

SUPER FISHING JAR

Instruction Manual 4100



Super Fishing Jar



One Company Unlimited Solutions

Super Fishing Jar

Super Fishing jar

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General Description

The **Bowen Super Fishing Jar** is a straight-pull operated jar which employs a patented combination of proven principles of hydraulics and mechanics. This jar is simple to assemble and its unique design allows for easy operation.

No setting or adjustment is required before going in the hole, or after the fish has been engaged. The Bowen Super Fishing Jar is designed to permit the operator to easily and simply control the intensity of the jarring blow within a wide range, from a very light impact to a blow of very high impact. The unique impact control of the Bowen Super Fishing Jar is made possible by the metering action of the patented cone assembly. As pull is applied to the jar, oil is forced from one side of the cone to the other through a metering slot. By being forced through a restricted passage, the fluid flow is retarded in such a manner that the stroke is delayed until the operator has ample time to take the necessary stretch in the running string (and Intensifier, when it is used) to strike a blow of given impact.

Another important feature of the Super Fishing Jar is the ease of closing or resetting. Only sufficient weight to overcome friction is required. Closing is free of any danger of causing damage to the tool, since the metering action does not take place during resetting. During resetting, large ports are opened in the cone assembly, allowing unimpeded flow of fluid from one cavity to the other.

Other important features are: The ability to transmit full torque at all times during operation, in either direction; the ability to deliver a rapid series of blows when desired, the only limitation being the time required to raise and lower the fishing string the short distance required to make each stroke; this tool does not interfere with the free operation of fishing tools, formation testers, safety joints, reversing tools, etc.

Use Fishing

When used in fishing operations, a Bowen Super Fishing Jar should be installed immediately below a string of drill collars. See Chart C on page 15 for approximate weights of collars. For maximum effectiveness of jarring, a Bowen Jar Intensifier should be installed in the fishing string. The intensifier should be located in the fishing string about four drill collars above the Jar.

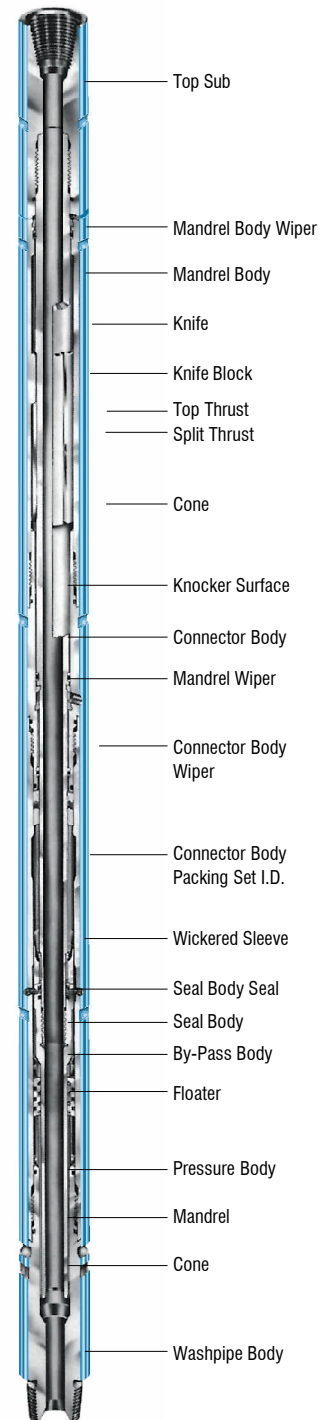
Coring

The Bowen Super Fishing Jar is often run just above a diamond core barrel. As in drill stem testing, from three to fifteen drill collars are placed in the string, just above the Jar. Breaking a core without a Jar in the string is often awkward and requires considerable pull load be taken in the drill pipe.

When a Jar is in the string, moderate pull load is all that is required to deliver a comparatively light blow which is usually sufficient to break the core.

Construction

The Bowen Internal Cutter consists essentially of a Wiper Block (or a Drag Spring Assembly) to accomplish setting in the pipe, Slips and Cone Assembly to anchor the tool, a Main Spring to assist in maintaining uniform feed to the Knives, wedge-like Knife Blocks to drive the Knives upward and outward to engage the pipe, and especially hardened and ground Knives for easy, efficient pipe cutting. A feature of the Bowen Internal Cutter is the "Automatic Bottom" which permits the operator to set the cutter easily at any desired depth, to release the tool by simply pulling upward, and to reset at another depth - all without coming out of the hole.



Bowen Super Fishing Jar

Operation

Prior to use, the Bowen Super Fishing Jar should be carefully examined to assure that it is properly assembled and filled with Bowen Jar Lube. The tool should be tested in a Bowen Jar Tester (or equal testing equipment) if one is available, to assure proper performance.

Check all threaded connections to assure that they are made up as tight as the joints in the running string. (See Maximum Recommended Tightening Torque, Chart A, page 15.) Do not tong on the threaded connections; tong at least 4" from the joint.

Assemble the Jar in the string below the drill collars. It is recommended that a Bowen Jar Intensifier be run with the Jar for maximum effectiveness; particularly in shallow, deep or crooked holes. When the Intensifier is run, it should be located in the string about four drill collars above the Jar.

NOTE: See Bowen Instruction Manual No.4019 for recommended weights to be run with Bowen Jar Intensifier.

To strike the initial blow, raise the string enough to take the stretch judged necessary to produce the required impact; set the brake, and wait for the jar to hit. The first blow may take from a few seconds to several minutes, depending on circumstances. The variables are depth of operation, amount of stretch in the string, whether an intensifier is used, downhole temperature and mechanical condition of the hole.

For example, when a crooked hole prevents a uniform stretch over the entire string, it is impossible to exert as much pull at the Jar as would be exerted if the hole were straight.

The operator should use caution in applying pull load to the Jar. He should not exceed the safe working load for the particular Jar being used. Especially on the first pull, the tendency is to speed the action by applying additional load. Determine the maximum safe working load for the Jar (Refer to Strength and Test Data Chart B on page 15), and never exceed this load during operation.

The velocity, and the relative impact load of the blow is controlled by the amount of stretch taken in the running string and the weight of the drill collars installed above the Jar.

After a stroke has been made, it is only necessary to close the Jar and then to take the necessary stretch in the string to strike the next blow. Several blows per minute, at any desired intensity, may be struck, even in a crooked hole.

CAUTION: The Jar will usually be brought out of the hole in the open position. Perform Rig Floor Maintenance described at right. It should be closed, taken from the string and laid on the derrick floor. Once closed, the Jar should not be left suspended from the elevators, especially with any appreciable weight suspended below it. In this position the Jar can open, dropping the length of its travel and may cause damage to the rig or injury to crewmen.

Listed below are difficulties and their corrective procedures sometimes encountered by operators:

1. If not able to hit the first blow:
 - A. Pull up to the desired stretch in the string and set the brake. Hold this position until the Jar strikes its blow.
 - B. Increase the tension in the running string if possible, but do not exceed the allowable working load on the Jar. Refer to Chart B on page 15.

2. If unable to hit the second blow, lower the string farther, as the Jar is probably not closing sufficiently.
3. If the blows being struck are not as heavy as desired:
 - A. Be sure that the Jar is fully closed.
 - B. Pull the running string up faster.
 - C. Increase the number of drill collars installed above the Jar.
 - D. Install a Jar Intensifier above the drill collar.

Rig Floor Maintenance

After moderate use on a short job, the Jar is usually kept at the rig site where it will require only minor maintenance which, in most cases, may be done on the rig floor.

Immediately after removal from the fishing string, flush all mud from the bore especially in the Washpipe Body and around the Washpipe. Also, flush all mud from the Connector Body Pressure Balance Ports on the O.D. of the Connector Body. The Mandrel seal surface should be cleaned, well greased to prevent rust and then the Jar should be pushed into the closed position until its next use.

Before storing, coat box and pin threads with anti-gall grease or an approved thread lubricant such as KOPR-KOTE® to prevent corrosion and to aid make-up in next use. The Jar should be stored with the Mandrel end up or horizontally on a suitable rack.

Dressing Area Maintenance

After prolonged and/or hard use, the Bowen Super Fishing Jar should be taken to an adequate dressing area, as soon as possible, to be completely **DISASSEMBLED, INSPECTED, REASSEMBLED, FILLED WITH BOWEN JAR LUBE** and **TESTED**.

The following list of tools, equipment and parts should be obtained before starting dressing area maintenance:

1. Bowen Vise and Tong or equivalent (suitable for the Jar size).
2. Overhead Crane (2,000 lb. minimum capacity).
3. Pipe Wrenches (suitable for the O.D.s of interior Jar parts).
4. Chain Wrenches (suitable for spinning on or off threaded parts. (See Figure 2, page 7).
5. Bowen V-Belt Pulley Assembly No. 92070 (or equal) which can be suspended from the crane to support threaded parts while spinning them on or off (See Figure 2, page 7).
6. Nylon Strap (suitable for lifting and handling parts with the overhead crane without damaging the parts).
7. Bowen Jar Tester or equivalent (suitable for the Jar size). (See Figure 1, page 6).
8. Bowen Super Fishing Jar Service Kit (See page 16 or Parts List, page 17).
9. Packing Assembly Sleeve (for the Jar being worked on) (See Figure 6, page 12 or the Replacement Parts List on page 17).
10. Connector Body Wiper Installation Tool (for 3¹/₈ thru 6" O.D. Tools) (See Figure 5, page 11 or the Replacement Parts List on page 17).

11. Floater Positioning Tool (for the size Jar being worked on. See Figure 7, page 13 or the Replacement Parts List on page 17).

12. Complete Packing Set, Floater and Fill Plugs (for the size Jar being worked on. See the Replacement Parts List on pages 17 thru 19).

13. Thread lubricant: KOPR-KOTE® (P/N 153823).

14. BOWEN JAR LUBE (P/N 49842).

CAUTION: THE BOWEN SUPER FISHING JAR IS A HYDRAULIC JAR: THEREFORE, CLOSE TOLERANCES AND SMOOTH FINISHES ARE MANDATORY. ALSO, THE JAR MUST BE KEPT FREE OF CONTAMINATION (DIRT, SAND, METAL, ETC.). CONTAMINATION LEFT ON THE PARTS CAN DAMAGE THEM OR THE SEALS AND COULD RESULT IN A MALFUNCTION OF THE JAR.

Throughout the entire Disassembly, Inspection and Reassembly Procedure the following notes should be helpful:

1. For proper location of parts during disassembly and assembly procedures, item numbers in parenthesis will correspond to Figures 3 and 4 on pages 8 and 9. Item Numbers in parenthesis, Part Numbers, Part Names, and number of parts required are shown under Specifications and Replacement Parts on pages 17, 18, and 19.
2. On the Replacement Parts List, major parts are listed in the order that they are assembled; other parts are listed below the major part that they go in or on.
3. Top (upper end) and bottom (lower end) will refer to the ends of the Jar as it is run in a fishing string. The Jar is run with the Mandrel (11) and Top Sub (16) up and the Washpipe Body (48) down.

4. To prevent damaging parts during servicing, **DO NOT** use the Vice, Tongs, Wrenches or Chains over the Fill Plug (42) holes, on any of the seal surfaces or on any of the other smooth surfaces.

Complete Disassembly

Before reading this section, read Dressing Area Maintenance on page 5.

For proper location of parts during disassembly and assembly procedures, item numbers in parenthesis will correspond to Figures 3 and 4 on pages 8 and 9. Item Numbers in parenthesis, Part Numbers, Part Names, and number of parts required are shown under Specifications and Replacement Parts on pages 17, 18, and 19. Bowen recommends an Assembly Drawing of the size Super Fishing Jar being serviced be available when Disassembling, Inspecting, or Reassembling the tool. Assembly Drawings are available through Bowen.

CAUTION: DO NOT REMOVE THE FILL PLUGS UNTIL THE TOOL IS FULLY DISASSEMBLED. THE POSSIBILITY OF TRAPPED RESIDUAL PRESSURE EXISTS AND CAN CAUSE POSSIBLE DAMAGE OR INJURY.

When disassembling the BOWEN SUPER FISHING JAR, note the direction and location of all Packing, O-Rings, Back-up Rings, and Wipers. This will help in the reassembly of the Jar.

1. Place the Super Fishing Jar in the Tester and close the jar if not already closed. Pull the jar open until it releases and stop there. When the jar is in this position (approximately 7") the Mandrel (11) seal surface is exposed (See Figure 8, page 14) and the Cone (33) O.D. is in the free area of the Pressure Body (41). This will prevent damaging the Piston Assembly (31) and the Pressure Body (41) bore while disassembling the Jar.

CAUTION: DO NOT remove the Fill Plugs (42) or Washpipe Body (48) first. Removal of these, before the release of any possible internally trapped pressure, may result in the ejection of loosened Fill Plugs (42) or the Floater (44), once the Washpipe Body (48) is removed.

2. Clamp the fully extended Jar in the Vise on the center of the Connector Body (18). Place pans under the Pressure Body (41) joints to catch the hydraulic oil.
3. Using the Tong centered between the Fill Plug (42) holes on the Pressure Body (41), break the connection (right hand threads) between the Pressure Body (41) and the Connector Body (18). Use a chain wrench and the V-Belt Pulley Assembly (see Figure 2, page 7) to unscrew the Pressure Body (41) and let the oil drain into the pans. DO NOT reuse this oil.
4. Reposition the Jar in the Vise and clamp onto the Pressure Body (41) within the vise centered between the Lower Fill Plug (42) hole and the lower end of the Pressure Body (41).
5. Use the Tong to break the connection (right hand threads) between the Washpipe Body (48) and the Pressure Body (14). Use a chain wrench and the V-Belt Pulley Assembly (see Figure 2, page 7) to unscrew and remove the Washpipe body (48). Using the crane to support the Pressure Body (41), slide it off.
6. Remove the male adapter from the bore of the pressure Body. Remove the Floater (44) which usually remains in the Pressure Body (41). Reach inside and pull it out; or if necessary, use a long thin board to push it out of the bottom from the upper end. Be careful not to damage the Pressure Body (41) bore or the Floater (44). If the Floater (44) is on the Washpipe (38), pull it off.
7. Break the Washpipe (38) to Mandrel (11) connection (right hand threads) by using a pipe wrench on the undercut wrench area on the upper end (large end) of the Washpipe (38) stenciled: "WRENCH HERE." Be careful not to damage the long seal surface. Use a chain wrench and the V-Belt Assembly (See Figure 2, page 7) to unscrew and remove the Washpipe (38).
8. Remove the Seal Body (34), Cone (33) and By-Pass Body (32). These parts simply slide off the lower end of the Mandrel (11). Handle these critical parts with care and wrap them in cloth for protection.
9. If the Jar is equipped with a single Connector Body Packing Set (27), remove the Connector Body Packing set (27), Connector Body Packing Male Adapter (26) and Connector Body Packing Female Adapter (28). On Jars with two Connector Body Packing Sets (24 and 25), the packing is removed with the Connector Body (18).
10. Reposition the Jar in the vise and clamp on the center of Spline Body (1).
11. Use the Tong to break the connection (right hand threads) between the Connector Body (18) and the Spline Body (1). Use a chain wrench and the V-Belt Pulley Assembly (see Figure 2, page 7) to unscrew and remove the Connector Body (18).
12. The Mandrel (11) is a sub type mandrel. Use the tong to break the connection (right-hand threads) between the Top Sub (16) and the Mandrel (11). Use a chain wrench

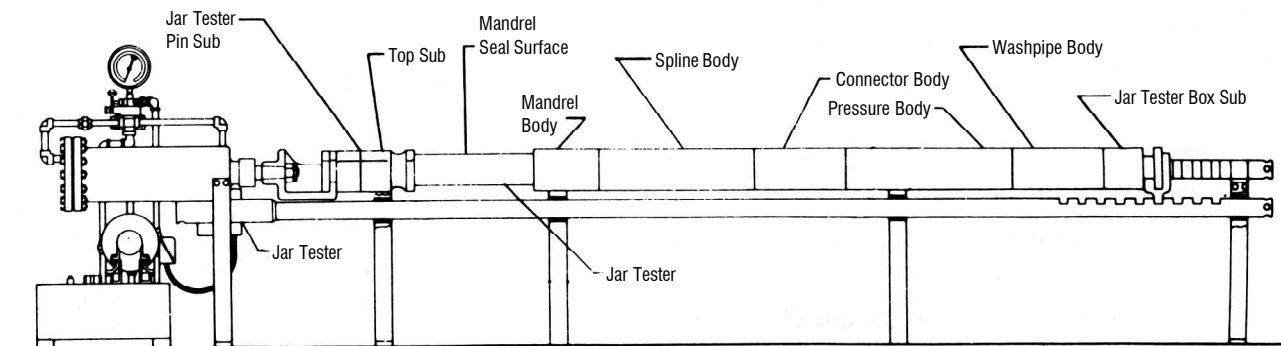


Figure 1
Testing the Jar (Shown in Open Position)

and the V-Belt Pulley Assembly (see Figure 2, below) to unscrew and remove the Top Sub (16).

13. While supporting the Mandrel (11) with a nylon strap and the over head crane, slide the Mandrel (11) toward the lower end of the Jar and remove it.

CAUTION: Handle with care. The entire O.D. of the Mandrel (11) consists of threads, seal surfaces and metal to metal sliding surfaces.

14. If the Jar has a Mandrel Body (5), use the Tong to break the connection (left hand threads) between the Mandrel Body (5) and the Spline Body (1). Use a chain wrench and the V-Belt Pulley Assembly (see Figure 2) to unscrew and remove the Mandrel Body (5).
15. Remove the Spline Body (1) from the Vise.
16. Remove the Fill Plugs (42) from the Pressure Body (41).
17. Remove all O-Rings, Back-Up Rings, Wipers and Packing from all parts by using a No. 625 (or 626) Tool (see Service Kit, page 16) or a screwdriver with its tip bent at an 80 to 90 degree angle. Be careful not to damage the seal grooves or other surfaces of the parts.
18. Immediately after disassembling the Jar, thoroughly inspect all the metal parts and the Floater (44).

Inspection of Parts

Before reading this section, read Dressing Area Maintenance on page 5.

Bowen recommends an assembly drawing of the size Super Fishing Jar being serviced be available when Disassembling, Inspecting, or Reassembling the tool. Assembly Drawings are available through Bowen.

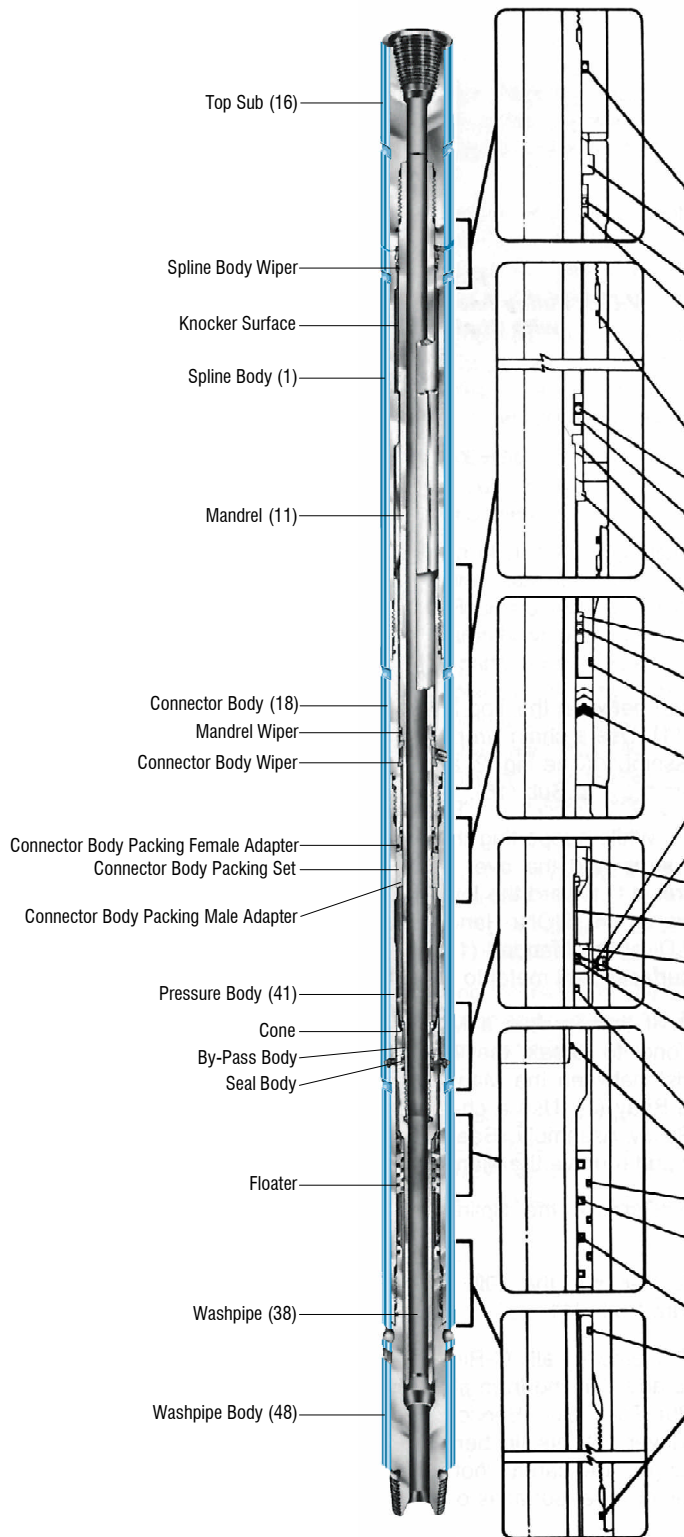
Notes:

- 1) The types of damage to inspect for are: pits, nicks, scratches, burrs, cracks, galled areas, worn areas, etc.
- 2) In general, minor damage may be removed by polishing with fine emery cloth.
- 3) Parts with major damage must be replaced or must undergo a more extensive repair process.
- 4) Any abrasions on O-Ring, Wiper or Packing grooves or on Seal surfaces can damage the seals and result in a loss of fluid or pressure control during the operation of the tool.
- 5) Any damage areas left uncorrected can cause additional damage to that part and possible other parts. This could result in the parts(s) being unreparable and/or in the Jar failing to work properly.



Figure 2
V-Belt Pulley Assembly No. 92070
with Chain Wrench

1. Carefully clean all parts with solvent and wipe them dry with a clean, lint free cloth.
2. Inspect all straight box and pin thread sections of all parts:
 - a) Check the threads on all parts for damage. Minor damage may be removed with atriangular hand file before polishing with fine emery cloth.
 - b) Examine the seal surfaces, the smooth surfaces and the corners, sides and bottom of all o-ring grooves at both ends of the threads. If damage is found, take the appropriate action described in the notes above.
 - c) Inspect the 15 degree shoulder (butting faces) on all Bodies (1, 5, 18, 41 and 48). Inspect both end faces of the Mandrel (11). Inspect the shoulder that the Mandrel (11) butts against inside the Top Sub (16) and the Washpipe (38). If damage is found, take the appropriate action described in the notes above.
 - d) If the Jar has been heavily abused (pulled harder than the maximum allowable or excessively bent in a crooked hole) fatigue cracking may occur. If fatigue cracking occurs, it is most likely to be in the corners where the cross sectional area changes. Therefore, examine the inside corner of the 15 degree shoulder of the pin sections, the corners at the bottom of the O-Ring and seal grooves, the corners at the bottom of the thread reliefs and threads (particularly the first six or eight threads nearest the thread relief). Parts with cracks must be replaced.

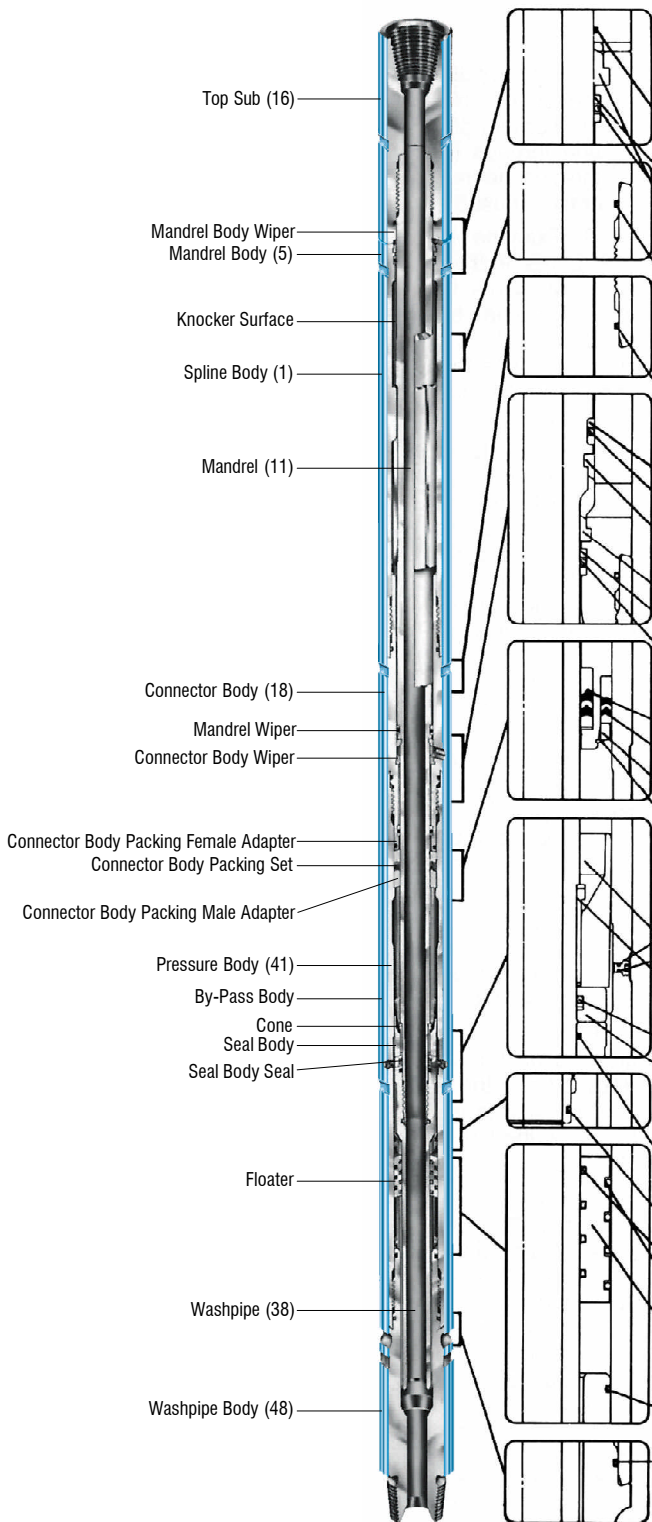


NOTE: Soft Rubber Packing Rings Shown in Black

ASSEMBLY NUMBER		72888	145737	147902	146544	80468	79789
Item No.	Part No.	Nominal O.D.					
		3 1/8"	3 3/4"	3 3/4"	3 3/4"	4 1/4"	4 1/4"
17	Top Sub O-Ring	568226	568332	568335	568333	568337	568237
4	Spline Body Wiper	72892	145741	147905	146547	80472	79793
2	Spline Body I.D. O-Ring	568329	568332	568335	568333	568337	---
3	Back-up Ring F/ Spline Body I.D. O-Ring (2 req.)	78281	145740	147904	148546	80471	---
8	Mandrel Body I.D. O-Ring (Not Shown)	---	---	---	---	---	568340
9	Back-up Ring F/ Mandrel Body I.D. O-Ring (Not Shown)	---	---	---	---	---	79792 (2 req.)
20	Connector Body O-Ring (Large) (2 req.)	568144	568234	568235	568235	568153	568242
13	Mandrel O Ring Middle	568326	568329	568331	568330	568333	568336
14	Back-up Ring F/ Mandrel Middle O-Ring (2 req.)	78282	145743	147907	146549	80474	79795
15	Mandrel Wiper	72895	145744	147908	146550	80475	79796
23	Connector Body Wiper	72898	145747	147912	146554	80479	79800
22	Back-up Ring F/ Connector Body I.D. O-Ring	78289	145746 (2 req.)	147911	146549	80478 (2 req.)	79799
21	Connector Body I.D. O-Ring	568327	568329	568333	568330	568334	568336
19	Connector Body O-Ring (Small)	568141	568232 (2 req.)	568233	568233	568236	568239
27	Connector Body Packing	148309	148304	147913	146555	148299	148293
43	Fill Plug O-Ring (2 req.)	568005	568005	568005	568005	568005	568005
42	Fill Plug (2 req.)	617 T	617 T	617 T	617 T	617 T	617 T
33	Cone	72904	145755	147917	146559	80484	80809
32	By-Pass Body	72905	145754	147916	146558	80483	79802
34	Seal Body	72906	148347	147918	146560	148344	79803
35	Seal Body Seal O-Ring	568223	568225	568229	568226	568230	568335
36	Seal Body Seal Protector Ring	148329	148345	147919	150925	148342	148338
37	Seal Body Seal Non Ext. Ring (Not Shown)	148328	148346	148886	146561	148343	148337
40	Washpipe O-Ring (Large)	568130	568133	568142	568226	568230	568231
39	Washpipe O-Ring (Small)	568221	568130	---	568225	568228	568229
45	Floater O.D. Seal (3 req.)	568227	568231	568232	568232	568235	568340
46	Floater I.D. Seal (2 req.)	72910	151684	151686	146565	151678	151677
47	Floater I.D. O-Ring	568224	568225	568230	568330	568231	568335
44	Floater	151580	151584	151577	151583	151576	151578
49	Washpipe Body O-Ring (Small)	568139	568231	568232	568232	568235	568238
50	Washpipe Body O-Ring (Large)	568144	568234	568235	568235	568153	568242

CAUTION: Tool will not operate if Packing Seals are improperly installed.

Figure 3
Super Jar 3-1/8, 3-3/4, 4-1/4, 4-3/4



NOTE: Soft Rubber Packing Rings Shown in Black

ASSEMBLY NUMBER		145484	79691	145440	72978
Item No.	Part Name	Nominal O.D			
		6"	6 1/4"	6 3/4"	7 3/4"
17	Top Sub O-Ring	568240	568243	568245	568253
9	Back-up Ring For Mandrel Body I.D. O-Ring (2 req.)	145487	79693	145443	72981
8	Mandrel Body I.D. O-Ring	568343	568346	568348	568432
10	Mandrel Body Wiper	145488	79701	145444	72982
7	Mandrel Body O-Ring	568250	568251	568255	568280
6	Mandrel Body O-Ring (Small) (Not Shown)	---	---	---	568258
19	Connector Body O-Ring (Small) (Not Shown)	---	---	---	568258
20	Connector Body O-Ring (2 req.)	568250	568251	568255	568260
14	Back-up Ring For Mandrel Middle O-Ring (2 req.)	145490	79692	145446	72984
13	Mandrel O-Ring Middle	568339	568342	568344	568428
15	Mandrel Wiper	145491	79702	145447	72985
23	Connector Body Wiper	145495	79700	145451	72988
22	Back-up Ring For Connector Body I.D. O-Ring (2 req.)	145494	79695	145450	72989
21	Connector Body I.D. O-Ring	568337	568339	568341	568426
24	Connector Body I.D. Packing Set	148628	148633	148638	148643
25	Connector Body O.D. Packing Set	148629	148634	148639	148644
29	Connector Body O.D. Packing Retainer	145498	79703	145454	72992
30	Connector Body O.D. Packing Retainer Ring	79697	79697	145455	78427
42	Fill Plug (2 req.)	329T	329T	329T	329T
43	Fill Plug O-Ring (2 req.)	568006	568006	568006	568006
33	Cone	145505	79709	145458	69275
32	By-Pass Body	145504	79704	145457	69277
36	Seal Body Seal O-Ring	568336	568338	568340	568349
34	Seal Body	145506	79705	145459	69276
36	Seal Body Seal Protector Ring (Not Shown)	148503	148493	148501	148499
37	Seal Body Seal Non-Ext. Ring (Not Shown)	148504	148494	148502	102253
40	Washpipe O-Ring	568233	568235	568237	568246
12	Mandrel O-Ring (Lower)	568228	568230	568232	568240
46	Floater Seal I.D. (2 req.)	151688	151675	73779	151691
45	Floater O.D. O-Ring (3 req.)	568349	568350	568354	568434
44	Floater	151579	151582	151581	102303
49	Washpipe Body O-Ring (Small)	568247	568248	568251	568257
50	Washpipe Body O-Ring (Large)	568250	568251	568355	568260

CAUTION: Tool will not operate if Packing and Seals are improperly installed.

Figure 4
Super Jar 6, 6-1/4, 6-3/4, 7-3/4

3. Examine the Pressure Body (41) bores (the bores that the Cone (33) and Floater (44) seal on). Minor damage is to be smoothed out with "very fine" emery cloth. Damage which cannot be smoothed out will render it unfit for further service unless the bores are reworked. Also, inspect the seal bore and threads in both Fill Plug (42) holes.
4. Carefully examine the Cone (33), Seal Body (34) and By-Pass Body (32). Polish off any damage found by using a "very fine" hand file, hand grinding stone, or emery cloth. Be very careful when working on these parts because the critical surfaces are ground and polished. Also, the mating surfaces of the Cone (33) and Seal Body (34) must remain flat and smooth. Damage which cannot be smoothed out will render these parts unusable. The Cone (33) O.D. should interfere slightly with the Pressure Body (41) bore. If the Cone (33) O.D. does not interfere with the Pressure Body (41) bore or if the Cone (33) or Seal Body (34) has minor damage which cannot be easily polished out, Bowen can possibly rework and salvage the Cone (33) and/or Seal Body (34).
5. Examine the seal surfaces, seal grooves and the metal to metal sliding surfaces of the Mandrel (11) and the Washpipe (38). If damage is found, take the appropriate action described in the notes above.
6. Inspect the bores and the I.D. seal grooves of the Connector Body (18), the Spline Body (1) and the Mandrel Body (5), if the Jar has one. If damage is found take the appropriate action described in the notes above.
7. Inspect the knocker surface for upset metal. The knocker surface on the Mandrel (11) is the upper end of the spline. This area should also be examined by magnetic particle methods for small cracks at the intersections of the spline and the upper seal surface. Such damage may be caused by prolonged or excessive impact loads from use at insufficient collars. On Jars without a Mandrel Body (5), the other knocker surface is the shoulder inside the Spline Body (1) just above the splines (See Figures 3 and 4 on Pages 6 and 7). Upsets are to be removed with a hand grinder or file. The area should then be polished with fine emery cloth. Do not leave sharp corners.
8. Inspect the splines on the Mandrel (11) and the Spline Body (1). Any damage found is to be removed. A hand grinder or file may be used followed by polishing the area with fine emery cloth.
9. The Mandrel should be inspected for "necking" in the cone area. This type of damage is always the result of excessive pull loads creating high internal pressure which tends to collapse the Mandrel at this point. A straight edge of some form may be necessary to detect such damage.
10. Inspect the floater (44), particularly the corners, sides and bottom of all seal grooves for chips, nicks, scratches and cracks. If the Floater (44) is not damaged or excessively worn it may be reused.
11. Inspect the Fill Plugs (42). If damaged, they should be replaced.
12. Thoroughly oil all parts with a good grade of clean, light oil.

Reassembly

Before reading this section, read Dressing Area Maintenance on page 5.

For proper location of parts during disassembly and assembly procedures, item numbers in parenthesis will correspond to Figure 3 and 4 on pages 8 and 9. Item Numbers in parenthesis, Part Numbers, Part Names, and number of parts required are shown under Specifications and Replacement Parts on pages 17, 18, and 19.

Bowen recommends an Assembly Drawing of the size Super Fishing Jar being serviced be available when Disassembling, Inspecting, or Reassembling the tool. Assembly Drawings are available through Bowen.

Make sure all parts are clean and in good condition (See Inspection of Parts on pages 7 thru 10). Coat all metal parts with a good grade of clean, light oil and lay them out on clean cloths or paper.

It is recommended that the Jar be redressed with a new Complete Packing Set (58).

The Complete Packing Set (58) consists of all packing, o-rings, back-up rings, wipers and the seal body seal.

1. Coat all O-Rings, Back-Up Rings and Wipers with a good grade of clean, light oil and install them in their proper places. To install the Connector Body Wiper (23) in the 3¹/₈" thru 6" Jar follow the procedure in Figure 5 below).
2. On Jars that have two Connector Body Packing Sets (24 and 25), install the packing on the Connector Body (18). On the I.D Packing Set (24), install the flat spacers after all other rings are in place. After sliding the O.D. Packing Set (25) in place, install the Packing Retainer (29) and the Packing Retainer Ring (30). On Jars with a single Connector Body Packing Set (27), the packing will be installed later.

3. Center the Spline Body (1) in the vise and clamp securely. Coat the splines generously with Bowen Thread Lubricant (KOPR-KOTE).

NOTE: On Jars that have a Spline Body (1) with threads on one end only, skip steps 4 and 5.

4. Coat the threads, the surfaces on both ends of the threads and the 15 degree shoulder of Mandrel Body (5) with Bowen thread lubricant (KOPR-KOTE®).

5. Using the crane to lift Mandrel Body (5), slide it over the Mandrel (11). Use a chain wrench and the V-Belt Pulley Assembly (See Figure 2, page 7) to screw the Mandrel Body (5) (left hand threads) into the Spline Body (1). Tighten this connection with the Vise and Tong. See Chart A, page 15 for the recommend tightening torque. If this connection is not properly tightened it could result in a fatigue failure of the Mandrel Body (5).

6. Coat the splines on the Mandrel (11) with KOPR-KOTE®. Using the crane and nylon strap, lift the Mandrel (11) and insert it upper end (largest diameter end) through the lower end of the Spline Body (1) (end with internal threads visible). Align the splines and

push the Mandrel (11) through until the splines bottom out (Jar fully extended with Mandrel (11) upper seal surface exposed).

7. On the upper end of the Mandrel (11), coat the threads, the surface at both ends of the threads, and the end of the Mandrel (11) with Bowen Itcolube.

8. Use a crane to lift the Top Sub (16) into place. Use a chain wrench and the V-Belt Pulley Assembly (See Figure 2, page 7) to screw the Top Sub (16) onto the Mandrel (11). Tighten this connection with the Vice and Tong. (See Chart A, page 15 for the recommended lightening torque.)

9. Coat the Packing Assembly sleeve (51) with Bowen Jar Lube and slide it up over the lower end of the Mandrel (11) until it is against the By-Pass Body Shoulder. **DO NOT** use thread lubricant (KOPR-KOTE). See Figure 6, page 12.

10. Coat the smooth Mandrel (11) surface from the By-Pass Body Shoulder up to and including the Mandrel Wiper (15) with Bowen Jar Lube. Also coat the entire bore of the Connector Body (18) with Jar Lube. This will make the Connector Body (18) slide on easier.

11. Coat the threads, the surfaces on both ends of the threads and the 15 degree shoulder of the upper end of the Connector Body (18) with KOPR-KOTE®.

12. Using the crane to lift the Connector Body (18), slide it over the Mandrel (11). Use a chain wrench and the V-Belt Pulley Assembly (see Figure 2, page 7) to screw the Connector Body (18) into the Spline Body (1). Tighten this connection with the vice and tong. See Chart A, page 15 for the recommended tightening torque.

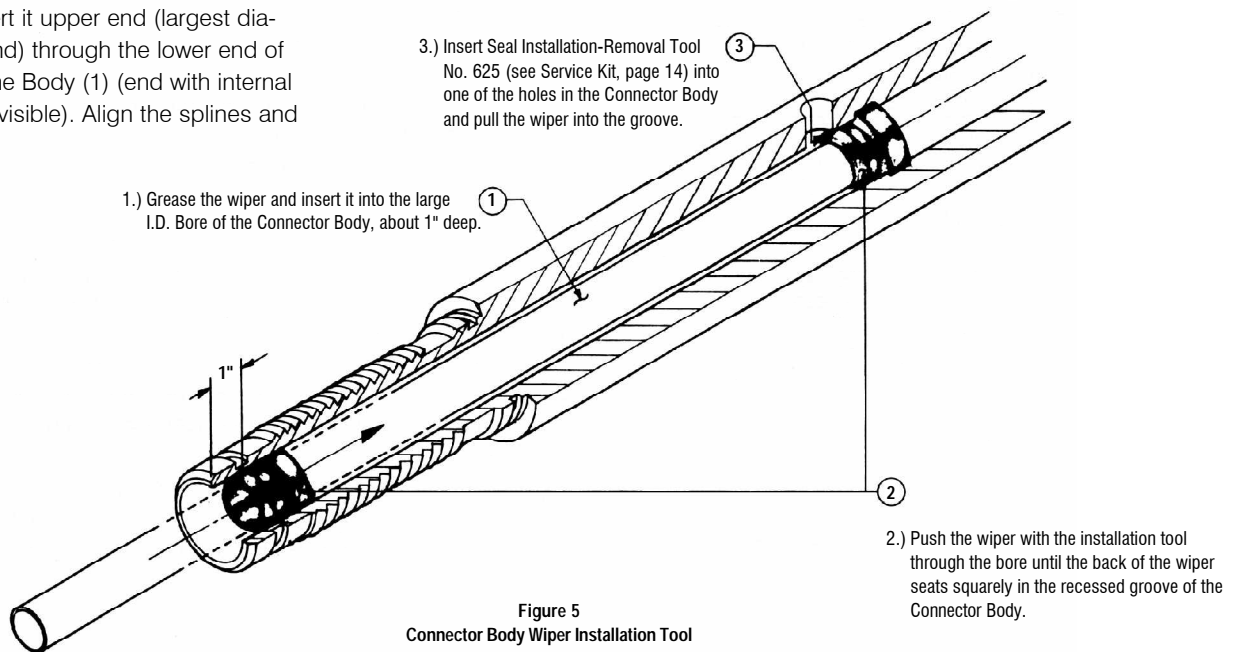


Figure 5
Connector Body Wiper Installation Tool

13. On Jars with two Connector Body Packing Sets (24 and 25), skip this step since the packing is already installed. Install the female adapter (28) over the Mandrel; up against the Connector Body (18), coat the Connector Body Packing Set (25) with Bowen Jar Lube and install it over the Mandrel against the female adapter (28).
14. Remove the Packing Assembly Sleeve (51) from the Mandrel (11). (See Figure 6 below.)
15. Reposition the Jar with the Vice centered on the Connector Body (18) and clamp securely.
16. Thoroughly clean the Cone (33). Install the Piston Assembly (31) onto the Mandrel (11). The Piston Assembly (31) consists of the By-Pass Body (32), the Cone (33), the Seal Body (34), the Seal Body Seal (35), the Seal Body Seal Protector Ring (36), and the Seal Body Seal Non-Extrusion Ring (37).
17. On the lower end of the Mandrel (11), coat the threads and the end with KOPR-KOTE®. Be careful not to get KOPR-KOTE above the thread relief. REMOVE ANY EXCESS KOPR-KOTE FROM THE THREADS.
18. Use a chain wrench and the V-Belt Pulley Assembly (see Figure 2, page 7) to screw the Washpipe (38) onto the Mandrel (11). If KOPR-KOTE is picked up from the Mandrel threads, it is to be wiped and washed off with solvent.

CAUTION: This connection is not torqued as high as the other connections in the jar. See the recommended tightening torque on Chart A on page 15. Tighten this connection using a pipe wrench on the undercut wrench area of the upper end (large end) of the Washpipe (38) (stenciled: "WRENCH HERE"). Any burrs on the wrench area must be removed. Coat the long seal surface of the Washpipe (38) with Bowen Jar Lube.

19. Coat the threads, the surfaces on both sides of the threads and the 15 degree shoulder of the lower end of the Connector Body (18) with KOPR-KOTE.
20. Install the male adapter (26) inside the bore of the Pressure Body (41) until it stops on the I.D. shoulder next to the fill plug (42) hole. Coat the bore of the Pressure Body (41) with Bowen Jar Lube. Using the crane, lift the Pressure Body (41) and slide it over the Washpipe (38). Be careful not to damage the Connector Body Packing (25 or 27). Use a chain wrench and the V-Belt Assembly (see Figure 2, page 5) to screw the Pressure Body (41) onto the Connector Body (18). Place the Tong between the Fill Plug (42) holes and tighten this connection (right hand threads). See recommended tightening torque on Chart A on page 15.
21. Reposition and clamp the Jar in the vise on the Pressure Body (41) with the vise centered between the lower Fill Plug (42) hole and the lower end of the Pressure Body (41).

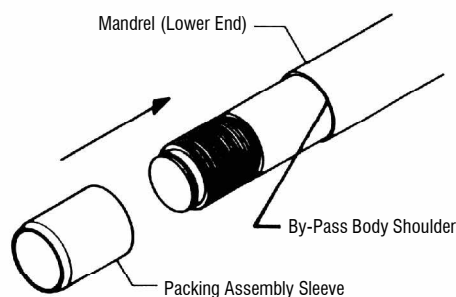


Figure 6
Packing Assembly Sleeve

22. Coat the I.D and O. D of the Floater (44) with Bowen Jar Lube. Slide the Floater (44) over the Washpipe (38). Push the Floater (44) with the Floater Positioning Tool (52) until the positioning tool comes in contact with the end of the Pressure Body (see Figure 7, page 13).

If a Floater Positioning Tool for the size jar being worked on is not available to set the Floater at its proper position, refer to Chart D, page 15.

NOTE: THE FLOATER MUST BE POSITIONED IN THIS MANNER (WHICH GIVES IT SPACE TO MOVE BOTH UP AND DOWN) TO FUNCTION PROPERLY.

23. Coat the Washpipe Body (48) straight threads, the surface at both ends of the threads and the 15 degree shoulder with KOPR-KOTE®.
24. Using the crane, lift the Washpipe Body (48) and slide it over the Washpipe (38). Use a chain wrench and the V- Belt Pulley Assembly (see Figure 2, page 7) to screw the Washpipe Body (48) into the Pressure Body (41). Tighten this connection with the Vise and Tong. See Chart A, page 15 for the recommended tightening torque.
25. Install the Thread Protector for Tool Joint Pin (55) on the Washpipe Body (48) to protect the Tool Joint Pin from damage during the filling operation. The Jar is now ready for filling with Bowen Jar Lube.

NOTE: THE JAR IS NOT TO BE CLOSED UNTIL AFTER IT IS FILLED WITH JAR LUBE.

Filling the Jar

NOTE: The Jar is still in the open position fully extended with the Mandrel (11) seal surface exposed (See Figure 8, page 14) and is not to be closed until it is filled with Bowen Jar Lube. If the Mandrel (11) was moved, the Floater (44) may have moved from its proper position. This would require that the Washpipe Body (48) be removed, the Floater (44) position checked, and corrected if it has moved.

Position the Jar with one of the Pressure Body Fill Plug (42) holes at the top of the Jar's OD. This will allow maximum air removal during filling. (See Figure 8.)

1. Tilt the Jar at least 10° from horizontal with the Mandrel (11) end lower than the Washpipe Body (48) end. (See Figure 8.)

NOTE: This can be done by using a crane to position the Jar in a floor vise with the vise between the Pressure Body Fill Plug (42) holes and the Connector Body (18). By leaving the vise loosened slightly, the Jar can be lowered to the required angle for filling.

2. Attach the Volume Oil Supply Hose to the Pressure Body Fill Plug (42) hole on the **underside** of the Jar using the assembled Adapter and Male Coupler. Both Fill Plug holes are located near the center of the Pressure Body (41) at 180° from one another. (See Figure 8.) 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 (56).
3. Operate the hand pump at a moderate speed until a bubble-free flow of Bowen Jar Lube comes through the clean Oil Exhaust Hose.
4. 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 9.) 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.

5. Remove the Oil Exhaust Hose and Coupler with Adapter from the **top** Fill Plug hole for fluid. 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.

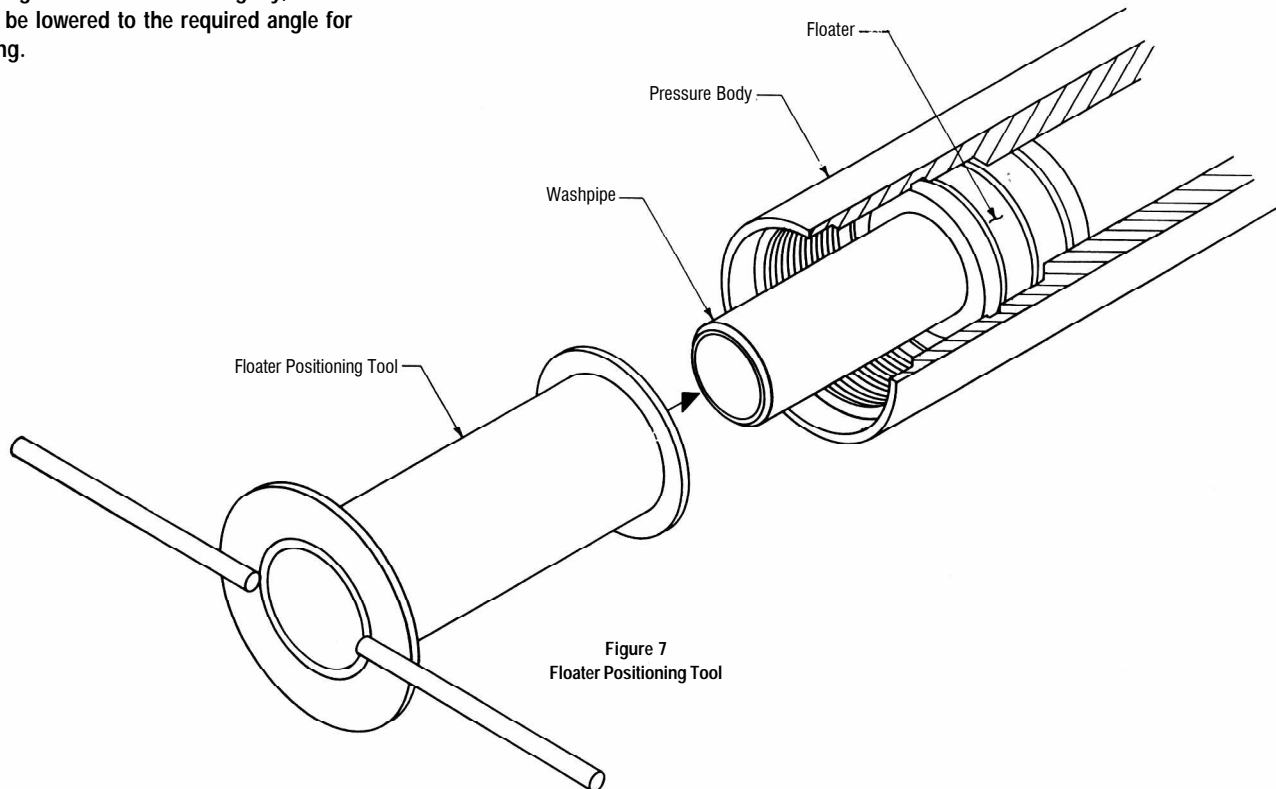


Figure 7
Floater Positioning Tool

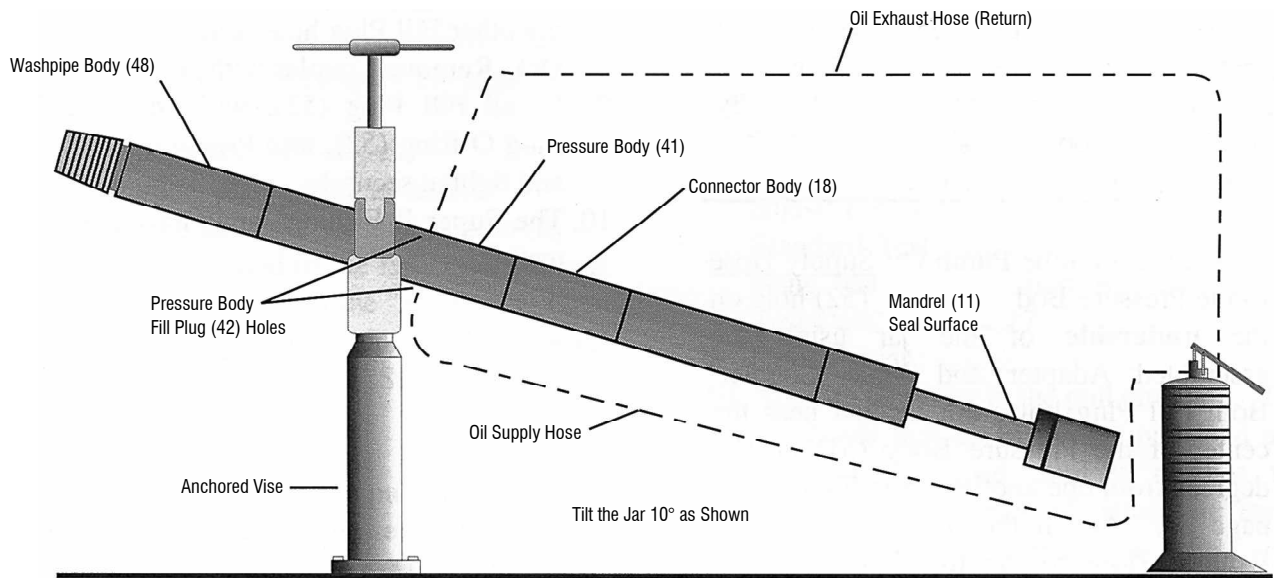


Figure 8
Initial Position of Super Fishing Jar During Filling Operation

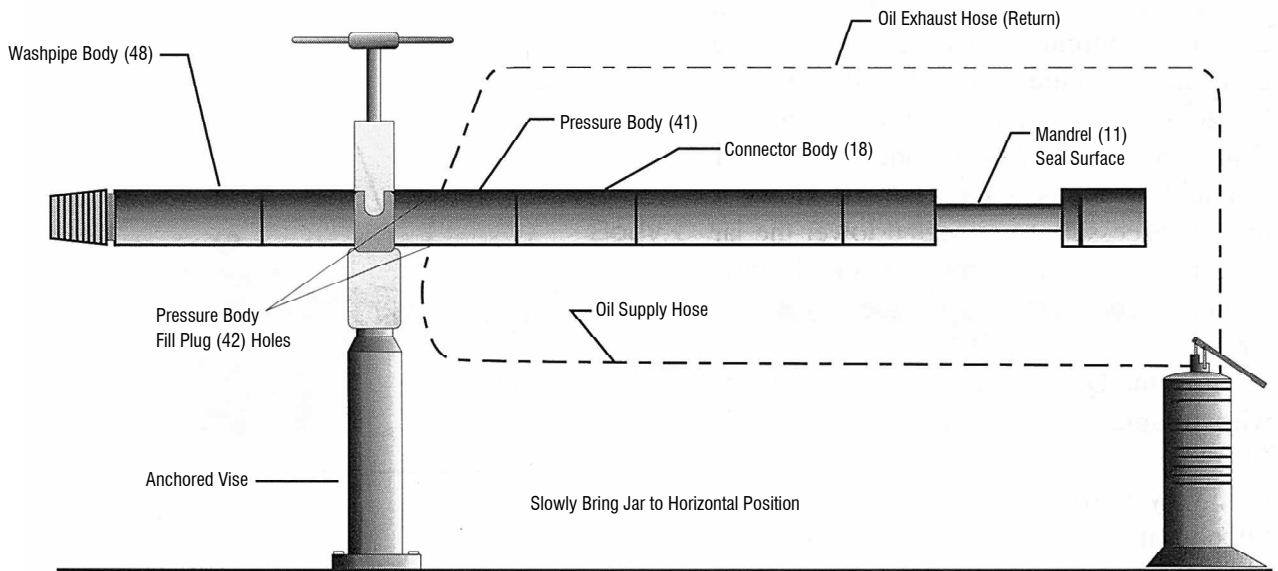


Figure 9
Final Position of Super Fishing Jar During Filling Operation

6. Install Fill Plug (42) with installed Fill Plug O-Ring (43) into **top** Fill Plug hole and tighten securely.
7. 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.
8. Install Fill Plug (42 with installed Fill Plug O-Ring (43) into Pressure Body (41) and tighten securely.
9. The Bowen Super Fishing Jar is now ready for testing.

Testing the Jar

After the Bowen Super Fishing Jar has been completely assembled and filled with Jar Lube, it is to be tested in a Bowen Jar Tester (or equal) (see Figure 1, page 6) to insure that it is functioning properly.

1. Screw the Jar Tester Subs on the Jar. Using a crane, place the Jar in the Jar Tester.
2. See Strength and Test Data, Chart B, page 15, for correct Low Pull Load for the size Jar being tested. Set the Jar Tester for this load.
3. Close the Jar. Actuate the Jar Tester in the pull direction. The Jar should pull up to the set pull load and maintain that load until it reaches its release point. Observe the movement of the Mandrel (11). It should move slow and steady. It should take a few minutes to pull through its stroke. When the Jar reaches its release point, the Mandrel (11) should pull easily and the pull load should be lower. Pull the Jar until it is completely open to be sure that it moves smoothly through its entire stroke. Repeat the Low Pull Test 4 to 6 times to assure uniform action.

NOTE: If the Jar does not pull through, increase the Low Pull Load setting by 2,000 lb. and repeat this test. If the Jar still does not pull through, the Jar is malfunctioning and the problem must be determined, corrected and the Jar retested. Contaminated Jar Lube and /or plugged slots on the bottom of the Cone are possible causes of a malfunction. Also, see Inspection of Parts on page 7.

4. See Strength and Test Data, Chart B, page 15, for the correct Standard Jar Tester Pull Load for the size jar being tested. Set the Jar Tester for this load.
5. Pull test the Jar 6 to 8 times. The test procedure is the same as in the Low Pull Test except the Jar will pull through faster (See procedure 3). If the Jar does not pull, at least up to the Minimum Standard Jar Tester Pull Load, the Jar is malfunctioning. The problem must be determined, corrected and the Jar retested before it is acceptable for field use.

NOTE: Possible causes of a malfunction are: the Jar not completely filled with Jar Lube; incorrect Jar Lube; diluted Jar Lube; damaged By-Pass Body (32), Cone (33), Seal Body (34), or Seal Body Seal (35); damaged bore in the Pressure Body (41) damaged Connector Body Packing (24 and 25 or 27); damaged O-Rings (40 and 39 or 12); damaged Floater (44) or Floater Seals (45, 46 and 47); or damaged fill plugs (42) or O-Rings (43). See inspection of Parts on pages 7.

6. Close the Jar and remove it from the Jar Tester. Remove the Jar Tester Subs. Install the tool Joint Thread Protectors (54 and 55). The Bowen Super Fishing Jar, after painting, is ready for field use.

Jar Service Kit

A **Jar Service Kit** (see page 17) is necessary to properly service the Bowen Super Fishing Jar. These kits are identical for every size Jar, so one kit may be used for any number of Jars. The kit does not include the Packing Assembly Sleeve for Mandrel or the Floater Positioning Tool. These parts are different for each size Jar and must be ordered separately (see Parts List, pages 18 – 20).

Chart A - Super Fishing Jar Maximum Recommended Tightening Torque for Threaded Connections

Assembly Part Number	Jar Size Connection	Jar Size		Top Sub To Mandrel (ft.-lb.)	Mandrel Body To Spline Body (ft.-lb.)	Splines Body To Connector (ft.-lb.)	Connector Body To Pressure Body (ft.-lb.)	Pressure Body To Washpipe Body (ft.-lb.)	Internal Joint Washpipe To Mandrel (ft.-lb.)
		O.D. (In.)	I.D. (In.)						
72888	2-3/8 REG.	3-1/8	1	1,640	—	2,650	3,520	3,330	750
145737	2-7/8 REG.	3-3/4	1-1/4	2,500	—	3,360	4,060	4,060	750
146544	2-3/8 I.F.	3-3/4	1-1/2	2,400	—	3,160	4,170	4,170	800
147902	2-3/8 EUE	3-3/4	1-7/8	2,260	—	3,050	3,690	3,690	1,100
80468	2-7/8 I.F.	4-1/4	2	3,400	—	4,230	5,100	5,100	1,000
79789	3-1/2 F.H. & I.F.	4-3/4	2	5,730	6,710	6,710	8,100	8,100	1,500
145484	4-1/2 F.H.	6	2	10,450	14,390	14,390	17,400	17,400	1,500
79691	4-1/2 I.F.	6-1/4	2-1/4	13,600	17,630	17,630	21,310	21,310	1,500
145440	5-1/2 REG.	6-3/4	2-3/8	15,980	21,160	21,160	25,560	25,560	2,700
72978	6-5/8 REG.	7-3/4	3-1/16	28,300	35,000	35,000	42,300	42,300	3,000

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. The tightening torque values were calculated assuming Itcolube or similar zinc-based grease on all threads and shoulders. Multiply chart values by .1382 to obtain Kg-m.

Chart B - Strength and Test Data for Bowen Super Fishing Jar

Warning! All jarring and pulling loads shown in the manual assume that the force is acting alone and is essentially along with major axis of the tool. If torque and tension or bending and tension are used together, the resulting combined stresses may lead to failure at substantially less than rated loads. Rotation and bending together can lead to fatigue.

Assembly Part Number	Jar Size Connection	Jar Size		Maximum Jarring Load		Tensile @ Yield In Lbs.	Torque At Yield	Jar Tester Pull Load	
		O.D. (in)	I.D. (in)	In Hole* (lbs)	After Jarring	(ft.-lb.)	Low**	Standard	
72888	2-3/8 REG.	3-1/8	1	59,000	240,000	3,280	9,000-12,000	30,000	
145737	2-7/8 REG.	3-3/4	1-1/4	78,000	324,000	5,000	12,000-16,000	39,000	
146544	2-3/8 I.F.	3-3/4	1-1/2	66,000	306,000	4,800	11,000-15,000	33,000	
147902	2-3/8 E.U.E.	3-3/4	1-7/8	48,000	258,000	4,520	10,000-15,000	24,000	
80468	2-7/8 I.F.	4-1/4	2	62,000	374,000	6,800	12,000-18,000	31,000	
79789	3-1/2 F.H. & I.F.	4-3/4	2	98,000	575,000	11,460	14,000-20,000	49,000	
145484	4-1/2 F.H.	6	2	196,000	913,000	20,900	14,000-20,000	98,000	
79691	4-1/2 I.F.	6-1/4	2-1/4	200,000	1.1 million	27,200	16,000-25,000	100,000	
145440	5-1/2 REG.	6-3/4	2-3/8	250,000	1.2 million	31,960	16,000-25,000	110,000	
72978	6-5/8 REG.	7-3/4	3-1/16	265,000	1.7 million	56,600	16,000-25,000	110,000	

The above tensile strengths are calculated theoretical yield strengths and are considered accurate to ±20%
 *Loads shown are maximum recommended pull loads. Pulling above the valve shown can damage the tools.
 **If Jar does not test at maximum low pull load shown, disassemble, inspect and repair tool.

Chart C - Super Fishing Jar Weight Chart

The following weights are provided as a guideline to the number of drill collars to be used and do not necessarily constitute the optimum weight for each hole condition which may be encountered.

Assembly Part No.	Connection	O.D. (Inches)	I.D. (Inches)	Weight Range (lbs)
72888	2-3/8 REG.	3-1/8	1	2,100-3,600
145737	2-7/8 REG.	3-3/4	1-1/4	3,000-5,000
147902	2-3/8 E.U.E.	3-3/4	1-7/8	
80468	2-7/8 I.F.	4-1/4	2	3,300-5,700
79789	3-1/2 I.F.	4-3/4	2	4,400-7,500
145484	4-1/2 F.H.	6	2	7,600-12,900
79691	4-1/2 I.F.	6-1/4	2-1/4	8,100-13,600
145440	5-1/2 REG.	6-3/4	2-3/8	9,400-16,200
72978	6-5/8 REG.	7-3/4	3-1/16	12,100-20,500

Chart D - Super Fishing Jar Floater Positioning

Assembly Part Number	Jar Size Connection	O.D. (In.)	I.D. (In.)	Steel Floater Number	Floater Position Normal Service (In.)	Floater Position High Temp. (In.)
72888	2-3/8 Reg.	3-1/8	1	151580/005	7-3/8	9-1/16
145737	2-7/8 REG.	3-3/4	1-1/4	151584/005	8-9/16	10-3/16
146544	2-3/8 I.F.	3-3/4	1-1/2	151583/005	8	9-11/16
147902	2-3/8 EUE	3-3/4	1-7/8	151577/005	8-1/4	10-1/8
80468	2-7/8 I.F.	4-1/4	2	151576/005	8-11/16	10-1/2
79789	3-1/2 F.H.	4-3/4	2	151578/005	10-9/16	12-13/16
	3-1/2 I.F.					
145484	4-1/2 F.H.	6	2	151579/005	10-5/8	12-5/8
79691	4-1/2 I.F.	6-1/4	2-1/4	151582/005	10-11/16	12-1/2
145440	5-1/2 REG.	6-3/4	2-3/8	151581/005	10-15/16	13
72978	6-5/8 REG.	7-3/4	3-1/16	102516/005	12-1/4	12-1/4

NOTE: Measure distance from floater face to pressure body end.

Users of Jars and Bumper Subs should be aware that milling or light drilling operations may develop stresses in these tools that are more complex than the simple torsional and tensile values listed in Bowen strength data. If unstabilized, the weight necessary for milling can induce bending forces that combine with torsional forces to generate very high stresses in some areas of the tool. Rotating in a deviated hole condition or with the tool in a neutral point may have the same effect.

The necessity for milling is recognized and this is not intended to advise against such operations, but merely to caution the user of possible dangers when rotating under the conditions described.

Jar Service Kit

A **Jar Service Kit** is necessary to properly service the Bowen Super Fishing Jar. These kits are identical for every size Jar, so one kit may be used for any number of Jars. The kit does not include the Packing Assembly Sleeve for mandrel or the Floater Positioning Tool. These parts are different for each size Jar and must be ordered separately (see Parts List, page 20).



Bowen Super Fishing Jar

Note: Major parts are listed in the order that they are assembled. Other parts are listed below the major part that they go in or on.										
Size Connection	2 ³ / ₈ API Reg.	2 ⁷ / ₈ API Reg.	2 ³ / ₈ API EUE	2 ³ / ₈ API I.F.	2 ⁷ / ₈ API I.F.	3 ¹ / ₂ API I.F.	4 ¹ / ₂ API F.H.	4 ¹ / ₂ API I.F.	5 ¹ / ₂ API Reg.	6 ⁵ / ₈ API Reg.
Outside Diameter (Inches)	3 ¹ / ₈	3 ³ / ₄	3 ³ / ₄	3 ³ / ₄	4 ¹ / ₄	4 ³ / ₄	6	6 ¹ / ₄	6 ³ / ₄	7 ³ / ₄
Inside Diameter (Inches)	1	1 ¹ / ₄	1 ⁷ / ₈	1 ¹ / ₂	2	2	2	2 ¹ / ₄	2 ³ / ₈	3 ¹ / ₁₆
Complete Assembly	Part No. 72888	145737	147902	146544	80468	79789	145484	79691	145440	72978
	Weight 160	—	—	—	320	465	—	890	—	1464

Replacement Parts

Item No.	Part No.	72889	145739	147903	146545	80469	79790	145492	79708	145441	72979
1 Spline Body	Part No.	72889	145739	147903	146545	80469	79790	145492	79708	145441	72979
	Weight	38	—	—	—	47	—	—	—	—	—
	No. Req'd.	1	1	1	1	1	1	1	1	1	1
2 Spline Body I.D. O-ring	Part No.	568329	568332	568335	568333	568337	—	—	—	—	—
	No. Req'd.	1	1	1	1	1	—	—	—	—	—
3 Back Up Ring F/ Spline Body I.d. O-ring	Part No.	78281	145740	147904	146546	80471	—	—	—	—	—
	No. Req'd.	2	2	2	2	2	—	—	—	—	—
4 Spline Body Wiper	Part No.	72892	145741	147905	146547	80472	—	—	—	—	—
	No. Req'd.	1	1	1	1	1	—	—	—	—	—
5 Mandrel Body	Part No.	—	—	—	—	—	79791	145486	79714	145442	78266
	Weight	—	—	—	—	—	32	—	70	—	110
	No. Req'd.	—	—	—	—	—	1	1	1	1	1
6 Mandrel Body O-ring (Small)	Part No.	—	—	—	—	—	—	—	—	—	568258
	No. Req'd.	—	—	—	—	—	—	—	—	—	1
7 Mandrel Body O-ring	Part No.	—	—	—	—	—	568242	568250	568251	568255	568260
	No. Req'd.	—	—	—	—	—	1	1	1	1	1
8 Mandrel Body I.D. O-ring	Part No.	—	—	—	—	—	568340	568343	568346	568348	568432
	No. Req'd.	—	—	—	—	—	1	1	1	1	1
9 Back Up Ring F/ Mandrel Body I.D. O-ring	Part No.	—	—	—	—	—	79792	145487	79693	145443	72981
	No. Req'd.	—	—	—	—	—	2	2	2	2	2
10 Mandrel Body Wiper	Part No.	—	—	—	—	—	79793	145488	79701	145444	72982
	No. Req'd.	—	—	—	—	—	1	1	1	1	1
11 Mandrel	Part No.	72893	145742	147906	146548	80473	79794	145489	79711	145445	72983
	Weight	36	—	—	—	82	120	—	200	—	440
	No. Req'd.	1	1	1	1	1	1	1	1	1	1
12 Mandrel O-ring (Lower)	Part No.	—	—	—	—	—	—	568228	568230	568232	568240
	No. Req'd.	—	—	—	—	—	—	1	1	1	1
13 Mandrel O-ring (Middle)	Part No.	568326	568329	568331	568330	568333	568336	568339	568342	568344	568428
	No. Req'd.	1	1	1	1	1	1	1	1	1	1
14 Back Up Ring F/ Mandrel Middle O-ring	Part No.	78282	145743	147907	146549	80474	79795	145490	79692	145446	72984
	No. Req'd.	2	2	2	2	2	2	2	2	2	2
15 Mandrel Wiper	Part No.	72895	145744	147908	146550	80475	79796	145491	79702	145447	72985
	No. Req'd.	1	1	1	1	1	1	1	1	1	1
16 Top Sub	Part No.	72896	145738	147909	146551	80476	79797	145485	79751	145448	72986
	Weight	17	—	—	—	42	53	—	125	—	189
	No. Req'd.	1	1	1	1	1	1	1	1	1	1
17 Top Sub O-ring	Part No.	568226	568332	568335	568333	568337	568237	568240	568243	568245	568253
	No. Req'd.	1	1	1	1	1	1	1	1	1	1

Bowen Super Fishing Jar

Complete Assembly	Part No.	72888	145737	147902	146544	80468	79789	145484	79691	145440	72978
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Replacement Parts

Item No.	Part No.	72897	145745	147910	146552	80477	79798	145493	79710	145449	729
18 Connector Body	Part No.	72897	145745	147910	146552	80477	79798	145493	79710	145449	729
	Weight	21	—	—	—	37	53	—	93	—	140
	No. Req'd.	1	1	1	1	1	1	1	1	1	1
19 Connector Body O-ring (Small)	Part No.	568141	568232	568233	568233	568236	568239	—	—	—	568258
	No. Req'd.	2	2	1	1	1	1	—	—	—	1
20 Connector Body O-ring (Large)	Part No.	568144	568234	568235	568235	568153	568242	568250	568251	568255	568260
	No. Req'd.	2	2	2	2	2	2	2	2	2	2
21 Connector Body I.D. O-ring	Part No.	568327	568329	568333	568330	568334	568336	568337	568339	568341	568426
	No. Req'd.	1	1	1	1	1	1	1	1	1	1
22 Back Up Ring F/ Connector Body I.D. O-ring	Part No.	78289	145746	147911	146549	80478	79799	145494	79695	145450	72989
	No. Req'd.	1	2	2	2	2	2	2	2	2	2
23 Connector Body Wiper	Part No.	72898	145747	147912	146554	80479	79800	145495	79700	145451	72988
	No. Req'd.	1	1	1	1	1	1	1	1	1	1
24 Connector Body I.D. Packing Set	Part No.	—	—	—	—	—	—	148628	148633	148638	148643
	No. Req'd.	—	—	—	—	—	—	1	1	1	1
25 Connector Body O.D. Packing Set	Part No.	—	—	—	—	—	—	148629	148634	148639	148644
	No. Req'd.	—	—	—	—	—	—	1	1	1	1
26 Connector Body Packing Male Adapter	Part No.	148312	148307	147914	146556	148302	148316	—	—	—	—
	No. Req'd.	1	1	1	1	1	1	—	—	—	—
27 Connector Body Packing Set	Part No.	148309	148304	147913	146555	148299	148293	—	—	—	—
	No. Req'd.	1	1	1	1	1	1	—	—	—	—
28 Connector Body Packing Female Adapter	Part No.	148313	148308	148885	150926	148303	148317	—	—	—	—
	No. Req'd.	1	1	1	1	1	1	—	—	—	—
29 Connector Body O.D. Packing Retainer	Part No.	—	—	—	—	—	—	145498	79703	145454	72992
	Weight	—	—	—	—	—	—	—	⁵ / ₈	—	1
	No. Req'd.	—	—	—	—	—	—	1	1	1	1
30 Connector Body O.D. Packing Retainer Ring	Part No.	—	—	—	—	—	—	79697	79697	145455	78427
	No. Req'd.	—	—	—	—	—	—	1	1	1	1
31 Piston Assembly (Cone Type) (Consists Of Items 32 Thru 37)	Part No.	72903	145753	147915	146557	80482	79801	145503	81617	145456	69274
	No. Req'd.	1	1	1	1	1	1	1	1	1	1
32 By-pass Body	Part No.	72905	145754	147916	146558	80483	79802	145504	79704	145457	69277
	Weight	¹ / ₈	—	—	—	¹ / ₄	¹ / ₂	—	1	—	1
	No. Req'd.	1	1	1	1	1	1	1	1	1	1
33 Cone	Part No.	72904	145755	147917	146559	80484	80809	145505	79709	145458	69275
	Weight	1	—	—	—	¹ / ₄	5	—	12	—	14
	No. Req'd.	1	1	1	1	1	1	1	1	1	1
34 Seal Body	Part No.	72906	148347	147918	146560	148344	79803	145506	79705	145459	69276
	Weight	¹ / ₄	—	—	—	³ / ₄	¹ / ₂	—	3	—	³ / ₂
	No. Req'd.	1	1	1	1	1	1	1	1	1	1
35 Seal Body Seal O-ring	Part No.	568223	568225	568229	568226	568230	568335	568336	568338	568340	568349
	No. Req'd.	1	1	1	1	1	1	1	1	1	1
36 Seal Body Seal Protector Ring	Part No.	148329	148345	147919	150925	148342	148338	148503	148493	148501	148499
	No. Req'd.	1	1	1	1	1	1	1	1	1	1
37 Seal Body Seal Non Extrusion Ring	Part No.	148328	148346	148886	146561	148343	148337	148504	148494	148502	102253
	No. Req'd.	1	1	1	1	1	1	1	1	1	1
38 Washpipe	Part No.	72908	145752	147920	146562	80487	79805	145502	79712	145461	73058
	Weight	12	—	—	—	21	29	—	46	—	97
	No. Req'd.	1	1	1	1	1	1	1	1	1	1
39 Washpipe O-ring (Small)	Part No.	568221	568130	—	568225	568228	568229	—	—	30-15	—
	No. Req'd.	1	1	—	1	1	1	—	—	1	—
40 Washpipe O-ring (Large)	Part No.	568130	568133	568142	568226	568230	568231	568233	568235	568237	568246
	No. Req'd.	1	1	1	1	1	1	1	1	1	1
41 Pressure Body	Part No.	72900	145750	147921	146563	80488	79806	145500	79713	145462	72994
	Weight	34	—	—	—	64	48	—	160	—	260
	No. Req'd.	1	1	1	1	1	1	1	1	1	1
42 Fill Plug	Part No.	617T	617T	617T	617T	617T	617T	329T	329T	329T	329T
	No. Req'd.	2	2	2	2	2	2	2	2	2	2
43 Fill Plug O-ring	Part No.	568005	568005	568005	568005	568005	568005	568006	568006	568006	568006
	No. Req'd.	2	2	2	2	2	2	2	2	2	2

Bowen Super Fishing Jar

Complete Assembly	Part No.	72888	145737	147902	146544	80468	79789	145484	79691	145440	72978
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Replacement Parts (Continued)

Item No.		Part No.	151580	151584	151577	151583	151576	151578	151579	151582	151581	102303
44	Floater	Part No.	151580	151584	151577	151583	151576	151578	151579	151582	151581	102303
		Weight.	1	2.3	2	1.8	2.7	2.3	7.1	7.7	10.3	—
		No. Req'd.	1	1	1	1	1	1	1	1	1	1
45	Floater O.D. Seal	Part No.	568227	568231	568232	568232	568235	568340	568349	568350	568354	568434
		No. Req'd.	3	3	3	3	3	3	3	3	3	3
		Part No.	72910	151684	151686	146565	151678	151677	151688	151675	73779	151691
46	Floater I.D. Seal Set	Part No.	72910	151684	151686	146565	151678	151677	151688	151675	73779	151691
		No. Req'd.	2	2	2	2	2	2	2	2	2	2
		Part No.	568224	568225	568230	568330	568231	568335	568337	568339	568341	568426
47	Floater I.D. O-ring	Part No.	568224	568225	568230	568330	568231	568335	568337	568339	568341	568426
		No. Req'd.	1	1	1	1	1	1	1	1	1	1
		Part No.	72913	145751	147924	146566	80491	79915	145501	79707	145465	73063
48	Washpipe Body	Part No.	72913	145751	147924	146566	80491	79915	145501	79707	145465	73063
		Weight	32	—	—	—	47	68	—	167	—	211
		No. Req'd.	1	1	1	1	1	1	1	1	1	1
49	Washpipe Body O-ring (Small)	Part No.	568139	568231	568232	568232	568235	568238	568247	568248	568251	568257
		No. Req'd.	1	1	1	1	1	1	1	1	1	1
		Part No.	568144	568234	568235	568235	568153	568242	568250	568251	568255	568260
50	Washpipe Body O-ring (Large)	Part No.	568144	568234	568235	568235	568153	568242	568250	568251	568255	568260
		No. Req'd.	1	1	1	1	1	1	1	1	1	1

Required Accessories

51	Packing Assembly Sleeve For Mandrel	Part No.	74957	145762	147925	146567	80494	79813	145512	79755	145478	70635
		Weight	—	—	—	—	—	—	—	—	—	—
		No. Req'd.	1	1	1	1	1	1	1	1	1	1
52	Floater Positioning Tool Required Accessory	Part No.	145215	153141	153142	153142	153144	153145	145513	153146	153147	153148
		Weight.	5	—	—	—	9	6	—	11	—	17
		No. Req'd.	1	1	1	1	1	1	1	1	1	1
53	Connector Body Wiper Installation Tool	Part No.	81897	146996	147927	146768	146749	146741	146748	—	—	—
		Weight.	—	—	—	—	—	—	—	—	—	—
		No. Req'd.	1	1	1	1	1	1	1	1	—	—

Optional - Extra

54	Thread Protector For Tool Joint Box	Part No.	146986	146984	149032	147649	147559	146959	63102	147552	63103	147540	
		No. Req'd.	1	1	1	1	1	1	1	1	1	1	
		Part No.	146987	146985	149031	63091	147558	146960	63083	147551	63084	147538	
55	Thread Protector For Tool Joint Pin	Part No.	146987	146985	149031	63091	147558	146960	63083	147551	63084	147538	
		No. Req'd.	1	1	1	1	1	1	1	1	1	1	
		Part No.	145213	145213	145213	Only one Service Kit Required For All Sizes of Jars							
56	Service Kit	Part No.	145213	145213	145213	Only one Service Kit Required For All Sizes of Jars							
		Weight.	—	—	—	For All Sizes of Jars							
		No. Req'd.	1	1	1								
57	O-ring Packing Set	Part No.	72914	145760	147928	146569	80492	79811	145510	79696	145466	73064	
		Weight	—	—	—	—	—	—	—	—	—	—	
		No. Req'd.	1	1	1	1	1	1	1	1	1	1	
58	Complete Packing Set (Includes O-ring Packing Set)	Part No.	72915	145761	147929	146570	80493	79812	145511	79698	145467	73065	
		Weight	—	—	—	—	—	—	—	—	—	—	
		No. Req'd.	1	1	1	1	1	1	1	1	1	1	
59	Thread Lubricant (KOPR-KOTE)	Part No.	153823										
60	Bowen Jar Lube	Part No.	49842										

How To Order:

- 1.) Name and Number of Assembly Or Part.
- 2.) Size and Type of Connections, If other than standard.
- 3.) Outside Diameter, If other than standard.
- 4.) Any spares or extras desired, by Name and Number.

Miscellaneous O-ring Seals are normally furnished sealed plastic bags of 10, 25, or 100 pieces each to prevent deterioration. Other quantities will be furnished in unsealed pack ages. Packing Sets, however, will always be furnished in sealed plastic bags.

Corporate Headquarters

10000 Richmond Avenue
Houston, Texas 77042
United States
Phone: 713 346 7500
Fax: 713 346 7959

Alaska
4111 Ingra
Anchorage, Alaska 99503
United States
Phone: 907 563 5253
Fax: 907 561 0071

California
4117 Atlas Court
Bakersfield, California 99308
United States
Phone: 661 395 0165
Fax: 661 328 1827

Louisiana
108 Nova Drive
Broussard, Louisiana 70518
United States
Phone: 337 839 2400
Fax: 337 839 2211

190 Thompson Road
Houma, Louisiana 70363
United States
Phone: 985 851 1111
Fax: 985 851 1117

Mississippi
2930 Industrial Blvd.
Laurel, Mississippi 39440
United States
Phone: 601 649 8671
Fax: 601 649 8673

New Mexico
#14 CR 5860
Farmington, New Mexico 87401
United States
Phone: 505 326 4303
Fax: 505 326 4304

North Dakota
3202 1st Avenue West
Williston, North Dakota 58801
United States
Phone: 701 774 0091
Fax: 701 774 0092

Oklahoma
3800 Thomas Road
Oklahoma City, Oklahoma 73179
United States
Phone: 405 677 2484
Toll Free: 877 760 1711
Fax: 405 677 2457

Texas
1249 Commerce Road
Alice, Texas 78332
United States
Phone: 361 664 8013
Fax: 361 664 0462

8411 Irvington Boulevard*
Houston, Texas 77022
United States
Phone: 713 691 7800
Fax: 713 691 7807

2810 Highway 135 North
Kilgore, Texas 75662
United States
Phone: 903 984 2553
Fax: 903 984 7170

10720 West I-20 East
Odessa, Texas 79765
United States
Phone: 432 563 1173
Fax: 432 563 1182

30444 Southwest Freeway
Rosenberg, Texas 77471
United States
Phone: 281 341 5365
Fax: 281 344 1986

Utah
1553 East Highway 40
Vernal, Utah 84078
United States
Phone: 435 789 0670
Fax: 435 789 6568

West Virginia
Route 2, Murphy Run Road
Clarksburg, West Virginia 26301
United States
Phone: 304 622 4303
Fax: 304 623 2174

Wyoming
1283 N. Derrick Drive
Unit 1, Box 2
Casper, Wyoming 82604
United States
Phone: 307 237 3100
Fax: 307 237 2546

Canada
9120 – 34A Avenue
Edmonton, Alberta T6E 5P4
Canada
Phone: 780 702 5209
Fax: 780 463 2348

3550 93 Street*
Edmonton, Alberta T6E 5N3
Canada
Phone: 780 944 3929
Fax: 780 430 0760

1100 540 5th Avenue SW (Mailing)
1010 540 5th Avenue SW (Office)
Calgary, Alberta T2P 0M2
Canada
Phone: 403 250 8000
Fax: 403 294 5790

England
2 Isbourne Way
Winchcombe
Cheltenham
Glos, GL54 5NS
England
Phone: 44 (0) 1242 603975
Fax: 44(0) 1242 602614

Dubai
Nr. R/A 13, Daimler Chrysler Street
P.O. Box 61490
Jebel Ali Free Zone
Dubai
UAE
Phone: 971 4 8838776
Fax: 971 4 8838795

Indonesia
Cilandak Commercial Estate Unit 105
Jl. Raya Cilandak KKO
P.O. Box 7541
Jakarta, 12560
Indonesia
Phone: 62 21 782 6088
Fax: 62 21 782 6086

Scotland
10 Kirkton Avenue
Pitmedden Road Industrial Estate
Dyce, Aberdeen AB21 0BF
Scotland
Phone: 441 224 334800
Fax: 441 224 723034

Singapore
9 Tuas Avenue 5
Singapore, 639335
Singapore
Phone: 65 68611566
Fax: 65 68610728

Germany
Edesser Straße 1
31234 Edemissen Berkhöpen
Postfach 31232
Germany
Phone: 49 5176 97670
Fax: 49 5176 9767 22

* Denotes Manufacturing and Engineering facilities

Downhole Solutions

Drilling Solutions

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Lifting and Handling Solutions

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Tubular and Corrosion Control Solutions

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