SUPER II FISHING JAR

Instruction Manual 4102

Super II Fishing Jar

NATIONAL OILWELL VARCO

One Company | Unlimited Solutions

INDEX

Super II Fishing Jar

The designs and specifications for the tools described in this instruction manual were in effect at the time this manual was approved for printing. National Oilwell Varco, whose policy is one of continuous improvement, reserves the right to discontinue models at any time, or to change designs and specifications without notice or without incurring obligation.

Seventh Printing, March 2006

General Description and Construction

The Bowen® Super II Fishing Jar is a straight pull up jarring tool that employs a patented combination of proven principles of hydraulics and mechanics. It also features a one-piece mandrel design (integral top sub) for greater torque and bending strength than other jars. This jar is simple to assemble and its unique design allows for easy, dependable operation. No setting or adjustment is required before going in the hole, or after the fish is engaged. The Super II Fishing Jar allows the operator to easily and simply control the intensity of jarring blows by simply varying the applied pull load. The jar can deliver a wide range of blows, from low to very high impact and impulse forces.

The variable impact control of the Super II Fishing Jar is made possible by the metering action of the cone assembly. Fluid flows from one side of the Piston to the other through a metering port as pull is applied to the jar. Forced through this restricted passage, flow is retarded in a manner that delays the stroke. This gives the operator ample time to take the necessary stretch in the running string (and Bowen® Jar Intensifier, when used) to strike a blow of given impact.

The operator can deliver a rapid series of blows when desired. He only needs to lower and raise the fishing string the short distance necessary to make each stroke.

Another advantage of the Super II Fishing Jar is the ease of closing or resetting. During closing or resetting, large ports open in the Piston assembly, allowing unimpeded fluid flow. Since the metering action does not occur during closing, only sufficient weight to overcome friction is required to close the jar.

The jar's internal chambers are sealed at both ends. Therefore, the lubricating and operating fluids cannot escape and well fluids cannot enter these chambers.

The lubricating and operating fluids constantly lubricate the internal working parts, promoting long wear life of the jar.

The Super II Fishing Jar does not interfere with the free operation of fishing tools, formation testers, or other tools, and is able to transmit torque in either direction.

Applications

Important Information

The Bowen® Fishing Jar Placement Program is available to Bowen® customers. The program should be run and used as a guide to optimize the string configuration; to include, if an intensifier should be used. The program provides information on impact forces and impulse values based on the fishing string components, the fish, the applied pull loads at the jar, and other downhole information. This maximizes the likelihood of success in all jarring operations .The program also provides information to avoid excessively high impact loads. Pull load and impact force information can be compared to the strength of the fishing string (to include all tools being used) and to the fish for possible limitations on pull loads and impact forces. Time spent running the program and planning the fishing job is very beneficial.

WARNING: The Bowen® Fishing Jar Placement Program is written specifically for Bowen® Jars and Intensifiers, with the unique characteristics of each tool incorporated in the program. See program for additional information. Contact National Oilwell Varco for a copy of the computer program.

A Bowen® Intensifier should be installed in the string when maximum jarring impact and impulse are needed. This is particularly true in shallow, deviated, or directional holes.

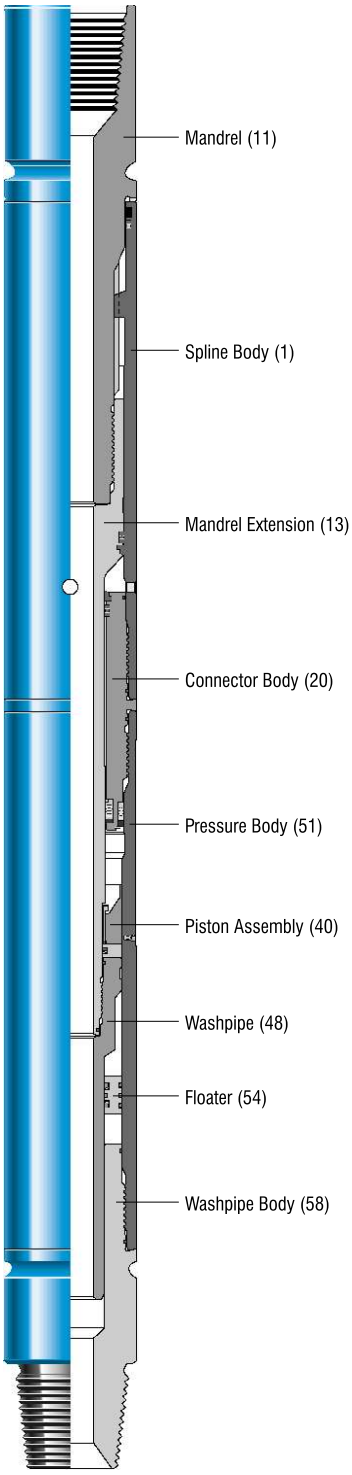

Figure 1
6-1/4" Super II Fishing Jar

CAUTION: The Intensifier should be located above all the concentrated mass (drill collars, heavy weight drill pipe, etc.) which is immediately above the jar. This concentrated mass is used to provide the impact and impulse at the stuck point while jarring. The working string above the intensifier should NOT have a "weight per foot" change for at least 1,000 feet of string directly above the intensifier. The only exception is for a lighter joint to be screwed directly into the intensifier for flexibility, when needed for bending. No mass above the intensifier improves the jarring results at the stuck point. Concentrated weight mass directly above the intensifier can cause the impact to occur in the intensifier. This may give the impression at the surface of harder hitting but will most likely result in less impact at the stuck point and can damage the BHA components or the fish.

The fishing tools should not be run at a highly deviated point in the hole or in the curvature of a directional hole if it can be avoided. In deviated, directional, or oversized holes, any jar and intensifier should be isolated from stiffer sections by a more flexible joint of string. This will protect the tools and other string components from excessive bending loads which can result in premature fatigue failure.

It is recommended that NOT LESS than two (2) joints of drill collars NOR LESS than four (4) joints of heavy weight drill pipe be run between the Super II Fishing Jar and the Intensifier or between the jar and the working string. However, if this is absolutely necessary or desired, care should be taken to avoid excessively high impact loads. Also, the Bowen® Fishing Jar Placement Program should be run, especially in these cases.

Fishing, Milling, and Washover

For fishing operations the Bowen® Super II Fishing Jar, as with any jar, should be placed immediately below a string of concentrated mass (drill collars, heavy weight drill pipe, etc.). It should also be located as close to the stuck point as possible for maximum effectiveness. The Super II Jar is particularly well suited for milling and was hover operations due to the rugged, integral top sub construction.

If it is not possible to run the Bowen® Fishing Jar Placement Program, the approximate "Drill Collar Weight Range" shown in "Chart A -Specifications" on page 18 may be used as a guide. See "Important Information" starting on page 3.

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Formation Testing

The Bowen® Super II Fishing Jar is excellent for use in drill stem testing. The jar will not interfere with the testing equipment and does not cause the test to be lost when jarring becomes necessary. The packing used in the Bowen® Super II Fishing Jar is designed to withstand much higher pressure than would normally be encountered in drill stem testing.

When an open-hole or hook-wall packer sticks enough to require jarring, one or two moderate jarring blows is usually sufficient to loosen the packer. The hookwall packer sticks less often than the open-hole type but requires higher jarring forces to free it.

In drill stem testing, if it is not possible to run the Bowen® Fishing Jar Placement Program, three to fifteen drill collars are usually installed immediately above the jar, depending on conditions of operation.

For additional information and recommendations, see "Important Information" starting on page 3.

Coring

Breaking a core without a jar in the string can require considerable pull load on the drill pipe. When a jar is used, only a comparatively moderate pull is usually required to deliver an impact sufficient to break the core. The Super II Fishing Jar should be run directly above a diamond core head assembly.

If it is not possible to run the Bowen® Fishing Jar Placement Program, three to fifteen drill collars are usually installed immediately above the jar. See "Important Information" starting on page 3.

Operation

Preparation

Before use, carefully examine the Bowen® Super II Fishing Jar to ensure it has been properly assembled and is filled with Bowen® Jar Lube. The tool should be tested in a Bowen® Jar Tester or equivalent, to ensure proper performance. Check all threaded connections to ensure they are made-up per "Chart C - Recommended Tightening Torques " on page 18. Place tongs at least four (4) inches from the jar's straight threads.

Rig Up

WARNING: The Super II Jar is in the cocked (closed) position when it is shipped to the rig. When closed, the jar should NOT be left suspended from the elevators, especially with any appreciable weight suspended below it. From this position, the jar may open and drop the length of its stroke which can cause bodily harm or damage.

The Super II Jar should be carefully opened and assembled in the string below the concentrated mass (drill collars, heavy weight drill pipe, etc.). It is recommended that a Bowen® Intensifier be run with the Super II Fishing Jar for maximum effectiveness.

See sections under "Applications" on pages 3 and 4. See Intensifier Instruction Manual for more information on Bowen® Intensifiers.

Jarring

WARNING: At no time during the pull cycle of the jar should the "Field Load: Maximum Pull Load (lbs)" be exceeded. See "Chart B - Strength and Test Data" on page 18.

It is recommended that a low initial load (30 to 50% of "Maximum Pull Load") be applied and the load increased on the following strokes if needed. This allows the operator to see and feel the effects of the jarring action.

If an intensifier is being used, the minimum applied pull load should be per the "Minimum Pull Required (Above Weight of String and Collars)to Obtain Effective Blow (lbs)" per "Strength Data" chart in the Bowen® Intensifier Manual.

The velocity and relative impact load of the jarring blow is controlled by the amount of stretch taken in the running string (pull load) and the weight of the drill collars installed above the jar.

Jarring Procedure:

1. To strike the initial blow, set the string down to ensure the jar is closed. Then, raise the string, applying the desired pull load at the jar. (See "Warning" at the beginning of this section.)
2. Set the brake and wait for the jar to strike. The first blow may take a few seconds to several minutes, depending on such variables as depth of operation, amount of stretch in the string (pull load), use of intensifier, downhole temperature, and hole condition.
3. Close the jar and repeat. After jarring, it is only necessary to close the jar before applying pull load to strike the next blow. Each blow may be struck at any desired pull load at the jar within the previously determined limits. Do not exceed the previously determined safe load limits, based on the earlier fishing job analysis and the "Field Load: Maximum Pull Load (lbs)" per "Chart B -Strength and Test Data" on page 18 for the jar size being used.

   See sections under "Applications" starting on pages 3 and 4.

Troubleshooting

Operation difficulties are sometimes encountered by operators, some of which are listed below along with corrective procedures.

A. If unable to strike the initial blow:
   1. Make sure the jar is fully closed.
      a. Lower the string further to apply more closing force before applying pull load.

      b. If the pumps are running, the pump pressure will be exerting an opening force on the jar. To determine the additional closing force required to overcome the pump opening force, multiply the pump pressure at the jar by the Pump Opening Area shown in "Chart A - Specification" on page 18. Apply the additional required closing force.

      c. If enough additional weight can not be applied to the jar to fully close it during the jar's closing cycle, it may be necessary to temporally reduce the pump pressure to allow the jar to fully close.
   2. Pull up to the desired stretch in the string and set the brake. Hold this position until the jar strikes a blow.

   3. If still unable to strike the initial blow, increase tension in the running string if possible, but do not exceed the previously determined safe load nor the "Field Load: Maximum Pull Load (lbs)" for the jar per "Chart B - Strength and Test Data" on page 18.

B. If unable to hit subsequent blows:
   1. The corrective procedure is the same as listed under A., above.

C. If blows are not as high as desired:
   1. Insure that the jar is fully closed before applying pull. See A., above.

2. Pull the running string up faster, but do not exceed the previously determined safe loads nor the "Field Load: Maximum Pull Load (lbs)" for the jar. Refer to "Chart B - Strength and Test Data" on page 18.

3. Run the Bowen® Fishing Jar Placement Program and vary the fishing string or fish configuration, if possible, to obtain better results. i.e., add an Intensifier, use more or fewer drill collars or heavy weight drill pipe, or if fishing for drill pipe, try using drill pipe for weight between the jar and intensifier.

Rig Down and Floor Maintenance

The Super II Fishing Jar will usually be brought out of the hole in the open position.

WARNING: Once closed, the jar should NOT be left suspended from the elevators, especially with any appreciable weight suspended below it. From this position, the jar may open and drop the length of its stroke which can cause bodily harm or damage.

To prevent corrosion, the Mandrel seal surface (see Figure 8 on page 15) should be thoroughly cleaned and well greased prior to closing the jar for storage until its next use or shipping for service. Flush all mud and corrosive fluids, including saltwater, from the bore, especially inside the Washpipe Body and around the Washpipe up to the Floater. Also flush the ports on the OD of the Spline Body and the cavity inside the ports. Allow all fluid to drain from these

areas. Clean the tool joint box and pin connections and coat with Bowen® Itcolube or other high quality anti-gall grease to prevent corrosion and facilitate tool make-up in next use.

After moderate use on a short job, the Super II Fishing Jar is usually kept at the rig site where it requires only minor maintenance, listed above, which in most cases can be done on the rig floor.

The Super II Fishing Jar should be stored with the Mandrel end up or horizontally on a suitable rack.

Dressing Area Maintenance

After prolonged or hard use, the Bowen® Super II Fishing Jar should be taken to an adequate dressing area as soon as possible for complete maintenance, including:

1. Disassembly
2. Inspection
3. Assembly
4. Filling with Bowen® Jar Lube
5. Testing

CAUTION: The Bowen® Super II Fishing Jar is a hydraulic jar; therefore, close tolerances and smooth finishes are mandatory. Also, the jar must be kept free of all contamination (dirt, sand, metal, etc.). Contamination left on parts can cause damage or malfunction.

Equipment

The following tools, equipment, and parts should be obtained before starting Dressing Area Maintenance:

1. Bowen® Vise and Tongs, or equivalent, suitable for jar size.

2. Overhead Crane, with 2,000 lb. minimum capacity.

3. Pipe Wrenches, suitable for outside diameters (ODs) of interior jar parts.

4. Chain wrenches, suitable for spinning on/off threaded parts as shown in Figure 2 at right.

5. Bowen® V-Belt Pulley Assembly No. 92070, or equivalent, which can be suspended from the crane to support threaded parts while spinning on/off. See Figure 2 below.

6. Nylon Strap of suitable strength and condition for safely lifting and handling parts with overhead crane.

7. Bowen® Jar Tester, or equivalent, suitable for jar size.

Figure 2
V-Belt Pulley Assembly and Chain Wrench

8. Bowen® Super II Fishing Jar Service Kit, as shown on page 23. See "Accessories - Required and Recommended" on page 22 for part numbers.

9. Packing Assembly Sleeve for specific jar size seen on Figure 6 on page 13, and "Accessories - Required and Recommended" on page 22 for part numbers.

10. Floater Positioning Tool for specific jar size. See Figure 7 on page 14, and "Accessories - Required and Recommended" on page 22 for part numbers.

11. Spare Parts for specific jar size. See "Recommended Spares" on bottom of page 22.

Notes

Throughout the Dressing Area Maintenance Procedures, the following notes should be helpful:

- "Replacement Parts" listed beginning on pages 19 through 22 list all major components in the order in which they are assembled, with subassembly parts (seals, etc.) listed below each major component. Item numbers are assigned to each part name for use in this manual only.

- Item numbers in parentheses indicate the location of parts as shown in the diagrams on page 9, 10, and 11. They are also used throughout the text in this manual.

- Each Item number corresponds to a Part Name and specific Part Number in the chart accompanying diagrams on pages 9, 10, and 11 and in the "Replacements Parts" list on pages 19 through 22.

- Part Numbers are specific to jar OD size.

Example:

Item No.	Part Name	Part No. (3-1/8")	Part No. (4-3/4")
(1)	Spline Body	153284	152799

- "Top" and "bottom" refer to the ends of the jar as it is run in a fishing string; i.e., the Mandrel (11) is on the top end, and the Washpipe Body (58) is on the bottom end.

- To prevent damage during servicing, do not use vise, tongs, wrenches, or chains on any seal surfaces or on any other smooth surfaces of the internal parts that are not stenciled "Wrench Area."

- When disassembling the Bowen® Super II Fishing Jar, note the direction and location of all Packing, O-Rings, Backup Rings, and Wipers. This will help in reassemble of the jar.

Disassembly

WARNING: Do not remove Fill Plugs (37 and 52) or Washpipe Body (58) first. Internal residual well pressure may exist within the jar and can cause serious damage or injury. Follow the procedure under "Preparation" below to release trapped internal well pressure.

Before proceeding with disassembly, read the "Dressing Area Maintenance" starting on page 6.

Disassembly Procedure

Preparation:

1. Place the Super II Fishing Jar in the jar tester and close the jar if not already closed. Then pull the jar open until it just releases. Do Not stroke the jar fully open. When the jar is in this position, the Cone (42) is in the relief area of the Pressure Body (51). This prevents damage to the Piston Assembly (40) and Pressure Body (51) bore during disassembly.
2. Clamp the jar in the vise on the center of the Connector Body (20). Position a pan under the Pressure Body (51) to catch Jar Lube.
3. Place the tongs on the Pressure Body (51), centered between the Fill Plug (52) and the Connector Body (20) end of the Pressure Body.
4. Release trapped internal well pressure by breaking the connection (right-hand threads) between the Pressure Body and Connector Body.
5. Use chain wrench and V-Belt Pulley Assembly (See Figure 2 on page 6) to carefully unscrew the Pressure Body (51) and allow any residual well pressure to escape. Then let the Jar Lube drain into the pan. Do not reuse this Jar Lube.

Remove Washpipe Body (58):

1. Reposition the jar in the vise and clamp onto the Pressure Body (51) with the vise centered between the Fill Plug (52) and the lower end of the Pressure Body.
2. Use tongs to break the connection (right hand threads) between the Washpipe Body (58) and the Pressure Body (51). Use a chain wrench and V-Belt Pulley Assembly to unscrew and remove the Washpipe Body.

Remove Pressure Body (51) and Floater (54):

1. Using a chain wrench and V-Belt Pulley Assembly, unscrew and remove the Pressure Body.
2. On 3-1/8" OD Jar only, remove Packing Male Adapter (30), Packing Pressure Ring Set (29), and Packing Female Adapter (28) from bore of Pressure Body if they remained in the Pressure Body.
3. Remove the Floater (54), which usually remains inside the Pressure Body. Reach inside and pull it out; or if necessary, use a long board to push it out of the bottom from the upper end. Be careful not to damage the Pressure Body bore or Floater. If the Floater is on the Washpipe (48), simply pull it off.

Remove Washpipe (48) and Piston Assembly (40):

CAUTION: On 4-3/4" OD x 2-1/4" ID Jar, remove the Cone Retainer (43) before disassembling the Washpipe (48). To remove the Cone Retainer, use a suitable tool to spread its longitudinal split just enough to slide it off. Do not open the split too wide or the Cone Retainer will be damaged.

1. Break the Washpipe (48) to Mandrel Extension (13) connection (right-hand threads) by using a pipe wrench on the undercut wrench area of the upper (large) end of the Washpipe, stenciled "Wrench Here." Make sure wrench only contacts the area marked "Wrench Here." Be careful not to damage the long seal surface. Use a chain wrench and the V-Belt Pulley Assembly to unscrew and remove the Washpipe.
2. Remove the Seal Body (44), Cone (42) and Bypass Body (41). These parts simply slide off the lower end of the Mandrel Extension (13). Handle these critical parts with care! Wrap them in cloth for protection.
3. On 3-1/8" OD Jars only, which are equipped with a single Connector Body Packing Set (29), remove this packing set, the Packing Male Adapter (30), and the Packing Female Adapter (28) from the Mandrel Extension.

NOTE: All other Super II Fishing Jar sizes have two Connector Body Packing Sets (32 and 34). These are removed with the Connector Body.

Remove Connector Body (20):

1. Reposition the jar in the vise and clamp onto the center of the Spline Body (1).

2. Use the tongs to break the connection (right-hand threads) between the Connector Body (20) and the Spline Body (1). Use a chain wrench and V-Belt Pulley Assembly to unscrew and remove the Connector Body.

Remove Mandrel (11) and Mandrel Extension (13):

CAUTION: Handle with care! The OD of the Mandrel Extension (13) consists of threads, seal surfaces, and only one wrench area. The OD of the Mandrel (11) consists of threads, spline, and seal surface.

1. Use the tongs to break the connection (right-hand threads) between the Mandrel (11) and Mandrel Extension (13). Make sure the wrench only contacts the Mandrel Extension in the undercut area stenciled "Wrench Here." Use a chain wrench and V-Belt Pulley Assembly to unscrew the Mandrel Extension.

2. While supporting the Mandrel Extension (13) with a nylon strap and the overhead crane, slide the Mandrel Extension toward the lower end of the jar and remove it. Then, supporting the Mandrel with the crane and nylon strap, slide the Mandrel out of the Spline Body toward the upper end of the jar.

Remove Mandrel Body (7):

(Only the 4-3/4" OD Jar has a Mandrel Body.)

CAUTION: The Mandrel Body has left-hand threads.

1. Use the tongs to break the connection (left-hand threads) between the Mandrel Body (7) and the Spline Body (1). Use a chain wrench and V-Belt Pulley Assembly to unscrew and remove the Mandrel Body.

Remove Spline Body (1) and Sub-Assemblies:

1. Remove the Spline Body from the vise.

2. Remove the Fill Plug(s) (52) from the Pressure Body (51), and on the 4-3/4" OD Jar, remove the Fill Plug (37) from the Connector Body (20).

3. Remove all sealing components from all parts using Tools 625 or 626 in "Service Kit" shown on page 23.

CAUTION: Be careful not to damage the seal grooves or other surfaces.

NOTE: Immediately after disassembly, thoroughly clean and inspect all parts according to "Inspection" beginning on page 12.

3-1/8" OD x 1" ID Super II Fishing Jar Diagram

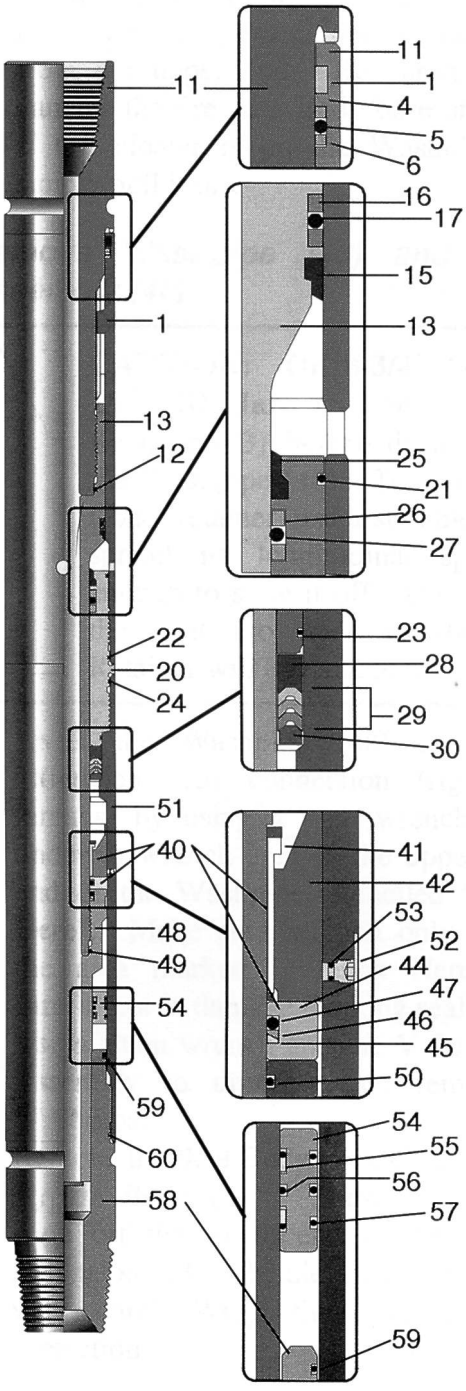


Figure 3
3-1/8" OD x 1" ID Super II Fishing Jar

ItemNo.	PartName	3-1/8"PartNo.
1	Spline Body	153284
4	Wiper	153286
5	ID O-Ring	568334
6	Backup Ring *(2 req'd)*	153285
11	Mandrel (Integral type)	153287
12	OD O-Ring (small)	568221
13	Mandrel Extension	153288
15	Wiper	153290
16	Backup Ring for OD Seal (box end) *(2 req'd)*	153289
17	OD Seal (box end)	568330
20	Connector Body	153291
21	OD O-Ring (small) for Spline Body End	568142
22	OD O-Ring (large) for Spline Body End	568145
23	OD O-Ring (small) for Pressure Body End	568141
24	OD O-Ring (large) for Pressure Body End	568144
25	Wiper	153293
26	Backup Ring *(2 req'd)*	153292
27	ID Seal	568327
28	Packing Female Adapter	148313
29	Packing Pressure Ring Set	153294
30	Packing Male Adapter	148312
40	Piston Assembly	72903
41	Bypass Body	72905
42	Cone	156486
44	Seal Body	72906
45	Non Extrusion Ring for O-Ring	148328
46	Seal Protector Ring for O-Ring	148329
47	O-Ring	568223
48	Washpipe	72908
49	O-Ring (small)	568221
50	O-Ring (large)	568130
51	Pressure Body	72900
52	Fill Plug *(2 req'd)*	617T
53	O-Ring *(2 req'd)*	568005
54	Floater (steel)	151580
55	ID Seal *(2 req'd)*	72910
56	ID O-Ring *(2 req'd)*	568224
57	OD O-Ring *(3 req'd)*	568227
58	Washpipe Body	72913
59	O-Ring (small)	568139
60	O-Ring (large)	568144

Note: Items numbers not shown are not in this assembly.

4-3/4" OD x 2-1/4" ID Super II Fishing Jar Diagram

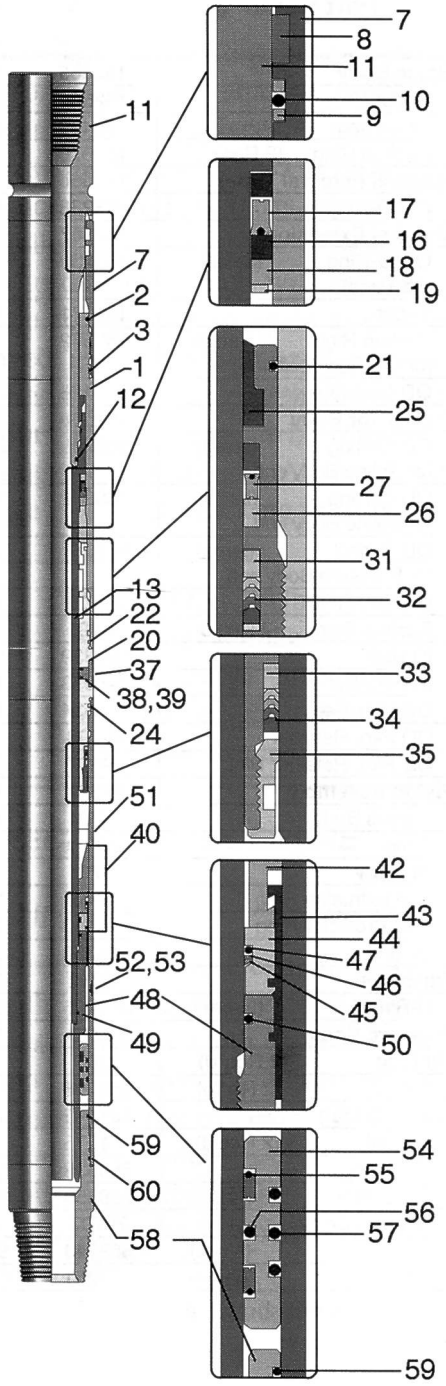


Figure 4
4-3/4" OD x 2-1/4" ID Super II Fishing Jar

Item No.	Part Name	4-3/4" Part No.
1	Spline Body	152799
2	OD O-ring (small)	568241
3	OD O-Ring (large)	565243
7	Mandrel Body	153355
8	Wiper for Mandrel Body	153356
9	Backup Ring *(2 req'd)*	153357
10	ID O-Ring	568343
11	Mandrel (Integral Type)	153354
12	OD O-Ring (small)	568231
13	Mandrel Extension	152797
16	Backup Ring for OD Seal (box end) *(2 req'd)*	152795
17	OD Seal (box end)	152815
18	Seal Retainer for OD Seal (box end)	152794
19	Seal Retainer Ring for OD Seal (box end)	152442
20	Connector Body	152443
21	OD O-Ring (small) for Spline Body End	568239
22	OD O-Ring (large) for Spline Body End	568242
24	OD O-Ring (large) for Pressure Body End	568242
25	Wiper	70536
26	Backup Ring *(2 req'd)*	152796
27	ID Seal	152813
31	ID Packing Female Adapter	152926
32	ID Packing Set	152793
33	OD Packing Female Adapter	102387
34	OD Packing Set	102400
35	OD Packing Retainer	152801
37	Fill Plug *(1 req'd)*	102025
38	Backup Ring	8-010
39	O-Ring	568010
40	Piston Assembly	152817
42	Cone	152317
43	Cone Retainer*	153203
44	Seal Body	152316
45	Non Extrusion Ring	370-11
46	Seal Protector Ring	376-11
47	O-Ring	568233
48	Washpipe	152314
49	O-Ring (small)	568231
50	O-Ring (large)	568233
51	Pressure Body	153183
52	Fill Plug *(1 req'd)*	617T
53	O-Ring	568005
54	Floater (steel)	102301
55	ID Seal *(2 req'd)*	152816
56	ID O-Ring	568336
57	OD O-Ring *(3 req'd)*	568341
58	Washpipe Body	152315
59	O-Ring (small)	568239
60	O Ring (large)	568242

Note: Items numbers not shown are not in this assembly.
** Installed after Washpipe Body.*

6-1/4" OD x 2-1/4" ID and 7-3/4" OD x 3-1/16" ID Super II Fishing Jar Diagram

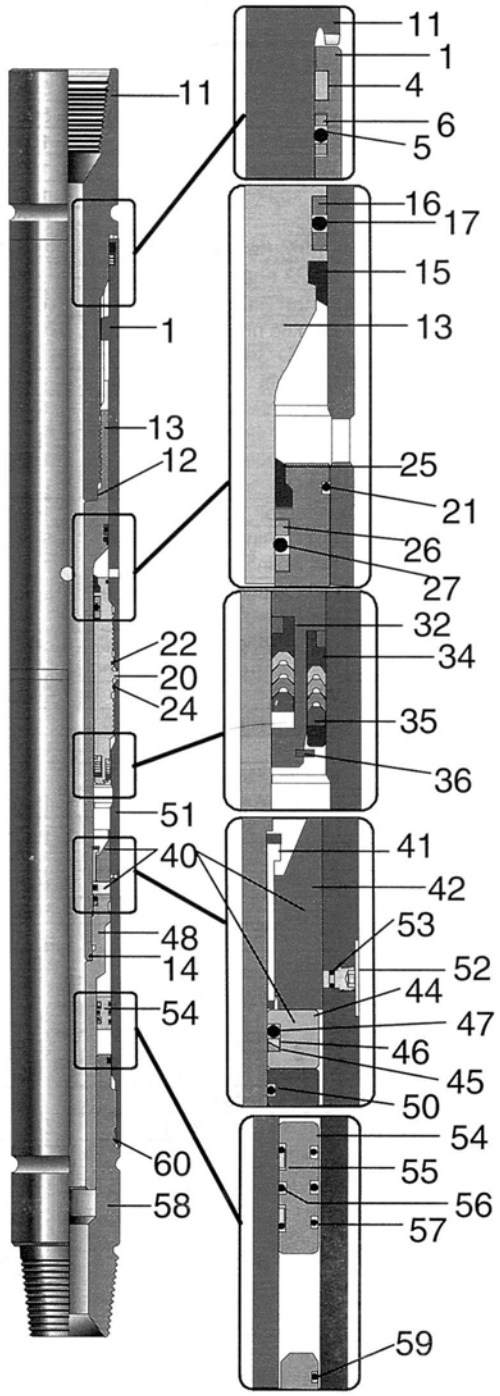


Figure 5
6-1/4" OD x 2-1/4" ID Super II Fishing Jar

Item No.	Part Name	6-1/4" Part No.	7-3/4" Part No.
1	Spline Body	152565	152409
4	Wiper	152569	152413
5	ID O-Ring	568430	568439
6	Backup Ring *(2 req'd)*	152570	154414
11	Mandrel (Integral Type)	152566	152410
12	OD O-Ring	568238	568246
13	Mandrel Extension	152567	152411
14	OD O-Ring (small) (pin end)	568230	568240
15	Wiper	152571	152415
16	Backup Ring for OD Seal (box end) *(2 req'd)*	152572	152416
17	OD Seal (box end)	568426	568435
20	Connector Body	152568	152412
21	OD O-Ring (small) for Spline Body End	568249	568258
22	OD O-Ring (large) for Spline Body End	568252	568260
24	OD O-Ring (large) for Pressure Body End	568251	568260
25	Wiper	79700	72988
26	Backup Ring *(2 req'd)*	79695	72989
27	D Seal	568339	568246
32	ID Packing Set	148633	148643
34	OD Packing Set	148634	148644
35	OD Packing Retainer	79703	72992
36	OD Packing Retainer Ring	79697	78427
40	Piston Assembly	81617	69274
41	Bypass Body	79704	69277
42	Cone	79709	69275
44	Seal Body	79705	69276
45	Non Extrusion Ring	148494	102253
46	Seal Protector Ring	148493	148499
47	O-Ring	568338	568349
48	Washpipe	79712	73058
50	O-Ring (large)	568235	568246
51	Pressure Body	79713	72994
52	Fill Plug *(2 req'd)*	329T	329T
53	O-Ring *(2 req'd)*	568006	568006
54	Floater (steel)	151582	102303
55	ID Seal *(2 req'd)*	151675	151691
56	ID O-Ring	568339	568426
57	OD O-Ring *(3 req'd)*	568350	568434
58	Washpipe Body	79707	73063
59	O-Ring (small)	568243	568257
60	O-Ring (large)	568251	568260

Note: Items numbers not shown are not in this assembly.

Inspection

During inspection of Super II Fishing Jar parts, look for damage to smooth surfaces, sliding surfaces, seal surfaces, threads, spline, grooves, and bores. Types of damage include: pits, nicks, scratches, burrs, abrasions, cracks, and galled or worn areas. Minor damage refers to damage which will not cause further damage to parts or to seals after it has been removed using a small hand grinder or file, followed by polishing with fine emery cloth. Major damage cannot be restored by hand grinding and polishing. All parts with major damage or fatigue cracking must be replaced.

CAUTION: Uncorrected major or minor damage may render parts non-repairable and could interfere with proper jar operation or cause additional damage.

Inspection Procedure

All Parts:
Carefully steam clean all parts or clean with solvent, and wipe them dry with a clean, lint-free cloth. Examine straight box and pin threads, removing any minor damage with a triangular profile grinder or hand file before polishing with emery cloth. Specifically, examine all seal surfaces, smooth surfaces, and the corners, sides, and bottoms of all grooves. Also examine butting faces (15° shoulders) on all jar bodies (Item No's. 7, 20, 51, and 58), as well as mating faces of Mandrel (11), Mandrel Extension (13) and Washpipe (48).

Magnetic particle inspection is strongly recommended for locating fatigue cracks. Parts with cracks MUST NOT be used. Magnetic Particle Inspection for fatigue cracking on:

- pin sections at inside corner of the 15° shoulder
- corners at the bottom of all grooves
- corners at bottom of thread relief
- threads nearest the thread relief
- all locations where there is a cross sectional area change (where a face or beveled surface intersects a cylinder)
- mud port holes in the Spline Body and Fill Plug holes

Pressure Body (51):
Examine the bore of the Pressure Body where the Cone and Floater seal. Remove minor damage using very fine emery cloth. If damage cannot be smoothed out, the bores must be reworked before being put back in to service. Also inspect seal bore and threads in Fill Plug hole(s).

Piston Assembly (40):
Inspect Piston Assembly components, including Cone (42), Seal Body (44) and Bypass Body (41) or Cone Retainer (43). Remove minor damage with extreme care as critical surfaces of these parts are ground and polished. Ensure that mating surfaces of the Cone and Seal Body remain flat and smooth, and that the Cone OD interferes slightly with the bore of the Pressure Body. If they do not, these parts are unusable. In such cases, Bowen® may be able to rework and salvage the part(s).

Mandrel Extension (13):
Use a micrometer or straight edge to inspect the cone area of the Mandrel Extension for necking caused by excessively high pull loads. If necking has occurred, the part is to be replaced. Also, inspect the 90° shoulder on the Mandrel Extension which retains the Bypass Body and Cone. It must be square, smooth, and not have an excessively large bevel at the OD corner.

Knocker Surfaces:
The knocker surface on the Mandrel Extension (13) is the uppermost face of the box end. The mating knocker surface is the shoulder inside the Spline Body (1) at the lower end of the spline on the Connector Body side. Examine knocker surfaces and spline in this area for damage. Remove upset material and sharp corners. Also using magnetic particle inspection methods for crack detection, inspect the inside corner at the intersections of spline with the bores at both ends of the Spline in the Spline Body. If cracks are found, the Spline Body is to be replaced.

Mandrel (11) and Spline Body (1):
Inspect the spline on both the Mandrel and Spline Body, removing any minor damage.

Seals, O-Rings, Packing, and Wipers:
These parts are to be replaced during dressing area maintenance. However, inspect these parts to detect potential problems with the other jar parts due to wear or damage.

Backup Rings, Packing Adapters, Packing Retainers, Seal Retainers, Packing Retainer Rings, and Seal Retainer Rings, Non Extrusion Rings, Seal Protector Rings, Floater, and Fill Plugs:
Inspect and repair all minor damage or replace with new parts.

All Parts:
Thoroughly oil all metal parts with Bowen® Jar Lube (69) to protect from corrosion.

Assembly

Before proceeding with assembly; read "Dressing Area Maintenance" starting on page 6.

Assembly Procedure

Preparation:

Before assembly, make sure all parts are clean and in good condition per "Inspection" on page 12. Coat the mating surfaces of all metal parts with Bowen® Jar Lube (69) before assembly, except where Bowen® Itcolube (68) is specified. It is recommended that the Super II Fishing Jar be redressed with a new Complete Packing Set (65 or 67).

Install O-Rings, Seals, Wipers, Backup Rings, Packing sets (with Adapters, which may be separate), Non Extrusion Rings, and Seal Protector Rings:

1. Coat all parts with Bowen® Jar Lube (69).

2. Install parts in their location and orientation. Refer to Figures 3, 4, or 5 on pages 9, 10, and 11.

NOTE: The 3-1/8" OD Jar has a single Connector Body Packing Set. It will be installed later in the procedure.

Prepare Spline Body (1):

1. Center and secure the Spline Body in the vise.

2. Coat the spline generously with Bowen® Itcolube (68).

Install Mandrel Body (7) to Spline Body (1):

(4-3/4" OD Size only)

1. Coat the threads, including surfaces on both ends of the threads, and the 15° shoulder of Spline Body pin thread using Bowen® Itcolube (68).

2. Use a chain wrench and V-Belt Pulley Assembly as shown in Figure 2 on page 6 to screw the Mandrel Body to the Spline Body.

NOTE: This joint has LEFT-HAND threads.

3. Tighten with vise and tongs. Refer to "Chart C - Recommended Tightening Torques" on page 18 for proper makeup torque.

Install Mandrel (11):

1. Coat the Mandrel splines with Bowen® Itcolube (68). On the end with Bowen® straight threads, also coat the threads, the OD surfaces on both ends of the threads, and the end face with Bowen® Itcolube.

2. Using crane and nylon strap, lift Mandrel and insert the lower end through the Spline Body. In the 4-3/4" OD Jar, slide the Mandrel through the Mandrel Body and Spline Body.

Install Mandrel Extension (13) to Mandrel (11):

1. Lightly coat the OD of the box thread with Bowen® Itcolube (68).

2. Use the crane to lift the Mandrel Extension into place and screw onto Mandrel using chain wrench and V-Belt Pulley Assembly as shown in Figure 2 on page 6. Placing wrench on area stenciled "Wrench Here."

3. Tighten connection with vise and tongs according to "Chart C - Recommended Tightening Torque" on page 18.

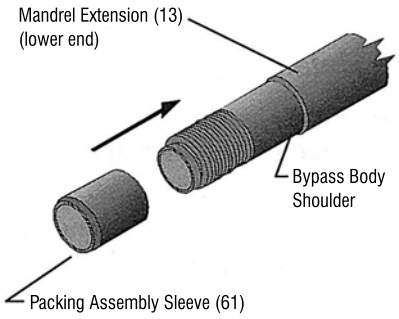


Figure 6
Packing Assembly Sleeve Installation

Prepare Packing Assembly Sleeve (61):

(Not required on 4-3/4" OD Jar)

1. Slide Packing Assembly Sleeve over the lower end of Mandrel Extension (13) until it is against the Bypass Body Shoulder. (See Figure 6 below.)

2. Coat Packing Assembly Sleeve and entire length of Mandrel Extension with Bowen® Jar Lube (69). Do not use Itcolube (68) or grease.

Install Connector Body (20) to Spline Body (1):

1. Coat only the upper threads of the Connector Body with Itcolube (68), including OD surfaces on both ends of the threads, and the 15° shoulder.

2. Using crane to lift the Connector Body, slide it over the Mandrel Extension.

3. Remove the Packing Assembly Sleeve (see Figure 6 below) from Mandrel Extension (13).

4. Use chain wrench and V-Belt Pulley Assembly to screw Connector Body to Spline Body.

5. Tighten connection with vise and tong according to "Chart C - Recommended Tightening Torques" on page 18.

Reposition Jar in Vise:

1. Reposition the jar with the Connector Body centered in the vise and clamp securely.

Install Connector Body Packing:

(3-1/8" OD Jar only)

Refer to Figure 3 on page 19 for proper orientation and location.

1. Install the Female Adapter (28), Pressure Ring Set (29), and Male Adapter (30), in that order, over the Mandrel Extension.

2. Slide up against the Connector Body (20).

Install Piston Assembly (40) on Mandrel Extension (13):
(All Except 4-3/4" OD Jar)
1. The Piston Assembly consists of the Bypass Body (41), Cone (42), and Seal Body (44) with the Non Extrusion Ring (45), Seal Protector Ring (46), and O-Ring (47) installed earlier.

2. Thoroughly clean the Piston Assembly and install it onto the Mandrel Extension per Figures 3, 4, or 5 on pages 9, 10, or 11.

Install Piston Assembly (40) on Mandrel Extension (13):
(On 4-3/4" OD Jar)
1. The Piston Assembly consists of the Cone (42), Cone Retainer (43), and Seal Body with Non Extrusion Ring (45), Seal Protector Ring (46), and O-Ring (47) installed earlier.

2. Thoroughly clean the Piston Assembly and install the Cone and Seal Body per Figure 4 on page 10.

3. The Cone Retainer (43) will be installed later.

Install Washpipe (48) to Mandrel Extension (13):
1. Coat threads, and only the OD surface and face at the very end of Mandrel Extension using Bowen® Itcolube (68), taking care not to lube above thread relief.

2. Remove excess Itcolube from threads.

3. Using chain wrench on undercut wrench area of upper (large) end of Washpipe, stenciled "Wrench Here" and the V-Belt Pulley Assembly, screw Washpipe onto Mandrel Extension. Again, wipe off any excess Itcolube and wash with solvent to prevent contamination of fluid reservoir with Itcolube.

4. Tighten connection using pipe wrench on wrench area. Remove any burrs and filings left on wrench area.

CAUTION: Washpipe to Mandrel Extension connection is not torqued as high as other connections. Refer to "Chart C - Recommended Tightening Torques" on page 18.

Install Cone Retainer (43):
(4-3/4" OD Jar only)
1. To install the Cone Retainer, use a suitable tool to spread the longitudinal split just enough to slide it over the end of the Washpipe (48), Seal Body (44), and lower end of the Cone (42).

CAUTION: DO NOT open the split too wide or the Cone Retainer will be damaged. Be sure the three rings on the ID of the Cone Retainer fully engage the three grooves on the OD of the Washpipe, Seal Body, and Cone. The Cone should be free to slide a short distance but must be held relatively close to the Seal Body. The Cone Retainer must fit tightly around the parts to function properly; if not, it should be replaced.

Lube Washpipe (48) and Connector Body (20):
1. Coat long seal surface of Washpipe (48) using Bowen® Jar Lube (69).

2. Coat Connector Body Packing (34) on 4-3/4", 6-1/4", and 7-3/4" OD Jars OR Connector Body Packing (29) on 3-1/8" OD Jar using Bowen® Jar Lube.

3. On lower end of Connector Body coat threads, including OD surfaces on both sides of threads, and 15° shoulder with Bowen® Itcolube (68). Take care not to get Itcolube on the Packing or on the fluid chamber end of the Packing.

Install Pressure Body (51) to Connector Body (20):
1. Coat bore of Pressure Body using Bowen® Jar Lube (69).

2. Using crane, lift Pressure Body and slide it over Washpipe (48), taking care not to damage Connector Body Packing Set (29 or 34).

3. Use chain wrench and V-Belt Pulley Assembly to screw Pressure Body onto Connector Body.

4. Place tongs between Fill Plug hole(s) (52) and upper end of Pressure Body and tighten connection (right hand threads) according to "Chart C - Recommended Tightening Torques" on page 18.

Install Floater (54):
(See Figure 7 below.)
1. Before installing the Floater, pull the jar to the fully open position (fully extended), if not already in this position.

2. Coat ID and OD of Floater, seals installed earlier, with Bowen® Jar Lube (69).

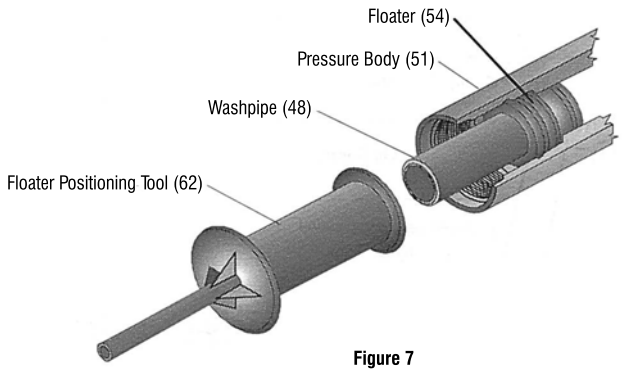


Figure 7
Floater Positioning Tool

3. Slide Floater over Washpipe (48).

4. Push Floater with Floater Positioning Tool (62) until tool contacts end of Pressure Body.

NOTE: If proper size Positioning Tool is unavailable, refer to Floater Position in "Chart A - Specifications" on page 18. To function properly, Floater must be positioned with sufficient space to move both up and down.

Install Washpipe Body (58) to Pressure Body (51):

1. Reposition jar in vise, with vise centered between Pressure Body Fill Plug hole(s) and lower end of Pressure Body.

2. Coat Washpipe Body straight threads, including OD surfaces at both ends of threads, and 15° shoulder using Bowen® Itcolube (68).

3. Use crane to lift Washpipe Body and slide it over Washpipe (48).

4. Use chain wrench and V-Belt Pulley Assembly to screw Washpipe Body onto Pressure Body.

5. Tighten connection with vise and tongs according to "Chart C - Recommended Tightening Torques" on page 18. Install Tool Joint Pin Thread Protection Install jar tester sub on tool joint pin connection for protection while handling and filling the jar.

NOTE: Do not close the Super II Jar until it is filled with Bowen® Jar Lube (69).

Filling the Super II Fishing Jar

NOTE: After assembly, all Super II Fishing Jar must remain open, fully extended, with Mandrel (11) seal surface exposed until jar is filled, see Figures 8, 9, and 10 on pages 15 and 16. If the Mandrel moves, the Floater may shift from its proper position, requiring removal of Washpipe Body to check and correct Floater position.

The Volume Pump shown on page 23 is to be filled with clean Bowen® Jar Lube (69).

Filling the 4-3/4" OD Super II Fishing Jar
(See page 23 for other sizes of jars.)

1. Position the jar with the Connector Body Fill Plug (37) hole at the top of the jar's OD. This will allow maximum air removal during filling. See Figure 8 below.

2. Tilt the jar at least 10° from horizontal with the Washpipe Body (58) end lower than the Mandrel (11) end. See Figure 8 below.

NOTE: This can be done by using the crane to position the jar in the floor vise. Center the vise on the Spline Body (1). By leaving the vise loosened slightly, the jar can be lowered to the required angle for filling.

3. Attach the Volume Pump Oil Supply Hose to the Pressure Body Fill Plug (52) hole using the Assembled Adapter and Male Coupler. This Fill Plug hole may be located anywhere around the OD, but is near the center of the length of the Pressure Body (51), see Figure 8 below. Attach the Volume Pump Oil Exhaust Hose to the Connector Body Fill Plug (37) hole using the assembled adapter and male coupler. Required hardware is included in Service Kit (63), shown on page 22.

4. Operate Volume Pump at moderate speed until a bubble-free flow of Bowen® Jar Lube comes through the clear Oil Exhaust Hose.

5. Remove Oil Exhaust Hose and Coupler with Adapter from Connector Body (20). Check Fill Plug hole for fluid; if not full, very slowly pump in additional Jar Lube until the last of the air is removed. Remove Oil Supply Hose, but leave this Coupler and Adapter in the Pressure Body. This will prevent Jar Lube from draining from the jar back into Volume Pump. The Male Coupler has a check valve that will prevent Jar Lube from leaking out when the hose is disconnected.

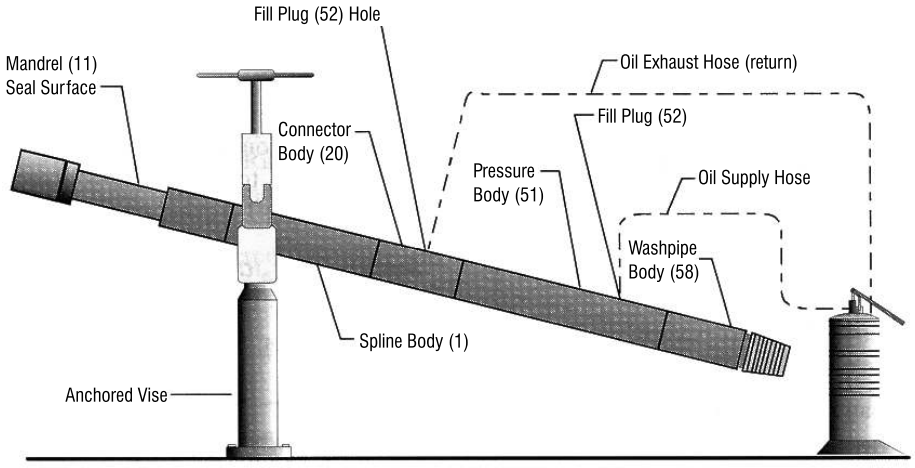


Figure 8
Position of 4-3/4" OD Super II Fishing Jar During Filling Operation

6. Install Fill Plug (37), with Fill Plug ORing 38) in place, into Connector Body (20) and tighten securely.

7. Raise lowered end of jar until it is horizontal. Rotate jar until Pressure Body Fill Plug (52) hole is at the top of jar's OD. Remove Coupler with Adapter.

8. Install Fill Plug (52), with Fill Plug O-Ring (53) in place, into Pressure Body (51) and tighten securely.

9. The 4-3/4" OD Super II Fishing Jar is now ready for testing.

Filling the 3-1/8", 6-1/4", and 7-3/4" OD Super II Fishing Jars:
(4-3/4" OD Jar is at the beginning of section "Filling the Super II Fishing Jar" on page 15.)

1. Position the jar with one of the Pressure Body Fill Plug (52) holes at the top of the jar's OD. This will allow maximum air removal during filling. See Figure 9 at right.

2. Tilt the jar at least 10° from horizontal with the Mandrel (11) end lower than the Washpipe Body (58) end. See Figure 9 at right.

NOTE: This can be done by using the crane to position the jar in the floor vise with the vise between the Pressure Body Fill Plugs (52) holes and the Connector Body (20). By leaving the vise loosened slightly, the jar can be lowered to the required angle for filling.

3. Attach the Volume Pump Oil Supply Hose to the Pressure Body Fill Plug (52) hole on the underside of the jar using the assembled Adapter and Male Coupler. Both Fill Plug holes are located near the center of Pressure Body (51) at 180° from one another. See Figure 9 at right. Attach the Volume Pump Oil Exhaust Hose to the top Fill Plug hole using the assembled adapter and Male Coupler. Required hardware is included in Service Kit (63), shown on page 23.

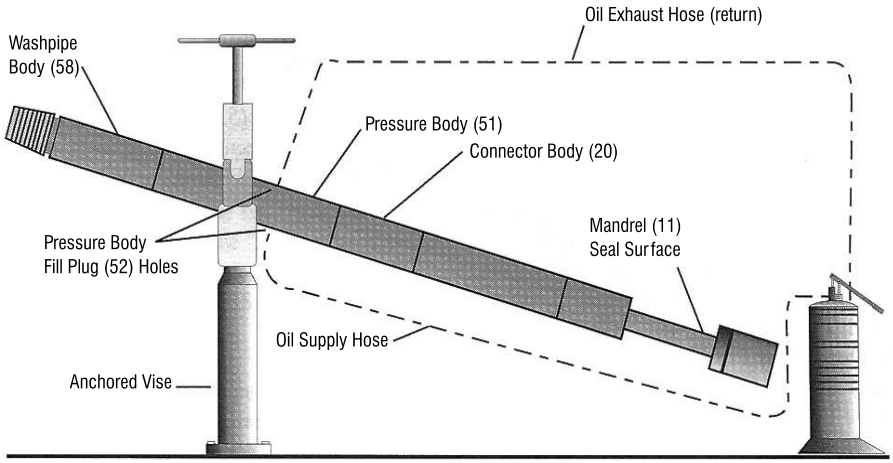


Figure 9
Initial Position of Super II Fishing Jar During Filling Operation

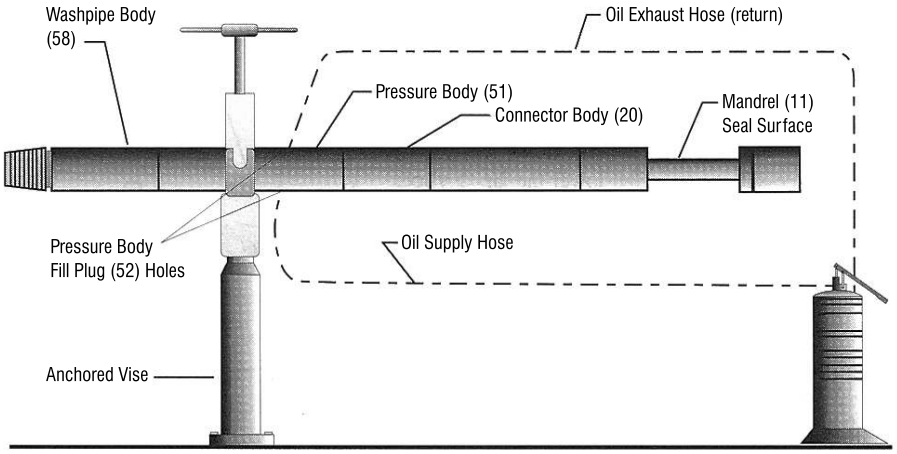


Figure 10
Final Position of Super II Fishing Jar During Filling Operation

4. Operate hand pump at moderate speed until a bubble-free flow of Bowen® Jar Lube comes through the clean Oil Exhaust Hose.

5. Slowly raise the jar to the horizontal position. Continue to fill the jar allowing air to escape as the jar is gradually raised to horizontal. See Figure 10 above. When the jar is horizontal and no more air is bubbling in the clear Exhaust Hose, it may be necessary to raise and lower the jar slightly above and below horizontal while pumping slowly to remove the last of the air.

6. Remove the Oil Exhaust Hose and Coupler with Adapter from the top Fill Plug hole. Check the Fill Plug hole for fluid; if not full, very slowly pump in additional Jar Lube until the air is removed. With the jar horizontal, remove the Oil Supply Hose from the bottom Fill Plug hole, but, leave this Coupler and Adapter in the Pressure Body. This will prevent Jar Lube from draining from the jar back into the Volume Pump. The Male Coupler has a check valve that will prevent Jar Lube from leaking out when the hose is disconnected.

7. Install Fill Plug (52), with installed Fill Plug O-Ring (53), into top Fill Plug hole and tighten securely.

8. Keep the jar horizontal and rotate jar until the other Fill Plug hole is at the top of jar's OD. Remove Coupler with Adapter.

9. Install Fill Plug (52), with installed Fill Plug O-Ring (53), into Pressure Body (51) and tighten securely.

10. The Super II Fishing Jar is now ready for testing.

Testing the Super II Fishing Jar

After the Super II Fishing Jar has been completely assembled and filled with Bowen® Jar Lube (69), it is to be tested in a Bowen® Jar Tester (or equivalent) to ensure that it functions properly. (See Figure 11 below.)

1. Screw jar tester subs on jar.

2. Using crane, place jar in jar tester.

3. Reduce the jar tester set load to zero.

4. Applying pull load to the fully open jar and adjust the pull load to the "Jar Tester: Low Test Pull Load (lbs)" for jar size being tested, see "Chart B - Strength and Test Data" on page 18.

5. Close the jar.

6. Activate jar tester in the pull direction. The jar should pull up to the set pull load, with only minor adjustment to pull load. Maintain that load until it reaches the release point. It may take a few minutes to pull through its stroke. When the jar reaches the release point, the Mandrel should pull easily and pull load should be lower. Pull jar until it is completely open to ensure it moves smoothly through the free stroke. Repeat Low Pull test to ensure uniform action.

NOTE: If jar does not pull through, increase Low Pull Load setting by 2,000 lbs. and repeat test. If the jar still does not pull through, the jar is malfunctioning. The problem must be determined and corrected, and the jar tested again before continuing. Contaminated Jar Lube and/or plugged metering grooves on the bottom of the Cone (42) may be possible causes of malfunction. Also, refer to "Inspection" on pages 12 for additional information.

7. Applying pull load to the fully open jar and adjust the pull load to the "Jar Tester: Standard Test Pull Load (lbs.)" for jar size being tested, see "Chart B - Strength and Test Data" on page 18.

8. Close the jar.

9. Activate jar tester in the pull direction. The jar should pull up to the set pull load and maintain that load until it reaches the release point. Minor adjustment to tester pull load may be necessary, but do not over pull the jar. The jar should take from fifteen to Forty-five seconds to pull through its pull stroke. When the jar, reaches the release point, the Mandrel should pull easily and the pull load should be considerably lower. Pull jar until it is completely open to ensure it moves smoothly through the free stroke. Repeat this test six to eight times to insure proper operation.

NOTE: If the jar does not pull at least up to "Jar Tester: Standard Test Pull Load" there is a malfunction. The problem must be determined and corrected, and the jar tested again before use. Possible causes of malfunction include: Jar not completely filled with jar lube, wrong or diluted jar lube was used, damage exists on various jar parts or seal assemblies, or jar tester is not functioning properly. Also refer to "Inspection" on page 12 for additional information.

10. Close the jar and remove it from jar tester. Remove jar tester subs, and install tool joint thread protectors. The Super II Fishing Jar is now ready for use.

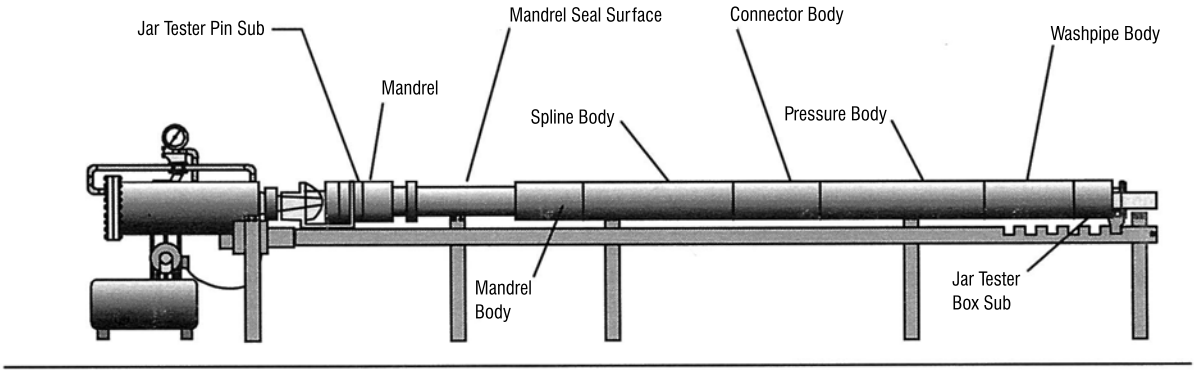


Figure 11
Jar Tester with Jar

Chart A — Bowen® Super II Fishing Jar Specifications

Outside Diameter (OD)	(inches)	3-1/8	4-3/4	6-1/4	7-3/4
Inside Diameter (ID)	(inches)	1	2-1/4	2-1/4	3-1/16
Connection		2-3/8 API Reg.	3-1/2 IF	4-1/2 IF	6-5/8 API Reg.
Assembly Number		153283	152790	152564	152408
Length (Closed Position)	(feet - inches)	9 - 10-3/8	12 - 6-7/8	12 - 10-5/16	13 - 2
Stroke	(inches)	11-3/4	12	12	12
Pump Open Area	(square inches)	2.4	6.5	8.3	16.8
		MEASURED DISTANCE FROM FLOATER FACE TO END OF PRESSURE BODY			
FLOATER POSITION					
STANDARD TEMPERATURE	(inches)	7-3/8	9-1/16	8-11/16	8-7/16
HIGH TEMPERATURE	(inches)	10	12-1/2	12-1/4	—
DRILL COLLAR WEIGHT RANGE *(See Note 7)*	(lbs)	2,100 to 3,600	440 to 7,500	8,100 to 13,600	12,100 to 20,500

Chart B — Strength and Test Data

JAR TESTER LOW TEST PULL LOAD *(See Note 1)*	(min/max lbs)	9,000 / 12,000	14,000 / 20,000	16,000 / 25,000	16,000 / 20,000
JAR TESTER STANDARD TEST PULL LOAD *(See Note 1)*	(lbs)	30,000	50,000	100,000	110,000
FIELD LOAD: MAX. PULL LOAD (During Pull Stroke) *(See Notes 2, 3, and 4)*	(lbs)	59,000	100,000	200,000	265,000
LIFT LOAD: TENSILE AT YIELD (Jar Fully Extended) *(See Notes 2 and 4)*	(lbs)	257,000	484,000	900,000	1.58 million
TORQUE AT YIELD *(See Notes 2, 4, and 5)*	(ft-lbs)	5,630	16,700	36,300	76,000

Chart C — Recommended Tightening Torques (ft-lbs) *(See Note 6)*

MANDREL EXTENSION TO MANDREL	1,000	1,200	1,900	2,200
WASHPIPE TO MANDREL EXTENSION	500	600	900	1,200
MANDREL BODY TO SPLINE BODY (LEFTHAND THREADS)	—	6,850	—	—
CONNECTOR BODY TO SPLINE BODY	2,830	8,350	18,150	38,040
PRESSURE BODY TO CONNECTOR BODY	3,560	9,280	21,300	39,450
WASHPIPE BODY TO PRESSURE BODY	3,330	9,280	21,300	39,450

NOTES:

1) *If jar does not test at Low and Standard Pull Loads shown, disassemble, inspect and repair tool.*

2) *All strengths listed are calculated theoretical yield points and are accurate within 20%. The strength values shown are basedon only one(1) load type being applied at a time; this is consistent with API methods for their published strength values for drill string components. When two (2) or more load types (pull, lift, torque, rotation and/or bending) are applied at the same time, the stresses on the tool are increased and the listed load ratings are reduced substantially. This is particularly true in milling, was hover or drilling operations; in deviated or directional holes; and in the neutral zone, where combining loads (stress) can also lead to fatigue failure. The need for operating under such conditions is acknowledged. This is not intended to advise against such operations, but merely to caution the operator of possible risks when operating in these conditions. Rotation and bending together can lead to fatigue failure. As with all oil field equipment, a safety factor should be applied with running the tools to avoid damage.*

3) *Loads indicated are Maximum Recommended Pull Loads during the pull stroke of the jars. Pulling above the value show can damage the jar. The Bowen® Jar Placement Program should also be run to avoid excessively high impact loads.*

4) *The values shown do not cover API tool joints or other downhole connection strengths since various connections may be used on either end of the tools. Users should be guided by API or other published specifications covering downhole connections for the connection strengths.*

5) *Torque at Yield is the value that will cause yield of the material in one (1) or more parts of a tool. It may or may not refer to yielding of a threaded connection within the tool, but will always refer to the weakest torsional components within the tool.*

6) *The make up torques are the maximum recommended make up torques for each connection. They are set at 50% of the calculated theoretical yield torque. Tightening torque values were calculated assuming Itcolube or similar anti-galling grease with low coefficient of friction being applied to all threads and butting shoulders of the connections. Tightening Torque values are in ft-lbs. Multiply chart value by 0.1382 to obtain Kg-m.*

7) *These weight values are provided as a guideline to the weight of drill collars to be used, and do not necessarily constitute the optimum weight for each hole condition which may be encountered. It is recommended that the Bowen® Fishing Jar Placement Program be used.*

Replacement Parts - Bowen® Super II Fishing Jars

	Outside Diameter (Inches)		3-1/8	4-3/4	6-1/4	7-3/4
	Inside Diameter (Inches)		1	2-1/4	2-1/4	3-1/16
	Connection		2-3/8 Reg	3-1/2 If	4-1/2 If	6-5/8 Reg
	Complete Assembly	Part No.	153283	152790	152564	152408
		Weight	≡	≡	≡	≡

Replacement Parts

Item #	Part Name		Part Number			
1	**Spline Body**	Part No.	153284	152799	152565	152409
		Weight	≡	≡	≡	≡
2	OD O-ring (Small)	Part No.	≡	568241	≡	≡
	For Spline Body	Weight	≡	≡	≡	≡
3	OD O-ring (Large)	Part No.	≡	568243	≡	≡
	For Spline Body	Weight	≡	≡	≡	≡
4	Wiper	Part No.	153286	≡	152569	152413
	For Spline Body	Weight	≡	≡	≡	≡
5	ID O-ring	Part No.	568334	≡	568430	568439
	For Spline Body	Weight	≡	≡	≡	≡
6	Back-up Ring	Part No.	153285	≡	152570	152414
	For Spline Body, For ID O-ring	Weight	(2 Req.)	≡	(2 Req.)	(2 Req.)
7	**Mandrel Body**	Part No.	≡	153355	≡	≡
		Weight	≡	≡	≡	≡
8	Wiper	Part No.	≡	153356	≡	≡
	For Mandrel Body	Weight	≡	≡	≡	≡
9	Backup Ring	Part No.	≡	153357	≡	≡
	For ID O-ring, For Mandrel Body	Weight	≡	(2 Req.)	≡	≡
10	ID O-ring	Part No.	≡	568343	≡	≡
	For Mandrel Body	Weight	≡	≡	≡	≡
11	**Mandrel**	Part No.	153287	153354	152566	152410
	(Integral Type)	Weight	≡	≡	≡	≡
	(Std. With J. Box Conn.)					
12	OD O-ring (Small)	Part No.	568221	568231	568238	568246
	For Mandrel	Weight	≡	≡	≡	≡
13	**Mandrel Extension**	Part No.	153288	152797	152567	152411
		Weight	≡	≡	≡	≡
14	OD O-ring (Small) (Pin End)	Part No.	≡	≡	568230	568240
	of Mandrel Extension	Weight	≡	≡	≡	≡
15	Wiper	Part No.	153290	≡	152571	152415
	For Mandrel Extension	Weight	≡	≡	≡	≡
16	Backup Ring	Part No.	153289	152795	152572	152416
	For Od Seal (Box End),	Weight	(2 Req.)	(2 Req.)	(2 Req.)	≡
	of Mandrel Ext.					
17	OD Seal (Box End),	Part No.	568330	152815	568426	568435
	of Mandrel Extension	Weight		≡	≡	

Bowen® Super II Fishing Jars (Continued)

Item #	Description		Part Number			
	Outside Diameter (OD) (Inches)		3-1/8	4-3/4	6-1/4	7-3/4
	Inside Diameter (ID) (Inches)		1	2-1/4	2-1/4	3-1/16
	Complete Assembly	Part No.	153283	152790	152564	152408

Replacement Parts (Continued)

18	Seal Retainer For OD Seal (Box End), Of Mandrel Extension	Part No. Weight	≡ ≡	152794 ≡	≡ ≡	≡ ≡
19	Seal Retainer Ring For OD Seal (Box End) Of Mandrel Extension	Part No. Weight	≡ ≡	152442 ≡	≡ ≡	≡ ≡
20	Connector Body	Part No. Weight	153291	152443	152568	152412
21	OD O-ring (Small) For Spline Body End, Of Conn. Body	Part No. Weight	568142 ≡	568239 ≡	568249 ≡	568258 ≡
22	OD O-ring (Large) For Spline Body End, Of Conn. Body	Part No. Weight	568145 ≡	568242 ≡	568252 ≡	568260 ≡
23	OD O-ring (Small) For Pressure Body End, Of Conn. Body	Part No. Weight	568141 ≡	≡ ≡	≡ ≡	≡ ≡
24	OD O-ring (Large) For Pressure Body End, Of Conn. Body	Part No. Weight	568144 ≡	568242 ≡	568251 ≡	568260
25	Wiper For Conn. Body	Part No. Weight	153293 ≡	70536 ≡	79700 ≡	72988 ≡
26	Backup Ring For ID Seal, For Conn. Body	Part No. Weight	153292 (2 Req)	152796 (2req)	79695 (2 Req)	72989 (2 Req)
27	ID Seal For Conn. Body	Part No. Weight	568327 ≡	152813 ≡	568339 ≡	568246 ≡
28	Packing Female Adapter For Conn. Body	Part No. Weight	148313 ≡	≡ ≡	≡ ≡	≡ ≡
29	Packing Pressure Ring Set For Conn. Body	Part No. Weight	153294 ≡	≡ ≡	≡ ≡	≡ ≡
30	Packing Male Adapter For Conn. Body	Part No. Weight	148312 ≡	≡ ≡	≡ ≡	≡ ≡
31	ID Packing Female Adapter For Conn. Body	Part No. Weight	≡ ≡	152926 ≡	≡ ≡	≡ ≡
32	ID Packing Set For Conn. Body	Part No. Weight	≡ ≡	152793 ≡	148633 ≡	148643 ≡
33	OD Packing Female Adapter For Conn. Body	Part No. Weight	≡ ≡	102387 ≡	≡ ≡	≡ ≡
34	OD Packing Set For Conn. Body	Part No. Weight	≡ ≡	102400 ≡	148634 ≡	148644 ≡
35	OD Packing Retainer For Conn. Body	Part No. Weight	≡ ≡	152801 ≡	79703 ≡	72992 ≡
36	OD Packing Retainer Ring For Conn. Body	Part No. Weight	≡ ≡	≡ ≡	79697 ≡	78427 ≡
37	Fill Plug For Conn. Body (Also See Pressure Body Fill Plug)	Part No. Weight	≡ ≡	102025 (1 Req)	≡ ≡	≡ ≡

Bowen® Super II Fishing Jars (Continued)

Item #	Part Name		Part Number			
	Outside Diameter (Od) (Inches)		3-1/8	4-3/4	6-1/4	7-3/4
	Inside Diameter (ID) (Inches)		1	2-1/4	2-1/4	3-1/16
	Complete Assembly	Part No.	153283	152790	152564	152408

Replacement Parts (Continued)

38	Backup Ring For O-ring	Part No.	≡	8-010	≡	≡
	For Fill Plug, For Conn. Body	Weight	≡	≡	≡	≡
39	O-ring	Part No.	≡	568010	≡	≡
	For Fill Plug, For Conn. Body	Weight	≡	(2 Req)	≡	≡
40	**Piston Assembly** (Cone Type)	Part No.	72903	152817	81617	69274
	Consists Of 6 Of Next 7 Items	Weight	≡	≡	≡	≡
41	Bypass Body	Part No.	72905	≡	79704	69277
		Weight	≡	≡	≡	≡
42	Cone	Part No.	156486	152317	79709	69275
		Weight	≡	≡	≡	≡
43	Cone Retainer	Part No.	≡	153203	≡	≡
	(Note: Installed After Washpipe)	Weight	≡	≡	≡	≡
44	Seal Body	Part No.	72906	152316	79705	69276
		Weight	≡	≡	≡	≡
45	Non-extrusion Ring	Part No.	148328	370-11	148494	102253
	For O-ring, For Seal Body	Weight	≡	≡	≡	≡
46	Seal Protector Ring	Part No.	148329	376-11	148493	148499
	For O-ring, For Seal Body	Weight	≡	≡	≡	≡
47	O-ring	Part No.	568223	568233	568338	568349
	For Seal Body	Weight	≡	≡	≡	≡
48	**Washpipe**	Part No.	72908	152314	79712	73058
		Weight	≡	≡	≡	≡
49	O-ring (Small)	Part No.	568221	568231	≡	≡
	For Washpipe	Weight	≡	≡	≡	≡
50	O-ring (Large)	Part No.	568130	568233	568235	568246
	For Washpipe	Weight	≡	≡	≡	≡
51	**Pressure Body**	Part No.	72900	153183	79713	72994
		Weight	≡	≡	≡	≡
52	Fill Plug (Torx Hd.),	Part No.	617t	617t	329t	329t
	For Pressure Body	Weight	(2 Req)	(1 Req)	(2 Req)	(2 Req)
	(Also See Connector Body Fill Plug)					
53	O-ring	Part No.	568005	568005	568006	568006
	For Fill Plug, For Pressure Body	Weight	(2 Req)	(1 Req)	(2 Req)	(2req)
54	Floater (Metal)	Part No.	151580	102301	151582	102303
		Weight	≡	≡	≡	≡
55	ID Seal	Part No.	72910	152816	151675	151691
	For Floater	Weight	(2 Req)	(2 Req)	(2 Req)	(2 Req)
56	ID O-ring	Part No.	568224	568336	568339	568426
	For Floater	Weight	≡	≡	≡	≡
57	OD O-ring)	Part No.	568227	568341	568350	568434
	For Floater	Weight	(3 Req)	(3 Req)	3 (Req)	(3 Req)

Bowen® Super II Fishing Jars (Continued)

Item #	Part Name		Part Number			
	Outside Diameter (OD) (Inches)		3-1/8	4-3/4	6-1/4	7-3/4
	Inside Diameter (ID) (Inches)		1	2-1/4	2-1/4	3-1/16
	Complete Assembly	Part No.	153283	152790	152564	152408

Replacement Parts (Continued)

58	Washpipe Body*	Part No.	72913	152315	79707	73063
	(Std. With J. Pin Conn.)	Weight	≡	≡	≡	≡
59	O-ring (Small)	Part No.	568139	568239	568248	568257
	For Washpipe Body	Weight				
60	O-ring (Large)	Part No.	568144	568242	568251	568260
	For Washpipe Body	Weight				

Accessories - Required and Recommended

61	Packing Assembly Sleeve	Part No.	74957	≡	79755	70635
	For Mandrel Extension,	Weight	≡	≡	≡	≡
	Required Accessory					
62	Floater Positioning Tool	Part No.	145215	80228	153146	153148
	(Std. Temp.) Recommended Accessory	Weight	≡	≡	≡	≡
63	Service Kit- Assembly	Part No.			145213	
	Recommended Accessory	Weight	Only one service kit required for all sizes of jars			

Extra

64	O-ring Pkg. Set (Std.temp.)	Part No.	153315/005	152818/005	152573/005	152417/005
	Included In Complete Packing Set	Weight	≡	≡	≡	≡
65	Complete Pkg. Set (Std. Temp.)	Part No.	153316/005	152819/005	152574/005	152418/005
	Includes O-ring Pkg. Set	Weight	≡	≡	≡	≡
66	O-ring Pkg. Set (Hi-temp)	Part No.	153315/006	152818/006	152573/006	152417/006
	Included In Complete Packing Set	Weight				
67	Complete Pkg. Set (Hi-temp)	Part No.	153316/006	152819/006	152574/006	152418/006
	Includes O-ring Pkg. Set	Weight	≡	≡	≡	≡
68	Bowen® Itcolube,	Part No.	64919	64919	64919	64919
	Anti-gall Grease	Weight				
69	Bowen® Jar Lube	Part No.	49842	49842	49842	49842
		Weight				

How to Order:

1. *Specify name, part number, and quality of assembly of part.*
2. *Specify O.D.,I.D., and connection size & type. Label oversize O.D. And undersize I.D. If other than standard.*
3. *Specify with or without pin stress relief groove and box Bore-back reliefs.*
   Bowen® pin stress relief groove is standard where a pin Stress relief is permitted for the tool O.D./I.D. Combination. API pin stress relief groove can be supplied if Specified. Box bore-back is not standard but can be supplied If specified
4. *Specify any desired spare parts, accessories, and extras. Include above information 1 through 3, for each part ordered.*
5. *Note: Thread protectors are extra and can be found in Section 4100 of the Bowen® price manual.*

Recommended spares for one year per tool

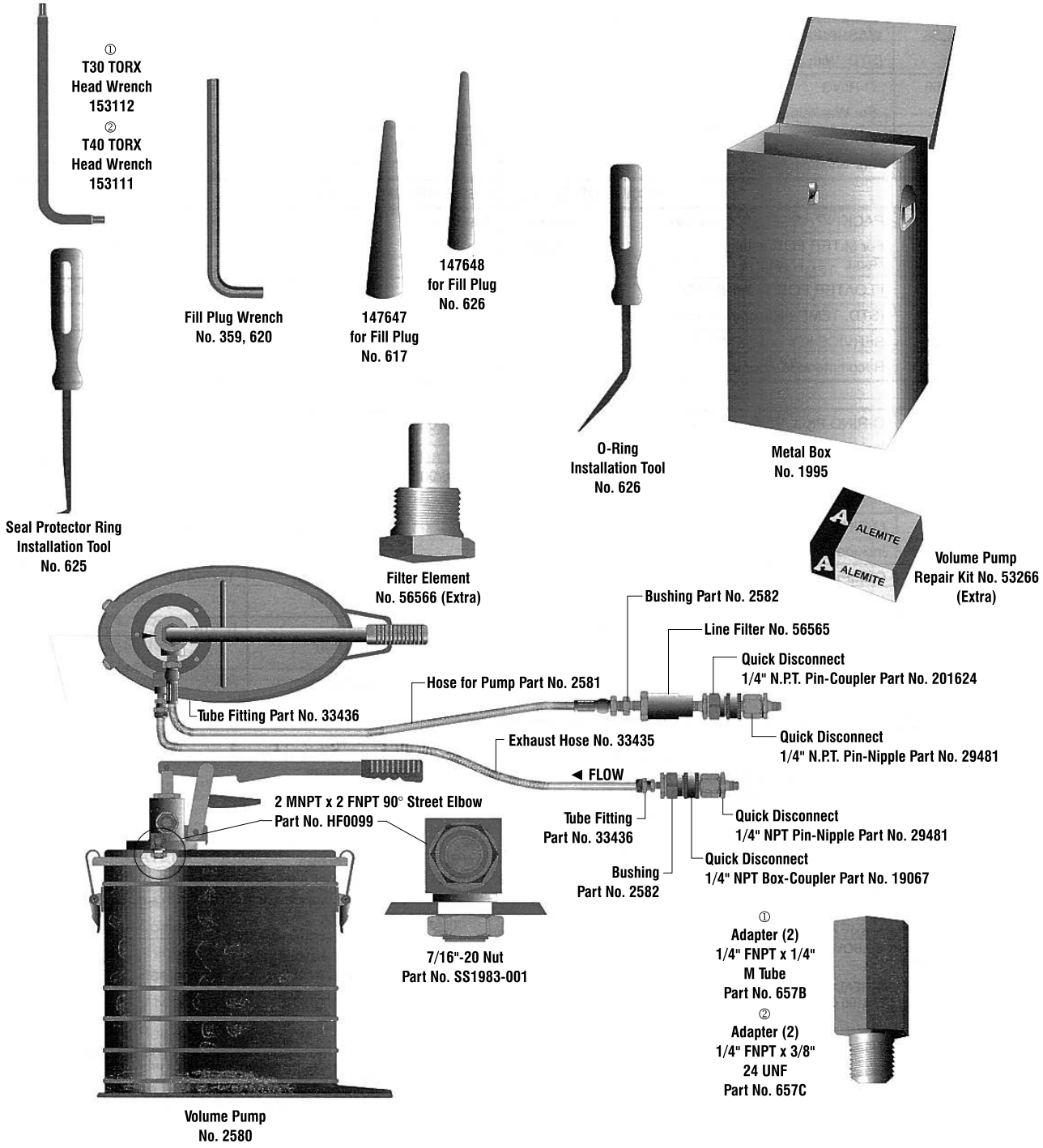
	Qty.	Part Name
1.	1	*Bypass bodies*
2.	2	*Cone*
3.	1	*Cone retainers*
4.	2	*Seal bodies*
5.	1	*Pressure body (f/one to ten tools)*
6.	8	*Fill plugs (or 4 of each size, for 4-3/4" O.D. Tool)*
7.	1	*Floater*
8.	12	*Complete packing sets*
9.	4	*O-ring packing sets*
10.	1	*Bowen® Itcolube, anti-gall grease*
11.	1	*Bowen® jar lube*

Note:
Miscellaneous O-ring seals are normally furnished in sealed plastic bags with one (1) O-ring per bag to prevent deterioration.

O-ring packing sets are furnished in sealed plastic bags.

Super II Fishing Jar Service Kit (145213)

A Service Kit is necessary to properly service the Jar. Because these kits are identical for every size Jar, a single kit may be used for all Jars at a particular site. The kit does not include a seal setting tool, which is required for each size Jar. This setting tool must be ordered separately. It is usually stored in the service kit metal box.



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