SHERWOOD SCUBA® CYLINDER VALVES



Assembly & Maintenance Guide

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YOKE CONNECTION VALVES
(TYPE A STEM/PLUG ASSEMBLY)

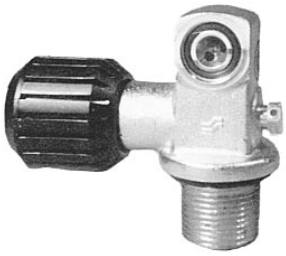
The valves shown on this page are all yoke outlet style valves. Some are no longer in production, but all can be repaired with the same Type A stem/plug assembly (see Fig. 1, page 9).



SVB5000
(Currently SVA5000)



SVB4000J



SVB1396A or SVM1396B



KVA6535X-1



SVB4240



YVA3010



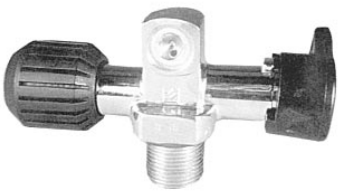
YVA3010A OA



SVA3010 FILLER VALVE



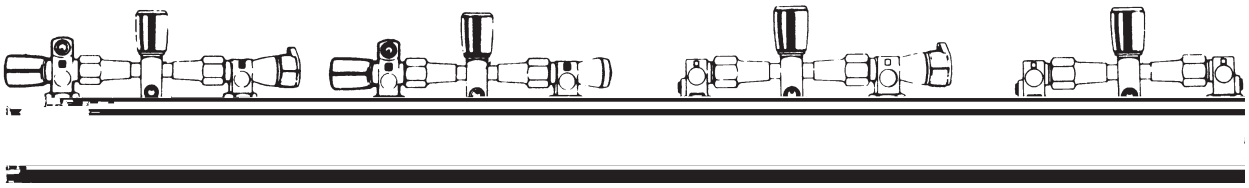
SVB4000K



SVB 1395A



SVB4000KDE DOUBLE TANK MANIFOLD
(See the following illustrations)



SVB4000JD SVB4000KD SVB4042JD SVB4042KD

SHERWOOD 6300 SERIES VALVES
(TYPE B STEM/PLUG ASSEMBLY)

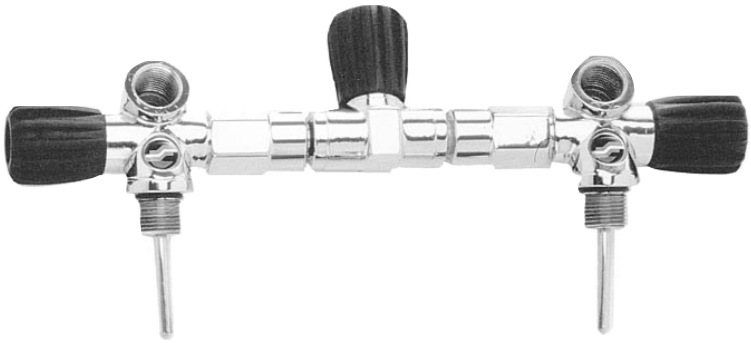
The valves shown on this page are included in the 6300 Series. These valves have a 300 BAR DIN outlet. All of these valves use the same Type B stem/plug assembly (see Fig. 2, page 9).



SVB6307
7/8" INLET-DIN OUTLET



SVB6306
3/4" INLET-DIN OUTLET



SVB6306D
3/4" INLET-DIN OUTLET
or
SVB6307D
7/8" INLET-DIN OUTLET

ANNUAL SERVICE PROCEDURE FOR ALL SHERWOOD VALVE MODELS

See pages 9, 10, 11, 12, 13, 14 and 15 for diagrams and part numbers.

Sherwood valves are simply constructed and easy to service. For best performance, all valves should be serviced annually. If the valves are not worn, all parts can be lubricated where needed, and reused. An exception to this is the copper crush gasket beneath the bonnet nut on SVB4000, SVB5000, and some older style valves. This gasket must be replaced when the bonnet nut is removed from the valve.

Sherwood valves, with the exception of the 6300 Series, now contain all-Teflon® stem seals. This feature, combined with a good preventive maintenance schedule, will help to extend valve life.

Where lubrication is required, Sherwood recommends the use of LTI Christo-Lube 111®,or an equivalent oxygen compatible lubricant. Enriched air conversion kits are available for all current Sherwood Scuba valves. See page 15 for kit number information.

PRE-TEARDOWN INSPECTION:

1. Start with full working pressure in cylinder and a properly functioning regulator attached to outlet.

2. Slowly turn valve on fully, then back a quarter-turn.

3. Remove all handwheels.

4. Apply a non-ammonia soap and water solution to the valve stem nut area, the inlet neck O-ring area, the safety, and the outlet. **For dual tank manifolds only,** apply solution to both ends of yoke nuts, holes in yoke nut flats, and both sides of the center valve body where the nipples enter.

5. Allow the soap solution to sit for at least 15 seconds, and check for signs of leakage. If you find leaks, pay particular attention to these areas during servicing.

6. Turn the valve off with **moderate** force. Remove the regulator from the valve. Apply a soap solution to valve outlet and check for leakage.

7. Empty the air from the cylinder and thoroughly rinse the soap solution from the valve with clean, fresh water. Blow or wipe dry.

DISASSEMBLY:

1. If there are no signs of leakage at the burst disc location, do not replace the burst disc at the annual inspection. The burst disc assembly, the plug assembly and washer, and all O-rings **must** be replaced at each five-year tank hydro interval.

2. To simplify disassembly, loosen bonnet nut while valve is still in tank.

3. Remove valve from tank.

4. Remove bonnet nut assembly and plug assembly.

5. Remove the copper gasket (not found in the 6300 series) and discard it.

6. Use compressed air to blow the orifice chamber and plug threads clean.

7. The plug assembly can be reused if no outlet leakage was found during the pre-teardown pressure test (valve turned off with moderate force). At five-year hydro interval, the plug assembly **must** be replaced.

8. If outlet leakage was found, replace the plug assembly and inspect the orifice closely for nicks on the sealing surfaces.

9. Remove the stem from the bonnet nut.

10. If the leakage occurred at the stem, replace the O-ring and the Teflon packing washer. On all valves (excepting the 6300 Series), replace old packing with newer two-piece all-Teflon packing. Visually inspect the stem for straightness, and replace if it is bent.

11. If there is no leakage at the stem and the O-ring appear unworn and undamaged, the O-rings and/or packing washers may be cleaned, well-lubricated using a recommended product, and reused. NOTE: If this is a 5-year hydro interval inspection, the O-rings and washers **must** be replaced.

ASSEMBLY:

1. Apply a dab of silicone grease to the plug assembly threads.

2. Use the stem to install the plug assembly finger-tight into the valve body until it touches the orifice.

3. Install a new copper crush gasket (excepting the 6300 Series).

4. Reinstall the lubricated stem assembly partway into the bonnet nut.

5. Install the bonnet nut into the body, using the protruding slot of the stem to engage the tang of the plug assembly before tightening.

6. Stem packing nut should turn easily all the way down. If binding occurs, check for proper tang engagement.

7. Remove old tank O-ring from valve. Clean the groove and threads of the valve body inlet with a dry cloth.

8. Lightly lubricate a new tank O-ring and install it.

9. Apply a dab of lubricant to the first three inlets of the valve, and install the valve into the tank.

10. Tighten the valve into the tank to 40-50 ft. lbs. of torque. This torque will help prevent water and corrosion in the O-ring area.

11. Tighten bonnet nut into valve to 10-15 ft. lbs. of torque.

12. If a new burst disc assembly is installed, tighten to 50-60 in. lbs. See Burst Disc Procedures section in this manual).

13. Apply a dab of lubricant to the threads of the stem.

14. Install the washer, handwheel, spring, and stem nut.

15. Turn in stem nut until the end of the stem is flush with the top of the nut.

16. Refill the cylinder and retest for leaks.

SPECIAL INSTRUCTIONS FOR DUAL MANIFOLDS ONLY:

1. Check for leaks as covered in the “Pre-Teardown Inspection” section of this manual.

2. Overhaul the center valve using the same parts and in the same manner as a single-tank valve.

3. SVB6300 SERIES (DIN) ONLY: See page 16 for parts list. If no leaks were found during the pre-teardown test, the center manifold nipples do not ever have to be removed from the isolator valve. If a leak is discovered where the nipples screw into the center isolator valve, use the following procedure for repair:

   a. Remove the isolator valve bonnet assembly and plug assembly.

   b. Remove O-rings from the outboard ends of nipples.

   c. Heat the isolator valve in an oven at 350°F (175°C) for 15 minutes to soften the locking compound holding the nipple assemblies in the isolator valve.

   d. Clamp the isolator valve into a vise.

   e. A .187" rod or 3/16" drill bit can be used as a tool for loosening and tightening the nipple and the isolator valve.

   f. Look at the center manifold nut and locate the hole in one of the flats.

   g. Rotate the nut until you see a corresponding hole in the nipple.

   h. Insert the rod or drill bit through the nut hole into the nipple hole.

   i. Use a wrench on the nut to turn out the nipple from the valve.

   j. Repeat above to remove the other nipple nut assembly.

   k. Discard O-rings and clean the threads.

   l. Inspect and clean all sealing surfaces.

   m. Install new O-rings.

   n. Install nut onto nipples.

   o. Apply three drops of Hernon 472-02®, Loctite 271® or equivalent to encircle thread of each nipple near the end. Install the nipples into the isolator valve.

   p. Use the rod or drill bit to tighten the nipple snugly, 10-12 ft. lb.

   q. Reinstall on the manifold and test for leaks.

4. SVB4000KDE SERIES (Yoke only): See page 14 for parts list. The nuts and nipples on the center body assembly (p/n 2-4003-10) of the double yoke manifold series valves are brazed in place. You cannot repair them if a leak occurs where the nipple body meets the center valve body. You must replace the entire center body assembly if a leak occurs here. The internal valve parts in the center body assembly are common to all other Sherwood yoke valves. See page 10, “Parts List for Type A Stem/Plug Assembly.” When reassembling the three main sections of the double yoke manifold, carefully align the sections and tighten the center body assembly nuts to the tank sections with 10-12 ft. lbs. (14-16 joules) of torque.

SPECIAL INSTRUCTIONS FOR RESERVE MECHANISM OVERHAUL

TESTING AND TROUBLESHOOTING:

Single Tank Valves:

1. On valves with a reserve, introduce 400-450 psig (3 bar) pressure to the inlet side of the valve.

2. With the reserve lever in the dive position (up) and a flow meter connected to the outlet of the valve, open the handwheel and allow flow through the valve.

3. Gradually reduce the inlet pressure. The flow should start to reduce at approximately 300 psig (2 bar). The flow at 250 psig should be a maximum of 15 SLPM.

4. If flow is over maximum allowable flow, replace the cam and block assembly, or check the valve seat for imperfections.

5. If the orifice in the valve body is damaged, replace the body.

Double Tank Manifolds (SVB400JD):

1. On manifolds with a reserve, introduce 700-800 psig inlet pressure and follow the test procedure for a single tank valve.

2. The pressure should start reducing at approximately 600 psig (4 bar) with a maximum flow of 15 SPLM allowed.

3. When reassembling reserve mechanism, tighten the bonnet nut to 15-20 ft. lbs. (20-25 joules) of torque.

IMPORTANT:
When reserve lever is installed, it must be tested for proper orientation. With the manifold valve open and the reserve lever in the “down” position, you should be able to blow air gently through the valve (using lung pressure). Raising the reserve lever to the “up” position should stop the air flow. If the action is reversed, remove the reserve lever from the stem in the “up” position, rotate the lever 90 degrees, and place it on the stem in the “down” position. Retest for proper operation.

CAUTION

When filling cylinders equipped with a reserve valve, make sure the reserve lever is in the reserve position (down). If the lever is in the dive position (up) when filling, the cam and block assembly could be damaged. The fill rate may also be extremely slow.

VALVE BURST DISC ASSEMBLIES

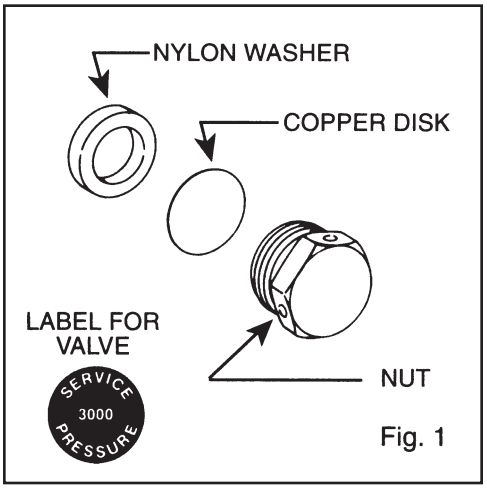
Sherwood valves in service use two basic types of burst disc assemblies.

1. Older valves use the small 3/8" hex 3-piece assembly shown in Fig. 1. It is installed into the valve cavity; nylon washer first, copper disc second, plug body third.

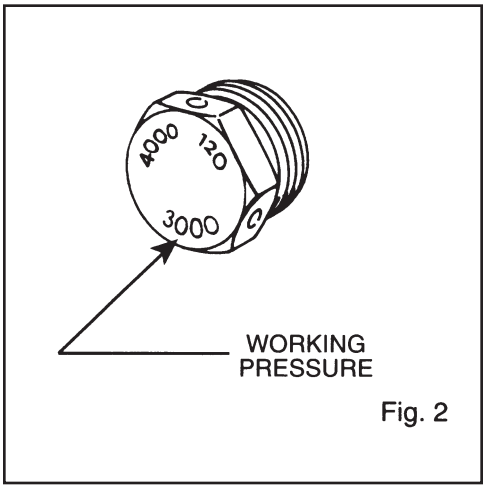
2. All currently manufactured valves use the 1/2" hex 1-piece unit shown in Fig. 2.

Tighten both styles to 50-60 in. lbs. Apply torque rapidly to avoid gasket deformation.

IMPORTANT:
The entire burst disc assembly **must** be replaced at every 5 year tank hydro interval.
Never reuse any parts of the burst disc assembly, since used parts may not function at proper pressure.



3/8" HEX 3-PIECE ASSEMBLY
Working pressure on sticker applied to valve.



1/2" HEX 1-PIECE ASSEMBLY
Working pressure shown on hex face (bottom line).

Tank Working Pressure	Overhaul Kits For 1/2" 1-Piece Assembly*	Overhaul Kits For 3/8" 3-Piece Assembly
1800 PSIG	P/N 14120-28	P/N 4000-970
2015 PSIG	P/N 14120-32	P/N 4000-940
2250 PSIG	P/N 14120-35	P/N 4000-850
2400 PSIG	P/N 14120-38	P/N 4000-890
3000 PSIG	P/N 14120-48	P/N 4000-860
3300 PSIG	P/N 14120-50	—
3500 PSIG	P/N 14120-49	—

*1/2" kits contain enough parts for overhauling 10 valves.

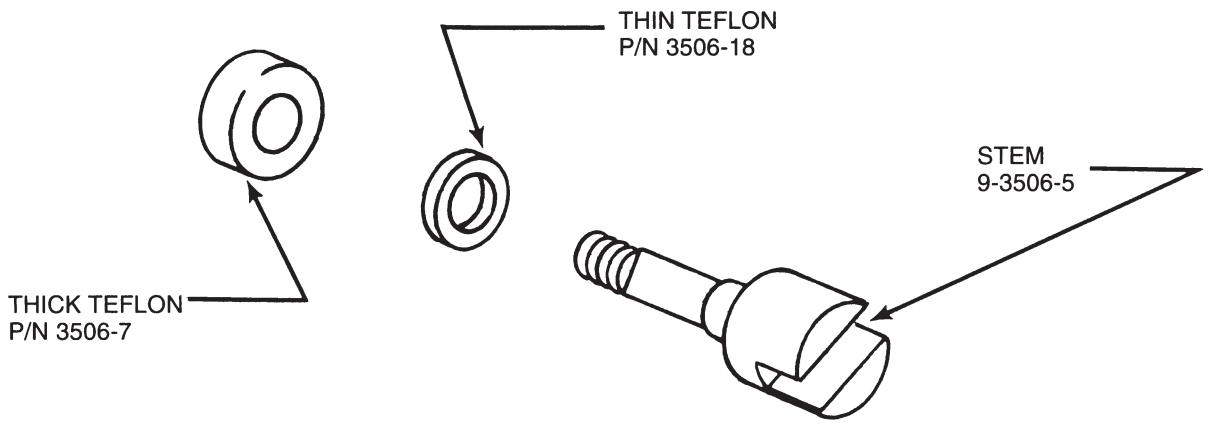
BONNET STEM PACKING

As of January 1990, Sherwood uses Teflon® for the bonnet stem packing on all standard yoke valve series. Teflon improves the service and durability of the valve, and reduces friction.

The Teflon packing is compatible with the newest and oldest Sherwood valves (with the exception of the 6300 Series DIN valves). As a result, the two different bonnet stem packing systems formerly in use previous to 1990 are now obsolete.

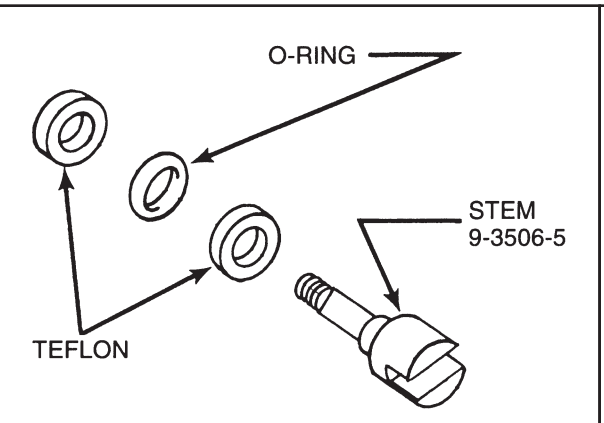
The newer packing consists of a thick Teflon washer (P/N 3506-7) and a thin Teflon washer (P/N 3506-18). The same stem and bonnet nut are still in use.

To install the new packing on the stem, lubricate both generously with a recommended lubricant (see page 4, “Service Procedure for All Sherwood Valve Models”). Then install the thin washer on the stem followed by the thick washer. Install the stem and packing into the nut, and assemble into valve following normal procedures.

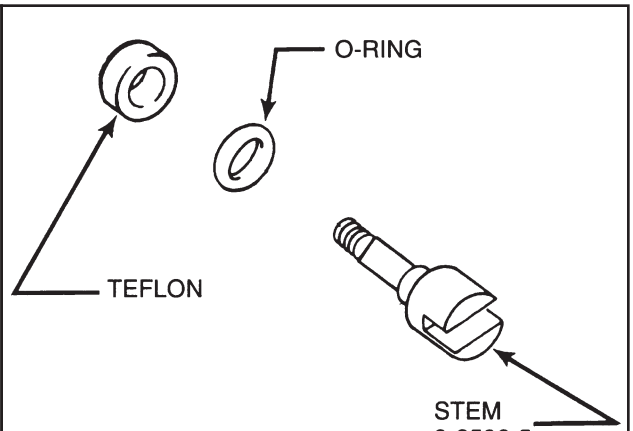


ALL-TEFLON PACKING*

**Kit P/N 3506-20 contains enough material for 10 valves.*



OBSOLETE 3-PIECE PACKING



PARTS LIST FOR TYPE "A" STEM/PLUG ASSEMBLY

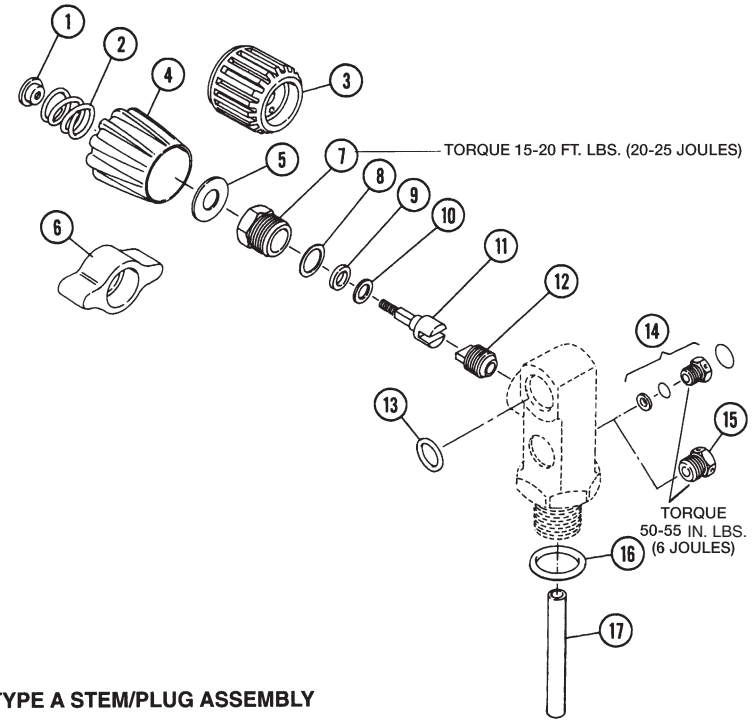
VALVE REPAIR PARTS AND KITS

NOTE: There are only two types of stem/plug assemblies for Sherwood valves. In this manual, we will refer to them as "Type A" and "Type B."

• The Type A stem/plug assembly (see page 10) is the older style and is used in **all** of the Sherwood valve models except the newer 6300 Series.
• The Type B stem plug assembly (see page 11) is the newer style used on the 6300 Series of valves (also known as T-valves). Type B has a higher flow and pressure rating and can be recognized by its larger plug assembly.

Item Number	Part Number	Description
1	1-3506-8	Stem nut
2	19-3506-11	Spring
3	1389-2D	Handwheel (short, round style)
4	4000-2	Handwheel (raised ribs)
5	1413	Washer
6	6521S	Handwheel (wing nut style)
7	3506-14	Bonnet nut
8*	3506-10	Copper gasket
9*	3506-7	Thick Teflon ring (new style seal)
10*	3506-18	Thin Teflon ring (new style seal)
11	9-3506-12	Stem
12*	3506-9	Plug assembly
–	Varies with model number	Valve body
–	Varies with model number	Label
13	G014L	O-ring (outlet)
14	—	Safety – 3 piece (see page 7 for details)
15	—	Safety – 1 piece (see page 7 for details)
16*	G214A	O-ring (tank)
17	25-6530	Dip tube
*	3506-20	Overhaul kit for valve stem/plug assembly (contains enough material for 10 valves)
*	3506-20N	Enriched air conversion/overhaul kit (contains enough material for one valve)

*Denotes parts supplied in valve overhaul kits

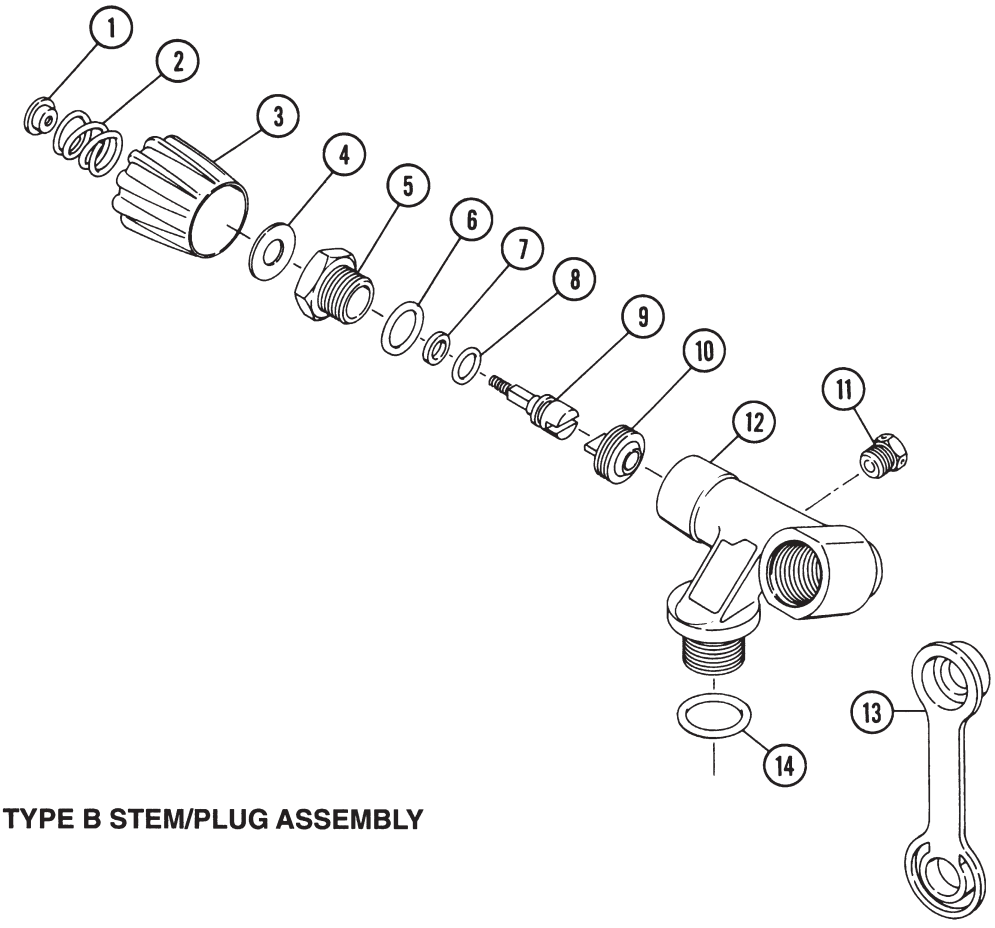


TYPE A STEM/PLUG ASSEMBLY

PARTS LIST FOR TYPE “B” STEM/PLUG ASSEMBLY

Item Number	Part Number	Description
1	1-3506-8	Stem nut
2	19-3506-11	Spring
3	6000-2	Handwheel
4	1413	Washer (for handwheel)
5	1-6000-3	Bonnet nut
6*	G1600-200A	O-ring (for bonnet nut)
7*	G011L	O-ring (for stem)
8*	3506-18	Teflon ring
9	9-3506-16	Stem (brass as of 4/1/91)
10*	6000-40	Plug assembly
11	—	Safety (see page 7 for details)
12	—	Body (p/n varies with model number)
13	6300-7	Soft protector cap
14	G214A9	O-ring (tank)
*	3506-30	Overhaul kit for valve stem/plug assembly (contains enough material for 10 valves)
*	3506-30N	Enriched air conversion/overhaul kit (contains enough material for one valve)

*Denotes parts supplied in valve overhaul kits

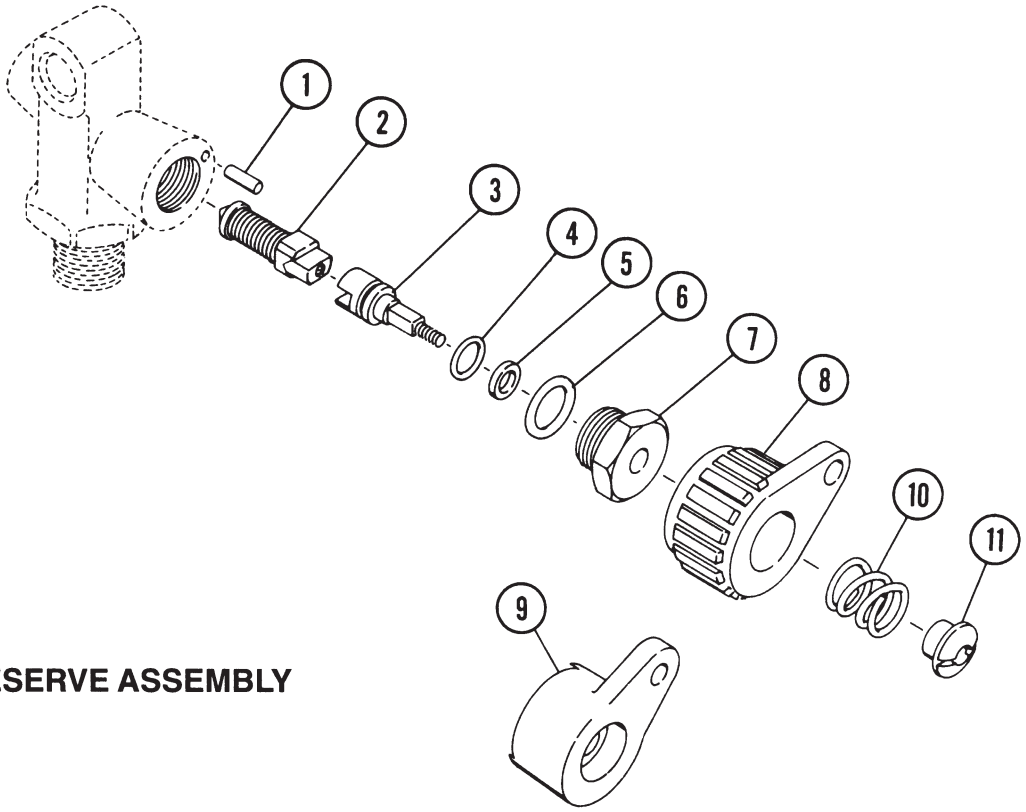


TYPE B STEM/PLUG ASSEMBLY

PARTS LIST FOR ALL RESERVE ASSEMBLIES

Item Number	Part Number	Description
1	3839-5	Pin
2	4000-90M	Cam and block assembly
3	1322-14	Stem
4*	G010A	O-ring
5*	3506-7	Teflon ring
6*	G113A	O-ring
7	1-1322-16	Bonnet nut
8	4000-3	Lever (ribbed style)
9	1389-5	Lever (smooth style)
10	3506-22	Spring
11	1-3506-8	Nut
*	3506-40	Overhaul kit for valve (contains enough material for 10 valves) for all reserve valve assemblies. Does not include cam block assembly.

*Denotes parts supplied in valve overhaul kits

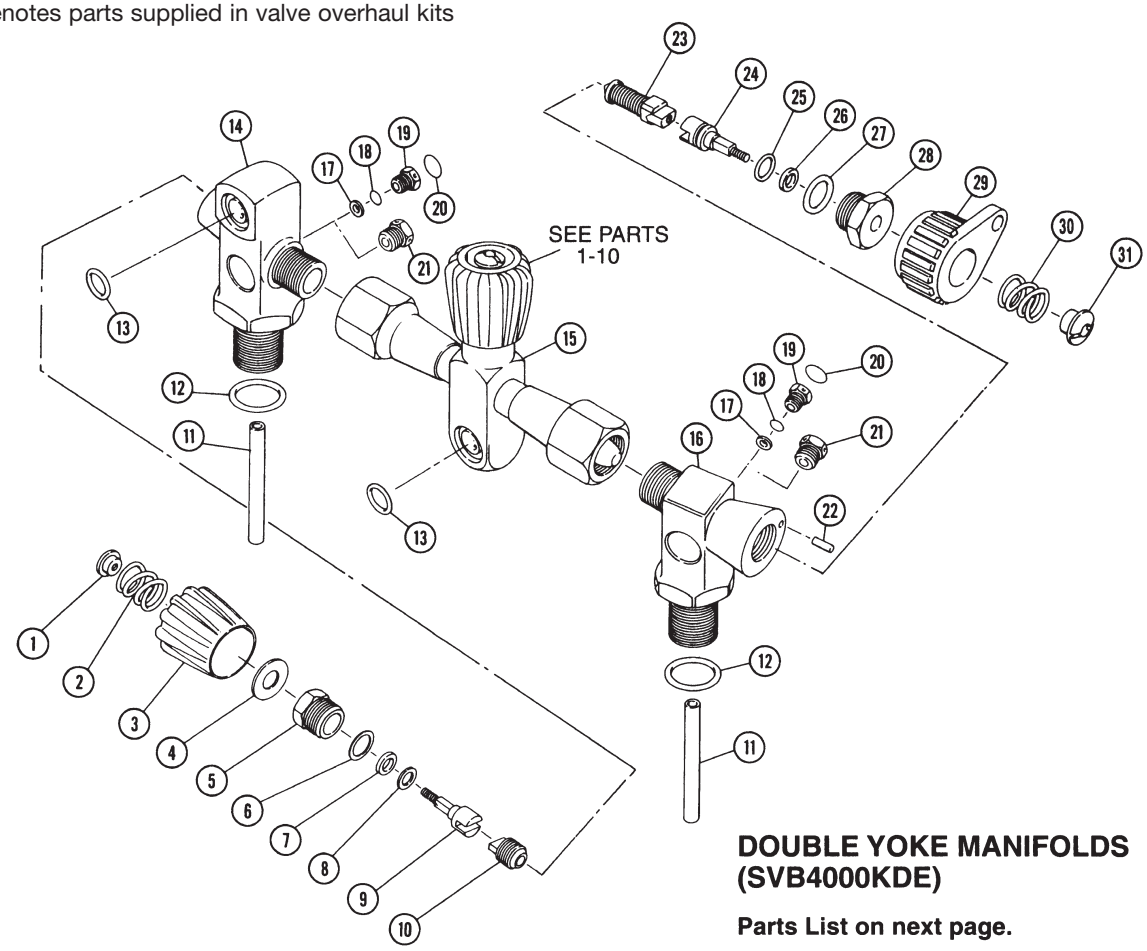


RESERVE ASSEMBLY

PARTS LIST FOR DOUBLE YOKE MANIFOLDS (SVB4000KDE)

Item Number	Part Number	Description
1 to 10	See page 10, Parts List for Type “A” Stem/Plug Assembly	
11	25-6530	Dip tube
12	G214A9	Valve to tank O-ring
13	G014L	Valve outlet to regulator O-ring
14	2-4002-1	Right side body, with regular gullet
14	2-4042-1	Elbow style body, no regular outlet
15	2-4003-10	Center body assembly (Items 1-10 not included)
16	4001-1	Left side body, reserve style
16	2-4042-1	Elbow style body, not reserve style
17	6510-N	Nylon washer (only available as part of 3/8" kit, page 8)
18	6509-XX	Copper disc (only available as part of 3/8" kit, page 8)
19	9-4000-6	Burst plug (only available as part of 3/8" kit, page 8)
20	4020-XX	Burst label (only available as part of 3/8" kit, page 8)
21	1-4000-120-XX	Newer one-piece burst plug assembly
22 to 31	See page 12, “Parts List for All Reserve Assemblies”	

*Denotes parts supplied in valve overhaul kits



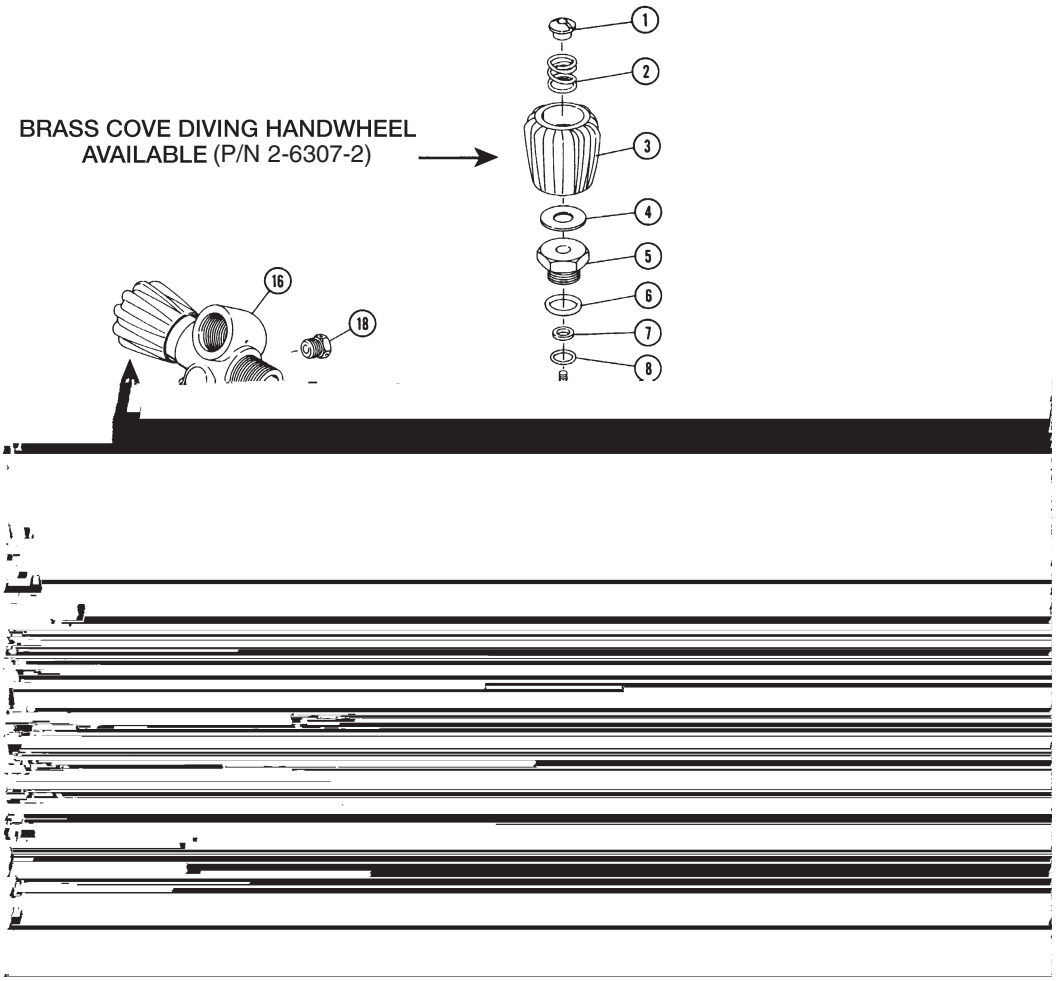
DOUBLE YOKE MANIFOLDS (SVB4000KDE)

Parts List on next page.

PARTS LIST FOR DOUBLE DIN MANIFOLD

Item #	Part #	Description
1	1-3506-8	Nut
2	19-3506-11	Spring
3	6000-2	Handwheel
4	1413	Washer
5	1-6000-3	Bonnet nut
6*	G1600-200A	O-ring (for bonnet nut)
7*	G011L	O-ring (for stem)
8*	3506-18	Teflon washer
9	9-3506-16	Stem
10*	6000-40	Plug & seat assembly
11	2-6000D-4	Center body (isolator valve)
12	2-6000D-2	Manifold nut
13	G011K	O-ring (inner nipple end)
14	9-6000D-3	Nipple

Item #	Part #	Description
15	G010K	O-ring (outer nipple end)
16	2-6307DR-1	Right side valve body Smaller 7/8" HP cylinder inlet
16	2-6306DR-1	Right side valve body Larger 3/4" standard inlet
17	2-6307DL-1	Left side valve body Smaller 7/8" HP cylinder inlet
17	2-6306DL-1	Left side valve body Larger 3/4" standard inlet
18	1-4000-120-XX	One-piece burst plug assembly (see page 7)
19*	G910A9	O-ring (for 7/8" inlet, eg.2-6307DL-1)
19	G214A9	O-ring (for 3/4" standard inlet, eg.2-6306DR-1)
20	25-6530	Dip tube



VALVE TORQUE SPECIFICATIONS

Valve into cylinder . . . . . .40-50 ft. lbs.
Bonnet nut into valve body . . . . . .10-15 ft. lbs.
Burst plug into valve body . . . . . .50-60 in. lbs.
Double manifold center section nuts to cylinder sections . . . . . .10-12 ft. lbs.

ENRICHED AIR KITS

Sherwood valves come from the factory clean and lubricated with an oxygen compatible lubricant. However, to convert Sherwood Scuba valves for use with air mixtures containing up to 40% oxygen, Sherwood Enriched Air Conversion Kits must be installed. These kits contain proper o-ring and plug seat compounds for use with air mixtures containing up to 40% oxygen. Used valves must be cleaned for enriched air use prior to installation of kits by a technician trained for enriched air service, by a recognized enriched air training agency.

Kit p/n **3506-30N** for type “A” yoke style packing (see page 10) (parts for one valve)

Kit p/n **3606-50N** for type “B” DIN style packing (see page 11) (parts for one valve)



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