

Pneumatic Division

Richland, Michigan USA

www.parker.com/pneumatics**VALVAIR II VALVE SERIES**

Bulletin Number		Bulletin Description
<input type="checkbox"/>	V539P	L-Pilot Valve, Installation & Service Instructions
<input type="checkbox"/>	V540P Rev. 6	3/8" Single Operated Valve, Installation Instructions
<input type="checkbox"/>	V541P Rev. 6	3/8" 2-Position Double Operated Valve, Installation Instructions
<input type="checkbox"/>	V542P Rev. 7	3/8" 3-Position Double Operated Valve, Installation Instructions
<input type="checkbox"/>	V543P	3/8" Subbase & Manifold, Installation Instructions
<input type="checkbox"/>	V544P	3/8" Single Operated Valve, Service Instructions
<input type="checkbox"/>	V545P Rev. 3	3/8" 2-Position Double Operated Valve, Installation & Service Instructions
<input type="checkbox"/>	V546P	3/8" 3-Position Double Operated Valve, Service Instructions
<input type="checkbox"/>	V547P Rev. 3	3/8" Sandwich Regulator, Original M.P.C. Design, Installation & Service Instructions
<input type="checkbox"/>	V548P Rev. 4	3/8" Sandwich Regulator Level "A" Design, Installation Instructions
<input type="checkbox"/>	V549P Rev. 3	3/8" Sandwich Regulator Level 'C' Design 07 Series, Installation & Service Instructions
<input type="checkbox"/>	V560P Rev. 6	1" Single Operated Valve, Installation Instructions
<input type="checkbox"/>	V561P Rev. 6	1" 2-Position Double Operated Valve, Installation Instructions
<input type="checkbox"/>	V562P Rev. 6	1" 3-Position Double Operated Valve, Installation Instructions
<input type="checkbox"/>	V563P	1" Subbase & Manifold, Instructions
<input type="checkbox"/>	V564P Rev. 3	1" Single Operated Valve, Installation & Service Instructions
<input type="checkbox"/>	V566P	1" 3-Position Double Operated Valve, Service Instructions
<input type="checkbox"/>	V644P Rev. 7	L-Pilot and Operators, Installation & Service Instructions
<input type="checkbox"/>	V648P	Time Delay Modules - K705 Series, Installation Instructions
<input type="checkbox"/>	Safety Guide	PDN Safety Guide



Visit www.pdnplu.com for additional instruction sheets.



Pneumatic Division
Richland, Michigan 49083

Installation & Service Instructions V539P

L-Pilot Series Valves

ISSUED: June, 2003

Supersedes: None

Doc.# V-539P, ECN030466

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.

Introduction

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

Service Kit O-Rings

Service Kits **K352166** and **K352366** will now have both the Small and Large O-ring. Use the one that is appropriate for your product and discard the other.

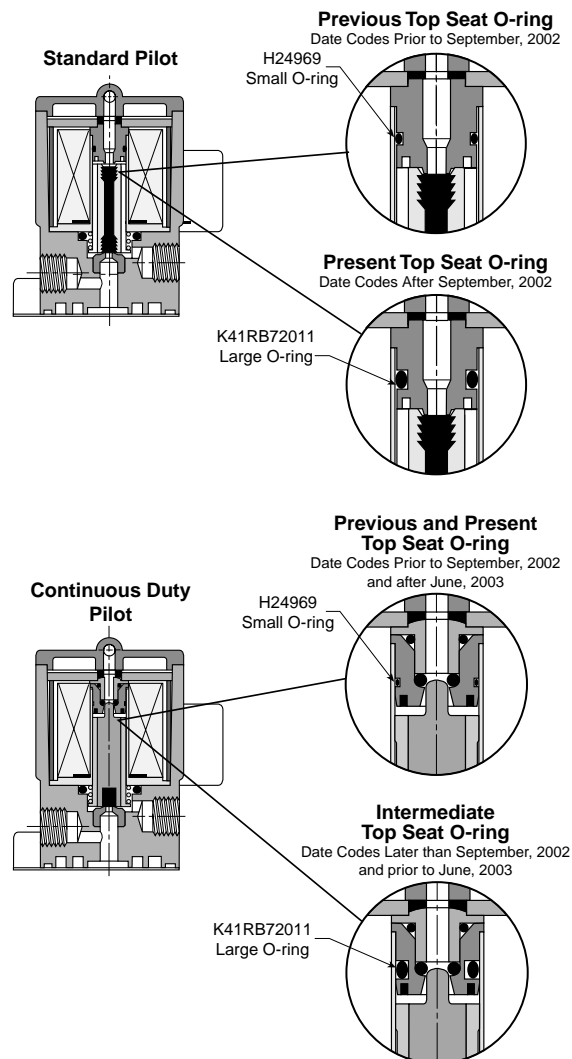
Top Seat O-rings supplied in this Service Kit:

As of September 2002 (Date Code 3702), the following series of Pilot Valves (Standard Service) have the Large O-ring.

K015	K175
K025	K185
K055	K225
K065	K235

As of June 2003 (Date Code 2503), the following series of Pilot Valves (Special Service) will have the Smaller O-ring.

K035	K085
K045	K245
K075	K255



WARNING

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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.



Pneumatic Division North America
Richland, MI 49083

Installation Instructions: V-540P

3/8" Valvair II/A4 Series Valves
Single Operated

ISSUED: May, 2001

Supersedes: November, 1998

ECN #9369 Rev. 6



WARNING

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

- Disconnect air supply and depressurize all air lines connected to this product before installation, servicing, or conversion.
- Disconnect electrical supply before installation, servicing or conversion.
- Operate within the manufacturer's specified pressure, temperature, voltage and other conditions listed in these instructions.
- Medium must be moisture-free if ambient temperature is below freezing.
- Service according to procedures listed on 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 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.

INSTALLATION / OPERATING INSTRUCTIONS

Valve 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. Mounting bolt torque 80-90 in-lbs for manifold and subbase mounting valves.

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

Life Expectancy - Normal multi-million cycle life expectancy of these valves is based on the use of properly filtered and lubricated air at room temperature. These valves are also designed to operate under non-lubricated conditions and will yield millions of maintenance free cycles.

Factory Pre-Lubrication - Valves are pre-lubricated at assembly with Sunaplex 781 or equivalent (Petroleum Base - Lithium Content) grease. Valves specified for vacuum service are lubricated with Dow Corning Valve Seal A.

In-Service Lubrication - In-service lubrication is not required; however, if lubrication is to be used, F442 oil is recommended. This oil is specially formulated to provide peak performance and maximum service life from all air operated equipment. Otherwise, use an air line lubricant (compatible with Nitrile & Polyurethane seals) which will readily atomize and be of the medium aniline type. Aniline point range must be between 180° and 220° F. Viscosity at 100° F: 140 - 170 SUS.

CAUTION: Do not use synthetic, reconstituted, or oils with an alcohol content or detergent additive.

Remote Pilot Operated Valves - Connect a 3-way normally open valve to the pilot signal port for normal valve logic (P → A, B → EB). Use of a 3-way normally closed pilot valve results in reverse logic (P → B; A → EA).

Override Operation - To operate override push and turn to a full stop (at least 90°).

APPLICATION LIMITS

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

Pressure Range for Solenoid Operated Valves

Media	Solenoid Pilot Supply Source							
	Internal Pilot Supply				External Pilot Supply			
		PSIG	BAR	kPa		PSIG	BAR	kPa
Air	Valve Inlet				Valve Inlet			
	Minimum	35	2.41	241	Minimum	0	0	0
	Maximum	140*	9.65	965	Maximum	250*	17.24	1724
	Pilot Supply Port				Pilot Supply Port			
	PLUGGED				Minimum	35	2.41	241
					Maximum	140*	9.65	965
Vacuum	DO NOT USE				Valve Inlet			
					Within 1" Hg of Perfect			
					Pilot Supply Port			
					Minimum	35	2.41	241
				Maximum	140*	9.65	965	

* Unless valve is equipped with 200 PSIG pilot valve (9th digit of model number is a "3", i.e. L6753810353 Valvair II Series only).

Pressure Range for Remote Pilot Operated Valves

Media	PSIG			BAR	kPa	PSIG			BAR	kPa
Air	Valve Inlet					Remote Pilot Signal				
	Minimum	35	2.41	241	Minimum	35	2.41	241		
	Maximum	250	17.24	1724	Maximum	200	13.79	1379		
Vacuum	DO NOT USE									

Operating Temperature Range:

Operator Type	Duty Cycle	Minimum Ambient Temperature	Maximum Ambient Temperature
Standard Service Solenoid	Intermittent	0°F (-18°C)	125°F (52°C)
	Continuous	0°F (-18°C)	100°F (38°C)
Special Service Solenoid	Intermittent	0°F (-18°C)	125°F (52°C)
	Continuous	0°F (-18°C)	125°F (52°C)
Remote Pilot	Not Applicable	0°F (-18°C)	200°F (93°C)

Voltage Range:

+10% to -15% of rating

WIRING INSTRUCTIONS

Units with flying leads

Either wire may be "Hot".



CAUTION: DC solenoids with indicator lights and/or arc suppression coils are polarity sensitive. Use red wire as positive.

Units with plug-in subbases or manifolds

Use wires marked "2" and "3" for connection to the solenoid. Either may be "Hot".



CAUTION: DC solenoids with indicator lights and/or arc suppression coils are polarity sensitive. Use wire number 3 for single solenoid valves as positive.

Earth ground: All electrically operated valves must be provided a proper earth ground. Connect to green wire from valve.

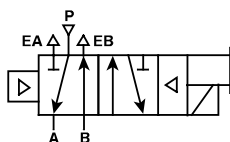


CAUTION: An interruption of 10 milliseconds or greater to the power supplied to the solenoid of a solenoid operated valve may cause the valve to shift. Provision must be made to prevent power interruption of this duration to avoid unintended, potentially hazardous, consequences.

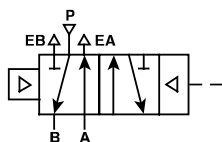
NOTE: In addition to the above instructions, follow all requirements for local and national electrical codes.

ANSI SYMBOLS

Single Solenoid Operated



Single Remote Pilot Operated



INSTALLATION

Manifold and Subbase Mounted Valves

See *Installation Instructions V-543P 3/8" & 1/2" Series Subbases and Manifolds* packed with subbases and manifolds.

Direct Pipe Ported Valves

PORT CONNECTIONS

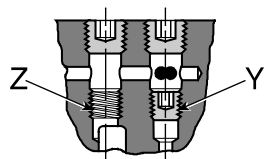
- 1) Connect a single inlet air supply to port "P". (For dual pressure applications, connect inlet air supplies to ports "EA" and "EB".)
- 2) Connect mufflers (or plumb exhaust) from ports "EA" and "EB" for single air supply. (For dual pressure applications, connect to port "P".)
- 3) Connect cylinder ports "A" and "B" to ends of cylinder or other device to be supplied air.

EXTERNAL PILOT SUPPLY CONNECTION

Use an external pilot for dual inlet air supplies, for inlet pressures below minimum valve ratings, or any other application requiring pilot pressure different than main supply pressure.

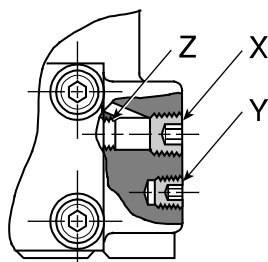
- 1) Perform **Conversion Procedure for External Pilot**.
- 2) Connect pilot supply source to port "X".

CONVERSION PROCEDURE FOR EXTERNAL PILOT



Base Mounted

For field conversion to external pilot supply, remove (2) 1/8" pipe plugs from top of valve body and move bottom plug from "Y" to "Z". Replace 1/8" pipe plugs and connect pilot pressure to the 1/4" pipe external pilot supply port "X" in subbase or manifold.



Direct Pipe Ported

For field conversion to external pilot supply, remove and discard 1/4" pipe plug in external pilot supply port "X". Move stored plug "Y" to location "Z" in bottom of pilot supply port "X". Then connect pilot pressure to port "X" in valve body.

SERVICE KITS / PARTS

Service Kit (Single Solenoid - Standard Service)	K352124
Service Kit (Single Solenoid - Special Service)	K352125
Service Kit (Single Remote Pilot Operated)	K352362
Pilot Valve / Remote Pilot Gasket	K183001
Body to Base Gasket	K183077
Indicator Light (24VDC - Line Mounting)	H19110
Indicator Light (24VDC - Base Mounting)	H19112
Indicator Light (120V / 60 HZ - Line Mounting)	H19102
Indicator Light (120V / 60 HZ - Base Mounting)	H19105

Direct Pipe Ported Valves

Voltage			Coil	
60 Hz	50 Hz	D. C.	19" Leads	72" Leads
12	--	--	K593007	K593178
24	--	6	K593003	K593179
--	24	--	K593015	K593181
--	36	--	K593016	K593183
--	--	12	K593010	K593182
--	--	24 (Standard)	K593014	K593184
--	--	24 (Arc Suppressed)	K593271	K593272
--	--	48	K593028	K593185
120	110	--	K593025	K593186
240	220	--	K593035	K593187
--	240	--	K593033	K593188
--	--	90	K593020	K593189
--	--	115	K593041	K593190
--	380	--	K593038	K593191

Base Mounting Valves

Voltage			Coil	
60 Hz	50 Hz	D. C.	No Light	With Light
12	--	--	K593052	--
24	--	6	K593048	--
--	24	--	K593061	--
--	36	--	K593062	--
--	--	12	K593055	--
--	--	24 (Standard)	K593060	K593274
--	--	24 (Arc Suppressed)	K593305	K593275
--	--	48	K593074	--
120	110	--	K593071	K593125
240	220	--	K593081	--
--	240	--	K593079	--

WARNING

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Pneumatic Division North America
Richland, MI 49083

Installation Instructions: V-541P

3/8" Valvair II/A4 Series Valves
Double Operated 2-Position

ISSUED: May, 2001

Supersedes: November, 1998

ECN #9369 Rev. 6

⚠ WARNING

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

- Disconnect air supply and depressurize all air lines connected to this product before installation, servicing, or conversion.
- Disconnect electrical supply before installation, servicing or conversion.
- Operate within the manufacturer's specified pressure, temperature, voltage and other conditions listed in these instructions.
- Medium must be moisture-free if ambient temperature is below freezing.
- Service according to procedures listed on 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 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.

INSTALLATION / OPERATING INSTRUCTIONS

Valve 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. Mounting bolt torque 80-90 in-lbs for manifold and subbase mounting valves.

⚠ CAUTION: Mount the valve so that the main valve spool is horizontal. When the valve is depressurized the spool could shift due to the effects of gravity and/or vibration.

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

Life Expectancy - Normal multi-million cycle life expectancy of these valves is based on the use of properly filtered and lubricated air at room temperature. These valves are also designed to operate under non-lubricated conditions and will yield millions of maintenance free cycles.

Factory Pre-Lubrication - Valves are pre-lubricated at assembly with Sunaplex 781 or equivalent (Petroleum Base - Lithium Content) grease. Valves specified for vacuum service are lubricated with Dow Corning Valve Seal A.

In-Service Lubrication - In-service lubrication is not required; however, if lubrication is to be used, F442 oil is recommended. This oil is specially formulated to provide peak performance and maximum service life from all air operated equipment. Otherwise, use an air line lubricant (compatible with Nitrile & Polyurethane seals) which will readily atomize and be of the medium aniline type. Aniline point range must be between 180° and 220° F. Viscosity at 100° F: 140 - 170 SUS.

⚠ CAUTION: Do not use synthetic, reconstituted, or oils with an alcohol content or detergent additive.

Override Operation - To operate override push and turn to a full stop (at least 90°).

APPLICATION LIMITS

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

Pressure Range for Solenoid Operated Valves

Media	Solenoid Pilot Supply Source			External Pilot Supply		
	Internal Pilot Supply			PSIG BAR kPa		
Air	Valve Inlet			Valve Inlet		
	Minimum	35	2.41	241	Minimum	0 0 0
	Maximum	140*	9.65	965	Maximum	250* 17.24 1724
	Pilot Supply Port PLUGGED			Pilot Supply Port		
Vacuum	DO NOT USE			Minimum	35	2.41 241
				Maximum	140*	9.65 965
				Valve Inlet Within 1" Hg of Perfect		
				Pilot Supply Port		
				Minimum	35	2.41 241
				Maximum	140*	9.65 965

* Unless valve is equipped with 200 PSIG pilot valve (9th digit of model number is a "3", i.e. L6553810353 Valvair II Series only).

Pressure Range for Remote Pilot Operated Valves

Media	PSIG	BAR	kPa	PSIG	BAR	kPa
Air	Valve Inlet			Remote Pilot Signal		
	Minimum	0	0	0	Minimum	35 2.41 241
	Maximum	250	17.24	1724	Maximum	200 13.79 1379
Vacuum	Valve Inlet Within 1" Hg of Perfect			Remote Pilot Signal		
				Minimum	35	2.41 241
				Maximum	200	13.79 1379

Operating Temperature Range:

Operator Type	Duty Cycle	Minimum Ambient Temperature	Maximum Ambient Temperature
Standard Service Solenoid	Intermittent	0°F (-18°C)	125°F (52°C)
	Continuous	0°F (-18°C)	100°F (38°C)
Special Service Solenoid	Intermittent	0°F (-18°C)	125°F (52°C)
	Continuous	0°F (-18°C)	125°F (52°C)
Remote Pilot	Not Applicable	0°F (-18°C)	200°F (93°C)

Voltage Range:

+10% to -15% of rating

WIRING INSTRUCTIONS

Units with flying leads

Either wire may be "Hot".

⚠ CAUTION: DC solenoids with indicator lights and/or arc suppression coils are polarity sensitive. Use red wire as positive.

Units with plug-in subbases or manifolds

Use wires marked "1" and "2" for Solenoid "A". Use wires marked "3" and "4" for solenoid "B". For units with DC solenoids and indicator lights or arc suppression coils, wires marked "1" and "3" are positive.

⚠ CAUTION: DC solenoids with indicator lights or arc suppression coils are polarity sensitive. Observe polarities indicated above.

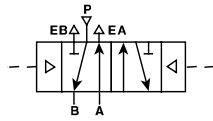
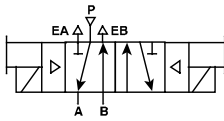
Earth ground: All electrically operated valves must be provided a proper earth ground. Connect to green wire from valve.

⚠ 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.

NOTE: In addition to the above instructions, follow all requirements for local and national electrical codes.

ANSI SYMBOLS

Double Solenoid Operated Double Remote Pilot Operated



INSTALLATION

Manifold and Subbase Mounted Valves

See *Installation Instructions V-543P 3/8" & 1/2" Series Subbases and Manifolds* packed with subbases and manifolds.

Direct Pipe Ported Valves

PORT CONNECTIONS

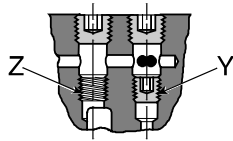
- 1) Connect a single inlet air supply to port "P". (For dual pressure applications, connect inlet air supplies to ports "EA" and "EB".)
- 2) Connect mufflers (or plumb exhaust) from ports "EA" and "EB" for single air supply. (For dual pressure applications, connect to port "P".)
- 3) Connect cylinder ports "A" and "B" to ends of cylinder or other device to be supplied air.

EXTERNAL PILOT SUPPLY CONNECTION

Use an external pilot for dual inlet air supplies, for inlet pressures below minimum valve ratings, or any other application requiring pilot pressure different than main supply pressure.

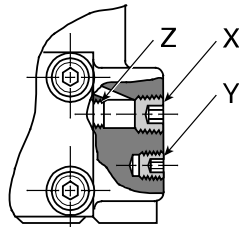
- 1) Perform **Conversion Procedure for External Pilot**.
- 2) Connect pilot supply source to port "X".

CONVERSION PROCEDURE FOR EXTERNAL PILOT



Base Mounted

For field conversion to external pilot supply, remove (2) 1/8" pipe plugs from top of valve body and move bottom plug from "Y" to "Z". Replace 1/8" pipe plugs and connect pilot pressure to the 1/4" pipe external pilot supply port "X" in subbase or manifold.



Direct Pipe Ported

For field conversion to external pilot supply, remove and discard 1/4" pipe plug in external pilot supply port "X". Move stored plug "Y" to location "Z" in bottom of pilot supply port "X". Then connect pilot pressure to port "X" in valve body.

SERVICE KITS / PARTS

Service Kit (Double Solenoid - Standard Service)	K352126
Service Kit (Double Solenoid - Special Service)	K352127
Service Kit (Double Remote Pilot Operated)	K352355
Pilot Valve / Remote Pilot Gasket	K183001
Body to Base Gasket	K183077
Indicator Light (24VDC - Line Mounting)	H19110
Indicator Light (24VDC - Base Mounting)	H19112
Indicator Light (120V / 60 HZ - Line Mounting)	H19102
Indicator Light (120V / 60 HZ - Base Mounting)	H19105

Direct Pipe Ported Valves

Voltage			Coil	
60 Hz	50 Hz	D. C.	19" Leads	72" Leads
12	--	--	K593007	K593178
24	--	6	K593003	K593179
--	24	--	K593015	K593181
--	36	--	K593016	K593183
--	--	12	K593010	K593182
--	--	24 (Standard)	K593014	K593184
--	--	24 (Arc Suppressed)	K593271	K593272
--	--	48	K593028	K593185
120	110	--	K593025	K593186
240	220	--	K593035	K593187
--	240	--	K593033	K593188
--	--	90	K593020	K593189
--	--	115	K593041	K593190
--	380	--	K593038	K593191

Base Mounting Valves

Voltage			Coil	
60 Hz	50 Hz	D. C.	No Light	With Light
12	--	--	K593052	--
24	--	6	K593048	--
--	24	--	K593061	--
--	36	--	K593062	--
--	--	12	K593055	--
--	--	24 (Standard)	K593060	K593274
--	--	24 (Arc Suppressed)	K593305	K593275
--	--	48	K593074	--
120	110	--	K593071	K593125
240	220	--	K593081	--
--	240	--	K593079	--



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Pneumatic Division North America
8676 East M-89
Richland, MI 49083

Installation Instructions: V-542P

3/8" Valvair II/A4 Series Valves
Double Operated 3-Position

ISSUED: May, 2001

Supersedes: November, 1998

ECN #9369 Rev. 7

WARNING

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

- Disconnect air supply and depressurize all air lines connected to this product before installation, servicing, or conversion.
- Disconnect electrical supply before installation, servicing or conversion.
- Operate within the manufacturer's specified pressure, temperature, voltage and other conditions listed in these instructions.
- Medium must be moisture-free if ambient temperature is below freezing.
- Service according to procedures listed on 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 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 label.

INSTALLATION / OPERATING INSTRUCTIONS

Valve 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. Mounting bolt torque 80-90 in-lbs for manifold and subbase mounting valves.

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

Life Expectancy - Normal multi-million cycle life expectancy of these valves is based on the use of properly filtered and lubricated air at room temperature. These valves are also designed to operate under non-lubricated conditions and will yield millions of maintenance free cycles.

Factory Pre-Lubrication - Valves are pre-lubricated at assembly with Sunaplex 781 or equivalent (Petroleum Base - Lithium Content) grease. Valves specified for vacuum service are lubricated with Dow Corning Valve Seal A.

In-Service Lubrication - In-service lubrication is not required; however, if lubrication is to be used, F442 oil is recommended. This oil is specially formulated to provide peak performance and maximum service life from all air operated equipment. Otherwise, use an air line lubricant (compatible with Nitrile & Polyurethane seals) which will readily atomize and be of the medium aniline type. Aniline point range must be between 180° and 220° F. Viscosity at 100° F: 140 - 170 SUS.



CAUTION: Do not use synthetic, reconstituted, or oils with an alcohol content or detergent additive.

Override Operation - To operate override push and turn to a full stop (at least 90°).

3-Position Valves are available in the following three classes of neutral or centered position (7th & 8th digits of model number):

"Class 21" - All ports blocked

"Class 22" - Pressure to cylinder ports (Exhaust ports blocked)

"Class 23" - Cylinder to exhaust ports (Inlet port blocked)

See the associated ANSI symbols on back.

APPLICATION LIMITS

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

Pressure Range for Solenoid Operated Valves

Media	Solenoid Pilot Supply Source							
	Internal Pilot Supply			External Pilot Supply				
		PSIG	BAR	kPa		PSIG	BAR	kPa
Air	Valve Inlet				Valve Inlet			
	Minimum	35	2.41	241	Minimum	0	0	0
	Maximum	140*	9.65	965	Maximum	250*	17.24	1724
	Pilot Supply Port				Pilot Supply Port			
	PLUGGED				Minimum	35	2.41	241
					Maximum	140*	9.65	965
Vacuum	DO NOT USE				Valve Inlet			
					Within 1" Hg of Perfect			
					Pilot Supply Port			
					Minimum	35	2.41	241
		140*	9.65	965				

* Unless valve is equipped with 200 PSIG pilot valve (9th digit of model number is a "3", i.e. L6653810353 Valvair II Series only).

Pressure Range for Remote Pilot Operated Valves

Media	PSIG BAR kPa			PSIG BAR kPa		
Air	Valve Inlet			Remote Pilot Signal		
	Minimum	0	0	0	Minimum	35 2.41 241
	Maximum	250	17.24	1724	Maximum	200 13.79 1379
Vacuum	Valve Inlet			Remote Pilot Signal		
	Within 1" Hg of Perfect			Minimum 35 2.41 241		
				Maximum 200 13.79 1379		

Operating Temperature Range:


Operator Type	Duty Cycle	Minimum Ambient Temperature	Maximum Ambient Temperature
Standard Service Solenoid	Intermittent	0°F (-18°C)	125°F (52°C)
	Continuous	0°F (-18°C)	100°F (38°C)
Special Service Solenoid	Intermittent	0°F (-18°C)	125°F (52°C)
	Continuous	0°F (-18°C)	125°F (52°C)
Remote Pilot	Not Applicable	0°F (-18°C)	200°F (93°C)

Voltage Range: +10% to -15% of rating

WIRING INSTRUCTIONS


Units with flying leads

Either wire may be "Hot".


 **CAUTION:** DC solenoids with indicator lights and/or arc suppression coils are polarity sensitive. Use red wire as positive.

Units with plug-in subbases or manifolds

Use wires marked "1" and "2" for Solenoid "A". Use wires marked "3" and "4" for solenoid "B". For units with DC solenoids and indicator lights or arc suppression coils, wires marked "1" and "3" are positive.


 **CAUTION:** DC solenoids with indicator lights or arc suppression coils are polarity sensitive. Observe polarities indicated above.

Earth ground: All electrically operated valves must be provided a proper earth ground. Connect to green wire from valve.

 **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.

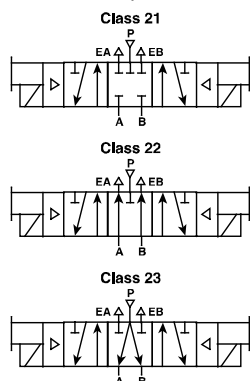
NOTE: In addition to the above instructions, follow all requirements for local and national electrical codes.

Remote Pilot Operated Valves require the use of two normally open pilot signal valves to ensure that the spool returns to the center position upon removal of electrical power from both pilot signal valves. This is because the valve is designed to use pressure instead of springs to perform this function.

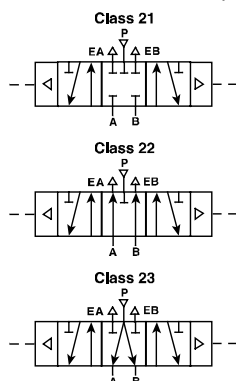
 **CAUTION:** Failure to use two normally open pilot signal valves could result in the valve remaining in some position other than centered upon removal of electrical power from both pilot signal valves.

ANSI SYMBOLS

Double Solenoid Operated



Double Remote Pilot Operated



INSTALLATION

Manifold and Subbase Mounted Valves

See *Installation Instructions V-543P 1/2" Series Subbases and Manifolds* packed with subbases and manifolds.

Direct Pipe Ported Valves

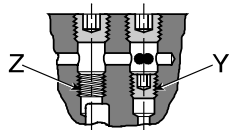
PORT CONNECTIONS

- 1) Connect a single inlet air supply to port "P". (For dual pressure applications, connect inlet air supplies to ports "EA" and "EB".)
- 2) Connect mufflers (or plumb exhaust) from ports "EA" and "EB" for single air supply. (For dual pressure applications, connect to port "P".)
- 3) Connect cylinder ports "A" and "B" to ends of cylinder or other device to be supplied air.

CONVERSION PROCEDURE FOR EXTERNAL PILOT

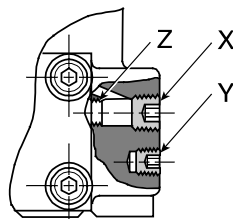
Base Mounted

For field conversion to external pilot supply, remove (2) 1/8" pipe plugs from top of valve body and move bottom plug from "Y" to "Z". Replace 1/8" pipe plugs and connect pilot pressure to the 1/4" pipe external pilot supply port "X" in subbase or manifold.



Direct Pipe Ported

For field conversion to external pilot supply, remove and discard 1/4" pipe plug in external pilot supply port "X". Move stored plug "Y" to location "Z" in bottom of pilot supply port "X". Then connect pilot pressure to port "X" in valve body.



EXTERNAL PILOT SUPPLY CONNECTION

Use an external pilot for dual inlet air supplies, for inlet pressures below minimum valve ratings, or any other application requiring pilot pressure different than main supply pressure.

- 1) Perform **Conversion Procedure for External Pilot**.
- 2) Connect pilot supply source to port "X".

SERVICE KITS / PARTS

Service Kit (Double Solenoid - Standard Service)	K352126
Service Kit (Double Solenoid - Special Service)	K352127
Service Kit (Double Remote Pilot Operated)	K352355
Pilot Valve / Remote Pilot Gasket	K183001
Body to Base Gasket	K183077
Indicator Light (24VDC - Line Mounting)	H19110
Indicator Light (24VDC - Base Mounting)	H19112
Indicator Light (120V / 60 HZ - Line Mounting)	H19102
Indicator Light (120V / 60 HZ - Base Mounting)	H19105

Direct Pipe Ported Valves

Voltage			Coil	
60 Hz	50 Hz	D. C.	19" Leads	72" Leads
12	--	--	K593007	K593178
24	--	6	K593003	K593179
--	24	--	K593015	K593181
--	36	--	K593016	K593183
--	--	12	K593010	K593182
--	--	24 (Standard)	K593014	K593184
--	--	24 (Arc Suppressed)	K593271	K593272
--	--	48	K593028	K593185
120	110	--	K593025	K593186
240	220	--	K593035	K593187
--	240	--	K593033	K593188
--	--	90	K593020	K593189
--	--	115	K593041	K593190
--	380	--	K593038	K593191

Base Mounting Valves

Voltage			Coil	
60 Hz	50 Hz	D. C.	No Light	With Light
12	--	--	K593052	--
24	--	6	K593048	--
--	24	--	K593061	--
--	36	--	K593062	--
--	--	12	K593055	--
--	--	24 (Standard)	K593060	K593274
--	--	24 (Arc Suppressed)	K593305	K593275
--	--	48	K593074	--
120	110	--	K593071	K593125
240	220	--	K593081	--
--	240	--	K593079	--



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 system 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 INSTRUCTION MANUALS THAT UTILIZE THESE PRODUCTS. CONTACT YOUR LOCAL REPRESENTATIVE.



Pneumatic Division North America
Richland, MI 49083

Installation Instructions: V-543P

3/8" Valvair II/A4/A5 Series and 1/2"
SK200 Subbases and Manifolds

ISSUED: November, 1998

Supersedes: K583-276, April 1995

ECN #8927



WARNING

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

- Disconnect air supply and depressurize all air lines connected to this product before installation, servicing, or conversion.
- Disconnect electrical supply before installation, servicing or conversion.
- Operate within the manufacturer's specified pressure, temperature, voltage and other conditions listed in these instructions.
- Medium must be moisture-free if ambient temperature is below freezing.
- Service according to procedures listed on service instruction sheets.
- 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 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.

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 instructions packed with (or label on) valve.

WIRING INSTRUCTIONS

Single Solenoid: Use wires marked "2" and "3" for connection to the solenoid. For units with DC solenoids and indicator lights or arc suppression coils, wire marked "3" is positive.

Double Solenoid: Use wires marked "1" and "2" for Solenoid "A". Use wires marked "3" and "4" for Solenoid "B". For units with DC solenoids and indicator lights or arc suppression coils, wires marked "1" and "3" are positive.



CAUTION: DC solenoids with indicator lights and/or arc suppression coils are polarity sensitive. Observe polarities indicated above.

Earth ground: All electrically operated valves must be provided a proper earth ground. Remove the end cover of the manifold or subbase and connect a ground lead to the green ground screw.

NOTE: In addition to the above instructions, follow all requirements for local and national electrical codes.

VALVE MOUNTING PROCEDURES

(Applies to both subbases and manifolds)

- 1) Clean top surface of subbase or manifold and bottom surface of valve body of any dirt or dust.
- 2) Position gasket on top of subbase or manifold, lining up all four mounting holes.

VALVE MOUNTING PROCEDURES –CONTINUED

- 3) Place valve on top of gasket, lining up all four mounting holes. Electrically operated valves also require pressing down on valve to seat electrical plug.
- 3) Insert (4) valve mounting screws and torque to 80-90 in.-lbs in progressive steps with a crisscross pattern.

SUBBASE PORT CONNECTIONS

(See reverse for Manifold Port Connections)

- 1) Connect a single inlet air supply to port "P". (For dual pressure applications, connect inlet air supplies to ports "EA" and "EB".)
- 2) Connect mufflers (or plumb exhaust) from ports "EA" and "EB" for single air supply. (For dual pressure applications, connect to port "P".)
- 3) Connect cylinder ports "A" and "B" to ends of cylinder or other device to be supplied air.

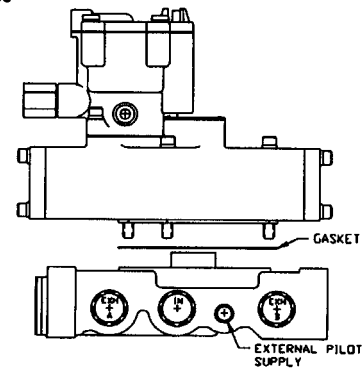
SUBBASE EXTERNAL PILOT SUPPLY CONNECTION

(See reverse for Manifold External Pilot Supply Connections.)

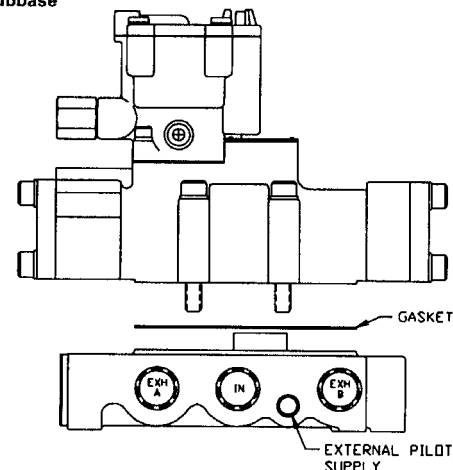
Use an external pilot for dual inlet air supplies, for inlet pressures below minimum valve ratings, or any other application requiring pilot pressure different than main supply pressure.

- 1) Perform pilot supply conversion outlined on Installation Instructions packed with valve.
- 2) Connect pilot supply source to port "X".

3/8" Subbase



1/2" Subbase



MANIFOLD APPLICATION

Valves may be gang manifolded up to any number of stations, providing that sufficient pressure is realized in the circuits down-stream of the valve outlets; and sufficient pressure is available for shifting the valves. Longer manifold gangs may require intermediate supports. Means to increase pressure levels include supply connections at both ends of the manifold gang, external pilot supplies and sequencing the valve operation to maximize time between different valve shifts.



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

MANIFOLD ASSEMBLY PROCEDURES

Manifolds may be assembled to one another either before or after assembling valves to manifolds. If inlet, exhaust or external pilot galleries are to be isolated from neighboring manifolds, be sure to follow **Manifold Isolation Procedures** before proceeding with this section.

- 1) If wiring is to be done in manifold junction boxes, rather than in an external junction box, loosen electrical cover mounting screws on end of manifolds, remove covers and pull wires out through cover openings.
- 2) Clean counterbores inside of manifold and mating surface of neighboring manifold.
- 3) Apply light coating of grease (in kit) to o-rings and place in counterbores.
- 4) Place manifold next to neighboring manifold. If wiring is to be done in an external junction box, pull wires through conduit gallery of neighboring manifold.
- 5) Insert hex head screws through clearance holes in one manifold and screw into neighboring manifold. Torque screws to 160-180 in.-lbs.
- 6) Connect a grounding wire to the green ground screw of a least one manifold and feed this wire through conduit gallery to either end of manifold.
- 7) Replace electrical covers and tighten cover screws.

MANIFOLD PORT CONNECTIONS

(See front for Subbase Port Connections)

- 1) Connect inlet air supply to manifold inlet gallery by one of the following methods:
All valves to be supplied with a common pressure: Connect air supply to port "P" on either end of manifold package and plug other end port "P" (or connect air supply to both ends for applications requiring a larger volume of air).
Two groups of valves each requiring a different pressure: Isolate valves into two groups using **Manifold Isolation Procedures**. Connect appropriate air supply to each end of manifold bank at port "P".
- 2) Connect mufflers (or plumb exhaust) at "E" ports.
- 3) Connect cylinder ports "A" and "B" to ends of cylinder or other device to be supplied air. Connections are commonly made to ports on end of manifold opposite wiring cavity. If bottom ports are more accessible to your application, plug end cylinder ports and remove plugs from bottom ports.

MANIFOLD EXTERNAL PILOT CONNECTIONS

(See front for Subbase External Pilot Supply Connections)

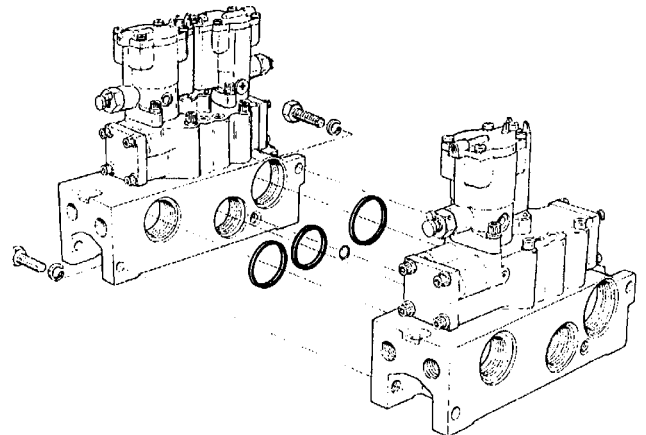
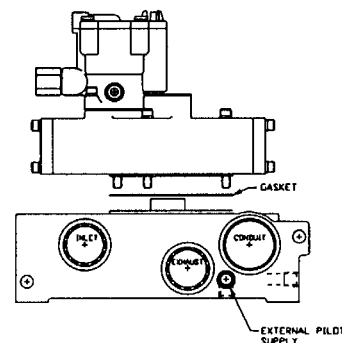
Use an external pilot for dual inlet air supplies, for inlet pressures below minimum valve ratings, or any other application requiring pilot pressure different than main supply pressure.

- 1) Perform pilot supply conversion outlined on Installation Instructions packed with valve.
- 2) Isolate external pilot supply gallery (designated by "X") to those valves requiring external pilot supply.
- 3) Connect pilot supply to the "X" port gallery, or to those stations requiring external pilot supply, at their alternate "X" port connection. Plug all open "X" ports.

MANIFOLD ISOLATION PROCEDURES

Inlet, exhaust and external pilot galleries may be isolated from those in neighboring manifolds through the use of flush pipe plugs.

- 1) Determine gallery and manifold position to be isolated.
- 2) Apply pipe sealant to threads of pipe plug.
- 3) Screw pipe plug into threaded end of gallery and tighten.



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.

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



Pneumatic Division North America
Richland, MI 49083

Service Instructions: V-544P

3/8" Valvair II/A4 Series Valves
Single Operated

ISSUED: November, 1998

Supersedes: K583-380, March, 1996

ECN #8927



WARNING

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

- Disconnect air supply and depressurize all air lines connected to this product before installation, servicing, or conversion.
- Disconnect electrical supply before installation, servicing or conversion.
- Operate within the manufacturer's specified pressure, temperature, voltage and other conditions listed in these instructions.
- Medium must be moisture-free if ambient temperature is below freezing.
- Service according to procedures listed on 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 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.

APPLICATION LIMITS

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

Pressure Range for Solenoid Operated Valves

Pressure Range for Solenoid Operated Valves										
Media	Solenoid Pilot Supply Source						External Pilot Supply			
	Internal Pilot Supply									
		PSIG	BAR	kPa			PSIG	BAR	kPa	
Air	Valve Inlet					Valve Inlet				
	Minimum	35	2.41	241	Minimum	0	0	0		
	Maximum	140*	9.65	965	Maximum	250*	17.24	1724		
	Pilot Supply Port					Pilot Supply Port				
	PLUGGED					Minimum	35	2.41	241	
						Maximum	140*	9.65	965	
Vacuum	DO NOT USE					Valve Inlet				
						Within 1" Hg of Perfect				
						Pilot Supply Port				
						Minimum	35	2.41	241	
						Maximum	140*	9.65	965	

* Unless valve is equipped with 200 PSIG pilot valve (9th digit of model number is a "3", i.e. L6753810353 Valvair II Series only).

Pressure Range for Remote Pilot Operated Valves

Media	PSIG			BAR			kPa		
	PSIG	BAR	kPa	PSIG	BAR	kPa	PSIG	BAR	kPa
Air	Valve Inlet			Remote Pilot Signal					
	Minimum	35	2.41	241	Minimum	35	2.41	241	
	Maximum	250	17.24	1724	Maximum	200	13.79	1379	
Vacuum	DO NOT USE								

Operating Temperature Range:

Operator Type	Duty Cycle	Minimum Ambient Temperature	Maximum Ambient Temperature
Std Service Solenoid	Intermittent	0°F (-18°C)	125°F (52°C)
	Continuous	0°F (-18°C)	100°F (38°C)
Special Service Solenoid	Intermittent	0°F (-18°C)	125°F (52°C)
	Continuous	0°F (-18°C)	125°F (52°C)
Remote Pilot	Not Applicable	0°F (-18°C)	200°F (93°C)

Voltage Range:

+10% to -15% of rating

WIRING INSTRUCTIONS

Units with flying leads

Either wire may be "Hot".



CAUTION: DC solenoids with indicator lights and/or arc suppression coils are polarity sensitive. Use red wire as positive.

WIRING INSTRUCTIONS (Continued)

Units with plug-in subbases or manifolds

Use wires marked "2" and "3" for connection to the solenoid. Either may be "Hot".



CAUTION: DC solenoids with indicator lights and/or arc suppression coils are polarity sensitive. Use wire number 3 for single solenoid valves as positive.

Earth ground: All electrically operated valves must be provided a proper earth ground. Connect to green wire from valve.

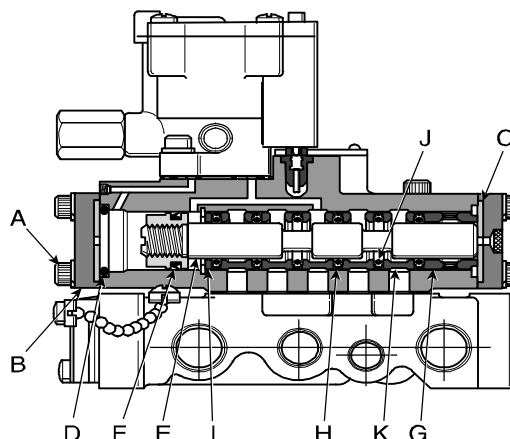
NOTE: In addition to the above instructions, follow all requirements for local and national electrical codes.

SERVICE PROCEDURES

NOTE: All cleaning of parts to be done with mineral spirits or equivalent cleaning solution. Grease should be a mineral based lubricant (Sunaplex 781). All parts showing nicks, scratches or other signs of wear or damage should be replaced.

Valve Service

- 1) Orient valve with Solenoid 'B' on the left hand side. (Letters 'A' and 'B' are cast into the sides of the body near each end.)
- 2) Loosen (4) socket head cap screws (A) on each end of valve until they disengage from body.
- 3) Remove end caps (B), bumpers (C) and seal (D). Discard seal.
- 4) Insert finger into right end of body and push spool assembly (E) out left end.
- 5) Remove and discard u-cup (F) from spool assembly. Clean spool assembly. Apply grease to new u-cup from kit and assemble to spool assembly (open end toward spool).
- 6) Remove long end spacer (G), o-rings (H & J), spacers (K) and short spacer ring (L). Discard o-rings. Clean spacers.
- 7) Apply lubricant (tube in kit) to inner and outer o-rings (H & J).
- 8) Reassemble short spacer ring (L), a set of o-rings (H & J) and one spacer (K). Alternatively assemble a set of o-rings and a spacer until all o-rings and spacers are used. Press each set firmly into place.
- 9) Reassemble long end spacer (G).
- 10) On right end of valve, assemble bumper (C), end cap (B), and tighten (4) socket head screws (A) to 50-65 in-lbs.
- 11) Slide spool assembly (E) into left end of valve.
- 12) On left end of valve, assemble seal (D), bumper (C), end cap (B), and tighten (4) socket head screws (A) to 50-65 in-lbs.



SERVICE PROCEDURES (CONTINUED)

Pilot Valve Service

See **Service Instructions V-644P L-Pilot Valves and Operators** packed with **Pilot Valve Service Kit K352166** included in this kit.

Coil / Indicator Light Replacement

See **Service Instructions V-644P L-Pilot Valves and Operators** packed with replacement coils and lights.

MANUAL OVERRIDE REPLACEMENT OR CONVERSION

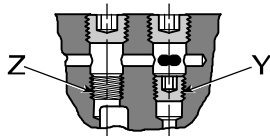
The following override assemblies are interchangeable and can be replaced or field converted:

Non-locking override	K162001
Locking override	K152003
Extended locking override	K152006

Remove override and clean internal threads in housing. Apply pipe sealant sparingly to threads of override housing and assemble override to pilot valve housing.

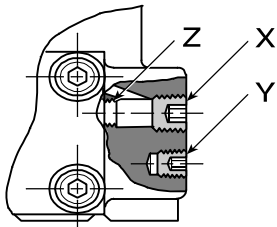
NOTE: Overrides are held out by air pressure and may not extend until pressure is reapplied to the valve.

CONVERSION PROCEDURE FOR EXTERNAL PILOT



Base Mounted

For field conversion to external pilot supply, remove (2) 1/8" pipe plugs from top of valve body and move bottom plug from "Y" to "Z". Replace 1/8" pipe plugs and connect pilot pressure to the 1/4" pipe external pilot supply port "X" in subbase or manifold.



Direct Pipe Ported

For field conversion to external pilot supply, remove and discard 1/4" pipe plug in external pilot supply port "X". Move stored plug "Y" to location "Z" in bottom of pilot supply port "X". Then connect pilot pressure to port "X" in valve body.

SERVICE KITS / PARTS

Service Kit (Single Solenoid - Standard Service)	K352124
Service Kit (Single Solenoid - Special Service)	K352125
Service Kit (Single Remote - Pilot Operated)	K352362
Pilot Valve / Remote Pilot Gasket	K183001
Body to Base Gasket	K183077
Indicator Light (24VDC - Line Mounting)	H19110
Indicator Light (24VDC - Base Mounting)	H19112
Indicator Light (120V / 60 HZ - Line Mounting)	H19102
Indicator Light (120V / 60 HZ - Base Mounting)	H19105

Direct Pipe Ported Valves

Voltage			Coil	
60 Hz	50 Hz	D. C.	19" Leads	72" Leads
12	--	--	K593007	K593178
24	--	6	K593003	K593179
--	24	--	K593015	K593181
--	36	--	K593016	K593183
--	--	12	K593010	K593182
--	--	24	K593014	K593184
--	--	24 (Arc Suppressed)	K593271	K593272
--	--	48	K593028	K593185
120	110	--	K593025	K593186
240	220	--	K593035	K593187
--	240	--	K593033	K593188
--	--	90	K593020	K593189
--	--	115	K593041	K593190
--	380	--	K593038	K593191

Base Mounting Valves

Voltage			Coil	
60 Hz	50 Hz	D. C.	No Light	With Light
12	--	--	K593052	--
24	--	6	K593048	--
--	24	--	K593061	--
--	36	--	K593062	--
--	--	12	K593055	--
--	--	24 (Standard)	K593060	K593274
--	--	24 (Arc Suppressed)	K593305	K593275
--	--	48	K593074	--
120	110	--	K593071	K593125
240	220	--	K593081	--
--	240	--	K593079	--

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 system 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 INSTRUCTION MANUALS THAT UTILIZE THESE PRODUCTS. CONTACT YOUR LOCAL REPRESENTATIVE.



Pneumatic Division
Richland, Michigan 49083

Installation & Service Instructions V545P

3/8" Valvair II / A4 Series Valves
Double Operated 2-Position

ISSUED: February, 2002

Supersedes: November, 2001

Doc.# V-545P, ECN# P28822, Rev. 3

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.

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.

Pressure Range for Solenoid Operated Valves

Media	Solenoid Pilot Supply Source					
	Internal Pilot Supply			External Pilot Supply		
	PSIG bar kPa			PSIG bar kPa		
Air	Valve Inlet			Valve Inlet		
	Minimum	35	2.41	241	Minimum	0 0 0
	Maximum	140*	9.65	965	Maximum	250* 17.24 1724
Vacuum	Pilot Supply Port			Pilot Supply Port		
	PLUGGED			Minimum		
				35 2.41 241		
Vacuum	DO NOT USE			Maximum		
				140* 9.65 965		
				Valve Inlet		
Vacuum				Within 1" Hg of Perfect		
				Pilot Supply Port		
				Minimum 35 2.41 241		
Vacuum				Maximum 140* 9.65 965		

* Unless valve is equipped with 200 PSIG pilot valve (9th digit of model number is a "3", i.e. L6553810353 3/8" Valvair II Series only).

Pressure Range for Remote Pilot Operated Valves

Media	PSIG bar kPa	PSIG bar kPa
Air	Valve Inlet	Remote Pilot Signal
	Minimum 0 0 0	Minimum 35 2.41 241
	Maximum 250 17.24 1724	Maximum 200 13.79 1379
Vacuum	Valve Inlet	Remote Pilot Signal
	Within 1" Hg of Perfect	Minimum 35 2.41 241
		Maximum 200 13.79 1379

Operating Temperature Range:


Operator Type	Duty Cycle	Minimum Ambient Temperature	Maximum Ambient Temperature
Standard Service Solenoid	Intermittent	0°F (-18°C)	125°F (52°C)
	Continuous	0°F (-18°C)	100°F (38°C)
Special Service Solenoid	Intermittent	0°F (-18°C)	125°F (52°C)
	Continuous	0°F (-18°C)	125°F (52°C)
Remote Pilot	Not Applicable	0°F (-18°C)	200°F (93°C)

Voltage Range: +10% to -15% of rating

Wiring Instructions


Units With Flying Leads

Either wire may be "Hot".

 **CAUTION:** DC solenoids with indicator lights and / or arc suppression coils are polarity sensitive. Use red wire as positive.

Units With Plug-in Subbases or Manifolds

Use wires marked "1" and "2" for Solenoid "A". Use wires marked "3" and "4" for solenoid "B". For units with DC solenoids and indicator lights or arc suppression coils, wires marked "1" and "3" are positive.

 **CAUTION:** DC solenoids with indicator lights and / or arc suppression coils are polarity sensitive. Observe polarities indicated above.

Earth ground: All electrically operated valves must be provided a proper earth ground. Connect to green wire from valve.

NOTE: In addition to the above instructions, follow all requirements for local and national electrical codes.

Service Procedures

NOTE: All cleaning of parts to be done with mineral spirits or equivalent cleaning solution. Grease should be a mineral based lubricant (Magnalube G). All parts showing nicks, scratches or other signs of wear or damage should be replaced.

WARNING

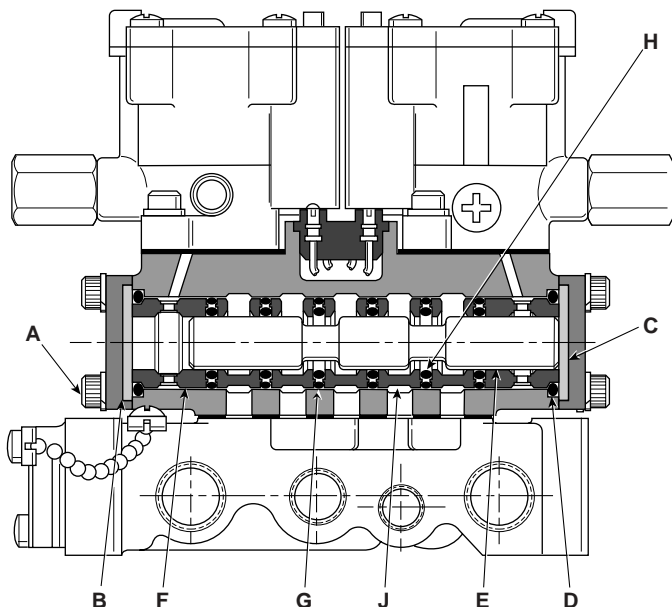
FAILURE OR IMPROPER SELECTION OR IMPROPER USE OF THE PRODUCTS AND/OR SYSTEMS DESCRIBED HEREIN OR RELATED ITEMS CAN CAUSE DEATH, PERSONAL INJURY AND PROPERTY DAMAGE.

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1. Loosen (4) socket head cap screws **(A)** on each end of valve until they disengage from body.
2. Remove end caps **(B)**, bumpers **(C)** and seals **(D)**. Discard seals.
3. Insert finger into one end of body and push spool **(E)** out other end. Clean spool.
4. Remove end spacers **(F)**, o-rings **(G & H)**, and spacers **(J)**. Discard o-rings. Clean spacers.
5. Apply lubricant (tube in kit) to inner and outer o-rings **(G & H)**.
6. Reassemble one end spacer **(F)**, a set of o-rings **(G & H)** and one spacer **(J)**. Alternatively assemble a set of o-rings and a spacer until all o-rings and spacers are used. Press each set firmly into place.
7. Reassemble other end spacer **(F)**. Apply lubricant to seals **(D)** and place in ends of body.
8. On one end of valve, assemble bumper **(C)**, end cap **(B)**, and tighten (4) socket head screws **(A)** to 50-65 in-lbs.
9. Slide spool **(E)** into open end of valve.
10. On other end of valve, assemble seal **(D)**, bumper **(C)**, end cap **(B)**, and tighten (4) socket head screws **(A)** to 50-65 in-lbs.



Pilot Valve Service

See **Service Instructions V-644P L-Pilot Valves and Operators** packed with **Pilot Valve Service Kit K352166** included in this kit.

Coil / Indicator Light Replacement

See **Service Instructions V-644P L-Pilot Valves and Operators** packed with replacement coils and lights.

Manual Override Replacement Or Conversion

The following override assemblies are interchangeable and can be replaced or field converted:

Non-locking override K162001

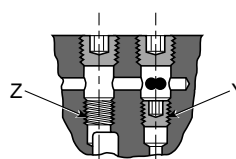
Locking override K152003

Extended locking override K152006

Remove override and clean internal threads in housing. Apply pipe sealant sparingly to threads of override housing and assemble override to pilot valve housing.

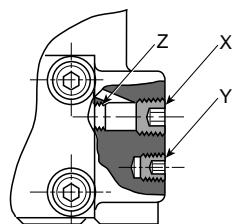
NOTE: Overrides are held out by air pressure and may not extend until pressure is reapplied to the valve.

Conversion Procedure For External Pilot



Base Mounted

For field conversion to external pilot supply, remove (2) 1/8" pipe plugs from top of valve body and move bottom plug from "Y" to "Z". Replace 1/8" pipe plugs and connect pilot pressure to the 1/4" pipe external pilot supply port "X" in subbase or manifold.



Direct Pipe Ported

For field conversion to external pilot supply, remove and discard 1/4" pipe plug in external pilot supply port "X". Move stored plug "Y" to location "Z" in bottom of pilot supply port "X". Then connect pilot pressure to port "X" in valve body.

Service Kits / Parts

Service Kit (Double Solenoid - Standard Service)	K352126
Service Kit (Double Solenoid - Special Service)	K352127
Service Kit (Double Remote - Pilot Operated)	K352355
Pilot Valve / Remote Pilot Gasket	K183001
Body to Base Gasket.....	K183077
Indicator Light (24VDC - Line Mounting)	H19110
Indicator Light (24VDC - Base Mounting)	H19112
Indicator Light (120V / 60 HZ - Line Mounting)	H19102
Indicator Light (120V / 60 HZ - Base Mounting)	H19105

Direct Pipe Ported Valves

Voltage			Coil	
60 Hz	50 Hz	D. C.	19" Leads	72" Leads
12	—	—	K593007	K593178
24	—	6	K593003	K593179
—	24	—	K593015	K593181
—	36	—	K593016	K593183
—	—	12	K593010	K593182
—	—	24 (Standard)	K593014	K593184
—	—	24 (Arc Suppressed)	K593271	K593272
—	—	48	K593028	K593185
120	110	—	K593025	K593186
240	220	—	K593035	K593187
—	240	—	K593033	K593188
—	—	90	K593020	K593189
—	—	115	K593041	K593190
—	380	—	K593038	K593191

Base Mounting Valves

Voltage			Coil	
60 Hz	50 Hz	D. C.	No Light	With Light
12	—	—	K593052	—
24	—	6	K593048	—
—	24	—	K593061	—
—	36	—	K593062	—
—	—	12	K593055	—
—	—	24 (Standard)	K593060	K593274
—	—	24 (Arc Suppressed)	K593305	K593275
—	—	48	K593074	—
120	110	—	K593071	K593125
240	220	—	K593081	—
—	240	—	K593079	—



Pneumatic Division North America
Richland, MI 49083

Service Instructions: V-546P

3/8" Valvair II/A4 Series Valves
Double Operated 3-Position

ISSUED: November, 1998

Supersedes: K583-382, March 1996

ECN #8927



WARNING

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

- Disconnect air supply and depressurize all air lines connected to this product before installation, servicing, or conversion.
- Disconnect electrical supply before installation, servicing or conversion.
- Operate within the manufacturer's specified pressure, temperature, voltage and other conditions listed in these instructions.
- Medium must be moisture-free if ambient temperature is below freezing.
- Service according to procedures listed on 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 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.

APPLICATION LIMITS

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

Pressure Range for Solenoid Operated Valves

Media	Solenoid Pilot Supply Source							
	Internal Pilot Supply				External Pilot Supply			
	PSIG	BAR	kPa		PSIG	BAR	kPa	
Air	Valve Inlet				Valve Inlet			
	Minimum	35	2.41	241	Minimum	0	0	0
	Maximum	140*	9.65	965	Maximum	250*	17.24	1724
	Pilot Supply Port				Pilot Supply Port			
	PLUGGED				Minimum	35	2.41	241
					Maximum	140*	9.65	965
Vacuum	DO NOT USE				Valve Inlet			
					Within 1" Hg of Perfect			
					Pilot Supply Port			
					Minimum	35	2.41	241
					Maximum	140*	9.65	965

* Unless valve is equipped with 200 PSIG pilot valve (9th digit of model number is a "3", i.e. L6653810353 3/8" Valvair II Series only).

Pressure Range for Remote Pilot Operated Valves

Media	PSIG			BAR			kPa		
Air	Valve Inlet			Remote Pilot Signal					
	Minimum	0	0	0	Minimum	35	2.41	241	
	Maximum	250	17.24	1724	Maximum	200	13.79	1379	
Vacuum	Valve Inlet			Remote Pilot Signal					
	Within 1" Hg of Perfect			Minimum	35	2.41	241		
				Maximum	200	13.79	1379		

Operating Temperature Range:

Operator Type	Duty Cycle	Minimum Ambient Temperature	Maximum Ambient Temperature
Std Service Solenoid	Intermittent	0°F (-18°C)	125°F (52°C)
	Continuous	0°F (-18°C)	100°F (38°C)
Special Service Solenoid	Intermittent	0°F (-18°C)	125°F (52°C)
	Continuous	0°F (-18°C)	125°F (52°C)
Remote Pilot	Not Applicable	0°F (-18°C)	200°F (93°C)

Voltage Range: +10% to -15% of rating

WIRING INSTRUCTIONS

Units with flying leads

Either wire may be "Hot".



CAUTION: DC solenoids with indicator lights and/or arc suppression coils are polarity sensitive. Use red wire as positive.

WIRING INSTRUCTIONS (Continued)

Units with plug-in subbases or manifolds

Use wires marked "1" and "2" for Solenoid "A". Use wires marked "3" and "4" for solenoid "B". For units with DC solenoids and indicator lights or arc suppression coils, wires marked "1" and "3" are positive.



CAUTION: DC solenoids with indicator lights or arc suppression coils are polarity sensitive. Observe polarities indicated above.

Earth ground: All electrically operated valves must be provided a proper earth ground. Connect to green wire from valve.

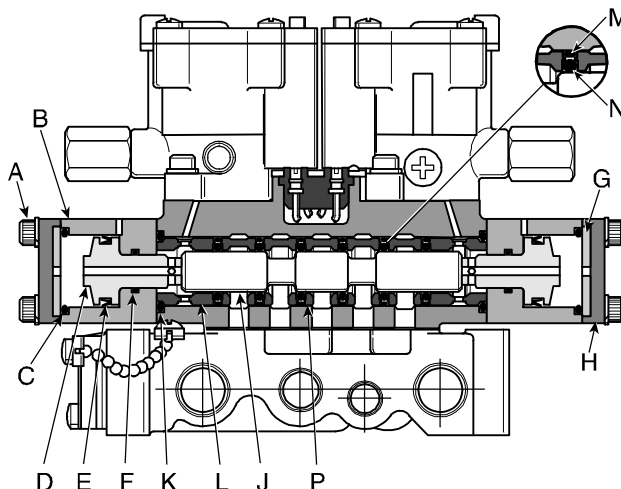
NOTE: In addition to the above instructions, follow all requirements for local and national electrical codes.

SERVICE PROCEDURES

NOTE: All cleaning of parts to be done with mineral spirits or equivalent cleaning solution. Grease should be a mineral based lubricant (Sunplex 781). All parts showing nicks, scratches or other signs of wear or damage should be replaced.

Valve Service

- 1) Loosen (4) socket head cap screws (A) on each end of valve until they detach end sections from body.
- 2) **End Section Disassembly** - Detach housing (B) from end section. Remove and discard seal (C). Push piston (D) out of housing. Remove and discard v-seals (E) and (F). Clean piston and housing.
- 3) **End Section Reassembly** - Apply lubricant (tube in kit) to v-seals (E & F) and piston bore in housing (B). Install v-seal (E) onto piston (D) with grooved end facing large diameter end of piston. Install v-seal (F) into housing with grooved end facing away from piston bore. Assemble piston (D) and seal (C) into housing. Place bumper (G) back into endcap (H) if it has become dislodged. Slide housing back over screws.
- 4) Insert finger into one end of body and push spool (J) out other end. Clean spool.
- 5) Remove seals (K), end spacers (L), o-rings (M & N), and spacers (P). Discard o-rings. Clean spacers and body bore.
- 6) Apply lubricant (tube in kit) to inner and outer o-rings (M & N).
- 7) Reassemble one end spacer (L), a set of o-rings (M & N) and one spacer (P). Alternatively assemble a set of o-rings and a spacer until all o-rings and spacers are used. Press each set firmly into place.
- 8) Reassemble other end spacer (L). Apply lubricant to seals (K) and place in ends of body.



Valve Service (Continued)

- 9) On one end of valve, assemble end section and tighten (4) socket head screws (A) to 50-65 in-lbs.
- 10) Slide spool (J) into open end of valve.
- 11) On other end of valve, assemble end section and tighten (4) socket head screws (A) to 50-65 in-lbs.

Pilot Valve Service

See **Service Instructions V-644P L-Pilot Valves and Operators** packed with **Pilot Valve Service Kit K352166** included in this kit.

Coil / Indicator Light Replacement

See **Service Instructions V-644P L-Pilot Valves and Operators** packed with replacement coils and lights.

MANUAL OVERRIDE REPLACEMENT OR CONVERSION

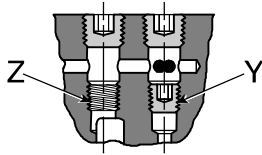
The following override assemblies are interchangeable and can be replaced or field converted:

Non-locking override	K162001
Locking override	K152003
Extended locking override	K152006

Remove override and clean internal threads in housing. Apply pipe sealant sparingly to threads of override housing and assemble override to pilot valve housing.

NOTE: Overrides are held out by air pressure and may not extend until pressure is reapplied to the valve.

CONVERSION PROCEDURE FOR EXTERNAL PILOT

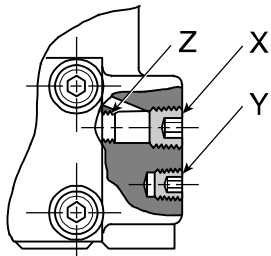


Base Mounted

For field conversion to external pilot supply, remove (2) 1/8" pipe plugs from top of valve body and move bottom plug from "Y" to "Z". Replace 1/8" pipe plugs and connect pilot pressure to the 1/4" pipe external pilot supply port "X" in subbase or manifold.

Direct Pipe Ported

For field conversion to external pilot supply, remove and discard 1/4" pipe plug in external pilot supply port "X". Move stored plug "Y" to location "Z" in bottom of pilot supply port "X". Then connect pilot pressure to port "X" in valve body.



SERVICE KITS / PARTS

Service Kit (Double Solenoid - Standard Service).	K352126
Service Kit (Double Solenoid - Special Service).	K352127
Service Kit (Double Remote - Pilot Operated).	K352355
Pilot Valve / Remote Pilot Gasket.	K183001
Body to Base Gasket.	K183077
Indicator Light (24VDC - Line Mounting).	H19110
Indicator Light (24VDC - Base Mounting).	H19112
Indicator Light (120V / 60 HZ - Line Mounting).	H19102
Indicator Light (120V / 60 HZ - Base Mounting).	H19105

Direct Pipe Ported Valves

Voltage			Coil	
60 Hz	50 Hz	D. C.	19" Leads	72" Leads
12	--	--	K593007	K593178
24	--	6	K593003	K593179
--	24	--	K593015	K593181
--	36	--	K593016	K593183
--	--	12	K593010	K593182
--	--	24 (Standard)	K593014	K593184
--	--	24 (Arc Suppressed)	K593271	K593272
--	--	48	K593028	K593185
120	110	--	K593025	K593186
240	220	--	K593035	K593187
--	240	--	K593033	K593188
--	--	90	K593020	K593189
--	--	115	K593041	K593190
--	380	--	K593038	K593191

Base Mounting Valves

Voltage			Coil	
60 Hz	50 Hz	D. C.	No Light	With Light
12	--	--	K593052	--
24	--	6	K593048	--
--	24	--	K593061	--
--	36	--	K593062	--
--	--	12	K593055	--
--	--	24 (Standard)	K593060	K593274
--	--	24 (Arc Suppressed)	K593305	K593275
--	--	48	K593074	--
120	110	--	K593071	K593125
240	220	--	K593081	--
--	240	--	K593079	--



WARNING

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Pneumatic Division
Richland, Michigan 49083

Installation & Service Instructions V547P

3/8" Valvair II Sandwich Regulator
Original M.P.C. Design

ISSUED: February, 2002

Supersedes: November, 2001

Doc.# V-547P, ECN# P28822, Rev. 3

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.

Introduction

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

Disassembly

1. Remove pressure from the regulator supply.
2. Remove regulator from manifold or mounting bracket, discard gasket (30).
3. Turn adjusting knob fully counter clockwise (manually adjusted models).
4. Remove four top cover screws (27) and cover (26), discard gasket (28). Remove pressure gage if installed.
5. Carefully remove upper piston assembly (9, 25, 17), main spring (19), lower piston assembly (18, 25, 15), spring (4), and pilot valve assembly (2, 3, 24).
6. Remove adjusting screw (17) from upper piston (9). Adjusting screw has left hand threads.
7. Remove and discard o-rings (25, 15, 24) from upper piston (9), lower piston (18), and pilot valve (2).
8. Unscrew bottom plug (8), remove o-ring (20) and discard.
9. Remove spring (7), main valve assembly (6), and screen (5).

Cleaning

1. Clean all parts with warm water and soap. Dry thoroughly.
2. Inspect all parts.
3. Replace damaged parts.

Lubrication

Prior to reassembly, lubricate the following items using Magnalube G (tube in kit).

- O-rings (25, 15, 20, and 24) Generous coating of lubricant.
Adjusting screw (17) Small amount on threads.
Upper piston (9) Wipe coat to bore for lower piston.
Body (1) Wipe coat to relief valve bore.
Valve (6) Wipe coat to pilot valve bore and o-rings on main valve.
Bottom plug (8) Wipe coat to main valve bore.

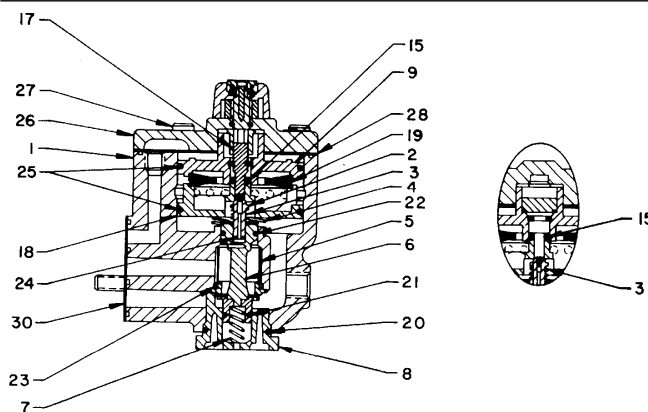
Reassembly

1. Install new o-rings (20, 25, 15, 24) on bottom plug (8), lower piston (18), upper piston (9), and pilot valve (2).
2. Assemble screen (5), main valve assembly (6), valve spring (7), and bottom plug (8), into bottom of body.
3. Install pilot valve spring (3) and pilot valve (2) into pilot valve bore in main valve.

4. Assemble the lower piston (18), main spring (19), and upper piston (9). Turn the adjusting screw (17) into the assembly until the tip of the screw is flush with the screw hole in the lower piston (Adjusting screw has left hand threads).
5. Carefully install spring (4), lower piston assembly (15, 18, 25), main spring (19), and upper piston assembly (9, 17, 25) into body.
6. Install new gasket (28) on body (1).
7. Turn adjusting knob (10) fully counterclockwise, then install cover (26) and bolts (27) to body.
8. Assemble pressure gage to body (1). NOTE: Slide mounting screws into holes in body before installing gage.
9. Install gasket (30) on body (1) and assemble regulator to manifold or mounting bracket.

Parts Included In K352367 Kit

Item	Description
28	Gasket
30	Gasket
15	O'ring For Upper And Lower Piston
20	O'ring For Valve Guide Plug
21	O'ring For Valve (Lower)
22	O'ring For Valve (Upper)
23	Seal (Square Cut) For Valve Assy
24	O'ring For Pilot Valve Assy
25	O'ring For Upper And Lower Piston (Outer)
	Tube Of Grease



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.



Pneumatic Division North America
Richland, MI 49083

Installation Instructions: V-548P

3/8" Valvair II/A4 Sandwich Regulator
Level 'A' Design

ISSUED: May, 2001

Supersedes: November, 1998

ECN #9369 Rev. 4

⚠ WARNING

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

- Disconnect electrical supply 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, voltage and other conditions listed in these instructions.
- Medium must be moisture-free if ambient temperature is below freezing.
- Service according to procedures listed on service instruction sheets.
- 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 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.

APPLICATION LIMITS

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

Operating pressure range:	PSIG	Bar	kPa
Maximum	140	9.65	965

Operating Temperature Range: 32°F (0°C) to 175°F (79°C)

NOTE: Solenoid Operated Valves limited to 125°F (52°C)

Voltage Range: +10% to -15% of rating
(Applicable only for solenoid operated valves)

NOTE: Some of the above ratings are those of the associated valve.

WIRING INSTRUCTIONS

Single Solenoid: Use wires marked "2" and "3" for connection to the solenoid. Either may be "Hot".

⚠ **Double Solenoid:** Use wires marked "1" and "2" for Solenoid "A". Either may be "Hot". Use wires marked "3" and "4" for Solenoid "B". Either may be "Hot".

CAUTION: DC solenoids with indicator lights and/or arc suppression coils are polarity sensitive. Use wire number 2 for single solenoid valves and wire numbers 1 and 4 for double solenoid valves as positive.

Earth ground: All electrically operated valves must be provided a proper earth ground. Remove the end cover of the manifold or subbase and connect a ground lead to the green ground screw.

NOTE: In addition to the above instructions, follow all requirements for local and national electrical codes.

NOTE: The above instructions are for the associated valve. The Sandwich Regulator contains a bridge plug for connecting the valve wiring to the base wiring.

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 Port Regulation - Provides (2) separately adjustable regulated air pressures, one to each of the valves exhaust passages. The valves exhaust (coming out of its inlet passage) is directed to the manifold or subbase exhaust ports.

Single Port Regulation - Provides adjustable regulated air pressure to one of the valves exhaust passages and full inlet pressure to the other. The valves exhaust (coming out of its inlet passage) is directed to the manifold or subbase exhaust port.



CAUTION: The reverse valve porting utilized with Independent Port and Single 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.

Factory Pre-Lubrication - Sandwich regulators are pre-lubricated at assembly with Sunaplex 781 grease.



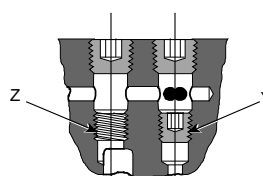
CAUTION: Do not use synthetic, reconstituted, or oils with an alcohol content or detergent additive.

NOTE: This is a constant bleed regulator. Air bleeding from the relief holes in the body may be audible. This is a design feature to insure high performance under a variety of inlet pressures and air flows.

INSTALLATION

If valve is not mounted to base skip steps 1 and 2.

- 1) Remove (4) body to base mounting bolts and lift valve body from subbase or manifold. Retain the gasket.
- 2) Thoroughly clean both valve body and base mounting surfaces of all foreign residue.
- 3) Place the gasket that came with the Sandwich Regulator on top of the manifold lining up the (4) mounting bolt holes.
- 4) Using the (4) button head screws, secure the Sandwich Regulator to the base torquing the bolts to 80-90 in-lbs.
- 5) Place the gasket removed from between the valve body and the subbase or manifold on top of the Sandwich Regulator lining up the (4) mounting bolt holes.



- 6) Using the (4) existing mounting bolts, secure the valve to the Sandwich Regulator base torquing the bolts to 80-90 in-lbs.
- 7) Remove (2) 1/8" pipe plugs from top of valve body and move bottom plug from "Y" to "Z". Replace 1/8" pipe plugs.

INSTALLATION (CONTINUED)

Remote Operated Only - Connect outlet of pilot regulator to 1/8" port on top of function block next to regulator. Perform outlet pressure adjustment on pilot regulator.

OUTLET PRESSURE ADJUSTMENT

(Applies to pilot regulator for Remote Operated Regulators.)

- 1) Before turning on system air pressure, turn adjusting knob counterclockwise until knob stops.
- 2) Turn on system pressure.
- 3) Turn adjusting knob clockwise until the desired outlet pressure is reached.
- 4) To avoid minor readjustment after making a change in pressure setting, always approach the desired pressure from a lower pressure. When reducing from a higher to a lower setting, first reduce to some pressure less than that desired, then bring up to the desired pressure.
- 5) If desired, a maximum or a minimum outlet pressure adjustment limit may be set. See the following instructions.

SETTING OUTLET PRESSURE ADJUSTMENT LIMITS

(Applies only to Manual Adjusting Regulators.)

The regulator adjusting knob can be set to limit the maximum **or** the minimum adjustable pressure setting of the regulator. For example, a regulator with a 10 to 125 psig outlet pressure range could be set to limit the maximum outlet pressure to 90 psig (providing an operating range up to 90 psig), or it could be set to limit the minimum outlet pressure to 25 psig (providing a minimum outlet pressure of 25 psig).

Regulators shipped from the factory:

- Allow pressure adjustment throughout the entire outlet pressure adjustment range.
- Have the red pressure set button in the adjustable position. To prevent the accidental setting of a pressure limit see the **Tamper Resistant Procedure** at right.

When the button is in the tamper resistant position, the letters **TR** are visible on the button: when the button is in the adjustable position, the letter **A** is visible.


HOW TO SET PRESSURE LIMITS WHEN THE PRESSURE SET BUTTON IS IN THE TAMPER RESISTANT POSITION

To Set a Maximum Pressure Limit

1. With primary pressure applied to the regulator, turn adjusting knob clockwise until the desired maximum outlet pressure is reached.
2. Hold adjusting knob, then use a 5/64" hex wrench to loosen button screw 4 to 5 turns.
3. Depress and hold button screw, then turn adjusting knob clockwise until it stops. Release button screw.
4. Hold adjustment knob and tighten button screw to 4-5 in-lbs. **Do not depress screw, as the adjustment limit will be affected.**
5. Turn adjusting knob fully counterclockwise.

To Set a Minimum Pressure Limit

1. With primary pressure applied to the regulator, turn adjusting knob clockwise until the desired minimum outlet pressure is reached.
2. Hold adjusting knob, then use a 5/64" hex wrench to loosen button screw 4 to 5 turns.
3. Depress and hold button screw, then turn the adjusting knob counterclockwise until it stops. Release button screw.
4. Hold adjustment knob and tighten screw to 4-5 in-lbs. **Do not depress screw, as the adjustment limit will be affected.**

 **CAUTION:** When the minimum adjustment limit is set above zero, the upper limit for adjustment increases correspondingly, and could possibly approach inlet pressure.


HOW TO SET PRESSURE LIMITS WHEN THE PRESSURE SET BUTTON IS IN THE ADJUSTABLE POSITION.

To Set a Maximum Pressure Limit

1. With primary pressure applied to the regulator, turn adjusting knob clockwise until the desired maximum outlet pressure is reached.
2. Depress and hold button screw, then turn the adjusting knob clockwise until it stops. Release button screw.
3. Turn adjusting knob fully counterclockwise.

To Set a Minimum Pressure Limit

1. With primary pressure applied to the regulator, turn adjusting knob clockwise until the desired minimum outlet pressure is reached.
2. Depress and hold button screw, then turn the adjusting knob counterclockwise until it stops. Release button screw.

 **CAUTION:** When the minimum adjustment limit is set above zero, the upper limit for adjustment increases correspondingly, and could possibly approach inlet pressure.

Tamper Resistant Procedure

Adjustment limits can be made tamper resistant by reversing the position of the red pressure set button so the end marked **TR** is up. To reverse the button:

1. Apply minimum 25 psig (1.7 bar) to the regulator. Turn adjusting knob fully clockwise, then hold adjusting knob and remove button screw using a 5/64" hex wrench. **Do not depress screw, as the adjustment limit will be affected.** Remove button, then reinstall with the end marked **TR** up.
2. Install button screw, taking care not to push screw in when tightening. Tighten to 4-5 in-lbs. Turn adjusting knob fully counterclockwise.

HOW TO RESET THE REGULATOR FOR NORMAL OPERATION

The regulator may be reset to normal operation (i.e., set to operate through the entire outlet pressure adjustment range by performing the following steps.

1. Make sure the red pressure set button is in the adjustable position (end marked **A** up). If the end marked **TR** is up, reverse the position of the button by performing steps 1 and 2 under the **Tamper Resistant Procedure** paragraph, but reinstall the button with the end marked **A** up.
2. Install the regulator in a compressed air test line with gages installed for observing inlet and outlet pressures. Inlet pressure should not exceed 140 psig (9.65 bar).
3. Turn adjusting knob fully counterclockwise (ccw), then slowly apply inlet pressure while observing the outlet pressure gage.

If outlet pressure is indicated with the knob fully ccw:

- a. Depress and hold the pressure set button, then turn adjusting knob clockwise (cw) until it stops and release button.
- b. Turn adjusting knob ccw until outlet pressure reaches zero. If outlet pressure does not reach zero when knob is turned fully ccw, repeat steps (a) and (b) until it does.
- c. When outlet pressure reaches zero, turn knob an additional 1/4 turn ccw. Depress pressure set button, then turn knob fully ccw and release button.
- d. Turn knob slowly cw and verify that outlet pressure starts after knob is turned 1/4 turn. Fine adjustment can be made by depressing the pressure set button and turning knob cw or ccw as needed.

If outlet pressure is not indicated with the knob fully ccw:

- a. Turn adjusting knob clockwise (cw) until outlet pressure is indicated.
- b. If outlet pressure is not indicated when the knob is turned fully cw, depress pressure set button, then turn adjusting knob ccw until it stops and release button. Repeat steps (a) and (b) until outlet pressure is indicated when the knob is turned cw.
- c. When outlet pressure starts, turn knob ccw 1/4 turn. Depress pressure set button, then turn knob fully ccw and release button.
- d. Turn knob slowly cw and verify that outlet pressure starts after knob is turned 1/4 turn. Fine adjustment can be made by depressing the pressure set button and turning knob cw or ccw as needed.

SERVICE INSTRUCTIONS-MANUAL ADJUSTING(See *Manual Adjusting Illustration on page 5*)**DISASSEMBLY**

- 1) Bleed off all downstream air pressure by turning regulator adjustment knob fully counterclockwise.
- 2) Remove pressure gauge and (2) socket head capscrews holding regulator to function block.
- 3) Remove (4) socket head capscrews and lift off cover assembly. Remove and discard gasket (Item 3).
- 4) Unscrew socket head cap screw from top of cover assembly using a 5/64" hex wrench. Remove button, spring, knob, links and coupling. Remove o-ring (Item 1) from coupling and discard.
- 5) Remove adjusting screw (Item 2) by turning clockwise and discard.
- 6) Remove upper and lower piston assemblies and spring. Remove and discard o-rings (Item 4 and Item 6).
- 7) Remove and discard pilot valve assembly (Item 9) and ball (Item 8). Remove and retain spring.
- 8) Remove bottom plug assembly. Remove and discard o-rings (Item 6) and Item 11).
- 9) Remove and discard spring (Item 12) and poppet valve assembly (Item 5).

CLEANING

- 1) Clean all parts with warm water and soap. Dry thoroughly.
- 2) Inspect all parts.
- 3) Replace damaged parts.

LUBRICATION

Lubricate the following items with Sunaplex 781 grease (tube in kit):

- All o-rings
- Bore for lower piston in upper piston
- Threads of adjusting screw (Item 2)
- Bore for poppet valve in bottom plug
- Bore and seat for poppet valve in body

REASSEMBLY

- 1) Assemble o-rings (Item 4 and Item 6) to upper and lower pistons. Place upper piston on lower piston (spring is sandwiched between). Assemble adjusting screw by turning counterclockwise until the tip is flush with the bottom of the lower piston. Place the spring and piston assemblies in the body.
- 2) Place o-ring (Item 1) on coupling and insert into cover. Place links, knob, spring and button into position on top of cover and secure with socket head cap screw. Tighten to 4-5 in.-lbs. Assemble button with the end marked "A" up.
- 3) Place gasket (Item 3) on top of body and cover assembly on top of gasket, making sure hex on adjusting screw lines up with the one in the coupling. Secure cover with (4) socket head capscrews and torque to 50-60 in.-lbs.
- 4) Press ball (Item 8) into pilot valve assembly (Item 9). Assemble o-rings (Item 10) to poppet valve assembly (Item 5). Assemble o-rings (Item 6 and Item 11) to bottom plug.
- 5) Place spring (Item 12) on pilot valve assembly and insert into poppet valve assembly. Insert spring and poppet valve assembly into bottom plug. Insert this collection of parts into body and tighten bottom plug to 20-30 in.-lbs.
- 6) Line up gasket (Item 7) and regulator on function block and assemble with (2) socket head capscrews tightened to 50-60 in.-lbs.
- 7) Sparingly coat threads of gauge with pipe sealant and tighten into regulator body.
- 8) Reapply pressure to unit and check for audible leakage at joints or out bleed holes.
- 9) Adjust outlet pressure per *Outlet Pressure Adjustment* procedure on page 3 of these instructions to verify proper function.
- 10) Set *Outlet Pressure Adjustment Limits* per procedure on page 3 of these instructions if this feature is desired.

SERVICE INSTRUCTIONS-REMOTE OPERATED(See *Remote Operated Illustration on page 5*)

- 1) Bleed off all downstream air pressure by turning regulator adjustment knob full counterclockwise on pilot regulator.
- 2) Remove pressure gauge and (2) socket head capscrews holding regulator to function block.
- 3) Remove (4) socket head capscrews, lift off cover assembly. Remove and discard gasket (Item 3).
- 4) Remove upper and lower piston assemblies and spring. Remove and discard o-rings (Item 4 and Item 6).
- 5) Remove bottom plug assembly. Remove and discard o-rings (Item 6 and Item 11).
- 6) Remove and discard spring (Item 12) and poppet valve assembly (Item 13).

CLEANING

- 1) Clean all parts with warm water and soap. Dry thoroughly.
- 2) Inspect all parts.
- 3) Replace damaged parts.

LUBRICATION

Lubricate the following items with Sunaplex 781 grease (tube in kit):

- All o-rings
- Bore for lower piston in upper piston
- Bore for poppet valve in bottom plug
- Bore and seat for poppet valve in body

REASSEMBLY

- 1) Assemble o-rings (Item 4 and Item 6) to upper and lower pistons. Place upper piston on lower piston (washers sandwiched between). Place the spring and piston assemblies in the body.
- 2) Place gasket (Item 3) on top of body and cover assembly on top of gasket. Secure cover with (4) socket head capscrews and torque to 50-60 in.-lbs.
- 3) Assemble o-rings (Item 10) to poppet valve assembly (Item 13). Assemble o-rings (Item 6 and Item 11) to bottom plug.
- 4) Insert spring (Item 12) and poppet valve assembly into bottom plug. Screw bottom plug into body and tighten to 20-30 in.-lbs.
- 5) Line up gasket (Item 7) and regulator on function block and assemble with (2) socket head capscrews tightened to 50-60 in.-lbs.
- 6) Sparingly coat threads of gauge with pipe sealant and tighten into regulator body.
- 7) Reapply pressure to unit and check for audible leakage at joints or out bleed holes.
- 8) Adjust outlet pressure per *Outlet Pressure Adjustment* procedure on page 2 of these instructions to verify proper function.


REGULATOR SPRING CONVERSION

- 1) Bleed off all downstream air pressure by turning regulator (or pilot regulator) adjustment knob fully counterclockwise.
- 2) Remove (4) socket head capscrews and lift off cover assembly and gasket (Item 3). Discard gasket.
- 3) Remove upper piston assembly and spring (Item 14). Replace spring (Item 14) with one for new pressure range.
- 4) Assemble upper piston assembly.
- 5) Place new gasket (Item 3 - purchased separately as K183080) on top of body and cover assembly on top of gasket. Secure cover with (4) socket head capscrews and tighten to 50-60 in.-lbs.
- 6) Reapply pressure to unit and check for audible leakage at joints or out bleed holes.
- 7) **Manual Adjusting Regulators Only** - If Outlet Pressure Adjustment Limits were set on this unit, you must reset it for normal operation after converting spring. See *How to Reset the Regulator for Normal Operation* procedure on page 2 of these instructions.
- 8) Adjust outlet pressure per *Outlet Pressure Adjustment* procedure on page 2 of these instructions to verify proper function.
- 9) **Manual Adjusting Regulators Only** - Set *Outlet Pressure Adjustment Limits* per procedure on page 2 of these instructions if this feature is desired.

Independent Port Regulator with 4-way, 3-position, All Ports Blocked Valve


Single Port Regulator with
4-way, 3-position, All Ports Blocked Valve
Supply Pressure at "A" / Regulated Pressure at "B"

Independent Port Regulator with
4-way, 3-position, Inlet to Cylinder Function

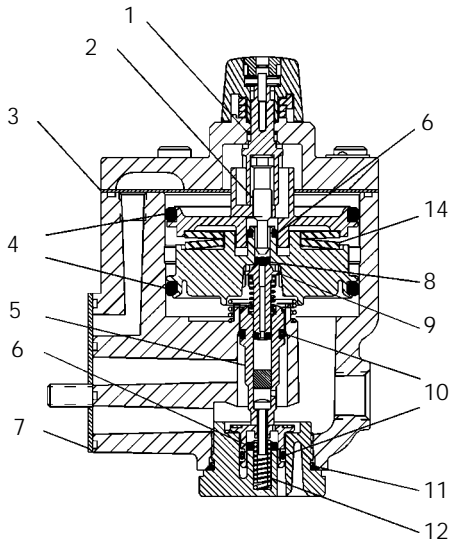
 **CAUTION:** Requires 4-way, 3-position,
Cylinder to Exhaust Valve

Single Port Regulator with
4-way, 3-position, All Ports Blocked Valve
Supply Pressure at "B" / Regulated Pressure at "A"

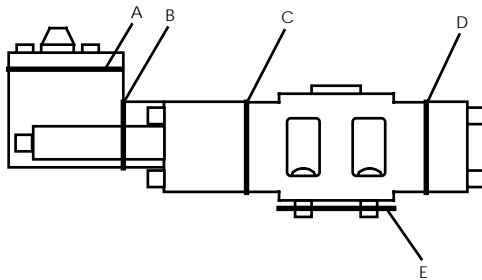
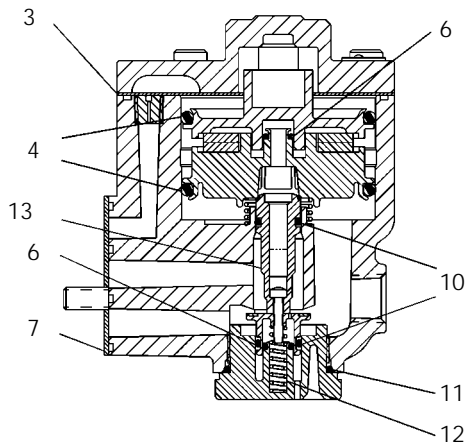
Independent Port Regulator with
4-way, 3-position, Cylinder to Exhaust Function

 **CAUTION:** Requires 4-way, 3-position,
Inlet to Cylinder Valve

Manual Adjusting



Remote Operated



Replacement Parts

Item No.	Part Number	Description
1	O	O-Ring For Coupling
2	O	Adjusting Screw
3	O ●	Gasket
4	O ●	O-Ring For Upper & Lower Piston (Outer)
5	O	Poppet Valve Assembly.
6	O ●	O-Ring
7	O ●	Gasket
8	O	Ball
9	O	Pilot Valve Assy.
10	O ●	O-Ring For Valve
11	O ●	O-Ring For Valve Guide
12	O ●	Spring
13	●	Poppet Valve Assy.
14	K473044 K473045 K473046	0-30 PSI Spring (Silver) 0-60 PSI Spring (Green) 0-125 PSI Spring (Yellow)

O Parts included in K352406 Service Kit for Manual Operated Modular Regulators.

● Parts included in K352407 Service Kit for Remote Operated Modular Regulators

Replacement Gaskets

Item No.	Part Number	Description
A	K183080	Gasket
B	K183081	Gasket
C	K183082 K183084	Gasket (Common Port) Gasket (Single & Independent Port)
D	K183082 K183083	Gasket (Common Port) Gasket (Single Port)
E	K183077	Gasket

Replacement Gauges

PSI	STANDARD	LIQUID FILLED
0 - 60	3560 0400	H032 57
0 - 160	3560 0410	H032 58

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Pneumatic Division North America
Richland, MI 49083

Installation/Service Instructions: V-549P

3/8" Valvair II/A4 Sandwich Regulator
Level 'C' Design-07 Series

ISSUED: May, 2001

Supersedes: November, 1998

ECN #9369 Rev. 3

WARNING

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- Disconnect air supply and depressurize all air lines connected to this product before installation, servicing, or conversion.
- Disconnect electrical supply before installation, servicing or conversion.
- Operate within the manufacturer's specified pressure, temperature, voltage and other conditions listed in these instructions.
- Medium must be moisture-free if ambient temperature is below freezing.
- Service according to procedures listed on service instruction sheets.
- 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 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.
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APPLICATION LIMITS

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

Operating pressure range:	PSIG	Bar	kPa
Maximum	140	9.65	965

Operating Temperature Range: 32°F (0°C) to 175°F (79°C)

NOTE: Solenoid Operated Valves limited to 125°F (52°C)


Voltage Range: +10% to -15% of rating
(Applicable only for solenoid operated valves)

NOTE: Some of the above ratings are those of the associated valve.

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 **CAUTION:** DC solenoids with indicator lights and/or arc suppression coils are polarity sensitive. Use wire number 2 for single solenoid valves and wire numbers 1 and 4 for double solenoid valves as positive.

Earth ground: All electrically operated valves must be provided a proper earth ground. Remove the end cover of the manifold or subbase and connect a ground lead to the green ground screw.

NOTE: In addition to the above instructions, follow all requirements for local and national electrical codes.

NOTE: The above instructions are for the associated valve. The Sandwich Regulator contains a bridge plug for connecting the valve wiring to the base wiring.


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:

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Single Port Regulation - Provides adjustable regulated air pressure to one of the valves exhaust passages and full inlet pressure to the other. The valves exhaust (coming out of its inlet passage) is directed to the manifold or subbase exhaust port.

 **CAUTION:** The reverse valve porting utilized with Independent Port and Single 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.

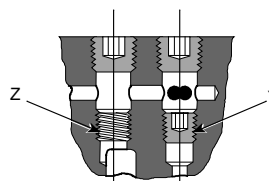
Factory Pre-Lubrication - Sandwich regulators are pre-lubricated at assembly with Marfak MP-2 grease.

 **CAUTION:** Do not use synthetic, reconstituted, or oils with an alcohol content or detergent additive.

INSTALLATION

If valve is not mounted to base skip steps 1 and 2.

- 1) Remove (4) body to base mounting bolts and lift valve body from subbase or manifold. Retain the gasket.
- 2) Thoroughly clean both valve body and base mounting surfaces of all foreign residue.
- 3) Place the gasket that came with the Sandwich Regulator on top of the manifold lining up the (4) mounting bolt holes.
- 4) Using the (4) button head screws, secure the Sandwich Regulator to the base torquing the bolts to 80-90 in-lbs.
- 5) Place the gasket removed from between the valve body and the subbase or manifold on top of the Sandwich Regulator lining up the (4) mounting bolt holes.



- 6) Using the (4) existing mounting bolts, secure the valve to the Sandwich Regulator base torquing the bolts to 80-90 in-lbs.
- 7) Remove (2) 1/8" pipe plugs from top of valve body and move bottom plug from "Y" to "Z". Replace 1/8" pipe plugs.

Remote Operated Only - Connect outlet of pilot regulator to 1/4" port in end of regulator. Perform outlet pressure adjustment on pilot regulator.

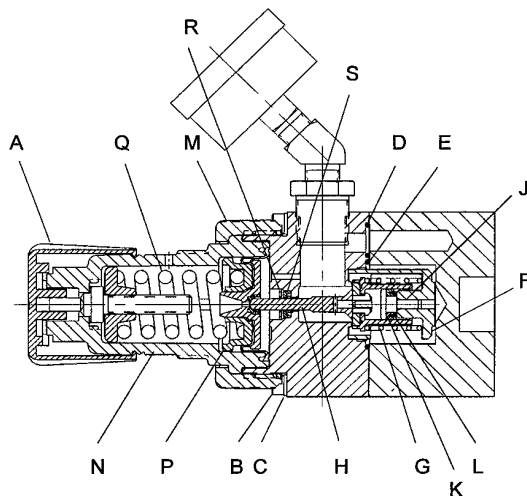
INSTALLATION (CONTINUED)

OUTLET PRESSURE ADJUSTMENT

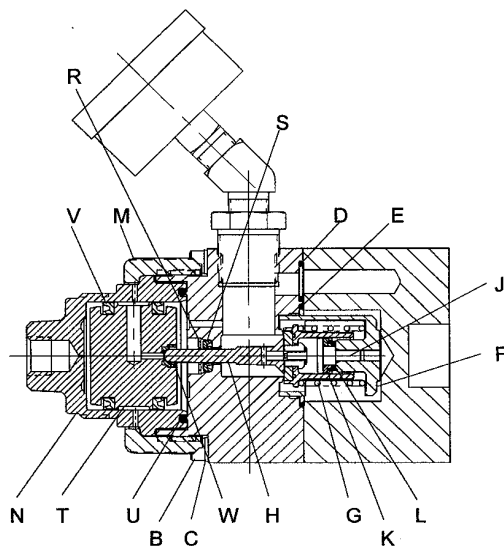
(Applies to pilot regulator for Remote Operated Regulators.)

- 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 80 PSIG to 60 PSIG is best accomplished by dropping the secondary pressure to 50 PSIG, then adjusting upward to 60 PSIG.
- 3) When desired secondary pressure setting has been reached, push the adjusting knob down to lock the adjusting knob.

Manually Adjusting Regulators



Remote Operated Regulators



SERVICE INSTRUCTIONS

DISASSEMBLY

- 1) Shut off air supply and depressurize the unit.
- 2) Disengage the adjusting knob (A) by pulling outward. Turn adjusting knob (A) counterclockwise until the compression is released from the pressure control spring (Q). Perform this step at the pilot regulator for remote operated regulators.
- 3) Remove (4) socket head cap screws (B) and lock washers (C) and remove regulator from function block.
- 4) Remove and discard o-rings (D & E).
- 5) Unscrew poppet retainer (F). Remove and discard spring (G) and poppet assembly (H).
- 6) Remove seal retainer (J). Remove and discard vee packing (K) and backflow retainer (L).
- 7) Unscrew the collar (M) and remove the bonnet assembly (N).
- 8) **Manually Adjusting Regulators** - Remove and discard diaphragm assembly (P). Remove and retain spring (Q).
Remote Operated Regulators - Remove piston (T) from bonnet (N). Remove and discard o-ring (U), vee-packings (V) and vent seal (W).
- 9) Remove retaining ring (R) from regulator body using needle nosed pliers and discard. Remove and discard vee packing (S).

CLEANING AND LUBRICATION

- 1) Clean all parts with warm water and soap. Dry thoroughly.
- 2) Inspect all parts.
- 3) Replace damaged parts.
- 4) Lubricate all o-rings and vee packings with Marfak MP-2 grease (tube in kit):

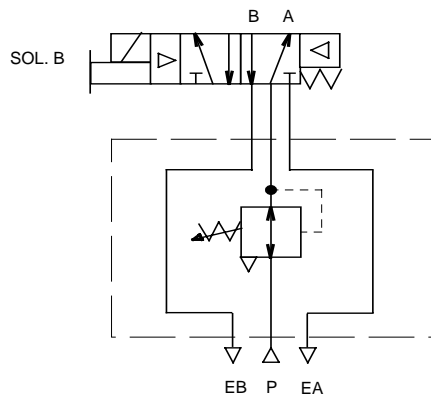
REASSEMBLY

- 1) Insert vee packing (S) into regulator body with open end of vee facing towards interior of regulator body. Press retaining ring (R) into regulator body using a 7/16 diameter wooden dowell.
- 2) **Manually Adjusting Regulators** - Place spring (Q) and diaphragm assembly (P) into bonnet assembly (N).
Remote Operated Regulators - Assemble vee packings (V) and vent seal (W) to piston (T). Open ends of vee's should face towards ends of piston. Assemble piston assembly to bonnet with vent seal facing out. Place o-ring (U) into groove in end of bonnet.
- 3) Assemble bonnet assembly (N) and collar (M) to regulator body. Tighten collar hand tight plus 1/4 turn.
- 4) Assemble vee packing (K) and backflow retainer (L) to seal retainer (J). Vee on vee packing (K) and flat side of backflow retainer (L) should face the threaded end of the seal retainer (J).
- 5) Assemble the seal retainer (J) to the poppet retainer (F) using a T15 Torx driver.
- 6) Assemble poppet assembly (H), spring (G) and poppet retainer (F) into regulator body. Poppet retainer (F) need only be hand tight.
- 7) Assemble o-rings (D & E) to regulator body.
- 8) Attach regulator to function block using (4) socket head cap screws (B) and lock washers (C). Tighten to 30-40 in-lb.
- 9) Reapply pressure to unit and check for audible leakage at joints or out bleed holes.
- 10) Adjust outlet pressure per *Outlet Pressure Adjustment* procedure at top left of this page to verify proper function.

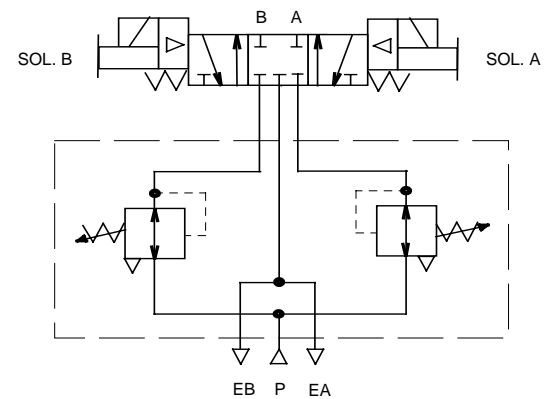
REGULATOR SPRING CONVERSION

- 1) Shut off main and pilot air supplies and depressurize the unit.
- 2) Disengage the adjusting knob (A) by pulling outward. Turn adjusting knob counterclockwise until the compression is released from the pressure control spring.
- 3) Unscrew the collar (M) and remove the bonnet assembly (N). Remove diaphragm assembly (P) and spring (Q).
- 4) Replace spring (Q) with one for new pressure range and assemble along with diaphragm assembly (P) into bonnet assembly (N).
- 5) Assemble bonnet assembly (N) and collar (M) to regulator body. Tighten collar hand tight plus 1/4 turn.
- 6) Reapply pressure to unit and check for audible leakage at joints or out bleed holes.
- 7) Adjust outlet pressure per *Outlet Pressure Adjustment* procedure at top left of this page to verify proper function.

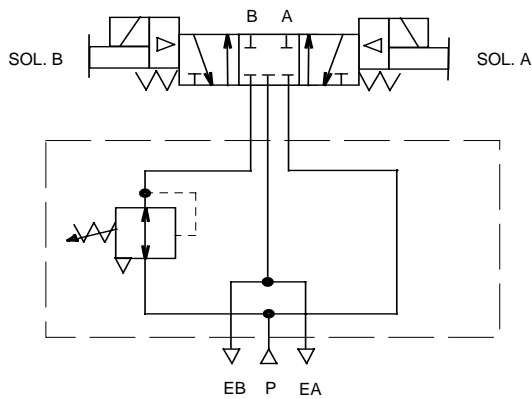
Common Port Regulator with
4-way, 2-position Valve



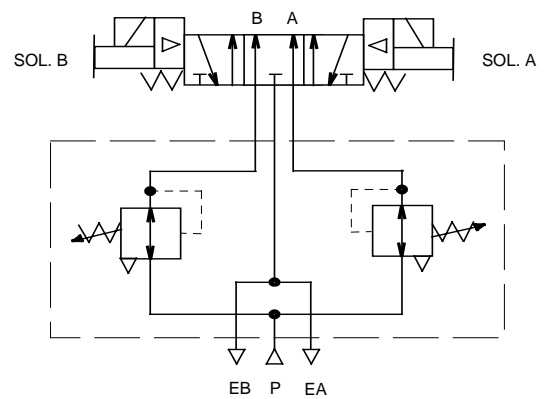
Independent Port Regulator with
4-way, 3-position, All Ports Blocked Valve



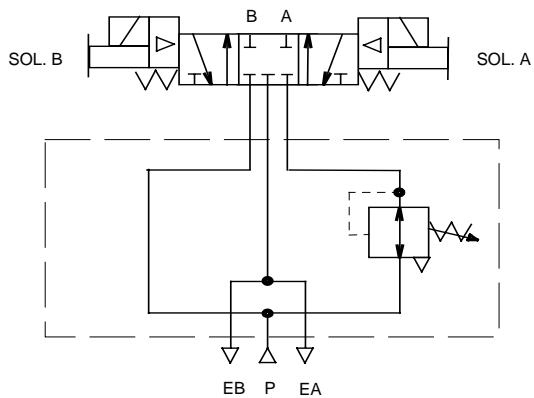
Single Port Regulator with
4-way, 3-position, All Ports Blocked Valve
Supply Pressure at "A" / Regulated Pressure at "B"



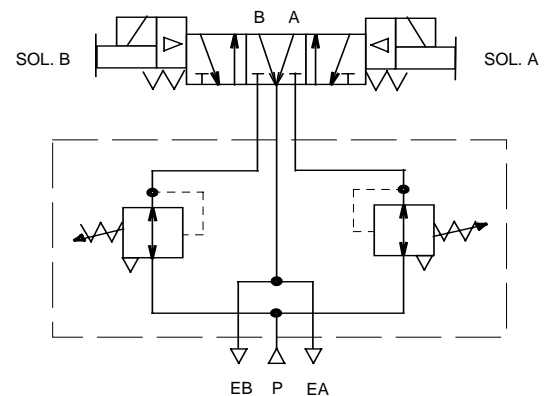
Independent Port Regulator with
4-way, 3-position, Inlet to Cylinder Function
CAUTION: Requires 4-way, 3-position,
Cylinder to Exhaust Valve



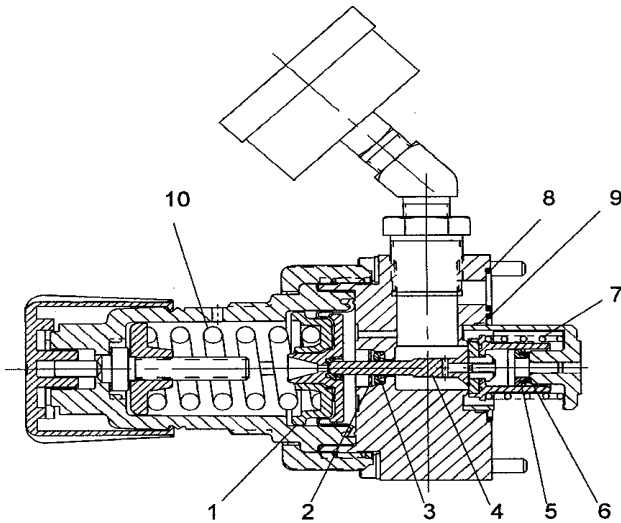
Single Port Regulator with
4-way, 3-position, All Ports Blocked Valve
Supply Pressure at "B" / Regulated Pressure at "A"



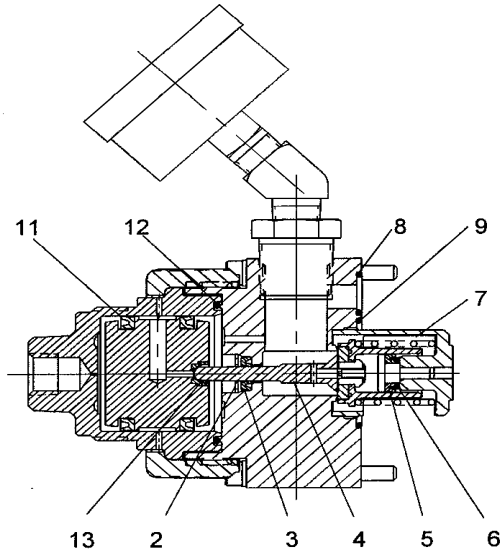
Independent Port Regulator with
4-way, 3-position, Cylinder to Exhaust Function
CAUTION: Requires 4-way, 3-position,
Inlet to Cylinder Valve



MANUALLY ADJUSTING REGULATORS



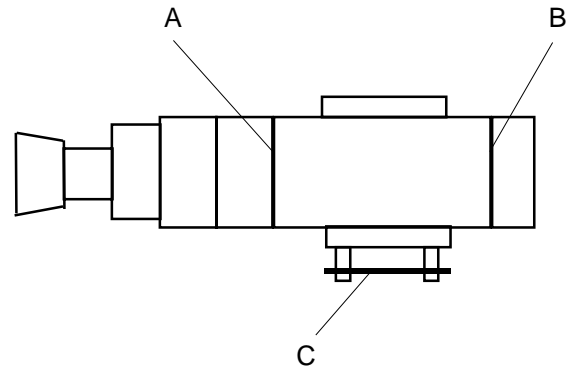
REMOTE OPERATED REGULATORS



Replacement Parts

Item No.	Part Number	Description
1	O	Diaphragm Assembly
2	O ●	Retaining Ring
3	O ●	Vee Packing
4	O ●	Poppet Assembly
5	O ●	Vee Packing
6	O ●	Backflow Retainer
7	O ●	Poppet Spring
8	O ●	.989 ID x .070 W O-Ring
9	O ●	1.301 ID x .070 W O-Ring
10	P01698 P04062 P04063	1-30 PSI Spring 1-60 PSI Spring (Blue) 2-125 PSI Spring
11	●	Vee Packing
12	●	1.674 ID x .103 W O-Ring
13	●	Vent Seal

- O Parts included in K352409 Service Kit for Manual Operated Modular Regulators.
- Parts included in K352411 Service Kit for Remote Operated Modular Regulators



Replacement Gaskets

Item No.	Part Number	Description
A	K183082 K183084	Gasket (Common Port) Gasket (Single & Independent Port)
B	K183082 K183083	Gasket (Common Port) Gasket (Single Port)
C	K183077	Gasket

Replacement Gauges

PSI	STANDARD	LIQUID FILLED
0 - 60	3560 0400	H032 57
0 - 160	3560 0410	H032 58

⚠ 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 system 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 INSTRUCTION MANUALS THAT UTILIZE THESE PRODUCTS. CONTACT YOUR LOCAL REPRESENTATIVE.



Pneumatic Division North America
Richland, MI 49083

Installation Instructions: V-560P

1" Valvair II/A6 Single Operated Valves

ISSUED: May, 2001

Supersedes: November, 1998

ECN #9369 Rev. 6



WARNING

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

- Disconnect air supply and depressurize all air lines connected to this product before installation, servicing, or conversion.
- Disconnect electrical supply before installation, servicing or conversion.
- Operate within the manufacturer's specified pressure, temperature, voltage and other conditions listed in these instructions.
- Medium must be moisture-free if ambient temperature is below freezing.
- Service according to procedures listed on 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 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.

INSTALLATION / OPERATING INSTRUCTIONS

Valve 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. Mounting bolt torque 160-180 in-lb. for manifold and subbase mounting valves.

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

Life Expectancy - Normal multi-million cycle life expectancy of these valves is based on the use of properly filtered and lubricated air at room temperature. These valves are also designed to operate under non-lubricated conditions and will yield millions of maintenance free cycles.

Factory Pre-Lubrication - Valves are pre-lubricated at assembly with Sunplex 781 or equivalent (Petroleum Base - Lithium Content) grease. Valves specified for vacuum service are lubricated with Dow Corning Valve Seal A.

In-Service Lubrication - In-service lubrication is not required; however, if lubrication is to be used, F442 oil is recommended. This oil is specially formulated to provide peak performance and maximum service life from all air operated equipment. Otherwise, use an air line lubricant (compatible with Nitrile & Polyurethane seals) which will readily atomize and be of the medium aniline type. Aniline point range must be between 180° and 220° F. Viscosity at 100° F: 140 - 170 SUS.



CAUTION: Do not use synthetic, reconstituted, or oils with an alcohol content or detergent additive.

Remote Pilot Operated Valves - Connect a 3-way normally open valve to the pilot signal port for normal valve logic (P → A, B → EB). Use of a 3-way normally closed pilot valve results in reverse logic (P → B;

A → EA).

Override Operation - To operate override push and turn to a full stop (at least 90°).

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

Pressure Range for Solenoid Operated Valves

Media	Solenoid Pilot Supply Source			External Pilot Supply		
	Internal Pilot Supply					
	PSIG	BAR	kPa	PSIG	BAR	kPa
Air	Valve Inlet			Valve Inlet		
	Minimum	35	2.41	Minimum	0	0
	Maximum	140*	9.65	Maximum	250*	17.24
	Pilot Supply Port PLUGGED			Pilot Supply Port		
Vacuum	DO NOT USE			Minimum	35	2.41
				Maximum	140*	9.65
				Valve Inlet Within 1" Hg of Perfect		
				Pilot Supply Port		
				Minimum	35	2.41
				Maximum	140*	9.65

* Unless valve is equipped with 200 PSIG pilot valve (9th digit of model number is a "3", i.e. L6757810353 Valvair II Series Only).

Pressure Range for Remote Pilot Operated Valves

Media	PSIG	BAR	kPa	PSIG	BAR	kPa
Air	Valve Inlet			Remote Pilot Signal		
	Minimum	35	2.41	Minimum	35	2.41
	Maximum	250	17.24	Maximum	200	13.79
				Maximum	200	13.79
Vacuum	DO NOT USE					

Operating Temperature Range:

Operator Type	Duty Cycle	Minimum Ambient Temperature	Maximum Ambient Temperature
Standard Service	Intermittent	0°F (-18°C)	125°F (52°C)
	Continuous	0°F (-18°C)	100°F (38°C)
Solenoid	Intermittent	0°F (-18°C)	125°F (52°C)
	Continuous	0°F (-18°C)	125°F (52°C)
Remote Pilot	Not Applicable	0°F (-18°C)	200°F (93°C)

Voltage Range:

+10% to -15% of rating

WIRING INSTRUCTIONS

Units with flying leads

Either wire may be "Hot".



CAUTION: DC solenoids with indicator lights and/or arc suppression coils are polarity sensitive. Use red wire as positive.

Units with plug-in subbases or manifolds

Use wires marked "2" and "3" for connection to the solenoid. Either may be "Hot".



CAUTION: DC solenoids with indicator lights and/or arc suppression coils are polarity sensitive. Use wire number 3 for single solenoid valves as positive.

Earth ground: All electrically operated valves must be provided a proper earth ground. Connect to green wire from valve.

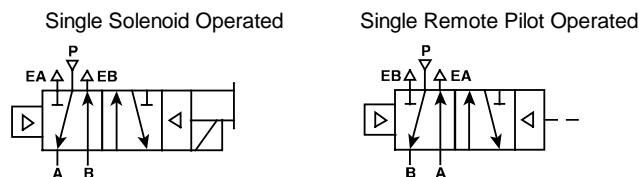


CAUTION: An interruption of 10 milliseconds or greater to the power supplied to the solenoid of a solenoid operated valve may cause the valve to shift. Provision must be made to prevent power interruption of this duration to avoid unintended, potentially hazardous, consequences.

NOTE: In addition to the above instructions, follow all requirements for local and national electrical codes.

APPLICATION LIMITS

ANSI SYMBOLS



INSTALLATION

Manifold and Subbase Mounted Valves

See *Installation Instructions V-563P 1" Series Subbases and Manifolds* packed with subbases and manifolds.

Direct Pipe Ported Valves

PORT CONNECTIONS

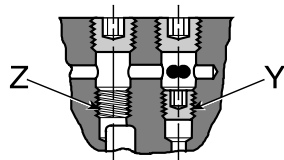
- 1) Connect a single inlet air supply to port "P". (For dual pressure applications, connect inlet air supplies to ports "EA" and "EB".)
- 2) Connect mufflers (or plumb exhaust) from ports "EA" and "EB" for single air supply. (For dual pressure applications, connect to port "P".)
- 3) Connect cylinder ports "A" and "B" to ends of cylinder or other device to be supplied air.

EXTERNAL PILOT SUPPLY CONNECTION

Use an external pilot for dual inlet air supplies, for inlet pressures below minimum valve ratings, or any other application requiring pilot pressure different than main supply pressure.

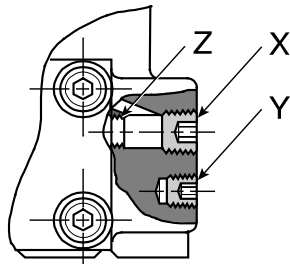
- 1) Perform **Conversion Procedure for External Pilot**.
- 2) Connect pilot supply source to port "X".

CONVERSION PROCEDURE FOR EXTERNAL PILOT



Base Mounted

For field conversion to external pilot supply, remove (2) 1/8" pipe plugs from top of valve body and move bottom plug from "Y" to "Z". Replace 1/8" pipe plugs and connect pilot pressure to the 1/4" pipe external pilot supply port "X" in subbase or manifold.



Direct Pipe Ported

For field conversion to external pilot supply, remove and discard 1/4" pipe plug in external pilot supply port "X". Move stored plug "Y" to location "Z" in bottom of

pilot supply port "X". Then connect pilot pressure to port "X" in valve body.

SERVICE KITS / PARTS

Service Kit (Single Solenoid - Standard Service)	K352128
Service Kit (Single Solenoid - Special Service)	K352129
Service Kit (Single Remote Pilot Operated)	K352359
Pilot Valve / Remote Pilot Gasket	K183001
Body to Base Gasket	K183038
Indicator Light (24VDC - Line Mounting)	H19110
Indicator Light (24VDC - Base Mounting)	H19112
Indicator Light (120V / 60 HZ - Line Mounting)	H19102
Indicator Light (120V / 60 HZ - Base Mounting)	H19105

Direct Pipe Ported Valves

Voltage			Coil	
60 Hz	50 Hz	D. C.	19" Leads	72" Leads
12	--	--	K593007	K593178
24	--	6	K593003	K593179
--	24	--	K593015	K593181
--	36	--	K593016	K593183
--	--	12	K593010	K593182
--	--	24	K593014	K593184
--	--	(Standard)		
--	--	24	K593271	K593272
--	--	(Arc Suppressed)		
--	--	48	K593028	K593185
120	110	--	K593025	K593186
240	220	--	K593035	K593187
--	240	--	K593033	K593188
--	--	90	K593020	K593189
--	--	115	K593041	K593190
--	380	--	K593038	K593191

Base Mounting Valves

Voltage			Coil	
60 Hz	50 Hz	D. C.	No Light	With Light
12	--	--	K593052	--
24	--	6	K593048	--
--	24	--	K593061	--
--	36	--	K593062	--
--	--	12	K593055	--
--	--	24	K593060	K593274
--	--	(Standard)		
--	--	24	K593305	K593275
--	--	(Arc Suppressed)		
--	--	48	K593074	--
120	110	--	K593071	K593125
240	220	--	K593081	--
--	240	--	K593079	--



WARNING

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Pneumatic Division North America
Richland, MI 49083

Installation Instructions: V-561P

1" Valvair II/A6 Double Operated Valves
2-Position

ISSUED: May, 2001

Supersedes: November, 1998

ECN #9369 Rev. 6



WARNING

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

- Disconnect air supply and depressurize all air lines connected to this product before installation, servicing, or conversion.
- Disconnect electrical supply before installation, servicing or conversion.
- Operate within the manufacturer's specified pressure, temperature, voltage and other conditions listed in these instructions.
- Medium must be moisture-free if ambient temperature is below freezing.
- Service according to procedures listed on 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 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.

INSTALLATION / OPERATING INSTRUCTIONS

Valve 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. Mounting bolt torque 160-180 in-lb. for manifold and subbase mounting valves.



CAUTION: Mount the valve so that the main valve spool is horizontal. When the valve is depressurized the spool could shift due to the effects of gravity and/or vibration.

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

Life Expectancy - Normal multi-million cycle life expectancy of these valves is based on the use of properly filtered and lubricated air at room temperature. These valves are also designed to operate under non-lubricated conditions and will yield millions of maintenance free cycles.

Factory Pre-Lubrication - Valves are pre-lubricated at assembly with Sunplex 781 or equivalent (Petroleum Base - Lithium Content) grease. Valves specified for vacuum service are lubricated with Dow Corning Valve Seal A.

In-Service Lubrication - In-service lubrication is not required; however, if lubrication is to be used, F442 oil is recommended. This oil is specially formulated to provide peak performance and maximum service life from all air operated equipment. Otherwise, use an air line lubricant (compatible with Nitrile & Polyurethane seals) which will readily atomize and be of the medium aniline type. Aniline point range must be between 180° and 220° F. Viscosity at 100° F: 140 - 170 SUS.



CAUTION: Do not use synthetic, reconstituted, or oils with an alcohol content or detergent additive.

Override Operation - To operate override push and turn to a full stop (at least 90°).

APPLICATION LIMITS

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

Pressure Range for Solenoid Operated Valves

Media	Solenoid Pilot Supply Source				External Pilot Supply			
	Internal Pilot Supply							
		PSIG	BAR	kPa		PSIG	BAR	kPa
Air	Valve Inlet				Valve Inlet			
	Minimum	35	2.41	241	Minimum	0	0	0
	Maximum	140*	9.65	965	Maximum	250*	17.24	1724
	Pilot Supply Port				Pilot Supply Port			
	PLUGGED				Minimum	35	2.41	241
					Maximum	140*	9.65	965
Vacuum	DO NOT USE				Valve Inlet			
					Within 1" Hg of Perfect			
					Pilot Supply Port			
					Minimum	35	2.41	241
					Maximum	140*	9.65	965

* Unless valve is equipped with 200 PSIG pilot valve (9th digit of model number is a "3", i.e. L6557810353 Valvair II Series Only).

Pressure Range for Remote Pilot Operated Valves

Media	PSIG			PSIG		
	BAR	kPa		BAR	kPa	
Air	Valve Inlet			Remote Pilot Signal		
	Minimum	0	0	Minimum	35	2.41
	Maximum	250	17.24	Maximum	200	13.79
Vacuum	Valve Inlet			Remote Pilot Signal		
	Within 1" Hg of Perfect			Minimum	35	2.41
				Maximum	200	13.79

Operating Temperature Range:

Operator Type	Duty Cycle	Minimum Ambient Temperature	Maximum Ambient Temperature
Standard Service Solenoid	Intermittent	0°F (-18°C)	125°F (52°C)
	Continuous	0°F (-18°C)	100°F (38°C)
Special Service Solenoid	Intermittent	0°F (-18°C)	125°F (52°C)
	Continuous	0°F (-18°C)	125°F (52°C)
Remote Pilot	Not Applicable	0°F (-18°C)	200°F (93°C)

Voltage Range:

+10% to -15% of rating

WIRING INSTRUCTIONS

Units with flying leads

Either wire may be "Hot".



CAUTION: DC solenoids with indicator lights and/or arc suppression coils are polarity sensitive. Use red wire as positive.

Units with plug-in subbases or manifolds

Use wires marked "1" and "2" for solenoid A. Use wires marked "3" and "4" for solenoid "B". For units with DC solenoids and indicator lights or arc suppression coils, wires marked "1" and "3" are positive.



CAUTION: DC solenoids with indicator lights or arc suppression coils are polarity sensitive. Observe polarities indicated above.

Earth ground: All electrically operated valves must be provided a proper earth ground. Connect to green wire from valve.

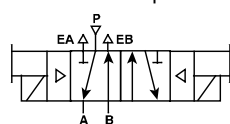


CAUTION: An interruption of 10 milliseconds or greater to the power supplied to the solenoid of a solenoid operated valve may cause the valve to shift. Provision must be made to prevent power interruption of this duration to avoid unintended, potentially hazardous, consequences.

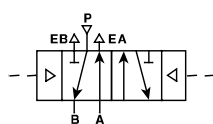
NOTE: In addition to the above instructions, follow all requirements for local and national electrical codes.

ANSI SYMBOLS

Double Solenoid Operated



Double Remote Pilot Operated



INSTALLATION

Manifold and Subbase Mounted Valves

See *Installation Instructions V-563P 1" Series Subbases and Manifolds* packed with subbases and manifolds.

Direct Pipe Ported Valves

PORT CONNECTIONS

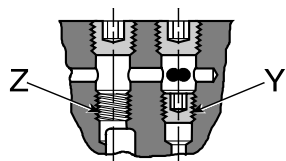
- 1) Connect a single inlet air supply to port "P". (For dual pressure applications, connect inlet air supplies to ports "EA" and "EB".)
- 2) Connect mufflers (or plumb exhaust) from ports "EA" and "EB" for single air supply. (For dual pressure applications, connect to port "P".)
- 3) Connect cylinder ports "A" and "B" to ends of cylinder or other device to be supplied air.

EXTERNAL PILOT SUPPLY CONNECTION

Use an external pilot for dual inlet air supplies, for inlet pressures below minimum valve ratings, or any other application requiring pilot pressure different than main supply pressure.

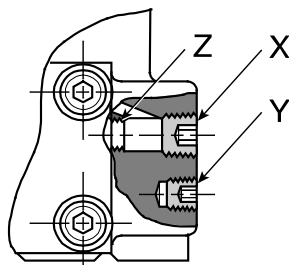
- 1) Perform **Conversion Procedure for External Pilot**.
- 2) Connect pilot supply source to port "X".

CONVERSION PROCEDURE FOR EXTERNAL PILOT



Base Mounted

For field conversion to external pilot supply, remove (2) 1/8" pipe plugs from top of valve body and move bottom plug from "Y" to "Z". Replace 1/8" pipe plugs and connect pilot pressure to the 1/4" pipe external pilot supply port "X" in subbase or manifold.



Direct Pipe Ported

For field conversion to external pilot supply, remove and discard 1/4" pipe plug in external pilot supply port "X". Move stored plug "Y" to location "Z" supply port "X". Then connect pilot pressure to port "X" in valve body.

SERVICE KITS / PARTS

Service Kit (Double Solenoid - Standard Service)	K352130
Service Kit (Double Solenoid - Special Service)	K352131
Service Kit (Double Remote Pilot Operated)	K352360
Pilot Valve / Remote Pilot Gasket	K183001
Body to Base Gasket	K183038
Indicator Light (24VDC - Line Mounting)	H19110
Indicator Light (24VDC - Base Mounting)	H19112
Indicator Light (120V / 60 HZ - Line Mounting)	H19102
Indicator Light (120V / 60 HZ - Base Mounting)	H19105

Direct Pipe Ported Valves

Voltage			Coil	
60 Hz	50 Hz	D. C.	19" Leads	72" Leads
12	--	--	K593007	K593178
24	--	6	K593003	K593179
--	24	--	K593015	K593181
--	36	--	K593016	K593183
--	--	12	K593010	K593182
--	--	24 (Standard)	K593014	K593184
--	--	24 (Arc Suppressed)	K593271	K593272
--	--	48	K593028	K593185
120	110	--	K593025	K593186
240	220	--	K593035	K593187
--	240	--	K593033	K593188
--	--	90	K593020	K593189
--	--	115	K593041	K593190
--	380	--	K593038	K593191

Base Mounting Valves

Voltage			Coil	
60 Hz	50 Hz	D. C.	No Light	With Light
12	--	--	K593052	--
24	--	6	K593048	--
--	24	--	K593061	--
--	36	--	K593062	--
--	--	12	K593055	--
--	--	24 (Standard)	K593060	K593274
--	--	24 (Arc Suppressed)	K593305	K593275
--	--	48	K593074	--
120	110	--	K593071	K593125
240	220	--	K593081	--
--	240	--	K593079	--

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.

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



Pneumatic Division North America
Richland, MI 49083

Installation Instructions: V-562P

1" Valvair II/A6 Double Operated Valves
3-Position

ISSUED: May, 2001

Supersedes: November, 1998

ECN #9369 Rev. 6



WARNING

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

- Disconnect air supply and depressurize all air lines connected to this product before installation, servicing, or conversion.
- Disconnect electrical supply before installation, servicing or conversion.
- Operate within the manufacturer's specified pressure, temperature, voltage and other conditions listed in these instructions.
- Medium must be moisture-free if ambient temperature is below freezing.
- Service according to procedures listed on 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 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.

INSTALLATION / OPERATING INSTRUCTIONS

Valve 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. Mounting bolt torque 160-180 in-lb. for manifold and subbase mounting valves.

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

Life Expectancy - Normal multi-million cycle life expectancy of these valves is based on the use of properly filtered and lubricated air at room temperature. These valves are also designed to operate under non-lubricated conditions and will yield millions of maintenance free cycles.

Factory Pre-Lubrication - Valves are pre-lubricated at assembly with Sunplex 781 or equivalent (Petroleum Base - Lithium Content) grease. Valves specified for vacuum service are lubricated with Dow Corning Valve Seal A.

In-Service Lubrication - In-service lubrication is not required; however, if lubrication is to be used, F442 oil is recommended. This oil is specially formulated to provide peak performance and maximum service life from all air operated equipment. Otherwise, use an air line lubricant (compatible with Nitrile & Polyurethane seals) which will readily atomize and be of the medium aniline type. Aniline point range must be between 180° and 220° F. Viscosity at 100° F: 140 - 170 SUS.



CAUTION: Do not use synthetic, reconstituted, or oils with an alcohol content or detergent additive.

Override Operation - To operate override push and turn to a full stop (at least 90°).

3-Position Valves are available in the following three classes of neutral or centered position (7th & 8th digits of model number):

“Class 21” -- All ports blocked

“Class 22” -- Pressure to cylinder ports (Exhaust ports blocked)

“Class 23” -- Cylinder to exhaust ports (inlet port blocked)

See the associated ANSI symbols on back.

APPLICATION LIMITS

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

Pressure Range for Solenoid Operated Valves

Media	Solenoid Pilot Supply Source					
	Internal Pilot Supply			External Pilot Supply		
	PSIG	BAR	kPa	PSIG	BAR	kPa
Air	Valve Inlet			Valve Inlet		
	Minimum	35	2.41	0	0	0
	Maximum	140*	9.65	250*	17.24	1724
	Pilot Supply Port			Pilot Supply Port		
Vacuum	PLUGGED			Minimum 35 2.41 241		
	DO NOT USE			Maximum 140* 9.65 965		
				Valve Inlet		
				Within 1" Hg of Perfect		
				Pilot Supply Port		
				Minimum 35 2.41 241		
				Maximum 140* 9.65 965		

* Unless valve is equipped with 200 PSIG pilot valve (9th digit of model number is a "3", i.e. L6657810353 Valvair II Series Only).

Pressure Range for Remote Pilot Operated Valves

Media						
	PSIG	BAR	kPa	PSIG	BAR	kPa
Air	Valve Inlet			Remote Pilot Signal		
	Minimum	0	0	0	35	2.41
	Maximum	250	17.24	1724	200	13.79
Vacuum	Valve Inlet			Remote Pilot Signal		
	Within 1" Hg of Perfect			Minimum 35 2.41 241		
				Maximum 200 13.79 1379		

Operating Temperature Range:

Operator Type	Duty Cycle	Minimum Ambient Temperature	Maximum Ambient Temperature
Standard Service Solenoid	Intermittent	0°F (-18°C)	125°F (52°C)
	Continuous	0°F (-18°C)	100°F (38°C)
Special Service Solenoid	Intermittent	0°F (-18°C)	125°F (52°C)
	Continuous	0°F (-18°C)	125°F (52°C)
Remote Pilot	Not Applicable	0°F (-18°C)	200°F (93°C)

Voltage Range:

+10% to -15% of rating

WIRING INSTRUCTIONS

Units with flying leads

Either wire may be "Hot".



CAUTION: DC solenoids with indicator lights and/or arc suppression coils are polarity sensitive. Use red wire as positive.

Units with plug-in subbases or manifolds

Use wires marked "1" and "2" for solenoid A. Use wires marked "3" and "4" for solenoid "B". For units with DC solenoids and indicator lights or arc suppression coils, wires marked "1" and "3" are positive.



CAUTION: DC solenoids with indicator lights or arc suppression coils are polarity sensitive. Observe polarities indicated above.

Earth ground: All electrically operated valves must be provided a proper earth ground. Connect to green wire from valve.



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.

NOTE: In addition to the above instructions, follow all requirements for local and national electrical codes.

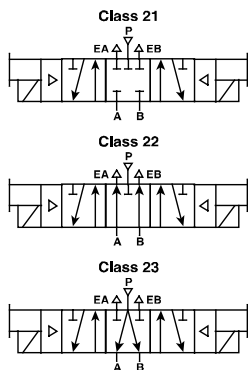
Remote Pilot Operated Valves require the use of two normally open pilot signal valves to ensure that the spool returns to the center position upon removal of electrical power from both pilot signal valves. This is because the valve is designed to use pressure instead of springs to perform this function.



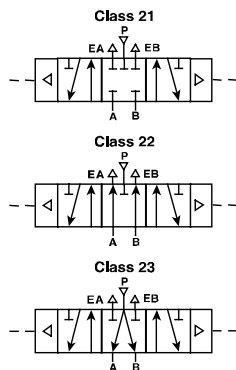
CAUTION: Failure to use two normally open pilot signal valves could result in the valve remaining in some position other than centered

ANSI SYMBOLS

Double Solenoid Operated



Double Remote Pilot Operated



INSTALLATION

Manifold and Subbase Mounted Valves

See *Installation Instructions V-563P 1" Series Subbases and Manifolds* packed with subbases and manifolds.

Direct Pipe Ported Valves

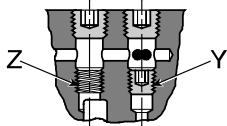
PORT CONNECTIONS

- 1) Connect a single inlet air supply to port "P". (For dual pressure applications, connect inlet air supplies to ports "EA" and "EB".)
- 2) Connect mufflers (or plumb exhaust) from ports "EA" and "EB" for single air supply. (For dual pressure applications, connect to port "P".)
- 3) Connect cylinder ports "A" and "B" to ends of cylinder or other device to be supplied air.

CONVERSION PROCEDURE FOR EXTERNAL PILOT

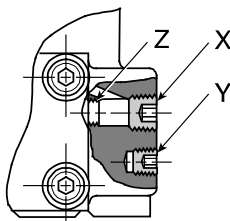
Base Mounted

For field conversion to external pilot supply, remove (2) 1/8" pipe plugs from top of valve body and move bottom plug from "Y" to "Z". Replace 1/8" pipe plugs and connect pilot pressure to the 1/4" pipe external pilot supply port "X" in subbase or manifold.



Direct Pipe Ported

For field conversion to external pilot supply, remove and discard 1/4" pipe plug in external pilot supply port "X". Move stored plug "Y" to location "Z" in bottom of pilot supply port "X". Then connect pilot pressure to port "X" in valve body.



EXTERNAL PILOT SUPPLY CONNECTION

Use an external pilot for dual inlet air supplies, for inlet pressures below minimum valve ratings, or any other application requiring pilot pressure different than main supply pressure.

1. Perform **Conversion Procedure for External Pilot**.
2. Connect pilot supply source to port "X".

SERVICE KITS / PARTS

Service Kit (Standard Solenoid - Standard Service). K352130
 Service Kit (Double Solenoid - Special Service). K352131
 Service Kit (Double Remote Pilot Operated). K352360
 Pilot Valve / Remote Pilot Gasket. K183001
 Body to Base Gasket. K183038
 Indicator Light (24VDC - Line Mounting). H19110
 Indicator Light (24VDC - Base Mounting). H19112
 Indicator Light (120V / 60 HZ - Line Mounting). H19102
 Indicator Light (120V / 60 HZ - Base Mounting). H19105

Direct Pipe Ported Valves

Voltage			Coil	
60 Hz	50 Hz	D. C.	19" Leads	72" Leads
12	--	--	K593007	K593178
24	--	6	K593003	K593179
--	24	--	K593015	K593181
--	36	--	K593016	K593183
--	--	12	K593010	K593182
--	--	24 (Standard)	K593014	K593184
--	--	24 (Arc Suppressed)	K593271	K593272
--	--	48	K593028	K593185
120	110	--	K593025	K593186
240	220	--	K593035	K593187
--	240	--	K593033	K593188
--	--	90	K593020	K593189
--	--	115	K593041	K593190
--	380	--	K593038	K593191

Base Mounting Valves

Voltage			Coil	
60 Hz	50 Hz	D. C.	No Light	With Light
12	--	--	K593052	--
24	--	6	K593048	--
--	24	--	K593061	--
--	36	--	K593062	--
--	--	12	K593055	--
--	--	24 (Standard)	K593060	K593274
--	--	24 (Arc Suppressed)	K593305	K593275
--	--	48	K593074	--
120	110	--	K593071	K593125
240	220	--	K593081	--
--	240	--	K593079	--

WARNING

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Pneumatic Division North America
Richland, MI 49083

Installation Instructions: V-563P

1" Series Subbases and Manifolds

ISSUED: November, 1998

Supersedes: K583-279, April, 1995

ECN #8915



WARNING

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

- Disconnect air supply and depressurize all air lines connected to this product before installation, servicing, or conversion.
- Disconnect electrical supply before installation, servicing or conversion.
- Operate within the manufacturer's specified pressure, temperature, voltage and other conditions listed in these instructions.
- Medium must be moisture-free if ambient temperature is below freezing.
- Service according to procedures listed on service instruction sheets.
- 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 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.

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 instructions packed with (or label on) valve.

WIRING INSTRUCTIONS

Single Solenoid: Use wires marked "2" and "3" for connection to the solenoid. For units with DC solenoids and indicator lights or arc suppression coils, wire marked "3" is positive.

Double Solenoid: Use wires marked "1" and "2" for Solenoid "A". Use wires marked "3" and "4" for Solenoid "B". For units with DC solenoids and indicator lights or arc suppression coils, wires marked "1" and "3" are positive.



CAUTION: DC solenoids with indicator lights or arc suppression coils are polarity sensitive. Observe polarities indicated above.

Earth ground: All electrically operated valves must be provided a proper earth ground. Remove the end cover of the manifold or subbase and connect a ground lead to the green ground screw.



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.

NOTE: In addition to the above instructions, follow all requirements for local and national electrical codes.

VALVE MOUNTING PROCEDURES

(Applies to both subbases and manifolds)

1. Clean top surface of subbase or manifold and bottom surface of valve body of any dirt or dust.
2. Position gasket on top of subbase or manifold, lining up all four mounting holes.
3. Place valve on top of gasket, lining up all four mounting holes. Electrically operated valves also require pressing down on valve to seat electrical plug.
4. Insert (4) valve mounting screws and torque to 160-180 in-lbs in progressive steps with a criss-cross pattern.

SUBBASE PORT CONNECTIONS

(See reverse for Manifold Port Connections)

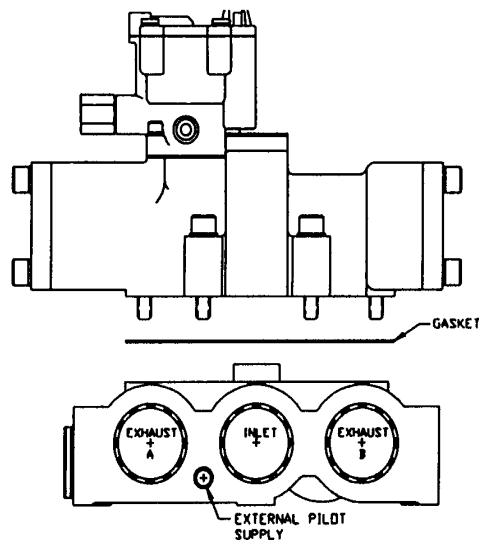
1. Connect a single inlet air supply to port "P". (For dual pressure applications, connect inlet air supplies to ports "EA" and "EB").
2. Connect mufflers (or plumb exhaust) from ports "EA" and "EB" for single air supply. (For dual pressure applications, connect to port "P".)
3. Connect cylinder ports "A" and "B" to ends of cylinder or other device to be supplied air.

SUBBASE EXTERNAL PILOT SUPPLY CONNECTION

(See reverse for Manifold External Pilot Supply connections)

Use an external pilot for dual inlet air supplies, for inlet pressures below minimum valve ratings, or any other application requiring pilot pressure different than main supply pressure.

1. Perform pilot supply conversion outlined on Installation Instructions packed with valve.
2. Connect pilot supply source to port "X".



MANIFOLD APPLICATION

Valves may be gang manifolded up to any number of stations, providing that sufficient pressure is realized in the circuits downstream of the valve outlets; and sufficient pressure is available for shifting the valves. Longer manifold gangs may require intermediate supports. Means to increase pressure levels include supply connections at both ends of the manifold gage, external pilot supplies and sequencing the valve operation to maximize time between different valve shifts.



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

MANIFOLD ASSEMBLY PROCEDURES

Manifolds may be assembled to one another either before or after assembling valves to manifolds. If external pilot gallery is to be isolated from neighboring manifolds, be sure to follow **Manifold Isolation Procedures** before proceeding with this section.

1. If wiring is to be done in manifold junction boxes, rather than in an external junction box, loosen electrical cover mounting screws on end of manifolds, remove covers and pull wires out through cover openings.
2. Clean counterbores inside of manifold and mating surface of neighboring manifold.
3. Apply light coating of grease (in kit) to tetraseals and place in counterbores.
4. Place manifold next to neighboring manifold. If wiring is to be done in an external junction box, pull wires through conduit gallery of neighboring manifold.
5. Insert hex head screws through clearance holes in one manifold and screw into neighboring manifold. Torque screws to 160-180 in-lbs.
6. Connect a grounding wire to the green ground screw of at least one manifold and feed this wire through conduit gallery to either end of manifold.
7. Replace electrical covers and tighten cover screws.
8. Apply a light coating of grease to tetraseals from Installation Kit K122016 and place in counterbores of each end plate.
9. Attach end plate to each end of manifold bank with (4) capscrews. Torque to 160-180 in lbs in progressive steps.

MANIFOLD PORT CONNECTIONS

(See front for Subbase Port Connections)

1. Connect inlet air supply to port "P" on either end of manifold package and plug other end port "P" (or connect air supply to both ends for applications requiring a larger volume of air).
2. Connect mufflers (or plumb exhaust) at "E" ports.
3. Connect cylinder ports "A" and "B" to ends of cylinder or other device to be supplied air. Connections are commonly made to ports on end of manifold opposite wiring cavity. If bottom ports are more accessible to your application, plug end cylinder ports and remove plugs from bottom ports.

MANIFOLD EXTERNAL PILOT CONNECTIONS

(See front for Subbase External Pilot Supply Connections)

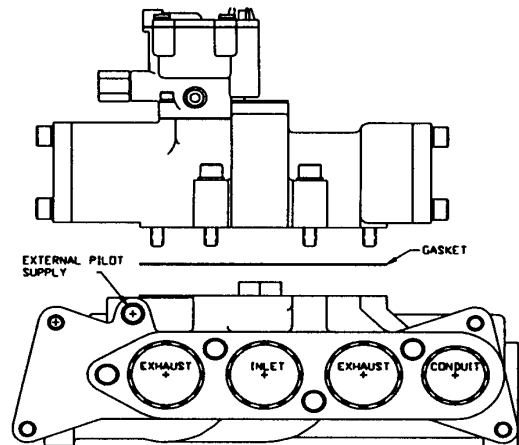
Use an external pilot for dual inlet air supplies, for inlet pressures below minimum valve ratings, or any other application requiring pilot pressure different than main supply pressure.

1. Perform pilot supply conversion outlined on Installation Instructions packed with valve.
2. Isolate external pilot supply gallery (designated by "X") to those valves requiring external pilot supply.
3. Connect pilot supply to the "X" port gallery, or to those stations requiring external pilot supply, at their alternate "X" port connection. Plug all open "X" ports

MANIFOLD ISOLATION PROCEDURES

External pilot gallery may be isolated from those in neighboring manifolds through the use of flush pipe plugs.

1. Determine gallery and manifold position to be isolated.
2. Apply pipe sealant to threads of pipe plug.
3. Screw pipe plug into threaded end of gallery and tighten.



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Pneumatic Division
Richland, Michigan 49083

Installation & Service Instructions V564P

1" Valvair II / A6
Single Operated Valves

ISSUED: February, 2002

Supersedes: November, 2001

Doc.# V-564P, ECN# P28822, Rev. 3

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.

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.

Pressure Range for Solenoid Operated Valves

Media	Solenoid Pilot Supply Source					
	Internal Pilot Supply			External Pilot Supply		
	PSIG	bar	kPa	PSIG	bar	kPa
Air	Valve Inlet			Valve Inlet		
	Minimum	35	2.41	241	Minimum	0 0 0
	Maximum	140*	9.65	965	Maximum	250* 17.24 1724
Vacuum	Pilot Supply Port PLUGGED			Pilot Supply Port		
				Minimum	35	2.41 241
				Maximum	140*	9.65 965

* Unless valve is equipped with 200 PSIG pilot valve (9th digit of model number is a "3", i.e. L6757810353 Valvair II Series only).

Pressure Range for Remote Pilot Operated Valves

Media	PSIG	bar	kPa	PSIG	bar	kPa
Air	Valve Inlet			Remote Pilot Signal		
	Minimum	0	0 0	Minimum	35	2.41 241
	Maximum	250	17.24 1724	Maximum	200	13.79 1379
Vacuum	DO NOT USE					

Operating Temperature Range:


Operator Type	Duty Cycle	Minimum Ambient Temperature	Maximum Ambient Temperature
Standard Service Solenoid	Intermittent	0°F (-18°C)	125°F (52°C)
	Continuous	0°F (-18°C)	100°F (38°C)
Special Service Solenoid	Intermittent	0°F (-18°C)	125°F (52°C)
	Continuous	0°F (-18°C)	125°F (52°C)
Remote Pilot	Not Applicable	0°F (-18°C)	200°F (93°C)

Voltage Range: +10% to -15% of rating

Wiring Instructions


Units With Flying Leads

Either wire may be "Hot".

 **CAUTION:** DC solenoids with indicator lights and / or arc suppression coils are polarity sensitive. Use red wire as positive.

Units With Plug-in Subbases or Manifolds

Use wires marked "2" and "3" for connection to the solenoid. Either may be "Hot".

 **CAUTION:** DC solenoids with indicator lights and / or arc suppression coils are polarity sensitive. Use wire number 3 for single solenoid valves as positive.

Earth ground: All electrically operated valves must be provided a proper earth ground. Connect to green wire from valve.

NOTE: In addition to the above instructions, follow all requirements for local and national electrical codes.

Service Procedures

NOTE: All cleaning of parts to be done with mineral spirits or equivalent cleaning solution. Grease should be a mineral based lubricant (MagnaLube G). All parts showing nicks, scratches or other signs of wear or damage should be replaced.

WARNING

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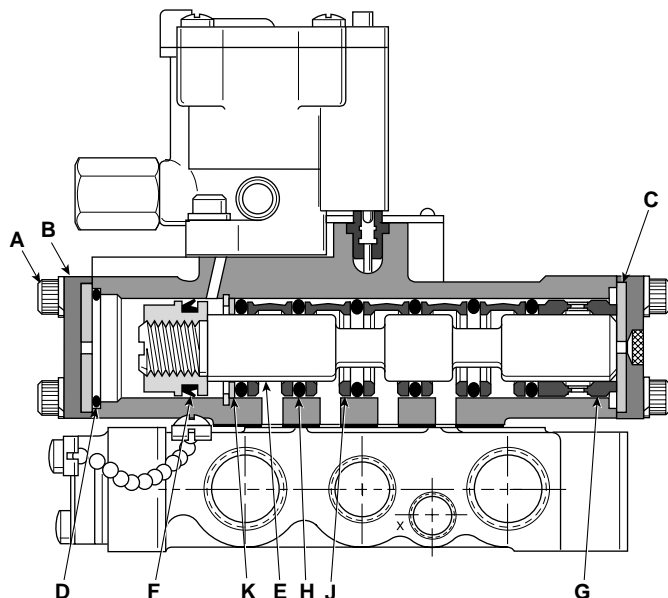
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Valve Service

1. Orient valve with Solenoid "B" on the left hand side. (Letters "A" and "B" are cast into the sides of the body near each end.)
2. Loosen (4) socket head cap screws (A) on each end of valve until they disengage from body.
3. Remove end caps (B), bumpers (C) and seal (D). Discard seal.
4. Insert finger into right end of body and push spool assembly (E) out left end.
5. Remove and discard o-ring (F) from spool assembly. Clean spool assembly. Apply grease to new o-ring from kit and assemble to spool assembly.
6. Remove long end spacer (G), o-rings (H & J), spacers (K) and short spacer ring (L). Discard o-rings. Clean spacers.
7. Apply lubricant (tube in kit) to inner and outer o-rings (H & J).
8. Reassemble short spacer ring (L), a set of o-rings (H & J), and one spacer (K). Alternatively assemble a set of o-rings and a spacer until all o-rings and spacers are used. Press each set firmly into place.
9. Reassemble long end spacer (G).
10. On right end of valve, assemble bumper (C) and end cap (B). Tighten (4) socket head screws (A) to 50-65 in-lb.
11. Slide spool assembly (E) into left end of valve.
12. On left end of valve, assemble seal (D), bumper (C), end cap (B), and tighten (4) socket head screws (A) to 50-65 in-lb.



Pilot Valve Service

See **Service Instructions V-644P L-Pilot Valves and Operators** packed with **Pilot Valve Service Kit K352166** included in this kit.

Coil / Indicator Light Replacement

See **Service Instructions V-644P L-Pilot Valves and Operators** packed with replacement coils and lights.

Manual Override Replacement Or Conversion

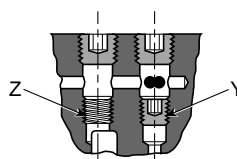
The following override assemblies are interchangeable and can be replaced or field converted:

- Non-locking override K162001
- Locking override K152003
- Extended locking override K152006

Remove override and clean internal threads in housing. Apply pipe sealant sparingly to threads of override housing and assemble override to pilot valve housing.

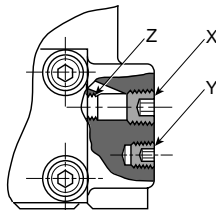
NOTE: Overrides are held out by air pressure and may not extend until pressure is reapplied to the valve.

Conversion Procedure For External Pilot



Base Mounted

For field conversion to external pilot supply, remove (2) 1/8" pipe plugs from top of valve body and move bottom plug from "Y" to "Z". Replace 1/8" pipe plugs and connect pilot pressure to the 1/4" pipe external pilot supply port "X" in subbase or manifold.



Direct Pipe Ported

For field conversion to external pilot supply, remove and discard 1/4" pipe plug in external pilot supply port "X". Move stored plug "Y" to location "Z" in bottom of pilot supply port "X". Then connect pilot pressure to port "X" in valve body.

Service Kits / Parts

Service Kit (Single Solenoid - Standard Service)	K352128
Service Kit (Single Solenoid - Special Service)	K352129
Service Kit (Single Remote - Pilot Operated)	K352359
Pilot Valve / Remote Pilot Gasket.	K183001
Body to Base Gasket.....	K183038
Indicator Light (24VDC - Line Mounting)	H19110
Indicator Light (24VDC - Base Mounting)	H19112
Indicator Light (120V / 60 HZ - Line Mounting)	H19102
Indicator Light (120V / 60 HZ - Base Mounting)	H19105

Direct Pipe Ported Valves

Voltage			Coil	
60 Hz	50 Hz	D. C.	19" Leads	72" Leads
12	—	—	K593007	K593178
24	—	6	K593003	K593179
—	24	—	K593015	K593181
—	36	—	K593016	K593183
—	—	12	K593010	K593182
—	—	24	K593014	K593184
—	—	(Standard)		
—	—	24	K593271	K593272
—	—	(Arc Suppressed)	K593028	K593185
—	—	48	K593025	K593186
120	110	—	K593035	K593187
240	220	—	K593033	K593188
—	240	—	K593020	K593189
—	—	90	K593041	K593190
—	—	115	K593038	K593191
—	380	—		

Base Mounting Valves

Voltage			Coil	
60 Hz	50 Hz	D. C.	No Light	With Light
12	—	—	K593052	—
24	—	6	K593048	—
—	24	—	K593061	—
—	36	—	K593062	—
—	—	12	K593055	—
—	—	24	K593060	K593274
—	—	(Standard)		
—	—	24	K593305	K593275
—	—	(Arc Suppressed)		
—	—	48	K593074	—
120	110	—	K593071	K593125
240	220	—	K593081	—
—	240	—	K593079	—



Pneumatic Division North America
Richland, MI 49083

Service Instructions: V-566P

1" Valvair II/A6 Double Operated Valves
3-Position

ISSUED: November, 1998

Supersedes: K583-385, March, 1996

ECN 8915



WARNING

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

- Disconnect air supply and depressurize all air lines connected to this product before installation, servicing, or conversion.
- Disconnect electrical supply before installation, servicing or conversion.
- Operate within the manufacturer's specified pressure, temperature, voltage and other conditions listed in these instructions.
- Medium must be moisture-free if ambient temperature is below freezing.
- Service according to procedures listed on 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 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.

APPLICATION LIMITS

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

Pressure Range for Solenoid Operated Valves

Pressure Ratings for New Updated Valves						
Media	Solenoid Pilot Supply Source					
	Internal Pilot Supply			External Pilot Supply		
	PSIG	BAR	kPa	PSIG	BAR	kPa
Air	Valve Inlet			Valve Inlet		
	Minimum	35	2.41	241	Minimum	0 0 0
	Maximum	140*	9.65	965	Maximum	250* 17.24 1724
	Pilot Supply Port			Pilot Supply Port		
	PLUGGED					
				Minimum 35 2.41 241 Maximum 140* 9.65 965		
Vacuum	DO NOT USE			Valve Inlet		
				Within 1" Hg of Perfect		
				Pilot Supply Port		
				Minimum 35 2.41 241 Maximum 140* 9.65 965		

* Unless valve is equipped with 200 PSIG pilot valve (9th digit of model number is a "3", i.e. L6657810353 Valvair II Series only).

Pressure Range for Remote Pilot Operated Valves

Media	PSIG BAR kPa			PSIG BAR kPa		
	Valve Inlet			Remote Pilot Signal		
Air	Minimum	0	0	0	Minimum	35 2.41 241
	Maximum	250	17.24	1724	Maximum	200 13.79 1379
Vacuum	Valve Inlet			Remote Pilot Signal		
	Within 1" Hg of Perfect			Minimum	35	2.41 241
				Maximum	200	13.79 1379

Operating Temperature Range:

Operator Type	Duty Cycle	Minimum Ambient Temperature	Maximum Ambient Temperature
Std Service Solenoid	Intermittent	0°F (-18°C)	125°F (52°C)
	Continuous	0°F (-18°C)	100°F (38°C)
Special Service Solenoid	Intermittent	0°F (-18°C)	125°F (52°C)
	Continuous	0°F (-18°C)	125°F (52°C)
Remote Pilot	Not Applicable	0°F (-18°C)	200°F (93°C)

Voltage Range: +10% to -15% of rating

WIRING INSTRUCTIONS



Units with flying leads

Either wire may be "Hot".

CAUTION: DC solenoids with indicator lights and/or arc suppression coils are polarity sensitive. Use red wire as positive.

WIRING INSTRUCTIONS (Continued)

Units with plug-in subbases or manifolds

Use wires marked "1" and "2" for Solenoid "A". Use wires marked "3" and "4" for solenoid "B". For units with DC solenoids and indicator lights or arc suppression coils, wires marked "1" and "3" are positive.



CAUTION: DC solenoids with indicator lights or arc suppression coils are polarity sensitive. Observe polarities indicated above.

Earth ground: All electrically operated valves must be provided a proper earth ground. Connect to green wire from valve.

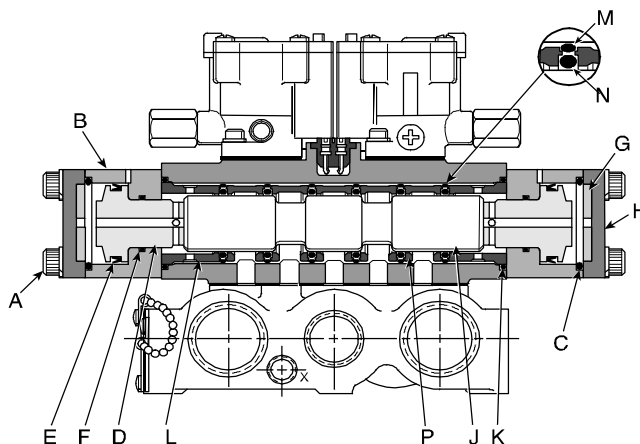
NOTE: In addition to the above instructions, follow all requirements for local and national electrical codes.

SERVICE PROCEDURES

NOTE: All cleaning of parts to be done with mineral spirits or equivalent cleaning solution. Grease should be a mineral based lubricant (Sunaplex 781). All parts showing nicks, scratches or other signs of wear or damage should be replaced.

Valve Service

- 1) Loosen (4) socket head cap screws (A) on each end of valve until they detach end sections from body.
- 2) **End Section Disassembly** - Detach housing (B) from end section. Remove and discard seal (C). Push piston (D) out of housing. Remove and discard v-seals (E) and (F). Clean piston and housing.
- 3) **End Section Reassembly** - Apply lubricant (tube in kit) to v-seals (E & F) and piston bore in housing (B). Install v-seal (E) onto piston (D) with grooved end facing large diameter end of piston. Install v-seal (F) into housing with grooved end facing away from piston bore. Assemble piston (D) and seal (C) into housing. Place bumper (G) back into end cap (H) if it has become dislodged. Slide housing back over screws.
- 4) Insert finger into one end of body and push spool (J) out other end. Clean spool.
- 5) Remove seals (K), end spacers (L), o-rings (M & N), and spacers (P). Discard o-rings. Clean spacers and body bore.
- 6) Apply lubricant (tube in kit) to inner and outer o-rings (M & N).
- 7) Reassemble one end spacer (L), a set of o-rings (M & N) and one spacer (P). Alternatively assemble a set of o-rings and a spacer until all o-rings and spacers are used. Press each set firmly into place.
- 8) Reassemble other end spacer (L). Apply lubricant to seals (K) and place in ends of body.



Valve Service (Continued)

- 9) On one end of valve, assemble end section and tighten (4) socket head screws (A) to 50-65 in-lb.
- 10) Slide spool (J) into open end of valve.
- 11) On other end of valve, assemble end section and tighten (4) socket head screws (A) to 50-65 in-lb.

Pilot Valve Service

See **Service Instructions V-644P L-Pilot Valves and Operators** packed with **Pilot Valve Service Kit K352166** included in this kit.

Coil / Indicator Light Replacement

See **Service Instructions V-644P L-Pilot Valves and Operators** packed with replacement coils and lights.

MANUAL OVERRIDE REPLACEMENT OR CONVERSION

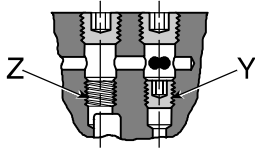
The following override assemblies are interchangeable and can be replaced or field converted:

Non-locking override	K162001
Locking override	K152003
Extended locking override	K152006

Remove override and clean internal threads in housing. Apply pipe sealant sparingly to threads of override housing and assemble override to pilot valve housing.

NOTE: Overrides are held out by air pressure and may not extend until pressure is reapplied to the valve.

CONVERSION PROCEDURE FOR EXTERNAL PILOT

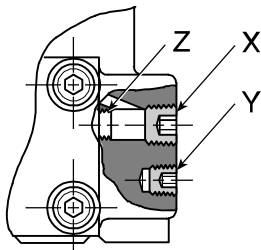


Base Mounted

For field conversion to external pilot supply, remove (2) 1/8" pipe plugs from top of valve body and move bottom plug from "Y" to "Z". Replace 1/8" pipe plugs and connect pilot pressure to the 1/4" pipe external pilot supply port "X" in subbase or manifold.

Direct Pipe Ported

For field conversion to external pilot supply, remove and discard 1/4" pipe plug in external pilot supply port "X". Move stored plug "Y" to location "Z" in bottom of pilot supply port "X". Then connect pilot pressure to port "X" in valve body.



SERVICE KITS / PARTS

Service Kit (Double Solenoid - Standard Service)	K352130
Service Kit (Double Solenoid - Special Service)	K352131
Service Kit (Double Remote - Pilot Operated)	K352360
Pilot Valve / Remote Pilot Gasket	K183001
Body to Base Gasket	K183038
Indicator Light (24VDC - Line Mounting)	H19110
Indicator Light (24VDC - Base Mounting)	H19112
Indicator Light (120V / 60 HZ - Line Mounting)	H19102
Indicator Light (120V / 60 HZ - Base Mounting)	H19105

Direct Pipe Ported Valves

Voltage			Coil	
60 Hz	50 Hz	D. C.	19" Leads	72" Leads
12	--	--	K593007	K593178
24	--	6	K593003	K593179
--	24	--	K593015	K593181
--	36	--	K593016	K593183
--	--	12	K593010	K593182
--	--	24 (Standard)	K593014	K593184
--	--	24 (Arc Suppressed)	K593271	K593272
--	--	48	K593028	K593185
120	110	--	K593025	K593186
240	220	--	K593035	K593187
--	240	--	K593033	K593188
--	--	90	K593020	K593189
--	--	115	K593041	K593190
--	380	--	K593038	K593191

Base Mounting Valves

Voltage			Coil	
60 Hz	50 Hz	D. C.	No Light	With Light
12	--	--	K593052	--
24	--	6	K593048	--
--	24	--	K593061	--
--	36	--	K593062	--
--	--	12	K593055	--
--	--	24 (Standard)	K593060	K593274
--	--	24 (Arc Suppressed)	K593305	K593275
--	--	48	K593074	--
120	110	--	K593071	K593125
240	220	--	K593081	--
--	240	--	K593079	--



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 system 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 INSTRUCTION MANUALS THAT UTILIZE THESE PRODUCTS. CONTACT YOUR LOCAL REPRESENTATIVE.



Pneumatic Division
Richland, Michigan 49083

Installation & Service Instructions:
V-644P

L-Pilot and Operators

ISSUED: November, 2012
Supersedes: April, 2005

Doc. #V644, EN #120642, Rev. 7

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

NOTE: Locking manual overrides should be in the out position for proper valve operation.

Application Limits

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

0 PSIG Minimum / Maximum pressures vary with model.
Take the 5th through 7th digits in the model number and then look up maximum rating in the following table.

Kxxx-xxxx < Model Number
└─── "C" - (Orifice / Function Code)

C	psig	bar	kPa	C	psig	bar	kPa
001	250	17.24	1724	029	150	10.34	1034
003	200	13.79	1379	033	140	9.65	965
005	150	10.34	1034	035	140	9.65	965
007	200	13.79	1379	036	150	10.34	1034
009	200	13.79	1379	037	125	8.62	862
013	200	13.79	1379	039	90	6.21	621
014	200	13.79	1379	041	60	4.14	414
015	175	12.07	1207	043	90	6.21	621
017	140	9.65	965	045	90	6.21	621
019	90	6.21	621	054	90	6.21	621
021	90	6.21	621	056	90	6.21	621
023	130	8.96	896	080	150	10.34	1034
025	140	9.65	965				

Operating Temperature Range

Minimum*: -17°C (0°F)

Maximum (Standard Service): 37°C (100°F)

Maximum (Special Service): 52°C (125°F)


* In below-freezing ambient temperatures, it is important that a suitable lubricant be reasonably moisture-free.

Voltage Range: +10% to -15% of rating.

Wiring Instructions

(Units with flying leads)

Connect the two wires to suitable supply voltage. Either may be "Hot". (Plug-in valves are merely plugged into the mating power valve or manifold base.)

 **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.

NOTE: In addition to above instructions, follow all requirements for local and national electrical codes.

Pilot Valve Replacement

1. Loosen and remove (2) socket head capscrews and lockwashers from mounting feet.
2. Remove pilot valve and gasket.
3. Place new gasket and pilot valve on top of power valve or base, aligning edges of gasket with footprint of pilot valve.
4. Screw capscrews (with lockwashers) into power valve or base. Tighten capscrews to 4.5 to 5.6 Nm (40 to 50 in. lbs.) torque by alternatively tightening screws in progressive steps.

Service Procedures

General Service (Conduit, JIC and Plug-In Style)

1. Loosen cover screws and remove cover and top plate. Remove and discard seals from top plate and underside of cover. Replace with new seals from kit.

WARNING

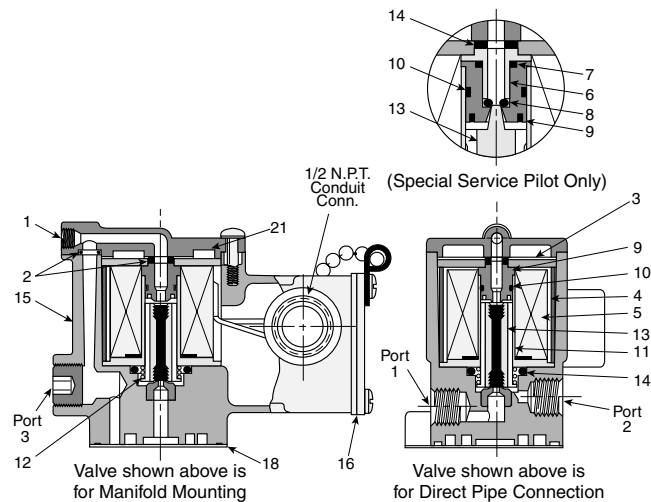
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The products described herein, including without limitation, product features, specifications, designs, availability and pricing, are subject to change by Parker Hannifin Corporation and its subsidiaries at any time without notice.

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

- Remove split sleeve and then pull up on coil while pushing lead wires toward center of housing.
- Remove sleeve assembly, plunger and spring. Discard plunger (retain spring). Remove and replace tetraseal in bottom of housing with new one from kit.
- Pull top seat out of sleeve. Remove and discard o-rings from top seat. Clean top seat, sleeve, spring and seat in housing.
- Lightly grease new o-rings from kit and assemble to top seat. (Include insert where applicable). Push top seat into sleeve. Slide spring onto new plunger and then plunger into sleeve.
- Reassemble sleeve assembly and plunger into housing. Slide coil over sleeve assembly while lightly pulling on coil wires. Slide split sleeve over coil.
- Reassemble top plate and cover. Tighten cover screws to 2.3 to 2.8 Nm (20 to 25 in. lbs) torque.



Conduit, JIC and Plug-In Style

Item	Kit	Description
1		Cover Assembly
2	(1) & (2)	Tetraseal (Qty 2)
3		Top Plate
4		Split Sleeve
5	(3)	Coil
6		Insert
7	(2)	O-Ring (.176 ID X .070W) Silicone, Red
8	(2)	O-Ring (.114 ID X .070W)
9		Top Seat
10	(1) & (2)	O-Ring (.375 ID X .030W)
11		Sleeve Assembly
12		Spring
13	(1) & (2)	Plunger
14	(1) & (2)	Tetraseal
15		Body Assembly
16		Junction Box Cover Assy.
17		Exhaust Deflector**
18	(1) & (2)	Gasket
19	(1) & (2)	O-Ring (.300 ID X .050W)**
20	(4)	Override**

(1) Included in standard service repair kit K352166.

(2) Included in special service repair kit K352366.

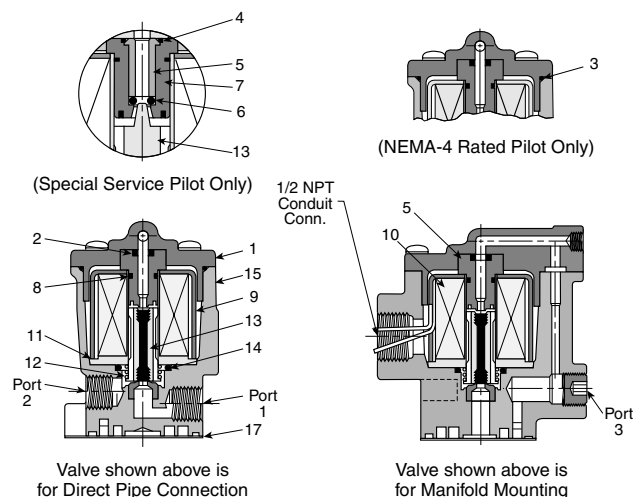
(3) See coil chart page 3.

(4) See list on page 3.

** Not Shown.

General Service (Hazardous Duty & NEMA-4)

- Loosen cover screws and remove cover. Remove and discard seals from underside of cover. Replace with new seals from kit.
- Remove top seat and insert (where applicable), remove and discard o-rings and clean parts.
- Lightly grease new o-ring(s) from kit and assemble o-ring(s) and insert (where applicable) to top seat.
- Remove inner housing and then pull up on coil while pushing lead wires toward center of housing.
- Remove sleeve assembly, plunger and spring. Discard plunger (retain spring). Remove and replace tetraseal in bottom of housing with new one from kit.
- Clean sleeve, spring and seat in housing.
- Slide spring onto new plunger and then plunger into sleeve.
- Reassemble sleeve assembly and plunger into housing. Slide coil over sleeve assembly while lightly pulling on coil wires. Slide inner housing over coil.
- Reassemble top seat and cover. Tighten cover screws to 2.3 to 2.8 Nm (20 to 25 in. lbs) torque.



Hazardous Duty and Nema 4

Item	Kit	Description
1		Cover Assembly
2	(1) & (2)	O-Ring (.176 ID X .070 W Nitrile – Black)
3	(1) & (2)	O-Ring (Nema 4 Only)
4	(2)	O-Ring (.208 ID x .070W)
5		Top Seat Insert
6	(2)	O-Ring (.114 ID X .070W)
7		Top Seat
8	(1) & (2)	O-Ring (.375 ID X .030W)
9		Housing
10	(3)	Coil
11		Plate – Sleeve Assy.
12		Spring
13	(1) & (2)	Plunger
14	(1) & (2)	Tetraseal
15		Body Assy.
16		Exhaust Deflector **
17	(1) & (2)	Gasket
18	(1) & (2)	O-Ring (.300 ID X .050W)**
19	(4)	Override**

(1) Included in standard service kit K352166.

(2) Included in special service repair kit K352366.

(3) See coil chart on page 3.

(4) See list on page 3.

** Not Shown.

Indicator Light Replacement

Indicator Lights

Volts/Hertz	Plug-In Style	JIC Style (KIT)
120V 60 HZ/110V 50 HZ	H19105	K252050
24 VDC	H19112	K252051

Plug-In Style Valves

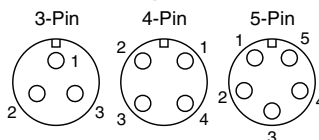
1. Loosen cover screws and remove cover.
2. Remove light from cover by pushing on lens. Discard light.
3. Push new light into socket in housing. Be careful to align pins on bottom of light with connectors in socket.
4. Reassemble cover and tighten screws to 2.3 to 2.8 Nm (20 to 25 in. lbs) torque.

JIC Valves (Without Multi-Pin Connector)

1. Loosen screws and remove junction box cover.
2. Snap open splice connectors and pry clip out of splice. Slide wires out of splice. Pull light out of housing and discard.
3. Push new light into housing (be careful not to dislodge seal). Slide one indicator light wire into each splice. Place clip into splice and press until flush with top of splice (vice or long-handled pliers required). Snap splice housing shut. Reassemble junction box cover and tighten screws to 2.3 to 2.8 Nm (20 to 25 in. lbs) torque.

JIC Valves (with 3, 4, or 5-pin connector)

NOTE: Refer to Decal placed on cover or Inside Junction Box of Pilot Operator for wiring configuration.



1. Loosen screws and remove junction box cover.
2. Unscrew wire nut from lamp leads and corresponding connector leads. Retain wire nuts.
3. If lamp contains a spring clip, (24VDC) use needle nose pliers to press together tangs on the spring clip holding the lamp to the cover. Slide spring clip off lamp body and lamp leads.
4. Gently pry up lamp and remove from cover. Discard lamp, o-ring seal, and spring clip.
5. Slide new o-ring over lamp body if necessary, and reinstall lamp into cover, pressing firmly to seat.
6. With needle nose pliers, depress tangs on the spring clip and slip over lamp leads and down onto lamp body until firmly contacting inside of cover. Lamp should not be loose.
7. If lamp does not contain a spring clip (120VAC) then pull light out of housing and discard.
8. Push new light into housing (be careful not to dislodge seal).
9. Reattach electrical lead wires from lamp and corresponding connector leads. Cap with wire nuts. Screw wire nuts down until all leads are secured and covered.
10. Reassemble junction box cover and tighten screws to 2.3 to 2.8 Nm (20 to 25 in. lbs) torque.

For units with DC indicator lamps red wire is (+) positive white wire is (-) negative.

CAUTION: DC solenoids with indicator lamps are polarity sensitive. Observe polarities indicated above.

NOTE: In addition to the above instructions, follow all requirements for local and national electrical codes.

Manual Override Replacement

Manual overrides may be replaced or field converted. Overrides of various styles may be interchanged as long as they are of the same functional type (normally open or normally closed). (Normally closed overrides are color-coded gold).

Non-Locking Normally Open	K162001
Locking Normally Open	K152003
Extended Locking Normally Open.....	K152006
Non-Locking Normally Closed.....	K162004
Locking Normally Closed.....	K152005
Extended Locking Normally Closed	K152007
Spring Return Locking Override	K15020002

Remove override and clean internal threads in housing. Apply pipe sealant sparingly to threads of override housing and assemble override to pilot valve housing.

NOTE: Non-locking overrides are held out by air pressure and may not extend until pressure is reapplied to the valve.

NOTE: Locking overrides should be in the out position for proper valve operation. With pressure applied use a flat head screw driver to press and rotate the plunger 90 degrees until the plunger locks in place.

Coil Chart

Voltage			Coil Number		
60 Hz	50 Hz	D.C.	Plug-In	19" Leads	72" Leads
12	-	-	K593052	K593007	K593178
24	-	6	K593048	K593003	K593179
-	24	-	K593061	K593015	K593181
-	-	12	K593055	K593010	K593182
-	36	-	K593062	K593016	K593183
-	-	24	K593060	K593014	K593184
-	-	48	K593074	K593028	K593185
120	110	-	K593125	K593025	K593186
240	220	-	K593081	K593035	K593187
-	230	-	K593079	-	-
-	240	-	-	K593033	K593188
-	-	90	-	K593020	K593189
-	-	115	-	K593041	K593190
-	380	-	-	K593038	K593191

NOTE: Units with multi-pin connectors should use 19" lead coils. These leads may be cut-to-length, using old coil for length measurements.



Pneumatic Division North America
8676 East M-89
Richland, MI 49083

Installation Instructions: V-648P
Time Delay Modules – K705 Series
ISSUED: November, 1998
Supersedes: K583-012, Jan., 1989
ECN #8980

INSTALLATION AND OPERATING INSTRUCTIONS FOR TIME DELAY MODULES

INSTALLATION

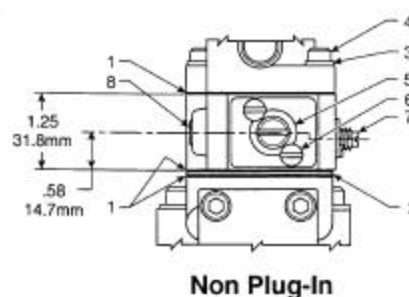
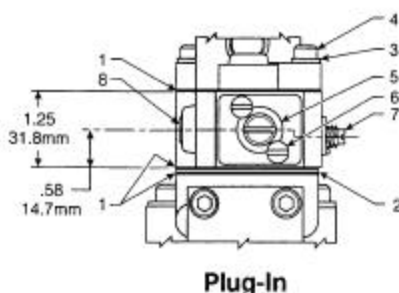
1. Remove pilot or remote adaptor from valve.
2. Place pilot valve gaskets (Item 1) on each side of brass plate (Item 2) and position on main valve. Align two small holes in main valve with holes in gaskets and plate. (Grease gaskets for best results.)
3. Place time delay module, open side down, on top of gaskets and plate. Position third gasket (Item 1) on top of time delay module with two small holes aligned with holes in gasket.
4. Replace pilot valve or remote adaptor on top of module and secure entire assembly using lock washers and cap screws provided. Tighten screws evenly (40-50 in.-lbs.).

SETTING DESIRED FUNCTION

1. First loosen locking screws (Item 6) about $\frac{1}{4}$ turn. If delay of valve action is desired after application of signal, set pointer on selector plate (Item 5) to "On-Delay". (Use pointer marked "Elect" when time delay module is used on solenoid-operated valve. Use pointer marked "Air" when time delay module is used with remote adaptor and normally closed remote pilot signal.)
2. To delay valve action after removal of signal, set pointer to "Off-Delay".
3. When pointer is set at "On-Off-Delay", valve action will be delayed after both application and removal of signal.
4. Be sure to lock the selector plate by retightening the two locking screws.

OPERATION

1. Check length of time delay by cycling valve with pilot and main valve supply set at desired operating pressures. If a longer delay is required, turn the metering screw (Item 7) in. To shorten delay, turn metering screw out.
2. To get accurate and repeatable timing cycles, the following conditions should be met:
 - (A) Use filtered air to the pilot valve or remote adaptor.
 - (B) All external leakage should be eliminated.
 - (C) Screws holding selector plate should be tight.
2. If extended time delay is required, remove the $\frac{1}{4}$ " N.P.T.F. pipe plug (Item 8) and pipe a small reservoir to the $\frac{1}{4}$ " N.P.T.F. port provided. A 2" long piece of $\frac{1}{4}$ " pipe installed in this port, with end capped, will approximately double the time range of the time delay module.





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 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, 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.

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.
- 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.
- 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.