



GARDNER DENVER WATER JETTING SYSTEMS, INC.

Partek • Liqua-Blaster • Geoquip • CRS Power Flow • Jetting Systems • American Waterblaster

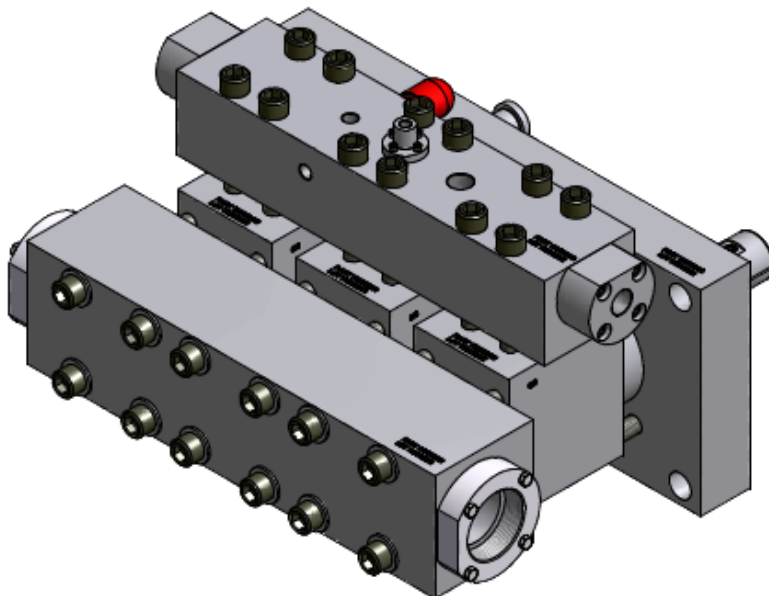
12300 North Houston-Rosslyn Road • Houston, Texas 77086

800-231-3628 • 281-448-5800 • Fax 281-448-7500

www.waterjetting.com • mktg.wjs@gardnerdenver.com

375S Fluid End

O&M Manual, 987014100



Model Number:

TY-375S, 7014100

12300 North Houston Rosslyn Road

Houston, TX 77086

Phone: 281-448-5800

Fax: 281-272-0281

Notice

Neither Gardner Denver Water Jetting Systems (WJS) nor any person acting on behalf of the company assumes any liability resulting from the use of information contained in this document.

"Printed version of this document is uncontrolled"



GARDNER DENVER WATER JETTING SYSTEMS, INC.

Partek • Liqua-Blaster • Geoquip • CRS Power Flow • Jetting Systems • American Waterblaster

12300 North Houston-Rosslyn Road • Houston, Texas 77086

800-231-3628 • 281-448-5800 • Fax 281-448-7500

www.waterjetting.com • mktg.wjs@gardnerdenver.com

Table of Contents

Section 1.0	Introduction.....	4
Section 2.0	How to Contact Gardner Denver Water Jetting Systems, Inc.....	4
Section 3.0	Safety.....	4
Section 4.0	Copyright Notice	6
Section 5.0	Terms and Definitions	6
Section 6.0	General Maintenance	7
6.1	Maintenance Overview.....	7
6.2	Receiving, Acceptance Inspection, and Storage.....	7
6.3	Corrosive Environments	8
6.4	Freezing Temperatures	8
6.5	Preventative Maintenance Schedule	8
6.5.1	Daily Maintenance:.....	8
6.5.2	Monthly Maintenance:.....	9
6.5.3	Semi-Annual:	9
Section 7.0	375S Fluid End.....	9
7.1	Triplex General Specification, 7014100.....	9
Figure 1	Triplex Plunger Specifications	9
Figure 2	375S Illustration	10
Figure 3	375S Special Tools	11
7.2	TY-375S Quick Change Plunger Parts Lists.....	12
Figure 4	Parts List 7014100, TY-375S.....	12
Figure 5	Parts List, 70-14100100, 1 1/16 Plunger.....	13
Figure 6	Parts List, 70-14100200, 1 1/4 Plunger.....	13
Figure 7	Parts List, 70-14100300, 1 9/16 Plunger.....	13
Figure 8	Parts List, 70-14100400, 1 3/4 Plunger.....	14
Figure 12	Item 15 Parts List, 70-20922, Clamp Assembly.....	14
Section 8.0	375S Fluid End Disassembly/Assembly.....	15
8.1	Packing, Plunger and Bushing Removal and Installation.....	15
8.1.1	Removal Set-up.....	15
Figure 13	Plunger & Bushing Illustration.....	15
8.1.2	Clamp Removal	16
Figure 14	Plunger to Pony Rod Clamp	16
8.1.3	Gland Nut Removal	16
8.1.4	Plunger Removal.....	16



GARDNER DENVER WATER JETTING SYSTEMS, INC.

Partek • Liqua-Blaster • Geoquip • CRS Power Flow • Jetting Systems • American Waterblaster

12300 North Houston-Rosslyn Road • Houston, Texas 77086

800-231-3628 • 281-448-5800 • Fax 281-448-7500

www.waterjetting.com • mktg.wjs@gardnerdenver.com

8.1.5	Packing Removal	17
	Figure 15 Packing Removal.....	18
8.2	Reinstall the Packing Set & Plunger.	19
	Figure 16 Packing Stack	19
8.2.1	Reinstall Gland Nut	20
	Figure 17 Install Gland Nut	20
8.2.2	Install the Plunger/Pony Rod Clamp.	21
	Figure 18 Re-install the clamp.....	21
8.3	Fluid End Assembly:	22
	Figure 19 70-14156 Valve TY-375S Suction/Discharge.....	23
8.3.1	Inspect Valve Components	23
8.4	Torque Requirements.....	24
	Figure 20 Manifold Torque Sequence for Triplex.....	24
	Figure 21 Torque requirements.....	24
Section 9.0	Trouble Shooting Guide	25
Section 10.0	7014100 375S Drawing.....	26



GARDNER DENVER WATER JETTING SYSTEMS, INC.

Partek • Liqua-Blaster • Geoquip • CRS Power Flow • Jetting Systems • American Waterblaster

12300 North Houston-Rosslyn Road • Houston, Texas 77086

800-231-3628 • 281-448-5800 • Fax 281-448-7500

www.waterjetting.com • mktg.wjs@gardnerdenver.com

Section 1.0 Introduction

This manual covers the correct method for the safe installation, startup, and maintenance of the T-375S fluid end.

Note: *Additional electronic copies of this manual may be obtained from customer service.*

Section 2.0 How to Contact Gardner Denver Water Jetting Systems, Inc.

Our address is:

12300 North Houston-Rosslyn Rd. Houston, Texas 77086 USA

Phone: 1-281-448-5800

Fax: 1-281-448-7500

Toll Free (US & Canada): 1 800-231-3628

E-Mail: mktg.wjs@gardnerdenver.com

Section 3.0 Safety

Gardner Denver Water Jetting Systems, Inc. publishes various guides for the safe use of Water Blasting Equipment and also recommends that operating personnel have a thorough understanding of "**RECOMMENDED PRACTICES FOR THE USE OF MANUALLY OPERATED HIGH PRESSURE WATER JETTING EQUIPMENT**" published by the Water Jet Technology Association.

Copies of "Recommended Practices for the Use of Manually Operated High Pressure Water Jetting

917 Locust Street, Suite 1100,
St. Louis, MO 63101-1419,
Telephone: (314) 241-1445,
Fax: (314) 241-1449,
Email: wjta@wjta.org

These publications can also be obtained free of charge by contacting Gardner Denver Water Jetting Systems, Inc. 1-800-231-3628.





GARDNER DENVER WATER JETTING SYSTEMS, INC.

Partek • Liqua-Blaster • Geoquip • CRS Power Flow • Jetting Systems • American Waterblaster

12300 North Houston-Rosslyn Road • Houston, Texas 77086

800-231-3628 • 281-448-5800 • Fax 281-448-7500

www.waterjetting.com • mktg.wjs@gardnerdenver.com

Train And Maintain For Safety!

All high velocity water jets can be extremely dangerous to personnel. This potential hazard is magnified with introduction of abrasive materials into the water stream. All personnel operating this equipment should be properly trained and familiar with all safety and operational procedures furnished with the high-pressure unit used in conjunction with this equipment.

WARNING: *Never permit untrained personnel to operate this equipment.*

1. All personnel must be trained in safe operation of water jetting equipment.
2. Erect barricades or warning signs around work area.
3. Water jet lacerations can induce air and bacteria into the blood stream. Seek immediate medical attention.
4. Wear appropriate personal protective equipment including rain suit, face shield, gloves, safety glasses with side shields, and hearing protection.
5. Never aim the water jet at your body or others.
6. Do not use damaged or leaking fittings.
7. Inspect hoses and nozzles for leaks, obstructions or other damage before every use. Do not use if damaged.
8. Keep work area clean and well lit.
9. Clean all water jetting equipment parts after each use.
10. Do not use water jetting equipment in pressure ranges outside of maximum allowable working pressure (MAWP). Consult manuals for proper use.
11. Do not modify or alter factory shipped equipment. Use only genuine Gardner Denver replacement parts. Warranties will not apply to equipment which has been modified or subjected to improper handling, installation, operation, or inadequate maintenance by customer. Consult warranty information provided by GDWJSI.
12. Without limitation, GDWJSI shall **not** be held liable in any event for any claims arising from the misuse of any Gardner Denver equipment.

WARNING: *The fluid end assembly must be properly mounted on the pump power end assembly. There are four mounting studs. Refer to the power end assembly for the torque requirements. These should be tightened in steps to ensure uniform loading.*



GARDNER DENVER WATER JETTING SYSTEMS, INC.

Partek • Liqua-Blaster • Geoquip • CRS Power Flow • Jetting Systems • American Waterblaster

12300 North Houston-Rosslyn Road • Houston, Texas 77086

800-231-3628 • 281-448-5800 • Fax 281-448-7500

www.waterjetting.com • mktg.wjs@gardnerdenver.com



WARNING: Proper torque is **CRITICAL** to preventing fastener failure. Fasteners clamping the fluid end assembly together must be tightened according to the drawing. The torque must be obtained by tightening in three or more approximately equal steps. See [Manifold Torque Sequence](#)

Section 4.0 Copyright Notice

All rights are reserved under International and Pan-American Copyright Conventions. No portion of this manual may be copied or reproduced without written permission from Gardner Denver WJS, Inc.

Section 5.0 Terms and Definitions

Abbreviation	Description
FTTNG	Fitting (Pipe)
GSKT	Gasket
HDWR	Hardware (Fasteners)
HHCS	Hex Head Capscrew
HPF	High Pressure Female
I.R.	Initial Release
IND	Indicator
NPT	National Taper Pipe Thread
NS	Not Shown
MP	Medium Pressure
PE	Power End Assembly
PSI	Pounds Per Square Inch
SHCS	Socket Head Capscrew
S/N	Serial Number
WP	Working Pressure



GARDNER DENVER WATER JETTING SYSTEMS, INC.

Partek • Liqua-Blaster • Geoquip • CRS Power Flow • Jetting Systems • American Waterblaster

12300 North Houston-Rosslyn Road • Houston, Texas 77086

800-231-3628 • 281-448-5800 • Fax 281-448-7500

www.waterjetting.com • mktg.wjs@gardnerdenver.com

Section 6.0 General Maintenance

It is extremely important to check all components in the system to ensure that they have appropriate pressure ratings. This includes *(but is not limited to)* the relief valves, rupture discs, flow control valves, pressure regulators, pressure gauges, hoses and connector fittings used with the fluid end.

Operators must understand basic water jetting safety and have been trained on all aspects of the equipment operation.

This manual must be supplemented by other manuals and training materials to ensure that all operators sufficiently understand how to use this equipment safely.

6.1 Maintenance Overview

Both the fluid and power end assemblies of this pump are manufactured from precision-machined components. A preventative maintenance program is essential to ensure that the pump continues to operate properly over an extended period of time.

Some of the following environmental categories will require special or more frequent maintenance:

- Offshore platforms, salt water, or corrosive environments such as chemical plants.
- Dusty environments such as construction sites; mining operations or plants that process grains, pellets, ground materials, or fibrous products.
- Climates where the pump will be exposed to freezing temperatures.

It is very helpful to record maintenance work performed on your pump. It will allow tracking of component life and help you establish a preventative maintenance program that will avoid unscheduled downtime.

The maintenance schedule should be based on the hour-meter reading on either the engine or motor that drives the pump.

6.2 Receiving, Acceptance Inspection, and Storage

The fluid end assembly is shipped on a heavy duty wood pallet to prevent damage during shipping. It should be similarly protected during subsequent handling and storage. Always keep all ports plugged to prevent intrusion of foreign materials.

When you receive fluid end assembly, it should immediately be inspected visually. If there are indications of physical damage, report this to the carrier.



GARDNER DENVER WATER JETTING SYSTEMS, INC.

Partek • Liqua-Blaster • Geoquip • CRS Power Flow • Jetting Systems • American Waterblaster

12300 North Houston-Rosslyn Road • Houston, Texas 77086

800-231-3628 • 281-448-5800 • Fax 281-448-7500

www.waterjetting.com • mktg.wjs@gardnerdenver.com

The fluid end assembly should be left on the pallet until it is to be mounted on the pump or unit. It should be handled by one of the following means:

- Overhead crane with slings hung around the stuffing boxes in front of the adapter plate.
- Tow Motor with forks extended from the front of the torque plate to the adapting plate.

It should be stored in a clean environment until it is to be mounted on a skid. If it is to be stored for an extended period of time, check with the factory for recommendations.

6.3 Corrosive Environments

If the pump is operated with salt water or water contaminated with corrosive materials, it is recommended that the fluid end be flushed with fresh or potable water at least once a week. This is especially important if air is allowed into either the suction or discharge ports when the pump is not operated for an extended period.

Gritty or abrasive airborne materials can deposit on the plungers and plunger adapters when the pump is not operating. When the pump starts some of the particles will be pulled through the packing and/or seals. This may score the plungers and drastically shorten packing life.

The power end cradle has a plexiglass cover that will minimize the intrusion of these materials and should be visually inspected daily. It can easily be removed to clean off the plungers and plunger adapters as needed.

6.4 Freezing Temperatures

Freezing water in the pump fluid end can crack the fluid cylinder, discharge and suction manifolds, and stuffing boxes. If the pump is exposed to potential freezing temperatures, drain all water from fluid end and add an anti-freeze mixture that will remain in the liquid state.

If the pump is to be operated at temperatures approaching freezing conditions, it may be necessary to heat both the power and fluid end assemblies before the pump is started.

6.5 Preventative Maintenance Schedule

6.5.1 Daily Maintenance:

- Verify that suction supply pressure exceeds minimum requirements.
- Check and replace filter bags or cartridges as required.
- At startup listen to pump operation for any abnormal sounds or vibration.
- Verify plunger water lubrication is flowing at approximately 1 GPM per plunger. Look for excessive flow from any of the gland nuts that would



GARDNER DENVER WATER JETTING SYSTEMS, INC.

Partek • Liqua-Blaster • Geoquip • CRS Power Flow • Jetting Systems • American Waterblaster

12300 North Houston-Rosslyn Road • Houston, Texas 77086

800-231-3628 • 281-448-5800 • Fax 281-448-7500

www.waterjetting.com • mktg.wjs@gardnerdenver.com

indicate significant packing leakage. Make sure that the water is not accumulating in the pump cradle.

6.5.2 Monthly Maintenance:

- Check torque of all fluid end fasteners.

6.5.3 Semi-Annual:

- Disassemble and inspect expendable fluid end components including valves and valve seats, valve springs, plungers and brass components.
- Replace broken or weak springs.
- Replace scored or worn plungers.
- Reassemble the fluid end per instructions. Refer to the torque specifications on the drawing

Section 7.0 375S Fluid End

7.1 Triplex General Specification, 7014100

- ✓ Max. Pressure: 15,000 (see chart)
- ✓ Max. RPM: 600
- ✓ Stroke: 3.750 in.
- ✓ Max. No. of Plungers: 3
- ✓ Max. Power: 294 HP
- ✓ Max. Rod Load capacity: 19,000 LBF
- ✓ A minimum of 40 PSIG supply pressure at the pump is required for this fluid end at maximum flow rate to prevent pump cavitation.
- ✓ A minimum of a 100 micron bag filter is required.

Pressure PSIG	Plunger Size (in)	Theoretical Flow Rate GPM	Volumetric Efficiency	Estimated Flow Rate GPM	Estimated Power HP
15000	1.188	27.8	87%	24.0	233.5
15000	1.250	30.7	88%	27.1	263.6
11088	1.457	41.7	94%	39.3	282.6
9635	1.563	48.0	96%	46.1	287.8
8914	1.625	51.9	97%	50.2	290.1
7686	1.750	60.2	98%	58.9	293.5

Figure 1 Triplex Plunger Specifications



GARDNER DENVER WATER JETTING SYSTEMS, INC.

Partek • Liqua-Blaster • Geoquip • CRS Power Flow • Jetting Systems • American Waterblaster

12300 North Houston-Rosslyn Road • Houston, Texas 77086

800-231-3628 • 281-448-5800 • Fax 281-448-7500

www.waterjetting.com • mktg.wjs@gardnerdenver.com

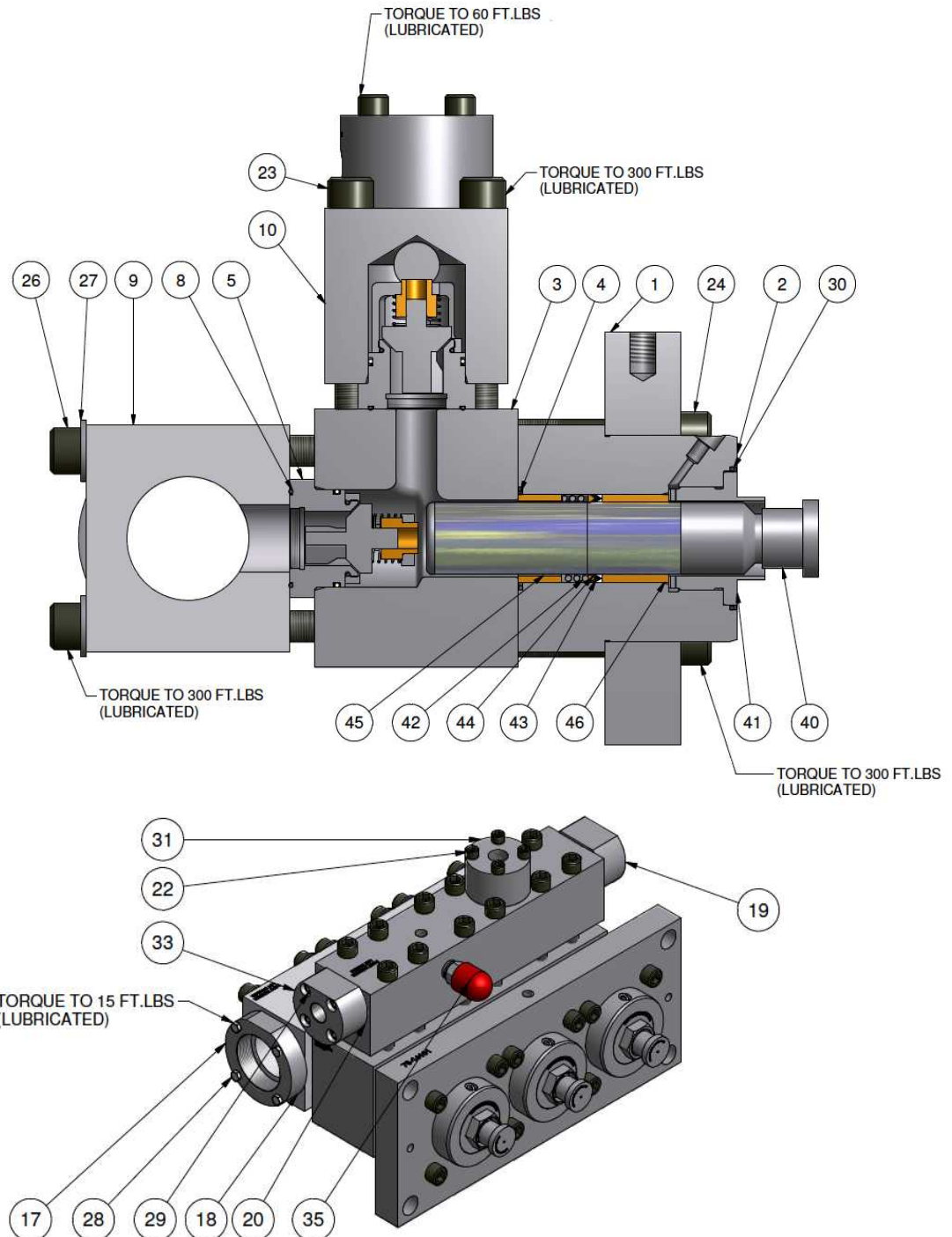


Figure 2 375S Illustration



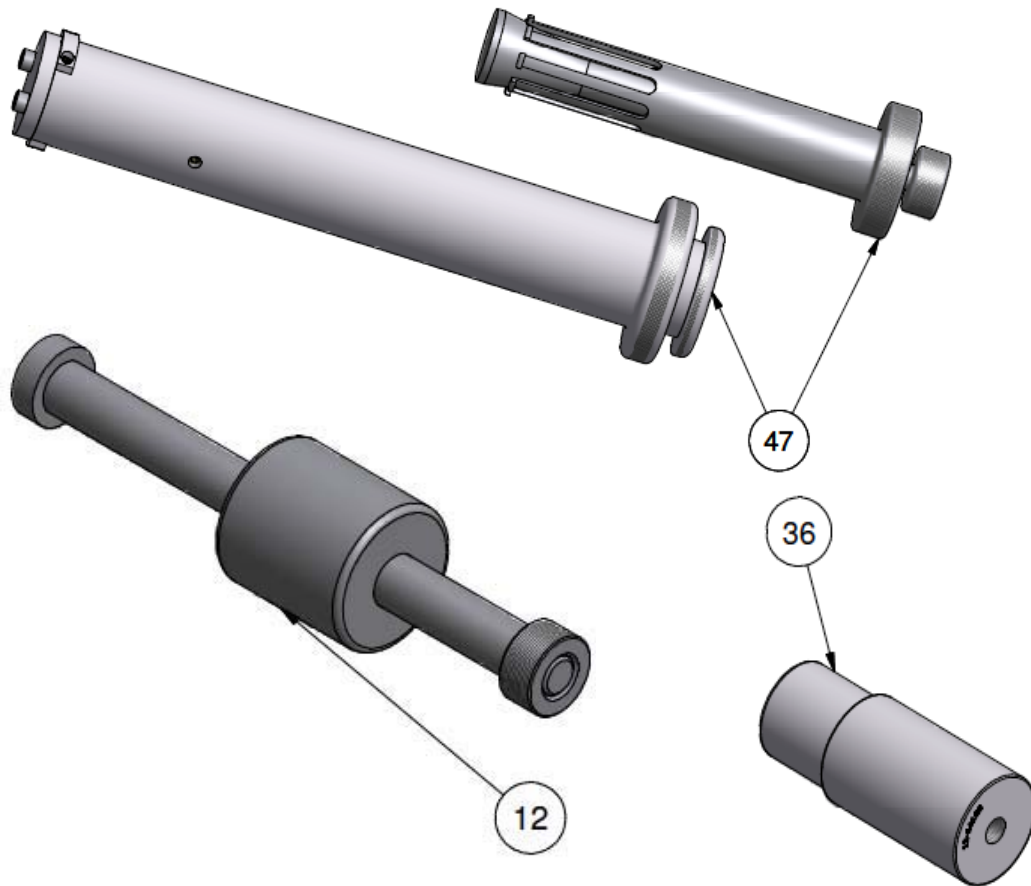
GARDNER DENVER WATER JETTING SYSTEMS, INC.

Partek • Liqua-Blaster • Geoquip • CRS Power Flow • Jetting Systems • American Waterblaster

12300 North Houston-Rosslyn Road • Houston, Texas 77086

800-231-3628 • 281-448-5800 • Fax 281-448-7500

www.waterjetting.com • mktg.wjs@gardnerdenver.com



Item	Qty	Part No.	Description
12	1	12-78033	Valve Removal Tool, TY-375S
36	2	1214102	Alignment Pin, TY-375S Fluid End
47	1	12-20905	Tool, Packing Removal, 1 1/16
47	1	12-20916	Tool Kit, Packing Removal, 1 1/4
47	1	12-20945	Tool Kit, Packing Removal, 1 9/16
47	1	12-20955	Tool Kit, Packing Removal, 1 3/4

Figure 3 375S Special Tools



GARDNER DENVER WATER JETTING SYSTEMS, INC.

Partek • Liqua-Blaster • Geoquip • CRS Power Flow • Jetting Systems • American Waterblaster

12300 North Houston-Rosslyn Road • Houston, Texas 77086

800-231-3628 • 281-448-5800 • Fax 281-448-7500

www.waterjetting.com • mktg.wjs@gardnerdenver.com

7.2 TY-375S Quick Change Plunger Parts Lists

Item	Qty	Part No.	Description
0	0	7014100	Kit, Fluid End, TY-375S, Quick Change
1	1	7014161	Plate, Adapting, TY-375S
2	3	7014102	Stuffing Box, TY-375S, Quick Change
3	1	7014166	Cylinder, Fluid, TY-375S
4	3	2280120002	O-Ring, 2 1/2, 228-90, Disogrin 9250 Compound
5	6	7014156	Valve, Assy. TY-375S Suction & Discharge
8	6	2274217	O-Ring, 2-3/8, 2-139-90
9	1	7014153	Manifold, Suction, TY-375S
10	1	7014159	Manifold, Discharge, TY-375S
12	1	1214160	Valve Removal Tool, TY-375S
17	1	7080118001	Flange, S.S., Suction Manifold, 3 NPT
18	2	2280179	O-Ring, 4, 2-240-70,
19	1	7078604	Adapter, Manifold, Blind
20	3	2274207	O-Ring, 1-1/2, 2-218-90
22	4	1608205	Screw, SHC, 1/2-13 X 3
23	12	1614152	Screw, SHC, 3/4-16 X 5 3/4
24	12	1614104	Screw SHC 3/4-16 X 5
26	12	1614151	Screw, SHC, 3/4-16 X 6 1/2
27	12	1620101	Washer, Series N, Type A, 3/4
28	8	1640002	Bolt, Hex HD, 3/8-16 1 3/4 #5
29	8	1677111	Screw, SHC, 1/2-13 X 2
30	3	2220972	O-Ring 3 1/2, 2-236-90
31	1	7078604006	Flange Straight 1 NPT, 90 Ell 1/2 NPT
33	1	7078604001	Adapter, Manifold, 1 NPT
35	1	3103500	Press Safety HD Assembly
36	2	1214102	Alignment Pin, TY-375S Fluid End

Figure 4 Parts List 7014100, TY-375S



GARDNER DENVER WATER JETTING SYSTEMS, INC.

Partek • Liqua-Blaster • Geoquip • CRS Power Flow • Jetting Systems • American Waterblaster

12300 North Houston-Rosslyn Road • Houston, Texas 77086

800-231-3628 • 281-448-5800 • Fax 281-448-7500

www.waterjetting.com • mktg.wjs@gardnerdenver.com

Item	Qty	Part No.	Description
0	0	70-14100100	Kit, 1 1/16 Plunger Set, Colmonoy, TY-375S
40	3	70-14672012	Plunger, 1 1/16, Colmonoy, TY-375S
41	3	70-14673003	Gland Nut, 1 1/4, TY-375HC
42	3	25-14101	Spring, Packing, TY-375S, 2.125 OD, 90#
43	3	22-14110002	Packing Set, 1 1/16 X 2 1/8
44	3	70-14109002	Front Packing Ring, 1 1/16, TY-375S
45	3	70-14107002	Throat Bushing, 1 1/16, TY-375S
46	3	70-14108002	Back Packing Ring, 1 1/16, TY-375S s
47	1	12-20905	Tool, Packing Removal, 1 1/16, TF-450HC

Figure 5 Parts List, 70-14100100, 1 1/16 Plunger

Item	Qty	Part No.	Description
0	0	70-14100200	Kit, 1 1/4 Plunger Set, Colmonoy, TY-375S
40	3	70-14672013	Plunger, 1 1/4, Colmonoy, TY-375HC
41	3	70-14673003	Gland Nut, 1 1/4, TY-375HC
42	3	25-14101	Spring, Packing, TY-375S, 2.125 OD, 90#
43	3	22-14110003	Packing Set, 1 1/4 X 2 1/8
44	3	70-14109003	Front Packing Ring, 1 1/4, TY-375S
45	3	70-14107003	Throat Bushing, 1 1/4, TY-375S
46	3	70-14108003	Back Packing Ring, 1 1/4, TY-375S
47	1	12-20916	Tool, Packing Removal, 1 1/4, TF-450HC

Figure 6 Parts List, 70-14100200, 1 1/4 Plunger

Item	Qty	Part No.	Description
0	0	70-14100300	Kit, 1 9/16 Plunger Set, Colmonoy, TY-375S
40	3	70-14672017	Plunger, 1 9/16, Colmonoy, TY-375S
41	3	70-14673009	Gland Nut, 1 3/4, TY-375S
42	3	25-14101	Spring, Packing, Ty-375s, 2.125 OD, 90#
43	3	22-14110007	Packing Set, 1 9/16 X 2 1/8
44	3	70-14109007	Front Packing Ring, 1 9/16, TY-375S
45	3	70-14107007	Throat Bushing, 1 9/16, TY-375S
46	3	70-14108007	Back Packing Ring, 1 9/16, TY-375S
47	1	12-20945	Tool, Packing Removal, 1 9/16, TF-450HC

Figure 7 Parts List, 70-14100300, 1 9/16 Plunger



GARDNER DENVER WATER JETTING SYSTEMS, INC.

Partek • Liqua-Blaster • Geoquip • CRS Power Flow • Jetting Systems • American Waterblaster

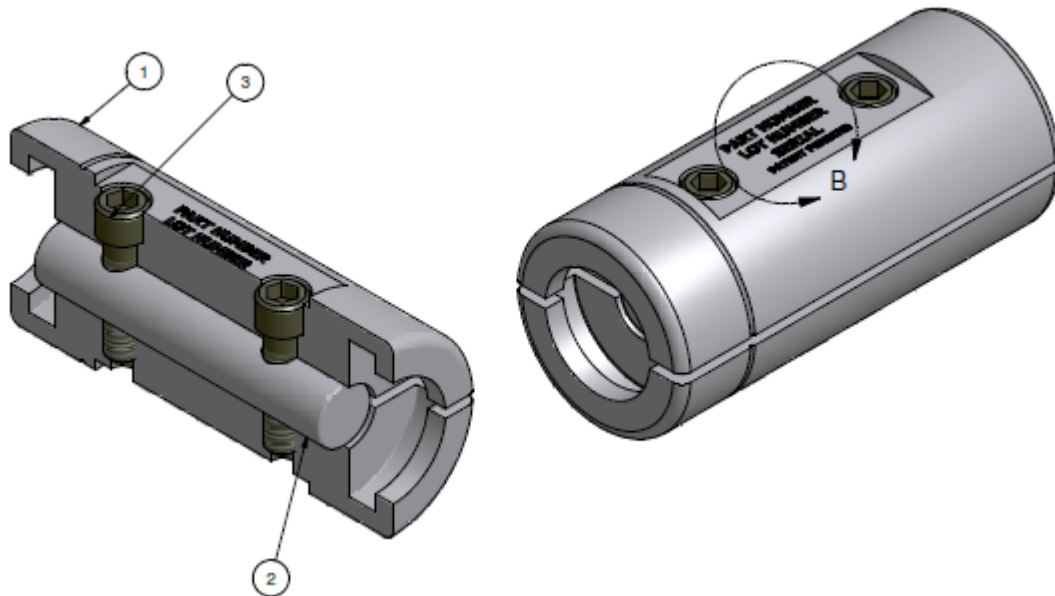
12300 North Houston-Rosslyn Road • Houston, Texas 77086

800-231-3628 • 281-448-5800 • Fax 281-448-7500

www.waterjetting.com • mktg.wjs@gardnerdenver.com

Item	Qty	Part No.	Description
0	0	7014100400	Kit, 1 3/4 Plunger Set, Colmonoy, TY-375S
40	3	7014672019	Plunger, 1 3/4, Colmonoy, TY-375S
41	3	7014673009	Gland Nut, 1 3/4, TY-375S
42	3	2514160	Spring, Packing, Ty-375s, 2.11 OD X 1.31 Fl
43	3	2214110009	Packing Set, 1 3/4 X 2 1/8
44	3	7014109009	Front Packing Ring, 1 3/4, TY-375S
45	3	7014107009	Throat Bushing, 1 3/4, Ty-375s
46	3	7014108009	Back Packing Ring, 1 3/4, TY-375S
47	1	1220955	Assy, Tool, Packing Removal, 1 5/8 - 1 3/4

Figure 8 Parts List, 70-14100400, 1 3/4 Plunger



Item	Qty	Part No.	Description
0	0	70-20922	Assy, Clamp, Plunger Adapter
1	1	70-20923	Clamp, Pair, Plunger, TF-450HC, Convertible
2	1	70-20924	Pin, Clamp, Plunger, TF-450HC, Convertible
3	2	16-10001	Screw, SHC, 3/8-16 X 1 1/2

Figure 9 Item 15 Parts List, 70-20922, Clamp Assembly



GARDNER DENVER WATER JETTING SYSTEMS, INC.

Partek • Liqua-Blaster • Geoquip • CRS Power Flow • Jetting Systems • American Waterblaster

12300 North Houston-Rosslyn Road • Houston, Texas 77086
800-231-3628 • 281-448-5800 • Fax 281-448-7500
www.waterjetting.com • mktg.wjs@gardnerdenver.com

Section 8.0 375S Fluid End Disassembly/Assembly

8.1 Packing, Plunger and Bushing Removal and Installation

8.1.1 Removal Set-up

Manually crank the pump to pull the plunger-plunger adapter toward the power end.

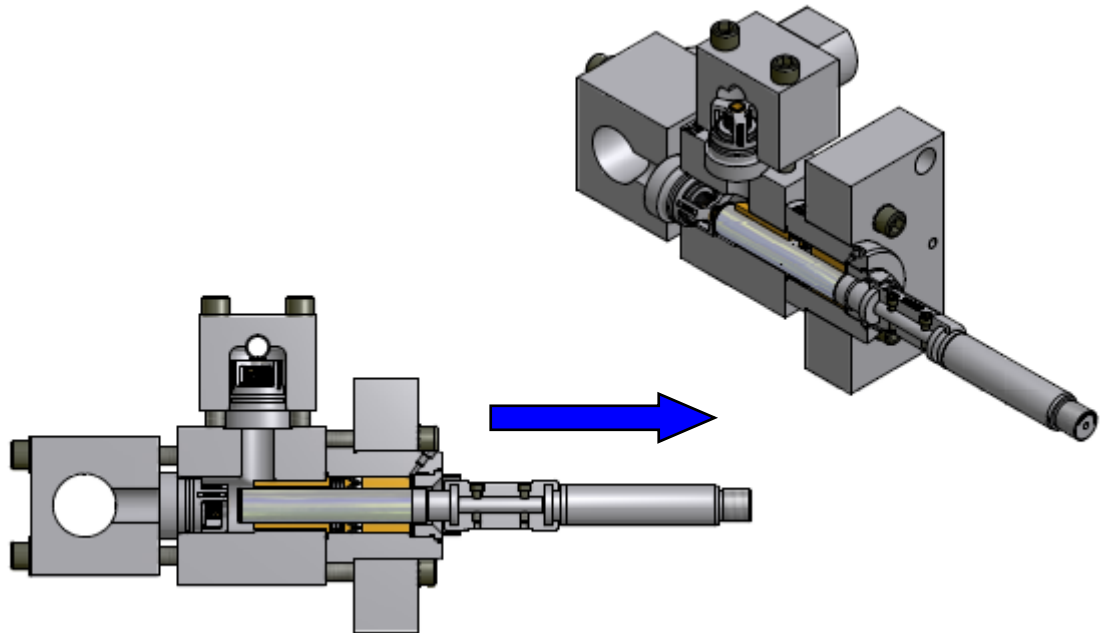


Figure 10 Plunger & Bushing Illustration



GARDNER DENVER WATER JETTING SYSTEMS, INC.

Partek • Liqua-Blaster • Geoquip • CRS Power Flow • Jetting Systems • American Waterblaster

12300 North Houston-Rosslyn Road • Houston, Texas 77086

800-231-3628 • 281-448-5800 • Fax 281-448-7500

www.waterjetting.com • mktg.wjs@gardnerdenver.com

8.1.2 Clamp Removal

Split the clamp [15] by removal the two screws (16-10001).

Caution: *Keep the clamp's part together and do not mix with other clamps.*

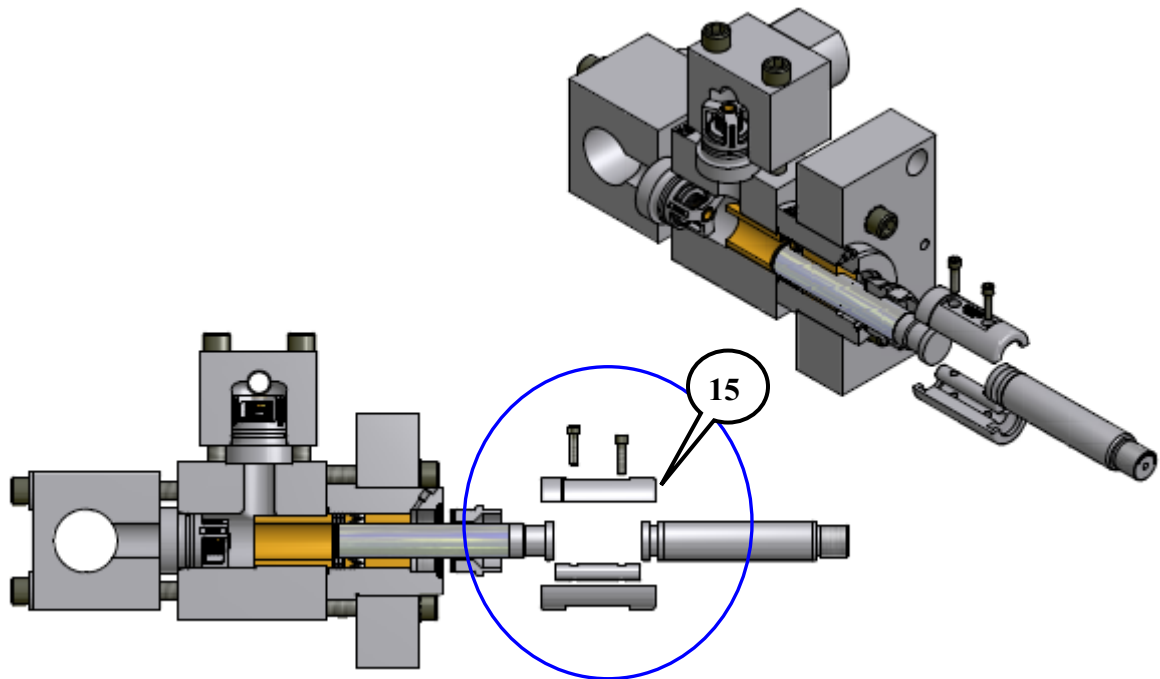


Figure 11 Plunger to Pony Rod Clamp

8.1.3 Gland Nut Removal

Remove the gland nut [41] from the stuffing box [2] and slide them over the plunger [40].

8.1.4 Plunger Removal

Remove the plunger [40].



GARDNER DENVER WATER JETTING SYSTEMS, INC.

Partek • Liqua-Blaster • Geoquip • CRS Power Flow • Jetting Systems • American Waterblaster

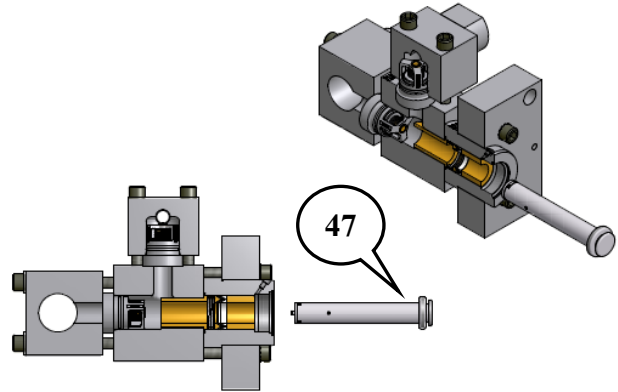
12300 North Houston-Rosslyn Road • Houston, Texas 77086

800-231-3628 • 281-448-5800 • Fax 281-448-7500

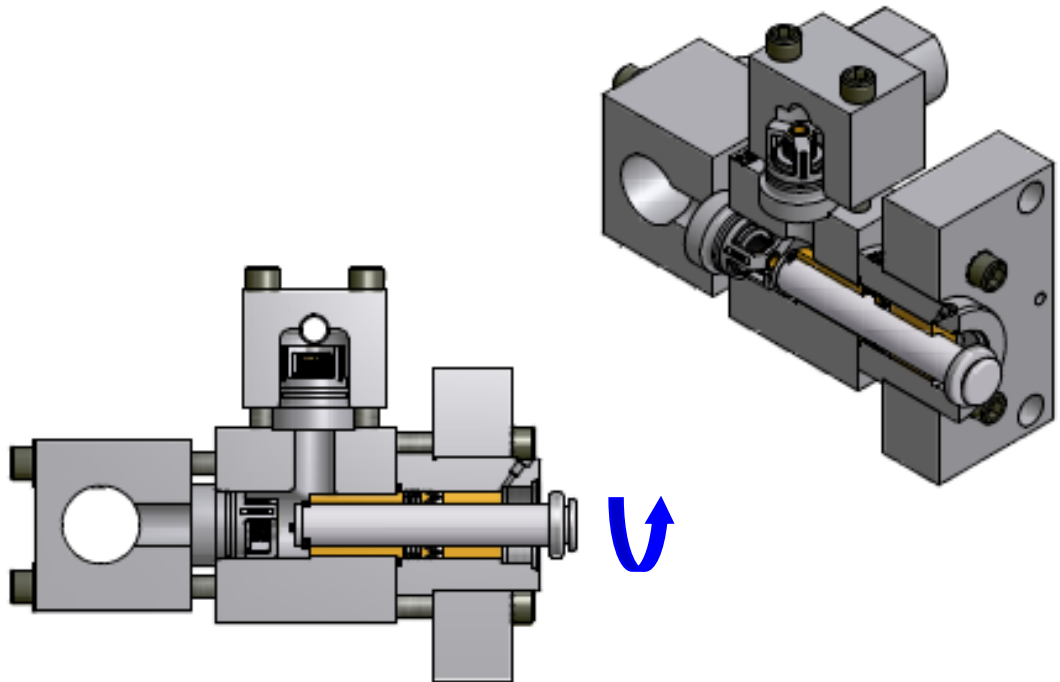
www.waterjetting.com • mktg.wjs@gardnerdenver.com

8.1.5 Packing Removal

Use the packing removal tool [47] to pull the packing and bushings set, position the tool so that way the teeth will be in front of the front packing ring [45].



Hold the handle and turn the knob 90 degrees (in either direction) to catch the Throat Bushing [45].





GARDNER DENVER WATER JETTING SYSTEMS, INC.

Partek • Liqua-Blaster • Geoquip • CRS Power Flow • Jetting Systems • American Waterblaster

12300 North Houston-Rosslyn Road • Houston, Texas 77086

800-231-3628 • 281-448-5800 • Fax 281-448-7500

www.waterjetting.com • mktg.wjs@gardnerdenver.com

Pull the packing set out and remove.

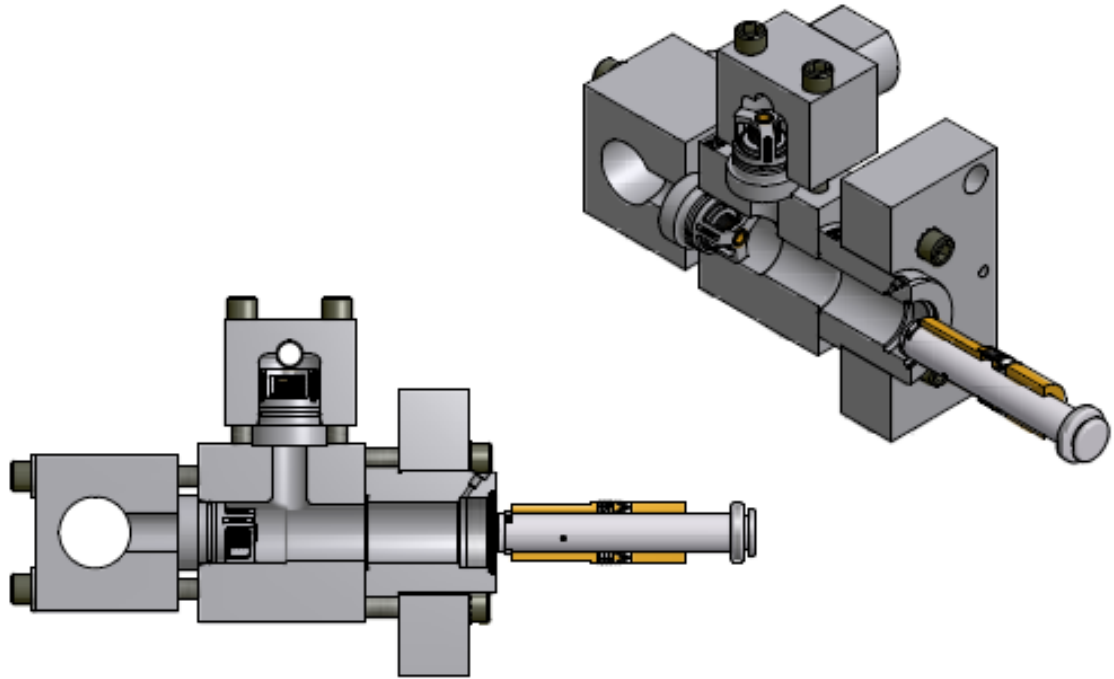


Figure 12 Packing Removal



GARDNER DENVER WATER JETTING SYSTEMS, INC.

Partek • Liqua-Blaster • Geoquip • CRS Power Flow • Jetting Systems • American Waterblaster

12300 North Houston-Rosslyn Road • Houston, Texas 77086
800-231-3628 • 281-448-5800 • Fax 281-448-7500
www.waterjetting.com • mktg.wjs@gardnerdenver.com

8.2 Reinstall the Packing Set & Plunger.

Follow the packing stack set illustration below to assemble the.

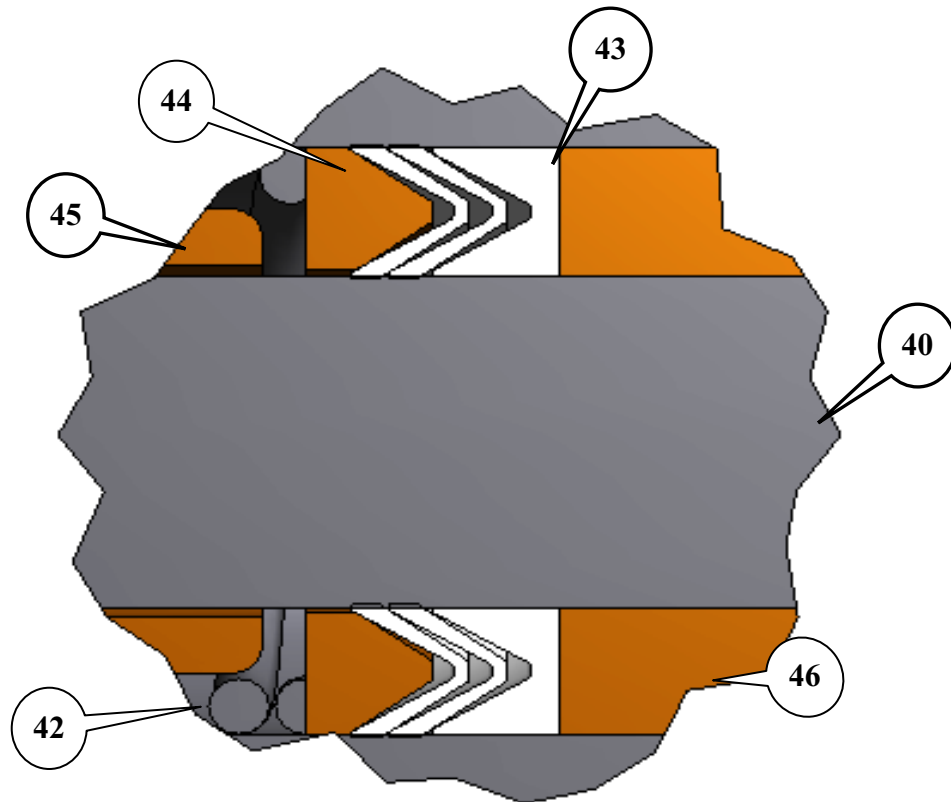


Figure 13 Packing Stack



GARDNER DENVER WATER JETTING SYSTEMS, INC.

Partek • Liqua-Blaster • Geoquip • CRS Power Flow • Jetting Systems • American Waterblaster

12300 North Houston-Rosslyn Road • Houston, Texas 77086

800-231-3628 • 281-448-5800 • Fax 281-448-7500

www.waterjetting.com • mktg.wjs@gardnerdenver.com

8.2.1 Reinstall Gland Nut

After the packing is installed, **using 70% Moly-Disulfide Grease P/N 1301516** or equivalent anti-seize compound, lube the threads of the Gland Nut [41].

Carefully screw the Gland Nut [41] into the Stuffing Box [2].

Warning: Do **NOT** use anti-seize lubricant on the O-ring [30], the purpose of the O-ring's is to apply tension on the Gland Nut to prevent it from backing up during operation.

Caution: Water Jetting recommends that this be done by hand to prevent gauling.

Warning: Do not use a pneumatic or electrical wrench to tighten the gland nut. Water Jetting recommends that this be done by hand to prevent gauling.

Torque the gland nut [41] to 75 ⁺/₋ 25 Ft Lbs

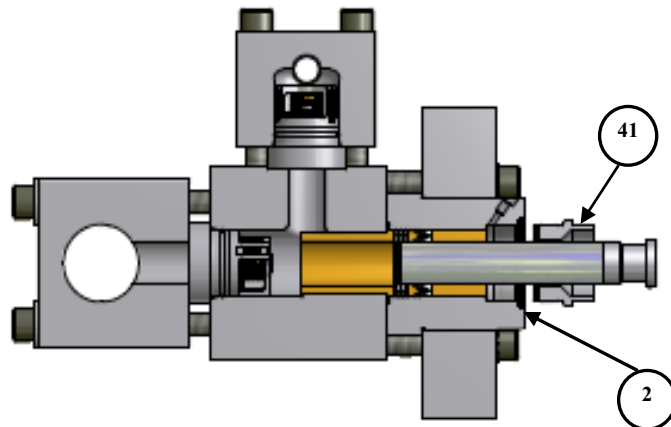


Figure 14 Install Gland Nut



GARDNER DENVER WATER JETTING SYSTEMS, INC.

Partek • Liqua-Blaster • Geoquip • CRS Power Flow • Jetting Systems • American Waterblaster

12300 North Houston-Rosslyn Road • Houston, Texas 77086

800-231-3628 • 281-448-5800 • Fax 281-448-7500

www.waterjetting.com • mktg.wjs@gardnerdenver.com

8.2.2 Install the Plunger/Pony Rod Clamp.

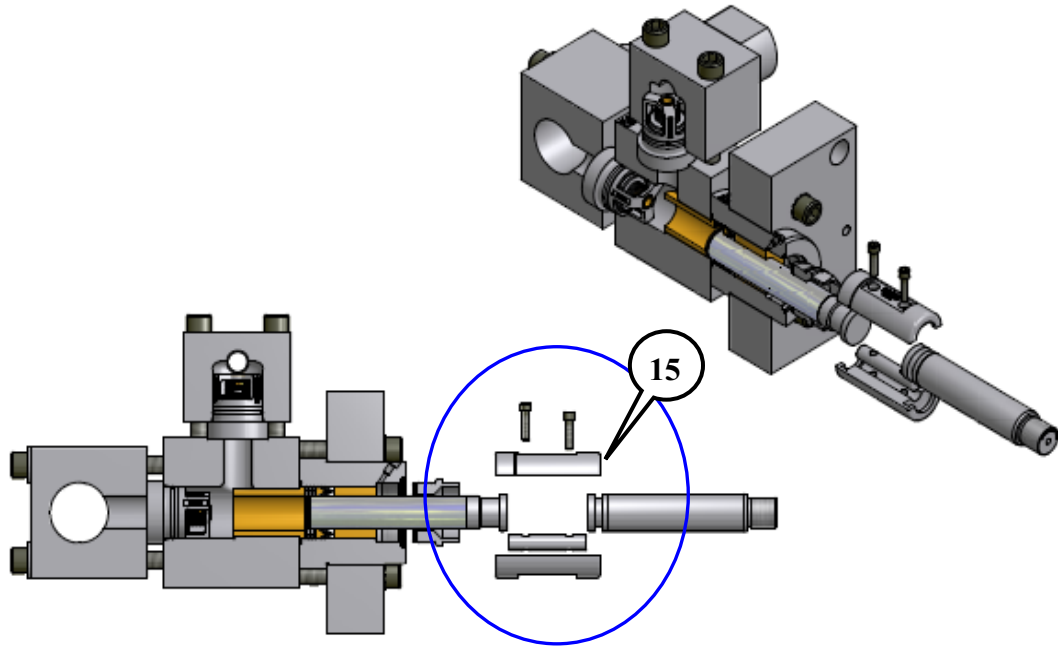


Figure 15 Re-install the clamp.



GARDNER DENVER WATER JETTING SYSTEMS, INC.

Partek • Liqua-Blaster • Geoquip • CRS Power Flow • Jetting Systems • American Waterblaster

12300 North Houston-Rosslyn Road • Houston, Texas 77086

800-231-3628 • 281-448-5800 • Fax 281-448-7500

www.waterjetting.com • mktg.wjs@gardnerdenver.com

8.3 Fluid End Assembly:

- 1- Install the stuffing boxes [2] in the power end face in a way that the packing lubricating holes will be at the top.
- 2- Install the components in the stuffing boxes as shown in [Reinstall the Packing Set & Plunger](#).
- 3- Lubricate the threads and insert the screws [24] through the adapting plate [1], do not tighten.
- 4- Attach the fluid cylinder [3] to the stuffing boxes [2], tighten the screws [24] just enough to hold the fluid cylinder [3] against the stuffing boxes [2], but do not torque..
- 5- Install the alignment pins [36] through the outside stuffing boxes [2] and into the fluid cylinder.
- 6- When you have the alignment tool in place, torque the screws {24} to 300 ft lbs
- 7- Remove the alignment pins [36].

Note: *The pins should slide freely out through the stuffing boxes.*

- 8- Insert the o-rings [8] and [6] and the backup ring [7] into the grooves of the valve assemblies [5]. [Inspect Valve Components](#)
- 9- Place valve assembly [5] on the top of the fluid cylinder [3] as shown.
- 10- Install the discharge manifold [10] over the three valve assemblies so that the rupture disk port will be towards the power end (to the rear) as shown.
- 11- Lubricate the threads and insert screws [26] through the top of the discharge manifold [10] and torque them as indicated in the drawing to the maximum value.



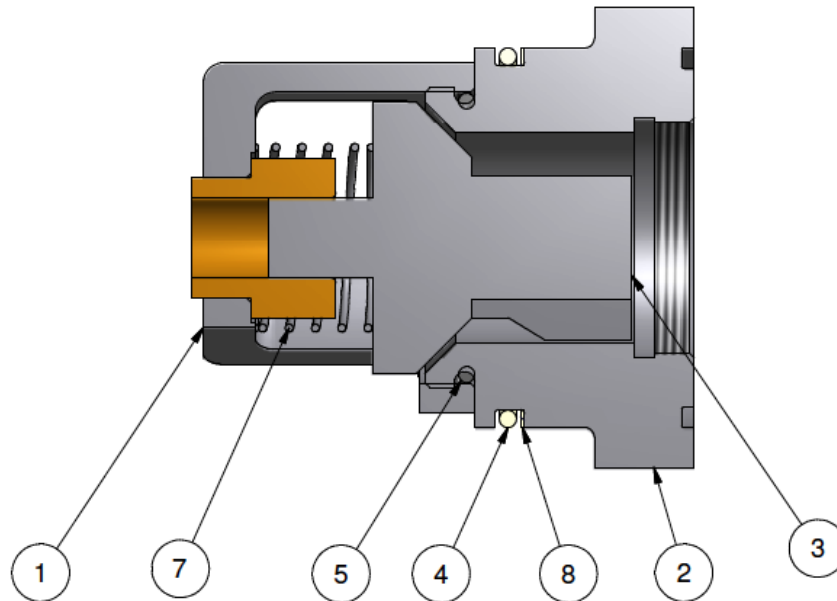
GARDNER DENVER WATER JETTING SYSTEMS, INC.

Partek • Liqua-Blaster • Geoquip • CRS Power Flow • Jetting Systems • American Waterblaster

12300 North Houston-Rosslyn Road • Houston, Texas 77086

800-231-3628 • 281-448-5800 • Fax 281-448-7500

www.waterjetting.com • mktg.wjs@gardnerdenver.com



Item	Qty	Part No.	Description
0	0	70-14156	Valve, Assy. TY-375S Suction & Discharge
1	1	70-14156008	Cage Assembly, Valve, TY-375S
2	1	70-14156001	Seat, Valve, TY-375S
3	1	70-14156006	Valve, TY-375S With Plastic Insert
4	1	22-80205	O-Ring 2 3/8 2-227-90 Disogrin 9250 Compd
5	1	22-14156004	O-Ring, 1 13/16 OD, 2-130-70
7	1	25-14156	Spring, Valve Assembly, TY-375S
8	1	22-14167	Backup O-Ring, Nylon, 8-227

Figure 16 70-14156 Valve TY-375S Suction/Discharge

8.3.1 Inspect Valve Components

Check the following for damage and wear, especially on seating surfaces:

3. Check the o-rings, particularly the high pressure o-ring [14],
4. Check the valve seat [3],
5. the discharge valve [6],
6. the suction valve [12],
7. Check the springs for distortion.



GARDNER DENVER WATER JETTING SYSTEMS, INC.

Partek • Liqua-Blaster • Geoquip • CRS Power Flow • Jetting Systems • American Waterblaster

12300 North Houston-Rosslyn Road • Houston, Texas 77086

800-231-3628 • 281-448-5800 • Fax 281-448-7500

www.waterjetting.com • mktg.wjs@gardnerdenver.com



Note: For all torque specification refer to the drawings. [7014100 375S Drawing](#)

8.4 Torque Requirements

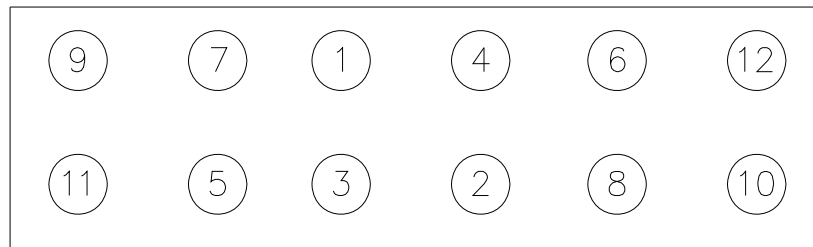


Figure 17 Manifold Torque Sequence for Triplex

WARNING: Lubricate threads with 70% Moly Disulfide

Torque Specifications: Fluid End Assembly			
Item	Description	Thread Size	Torque
41	Gland Nut, 450SB Fluid End	various	75 +/- 25 Ft Lbs
26	Bolt, SHCS, 7/8-9 X 8	7/8-9 X 8	300 Ft. Lbs.
24	Screw, SHCS, 7/8-9 X 5 1/2	7/8-9 X 5 1/2	300 Ft. Lbs.
23	Screw, SHC, 7/8-9 X 6 1/2	7/8-9 X 6 1/2	300 Ft. Lbs.

Figure 18 Torque requirements



GARDNER DENVER WATER JETTING SYSTEMS, INC.

Partek • Liqua-Blaster • Geoquip • CRS Power Flow • Jetting Systems • American Waterblaster

12300 North Houston-Rosslyn Road • Houston, Texas 77086

800-231-3628 • 281-448-5800 • Fax 281-448-7500

www.waterjetting.com • mktg.wjs@gardnerdenver.com

Section 9.0 Trouble Shooting Guide

Problem	Inspection	Suggested Corrective Action (see notes below)
Fluid End Knocking - Cavitation This can be caused by any of the following: Inadequate suction supply pressure, Inadequate supply hose size Air trapped in the fluid end assembly Broken or weak valve springs.	Audible sound	A minimum of 30 PSIG supply pressure is required for this pump. Supply hose must be at least 3" ID Open the flow control valve completely if the pump is so equipped to remove all air Replace weak or broken valve springs on both suction & discharge ports. (See notes below)
Low Pressure – due to pump capacity	Check pressure on pump gauge	Check pump speed; verify pump is operating at the rated RPM.
Low Pressure – due to valve leakage	Check pressure on pump gauge	Replace valve and/or valve seat.
Low Pressure – due to packing leakage	Observe water flow thru gland nut	Replace packing set
Premature packing failure – due to water quality	Check pump maintenance records	Replace filter bags with correct micron rating.
Premature packing failure – due to worn plungers	Inspect plunger surface for scratches, pitting, corrosion & finish	Replace plunger(s)
Premature packing failure – due to worn packing bushings	Inspect bushing bore surface for scratches, pitting, corrosion & finish	Replace throat bushing(s) and/or back packing ring(s)
Leakage between manifold & valve seat – due to improperly torqued fasteners	Use torque wrench to check fastener torque	Loosen all fasteners holding the suction manifold and re-torque following assembly instructions.
Leakage between manifold & valve seat due to worn or damaged O-Rings	Inspect O-Rings and seating surfaces	Replace O-Rings on valve seat face and OD.
Broken stud or capscrew	Visual	Replace and torque per guidelines in Dwg



GARDNER DENVER WATER JETTING SYSTEMS, INC.

Partek • Liqua-Blaster • Geoquip • CRS Power Flow • Jetting Systems • American Waterblaster

12300 North Houston-Rosslyn Road • Houston, Texas 77086

800-231-3628 • 281-448-5800 • Fax 281-448-7500

www.waterjetting.com • mktg.wjs@gardnerdenver.com

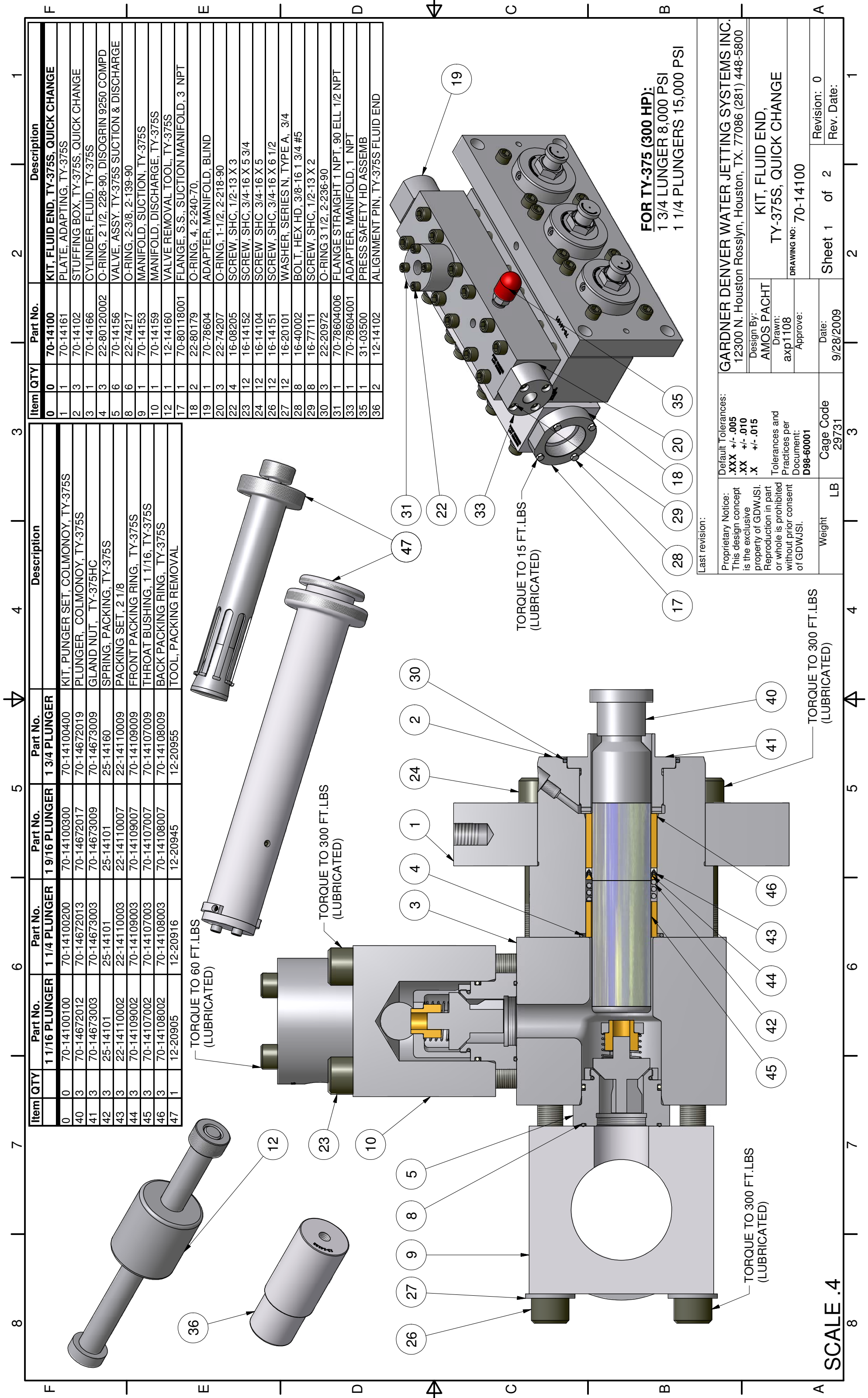


Notes: *To determine if the knocking sound is coming from the power end or fluid end of the pump, it may be necessary to temporarily disconnect the plungers from the plunger adapter. If the sound continues with the fluid end disconnected, the problem is in the power end. Check the power end manual for troubleshooting instructions.*

Section 10.0 7014100 375S Drawing



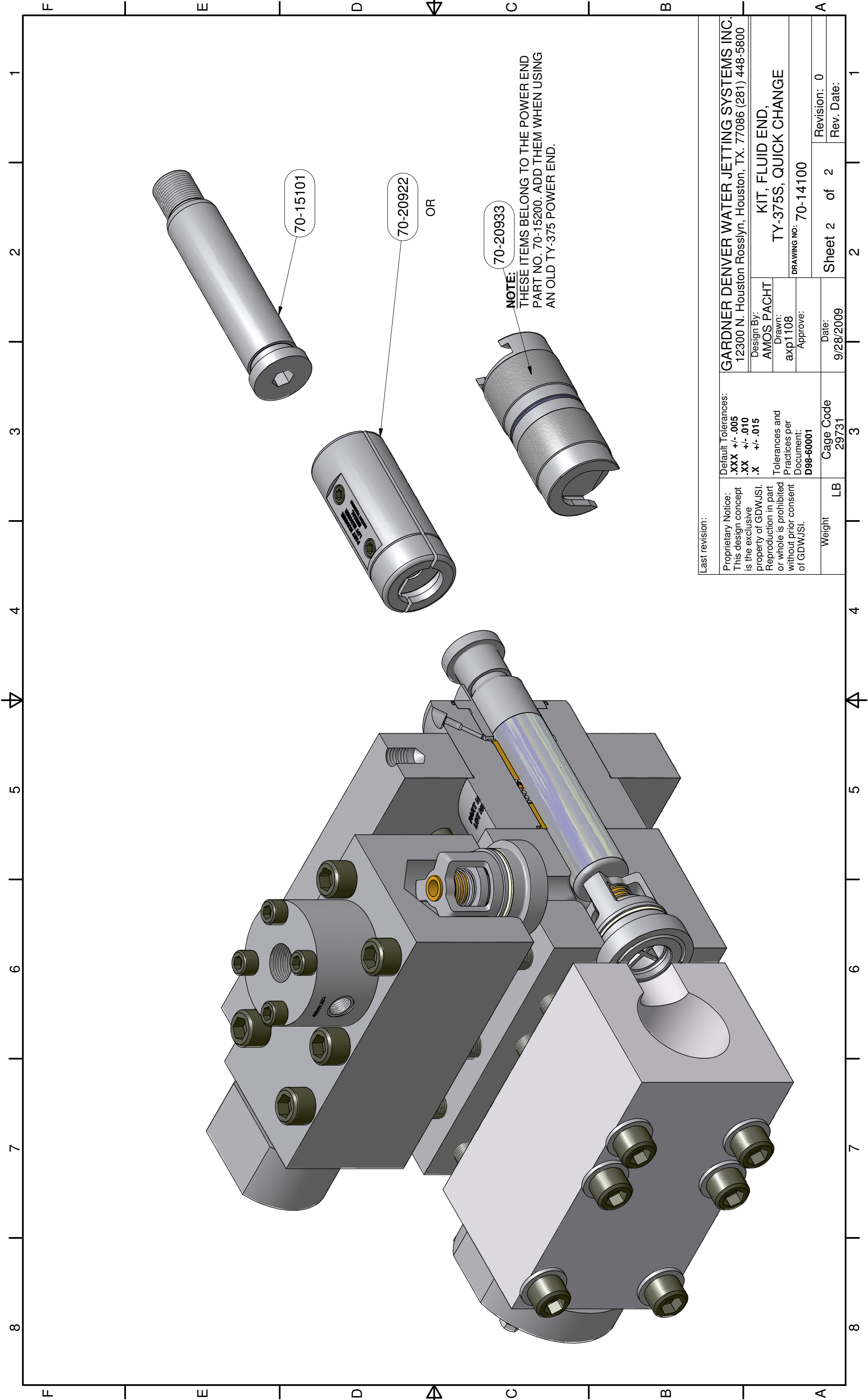
"Printed version of this document is uncontrolled"



Item	QTY	Part No.	Description
0	0	70-14100	KIT, FLUID END, TY-375S, QUICK CHANGE
1	1	70-14161	PLATE, ADAPTING, TY-375S
2	3	70-14102	STUFFING BOX, TY-375S, QUICK CHANGE
3	1	70-14166	CYLINDER, FLUID, TY-375S
4	3	22-80120002	O-RING, 2 1/2, 228-90, DISOGRIN 9250 COMPD
5	6	70-14156	VALVE, ASSY. TY-375S SUCTION & DISCHARGE
8	6	22-74217	O-RING, 2-3/8, 2-139-90
9	1	70-14153	MANIFOLD, SUCTION, TY-375S
10	1	70-14159	MANIFOLD, DISCHARGE, TY-375S
12	1	12-14160	VALVE REMOVAL TOOL, TY-375S
17	1	70-80118001	FLANGE, S.S., SUCTION MANIFOLD, 3 NPT
18	2	22-80179	O-RING, 4, 2-240-70,
19	1	70-78604	ADAPTER, MANIFOLD, BLIND
20	3	22-74207	O-RING, 1-1/2, 2-218-90
22	4	16-08205	SCREW, SHC, 1/2-13 X 3
23	12	16-14152	SCREW, SHC, 3/4-16 X 5 3/4
24	12	16-14104	SCREW SHC 3/4-16 X 5
26	12	16-14151	SCREW, SHC, 3/4-16 X 6 1/2
27	12	16-20101	WASHER, SERIES N, TYPE A, 3/4
28	8	16-40002	BOLT, HEX HD, 3/8-16 1 3/4 #5
29	8	16-77111	SCREW, SHC, 1/2-13 X 2
30	3	22-20972	O-RING 3 1/2, 2-236-90
31	1	70-78604006	FLANGE STRAIGHT 1 NPT, 90 ELL 1/2 NPT
33	1	70-78604001	ADAPTER, MANIFOLD, 1 NPT
35	1	31-03500	PRESS SAFETY HD ASSEMB
36	2	12-14102	ALIGNMENT PIN, TY-375S FLUID END

Item	QTY	Part No.	Part No.	Part No.	Description
		1 1/16 PLUNGER	1 1/4 PLUNGER	1 9/16 PLUNGER	1 3/4 PLUNGER
0	0	70-14100100	70-14100200	70-14100300	70-14100400
40	3	70-14672012	70-14672013	70-14672017	70-14672019
41	3	70-14673003	70-14673003	70-14673009	70-14673009
42	3	25-14101	25-14101	25-14101	25-14160
43	3	22-14110002	22-14110003	22-14110007	22-14110009
44	3	70-14109002	70-14109003	70-14109007	70-14109009
45	3	70-14107002	70-14107003	70-14107007	70-14107009
46	3	70-14108002	70-14108003	70-14108007	70-14108009
47	1	12-20905	12-20916	12-20945	12-20955

Item	QTY	Part No.	Part No.	Part No.	Description
		1 1/16 PLUNGER	1 1/4 PLUNGER	1 9/16 PLUNGER	1 3/4 PLUNGER
0	0	70-14100100	70-14100200	70-14100300	70-14100400
40	3	70-14672012	70-14672013	70-14672017	70-14672019
41	3	70-14673003	70-14673003	70-14673009	70-14673009
42	3	25-14101	25-14101	25-14101	25-14160
43	3	22-14110002	22-14110003	22-14110007	22-14110009
44	3	70-14109002	70-14109003	70-14109007	70-14109009
45	3	70-14107002	70-14107003	70-14107007	70-14107009
46	3	70-14108002	70-14108003	70-14108007	70-14108009
47	1	12-20905	12-20916	12-20945	12-20955





GARDNER DENVER WATER JETTING SYSTEMS, INC.

Partek • Liqua-Blaster • Geoquip • CRS Power Flow • Jetting Systems • American Waterblaster

12300 North Houston-Rosslyn Road • Houston, Texas 77086
800-231-3628 • 281-448-5800 • Fax 281-448-7500
www.waterjetting.com • mktg.wjs@gardnerdenver.com

This page was intentionally left blank



"Printed version of this document is uncontrolled"