

# Bowen™ Fishing Jar Systems



More than a name.

Our Legacy.



**Bowen™ tools** have a rich history in the fishing business. From the creation of the first overshoot in the industry in 1935 and continuing through today, Bowen has set the standard for fishing tool technology. We used that experience and expertise to create a suite of jarring systems with products suited to any fishing application.

Bowen jarring systems from NOV consist of a **Fishing jar** and an **Intensifier™ tool**. Our fishing jars create the impact and impulse force needed to free the stuck fish, and our Intensifier tools work to increase the jarring impact. Jars can be run with or without a corresponding Intensifier tool. We currently offer three lines of jarring systems: **Bowen Type Z Oil Jar, Bowen Super Jar, and Bowen Super II Jar.**



## Bowen™ Fishing Jar Systems

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### Bowen Jars

Jarring is the process of transferring stored energy (trapped in the string or the Intensifier) into kinetic energy by releasing the detent mechanism in the jar. This release allows a portion of the jar to move rapidly and strike against a robust portion inside the jar itself. This impact is delivered through the string and acts on the stuck fish. The impact force, in pounds, is calculated by the mass that is moving and the speed at which the mass is moving. The duration, that the impact exists for is considered impulse. This is a calculation of the force multiplied by the time in which the impact lasts.

The jars in our fishing systems reflect years of experience and continuous improvement. Our engineers have taken field data and made ongoing updates to our jarring technologies to deliver the proven, reliable impact forces needed to free your fish. All the jars in our suite are straight-pull operated, and are easy to assemble and use. Our patented metering action provides operators with full control of the impact force, giving the ability to deliver a light or heavy blow. Successive blows can be struck as often as the operator can slack off and raise the running string.

Our suite of jarring systems can be used for fishing, testing, coring, reaming, light drilling, side tracking, and washover operations.



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### Bowen Type Z Oil Jar

- First generation jar
- Uses piston rings for metering fluid
- Not hydrostatically balanced (no floater piston)
- Many have 2-piece mandrels
- Short length
- Cost-effective



### Bowen Super Jar

- Second generation jar
- Uses cone and seal body metering mechanism
- Hydrostatically balanced (has floater piston)
- Many have 2-piece mandrels

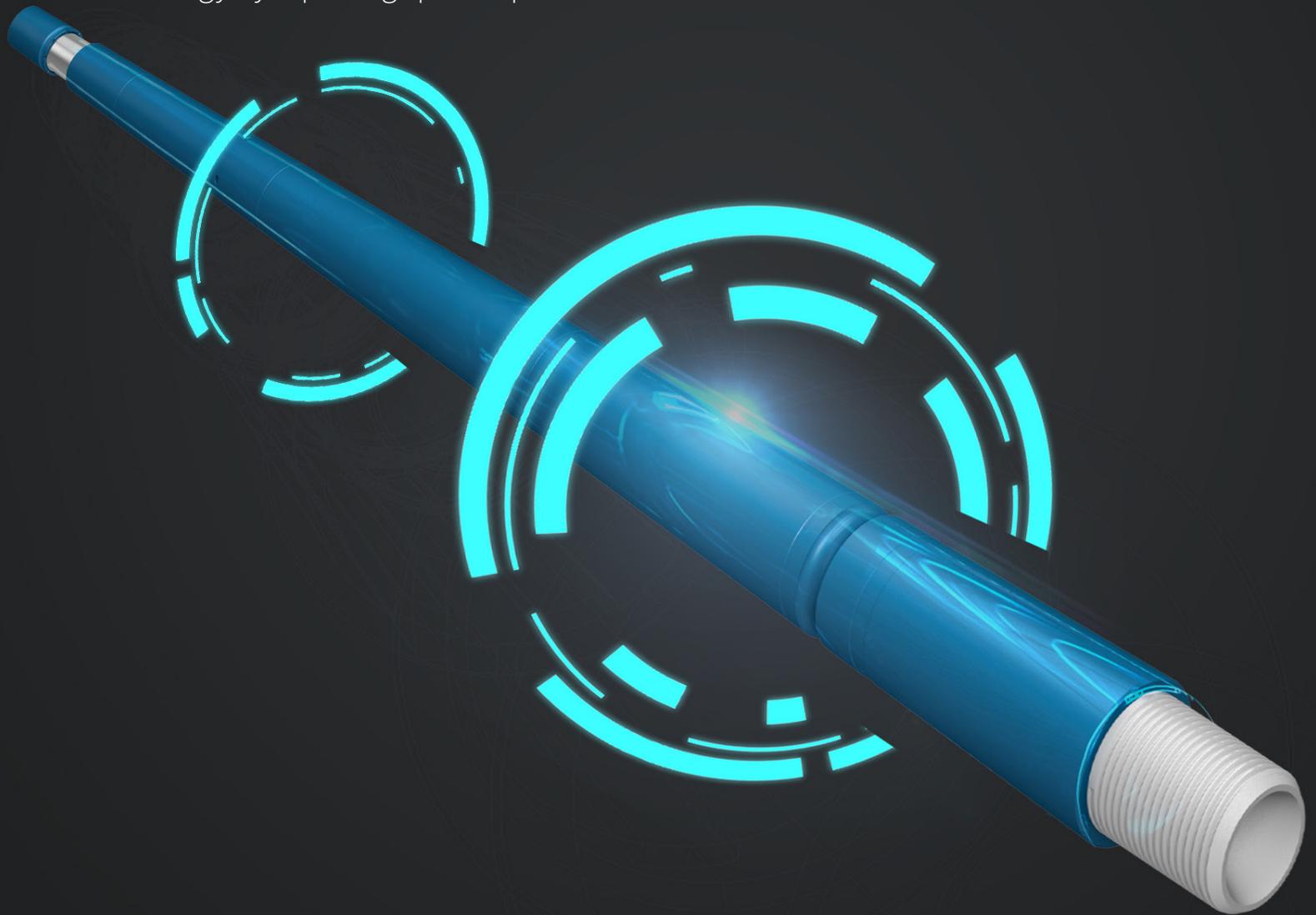


### Bowen Super II Jar

- Third generation jar, incorporating all previous designs
- Most robust jarring system available
- All have integral mandrels
- Available with JarMax technology in certain sizes
- May be used for heavy milling and/or short term light drilling operations



**JarMax technology**, an industry-leading innovation, allows you to get the most out of your jar, without risk of damaging the tool. It includes an over-pressure release mechanism, which prevents the tool from being over-pulled. If the maximum load is exceeded during jarring, the mechanism allows excess pressure to be released past the cone and seal body. An existing standard Super II Jar can be retrofitted into an assembly with JarMax technology by replacing specific parts.



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### Bowen Jar Intensifier™ Tools

The Bowen Jar Intensifier tool is run in conjunction with a Bowen Jar: Bowen Type Z Oil Jar, Bowen Super Jar, or Bowen Super II Jar. Its function is to supply acceleration to the upper end of the jar and lower portion of the work string during the jarring stroke, enhancing the impact force of the fishing jar. A secondary advantage of the tool is its ability to absorb much of the shock of the rebounding string after the jarring stroke, protecting tools and string from damage. Each Intensifier tool is designed to match a corresponding Bowen jar.

The Intensifier tool is essentially a fluid spring that stores energy when a strain is pulled on the running string. When the strain is removed by the free stroke of the jar, the stored energy is released, accelerating the drill collars and jar end upward until a blow of high impact is struck.

Full torque may be transmitted through the Intensifier tool, while also maintaining the ability to provide full circulation. Operation of the tool is very simple, requiring only straight pull, as rapidly or as slowly as required by the operation.



### NOV Jar Placement Program

The effectiveness of fishing jars depends not only on the design of the jar, but also on:

- Placement of the jar in the fishing string
- Fishing string design
- Hole conditions
- Description of fish

Proper placement can affect your jar's performance by a factor of as much as four. Simple rules of thumb for jar placement do not always work. Recognizing the importance and complexity of analyzing jarring mechanics, we developed our proprietary NOV Jar Placement Program.

### The Importance of the Stress Wave Theory

The energy for jarring comes from the spring effect of the drill string when it is either stretched or compressed. When the jar trips, the sudden release of energy does not instantaneously go to the stuck point. Rather, the energy is transmitted by stress waves which travel at the speed of sound in metal. This energy transmission is further complicated by the following:

- Stress waves are partially transmitted and partially reflected at any change in drill string cross-section.
- Friction between the drill string and hole acts to dissipate the stress wave's energy

Sometimes moving the jar only a few feet up or down in the fishing string can drastically change how the stress waves add together to create jarring force on the stuck point.

## The Impact Impulse Factor

To move a fish, the jarring force (impact load) must exceed the sticking force. How far the fish moves depends on the duration of the impact load. The combined effect of impact load and duration is called impulse.

With optimum jar placement, the jar will deliver an impact load greater than the sticking force and provide the largest possible impulse.

## The NOV Solution

We spent many years perfecting software that provides optimum results in jarring operations. Our proprietary Jar Placement Program includes the specs and operational parameters of Bowen fishing tools, providing you a level of assurance and precision not possible with other jar placement software.

### **NOV Jar Placement Program Features and Benefits**

- Analyzes stress waves for each placement configured
- Allows unlimited number of drill string and bottom hole assembly changes/configurations
- Calculates the effects of hole angle, hole curvature, and frictional drag
- Analyzes straight, directional, and horizontal holes
- Designed to model all Bowen jars and Intensifier tools
- Provides separate programs for drilling and fishing to allow appropriate data input and output results
- Supplies rapid solutions in the office or in the field
- Backed by years of proven success in all types of field applications

To download the NOV Jar Placement Program, visit: [nov.com/jarplacement](https://nov.com/jarplacement)

# Bowen™ Fishing Jar Systems

## Jar Reference Chart

Tool OD (in.)	Tool ID (in.)	Type	Part No.	Connection (in.)	Max Jarring Load (lbs)	Max Lift After Jarring (lbs)	Total Stroke (in.)	Max Torque at Yield (ft-lbs)
1 5/8	1/4	Type Z	70822	1 AMMT	15400	43000	7 1/16	260
1 13/16	5/16	Type Z	74723	1 13/16 WFJ	18000	59400	7	340
2 1/4	3/8	Type Z	54020	1 1/4 Reg	21000	118500	6 15/16	1800
2 7/8	1	Super II	504789	2 3/8 PAC	37500	200000	10 1/4	5000
2 29/32	1	Type Z	68010	2 3/8 PH6	35400	194800	11 7/16	2260
3 1/16	1 1/2	Type Z	55670	2 7/8 PAC / 2 3/8 EUE	27800	160200	11 9/16	2200
3 1/16	1 1/2	Super II	500635	2 7/8 PAC / 2 3/8 EUE	35000	195000	11 3/4	4300
3 1/8	1	Type Z	52504	2 3/8 Reg	32400	229200	11 13/16	4060
3 1/8	1	Super	72888	2 3/8 Reg	59000	240000	11 3/4	3280
3 1/8	1	Super II	153283	2 3/8 Reg	59000	257000	11 3/4	5630
3 3/4	1 7/8	Type Z	52497	2 3/8 EUE	46500	179500	10 1/8	2980
3 3/4	1 7/8	Super	147902	2 3/8 EUE	48000	258000	10	4520
3 3/4	1 1/4	Type Z	52506	2 7/8 Reg	56500	345000	11 13/16	7640
3 3/4	1 1/4	Super	145737	2 7/8 Reg	78000	324000	11	5000
3 3/4	1 1/2	Type Z	52528	2 3/8 IF	46000	299700	12 1/8	5340
3 3/4	1 1/2	Super	146544	2 3/8 IF	66000	306000	10	4800
4 1/4	1 15/16	Type Z	52502	2 7/8 IF	46700	430300	11 13/16	9920
4 1/4	2	Super	80468	2 7/8 IF	62000	374000	11	6800
4 1/2	2 3/8	Type Z	52653	2 7/8 EUE	49000	375000	12 1/4	11160
4 3/4	1 1/2	Type Z	52530	3 1/2 FH	85000	591900	11 13/16	18420
4 3/4	2	Type Z	52500	3 1/2 IF / 3 1/2 FH	74500	468800	13 5/16	17200
4 3/4	2	Super	79789	3 1/2 IF	98000	575000	12	11460
4 3/4	2 1/4	Super II	152790	3 1/2 IF	100000	484000	12	16700
4 3/4	2 1/4	Super II JarMax	507166	3 1/2 IF / 3 1/2 FH	100000	484000	12	16700
6	2	Type Z	52498	4 1/2 FH	136400	937000	11 7/16	34320
6	2	Super	145484	4 1/2 FH	196000	913000	12	20900
6 1/4	2 1/4	Type Z	52544	4 1/2 IF	159000	917400	14 3/8	40680
6 1/4	2 1/4	Super	79691	4 1/2 IF	200000	1100000	12	27200
6 1/4	2 1/4	Super II	152564	4 1/2 IF	200000	900000	12	36300
6 1/4	2 1/4	Super II JarMax	506248	4 1/2 IF	200000	900000	12	36300
6 3/4	2 3/8	Type Z	52680	5 1/2 Reg	172800	1013000	14 11/16	48660
6 3/4	2 3/8	Super	145440	5 1/2 Reg	250000	1200000	12	31960
7 3/4	3 1/16	Type Z	52711	6 5/8 Reg	149000	1587900	14 3/8	64020
7 3/4	3 1/16	Super	72978	6 5/8 Reg	265000	1700000	12	56600
7 3/4	3 1/16	Super II	152408	6 5/8 Reg	265000	1580000	12	76000
9	3 3/4	Type Z	66346	7 5/8 Reg	214000	1621000	13 13/16	92260

## Intensifier Reference Chart

Tool OD (in.)	Tool ID (in.)	Part No.	Connection (in.)	Pull Load to Open Fully (lbs)	Max Lift After Jarring (lbs)	Total Stroke (in.)	Max Torque at Yield (ft-lbs)
1 5/8	1/4	70957	1 AMMT	14000	46300	6	260
1 13/16	5/16	64460	1 13/16 WFJ	18100	59400	6	340
2 1/4	3/8	50640	1 1/4 Reg	20700	118500	8	1800
2 7/8	1	504926	2 3/8 PAC	37500	202000	6	5000
2 29/32	1	68262	2 3/8 PH6	37000	194800	12	2260
3 1/16	1 1/2	500651	2 7/8 PAC / 2 3/8 EUE	35000	202000	6	4300
3 1/8	1	55867	2 3/8 Reg	30000	229000	8	4068
3 3/4	1 7/8	50660	2 3/8 EUE	43000	179500	7 5/8	2980
3 3/4	1 1/4	55895	2 7/8 Reg	52000	345000	8 1/2	7640
3 3/4	1 1/2	55747	2 3/8 IF	43500	299700	7 7/8	5340
4 1/4	1 15/16	55664	2 7/8 IF	43000	430300	8 5/8	9920
4 1/2	2 3/8	50708	2 7/8 EUE	49000	375000	10 3/8	11160
4 3/4	1 1/2	50700	3 1/2 FH	78000	591900	8 7/8	18420
4 3/4	2	55812	3 1/2 IF / FH	63000	468800	10 1/8	17200
4 3/4	2 1/4	153445	3 1/2 IF	100000	281000	11	15200
6	2	55860	4 1/2 FH	128500	937000	8 5/8	34320
6 1/4	2 1/4	55905	4 1/2 IF	147000	917000	13	40680
6 1/2	2 1/2	506610	4 1/2 IF	220000	940000	8 3/8	68750
6 3/4	2 3/8	50720	5 1/2 Reg	172900	1013800	13	48660
7 3/4	3 1/16	55910	6 5/8 Reg	126000	1587900	13	64020
7 3/4	3 1/16	78964	6 5/8 Reg	220000	1600000	13	52700
9	3 3/4	66372	7 5/8 Reg	200000	1621000	13	92260

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