

## Pneumatic Division

Richland, Michigan USA

[www.parker.com/pneumatics](http://www.parker.com/pneumatics)



### H ISO VALVE SERIES

Bulletin Number		Bulletin Description	
<input type="checkbox"/>	V450P	Rev. F	H Series HA 26mm & HB 18mm ISO 15407 Valve, Installation & Service Instructions
<input type="checkbox"/>	V452P	Rev. A	H Series HA & HB ISO 15407-2 Sandwich Flow Controls, Installation & Service Instructions
<input type="checkbox"/>	V453P	Rev. G	H Series HA & HB 15407-2 Manifold, Installation & Service Instructions
<input type="checkbox"/>	V454P	Rev. C	H Series HA & HB Sandwich Regulator, Installation & Service Instructions
<input type="checkbox"/>	V455P	Rev. B	H Series HA, HB ISO 15407-1 Subbase & Manifold Assembly, Installation & Service
<input type="checkbox"/>	V459P	Rev. B	H Series HA, HB, H1, H2, H3 with Moduflex Fieldbus, Installation & Service Instructions
<input type="checkbox"/>	V463P	Rev. C	H Series H3 5599-2 Valve, Installation & Service Instructions
<input type="checkbox"/>	V464P	Rev. B	H Series HA, HB, H1, H2, H3 with Turck Fieldbus, Installation & Service Instructions
<input type="checkbox"/>	V467P	Rev. C	H Series H1 Sandwich Regulators, Installation & Service Instructions
<input type="checkbox"/>	V468P	Rev. -	H Series H1, H2, H3 ISO 5599-1 / 5599-2 Sandwich Flow Controls, Installation & Service
<input type="checkbox"/>	V469P	Rev. J	H Series H1, H2, H3 ISO 5599-1 / 5599-2 Subbase & Manifold, Installation & Service
<input type="checkbox"/>	V470P	Rev. F	H Series H1, H2, H3 ISO 5599-1 / 5599-2 Valves, Installation & Service Instructions
<input type="checkbox"/>	V471P	Rev. D	H Series H2 & H3 Sandwich Regulator, Installation & Service Instructions
<input type="checkbox"/>	Safety Guide		PDN Safety Guide

**⚠ WARNING**

To avoid unpredictable system behavior that can cause personal injury and property damage:

- Disconnect electrical supply (when necessary) before installation, servicing, or conversion.
- Disconnect air supply and depressurize all air lines connected to this product before installation, servicing, or conversion.
- Operate within the manufacturer's specified pressure, temperature, and other conditions listed in these instructions.
- Medium must be moisture-free if ambient temperature is below freezing.
- Service according to procedures listed in these instructions.
- Installation, service, and conversion of these products must be performed by knowledgeable personnel who understand how pneumatic products are to be applied.
- After installation, servicing, or conversion, air and electrical supplies (when necessary) should be connected and the product tested for proper function and leakage. If audible leakage is present, or the product does not operate properly, do not put into use.
- Warnings and specifications on the product should not be covered by paint, etc. If masking is not possible, contact your local representative for replacement labels.

**⚠ WARNING**

**FAILURE OR 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 authorized distributors provide product and/or system options for further investigation by users having technical expertise. It is important that you analyze all aspects of your application, including consequences of any failure and review the information concerning the product or systems in the current product catalog. 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.

The products described herein, including without limitation, product features, specifications, designs, availability and pricing, are subject to change by Parker Hannifin Corporation and its subsidiaries at any time without notice.

**EXTRA COPIES OF THESE INSTRUCTIONS ARE AVAILABLE FOR INCLUSION IN EQUIPMENT / MAINTENANCE MANUALS THAT UTILIZE THESE PRODUCTS. CONTACT YOUR LOCAL REPRESENTATIVE.**

**Safety Guide**

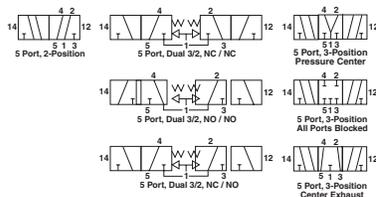
For more complete information on recommended application guidelines, see the Safety Guide section of Pneumatic Division catalogs or you can download the **Pneumatic Division Safety Guide** at: [www.parker.com/safety](http://www.parker.com/safety)

**Introduction**

Follow these instructions when installing, operating, or servicing the product.

**Port Identification / Connections / Symbols**

Port No.	Single Pressure	Dual Pressure
1	Inlet	Exhaust
2	Outlet	Outlet
3	Exhaust	Inlet
4	Outlet	Outlet
5	Exhaust	Inlet
12, 14	Pilot Ports for External Pilot or Remote Pilot	



Valves may be used for single outlet (3-Way) by plugging an outlet Port.

**NOTE:** The operator identification describes the ports that are connected when the operator is energized: operator 12 connects Port 1 to Port 2; operator 14 connects Port 1 to Port 4. Other ports may also be connected, or blocked – see symbols on the valve.

**⚠ CAUTION:** It is recommended that double solenoid and double remote air pilot operated 2-Position valves be mounted so that the axis of the valve spool is in the horizontal plane.

**Lubrication**

Factory Pre-lubed. If lubricating in service, use Parker F442 oil or equivalent paraffin based mineral oil with 150 to 200 SSU viscosity @ 100°F.

**⚠ CAUTION:** Do not use oils that are synthetic, reconstituted, have an alcohol content or a detergent additive.

**Application Limits**

These products are intended for use in general purpose compressed air systems only.

**Operating Pressure Range:**

**Maximum: 145 PSIG (1000 kPa)**  
**Minimum: See Chart**

Operator / Function	Internal Pilot	Min. PSIG (kPa)	Min. PSIG (kPa)
		HA	HB
1	Single Solenoid - 2-Pos	25 (173)	30 (207)
2	Double Solenoid - 2-Pos		
N, P, Q	Double Solenoid - 3/2**		
3	Single Remote - 2-Pos	Vacuum	Vacuum
4	Double Remote Pilot - 2-Pos	Vacuum	Vacuum
5, 6, 7	Double Solenoid - 3-Pos	35 (241)	35 (241)
8, 9, 0	Double Remote Pilot - 3-Pos	Vacuum	Vacuum
E	Single Solenoid - 2-Pos Air Return / Spring Assist	30 (207)	30 (207)
F	Single Remote Pilot - 2-Pos Air Return / Spring Assist		
<b>External Pilot*</b>			
All	HA & HB Series	Vacuum	Vacuum

\* External Pilot Pressure / Remote Pilot Signal - 45 to 145 PSIG (310 to 1000 kPa).  
 \*\* Operator / Function N, P, Q not suitable for Vacuum Service or External Pilot.

**Ambient Temperature Range:** -15°C to 49°C (5°F to 120°F)

**Voltage Range:** Rated Voltage +10%, -15%

**Media:** Dry air or inert gas filtered to 40µ

**⚠ CAUTION:** Solenoid versions of this valve contain solid state components that can be damaged by transient voltage spikes, over-voltage or high temperature. To protect against premature solenoid failure, please read and adhere to the following:

If this solenoid operated valve is used in a circuit with other inductive loads, the solenoid should be electrically protected with a voltage suppression device (e.g. transient voltage suppressor or varistor) that has a minimum rating of 1.6 times the rated voltage of the solenoid valve and sufficient capacity to dissipate the energy of other inductive loads.

**⚠ CAUTION:** Solenoid versions of this valve are to be earth grounded through the direct metal to metal contact of the valve body to an appropriately grounded metal mounting surface.

**Servicing Valve Body**

Refer to Figure 1 and 2 to aid with disassembly and reassembly.

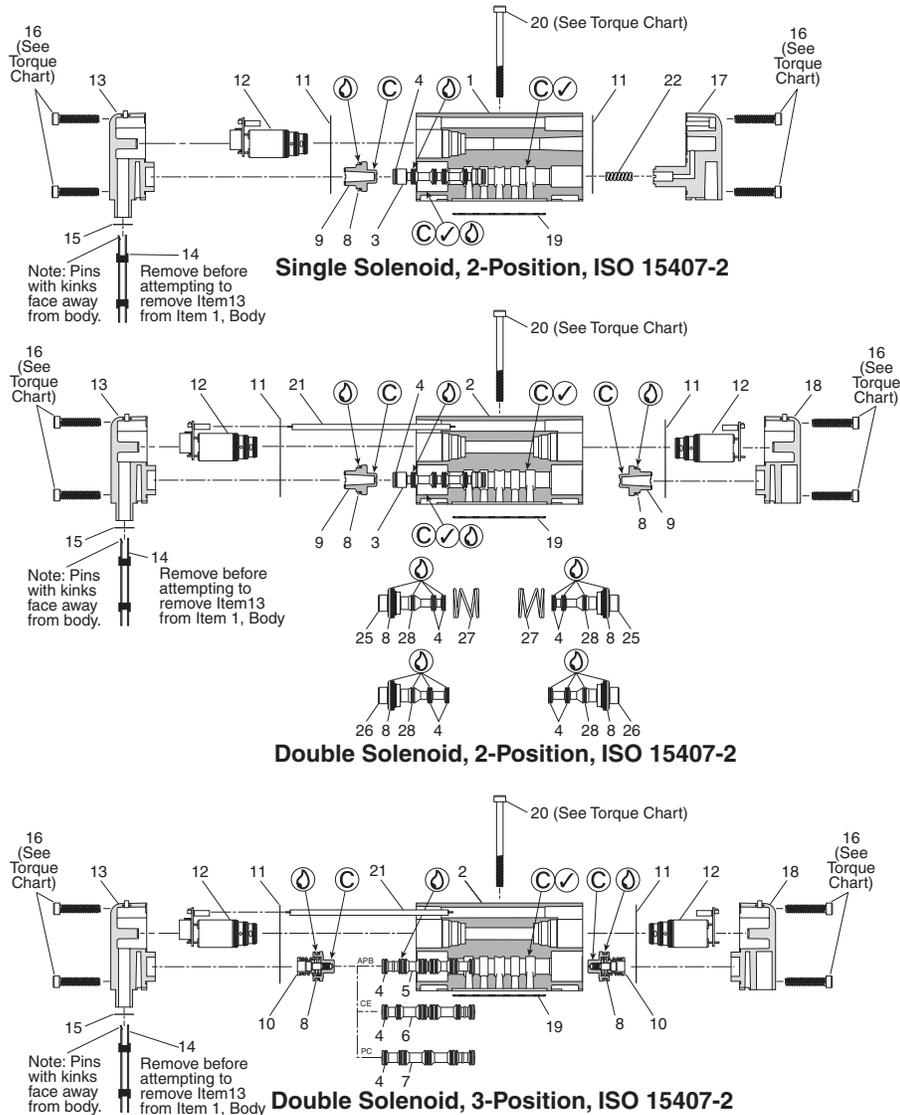
1. Remove Valve from base by removing Body to Base Screws (20).
2. For ISO 15407-2: Remove Connector (14) by carefully gripping the pins with a needle nose pliers and pull to remove.  
For ISO 15407-1: Go directly to Step 3.
3. Remove each End Cap (13 / 17 / 18) by removing the Screws (16).
4. Remove the Pistons (9 or 10), Spool Return Spring (22) if applicable, and Spool (3, 5, 6 or 7), or for dual 3/2 (Split Spool Valve), remove Spool (25 or 26) and Spring (27), **being careful not to scratch the valve body bore.**
5. Using a clean, lint free cloth, clean sealing surfaces.
6. Apply a light coating of grease to each part noted in Figure 1 and the mating sealing surface of each of these parts.
7. Reassemble valve in reverse order of disassembly, replacing the necessary parts. Care must be taken when reassembling the End Caps. **Install Item 14 Connector after Item 13**

**Operator End Cap is installed on the Body. Note pin kink orientation in Figure 1.**

8. Install Base Gasket (19) onto pin on bottom of valve. For Internal Pilot Pressure, be sure the letters "I" are visible. For External Pilot Pressure, be sure the letters "X" are visible. See the valve to base gasket drawings below.

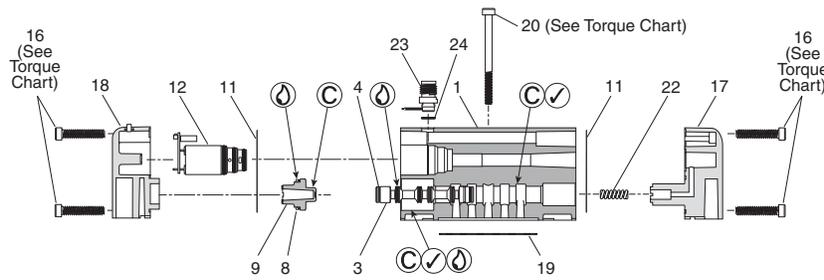
**Note:** After servicing the valve in any way, apply pressure to the valve and check for leaks. If any leak exists, repeat assembly process and retest until valve is leak free.

Item	Description	Item	Description
1	Body, Single Solenoid	14	Connector
2	Body, Double Solenoid	15	O-Ring
3	Spool - 2-Position (Seals Assembled)	16	Screws, Operator to Body
4	Seal - Spool	17	Return Operator End Cap, Single Solenoid
5	Spool - 3-Position APB (Seals Assembled)	18	Return Operator End Cap, Double Solenoid
6	Spool - 3-Position CE (Seals Assembled)	19	Body to Base Gasket
7	Spool - 3-Position PC (Seals Assembled)	20	Screws, Body to Base
8	Seal, Operator Piston	21	Connector, 2-Pin
9	Operator Piston, 2-Position	22	Spool Return Spring
10	Operator Piston, 3-Position	23	M12 Insert Assembly
11	End Cap Gasket	24	O-Ring
12	Solenoid / Circuit Board Assy	25	Split Spool, N.O.
13	Solenoid Operator End Cap	26	Split Spool, N.C.
		27	Spring, Split Spool
		28	O-ring, Split Spool

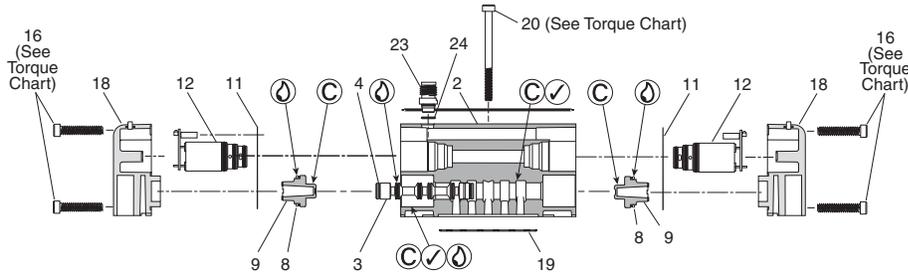


- ⊙ Lightly grease with provided lubricant.
- ✓ Inspect for nicks, scratches, and surface imperfections. If present, reduced service life is probable and future replacement should be planned.
- Ⓒ Clean with lint-free cloth.

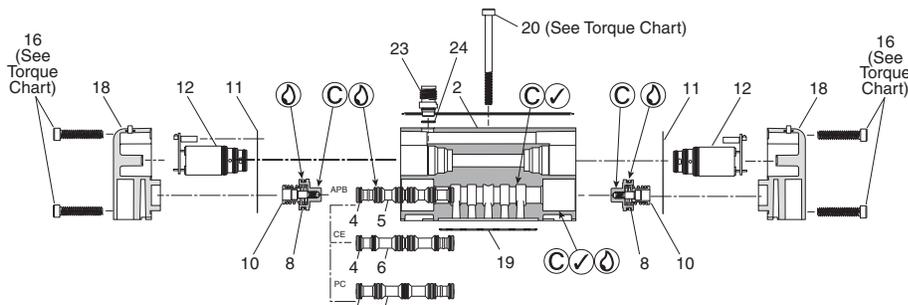
**Figure 1**



Single Solenoid, ISO 15407-1

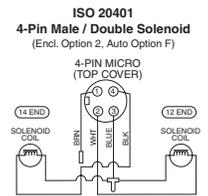
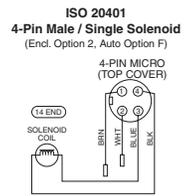


Double Solenoid, ISO 15407-1



Double Solenoid, 3-Position, ISO 15407-1

Figure 2



**Body Service Kits**

Valve	Kit Number	Description	Kit Includes (Qty)	
HA	PS5501P	2-Position	All parts below plus Return Spring (1)	
HB	PS5601P	Body Service Kit		
HA	PS5502P	3-Position APB	Spool (1) Piston Assembly (2) Grease Tube (1)	
HB	PS5602P	Body Service Kit		
HA	PS5503P	3-Position CE		
HB	PS5603P	Body Service Kit		
HA	PS5504P	3-Position PC		
HB	PS5604P	Body Service Kit		
HB	PS5606P	2-Position, Dual 3/2, N.C. Body Service Kit		Spool Assembly (1)
HB	PS5607P	2-Position, Dual 3/2, N.O. Body Service Kit		Spring (1) Grease Tube (1)

**Accessory Kits**

Valve	Kit Number	Description	(Qty)
HA	PS5587P	Valve Bolt Kit	12
HB	PS5687P		
HA	PS5505P	Body to Base Gasket Kit - Standard	10
HB	PS5605P		

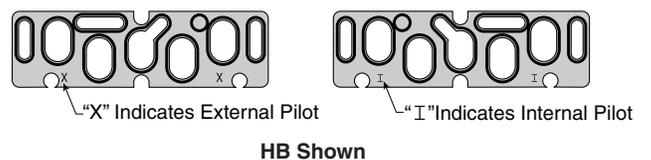
**Valve Mounting Torque Specifications (Item 20)**

Valve to Base	HA	HB
Torque - in.lb. (Nm)	15 to 18 (1.7 to 2.0)	10 to 12 (1.1 to 1.3)

**Operator Cap to Body Torque Specifications (Item 16)**

Cap to Body	HA / HB
Torque - in.lb. (Nm)	5 to 7 (.60 to .80)

**Pilot Select Gasket Kits**



**Remote Pilot Block Installation**

**Warning:**

Not following instruction may result in Remote Pilot Block damage or inadequate thread engagement, which may lead to personal injury, property damage, or economic loss.

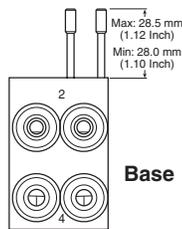
**Important:**

- Remove pressure and electrical connections before installation.
- All threads on tie rods and screws must be free of rust, water or other debris, which could prevent finger thread engagement.

**Step 1: Install Tie Rods**

1. Install two Tie Rods (3) to the base, torque finger tight.
2. Adjust tie rod height to 28.5 / 28.0 mm (1.12 / 1.10 inch) as figure shows.
3. If finger tight height exceeds 28.5 mm (1.12 inch), use mechanical tightening as necessary to get the proper height.

**Note:** “Base” could be a manifold, sub-base or sandwich flow control.



**Step 2: Install Remote Pilot Block**

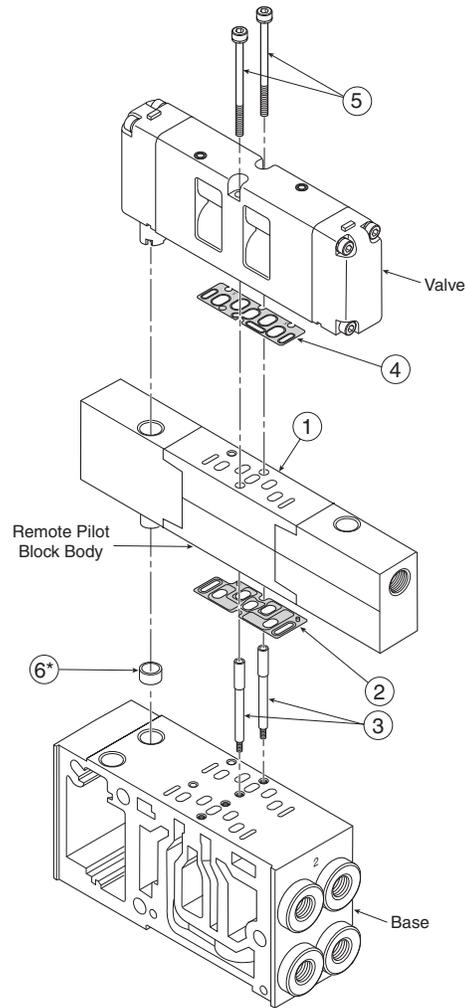
1. Lay the Pilot Block Gasket (2) on the Base. Make sure the two rubber projections are face up and the orientation of the gasket is correct.
2. Engage both Tie Rods (3) into mounting holes on the Remote Pilot Block.
3. Carefully engage the Plug into the Base.
4. Continue to lower the Pilot Block Body by carefully engaging the two rubber projections on the gasket into the appropriate holes on the Pilot Block Body.
5. Press the Pilot Block Body by hand firmly. To confirm the gasket is indeed attached to the Pilot Block Body, lift the Body by about one half inch. Both rubber projections should remain in the holes.
6. Lay the Pilot Block Body back on the Base.

**Step 3: Install Valve**

1. Locate Valve Gasket (4) on bottom of Valve.
2. Install valve onto Pilot Block Body.
3. Carefully engage the Valve Plug.
4. Using hex wrench, tighten two Screws (5) – torque 1.5 to 1.7 Nm (13 to 15 in-lb) for HA, 0.9 to 1.1 Nm (8 to 10 in-lb) for HB.

**Step 4: Leakage Check**

1. Apply pressure to base and check for audible leakage at various joints. If any are present, do not operate the valve, repeat the assembly procedure until satisfied.



**Figure 3**  
ISO 15407-2 HB Pilot Block Body Shown  
(Valve & Base shown for reference only)

**Component List**

The components listed below are for identification purposes only, some of these components are available in various Sandwich Regulator Kits, some are not available due to special factory assembly. Individual components are not sold separately since all kit components should be installed when serviced.

Item	Description
1	Remote Pilot Block Body
2	Pilot Block Gasket
3	Tie Rods
4	Valve Gasket
5	Mounting Screws
6	Protective Cap*

\*Install Item 6, Protective Cap, in manifold over electrical plug if servicing manifold assembly with valve or remote pilot block removed and power is on. Remove cap before re-installing valve or remote pilot block.

**For all Instruction Sheets, go to [www.parker.com/pneumatic](http://www.parker.com/pneumatic)**

V450P - H Series HA 26mm & HB 18mm ISO 15407 Valve Service  
 V452P - H Series HA & HB ISO 15407-2 Sandwich Flow Controls  
 V454P - H Series HA & HB Sandwich Regulators  
 V455P - H Series HA & HB ISO 15407-1 Subbase & Manifold Installation  
 V467P - H Series H1 Sandwich Regulators

V468P - H Series H1, H2 & H3, ISO 5599-1, 5599-2 Sandwich Flow Controls  
 V469P - H Series H1, H2 & H3, ISO 5599-1, 5599-2 Subbase & Manifold Installation  
 V470P - H Series H1, H2 & H3, ISO 5599-1, 5599-2 Valve Service  
 V471P - H Series H2 & H3 Sandwich Regulators

**⚠ WARNING**

- To avoid unpredictable system behavior that can cause personal injury and property damage:
- Disconnect electrical supply (when necessary) before installation, servicing, or conversion.
- Disconnect air supply and depressurize all air lines connected to this product before installation, servicing, or conversion.
- Operate within the manufacturer's specified pressure, temperature, and other conditions listed in these instructions.
- Medium must be moisture-free if ambient temperature is below freezing.
- Service according to procedures listed in these instructions.
- Installation, service, and conversion of these products must be performed by knowledgeable personnel who understand how pneumatic products are to be applied.
- After installation, servicing, or conversion, air and electrical supplies (when necessary) should be connected and the product tested for proper function and leakage. If audible leakage is present, or the product does not operate properly, do not put into use.
- Warnings and specifications on the product should not be covered by paint, etc. If masking is not possible, contact your local representative for replacement labels.

**Safety Guide**

For more complete information on recommended application guidelines, see the Safety Guide section of Pneumatic Division catalogs or you can download the **Pneumatic Division Safety Guide** at: [www.parker.com/safety](http://www.parker.com/safety)

**⚠ WARNING**

**FAILURE OR 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 authorized distributors provide product and/or system options for further investigation by users having technical expertise. It is important that you analyze all aspects of your application, including consequences of any failure and review the information concerning the product or systems in the current product catalog. 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.

The products described herein, including without limitation, product features, specifications, designs, availability and pricing, are subject to change by Parker Hannifin Corporation and its subsidiaries at any time without notice.

**EXTRA COPIES OF THESE INSTRUCTIONS ARE AVAILABLE FOR INCLUSION IN EQUIPMENT / MAINTENANCE MANUALS THAT UTILIZE THESE PRODUCTS. CONTACT YOUR LOCAL REPRESENTATIVE.**

**Introduction**

Follow these instructions when installing, operating, or servicing the product.

**Installation & Operating Instructions:**

A Flow Control "Sandwich" controls the flow of air from the valve exhaust ports to atmosphere. The HA & HB 4-Way valve is typically used with a double acting cylinder alternately pressurizing one end while exhausting the other. Cylinder speed can be influenced by restricting the exhaust path.

The Flow Control "Sandwich" is intended for use with the respective subbase or manifold mounted valves. HA & HB valves and flow controls are designed in conformance to ISO 15407-2 HA & HB Flow Control "Sandwiches" are only recommended for use with Common Port versions of Sandwich Regulators. The Flow Control is to be assembled between the regulator and the subbase or manifold.

If used with Independent Port version of Sandwich Regulator, functionality is limited as follows:

**Flow Control "Sandwich" used in conjunction with Independent Port version of Sandwich Regulator** - Adjust speed with the adjusting screw labeled "5". It adjusts the speed of exhaust flow from cylinder ports "2" and "4". Independent speed adjustment is not possible. This could result in different exhaust speeds for cylinder ports "2" and "4" since line pressure is supplied to one cylinder port and a regulated pressure is supplied to the other. The other adjusting screw is non-functional.

**Lubrication**

Factory Pre-lubed. If lubricating in service, use Parker F442 oil or equivalent paraffin based mineral oil with 150 to 200 SSU viscosity @100°F.

**⚠ CAUTION: Do not use oils that are synthetic, reconstituted, have an alcohol content or a detergent additive.**

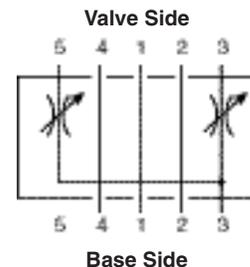
**Application Limits:**

These products are intended for use in general purpose compressed air systems only.

**Operating Pressure Range:** Maximum 145 PSIG, 1000 kPa

**Ambient Temperature Range:** -15°C to 49°C (5°F to 120°F)

**ANSI Symbol:**



**Installation:**

(See Figure 1, HB Sandwich Flow Control shown as example)

**⚠ Warning:**

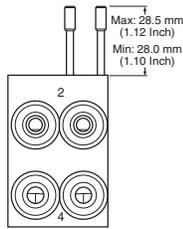
Not following instruction may result in Sandwich Flow Control damage or inadequate thread engagement, which may lead to personal injury, property damage, or economic loss.

**Important:**

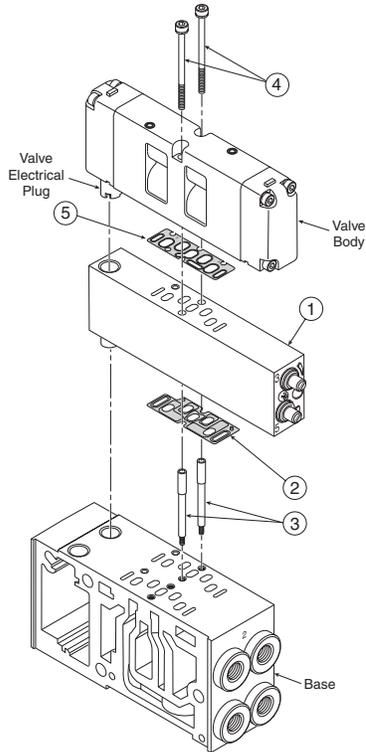
- Remove pressure and electrical connections before installation.
- All threads on tie rods and screws must be free of rust, water or other debris, which could prevent finger thread engagement.

**Step 1: Install Tie Rods**

1. Install two Tie Rods (6) to the base, torque finger tight.
2. Adjust tie rod height to 28.5/28.0 mm (1.12/1.10 inch) as figure shows.
3. If finger tight height exceeds 28.5 mm (1.12 inch), use mechanical tightening as necessary to get the proper height.



**Note:** "Base" could be a manifold or a sub-base.



**Figure 1 (HB Shown)**

**Step 2: Install Sandwich Flow Control**

1. Lay the Sandwich Flow Control Gasket (2) on the Base. Make sure the two rubber projections are face up and the orientation of the gasket is correct.
2. Engage both Tie Rods (3) into mounting holes on Flow Control Body, lower the Flow Control body.
3. Carefully engage the Electrical Plug into the Base.
4. Continue to lower the Flow Control Body by carefully engaging the two rubber projections on the gasket into the appropriate holes on the Flow Control Body.
5. Press the Flow Control Body by hand firmly. To confirm the gasket is indeed attached to the Flow Control Body, lift the Flow Control Body by about one half inch. Both rubber projections should remain in the holes.
6. Lay the Flow Control Body back on the Base.

**Step 3: Install Valve**

1. Locate Valve Gasket (5) on bottom of Valve Body.
2. Install valve onto Flow Control.

3. Carefully engage the Valve Electrical Plug.
4. Using hex wrench, tighten two Screws (4) – torque 1.5 to 1.7 Nm (13 to 15 in-lb) for HA, 0.9 to 1.1 Nm (8 to 10 in-lb) for HB.

**Step 4: Leakage Check**

1. Apply pressure to base and check for audible leakage at various joints. If any are present, do not operate the valve, repeat the assembly procedure until satisfied.

**Note:** If both a Sandwich Flow Control and Sandwich Regulator is to be installed, the Flow Control should be installed between the Regulator and the Base. Refer to Sandwich Regulator Installation & Service Instructions (V454) for Sandwich Regulator installation.

**Adjustment Procedures:**

**For HA & HB**

Both Adjusting Screws (4) are located at the 12 End of the assembly. Adjustment screw labeled "5" controls the flow of air from cylinder Port 4 to exhaust Port 3. With a double solenoid valve this occurs when Operator #12 is actuated. With a single solenoid valve this occurs when Operator #14 is not actuated. Adjustment screw labeled "3" controls air from cylinder Port 2 to exhaust Port 3.

1. Turn both adjustment screws clockwise until fully closed and then counterclockwise slightly.
2. While cycling valve with cylinder adjust clockwise to decrease speed or counterclockwise to increase speed.

**Component List**

The components listed below are for identification purposes only, some of these components are available in various Sandwich Flow Control Kits, some are not available due to special factory assembly. Individual components are not sold separately since all kit components should be installed when serviced.

Item	Description
1	Flow Control Body
2	Flow Control / Regulator Gasket
3	Tie Rods
4	Mounting Screws
5	Valve Gasket

**Sandwich Flow Control Kits**

Size	Kit Number	Kit Includes Item # , (Qty)	Description
HB	PS5635	1, 2, 3 (2)	18mm Sandwich Flow Control Kit with Plug-in (Type 2)
HA	PS5535	1, 2, 3 (2)	26mm Sandwich Flow Control Kit with Plug-in (Type 2)
HB	PS5642	1 (Without Elect. Plug), 2, 3 (2)	18mm Sandwich Flow Control Kit without Plug-in (Type 1)
HA	PS5542	1 (Without Elect. Plug), 2, 3 (2)	26mm Sandwich Flow Control Kit with Plug-in (Type 1)
HB	PS5636	3 (12)	18mm Sandwich Flow Control Tie Rod Kit
HA	PS5536	3 (12)	26mm Sandwich Flow Control Tie Rod Kit

**For all Instruction Sheets, go to [www.parker.com/pneumatic](http://www.parker.com/pneumatic)**

V450P - H Series HA 26mm & HB 18mm ISO 15407-2 Valve Service  
 V452P - H Series HA & HB ISO 15407-2 Sandwich Flow Controls  
 V454P - H Series HA & HB Sandwich Regulators  
 V467P - H Series H1 Sandwich Regulators

V468P - H Series H1, H2 & H3, ISO 5599-1, 5599-2 Sandwich Flow Controls  
 V469P - H Series H1, H2 & H3, ISO 5599-1, 5599-2 Subbase & Manifold Installation  
 V470P - H Series H1, H2 & H3, ISO 5599-1, 5599-2 Valve Service  
 V471P - H Series H2 & H3 Sandwich Regulators

**⚠ WARNING**

To avoid unpredictable system behavior that can cause personal injury and property damage:

- Disconnect electrical supply (when necessary) before installation, servicing, or conversion.
- Disconnect air supply and depressurize all air lines connected to this product before installation, servicing, or conversion.
- Operate within the manufacturer's specified pressure, temperature, and other conditions listed in these instructions.
- Medium must be moisture-free if ambient temperature is below freezing.
- Service according to procedures listed in these instructions.
- Installation, service, and conversion of these products must be performed by knowledgeable personnel who understand how pneumatic products are to be applied.
- After installation, servicing, or conversion, air and electrical supplies (when necessary) should be connected and the product tested for proper function and leakage. If audible leakage is present, or the product does not operate properly, do not put into use.
- Warnings and specifications on the product should not be covered by paint, etc. If masking is not possible, contact your local representative for replacement labels.

**⚠ WARNING**

**FAILURE OR 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 authorized distributors provide product and/or system options for further investigation by users having technical expertise. It is important that you analyze all aspects of your application, including consequences of any failure and review the information concerning the product or systems in the current product catalog. 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.

The products described herein, including without limitation, product features, specifications, designs, availability and pricing, are subject to change by Parker Hannifin Corporation and its subsidiaries at any time without notice.

**EXTRA COPIES OF THESE INSTRUCTIONS ARE AVAILABLE FOR INCLUSION IN EQUIPMENT / MAINTENANCE MANUALS THAT UTILIZE THESE PRODUCTS. CONTACT YOUR LOCAL REPRESENTATIVE.**

**⚠ WARNING**

**Air exhausting from one valve into the exhaust gallery of the manifold assembly may momentarily pressurize other valve circuits open to the same gallery. Design the circuit such that there is no hazard or consequence of damage from this action.**

**Safety Guide**

For more complete information on recommended application guidelines, see the Safety Guide section of Pneumatic Division catalogs or you can download the **Pneumatic Division Safety Guide** at: [www.parker.com/safety](http://www.parker.com/safety)

**Introduction**

Follow these instructions when installing, operating, or servicing the product.

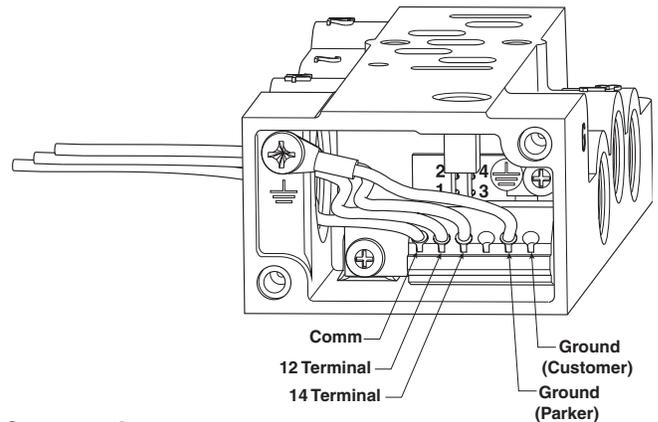
**Application Limits**

These products are intended for use in general purpose compressed air systems only. Compliance with the rated pressure, temperature, and voltage is necessary - see Installation & Service Instructions packed with valve.

**Wiring Instructions for Individual Base Wiring**

1. Follow all requirements for local and national electrical codes.
2. Remove end cover from base by backing off the two captive screws.
3. Connect wires as shown in chart.
4. An external ground connection must be attached to the green ground screw of every base in an assembly.
5. Disregard unused wires or terminals.
6. Reassemble cover to base by tightening screws from 0.8 to 1.0 Nm (7 to 9 in-lbs).

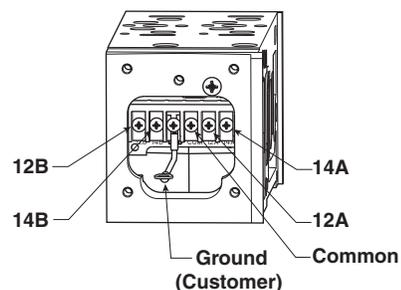
**Subbase Wiring**

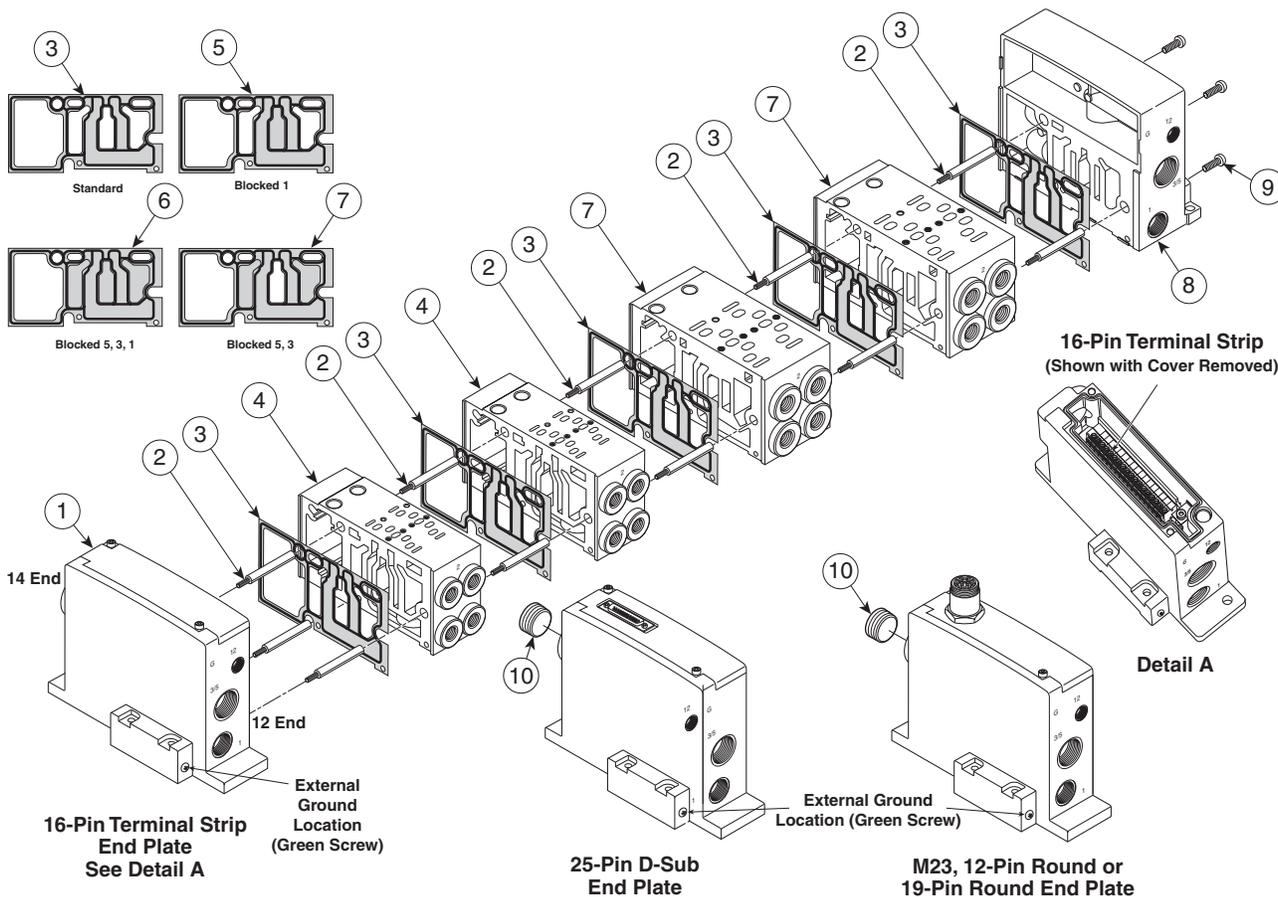


**Connections**

	14 Solenoid	12 Solenoid
Valves with Wires	Black Wires	Red Wires
Valves with Terminal Block (Will accept 18 to 24 Gauge Wires)	14 and Com Terminals	12 and Com Terminals

**Manifold Wiring**





Item #	Description	Item #	Description
1	Left End Plate	6	Gasket - Blocked 1, 3, 5
2	Tie Rod (3 per Base)	7	Manifold Base (HA)
3	Gasket - Standard	8	Right End Plate
4	Manifold Base (HB)	9	Mounting Screws
5	Gasket - Blocked 1	10	Pipe Plug

**Assembly Techniques**

- Lay Left Hand End Plate (Item 1) on left side (when looking at cylinder ports).
- Attach three Tie Rods (Item 2) to the Left End Plate (Item 1) by hand tightening them down completely and then backing off 1-2 turns. Mount the Gasket (Item 3) over the Tie Rods.
- Add Manifold Base (Item 4). Place 3 Tie Rods (Item 2) through the Base and screw into the Tie Rods mounted in the Left End Plate by hand tightening them down completely and then backing off 1-2 turns.
- Build manifold vertically by adding remaining Manifolds, Gaskets and Tie Rods.
- Place Right Hand End Plate and tighten screws to torque specification.
- Check the manifold for straightness. Loosen and tighten bolts if needed.
- Add Valves and Accessories. All Manifold Assemblies should be leak tested before operation.

**⚠ Caution:** If the socket head cap screws do not engage the last tie rod, it is because the stack of uncompressed gaskets causes the manifolds and gaskets to be longer than the tie rod sets. It will be necessary to lengthen the tie rod sets by backing away each tie rod from its adjacent tie rod about one or two turns. This stack length

problem is likely to occur at 6 or 7 manifold bases and worsens with each additional manifold

**Manifold Assembly Wiring Instructions**

- Follow all requirements for local and national electrical codes.
- An External Ground Connection must be attached to the Manifold Assembly. An external ground location is provided on the Manifold End Plate (See drawing). All 25-Pin, D-Sub versions must use this ground connection. 19-Pin and 16-Pin Terminal Strip versions may omit this connection only if the ground is connected through the connector. Otherwise, the external ground connection location must be used.

**Manifold / End Plate Assembly Torque Values**

	HA / HB
Torque - in.lb. (Nm)	65 to 70 (7.3 to 7.9)

**Manifold Kits**

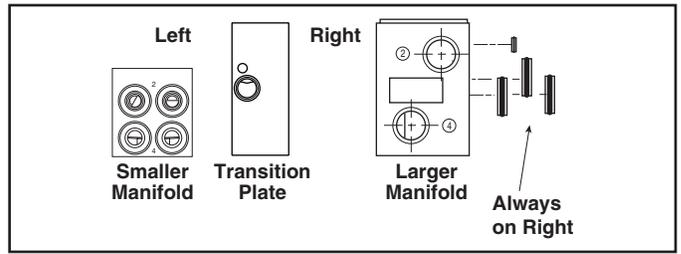
Kit Number	Description	Item Number
PS5612P	HB Manifold Hardware Kit	2
PS5512P	HA Manifold Hardware Kit	2
PS561AP	HB / HA Manifold to Manifold Gasket Kit (Standard)	3
PS561BP	HB / HA Manifold to Manifold Gasket Kit (Blocked #1 Port)	5
PS561CP	HB / HA Manifold to Manifold Gasket Kit (Blocked #1, 3, 5 Ports)	6
PS561DP	HB / HA Manifold to Manifold Gasket Kit (Blocked #3, 5 Ports)	7

### HA to H2 Manifold Assembly

The smaller manifold must be on the left side of the Transition Plate. The Transition Plate (Item 6) acts as a combination right end plate for the smaller manifold and left end plate for the larger manifold.

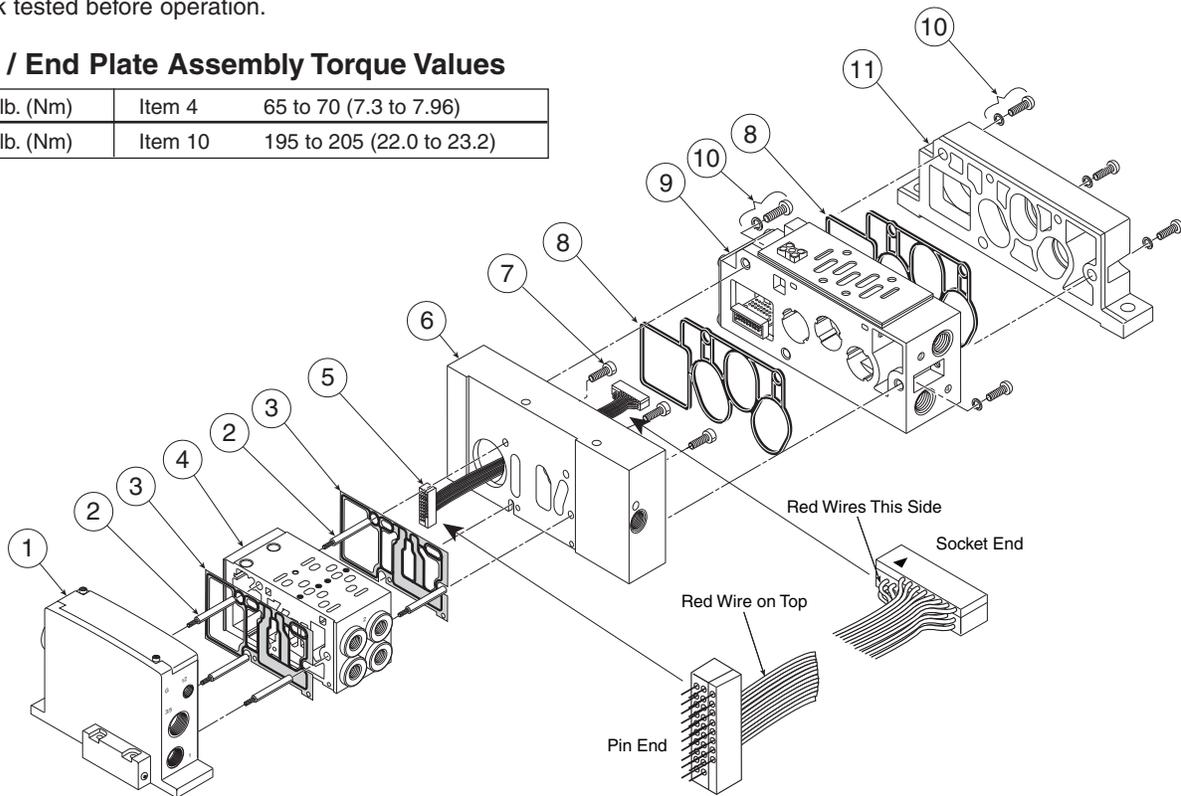
1. Lay Left Hand End Plate (Item 1) on left side (when looking at cylinder ports).
2. Attach three Tie Rods (Item 2) to the Left End Plate (Item 1) by hand tightening them down completely and then backing off 1-2 turns. Mount the Gasket (Item 3) over the Tie Rods.
3. Add Manifold Base (Item 4). Place 3 Tie Rods (Item 2) through the Base and screw into the Tie Rods mounted in the Left End Plate by hand tightening them down completely and then backing off 1-2 turns.
4. Build manifold vertically by adding remaining Manifolds, Gaskets, Tie Rods and Transition Plate.
5. Lay entire manifold on a flat surface and tighten screws to torque specification.
6. Place Right Hand End Plate and tighten screws to torque specifications in chart.
7. Add Valves and Accessories. All Manifold Assemblies should be leak tested before operation.

### Isolator Plug Locations with Transition Plates



### Manifold / End Plate Assembly Torque Values

Torque - in.lb. (Nm)	Item 4	65 to 70 (7.3 to 7.96)
Torque - in.lb. (Nm)	Item 10	195 to 205 (22.0 to 23.2)



HA to H2 Transition Assembly

Item #	Description
1	Left End Plate (HA)
2	Tie Rod (3 per Base)
3	Manifold Gasket (Standard)
4	Manifold Base (HA)
5	Wire Harness
6	Transition Plate (HA to H2)
7	Mounting Screws
8	Manifold Gasket (H2)
9	Manifold Base (H2)
10	Mounting Screws & Lock Washers (H2)
11	Right End Plate

### 32 Output Expansion Cable Installation

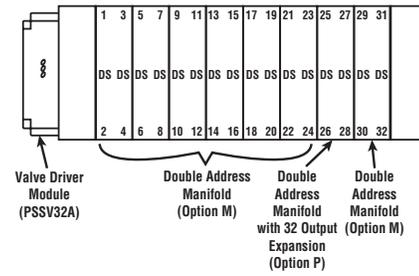
The 32 output expansion cable is only used for H Series Fieldbus or Turck fieldbus with a valve driver module – 32 output.

#### When using an HA or HB manifold base with the “N” Enclosure/Lead Length option:

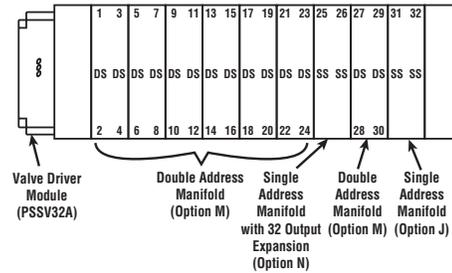
- Outputs 1 – 24 can be single or double address bases. Use a combination of bases with “J” or “M” option.
- Outputs 25-26 are a single address base. Use a base with “N” option.
- Outputs 27-32 can be single or double. Use a combination of bases with “J” or “M” option.

#### When using an HA or HB manifold base with the “P” Enclosure/Lead Length option:

- Outputs 1 – 24 can be single or double address bases. Use a combination of bases with “J” or “M” option.
- Outputs 25-28 are a double address base. Use a base with “P” option.
- Outputs 29-32 can be single or double. Use a bases with “J” or “M” option.



Option “P”

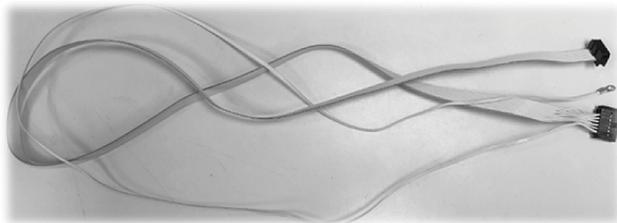


Option “N”

### Attach 32 Output Expansion Cable to Manifold Assembly

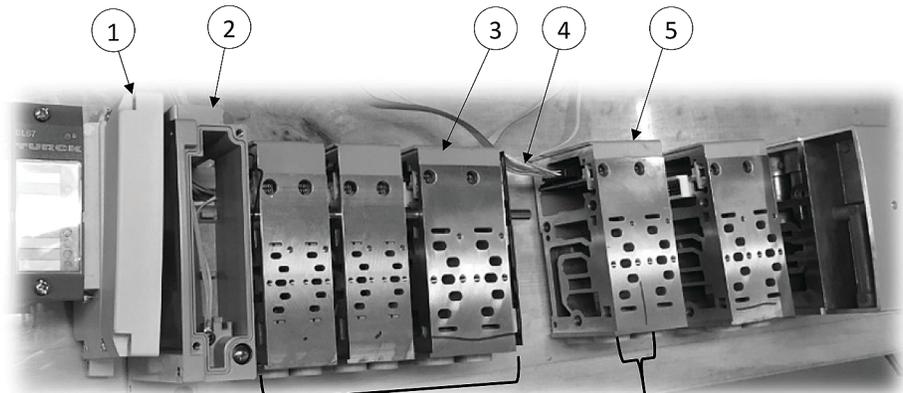
Construct manifold assemblies from left to right while looking at the ports.

1. Plug Cable’s 90 deg connector (Item 4) into valve driver module (Item 1)
2. Attach cable’s ground lug to left plate (Item 2)
3. Lace cable assembly through Manifold Bases (Item 3)
4. Connect Cable to the 25th output Manifold Base (Item 5)
5. Assemble Manifold Bases. During assembly place additional cable slack inside the Manifold Bases.



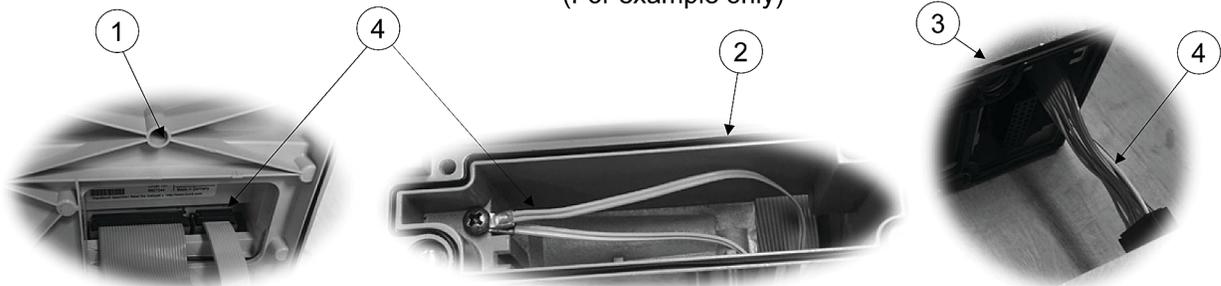
25 -32 Output Expansion Cable

Item #	Description
1	Valve Driver Module
2	Left End Plate
3	Manifold Base
4	32 Output Expansion Cable
5	25th Output Manifold Base



Represents 24 output Manifold stations (For example only)

Represents 25<sup>th</sup> output Manifold station (For example only)



**⚠ WARNING**

- To avoid unpredictable system behavior that can cause personal injury and property damage:
- Disconnect electrical supply (when necessary) before installation, servicing, or conversion.
- Disconnect air supply and depressurize all air lines connected to this product before installation, servicing, or conversion.
- Operate within the manufacturer's specified pressure, temperature, and other conditions listed in these instructions.
- Medium must be moisture-free if ambient temperature is below freezing.
- Service according to procedures listed in these instructions.
- Installation, service, and conversion of these products must be performed by knowledgeable personnel who understand how pneumatic products are to be applied.
- After installation, servicing, or conversion, air and electrical supplies (when necessary) should be connected and the product tested for proper function and leakage. If audible leakage is present, or the product does not operate properly, do not put into use.
- Warnings and specifications on the product should not be covered by paint, etc. If masking is not possible, contact your local representative for replacement labels.

**Safety Guide**

For more complete information on recommended application guidelines, see the Safety Guide section of Pneumatic Division catalogs or you can download the **Pneumatic Division Safety Guide** at: [www.parker.com/safety](http://www.parker.com/safety)

**⚠ WARNING**

**FAILURE OR 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 authorized distributors provide product and/or system options for further investigation by users having technical expertise. It is important that you analyze all aspects of your application, including consequences of any failure and review the information concerning the product or systems in the current product catalog. 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.

The products described herein, including without limitation, product features, specifications, designs, availability and pricing, are subject to change by Parker Hannifin Corporation and its subsidiaries at any time without notice.

**EXTRA COPIES OF THESE INSTRUCTIONS ARE AVAILABLE FOR INCLUSION IN EQUIPMENT / MAINTENANCE MANUALS THAT UTILIZE THESE PRODUCTS. CONTACT YOUR LOCAL REPRESENTATIVE.**

**Introduction**

Follow these instructions when installing, operating, or servicing the product.

**Installation & Operating Instructions:**

A sandwich regulator is used to provide regulated pressure to individual valves in a manifolded valve arrangement. Three basic modes of regulation are available as follows:

**Common Port Regulation** - Provides adjustable regulated air pressure to the valve inlet.

**Independent Single Port Regulation** - Provides regulated pressure to one of the ports and full line pressure to the other. Pressure regulation can occur out of the #4 port of the valve. The valve exhaust is directed to manifold or subbase exhaust port "5".

**Independent Dual Port Regulation** - Provides (2) separately adjustable regulated air pressures, one to each of the valves exhaust passages. The valves exhaust is directed to manifold or subbase exhaust port "5".

**⚠ CAUTION: The reverse valve porting utilized with Independent Port Regulation will reverse the function of 4-Way, 3-Position cylinder to exhaust and 4-Way, 3-Position inlet to cylinder valves. Utilize the opposite function valve for normal operation.**

Sandwich regulator should be installed with reasonable accessibility for service whenever possible. Repair service kits are available. Keep pipe or tubing lengths to a minimum with inside clean and free of dirt and chips. Pipe joint compound should be used sparingly and applied only to the male pipe, never into the female port. Do not use PTFE tape to seal pipe joints. Pieces have a tendency to break off and lodge inside the unit, possibly causing malfunction.

Air applied to the sandwich regulator must be filtered to realize maximum component life.

**Lubrication**

Factory pre-lubed. If lubricating in service, use Parker F442 oil or equivalent paraffin based mineral oil with 150 to 200 SSU viscosity @ 100°F.

**⚠ CAUTION: Do not use oils that are synthetic, reconstituted, have an alcohol content or a detergent additive.**

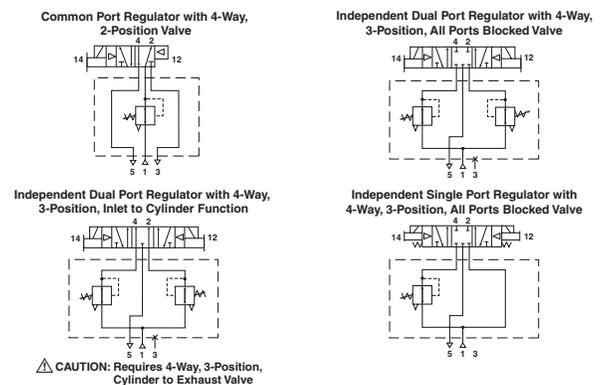
**Application Limits**

These products are intended for use in general purpose compressed air systems only.

**Operating Pressure Range:** Maximum 145 PSIG (1000 kPa)

**Ambient Temperature Range:** -15°C to 49°C (5°F to 120°F)

**ANSI Symbol**



**Installation:**

(See Figure 1, HB Sandwich Regulator shown as example)

**⚠ Warning:**

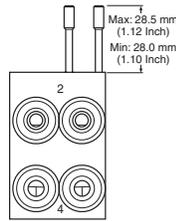
**Not following instruction may result in Sandwich Regulator damage or inadequate thread engagement, which may lead to personal injury, property damage, or economic loss.**

**Important:**

- Remove pressure and electrical connections before installation.
- All threads on tie rods and screws must be free of rust, water or other debris, which could prevent finger thread engagement.

**Step 1: Install Tie Rods**

1. Install two Tie Rods (6) to the base, torque finger tight.
2. Adjust tie rod height to 28.5/28.0 mm (1.12/1.10 inch) as figure shows.
3. If finger tight height exceeds 28.5 mm (1.12 inch), use mechanical tightening as necessary to get the proper height.



**Note:** “Base” could be a manifold, sub-base or sandwich flow control.

**Step 2: Install Sandwich Regulator**

1. Lay the Sandwich Regulator Gasket (5) on the Base. Make sure the two rubber projections are face up and the orientation of the gasket is correct.
2. Engage both Tie Rods (6) into mounting holes on Regulator Body, lower the Regulator Body.
3. Carefully engage the Electrical Plug into the Base.
4. Continue to lower the Regulator Body by carefully engaging the two rubber projections on the gasket into the appropriate holes on the Regulator Body.
5. Press the Regulator Body by hand firmly. To confirm the gasket is indeed attached to the Regulator Body, lift the Regulator Body by about one half inch. Both rubber projections should remain in the holes.
6. Lay the Regulator Body back on the Base.

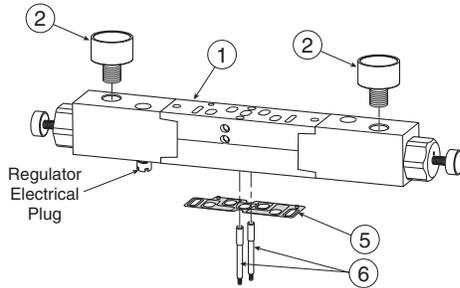
**Step 3: Install Valve**

1. Locate Valve Gasket (7) on bottom of Valve Body.
2. Install valve onto Regulator.
3. Carefully engage the Valve Electrical Plug.
4. Using hex wrench, tighten two Screws (8) – torque 1.5 to 1.7 Nm (13 to 15 in-lb) for HA, 0.9 to 1.1 Nm (8 to 10 in-lb) for HB.

**Step 4: Leakage Check**

1. Apply pressure to base and check for audible leakage at various joints. If any are present, do not operate the valve, repeat the assembly procedure until satisfied.

**Note:** If both a Sandwich Flow Control and Sandwich Regulator is to be installed, the Flow Control should be installed between the Regulator and the Base. Refer to Sandwich Flow Control Installation & Service Instructions (V452) for Sandwich Flow Control installation.



HA Independent Dual Port Sandwich Regulator

**Outlet Pressure Adjustment:**

1. Before turning on the air supply, turn the adjusting knob counterclockwise until compression is released from the pressure control spring then turn on air supply. Proceed to adjust the desired downstream pressure by turning adjusting knob clockwise. This permits pressure to build up slowly in the downstream line.
2. To decrease regulated pressure setting, always reset from a pressure lower than the final setting required. Example, lowering

the secondary pressure from 550 kPa (80 PSIG) to 410 kPa (60 PSIG) is best accomplished by dropping the secondary pressure to 345 kPa (50 PSIG), then adjusting upward to 410 kPa (60 PSIG).

**Service Instructions:**

1. Disconnect air supply and depressurize the unit.
2. Loosen nut on adjusting screw. Turn adjusting screw counterclockwise until all downstream air is exhausted.
3. For HB Regulator, remove Regulator Cartridge from block and replace with a new unit, use PS299922P for 0-60 PSI cartridge kit or PS299933P for 0-125 PSI cartridge. For HA Regulator, remove Regulator from base and replace with a new unit per installation procedure.
4. Reapply pressure to unit and check for audible leakage at joints or out bleed holes. If any are present, do not operate the valve. Repeat assembly procedure until satisfied.
5. Adjust outlet pressure per *Outlet Pressure Adjustment* procedure.

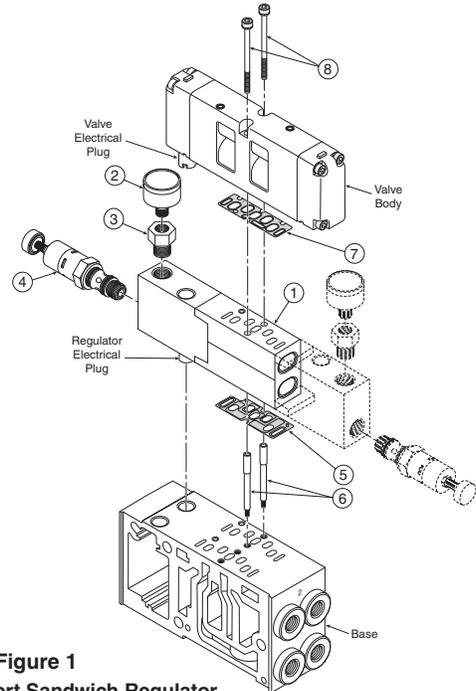


Figure 1

HB Common Port Sandwich Regulator (Valve & Base shown for reference only)

**Component List**

The components listed below are for identification purposes only, some of these components are available in various Sandwich Regulator Kits, some are not available due to special factory assembly. Individual components are not sold separately since all kit components should be installed when serviced.

Item	Description
1	Regulator Body Assembly
2	Gauge
3*	Adapter Fitting
4	Cartridge Regulator
5	Flow Control / Regulator Gasket
6	Tie Rods
7	Valve Gasket
8	Mounting Screws

\* Alternating Fittings must be used in order to fit two HB regulators to each other.

**For all Instruction Sheets, go to [www.parker.com/pneumatic](http://www.parker.com/pneumatic)**

V450P - H Series HA 26mm & HB 18mm ISO 15407-2 Valve Service  
 V452P - H Series HA & HB ISO 15407-2 Sandwich Flow Controls  
 V454P - H Series HA & HB Sandwich Regulators  
 V467P - H Series H1 Sandwich Regulators

V468P - H Series H1, H2 & H3, ISO 5599-1, 5599-2 Sandwich Flow Controls  
 V469P - H Series H1, H2 & H3, ISO 5599-1, 5599-2 Subbase & Manifold Installation  
 V470P - H Series H1, H2 & H3, ISO 5599-1, 5599-2 Valve Service  
 V471P - H Series H2 & H3 Sandwich Regulators

**⚠ WARNING**

To avoid unpredictable system behavior that can cause personal injury and property damage:

- Disconnect electrical supply (when necessary) before installation, servicing, or conversion.
- Disconnect air supply and depressurize all air lines connected to this product before installation, servicing, or conversion.
- Operate within the manufacturer's specified pressure, temperature, and other conditions listed in these instructions.
- Medium must be moisture-free if ambient temperature is below freezing.
- Service according to procedures listed in these instructions.
- Installation, service, and conversion of these products must be performed by knowledgeable personnel who understand how pneumatic products are to be applied.
- After installation, servicing, or conversion, air and electrical supplies (when necessary) should be connected and the product tested for proper function and leakage. If audible leakage is present, or the product does not operate properly, do not put into use.
- Warnings and specifications on the product should not be covered by paint, etc. If masking is not possible, contact your local representative for replacement labels.

**⚠ WARNING**

**FAILURE OR 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 authorized distributors provide product and/or system options for further investigation by users having technical expertise. It is important that you analyze all aspects of your application, including consequences of any failure and review the information concerning the product or systems in the current product catalog. 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.

The products described herein, including without limitation, product features, specifications, designs, availability and pricing, are subject to change by Parker Hannifin Corporation and its subsidiaries at any time without notice.

**EXTRA COPIES OF THESE INSTRUCTIONS ARE AVAILABLE FOR INCLUSION IN EQUIPMENT / MAINTENANCE MANUALS THAT UTILIZE THESE PRODUCTS. CONTACT YOUR LOCAL REPRESENTATIVE.**

**⚠ WARNING**

Air exhausting from one valve into the exhaust gallery of the manifold assembly may momentarily pressurize other valve circuits open to the same gallery. Design the circuit such that there is no hazard or consequence of damage from this action.

**Safety Guide**

For more complete information on recommended application guidelines, see the Safety Guide section of Pneumatic Division catalogs or you can download the **Pneumatic Division Safety Guide** at: [www.parker.com/safety](http://www.parker.com/safety)

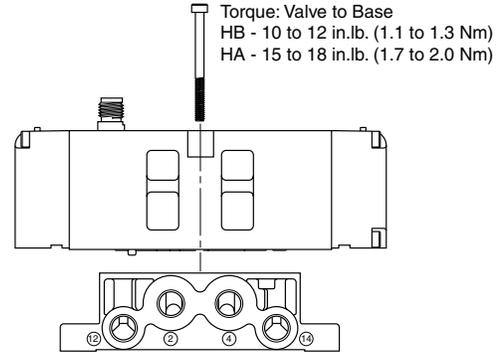
**Introduction**

Follow these instructions when installing, operating, or servicing the product.

**Application Limits**

These products are intended for use in general purpose compressed air systems only. Compliance with the rated pressure, temperature, and voltage is necessary - see Installation & Service Instructions packed with valve.

**Subbase Assembly**



**Wiring - ISO 20401**

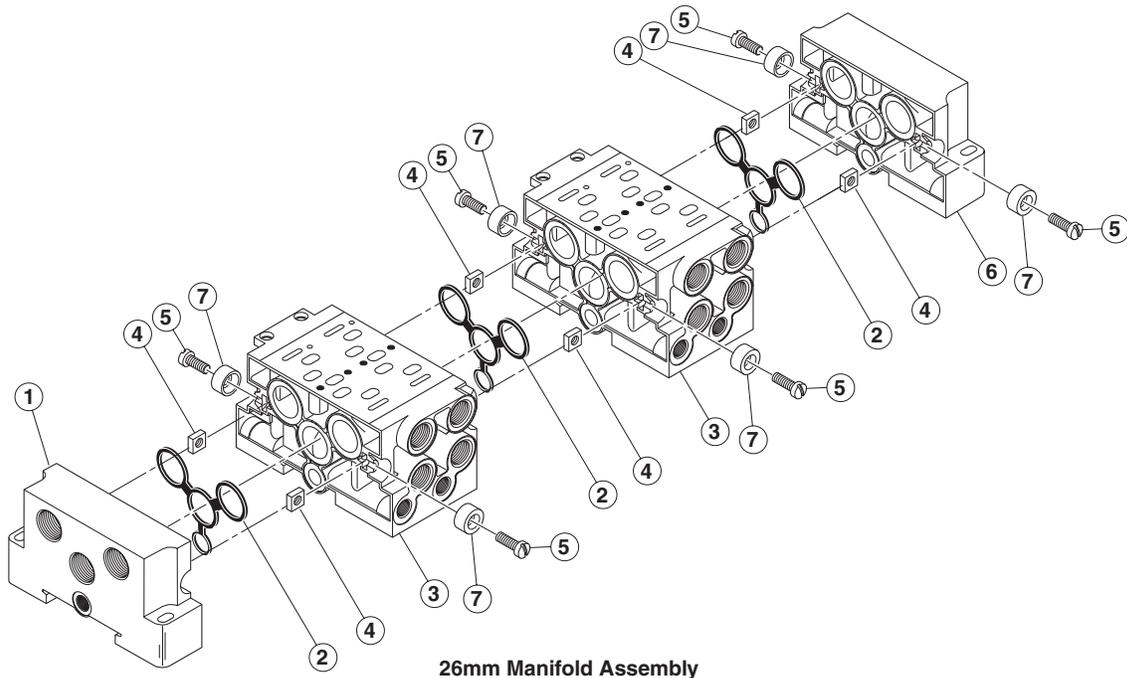
**4-Pin M12**

Wiring Type	ISO
Pin #1	N/A
Pin #2	12
Pin #3	Com
Pin #4	14

**Service Kits**

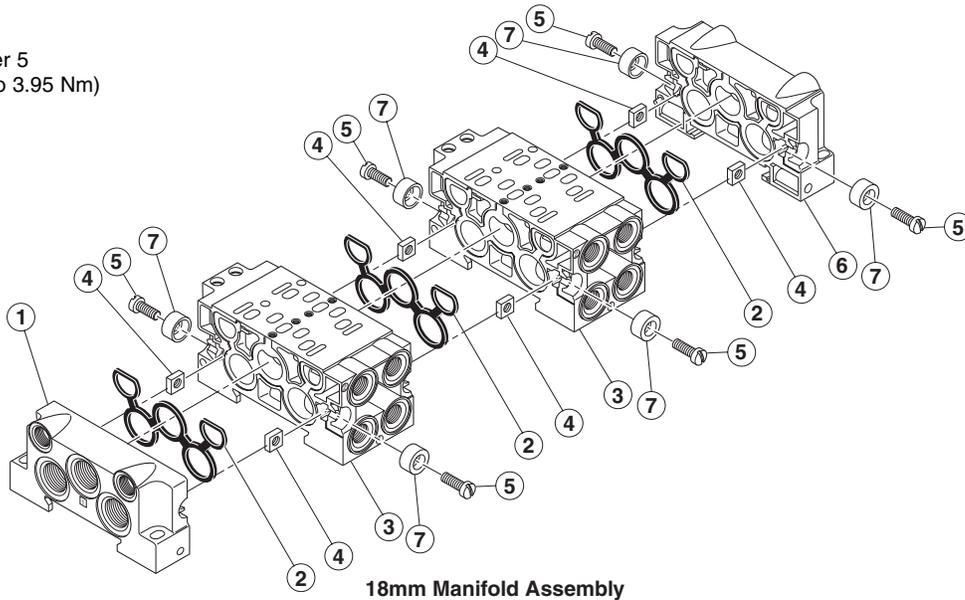
Kit Number	Description	Items Included (Qty)
PEJ02-02-80	18mm End Plate Kit, 1/4" NPT	1 (1), 2 (1), 4 (2) 5 (2), 6 (1), 7 (2)
PEJ02-02-70	18mm End Plate Kit, 1/4" BSPP	
PEJ01-03-80	26mm End Plate Kit, 3/8" NPT	
PEJ01-03-70	26mm End Plate Kit, 3/8" BSPP	
D02P-01-80	18mm Intermediate Air Supply Base Kit, 1/8" NPT	Not Shown
D01P-02-80	26mm Intermediate Air Supply Base Kit, 1/4" NPT	Not Shown
D02BD0	18mm Manifold Port Isolation Disc Kit	Not Shown (3 per Kit)
D01BD0	26mm Manifold Port Isolation Disc Kit	Not Shown (3 per Kit)
DX02BLK	18mm Blanking Plate Kit	Not Shown
DX01BLK	26mm Blanking Plate Kit	Not Shown
DX02M2MB*	Manifold to Manifold Bolt Kit	4 (10), 5 (10), 7 (10)
DX02M2MGSKT	02 Manifold to Manifold Gasket Kit	
DX01M2MGSKT	01 Manifold to Manifold Gasket Kit	

\* Use this Number for both sizes, PJLP02 & PJLP01.



26mm Manifold Assembly

Torque - Item Number 5  
25 to 35 in-lb (2.82 to 3.95 Nm)



18mm Manifold Assembly

### Manifold to Manifold Assembly

1. Lay Right End Plate (when looking at Cylinder Ports) Port Side down.
2. Place Gasket in gasket track and Retaining Nut in slot.
3. Place Manifold on top and tighten using Screw and Washer (both sides).
4. Repeat Steps 2 and 3 until all manifold slices are assembled.
5. Attach Left End Plate.
6. Lay Manifold on flat surface and check for straightness. Tighten all bolts per torque specifications.

Item Number	Description
1	Left End Plate
2	Gasket
3	Manifold
4	Retaining Nut
5	Screw
6	Right End Plate
7	Washer

**For all Instruction Sheets, go to [www.parker.com/pneumatic](http://www.parker.com/pneumatic)**

V450P - H Series HA 26mm & HB 18mm ISO 15407 Valve Service  
 V452P - H Series HA & HB ISO 15407-2 Sandwich Flow Controls  
 V454P - H Series HA & HB Sandwich Regulators  
 V455P - H Series HA & HB ISO 15407-1 Subbase & Manifold Installation  
 V467P - H Series H1 Sandwich Regulators

V468P - H Series H1, H2 & H3, ISO 5599-1, 5599-2 Sandwich Flow Controls  
 V469P - H Series H1, H2 & H3, ISO 5599-1, 5599-2 Subbase & Manifold Installation  
 V470P - H Series H1, H2 & H3, ISO 5599-1, 5599-2 Valve Service  
 V471P - H Series H2 & H3 Sandwich Regulators

 **WARNING**

To avoid unpredictable system behavior that can cause personal injury and property damage:

- Disconnect electrical supply (when necessary) before installation, servicing, or conversion.
- Disconnect air supply and depressurize all air lines connected to this product before installation, servicing, or conversion.
- Operate within the manufacturer's specified pressure, temperature, and other conditions listed in these instructions.
- Medium must be moisture-free if ambient temperature is below freezing.
- Service according to procedures listed in these instructions.
- Installation, service, and conversion of these products must be performed by knowledgeable personnel who understand how pneumatic products are to be applied.
- After installation, servicing, or conversion, air and electrical supplies (when necessary) should be connected and the product tested for proper function and leakage. If audible leakage is present, or the product does not operate properly, do not put into use.
- Warnings and specifications on the product should not be covered by paint, etc. If masking is not possible, contact your local representative for replacement labels.

 **WARNING**

**FAILURE OR 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 authorized distributors provide product and/or system options for further investigation by users having technical expertise. It is important that you analyze all aspects of your application, including consequences of any failure and review the information concerning the product or systems in the current product catalog. 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.

The products described herein, including without limitation, product features, specifications, designs, availability and pricing, are subject to change by Parker Hannifin Corporation and its subsidiaries at any time without notice.

**EXTRA COPIES OF THESE INSTRUCTIONS ARE AVAILABLE FOR INCLUSION IN EQUIPMENT / MAINTENANCE MANUALS THAT UTILIZE THESE PRODUCTS. CONTACT YOUR LOCAL REPRESENTATIVE.**

 **WARNING**

Air exhausting from one valve into the exhaust gallery of the manifold assembly may momentarily pressurize other valve circuits open to the same gallery. Design the circuit such that there is no hazard or consequence of damage from this action.

**Safety Guide**

For more complete information on recommended application guidelines, see the Safety Guide section of Pneumatic Division catalogs or you can download the **Pneumatic Division Safety Guide** at: [www.parker.com/safety](http://www.parker.com/safety)

**Introduction**

Follow these instructions when installing, operating, or servicing the product.

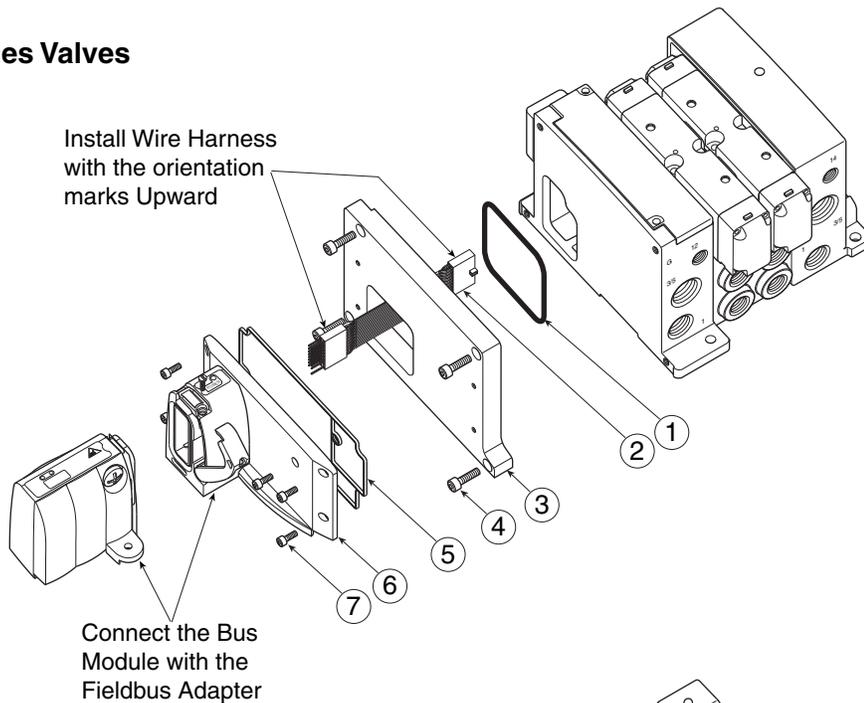
**Application Limits**

These products are intended for use in general purpose compressed air systems only. Compliance with the rated pressure, temperature, and voltage is necessary - see Installation & Service Instructions packed with valve.

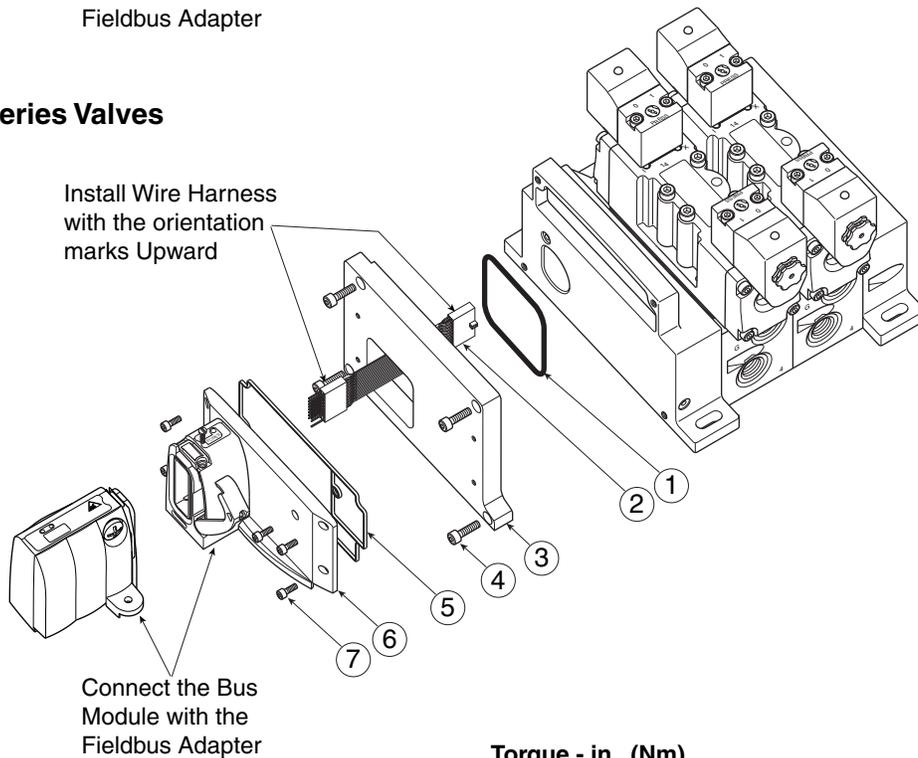
**Kits**

Kit Number	Description
PS5620M4*P	HA / HB Moduflex Adapter Kit
PS5624M4*P	HA / H2 Moduflex Adapter Kit
PS4025M4*CP	H1 / H2 / H3 Moduflex Adapter Kit
PS4026M4*CP	H1 / H3 Moduflex Adapter Kit
PS4027M4*CP	H1 / H2 Moduflex Adapter Kit
PS4028M4*CP	H2 / H3 Moduflex Adapter Kit
PS4020M4*CP	H1 Moduflex Adapter Kit
PS4120M4*CP	H2 Moduflex Adapter Kit
PS4220M4*CP	H3 Moduflex Adapter Kit

**For HA / HB Series Valves**



**For H1, H2, H3 Series Valves**



**Assembly Technique**

1. Connect the Wire Harness (Item 2) to the interconnect board in the valve stack.
2. Fit O-ring (Item 1) into the slot in the Adapter Plate (Item 3).
3. Pass the Wire Harness through the Adapter Plate.
4. Screw the Adapter Plate to the Valve Stack. Torque the Screws (Item 4) to specification.
5. Fit Gasket (Item 5) into the Field Bus Adapter (Item 6).
6. Pass the Wire Harness through the Adapter and make the connection to the Bus Module. Clamp the Bus Module with the Adapter.
7. Screw the Bus Adapter to the Valve Stack. Torque Screws (Item 7) to specification.

**Torque - in. (Nm)**

- Item 4  
25-35 (2.8 - 4.0)
- Item 7  
8-10 (0.9 - 1.1)

Item Number	Description
1	O-ring
2	Interconnect Jumper Wire
3	Screw
4	Adapter Plate
5	Gasket
6	Adapter - Fieldbus (Moduflex)
7	Screw



**Pneumatic Division**  
Richland, Michigan 49083

**Installation & Service Instructions**  
**V463P**  
**H3 5599-2 Series Air Control Valves**  
**ISSUED: September, 2016**  
**Supersedes: October, 2009**  
Doc. #V463P, EN# 160068, Rev. C

**⚠ WARNING**

To avoid unpredictable system behavior that can cause personal injury and property damage:

- Disconnect electrical supply (when necessary) before installation, servicing, or conversion.
- Disconnect air supply and depressurize all air lines connected to this product before installation, servicing, or conversion.
- Operate within the manufacturer's specified pressure, temperature, and other conditions listed in these instructions.
- Medium must be moisture-free if ambient temperature is below freezing.
- Service according to procedures listed in these instructions.
- Installation, service, and conversion of these products must be performed by knowledgeable personnel who understand how pneumatic products are to be applied.
- After installation, servicing, or conversion, air and electrical supplies (when necessary) should be connected and the product tested for proper function and leakage. If audible leakage is present, or the product does not operate properly, do not put into use.
- Warnings and specifications on the product should not be covered by paint, etc. If masking is not possible, contact your local representative for replacement labels.

**⚠ WARNING**

**FAILURE OR 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 authorized distributors provide product and / or system options for further investigation by users having technical expertise. It is important that you analyze all aspects of your application, including consequences of any failure and review the information concerning the product or systems in the current product catalog. 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.

The products described herein, including without limitation, product features, specifications, designs, availability and pricing, are subject to change by Parker Hannifin Corporation and its subsidiaries at any time without notice.

**⚠ WARNING**

This valve / base has a standard ISO 5599/2: 1990 mounting interface. Valve bodies labeled Parker Model 45\_, and bases marked ISO 2E, 3E, or 4E or simply O 2E, O 3E, or O 4 E (opposite the junction box under the valve body) - and without blue wires in the base - can be connected to this valve / base, but may have incompatible wiring. Base wiring may be reversed, resulting in unpredictable machine function that may cause injury, property damage, or death. Completely test the machine for correct function before using, and rewire if necessary. Call 1-800-272-7537 for special ISO Valve Service Bulletin No. VAL-SIF73.

**Safety Guide**

For more complete information on recommended application guidelines, see the Safety Guide section of Pneumatic Division catalogs or you can download the **Pneumatic Division Safety Guide** at: [www.parker.com/safety](http://www.parker.com/safety)

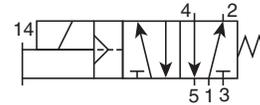
**Introduction**

Follow these instructions when installing, operating, or servicing the product.

**Application Limits**

These products are intended for use in general purpose compressed air systems only. Compliance with the rated pressure, temperature, and voltage is necessary.

**5/2 Single Solenoid Valve**



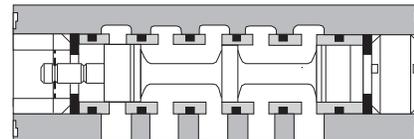
**Solenoid Pilot**

**No Signal Applied:** Inlet 1 connected to outlet 2; outlet 4 connected to exhaust 5; exhaust 3 closed.

**Signal 14 Applied:** Inlet 1 connected to outlet 4; outlet 2 connected to exhaust 3; exhaust 5 closed.

Listed below are the valve body service kits and solenoid replacement coils for Series H3A00001 valves.

**Valve Body Service Kits.** These kits contain parts needed for the reconditioning of a valve body. Included are all required gaskets and seals, and instructions for use.



**Typical Spool-and-Sleeve Cross Section**

<b>H3A00002</b>	Body to Base Gasket
<b>H3A00003</b>	Valve Repair Kit (Includes Internal Gaskets and Seals. Lapped Spool and Sleeve are <u>NOT</u> included)
<b>H3A00004</b>	Pilot Operator with 10mm Extended Non-locking Override and 120VAC / 60Hz Coil
<b>H3A00005</b>	Replacement Coil. 120VAC / 60Hz
<b>H3A00006</b>	Replacement Spool and Sleeve only
<b>H3A00007</b>	Replacement Pilot Body, less Coil and Nut
<b>H3A00008</b>	Replacement Jam Nut

**⚠ WARNING**

**FAILURE OR 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 authorized distributors provide product and/or system options for further investigation by users having technical expertise. It is important that you analyze all aspects of your application, including consequences of any failure and review the information concerning the product or systems in the current product catalog. 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.

The products described herein, including without limitation, product features, specifications, designs, availability and pricing, are subject to change by Parker Hannifin Corporation and its subsidiaries at any time without notice.

**EXTRA COPIES OF THESE INSTRUCTIONS ARE AVAILABLE FOR INCLUSION IN EQUIPMENT / MAINTENANCE MANUALS THAT UTILIZE THESE PRODUCTS. CONTACT YOUR LOCAL REPRESENTATIVE.**

### Conversion to External Pilot Supply

To convert a H3A00001 Series ISO valve to external pilot supply:

Pressure in external supply line should be greater than inlet. If, for any reason, the external supply is lost or drops below inlet pressure (Port 1), the valve will switch back to internal pilot supply.

### Valve Maintenance

**Pneumatic equipment should be maintained only by persons trained and experienced in the maintenance of such equipment.**

**Supply Clean Air.** Foreign material lodging in valves is a major cause of breakdowns. The use of a 5-micron-rated air filter located close to the valve is strongly recommended. The filter bowl should be drained regularly, and if its location makes draining difficult, the filter should be equipped with an automatic drain.

**Check Lubricator Supply Rate.** A lubricator should put a fine oil mist into the air line in direct proportion to the rate of air flow. Excessive lubrication can cause puddling in the valve and lead to malfunctions. For most applications an oil flow rate in the lubricator of one drop per minute is adequate.

**Compatible Lubricants.** Although this valve does not require air line lubrication, it may be used with lubricated air being supplied to other mechanisms. Some oils contain additives that can harm seals or other valve components and so cause the valve to malfunction. Avoid oils with phosphate additives (e.g., zinc dithiophosphate), and diester oils; both types can harm valve components. The best oils to use are generally petroleum base oils with oxidation inhibitors, an aniline point between 180°F (82°C) and 220°F (104°C), and an ISO 32 or lighter viscosity.

Some compatible oils are listed at the right. These oils, although believed to be compatible, could change without notice because manufacturers sometimes reformulate their oils. Therefore, use oils specifically compounded for air line service. If it is a synthetic oil, contact the oil manufacturer for compatibility information.

**Cleaning the Valve.** If the air supplied to the valve has not been well filtered, the interior of the valve may accumulate dirt and varnish which can affect the valve's performance.

A schedule should be established for cleaning all valves, the frequency depending on the cleanliness of the air being supplied.

To clean the valve use a solvent which will dry without leaving a residue. This is especially important for the spool-and-sleeve assembly. Do not use a chlorinated solvent or abrasive materials which can damage seals or do permanent damage to metal parts.

### Compatible Lubricants

Maker	Brand Name
Amoco .....	American Industrial Oil 32; Amoco Spindle Oil C; Amolite 32
Citgo .....	Pacemaker 32
Exxon .....	Spinesstic 22; Teresstic 32
Mobil.....	Velocite 10
Non-Fluid Oil .....	Air Lube 10H/NR
Shell .....	Turbo T32
Sun .....	Sunvis 11; Sunvis 722
Texaco .....	Regal R&O 32
Union .....	Union Turbine Oil

To reassemble the spool and sleeve put one drop of Anderol 735 (or equivalent lubricant) on each spool land. Insert the spool into the sleeve and rotate it several times to ensure even distribution of the lubricant. If the valve is used in a non-lubricated application, do not use a lubricant for reassembly which can dry out and leave a residue. Dry assembly of the spool and sleeve is preferable. Each spool and sleeve is a matched set, so care must be taken not to reverse the position of the spool in the sleeve.

Before inserting the spool-and-sleeve into the valve body, very lightly lubricate the O-rings with a lubricant such as Mobil Grease 28. Do not use Anderol; it causes the O-rings to deteriorate.

**Electrical Contacts.** In the electrical circuits associated with the valve solenoids, keep all switches or relay contacts in good condition to avoid solenoid malfunctions.

**Replace Worn Components.** After long usage the spool and sleeve may show signs of wear. The valve can be completely reconditioned with the use of service kits. See page 1 for information about such kits.

## Valve Specifications

### Pressure Controlled

**Temperature Range:** 40° to 175°F (4° to 80°C).

**Flow Media:** Filtered air; 5 micron recommended.

**Inlet Pressure:** Vacuum to 150 psig (10 bar)

**Pilot Pressure:** At least 30 psig (2 bar).

**IMPORTANT NOTE:** Please read carefully and thoroughly all the CAUTIONS on page 1.

### Solenoid Pilot

**Solenoids:** Rated for continuous duty. Voltage and hertz ratings shown on valve.

**Power Consumption:** Each solenoid: 6.5 VA holding on 50 or 60 Hz.

**Temperature Range:** Ambient: 40° to 120°F (4° to 50°C).  
Media: 40° to 175°F (4° to 80°C).

**Flow Media:** Filtered air; 5 micron recommended.

**Inlet Pressure:** Vacuum to 150 PSIG (10 bar).

**Pilot Pressure:** At least 30 PSIG (2 bar).

 **WARNING**

To avoid unpredictable system behavior that can cause personal injury and property damage:

- Disconnect electrical supply (when necessary) before installation, servicing, or conversion.
- Disconnect air supply and depressurize all air lines connected to this product before installation, servicing, or conversion.
- Operate within the manufacturer's specified pressure, temperature, and other conditions listed in these instructions.
- Medium must be moisture-free if ambient temperature is below freezing.
- Service according to procedures listed in these instructions.
- Installation, service, and conversion of these products must be performed by knowledgeable personnel who understand how pneumatic products are to be applied.
- After installation, servicing, or conversion, air and electrical supplies (when necessary) should be connected and the product tested for proper function and leakage. If audible leakage is present, or the product does not operate properly, do not put into use.
- Warnings and specifications on the product should not be covered by paint, etc. If masking is not possible, contact your local representative for replacement labels.

 **WARNING**

**FAILURE OR 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 authorized distributors provide product and/or system options for further investigation by users having technical expertise. It is important that you analyze all aspects of your application, including consequences of any failure and review the information concerning the product or systems in the current product catalog. 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.

The products described herein, including without limitation, product features, specifications, designs, availability and pricing, are subject to change by Parker Hannifin Corporation and its subsidiaries at any time without notice.

**EXTRA COPIES OF THESE INSTRUCTIONS ARE AVAILABLE FOR INCLUSION IN EQUIPMENT / MAINTENANCE MANUALS THAT UTILIZE THESE PRODUCTS. CONTACT YOUR LOCAL REPRESENTATIVE.**

 **WARNING**

Air exhausting from one valve into the exhaust gallery of the manifold assembly may momentarily pressurize other valve circuits open to the same gallery. Design the circuit such that there is no hazard or consequence of damage from this action.

**Safety Guide**

For more complete information on recommended application guidelines, see the Safety Guide section of Pneumatic Division catalogs or you can download the **Pneumatic Division Safety Guide** at: [www.parker.com/safety](http://www.parker.com/safety)

**Introduction**

Follow these instructions when installing, operating, or servicing the product.

**Application Limits**

These products are intended for use in general purpose compressed air systems only. Compliance with the rated pressure, temperature, and voltage is necessary - see Installation & Service Instructions packed with valve.

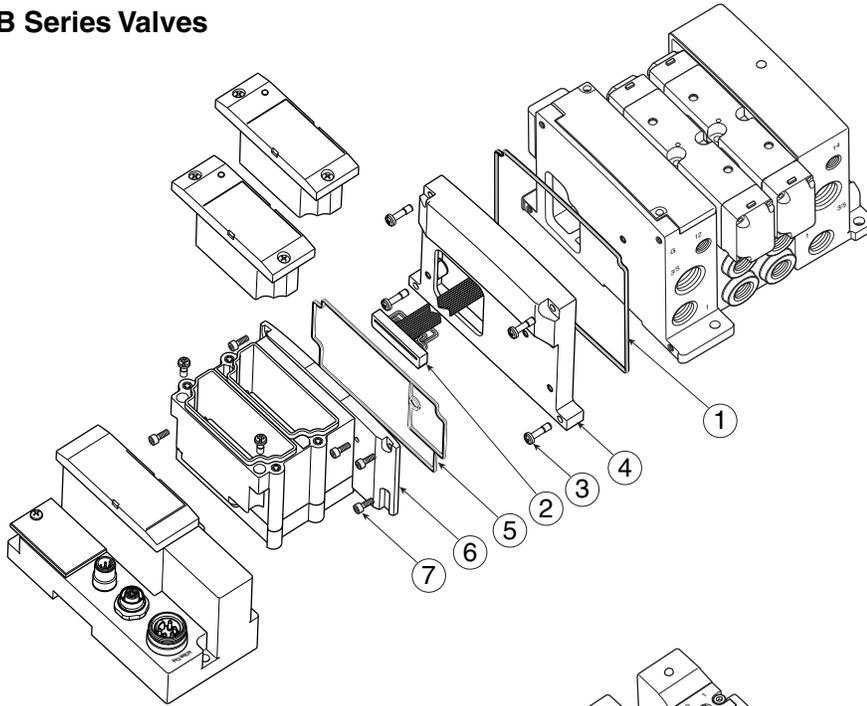
**Kits - with 16 Solenoid Outputs**

Kit Number	Description
PS5620T1*P	HA / HB Turck Adapter Kit
PS5624T1*P	HA / H2 Turck Adapter Kit
PS4025T1*CP	H1 / H2 / H3 TurckAdapter Kit
PS4026T1*CP	H1 / H3 Turck Adapter Kit
PS4027T1*CP	H1 / H2 Turck Adapter Kit
PS4028T1*CP	H2 / H3 Turck Adapter Kit
PS4020T1*CP	H1 Turck Adapter Kit
PS4120T1*CP	H2 Turck Adapter Kit
PS4220T1*CP	H3 Turck Adapter Kit

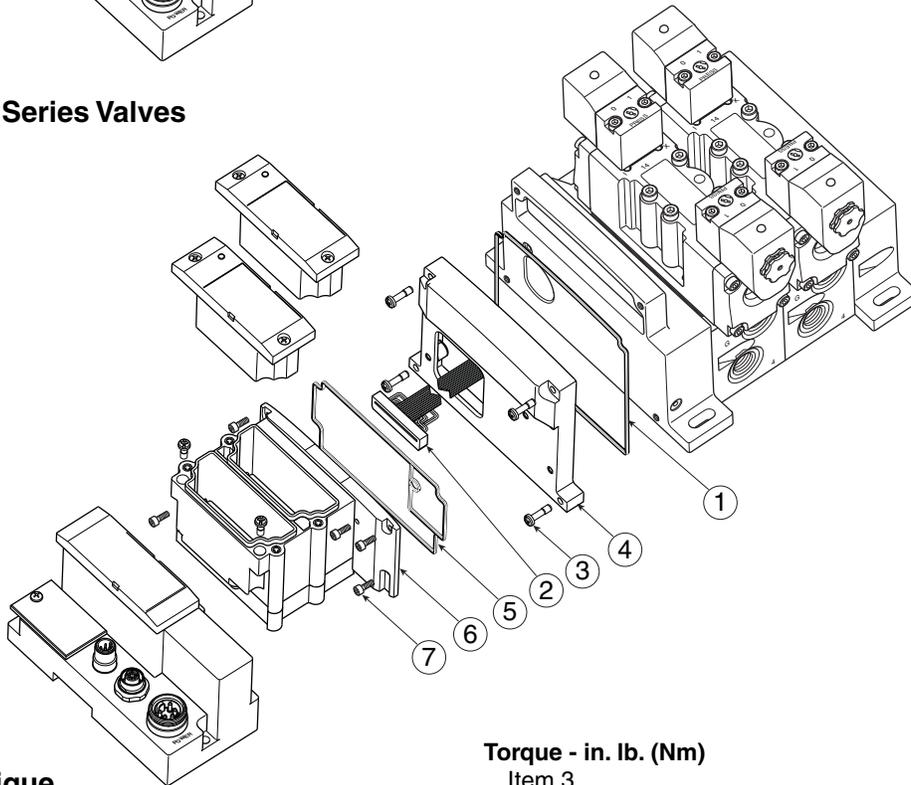
**Kits - with 32 Solenoid Outputs**

Kit Number	Description
PS5620T2*P	HA / HB Turck Adapter Kit
PS5624T2*P	HA / H2 Turck Adapter Kit
PS4025T2*CP	H1 / H2 / H3 TurckAdapter Kit
PS4026T2*CP	H1 / H3 Turck Adapter Kit
PS4027T2*CP	H1 / H2 Turck Adapter Kit
PS4028T2*CP	H2 / H3 Turck Adapter Kit
PS4020T2*CP	H1 Turck Adapter Kit
PS4120T2*CP	H2 Turck Adapter Kit
PS4220T2*CP	H3 Turck Adapter Kit

**For Size HA & HB Series Valves**



**For H1, H2, & H3 Series Valves**



**Assembly Technique**

1. Connect the Wire Harness (Item 2) to the interconnect board in the valve stack.
2. Fit Gasket (Item 1) into the slot in the Adapter Plate (Item 4).
3. Pass the Wire Harness through the Adapter Plate.
4. Screw the Adapter Plate to the Valve Stack. Torque the Screws (Item 3) to specification.
5. Fit Gasket (Item 5) into the Field Bus Adapter (Item 6).
6. Pass the Wire Harness through the Adapter and make the connection to the Bus Module. Clamp the Bus Module with the Adapter.
7. Screw the Bus Adapter to the Valve Stack. Torque Screws (Item 7) to specification.

**Torque - in. lb. (Nm)**

- Item 3  
25-35 (2.8 - 4.0)
- Item 7  
8-10 (0.9 - 1.1)

Item Number	Description
1	Gasket
2	Interconnect Jumper Wire
3	Screw
4	Adapter Plate
5	Gasket
6	Adapter - Fieldbus (Turck)
7	Screw

**⚠ WARNING**

To avoid unpredictable system behavior that can cause personal injury and property damage:

- Disconnect electrical supply (when necessary) before installation, servicing, or conversion.
- Disconnect air supply and depressurize all air lines connected to this product before installation, servicing, or conversion.
- Operate within the manufacturer's specified pressure, temperature, and other conditions listed in these instructions.
- Medium must be moisture-free if ambient temperature is below freezing.
- Service according to procedures listed in these instructions.
- Installation, service, and conversion of these products must be performed by knowledgeable personnel who understand how pneumatic products are to be applied.
- After installation, servicing, or conversion, air and electrical supplies (when necessary) should be connected and the product tested for proper function and leakage. If audible leakage is present, or the product does not operate properly, do not put into use.
- Warnings and specifications on the product should not be covered by paint, etc. If masking is not possible, contact your local representative for replacement labels.

**Safety Guide**

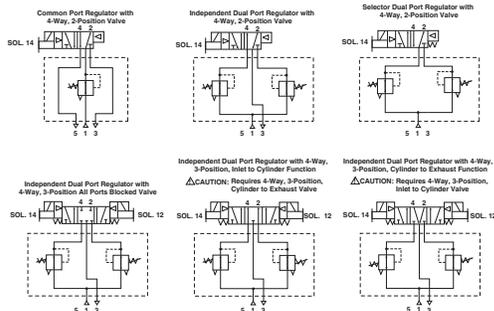
For more complete information on recommended application guidelines, see the Installation Safety Guidelines section of Bulletin 600 (Form A10309) or you can download the Installation Safety Guidelines at: [www.rosscontrols.com/rosslit.htm](http://www.rosscontrols.com/rosslit.htm).

**⚠ WARNING**

Air exhausting from one valve into the exhaust gallery of the manifold assembly may momentarily pressurize other valve circuits open to the same gallery. Design the circuit such that there is no hazard or consequence of damage from this action.

**Introduction**

Follow these instructions when installing, operating, or servicing the product.



**NOTE:** The Regulators shown on the 14 and 12 End of Independent Port and Selector Units may be replaced with a By-Pass Plate to provide unregulated pressure.



**CAUTION:** The reverse valve porting utilized with Independent Port will reverse the function of 4-Way, 3-Position cylinder to exhaust and 4-Way, 3-Position inlet to cylinder to valves. Utilize opposite function valve for normal operation.

**Application Limits**

These products are intended for use in general purpose compressed air systems only.

**Operating Pressure Range:** Maximum 145 PSIG (1000 kPa)

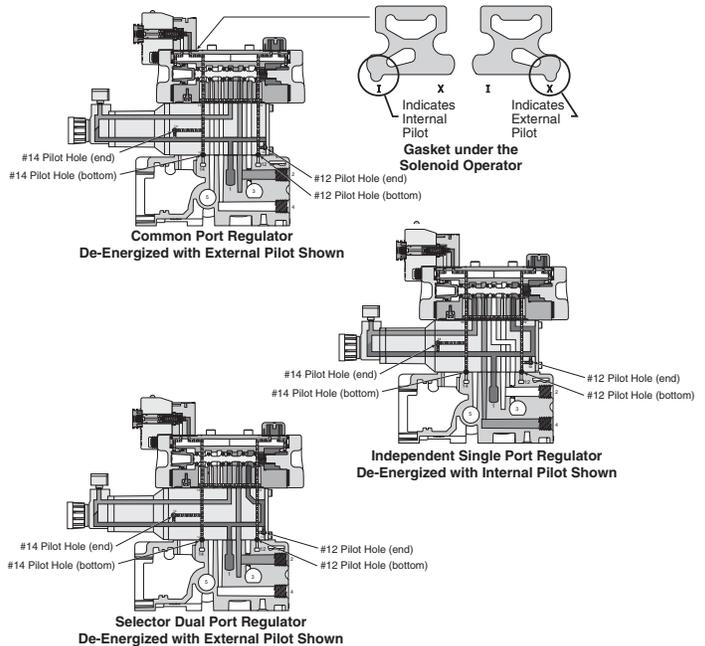
**Ambient Temperature Range:** -15°C to 49°C (5°F to 120°F)

**H1 Sandwich Regulator Shown**

**NOTE:** For all regulator options, valve must be set up for external pilot by assembling the gasket under the solenoid operator as shown below.

All sandwich regulators ship with 2 pilot port plugs located in the 12 and 14 end bottom pilot hole. Follow the table below to relocate the pilot plugs to the proper location if necessary. See images below for reference.

Product Line (H2/H3 or DX2/DX3)	Pilot Type (Internal, External 12, External 14)	14 End Pilot Plug Location	12 End Pilot Plug Location
H1	Internal	Bottom Hole	Bottom Hole
H1	External 12 or 14	End Hole	End Hole
DX1 Single Solenoid	Internal	Bottom Hole	End Hole
DX1 Single Solenoid	External 14 Only	End Hole	End Hole
DX1 Double Solenoid	Internal	Bottom Hole	Bottom Hole
DX1 Double Solenoid	External 12 or 14	End Hole	End Hole



**⚠ WARNING**

**FAILURE OR 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 ROSS CONTROLS, its subsidiaries and authorized distributors provide product and/or system options for further investigation by users having technical expertise. It is important that you analyze all aspects of your application, including consequences of any failure and review the information concerning the product or systems in the current product catalog. 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.

The products described herein, including without limitation, product features, specifications, designs, availability and pricing, are subject to change by ROSS CONTROLS and its subsidiaries at any time without notice.

**EXTRA COPIES OF THESE INSTRUCTIONS ARE AVAILABLE FOR INCLUSION IN EQUIPMENT / MAINTENANCE MANUALS THAT UTILIZE THESE PRODUCTS. CONTACT YOUR LOCAL REPRESENTATIVE.**

**Installation**

Remove pressure and electrical connections before installation.

1. After removing Valve from Base, install four Mounting Studs (24) from Regulator Kit to the Base, torque finger tight.
2. Place the Gasket (23) over the Studs and on the Base.
3. Install Regulator over Studs. Carefully engage the Electrical Plug (5599-2).
4. Install Valve onto Regulator. Carefully engage the Electrical Plug (5599-2).
5. Tighten Valve Bolts (19) from 2.8 to 3.9 Nm (25 to 35 in-lbs).
6. Apply main pressure and check for leaks - repeat assembly if leaks are present.

**NOTE:** If both a sandwich flow control and sandwich regulator are to be installed, the flow control should be installed between the regulator and the base. Both sets of studs should be installed to base before installing the flow control.

**Lubrication**

Factory pre-lubed. If lubricating in service, use Parker F442 oil or equivalent paraffin based mineral oil with 150 to 200 SSU viscosity @ 100°F.

**CAUTION:** Do not use oils that are synthetic, reconstituted, have an alcohol content or a detergent additive.

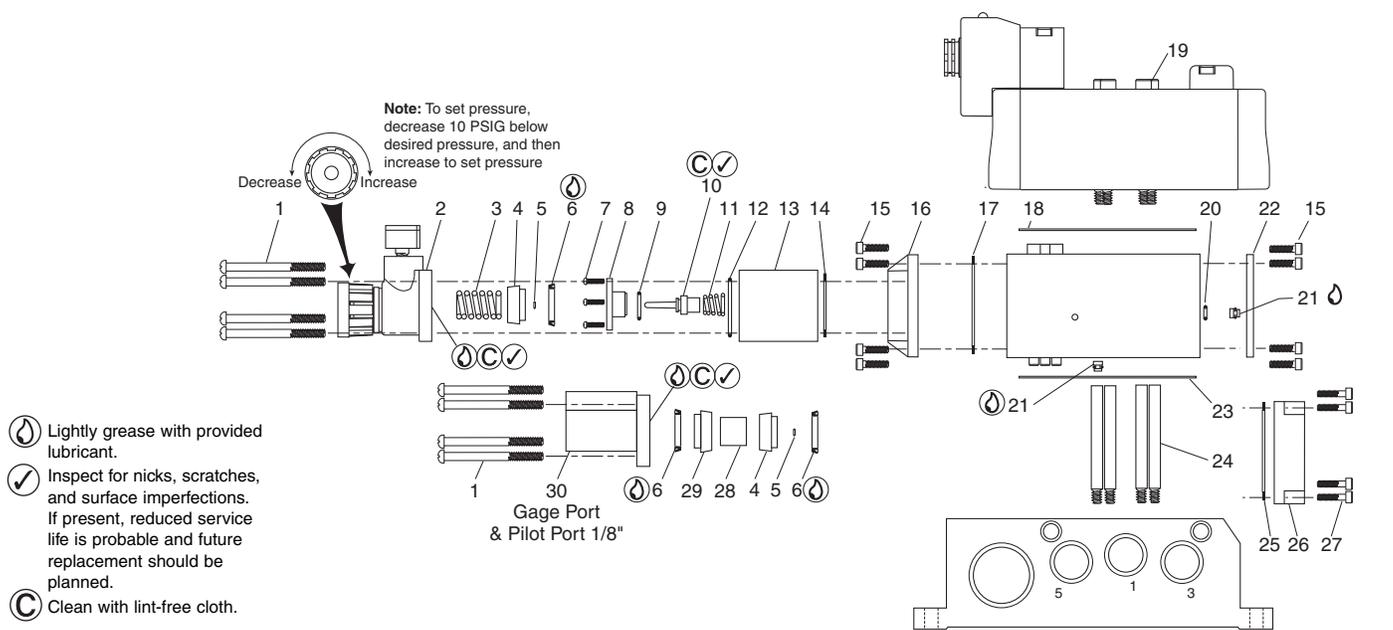
**Sandwich Regulator Kits**

Kit Number	Description	Kit Includes Item# (Qty.)
PS4039P	Repair Kit	4, 5, 6, 9, 10,11, 12, 29
PS4050030P	Spring - 30 PSIG	3
PS4050060P	Spring - 60 PSIG	3
PS4050125P	Spring - 125 PSIG	3
PS4009P	Pilot Plug Kit	21 (20)
PS4040P	Mounting Studs	24 (12)
PS4048P	By-Pass Plate	25, 26, 27 (4)

**Component List**

The components listed below are for identification purposes only. Some of these components are available in various Sandwich Regulator Kits, some are not available due to special factory assembly. Individual components are not sold separately since all kit components should be installed when serviced.

Item	Description	Torque Nm (In. / Lb.)
1	Screw, Regulator Block	0.9 to 1.4 (8 to 12)
2	Bonnet Assembly	
3	Spring, Control (30, 60 or 125 PSIG)	
4	Piston, Relieving (Includes vent hole)	
5	O-ring, Piston Vent	
7	Screw, Seat Plate	0.3 to 0.6 (3 to 5)
8	Seat Plate	
9	O-ring, Seat Plate	
10	Poppet Assembly	
11	Spring, Poppet Return	
12	O-ring, Bonnet / Body Seal	
13	Body, Regulator	
14	Gasket, Regulator Block	
15	Screw, End Plate	1.1 to 1.7 (10 to 15)
16	Adapter, Regulator	
17	Gasket, Regulator Block	
18	Gasket, Valve to Regulator Block	
19	Screw, Valve to Mtg. Stud	2.8 to 3.9 (25 to 35)
20	O-ring	
21	Plug, Pilot	
22	End Plate	
23	Gasket, Regulator Base	
24	Stud, Mounting	Finger Tight
25	Gasket, Bypass Plate	
26	Bypass Plate, Dual Pressure	
27	Screw, Bypass Plate	1.1 to 1.7 (10 to 15)
28	Spacer, Air Pilot	
29	Piston, Non-Relieving (No vent hole)	
30	Bonnet, Air Pilot	



**For all Instruction Sheets, go to [www.parker.com/pneumatic](http://www.parker.com/pneumatic)**

V450P - H Series HA 26mm & HB 18mm ISO 15407-2 Valve Service	V468P - H Series H1, H2 & H3, ISO 5599-1, 5599-2 Sandwich Flow Controls
V452P - H Series HA & HB ISO 15407-2 Sandwich Flow Controls	V469P - H Series H1, H2 & H3, ISO 5599-1, 5599-2 Subbase & Manifold Installation
V453P - H Series HA & HB ISO 15407-2 Manifold Installation	V470P - H Series H1, H2 & H3, ISO 5599-1, 5599-2 Valve Service
V454P - H Series HA & HB Sandwich Regulators	V471P - H Series H2 & H3 Sandwich Regulators
V467P - H Series H1 Sandwich Regulators	

**⚠ WARNING**

To avoid unpredictable system behavior that can cause personal injury and property damage:

- Disconnect electrical supply (when necessary) before installation, servicing, or conversion.
- Disconnect air supply and depressurize all air lines connected to this product before installation, servicing, or conversion.
- Operate within the manufacturer's specified pressure, temperature, and other conditions listed in these instructions.
- Medium must be moisture-free if ambient temperature is below freezing.
- Service according to procedures listed in these instructions.
- Installation, service, and conversion of these products must be performed by knowledgeable personnel who understand how pneumatic products are to be applied.
- After installation, servicing, or conversion, air and electrical supplies (when necessary) should be connected and the product tested for proper function and leakage. If audible leakage is present, or the product does not operate properly, do not put into use.
- Warnings and specifications on the product should not be covered by paint, etc. If masking is not possible, contact your local representative for replacement labels.

**⚠ WARNING**

**FAILURE OR 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 authorized distributors provide product and/or system options for further investigation by users having technical expertise. It is important that you analyze all aspects of your application, including consequences of any failure and review the information concerning the product or systems in the current product catalog. 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.

The products described herein, including without limitation, product features, specifications, designs, availability and pricing, are subject to change by Parker Hannifin Corporation and its subsidiaries at any time without notice.

**EXTRA COPIES OF THESE INSTRUCTIONS ARE AVAILABLE FOR INCLUSION IN EQUIPMENT / MAINTENANCE MANUALS THAT UTILIZE THESE PRODUCTS. CONTACT YOUR LOCAL REPRESENTATIVE.**

**⚠ WARNING**

Air exhausting from one valve into the exhaust gallery of the manifold assembly may momentarily pressurize other valve circuits open to the same gallery. Design the circuit such that there is no hazard or consequence of damage from this action.

**Safety Guide**

For more complete information on recommended application guidelines, see the Safety Guide section of Pneumatic Division catalogs or you can download the **Pneumatic Division Safety Guide** at: [www.parker.com/safety](http://www.parker.com/safety)

**Introduction**

Follow these instructions when installing, operating, or servicing the product.

**Installation & Operating Instructions:**

A Flow Control "Sandwich" controls the flow of air from the valve exhaust ports to atmosphere.

The Flow Control "Sandwich" is intended for use with the respective subbase or manifold mounted valves. H1, H2, & H3 valves and flow controls are designed in conformance to ISO 5599/1, 5599/2, Sizes 1, 2, & 3.

H1, H2, & H3 Flow Control "Sandwiches" are only recommended for use with Common Port versions of Sandwich Regulators. The Flow Control is to be assembled between the regulator and the subbase or manifold.

If used with Single Port or Independent Port versions of Sandwich Regulators functionality is limited as follows:

**Flow Control "Sandwich" used in conjunction with Single or Independent Port versions of Sandwich Regulator** - Adjust speed with the adjusting screw labeled "3". It adjusts the speed of exhaust flow from cylinder ports "2" and "4". Independent speed adjustment is not possible. This could result in different exhaust speeds for cylinder ports "2" and "4" since line pressure is supplied to one cylinder port and a regulated pressure is supplied to the other. The other adjusting screw is non-functional.

**Lubrication**

Factory Pre-lubed. If lubricating in service, use Parker F442 oil or equivalent paraffin based mineral oil with 150 to 200 SSU viscosity @ 100°F.

**⚠ CAUTION: Do not use oils that are synthetic, reconstituted, have an alcohol content or a detergent additive.**

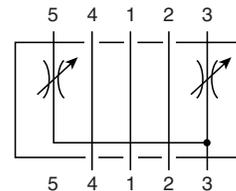
**Application Limits:**

These products are intended for use in general purpose compressed air systems only.

**Operating Pressure Range:** Maximum 145 PSIG, 1000kPa

**Ambient Temperature Range:** -18°C to 60°C (0°F to 140°F)

**ANSI Symbol:**



**Installation:**

1. Remove the valve from the subbase or manifold (if assembled) by removing and retaining the four mounting screws (A).
2. Clean all mating surfaces of valve, subbase or manifold and Flow Control "Sandwich" of dust and dirt.
3. Install male-female tie rods (C) to base. Tighten the tie rods using hex broached on the inside of the female end.
4. Slide gasket (D) over the male-female tie rods protruding from top of subbase or manifold, lining up electrical plug cavity.

Internal Hex		
H1	H2	H3
M3	M4	M5

- Slide Flow Control “Sandwich” over the male-female tie rods (C) protruding from top of subbase or manifold and press down on flow control to seat electrical plug (if applicable).
- Check to insure that the gasket (B) on the bottom of the valve body is still properly seated in its gasket track.
- Place valve on top of Flow Control “Sandwich” lining up all mounting holes and press down on flow control to seat electrical plug (if applicable).
- Assemble valve, flow control and subbase or manifold together with the valve mounting screws (A). Tighten as follows:

ISO Spec	Size	Sandwich Flow Control Model No.	Torque
5599/1	H1	PS4042P	3.4 to 4.0 Nm (30 to 35 in-lb)
5599/2	H1	PS4035P	3.4 to 4.0 Nm (30 to 35 in-lb)
5599/1	H2	PS4142P	5.1 to 5.6 Nm (45 to 50 in-lb)
5599/2	H2	PS4135P	5.1 to 5.6 Nm (45 to 50 in-lb)
5599/1	H3	PS4242P	9.0 to 11.3 Nm (80 to 100 in-lb)
5599/2	H3	PS4235P	9.0 to 11.3 Nm (80 to 100 in-lb)

- Apply inlet pressure and check for leaks. If any are present, do not operate the valve, repeat this assembly process until satisfactory.

**Adjustment Procedures:**

Both adjusting screws are located at the 12 End of the assembly. Adjustment screw labeled “5” controls the flow of air from cylinder Port 4 to exhaust Port 3. With a double solenoid valve this occurs when Operator #12 is actuated. With a single solenoid valve this occurs when Operator #14 is not actuated. Adjustment screw labeled “3” controls air from cylinder Port 2 to exhaust Port 3.

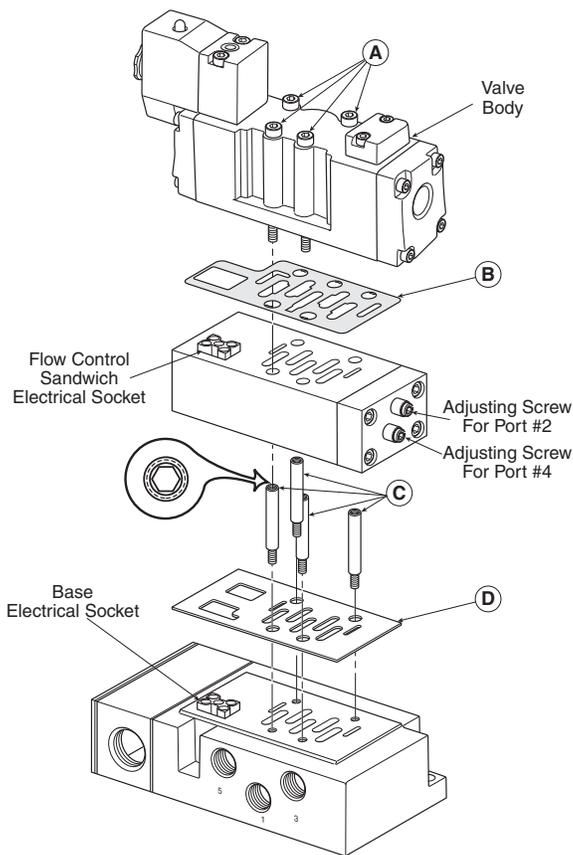
- Turn both adjustment screws clockwise until fully closed and then counterclockwise slightly.
- While cycling valve with cylinder adjust clockwise to decrease speed or counterclockwise to increase speed.

**Cv Values**

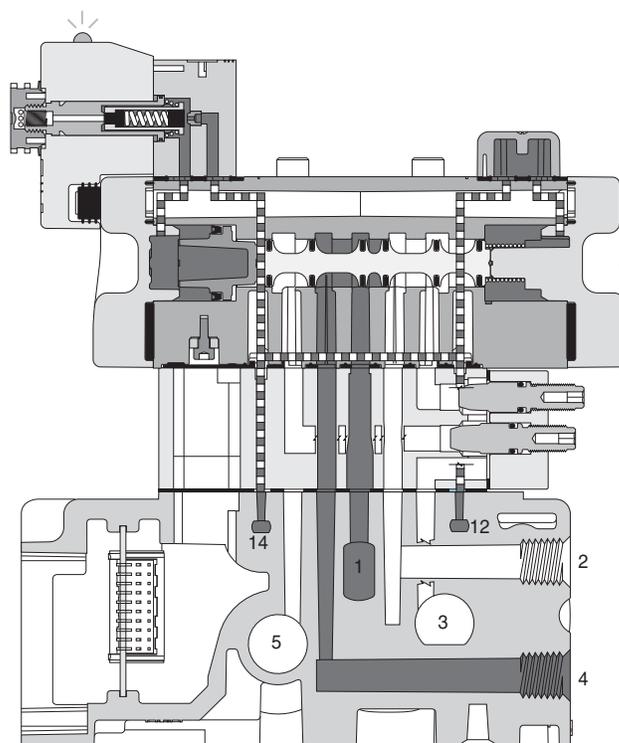
Size	Flow Control Part Number	Cv			
		1-2	1-4	2-3	4-3
H1	PS4042P	1.4	1.2	.09	.08
H2	PS4142P	2.2	2.2	1.5	1.6
H3	PS4242P	4.3	4.4	2.8	3.7

**Tie Rod Kits**

Valve	Qty.	Kit Number
H1	Tie Rods (12)	PS4036P
H2	Tie Rods (12)	PS4136P
H3	Tie Rods (12)	PS4236P



H1 Shown



H1 Shown

**For all Instruction Sheets, go to [www.parker.com/pneumatic](http://www.parker.com/pneumatic)**

V450P - H Series HA 26mm & HB 18mm ISO 15407-2 Valve Service  
 V452P - H Series HA & HB ISO 15407-2 Sandwich Flow Controls  
 V453P - H Series HA & HB ISO 15407-2 Manifold Installation  
 V454P - H Series HA & HB Sandwich Regulators  
 V467P - H Series H1 Sandwich Regulators

V468P - H Series H1, H2 & H3, ISO 5599-1, 5599-2 Sandwich Flow Controls  
 V469P - H Series H1, H2 & H3, ISO 5599-1, 5599-2 Subbase & Manifold Installation  
 V470P - H Series H1, H2 & H3, ISO 5599-1, 5599-2 Valve Service  
 V471P - H Series H2 & H3 Sandwich Regulators

**⚠ WARNING**

To avoid unpredictable system behavior that can cause personal injury and property damage:

- Disconnect electrical supply (when necessary) before installation, servicing, or conversion.
- Disconnect air supply and depressurize all air lines connected to this product before installation, servicing, or conversion.
- Operate within the manufacturer's specified pressure, temperature, and other conditions listed in these instructions.
- Medium must be moisture-free if ambient temperature is below freezing.
- Service according to procedures listed in these instructions.
- Installation, service, and conversion of these products must be performed by knowledgeable personnel who understand how pneumatic products are to be applied.
- After installation, servicing, or conversion, air and electrical supplies (when necessary) should be connected and the product tested for proper function and leakage. If audible leakage is present, or the product does not operate properly, do not put into use.
- Warnings and specifications on the product should not be covered by paint, etc. If masking is not possible, contact your local representative for replacement labels.

**⚠ WARNING**

**FAILURE OR 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 authorized distributors provide product and/or system options for further investigation by users having technical expertise. It is important that you analyze all aspects of your application, including consequences of any failure and review the information concerning the product or systems in the current product catalog. 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.

The products described herein, including without limitation, product features, specifications, designs, availability and pricing, are subject to change by Parker Hannifin Corporation and its subsidiaries at any time without notice.

**EXTRA COPIES OF THESE INSTRUCTIONS ARE AVAILABLE FOR INCLUSION IN EQUIPMENT / MAINTENANCE MANUALS THAT UTILIZE THESE PRODUCTS. CONTACT YOUR LOCAL REPRESENTATIVE.**

**⚠ WARNING**

Air exhausting from one valve into the exhaust gallery of the manifold assembly may momentarily pressurize other valve circuits open to the same gallery. Design the circuit such that there is no hazard or consequence of damage from this action.

**Safety Guide**

For more complete information on recommended application guidelines, see the Safety Guide section of Pneumatic Division catalogs or you can download the **Pneumatic Division Safety Guide** at: [www.parker.com/safety](http://www.parker.com/safety)

**Introduction**

Follow these instructions when installing, operating, or servicing the product.

**Application Limits**

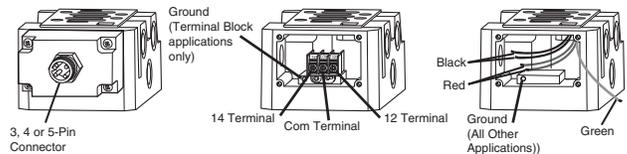
These products are intended for use in general purpose compressed air systems only. Compliance with the rated pressure, temperature, and voltage is necessary - see Installation & Service Instructions packed with valve.

**Wiring Instructions for Individual Base Wiring**

1. Follow all requirements for local and national electrical codes.
2. Remove end cover from base by backing out the two screws.
3. Connect wires as shown in chart.
4. An external ground connection must be attached to the green ground screw of every base in an assembly.
5. Disregard unused wires or terminals.
6. Reassemble cover to base by tightening screws from 0.8 to 1.0 Nm (7 to 9 in-lbs).

**Connections**

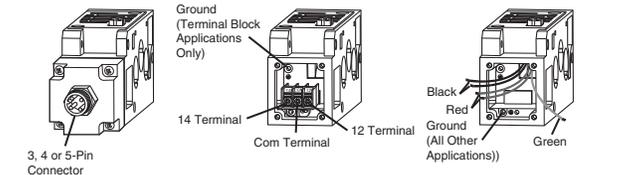
	14 Solenoid	12 Solenoid
Bases with Wires	Black Wires	Red Wires
Bases with Terminal Block (Will accept 18 to 24 Gauge Wires)	14 and Com Terminals	12 and Com Terminals



**Subbase With Auto C, F, G**

**Subbase With Terminal Block**

**Subbase With Wires**

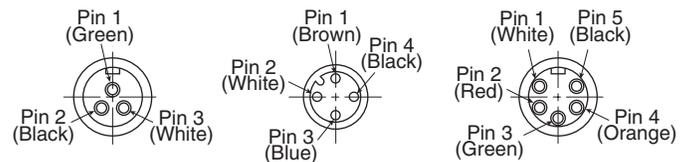


**Manifold With Auto C, F, G**

**Manifold With Terminal Block**

**Manifold With Wires**

**Wiring - Auto C, F, G**



**3-Pin Mini Enclosure "7"**

**4-Pin M12 Enclosure "8"**

**5-Pin Mini Enclosure "9"**

	3-Pin Mini Encl '7'	4-Pin M12 Encl '8'			5-Pin Mini Encl '9'		
Wiring Type	C, F, G	C	F	G	C	F	G
Pin #1	Gnd	14	N/A	12	12	14	12
Pin #2	14	Gnd	12	N/A	12	12	14
Pin #3	Com	Com	Com	Com	Gnd	Gnd	Gnd
Pin #4	N/A	12	14	14	14	12	14
Pin #5	N/A	N/A	N/A	N/A	14	14	12

### Wiring Instructions for Manifold Interconnect Wiring

**⚠ CAUTION: An interruption of 10 milliseconds or greater to the power supplied to the solenoid of a solenoid operated valve may cause the valve to shift. Provision must be made to prevent power interruption of this duration to avoid unintended, potentially hazardous, consequences.**

For connection simplicity, the Interconnect Wiring System has a single common lead with an amperage limit of 3 amps continuous service. The following chart indicates the upper limit of solenoids that can be energized simultaneously.

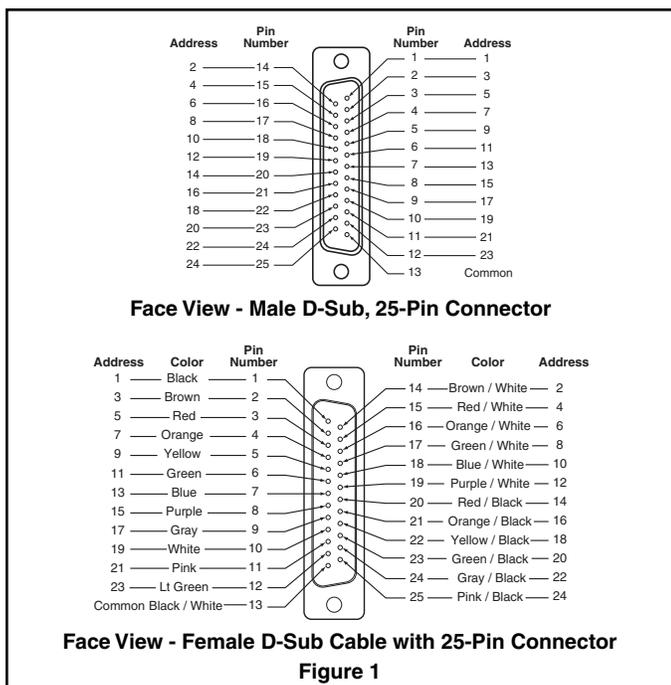
Voltage	25-Pin Code	19-Pin D-Sub	Single Round	12-Pin M23
12VDC	42	13	13	8
24VAC*	42	24	16	8
24VDC	B9	20	16	8
120VAC*	23	24	16	8

\* Not CSA certified for 25-Pin, D-Sub option.

The Interconnect Wiring System has great flexibility to meet user wiring needs. Each manifold base must be ordered with either a single or double address function. The single address circuit board works with single solenoid valves only. The double address circuit board works with both single and double solenoid valves. The end cover of each manifold base is labeled either "Single Address" or "Double Address". Power signals used to shift the valves can be connected using several different types of electrical connectors. These electrical connectors reside in the end plate kit and can be either a 25-Pin D-Sub (Figure 1), a 19-Pin Brad Harrison connector (Figure 2), or a 12/19-Pin M23 connector (Figure 3). A single address base uses one signal; a double address base uses two signals, the first to the 14 solenoid, the second to the 12 solenoid. Signal usage is sequential through the bases. Any combination of single or double addresses may be used.

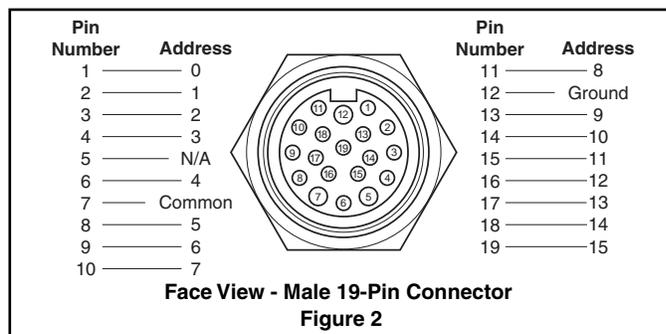
#### 25-Pin D-Sub Connector - Pin Out

Common Pin "13" is rated for 3 amps. Common wire rating MUST be greater than total amperage of all solenoids on an Add-A-Fold assembly.



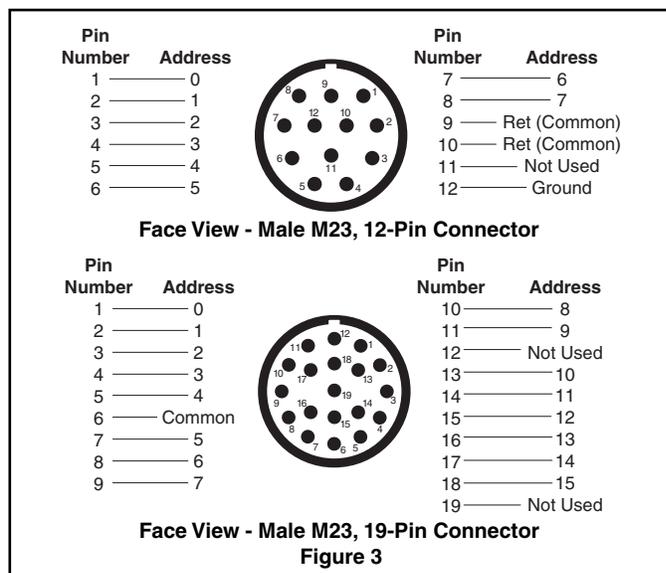
#### 19-Pin Brad Harrison Connector - Pin Out

Common Pin "7" is rated for 8 amps. Common wire rating MUST be greater than total amperage of all solenoids on a Add-A-Fold assembly.



#### M23 Connector (12 & 19-Pin) - Pin Out

Common Pins "9" and "10" are rated for 8 amps. Common wire rating MUST be greater than total amperage of all solenoids on a Add-A-Fold assembly.



#### Grounding Instructions

The Collective Wiring addressing system is grounded by connecting a **user supplied case wire** to the outside ground screw on the End Plate. Use 18 gauge, or larger, case wire.

The Collective Wiring 25-Pin D-Sub internal ground is made by connecting the loose ring terminal to the ground screw provided at the internal wire passageway.

The collective wiring 12-Pin or 19-Pin Round Connector internal ground is made by connecting the lead wire with a ring terminal (ground wire) to the ground screw provided at the internal wire passageway.

An earth ground is recommended for all voltages. Follow standard electrical protocol.

#### Air Piping Assembly

##### Port Connections:

Manifold stacks / subbases have three common air passage galleries. For Single pressure piping, connect the inlet supply to Port #1; Ports #3 and #5 are then the exhaust ports. For Dual pressure piping, connect the two inlet supplies to Port #3 and Port #5 (it is recommended that the higher pressure

**H1, H2 & H3 Subbase & Manifold Installation**

be supplied to Port #3); Port #1 is then the exhaust port. See **Manifold Isolation**, if the application requires groups of valves with different pressure supplies. Connect the cylinder ports #2 and #4 to the cylinder or other device to be supplied with air from the valve. These ports are at the end (and bottom, if so ordered) of each base.

Note: If Pressure is supplied to one end of a manifold, the pressure port(s) on the opposite end must be plugged.

**External Pilot Connections:**

An external pilot supply is used when the main inlet pressure is below the minimum valve operating pressure or when the pilot pressure is different from the main inlet pressure. Supply pilot

air to either Port #14 or Port #12 and plug the one not being used.

**Remote Pilot Signal Connections:**

**Manifolds:**

For remote pilot signal valves, connect the pilot signal to the Remote Pilot Access Plate mounted directly under the valve body. NOTE: Signals into the remote pilot plate do not connect to the #12 or #14 galleries on the End Plates. See Remote Pilot Access Plate instructions.

**Subbases:**

Connect pilot signal to the #12 and #14 Ports.

**Manifold Assembly with Interconnect Wiring**

The Interconnect Wiring System (Figure 4 & 5) makes the electrical connection user friendly. Each individual manifold base carries its own connector circuit board which self aligns and plugs into the circuit board of the mating manifold base. The power is supplied at the left end of the stack (as you are viewing the cylinder ports) by means of a plug-in harness or serial module.

The stack assembly is built from left to right (viewing the cylinder ports). Start with the Interconnect Wiring End Plate and add manifold bases as required. If the stack includes transitions from one valve size to another, the left most size is the smallest and then progressing to successively larger sizes. Follow the techniques described below for the easiest assembly. Consult the torque chart for screw tightening specifications.

from the harness into the base connector circuit board. The connectors are keyed, there is only one assembly possible. Do not twist cables. Attach the Base to the Interconnect Wiring End Plate by finger tightening the three Bolts (Item 4). Continue to mount each successive Gasket (Item 2) and Base (Item 3) to the previous Base. Lay the entire manifold on a flat surface, align for straightness and alternately tighten each screw incrementally to torque specifications in the torque chart. Place the right hand End Plate (Item 5) on last base and tighten screws (see torque chart).

3. **NOTE: Transition Plates or Isolation Plugs must be properly placed as the construction of the stack progresses. See individual sections of this bulletin.**

4. Add valves and accessories to the manifold (if not already attached). The final assembly should be leak and electrically tested before operation.

**For H1 Valves (See Figure 4)**

1. Lay Interconnect Wiring End Plate (Item 1 / 7) port side down (when looking at Manifold Cylinder Ports) and expose the wiring harness. Locate Gasket (Item 2) in place on the Interconnect Wiring End Plate (Item 1).
2. Bring the first station Manifold Base to the Interconnect Wiring End Plate and plug in the two black connectors

**Manifold / End Plate Assembly Torque Values**

Torque - in.lb. (Nm)	Item 4	40 to 50 (4.5 to 5.6)
----------------------	--------	-----------------------

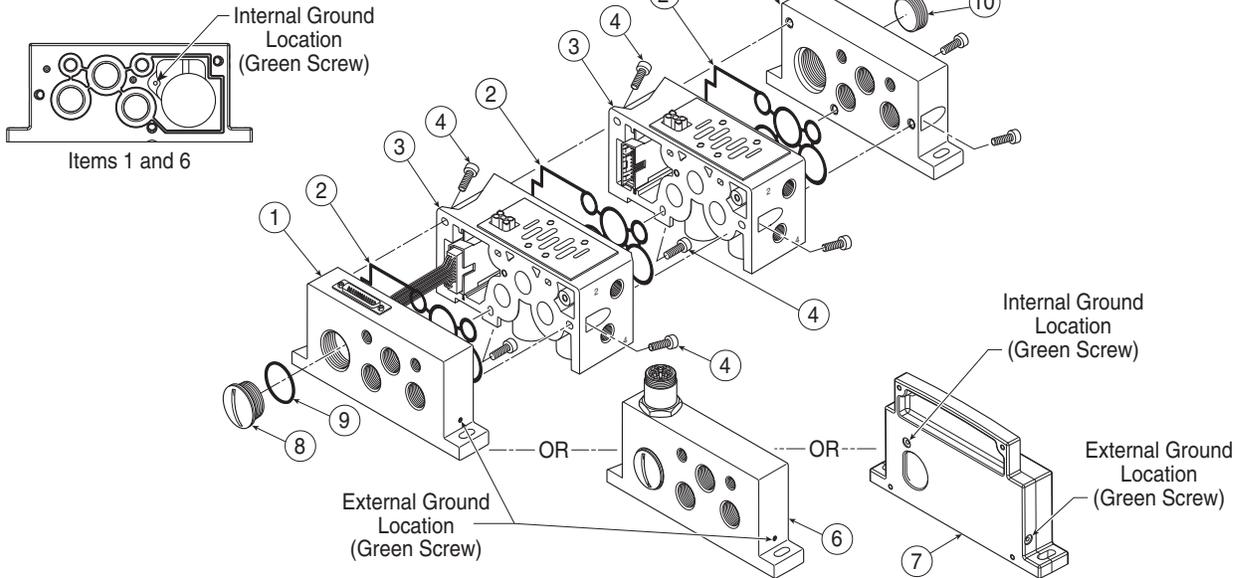


Figure 4 (H1 Valves Shown)

Item #	Description
1	Interconnect Wiring End Plate (25-Pin, D-Sub Connector)
2	Molded Gasket
3	Manifold Base
4	Mounting Screws
5	Right Hand End Plate

Item #	Description
6	Interconnect Wiring End Plate (12 or 19-Pin Connector)
7	Interconnect Wiring End Plate (H Series Fieldbus / Turck)
8	Dome Plug
9	O-ring
10	Plastic Plug

**For H2 & H3 Valves (See Figure 5)**

1. Lay Interconnect Wiring End Plate (Item 1 / 7) port side down (when looking at Manifold Cylinder Ports) and expose the wiring harness. Locate Gasket (Item 2) in place on the Interconnect Wiring End Plate (Item 1).
2. Bring the first station Manifold Base to the Interconnect Wiring End Plate and plug in the two black connectors from the harness into the base connector circuit board. The connectors are keyed, there is only one assembly possible. Do not twist cables. Attach the Base to the Interconnect Wiring End Plate by finger tightening the three Bolts (Item 5). Continue to mount each successive Gasket (Item 2) and Base (Item 4) to the previous Base. Lay the entire manifold on a flat surface, align for straightness and alternately tighten each screw incrementally to torque specifications in the torque chart. Place the right hand End Plate (Item 6) on last base and tighten screws (see torque chart).
3. **NOTE: Transition Plates or Isolation Plugs must be properly placed as the construction of the stack progresses. See individual sections of this bulletin.**
4. Add valves and accessories to the manifold (if not already attached). The final assembly should be leak and electrically tested before operation.

**Manifold / End Plate Assembly  
Torque Values**

Torque - in.lb. (Nm)	Item 5	195 to 205 (22.0 to 23.2)
-------------------------	--------	------------------------------

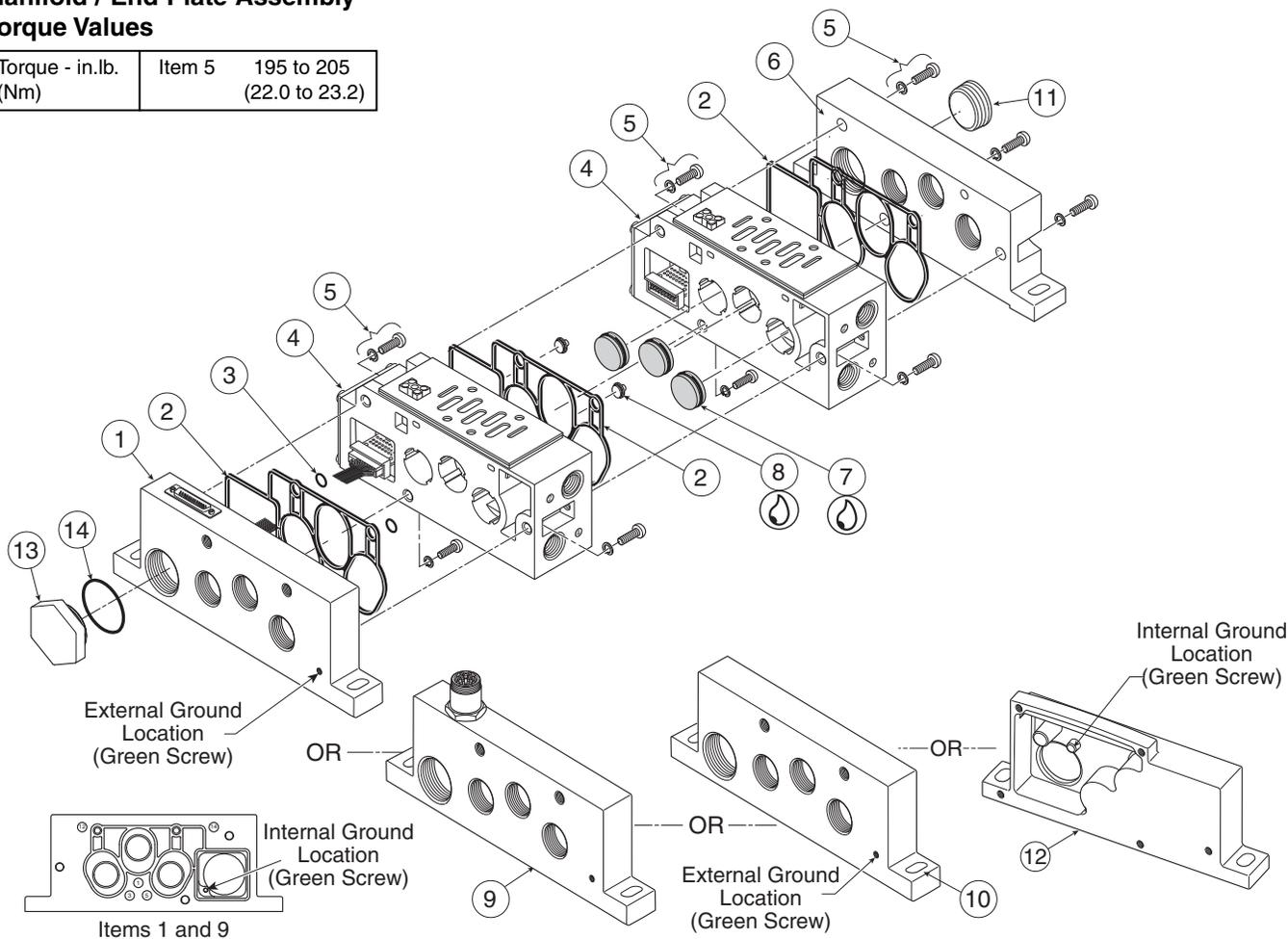


Figure 5 (H2 Manifold Assembly Shown)

Item #	Description
1	Interconnect Wiring End Plate (25-Pin, D-Sub Connector)
2	Molded Gasket
3	Pilot Gallery O-Rings
4	Manifold Base (H2)
5	Mounting Screw & Lockwasher
6	Right Hand End Plate
7	Isolation Plugs

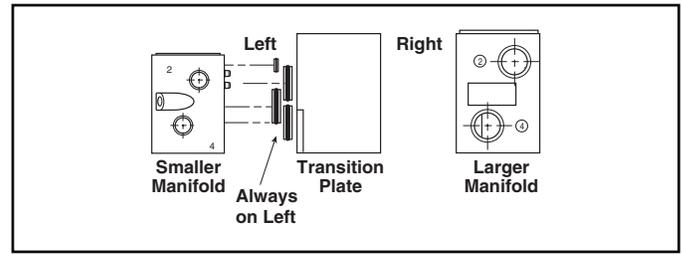
Item #	Description
8	Pilot Isolation Plug
9	Interconnect Wiring End Plate (12 or 19-Pin Connector)
10	Left Hand End Plate
11	Pipe Plug
12	Interconnect Wiring End Plate (H Series Fieldbus / Turck)
13	Hex Plug
14	O-Ring

**H1 to H2 Manifold Assembly (See Figure 6)**

The smaller manifold must be on the left side of the Transition Plate. The Transition Plate (Item 6) acts as a combination right end plate for the smaller manifold and left end plate for the larger manifold.

1. Lay Left Hand End Plate (Item 1) port side down (when looking at manifold Cylinder Ports) and expose the wiring harness. Locate Gasket (Item 2) in place on the Left Hand End Plate.
2. Bring the first station Manifold Base (Item 3) to the Left Hand End Plate and plug in the two black connectors from the harness into the base connector circuit board. The connectors are keyed, there is only one assembly possible. Do not twist cables. Attach the Base to the Left Hand End Plate by finger tightening the three Bolts (Item 4). Continue to mount each successive Gasket and Base to the previous Base. When all H2 base(s) have been assembled then attach the Transition Plate (Item 6). Continue to mount each successive Gasket (Item 7), Base (Item 8), and Wire Harness (Item 5). Lay the entire manifold on a flat surface, align for straightness and alternately tighten each screw incrementally to torque specifications in the torque chart. Place the right hand End Plate (Item 9) on the last base and tighten screws (see torque chart).
3. **Note: Transition Plates or Isolation Plugs must be properly placed as the construction of the stack progresses. See individual sections of this bulletin.**
4. Add valves and accessories to the manifold (if not already attached). The final assembly should be leak and electrically tested before operation.

**Isolator Plug Locations with Transition Plates**



**Manifold / End Plate Assembly Torque Values**

Torque - in.lb. (Nm)	Item 4	40 to 50 (4.5 to 5.6)
Torque - in.lb. (Nm)	Item 10	195 to 205 (22.0 to 23.2)

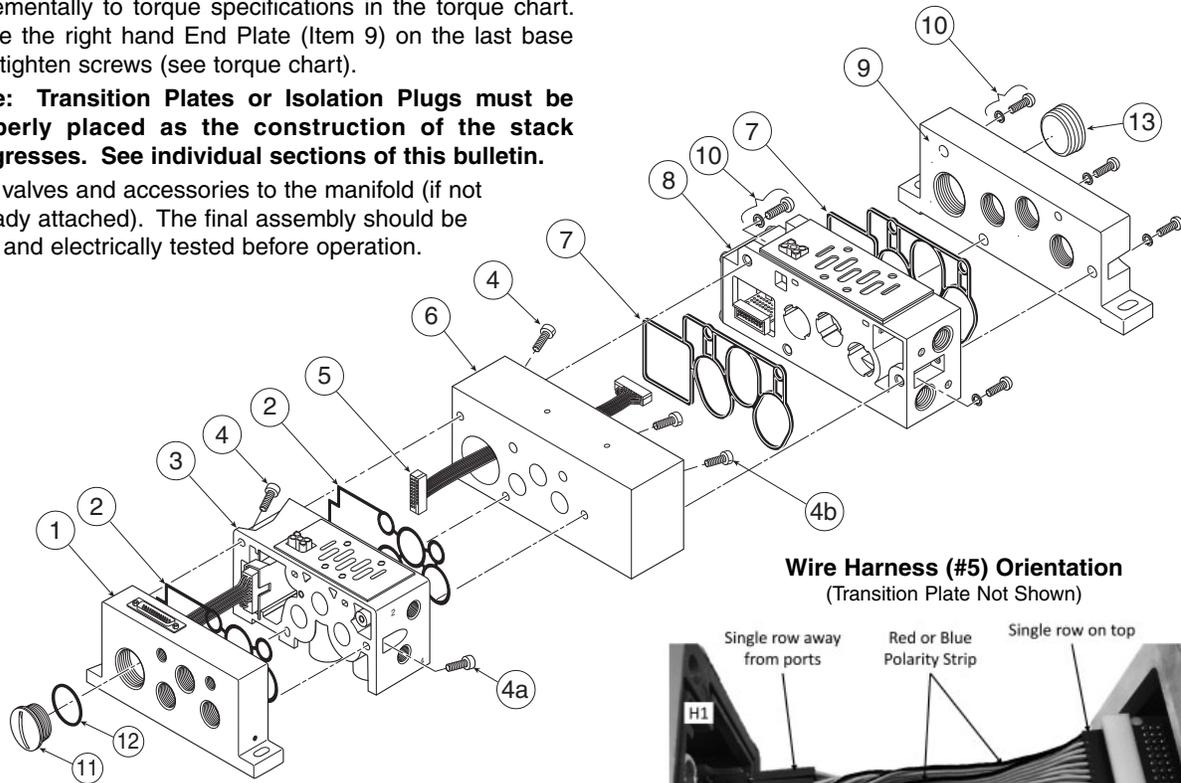
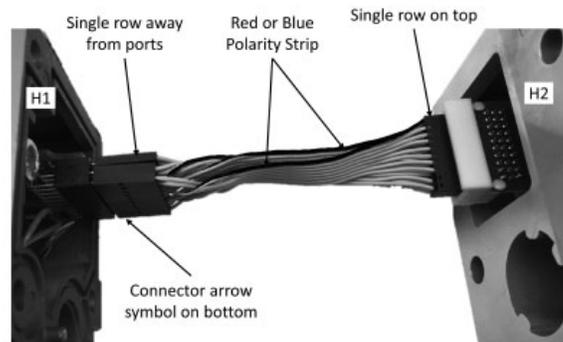


Figure 6 (H1 to H2 Transition Assembly)

**Wire Harness (#5) Orientation (Transition Plate Not Shown)**



Item #	Description
1	Interconnect Wiring Plate (25-Pin, D-Sub Connector Shown) (H1)
2	Manifold Gasket (H1)
3	Manifold Base (H1)
4a	Mounting Screws (M6 x 16mm)
4b	Mounting Screws (M6 x 25mm)
5	Wire Harness
6	Transition Plate (H1 to H2)

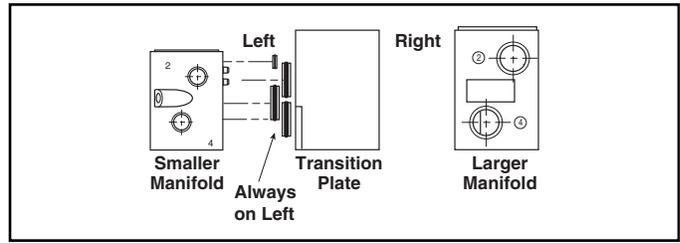
Item #	Description
7	Manifold Gasket (H2)
8	Manifold Base (H2)
9	Right End Plate (H2)
10	Mounting Screws & Lock Washers (H2)
11	Dome Plug
12	O-ring
13	Pipe Plug

**H1 to H3 Manifold Assembly (See Figure 7)**

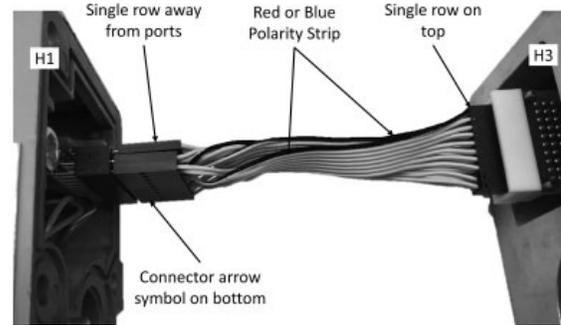
The smaller manifold must be on the left side of the Transition Plate. The Transition Plate (Item 6) acts as a combination right end plate for the smaller manifold and left end plate for the larger manifold.

1. Lay Left Hand End Plate (Item 1) port side down (when looking at manifold Cylinder Ports) and expose the wiring harness. Locate Gasket (Item 2) in place on the Left Hand End Plate.
2. Bring the first station Manifold Base (Item 3) to the Left Hand End Plate and plug in the two black connectors from the harness into the base connector circuit board. The connectors are keyed, there is only one assembly possible. Do not twist cables. Attach the Base to the Left Hand End Plate by finger tightening the three Bolts (Item 4). Continue to mount each successive Gasket and Base to the previous Base. When all H2 base(s) have been assembled then attach the Transition Plate (Item 6). Continue to mount each successive Gasket (Item 7), Base (Item 8), and Wire Harness (Item 5). Lay the entire manifold on a flat surface, align for straightness and alternately tighten each screw incrementally to torque specifications in the torque chart. Place the right hand End Plate (Item 9) on the last base and tighten screws (see torque chart).
3. **Note: Transition Plates or Isolation Plugs must be properly placed as the construction of the stack progresses. See individual sections of this bulletin.**
4. Add valves and accessories to the manifold (if not already attached). The final assembly should be leak and electrically tested before operation.

**Isolator Plug Locations with Transition Plates**

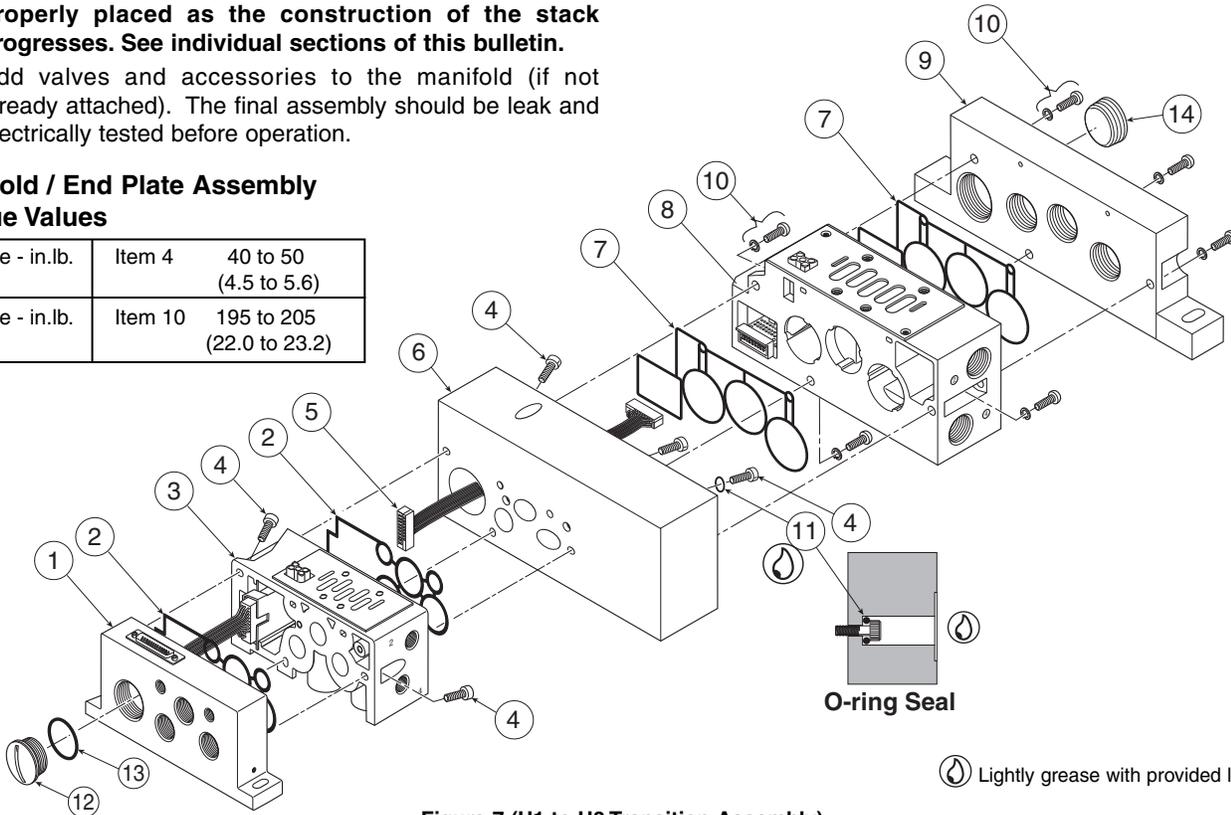


**Wire Harness (#5) Orientation**  
(Transition Plate Not Shown)



**Manifold / End Plate Assembly Torque Values**

Torque - in.lb. (Nm)	Item 4	40 to 50 (4.5 to 5.6)
Torque - in.lb. (Nm)	Item 10	195 to 205 (22.0 to 23.2)



Lightly grease with provided lubricant.

Figure 7 (H1 to H3 Transition Assembly)

Item #	Description
1	Interconnect Wiring Plate (25-Pin, D-Sub Connector Shown) (H1)
2	Manifold Gasket (H1)
3	Manifold Base (H1)
4	Mounting Screws (H1)
5	Wire Harness
6	Transition Plate (H1 to H3)
7	Manifold Gasket (H3)

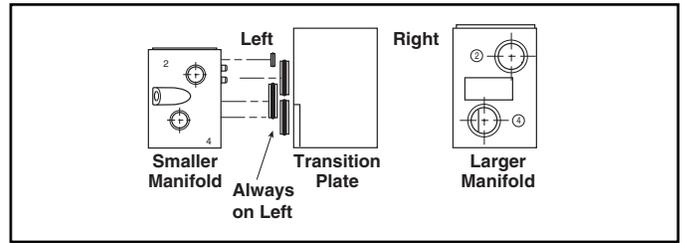
Item #	Description
8	Manifold Base (H3)
9	Right End Plate (H3)
10	Mounting Screws & Lock Washers (H3)
11	O-ring Seal Washer
12	Dome Plug
13	O-Ring
14	Pipe Plug

**H2 to H3 Manifold Assembly (See Figure 8)**

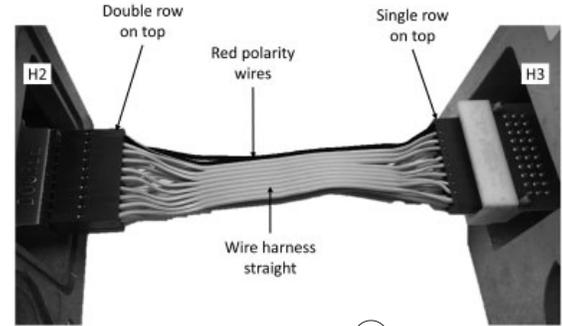
The smaller manifold must be on the left side of the Transition Plate. The Transition Plate (Item 7) acts as a combination right end plate for the smaller manifold and left end plate for the larger manifold.

1. Lay Left Hand End Plate (Item 1) port side down (when looking at manifold Cylinder Ports) and expose the wiring harness. Locate Gasket (Item 2) in place on the Interconnect Wiring End Plate.
2. Bring the first station Manifold Base (Item 4) to the Left Hand End Plate and plug in the two black connectors from the harness into the base connector circuit board. The connectors are keyed, there is only one assembly possible. Do not twist cables. Attach the Base to the Interconnect Wiring End Plate by finger tightening the three Bolts (Item 5). Continue to mount each successive Gasket and Base to the previous Base. When all H2 base(s) have been assembled then attach the Transition Plate (Item 7). Continue to mount each successive Gasket (Item 8), Base (Item 9), and Wire Harness (Item 6). Lay the entire manifold on a flat surface, align for straightness and alternately tighten each screw incrementally to torque specifications in the torque chart. Place the right hand End Plate (Item 11) on the last base and tighten screws (see torque chart).
3. **Note: Transition Plates or Isolation Plugs must be properly placed as the construction of the stack progresses. See individual sections of this bulletin.**
4. Add valves and accessories to the manifold (if not already attached). The final assembly should be leak and electrically tested before operation.

**Isolator Plug Locations with Transition Plates**

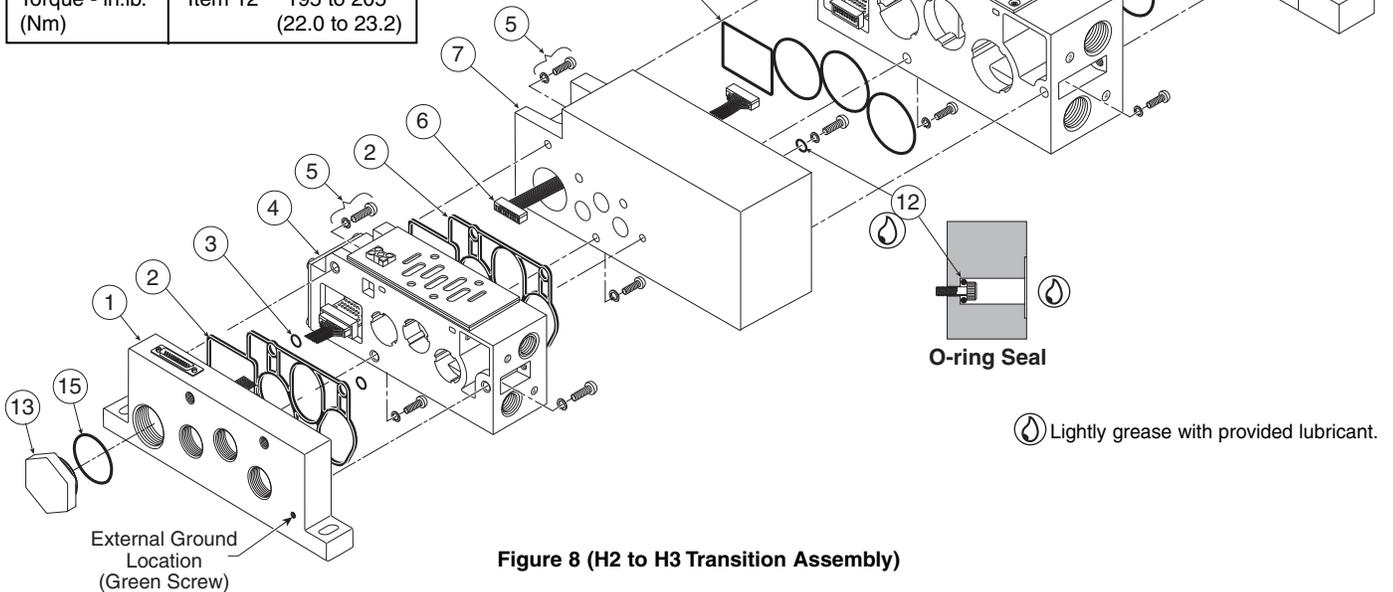


**Wire Harness (#6) Orientation**  
(Transition Plate Not Shown)



**Manifold / End Plate Assembly Torque Values**

Torque - in.lb. (Nm)	Item 12	195 to 205 (22.0 to 23.2)
----------------------	---------	---------------------------



**Figure 8 (H2 to H3 Transition Assembly)**

Item #	Description	Item #	Description
1	Interconnect Wiring Plate (25-Pin, D-Sub Connector)	9	Manifold Base (H3)
2	Molded Gasket	10	Manifold to Transition Plate Gasket (H3)
3	Pilot Gallery O-Rings	11	Right End Plate (H3)
4	Manifold Base (H2)	12	O-ring Seal Washer
5	Mounting Screw & Lockwasher	13	Hex Plug
6	Wire Harness	14	Pipe Plug
7	Transition Plate (H2 to H3)	15	O-Ring
8	Manifold to Transition Plate Gasket (H3)		

### Manifold Isolation Assembly

Inlet & exhaust galleries, and pilot supply / signal galleries may be isolated from those in adjacent manifolds through the use of isolation plugs. Note: air piloted valves, whether single or double, will need to be isolated at 14 and / or 12 galleries to prevent improper air pressure signals reaching adjacent valves. Figure 9 indicates typical assembly locations of the Main Gallery Plugs (Item 1) and the Pilot Gallery Plugs (Item 2).

The following describes how to install plugs:

1. Determine which gallery is to be isolated between two manifolds.
2. Use the large Plugs (Item 1) from the service kits to isolate manifolds from the main gallery(s).
3. Apply a light coating of grease to isolation plug and insert it into counterbore of left manifold base.
4. Apply a light coating of grease to Gasket (Item 3) and assemble in manifold groove.
5. Assemble plugged manifold into manifold bank in its proper position.
6. Apply main pressure and check for leaks. If any are present, do not operate the valve - repeat the reassembly process until satisfactory.

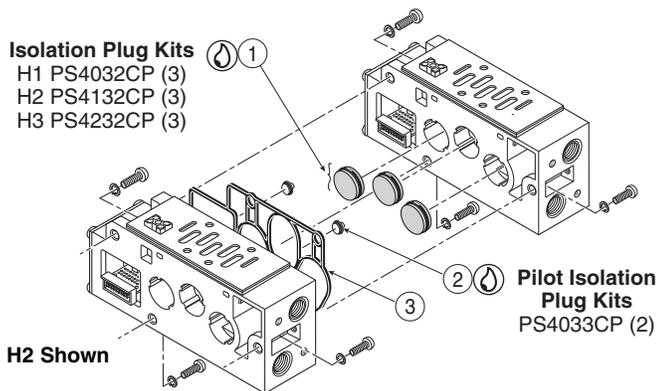
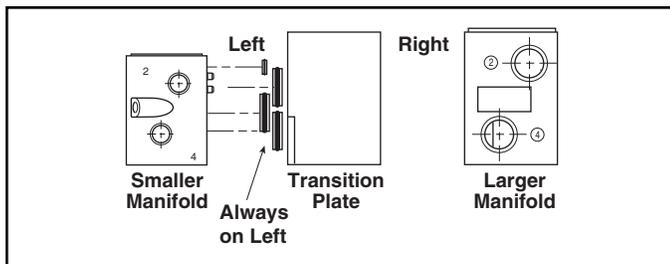


Figure 9

### Isolator Plug Locations with Transition Plates



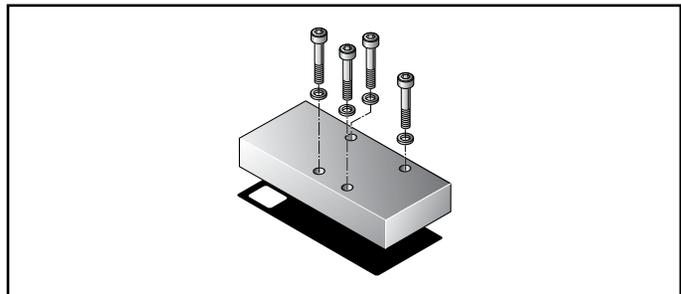
### Station Blanking Plate

Use top Blanking Plate on a Manifold to reserve a place for a valve that will be added later to the manifold bank or to remove a valve from a manifold without having to remove the manifold block from the manifold bank.

Place Gasket and Blanking Plate on Manifold and assemble using Mounting Screws provided with kit. Tighten screws to torque specifications shown in the torque chart below.

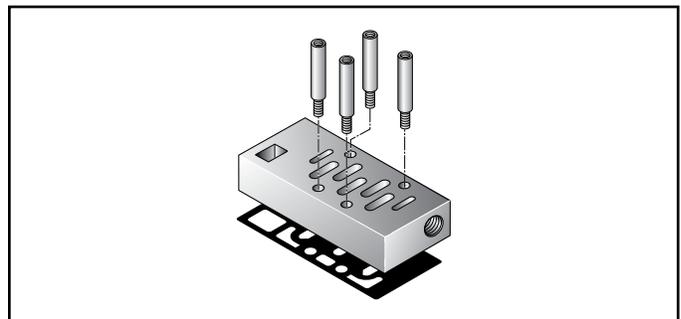
Apply main pressure and check for leaks. If any are present, do not operate valves on the manifold bank - repeat the assembly process until satisfactory.

Valve Series	H1	H2	H3
Torque - in. lb. (Nm)	25 to 35 (2.8 to 3.9)	115 to 130 (12.9 to 14.7)	120 to 140 (13.6 to 15.8)



### Remote Pilot Access Plate

The Remote Pilot Access Plate provides access to the #12 and #14 valve pilot galleries for an H1, H2 & H3 manifold. It is required for Single or Double Remote Pilot Valves on a manifold. Hand tighten the tie rods into the base.



### Hi-Flow Manifold Repair Kits

Kit Number	Description	Item Number
PS4012P	H1 Manifold to Manifold Screws (3)	3
PS4013P	H1 Manifold to Manifold Gasket (1)	2
PS4112P	H2 / H3 Manifold to Manifold Screws and Washers (12)	10
PS4113P	H2 Manifold to Manifold Gasket (1)	12
PS4213P	H3 Manifold to Manifold Gasket (1)	12

For all Instruction Sheets, go to [www.parker.com/pneumatic](http://www.parker.com/pneumatic)

V450P - H Series HA 26mm & HB 18mm ISO 15407-2 Valve Service
V452P - H Series HA & HB ISO 15407-2 Sandwich Flow Controls
V453P - H Series HA & HB ISO 15407-2 Manifold Installation
V454P - H Series HA & HB Sandwich Regulators
V467P - H Series H1 Sandwich Regulators
V468P - H Series H1, H2 & H3, ISO 5599-1, 5599-2 Sandwich Flow Controls
V469P - H Series H1, H2 & H3, ISO 5599-1, 5599-2 Subbase & Manifold Installation
V470P - H Series H1, H2 & H3, ISO 5599-1, 5599-2 Valve Service
V471P - H Series H2 & H3 Sandwich Regulators

**⚠ WARNING**

- To avoid unpredictable system behavior that can cause personal injury and property damage:
- Disconnect electrical supply (when necessary) before installation, servicing, or conversion.
- Disconnect air supply and depressurize all air lines connected to this product before installation, servicing, or conversion.
- Operate within the manufacturer's specified pressure, temperature, and other conditions listed in these instructions.
- Medium must be moisture-free if ambient temperature is below freezing.
- Service according to procedures listed in these instructions.
- Installation, service, and conversion of these products must be performed by knowledgeable personnel who understand how pneumatic products are to be applied.
- After installation, servicing, or conversion, air and electrical supplies (when necessary) should be connected and the product tested for proper function and leakage. If audible leakage is present, or the product does not operate properly, do not put into use.
- Warnings and specifications on the product should not be covered by paint, etc. If masking is not possible, contact your local representative for replacement labels.

**⚠ WARNING**

**FAILURE OR 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 authorized distributors provide product and / or system options for further investigation by users having technical expertise. It is important that you analyze all aspects of your application, including consequences of any failure and review the information concerning the product or systems in the current product catalog. 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.

The products described herein, including without limitation, product features, specifications, designs, availability and pricing, are subject to change by Parker Hannifin Corporation and its subsidiaries at any time without notice.

**⚠ WARNING**

This valve / base has a standard ISO 5599/2: 1990 mounting interface. Valve bodies labeled Parker Model 45\_, and bases marked ISO 2E, 3E, or 4E or simply O 2E, O 3E, or O 4 E (opposite the junction box under the valve body) - and without blue wires in the base - can be connected to this valve / base, but may have incompatible wiring. Base wiring may be reversed, resulting in unpredictable machine function that may cause injury, property damage, or death. Completely test the machine for correct function before using, and rewire if necessary. Call 1-800-272-7537 for special ISO Valve Service Bulletin No. VAL-SIF73.

**Safety Guide**

For more complete information on recommended application guidelines, see the Safety Guide section of Pneumatic Division catalogs or you can download the **Pneumatic Division Safety Guide** at: [www.parker.com/safety](http://www.parker.com/safety)

**Introduction**

Follow these instructions when installing, operating, or servicing the product.

**⚠ CAUTION: It is recommended that double solenoid and double remote pilot operated 2-Position valves be mounted so that the axis of the valve spool is in the horizontal plane.**

**Lubrication**

Factory Pre-lubed. If lubricating in service, use Parker F442 oil or equivalent paraffin based mineral oil with 150 to 200 SSU viscosity @100°F.

**⚠ CAUTION: Do not use oils that are synthetic, reconstituted, have an alcohol content or a detergent additive.**

**Application Limits**

These products are intended for use in general purpose compressed air systems only. Compliance with the rated pressure, temperature, and voltage is necessary.

**Operating Pressure Range**

**Maximum:** 145 PSIG (1000 kPa)  
**Minimum:** See Chart Below

Operator / Function	Internal Pilot	Min. kPa (PSIG) H1	Min. kPa (PSIG) H2	Min. kPa (PSIG) H3
1	Single Solenoid - 2-Pos	173	173	241
2	Double Solenoid- 2-Pos	(25)	(25)	(35)
3	Single Remote Pilot - 2-Pos	Vacuum	Vacuum	Vacuum
4	Double Remote Pilot - 2-Pos	Vacuum	Vacuum	Vacuum
5, 6, 7	Double Solenoid - 3-Pos	241	345	345
	APB, CE, PC	(35)	(50)	(50)
8, 9, 0	Double Remote Pilot - 3-Pos	Vacuum	Vacuum	Vacuum
	APB, CE, PC			
E	Single Solenoid Pilot - 2-Pos			
	Air Return / Spring Assist	241	310	310
F	Single Remote Pilot - 2-Pos	(35)	(45)	(45)
	Air Return / Spring Assist			
	<b>External Pilot *</b>	*	*	*
All	H1, H2, H3	Vacuum	Vacuum	Vacuum

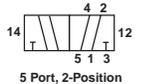
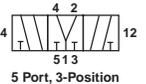
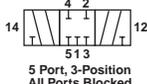
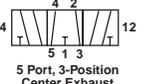
\*External Pilot Pressure / Remote Pilot Signal - 45-145 PSIG (310-1000 kPa).

**Ambient Temperature Range:** -15°C to 49°C (5°F to 120°F)

**Voltage Range:** Rated Voltage +10%, -15%

**Media:** Dry air or inert gas filtered to 40µ

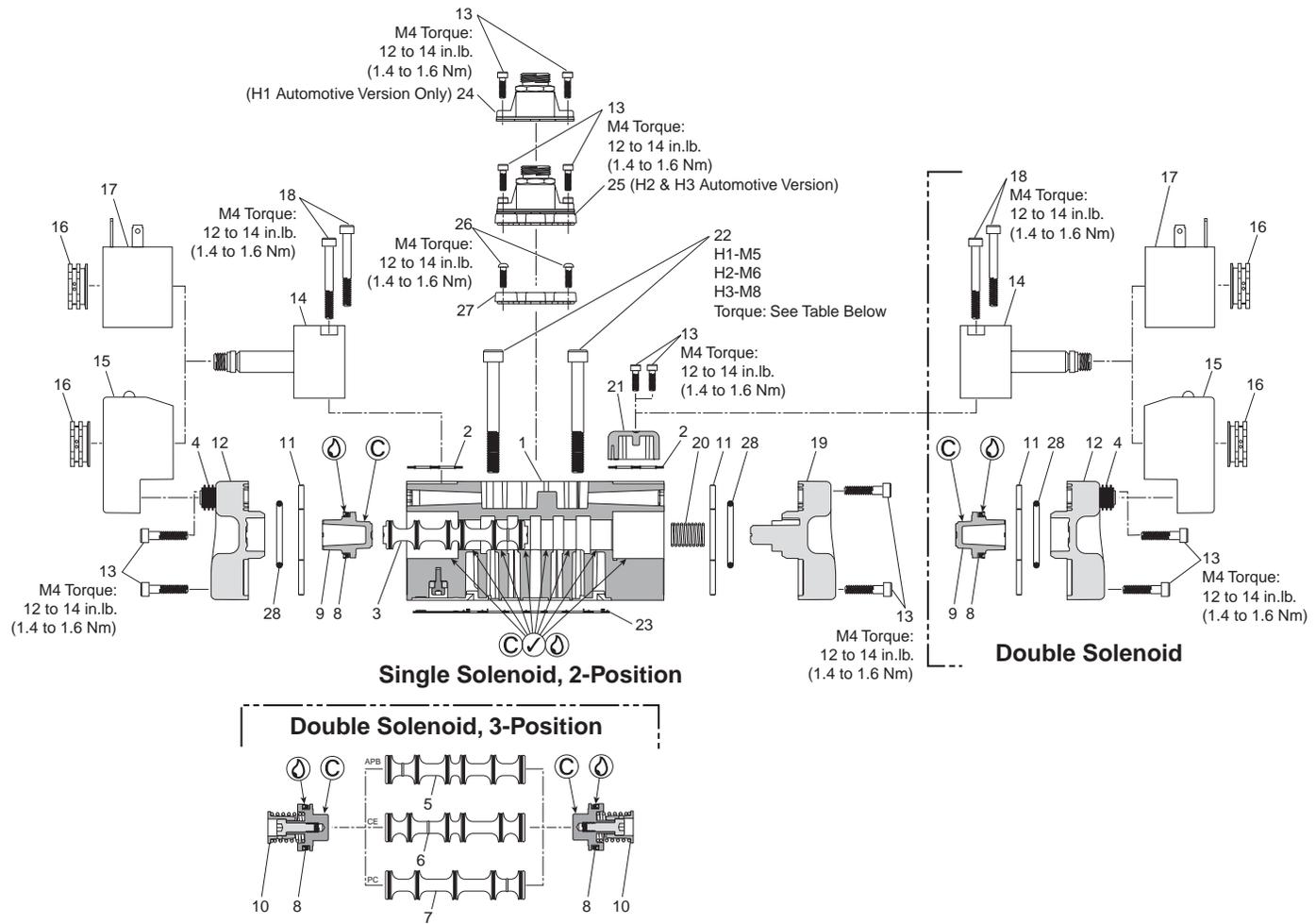
**Port Identification / Connections / Symbols**

Port No.	Single Pressure	Dual Pressure		
1	Inlet	Exhaust		
2	Outlet	Outlet		
3	Exhaust	Inlet		
4	Outlet	Outlet		
5	Exhaust	Inlet		
12, 14	Pilot ports for External Pilot or Remote Pilot			

Valves may be used for single outlet (3-Way) by plugging an outlet Port.

**NOTE:** The operator identification describes the ports that are connected when the operator is energized: operator 12 connects Port 1 to Port 2; operator 14 connects Port 1 to Port 4. Other ports may also be connected, or blocked – see symbols on the valve.

**NOTE:** For dual pressure valves with internal piloting, it is recommended that the inlet port with the higher pressure be connected to Port #3 and be used for piloting.



Single Solenoid, 2-Position

Double Solenoid

Double Solenoid, 3-Position

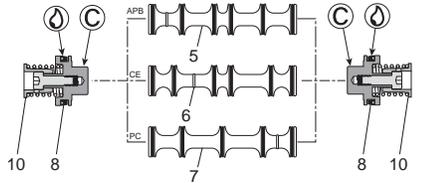


Figure 1 (H1 Shown)

Valve to Base Torque Values (Item 22)

	H1	H2 / H3
Torque - in.lb. (Nm)	25 to 35 (2.8 to 3.9)	50 to 70 (5.6 to 7.9)

- Lightly grease with provided lubricant.
- Inspect for nicks, scratches, and surface imperfections. If present, reduced service life is probable and future replacement should be planned.
- Clean with lint-free cloth.

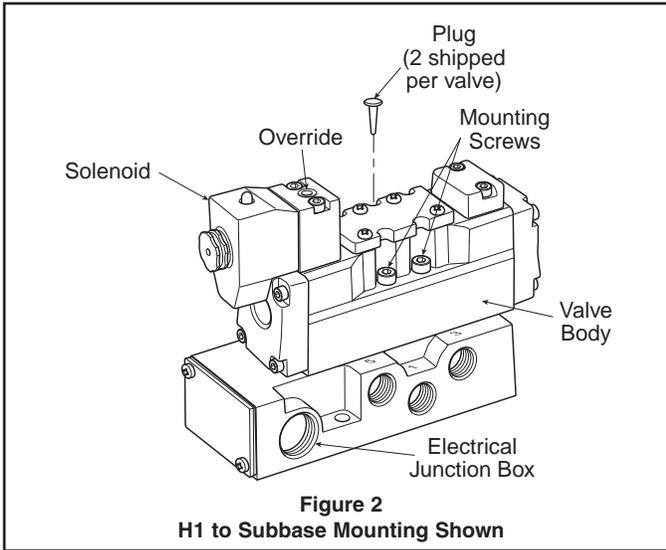
Item	Description	Item	Description	Item	Description
1	Body	11	Gasket - Body to End Cap	21	Pilot Bypass Plate
2	Pilot Select Gasket	12	Solenoid End Cap	22	Screw, Body to Base
3	Spool, 2-Position	13	Screws	23	Gasket, Body to Base
4	Gasket, Coil to End Cap	14	Solenoid Pilot Operator	24	H1 Auto Harness, Cover & Gasket (Automotive Version Only)
5	Spool, 3-Position, APB	15	Coil, Plug-in	25	H2 & H3 Auto Harness, Cover & Gasket (Automotive Version Only)
6	Spool, 3-Position, CE	16	Coil Nut	26	Screw, Body Cover
7	Spool, 3-Position, PC	17	Coil, CNOMO	27	Body Cover (Plug-in & Non Plug-in)
8	Lip Seal, Piston	18	Screw, Solenoid Pilot Operator to Body	28	O-ring
9	Piston - 2-Position	19	Return End Cap		
10	Piston - 3-Position	20	Spring, Return		

**Valve to Base Mounting Procedures**

Use the following procedure to mount valve to base:

- Using a clean, lint free cloth, clean top surface of subbase and bottom surface of valve body.
- Check to insure that gasket is properly seated in gasket track on valve body.
- Place valve assembly on top of base. On electrically operated valves, line up plug with socket in base and gently press down on valve to seat plug properly.
- Line up the mounting screws. Tighten using an allen wrench using progressive steps with a criss-cross pattern. See chart for torque specifications.

- For new automotive valves with (5) five mounting holes in the valve body, plugs must be used to prevent foreign material from entering. For H1, H2, & H3 applications, the center hole is to be plugged with (1) one plug (See Figure 2). On applications with the valve mounted on the "F" series base, plug both outside holes.
- Apply main pressure and check for leaks. If any are present, do not operate the valve - repeat the reassembly process until satisfactory.



**Figure 2**  
H1 to Subbase Mounting Shown

**Replacing Coil**

Refer to Figure 1 to aid with disassembly and reassembly.

1. Remove Coil Nut (16), Coil (15 / 17) and Coil to End Cap Gasket (4).
2. Replace Coil (15 / 17) and Coil to End Cap Gasket (4).
3. Reassemble / replace Coil Nut (16).

**Replacing Solenoid Pilot Operator**

**H1, H2 & H3**

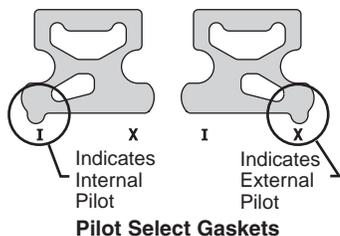
Refer to Figure 1 to aid with disassembly and reassembly.

1. Remove Valve from base by removing Body to Base Screws (22).
2. Remove Coil Nut (16), Coil (15 / 17) and Coil to End Cap Gasket (4).
3. Remove Solenoid Pilot Operator (14) by removing the two Screws (18).
4. Remove Pilot Select Gasket (2).
5. Using a clean, lint free cloth, clean pilot select gasket sealing surface.
6. Replace the Solenoid Pilot Operator (14) and reassemble valve in reverse order of disassembly.
7. Pressurize the valve and check for leaks. If any leak exists, repeat assembly process and retest until valve is leak free.

**Pilot Pressure Supply**

Conversion in the field from an internal pilot supply to an external pilot supply, or vice versa, is possible.

1. For Solenoid Operator, remove Coil Nut and Coil. Remove the two (2) Screws on the Pilot Operator. For Remote Pilot Operator or Return Operator, remove the two (2) Screws securing it to the Body.
2. Slip the Pilot Supply Gasket so that the small tab with the arrow points to either the "I" for internal supply, or "X" for external supply.



3. Reassemble and torque Screws to 1.4 to 1.6 Nm (12 to 14 in-lbs). Finger tighten Coil Nut.
4. Apply main pressure and check for leaks. If any are present, do not operate the valve - repeat the reassembly process until satisfactory.
5. Valve can be supplied with an external pilot supply pressure from either the #12 or #14 port on the base or end plate. The unused pilot port must be plugged.

**Servicing Valve Body**

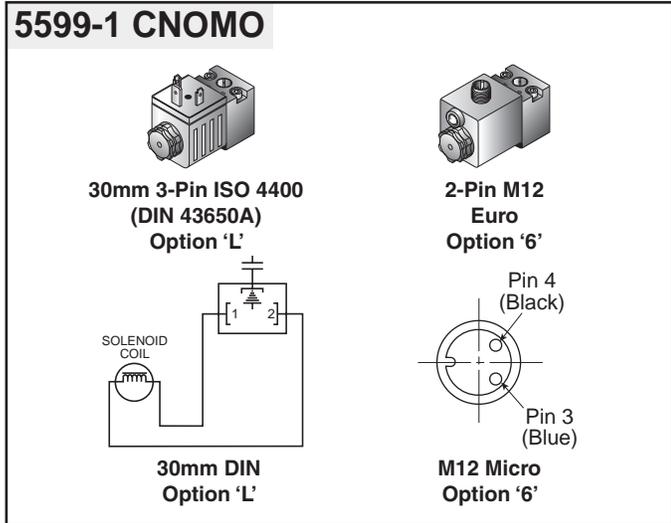
Refer to Figure 1 to aid with disassembly and reassembly.

1. Remove Valve from base by removing Body to Base Screws (22).
2. Remove Coil Nut(s) (16), Coil(s) (15 / 17) and Coil to End Cap Gasket(s) (4).
3. Remove Solenoid Pilot Operator(s) (14), if applicable, by removing the two Screws (18).
4. Remove Pilot Bypass Plate (21), if applicable, by removing the two Screws (13).
5. Remove Pilot Select Gasket(s) (2).
6. Remove each End Cap (12 / 19) by removing the 4 Screws (13).
7. Remove the Pistons (9 or 10), Spool Return Spring (20), if applicable, and the Spool (3, 5, 6 or 7), being careful not to scratch the valve body bore.
8. Using a clean, lint free cloth, clean pilot select gasket sealing surface.
9. Apply a light coating of grease to each part noted in Figure 1 and the mating sealing surface of each of these parts.
10. Reassemble valve in reverse order of disassembly, replacing the necessary parts. Care must be taken when reassembling the End Caps so that the wires do not become pinched between the End Cap and the Body, if applicable.
11. Pressurize the valve and check for leaks. If any leak exists, repeat assembly process and retest until valve is leak free.

**Wiring - Auto C, F, G**

**5599-1 AUTO**

	3-Pin Mini Encl "1"	4-Pin M12 Encl "2"			5-Pin Mini Encl "3"		
Wiring Type	C, F, G	C	F	G	C	F	G
Pin #1	Gnd	14	N/A	12	12	14	12
Pin #2	14	Gnd	12	N/A	12	12	14
Pin #3	Com	Com	Com	Com	Gnd	Gnd	Gnd
Pin #4	N/A	12	14	14	14	12	14
Pin #5	N/A	N/A	N/A	N/A	14	14	12



**⚠ CAUTION:** An interruption of 10 milliseconds or greater to the power supplied to the solenoid of a solenoid operated valve may cause the valve to shift. Provision must be made to prevent power interruption of this duration to avoid unintended, potentially hazardous, consequences.

**⚠ CAUTION:** Solenoid versions of this valve contain solid state components that can be damaged by transient voltage spikes, over-voltage or high temperature. To protect against premature solenoid failure, please read and adhere to the following:

If this solenoid operated valve is used in a circuit with other inductive loads. The solenoid should be electrically protected with a voltage suppression device (e.g. transient voltage suppressor or varistor) that has a minimum rating of 1.6 times the rated voltage of the solenoid valve and sufficient capacity to dissipate the energy of other inductive loads.

### 5599-2 & 5599-1 Auto Solenoid Kits

Kit Number	Voltage	Item* (Qty)
PS404123P	120/60VAC	15 (1)
PS404142P	24/60VAC	
PS404145P	12VDC	
PS404157P	240/60VAC	
PS4041B9P	24VDC	

\* See Figure 1

### 5599-1 CNOMO Solenoid Information and Kits

Code	Voltage			Coil Kits	
	AC		DC	3-Pin, 30mm	2-Pin, M12
	60Hz	50Hz		Enclosure 'L'	Enclosure '6'
19	—	—	24	—	PS2828619P
42	24	—	—	P2FCA442	—
45	—	—	12	P2FCA445	—
49	—	—	24	P2FCA449	—
53	120	115	—	P2FCA453	—
57	230	—	—	P2FCA457	—

### Solenoid Pilot Operator Kits

Kit Number	Description	Item* (Qty)
PS4052CP	Solenoid Pilot Operator / LMOR	14 (1), 2 (2), 18 (2)
PS4053CP	Solenoid Pilot Operator / NLMOR	14 (1), 2 (2), 18 (2)
PS4056CP	Coil Nut / Vented	16 (10)

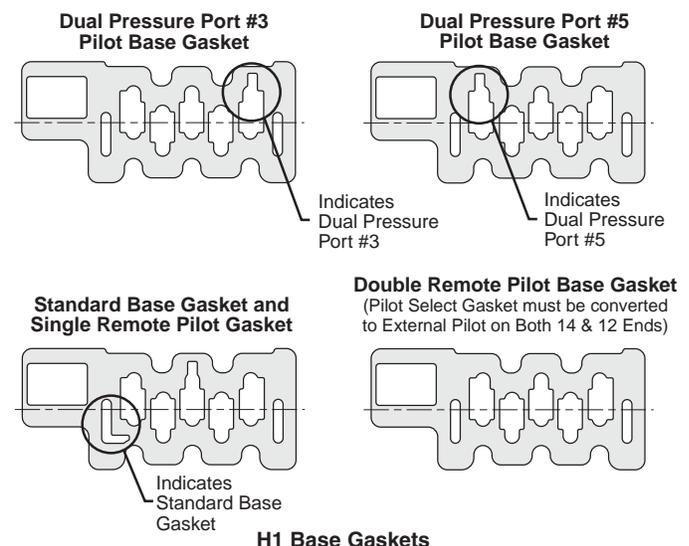
\* See Figure 1

### Accessory Kits

Kit Type	Qty	Kit Number		
		H1	H2	H3
Valve Bolt Kit	12	PS4087DP	PS4187DP	PS4287DP
Base Gasket Kit - Standard	1	PS4005DP	PS4105DP	PS4205DP
Base Gasket Kit - Remote Pilot	1	PS4006DP	PS4106DP	PS4206DP
Base Gasket Kit - Dual Pressure Port #3 Pilot	1	PS40D3DP	PS41D3DP	PS42D3DP
Base Gasket Kit - Dual Pressure Port #5 Pilot	1	—	PS41D5DP	PS42D5DP
Pilot Select Gasket Kit	10	PS4007DP	—	—

### Body Service Kits

Valve	Kit Number	Description	Kit Includes (Qty.)
H1	PS4001CP	2-Position Body Service Kit	All Parts Below Plus Return Spring (1)
H2	PS4101CP		
H3	PS4201CP		
H1	PS4002CP	3-Position APB Body Service Kit	Spool (1) Piston Assembly (2) Pilot Select Gasket (2) Coil to End Cap Gasket (2) Coil Nut Vented (2) Coil Nut Tapped (2) Grease Tube (1)
H2	PS4102CP		
H3	PS4202CP		
H1	PS4003CP	3-Position CE Body Service Kit	
H2	PS4103CP		
H3	PS4203CP		
H1	PS4004CP	3-Position PC Body Service Kit	
H2	PS4104CP		
H3	PS4204CP		



**Single Remote Pilot:** Use Standard Base Gasket, 14 End Pilot Select Gasket to be assembled in the external pilot position, 12 End Pilot Select Gasket to be assembled as internal pilot.

**⚠ WARNING**

To avoid unpredictable system behavior that can cause personal injury and property damage:

- Disconnect electrical supply (when necessary) before installation, servicing, or conversion.
- Disconnect air supply and depressurize all air lines connected to this product before installation, servicing, or conversion.
- Operate within the manufacturer's specified pressure, temperature, and other conditions listed in these instructions.
- Medium must be moisture-free if ambient temperature is below freezing.
- Service according to procedures listed in these instructions.
- Installation, service, and conversion of these products must be performed by knowledgeable personnel who understand how pneumatic products are to be applied.
- After installation, servicing, or conversion, air and electrical supplies (when necessary) should be connected and the product tested for proper function and leakage. If audible leakage is present, or the product does not operate properly, do not put into use.
- Warnings and specifications on the product should not be covered by paint, etc. If masking is not possible, contact your local representative for replacement labels.

**Safety Guide**

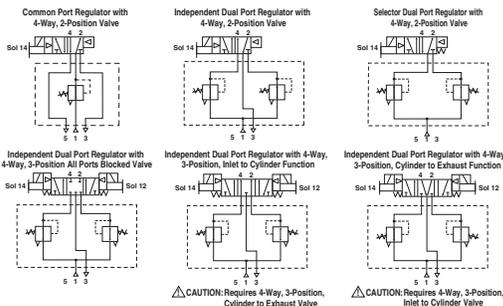
For more complete information on recommended application guidelines, see the Safety Guide section of Pneumatic Division catalogs or you can download the **Pneumatic Division Safety Guide** at: [www.parker.com/safety](http://www.parker.com/safety)

**⚠ WARNING**

Air exhausting from one valve into the exhaust gallery of the manifold assembly may momentarily pressurize other valve circuits open to the same gallery. Design the circuit such that there is no hazard or consequence of damage from this action.

**Introduction**

Follow these instructions when installing, operating, or servicing the product.



**NOTE:** The Regulators shown on the 14 and 12 End of Independent Port and Selector Units may be replaced with a By-Pass Plate to provide unregulated pressure.

**⚠ CAUTION:** The reverse valve porting utilized with Independent Port will reverse the function of 4-Way, 3-Position cylinder to exhaust and 4-Way, 3-Position inlet to cylinder to valves. Utilize opposite function valve for normal operation.

**Application Limits**

These products are intended for use in general purpose compressed air systems only.

**Operating Pressure Range:** Maximum 145 PSIG (1000 kPa)

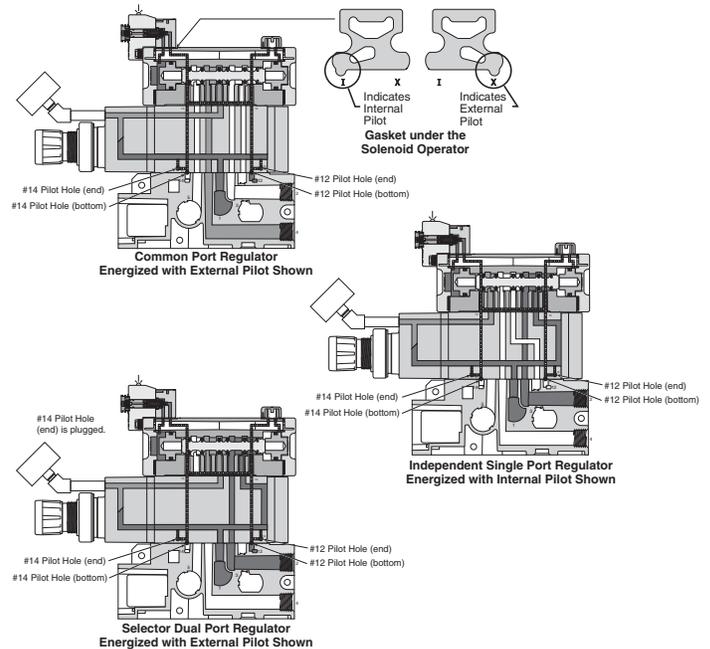
**Ambient Temperature Range:** -15°C to 49°C (5°F to 120°F)

**H2 Sandwich Regulator Shown**

**NOTE:** For all regulator options, valve must be set up for external pilot by assembling the gasket under the solenoid operator as shown below.

All sandwich regulators ship with 2 pilot port plugs located in the 12 and 14 end bottom pilot hole. Follow the table below to relocate the pilot plugs to the proper location if necessary. See images below for reference.

Product Line (H2/H3 or DX2/DX3)	Pilot Type (Internal, External 12, External 14)	14 End Pilot Plug Location	12 End Pilot Plug Location
H2/H3	Internal	Bottom Hole	Bottom Hole
H2/H3	External 12 or 14	End Hole	End Hole
DX2/DX3 Single Solenoid	Internal	Bottom Hole	End Hole
DX2/DX3 Single Solenoid	External 14 Only	End Hole	End Hole
DX2/DX3 Double Solenoid	Internal	Bottom Hole	Bottom Hole
DX2/DX3 Double Solenoid	External 12 or 14	End Hole	End Hole



**⚠ WARNING**

**FAILURE OR 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 authorized distributors provide product and/or system options for further investigation by users having technical expertise. It is important that you analyze all aspects of your application, including consequences of any failure and review the information concerning the product or systems in the current product catalog. 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.

The products described herein, including without limitation, product features, specifications, designs, availability and pricing, are subject to change by Parker Hannifin Corporation and its subsidiaries at any time without notice.

**EXTRA COPIES OF THESE INSTRUCTIONS ARE AVAILABLE FOR INCLUSION IN EQUIPMENT / MAINTENANCE MANUALS THAT UTILIZE THESE PRODUCTS. CONTACT YOUR LOCAL REPRESENTATIVE.**

**Installation**

Remove pressure and electrical connections before installation.

1. After removing Valve from Base, install four (H2, H3) Mounting Studs (26) from Regulator Kit to the Base, torque finger tight.
2. **H2 Common & Independent Port Versions** – Place Interface Block Track Seal (29) into Interface Block Assembly (22).
- H3 All Versions & H2B Selector Regulator Version-** Place the Gasket (29) over the Studs and on the Base.
3. Install Regulator over Studs. Carefully engage the Electrical Plug (H2 5599-2, H3 5599-2).
4. Install Valve onto Regulator. Carefully engage the Electrical Plug (H2 5599-2, H3 5599-2).
5. Tighten Valve Bolts (20) as follows:

Valve Type	No. of Bolts	Wrench Size	Torque Nm (In.-Lb.)
H2	3 / 4	M5	13 to 15 (115 to 130)
H3	3 / 4	M6	14 to 16 (120 to 140)

6. Apply main pressure and check for leaks – repeat assembly if leaks are present.

**NOTE:** If both a sandwich flow control and sandwich regulator are to be installed, the flow control should be installed between the regulator and the base. Both sets of studs should be installed to base before installing the flow control.

**Lubrication**

Factory pre-lubed. If lubricating in service, use Parker F442 oil or equivalent paraffin based mineral oil with 150 to 200 SSU viscosity @ 100°F.

**⚠ CAUTION:** Do not use oils that are synthetic, reconstituted, have an alcohol content or a detergent additive.

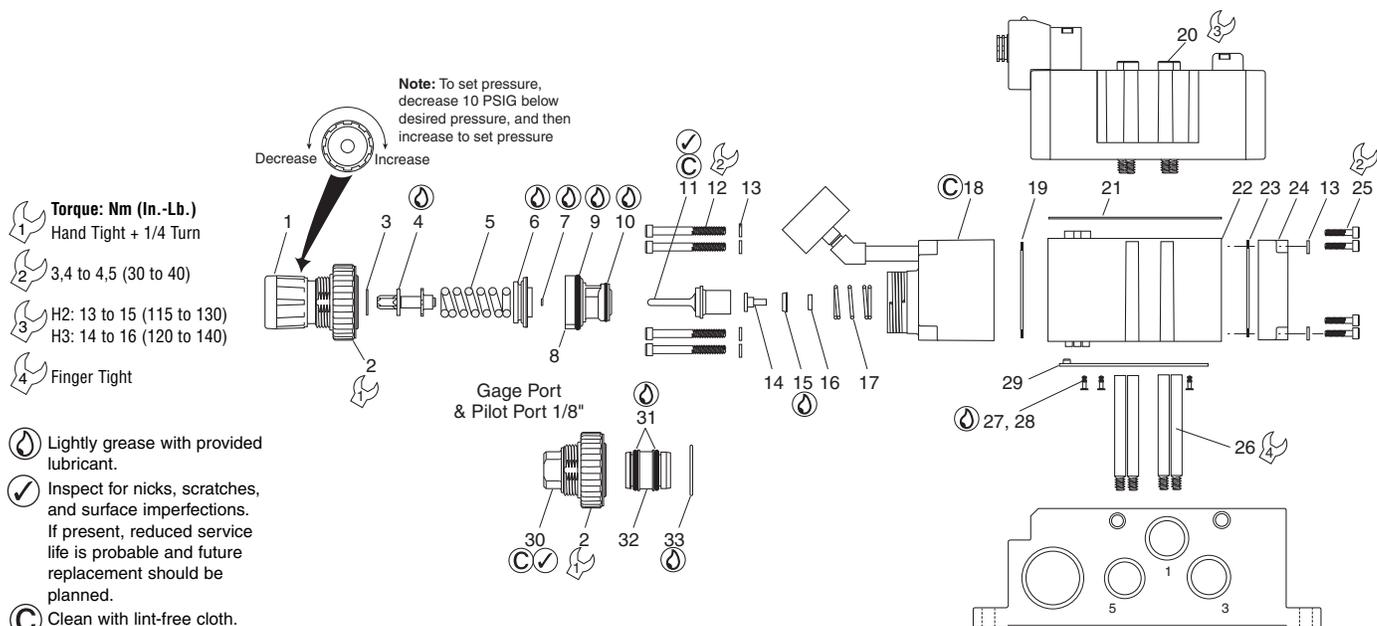
**Component List**

The components listed below are for identification purposes only. Some of these components are available in various Sandwich Regulator Kits, some are not available due to special factory assembly. Individual components are not sold separately since all kit components should be installed when serviced.

Item	Description	Item	Description
1	Bonnet Assembly	18	Housing, Regulator
2	Collar	19	Seal, Regulator Track
3	Thrust Washer	20	Screw, Valve Mounting - H2
4	Control Screw Assembly		Screw, Valve Mounting - H3
5	Spring, Control (30, 60 or 125 PSIG)	21	Gasket, Valve to Regulator Base
6	Diaphragm Assembly, Relieving (Includes vent hole)	22	Block Assembly, Interface
7	O-ring, Piston Vent	23	Seal, Bypass Cap Track
8	Seat Insert Assembly	24	Bypass Cap, Dual Pressure
9	O-ring, Upper Seat Insert	25	Screw, Bypass Cap
10	O-ring, Lower Seat Insert	26	Stud, Mounting
11	Poppet Assembly	27	Plug, Pilot (H2 Regulator)
12	Screw, Regulator Housing	28	Plug, Pilot (H3 Regulator, H2 Valves, H3 Valves)
13	M5 Lockwasher	29	Seal, Interface Block Track
14	Retainer, Seal	30	Bonnet, Air Pilot
15	Vee Packing	31	O-ring, Piston
16	Retainer, Backflow	32	Piston
17	Spring, Poppet Return	33	O-ring, Air Pilot Cap

**Sandwich Regulator Kits**

Kit Number	Description	Kit Includes Item# (Qty.)
PS4009P	Repair Kit (H2, HB)	6, 7, 8, 9, 10, 11, 17, 19 (2), 31, 33
PS4150030BP	Spring - 30 PSIG (H2, H3)	5
PS4150060BP	Spring - 60 PSIG (H2, H3)	5
PS4150125BP	Spring - 125 PSIG (H2, H3)	5
PS4109P	Pilot Plug Kit (H2)	27 (20)
PS4140P	Mounting Studs (H2)	26 (12)
PS4240P	Mounting Studs (H3)	26 (12)
PS4148BP	By-Pass Cap (H2, H3)	13 (4), 23, 24, 25 (4)
PS4154P	Regulator to Base Gasket Kit (H2 Common & Independent Port)	29 (5)
PS415401P	Regulator to Base Gasket (H2 Selector)	29 (5)
PS4254P	Regulator to Base Gasket Kit (H3)	29 (5)



**For all Instruction Sheets, go to [www.parker.com/pneumatics](http://www.parker.com/pneumatics)**

- V450P - H Series HA 26mm & HB 18mm ISO 15407-2 Valve Service
- V452P - H Series HA & HB ISO 15407-2 Sandwich Flow Controls
- V453P - H Series HA & HB ISO 15407-2 Manifold Installation
- V454P - H Series HA & HB Sandwich Regulators
- V467P - H Series H1 Sandwich Regulators

- V468P - H Series H1, H2 & H3, ISO 5599-1, 5599-2 Sandwich Flow Controls
- V469P - H Series H1, H2 & H3, ISO 5599-1, 5599-2 Subbase & Manifold Installation
- V470P - H Series H1, H2 & H3, ISO 5599-1, 5599-2 Valve Service
- V471P - H Series H2 & H3 Sandwich Regulators



**Pneumatic Division**  
Richland, Michigan 49083  
269-629-5000

**PDNSG-1**

**Pneumatic Division Safety Guide**

**ISSUED: August 1, 2006**

**Supersedes: June 1, 2006**

## **Safety Guide For Selecting And Using Pneumatic Division Products And Related Accessories**

### **⚠ WARNING:**

**FAILURE OR IMPROPER SELECTION OR IMPROPER USE OF PNEUMATIC DIVISION PRODUCTS, ASSEMBLIES OR RELATED ITEMS ("PRODUCTS") 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:**

- Unintended or mistimed cycling or motion of machine members or failure to cycle
- Work pieces or component parts being thrown off at high speeds.
- Failure of a device to function properly for example, failure to clamp or unclamp an associated item or device.
- Explosion
- Suddenly moving or falling objects.
- Release of toxic or otherwise injurious liquids or gasses.

Before selecting or using any of these Products, it is important that you read and follow the instructions below.

### **1. GENERAL INSTRUCTIONS**

- 1.1. Scope:** This safety guide is designed to cover general guidelines on the installation, use, and maintenance of Pneumatic Division Valves, FRLs (Filters, Pressure Regulators, and Lubricators), Vacuum products and related accessory components.
- 1.2. Fail-Safe:** Valves, FRLs, Vacuum products and their related components can and do fail without warning for many reasons. Design all systems and equipment in a fail-safe mode, so that failure of associated valves, FRLs or Vacuum products will not endanger persons or property.
- 1.3. Relevant International Standards:** For a good guide to the application of a broad spectrum of pneumatic fluid power devices see: ISO 4414:1998, Pneumatic Fluid Power – General Rules Relating to Systems. See [www.iso.org](http://www.iso.org) for ordering information.
- 1.4. Distribution:** Provide a copy of this safety guide to each person that is responsible for selection, installation, or use of Valves, FRLs or Vacuum products. Do not select, or use Parker valves, FRLs or vacuum products without thoroughly reading and understanding this safety guide as well as the specific Parker publications for the products considered or selected.
- 1.5. User Responsibility:** Due to the wide variety of operating conditions and applications for valves, FRLs, and vacuum products Parker and its distributors do not represent or warrant that any particular valve, FRL or vacuum product is suitable for any specific end use system. This safety guide does not analyze all technical parameters that must be considered in selecting a product. The user, through its own analysis and testing, is solely responsible for:
  - Making the final selection of the appropriate valve, FRL, Vacuum component, or accessory.
  - Assuring that all user's performance, endurance, maintenance, safety, and warning requirements are met and that the application presents no health or safety hazards.
  - Complying with all existing warning labels and / or providing all appropriate health and safety warnings on the equipment on which the valves, FRLs or Vacuum products are used; and,
  - Assuring compliance with all applicable government and industry standards.
- 1.6. Safety Devices:** Safety devices should not be removed, or defeated.
- 1.7. Warning Labels:** Warning labels should not be removed, painted over or otherwise obscured.
- 1.8. Additional Questions:** Call the appropriate Parker technical service department if you have any questions or require any additional information. See the Parker publication for the product being considered or used, or call 1-800-CPARKER, or go to [www.parker.com](http://www.parker.com), for telephone numbers of the appropriate technical service department.

### **2. PRODUCT SELECTION INSTRUCTIONS**

- 2.1. Flow Rate:** The flow rate requirements of a system are frequently the primary consideration when designing any pneumatic system. System components need to be able to provide adequate flow and pressure for the desired application.
- 2.2. Pressure Rating:** Never exceed the rated pressure of a product. Consult product labeling, Pneumatic Division catalogs or the instruction sheets supplied for maximum pressure ratings.
- 2.3. Temperature Rating:** Never exceed the temperature rating of a product. Excessive heat can shorten the life expectancy of a product and result in complete product failure.
- 2.4. Environment:** Many environmental conditions can affect the integrity and suitability of a product for a given application. Pneumatic Division products are designed for use in general purpose industrial applications. If these products are to be used in unusual circumstances such as direct sunlight and/or corrosive or caustic environments, such use can shorten the useful life and lead to premature failure of a product.
- 2.5. Lubrication and Compressor Carryover:** Some modern synthetic oils can and will attack nitrile seals. If there is any possibility of synthetic oils or greases migrating into the pneumatic components check for compatibility with the seal materials used. Consult the factory or product literature for materials of construction.
- 2.6. Polycarbonate Bowls and Sight Glasses:** To avoid potential polycarbonate bowl failures:
  - Do not locate polycarbonate bowls or sight glasses in areas where they could be subject to direct sunlight, impact blow, or temperatures outside of the rated range.
  - Do not expose or clean polycarbonate bowls with detergents, chlorinated hydro-carbons, ketones, esters or certain alcohols.
  - Do not use polycarbonate bowls or sight glasses in air systems where compressors are lubricated with fire resistant fluids such as phosphate ester and di-ester lubricants.

## Pneumatic Division Safety Guide

- 2.7. Chemical Compatibility:** For more information on plastic component chemical compatibility see Pneumatic Division technical bulletins Tec-3, Tec-4, and Tec-5
- 2.8. Product Rupture:** Product rupture can cause death, serious personal injury, and property damage.
- Do not connect pressure regulators or other Pneumatic Division products to bottled gas cylinders.
  - Do not exceed the maximum primary pressure rating of any pressure regulator or any system component.
  - Consult product labeling or product literature for pressure rating limitations.

### 3. PRODUCT ASSEMBLY AND INSTALLATION INSTRUCTIONS

- 3.1. Component Inspection:** Prior to assembly or installation a careful examination of the valves, FRLs or vacuum products must be performed. All components must be checked for correct style, size, and catalog number. DO NOT use any component that displays any signs of nonconformance.
- 3.2. Installation Instructions:** Parker published Installation Instructions must be followed for installation of Parker valves, FRLs and vacuum components. These instructions are provided with every Parker valve or FRL sold, or by calling 1-800-CPARKER, or at [www.parker.com](http://www.parker.com).
- 3.3. Air Supply:** The air supply or control medium supplied to Valves, FRLs and Vacuum components must be moisture-free if ambient temperature can drop below freezing

### 4. VALVE AND FRL MAINTENANCE AND REPLACEMENT INSTRUCTIONS

- 4.1. Maintenance:** Even with proper selection and installation, valve, FRL and vacuum products service life may be significantly reduced without a continuing maintenance program. The severity of the application, risk potential from a component failure, and experience with any known failures in the application or in similar applications should determine the frequency of inspections and the servicing or replacement of Pneumatic Division products so that products are replaced before any failure occurs. A maintenance program must be established and followed by the user and, at minimum, must include instructions 4.2 through 4.10.
- 4.2. Installation and Service Instructions:** Before attempting to service or replace any worn or damaged parts consult the appropriate Service Bulletin for the valve or FRL in question for the appropriate practices to service the unit in question. These Service and Installation Instructions are provided with every Parker valve and FRL sold, or are available by calling 1-800-CPARKER, or by accessing the Parker web site at [www.parker.com](http://www.parker.com).
- 4.3. Lockout / Tagout Procedures:** Be sure to follow all required lockout and tagout procedures when servicing equipment. For more information see: OSHA Standard – 29 CFR, Part 1910.147, Appendix A, The Control of Hazardous Energy – (Lockout / Tagout)
- 4.4. Visual Inspection:** Any of the following conditions requires immediate system shut down and replacement of worn or damaged components:
- Air leakage: Look and listen to see if there are any signs of visual damage to any of the components in the system. Leakage is an indication of worn or damaged components.
  - Damaged or degraded components: Look to see if there are any visible signs of wear or component degradation.
  - Kinked, crushed, or damaged hoses. Kinked hoses can result in restricted air flow and lead to unpredictable system behavior.
  - Any observed improper system or component function: Immediately shut down the system and correct malfunction.
  - Excessive dirt build-up: Dirt and clutter can mask potentially hazardous situations.

**Caution: Leak detection solutions should be rinsed off after use.**

- 4.5. Routine Maintenance Issues:**
- Remove excessive dirt, grime and clutter from work areas.
  - Make sure all required guards and shields are in place.
- 4.6. Functional Test:** Before initiating automatic operation, operate the system manually to make sure all required functions operate properly and safely.
- 4.7. Service or Replacement Intervals:** It is the user's responsibility to establish appropriate service intervals. Valves, FRLs and vacuum products contain components that age, harden, wear, and otherwise deteriorate over time. Environmental conditions can significantly accelerate this process. Valves, FRLs and vacuum components need to be serviced or replaced on routine intervals. Service intervals need to be established based on:
- Previous performance experiences.
  - Government and / or industrial standards.
  - When failures could result in unacceptable down time, equipment damage or personal injury risk.
- 4.8. Servicing or Replacing of any Worn or Damaged Parts:** To avoid unpredictable system behavior that can cause death, personal injury and property damage:
- Follow all government, state and local safety and servicing practices prior to service including but not limited to all OSHA Lockout Tagout procedures (OSHA Standard – 29 CFR, Part 1910.147, Appendix A, The Control of Hazardous Energy – Lockout / Tagout).
  - Disconnect electrical supply (when necessary) before installation, servicing, or conversion.
  - Disconnect air supply and depressurize all air lines connected to system and Pneumatic Division products before installation, service, or conversion.
  - Installation, servicing, and / or conversion of these products must be performed by knowledgeable personnel who understand how pneumatic products are to be applied.
  - After installation, servicing, or conversions air and electrical supplies (when necessary) should be connected and the product tested for proper function and leakage. If audible leakage is present, or if the product does not operate properly, do not put product or system into use.
  - Warnings and specifications on the product should not be covered or painted over. If masking is not possible, contact your local representative for replacement labels.
- 4.9. Putting Serviced System Back into Operation:** Follow the guidelines above and all relevant Installation and Maintenance Instructions supplied with the valve FRL or vacuum component to insure proper function of the system.