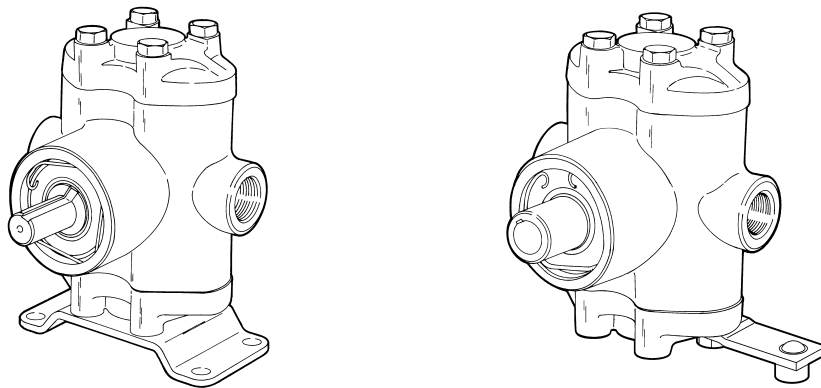


HYPRO®Form L-1574
Rev. B

Original Instruction Manual**KEEP FOR FUTURE REFERENCE**



**Series 5315C & 5320C & 5330C & 5324C & 5324C
& 5321C & 5322C & 5321C-H & 5322C-H 53702 53703
Small Twin® Piston and Plunger Pumps**

Pentair

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www.hypropumps.com

EU Authorized Representative:

EC	REP
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KvK Zuid-Limburg 14091511

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EU Languages

DO NOT attempt to install or operate your pump before reading the manual. Original copies of the manual for Hypro pumps are provided in English. To find a copy in your native language, go to www.hypropumps.com.

Vor dem Ablesen des Handbuches versuchen Sie NICHT, Ihre Pumpe zu installieren. Originale des Handbuches für Hypro-Pumpen werden auf englisch zur Verfügung gestellt. Zu eine Kopie in Ihrer Muttersprache finden, zu www.hypropumps.com zu gehen (German)

N'essayez pas d'installer votre pompe avant de lire le manuel. Des exemplaires originaux du manuel pour des pompes de Hypro sont fournis en anglais. Pour trouver une copie dans votre langue maternelle pour aller a www.hypropumps.com (French)

NON tentare di installare la vostra pompa prima di leggere il manuale. Esempio originale del manuale per Hypro pompe sono in inglese. Per trovare una copia nella vostra lingua andare a www.hypropumps.com (Italian)

Не пытайтесь установить ваш насос до чтения руководства. Оригинальные копии этого руководства для насосы Hypro на английском языке. Найти копию на ваш родной язык перейти к www.hypropumps.com (Russian)

NO intente instalar su bomba antes de leer el manual. Copias originales del manual para Hypro se provee de bombas en ingles. Para encontrar una copia en tu idioma nativo ir a www.hypropumps.com (Spanish)

NIE próbować instalować pompy przed jej odczytaniem instrukcji. Oryginalne kopie instrukcji obsługi pomp Hypro są dostarczane w języku angielskim. Aby uzyskać kopię w twoim ojczystym języku przejdź do www.hypropumps.com (Polish)

Takmaya çalışmayın okumadan önce pompanın manuel. Orijinal kopyalarını Hypro pompaları için İngilizce olarak sunulmuştur. Bir kopyasını bulmak için yerel dil git www.hypropumps.com (Turkish)

Nao tente instalar a bomba antes de ler o manual. As copias originais dos manuais para Hypro bombas sao fornecidos em Ingles. Para encontrar uma copia em sua lingua nativa ir para www.hypropumps.com (Portuguese)

VERGEET NIET uw pomp voor het lezen van het handboek. Exemplaren van de handleiding voor Hypro pompen zijn beschikbaar in het Engels. Op zoek naar een exemplaar in uw eigen taal ga naar www.hypropumps.com (Dutch)

Introduction

Description

Hypro Piston pumps are designed for creating and boosting pressure in fluid circuits. The pump operates by taking in fluid from the inlet port after which it is slung by the piston and expelled through the outlet port. Construction features come in a variety of materials in order to be resistant to a range of chemicals. Standard models of Piston pumps shaft rotation is bi-rotational.

Intended Uses

Hypro Piston pumps are intended for creating or boosting dynamic pressure in approved fluids. Hypro Piston pumps should never be used to pump liquids above 140°F (60°C), or below 34°F (1°C). Any uses outside of those specified in this manual are considered misuses and are prohibited. Contact Hypro technical service with any questions regarding specific acceptable uses.

Purpose of Manual

This manual provides instructions and requirements that must be met when installing, using and maintaining the product(s) identified on the cover.

If the product is sold, the seller must pass this manual onto the new owner.

The following special attention notices are used to notify and advise the user of this product of procedures that may be dangerous to the user or result in damage to the product.

ATTENTION

Attention is used to notify of installation, operation, or maintenance information that is important but not safety related.



This symbol is used to denote the presence of an electrical hazard that will result in personal injury, death or property damage.



This symbol is used to denote the presence of a hazard that will result in personal injury, death or property damage.

California Proposition 65 Warning -- This product and related accessories contain chemicals known to the State of California to cause cancer, birth defects or other reproductive harm.

Misuses

Hypro Piston pumps are designed to operate effectively within the specified speed, pressure and environmental ranges. Going outside of these ranges will void the warranty and could cause damage to property or serious injury or death.

- **DO NOT** run the pump faster than the maximum specified speed.
- **DO NOT** run the pump higher than the maximum specified pressure.
- **DO NOT** run pumps when the liquid has exceeded the maximum or minimum temperature limit (see Intended Uses).
- **DO NOT** pump non-approved liquids.
- **DO NOT** pump water or other liquids for human consumption.
- **DO NOT** operate any pump under the influence of drugs or alcohol.
- **DO NOT** run the pump dry.

Pump Identification

Hypro uses serialized labeling to enable users to precisely identify the pump's manufacturing date.

Serial Number:

First and second digits: year (14 = 2014)

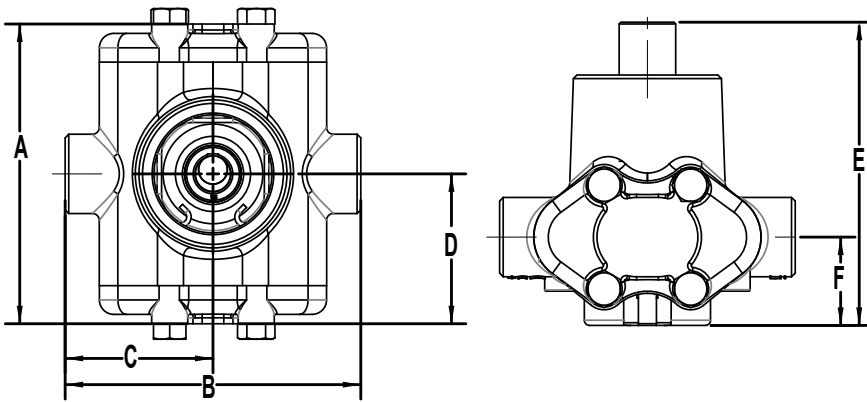
Third through fifth digits: consecutive day of the year the pump was manufactured.

Sixth through tenth digits: unique pump serial number.

Pump Technical Data

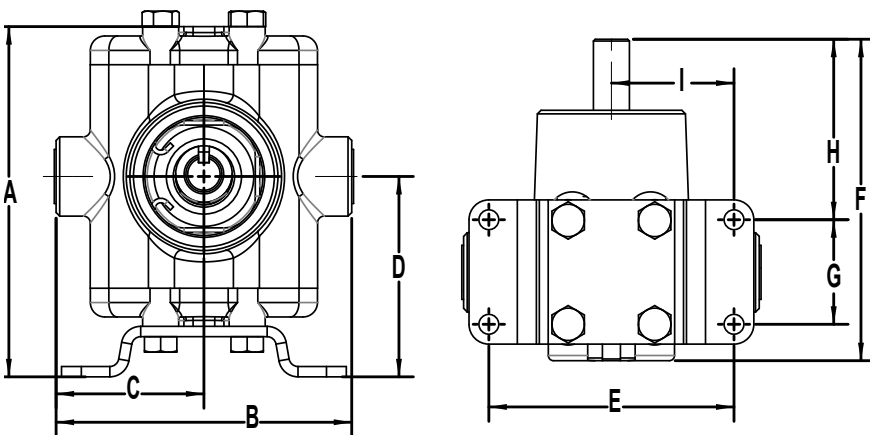
(All specifications and performance data are based on water as a carrier fluid)

5315C-HX, 5320C-HX, 5325C-CH



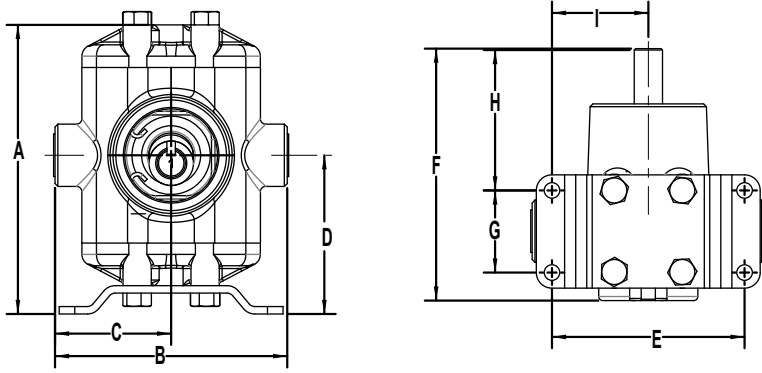
Pump Dimensions			
	Dim.	Inch	mm
All Models	A	5.20	132.08
	B	5.23	132.84
	C	2.56	65.02
	D	2.60	66.04
5315C-HX	E	5.26	133.60
5320C-HX	E	5.14	130.06
5325C-HX	E	5.98	151.89
5315C-HX	F	1.53	38.86
5320C-HX	F	1.45	36.83
5325C-HX	F	1.53	38.86

5315C-X, 5320C-X, 5325C-X



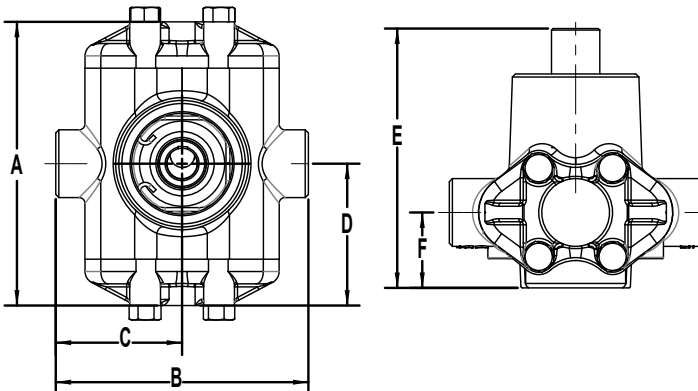
Pump Dimensions			
	Dim.	Inch	mm
All Models	A	6.07	154.18
	B	5.13	130.30
	C	2.56	65.02
	D	3.47	88.14
	E	4.25	107.95
5315C-X	F	5.57	141.48
5320C-X	F	5.57	141.48
5325C-X	F	5.42	137.67
All Models	G	1.81	45.97
5315C-X	H	3.13	79.50
5320C-X	H	3.13	79.50
5325C-X	H	3.06	77.72
All Models	I	2.13	53.98

5321C, 5322C, 5324C



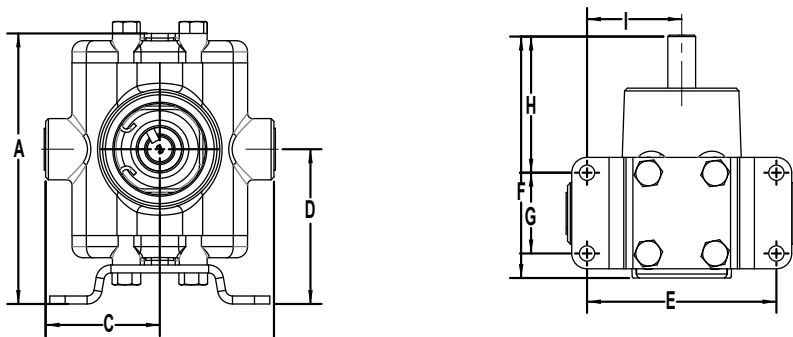
Pump Dimensions			
	Dim.	Inch	mm
All Models	A	6.38	162.05
	B	5.13	130.30
	C	2.56	65.02
	D	3.50	88.90
	E	4.25	107.95
5321C	F	5.56	141.22
5322C	F	5.50	141.48
5324C	F	5.00	127.00
All Models	G	1.81	45.97
5321C	H	3.10	78.74
5322C	H	3.14	79.76
5324C	H	2.80	71.12
All Models	I	2.13	54.10

5321-C-H, 5322C-, 5324C-H



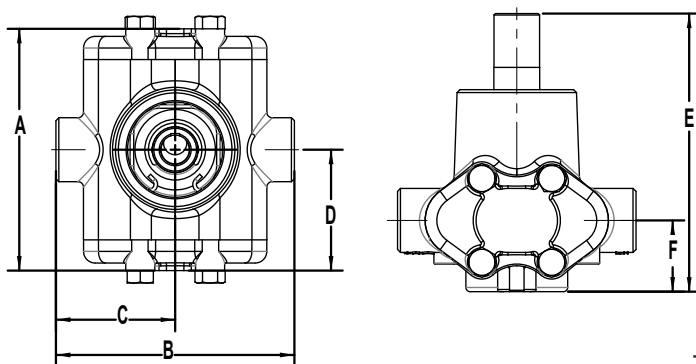
Pump Dimensions			
	Dim.	Inch	mm
All Models	A	5.76	146.30
	B	5.13	130.30
	C	2.56	65.02
	D	2.88	73.15
5321C-H	E	5.26	133.60
5322C-H	E	5.11	139.74
5324C-H	E	4.93	125.22
5321C-H	F	1.53	38.86
5322C-H	F	1.45	36.83
5324C-H	F	1.20	30.48

5330C-X



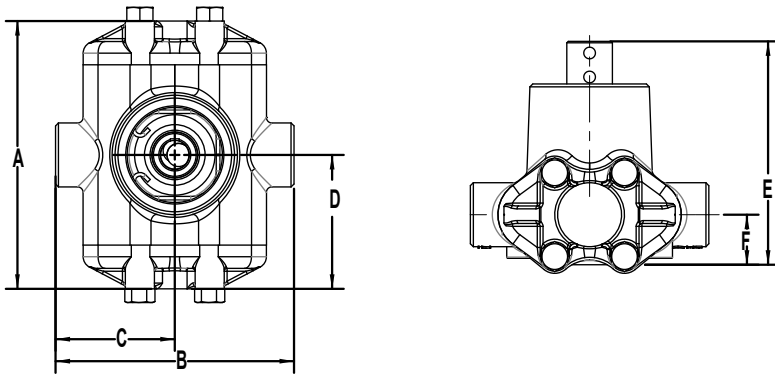
Pump Dimensions		
Dim.	Inch	mm
A	7.62	193.55
B	6.70	170.18
C	3.35	85.09
D	4.07	103.38
E	5.00	127.00
F	6.12	155.45
G	2.69	68.33
H	3.02	76.71
I	2.50	63.50

5330C-HX



Pump Dimensions		
Dim.	Inch	mm
A	7.62	193.55
B	6.70	170.18
C	3.35	85.09
D	4.07	103.38
E	5.00	127.00
F	6.30	160.02
G	2.69	68.33
H	3.21	81.53
I	2.50	63.50

53702, 53703



Pump Dimensions			
	Dim.	Inch	mm
All Models	A	5.76	146.30
	B	5.13	130.30
	C	2.56	65.02
	D	2.88	73.15
53702	E	4.80	121.92
53703	E	4.90	124.46
53702	F	1.08	27.43
53703	F	1.16	29.46

Pump	Power Source	PTO or Shaft Output	Max. Flow Rate GPM [LPM]:	Max. Pressure PSI [BAR]:	Max RPM	Ports:	Dry Weight	Mounting bolts			
5315C-X	PTO	5/8" OD solid shaft	1.5 [5.7]	500 [34.5]	1800	1/2" NPT Inlet & Outlet	11 lbs (5kg)	3/8" or M10			
5320C-X			2.2 [8.3]								
5325C-X			2.5 [9.5]								
5330C-X			3 [11.4]								
5315C-HX		5/8" ID Hollow shaft	1.5 [5.7]								
5320C-HX			2.2 [8.3]								
5325C-HX			2.5 [9.5]								
5330C-HX			3 [11.4]								
5324C		5/8" OD solid shaft	2.9 [11]	800 [55.2]							
5324C-H		5/8" ID Hollow shaft									
5321C		5/8" OD solid shaft	2.2 [8.3]	1000 [68.9]	3450						
5322C											
5321C-H											
5322C-H											
53702									5/8" ID Hollow shaft	2.3 [8.7]	3100
53703											

US

MODELS	5315C-X &H		5320C-X &H		5325C-X &H		5330C-X &H	
PSI	GPM	HP	GPM	HP	GPM	HP	GPM	HP
	AT 1725 RPM		AT 1725 RPM		AT 1725 RPM		AT 1725 RPM	
50	1.6	0.12	2.2	0.21	2.6	0.25	3.02	0.37
100	1.5	0.15	2.2	0.28	2.5	0.37	3.01	0.49
200	1.5	0.28	2.2	0.43	2.5	0.52	3.00	0.74
300	1.5	0.35	2.1	0.57	2.5	0.68	2.98	0.92
400	1.5	0.43	2.1	0.71	2.1	0.82	2.96	1.11
500	1.4	0.56	2.1	0.83	2.4	0.96	2.94	1.23

MODELS	5324C-X &H									
PSI	GPM	HP	GPM	HP	GPM	HP	GPM	HP	GPM	HP
	AT 1725 RPM		AT 1725 RPM		AT 1725 RPM		AT 1725 RPM		AT 1725 RPM	
100	0.96	0.12	1.51	0.19	2.00	0.28	2.42	0.34	2.90	0.40
200	0.94	0.19	1.49	0.30	1.98	0.41	2.40	0.50	1.89	0.59
300	0.94	0.26	1.48	0.41	1.97	0.55	2.38	0.67	1.87	0.80
400	0.96	0.33	1.47	0.50	1.96	0.67	2.37	0.83	2.85	1.00
500	0.94	0.39	1.47	0.60	1.96	0.81	2.36	0.97	2.83	1.19
600	0.93	0.45	1.46	0.69	1.95	0.93	2.35	1.13	2.81	1.38
700	0.93	0.52	1.46	0.78	1.94	1.06	2.33	1.27	2.80	1.54
800	0.93	0.58	1.45	0.87	1.93	1.16	23.2	1.42	2.79	1.69

MODELS	5321C 5322C 5321C-H 5322C-H									
PSI	GPM	HP	GPM	HP	GPM	HP	GPM	HP	GPM	HP
	AT 900 RPM		AT 1200 RPM		AT 1450 RPM		AT 1725 RPM		AT 1725 RPM	
100	1.1	0.2	1.5	0.30	1.8	0.40	2.20	0.40	2.20	0.40
300	1.1	0.4	1.5	0.50	1.8	0.60	2.10	0.70	2.10	0.70
500	1.1	0.5	1.5	0.60	1.8	0.70	2.10	0.80	2.10	0.80
700	1.1	0.6	1.5	0.80	1.8	0.90	2.10	1.10	2.10	1.10
1000	1.1	0.8	1.4	1.00	1.8	1.20	2.10	1.40	2.10	1.40

MODELS	53702	
PSI	GPM	HP
	AT 3450 RPM	
100	2.3	0.4
300	2.2	0.7
500	2.1	0.9
700	2.1	1.2
100	2.0	1.5

MODELS	53703	
PSI	GPM	HP
	AT 3100 RPM	
100	2.3	0.4
300	2.2	0.7
500	2.1	0.9
700	2.1	1.2
100	2.0	1.5

METRIC

MODELS	5315C-X &H		5320C-X &H		5325C-X &H		5330C-X &H	
BAR	LPM	HP	LPM	HP	LPM	HP	LPM	HP
	AT 1725 RPM		AT 1725 RPM		AT 1725 RPM		AT 1725 RPM	
3.4	5.9	0.12	8.4	0.21	9.7	0.25	11.40	0.37
6.9	5.8	0.15	8.3	0.28	9.6	0.37	11.40	0.49
13.8	5.7	0.28	8.2	0.43	9.3	0.52	11.40	0.74
20.7	5.6	0.35	8.0	0.57	9.5	0.68	11.30	0.92
27.6	5.5	0.43	8.0	0.71	7.9	0.82	11.20	1.11
34.5	5.5	0.56	7.9	0.83	9.9	0.96	11.10	1.23

MODELS	5324C-X &H									
BAR	LPM	HP	LPM	HP	LPM	HP	LPM	HP	LPM	HP
	AT 1725 RPM		AT 1725 RPM		AT 1725 RPM		AT 1725 RPM		AT 1725 RPM	
6.9	3.60	0.12	5.70	0.19	7.60	0.28	9.20	0.34	11.00	0.40
13.8	3.60	0.19	5.60	0.30	7.50	0.41	9.10	0.50	10.90	0.59
20.7	3.60	0.26	5.60	0.41	7.50	0.55	9.00	0.67	10.90	0.80
27.6	3.60	0.33	5.60	0.50	7.40	0.67	9.00	0.83	10.80	1.00
34.5	3.60	0.39	5.60	0.60	7.40	0.81	8.90	0.97	10.70	1.19
41.4	3.50	0.45	5.50	0.69	7.40	0.93	8.90	1.13	10.60	1.38
48.3	3.50	0.52	5.50	0.78	7.30	1.06	8.80	1.27	10.60	1.54
55.2	3.50	0.58	5.50	0.87	7.30	1.16	8.80	1.42	10.6	1.69

MODELS	5321C 5322C 5321C-H 5322C-H									
BAR	LPM	HP	LPM	HP	LPM	HP	LPM	HP	LPM	HP
	AT 900 RPM		AT 1200 RPM		AT 1450 RPM		AT 1725 RPM		AT 1725 RPM	
6.9	4.2	0.2	5.7	0.30	6.8	0.40	8.30	0.40	8.30	0.40
20.7	4.2	0.4	5.7	0.50	6.8	0.60	7.90	0.70	7.90	0.70
34.5	4.2	0.5	5.7	0.60	6.8	0.70	7.90	0.80	7.90	0.80
48.3	4.2	0.6	5.7	0.80	6.8	0.90	7.90	1.10	7.90	1.10
69	4.2	0.8	5.3	1.00	6.8	1.20	7.90	1.40	7.90	1.40

MODELS	53702	
BAR	LPM	HP
	AT 3450 RPM	
6.9	8.7	0.4
20.7	8.3	0.7
34.5	8.0	0.9
48.3	8.0	1.2
69	7.6	1.5

MODELS	53703	
BAR	GPM	HP
	AT 3100 RPM	
6.9	8.7	0.4
20.7	8.3	0.7
34.5	8.0	0.9
48.3	8.0	1.2
69	7.6	1.5

Fluid Pumping Applications

Application	Pump Materials Compatibility			
	Pump Housing	CUP		
	Cast Iron	Leather	Buna-n	Teflon
Weed Control Chemicals	X	X	X	X
Insect Control	X	X	X	X
Brush Control	X	X	X	X
Pest Control Chemicals and Fumigants	X	X	X	X
Liquid Fertilizers		X	X	X
Powdered Fertilizers	X	X	X	X
Fluid Transfer	X	X	X	X
Acids			X	X

Table 1

Flammable liquids, sewage, and potable water should never be put through any Hypro pump.

Tools


The Hypro Piston pumps and mounting assemblies are designed with Imperial (inch) bolts, however, there are many metric (mm) sizes which will work with these mounts. In most cases an adjustable spanner wrench can also be used.

Lifting, Transport, and Intermediate Storage

Packaging Descriptions and Unpacking Instructions

- Hypro Piston pumps are shipped in cardboard boxes for safe transporting.
- When pumps are shipped in large quantities they may be put on a pallet to allow for easy storage, lifting and handling.
- Before lifting any pump or pallet determine the weight of the item by looking at the attached packing slips to establish what lifting equipment should be used.
- Before installing the pump determine if all the components are present and undamaged. If the pump is missing components contact customer service immediately.
- Once the pump is unpacked dispose of the packaging in a manner compliant with local and national regulations.

Lifting Instructions

- Before attempting to lift a Hypro pump ensure that the surrounding working area is free of hazards which could cause injury or damage to property.
- During lifting operations any personnel not involved in the lift should not enter the working area.
- If lifting hooks, rope or chains are being used for a lift they must be free of damage and be rated to carry 150% of the weight of the load to be lifted.
-  Always wear steel toed shoes and cut resistant gloves when attempting to lift.
- When lifting and carrying always keep the pump close to your body. (See Figure 1)
- When starting the lift bend your knees and keep your back straight. (See Figure 1) Tightening the stomach muscles will help keep your back straight.
- During the lift use your legs to do the work never use you back and make sure your legs are at least shoulder width apart. (See Figure 1)

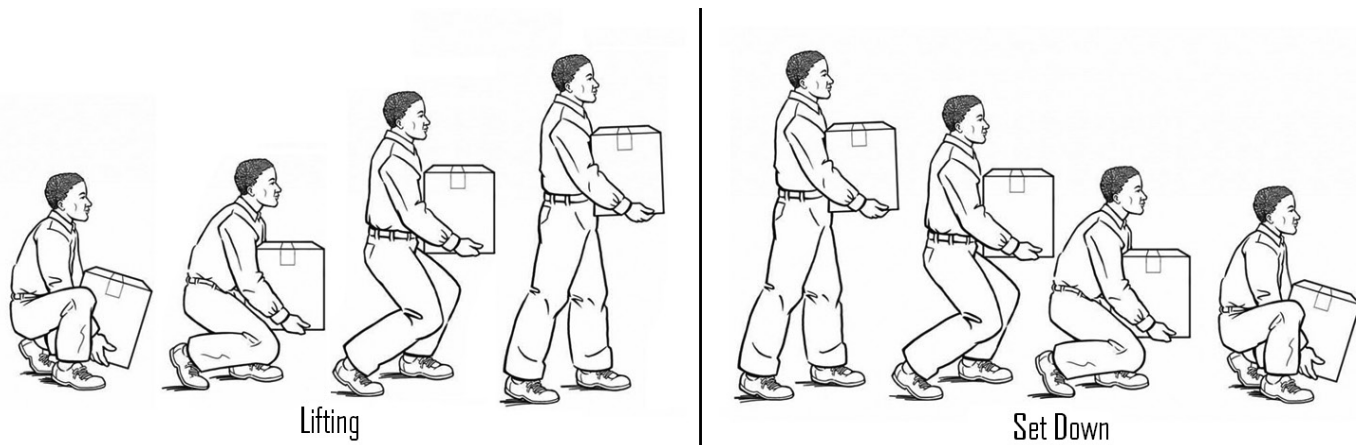


Figure 1

Transport

- All Hypro pumps are capable of being transported by air, sea, rail or motor vehicle. When the pump is shipped ensure that the pump is moved in accordance with local and national laws, and is properly secured to prevent unwanted movement which could cause damage to person or property. Prior to shipping all fluids should be removed from the pump.

Storage

- New pumps in their boxes can be stored several years as long as the port plugs are not removed. Once the plugs have been removed if the pump is not to be used for an extended period of time (i.e. more than 30 days) the pump must be winterized as described in the Cleaning section of this manual.

Assembly and Installation

Assembly

- This pump comes completely assembled

Installation

Before attempting to install your Hypro Piston pump it is imperative to read and understand the following:

- ⚠ Installation of a Hypro pump should only be performed by a technician having the knowledge and skills necessary to install the pump without the risk of property damage or injury.
- ⚠ When handling hypro pumps one should wear steel toed shoes and protective gloves in order to protect the feet in the event the pump is dropped and protect the hands from any sharp surfaces on the pump or chemicals.
- ⚠ Pumping systems must be installed in accordance with Hypro installation instructions. Failure to do so will void your warranty and could cause damage to property, serious personal injury, or death
- ⚠ Electrical power cables and pump hoses must be routed where there is no risk of personnel tripping, walking into, or falling because they have been routed in areas where personnel are expected to move. Electrical power cables and pump hoses should be routed according to local and national standards.
- ⚡ It is the installer's responsibility to ensure that AC electric-drive motors, Hypro pumps, and metalwork of support structures are bonded to earth (ground), per local and national standards.
- ⚡ It is the installer's responsibility to conduct earth continuity tests between AC electric-drive motors, Hypro pumps, and metalwork of support structures and earth according to EN60204-1:2006/A1:2009, or its superseding standard, to confirm that all components that need to be connected to earth are satisfactorily bonded.
- ⚡ It is the installer's responsibility to conduct electrical tests in accordance with EN60204-1:2006/A1:2009, or its superseding standard, on finished pump assemblies.
- All connections to electrical components must be number, symbol, or color coded generally as recommended by EN60204-1:2006/A1:2009, or its superseding standard. .

- ⚠ For pumps with gas engines, the exhaust must be directed away from operators and anyone standing nearby to ensure that exhaust fumes do not enter their breathing zone.
- ⚠ If a rigid plumbing system is to be used on a Hypro Piston pump the system must be properly aligned with the inlet and outlet ports.
- ⚠ When installing, adjusting or removing a Hypro Piston pump ensure that there are no objects which can fall on the installer and make certain that all machinery to which the pump is to be attached is turned off.
- ⚠ Pumps must be installed in a location where they are accessible for any necessary maintenance.
- ⚠ When a main electrical supply is needed to power electric drive motors installers are responsible for ensuring that a supply disconnect device capable of isolating the machine from its electricity supply should be provided.

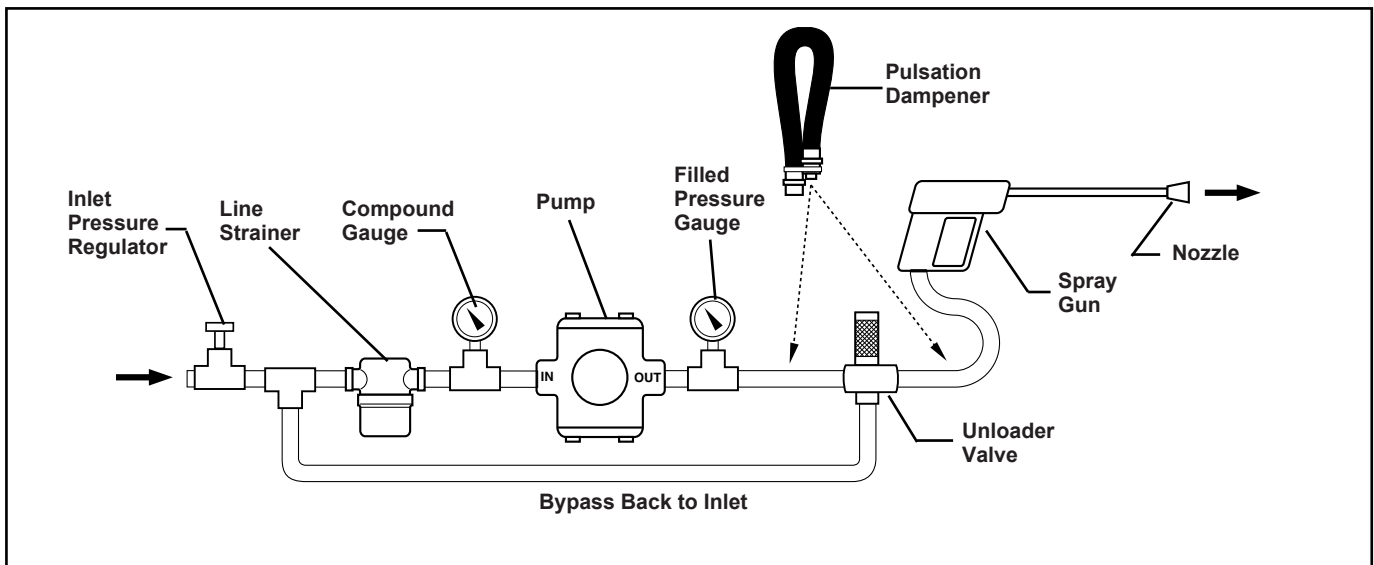
Standard Mounting

- In order to prevent injury or damage to property all Hypro pumps should be properly mounted to a solid base where there is no danger of the pump falling or breaking loose. All Hypro pumps come with mounting base which allow the pump to be secured. When mounting your Hypro Piston pump be sure to use bolts and nuts which are compatible with any chemicals that may come into contact with them as well as choosing the correct grade of bolt based on the pump weight and any expected loads.

Pump Plumbing

- Pump inlet and outlet lines should be at least the same size as their respective port. Pump plumbing must be capable of withstanding the maximum suction, and pressure, generated by the pump and should have as few restrictions as possible.

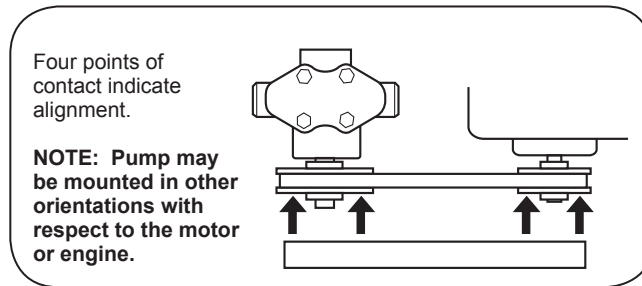
Plumbing Diagram



Belt & Pulley Drive Installation

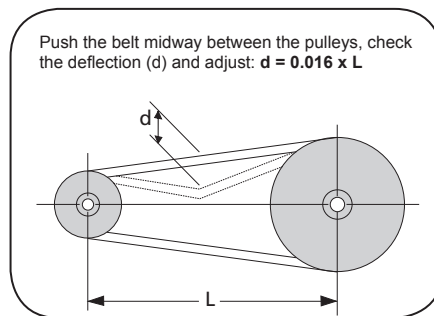
- **Pulley Driven** - Mount pulleys as close to pump and motor engine shaft bearings as possible. Check alignment with a straight edge as shown in Fig. 1.
- Make sure that belt has proper tension. (Too much tension will cause bearing wear; too little will cause slippage.) See Fig. 2.

Figure 1



- Check with belt and pulley sources for specific recommendation. To figure proper diameter of pump pulley, multiply motor/engine rpm by diameter of the motor/engine pulley and divide that figure by desired pump speed. Belt and pulley drive systems are typically used to reduce pump speed. For determining proper pulley sizes, use the formula

Figure 2



below as a guideline and use “A” or “B” section belts.

$$\frac{\text{Motor RPM}}{\text{Pump RPM}} = \frac{\text{Flow (@ Rated Speed)}}{\text{Flow (Desired)}} = \frac{\text{Pump Pulley Dia.}}{\text{Motor Pulley Dia.}}$$

Example:

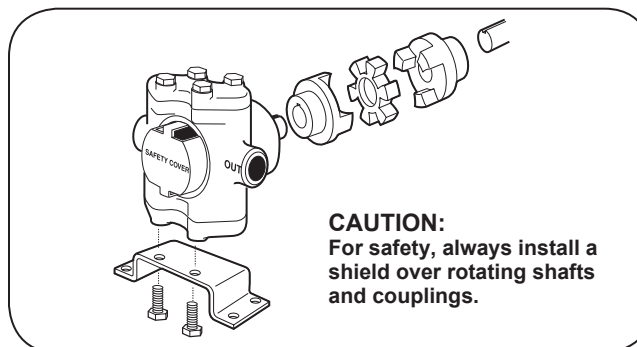
- Use a 1725 RPM electric motor to drive a pump at 950 RPM.
- Typically, a pulley diameter on the motor is 3.4 inches. The pump pulley diameter can be determined from the formula above:

$$\frac{1725 \text{ RPM}}{950 \text{ RPM}} = \frac{\text{Pump Pulley Dia.}}{3.4''}$$

- Solving this equation for the Pump Pulley diameter yields:

$$\frac{1725 \text{ RPM}}{950 \text{ RPM}} \times 3.4'' = 6.2''$$

- Refer to pump performance charts to determine desired speed and to obtain desired maximum flow.

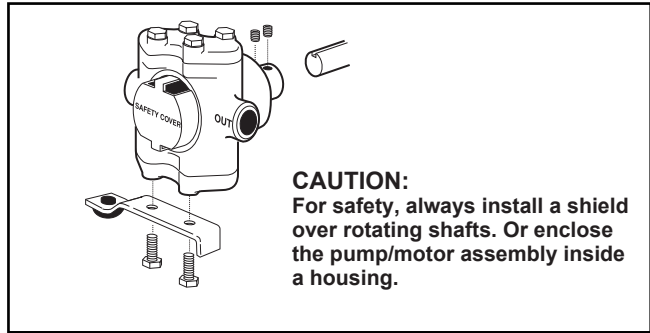


- **Flexible Coupling** - To install couplings, slide coupling ends onto motor or engine and pump shafts as far as possible. Mount engine/motor and pump on base. Shim up pump or power to align shafts. Leave enough room between shaft ends to install center disc. When aligned, slide ends over disc. Select couplings rated twice required horsepower when using motor; three times when using gas engine.

Direct Drive - Hollow Shaft Installation

Hollow shaft models mount directly on the motor or engine shaft. After mounting the pump, always turn it by hand to make sure the pump is operating freely. Never apply power to a pump that appears to be stuck.

CAUTION: Use a torque arm to keep the pump from rotating with the shaft. The pump must be allowed to float on the shaft and must not be tied rigidly to the equipment on which it is mounted.
















Control Systems

- All pump systems with electric, hydraulic power sources and gas engines are required to have a control system which meets all local and national standards.
- Overload and short-circuit protection devices should open at a current that is 10% higher than the normal load current.
- For more detail on a typical system installation, see preceding subsections of the “Assembly and Installation” section of this manual.

Commissioning, Start-Up, Operation, Shutdown

Before attempting to start your pump the following must be understood and followed to ensure safe operation.

Information

-  When running Hypro Piston pumps it is essential that operators use hearing protection as the sound levels can reach levels of 80 decibels.
 -  When handling hypro pumps one should wear steel toed shoes and protective gloves in order to protect the feet in the event the pump is dropped and protect the hands from any sharp surfaces on the pump or chemicals.
 -  Only authorized operators having the knowledge and skill necessary to safely use a Hypro pump, or any equipment the pump is connected to, may run the pump.
 -  When spraying manually it is recommended that chemical resistant facemasks and clothing be worn to prevent any chemicals from coming into contact with the skin or being inhaled.
 -  When spraying manually always spray upwind of yourself as long as the sprayed chemical will not drift into the vicinity of other people.
 -  When installing, adjusting or removing a Hypro Piston pump ensure that there are no objects which can fall on the installer and make certain that all machinery to which the pump is to be attached is turned off.
 -  Hypro Piston pumps should only be used on tractors or tow behind spray platforms which have electrically conductive tires in order to reduce the risk of electrocution.
 -  Never operate a Hypro Piston pump from outside while there is a chance of getting struck by lightning.
 -  Never leave electrical wires or plumbing components where they can be a tripping hazard or become entangled in a moving component. Ideally electrical cables, hoses, pipes and fittings should be routed overhead. In the event electrical wiring must be routed over the ground operators are required to use rubber ramps if they cross a gangway.
 -  If users of a Hypro Piston pump are using a PTO shaft, flexible coupling or belt drive they are required to use CE approved PTO shafts and guards
 -  Hypro Piston pumps should not be used if the ambient light is below 200lux.
 -  For Piston pumps which use gas engines the user should always ensure the exhaust is properly attached to the engine and is not leaking
-  **Only use approved chemicals in your pump, for a complete list of approved chemicals see the “Fluid Pumping Applications” section. Failure to follow this warning will void your warranty and could lead to property damage, serious injury or death.**





Start-up, Operation, Shutdown

Before Starting the Pump

- Ensure all unnecessary personnel are clear of the area
- For initial setup and test of your system, it is recommended to start with clean water instead of chemicals, and confirm the system and plumbing connections are leak free.
- Ensure that there is fluid in the source tank or supply line. Do not run dry.
- Check line strainer for debris or clogs. Remove any found.
- Check all plumbing connections to make sure they are tight.
- Check power source and connections.
- Check all valves and regulators are set to the desired setting and are functioning properly.
- Ensure all hoses are properly positioned and are not damaged in any way.
- Ensure PTO shaft shields are in place and are not loose

Maintenance and Servicing

Information

-  All maintenance should be done when machinery is stationary and has been isolated from its energy sources. It is dangerous to perform maintenance while machinery is still connected to its power source. Machinery should be isolated from its electrical, hydraulic or gas engine power source.
-  Be sure to release all pressure from the system before performing any sort of maintenance on a Hypro pump.
-  DO NOT perform service or maintenance to the pump, or attached components, until the pump unit is below 109°F(43°C)
-  When handling Hypro pumps one should wear steel toed shoes and protective gloves in order to protect the feet in the event the pump is dropped and protect the hands from any sharp surfaces on the pump or chemicals. If the pump is being repaired while the pump is in service eye protection should also be worn.

Any hazardous liquids should be disposed of in a manner which complies with local and national regulations, never dump fluids onto the ground.

Disposal

When disposing of a Hypro pump be sure to remove all fluids from the pump before scrapping. These fluids should be disposed of in a manner which complies with local and national regulations, never dump fluids onto the ground. Once the pump is free of all fluids it may be scrapped in accordance with local and national laws.

Cleaning

Your pump will last longer and give best performance when properly taken care of. Proper pump care depends on the liquid being pumped and when the pump will be used again. After each use, flush pump with a neutralizing solution for the liquid just pumped. Follow with a clean water rinse. This is especially important for corrosive chemicals. It is good practice to clean the pump after each use to prevent deposits from forming and damaging the pump. For infrequent use and before long periods of storage, drain pump thoroughly. Open any drain plugs, remove suction hose from liquid, and blow pump dry with air. A antifreeze/rust inhibitor should be injected into the pump before both ports are plugged and the pump is stored. Plug all ports to keep out air until pump is used again.

Maintenance, Routine Servicing, and Inspection

PREVENTATIVE MAINTENANCE CHECK-LIST

Check	Daily	Weekly
Water Leaks	X	
Plumbing		X

- Each system's maintenance cycle will be exclusive. If system performance decreases, check immediately.
- Duty cycle, temperature, quality, type of fluid being pumped, and inlet feed conditions all affect the life of spray boom assemblies and service cycle.

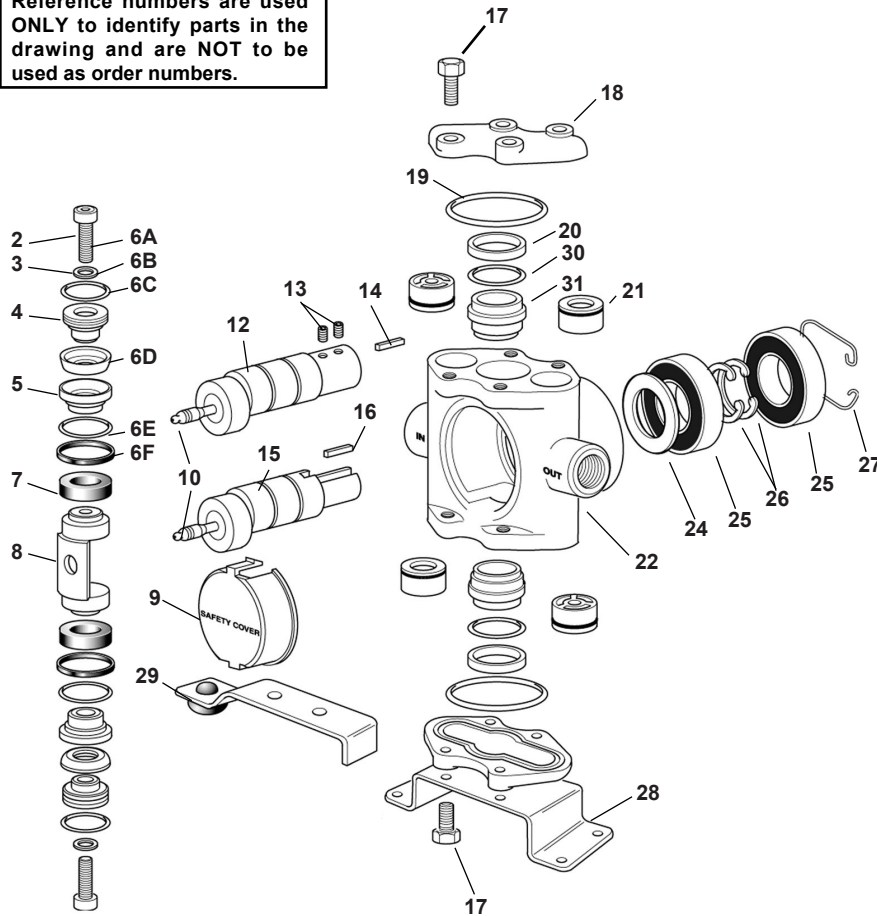
Troubleshooting

Symptom	Probable Cause(s)	Corrective Action(s)
No Flow or Low Flow	Pump not primed	Check for obstructions and leaks in line.
	Air leaks in suction line	Check and reseal inlet fittings.
	Blocked or clogged line strainer	Inspect strainer and clear any debris from screen.
	Undersize suction line or collapsed hose	Suction line should be the same diameter as inlet port of Pump or larger.
	Nozzle clogged	Clear nozzle or replace.
	Unloader or Relief Valve not functioning properly	Repair or replace relief valve.
Low pressure	Debris in Valves	Remove debris.
	Valves worn	Replace Valves.
	Unloader or Relief Valve not functioning properly	Repair or replace relief valve.
Pump Leaking	Seals worn	Replace Seals.
	Body cracked	Replace Body.

Replacement Parts

Models 5315C-X, 5320C-X, 5325C-X and 5330C-X

NOTE: When ordering parts, give **QUANTITY, PART NUMBER, DESCRIPTION, and COMPLETE MODEL NUMBER.** Reference numbers are used **ONLY** to identify parts in the drawing and are **NOT** to be used as order numbers.



Piston Stack Parts Kit

Leather Cup Kit No. 3430-0007

Consists of two each of the following parts: No. 2220-0012 Piston Cap Screw (Ref. 6A), No. 2270-0011 Washer (Ref. 6B), No. 1720-0029 O-ring (Ref. 6C), No. 2150-0002 Leather Cup (Ref. 6D), No. 1720-0039 O-Ring (Ref. 6E), and No. 1440-0008 Seal Ring (Ref. 6F).

Rubber Cup Kit No. 3430-0009

Same as above kit except with No. 2150-0005 Rubber Cups.

Piston Stack and Guide Parts Kits

Leather Cup and Guide Kit No. 3430-0008

Consists of Leather Cup Kit No. 3430-0007 plus two No. 1440-0004 Piston Guides (Ref. 7).

Rubber Cup and Guide Kit No. 3430-0010

Consists of Rubber Cup Kit No. 3430-0009 plus two No. 1440-0004 Piston Guides.

Teflon Cup and Guide Kit No. 3430-0046

Consists of Teflon Cup Stack Kit plus 2 Piston Guides.

Ni-Resist Cylinder Sleeve Assembly Kit No. 3430-0209

Consists of two each of No. 1830-0033 Retainer (Ref. 20), No. 1720-0079 O-ring (Ref. 30), and No. 3550-0018 Sleeve (Ref. 31).

Ref. No.	Qty. Req'd.	Part No.	Description
2	2	2220-0012	Piston Cap Screw
3	2	2270-0011	Washer
4	2	1830-0017	Piston Cup Spreader
5	2	1410-0030	Cup Backing Plate
6	1		Piston Stack Parts Kit (see listing above)
7	2	1440-0004	Piston Guide
8	1	0502-5300	Connecting Rod
9	1	0608-5300	Safety Cover
10	1	2405-0006	Grease Fitting Assembly
12A	1	5501-5315	Pump 5315C-H Hollow Shaft with 5/8" (I.D.)
12B	1	5501-5320	Pump 5320C-H Hollow Shaft with 5/8" (I.D.)
12C	1	5501-5325	Pump 5325C-H Hollow Shaft with 5/8" (I.D.)
12D	1	5501-5330	Pump 5330C-H Hollow Shaft with 5/8" (I.D.)
12E	1	5500-5315	Pump 5315C-H Hollow Shaft with 5/8" (I.D.)
12F	1	5500-5320	Pump 5320C-H Hollow Shaft with 5/8" (I.D.)
12G	1	5500-5325	Pump 5325C-H Hollow Shaft with 5/8" (I.D.)
12H	1	5500-5330	Pump 5330C-H Hollow Shaft with 5/8" (I.D.)
13	2	2230-0017	Set Screw for Hollow Shaft
14	1	1610-0011	Spline Key for Hollow Shaft

Ref. No.	Qty. Req'd.	Part No.	Description
15A	1	5501-5315	Pump 5315C Solid Shaft with 5/8" (I.D.)
15A	1	5501-5320	Pump 5320C Solid Shaft with 5/8" (I.D.)
15A	1	5501-5325	Pump 5325C Solid Shaft with 5/8" (I.D.)
15A	1	5501-5330	Pump 5330C Solid Shaft with 5/8" (I.D.)
15A	1	5500-5315	Pump 5315C Solid Shaft with 5/8" (I.D.)
15A	1	5500-5320	Pump 5320C Solid Shaft with 5/8" (I.D.)
15A	1	5500-5325	Pump 5325C Solid Shaft with 5/8" (I.D.)
15A	1	5500-5330	Pump 5330C Solid Shaft with 5/8" (I.D.)
16	1	1610-0007	Spline Key for Solid Shaft
17	8	2210-0062	Cylinder Head Bolt
18	2	0204-5300C	Cylinder Head (Cast Iron)
19	2	1720-0038	O-ring for Cylinder Head
20	1	3430-0209	Sleeve Assembly
21	1 set	3430-0197	Valve Assemblies
22	1	0108-5300C	Body (Cast Iron)
24	1	2130-0007	Bearing Shield
25	2	2008-0001	Main Bearing (Ball Bearing)
26	2	1810-0013	Bearing Retainer Ring (shaft)
27	1	1820-0025	Bearing Retainer Ring (housing)
28	1	1510-0056	Mounting Base
29	1	2820-0040	Torque Arm - for Electric Motor Mounting
30	1	3430-0209	
31	1	3430-0209	

Plunger Parts Kits

Plunger Stack Parts Kit No. 3430-0144 (Model 5321)

Consists of two each of the following parts: No. 1440-0010 Seal Rings, No. 1440-0037 Guides, No. 1720-0064 O-rings, No. 1720-0079 O-rings, No. 2150-0027 Seal Assemblies, No. 2220-0039 Socket Head Cap Screws, and No. 2270-0042 Washers.

Plunger Parts Kit No. 3430-0145 (Model 5321)

Consists of one No. 3430-0144 Plunger Stack Parts Kit and two No. 3500-0021 Plungers.

Plunger Stack Parts Kit No. 3430-0291 (Model 5322)

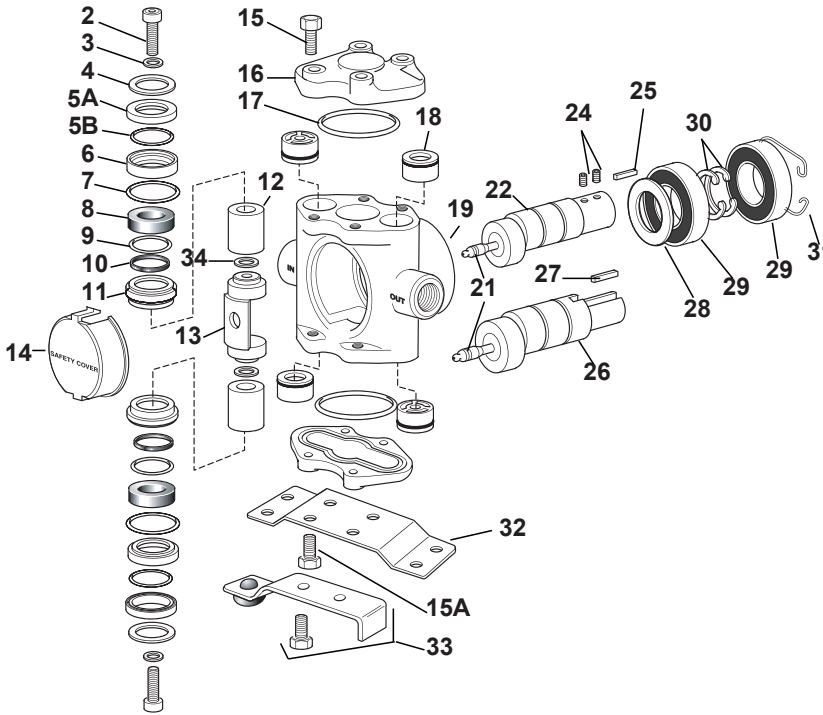
Consists of two each of the following parts: No. 1440-0010 Seal Rings, No. 1440-0037 Guides, No. 1720-0064 O-rings, No. 1720-0079 O-rings, No. 2150-0027 Seal Assemblies, No. 2220-0039 Socket Head Cap Screws, and No. 2270-0042 Washers.

Plunger Parts Kit No. 3430-0292 (Model 5322)

Consists of one No. 3430-0291 Plunger Stack Parts Kit and two No. 3500-0036 Plungers.

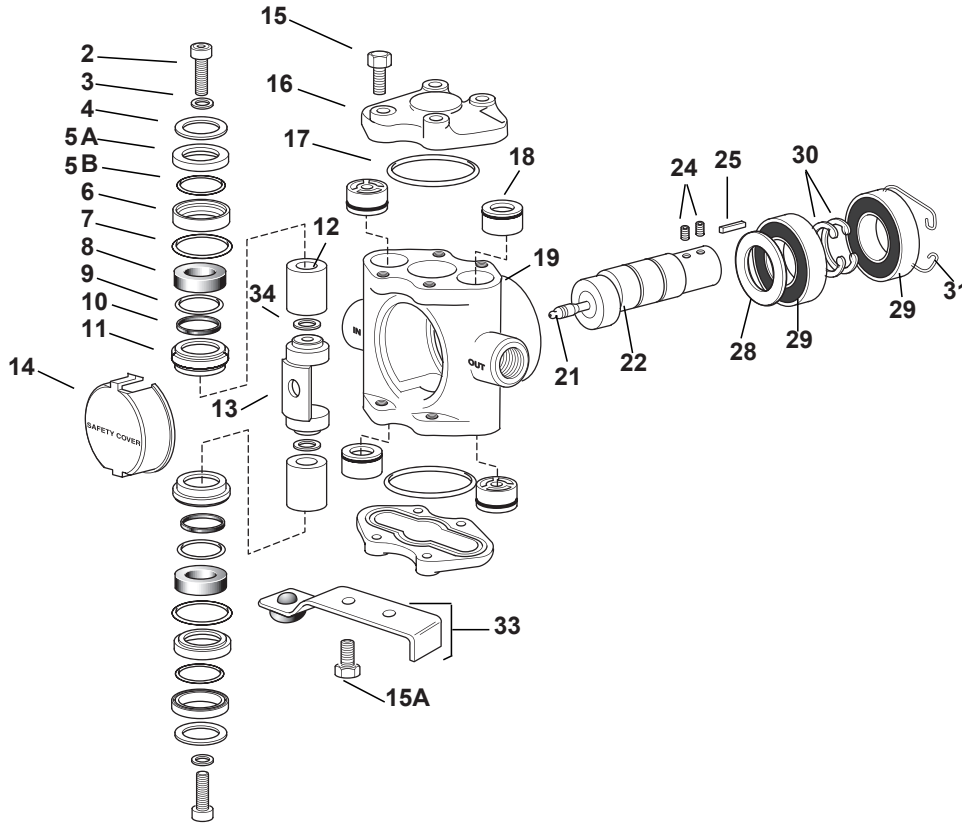
Torque Arm Kit No. 3420-0030

Consists (1) No. 2820-0035 Torque Arm, (1) No. 1450-0003 Bumper and (2) No. 2210-0064 Bolts.



Ref. No.	Qty. Req'd.	Part No.	Description
2	2	2220-0039	Socket Head Cap Screw
3	2	2270-0042	Washer
4	2	1830-0056	Retainer
5	2	2150-0027	Seal Assembly
5A	1	2150-0049	Seal
5B	1	1440-0061	Support Ring
6	2	1830-0054	Seal Retainer
7	2	1720-0079	O-ring for Seal Retainer
8	2	1440-0037	Guide
9	2	1720-0064	O-ring for Seal Ring
10	2	1440-0010	Seal Ring
11	2	1830-0053	Guide Retainer
12	2	3500-0021	Plunger (steel, Model 5321)
12	2	3500-0036	Plunger (ceramic, Model 5322)
13	1	0502-5300	Connecting Rod (Model 5321)
13	1	0504-5300	Connecting Rod (Model 5322)
14	1	0608-5300	Safety Cover
15	4	2210-0063	Cylinder Head Bolt
15A	4	2210-0064	Head Bolt
16	2	0201-5300CK	Cylinder Head (Cast Iron)

Ref. No.	Qty. Req'd.	Part No.	Description
17	2	1720-0038	O-ring for Cylinder Head
18	1 set	3430-0197	Valve Assemblies
19	1	0108-5300C	Body (Cast Iron)
21	1	2405-0006A	Grease Fitting
22	1	5500-5321	Hollow Shaft
24	2	2230-0017	Set Screws for Hollow Shaft
25	1	1610-0011	Spline Key for Hollow Shaft
26	1	5001-5321	Solid Shaft
27	1	1610-0007	Spline Key for Solid Shaft
28	1	2130-0007	Shield
29	2	2008-0001	Main Bearing
30	2	1810-0013	Retaining Ring (shaft)
31	1	1820-0025	Retaining Ring (housing)
32	1	1510-0041	Mounting Base for Solid Shaft Models
33	1	3420-0030	Torque Arm Kit for Hollow Shaft Models
34	2	2270-0097	Washer (Model 5322 only)



Plunger Parts Kits

Plunger Stack Parts Kit No. 3430-0291

Consists of two each of the following parts: No. 1440-0010-6 Seal Rings, No. 1440-0037 Guides, No. 1720-0064 O-rings, No. 1720-0079 O-rings, No. 2150-0027 Seal Assemblies, No. 2220-0039 Socket Head Cap Screws, No. 2270-0042 Washers, and No. 2270-0051 Washers.

Plunger Parts Kit No. 3430-0292

Consists of one No. 3430-0291 Plunger Stack Parts Kit and two No. 3500-0036 Plungers.

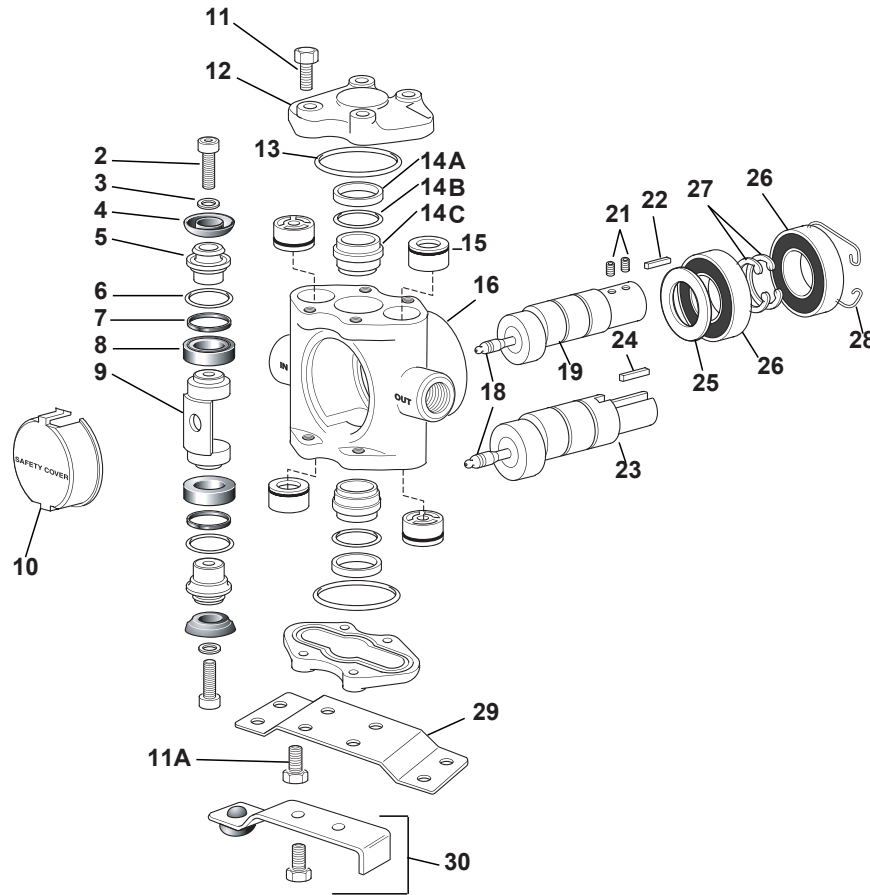
Torque Arm Kit No.3420-0030

Consists (1) No. 2820-0035 Torque Arm, (1) No. 1450-0003 Bumper and (2) No. 2210-0064 Bolts.

NOTE: When ordering parts, give QUANTITY, PART NUMBER, DESCRIPTION, and COMPLETE MODEL NUMBER. Reference numbers are used ONLY to identify parts in the drawing and are NOT to be used as order numbers.

Ref. No.	Qty. Req'd.	Part No.	Description
2	2	2220-0039	Socket Head Cap Screw
3	2	2270-0042	Washer
4	2	1830-0056	Retainer
5	2	2150-0027	Seal Assembly:
5A	1	2150-0049	Seal
5B	1	1440-0061	Support Ring
6	2	1830-0054	Seal Retainer
7	2	1720-0079	O-ring for Seal Retainer
8	2	1440-0037	Guide
9	2	1720-0064	O-ring for Seal Ring
10	2	1440-0010	Seal Ring
11	2	1830-0053	Guide Retainer
12	2	3500-0036	Plunger
13	1	0504-5300	Connecting Rod
14	1	0608-5300	Safety Cover
15	8	2210-0063	Cylinder Head Bolt
15A	2	2210-0064	Head Bolt
16	2	0201-5300CK	Cylinder Head (Cast Iron)
17	2	1720-0038	O-ring for Cylinder Head
18	1 Set	3430-0197	Valve Assemblies
19	1	0108-5300C	Body (Cast Iron)
21	1	2405-0006A	Grease Fitting

Ref. No.	Qty. Req'd.	Part No.	Description
22	1	5501-5318	Hollow Shaft with 5/8" (I.D.)
22B	1	5500-5318	Hollow Shaft with 5/8" (I.D.)
22C	1	5501-5320	Solid Shaft with 5/8" (I.D.)
22D	1	5500-5320	Hollow Shaft with 5/8" (I.D.)
24	2	2230-0017	Set Screws for Hollow Shaft
25	1	1610-0011	Spline Key for Hollow Shaft
28	1	2130-0007	Shield
29	2	2008-0001	Main Bearing
30	2	1810-0013	Retaining Ring (shaft)
31	1	1820-0025	Retaining Ring (housing)
33	1	3420-0030	Torque Arm Kit.
34	2	2270-0097	Washer



Piston Parts Kit

Piston Stack Parts Kit No. 3430-0191

Consists of two each of the following parts: No. 2220-0012 Cap Screw (Ref. 2), No. 2270-0011 Washer (Ref. 3), No. 2150-0047 Cup (Ref. 4), No. 1830-0092 Cup Holder (Ref. 5), No. 1720-0029 O-ring (Ref. 6), No. 1440-0059 Seal Ring (Ref. 7) and No. 1440-0060 Guide (Ref. 8).

Torque Arm Kit No.3420-0030

Consists (1) No. 2820-0035 Torque Arm, (1) No. 1450-0003 Bumper and (2) No. 2210-0064 Bolts.

Ref. No.	Qty. Req'd.	Part No.	Description
2	2	2220-0012	Piston Cap Screw
3	2	2270-0011	Washer
4	2	2150-0047	Cup
5	2	1830-0092	Cup Holder
6	2	1720-0029	O-Ring
7	2	1440-0059	Seal Ring
8	2	1440-0060	Guide
9	1	0500-5324	Connecting Rod
10	1	0608-5300	Safety Cover
11	4	2210-0063	Cylinder Head Bolt
11A	4	2210-0064	Head Bolt
12	2	0201-5300CK	Cylinder Head (Cast-Iron)
13	2	1720-0038	O-Ring
14	1	3430-0210	Ni-Resist Cylinder Sleeve Assembly:
14A	2	1830-0033	Retainer
14B	1	1720-0079	O-ring
14C	1	3550-0028	Sleeve
15	1 set	3430-0197	Valve Assemblies
16	1	0108-5300C	Body (Cast Iron)
18	1	2405-0006A	Grease Fitting

Ref. No.	Qty. Req'd.	Part No.	Description
19	1	5501-5321	Hollow Shaft
21	2	2230-0017	Set Screw for Hollow Shaft Pump
22	1	1610-0011	Key for Hollow Shaft Pump
23	1	0500-5321	Solid Shaft Sub-Assembly
24	1	1610-0007	Key for Solid Shaft Pump
25	1	2130-0007	Shield
26	2	2008-0001	Bearing
27	2	1810-0013	Retaining Ring (shaft)
28	1	1820-0025	Retaining Ring (housing)
29	1	1510-0041	Mounting Base for Solid Shaft Pump
30	1	3420-0030	Torque Arm Kit

Notes

EC Declaration of Incorporation

Manufacturers Name: Pentair Flow Technologies, LLC
Manufacturers' Address: 375 Fifth Avenue NW,
 New Brighton, MN 55112, USA

Declare that the partially complete machinery described below conforms to applicable health and safety requirements of Parts 1 of Annex I of Machinery Directive 2006/42/EC. This partly completed machinery must not be put into service until the equipment into which it is to be incorporated has been declared in conformity with the provisions of this directive. Confidential technical documentation has been compiled as described in Annex VII Part B of Machinery Directive 2006/42/EC and is available to European national authorities on written request. If a request is received, documentation will be transmitted either electronically or by post. Clauses 1.1.4, 1.1.7, 1.1.8 Section 1.2, Clauses 1.3.5, 1.3.6, 1.3.7, 1.3.8.1, 1.3.8.2, 1.3.9, 1.4.1, 1.4.2.1, 1.4.2.2, 1.4.2.3, 1.4.3, 1.5.2, 1.5.7, 1.5.12, 1.5.14, 1.5.16, 1.6.2, 1.7.1.1, 1.7.1.2, 1.7.2, and 1.7.4.2 are clauses of Machinery Directive 2006/42/EC that have not been met, but could be applicable and must be addressed during installation by a third party.

Description: PENTAIR Pump
Type: Roller Pumps
Series Numbers: 1502, 1700, 4001, 4101, 6500, 7560, 7700

Type: Centrifugal Pumps
Series Numbers: 1442P, 1539, 1540, 1550, 90XX, 9202, 9203, 9205, 9206, 9208, 9262, 9263, 9253, 9302, 9303, 9305, 9306, 9307, 9308, 9313, 9314, 9316, 9742P

Type: Piston/Plunger Pumps
Series Numbers: 5315C, 5320C, 5321C, 5322C, 5324C, 5325C, 5330C, 53702, 53703

The following standards have either been referred to or been complied with in part or in full as relevant:

ENISO 12100	Machinery Safety	-	General principles for design - Risk assessment and risk reduction
EN809-1998 + A1 2009	Machinery Safety	-	Pumps and pump units for liquids - Common safety requirements
EN ISO 13732-1	Machinery Safety	-	Ergonomics of the thermal environment
EN ISO 3744:2010	Acoustics	-	Determination of sound power levels and sound energy levels of noise sources using sound pressure
EN ISO 11202/A1 1997	Machinery Safety	-	Noise emitted by machinery and equipment
EN 12162:2001+A1:2009	Machinery Safety	-	Liquid pumps - Safety requirements -Procedure for hydrostatic testing
EN ISO 4254-6:2009	Machinery Safety	-	Sprayers and liquid fertilizer distributors
97-68-EC + 2010/26/EU	Gas Emission	-	Non-road gas emissions

Name **Position**

Signature **Date**

Place of Signing.....

 QNET BV
 Hommerterweg 286
 6436 AM Amstenrade
 The Netherlands

Limited Warranty on Hypro/SHURflo Agricultural Pumps & Accessories

Hypro/SHURflo (hereafter, "Hypro") agricultural products are warranted to be free of defects in material and workmanship under normal use for the time periods listed below, with proof of purchase.

- Pumps: one (1) year from the date of manufacture, or one (1) year of use. This limited warranty will not exceed two (2) years, in any event.
- Accessories: ninety (90) days of use.

This limited warranty will not apply to products that were improperly installed, misapplied, damaged, altered, or incompatible with fluids or components not manufactured by Hypro. All warranty considerations are governed by Hypro's written return policy.

Hypro's obligation under this limited warranty policy is limited to the repair or replacement of the product. All returns will be tested per Hypro's factory criteria. Products found not defective (under the terms of this limited warranty) are subject to charges paid by the returnee for the testing and packaging of "tested good" non-warranty returns.

No credit or labor allowances will be given for products returned as defective. Warranty replacement will be shipped on a freight allowed basis. Hypro reserves the right to choose the method of transportation.

This limited warranty is in lieu of all other warranties, expressed or implied, and no other person is authorized to give any other warranty or assume obligation or liability on Hypro's behalf. Hypro shall not be liable for any labor, damage or other expense, nor shall Hypro be liable for any indirect, incidental or consequential damages of any kind incurred by the reason of the use or sale of any defective product. This limited warranty covers agricultural products distributed within the United States of America. Other world market areas should consult with the actual distributor for any deviation from this document.

Return Procedures

All products must be flushed of any chemical (ref. OSHA section 1910.1200 (d) (e) (f) (g) (h)) and hazardous chemicals must be labeled/tagged before being shipped* to Hypro for service or warranty consideration. Hypro reserves the right to request a Material Safety Data Sheet from the returnee for any pump/product it deems necessary. Hypro reserves the right to "disposition as scrap" products returned which contain unknown fluids. Hypro reserves the right to charge the returnee for any and all costs incurred for chemical testing, and proper disposal of components containing unknown fluids. Hypro requests this in order to protect the environment and personnel from the hazards of handling unknown fluids.

Be prepared to give Hypro full details of the problem, including the model number, date of purchase, and from whom you purchased your product. Hypro may request additional information, and may require a sketch to illustrate the problem.

Contact Hypro Service Department at 800-468-3428 to receive a Return Merchandise Authorization number (RMA#). Returns are to be shipped with the RMA number clearly marked on the outside of the package. Hypro shall not be liable for freight damage incurred during shipping. Please package all returns carefully. All products returned for warranty work should be sent **shipping charges prepaid** to:

HYPRO / PENTAIR
Attention: Service Department
375 Fifth Avenue NW
New Brighton, MN 55112

For technical or application assistance, call the **Hypro Technical/Application number: 800-445-8360**, or send an email to: **technical@hypropumps.com**. To obtain service or warranty assistance, call the **Hypro Service and Warranty number: 800-468-3428**; or send a fax to the **Hypro Service and Warranty FAX: 651-766-6618**.

*Carriers, including U.S.P.S., airlines, UPS, ground freight, etc., require specific identification of any hazardous material being shipped. Failure to do so may result in a substantial fine and/or prison term. Check with your shipping company for specific instructions.

Visit www.hypropumps.com/register today to register your product and stay up-to-date on new products and promotional offers.

The following information is required:

Model # _____ Serial # _____