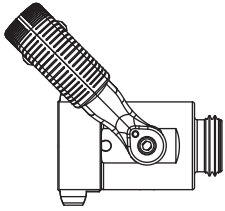
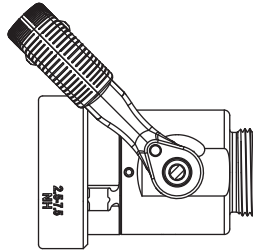


# HAND HELD BALL VALVE & DETENT STYLE BALL VALVES

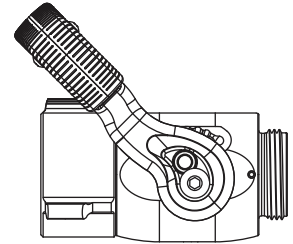
## SERVICE PROCEDURE



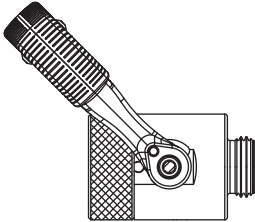
D75 SERIES



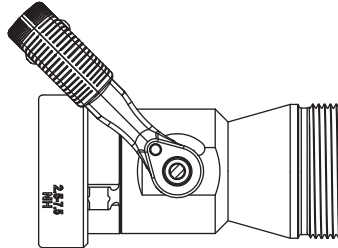
J140 SERIES



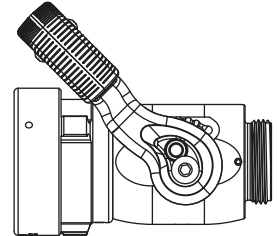
H-VO SERIES



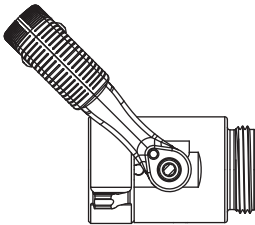
D100D SERIES



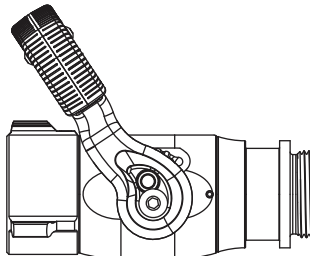
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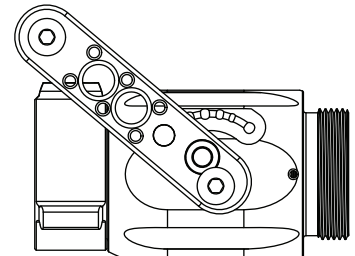
H-2VO SERIES



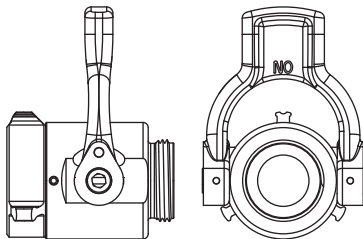
F100 SERIES



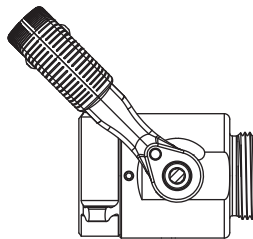
H-VIT SERIES



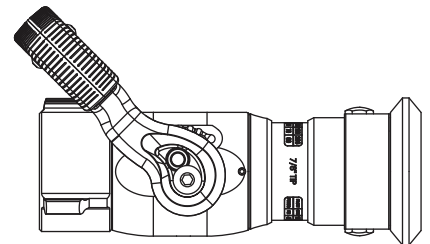
H-3VO SERIES



F125 SERIES



F140 SERIES



HVIT SERIES



#### PERSONAL RESPONSIBILITY CODE

The member companies of FEMSA that provide emergency response equipment and services want responders to know and understand the following:

1. Firefighting and Emergency Response are inherently dangerous activities requiring proper training in their hazards and the use of extreme caution at all times.
2. It is your responsibility to read and understand any user's instructions, including purpose and limitations, provided with any piece of equipment you may be called upon to use.
3. It is your responsibility to know that you have been properly trained in Firefighting and /or Emergency Response and in the use, precautions, and care of any equipment you may be called upon to use.
4. It is your responsibility to be in proper physical condition and to maintain the personal skill level required to operate any equipment you may be called upon to use.
5. It is your responsibility to know that your equipment is in operable condition and has been maintained in accordance with the manufacturer's instructions.
6. Failure to follow these guidelines may result in death, burns or other severe injury.



Fire and Emergency Manufacturers and Service Association  
P.O. Box 147, Lynnfield, MA 01940 • [www.FEMSA.org](http://www.FEMSA.org)

## D, F and J Series HAND-HELD BALL VALVES

Intended for use with all ball valves constructed of stainless steel with quick-change rear valve seat.

### 1.0 ITEMS NEEDED

Not Supplied	Bench Vise
In Repair Kit	Hammer
	1/8" Diameter Punch
	Safety Glasses
	Drill Press (or electric drill)
	Loctite 271

### 2.0 INSTRUCTIONS

1. Remove and discard Hose Gasket (20), Rear Seat (19), and O-ring (18).
2. Open or close bench vise until there is a gap between the jaws of 1/4" to 3/8". Prop Valve Handle (5) over gap so that Spirol Pins (5) can be driven into the gap between the vise jaws. Drive out the spirol pins using a 1/8" diameter punch. Note: Do not use a nail set or pointed punch. This may cause pins to expand, making it very difficult to remove. If possible, remove broken handle at this time. Be sure to wear safety glasses.
3. Pad vise jaws with several rags. Open valve and place repair mandrel through Valve Ball (16). Gently clamp valve in vise with one Trunnion (2) pointing up. Place allen wrench in end of Trunnion. Unscrew and discard trunnion along with O-ring (3). It may be necessary to place a piece of pipe or wrench on end of allen wrench for additional leverage.
4. Turn valve over in vise and repeat step #3.
5. Remove valve from vise and remove mandrel, f140 valve coupling (17) will need to be removed, Ball (16), Front Valve Seat (15), and Belleville Washer (14). Discard Valve Seat and Belleville Washer. Note: Earlier models may have an O-ring in place of the Belleville Washer.
6. Stand valve vertically on drill press and clamp in vise with coupling end up. Drop Belleville Washer (14) into Valve Body (1) (note orientation in drawing). Drop Front Valve Seat (15) into Valve Body (1) (note orientation in drawing). Drop Valve Ball (16) into Valve Body (1) and insert plastic mandrel through hole in ball.
7. Rotate Valve Ball (16) so that threaded holes are aligned with trunnion hole in Valve Body (1).
8. Install O-rings (3) on Trunnions (2).
9. Apply a thin film of grease (supplied) to O-rings and Trunnions, take care not to get any grease on the threads.
10. Apply one large drop of Loctite (supplied) on trunnion threads.
11. Place new Handle (5) in position over Valve Body (1). Make sure that "OFF" on the handle faces the coupling end of the valve.
12. Insert Trunnions (2) through Handle (5) and Valve Body (1) while pressing down on the plastic mandrel with drill press chuck or by hand. Note: It will take approximately 50 lb. to compress the Belleville Washer (14). Screw the Trunnion (2) into Valve Ball (16). Do not tighten yet.
13. Repeat step #12 with other Trunnion.
14. Clamp one allen wrench in vise with approximately 3/8" of the short end above the vise jaws.
15. Place one Trunnion on wrench in vise and second wrench in other Trunnion. The plastic mandrel should still be in the valve ball. Tighten both Trunnions as tight as you can by hand. Do not use a wrench or pipe on the allen wrench or threads may be damaged.
16. With the plastic mandrel still in the Valve Ball (16), pull the Handle (5) back to the open or "ON" position. Locate the small dimple on the Handle (5) above the Trunnions (2). Using the #22 drill (supplied), drill through the dimple, through the center of the Trunnion (2), and out the other side. Support the Handle (5) below the Trunnions (2) on the edge of the drill press table or on a pile of boards to insure that the hole passes through the center of the Trunnions (2).
17. Insert the new Spirol Pins (6) in the drilled holes and press, or gently tap them flush with the Handle (5).
18. Remove plastic mandrel. Lubricate and install O-ring (18) on Rear Valve Seat (19). Press Valve Seat (19) into Valve Body (1) (note orientation in drawing). Install new Hose Gasket (20).

If you have trouble, call 1-800-348-2686 for advice or send valve and remaining new parts to our service department. Failure to follow these instructions, or poor workmanship voids warranty.

\* Plastic Repair Mandrels:

3/4" Waterway (D75) - Part number D07535 (Included in repair kit D75-HRK)

1" Waterway (F100) - Part number F10035 (Included in repair kit F100-HRK)

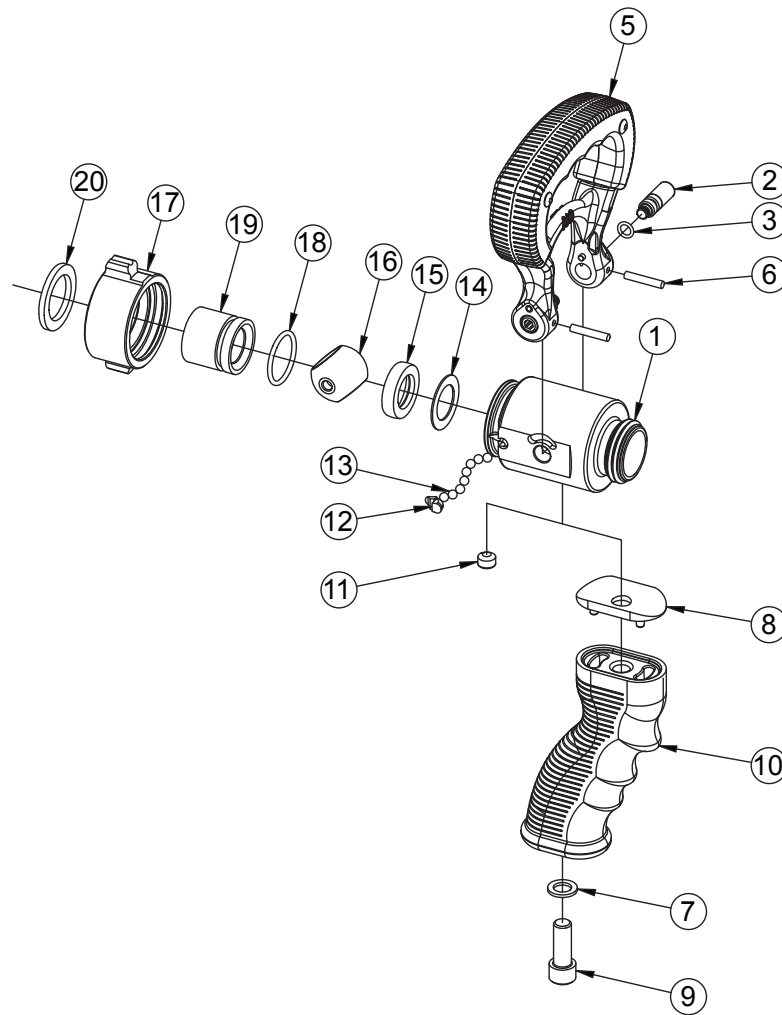
1 1/4" Waterway Exit (F125) - Part number F14035 (Included in the F125-HRK)

1 3/8" Waterway (F140) - Part number F14035 (Included in repair kit F140-HRK)

\* Valve Ball (16) and Valve Body (1) are NOT included in repair kits

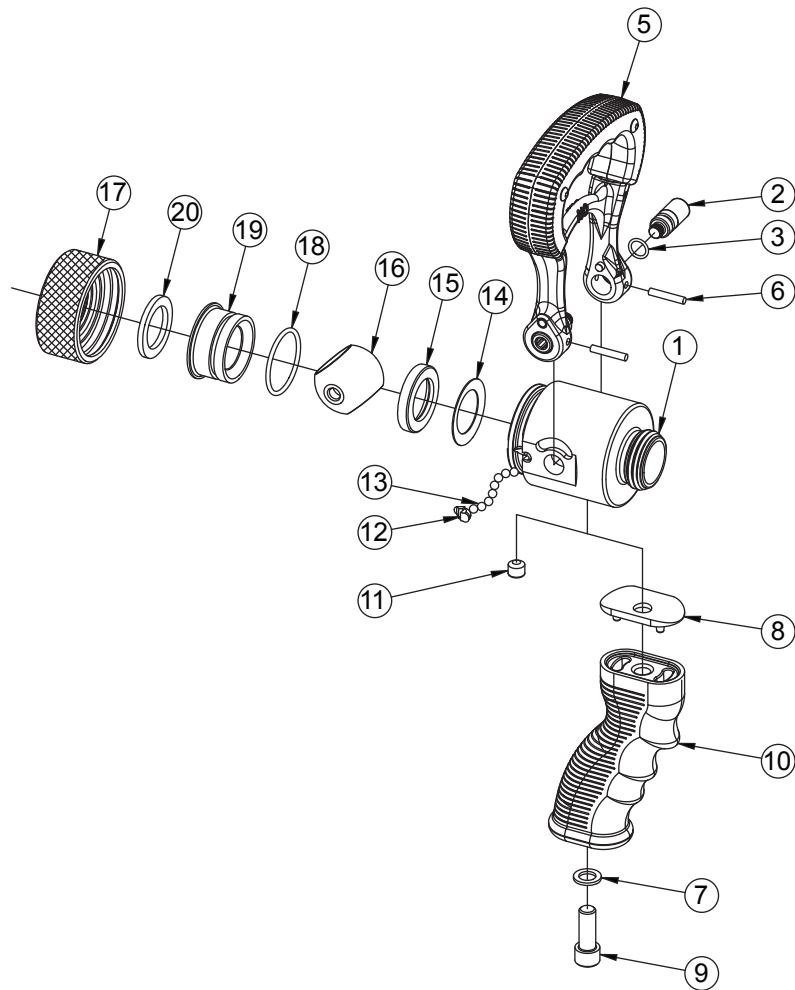
**Exploded view drawings and parts lists on following pages**

## D75 1" BALL VALVE



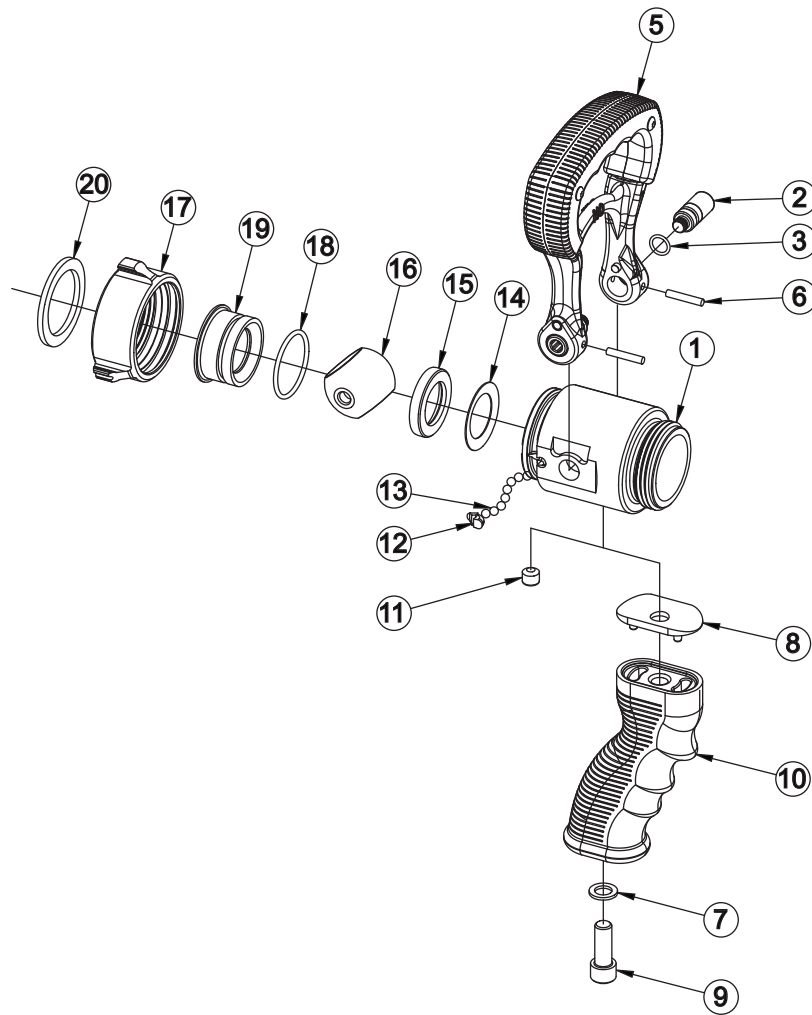
ITEM	DESCRIPTION	QTY	PART #
1*	75 VALVE BODY 1.0"	1	D07520
2	75 TRUNNION	2	D07540
3	O-RING-010	2	VO-010
5	DQ HANDLE SUBASSEMBLY	1	DQ860
DQ860 CONTAINS	75 SHUTOFF HANDLE	1	D07560
	BLACK HANDLE COVER	2	HM625-BLK
	8-32 X 3/8 BUTTON HEAD SCREW	4	VT08-32BH375
	75 STOP PIN	2	D07550
	6		
6	SPIROL PIN	2	V1900
7	WASHER	1	VM4901
8	GRIP SPACER D075	1	HM693-D
9	3/8-16 X 1 SOCKET HEAD SCREW	1	VT37-16SH1.0
10	PISTOL GRIP - BLACK	1	HM692-BLK
11	3/8-16 X 5/16 SET SCREW	1	VT37-16SS312
12	PORT PLUG	1	B770
13	3/16" SS BALL	26	V2120
14	BELLEVILLE WASHER	1	D07590
15	75 FRONT SEAT	1	D07570
16	75 BALL	1	D07530
17*	COUPLING 1.0"	1	D07597
18	O-RING-120	1	VO-120
19	75 REAR SEAT	1	D07580
20	GASKET - 1.0"	1	V3040
* - STATE DESIRED THREAD WHEN ORDERING			

## D100D 1" BALL VALVE



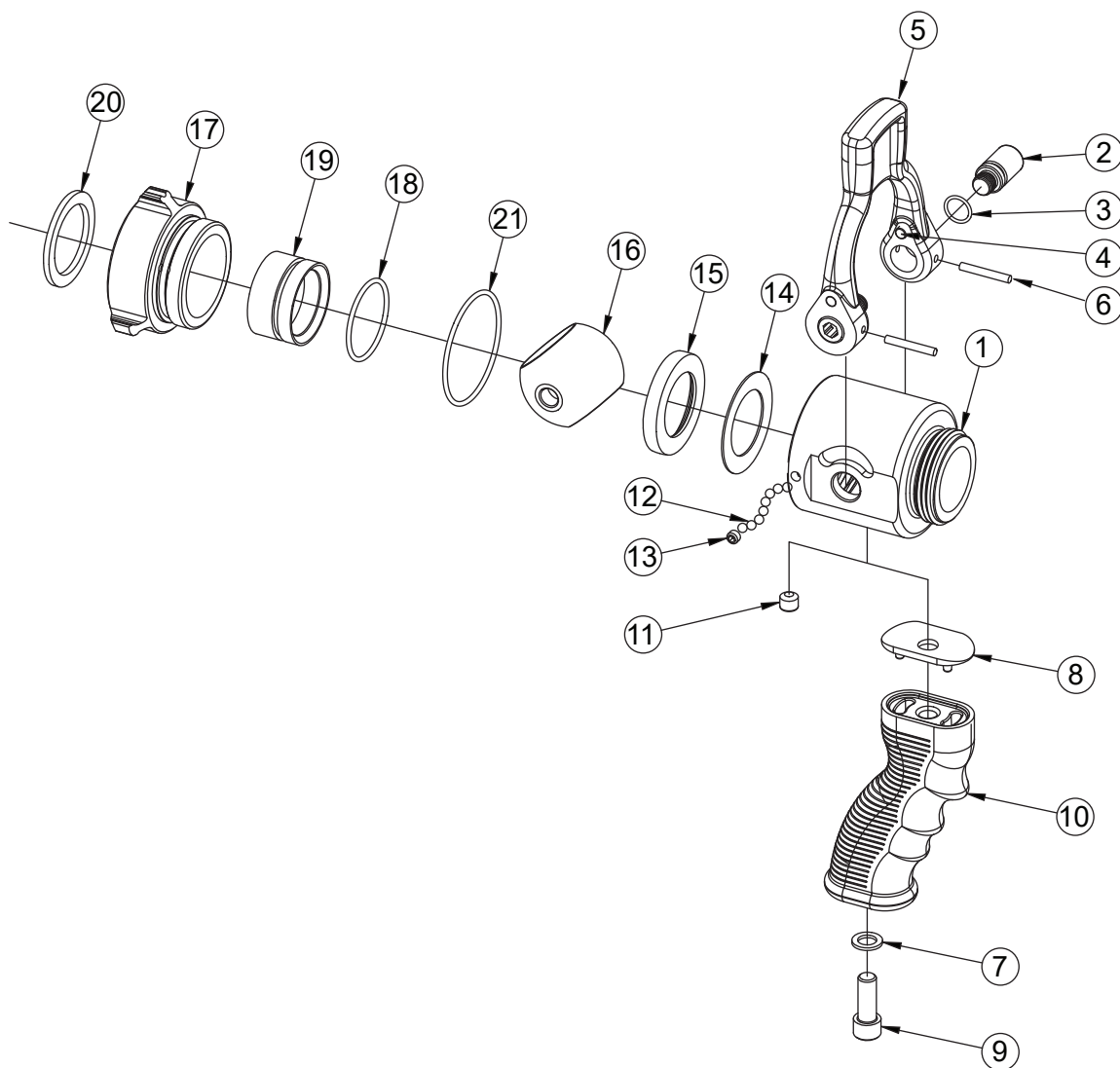
ITEM	DESCRIPTION	QTY	PART #
1*	100 VALVE BODY 1.0"	1	D10020
2	100 TRUNNION	2	F10040
3	O-RING-012	2	VO-012
5	FQ HANDLE SUBASSEMBLY	1	FQ860
FQ860 CONTAINS	100 SHUTOFF HANDLE	1	F10060
	BLACK HANDLE COVER	2	HM625-BLK
	8-32 X 3/8 BUTTON HEAD SCREW	4	VT08-32BH375
	100 STOP PIN	2	F10050
6	SPIROL PIN	2	V1900
7	WASHER	1	VM4901
8	GRIP SPACER F100	1	HM693-F
9	3/8-16 X 1 SOCKET HEAD SCREW	1	VT37-16SH1.0
10	PISTOL GRIP - BLACK	1	HM692-BLK
11	3/8-16 X 5/16 SET SCREW	1	VT37-16SS312
12	PORT PLUG	1	B770
13	3/16" SS BALL	34	V2120
14	BELLEVILLE WASHER	1	F10090
15	100 FRONT SEAT	1	F10070
16	100 BALL	1	F10030
17*	COUPLING 100 1.0"	1	D10097
18	O-RING-126	1	VO-126
19	100 REAR SEAT	1	D10080
20	GASKET - 1.0"	1	V3040
* - STATE DESIRED THREAD WHEN ORDERING			

## F100 1.5" BALL VALVE



ITEM	DESCRIPTION	QTY	PART #
1*	100 VALVE BODY 1.5"	1	F10020
2	100 TRUNNION	2	F10040
3	O-RING-012	2	VO-012
5	FQ HANDLE SUBASSEMBLY	1	FQ860
FQ860 CONTAINS	100 SHUTOFF HANDLE	1	F10060
	BLACK HANDLE COVER	2	HM625-BLK
	8-32 X 3/8 BUTTON HEAD SCREW	4	VT08-32BH375
	100 STOP PIN	2	F10050
6	SPIROL PIN	2	V1900
7	WASHER	1	VM4901
8	GRIP SPACER F100	1	HM693-F
9	3/8-16 X 1 SOCKET HEAD SCREW	1	VT37-16SH1.0
10	PISTOL GRIP - BLACK	1	HM692-BLK
11	3/8-16 X 5/16 SET SCREW	1	VT37-16SS312
12	PORT PLUG	1	B770
13	3/16" SS BALL	34	V2120
14	BELLEVILLE WASHER	1	F10090
15	100 FRONT SEAT	1	F10070
16	100 BALL	1	F10030
17*	COUPLING 1.0"	1	F10097
18	O-RING-126	1	VO-126
19	100 REAR SEAT	1	F10080
20	GASKET - 1.5"	1	V3130
* - STATE DESIRED THREAD WHEN ORDERING			

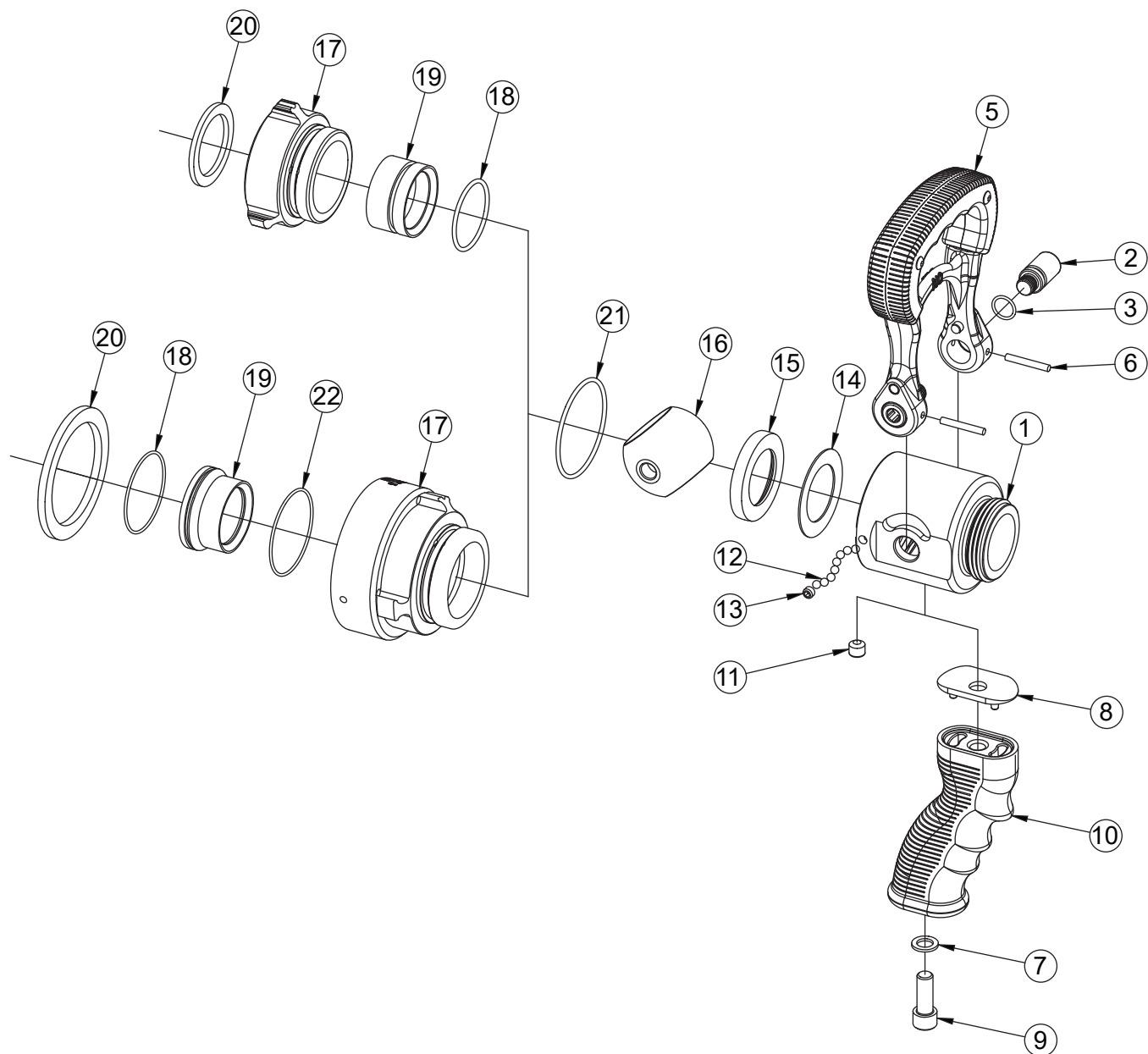
## F125F & F125FP BALL VALVE



ITEM	DESCRIPTION	QTY	PART #
1*	125 VALVE BODY 1.5"	1	F12520
2	140 TRUNNION	2	F14040
3	O-RING-014	2	VO-014
4	125 STOP PIN	1	F12560
5	125 TAB SHUTOFF HANDLE	2	F12560
6	SPIROL PIN	2	V1920
7	WASHER	1	VM4901
8	GRIP SPACER F140	1	HM693-J
9	3/8-16 X 1 SOCKET HEAD SCREW	1	VT37-16SH1.0
10	PISTOL GRIP - BLACK	1	HM692-BLK
* - STATE DESIRED THREAD WHEN ORDERING			

ITEM	DESCRIPTION	QTY	PART #
11	3/8-16 X 5/16 SET SCREW	1	VT37-16SS312
12	3/16" SS BALL	36	V2120
13	1/4-28 X 3/16 SET SCREW	1	VT25-28SS187
14	BELLEVILLE WASHER	1	F14090
15	140 FRONT SEAT	1	F14070
16	140 BALL	1	F14030
17*	COUPLING 1.0"	1	F14097
18	O-RING-129	1	VO-129
19	140 REAR SEAT 1.5"	1	F14080
20	GASKET - 1.5"	1	V3130
21	O-RING-140	1	VO-140

## F140 1.5" & J140 2.5" BALL VALVE



ITEM	DESCRIPTION	QTY	PART #
1*	140 VALVE BODY 1.5"	1	F14020
2	140 TRUNNION	2	F14040
3	O-RING-014	2	VO-014
5	FT HANDLE SUBASSEMBLY	1	FQ860
FT860 CONTAINS	140 SHUTOFF HANDLE	1	F14060
	BLACK HANDLE COVER	2	HM625-BLK
	8-32 X 3/8 BUTTON HEAD SCREW	4	VT08-32BH375
	140 STOP PIN	2	F14050
6	SPIROL PIN	2	V1920
7	WASHER	1	VM4901
8	GRIP SPACER F140	1	HM693-J
9	3/8-16 X 1 SOCKET HEAD SCREW	1	VT37-16SH1.0
10	PISTOL GRIP - BLACK	1	HM692-BLK
11	3/8-16 X 5/16 SET SCREW	1	VT37-16SS312
* - STATE DESIRED THREAD WHEN ORDERING			

ITEM	DESCRIPTION	QTY	PART #
12	3/16" SS BALL	36	V2120
13	1/4-28 X 3/16 SET SCREW	1	VT25-28SS187
14	BELLEVILLE WASHER	1	F14090
15	140 FRONT SEAT	1	F14070
16	140 BALL	1	F14030
17*	COUPLING 1.0"	1	F14097
	140 COUPLING 2.5"		J14097
18	O-RING-129	1	VO-129
	O-RING-032		VO-032
19	140 REAR SEAT 1.5"	1	F14080
	140 REAR SEAT 2.5"		J14080
20	GASKET - 1.5"	1	V3130
	GASKET - 2.5"		V3190
21	O-RING-140	1	VO-140
22	O-RING-033	1	VO-033



## DETENT STYLE HAND HELD BALL VALVES

This Service Procedure is intended for use with the HVIT, H-VIT, H-VO, H-VOI, H-2VO, H-2VOI, H-3VO, H-3VOI and H-2VPPIT series of 1.5 and 2.5 inlet Ball Valves.

### 1.0 ITEMS NEEDED

Not Supplied	Bench Vise
In Repair Kit	T-Handle Allen Wrench Set
	Loctite 271

### 2.0 INSTRUCTIONS FOR VALVE SEAT AND BALL REPLACEMENT

#### TEAR DOWN:

1. Remove set screws (27) from body that are forward of the bail handle. Grasp the front ring (35, 43, 51, or 78) in padded vise and remove by unthreading.
2. Remove the valve seat (32 or 75) from the male threaded section.
3. Place the bail handle (16) in the off position and through the female coupling, push the valve ball (33 or 76) out the front of the valve.
4. Use a straight blade screw driver to remove the rear valve seat (32 or 75).
5. Inspect the o-ring (34 or 77) in the front of the valve for damage and replace if required.

#### REBUILD SECTION:

6. Place a seat (32 or 75) in the front ring with the male threads.
7. Install valve seat (32 or 75) into the body, flat side down.
8. Install the ball (33 or 76) with the ID groove facing away from the bail handle side of the valve. If the ball has a turbulence reduction notch, install the ball with the notch down and towards the bail handle side of the valve.
9. Check for o-ring (34 or 77) in the front of the valve, install front ring (35, 43, 51 or 78) until the shoulder is flush with the front of the body. Compression on the valve is adjusted with the front ring.
10. Cycle bail handle to check for smooth operation. If bail is tight, un-thread front ring. If loose, tighten front ring. Required force to cycle bail is 3 to 15 lbs.
11. Tighten set screws (27) evenly. If set screws are not tightened evenly there may be a leak around the front ring seal.
12. Place ball valve on a pressurized water system and check for leaks and operation.

### 3.0 INSTRUCTIONS FOR BAIL HANDLE REPLACEMENT

#### REMOVAL OF OLD BAIL HANDLE

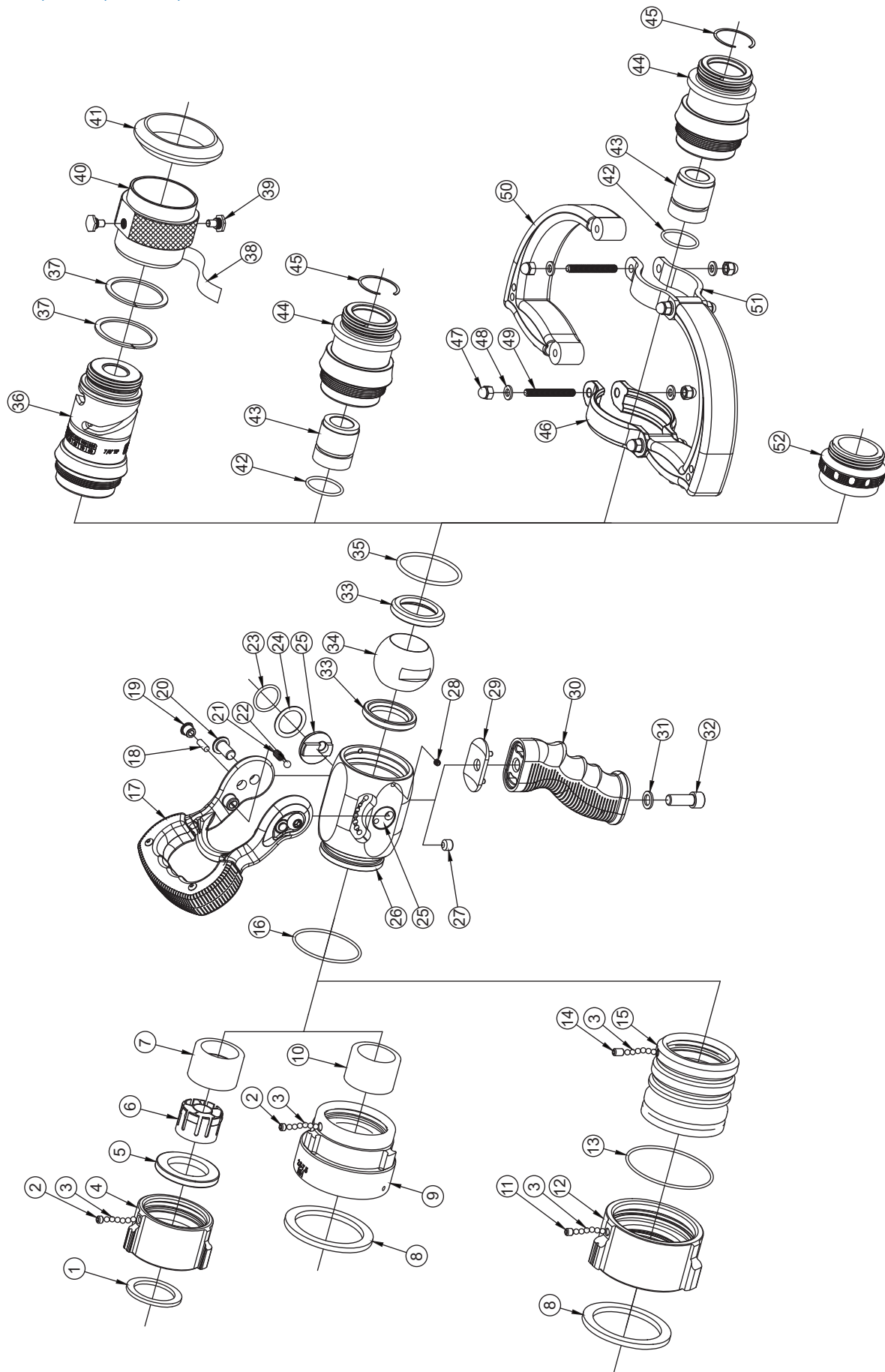
1. Remove set screws (27) from body that are forward of the bail handle. Grasp the front ring in padded vise and remove.
2. Remove the valve seat (32 or 75) from the male thread section.
3. Place the bail handle (16) in the off position and through the female coupling, push the valve ball (33 or 76) out the front of the valve.
4. Use a straight blade screw driver to remove the rear valve seat (32 or 75).
5. Inspect the o-ring (34 or 77) in the front of the valve for damage and replace if required.
6. Remove button head screws (19 or 65) from bail handle.
7. Push trunnions (24 or 73) into the valve body and remove. Note: There is a left and right trunnion on this model, do not mix.
8. Remove bail handle by lifting up off of the valve body. This will release the detent springs and balls.

#### INSTALLATION OF BAIL HANDLE

1. Insert one Detent Spring (20 or 67) and Detent Ball (21 or 66) into each of the stop lugs of the Bail Handle.  
Note: ( Make sure the belly shaped side of the handle faces the front of the valve body.)
2. While holding the detent springs and balls in the stop lugs, push bail handle onto valve body over detent area.
3. Apply lubricant to o-ring (22 or 71) on trunnion.
4. Align the roll pin (17 or 69) with the hole in Bail Handle and push from the inside.
5. Place Trunnion Driver (18 or 70) over roll pins.
6. Apply loctite 271 to the button head screws (19 or 65).
7. Install Button Head screws till tight.
8. **Complete steps 6 through 12 in Valve Seat and Ball Replacement Section.**

**Exploded view drawings and parts lists on following pages**

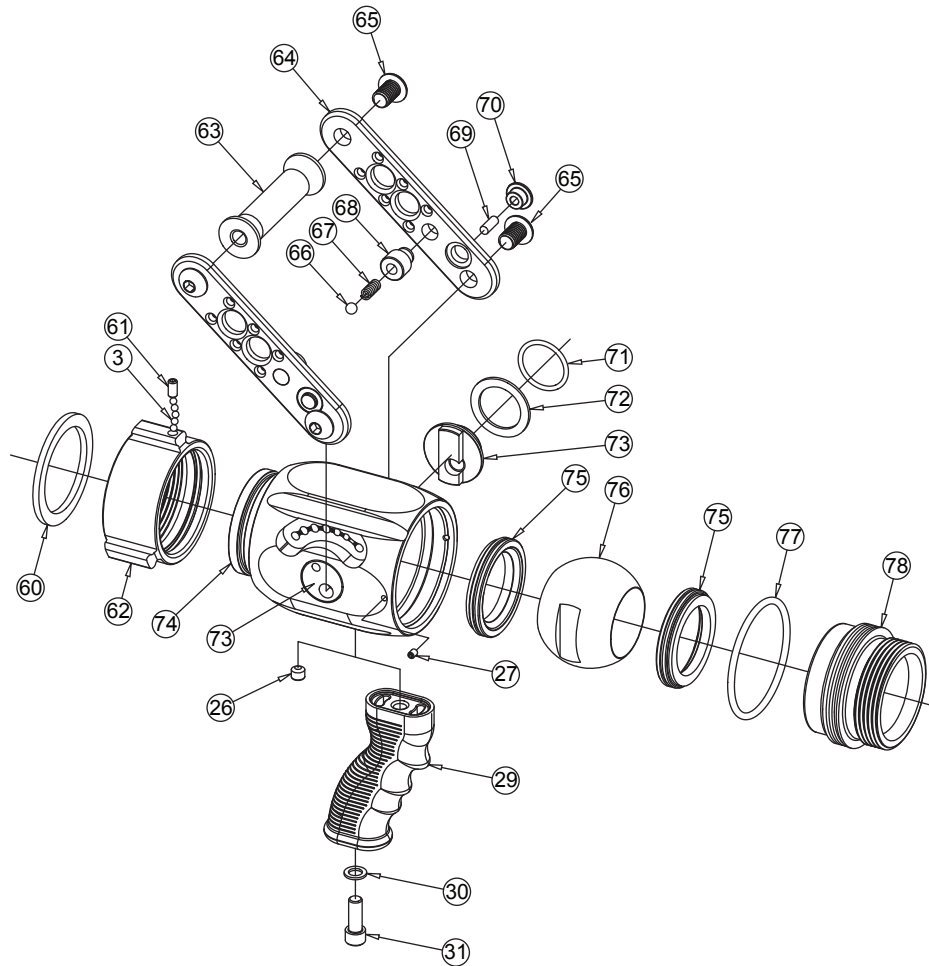
# HVIT, H-VIT, H-V0, H-VOI, H-2VO & H-2VOI



ITEM	DESCRIPTION	QTY	PART #
1	GASKET - 1.5"	1	V3130
2	1/4-28 X 3/16 SET SCREW	1	VT25-28SS187 (SWIVEL)
	1/4-28 X 3/8 SET SCREW		VT25-28SS375 (LOCK-OUT)
3	3/16" SS BALL	38	V2120
4*	COUPLING 1.5"	1	H694
5	ANTI GG RING VO	1	P147
6**	STREAM STRAIGHTENER	1	P116
7	REDUCTION INSERT F	1	P119F
8	GASKET - 2.5"	1	V3190
9*	COUPLING 2.5"	1	P198
10	REDUCTION INSERT J	1	P199J
11	1/4-28 X 1/4 SET SCREW	1	VT25-28SS250
12*	COUPLING 2.5"	1	P197
13	O-RING-151	1	VO-151
14	1/4-28 X 3/8 SET SCREW	1	VT25-28SS375
15	BLITZ BASE 2.5	1	H675
16	O-RING-141	1	VO-141
17	HANDLE SUBASSEMBLY	1	HX920
	BLACK HANDLE COVER	2	HM625-BLK
	HANDLE	1	HX620
	8-32 X 3/8 BUTTON HEAD SCREW	4	VT08E32BH375
18	SPIROL PIN	2	V2005
19	TRUNNION DRIVER	2	HX650
20	HANDLE SCREW	2	VT37E24BH750
21	DETENT SPRING	2	HM770
22	.243" TORLON BALL	2	VB243TO
23	O-RING-118	2	VO-118
24	TEFLON TRUNNION SHIM	2	P170
25	TRUNNION - LEFT	1	P120L
	TRUNNION - RIGHT	1	P120R
26	DETENT VALVE BODY	1	P110
27	3/8-16 X 5/16 SET SCREW	1	VT37-16SS312
28	10-32 X 3/16 SET SCREW	2	VT10Y32SS187
29	GRIP SPACER HANDLINE	1	HM693-H
30	PISTOL GRIP - BLACK	1	HM692-BLK
31	WASHER	1	VM4109

ITEM	DESCRIPTION	QTY	PART #
32	3/8-16 X 1 SOCKET HEAD SCREW	1	VT37-16SH1.0
33	VALVE BALL SEAT	2	P104
34	DELFIN VALVE BALL	1	P103
35	O-RING-227	1	VO-227
36	FRONT END - 7/8" TIP	1	P181
	FRONT END - 15/16" TIP	1	P182
	FRONT END - 1.0" TIP	1	P183
	FRONT END - 1 1/8" TIP	1	P184
	FRONT END - 1 1/4" TIP	1	P185
	FRONT END - 1 3/8" TIP	1	P186
37	TEFLON WEAR RING	2	P172
38	VIT FRONT RING LABEL	1	P163
39	CAM SCREW	2	HD780
40	THREAD PROTECTOR RING	1	P175
41	GAUGE BUMPER	1	G262
42	O-RING 123	1	VO-123
43	7/8" SMOOTH BORE INSERT	1	F14031
	15/16" SMOOTH BORE INSERT	1	F14032
	1" SMOOTH BORE INSERT	1	F14033
	1-1/8" SMOOTH BORE INSERT	1	F14034
44*	FRONT RING VPP 1.5"	1	P160
45	VH-143-S02 SMALLEY RING	1	V4232
46	BLITZ BRACKET	2	H676
47	1/4-20 SS ACORN NUT	8	VT25E20AC
48	WASHER	8	VW500X265-63
49	1/4-20 X 2 STUD FULL THREAD	4	VT25-20ST2.0
50	PLAYPIPE HANDLE	2	P220
51	SMALL PLAYPIPE BRACKET	2	P210
52*	FRONT RING VO 1.5"	1	P150
* - STATE DESIRED THREAD WHEN ORDERING			
** - CONTACT TFT FOR USE WITH 2.5" CONNECTIONS			

## H-3VO & H-3VOI



ITEM	DESCRIPTION	QTY	PART #
3	3/16" SS BALL	48	V2120
26	3/8-16 X 5/16 SET SCREW	1	VT37-16SS312
27	10-32 X 1/4 SET SCREW	2	VT10Y32SS250
29	PISTOL GRIP - BLACK	1	HM692-BLK
30	WASHER	1	VM4901
31	3/8-16 X 1 SOCKET HEAD SCREW	1	VT37-16SH1.0
60	GASKET - 2.5"	1	V3185
61	1/4-28 X 1/2 SET SCREW	1	VT25-28SS500
62*	COUPLING 2.5"	1	M307
63	TOP BAR	1	P345
64	SIDE BAR	2	P340
65	1/2-13 X 3/4 BUTTON HEAD SCREW	4	VT50-13BH750
66	5/16" TORLON BALL	2	VB.312TO
67	DETENT SPRING	2	P360

ITEM	DESCRIPTION	QTY	PART #
68	STOP LUG	2	P350
69	SPIROL PIN	2	VP250X.625H
70	TRUNNION DRIVER	2	P335
71	O-RING-219	2	VO-219
72	TRUNNION SHIM	2	P330
73	TRUNNION LEFT	1	P325L
	TRUNNION RIGHT	1	P325R
74	DETENT VALVE BODY	1	P320
75	VALVE BALL SEAT 2.5"	2	P315
76	BALL VALVE 2.5"	1	P310
77	O-RING-388	1	VO-388
78*	FRONT RING VO3 2.5"NH	1	P355
* - STATE DESIRED THREAD WHEN ORDERING			