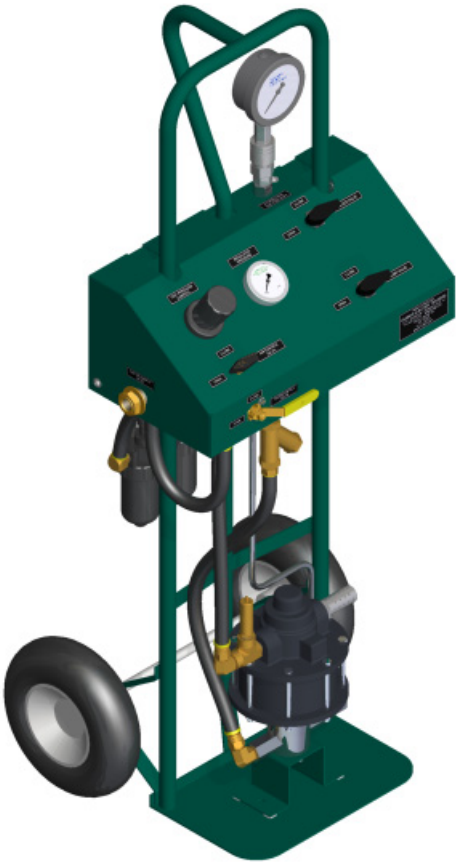
1900 HAND CART

Model 1900-W-10K

HYDROSTATIC TEST HAND CART

OPERATING MANUAL



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WHAT COULD BE.

CLIMAX
Portable Machining & Welding Systems

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- Your name
- Shipping address
- Telephone number
- Machine model
- Serial number (if applicable)
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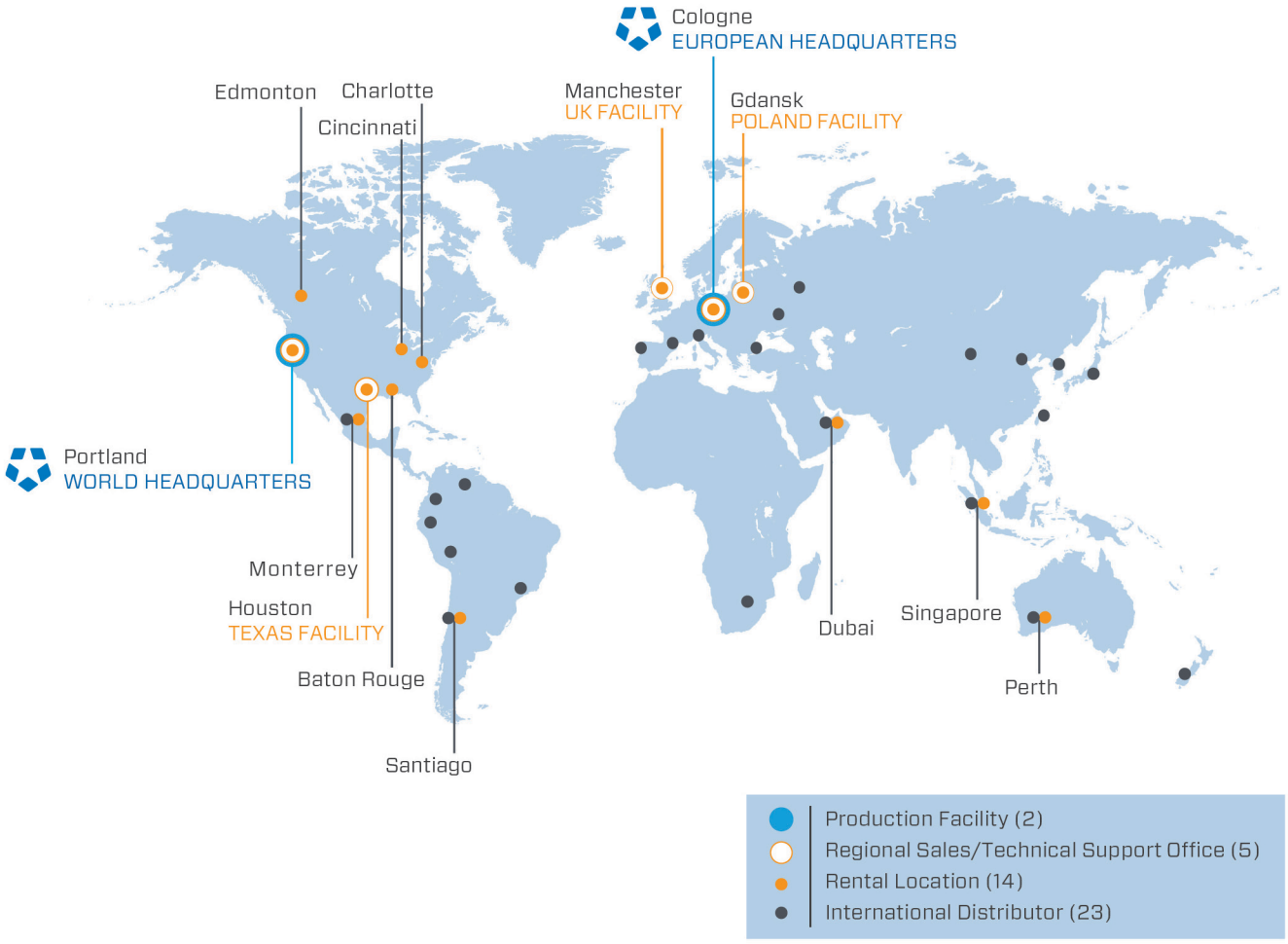

LIMITED WARRANTY

Climax Portable Machine Tools, Inc. (hereafter referred to as “Climax”) warrants that all new machines are free from defects in materials and workmanship. This warranty is available to the original purchaser for a period of one year after delivery. If the original purchaser finds any defect in materials or workmanship within the warranty period, the original purchaser should contact its factory representative and return the entire machine, shipping prepaid, to the factory. Climax will, at its option, either repair or replace the defective machine at no charge and will return the machine with shipping prepaid.

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- Damage caused by improper or inadequate machine maintenance
- Damage caused by unauthorized machine modification or repair
- Damage caused by machine abuse
- Damage caused by using the machine beyond its rated capacity

All other warranties, express or implied, including without limitation the warranties of merchantability and fitness for a particular purpose are disclaimed and excluded.

Terms of sale

Be sure to review the terms of sale which appear on the reverse side of your invoice. These terms control and limit your rights with respect to the goods purchased from Climax.

About this manual

Climax provides the contents of this manual in good faith as a guideline to the operator. Climax cannot guarantee that the information contained in this manual is correct for applications other than the application described in this manual. Product specifications are subject to change without notice.

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1 INTRODUCTION

IN THIS CHAPTER:

1.1 How to use this manual

This manual describes information necessary for the setup, operation, maintenance, storage, shipping, and decommissioning of the 1900 HC.

The first page of each chapter includes a summary of the chapter contents to help you locate specific information. The appendices contain supplemental product information to aid in setup, operation, and maintenance tasks.

Read this entire manual to familiarize yourself with the 1900 HC before attempting to set it up or operate it.

1.2 Safety alerts

Pay careful attention to the safety alerts printed throughout this manual. Safety alerts will call your attention to specific hazardous situations that may be encountered when operating this machine. Examples of safety alerts used in this manual are defined here[1]:

⚠ DANGER

indicates a hazardous situation which, if not avoided, ***WILL*** result in death or severe injury.

1. For more information on safety alerts, refer to *ANSI/NEMA Z535.6-2011, Product safety Information in Product Manuals, Instructions, and Other Collateral Materials*.

⚠ WARNING

indicates a hazardous situation which, if not avoided, ***COULD*** result in death or severe injury.

⚠ CAUTION

indicates a hazardous situation which, if not avoided, could result in minor or moderate injury.

NOTICE

indicates a hazardous situation which, if not avoided, could result in property damage, equipment failure, or undesired work results.

1.3 GENERAL SAFETY PRECAUTIONS

Climax Calder Testing Systems (Climax) leads the way in promoting the safe use of portable machine tools. Safety is a joint effort. You, the end user, must do your part by being aware of your work environment and closely following the operating procedures and safety precautions contained in this manual, as well as your employer's safety guidelines.

Observe the following safety precautions when operating or working around the machine.

Training – Before operating this or any machine tool, you should receive instruction from a qualified trainer. Contact Climax for machine-specific training information.

Risk assessment – Working with and around this machine poses risks to your safety. You, the end user, are responsible for conducting a risk assessment of each job site before setting up and operating this machine.

Intended use – Use this machine in accordance with the instructions and precautions in this manual. Do not use this machine for any purpose other than its intended use as described in this manual.

Personal protective equipment – Always wear appropriate personal protective gear when operating this or any other machine tool. Eye and ear protection are required when operating or working around the machine.

Work area – Keep the work area around the machine clear of clutter. Keep all cords and hoses away from the work area when operating the machine.

1.4 MACHINE-SPECIFIC SAFETY PRECAUTIONS

Clamping – Keep hands clear while clamping. Do not release the clamp

while the system is pressurized.

Hazardous environments – Do not operate the machine in environments where potentially explosive materials, toxic chemicals, or radiation may be present.

Eye hazard – This machine utilizes high-pressure fluids during operation. Always wear eye protection when operating the machine.

Pressurization – Do not over-pressurize the valve test system beyond the limits described in this manual and on machine labels. Do not pressurize the system while the side panels are removed from the test console.

Sound level – This machine produces bursts of air that could damage hearing. Hearing protection is required when operating this machine or working around it.

Test gauges – Do not use any gauge above its rating. Do not remove test gauges while the system is pressurized.

Utility service requirements – Do not exceed the pressure ratings stated in this manual and on the machine labels.

1.5 RISK ASSESSMENT AND HAZARD MITIGATION

To achieve the intended results and to promote safety, the operator must understand and follow the design intent, set-up, and operation practices that are unique to hydrostatic test hand carts.

The operator must perform an overall review and on-site risk assessment of the intended application. Due to the unique nature of hydrostatic testing, identifying one or more hazard that must be addressed is typical.

When performing an on-site risk assessment, it is important to consider the test console and the test vessel as a whole.

⚠ WARNING

The 1900 HC is intended for use with pressurized water with a maximum working pressure of 10,000 psi.

It is the operator's responsibility to use the system within its intended service pressure.

Operating the system with pressures that exceed 10,000 psi may cause damage to the test equipment, the device under test, and may result in personnel injury.

1.6 RISK ASSESSMENT CHECKLIST

Pressure testing is a high-risk activity. When applying stored energy to an assembly, especially for the first time, there is potential for an unintended or premature pressure release while people are in the danger zone.

The following checklist is not intended to be an all inclusive list of things to watch out for when setting up and operating this hydrostatic test hand cart. However, these checklists are typical of the types of risks the assembler and operator should consider. Use these checklists as part of your risk assessment:

TABLE 1-1. RISK ASSESSMENT CHECKLIST BEFORE SET-UP

	Before set-up
☐	I read the machine setup instructions (Section 3).
☐	I took note of all the warning labels on the machine (Section 1.7).
☐	I considered the following risks associated with pressure testing: • Test assembly rupture • Component or connector failure • Test hose failure including detachment, with consequential hose whip • Sudden release of the test medium
☐	I considered the need for the following personnel safety measures: • Segregating or enclosing the test vessel • Tethering or restraining the test console and test hoses
☐	I considered how this machine operates and identified the safest placement for the test vessel, the test console, and the operator.
☐	I prepared a written safe system of work that identified how the assembly under test can do the following: • Safely energized • Safely monitored • Have the test medium evacuated
☐	I evaluated and mitigated any other potential risks specific to my work area.

TABLE 1-2. RISK ASSESSMENT CHECKLIST AFTER SET-UP

	After set-up
☐	I followed the required maintenance checklist (Section 5).
☐	I checked that the machine is safely installed (according to Section 3).
☐	I checked that all appropriate personnel safety measures have been employed.
☐	I checked that all affected personnel understand the risks of pressure testing and are clear of the danger zone.
☐	I evaluated and mitigated any other potential risks specific to my work area.

1.7 LABELS

1.7.1 Label identification

The following warning labels should be on your machine. If any are defaced or missing, contact Climax immediately for replacements.

TABLE 1-3. 1900 HC LABELS

DO NOT BLOCK SUMP PORT OR DRAIN LINE	PN 85962 Warning label: do not block sump

1.7.2 Label location

The following figures display the location of the labels on each of the components of the 1900 HC. For further identification of location placement, refer to the exploded views in Appendix A.

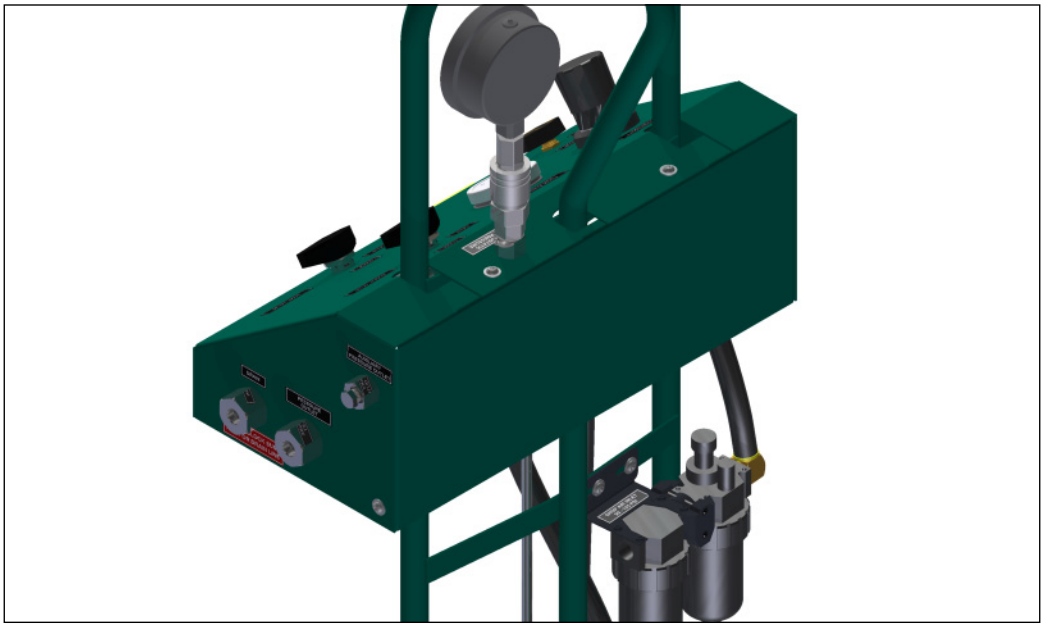

FIGURE 1-1. 1900 HC FRONT LABEL LOCATION (P/N 85144)

Label P/N: 85962

2 OVERVIEW

IN THIS CHAPTER:

2.1 FEATURES AND COMPONENTS

The Model 1900 Hand Cart is a valve test system that performs the following types of seat leakage tests:

- Hydrostatic seat test
- Hydrostatic shell test

The following maximum pressure limitations apply:

- Test pressure: 10,000 psi (hydrostatic)

2.2 CONTROLS

The 1900 HC controls are all located on the machine, as shown in Figure 2-1 and Figure 2-2.

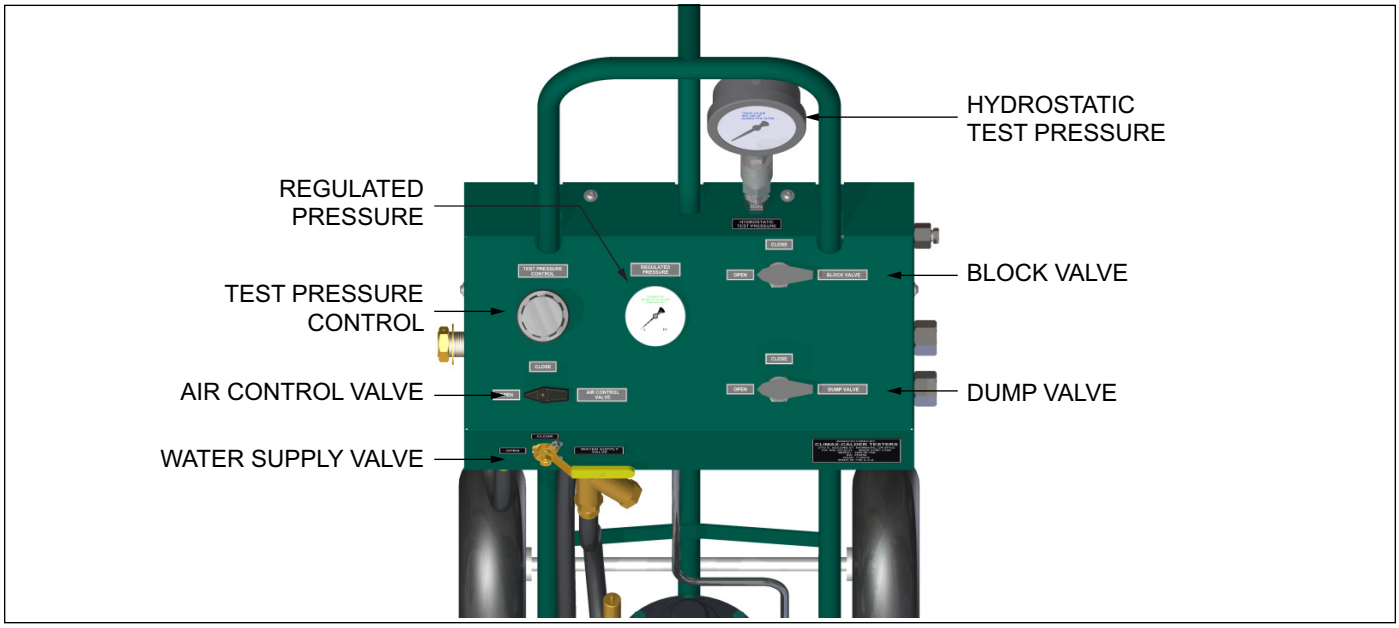

FIGURE 2-1. 1900 HC CONTROLS

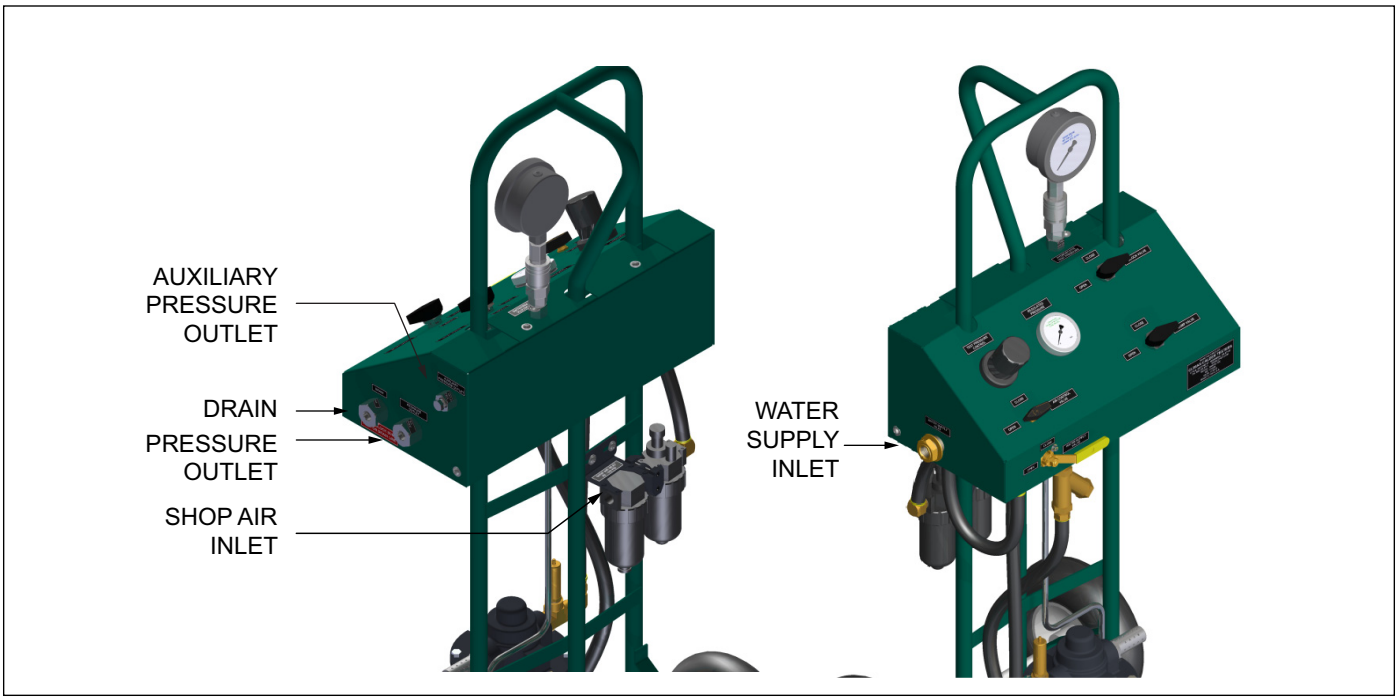

FIGURE 2-2. 1900 HC CONNECTIONS

2.3 ITEMS REQUIRED BUT NOT SUPPLIED

The following items are required but not supplied in your Climax product kit:

- Shop air (90–125 psi)
- Supply water (160 psi maximum)
- Air tool oil (general purpose)
- Open-end wrenches
- High-pressure hose with hose restraints or alternate means to prevent hose whip
- High-pressure hose with burst guard to prevent a high-velocity release of contained fluid
- Structure suitable for tethering and restraining high-pressure hoses subject to hose whip
- Anti-tip device to prevent the 1900 HC from tipping over unexpectedly

3 SETUP

IN THIS CHAPTER:

3.1 RECEIPT AND INSPECTION

Your Climax product was inspected and tested prior to shipment, and packaged for normal shipment conditions. Climax does not guarantee the condition of your machine upon delivery.

When you receive your Climax product, perform the following receipt checks.

1. Inspect the shipping containers for damage.
2. Check the contents of the shipping containers against the included invoice to make sure that all components have been shipped.
3. Inspect all components for damage.

Contact Climax immediately to report damaged or missing components.

NOTICE

Keep the shipping container and all packing materials for future storage and shipping of the machine.

3.2 INSTALLING UTILITIES

Connect all of the following before operating the 1900 HC.

3.2.1 Connect air to the control panel

Pressurized air is the major power source for the control panel.

Connect 90–125 psi shop air to the SHOP AIR INLET (a 1/2” female National Pipe Thread [NPT]), which is located at the air filter on the back of the test console. Refer to Figure 2-2.

NOTICE

A constant shop air supply of 75 scfm at 90 psi is recommended for the Control Panel's optimal performance.

3.2.2 Connect the drain to the control panel

Connect a low-pressure hose to the port labeled DRAIN (a 3/8" female NPT).

This DRAIN port is the outlet that allows test air and water to leave the test valve and test console.

⚠ WARNING

Do not block the DRAIN port. High-pressure fluid vented to the drain must be able to flow freely. Blocking the drain could result in rupture of the drain line or fittings and may result in equipment damage or personnel injury.

3.2.3 Connect water from the source

Water transmits the pressure for the valve test.

The WATER INLET, a 1/2" female NPT on the bulkhead, is located on the side of the panel.

Connect your water line to the bulkhead.

⚠ WARNING

Do not apply high-pressure fluid to the AUXILIARY PORT. Applying high-pressure fluid to the AUXILIARY PORT may result in equipment damage or personnel injury.

4 OPERATION

IN THIS CHAPTER:

4.1 PRE-OPERATION CHECKS

Do the following checks before operating the machine:

1. Make sure that the work area is clear of non-essential personnel and equipment.
2. Check that the TEST PRESSURE GAUGES show 0 psi (except for the storage gauge, which is the maximum psi that the operator can achieve as test pressure).
3. Check that all valves, including the BLOCK VALVES, are in the closed position and the regulator is turned counter-clockwise until it stops.
4. Select test gauges appropriate for the test pressure.

⚠ WARNING

Performing a test with a gauge not rated to the test pressure will destroy the gauge and may result in personnel injury.

5. Restrain the test console with an anti-tip device (not supplied).

⚠ WARNING

The 1900 HC is top-heavy and presents a tip-over hazard. Failure to use an anti-tip device could result in equipment damage or personnel injury.

6. Connect high-pressure hoses (not supplied) with hose restraints to the pressure outlet and to the test vessel.

⚠ WARNING

Failure to properly restrain high-pressure hoses and test console could result in equipment damage or personnel injury.

FIGURE 4-1. TETHERED HOSE

4.2 FILLING WATER TO THE SYSTEM

Do the following to fill the system with water:

1. Check that the TEST VALVE is open.
2. Check that the DUMP VALVE is closed.
3. Open the WATER SUPPLY VALVE.
4. Open the BLOCK VALVE.
5. Fill the TEST VALVE until water overflows from the valve.
6. Seal off the TEST VALVE with a blind flange.

4.3 HYDROSTATIC SEAT AND SHELL TEST

NOTICE

At the start of every test, check that all valves are closed. Pressure Control should be turned counter-clockwise to a stop position to zero out any pressure.

Do the following to conduct a hydrostatic seat or shell test:

1. Open the AIR CONTROL VALVE.
2. Open the BLOCK VALVE.
3. Turn TEST PRESSURE CONTROL clockwise to increase the test pressure, until the reading on the HYDRO TEST PRESSURE gauge reaches the target test pressure.

4. Close the BLOCK VALVE.
5. Close the AIR CONTROL VALVE.
6. Monitor the HYDRO TEST PRESSURE gauge for any drop in pressure, according to the end user's test procedure.
7. Zero out the TEST PRESSURE CONTROL by turning it counter-clockwise all the way.
8. Close the WATER SUPPLY VALVE.
9. Slowly open the DUMP VALVE to gradually release the pressure from your test valve.

A shell test is similar to a seat test, except that the safety relief valve (that is, the device under test) needs to be open during the test.

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5 MAINTENANCE

Table 5-1 lists maintenance intervals and their associated tasks.

TABLE 5-1. MAINTENANCE INTERVALS AND TASKS

Interval	Task
Before each use	Inspect the testing unit, including all hose connections, inlet supply lines, and outlet lines.
During use	Check the lubricator to ensure one drip to every 30 strokes of the pump. Adjust as needed. Use the air tool oil for the lubricator.
After each use	Wipe the component parts clean and dry to prevent corrosion.
Once a month	Inspect mufflers for damage and plugging. Replace if any are clogged.
As needed	Clean the Y strainer. Change the air filter (Parker #PS701P).

NOTICE

If the pump is replaced, the operator must check that the system relief pressure is less than 10,000 psi.

6 STORAGE AND SHIPPING

IN THIS CHAPTER:

6.1 STORAGE

Proper storage of the 1900 HC will extend its usefulness and prevent undue damage.

Before storing, do the following:

1. Clean and dry the machine.
2. Remove all fluids from the system.

Store the 1900 HC in its original shipping container. Keep all packing materials for repackaging the machine.

6.1.1 Short-term storage

Do the following for short-term storage (three months or less):

1. Remove hoses.
2. Cap the ports.
3. Spray all unpainted surfaces with LPS-2 to prevent corrosion.
4. Store the 1900 HC in its original shipping box.

6.1.2 Long-term storage

Do the following for long-term storage (longer than three months):

1. Follow the short-term storage instructions, but use LPS-3 instead of LPS-2.
2. Add a desiccant pouch to the shipping container. Replace according to manufacturer instructions.
3. Store the shipping container in an environment out of direct sunlight with temperature < 70ºF (21ºC) and humidity < 50%.

6.2 SHIPPING

The 1900 HC can be shipped in its original shipping container.

6.3 DECOMMISSIONING

To decommission the 1900 HC prior to disposal, remove all fluids from the system. Refer to Appendix A for component assembly information.

APPENDIX A ASSEMBLY DRAWINGS

Drawing list

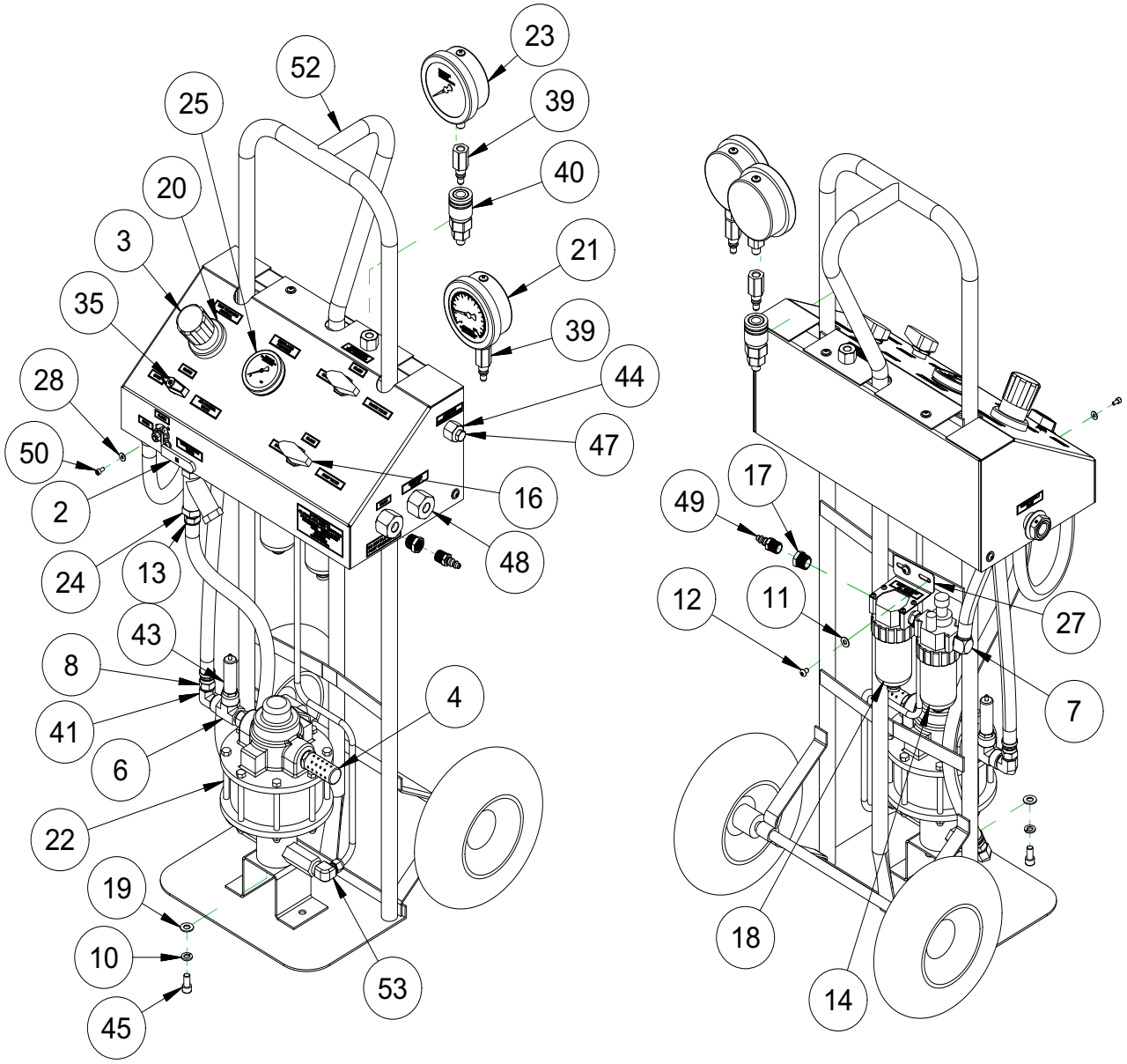

FIGURE A-1. 1900 HC ASSEMBLY (P/N 85144)

PARTS LIST				
ITEM	QTY	PART No.	DESCRIPTION	SCHEMATIC ID
1	1	59342	FTG ELBOW 1/4 NPTMS X 1/4 TUBE F PRESTOLOCK NICKEL PLATED	
2	1	77389	BALL VALVE 1/2 NPT FEMALE 160 PSI	
3	1	77394	REGULATOR AIR 1/2 NPT 125 PSI	PRV1
4	1	77399	HIGH FLOW MUFFLER 3/4 NPTM COMPACT	
5	1	77421	FTG BULKHEAD 1/2 NPTF BRASS	
6	1	77422	FTG TEE 1/2 NPTM X 1/2 NPTF MALE RUN TEE BRASS	
7	4	77427	FTG BARB 1/2 NPTM X 1/2 HOSE 90 DEG ELBOW	
8	5	77433	FTG 1/2 POHB X 1/2 F JIC SWVL	
9	1	77457	FTG ELBOW 1/2 NPTM X 1/2 NPTF STREET 90 DEG	
10	2	77523	WASHER 3/8 LOCK SS	
11	2	77544	WASHER 1/4 FLTW SS	
12	2	77602	SCREW 1/4-20 X 3/8 BHCS SS	
13	1	77649	FTG BARB 1/2 NPTM X 1/2 HOSE BRASS	
14	1	77784	LUBRICATOR AIR 1/2 NPTF PORTS	L1
15	2	77786	FTG NIPPLE 1/2 NPTM X 1/2 NPTM BRASS HEX	
16	2	77792	VALVE BALL 2 WAY 1/4 NPTF 10000 PSI	V3, V4
17	1	77876	FTG BUSHING 1/2 NPTM X 3/8 NPTF BRASS	
18	1	77922	FILTER AIR 1/2 NPTF PORT W/AUTOMATIC DRAIN	FLT1
19	2	78672	WASHER 3/8 FLTW SS	
20	1	81787	MOUNT NUT REGULATOR PANEL	
21	1	81789	GAUGE PRESSURE 4 INCH DIA 1000 PSI GLYCERIN FILLED 1/4 MNPT BOTTOM MOUNT CALIBRATION CERT	G3
22	1	81792	PUMP AIR DRIVEN 10,000 PSI WATER SERVICE	P1
23	1	81794	GAUGE PRESSURE 4 IN DIA 10000 PSI 1/4" NPT BOTTOM MOUNT	G2
24	1	81796	Y-STRAINER 150 PSI 1/2 NPTF	FLT2
25	1	81815	GAUGE PRESSURE 2.5 INCH DIA 160 PSI GLYCERIN FILLED 1/4 MNPT C-CLAMP MOUNT CALIBRATION CERT	G1
26	1	81816	FTG CONNECTOR 1/4 NPTF X 1/4 TUBE PRESTOLOK	
27	1	82481	MOUNT BRACKET AIR FILTER	

FIGURE A-2. 1900 HC ASSEMBLY PARTS LIST 1–27 (P/N 85144)

PARTS LIST				
ITEM	QTY	PART No.	DESCRIPTION	SCHEMATIC ID
28	2	82685	WASHER #10 FLTW SS	
29	96	82847	HOSE LOW PRESSURE PUSH LOK 1/2 ID	
30	2	83092	FTG CONNECTOR 3/8NPTM X 3/8 TUBE SUPER DUPLEX	
31	2	83094	FTG TUBE TEE UNION 3/8 TUBE SUPER DUPLEX	
32	1	83101	FTG TEE 1/4 TUBE SUPER DUPLEX	
33	4	83105	FTG TUBE CONNECTOR 1/4 NPTM X 3/8 TUBE SUPER DUPLEX	
34	24	83226	TUBING 1/4 OD X .049 WALL SUPER DUPLEX SAF 2507	
35	1	83364	VALVE BALL 2-WAY 1/2 NPTF 1000 PSI BRASS	V1
36	2	83713	FTG CONNECTOR 1/4 TUBE X 1/4 NPTM SUPER DUPLEX	
37	1	83716	FTG REDUCER 1/4 TUBE X 3/8 TUBE SUPER DUPLEX	
38	1	83983	FTG ADAPTER HEX 1/2 NPTM X 1/2 NPTF BRASS	
39	2	84795	FTG QUICK DISCONNECT MALE NIPPLE W/O CHECK VALVE 15000 PSI 1/4" FNPT	
40	1	84796	FTG QUICK DISCONNECT FEMALE COUPLER W/ CHECK VALVE 15000 PSI 1/4 MNPT	
41	5	84954	FTG ELBOW 1/2 NPTM X JIC-8 MALE 90 DEG BRASS	
42	96	85055	TUBING 3/8 OD X .049 WALL SUPER DUPLEX SAF 2507	
43	1	85056	VALVE PRESSURE RELIEF AIR 90 PSI 1/2 NPTM	R1
44	2	85232	FTG BULKHEAD 1/4 NPTF 15000 PSI	
45	2	85271	SCREW 3/8-24 X 3/4 SHCS SS	
46	12	85288	TUBING 1/4 OD X .170 ID POLYETHELYNE	
47	1	85330	FTG PLUG 1/4 NPTM HEX HEAD 15 KSI	
48	2	85407	FTG BULKHEAD 3/8 NPTF X 3/8 NPTF 15000 PSI SS	
49	1	85411	FTG QUICK COUPLER 1/4B MALE X 3/8 NPTM AIR INDUSTRIAL-SHAPE	
50	2	85457	SCREW 10-24 X 3/8 SHCS SS	
51	1	85549	LABEL SET 1900-W-10K	
52	1	85557	ASSY HAND CART 1900-W-10K	
53	1	85945	FTG ELBOW 1/2 NPTM X 3/8 TUBE 90 DEG SUPER DUPLEX	
54	1	85962	LABEL - DO NOT BLOCK SUMP PORT OR DRAIN LINE	

FIGURE A-3. 1900 HC ASSEMBLY PARTS LIST 28–54 (P/N 85144)

APPENDIX B SCHEMATIC

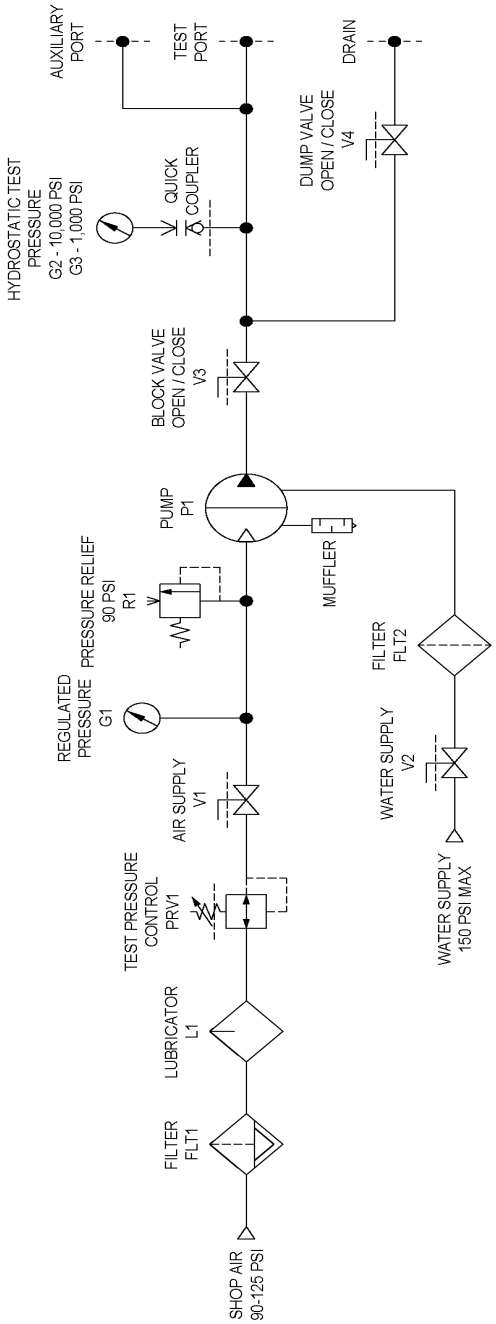

FIGURE B-1. 1900 HC SCHEMATIC (P/N 85343)

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