WARREN RUPP®

IDEX FLUID & METERING

SANDPIPER®
A WARREN RUPP, INC. BRAND

SERVICE AND OPERATING MANUAL

Model GH2

High Pressure
1:2 ratio Type 1

Designed to meet CSA Requirement 2:01 US for Natural Gas Operated Diaphragm Pumps

PRINCIPLE OF OPERATION

This pump is a 2:1 pressure ratio single acting pump powered by compressed natural gas. The 2:1 ratio is achieved by simultaneously applying gas pressure over a single end of each of two pistons connected in series by a shaft. The two pressurized ends are those most distant from the pumped fluid, with the force from the gas pressure exerted in the direction of the pumped fluid. The combined force is transferred through to the single end of the piston nearer to the pumped fluid—the single piston end having an area equal to one-half that of the two "gas" ends—and then through a fluid cell to a single pumping diaphragm.

On this single acting pump the suction stroke is independent of all discharge conditions and requires less gas pressure than the discharge stroke. The suction stroke is accomplished through a natural gas regulator which pressurizes the piston area in the rear cylinder adjacent to the intermediate bracket, while simultaneously exhausting the other two piston areas: one in the front cylinder, adjacent to the intermediate bracket, and the other behind the rear cylinder piston, adjacent to the cap end.

OPERATION

The regulator is factory preset to 30 psi. After the pump is installed and in operation, the operator should raise or lower the setting until maximum performance is determined by trial and error. A setting which is too high will result in excessively rapid and noisy operation, with a loss in performance and eventually shortened pump life.

The hose assemblies deliver natural gas to the non-wetted portions of the pump, and care should be taken that they are neither crimped nor cut.

INSTALLATION PROCEDURES

Position the pump as close as possible to the source of the liquid to be pumped. Avoid long or undersize suction lines and use the minimum number of fittings.

For permanent installation involving rigid piping, install short flexible sections of hose between the pump and piping. This reduces strains and permits easier removal of the pump for service when required. Important: The pump must be installed on a flat, level surface. Use shims as neccessary.

NATURAL GAS SUPPLY

Do not connect the unit to a natural gas supply in excess of 125 PSI (8.61 bars). Install a shutoff valve in the gas supply line to permit removal of the unit for servicing. When connecting a gas supply of rigid piping, mount a section of flexible line to the pump to eliminate piping strain. In permanent installations, a gas filter is recommended.

FREEZING OR ICING OF EXHAUST

Icing of the gas exhaust can occur under certain conditions of temperature and humidity on compressed gas power equipment. Icing is more likely to occur at high discharge pressures.

MAINTENANCE AFTER USE

When the pump is used for materials that tend to settle out or transform from liquid to solid form, care must be taken after each use or during idle time to remove them and flush the pump as required to prevent damage. In freezing temperatures the pump must be completely drained when idle. This model must be tilted to allow the liquid from the chambers to run out of the discharge port.

⚠ IMPORTANT

Read these safety warnings and instructions in this manual completely, before installation and start-up of the pump. It is the responsibility of the purchaser to retain this manual for reference. Failure to comply with the recommendations stated in this manual will damage the pump, and void factory warranty.

⚠ CAUTION

Before pump operation, inspect all gasketed fasteners for looseness caused by gasket creep. Re-torque loose fasteners to prevent leakage. Follow recommended torques stated in this manual.

⚠ WARNING

Before maintenance or repair, shut off the com-pressed air line, bleed the pressure, and disconnect the air line from the pump. The discharge line may be pressurized and must be bled of its pressure.

⚠ WARNING

In the event of diaphragm rupture, pumped material may enter the air end of the pump, and be discharged into the atmosphere. The air exhaust must be piped to an appropriate area for safe disposition.

⚠ WARNING

Take action to prevent static sparking. Fire or explosion can result, especially when handling flammable liquids. The pump, piping, valves, containers or other miscellaneous equipment must be grounded.

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CHECK VALVE SERVICING

Need for inspection or service is usually indicated by poor priming, unstable cycling, reduced performance or the pump's cycling but not pumping.

DIAPHRAGM SERVICING/FILLING DRIVER FLUID

Motive power is delivered to the single diaphragm of the pump through a fluid cell located between the diaphragm and the drive piston. During preventative maintenance servicing (where the diaphragm has not ruptured, and the fluid cell is still filled), the fluid should be drained from the chamber by removing the pipe plug, in the lower most portion of inner chamber, item 54.

To fill the fluid cell, the piston(s) must be on full discharge stroke. To do this and hold during fill procedure, remove item 46, (fitting) from the cylinder cap (item 15) and insert gas pressure. This need not be more than 10 PSI. This will move the piston(s) and hold them in the discharge position. Remove the pipe plug at the top of the fluid chamber, and fill the chamber with ethylene glycol (anti-freeze). The chamber will take 3000 ml (101.5 fluid ounces) of fluid. If the diaphragm is PTFE, use 2800 ml (95 fluid ounces). Tilt the pump to evacuate air pockets from the fluid chamber. A box wrench can be used to flex the diaphragm and purge air from the fluid chamber. Fill the chamber to the top of the fill hole, and re-insert the pipe plug, using thread compound.

If the glycol cell fluid is not compatible with the pumped product or would form a potentially dangerous mixture if the diaphragm ruptured, consult the factory before choosing an alternative fluid.

CYLINDER PISTON SERVICING

The driver fluid must be drained (see above) to service the cylinder piston. The piston seals are different on the natural gas side versus the driver fluid side. Typically, the fluid side will require replacement before the gas side. Remove the nuts and washers that secure the gas side piston cap and inner fluid chamber to the intermediate bracket. The cylinders may now be removed. Inspect the cylinder wall carefully. Scratches can cause driver fluid to leak to the gas side of the pump, which can find its way to the exhaust muffler. Scratches on the gas cylinder will cause too much gas to leak when on pressure stroke. The locknuts holding the cylinder to the rod can now be removed. Carefully inspect the piston for scratches, burrs and wear, especially if the piston seals are worn.

The piston seals can now be inspected or replaced. NATURAL GAS SIDE–The gas side piston has a T-Seal. If the seal is worn showing flat areas or gouges, it will require replacement. Remove seal and back-up (spacer). Remove wear rings and carefully inspect for wear. During reassembly make sure the ends of the back up spacer and wear ring end are not across from each other. WET SIDE–The wet side piston has a yellow PSP seal. Inspect for flat spots and gouges. Behind the seal is an energizer ring that helps to load the seal against the cylinder wall. (The energizer ring is included with the new seal.) The wear rings are the same as on the air side. Again, make sure the ends are not across from each other.

Reassembly of both pistons is the opposite of removal. Make sure the side of the **locknut with the seal is next to the piston.** The groove in the piston or o-ring (item 35), must be toward the pump center (o-ring seals next to the rod). Apply a heavy oil to the piston seals when sliding on the cylinder. The piston/nut should be torqued at 500 in./lbs. (56.49 Newton meters). The studs that secure the cylinders to the intermediate should be torqued at 250 in./lbs. (28.24 Newton meters). **IMPORTANT NOTE:** Reassembly of the wet side piston/seal assembly differs from the gas side in that it must be carefully pressed into the cylinder. An arbor press is commonly used for this purpose.

NATURAL GAS VALVE LUBRICATION

The SandPIPER pump's pilot valve and main gas valve assemblies are designed to operate WITHOUT lubrication. This is the preferred mode of operation. There may be instances of personal preference, or poor quality gas supplies when lubrication of the compressed natural gas supply is required. The pump gas system will operate with properly lubricated compressed gas supplies. Proper lubricatrion of the compressed gas supply would entail the use of a natural gas line lubricator set to deliver one drop of 10 wt., non-detergent oil for every 20 SCFM of gas the pump consumed at its point of operation. Consult the pump's published performance curve to determine this.

It is important to remember to inspect the sleeve and spool set routinely. It should

Pump complies with EN809 Pumping Directive, Directive 98/37/EC Safety of Machinery.

move back and forth freely. This is most important when the gas supply is lubricated. If a lubricator is used, oil accumulation will, over time, collect any debris from the compressed gas. This can prevent the pump from operating properly.

Water in the compressed gas supply can create problems such as icing or freezing of the exhaust gas causing the pump to cycle erratically, or stop operating. This can be addressed by using a point of use dryer to supplement a plant's gas drying equipment. This device will remove excess water from the compressed gas supply and alleviate the icing or freezing problem.

ESGDS: Externally Serviceable Gas Distribution System

Please refer to the exploded view drawing and parts list in the Service Manual supplied with your pump. If you need replacement or additional copies, contact your local Warren Rupp Distributor, or the Warren Rupp factory Literature Department. To receive the correct manual, you must specify the MODEL and TYPE information found on the name plate of the pump.

Main Natural Gas Valve

The main natural gas valve sleeve and spool set is located in the valve body mounted on the pump with four hex head capscrews. The valve body assembly is removed from the pump by removing these four hex head capscrews.

With the valve body assembly off the pump, access to the sleeve and spool set is made by removing four hex head capscrews (each end) on the end caps of the valve body assembly. With the end caps removed, slide the spool back and forth in the sleeve. The spool is closely sized to the sleeve and must move freely to allow for proper pump operation. An accumulation of oil, dirt or other contaminants from the pump's gas supply, or from a failed diaphragm, may prevent the spool from moving freely. This can cause the spool to stick in a position that prevents the pump from operating. If this is the case, the sleeve and spool set should be removed from the valve body for cleaning and further inspection.

Remove the spool from the sleeve. Using an arbor press or bench vise (with an improvised mandrel), press the sleeve from the valve body. Take care not to damage the sleeve. At this point, inspect the o-rings on the sleeve for nicks, tears or abrasions. Damage of this sort could happen during assembly or servicing. A sheared or cut o-ring can allow the pump's compressed gas supply to leak or bypass within the valve assembly, causing the pump to leak compressed gas from the pump exhaust or not cycle properly. This is most noticeable at pump dead head or high discharge pressure conditions. Replace any of these o-rings as required or set up a routine, preventive maintenance schedule to do so on a regular basis. This practice should include cleaning the spool and sleeve components with a safety solvent or equivalent, inspecting for signs of wear or damage, and replacing worn components.

To re-install the sleeve and spool set, lightly lubricate the o-rings on the sleeve with an o-ring assembly lubricant or lightweight oil (such as 10 wt. gas line lubricant). Press the set into the valve body easily, without shearing the o-rings. Re-install one end cap, gasket and bumper on the valve body. Using the arbor press or bench vise that was used in disassembly, press the sleeve back into the valve body. You may have to clean the surfaces of the valve body where the end caps mount. Material may remain from the old gasket. Old material not cleaned from this area may cause air leakage after reassembly. Take care that the bumper stays in place allowing the sleeve to press in all the way. Reinstall the spool, the opposite end cap, gasket and bumper on the valve body. After inspecting and cleaning the gasket surfaces on the valve body and intermediate, reinstall the valve body on the pump using new gaskets. Tighten the four hex head capscrews evenly and in an alternating cross pattern.

PILOT VALVE ACTUATOR SERVICING

The bushings for the pilot valve actuators are threaded into the intermediate bracket from the outside. The plunger may be removed for inspection or replacement from the inside by removing the natural gas distribution valve body and the pilot valve body from the pump. The plungers should be visible as you look into the intermediate from the top. Depending on their position, you may find it necessary to use a fine piece of wire to pull them out.

Under rare circumstances, it may become necessary to replace the o-ring seal. The bushing can be pushed through the inner chamber by removing the outer chamber the assembly to reach the bushing.

TROUBLE SHOOTING

1. Pump will not cycle

A. Check to make sure the unit has enough pressure to operate and that the gas inlet valve is open.

B. Check the discharge line to insure that the discharge line is neither closed nor blocked.

C. If the spool in the gas distribution valve is not shifting check the main spool. It must slide freely.

D. Excessive gas leakage in the pump can prevent cycling. Natural Gas leakage from the exhaust port indicates leakage in the gas distribution valve. See further service instructions.

E. Blockage in the liquid chamber can impede movement of diaphragm.

2. Pump cycles but will not pump

A. Suction side of pump pulling in air. Check the suction line for gas leaks and be sure that the end of the suction line is submerged. Check flange bolting. Check valve flanges and manifolds to chamber flange joints.

B. Make certain the suction line or strainer is not plugged. Restriction at the suction is indicated by a high vacuum reading when a vacuum gauge is installed in the suction line.

C. Check valves may not be seating properly. To check, remove the suction line and cover the suction port with your hand. If the unit does not pull a good suction (vacuum), the check valves should be inspected for proper seating.

D. Static suction life may be too high. Priming can be improved by elevating the suction and discharge lines higher than the check valves and pouring liquid into the unit through the suction inlet. When priming at high suction lifts or with long suction lines operate the pump at maximum cycle rate.

3. Low performance

A. Capacity is reduced as the discharge pressure increases. Performance capability varies with available inlet supply. Check gas pressure at the pump inlet when the pump is operating to make certain that adequate gas supply is maintained.

B. Check vacuum at the pump suction. Capacity is reduced as vacuum increases. Reduced flow rate due to starved suction will be evident when cycle rate can be varied without change in capacity. This condition will be more prevalent when pumping viscous liquids. When pumping thick, heavy material the suction line must be kept as large in diameter and as short as possible, to keep suction loss minimal.

C. Low flow rate and slow cycling rate indicate restricted flow through the discharge line. Low flow rate and fast cycling rate indicate restriction in the suction line or gas leakage into suction.

For more information, refer to the Warren Rupp Troubleshooting Guide.

WARRANTY: This unit is guaranteed for a period of five years against defective material and workmanship.

ITEM NO.	PART NUMBER	DESCRIPTION	TOTAL RQD.
1	008-013-080	Adapter	1
2	020-056-000	Regulator w/Gauge	1
3	**031-012-000**	**Sleeve & Spool Set**	**1**
4	**095-115-001**	**Assembly Pilot Valve***	**1**
4-B	**755-025-001**	**Sleeve (without o-ring)**	**1**
4-C	**560-033-379**	**O-Ring (Sleeve)**	**4**
4-D	**775-026-001**	**Spool (without o-ring)**	**1**
4-E	**560-023-379**	**O-Ring (Spool)**	**2**
4-F	**675-037-080**	**Retaining Ring**	**1**
5	095-040-156	Valve Body	1
6	114-027-010	Bracket, Intermediate	1
7	070.006.571 H	Bearing, Sleeve	2
8	115-164-000	Bracket	1
9	115-067-080	Mounting Bracket Assembly	1
10	**132-002-360**	**Bumper, Diaphragm**	**2**
11	**132-014-358**	**Bumper, Spool**	**2**
12	**135-016-506**	**Bushing, Threaded**	**2**
13	**560-001-360**	**O-Ring**	**2**
14	165-011-157	Cap, Valve Body	2
15	165-047-010	Cap,Cylinder	1
16	170-024-330	Capscrew, Hex Head (CI)	2
	170-024-330	Capscrew, Hex Head (SS)	4
17	170-032-330	Capscrew, Hex Head	8
18	170-045-330	Capscrew, Hex Head	4
19	170-050-330	Capscrew, Hex Head	2
20	170-052-330	Capscrew, Hex Head (GH2, CI)	6
	170-066-330	Capscrew, Hex Head (GH2, SS)	4
21	170-057-330	Capscrew, Hex Head (GH2 only)	6
22	170-060-330	Capscrew, Hex Head	8
23	275-009-331	Cylinder	2
24	326-003-080	Foot, Mounting	1
25	**360-010-360**	**Gasket, End Cap**	**2**
26	**360-041-379**	**Gasket, Valve Body**	**1**
27	360-048-360	Gasket, Valve Body	1
28	426-047-000	Hose Assembly	2
29	426-048-000	Hose Assembly	1
30	920-025-000	Ground Strap	1
31	545-007-330	Nut, Hex (CI)	18
	545-007-330	Nut, Hex (SS)	20
32	547-009-080	Nut Lock	2
33	**560-020-360**	**O-Ring**	**6**
34	**560-022-360**	**O-Ring**	**5**
35	**560-076-360**	**O-Ring**	**2**
36	605-012-151	Piston	2
37	618-007-330	Plug, Pipe	1
38	**620-011-114**	**Plunger, Actuator**	**2**
39	685-043-120	Rod, Connecting	1
40	**720-004-377**	**Seal, U-Cup**	**2**
41-A	**720-022-360**	**T-Seal with 2 backups**	**1**
41-B	720-034-000	PSP Seal with energizer	1
42	677-001-542	Wear Ring	4
43	807-047-080	Stud	8
44	866-073-330	Connector, Male	2

Repair Parts shown in **bold face (darker)** type are more likely to need replacement after extended periods of normal use. They are readily available from most Warren Rupp distributors. The pump owner may prefer to maintain a limited inventory of these parts in his own stock to reduce repair downtime to a minimum.

IMPORTANT: When ordering repair parts always furnish pump model number, serial number and type number.

MATERIAL CODES
The Last 3 Digits of Part Number

000…Assembly, sub-assembly; and some purchased Items
010…Cast Iron
012…Powered Metal
015…Ductile Iron
020…Ferritic Malleable Iron
025…Music Wire
080…CarbonSteel AISI B-1112
100…Alloy 20
110…Alloy Type 316 Stainless Steel
111…Alloy Type 316 Stainless Steel (Electro Polished)
112…Alloy "C"
113…Alloy Type 316 Stainless Steel (Hand Polished)
114…303 Stainless Steel
115…302/304 Stainless Steel
117…440-C Stainless Steel (Martensitic)
120…416 Stainless Steel (Wrought Martensitic)
123…410 Stainless Steel (Wrought Martensitic)
148…Hardcoat Anodized Aluminum
149…2024-T4 Aluminum
150…6061-T6 Aluminum
151…6063-T6 Aluminum
152…2024-T4 Aluminum (2023-T351)
154…Almag 35 Aluminum
155 or 156…356-T6 Aluminum
157…Die Cast Aluminum Alloy #380
158…Aluminum Alloy SR-319
159…Anodized Aluminum
162…Brass, Yellow, Screw Machine Stock
165…Cast Bronze, 85-5-5-5
166…Bronze SAE 660
170…Bronze, Bearing Type, Oil Impregnated
180…Copper Alloy
310…Kynar Coated
330…Zinc Plated Steel
331…Chrome Plated Steel
332…Electroless Nickel Plated
335…Galvanized Steel
336…Zinc Plated Yellow Brass
337…Silver Plated Steel
340…Nickel Plated
342…Filled Nylon
354…Injection Molded #203-40 Santoprene Duro 40D ± 5; Color: RED
355…Thermoplastic Elastomer
356…Hytrel
357…Urethane
358…Urethane
359…Urethane Rubber
360…Buna-N Rubber Color coded: RED
361…Buna-N
363…FKM (Fluorel) Color coded: YELLOW
364…E.P.D.M. Rubber Color coded: BLUE
365…Neoprene Rubber Color coded: GREEN
370…Butyl Rubber Color coded: BROWN
371…Philthane (Tuftane)

List continued next page

ITEM NO.	PART NUMBER	DESCRIPTION	TOTAL RQD.
45	866-074-330	Fitting	2
46	866-075-330	Fitting	2
47	900-001-330	Washer, Lock	2
48	900-004-330	Washer, Lock	6
49	900-006-330	Washer, Lock (CI Models)	18
		(SS Models)	20
50	132-022-360	Bumper (goes to head of item 38)	2
51	901-005-330	Washer, Flat (GH2 only)	6
52	**050-005-360**	**Ball, Check Valve (CI Only)**	**2**
	050-005-363	**Ball, Check Valve (CI Only)**	**2**
	050-010-600	**Ball, Check Valve (CI Only)**	**2**
	050-017-360W	**Ball, Check Valve (SS Only)**	**2**
	050-018-600	**Ball, Check Valve (SS Only)**	**2**
53	115-064-080	Bracket, Mounting (GH2, CI Only)	1
	115-072-080	Bracket, Mounting (GH2, SS Only)	1
54	196-029-015	Chamber, Inner	1
55	196-053-010	Chamber, Outer	1
	196-047-110	Chamber, Outer	1
56	**286-036-360**	**Diaphragm**	**1**
	286-036-363	**Diaphragm**	**1**
57	312-046-020	90° Street Elbow (CI Only)	1
	312-046-110	90° Street Elbow (SS Only)	1
58	334-038-010	Flange, Suction	1
	334-044-110	Flange, Suction	1
59	334-039-010	Flange, Discharge	1
	334-043-110	Flange, Discharge	1
60	618-003-330	Plug, Pipe (CI Only)	1
	618-003-110	Plug Pipe (SS Only)	1
61	722-040-110	Seat Check Valve (SS Only)	2
	722-042-080	Seat, Check Valve (CI Only)	2
62	560-079-360	O-Ring (CI Only)	4
	560-079-611	O-Ring (CI Only)	4
	560-106-360	O-Ring (SS Only)	4
	560-106-363	O-Ring (SS Only)	4
	720-060-608	Seal (SS Only)	4
69	618-003-110	Plug, Pipe	1
70	326-006-080	Foot (SS Only)	1
71	866-076-330	Fitting	1
For models with PTFE overlay pumping diaphragm:			
63	612-097-110	Plate, Diaphragm (Outer)	1
	612-039-010	Plate, Diaphragm (Outer)	1
64	286-020-604	Diaphragm	1
65	286-005-360	Diaphragm	1
66	612-047-330	Plate, Diaphragm (Inner)	1
67	900-007-330	Washer, Lock	1
68	545-009-330	Nut, Hex	1
Not Shown:			
	545-008-330	Nut, Hex (SS Only)	4
	900-003-330	Washer, Lock (SS Only)	4

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IMPORTANT: When ordering repair parts always furnish pump model number, serial number and type number.

MATERIAL CODES
The Last 3 Digits of Part Number

Continued from previous page

375…Fluorinated Nitrile
378…High density Polypropylene
405…Cellulose Fibre
408…Cork and Neoprene
425…Compressed Fibre
426…Blue Gard
440…Vegetable Fibre
465…Fibre
500…Delrin 500
501…Delrin 570
505…Acrylic Resin Plastic
520…Injection Molded PVDF Natural Color
540…Nylon
541…Nylon
542…Nylon
544…Nylon Injection Molded
550…Polyethylene
551…Polypropylene
552…Unfilled Polypropylene
553…Unfilled Polypropylene
555…Polyvinyl Chloride
570…Rulon II
580…Ryton
590…Valox
591…Nylatron G-S
592…Nylatron NSB
600…Virgin PTFE
601…Virgin PTFE (Bronze and moly filled)
602…Filled PTFE
603…Blue Gylon
604…Virgin PTFE
606…Virgin PTFE
610... PTFE Encapsulated Silicon
611…PTFE Encapsulated Viton

Delrin and Hytrel are registered tradenames of E.I. DuPont.

Gylon is a registered tradename of Garlock. Inc.

Nylatron is a registered tradename of Polymer Corp.

Rulon II is a registered tradename of Dixion Industries Corporation.

Ryton is a registered tradename of Phillips Chemical Company.

Valox is a registered tradename of General Electric Company.

AVAILABLE REPAIR PART KITS

ITEM NO.	PART NUMBER	DESCRIPTION
	476-242-000	GAS END KIT Gaskets, O-Rings, Seals, Gas Valve Sleeve and Spool Set, Pilot Valve Assembly

Repair Parts Kit for EH2:

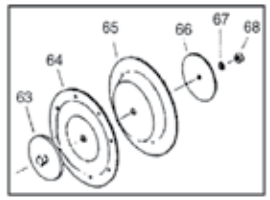
	476-048-360	WETTED END KIT (CI Only) Viton Diaphragm, Check Balls and O-Rings,Carbon Steel Seats
	476-048-363	WETTED END KIT (CI Only) Viton Diaphragm and Check Balls, PTFE O-Rings, Carbon Steel Seats
	476-048-633	WETTED END KIT (CI Only) Viton Diaphragm, PTFE Check Balls and O-Rings, Carbon Steel Seats
	476-048-649	WETTED END KIT (CI Only) Buna Backup Diaphragm, PTFE Overlay Diaphragm and O-Rings, Carbon Steel Seats
	476-056-649	WETTED END KIT (SS Only) Buna Backup Diaphragm, PTFE Overlay Diaphragm, Check Balls and O-Rings, Stainless Steel Seats
	476-056-360	WETTED END KIT (SS Only) Buna Diahragm, Check Balls and O-Rings, Stainless steel Seats
	476-056-633	WETTED END KIT (SS Only) Viton Diaphragm, PTFE Check Balls and O-Rings, Stainless Steel Seats

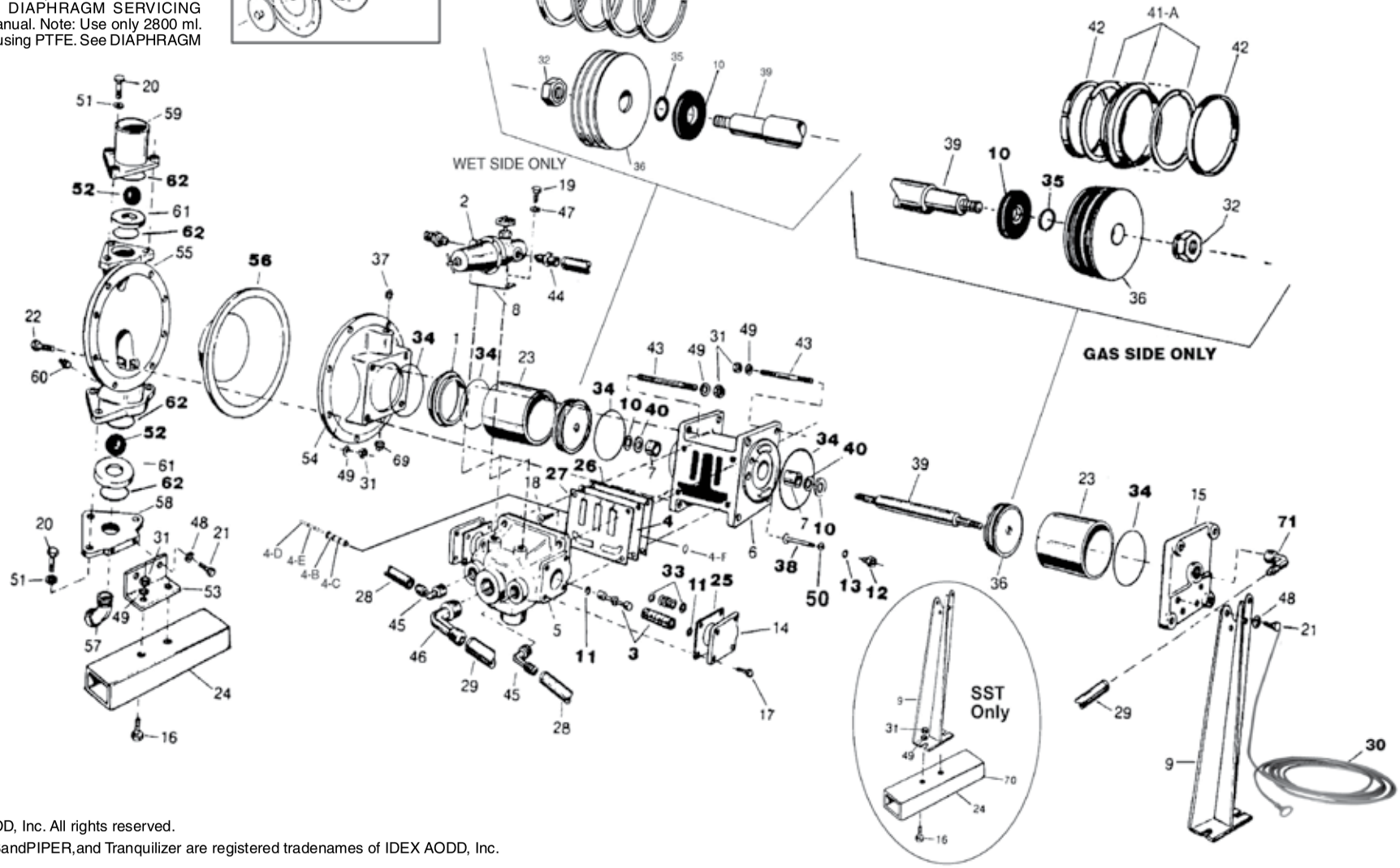
Conversion Kit:

	475-243-000	CONVERT EH2 TO GH2 Natural Gas Valve, Pilot Valve, Intermediate Bracket, Sleeve Bearings,Natural Gas Regulator, Hoses, Fittings

USE OF Virgin PTFE DIAPHRAGM:

When the PTFE diaphragm (item 64) is required, an outer plate (item 63) and inner plate (item 66) must be used to plug the diaphragm's center hole. Sandwich the PTFE and elastomeric diaphragms as shown. Torque the outer plate to the hex nut (item 68), utilizing the lock washer (item 67). Torque at 40 ft/lbs (54.23 Newton meters). Fill the fluid cell as specified in the DIAPHRAGM SERVICING section of this manual. Note: Use only 2800 ml. driver fluid when using PTFE. See DIAPHRAGM SERVICING.





WARREN RUPP, INC.®

Declaration of Conformity

Manufacturer:
Warren Rupp, Inc.®, 800 N. Main Street
Mansfield, Ohio, 44902 USA
certifies that Air-Operated Double Diaphragm Pump Series: HDB, HDF, M Non-Metallic, S Non-Metallic, M Metallic, S Metallic, T Series, G Series, RS Series U Series, EH and SH High Pressure, W Series, SMA and SPA Submersibles, and Tranquilizer Surge Suppressors comply with the European Community Directive 2006/42/EC on Machinery, according to Annex VIII. This product has used Harmonized Standard EN809:1998+A1:2009, Pumps and Pump Units for Liquids - Common Safety Requirements, to verify conformance.

David Roseberry
Signature of authorized person

October 20, 2005
Date of issue

David Roseberry
Printed name of authorized person

Engineering Manager
Title

Revision Level: F

April 19, 2012
Date of revision

IDEX FLUID & METERING

CE