	.6 cu in (9 ml)
	202	33000 psi (2275 bar)	.8 cu in (13.4 ml)

For service codes, see page 17.
For weights and dimensions, see page 21.

Optional Modifications (for 2 hp, 2.2 hp and 3 hp pump models)

Number	Description
16821	Assures reliable drive operation with pressures low as 3 psi as long as 20 psi or more is provided to the separate 1/8" NPT port.
16831	Low temperature modification. For special sealing in air drive for operating temperatures from as low as -20°F up to normal +120°F.
16834	Exhaust adapter. With back pressure balance piston.
29376	Three-way cycling spool. For 1.5 hp and 2 hp single acting pumps.
51050	Extreme service cycling modification. Not recommended for long stall periods.
51056	Exhaust/pilot vent combination.
51331	EPR (Ethylene propylene) static seals in wetted section. Applies to distance piece pumps only.
51345	Sour gas drive provision to N.A.C.E. specifications. 1.5 hp to 2.2 hp distance piece pumps only, single air head and double air head.
52788	Viton seals. Air drive only - 1.5 hp to 2.2 hp pumps only.
53925-4	Severe Arctic low temperature service. -10, -15, -22, -32
54885	Rotate pump body 90° from standard. Except 3 hp pump.
54935	SS trim for 5/3 air drive.
55516	Polyurethane ("W") seal. For F or TV series pumps, except high output models.
59353	Noise reduction kit fitted. Not available on AFD, DFD, ASFD or DSFD.
55465	Ceramic Plunger -60 Ratio.
55516	Polyurethane "W" seal in "F" series pumps-except high output models.
59353	Noise reduction kit fitted. Not available on AFD, DFD, ASFD or DSFD.
59888	Cycle timer installed.
82460	HNBR Seals in air drive section.



6 hp (4.47 kW) Pump Models



Key Features

- Choice of 10 models, 4 ratios, 20 possible combinations
- Output pressures to 10,000 psi (690 bar)
- Flow rates to 21 gpm (80 l/min)
- Choice of wetted materials
- Single air head – double acting
- Drive pressure 3 to 125 psi (.2 to 9 bar)
- All hydraulic fluids, water (plain or DI), solvents

Model	Nominal Ratio	Maximum Working Pressure <small>Consult chart on page 6 for more information regarding continuous/intermittent pressures.</small>	Displacement per Cycle
GWD, GSFD, DGSFD ⁽¹⁾ , DGSTVD ⁽¹⁾	-12	4000 psi (276 bar)	15.9 cu in (260 ml)
GW, GSF, DGSF, DGSTV	-35 -60 -100	4375 psi (302 bar) 7500 psi (517 bar) 10000 psi (690 bar)	6.0 cu in (98 ml) 3.5 cu in (57 ml) 2.1 cu in (34.5 ml)

(1) Double Acting "Lift" Pumps

*For service codes, see page 17.
For weights and dimensions, see page 22.*

Incorporating 10 models, this heavy duty range of double acting pumps provide pressures up to 10,000 psi (690 bar) and flow rates up to 4 gpm (15 l/min).

Designed to operate with air drive pressures between 40 and 125 psi (2.8 and 9 bar). For drive pressures 3 to 40 psi (.2 to 2.8 bar), order 51875-1 mod.

8 hp (5.97 kW) Pump Models



Key Features

- Choice of 9 models, 8 ratios, 9 possible combinations
- Pressures to 30,000 psi (2068 bar)
- Flow rates to 11.5 gpm (44 l/min)
- All hydraulic fluids, water (plain or DI), solvents, liquefied gases
- Choice of wetted materials
- Single air head – double acting
- Drive pressure 3 to 125 psi (.2 to 9 bar)

Model	Nominal Ratio	Maximum Working Pressure <small>Consult chart on page 6 for more information regarding continuous/intermittent pressures.</small>	Displacement per Cycle
8SFD, 8DSFD, 8DSTVD 8FD	-25 ⁽¹⁾	4000 psi (276 bar)	14 cu in (229 ml)
8SFD	-40 -65	6000 psi (408 bar) 10000 psi (690 bar)	9 cu in (145.3 ml) 5.4 cu in (88.2 ml)
8DSFD	-100 ⁽¹⁾	10000 psi (690 bar)	3.5 cu in (57.5 ml)
8SFD2 ⁽¹⁾	-55 -88 -224	7200 psi (496 bar) 10000 psi (786 bar) 29000 psi (1724 bar)	14 cu in (229 ml) 8.83 cu in (144 ml) 3.5 cu in (57 ml)
8HSFD	-225 ⁽¹⁾	25000 psi (1724 bar)	1.8 cu in (25.5 ml)

(1) Double Acting "Lift" Pumps

*For service codes, see page 17.
For weights and dimensions, see page 21.*

10 hp (7.46 kW) Pump Models



Key Features

- Choice of 4 models, 4 ratios, 4 possible combinations
- Pressures to 36000 psi (2500 bar)
- Flow rates to 3 gpm (11 l/min)
- Drive pressure 3 to 125 psi (.2 to 9 bar)
- All hydraulic fluids, water (plain or DI), solvents, liquefied gases
- Choice of wetted materials

Optional Modifications (for 6 hp, 8 hp and 10 hp pump)

Number	Description
29125	External pilot modification – for 6 hp thru 10 hp pumps.
87410	Low air pressure control – for 6 hp thru 10 hp pumps.
54030	Sour gas air drive provision to NACE spec. 6 hp distance piece pumps only.
54936	Exhaust/pilot vent combiner.
57002	Viton seals – air drive only – 6 hp
57944	Viton seals – air drive only – 8 hp
59888	Cycle timer installed.

Model	Nominal Ratio	Maximum Working Pressure		Displacement per Cycle
		Consult chart on page 6 for more information regarding continuous/intermittent pressures.		
D14STD	125 ⁽¹⁾	16000 psi (1103 bar)	8.8 cu in (144.2 ml)	
	315 ⁽¹⁾	36000 psi (2482 bar)	3.5 cu in (57.4 ml)	
D14SFD	125 ⁽¹⁾	16000 psi (1103 bar)	8.8 cu in (144.2 ml)	
	315 ⁽¹⁾	36000 psi (2482 bar)	3.5 cu in (57.4 ml)	

(1) Double Acting "Lift" Pumps

For service codes, see page 17.
For weights and dimensions, see page 21.

Incorporating two basic models, this heavy duty range of double acting pumps provide pressures up to 36000 psi (2482 bar) and output flow rate up to 3 gpm (11 l/min).

Operating from a maximum air drive pressure of 125 psi (9 bar), these pumps are designed for medium to high pressure service with minimum maintenance.

These large, slow speed pumps approach a seal life as high as 5 times that of many smaller pumps and this advantage becomes ever greater in heavy duty service involving water, or other liquids with negligible lubricity.



Power System Specialists

World safety standards and quality demands are rising. Component manufacturers are required to provide test certification and product quality assurance which can only be determined using the types of systems which Haskel can provide. Typically, we have built systems for production and field testing the proof, leak, and burst aspects of hoses, cylinders, and valves.

These systems can be portable, mobile, or static test rigs. We also offer a range of standard pressure packs used for power jacking, clamping, and other applications where reliable power is needed.

Selecting Your Accessories

Haskel can either provide accessories separately or supply them fitted to form a complete package suited to your application. Additionally, Haskel can fit customer nominated accessories. Our accessories catalog is available and our technical support team is always ready to advise you on the most suitable choice of accessories for your application.

- Air pilot switches
- Air pilot valves
- Regulating relief valves
- Directional control and release valves
- Hydraulic accumulators, gas receivers and storage cylinders
- High pressure valves, fittings and tubing
- Plenum chambers
- Port adapters
- Gauge snubbers
- Filters
- Stainless steel check valves
- Intensifiers with integral checks for cycling
- Capillary type gauge snubbers



Quality and After-Sale Service

Haskel meets the requirements of international quality assurance ISO 9001. Build quality is matched by an innovative design and problem solving ability which stems from years of experience. Our representatives around the world are carefully chosen and trained to help you arrive at a correct product choice, and to offer a maintenance and parts service that is second to none.

Please ask for your copy of our latest accessories brochure.



Liquids Compatible with Haskel Pumps

To assist in easier pump selection, we have classified various popular liquids in groups and assigned to each group a service code. These service code numbers are featured in the chart to the right and are designated for each pump series. Seals and other wetted materials can be supplied to suit your preferred liquid. For advice, please contact our technical services personnel at 818-843-4000.

Services

Service Codes

- 1** Petroleum-based oils, kerosene, ethylene glycol, water with 5% soluble oil.
- 2** Plain water, diesel fuel.
- 3** Most phosphate ester-based fire-resistant hydraulic fluids, e.g. Pydraul, Lindol, Cellulube, Fyrquel, and Houghtosafe 1120 and petroleum-based solvents compatible with UHMWPE (Ultra-high Molecular Weight Polyethylene) dynamic seals and Viton static seals.
- 4** Petroleum-based solvents, e.g. aromatic hydrocarbons (benzene, toluene, xylene, hylene, etc.); chlorinated solvents (trichlorethylene, carbon tetrachloride, chlorobenzene, etc.); mercaptans, Dowtherm A, fluorinated solvents (fluorobenzene, fluorochlorethylene, etc.); Dowtherm E, plus all of Group 3 and some mildly corrosive acids compatible with wetted materials. See note 5A for service with methyl-ethyl-ketone, methyl acetone, diacetone, alcohol and freon 22.
- 5** Skydrol and Aerosafe hydraulic fluid; acetone and some alcohols (ethyl, methyl, and isopropyl).
5A. Also suitable for these fluids if Viton static seals are replaced with EPR; specify modification number 51331 (no extra charge); e.g., 51331-MDTV-5. Most phosphate ester-based fluids solidify at approximately 30000 psi.
- 6** Deionized water; demineralized water.

Note: Dynamic seal life with non-lubricating fluids will understandably be less than with lubricating types.

Operating Temperatures

Drive Section

-4° (25°F) to +65°C (150°F) (low temperature seals are available for Arctic operation).

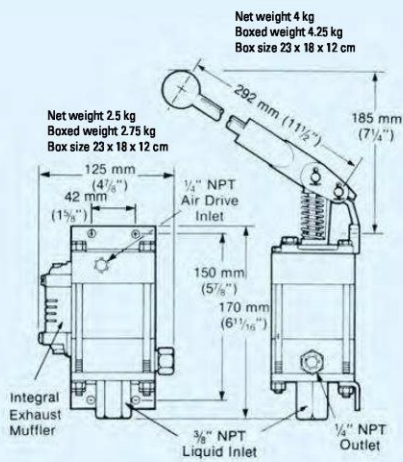
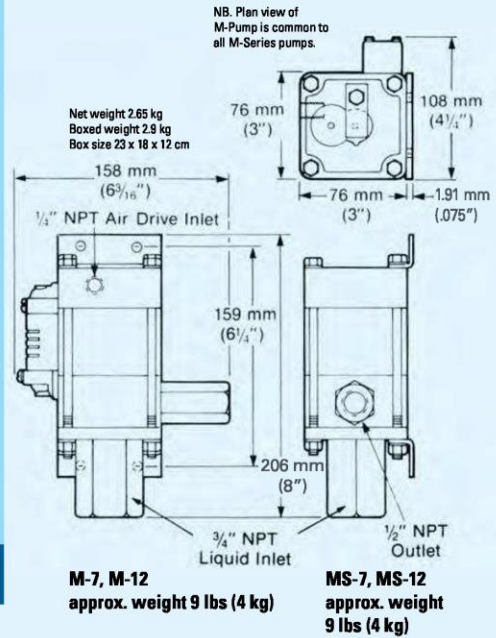
Liquid Section

For reasonable seal life, high temperature should be limited to 54° C (130° F), for F and W seal models, 135° C (275° F) for T and TV models (with distance piece).

		Services					
hp	Model	1	2	3	4	5	6
.33	M	•					
	MS	•	•				•
	MDSTV	•	•	•	•	•	•
	29723	•	•	•		•	•
.75	4B -14 to -37	•	•				•
	4B -55 to -100	•	•				•
1.5 2 2.2	AW	•					
	ASF	•	•				•
	DSF	•	•	•		•	•
	HF	•	•				
	HSF	•	•				•
	DSHF	•	•			•	•
	DSTV	•	•	•	•	•	•
	ATV	•	•	•			•
	DTV	•	•			•	•
	DSTV-1.5	•	•	•	•	•	•
	AFD	•		•			
	DFD	•		•		•	
	ASFD	•	•				•
	DSFD	•	•	•		•	•
DSXHF	•	•			•	•	
DSXHW	•	•				•	
3	ASFD	•	•				•
6	GW	•					•
	GSF	•	•				•
	DGSF	•	•	•		•	•
	DGSTV	•	•	•	•	•	•
	GWd	•					
	GSFD	•	•	•		•	•
	DGFD	•	•	•		•	•
	DGSFD	•	•	•	•	•	•
DGSTVD	•	•	•	•	•	•	
8	8FD	•					•
	8SFD	•	•	•	•	•	•
	8SFD2	•	•	•	•	•	•
	8DSFD	•	•	•		•	•
	8DSTVD	•	•	•		•	•
	8HSFD	•	•	•	•	•	•
10	D14STD-125	•	•	•	•	•	•
	D14STD-315	•	•	•	•	•	•
	D14SFD-125	•	•	•		•	•
	D14SFD-315	•	•	•		•	•

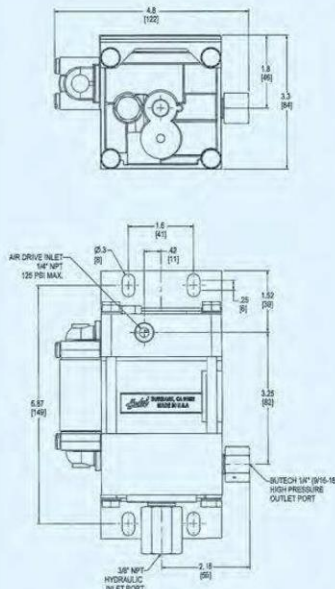
Weights and Dimensions

.33 hp (.25 kW) M Series Pump Models

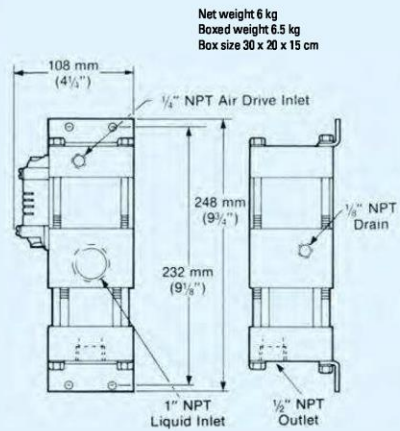


MS-21, MS-36, MS-71, MS-110, MS-188, approx. weight 6 lbs (2.7 kg)

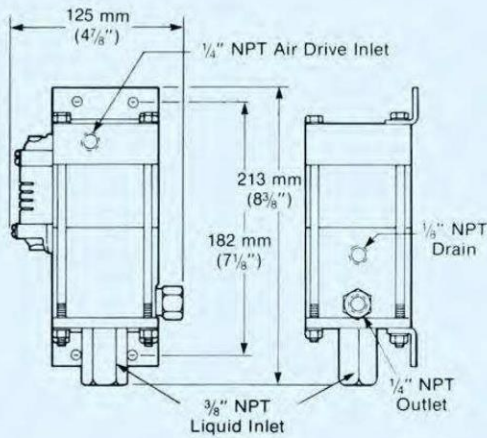
M-21, M-36, M-71, M-110, M-188 approx. weight 6 lbs (2.7 kg)



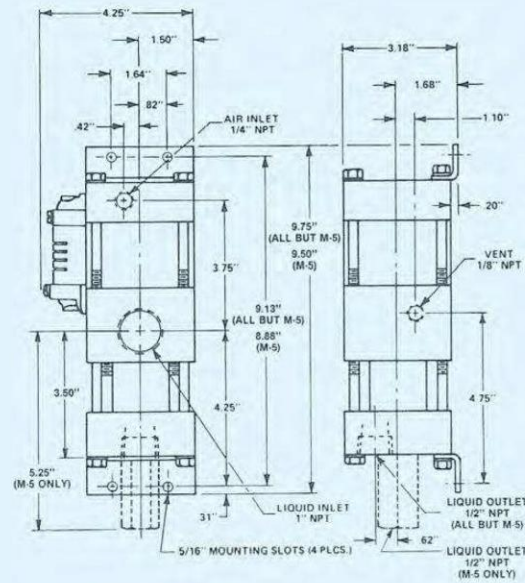
MS-220 approx. weight 6 lbs (2.7 kg)



M-5 approx. weight 9 lbs (4 kg)

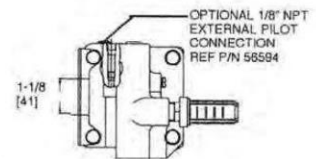
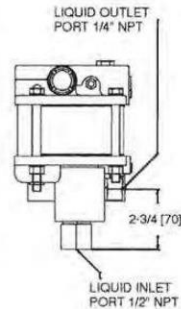
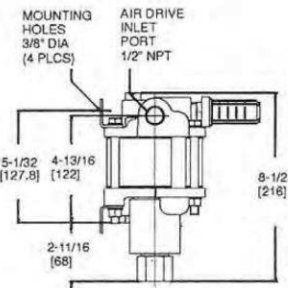
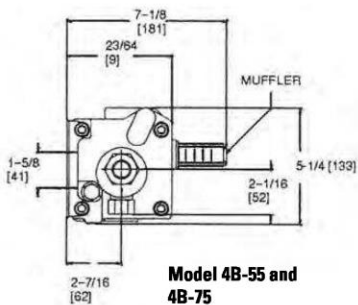
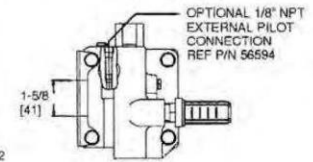
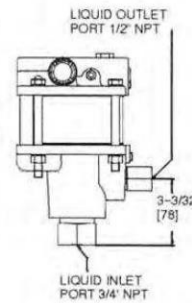
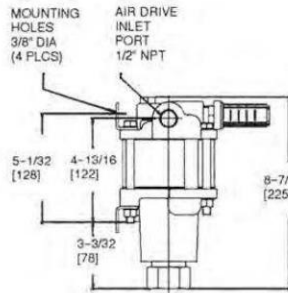
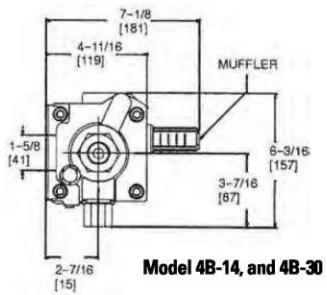


29723-21, 29723-36, 29723-71, 29723-110
approx. weight 6.5 lbs (3 kg)

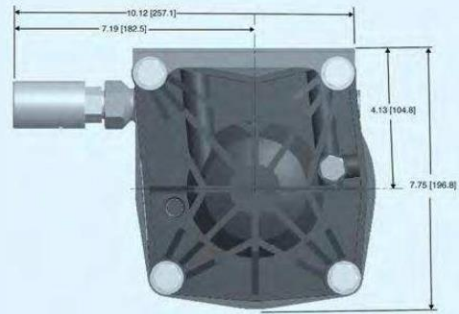
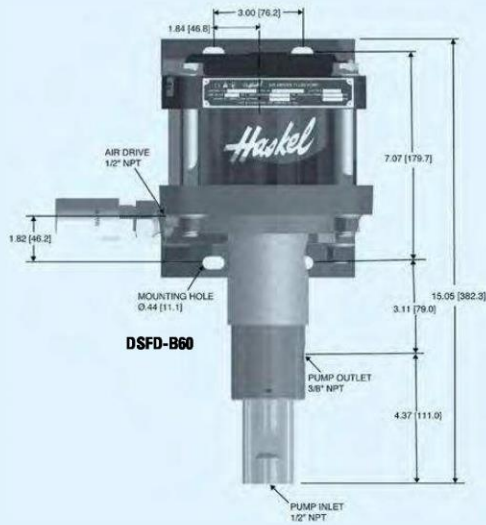


MDSTV-5, MDTV
Approx weight 15 1/2 lbs (7 kg)

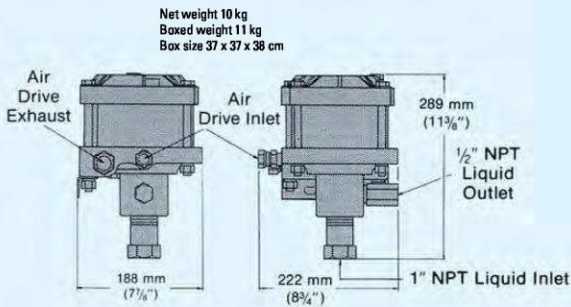
.75 hp (.56 kW) Pump Models



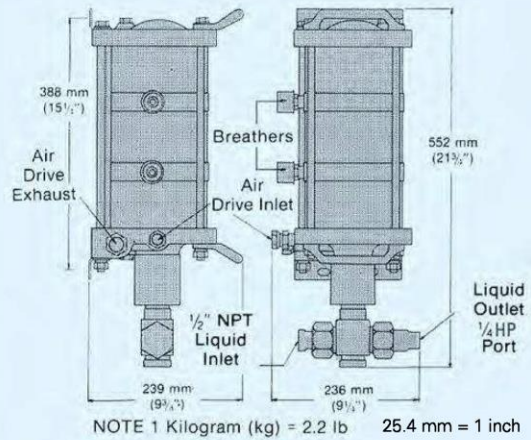
1.5 hp, 2 & 2.2 hp (1.12, 1.49 & 1.64 kW) Pump Models



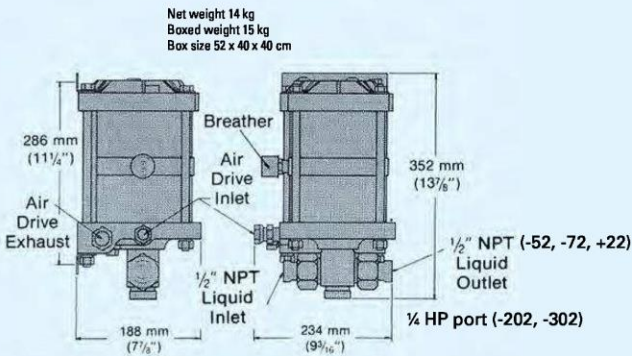
Net weight 18 kg
 Boxed weight 20 kg
 Box size 68 x 42 x 50 cm



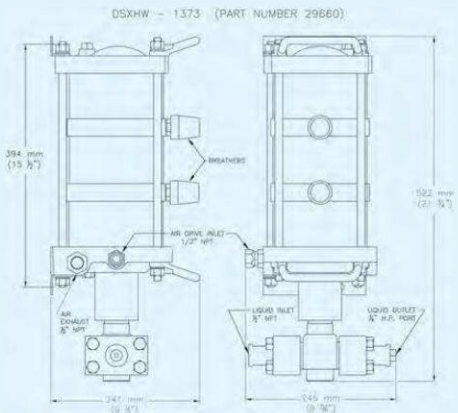
**1.5 and 2 hp low ratio pumps;
 -B10 and -B15 ratios**



**2 hp high ratio pumps;
 -683 and -903 ratios**

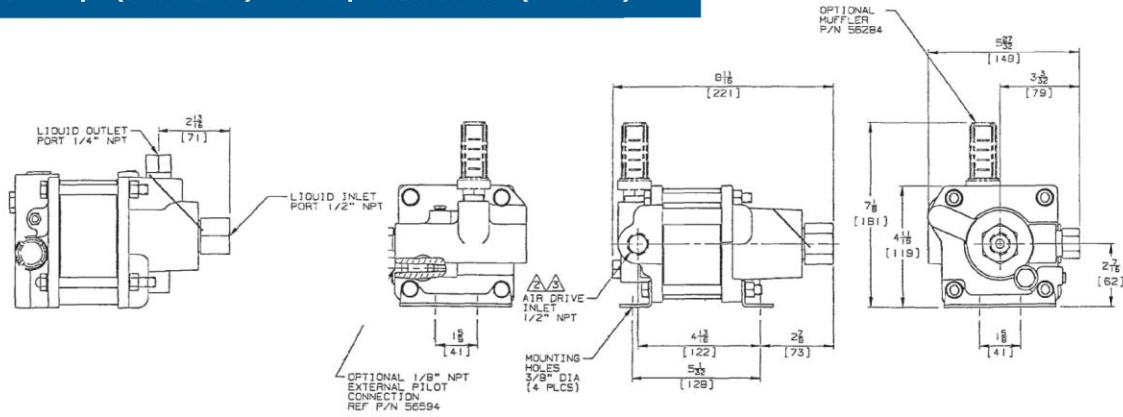


**1.5 and 2 hp medium ratio pumps;
 -52, -72, -122, -202 and -302 ratios**

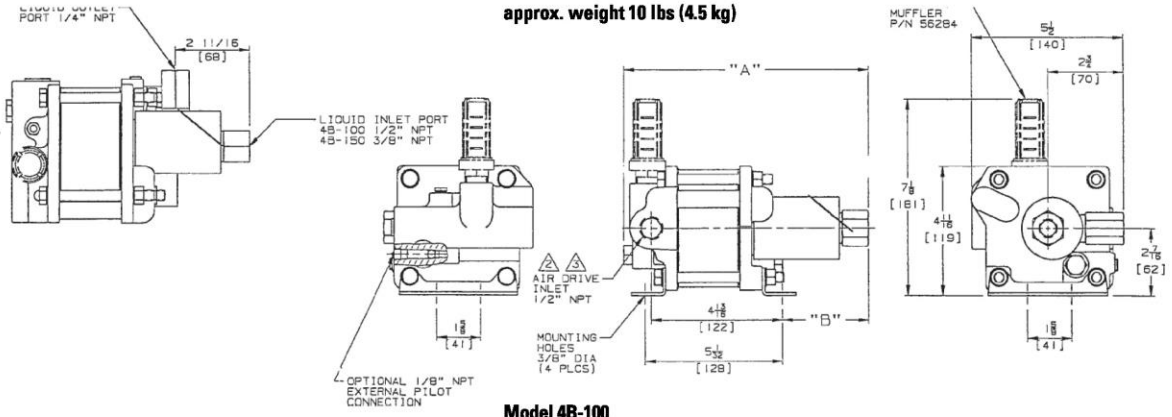


**2 hp (1.49 & 1.64 kW) Pump Models;
 -1373 ratio**

.75 hp (.56 kW) Pump Models (cont.)

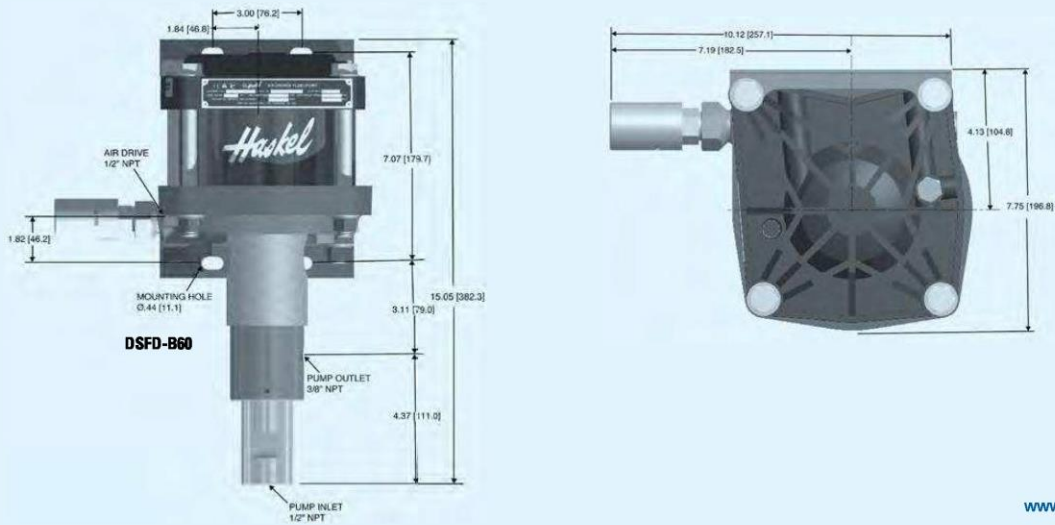


Model 4B-37
approx. weight 10 lbs (4.5 kg)

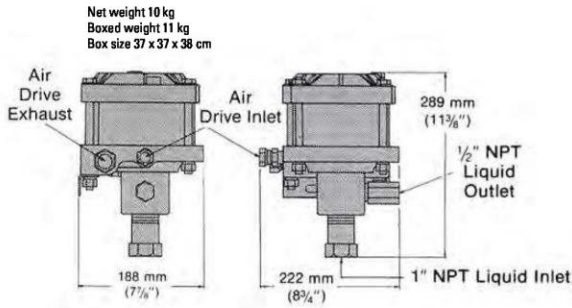


Model 4B-100
approx. weight 11 lbs (5 kg)

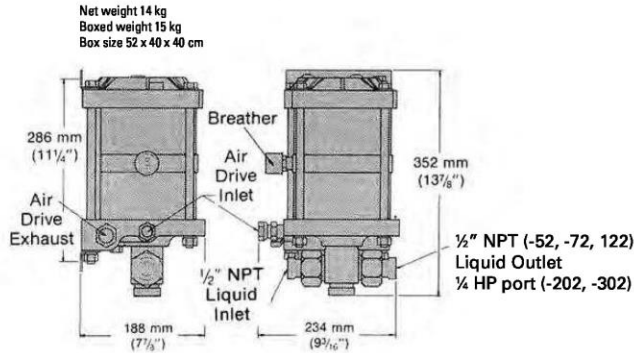
1.5 hp, 2&2.2 hp (1.12, 1.49 & 1.64 kW) Pump Models



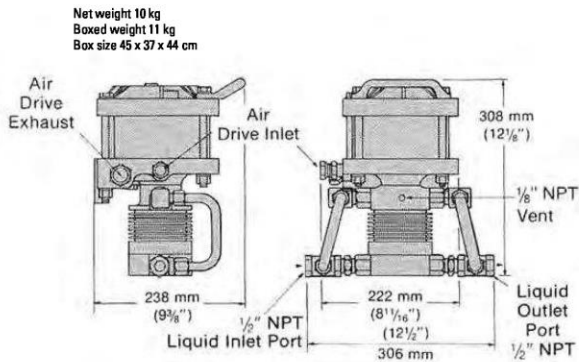
1.5 hp, 2&2.2 hp (1.12, 1.49 & 1.64 kW) Pump Models (cont.)



**1.5 and 2 hp low ratio pumps;
-B10 and -B15 ratios**

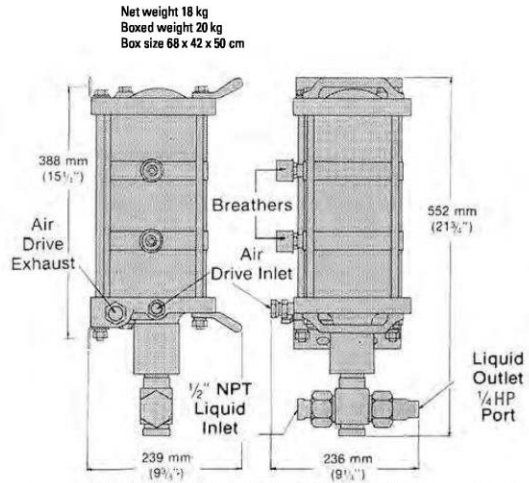


**1.5 and 2 hp medium ratio pumps;
-52, -72, -122, -202 and -302 ratios**



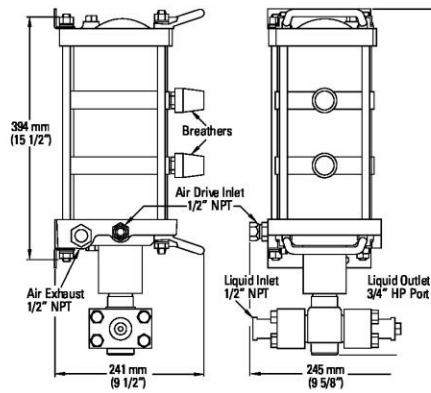
ATV-4 pumps; double acting, high output

Note: For model DTV-4, add distance piece dimension from page 11. Interconnecting inlet and outlet port tubing shown.

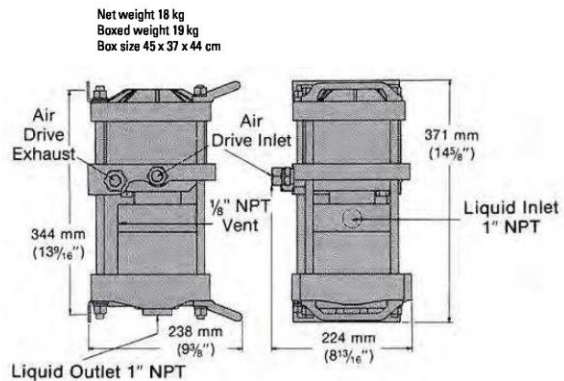


NOTE 1 Kilogram (kg) = 2.2 lb 25.4 mm = 1 inch

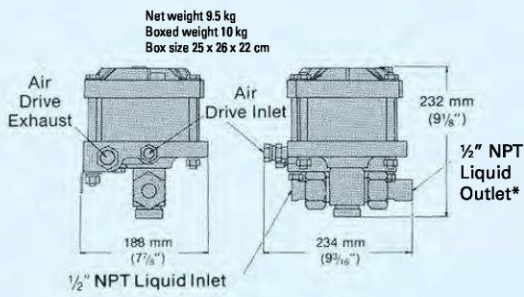
**2 hp high ratio pumps;
-683 and -903 ratios**



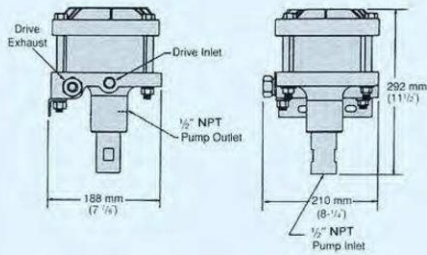
**2 hp (1.49 & 1.64 kW) pump models;
-1373 ratio**



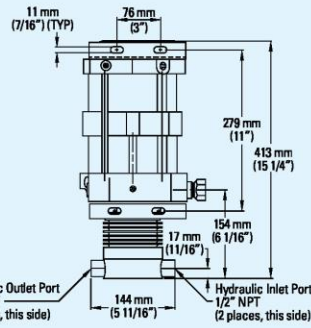
DSTV-1.5 pump; single acting, high output



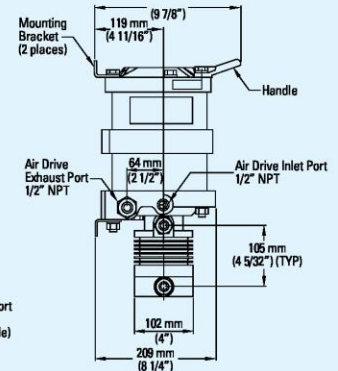
1.5 and 2 hp medium and high ratios: -25 through -150, -151*, -225*, -300* and -450* ratios
***1/4" Super Pressure Outlet Port**



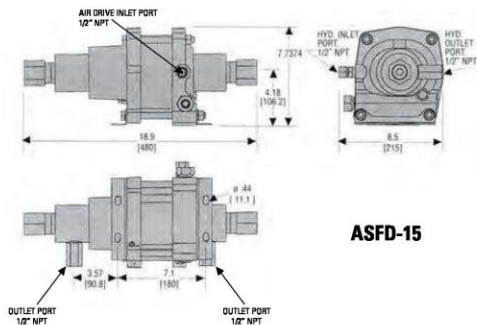
AFD or ASFD, -B60, -B100 pumps:
double acting, high output



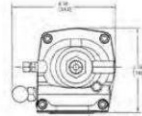
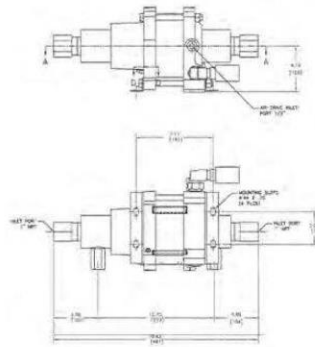
ATV-8 pumps



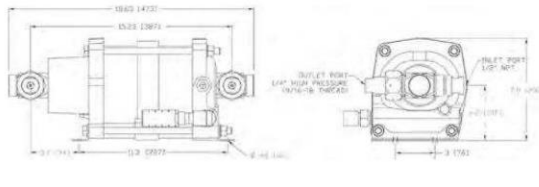
3 hp (2.24 kW) Pump Models



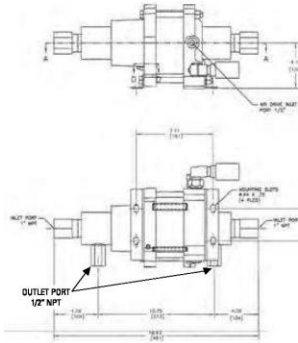
ASFD-15



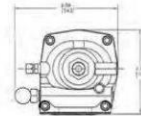
MODEL	OUTLET PORT	INLET PORT
ASFD-25	1/2" NPT	1/2" NPT
ASFD-35		
ASFD-60	3/8" MEDIUM PRESSURE 9/16-18 THREAD	1/2" NPT
ASFD-100		
ASFD-150		



ASFD-202



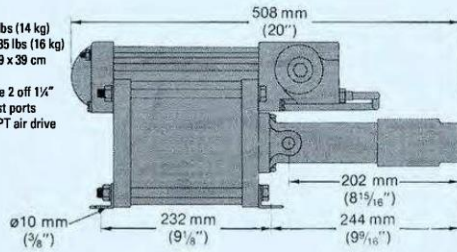
ASFD-10



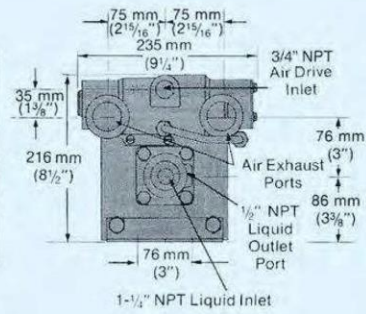
6 hp (4.47 kW) Pump Models

Net weight 31 lbs (14 kg)
Boxed weight 35 lbs (16 kg)
Box size 52 x 39 x 39 cm

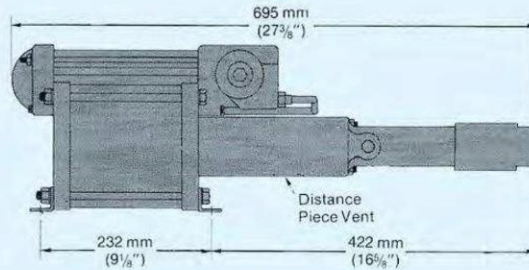
All models have 2 off 1/4" NPT air exhaust ports and 1 off 3/4" NPT air drive inlet ports.



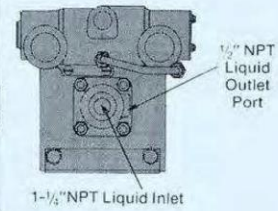
Models GW, GSF nominal ratio 35, 60 100:1



Net weight 41 lbs (18.5 kg)
Boxed weight 48 (22 kg)
Box size 66 x 41 x 49 cm



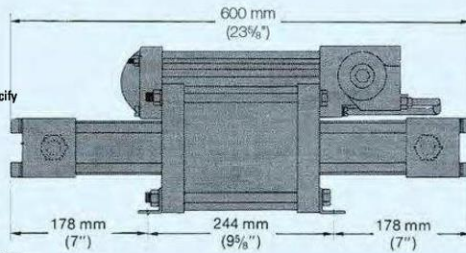
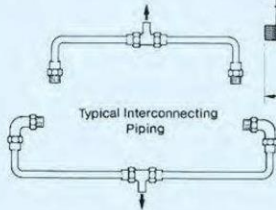
Models DGSF, DGSTV nominal ratio 35, 60 100:1



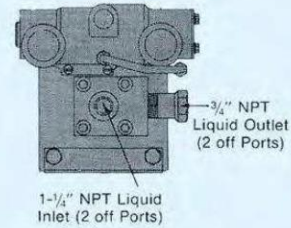
End dimensions as GW/GSF

Net weight 57 lbs (26 kg)
Boxed weight 61 (27 kg)
Box size 66 x 41 x 49 cm

If interconnecting piping for the two inlets and two outlets is required, specify modification 29077 with your order.



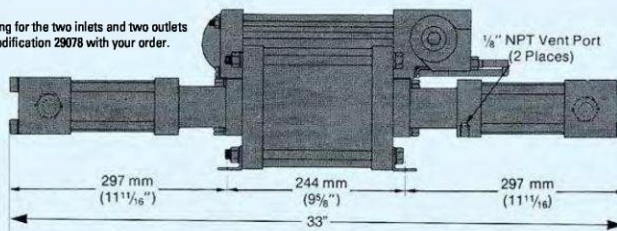
Models GWD, GSFD nominal ratio 12:1



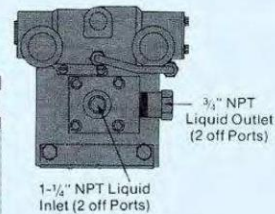
End dimensions as GW/GSF

Net weight 66 lbs (30 kg)
Boxed weight 75 lbs (34 kg)
Box size 91 x 51 x 39 cm

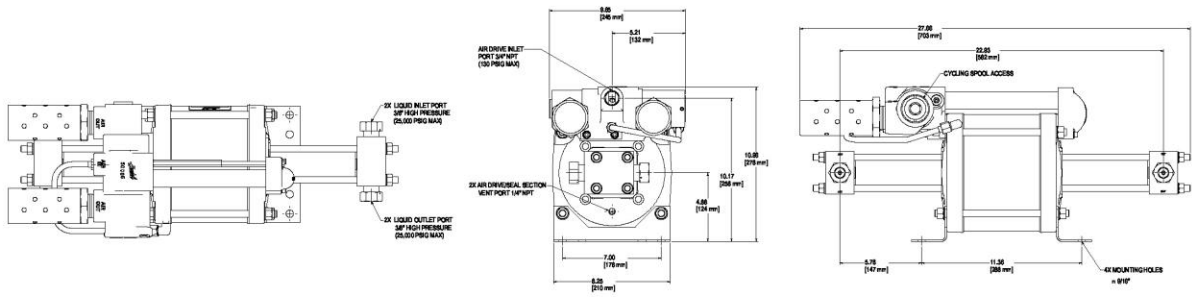
If interconnecting piping for the two inlets and two outlets is required, specify modification 29078 with your order.



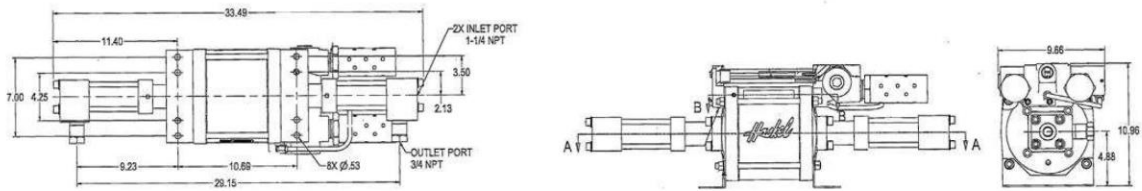
Models DGSFD, DGSTV nominal ratio 12:1



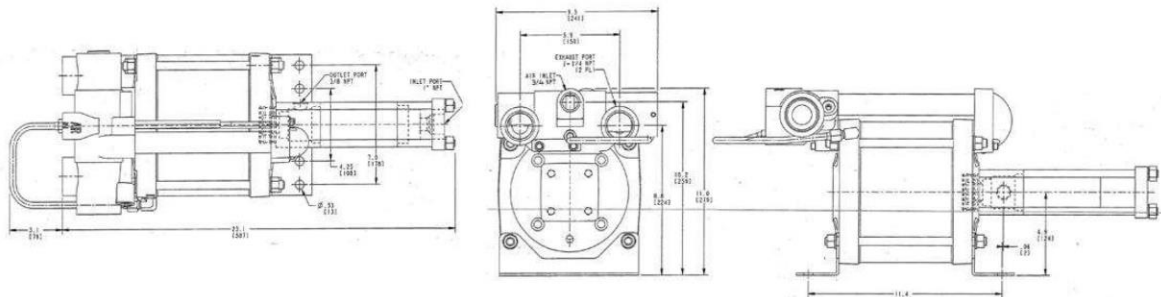
8 hp (5.97 kW) Pump Models



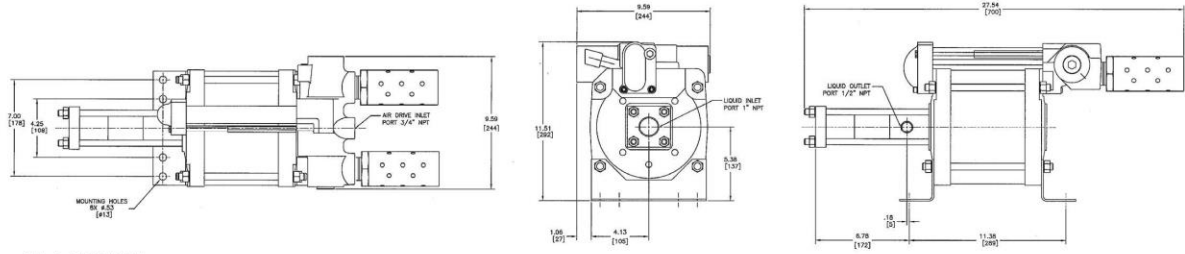
Model 8HSFD-25
Inlet, Outlet ports 3/8" HP



Models 8DSFD-25 & 8DSTVD-25

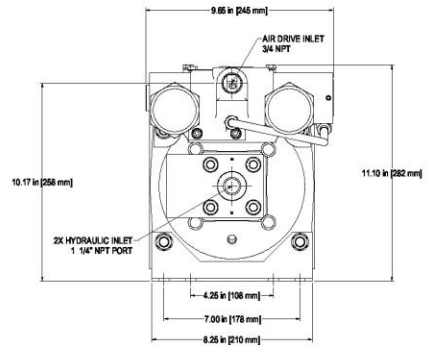
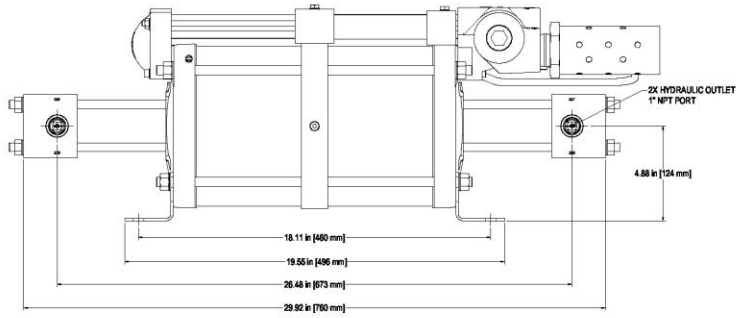
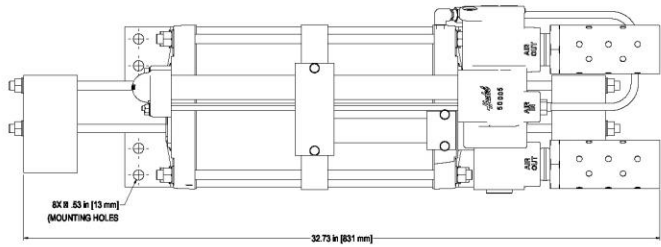


Model 8SFD-40

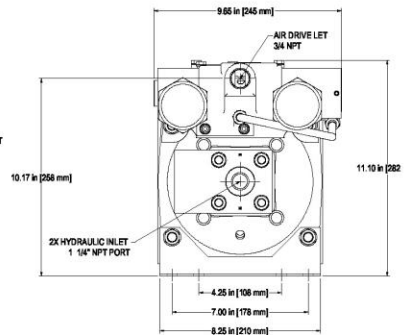
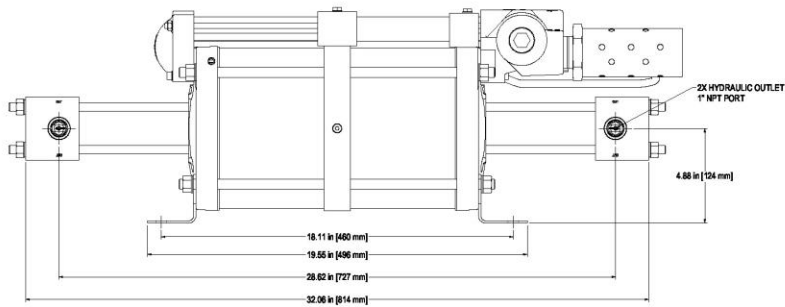
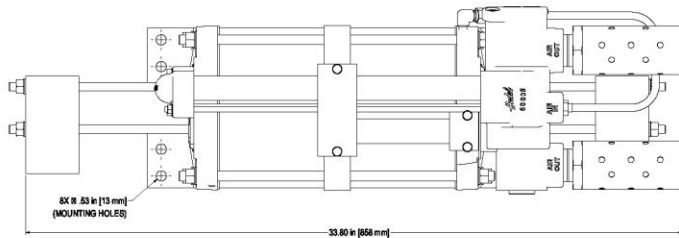


Model 8SFD-65

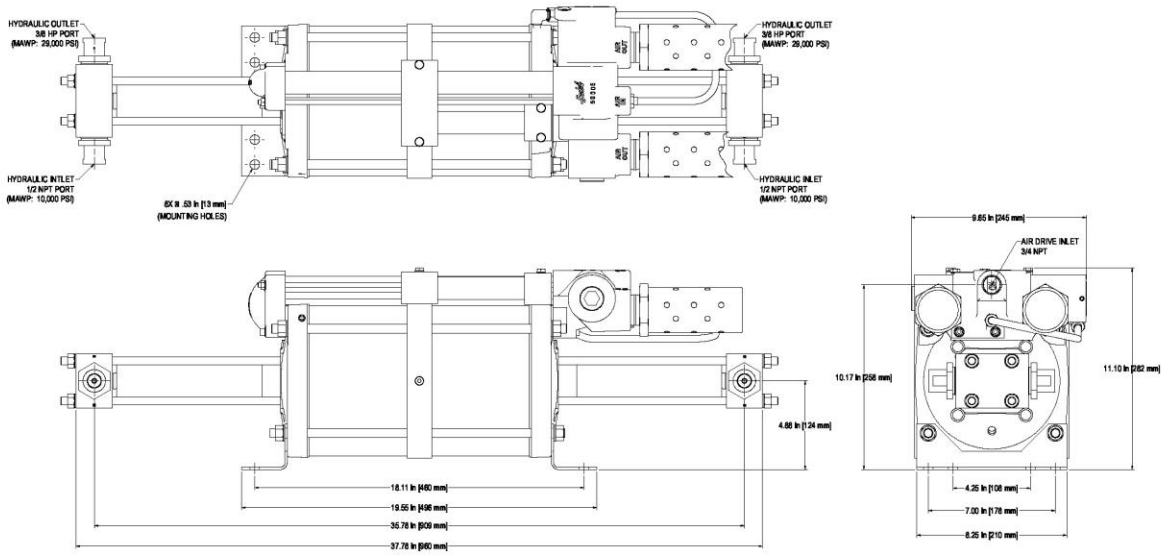
8 hp (5.97 kW) Pump Models (cont.)



Model 8SFD2-55

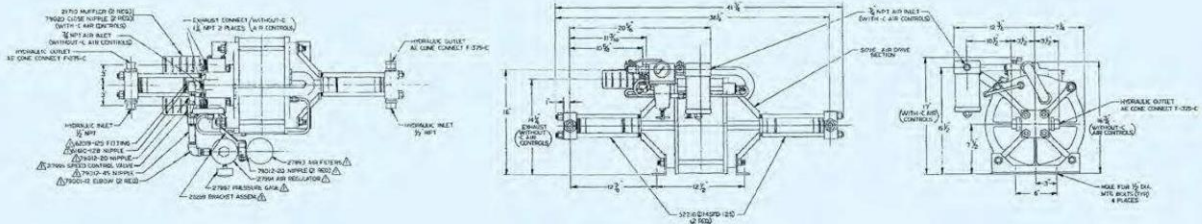


Model 8SFD2-88

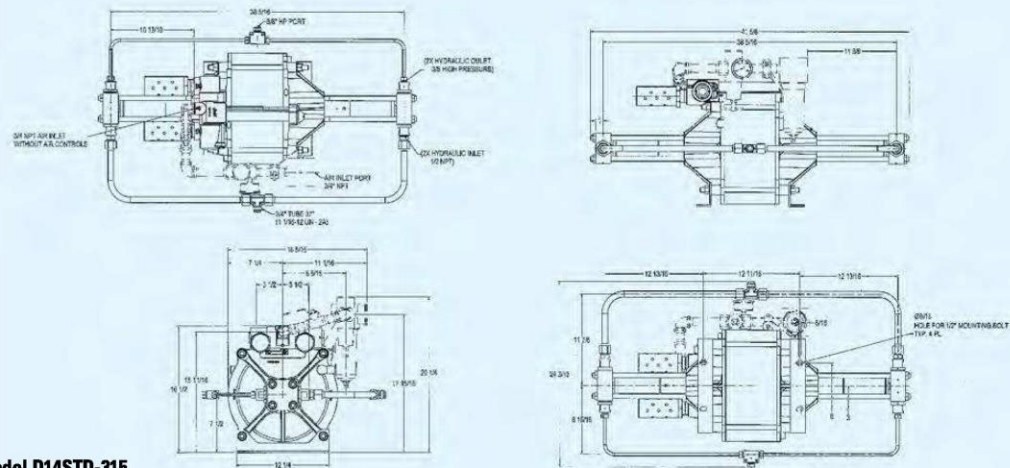


Model 8SFD2-22

10 hp (7.46 kW) Pump Models



Model D14STD-125



Model D14STD-315

For more information on our high-pressure products, visit Haskel.com or contact your local Haskel representative. *Haskel is a brand of Accudyne Industries, a leading global provider of precision-engineered, process-critical and technologically advanced flow control systems and industrial compressors that deliver consistently high performance and give confidence to the mission of our customers in the most important industries and harshest environments around the world. The company is powered by more than 3,000 employees at 18 manufacturing facilities, supporting a broad range of industries in more than 150 countries.*

Accudyne
INDUSTRIES

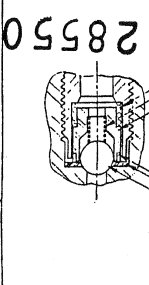
Haskel[®]

an Accudyne Industries brand

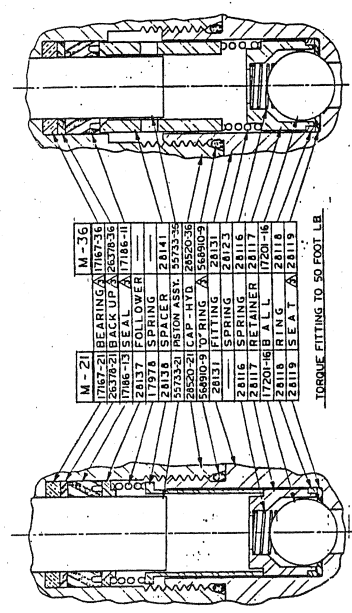
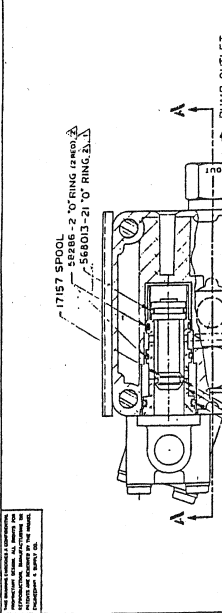
haskel.com
sales@haskel.com

LP-GL 04/17
Printed in USA

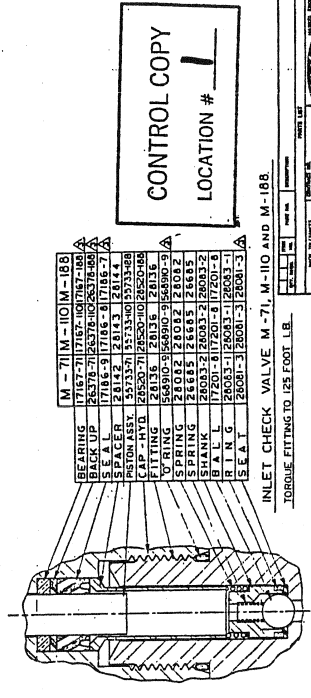
REV	DATE	DESCRIPTION	BY	CHK
1	08/11/64	INITIAL DESIGN	J. S. HARRIS	W. H. WILSON
2	08/11/64	REVISED TO INCLUDE PUMP INLET	J. S. HARRIS	W. H. WILSON
3	08/11/64	REVISED TO INCLUDE PUMP OUTLET	J. S. HARRIS	W. H. WILSON
4	08/11/64	REVISED TO INCLUDE AIR INLET	J. S. HARRIS	W. H. WILSON
5	08/11/64	REVISED TO INCLUDE TORQUE FITTINGS	J. S. HARRIS	W. H. WILSON
6	08/11/64	REVISED TO INCLUDE M-21 AND M-36	J. S. HARRIS	W. H. WILSON
7	08/11/64	REVISED TO INCLUDE M-71, M-110 AND M-188	J. S. HARRIS	W. H. WILSON
8	08/11/64	REVISED TO INCLUDE M-100M-109	J. S. HARRIS	W. H. WILSON



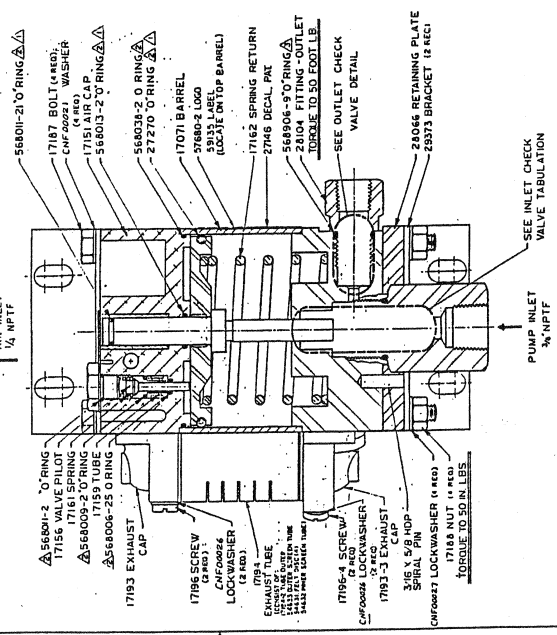
OUTLET CHECK VALVE



INLET CHECK VALVE M-21 AND M-36



INLET CHECK VALVE M-71, M-110 AND M-188



CROSS SECTION A-A

- 5743-XX TAIL MAY BE USED TO INSTALL NYLON SEAL.
- THESE PARTS ARE INCLUDED IN 17179-XX HYDRAULIC SECTION SEALS KIT.
- THESE PARTS ARE INCLUDED IN 17178 AIR DRIVE SEALS KIT.
- USE A VERY LIGHT COATING OF MASCHEL LUBRICANT PN 50866 TO DYNAMIC SEALS IN AIR DRIVE SECTION.

NOTE

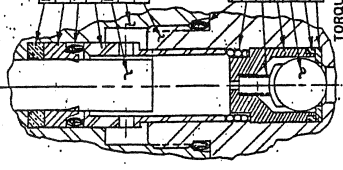
CONTROL COPY
LOCATION # 1

ASSEMBLY DRAWING MODEL M PUMP
DATE: 08/11/64
SCALE: 1:1
PROJECT: 28550
DRAWN BY: J. S. HARRIS
CHECKED BY: W. H. WILSON

28550

28550

INLET CHECK VALVE
M-50



BEARING	M-50
SEAL	57636
O-RING	56740-00
SPACER	19811-2
PISTON ASSY	55733-50
CAP HED.	50922-90
FITTING	50723
O-RING	56890-9
SPRING	56788
SPRING	26685
CAGE	56785
BALL	26110-12
BUNG	55733
SEAT	56741

TORQUER/TIGHT TO 70 FT/LB.

REVISIONS

NO.	DATE	BY	DESCRIPTION
1			ISSUE
2			REVISE
3			REVISE
4			REVISE
5			REVISE

CONTROL COPY
LOCATION # 1

DATE	10/11/00	BY	181100
TIME	10:30	BY	28550
DATE	10/11/00	BY	181100
TIME	10:30	BY	28550

ASSEMBLY DRAWING
MODEL "M" PUMP



APPENDIX III

Declaration of Conformity



DECLARATION of CONFORMITY

The design, development and manufacture is in accordance with European Community guidelines

Fluid Servicing Unit
06-5074-0800

Relevant provisions complied with by the machinery:
2006/42/EC

Identification of person empowered to sign on behalf of the manufacturer:

A handwritten signature in cursive script that reads "Patrick Finch". The signature is written in black ink and is positioned above a horizontal line.

Quality Assurance Representative