



Valves, Automation & Controls

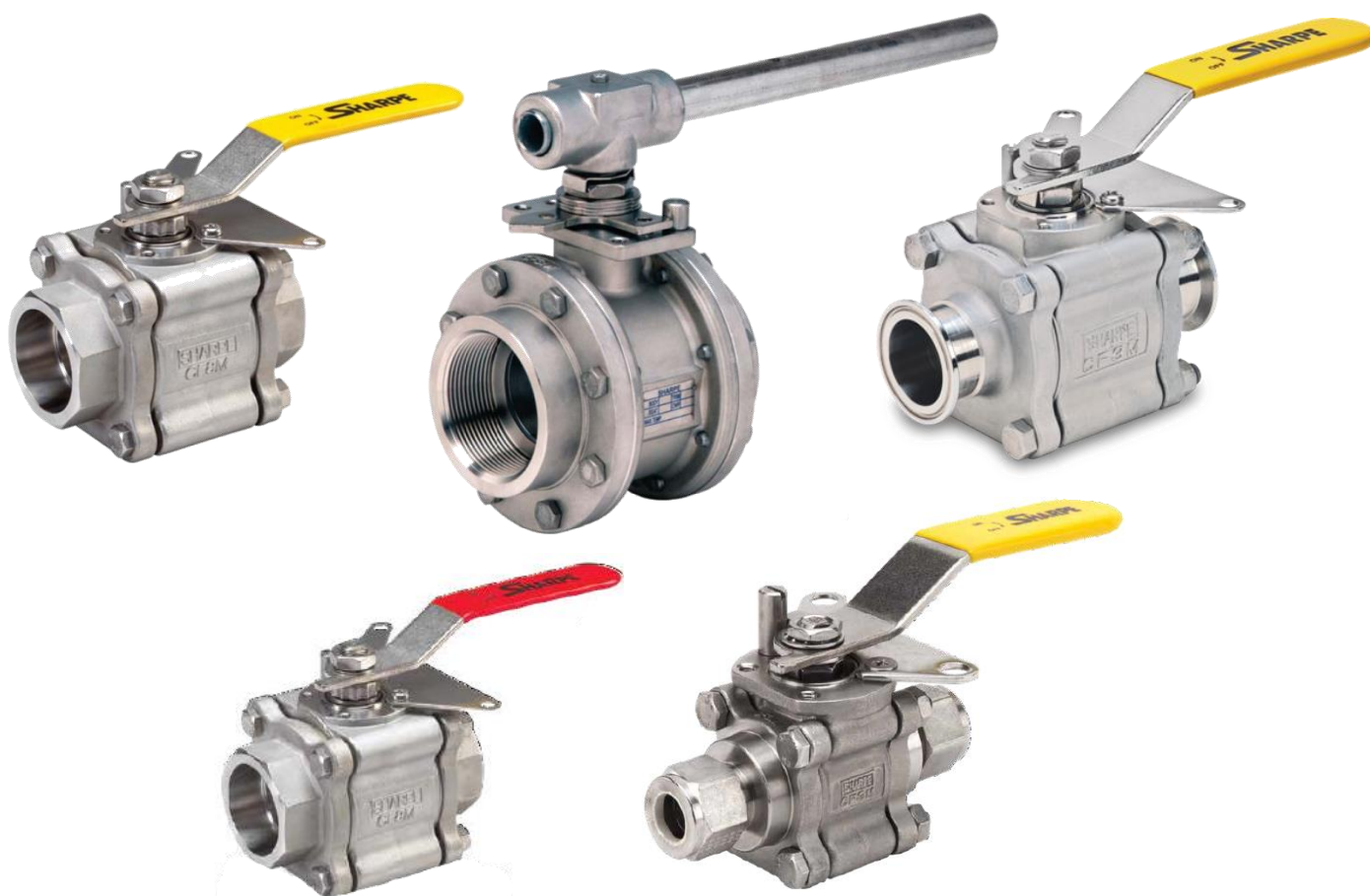
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84/99/66/86/88 IOM Manual

REVISION: A
DATE: 12-2020

INSTALLATION, OPERATION AND MAINTENANCE FOR SHARPE® 84/99(all variations) - 66 - 86 - 88 - D88 3 PIECE BALL VALVES



2701 Busse Rd., Elk Grove Village, IL 60007

Tel (800) 766-0076 Fax (708) 562-9250

It is the responsibility of the customer to determine the suitability of Sharpe® valves products in their particular application.
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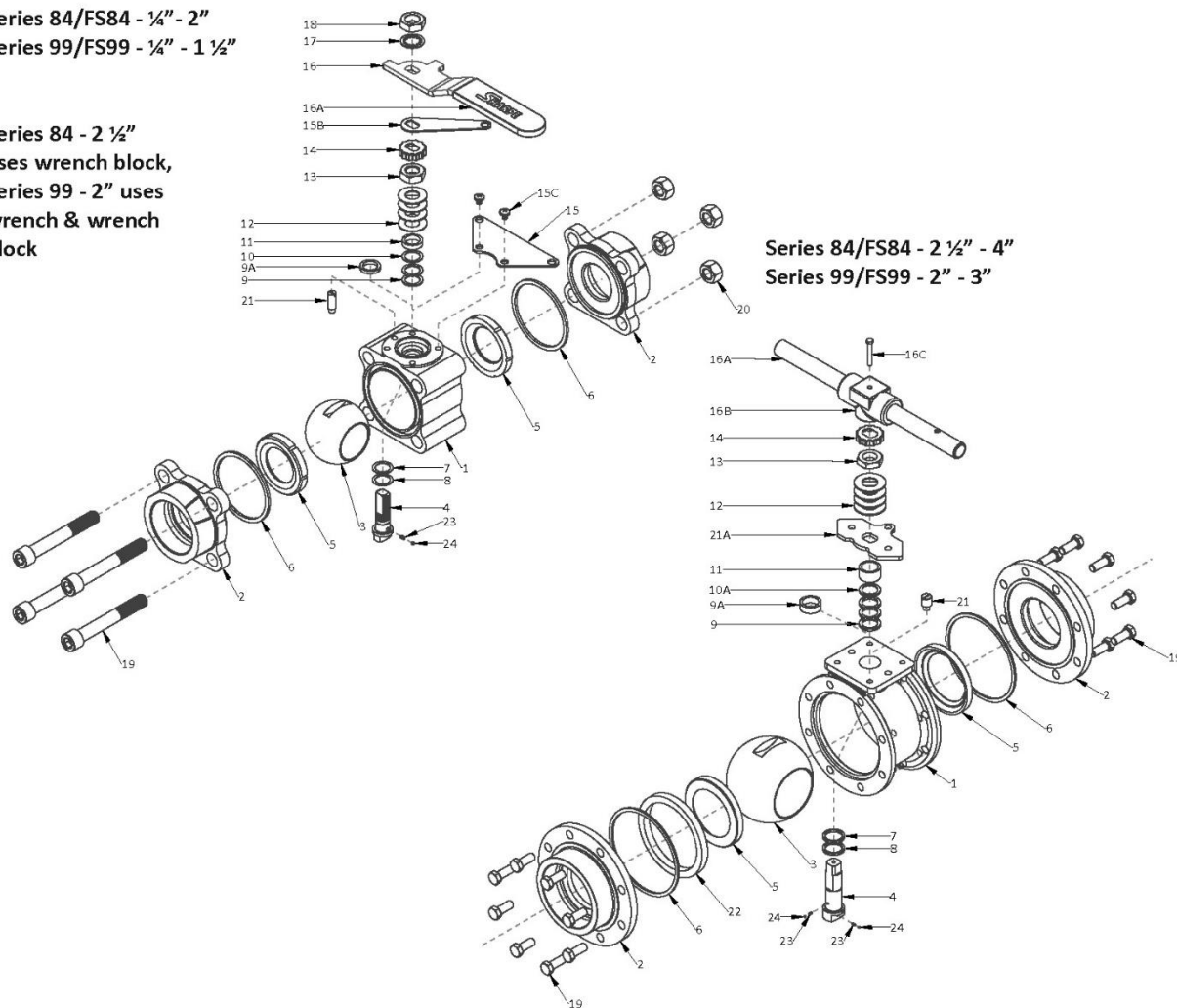
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Sharpe® Series 84/99/FS84/FS99/V84

Series 84/FS84 - ¼" - 2"
Series 99/FS99 - ¼" - 1 ½"

Series 84 - 2 ½"
uses wrench block,
Series 99 - 2" uses
wrench & wrench
block



PART NO.	PART	QTY	MATERIAL
1	Body	1	316 Stainless Steel ASTM A351 CF8M Carbon Steel ASTM A216 WCB Alloy 20 ASTM A351 CN7M Hastelloy C ASTM A494 Gr. CW-12MW
2	End Cap	2	316 Stainless Steel ASTM A351 CF8M 316L Stainless Steel ASTM A351 CF3M (used for stainless steel weld ends) Carbon Steel ASTM A216 WCB Alloy 20 ASTM A351 CN7M Hastelloy C ASTM A494 Gr. CW-12MW
3	Ball	1	316 Stainless Steel Alloy 20 Hastelloy C
4	Stem	1	316 Stainless Steel 17-4PH Alloy 20 Hastelloy C
5	Seat	2	PTFE TFM® UHMWPE Nova PEEK Delrin®
6	Body Seal	2	PTFE Graphite Buna UHMWPE Viton®
7	Thrust Bearing	1	Nova (UHMWPE with UHMWPE Seats)
8	Thrust Bearing	1	Peek (UHMWPE with UHMWPE Seats)
9	Stem Packing	2	Nova (UHMWPE with UHMWPE Seats)
9A	Stem Packing	1-2	Graphite (For Fire Safe & High Temperature Applications)
10	Seal Protector	1	Peek
10A	Washer	1	300 Series Stainless Steel

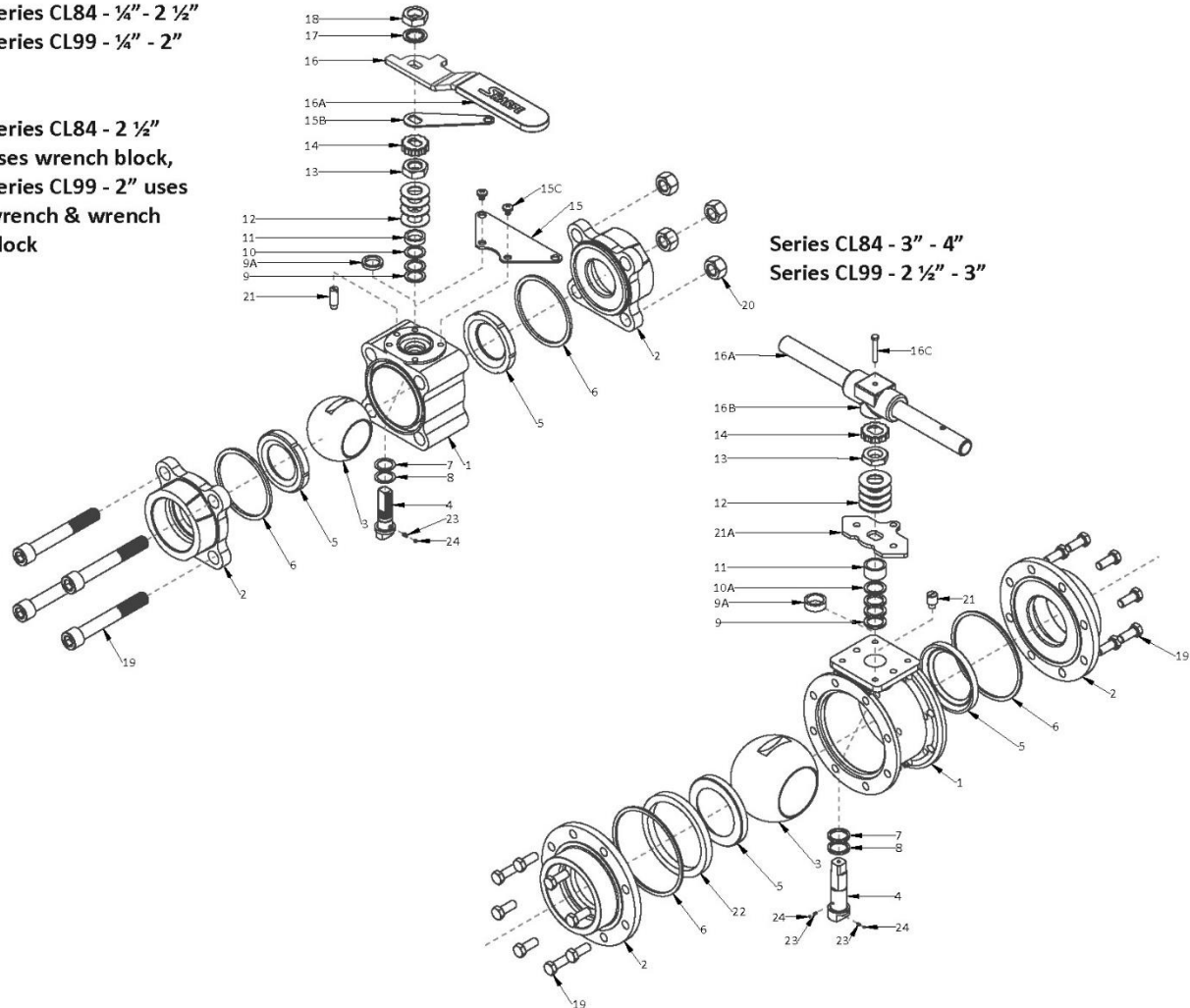
PART NO.	PART	QTY	MATERIAL
11	Gland	1	300 Series Stainless Steel
12	Belleville Washer	4	300 Series Stainless Steel
13	Packing Nut	1	300 Series Stainless Steel
14	Lock Tab	1	300 Series Stainless Steel
15	Lower Lock Latch	1	300 Series Stainless Steel
15B	Upper Lock Latch	1	300 Series Stainless Steel
15C	Latch Bolt	2	300 Series Stainless Steel
16	Handle (1/4" - 2")	1	300 Series Stainless Steel
16A	Wrench (3" & 4")	1	Galvanized
16B	Wrench Block	1	300 Series Stainless Steel
16C	Hex Head Bolt	1	300 Series Stainless Steel
17	Lock Washer	1	300 Series Stainless Steel
18	Handle Nut (1/4" - 2")	1	300 Series Stainless Steel
19	Body Bolts	4-16	304 Stainless Steel
20	Nuts	4	300 Series Stainless Steel
21	Stop Pin	1	300 Series Stainless Steel
21A	Stopper	1	300 Series Stainless Steel
22	Seat Retainer	1	300 Series Stainless Steel Carbon Steel
23	Anti-Static Spring	1	Hard Drawn Stainless Steel
24	Anti-Static Ball	1	300 Series Stainless Steel

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Sharpe® Series CL84/CL99

Series CL84 - ¼" - 2 ½"
Series CL99 - ¼" - 2"

Series CL84 - 2 ½"
uses wrench block,
Series CL99 - 2" uses
wrench & wrench
block



PART NO.	PART	QTY	MATERIAL
1	Body	1	Carbon Steel Hastelloy C
			ASTM A216 WCB ASTM A494 Gr. CW-12MW
2	End Cap	2	Carbon Steel Hastelloy C
			ASTM A216 WCB ASTM A494 Gr. CW-12MW
3	Ball	1	Hastelloy C Monel
4	Stem	1	Hastelloy C Monel
5	Seat	2	PTFE TFM®
			RTFE Nova
6	Body Seal	2	PTFE Graphite
7	Thrust Bearing	1	Nova
8	Thrust Bearing	1	Peek
9	Stem Packing	2	Nova
9A	Stem Packing	1-2	Graphite
10	Seal Protector	1	Peek
10A	Washer	1	300 Series Stainless Steel

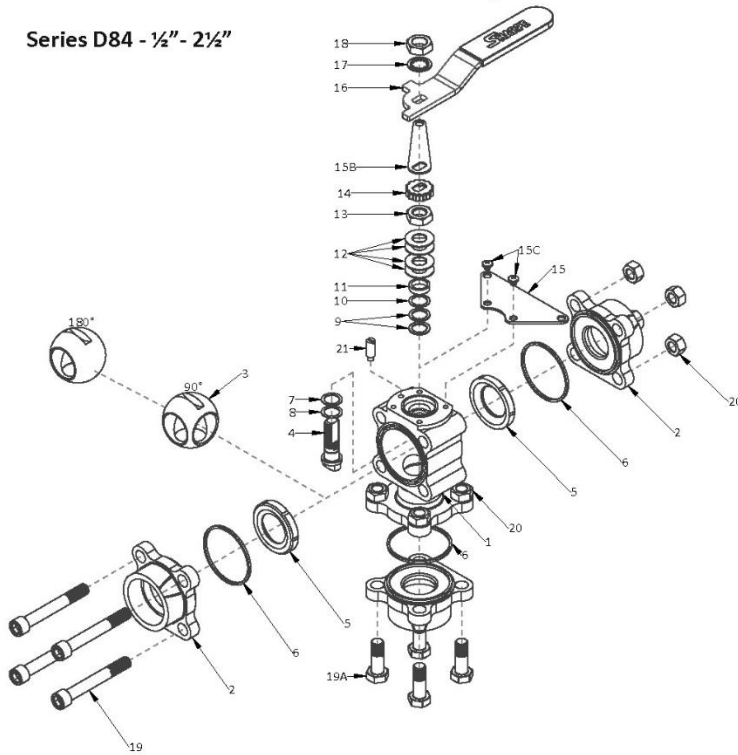
*POA

PART NO.	PART	QTY	MATERIAL
11	Gland	1	300 Series Stainless Steel
12	Belleville Washer	4	300 Series Stainless Steel
13	Packing Nut	1	300 Series Stainless Steel
14	Lock Tab	1	300 Series Stainless Steel
15	Lower Lock Latch	1	300 Series Stainless Steel
15B	Upper Lock Latch	1	300 Series Stainless Steel
15C	Latch Bolt	2	300 Series Stainless Steel
16	Handle (1/4"-2")	1	300 Series Stainless Steel
16A	Wrench (3" & 4")	1	Galvanized
16B	Wrench Block	1	300 Series Stainless Steel
16C	Hex Head Bolt	1	300 Series Stainless Steel
17	Lock Washer	1	300 Series Stainless Steel
18	Handle Nut (1/4"-2")	1	300 Series Stainless Steel
19	Body Bolts	4-16	304 Stainless Steel
20	Nuts	4	300 Series Stainless Steel
21	Stop Pin	1	300 Series Stainless Steel
21A	Stopper	1	300 Series Stainless Steel
22	Seat Retainer	1	300 Series Stainless Steel Carbon Steel
23	Anti-Static Spring	1	Hard Drawn Stainless Steel
24	Anti-Static Ball	1	300 Series Stainless Steel

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Sharpe® Series D84

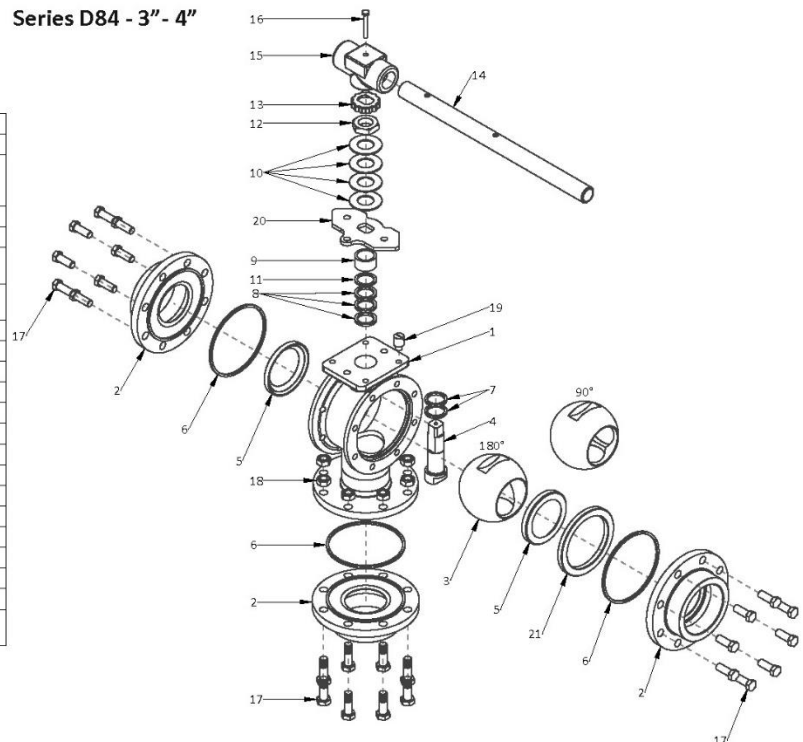
Series D84 - 1/2" - 2 1/2"



No.	Part Name	Qty	Material
1	Body	1	316 Stainless Steel ASTM A351 CF8M
2	Pipe Ends	3	316 Stainless Steel ASTM A351 CF8M 316L Stainless Steel ASTM A351 CF3M Carbon Steel ASTM A216 WCB
3	Ball	1	316 Stainless Steel
4	Stem	1	316 Stainless Steel
5	Seat	2	PTFE, TFM®, UHMWPE RTFE, Nova, PEEK, Delrin®
6	Body Seal	3	PTFE, TFM®, Grafoil, Buna, Neoprene UHMWPE, EPR, Viton®
7	Thrust Bearing	1	Nova (UHMWPE with UHMWPE Seats)
8	Thrust Bearing	1	PEEK (UHMWPE with UHMWPE Seats)
9	Stem Packing	2	Nova (UHMWPE with UHMWPE Seats)
10	Seat Protector	1	PEEK
11	Gland	1	300 Series Stainless Steel
12	Belleville Washer	4	300 Series Stainless Steel
13	Packing Nut	1	300 Series Stainless Steel
14	Lock Tab	1	300 Series Stainless Steel
15	Lower Lock Latch	1	300 Series Stainless Steel
15B	Upper Lock Latch	1	300 Series Stainless Steel
15C	Latch Bolt	2	300 Series Stainless Steel
16	Handle (1/4" - 2")	1	300 Series Stainless Steel
17	Lock Washer	1	300 Series Stainless Steel
18	Handle Nut	1	300 Series Stainless Steel
19	Body Bolts	4	300 Series Stainless Steel
19A	Body Connector Bolt	4	300 Series Stainless Steel
20	Nuts	8	300 Series Stainless Steel
21	Stop Pin (1/4" - 2")	1	300 Series Stainless Steel
		2	300 Series Stainless Steel

Series D84 - 3" - 4"

No.	Part Name	Qty	Material
1	Body	1	316 Stainless Steel ASTM A351 CF8M
2	Pipe Ends	3	316 Stainless Steel ASTM A351 CF8M 316L Stainless Steel ASTM A351 CF3M Carbon Steel ASTM A216 WCB
3	Ball	1	316 Stainless Steel
4	Stem	1	316 Stainless Steel
5	Seat	2	PTFE, TFM®, UHMWPE RTFE, Nova, PEEK, Delrin®
6	Body Seal	3	PTFE, TFM®, Grafoil, Buna, Neoprene UHMWPE, EPR, Viton®
7	Thrust Bearing	2	Nova (UHMWPE with UHMWPE Seats)
8	Stem Seal	1	Nova (UHMWPE with UHMWPE Seats)
9	Gland	1	300 Series Stainless Steel
10	Belleville Washer	4	300 Series Stainless Steel
11	Washer	4	300 Series Stainless Steel
12	Stem Nut	1	300 Series Stainless Steel
13	Lock Tab	1	300 Series Stainless Steel
14	Handle	1	Galvanized Steel
15	Wrench Block	1	300 Series Stainless Steel
16	Hex Head Bolt	1	300 Series Stainless Steel
17	Body Bolts	24	300 Series Stainless Steel
18	Nuts	8	300 Series Stainless Steel
19	Stop Pin	1	300 Series Stainless Steel
20	Stopper	1	300 Series Stainless Steel
21	Seat Retainer	1	300 Series Stainless Steel
	Seat Retainer	1	Carbon Steel





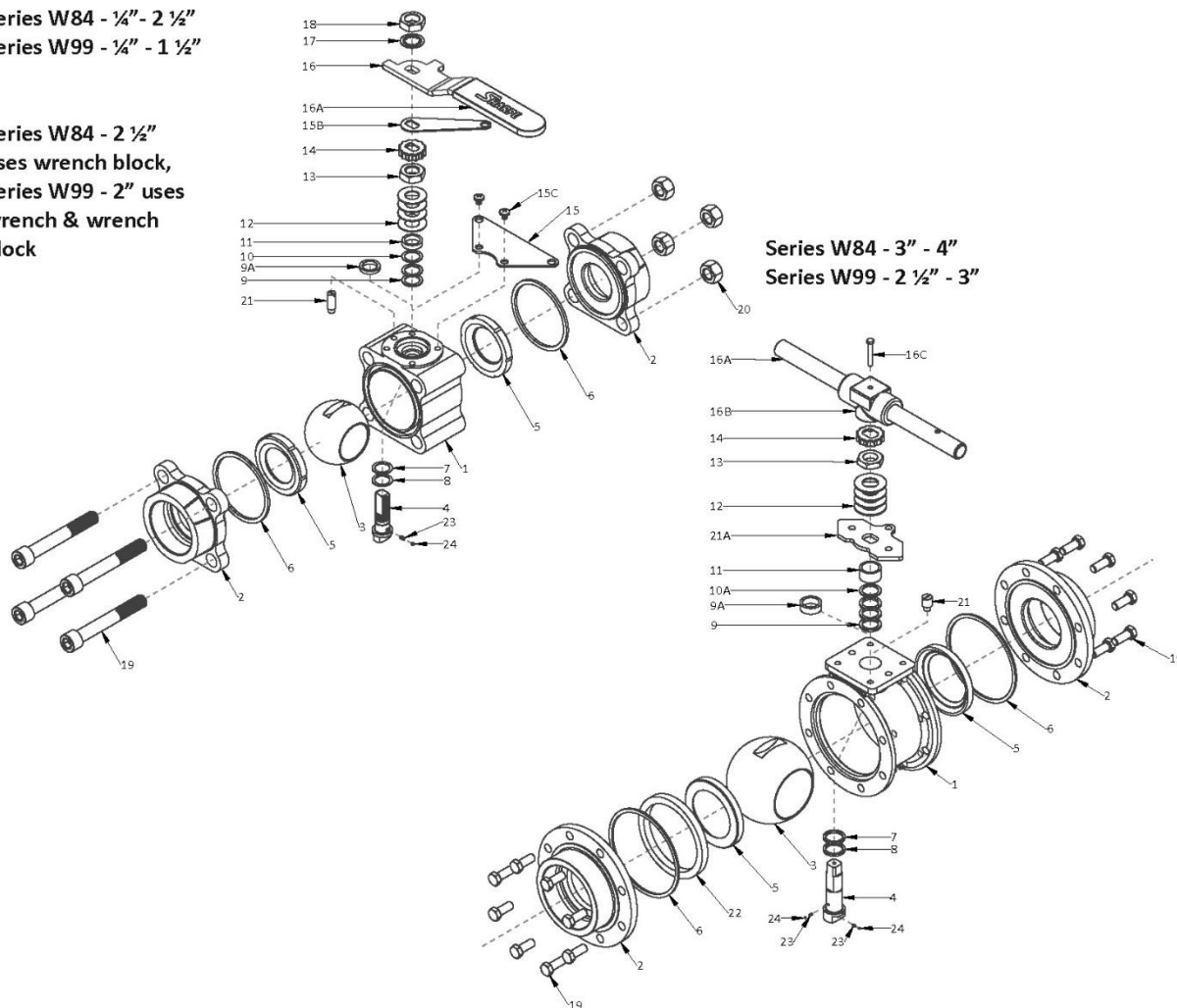
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Sharpe® Series W84/W99

Series W84 - ¼" - 2 ½"
Series W99 - ¼" - 1 ½"

Series W84 - 2 ½"
uses wrench block,
Series W99 - 2" uses
wrench & wrench
block



PART NO.	PART	QTY	MATERIAL
1	Body	1	316 Stainless Steel Carbon Steel Alloy 20
2	End Cap	2	316L Stainless Steel Carbon Steel Alloy 20
3	Ball	1	316 Stainless Steel Alloy 20
4	Stem	1	316 Stainless Steel Alloy 20
5	Seat	2	Nova PEEK
6	Body Seal	2	Graphite
7	Thrust Bearing	1	Nova (UHMWPE with UHMWPE Seats)
8	Thrust Bearing	1	Peek (UHMWPE with UHMWPE Seats)
9	Stem Packing	2	Nova (UHMWPE with UHMWPE Seats)
9A	Stem Packing	1-2	Graphite
10	Seal Protector	1	Peek
10A	Washer	1	300 Series Stainless Steel

PART NO.	PART	QTY	MATERIAL
11	Gland	1	300 Series Stainless Steel
12	Belleville Washer	4	300 Series Stainless Steel
13	Packing Nut	1	300 Series Stainless Steel
14	Lock Tab	1	300 Series Stainless Steel
15	Lower Lock Latch	1	300 Series Stainless Steel
15B	Upper Lock Latch	1	300 Series Stainless Steel
15C	Latch Bolt	2	300 Series Stainless Steel
16	Handle (1/4"-2")	1	300 Series Stainless Steel
16A	Wrench (3" & 4")	1	Galvanized
16B	Wrench Block	1	300 Series Stainless Steel
16C	Hex Head Bolt	1	300 Series Stainless Steel
17	Lock Washer	1	300 Series Stainless Steel
18	Handle Nut (1/4"-2")	1	300 Series Stainless Steel
19	Body Bolts	4-16	304 Stainless Steel
20	Nuts	4	300 Series Stainless Steel
21	Stop Pin	1	300 Series Stainless Steel
21A	Stopper	1	300 Series Stainless Steel
22	Seat Retainer	1	300 Series Stainless Steel Carbon Steel
23	Anti-Static Spring	1	Hard Drawn Stainless Steel
24	Anti-Static Ball	1	300 Series Stainless Steel

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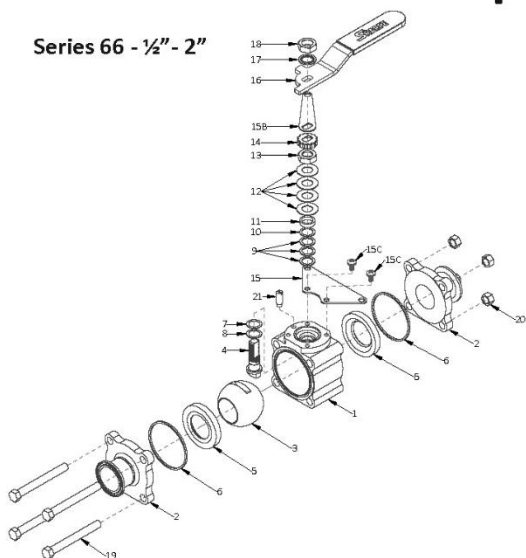


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Sharpe® Series 66

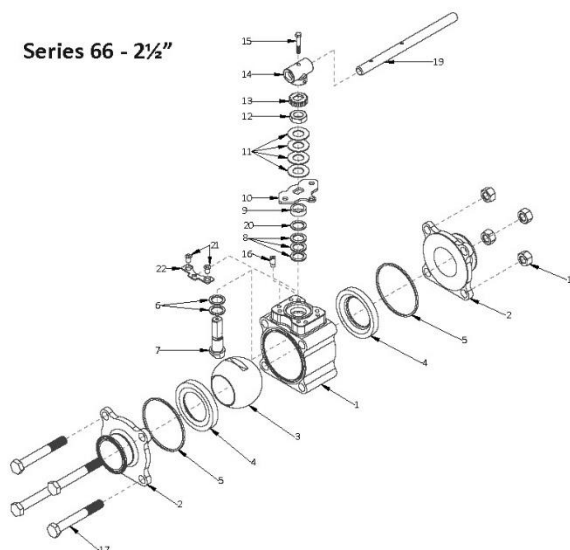
Series 66 - ½" - 2"



No.	Part Name	Qty	Material
1	Body	1	316L Stainless Steel ASTM A351 CF3M
2	Pipe Ends	2	316L Stainless Steel ASTM A351 CF3M
3	Ball	1	316L Stainless Steel
4	Stem	1	316L Stainless Steel
5	Seat	2	TRM® / PTFE / RTFE / Cavity Filler PTFE
6	Body Seal	2/3	PTFE, TRM
7	Thrust Bearing	1	TRM®
8	Thrust Bearing	1	TRM®
9	Stem Packing	3	TRM®
10	Seal Protector	1	TRM®
11	Gland	1	300 Series Stainless Steel

No.	Part Name	Qty	Material
12	Belleville Washer	4	300 Series Stainless Steel
13	Packing Nut	1	300 Series Stainless Steel
14	Lock Tab	1	300 Series Stainless Steel
15	Lower Lock Latch	1	300 Series Stainless Steel
15B	Upper Lock Latch	1	300 Series Stainless Steel
15C	Latch Bolt	2	300 Series Stainless Steel
16	Handle	1	300 Series Stainless Steel
17	Lock Washer	1	300 Series Stainless Steel
18	Handle Nut (1/4" - 2")	1	300 Series Stainless Steel
19	Body Bolts	4	304 Stainless Steel
20	Nuts	4	300 Series Stainless Steel
21	Stop Pin (1/2")	2	300 Series Stainless Steel

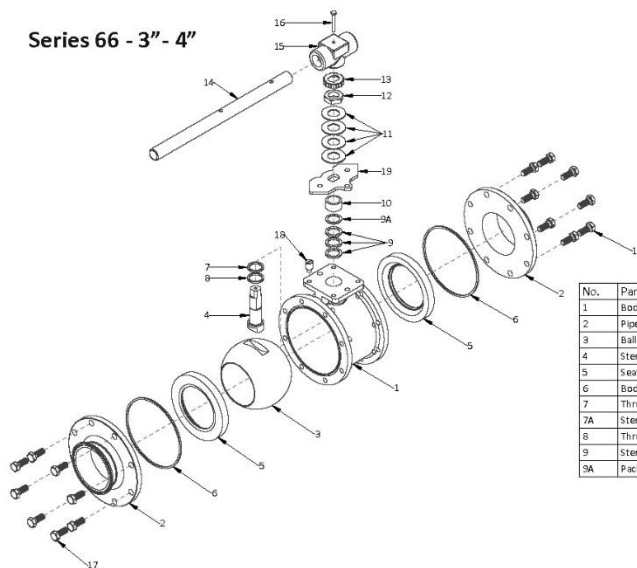
Series 66 - 2½"



No.	Part Name	Qty	Material
1	Body	1	316L Stainless Steel ASTM A351 CF3M
2	Pipe Ends	2	316L Stainless Steel ASTM A351 CF3M
3	Ball	1	316L Stainless Steel
4	Seat	2	TRM® / PTFE / RTFE / Cavity Filler PTFE
5	Body Seal	2	PTFE, TRM®
6	Thrust Bearing	2	TRM®
7	Stem	1	316L Stainless Steel
8	Stem Seal	3	TRM®
9	Gland	1	300 Series Stainless Steel
10	Stopper	1	300 Series Stainless Steel
11	Belleville Washer	4	300 Series Stainless Steel

No.	Part Name	Qty	Material
12	Packing Nut	1	300 Series Stainless Steel
13	Lock Tab	1	300 Series Stainless Steel
14	Wrench Block	1	300 Series Stainless Steel
15	Handle Bolt	1	300 Series Stainless Steel
16	Stop Pin	1	300 Series Stainless Steel
17	Body Bolts	4	304 Stainless Steel
18	Body Nuts	4	300 Series Stainless Steel
19	Handle	1	300 Series Stainless Steel
20	Gland Washer	1	300 Series Stainless Steel
21	Screw	2	304 Stainless Steel
22	Lower Stopper	1	316 Stainless Steel

Series 66 - 3" - 4"



No.	Part Name	Qty	Material
1	Body	1	316L Stainless Steel ASTM A351 CF3M
2	Pipe Ends	2	316L Stainless Steel ASTM A351 CF3M
3	Ball	1	316L Stainless Steel
4	Stem	1	316L Stainless Steel
5	Seat	2	TRM® / PTFE / RTFE / Cavity Filler PTFE
6	Body Seal	2	PTFE, TRM®
7	Thrust Bearing	1	TRM®
7A	Stem Location Ring	1	300 Series Stainless Steel
8	Thrust Bearing	1	TRM®
9	Stem Packing	3	TRM®
9A	Packing Protector	1	300 Series Stainless Steel

No.	Part Name	Qty	Material
10	Gland	1	300 Series Stainless Steel
11	Belleville Washer	4	300 Series Stainless Steel
12	Packing Nut	1	300 Series Stainless Steel
13	Lock Tab	1	300 Series Stainless Steel
14	Handle	1	300 Series Stainless Steel
15	Wrench Block	1	300 Series Stainless Steel
16	Hex Head Bolts	1	300 Series Stainless Steel
17	Body Bolts	16	304 Stainless Steel
18	Stop Pin	1	300 Series Stainless Steel
19	Stopper	1	300 Series Stainless Steel

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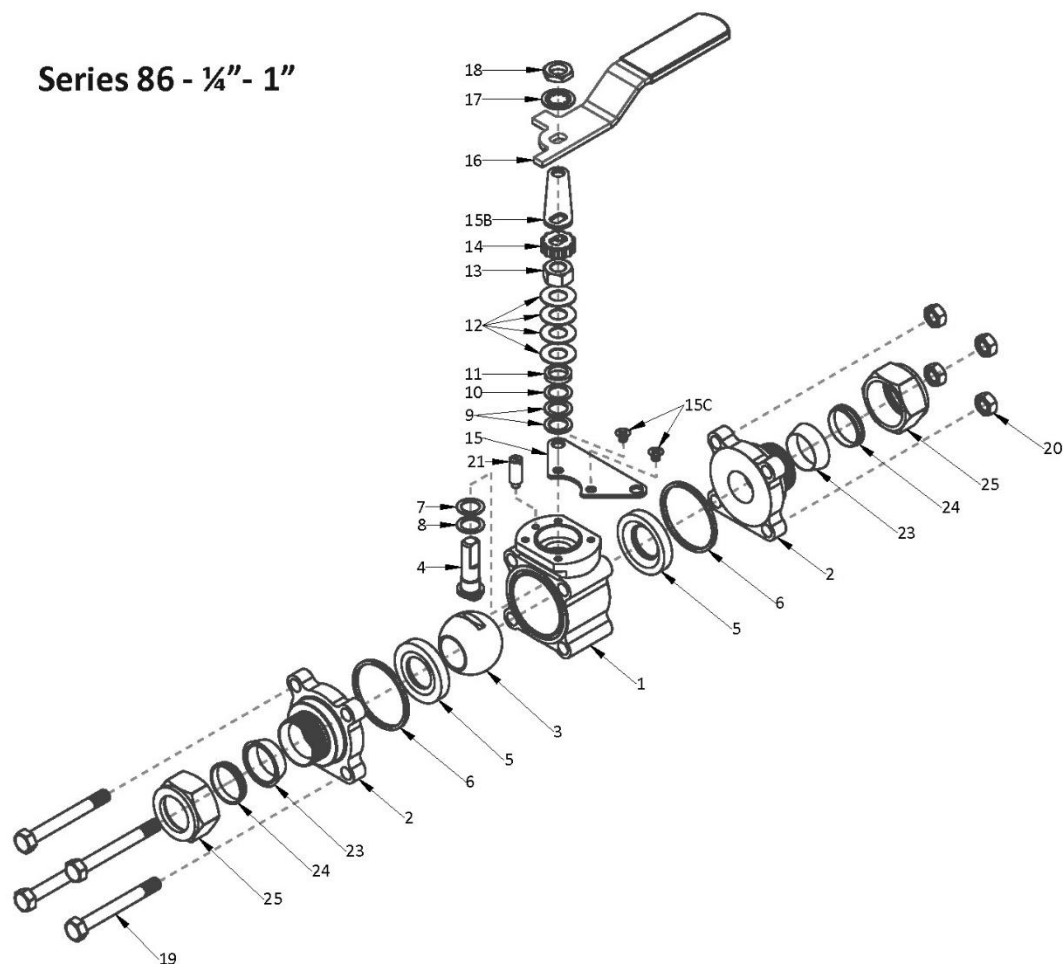


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Sharpe® Series 86

Series 86 - 1/4" - 1"



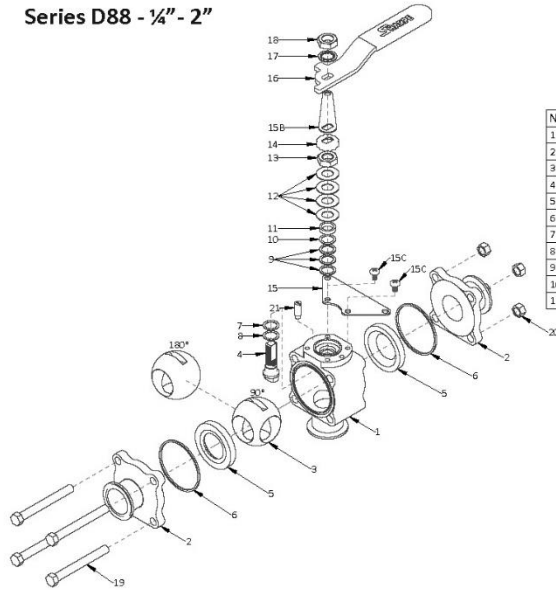
No.	Part Name	Qty	Material
1	Body	1	316L Stainless Steel ASTM A351 CF3M
2	Instrument Ends	2	316L Stainless Steel ASTM A351 CF3M
3	Ball	1	316L Stainless Steel
4	Stem	1	316L Stainless Steel
5	Seat	2	PTFE RTFE TFM® PTFE Catity Filler
6	Body Seal	2	PTFE TFM®
7	Thrust Bearing	1	TFM®
8	Thrust Bearing	1	TFM®
9	Stem Packing	2	TFM®
10	Seal Protector	1	TFM®

No.	Part Name	Qty	Material
11	Gland	1	300 Series Stainless Steel
12	Belleville Washer	4	300 Series Stainless Steel
13	Packing Nut	1	300 Series Stainless Steel
14	Lock Tab	1	300 Series Stainless Steel
15	Lower Lock Latch	1	300 Series Stainless Steel
15B	Upper Lock Latch	1	300 Series Stainless Steel
15C	Latch Bolt	2	300 Series Stainless Steel
16	Handle	1	300 Series Stainless Steel
17	Lock Washer	1	300 Series Stainless Steel
18	Handle Nut	1	300 Series Stainless Steel
19	Body Bolts	4	304 Stainless Steel
20	Nuts	4	316 Stainless Steel
21	Stop Pin	1	300 Series Stainless Steel
22	Front Ferrule	2	316 Stainless Steel
23	Back Ferrule	2	316 Stainless Steel
24	Companion Nut	2	316 Stainless Steel, Silver Plated

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Sharpe® Series D88

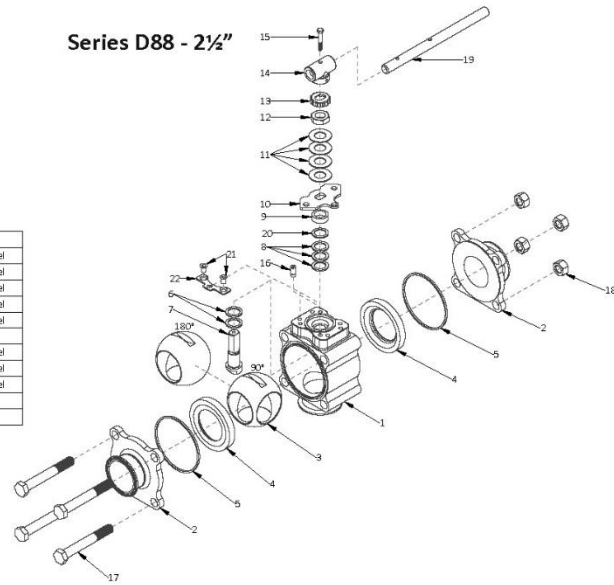
Series D88 - 1/4" - 2"



No.	Part Name	Qty	Material
1	Body	1	316L Stainless Steel ASTM A351 CF3M
2	Pipe Ends	2	316L Stainless Steel ASTM A351 CF3M
3	Ball	1	316L Stainless Steel
4	Stem	1	316L Stainless Steel
5	Seat	2	TFM® / PTFE / RTFE / Cavity Filler PTFE
6	Body Seal	2/3	PTFE, TFM
7	Thrust Bearing	1	TFM®
8	Thrust Bearing	1	TFM®
9	Stem Seal	3	TFM®
10	Seal Protector	1	TFM®
11	Gland	1	300 Series Stainless Steel

No.	Part Name	Qty	Material
12	Bellville Washer	4	300 Series Stainless Steel
13	Packing Nut	1	300 Series Stainless Steel
14	Lock Tab	1	300 Series Stainless Steel
15	Lower Lock Latch	1	300 Series Stainless Steel
15B	Upper Lock Latch	1	300 Series Stainless Steel
15C	Latch Bolt	2	300 Series Stainless Steel
16	Handle	1	300 Series Stainless Steel
17	Lock Washer	1	300 Series Stainless Steel
18	Handle Nut (1/4" - 2")	1	300 Series Stainless Steel
19	Body Bolts	4	304 Stainless Steel
20	Nuts	4	300 Series Stainless Steel
21	Stop Pin (1/2")	2	300 Series Stainless Steel

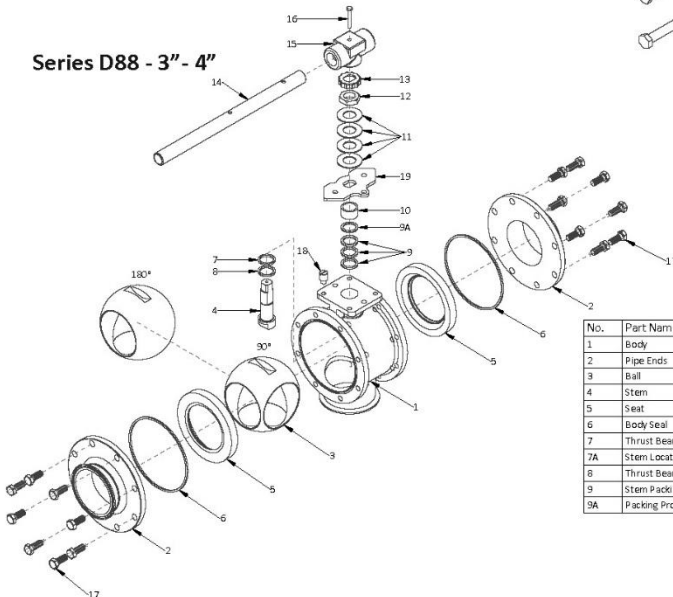
Series D88 - 2 1/2"



No.	Part Name	Qty	Material
1	Body	1	316L Stainless Steel ASTM A351 CF3M
2	Pipe Ends	2	316L Stainless Steel ASTM A351 CF3M
3	Ball	1	316L Stainless Steel
4	Seat	2	TFM® / PTFE / RTFE / Cavity Filler PTFE
5	Body Seal	2	PTFE, TFM®
6	Thrust Bearing	2	TFM®
7	Stem	1	316L Stainless Steel
8	Stem Seal	3	TFM®
9	Gland	1	300 Series Stainless Steel
10	Stopper	1	300 Series Stainless Steel
11	Bellville Washer	4	300 Series Stainless Steel

No.	Part Name	Qty	Material
12	Packing Nut	1	300 Series Stainless Steel
13	Lock Tab	1	300 Series Stainless Steel
14	Wrench Block	1	300 Series Stainless Steel
15	Handle Bolt	1	300 Series Stainless Steel
16	Stop Pin	1	300 Series Stainless Steel
17	Body Bolts	4	304 Stainless Steel
18	Body Nuts	4	300 Series Stainless Steel
19	Handle	1	300 Series Stainless Steel
20	Gland Washer	1	300 Series Stainless Steel
21	Screw	2	304 Stainless Steel
22	Lower Stopper	1	316 Stainless Steel

Series D88 - 3" - 4"



No.	Part Name	Qty	Material
1	Body	1	316L Stainless Steel ASTM A351 CF3M
2	Pipe Ends	2	316L Stainless Steel ASTM A351 CF3M
3	Ball	1	316L Stainless Steel
4	Stem	1	316L Stainless Steel
5	Seat	2	TFM® / PTFE / RTFE / Cavity Filler PTFE
6	Body Seal	2	PTFE, TFM®
7	Thrust Bearing	1	TFM®
7A	Stem Location Ring	1	300 Series Stainless Steel
8	Thrust Bearing	1	TFM®
9	Stem Packing	3	TFM®
9A	Packing Protector	1	300 Series Stainless Steel

No.	Part Name	Qty	Material
10	Gland	1	300 Series Stainless Steel
11	Bellville Washer	4	300 Series Stainless Steel
12	Packing Nut	1	300 Series Stainless Steel
13	Lock Tab	1	300 Series Stainless Steel
14	Handle	1	300 Series Stainless Steel
15	Wrench Block	1	300 Series Stainless Steel
16	Hex Head Bolts	1	300 Series Stainless Steel
17	Body Bolts	16	304 Stainless Steel
18	Stop Pin	1	300 Series Stainless Steel
19	Stopper	1	300 Series Stainless Steel

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INSTALLATION

Sharpe® ball valves have been designed and engineered to provide long lasting and trouble-free service when used in accordance with the instructions and specifications herein.

• General

- The following instructions only refer to Sharpe® standard valves as described in this document.
- Keep the protective covering in place until the moment of installation. Valve performance depends upon the prevention of damage to the ball surface. Upon removal of the cover, make sure that the valve is completely open and free of obstructions.
- When shipped, valves may contain a silicon based lubricant which aids in the assembly of the valve however valves can be ordered clean and free of lubricants.
- Certain ferrous valves are phosphate coated and oil dipped during the course of manufacture.

• Safety Precautions

- Before removing valve from pipeline: media flowing through a valve may be corrosive, toxic, flammable, or of a contaminant nature. Where there is evidence of harmful fluids having flowed through the valve, the utmost care must be taken. It is suggested that at least the following safety precautions should be taken when handling the valves. More precautions may be required, refer to the media's Safety Data Sheet for additional precautions.
 1. Always wear eye shields
 2. Always wear gloves and overalls
 3. Wear protective footwear
 4. Wear protective headgear
 5. Ensure that running water is easily available
 6. Have suitable fire extinguisher ready if the media is flammable
- By checking line gauges, ensure that no pressure exists on either the upstream or the downstream sides of the valve.
- Ensure that any media is released by operating the valve slowly to the half-open position.



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- Ideally, the valve should be decontaminated when the ball is in the half-open position and then leave the valve in the fully open position.
- These valves, when installed, have body connectors which form an integral part of the pipeline, and the valve cannot be removed from the pipeline without being dismantled. (See dismantling - page 15)

OPERATION

- Sharpe® valves provide tight shut off when used under normal conditions and in accordance with Sharpe® valves published pressure/temperature charts.
- If these valves are used in a partially open (throttled) position, seat life will be reduced and is not recommended unless it is a “V” series control valve that has been properly sized for the application.
- Any media which might solidify, crystallize or polymerize should not be allowed to stand in the ball valve cavities unless regular maintenance is provided. If minimal maintenance is performed, Sharpe® valves offers cavity filled and/or steam jacketed ball valves.

• Manual Operation

- Sharpe® valves use a ¼ turn operation closing in a clockwise direction. It is possible to see when the valve is open or closed by the position of the handle (wrench). When the handle (wrench) is across the pipeline (perpendicular), the valve is closed, reversing the handle is not recommended.

• Remote Operation

- Where manual operation is not required, valves may be automated for remote operation, instrument control, etc. A range of Sharpe® valves pneumatic and electric actuators are available.
- No stop plate is fitted to the valve, since that operation is normally part of the actuator, unless required.
- Operation will be in accordance with Sharpe® valves installation, operation and maintenance instructions for the relevant actuator.

INSTALLATION

- Sharpe® Valves cannot anticipate all of the situations a user may encounter while installing and using the valve.
- The user must know and follow all applicable industry specifications and government regulations for the safe installation and use of these valves.

It is the responsibility of the customer to determine the suitability of Sharpe® valves products in their particular application.
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- Only qualified personnel or technicians who are trained for maintenance work and have read the instructions are to assemble and disassemble the valve.
 - Misapplication of the product may result in injuries or property damage of which Sharpe® is not liable for.
1. Before installing the valves, the pipes must be flushed clean of dirt, burrs and welding residues, or you will damage the seats and ball surface. These valves should be installed using good pipe fitting practices.
 2. For Socket Weld End or Butt Weld End valves:
 - a. For valves with soft seats such as Delrin® or UHMWPE, the Ends **must** be disassembled to prevent heat damage to the seats during welding in line. A new body seal is required for reassembly
 - i. Place the valve into a vise with flat jaws squeezing only enough to securely hold the valve. Overtightening can cause damage to the valve. Then use a wrench to remove the body bolts. Valve must be in the partially open position to prevent the ball from sliding out.
 - ii. Place the center section assembly with seats and body seals in a clean area where it will not be damaged.
 - iii. Align the ends and then tack weld around them first and then complete the welding per industry standard. Once the caps are fully welded to the pipes, and the welds are cool to touch, re-install the center section with the seats and new body seals, then re-install the body bolts.
 - iv. Tighten all the nuts finger tight, open and close the valve slowly to make sure there is no binding and allow the ball to align.
 - v. Tighten the nuts evenly or in a star pattern and in according to the torques in the table at the end of this IOM.
 - b. Valves with PTFE, TFM®, RTFE, Nova, Kel-F, or PEEK seats with PTFE or FLEXIBLE GRAPHITE body seals may be welded in line without disassembly following the procedure on page 15.

MAINTENANCE

• General

- Sharpe® valves are designed to have a long, trouble-free life. When necessary, valves may be refurbished, using a small number of components, none of which require additional machining.

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- Sharpe® valves are designed for easy service and assembly in the field. The following checks should, however, help to extend valve life or reduce plant problems.

• Stem Leakage

- Examine the Belleville washers for damage. If they are in good condition, retighten the packing nut to the required torque listed at the end of this IOM. If no torque wrench is available start by tightening it $\frac{1}{8}$ of turn at a time. If after $\frac{1}{2}$ to $\frac{3}{4}$ of a turn leakage is still apparent then the packing should be replaced. If damaged, dismantle the stem down to the gland and install new Belleville washers with their outer edges touching. Further maintenance necessitates dismantling of the valve.

• Leakage at Body Joint

- Check for tightness in the body bolts. If loose, tighten body bolts to the specifications listed in the table below. Excessive force will only stretch or strip the bolts.
- If there is still leakage, this may be due to damage to the body seal, and it will be necessary to dismantle the valve.

• In-Line Leakage

- Check that the valve is fully closed. If it is, leakage may be due to a damaged seat or ball sealing surface and it will be necessary to dismantle the valve.
 - *Note:* Stem leakage and leakage at body joint, if not cured by simple means described above, necessitate dismantling valve. If there is not stem leakage, the stem assembly should not be touched.

• Leakage at Pipeline Joint

- *Threaded Valves:* Test for tightness of screwed thread. If loose, tighten with standard wrench - excessive force will only damage the connection. Normal jointing materials should be used in the correct quantity.
- *Welded Valves:* Examine welds for leakage point.
- *Clamp End Valves:* Check the tightness of the clamp and make sure the seal is properly aligned and not damaged.

REFURBISHING

- ❖ Before disassembly of valves from the pipeline follow these instructions.
 1. Cycle the valve with the line pressure fully relieved before attempting to the remove the valve from the pipeline to insure pressure has also been discharged from the valve cavity. Bring the valve handle to the open position.
 - **Warning:** trying to remove the valve body from the line in the closed position with the ends still attached in the pipe line will damage the ball.
 2. With the valve in the open position, loosen all the body bolts making sure that any leftover pressure or media has been evacuated. Remove the body bolts, so the valve body can be removed from between the end caps. Bring the body out from between the end caps and bring it to a clean space where it can be dismantled.
 3. Remove and discard the seats and body seals. Be careful not to damage the sealing surfaces.
 4. Support the ball to prevent it from falling out of the body and turn the handle to the closed position for its removal. Set the ball aside in a clean secure area for reuse.
 5. To dismantle the stem assembly, first remove the handle nut and handle from the stem. Using a wrench to prevent the stem from turning, remove the packing nut, Belleville washers and gland(s). It is normally not possible to remove the stem packing at this stage.
 6. Withdraw the stem through the body cavity and remove the thrust seals from the stem. Stem packing may now be removed from the top of the stem bore.
 7. Clean all components thoroughly and examine all seating/sealing surfaces.
 8. If there is a build-up of solids which cleaning fluids will not remove, use a proper tool to get it off making sure not to scratch the machined surfaces.
 9. No eroded or corroded leak paths are permissible. If any are found, the part must be replaced. The ball must have no scratches across its seating surfaces and any damage to the port lip will damage the new seats - a damaged ball must not be re-used, install a new ball.

• Rebuilding

- Before rebuilding, check that all the correct components are available and that they are fit for re-assembling. When rebuilding, cleanliness is essential to allow long valve life and provide cost-effective maintenance.



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- Note: The valve may be assembled and operated dry where no lubricants are allowed in the system; however, a light lubrication of mating parts will aid in assembly and reduce initial operating torque.
- Lubricant used must be compatible with the intended line fluid. Sharpe® uses food grade oil on valves for ball and seat lubricant.

1. Install thrust bearings on the stem and slide the stem up through the body.
2. Install new stem seals, gland ring, and Belleville washers onto the stem. Install stem nut and tighten to the torque values given in the table below.
3. Install the stem nut locking tab and tighten the stem nut slightly if necessary to align nut with locking device surfaces.
4. Install travel stop (if supplied) and handle. Make sure handle aligns with the flow bore through ball. Install the handle retainer nut or screw.
5. Turn the handle to the CLOSED position. Line up the ball slot with the stem tang and place the ball into position on the stem tang. Turn the handle to the OPEN position to hold the ball in place.
6. Install the seats into the body.
7. Install the seat retainer where applicable.
8. Install new body seals into the valve body.
9. Slide the body center-section assembly back between the end caps.
10. Install the body bolts and nuts and tighten in a "Star" pattern to the torque specified in the table below.
11. Cycle the valve open and closed several times slowly to ensure that operation is smooth and free of binding or sticking.

• Test

- If possible, leak tightness should be checked.

• New Parts

- Maintenance kits are available from Sharpe® valves.
- When ordering maintenance kits, please be sure to specify type and size of valve and seating material required.

- Where a valve needs repairing, rather than maintaining, it must be noted that only Sharpe® valves authorized spare parts should be used.
 - These also include basic components such as bolts, screws and nuts, etc.
- In addition to maintenance kits, spare parts available from Sharpe® valves including balls, stems, and glands for select series. If additional parts are required, it's normally recommended that the complete valve be replaced.
- Parts from different valve series or suppliers should **NOT** be interchanged.
 - This is to ensure, so far as is reasonably practicable, that the valve remains capable of being used for the purpose for which it was designed and constructed, without risk to health and safety of plant personnel.

HOWEVER, IF THE VALVE IS ALTERED IN ANY WAY, NO LIABILITY CAN BE ACCEPTED BY SHARPE® VALVES.

• Tools

- No special tools are required for the maintenance of Sharpe® valves.

• Dismantling

- If the valve is closed, and not in the fully open position as suggested, refer to safety precautions before proceeding further.
- During dismantling, do not assume that the valve is totally decontaminated - harmful media may still be trapped in crevices.
- To remove the valve from the pipeline, extract the body bolts and slide the body out from between the ends. For standard end cap valves it is in some cases unnecessary to remove the body completely away from the pipeline. Remove all but one of the body bolts, and with this remaining bolt loose, the body may be rotated out from the line using the remaining bolt as a hinge. However, this is not possible with flanged end caps.

Welding In-Line

The following welding instructions are to protect the soft internal components of Sharpe® Valves with socket weld ends or butt weld ends. The installer shall be responsible for all welding procedures and qualifications.

Valves with PTFE, TFM®, RTFE, Nova, Kel-F, or PEEK seats with PTFE or FLEXIBLE GRAPHITE body seals may be welded in line without disassembly following this procedure.

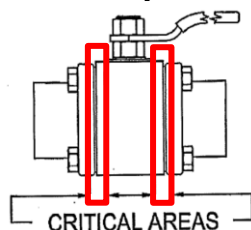
It is the responsibility of the customer to determine the suitability of Sharpe® valves products in their particular application.
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• Welding Procedure

- o Be sure the ends of the pipe that are to be welded are clean to the bare metal. Any contaminants in the weld area may cause porosity in the weld.
- o Valve **MUST** be in the fully **OPEN** position for the entire welding process and remain **OPEN** until the valve and welds are cool to the touch.
- o Position the valve in your piping scheme, being sure you achieve the standard end gap from the end of the pipe to the end of the valve.
- o Tack weld the valve in place taking care to monitor the temperature in the critical areas (see warnings below).
- o Immediately cool all portions of valve and pipe so the parts are cool to the touch. Non oily shop air or air convection can help accomplish this.
- o Tightly wrap a damp cotton shop towel or cloth around the valve exposing only the ends needing welding and the handle.
- o Alternate weld passes end to end allowing the valve and weld to cool between passes. Cool the valve and weld by using a damp cotton shop towel or cloth or by quenching with cool water until the entire valve and weld area is cool to the touch.
- o Remove the cloth that is wrapped around the body of the valve.
- o When the valve is cool, retighten the body bolts to the torque values in the table below.
- o It is **HIGHLY** recommended that the valve be flushed out while still in the open position after welding prior to any operating to prevent accidental damage to the seats from debris.
- o When possible, perform a final seat test before placing valve in service.

❖ WARNINGS:

1. Temperatures in the critical areas around the seats and seals must not exceed 350°F (300°F for Kel-F), it will damage the integrity of the soft seats and seals. Monitor with Tempilstik® or pyrometer.



2. Valves with Delrin® or UHMWPE seats must be disassembled for welding pipe ends in line.
3. Valves that are disassembled must be reassembled using new body seals.



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- Torque Requirements

Stem Nut					
Valve Size			Thread	Torque	
Ser. 66,86,88	Ser. 84 (all variations)	Ser. 99 (all variations)		N.M.	Lbf-In
¼-¾	¼ to ¾	¼ to ½	3/8-24	4.0	35.0
1 & 1-¼	1" & 1-¼	¾ & 1	7/16-20	9.0	80.0
1-½ & 2	1-½ & 2	1-¾ & 1-½	9/16-18	13.0	115.0
2-½	2-½	2	M20 X 2.5	30.0	265.0
3 & 4	3 & 4	2-½ & 3	1" - 14	60.0	530.0

Body Bolts				
Valve Size		Thread	Torque	
Ser. 84 (all variations)	Ser. 99 (all variations)		N.M.	Lbf-In
¼ to ¾	¼ to ½	1/4-20	5.0	40.0
1"	¾	5/16-18	19.0	168.0
1-¼	1	3/8-16	29.0	252.0
1-½	1-¼	7/16-14	45.0	396.0
2	1-½	1/2-13	70.0	612.0
2-½	2	5/8-11	137.0	1212.0
3	2-½	7/16-14	45.0	396.0
4	3	1/2-13	70.0	612.0

Body Bolts			
Valve Size	Thread	Torque	
Ser. 66,86,88		N.M.	Lbf-In
¼-¾	M6	5.0	40.0
1 & 1-¼	M8	19.0	168.0
1-½	M10	39.0	345.0
2	M12	65.0	576.0
2-½	M16	137.0	1212.0
3	M10	39.0	345.0
4	M12	65.0	576.0

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