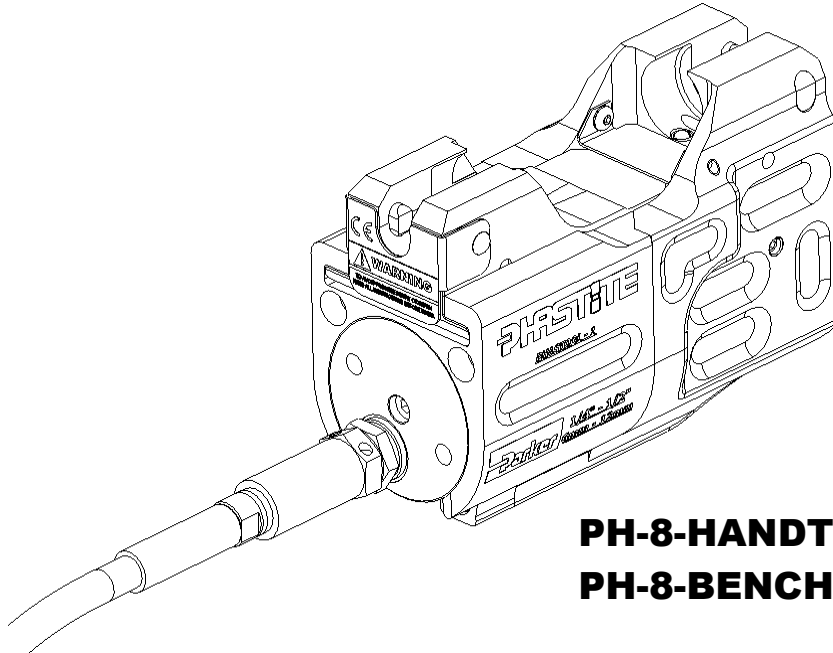


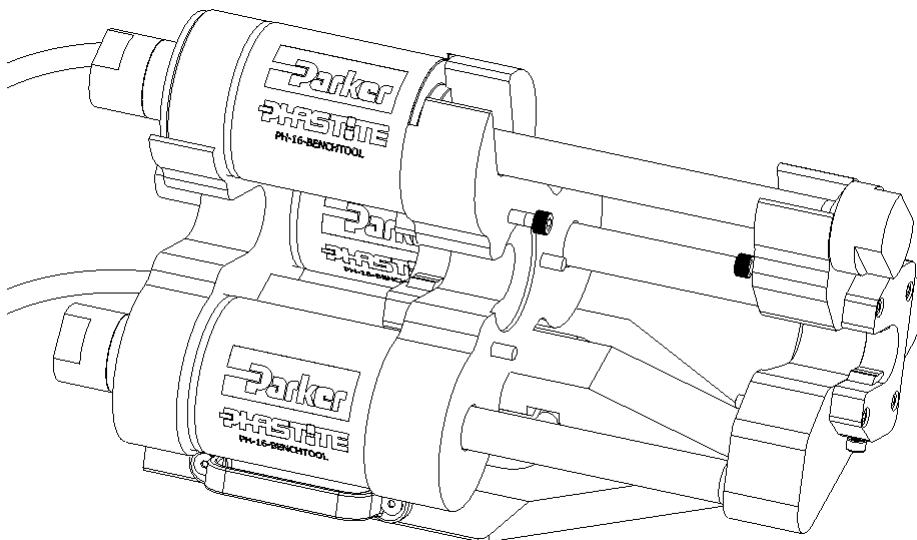
PHASTITE

ASSEMBLY

INSTRUCTIONS



**PH-8-HANDTOOL /
PH-8-BENCHTOOL**



PH-16-BENCHTOOL

1.0 ASSEMBLY INSTRUCTIONS

1.1 Tool Selection:

PH-8-HANDTOOL / PH-8-BENCHTOOL

The 'PH-8-HANDTOOL' and 'PH-8-BENCHTOOL' Phastite Assembly Tools are suitable for the following sizes of Phastite product only, and must not be used for any other application:

Metric Phastite Permanent Connectors for 6mm, 8mm, 10mm and 12mm O.D. tube.
 Inch Phastite Permanent Connectors for 1/4", 3/8" and 1/2" O.D. tube.

A Phastite Permanent Connector can be a union straight, elbow, tee or cross.

The tool is also suitable to pre-assemble the termination sleeve of the following product.

Metric Phastite Termination Sleeves for 6mm, 8mm, 10mm and 12mm O.D. tube.
 Inch Phastite Termination Sleeves for 1/4", 3/8" and 1/2" O.D. tube.

DANGER: The tool is not suitable for use for any other application than those stated above. Use of the tool for any other application may result in equipment damage and/or personal injury.

PH-16-BENCHTOOL

The 'PH-16-BENCHTOOL' Phastite Assembly Tool is suitable for the following sizes of Phastite product only, and must not be used for any other application:

Metric Phastite Permanent Connectors for 12mm, 14mm, 16mm, 18mm, 20mm, 22mm and 25mm O.D. tube.
 Inch Phastite Permanent Connectors for 1/2", 5/8", 3/4", 7/8" and 1" O.D. tube.

A Phastite Permanent Connector can be a union straight, elbow, tee or cross.

The tool is also suitable to pre-assemble the termination sleeve of the following product.

Metric Phastite Permanent Connectors for 12mm, 14mm, 16mm, 18mm, 20mm, 22mm and 25mm O.D. tube.
 Inch Phastite Permanent Connectors for 1/2", 5/8", 3/4", 7/8" and 1" O.D. tube.

DANGER: The tool is not suitable for use for any other application than those stated above. Use of the tool for any other application may result in equipment damage and/or personal injury.

1.2 Jaw Insert Selection:

The following tables should be used for jaw insert selection.

Fixed Jaw	Product Style.	Moving Jaw
A	 <i>Straight</i>	C
Shape	 <i>Elbow</i>	A
Shape	 <i>Tee</i>	A
A	 <i>Tee</i>	B
A	 <i>Cross</i>	B
Term	 <i>Termination Sleeve</i>	C

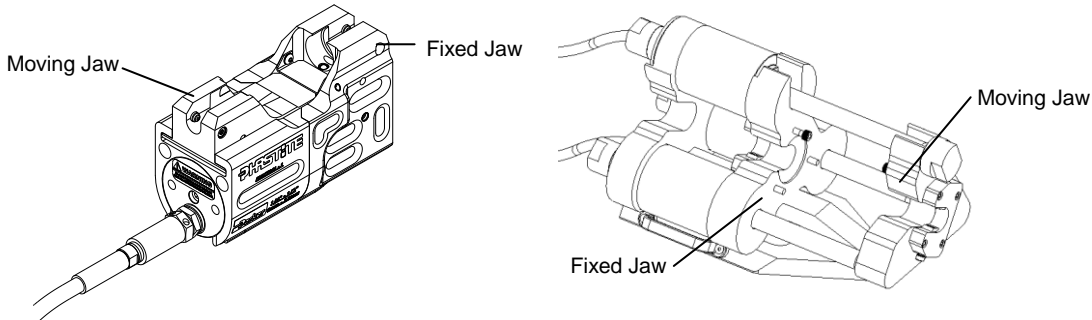
The 'Shape' insert provided with each tool is suitable for all sizes as per 1.1.

DANGER: Incorrect jaw insert selection may result in equipment damage and/or personal injury.

Tool	Tube O.D.	Jaw Size
PH-8-HANDTOOL PH-8-BENCHTOOL	6mm	6mm / 1/4"
	8mm	8mm
	10mm	10mm / 3/8"
	12mm	12mm / 1/2"
	1/4"	6mm / 1/4"
	3/8"	10mm / 3/8"
PH-16-BENCHTOOL	1/2"	12mm / 1/2"
	12mm	12mm / 1/2"
	14mm	14mm
	16mm	16mm / 5/8"
	18mm	18mm / 20mm / 3/4"
	20mm	18mm / 20mm / 3/4"
	22mm	22mm / 7/8"
	25mm	25mm / 1"
	1/2"	12mm / 1/2"
	5/8"	16mm / 5/8"
	3/4"	18mm / 20mm / 3/4"
	7/8"	22mm / 7/8"
1"	25mm / 1"	

1.3 Jaw Insert assembly / disassembly:

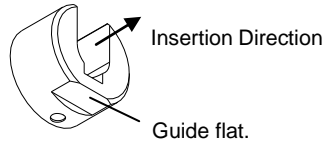
Ensure that the correct Jaw Inserts have been selected for the size and type of Phastite connector to be assembled, and jaw (see section 1.2).



1.3.1 PH-8-HANDTOOL / PH-8-BENCHTOOL

1.3.1.1 Assembly.

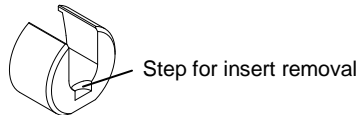
- Ensure that insert and jaw are free from damage / foreign bodies.
- Slide insert into jaw. Ensuring that the guide flat is facing the main body of the tool and inserted into the jaw in the direction shown.



- Once installed the insert will be retained by a self energising locking system.

1.3.1.2 Disassembly.

- The insert can removed from the jaw, simply by pulling.
- For smaller inserts a step is provided as shown. This can be used to remove the insert.



1.3.2 PH-16-BENCHTOOL

1.3.2.1 Assembly.

- Ensure that insert and jaw are free from damage / foreign bodies.
- Slide insert into jaw. Ensuring that the 2 location pins locate within the insert.
- Once installed retain the insert with the small socket cap screw provided – tighten hand tight only.

1.3.2.2 Disassembly.

- The insert can removed from the jaw, simply by removing the small socket cap screw.

1.4 Installing / Disconnecting Hose Couples.

Only the coupling between the hose assembly and the pump should be disconnected. The hose assembly to tool connection must not be disconnected.

An appropriate hose coupling has been supplied to suit 3/8 NPT ported equipment. If replaced the coupling must be selected to suit the pump and hose assembly and must be selected with all aspects of the application in mind. It is the user's responsibility to select a suitable coupling.

1.5 Adequate tube insertion.

Adequate tube insertion is essential.

To achieve this, a Phastite Tube Marker should be used.

To use the Phastite Tube Marker:

Insert the tube into the Tube Marker.

Ensure the tube is against the bottom of the bore (use the inspection hole to verify).

While holding the tube, push and twist the Tube Marker one third of a turn. The higher the load applied the clearer the tube marks will be.

The Phastite Tube Marker generates two lines on the tube.

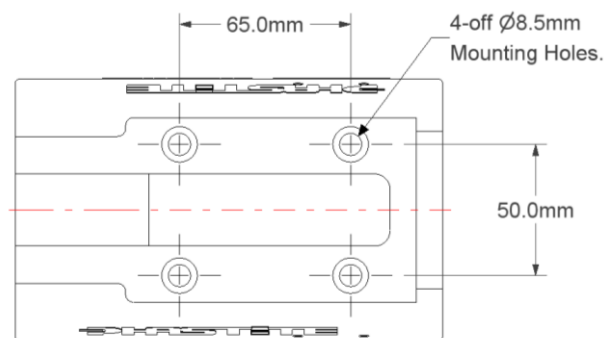
When inserting the tube into a Phastite connector the two lines should not be visible. This ensures adequate tube insertion prior to assembly.

After assembly only one of the lines will be visible. If both lines are visible the tube slipped during assembly and the connection should not be used.

1.6 PH-8-BENCHTOOL - Bench Mounting Bracket.

If required the 'PH-8-HANDTOOL' Phastite Tool can be bench mounted by using a Bench Mount Bracket.

The Bench Mount Bracket has four mounting holes as shown:



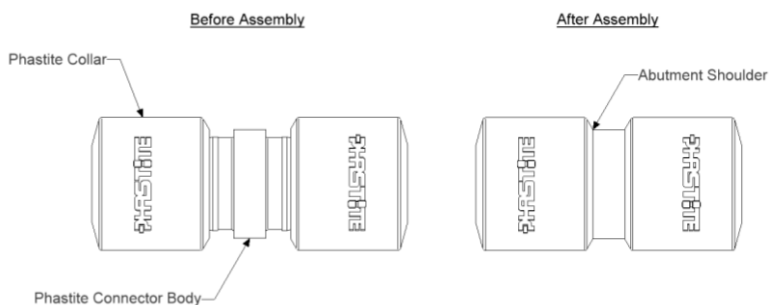
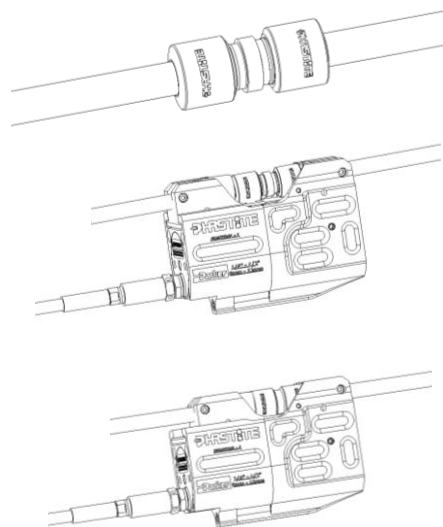
1.7 Tube Preparation

Ensure that the end of the tube is cut square and any burrs are removed without undue chamfering of the tube end.

1.8 Phastite Assembly

1.8.1 Permanent Straight Phastite Connectors.

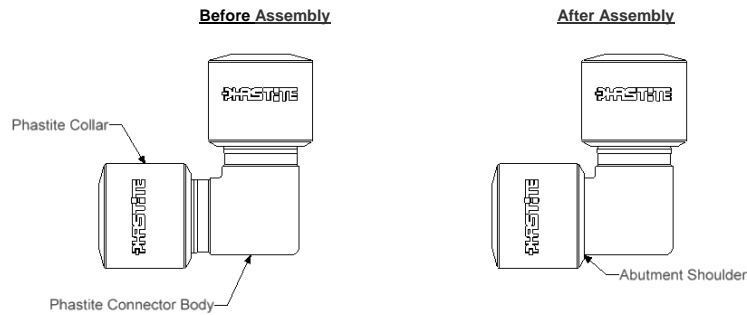
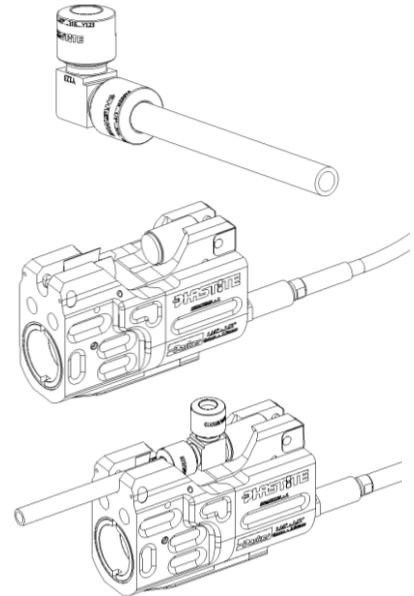
- A. Parker Phastite Connectors are supplied completely assembled and disassembly of the collar should not be attempted.
- B. Insert the tube into the Parker Phastite Connector, ensuring that adequate tube insertion is achieved, see 1.5 for details.
- C. Align the Phastite Connector into the tool ensuring that the Connector is orientated to the appropriate jaw insert, see 1.2 for details.
- D. Re-confirm adequate tube insertion by ensuring that both tube mark lines are hidden under the Phastite Collar.
- E. Apply pressure to the Phastite Assembly Tool, maximum pressure 700 bar (10,000 psi). The Moving jaw will close around the connector.
- F. Continue to apply pressure until the Phastite Collar makes contact with the Abutment Shoulder of the Phastite Connector Body.



- G. Remove pressure from the tool. The Moving Jaw will automatically retract.
- H. Remove connector and tube assembly from tool jaws, checking tube insertion, see 1.5 for details.

1.8.2 Permanent Shape Phastite Connectors.

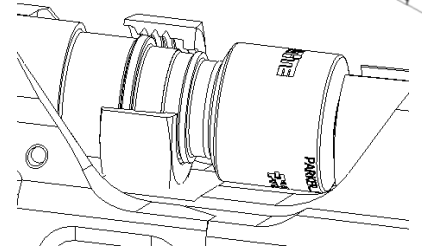
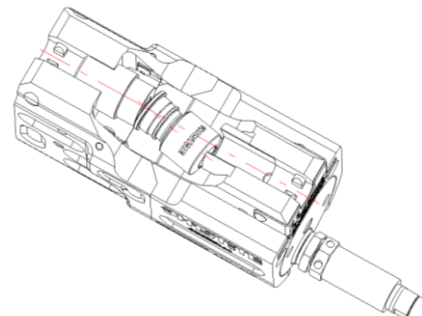
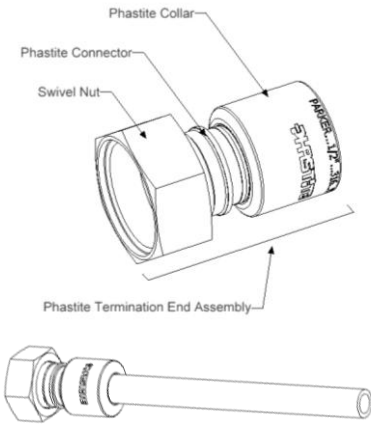
- A. Parker Phastite Connectors are supplied completely assembled and disassembly of the collar should not be attempted.
- B. Insert the tube into the Parker Phastite Connector, ensuring that adequate tube insertion is achieved, see 1.5 for details.
- C. Align the Phastite Connector into the tool ensuring that the Connector is orientated to the appropriate jaw insert, see 1.2 for details.
- D. Re-confirm adequate tube insertion by ensuring that both tube mark lines are hidden under the Phastite Collar.
- E. Apply pressure to the Phastite Assembly Tool, maximum pressure 700 bar (10,000 psi). The Moving jaw will close around the connector.
- F. Continue to apply pressure until the Phastite Collar makes contact with the Abutment Shoulder of the Phastite Connector Body.



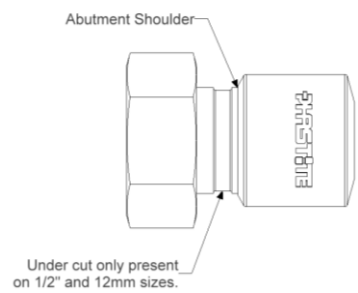
- G. Remove pressure from the tool. The Moving Jaw will automatically retract.
- H. Remove connector and tube assembly from tool jaws, checking tube insertion, see 1.5 for details.

1.8.3 Phastite Termination Connectors.

- A. Parker Phastite Termination Connectors are supplied completely assembled.
- B. The Phastite connector must be disassembled so that the body is separated from the termination end assembly. To do this, loosen the swivel nut from the Phastite body.
- C. Insert the tube through the Phastite Collar and into the Sealing Sleeve, ensuring that adequate tube insertion is achieved, see 1.5 for details.
- D. Align the tube, Collar and Sleeve into the tool ensuring that the Connector is orientated to the appropriate jaw insert, see 1.2 for details. It is vital that the termination insert, marked 'TERM' is installed into the fixed jaw, and that insert 'C' is installed into the moving jaw.
- E. Ensure that the swivel nut is square to the tools jaws and free to move with the jaw movement. It is critical that this is completed before activating the tool. Never attempt to place fingers within the tool working zone when the tool is activated.
- F. 1/2" and 12mm Phastite sizes only – PH-8-HANDTOOL / PH-8-BENCHTOOL only. The Phastite Termination End Assembly needs to be dropped into position at an angle and then aligned within the jaws, as shown. Please note the swivel nut is not shown in the following images to aid clarity.
- G. 1/2" and 12mm Phastite sizes only – PH-8-HANDTOOL / PH-8-BENCHTOOL only. Ensure that the Swivel Nut shoulder and Phastite Connector groove are aligned as shown. Please note the swivel nut shown sectioned for clarity.
- H. Re-confirm adequate tube insertion by ensuring that both tube mark lines are hidden under the Phastite Collar.
- I. Apply pressure to the Phastite Assembly Tool, maximum pressure 700 bar (10,000 psi). The Moving jaw will close around the connector.
- J. Continue to apply pressure until the Phastite Collar makes contact with the Abutment Shoulder of the Phastite Jaw Insert.
- K. Relieve pressure from the tool. The Moving Jaw will automatically retract.
- L. Remove the tube assembly from the tool jaws, checking tube insertion, see 1.5 for details.
- M. Ensure that the Swivel Nut rotates freely around the tube.
- N. Tighten the Swivel Nut onto the Phastite Connector Body, until the Swivel Nut abuts fully with the Phastite Connector Body.



After Assembly

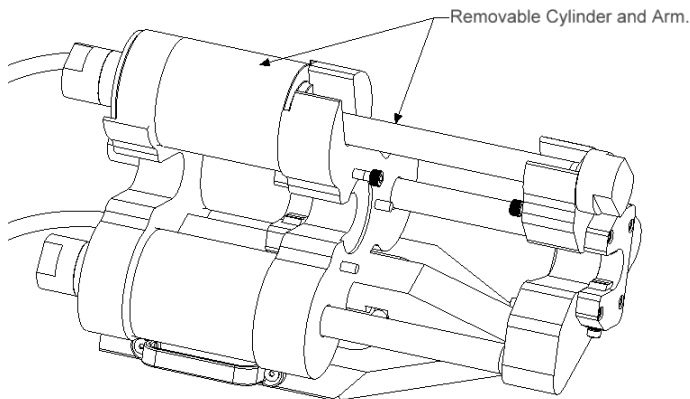


1.8.4 Disassembly and Retightening of Phastite Termination Connectors.

- A. With Phastite Termination Connectors the connection can be disconnected and re-tightened many times and the same reliable, safe, leak-proof connection obtained.
- B. Simply loosen the Swivel Nut to disassemble the connection.
- C. To retighten the connector simply, tighten the Swivel Nut onto the Phastite Connector, until the Collar abuts fully with the Phastite Connector Body.

1.8.5 PH-16-BENCHTOOL

In order to facilitate the assembly of complex tube runs the uppermost cylinder of the PH-16-BENCHTOOL can be removed for access purposes.



To remove and reinstall the upper cylinder and arm it is first necessary to activate the tool. This will compress all 3 cylinders. Continue to activate the tool until the moving jaw has moved by approximately $\frac{1}{2}$ " / 12mm.

Release the pressure from the tool thus allowing the three cylinders to return to the rest position.

During the cylinder return stroke, the removable cylinder can be lifted out of position. The cylinder will need to be pulled out of its retaining counter bores in order to fully remove from the tool.

Once removed the user may gain access to the tool jaws to insert or remove Phastite fittings / assemblies.

The upper cylinder must be reinstalled within the tool before use.

WARNING: It is critical that the PH-16-BENCHTOOL is never used with the upper cylinder removed as this will result in uneven loading of the tool.

SAFETY GUIDE

WARNING: Failure or improper use of the Phastite tool, including its hose, fittings, assemblies or related accessories can cause death, personal injury and property damage. Possible consequences of failure or improper selection or improper use of these Products include but are not limited to:

- Fittings thrown off at high speed.
- High velocity fluid discharge.
- Explosion or burning of the conveyed fluid.
- Electrocutation from high voltage electric power lines.
- Contact with suddenly moving or falling objects that are controlled by the conveyed fluid.
- Injections by high-pressure fluid discharge.
- Dangerously whipping Hose.
- Contact with conveyed fluids that may be hot, cold, toxic or otherwise injurious.
- Sparking or explosion caused by static electricity build up or other sources of electricity.
- Injuries resulting from inhalation, ingestion or exposure to fluids.

BEFORE USING THESE PRODUCTS, IT IS IMPORTANT THAT YOU READ AND FOLLOW THE INSTRUCTIONS BELOW.

2.0 GENERAL INSTRUCTIONS

2.1 Scope: This safety guide provides instructions for selecting and using (including assembling, installing, and maintaining) these Products. For convenience, the assembly tools including the hydraulic cylinders is called the "tool". The assembly made with hose and crimped on connectors are called the "Hose Assembly". All products commonly called "fittings" or "couplings" are called "couplings". All jaw inserts are called "inserts". All related accessories are called "Related Accessories". The complete assembly tool included but not limited to couplings and hose assembly is called the "tool assembly". The pump, intensifier or system used to generate the hydraulic power for the tool assembly is called "the pump".

2.2 Fail-Safe: Hose Assemblies and related connectors can and do fail without warning for many reasons. Design all systems and equipment in a fail-safe mode, so that failure of the Hose or Hose Assembly or Fitting will not endanger persons or property.

2.3 Distribution: Provide a copy of this safety guide to each person that is responsible for selecting or using any aspect of the tool assembly. Do not select or use the tool assembly without thoroughly reading and understanding this safety guide.

2.4 User Responsibility: Due to the wide variety of operating conditions and applications for the tool assembly. This safety guide does not analyze all technical parameters that must be considered when using the tool assembly. The user, through its own analysis and testing, is solely responsible for:

- Assuring that the user's requirements are met and that the application presents no health or safety hazards.
- Ensuring all appropriate health and safety warnings on the equipment are legible and not damaged / removed.
- Assuring compliance with all applicable government and industry standards.

2.5 Additional Questions: Call the appropriate Parker technical service department if you have any questions or require any additional information. Call 1-800-CPARKER, or go to www.parker.com, for telephone numbers of the appropriate technical service department.

2.6 Important receiving instructions: Visually inspect all components for shipping damage. Shipping damage is not covered by warranty. If shipping damage is found, notify carrier at once. The carrier is responsible for all repair and replacement costs resulting from damage in shipment.

3.0 Safety Issues: Read all instructions, warnings and cautions carefully. Follow all safety precautions to avoid personal injury or property damage during system operation. Parker cannot be responsible for damage or injury resulting from unsafe product use, lack of maintenance or incorrect product and/or system operation.

Contact Parker when in doubt as to the safety precautions and operations. If you have never been trained on high-pressure hydraulic safety, consult your distribution or service centre for a hydraulic safety course.

Failure to comply with the following cautions and warnings could cause equipment damage and personal injury.

A CAUTION is used to indicate correct operating or maintenance procedures and practices to prevent damage to, or destruction of equipment or other property.

A WARNING indicates a potential danger that requires correct procedures or practices to avoid personal injury.

A DANGER is only used when your action or lack of action may cause serious injury or even death.

3.1 Pressure: WARNING: Do not exceed equipment ratings. Never attempt to assemble a product with an assembly load higher than the capacity of the tool assembly. Overloading causes equipment failure and possible personal injury. The tool assemblies are designed for a maximum pressure of 700 bar [10,000 psi]. Do not connect a tool to a pump with a higher pressure rating.

WARNING: Whenever using hydraulic equipment personal protective wear, including eye protection should be utilised.

DANGER: Never set the pump/system relief valve to a higher pressure than the maximum rated pressure of the tool. Higher settings may result in equipment damage and/or personal injury. Do not remove relief valve.

WARNING: The system operating pressure must not exceed the pressure rating of the lowest rated component in the system. Install pressure gauges in the system to monitor operating pressure. Surge pressures or peak transient pressures in the system must be below the published maximum working pressure. Surge pressures and peak pressures can usually only be determined by sensitive electrical instrumentation that measures and indicates pressures at millisecond intervals. Mechanical pressure gauges indicate only average pressures and cannot be used to determine surge pressures or peak transient pressures. Published burst pressure ratings for hose assemblies is for manufacturing test purposes only and is no indication that the hose assemblies can be used in applications at the burst pressure or otherwise above the published maximum recommended working pressure.

DANGER: DO NOT HANDLE PRESSURIZED HOSES. Escaping oil under pressure can penetrate the skin, causing serious injury. If oil is injected under the skin, see a doctor immediately.

3.2 Temperature: CAUTION: KEEP HYDRAULIC EQUIPMENT AWAY FROM FLAMES AND HEAT. Excessive heat will soften packings and seals, resulting in fluid leaks. Heat also weakens hose materials and packings. Be certain that fluid and ambient temperatures, both steady and transient, do not exceed 60°C [140°F], or fall below -20°C [-4°F]. Temperatures below and above the recommended limit can degrade hose and seals to a point where a failure may occur and release fluid.

CAUTION: PROPERLY INSULATE AND PROTECT THE HOSE ASSEMBLY WHEN ROUTING NEAR HOT OBJECTS (e.g. manifolds). Hose assemblies and seals can be heated to destruction without contact by such nearby items as hot manifolds or molten metal. The same heat source may then initiate a fire. This can occur despite the presence of cool air around the Tool assembly.

CAUTION: PROTECT TOOL ASSEMBLIES FROM WELD SPATTER. When using a torch or arc welder in close proximity to tool assemblies, the tool assemblies should be removed or shielded with appropriate fire resistant materials. Flame or weld spatter could burn through the Hose and possibly ignite escaping fluid resulting in a catastrophic failure. Heating of plated parts, including Hose Fittings and adapters, above 450°F (232°C) such as during welding, brazing, or soldering may emit deadly gases.

Do not use any hose in any application where failure of the Hose could result in the conveyed fluids (or vapours or mist from the conveyed fluids) contacting any open flame, molten metal, or other potential fire ignition source that could cause burning or explosion of the conveyed fluids or vapours.

3.3 Hydraulic Fluid: Tool assemblies are supplied pre-filled with hydraulic oil; attached pumps must be used with compatible hydraulic oil. Parker recommends the use of Enerpac HF hydraulic oils. The Materials Date Sheet of the hydraulic fluid used to pre-fill the tool assemblies is available upon request.

3.4 Mechanical Loads / Hose Routing: CAUTION: Avoid damaging hydraulic hose. Avoid sharp bends and kinks when routing hydraulic hoses. Using a bent or kinked hose will cause severe back-pressure. Sharp bends and kinks will internally damage the hose leading to premature hose failure. Attention must be given to optimum routing of the hose assembly to minimize inherent problems (kinking or flow restriction due to Hose collapse, twisting of the Hose, proximity to hot objects or heat sources).

CAUTION: External forces can significantly reduce tool and hose life or cause failure. Mechanical loads which must be considered include excessive flexing, twist, kinking, tensile or side loads, bend radius, and vibration. Do not drop heavy objects on hose. A sharp impact may cause internal damage to hose wire strands. Applying pressure to a damaged hose may cause it to rupture.

IMPORTANT: Do not lift tool assemblies by the hoses or couplers. Use the hand grip or other means of safe transport.

3.5 Physical Damage: WARNING: Immediately replace worn or damaged parts by genuine Parker parts. Phastite assembly equipment is manufactured from extreme service materials. Standard grade parts will break causing personal injury and property damage. Parker Phastite parts are designed to fit properly and withstand high loads.

IMPORTANT: Phastite assembly equipment must only be serviced by a qualified parker technician. For repair / service, contact the **Authorized Parker Service Centre** in your area.

Care must be taken to protect the tool assembly from wear, snagging, kinking, bending smaller than minimum bend radius, and cutting, any of which can cause premature hose failure.

Any hose that has been kinked or bent to a radius smaller than the minimum bend radius, and any hose that has been cut or is cracked or is otherwise damaged, should be removed and discarded.

4.5 Hose Inspection and Failure: Hydraulic power is accomplished by utilizing high-pressure fluids to transfer energy and do work. Hoses, Fittings, and Hose Assemblies all contribute to this by transmitting fluids at high pressures. Fluids under pressure can be dangerous and potentially lethal and, therefore, extreme caution must be exercised when working with fluids under pressure and handling the Hoses transporting the fluids.

From time to time, Hose Assemblies will fail if they are not replaced at proper time intervals. Usually these failures are the result of some form of misapplication, abuse, wear, or failure to perform proper maintenance. When Hoses fail, generally the high-pressure fluids inside escape in a stream which may or may not be visible to the user. Under no circumstances should the user attempt to locate the leak by "feeling" with their hands or any other part of their body.

High-pressure fluids can and will penetrate the skin and cause severe tissue damage and possibly loss of limb. Even seemingly minor hydraulic fluid injection injuries must be treated immediately by a physician with knowledge of the tissue damaging properties of hydraulic fluid. If a Hose failure occurs, immediately shut down the equipment and leave the area until pressure has been completely released from the Hose Assembly. Simply shutting down the hydraulic pump may or may not eliminate the pressure in the Hose assembly. Many times check valves, etc., are employed in a system and can cause pressure to remain in a Hose Assembly even when pumps or equipment are not operating. Tiny holes in the Hose, commonly known as pinholes, can eject small, dangerously powerful but hard to see streams of hydraulic fluid. It may take several minutes or even hours for the pressure to be relieved so that the Hose Assembly may be examined safely.

WARNING

FAILURE, IMPROPER SELECTION OR IMPROPER USE OF THE PRODUCTS AND/OR SYSTEMS DESCRIBED HEREIN OR RELATED ITEMS CAN CAUSE DEATH, PERSONAL INJURY AND PROPERTY DAMAGE.

This document and other information from Parker Hannifin Corporation, its subsidiaries and authorised distributors provide product and/or system options for further investigation by users having technical expertise. It is important that you analyse all aspects of your application and review the information concerning the product or systems in the current product catalogue. Due to the variety of operating conditions and applications for these products or systems, the user, through its own analysis and testing, is solely responsible for making the final selection of the products and systems and assuring that all performance, safety and warning requirements of the application are met.

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