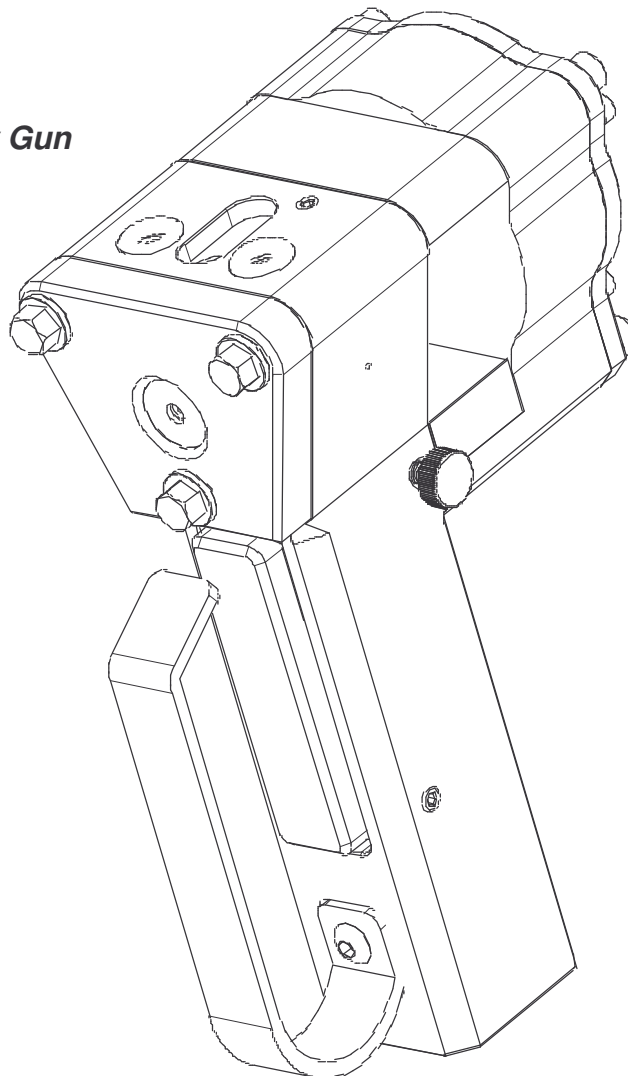


PENTECH, INC.

**Operating Manual– Parts Manual
May, 2008
Issue 1**

***Plural Component,
Impingement Mixing,
Mechanical Purge Spray Gun***



BD Spray Gun

PENTECH, INC.
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Gun Serial #. _____

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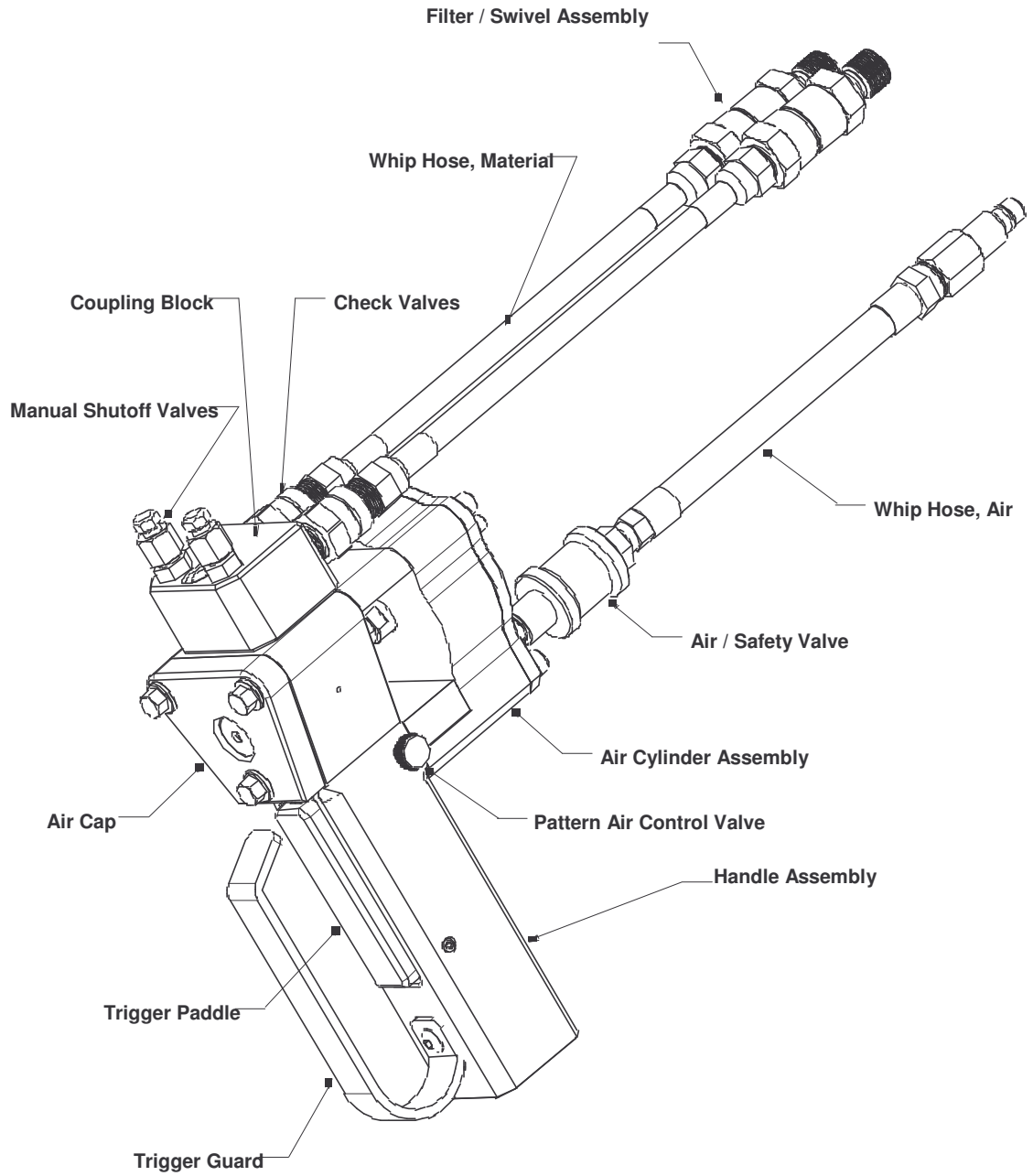
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BD Spray Gun Technical Data

Maximum Fluid Working Pressure	3500 psi
Minimum Air Inlet Pressure	80 psi
Maximum Air Inlet Pressure	130 psi
Minimum Material Output	2 Lbs. /Min.
Maximum Material Output	40 Lbs. /Min.
Maximum Fluid Temperature	200 F
Air Inlet Size	1/4 npt, Quick Disconnect Nipple
A Component (ISO) Inlet Size	1/4" Fpt.
B Component (Poly) Inlet Size	1/4" Fpt.
Dimensions:	Height – 6 3/4" Width – 2 5/8" Length – 4 1/4"
Weight	2.2 Lbs.
Wetted Parts	Aluminum, Stainless Steel, Carbon Steel, Teflon, Chemically Resistant Plastic And O-Rings
Plural Component	
Air Operated	
Impingement Mixing	
Mechanical Purge	

BD Spray Gun Overall View



The BD Spray Gun Package Includes

BD1003 BD Spray Gun Package

Includes:

BD2100 BD Gun Assembly
BD5300 Coupling Block / Whip Hose Assembly

BD3016 Start Up Kit

Includes:

1 BD9001-52 Module, Mix, Round Pattern, .052
1 BD9003-40 PCD, Round Pattern, .040
4 PSG2008 O-Ring
4 PSG4003 O-Ring, Coupling Block
1 BD2021 Rear Seal
1 PSG2016 Basket Filter

BD9000 Tool Kit

Includes:

1 BD9054 Flush Bottle
1 PSG9012 Drill Bit, 7/64" x 6"
1 PSG9010 Combination Wrench, 5/16"
1 PSG9009 Nut Driver, 5/16"
1 BD9011 Pin Vise, Large
1 BD9015 Drill Index, #60 - #41

BD100 Manual, Operation and Parts Identification

Note: BD Gun package comes ready to spray with:

BD 9001-52 – (052 Round Pattern Mix Module)
BD9003-40 – (040 Round Pattern Pattern Control Disc PCD)

Optional Items

BD8000 Flush Tank Assembly
BD6000 Adapter Block Assembly, To Gusmer Coupling Block
BD6100 Adapter Block Assembly, To Graco Coupling Block
PSG7016 Hose Adapter Fitting Assy. To Glascraft Hoses
PSG7017 Hose Adapter Fitting Assy. To Graco Hoses

Safety Information & Warnings

Before operating The BD Spray Gun, personnel should fully understand the contents, recommendations, and safety notes contained in this manual.

Failure to follow these guidelines may result in severe bodily injury or damage to equipment and property.

The safety guidelines outlined in this manual are not intended to be all inclusive. A certain degree of knowledge of general industrial safety practices as used in the spray applied coatings and foam industry are required to insure operator safety.

Aluminum Parts Hazard

Do Not Use 1,1,1-Trichloroethane, methylene Chloride, or other halogenated hydrocarbon solvents, or fluids containing these solvents in the BD Gun. These solvents are capable of causing a serious chemical reaction, and possible rupture when used in pressurized aluminum equipment.

Personal Protection

The operator and personnel in the vicinity of this equipment must ensure their personal safety by wearing:

- Protective eyewear
- Protective clothing and gloves
- Protective breathing apparatus, supplied fresh air system, or approved respirator.

Injection Hazard:

This equipment operates at high fluid pressure and is capable of injecting chemicals into skin.

- Do not place hands or fingers in area of spray pattern.
- Never point spray gun in the direction of other personnel.
- Close material supply valves before leaving spray gun unattended.
- Relieve all pressure before servicing or cleaning this equipment
- If chemicals have pierced skin, get immediate medical attention.

Chemical Materials and Fumes:

- Read and understand Material Safety Data Sheet (MSDS) provided by chemical manufacturer.
- Store and dispose of chemicals in accordance with manufactures guidelines.

GENERAL OPERATION OVERVIEW

GUN SAFETY DEVICES:

The BD Gun has two methods of putting the gun in the safe mode.

1. Air valve:

Gun will not trigger without air pressure to the air cylinder.

To engage air valve safety, slide air valve rearward away from air cylinder

Air valve will vent air contained in gun handle and air cylinder.

2. Material shut off valves:

Gun will not dispense material with A & B manual valves closed.

To engage manual valve safety, turn manual valves clockwise until closed.

Hose orientation:

With gun pointing away from operator, **A** component hose and manual valve is on operators left. **B** component hose and manual valve is on operator's right.

Air hose connection:

Insure that air valve at rear of air Cylinder is in the rearward, closed/safe position.

Air hose is connected by inserting male quick disconnect fitting located at end of whip hose into female quick disconnect air fitting located in heated hose bundle. When gun is not in use, keep air fitting free of debris.

Coupling block:

The A & B material whip hoses are connected to the gun head by the coupling block Bolt.

Insure that the two coupling block o-rings are in place.

Material shut off valves:

The A & B manual valves control the on/off flow of material to the gun.

Do not open a manual valve unless the gun is connected, or the coupling block material ports are directed into a suitable container.

Important Tips for Operation

Air cap and mating front face of gun must be very clean and free of nicks.

Air cap bolts must be tightened with wrench until tight.

Consult your material supplier for the proper cleaning and flushing solvent to use. Ensure that cleaning solvents do not cause swelling of o-rings.

Do not soak o-rings or mix module in solvent. Solvent may be used for cleaning, then dried off.

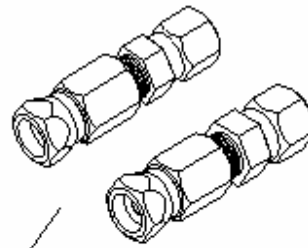
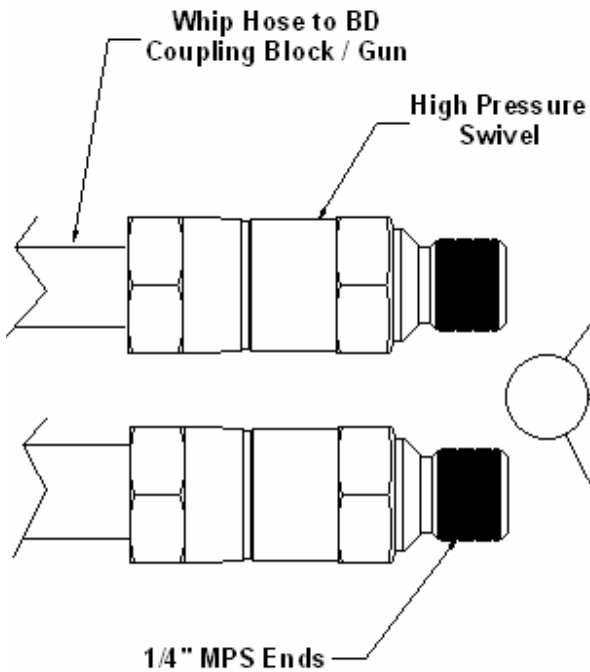
Air cap clean off air should remain on whenever manual valves are open.

Do not submerge entire gun in cleaning solvent. O-Ring damage will result.

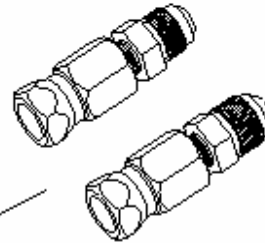
Lubricate air line inlet daily, 2-3 drops of air tool oil only.

Apply light coat of grease or wax to exterior of gun daily to prevent overspray build up.

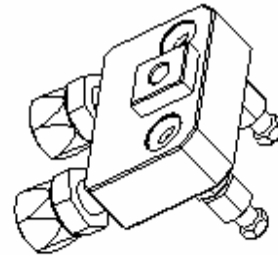
**Methods Of Attaching BD
Coupling Block / Whip Hose Assembly
To Heated Hose Assembly**



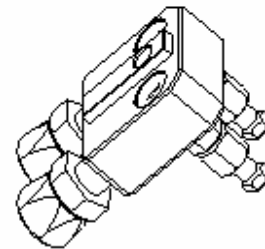
**Attach To Graco / Gusmer Heated Hose Ends
Hose Adapter Fitting Assembly, Graco / Gusmer
Part # PSG7017
1 Set, A & B**



**Attach To Glascraft Heated Hose Ends
Hose Adapter Fitting Ass embly, Glas craft
Part # BD7016
1 Set, A & B**



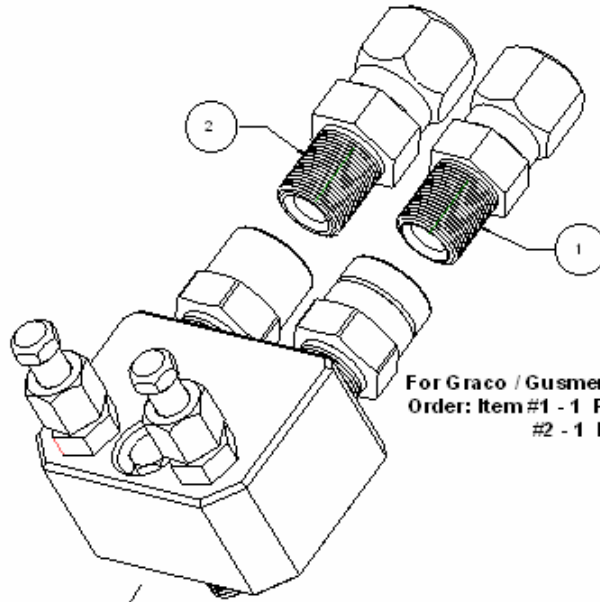
**Attach To Graco Style Coupling Block
Adapter Block Assembly, Graco
Part # BD6100**



**Attach To Gusmer Style Coupling Block
Adapter Block Assembly, Gusmer
Part # BD6000**

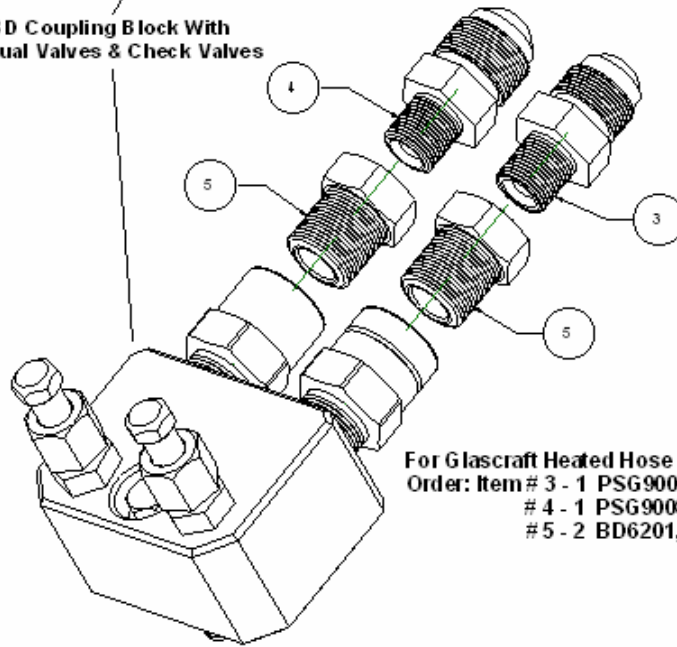
**See Following Page For
Attaching Heated Whip Hoses
Directly To BD Coupling Block**

**Attaching Heated Hose Ends
Directly To BD Coupling Block**



For Graco / Gusmer Heated Hose Ends
Order: Item #1 - 1 PSG7014, ISO Fitting
#2 - 1 PSG7013, Resin Fitting

**BD Coupling Block With
Manual Valves & Check Valves**



For Glascraft Heated Hose Ends
Order: Item # 3 - 1 PSG9007, Hose Adapter Swive, A
4 - 1 PSG9008, Hose Adapter Swivel, R
5 - 2 BD6201, Bushing, Reducer

Initial Gun Start Up

Install Coupling block / Whip hose assembly to heated hose set:

1. Attach Coupling block / whip hose assembly to existing hose assembly using either adapter fittings, or adapter blocks. See page 9 and 10. Check to see that A & B material shut off valves are closed.
2. Turn on hose heat and machine heaters. Set temperature, and allow machine to reach spray temperature.
3. Pressurize equipment, bleed air from coupling block/ whip hose assembly into suitable waste container. Equalize A & B component pressure gauges at correct spray pressure.

Assemble BD spray gun:

1. Check to see that basket filters and coupling block o-rings are in place.
2. Apply light coat of grease or wax to gun to prevent overspray from sticking.
3. Attach gun to coupling block using 5/16" nut driver.
4. Plug in air supply whip hose, open air / safety valve at rear of gun.
5. Open pattern air valve $\frac{1}{4}$ - $\frac{1}{2}$ turn.
6. Slowly open A & B material shutoff valves $1 \frac{1}{2}$ turns. Check for material mist in pattern or leakage at air cap.

Gun is now ready to spray.

Aim off target, spray off target until good pattern develops.

Normal Gun Start Up

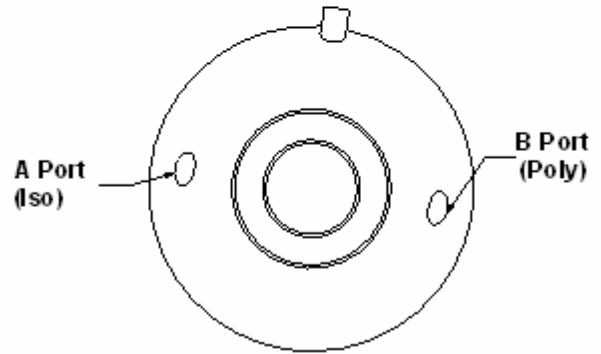
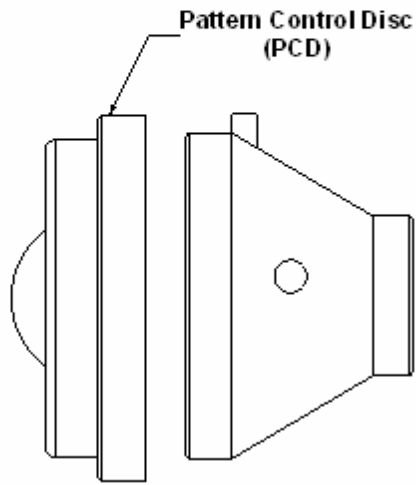
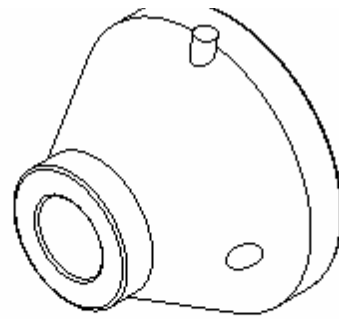
Assemble BD spray gun:

1. With air cap, PCD, and mix module removed, use flush tank or solvent squeeze bottle to ensure that basket filter ports and ports to mix module seat are clean and open. A drill of the proper diameter can be used to clear build-up that may be present.
2. Check ports in mix module to ensure they are clean. See Page 14 for details on drilling the mix module.
3. Using supplied grease gun, inject grease into grease fitting until clean grease is present in module seat area. Wipe grease around seat, use excess to apply a light coat to the outside of the mix module.
4. Push small end of module over end of valving rod. Carefully align module locating pin with groove in module seat ring. Push module fully into seat area. Recheck alignment of pin in slot.
5. Check to see that the orifice in the PCD is clean. Orifice may be cleaned with proper drill size. See page 14. Apply light coat of grease to PCD. Put PCD into place over large end of mix module.
6. Install air cap and 3 bolts over PCD. Tighten until very snug using 5/15" combination wrench. Apply light coat of grease to front of air cap.
7. Plug in air supply whip hose, open air / safety valve at rear of gun.
8. Open pattern air valve $\frac{1}{4}$ - $\frac{1}{2}$ turn. Trigger gun to check for proper operation.
9. Slowly open A & B material shutoff valves $1 \frac{1}{2}$ turns. Check for mist in pattern or leakage at air cap.
10. Check for leakage at rear seal packing nut. Nut should be only tight enough to prevent leakage. Do not over tighten.

Gun is now ready to spray.

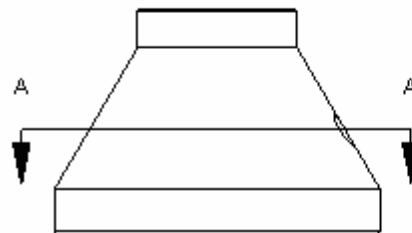
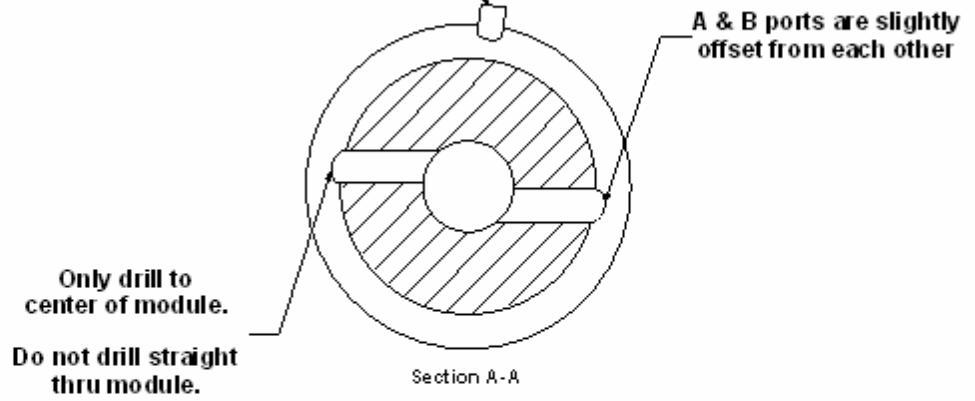
Aim off target, spray off target until good pattern develops.

BD Mix Module Round Spray Pattern



View from rear
of module

Alignment pin must be lined
up with slot in module seat ring.



Module / PCD Chart

	PART		Approx. Output	Number	Cleanout
Item #	NUMBER	DESCRIPTION	Pattern At 24"	Drill Size	Drill Size
1	BD9001-13	Module, Mix, Round Pattern	1.25-2.0 Lbs./Min.	80	0.0135
23	BD9003-24	PCD, Round Pattern	4-6"	73	0.024
1	BD9001-20	Module, Mix, Round Pattern	2.5 - 4.0 Lbs./Min.	76	0.020
23	BD9003-28	PCD, Round Pattern	5-8"	70	0.028
1	BD9001-52	Module, Mix, Round Pattern	10 - 18 Lbs./Min.	55	0.052
23	BD9003-40	PCD, Round Pattern	12-16"	60	0.040
1	BD9001-52	Module, Mix, Round Pattern	18 - 25 Lbs./Min.	55	0.052
23	BD9003-60	PCD, Round Pattern	14-21"	53	0.0595
1	BD9001-70	Module, Mix, Round Pattern	27 - 38 Lbs./Min	50	0.070
23	BD9003-89	PCD, Round Pattern	16-24"	43	0.089

Spraying and Normal Operation

Note: The BD Gun comes standard with 24" unheated whip hoses. Their purpose is to limit operator fatigue by providing more flexibility, as well as saving the wear and tear on the more expensive heated whip hose assembly.

Due to the small amount of unheated material in the whip hoses, it may take a moment for the spray pattern to fully develop when first triggered. Subsequent triggering will yield a good pattern instantly.

If this is an issue, heated whip hoses may be attached directly to the BD coupling block with fittings listed on page 10.

Start by spraying off target to check pattern.

Hold spray gun perpendicular to work surface whenever possible.

Overlap round pattern by approximately 1/3 for even application of coatings and foam.

Due to the direct impingement mixing of the BD gun, it may be triggered while aiming at the project surface without producing an Iso spit, or off ratio material.

Gun Shutdown Cleaning

Removing BD gun from coupling block:

1. Close A & B material shutoff valves.
2. With pattern air still on, trigger gun repeatedly to relieve pressure in material ports.
3. Turn off Pattern air valve.
4. Remove gun from coupling block.
5. Attach gun to flush tank block.
6. Attach air supply line to flush tank and pressurize tank.
7. Attach air whip hose to coupler on flush tank.
8. Open air valve on pressure tank to flush block.
9. Open safety air valve at rear of gun.
10. Open A shut off valve and trigger gun into waste container until solvent comes out of PCD. Close A valve.
11. Open B shut off valve and trigger gun into waste container until solvent comes out of PCD. Close B valve.
12. Remove 3 bolts and air cap.
13. Remove PCD. Trigger gun to remove module. Clean and dry module. Store dry.
14. Repeat steps 10 and 11 above. Allow enough solvent flow through ports to thoroughly flush ports and basket filters.
15. Disconnect gun from flush block, remove and dry coupling block o-rings and basket filters.
16. Disconnect flush tank air supply. Remove gun from flush block, blow out with air.

Note: Once familiar with gun operation and cleaning, gun may be left attached to flush tank until next use.

To clean overspray from gun, a rag may be wrapped around gun which has been soaked in suitable solvent, to soften overspray.

Do not immerse gun in solvent to clean as o-rings and trigger spool valve may be damaged.

Troubleshooting

PROBLEM	CAUSE	SOLUTION
Very slight air leakage at sides of air cap.	This is normal.	No action required.
Valving rod does not actuate.	No air pressure.	Connect air, open air valve.
	Low air pressure.	Set air pressure to 80-130 psi.
	Rear seal packing nut too tight.	Loosen packing nut slightly.
Mist from PCD when not triggered.	Air cap bolts loose.	Tighten air cap bolts with wrench.
	Rear surface of air cap dirty.	Clean, check for nicks.
	Module bore worn out.	Replace worn module.
Excessive overspray.	Excessive air flow to air cap.	Reduce air flow with needle valve.
	Fluid pressure set too high.	Reduce fluid pressure.
Round pattern has fingers, or is misshaped.	PCD orifice dirty.	Clean PCD orifice with proper clean out drill.
	PCD orifice worn.	Replace PCD.
Pressure imbalance.	Module ports dirty.	Clean module ports using proper drill size.
	Module ports worn.	Redrill module ports to next larger drill size.
	A & B viscosities not equal.	Adjust temperatures of A & B.
	Basket filters dirty.	Clean basket filters.
	Check valves dirty.	Clean or replace check valve.
Gelled, or hardened material in air passages feeding air cap.	Material crossover, air in hoses.	Clean, or replace check valves.
Material leakage at rear seal.	Rear seal packing nut loose.	Tighten packing nut slightly.
	Rear seal worn or damaged.	Replace rear seal.
Rapid material buildup on PCD or air cap.	Insufficient air flow to air cap.	Increase air flow to air cap.
Gun triggers slowly.	O-rings dry, or worn.	Lubricate gun with air tool oil in air inlet, or replace and lubricate o-rings.
Air Leakage from exhaust.	Damaged spool valve o-rings. Damaged piston o-ring	Replace spool valve o-rings. Replace piston o-ring.

Parts Identification

Section

Repair and Tool Kit List

BD3006 Air Cylinder Repair Kit

Includes:

2	PSG3014	O-Ring
1	BD3010	O-Ring, Piston
1	BD3007	O-Ring, Rear Cover
2	PSG3011	Snap Ring, External

BD3016 Start Up Kit

Includes:

1	BD9001-52	Mix Module, Round Pattern, .052
1	BD9003-40	PCD, Round Pattern, .040
4	PSG4003	O-Ring, Coupling Block
4	PSG2008	O-Ring
1	BD2021	Rear Seal
1	PSG2016	Basket Filter

BD9000 Tool Kit

Includes:

1	BD9054	Solvent Squeeze Bottle
1	PSG9012	Drill Bit, 7/64" x 6"
1	PSG9010	Combination Wrench, 5/16"
1	PSG9009	Nut Driver, 5/16"
1	BD9011	Pin Vise, Large
1	BD9015	Drill Index, #60 - #41

PSG3015 Trigger O-Ring Repair Kit

Includes:

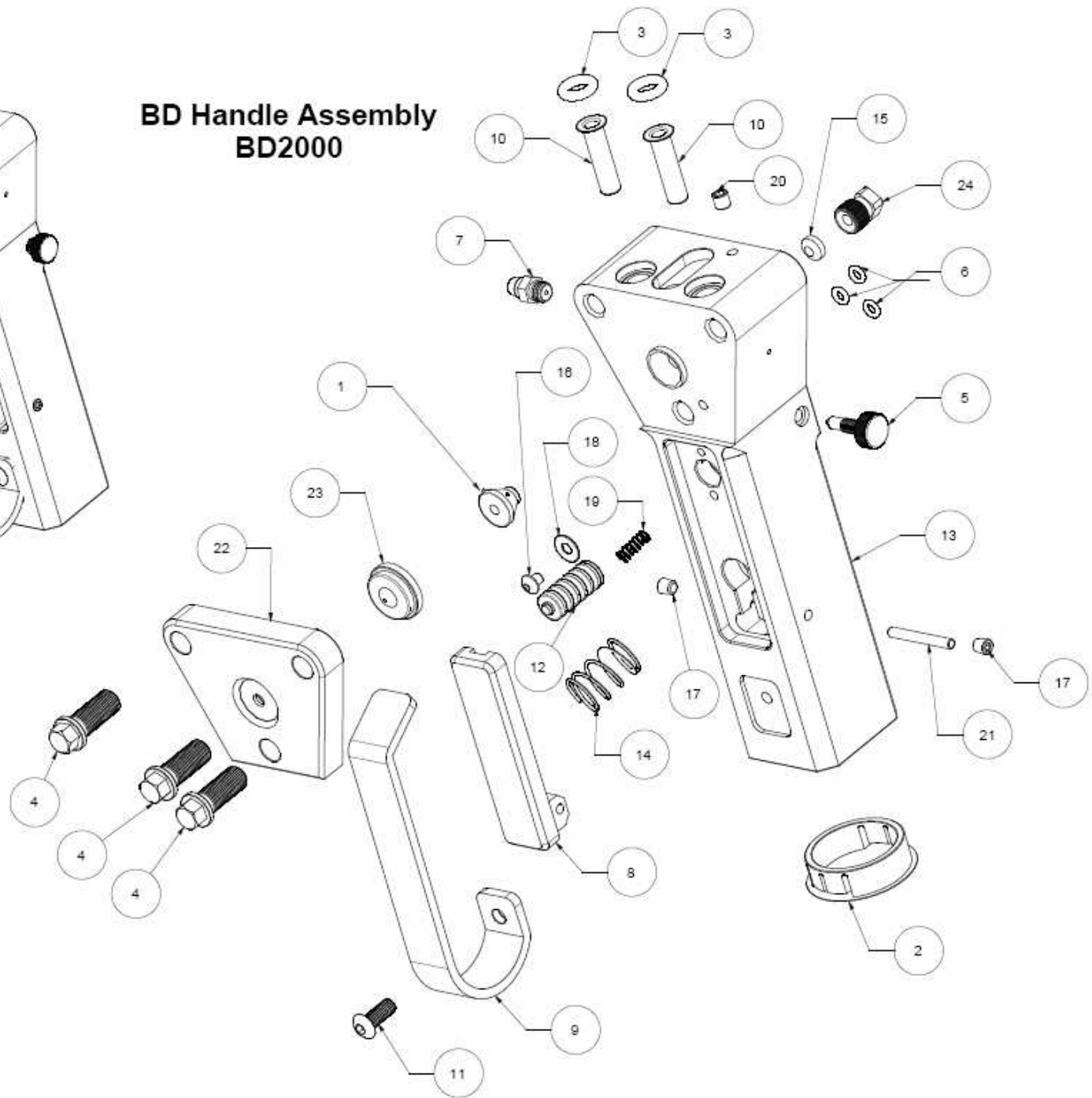
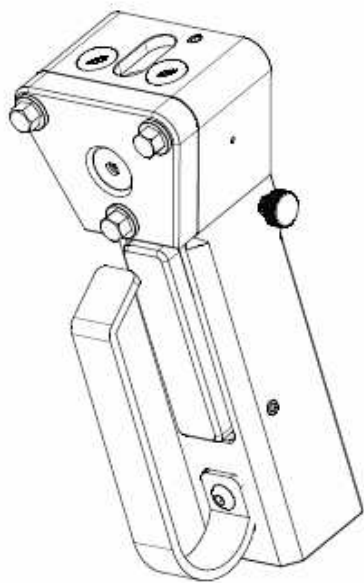
1	PSG2005	Spring, Spool Valve, Return
6	PSG2025	O-Ring, Spool Valve

BD5307 Check Valve Repair Kit

Includes:

2	BD5302	Ball Support
2	BD5303	Ball
2	BD5304	Snap Ring

BD Handle Assembly BD2000



Parts List

BD Handle Assembly BD2000

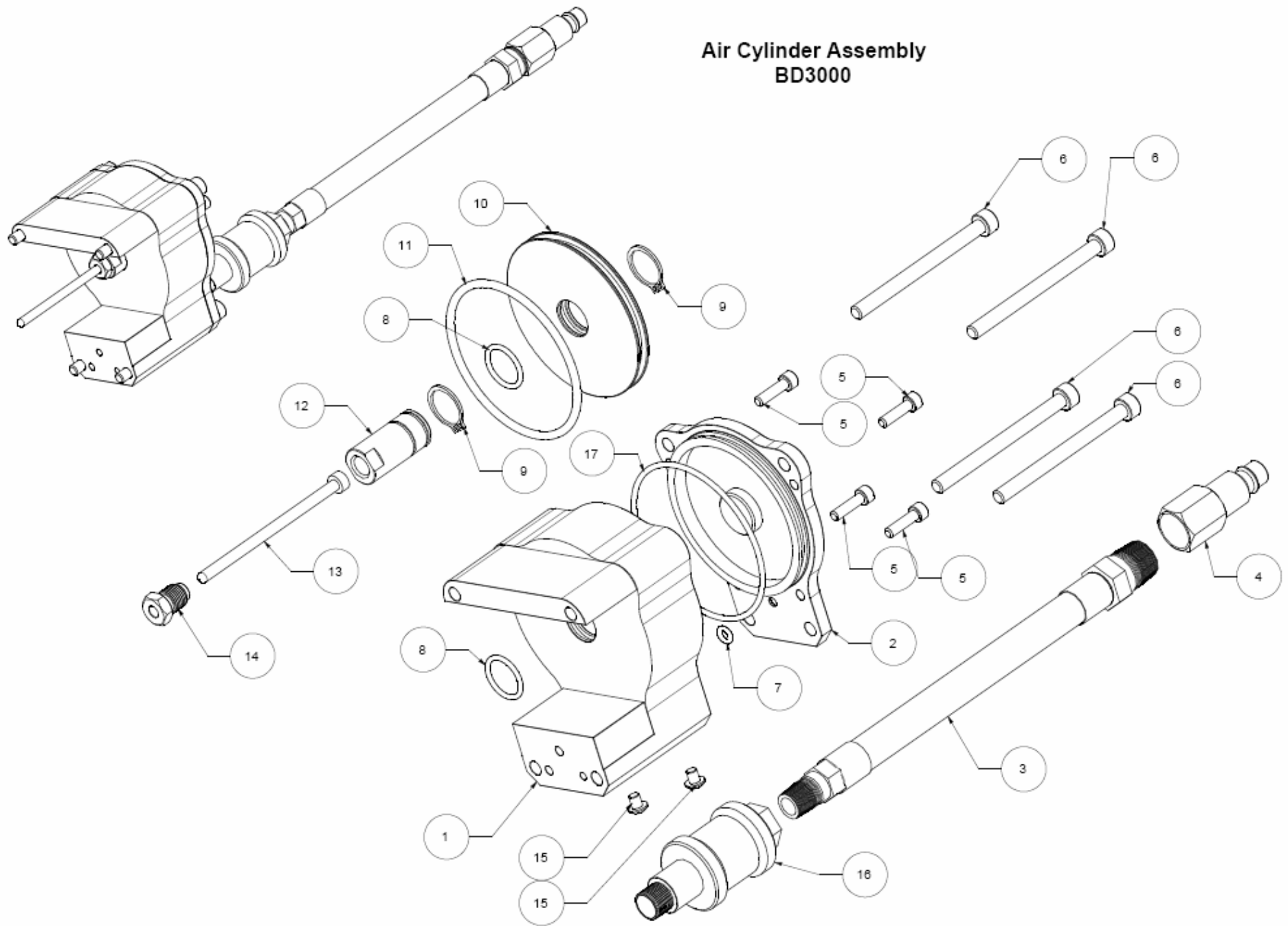
ITEM #	PART NUMBER	QTY. USED	DESCRIPTION
1	BD9001-Size	1	Module, Mix, Round Pattern
2	BD9044	1	Plug, Finish
3	PSG4003	2	O-Ring, Coupling Block
4	BD2012	3	Air Cap Bolt
5	BD2017	1	Air Needle Valve
6	PSG2008	3	O-Ring
7	BD9043	1	Grease Fitting
8	BD2003	1	Trigger Paddle
9	BD2010	1	Trigger Guard
10	PSG2016	2	Basket Filter
11	BD9045	1	Button Head Cap Screw
12	PSG2004	1	Spool Valve
13	BD2001	1	Handle
14	PSG2009	1	Spring, Trigger Paddle
15	BD2021	1	Rear Seal
16	PSG2006	1	Button Head Cap Screw
17	PSG2014	2	Socket Head Set Screw
18	PSG2007	1	Washer
19	PSG2005	1	Spring, Spool Valve
20		1	Socket Head Set Screw
21	BD9046	1	Dowl Pin
22	BD2002	1	Air Cap
23	BD9003-Size	1	PCD, Round Pattern
24	BD2022	1	Rear Seal Packing Nut

**See Module / PCD
Chart on Next Page**

Module / PCD Chart

Approx. Lbs. Per Minute	Item #	PART NUMBER	DESCRIPTION	Pattern Diameter At 24"	Cleanout Drill Size
1 - 2	1	BD9001-13	Module, Mix, Round Pattern		
	23	BD9003-24	PCD, Round Pattern		
3 - 4	1	BD9001-20	Module, Mix, Round Pattern		
	23	BD9003-28	PCD, Round Pattern		
	1	BD9001-52	Module, Mix, Round Pattern		
	23	BD9003-40	PCD, Round Pattern		
	1	BD9001-52	Module, Mix, Round Pattern		
	23	BD9003-60	PCD, Round Pattern		
	1	BD9001-70	Module, Mix, Round Pattern		
	23	BD9003-89	PCD, Round Pattern		

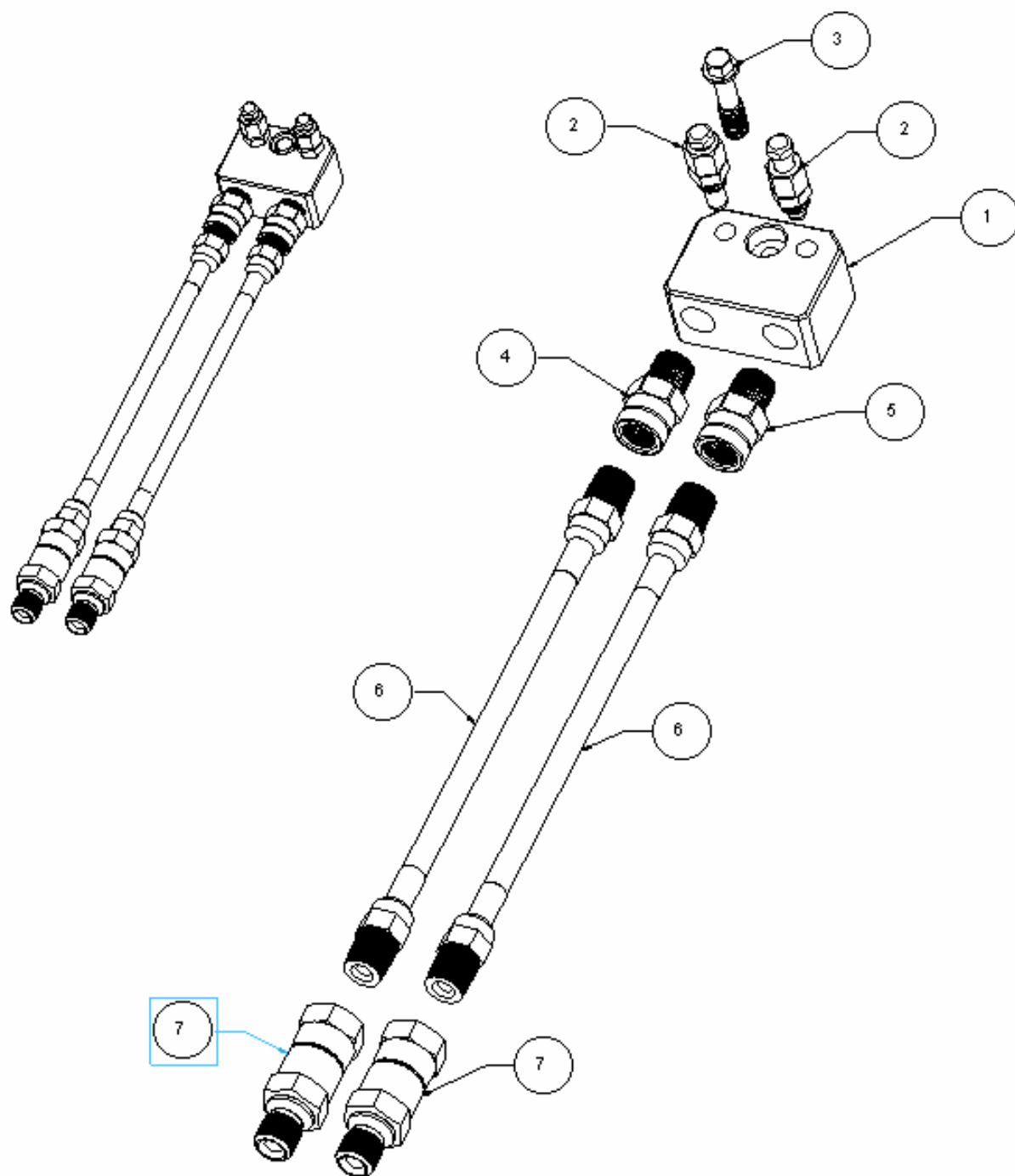
Air Cylinder Assembly BD3000



**BD Air Cylinder Assembly
BD3000**

	PART	QTY.	
ITEM #	NUMBER	USED	DESCRIPTION
1	BD3001	1	Air Cylinder
2	BD3009	1	Rear Cover
3	BD9041	1	Whip Hose, Air
4	PSG7008	1	Nipple, Male, QD
5	BD9040	4	Socket Head Cap Screw
6	BD3004	4	Socket Head Cap Screw
7	PSG2008	1	O-Ring
8	PSG3014	2	O-Ring
9	PSG3011	2	Snap Ring, External
10	BD3012	1	Piston
11	BD3010	1	O-Ring, Piston
12	BD3013	1	Piston Shaft
13	BD4000	1	Valving Rod
14	BD4001	1	Valving Rod Bolt
15	PSG2006	2	Button Head Cap Screw
16	BD5005	1	Air Slide Valve
17	BD3007	1	O-Ring, Rear Cover

BD Coupling Block / Whip Hose Assembly BD5300

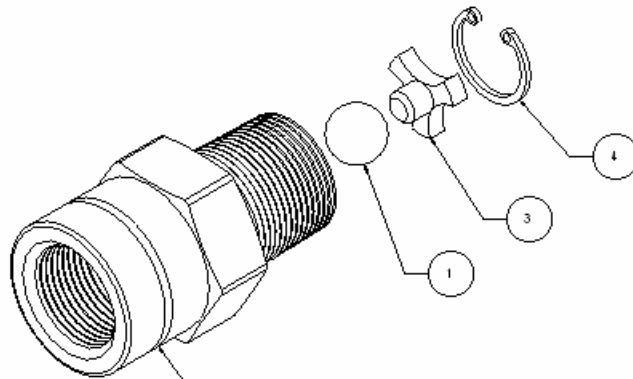
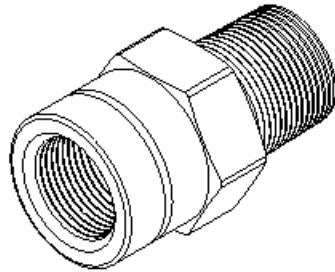


**Coupling Block / Whip Hose Assembly
BD5300**

ITEM #	PART NUMBER	QTY. USED	DESCRIPTION
1	BD5001	1	Coupling Block Bolt
2	PSG5500	2	Manual Valve Assembly
3	PSG5003	1	Coupling Block Bolt
4	BD5305	1	Check Valve - A
5	BD5306	1	Check Valve - B
6	BD5007	2	Whip Hose, A or B
7	BD9042	2	Swivel, High Pressure

Check Valve Repair Kit

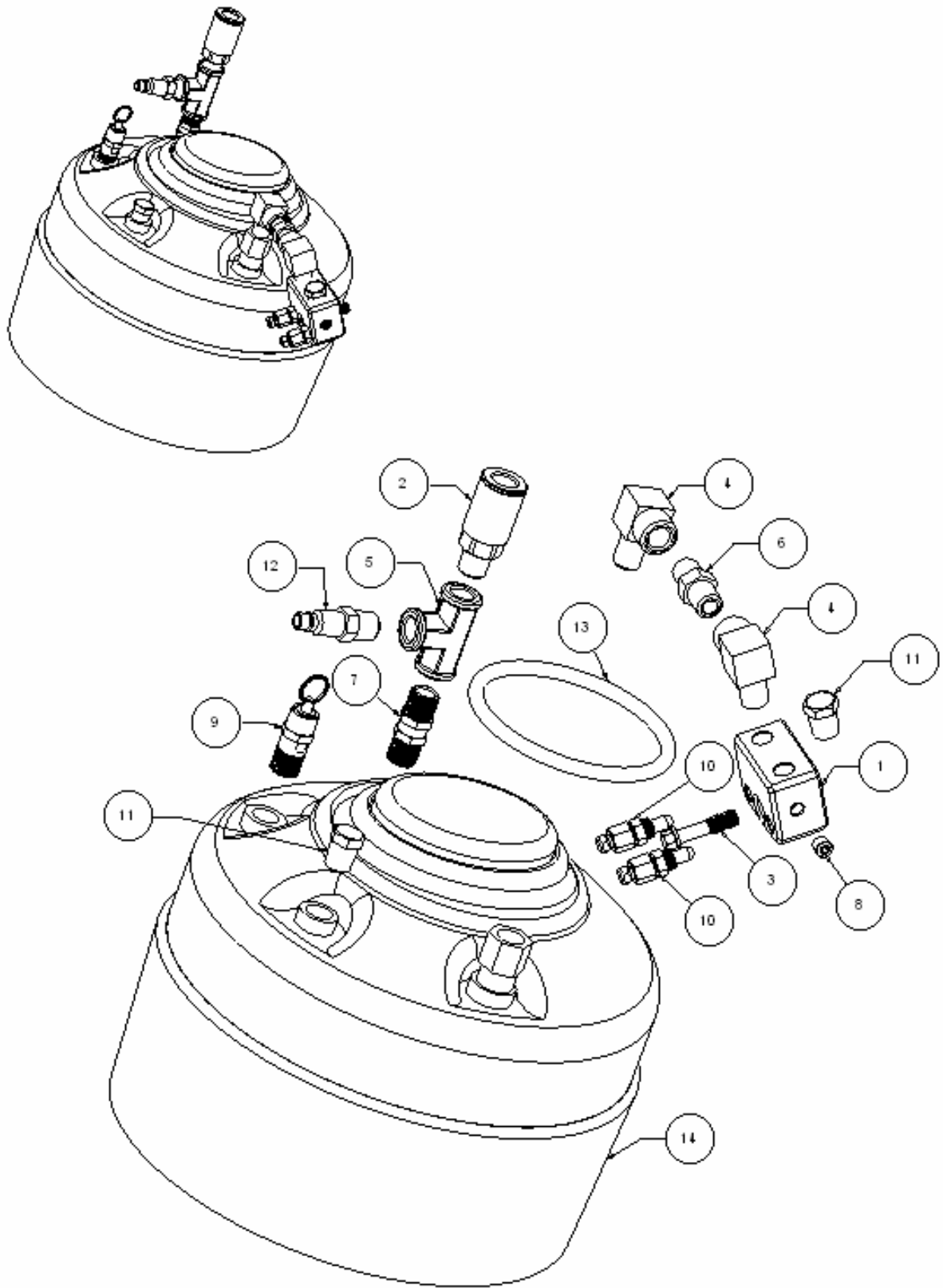
BD5305 A Check Valve BD5306 R Check Valve



Note: BD5305 A Check Valve Has Identifying Groove.

ITEM #	PART NUMBER	QTY. USED	DESCRIPTION
1	BD5303	1	Ball
3	BD5302	1	Ball Support
4	BD5304	1	Snap Ring

Flush Tank Assembly BD8000



Optional BD Flush Tank Assembly BD8000

	PART	QTY.	
ITEM #	NUMBER	USED	DESCRIPTION
1	BD7001	1	Flush Block
2	BD9059	1	QD Coupler, Female
3	PSG5003	1	Boupling Block Bolt
4	BD9060	2	Elbow, Street
5	PSG7007	1	Pipe Tee
6	BD9061	1	Nipple, Hex
7	PSG7012	1	Check Valve
8	PSG5004	1	Pipe Plug
9	PSG7002	1	Relief Valve
10	PSG5500	2	Manual Valve
11	PSG7006	1	Pipe Plug
12	PSG8009	1	Nipple, QD, 1/4" MPT
13	PSG8003	1	O-Ring
14	PSG8001	1	Flush Tank, 1 Gallon

PENTECH INC.

Standard Warranty

Pentech, Inc. provides a limited warranty to the original purchaser of Pentech manufactured parts and equipment against any defects in material or workmanship for a period of one year from the date of shipment from Pentech, Inc.

In the event product is suspected to be defective in material or workmanship, product must be returned in a cleaned and flushed condition, freight prepaid in suitable packaging, using a Returned Material Authorization (RMA) number issued by Pentech, Inc.

If product is found to be defective in material or workmanship, Pentech will issue full credit to customer for the freight charges involved in returning the product to Pentech. A credit will be issued for the replacement cost, or a replacement part will be sent to the customer, no charge, freight prepaid to customer.

This warranty shall not apply to product that Pentech determines to be damaged by misuse, normal wear, or negligence by the customer.

Mailing Address:

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