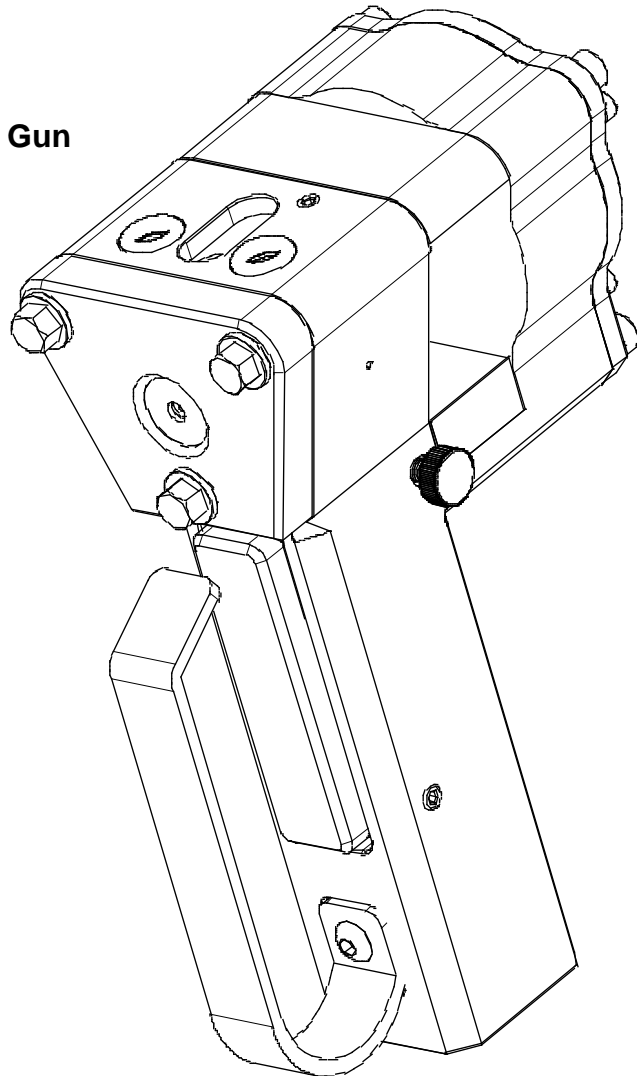


PENTECH INC.

Operating Manual – Parts Manual
April, 2017
Issue 4

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



BD Spray Gun

PENTECH INC.

7256 21st Street East
Sarasota, FL 34243

Phone: 941-739-2700

Fax: 941-739-2722

www.pentech.us

Gun Serial # _____

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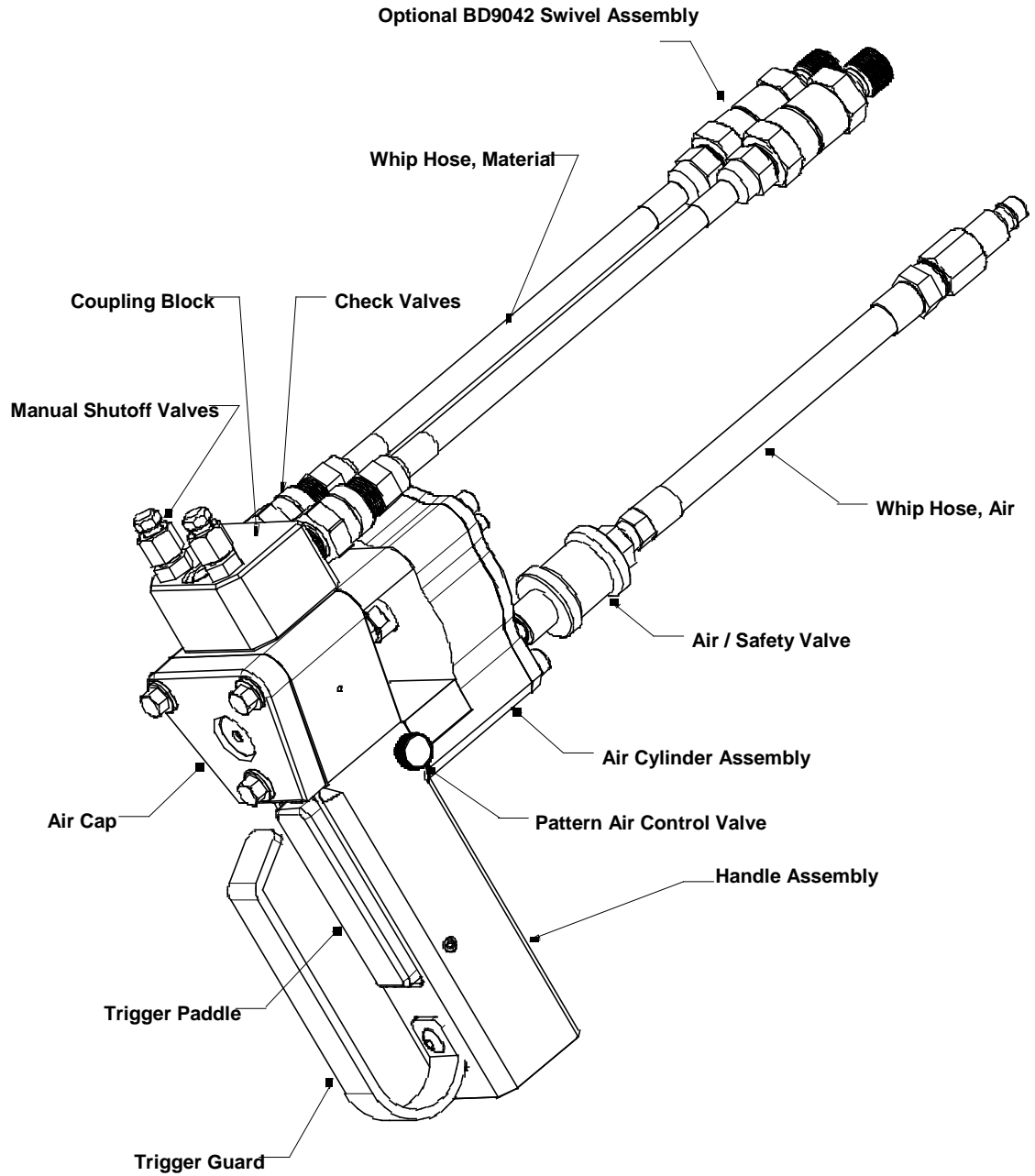
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BD Spray Gun Technical Data

Maximum Fluid Working Pressure	3500 psi
Minimum Air Inlet Pressure	100 psi
Maximum Air Inlet Pressure	130 psi
Minimum Material Output	1 Lbs. /Min.
Maximum Material Output	40 Lbs. /Min.
Maximum Fluid Temperature	200 F
Air Inlet Size	¼" NPT, Quick Disconnect Nipple
A Component (ISO) Inlet Size	¼" FPT.
B Component (Poly) Inlet Size	¼" FPT.
Dimensions:	Height – 6 ¾" Width – 2 ⅝" Length – 4 ¼"
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

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
4	PSG2008	O-Ring
4	PSG4003	O-Ring, Coupling Block

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
BD9042	Swivel, High Pressure
BD6000	Adapter Block Assembly, To Gusmer Coupling Block
BD6100	Adapter Block Assembly, To Graco Coupling Block
PSG7016	Hose Adapter Fitting Assembly, To Glascraft Hoses
PSG7017	Hose Adapter Fitting Assembly, To Graco Hoses
BD9063	Grease Gun
BD9062	Grease Cartridge

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.

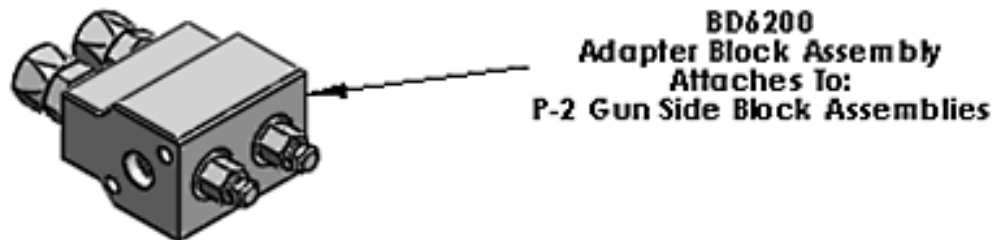
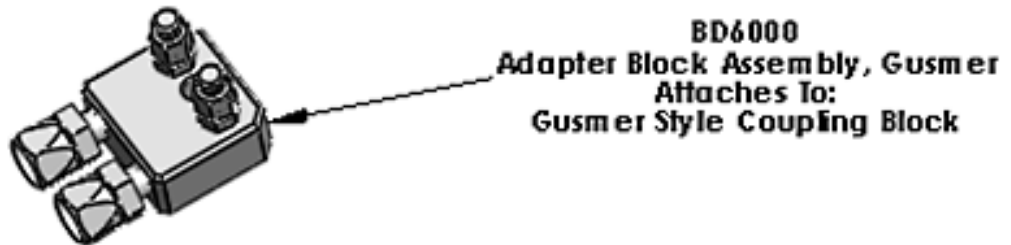
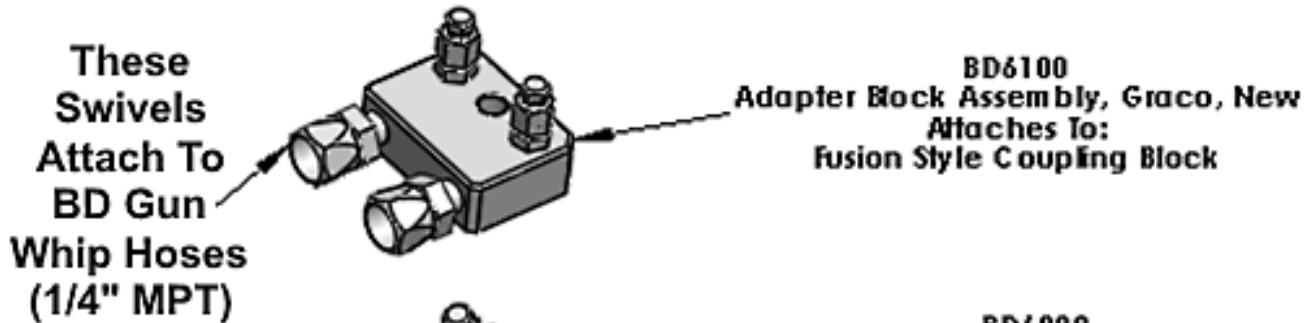
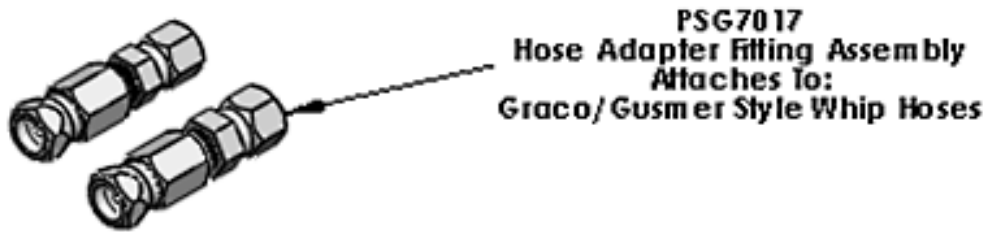
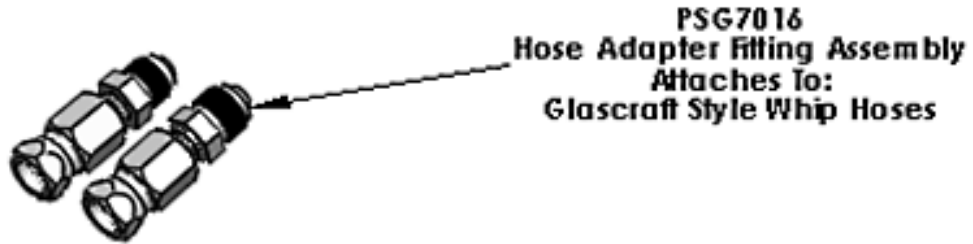
Insure that the two Coupling Block O-rings are in place.

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.

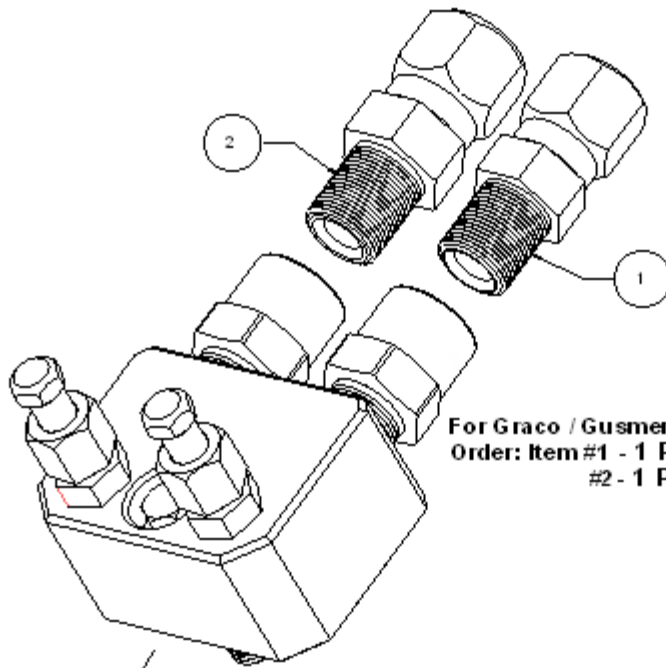
Attaching BD Gun Whip Hoses To Other Manufactures Whip Hoses



All Adapter Blocks Have Manual On/Off
Valves

Attaching Heated Hose Ends Directly to BD Coupling Block

Attaching Heated Hose Ends
Directly To BD Coupling Block



For Graco / Gusmer Heated Hose Ends
Order: Item #1 - 1 PSG9007, Hose Adapter Swive, A
#2 - 1 PSG9008, Hose Adapter Swivel, R

BD Coupling Block With
Manual Valves & Check Valves

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.

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 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.

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 8 and 9. 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

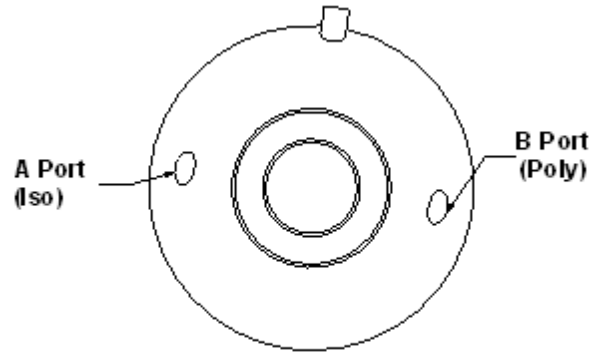
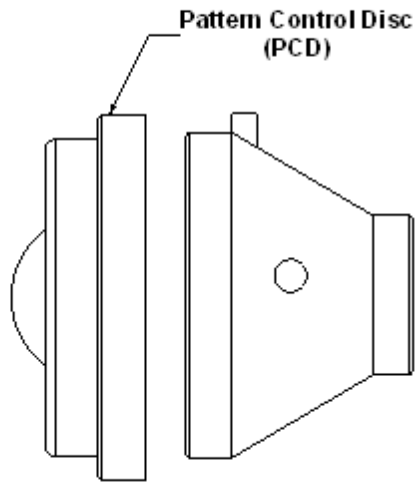
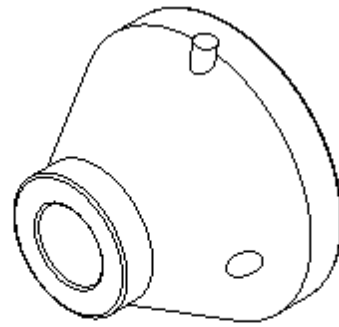
Assemble BD spray gun:

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 20 for details on drilling the mix module.
3. Using a 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 20. 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 5/16" 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.

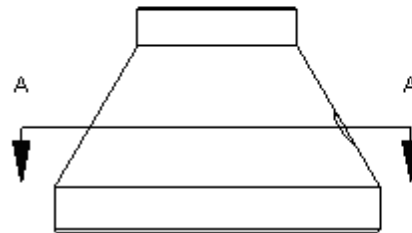
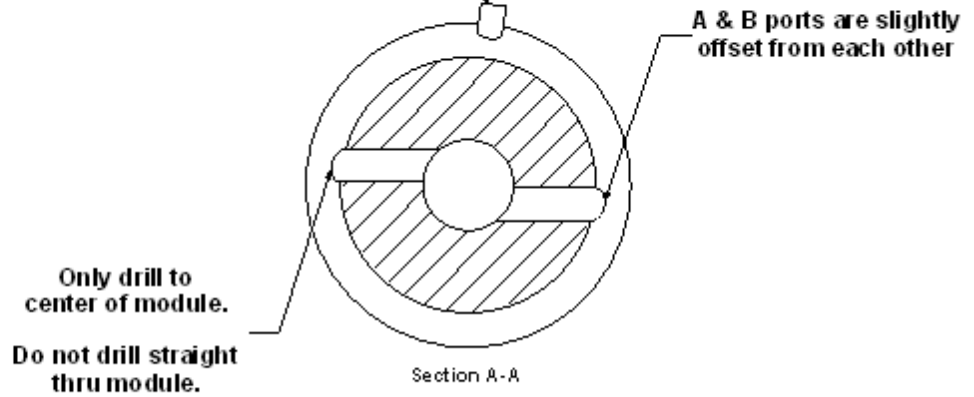
Aim off target, spray off target until good pattern develops.

BD Mix Module Round Spray Pattern



View from rear
of module

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



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 9.

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 into waste bucket repeatedly to relieve pressure in material ports.
3. Turn off Pattern Air Valve.
4. Remove gun from coupling block.

Cleaning with Flush Bottle:

1. Remove 3 bolts and air cap.
2. Remove PCD from air cap. Trigger gun to push out module. Air Safety valve can now be closed, and air hose disconnected from gun.
3. Using flush bottle, clean module ports by blocking one end of module with finger, and squirting solvent in open end until it comes out both ports. Clean outside of module. Store dry.
4. Remove 2 coupling block O-rings, clean and store dry. Remove basket filters from gun and clean in solvent. Using flush bottle, flush solvent thru each basket filter port until solvent comes out of material port in module seat area. Repeat for other side. Gun should be held at an angle to prevent solvent from flooding the trigger area.
5. Clean exterior of gun with solvent rag.

Note: 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.
O-rings in trigger spool valve and air cylinder will be damaged.**

Cleaning with Flush Tank:

1. Attach gun to flush tank block.
2. Attach air supply line to flush tank and pressurize tank.
3. Attach air whip hose to coupler on flush tank.
4. Open air valve on pressure tank to flush block.
5. Open safety air valve at rear of gun.
6. Open A shut off valve and trigger gun into waste container until solvent comes out of PCD. Close A valve.
7. Open B shut off valve and trigger gun into waste container until solvent comes out of PCD. Close B valve.
8. Remove 3 bolts and air cap.
9. Remove PCD. Trigger gun to remove module. Clean and dry module. Store dry.
10. Repeat steps 6 and 7 above. Thoroughly flush ports and basket filters.
11. Disconnect gun from flush block, remove and dry coupling block O-rings and basket filters.
12. 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.

Repair and Tool Kit List

BD3006 Air Cylinder Repair Kit

Includes:

1	PSG2008	O-Ring
1	PSG3014	O-Ring
1	BD3010	O-Ring, Piston
1	BD3007	O-Ring, Rear Cover

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	PSG2016A	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
4	PSG4003	O-Ring, Coupling Block
4	PSG2008	O-Ring

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

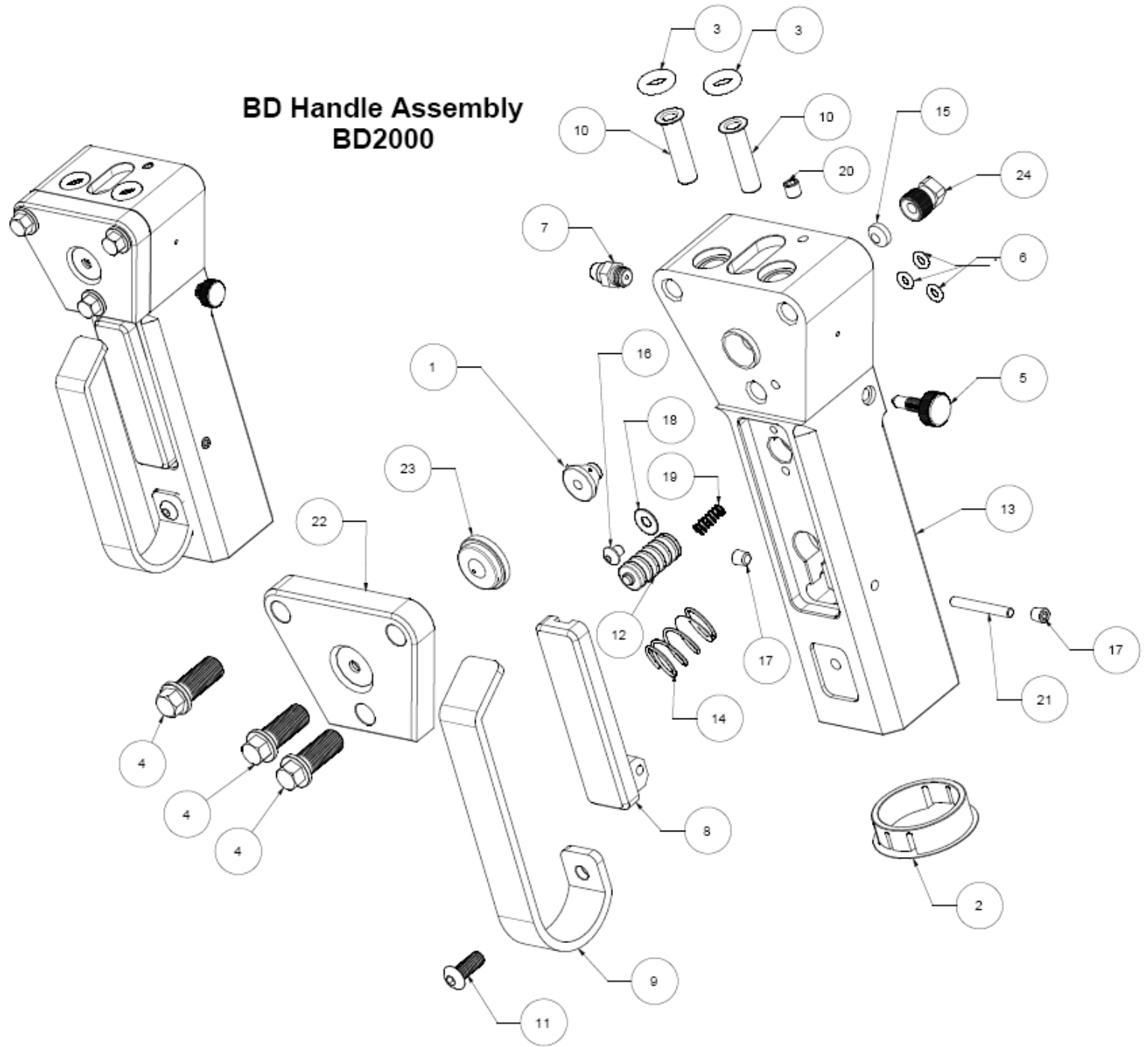
O-RING KITS: Package of 12 for price of 10

PSG4003-PKG	O-Ring, Coupling Block, PKG 12
PSG2008-PKG	O-Ring, PKG 12
BD3007-PKG	O-Ring, Rear Cover, PKG 12
BD3010-PKG	O-Ring, Piston, PKG 12
PSG3014-PKG	O-Ring, PKG 12

Parts Identification

Section

BD Handle Assembly BD2000



Parts List

BD Handle Assembly BD2000

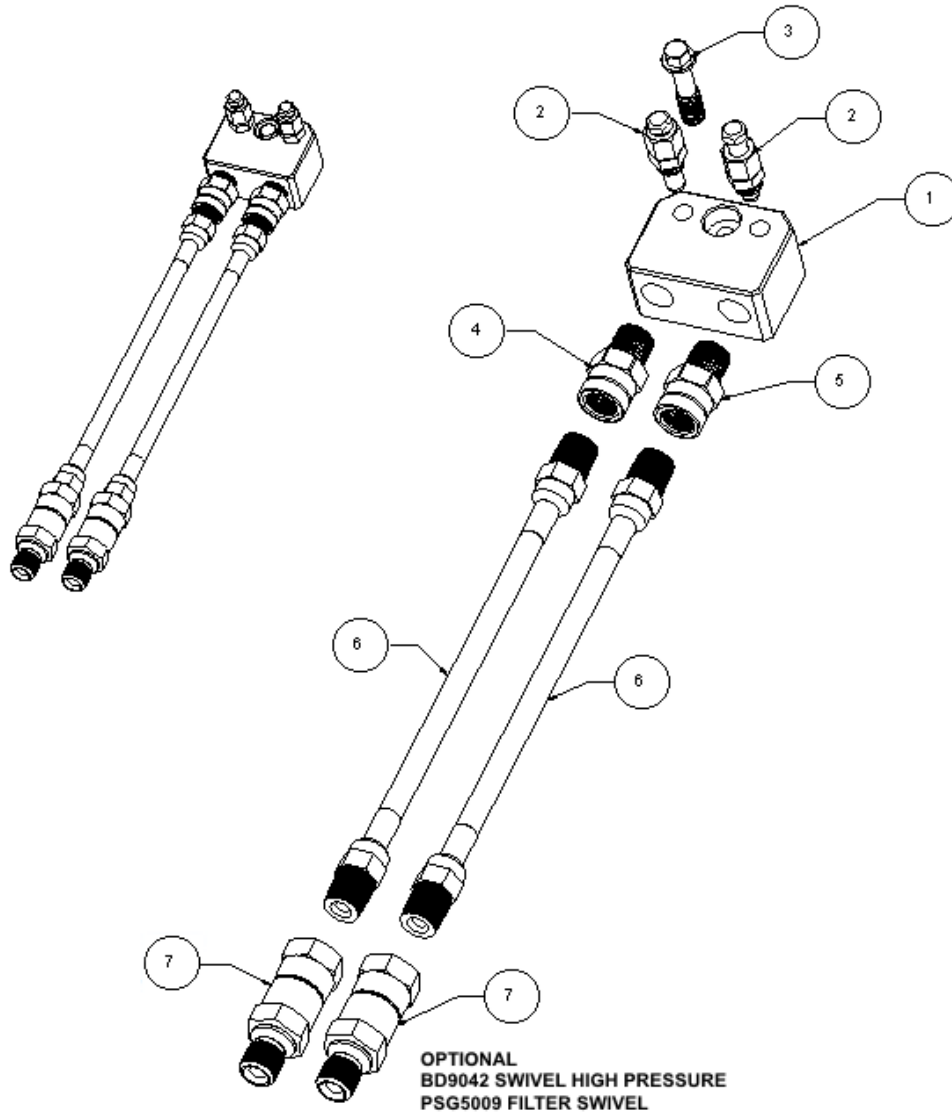
	PART	QTY.	
ITEM #	NUMBER	USED	DESCRIPTION
1	BD9001-Size	1	Module, Mix, Round Pattern
2	BD9044	1	Plug, Finish
3	PSG4003	2	O-Ring, Coupling Block
4	BD2012	3	Air Cap Bolt
5	BD2017	1	Air Needle Valve
6	PSG2008	3	O-Ring
7	BD9043	1	Grease Fitting
8	BD2003	1	Trigger Paddle
9	BD2010	1	Trigger Guard
10	PSG2016A	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 6-32
17	PSG2014	2	Socket Head Set Screw
18	PSG2007	1	Washer
19	PSG2005	1	Spring, Spool Valve
20	BD2015	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

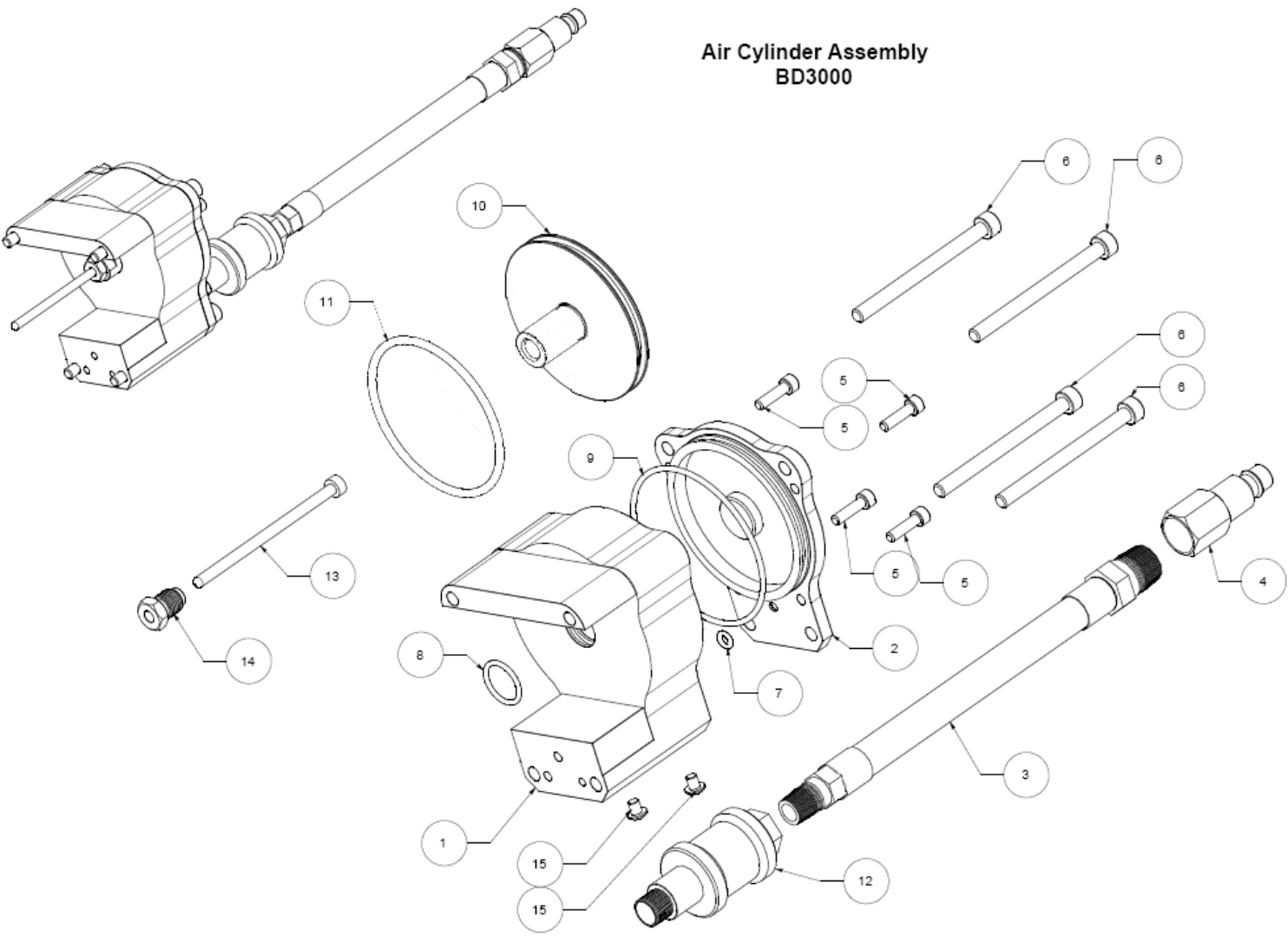
Item #	PART NUMBER	DESCRIPTION	Approx. Output Pattern At 24"	Number Drill Size	Cleanout Drill Size
1	BD9001-13	Module, Mix, Round Pattern	1.25-2.0 Lbs./Min.	80	0.0135
23	BD9003-24	PCD, Round Pattern	4-6"	73	0.024
1	BD9001-20	Module, Mix, Round Pattern	2.5 - 4.0 Lbs./Min.	76	0.020
23	BD9003-28	PCD, Round 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

BD 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, 5	BD5305	2	Check Valve
6	BD5007	2	Whip Hose, A or B
7	BD9042	2	Swivel, High Pressure

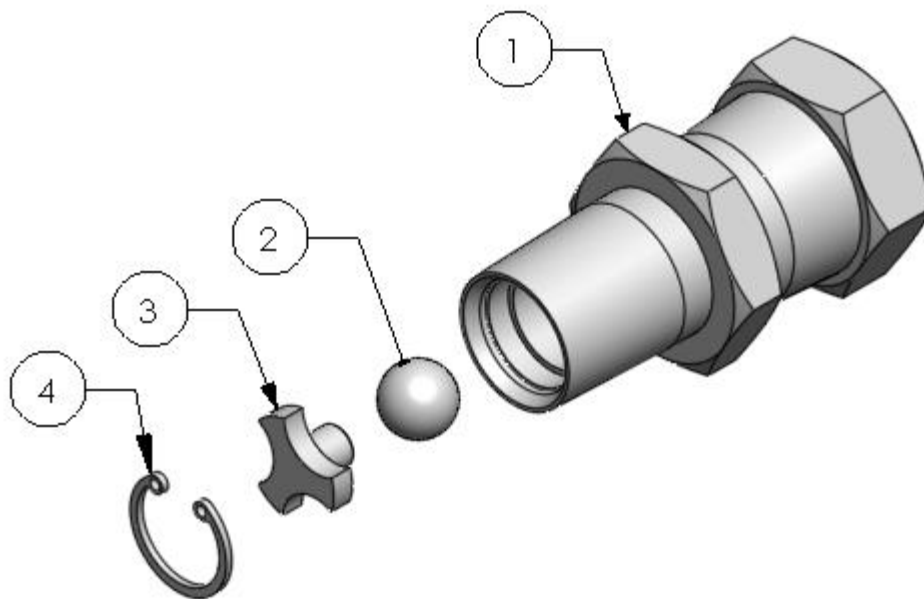
**Air Cylinder Assembly
BD3000**



**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	1	O-Ring
9	BD3007	1	O-Ring, Rear Cover
10	BD3012	1	Piston
11	BD3010	1	O-Ring, Piston
12	BD5005	1	Air Slide Valve
13	BD4000	1	Valving Rod
14	BD4001	1	Valving Rod Bolt
15	PSG2006	2	Button Head Cap Screw

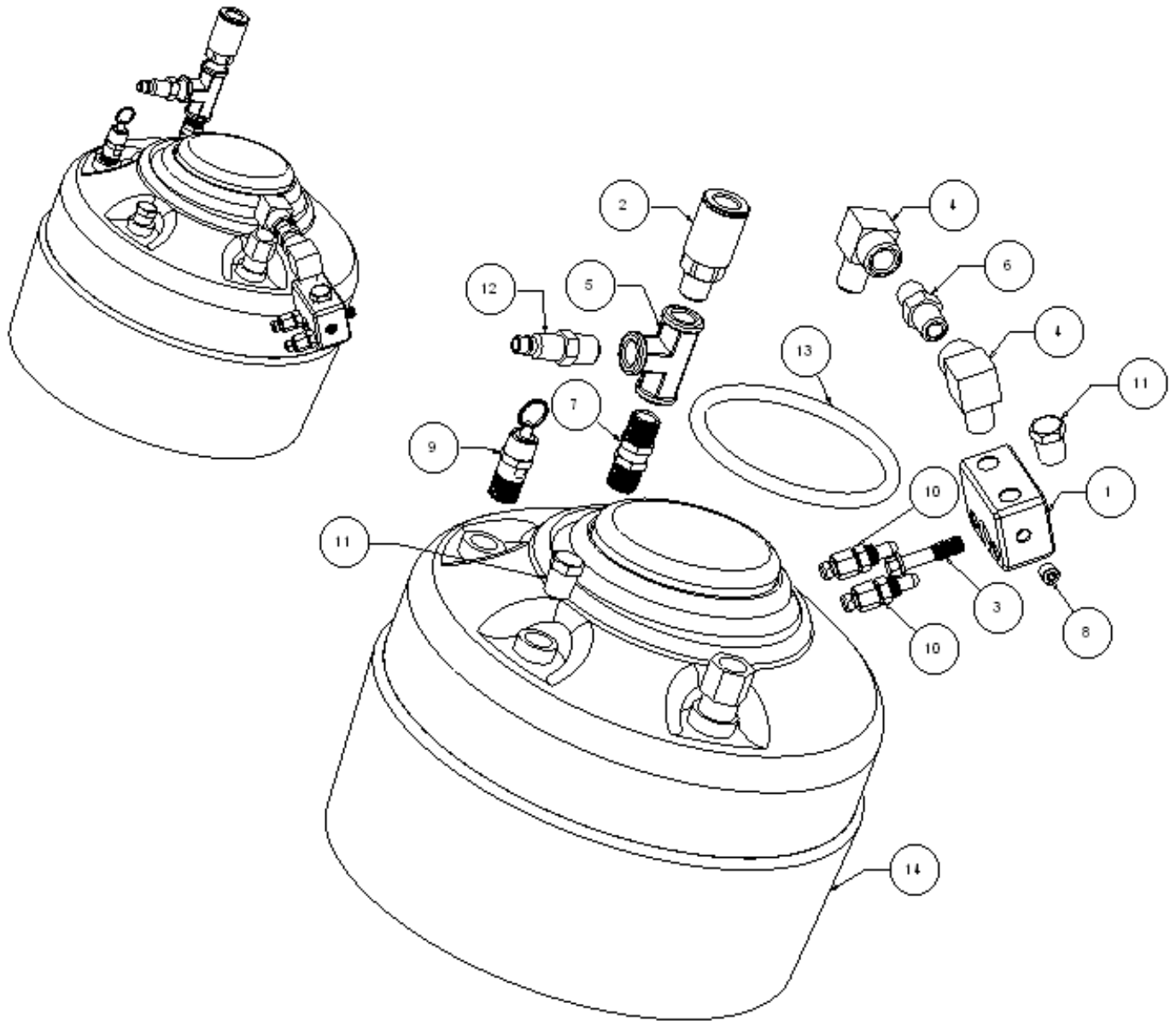
BD5305 Check Valve



1	Check Valve Body	1	BD5301
2	Ball, .250	1	BD5303
3	Ball Support	1	BD5302
4	Snap Ring, Internal	1	BD5304

BD5307 Check Valve Repair Kit: See Page 16

BD8000 Flush Tank Assembly



ITEM #	PART NUMBER	QTY. USED	DESCRIPTION
1	BD7001	1	Flush Block
2	BD9059	1	QD Coupler, Female
3	PSG5003	1	Coupling 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	2	Pipe Plug
12	PSG8009	1	Nipple, QD, 1/4" MPT
13	PSG8003	1	O-Ring
14	PSG8001	1	Flush Tank, 1 Gallon

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. Low air pressure. Rear seal packing nut too tight.	Connect air, open air valve. Set air pressure to 100-130 psi. Loosen packing nut slightly.
Mist from PCD when not triggered.	Air cap bolts loose. Rear surface of air cap dirty. Module bore worn out.	Tighten air cap bolts with wrench. Clean, check for nicks. Replace worn module.
Excessive overspray.	Excessive air flow to air cap. Fluid pressure set to high.	Reduce air flow with needle valve. Reduce fluid pressure.
Round pattern has fingers, or is misshaped.	PCD orifice dirty. Pressure too low. Heat too low. PCD orifice worn.	Clean PCD orifice with proper clean out drill. Increase pressure. Increase heat. Replace PCD.
Pressure imbalance.	Module ports dirty. Module ports worn. A & B viscosities not equal. Basket filters dirty. Check valves dirty.	Clean module ports using proper drill size. Drill module ports to next larger drill size. Adjust temperatures of A & B. Clean basket filters. 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 too loose. Rear seal worn or damaged.	Tighten packing nut slightly. 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.

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:

PENTECH INC.

P.O. Box 274
Tallevast, FL 34270-0274

Physical Address:

PENTECH INC.

7256 21st Street East
Sarasota, FL 34243

941-739-2700 Phone
941-739-2722 FAX

www.pentech.us