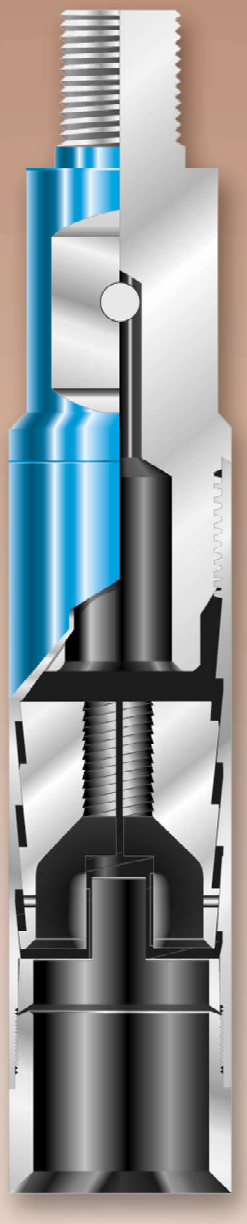
SUCKER ROD OVERSHOTS

Instruction Manual 1010



Series 10 and 20 Sucker Rod Overshots

NATIONAL OILWELL VARCO

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Series 10 and 20 Sucker Rod Overshots

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.

Twenty-fifth Printing, September 2005

General Description

Bowen Sucker Rod Overshots are sturdy, compact units designed to engage sucker rods or other items used inside of tubing. Designed and developed upon the same principle as other Bowen Overshots, they are the most effective means for the recovery of sucker rods.

Use

Bowen Series 10 Overshots are designed to recover non-hardened Sucker Rod Boxes up to 2" O.D. inside of $2^{7}/_{8}$" tubing and up to $1^{5}/_{8}$" O.D. inside of $2^{3}/_{8}$" tubing. Basket Grapples are recommended for fishing for hardened and ground boxes.

Bowen Series 20 Overshots are short catch sucker rod overshots, which provide a means for engaging the exposed portion of a fish too short to be engaged with conventional catch overshot.

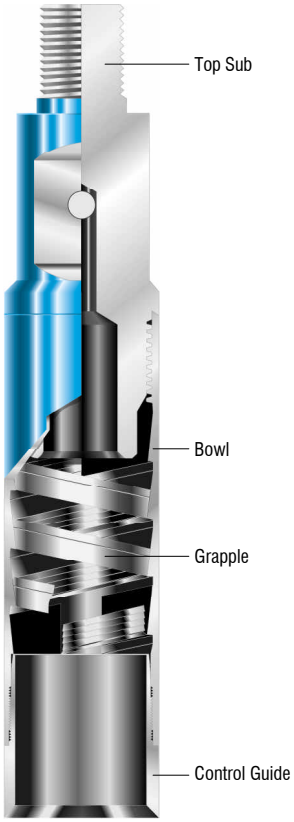
Bowen Sucker Rod Overshots fitted with tubing thread Top Subs and Oversize Guides are ideally suited for engaging the fishing neck of wire line rope sockets and retrieving wire line tools such as gun perforators lost inside of casing.

Bowen Series 10 and 20 Overshots will effectively catch fish as much as $^{1}/_{64}$" maximum undersize and $^{1}/_{64}$" maximum oversize.

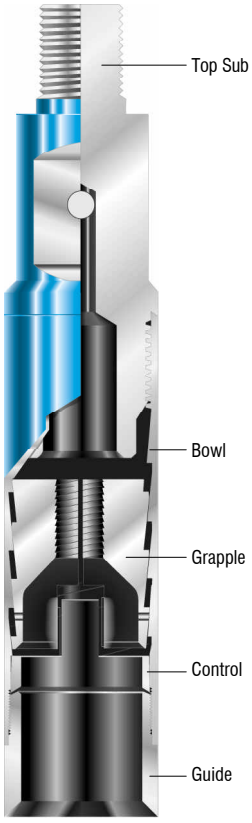
Construction

A Bowen Series 10 Sucker Rod Overshot consists of a Top Sub, a Bowl, a Spiral Grapple and a Control Guide. When a Basket Grapple is used in a Series 10 assembly, a Basket Grapple Control and a Plain Guide are required.

A Bowen Series 20 Sucker Rod Overshot consists of a Top Sub, a Bowl, a Grapple Control and a Basket Grapple. It differs from a Series 10 in that the Grapple Control is at the top of the Bowl above the Basket Grapple placing the Grapple at the lowermost position in the Bowl.



Series 10 Overshot with Spiral Grapple



Series 10 Overshot with Basket Grapple

Operation

First determine that the Overshot is properly assembled, is dressed with the proper size Grapple and that all of its parts are in good working order. Refer to the Specification Table for list of parts.

Make up the Overshot on the fishing string and run into the well.

To Engage and Pull the Fish

As the top of the fish is reached, slowly rotate the fishing string to the right and gradually lower the Overshot over the fish; combined rotating and lowering is important.

When wire line is used for a fishing string, sinker bars should be used for weight to force the Overshot down on the fish. Using wire line eliminates releasing effect because the Overshot cannot be rotated.

Allow the right-hand torque to slack out of the fishing string and then pull on the fish by elevating the fishing string.

To Release from the Fish

Bump down; then simultaneously rotate to the right and slowly elevate the fishing string until the Overshot is clear to the fish. Combined rotating and elevating is important.

To release from a recovered fish, follow the same procedure while holding the fish below the Overshot.

Precautions

Unless an upward strain is maintained, never rotate the fishing string to the right while the Overshot is engaged with the fish.

Always bump down the full weight of the fishing string before starting releasing operations.

Explanation of Mechanism

After the Overshot has reached the top of the fish, combined rotation and lowering results in the following:

1. The Guide will direct the fish into the Overshot.
2. The Grapple will expand and the fish will pass into it to be halted by the pin section of the Top Sub or by the stop of a Basket Grapple.
3. The fish is now properly located in the Overshot and thereafter, when upward pull is exerted, the Grapple is contracted by the tapers of the Bowl and the hold is secure.

   When releasing, the sharp downward bump places the largest portion of the Bowl tapers opposite the Grapple and breaks the hold. Right-hand rotation expands the Grapple and by maintaining right-hand rotation, the Overshot may be withdrawn from the fish.

Maintenance

Maintenance of Bowen Sucker Rod Overshots is simple, but important. After each use, the tool should be disassembled, inspected, repaired as required and re-assembled.

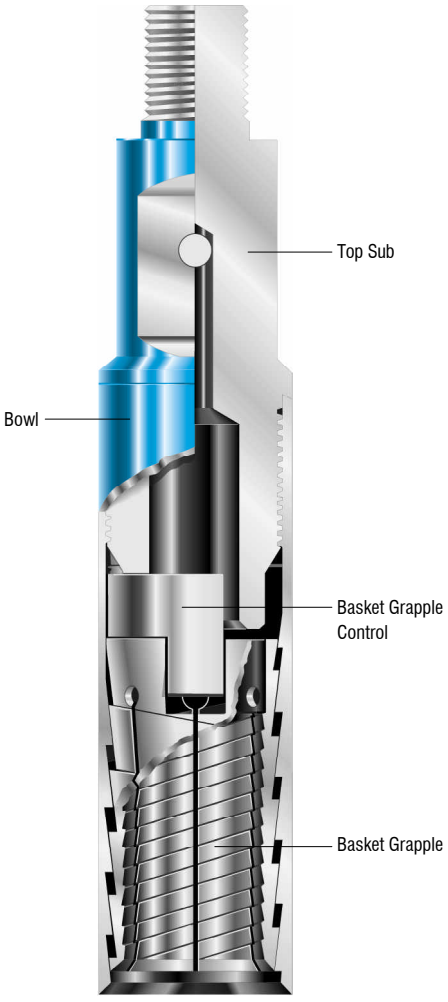
Disassembly

1. Clamp the Bowl in a vise between the threaded ends. Break loose the threaded connections of the Top Sub and Guide; remove the Top Sub and Guide.

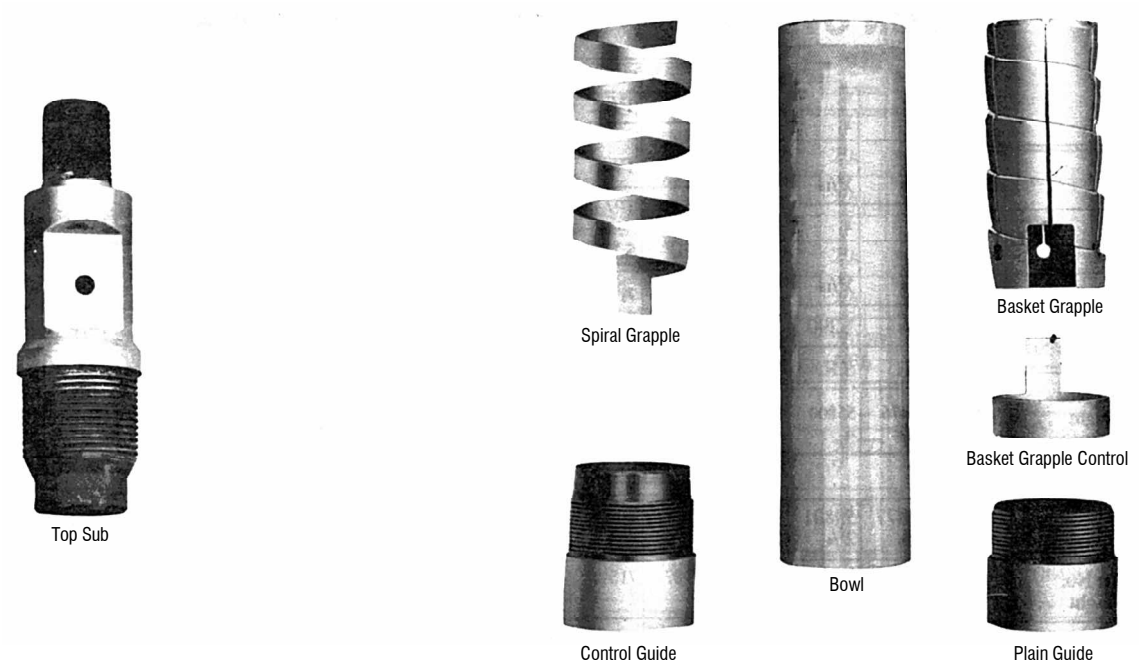
Caution: Use only sufficient gripping action in the vise to break connections; excessive force can distort or crack the Bowl. Also, avoid leaving heavy tool marks on the Bowl, which reduce the longevity of the Bowl.

2. Remove the Grapple. This may be done by unscrewing it from the Bowl, using right - hand rotation. Where the Grapple is a Basket type, the Control must first be lifted out through the bottom in the Series 10 Assembly, and through the top in the Series 20.

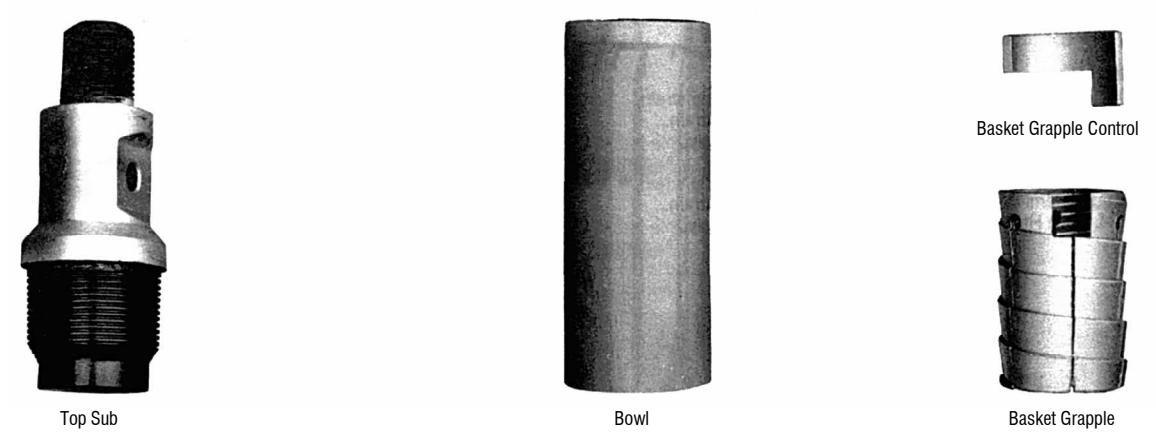
Inspect all the parts before reassembling them; particularly the Grapple. Check the wickers to assure that they have not been damaged or worn too much for additional safe operation. Grease the parts as they are re-assembled. To prevent rust or deterioration, either grease or paint the exterior.



Series 20 Overshot



Series 10 Disassembled



Series 20 Disassembled

Bowen Series 10 Sucker Rod Overshots

Maximum Catch – Spiral		3/4	3/4	1	1-1/16	1-1/4	1-3/8	1-3/8	1-3/8	1-1/2	1-1/2	1-1/2	1-1/2	1-5/8	1-5/8	1-5/8	1-5/8
Maximum Catch – Basket		9/16	9/16	13/16	7/8	1-1/16	1-3/16	1-3/16	1-3/16	1-5/16	1-5/16	1-5/16	1-5/16	1-7/16	1-7/16	1-7/16	1-7/16
Overshot O.D		0.955	1-1/8	1.290	1-9/16	1.43	1-21/32	1-21/32	1-21/32	1-25/32	1-25/32	1-25/32	1-29/32	1-29/32	1-29/32	1-29/32	1-29/32
Type		F.S.	S.H.	S.H.	S.H.	S.H.	S.H.	S.H.	S.H.	S.H.	S.H.	S.H.	S.H.	S.H.	S.H.	S.H.	S.H.
Complete	**Part No.**	29514	53476	55800	9790	17985	71344*	16490	26495**	47501*	49624**	13940	9990	9340	17040*	19265*	21625**
Assembly	**Weight**	3-3/4	3-3/4	4	4	4	4	4	4	4	4	4	4-7/8	5	4-1/2	5-1/2	5

Replacement Parts

Top Sub	**Part No.**	29853	53477	55801	9791	17986	26496*	16491	26496	47502*	49625*	13941	9341	9341	17041*	17041*	17041*
	Weight	2-1/8	2-1/8	2-1/4	2-1/4	2-1/4	2-1/4	2-1/4	2-1/4	2-1/4	2-1/4	2-1/4	3	3	2-1/2	2-1/2	2-1/2
Bowl	**Part No.**	29845	53478	55802	9792	17987	71345*	16492	26497**	47503*	49626**	13942	9991	9342	17042*	19266*	21626**
	Weight	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1.5	1
Spiral Grapple	**Part No.**	29855	53479	55803	9793	17988	16493	16493	26498	13943	49627	13943	9992	9343	9343	9343	21627
	Weight	1/8	1/8	1/4	1/4	1/4	1/4	1/4	1/4	1/4	1/4	1/4	3/8	1/2	1/2	1/2	1/2
Control Guide	**Part No.**	29856	53482	55804	9796	17989	26500	16496	26500*	47505	49630*	13945	9993†	9349	9349	19267*	19267*
	Weight	1/2	1/2	1/2	1/2	1/2	1/2	1/2	1/2	1/2	1/2	1/2	1/2	1/2	1/2	1	

Basket Parts

Basket Grapple	**Part No.**	29855	53479	55803	9793	17988	16493	16493	26498	13943	49628	13943	9992	9343	9343	9343	21627
	Weight	5/8	5/8	3/4	3/4	3/4	3/4	3/4	3/4	3/4	3/4	3/4	3/4	1-1/4	1-1/4	1-1/4	1-1/4
Grapple Control	**Part No.**	29857	53480	55809	9794	18003	16494	16494	16494	13947	13947	13947	9993	9344	9344	9344	9344
	Weight	1/8	1/8	1/8	1/8	1/8	1/4	1/4	1/4	1/4	1/4	1/4	1/8	1/8	1/8	1/8	1/8
Plain Guide	**Part No.**	29858	53481	55810	9795	18004	26499	16498	26499*	47504	49629	13944	9994	9345	9345	19268*	19268*
	Weight	1/2	1/2	1/2	1/2	1/2	1/2	1/2	1/2	1/2	1/2	1/2	3/4	1	1	1	1

Special Notes:
(1) Grapples availabe in 1/16* intervals
* Left-hand threads
** This is a left-hand tool
† Spiral control

F.S. (Full Strength) Engineered to wthstand all pulling and jarring strain.
S.F.S. (Semi Full Strength) Engineered to withstand all pulling strain.
S.H. (Slim Hole) Engineered to withstand heavy pulling strain only.

Overshot OD's are nominal OD's. If the tool is to be run through a tight clearance, the actual tool OD should be checked.

How to Order

Specify:

(1) Name and number of assembly or part
(2) Size and type of fish to be caught
(3) Top connection if other than standard

RECOMMENDED SPARES:

Spiral — 2 Grapples
1 Control Guide
Basket — 2 Grapples
1 Grapple Control

Bowen Series 10 Sucker Rod Overshots

Maximum Catch – Spiral		1-5/8	1-5/8	1-5/8	1-9/16	1-9/16	1-9/16	1-3/4	1-13/16	1-13/16	1-13/16	1-13/16	1-15/16	1-15/16	1-15/16	1-15/16
Maximum Catch – Basket		1-7/16	1-7/16	1-7/16	1-3/8	1-3/8	1-3/8	1-9/16	1-5/8	1-5/8	1.660	1.660	1-3/4	1-3/4	1-3/4	1-3/4
Overshot O.D.		2-5/16	2-5/16	2-5/16	1-27/32	1-27/32	1-27/32	2-1/16	2-1/8	2-5/16	2-5/16	2-5/16	2-1/4	2-1/4	2-1/4	2-5/16
Type		F.S	F.S	F.S	S.H	S.H	S.H	S.H	S.H	F.S	S.F.S	F.S	S.H	S.H	S.H	S.H
Complete Assembly	**Part No.**	9880	17045*	19270*	49637**	49780*	36423	54178*	27765	60340**	11480	30308*	78928**	77733*	16070	21630**
	Weight	5	7-1/4	7-1/4	5	5	5	4-3/4	4-3/4	6-1/2	4-7/8	4-7/8	6	6	4-3/4	4-7/8

Replacement Parts

Top Sub	**Part No.**	9341	17041*	17041*	49638*	49638*	36424	54179*	27766	30309*	11481	30309*	77734*	77734*	16071	21631*
	Weight	3	2-1/2	2-1/2	2-1/2	2-1/2	2-1/2	2-3/4	2-1/2	3	2-1/2	2-1/2	3	3	2-1/2	2-1/2
Bowl	**Part No.**	9881	17047*	19271*	49639**	49792*	36425	54180*	27767	60341**	11482	30310*	78929**	77735*	16072	21632**
	Weight	1	3-3/4	3-3/4	1-1/2	1-1/2	1-1/2	1	1-1/4	2-1/2	1-1/2	1-1/2	2	2	1-1/4	1-1/2
Spiral Grapple	**Part No.**	9343	9343	9343	49640	36436	36436	54181	27768	60342	11483	11483	78930	16073	16073	21633
	Weight	1/2	1/2	1/2	1/2	1/2	1/2	1/2	1/2	1/2	3/8	3/8	1/2	1/2	1/2	3/8
Control Guide	**Part No.**	9883	9883	19272*	49642*	49642	36427	54184	27764	30311*	11484	30311*	77738*	77738	16076	21634*
	Weight	1/2	1/2	1/2	1/2	1/2	1/2	1/2	1/2	1/2	1/2	1/2	1/2	1/2	1/2	1/2

Basket Parts

Basket Grapple	**Part No.**	9343	9343	9343	49640	36436	36436	54181	27768	60342	11483	11483	78930	16073	16073	21633
	Weight	1-1/4	1-1/4	1-1/4	1-1/4	1-1/4	1-1/4	1-1/8	7/8	1-1/4	7/8	7/8	1-1/4	1-1/4	7/8	7/8
Grapple Control	**Part No.**	153338	153338	153338	36437	36437	36437	54182	27763	11485	11485	11485	16074	16074	16074	16074
	Weight	1/8	1/8	1/8	1/8	1/8	1/8	1/4	1/4	1/4	1/4	1/4	1/4	1/4	1/4	1/4
Plain Guide	**Part No.**	9882	9882	19273*	49641	49641	36426	54183	27769	30312*	11486	30312*	77737*	77737*	16075	21636*
	Weight	1	1	1	1	1	1	1	1/2	1	1/2	1/2	1	1	1/2	1/2

Maximum Catch – Spiral		2	2	2	2	2	2	2	2.33	2.33	2-3/8	2-3/8	2-3/8
Maximum Catch – Basket		1-13/16	1-13/16	1-13/16	1-13/16	1-13/16	1-13/16	1-13/16	2.142	2.142	13/16	13/16	13/16
Overshot O.D.		2-5/16	2-5/16	2-5/16	2-5/16	2-7/8	2-7/8	2-7/8	2-13/16	2-13/16	2-27/32	2-27/32	2-27/32
Type		S.H	S.H	S.H	S.H	F.S	F.S	F.S	S.H	S.H	S.H	S.H	S.H
Complete Assembly	**Part No.**	9400	16985*	19280*	34492**	9530	17130*	77920	37315	44928*	17435*	17280*	15860
	Weight	6	5-7/8	6	6	6-5/8	6-5/8	6-5/8	6	6	6-1/8	6-1/8	6-5/8

Relacement Parts

Top Sub	**Part No.**	9401	16986*	16986*	16986*	9531	17131*	9531	37317	44930*	17281*	17281*	15863
	Weight	3-1/3	3-1/2	3-1/2	3-1/2	3-3/4	3-3/4	3-1/2	3-1/2	3-1/2	3-5/8	3-5/8	3-5/8
Bowl	**Part No.**	9402	16987*	19281*	34493**	9532	17132*	77921	37316	44929*	17436*	17282*	15861
	Weight	1-1/2	1-1/8	1-1/8	1-1/2	1-1/2	1-1/2	1-1/2	1-1/2	1-1/2	1-1/2	1-1/2	1-1/4
Spiral Grapple	**Part No.**	9403	9403	9403	34494	9403	9403	9403	37318	37318	9872	9872	9872
	Weight	3/8	3/8	3/8	3/8	3/8	3/8	3/8	1/2	1/2	1/2	1/2	1/2
Control Guide	**Part No.**	9406	9406	19282*	19282*	9535	9535	9535	37319†	37319†	9873†	9873†	9873†
	Weight	1/2	1/2	1/2	1/2	1	1	1	1/2	1/2	1/2	1/2	1

Basket Parts

Basket Grapple	**Part No.**	9403	9403	9403	34494	9403	9403	9403	37318	37318	9872	9872	9872
	Weight	1	1	1	1	1	1	1	1	1	1	1	1
Grapple Control	**Part No.**	9405	9405	9405	9405	9405	9405	9405	37319	37319	9873	9873	9873
	Weight	1/16	1/16	1/16	1/4	1/16	1/16	1/16	1/8	1/8	1/4	1/4	1/4
Plain Guide	**Part No.**	9404	9404	19283*	19283*	9533	9533	77922	37320	44931	17437	15862	15862
	Weight	1/2	1/2	1	1/2	3	3	3	1/2	1/2	1/2	1/2	1/2

Special Notes:
(1) Grapples availabe in 1/16* intervals
* Left-hand threads
** This is a left-hand tool
† Spiral control

F.S. (Full Strength) Engineered to wthstand all pulling and jarring strain.
S.F.S. (Semi Full Strength) Engineered to withstand all pulling strain.
S.H. (Slim Hole) Engineered to withstand heavy pulling strain only.

Overshot OD's are nominal OD's. If the tool is to be run through a tight clearance, the actual tool OD should be checked.

How to Order

Specify:

(1) Name and number of assembly or part
(2) Size and type of fish to be caught
(3) Top connection if other than standard

RECOMMENDED SPARES:
Spiral — 2 Grapples
1 Control Guide
Basket — 2 Grapples
1 Grapple Control

Bowen Series 20 Short Catch Sucker Rod

Maximum Catch – Basket Only		7/8	1	1-1/8	1-1/4	1-3/8	1-3/8	1-3/8	1-3/8
Overshot O.D.		1-1/4	1-3/8	1-1/2	1-5/8	1-3/4	1-3/4	1-27/32	1-15/16
Complete Assembly	**Part No.**	17315	25780	28774	28760	18355	34601**	21125	61737†
	Weight	4-7/8	4-7/8	5	5	5-1/8	5-1/8	5	5-1/4

Replacement Parts

Top Sub	**Part No.**	17316	25781	28775	28761	18356	34602*	18356	61912
	Weight	3	3	3-1/8	3-1/8	3-1/4	3-1/4	3	3
Bowl	**Part No.**	17317	25752	28776	28762	18357	34603**	21126	61738
	Weight	1	1	1	1	1	1	1	1-1/8
Basket Grapple	**Part No.**	17318	25783	28777	28763	18358	34604	18358	18358
	Weight	3/4	3/4	3/4	3/4	3/4	3/4	7/8	1
Grapple Control	**Part No.**	17319	25784	28778	28764	18359	18359	18359	18359
	Weight	1/8	1/8	1/8	1/8	1/8	1/8	1/8	1/8

Accessories – Extra

Oversize Guide	**Part No.**	—	—	—	—	—	—	21127	—
	Weight	—	—	—	—	—	—	—	—
Pin (2 Req'd.)	**Part No.**	—	—	—	—	—	—	14876	—
	Weight	—	—	—	—	—	—	—	—

Special Notes:
(1) Grapples availabe in 1/16* intervals
* Left-hand threads
** This is a left-hand tool
† Assembly requires Guide Ring 61739

F.S. (Full Strength) Engineered to wthstand all pulling and jarring strain.
S.H. (Slim Hole) Engineered to withstand heavy pulling strain only.

Overshot OD's are nominal OD's. If the tool is to be run through a tight clearance, the actual tool OD should be checked.

How to Order

Specify:

(1) Name and number of assembly or part
(2) Size and type of fish to be caught
(3) Top connection if other than standard

RECOMMENDED SPARES:
(1) 2 Grapples for Each Size
(2) 1 Control

Bowen Series 20 Short Catch Sucker Rod Overshots

Maximum Catch – Basket Only		1-15/32	1-1/2	1-5/8	1-3/4	1-13/16	1-13/16	2-1/8	2-1/8	2-5/16	2-3/8	2-1/2	2-5/8
Overshot O.D.		1-27/32	1-29/32	2-5/16	2-1/4	2-5/16	2-5/16	2-25/32	2-7/8	2-7/8	3-1/8	3-1/4	3-3/8
Complete Assembly	**Part No.**	49643**	11555	38506††	47464	17438	30421*	18305	20170	56073	20645	22270	55236
	Weight	4-7/8	4-7/8	8-1/8	7-5/8	7-5/8	7-5/8	7-1/4	10-1/2	10-1/4	10-1/2	10-1/2	10-1/2

Replacement Parts

Top Sub	**Part No.**	49638	9341	38507	16071	9401	16986*	18306	20172	56074	20646	22271	55237
	Weight	3	3	6	6	6	6	4-1/2	7	6-3/4	7	7	7
Bowl	**Part No.**	49644	11556	38508	47465	17439	30422*	18307	20171	56075	20647	22272	55238
	Weight	1	1	5/8	1/2	1/2	1/2	1/2	2	2	2	2	2
Basket Grapple	**Part No.**	49645	11557	38509	47466	17440	17440	18308	18308	56076	20648	22273	55239
	Weight	3/4	3/4	1-3/8	1	1	1	1	1	1	1	1	1
Grapple Control	**Part No.**	49646	11558	38510	47467	17441	17441	18309	18309	56077	20649	22274	55240
	Weight	1/8	1/8	1/8	1/8	1/8	1/8	1/4	1/4	1/4	1/4	1/4	1/4

Accessories - Extra

Oversize Guide	**Part No.**	—	—	—	—	22276	22276	—	20173	—	20650	22275	55320
	Weight	—	—	—	—	—	—	—	—	—	—	—	—
Pin (2 Req'd.)	**Part No.**	—	—	—	—	14876	14876	—	20174	—	20651	20651	25498
	Weight	—	—	—	—	—	—	—	—	—	—	—	—

Special Notes:
(1) Grapples availabe in 1/16* intervals
* Left-hand threads
** This is a left-hand tool
† Assembly requires Guide Ring 61739
†† Assembly requires Guide Ring 38511

F.S. (Full Strength) Engineered to wthstand all pulling and jarring strain.
S.H. (Slim Hole) Engineered to withstand heavy pulling strain only.

Overshot OD's are nominal OD's. If the tool is to be run through a tight clearance, the actual tool OD should be checked.

How to Order

Specify:

(1) Name and number of assembly or part
(2) Size and type of fish to be caught
(3) Top connection if other than standard

RECOMMENDED SPARES:
(1) 2 Grapples for Each Size
(2) 1 Control

Table of Calculated Strengths
Bowen Series 10 Sucker Rod Overshots

Complete Assembly Number	Bowl Number	O.D.	Maximum Catch Size with Spiral Grapple	Maximum Catch Size with Basket Grapple	Spiral Grapple	Load Capacity at Yield Points (in lbs) Basket Grapple Catch Size	Without Stop
						1-7/16" Down To, but not including 1"	28,500
9340	9342	1-29/32	1-5/8	1-7/16	39,500	1" Down	18,000
						1-13/16" Down To, but not including 1-1/8"	40,100
9400	9402	2-21/64	2	1-13/16	55,700	1-1/8" Down	25,400
						1-13/16" Down To, but not including 1-1/8"	144,400
9530	9532	2-7/8	2	1-13/16	200,400	1-1/8" Down	91,300
						1-7/16" Down To, but not including 1"	93,900
9880	9881	2-5/16	1-5/8	1-7/16	138,100	1" Down	59,400
9990	9991	1-29/32	1-1/2	1-5/16	83,800	1-5/16" Down	38,200
						1.660" Down To, but not including 1-1/8"	85,100
11480	11482	2-21/64	1-13/16	1.66	118,100	1-1/8" Down	53,800
						1-5/16" Down To, but not including 1"	28,500
13940	13942	1-25/32	1-1/2	1-5/16	39,500	1" Down	18,000
						2-3/16" Down To, but not including 1-1/8"	51,100
15860	15861	2—27/32	2-3/8	2-3/16	70,000	1-1/8" Down	37,700
						1-3/4" Down To, but not including 1-1/8"	40,100
16070	16072	2-17/64	1-15/16	1-3/4	55,700	1-1/8" Down	25,400
						1-3/16" Down To, But not including 1"	28,500
16490	16492	1-21/32	1-3/8	1-3/16	39,100	1" Down	18,000
						1-13/16" Down To, but not including 1-1/8"	40,100
16985	16987	2-21/64	2	1-13/16	55,700	1-1/8" Down	25,400
						1-7/16" Down To, but not including 1"	28,500
17040	17042	1-29/32	1-5/8	1-7/16	39,500	1" Down	18,000
						1-7/16" Down To, but not including 1"	93,900
17045	17047	2-5/16	1-5/8	1-7/16	138,100	1" Down	59,400
						1-13/16" Down To, but not including 1-1/8"	144,400
17130	17132	2-7/8	2	1-13/16	200,400	1-1/8" Down	91,300
						2-3/16" Down To, but not including 1-1/8"	51,100
17280	17282	2-27/32	2-3/8	2-3/16	70,000	1-1/8" Down	37,700
						2-3/16" Down To, but not including 1-1/8"	51,100
17435	17436	2-27/32	2-3/8	2-3/16	70,000	1-1/8" Down	37,700
17985	17987	1-7/16	1-1/4	1-1/16	16,500	1-1/16" Down	11,500
						1-7/16" Down To, but not including 1"	28,500
19265	19266	1-29/32	1-5/8	1-7/16	39,500	1" Down	18,000
						1-7/16" Down To, but not including 1"	93,900
19270	19271	2-5/16	1-5/8	1-7/16	138,100	1" Down	59,400
						1-13/16" Down To, but not including 1-1/8"	40,100
19280	19281	2-21/64	2	1-13/16	55,700	1-1/8" Down	25,400

NOTE: All strengths listed are calculated theoretical yield points and are accurate within 20%. It should be noted however, that all strengths assume a straight, steady pull and full grapple engagement of a round fish. Anything less than full engagement or straight pulling will reduce the listed strength. This includes tong marks or other damage to the bowl surface.

Overshot OD's are nominal OD's. If the tool is to be run through a tight clearance, the actual tool OD should be checked.

Table of Calculated Strengths

Bowen Series 10 Sucker Rod Overshots

Complete Assembly Number	Bowl Number	O.D.	Maximum Catch Size with Spiral Grapple	Maximum Catch Size with Basket Grapple	Spiral Grapple	Load Capacity at Yield Points (in lbs) Basket Grapple Catch Size	Without Stop
						1-7/16" Down To, but not including 1"	28,500
21625	21626	1-29/32	1-5/8	1-7/16	39,500	1" Down	18,000
						1-3/4" Down To, but not including 1-1/8"	49,000
21630	21632	2-5/16	1-15/16	1-3/4	68,100	1-1/8" Down	31,000
						1-3/16" Down To, but not including 1"	28,500
26495	26497	1-21/32	1-3/8	1-3/16	39,100	1" Down	18,000
						1-5/8" Down To, but not including 1"	40,100
27765	27767	2-9/64	1-13/16	1-5/8	55,700	1" Down	25,400
29514	29854	0.955	3/4	9/16	11,000	9/16" Down	8,500
						1.660" Down To, but not including 1-1/8"	85,100
30308	30310	2-21/64	1-13/16	1.660	118,100	1-1/8" Down	53,800
						1-13/16" Down To, but not including 1-1/8"	40,100
34492	34493	2-21/64	2	1-13/16	55,700	1-1/8" Down	25,400
						1-3/8" Down To, but not including 1"	28,500
36423	36425	1-27/32	1-9/16	1-3/8	39,500	1" Down	18,000
						2.142" Down To, but not including 1-1/8"	53,500
37315	37316	2-13/16	2.33	2.142	73,300	1-1/8" Down	39,400
						2.142" Down To, but not including 1-1/8"	53,500
44928	44929	2-13/16	2.33	2.142	73,300	1-1/8" Down	39,400
						1-5/16" Down To, but not including 1"	28,500
47501	47503	1-25/32	1-1/2	1-5/16	39,500	1" Down	18,000
						1-5/16" Down To, but not including 1"	28,500
49624	49626	1-25/32	1-1/2	1-5/16	39,500	1" Down	18,000
						1-3/8" Down To, but not including 1"	28,500
49637	49639	1-27/32	1-9/16	1-3/8	39,500	1" Down	18,000
						1-3/8" Down To, but not including 1"	28,500
49780	49782	1-27/32	1-9/16	1-3/8	39,500	1" Down	18,000
						1-9/16" Down To, but not including 1"	40,100
54178	54180	2-5/64	1-3/4	1-9/16	55,700	1" Down	25,400
55800	55802	1.290	1.0	13/16	55,000	—	—
						1.660" Down To, but not including 1-1/8"	85,100
60340	60341	2-21/64	1-13/16	1.660	118,100	1-1/18" Down	53,800
						1-3/16" Down To, but not including 1"	28,500
71344	71345	1-21/32	1-3/8	1-3/16	39,100	1" Down	18,000
						1-3/4" Down To, but not including 1-1/8"	40,100
77733	77735	2-17/64	1-15/16	1-3/4	55,700	1-1/8" Down	25,400
						1-13/16" Down To, but not including 1-1/8"	144,400
77920	77921	2-7/8	2.0	1-13/16	200,400	1-1/8" Down	91,300
						1-3/4" Down To, but not including 1-1/8"	40,100
78928	78929	2-17/64	1-15/16	1-3/4	55,700	1-1/8" Down	25,400

NOTE: All strengths listed are calculated theoretical yield points and are accurate within 20%. It should be noted however, that all strengths assume a straight, steady pull and full grapple engagement of a round fish. Anything less than full engagement or straight pulling will reduce the listed strength. This includes tong marks or other damage to the bowl surface.

Overshot OD's are nominal OD's. If the tool is to be run through a tight clearance, the actual tool OD should be checked.

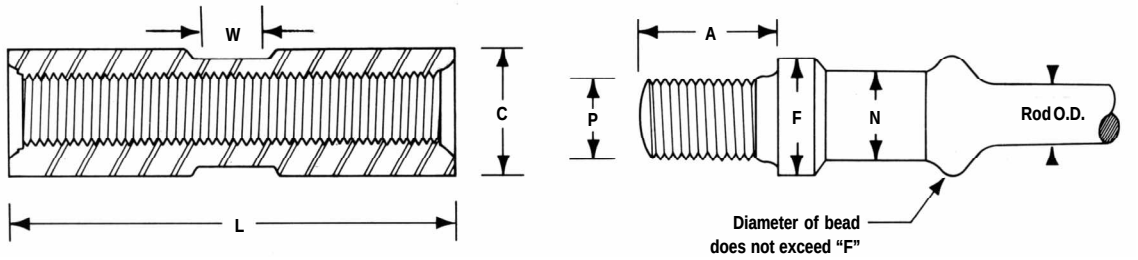
Table of Calculated Strengths

Bowen Series 20 Short Catch Sucker Rod Overshots

Complete Assembly Number	Bowl Number	O.D.	Maximum Catch Size	Load Capacity at Yield Point – Basket Grapple (in lbs)
11555	11556	1-29/32	1-1/2	41,000
17315	17317	1-9/32	7/8	31,500
17438	17439	2-5/16	1-13/16	50,400
18305	18307	2-25/32	2-1/8	102,300
18355	18357	1-3/4	1-3/8	35,100
20170	20171	2-7/8	2-1/8	101,800
20645	20647	3-1/8	2-3/8	127,000
21125	21126	1-27/32	1-3/8	52,900
22270	22272	3-1/4	2-1/2	127,000
25780	25782	1-13/32	1	31,500
28760	28762	1-5/8	1-1/4	42,200
28774	28776	1-1/2	1-1/8	35,100
30421	30422	2-5/16	1-13/16	60,200
34601	34603	1-3/4	1-3/8	40,900
38506	38508	2-5/16	1-5/8	79,000
47464	47465	2-1/4	1-3/4	50,298
49643	49644	1-27/32	1-15/32	41,000
55236	55238	3-3/8	2-5/8	126,000
56073	56075	2-7/8	2-5/16	62,100
61737	61738	1-15/16	1-3/8	73,000

NOTE: All strengths listed are calculated theoretical yield points and are accurate within 20%. It should be noted however,that all strengths assume a straight, steady pull and full grapple engagement of a round fish. Anything less than full engagement or straight pulling will reduce the listed strength. This includes tong marks or other damage to the bowl surface.

Overshot OD's are nominal OD's. If the tool is to be run through a tight clearance, the actual tool OD should be checked.



Sucker Rod Dimensions and Table of Calculated Strengths

Rod Size	"A" Length of of Pin	"F" Outside Dia. of Shoulder	"N" Wrench Flat	"P" Outside Dia. of Pin	"C" Outside Dia. of Full Sized Coupling	"L" Minimum Length	"W" Coupling Wrench Flat Width	Thread	
1/2"	1"	1"	5/8"	3/4"	1"	2-3/4"	3/4"	3/4"	10 thd
5/8"	1-1/8"	1-3/8"	7/8"	15/16"	1-1/2"	4"	1-3/8"	15/16"	10 thd
3/4"	1-3/8"	1-1/2"	1"	1-1/16"	1-5/8"	4"	1-1/2"	1-1/16"	10 thd
7/8"	1-3/8"	1-5/8"	1"	1-3/16"	1-13/16"	4"	1-5/8"	1-3/16"	10 thd
1"	1-3/4"	2"	1-5/16"	1-3/8"	2-3/16" or 2*	4"	1-7/8"	1-3/8"	10 thd
1-1/8"	2"	2-1/4"	1-1/2"	1-9/16"	2-3/8"	4-1/2"	2-1/8"	1-9/16"	10 thd

* Used when running 1" rods in 2-7/8" tubing. 2-3/16" is standard.

Sucker Rod Strength Table

Rod Size		1/2"	5/8"	3/4"	7/8"	1"
Rod Area		0.196	0.306	0.442	0.601	0.785
Based on J & L Type 7	Yield	16,000	21,400	30,900	42,100	55,000
with ultimate tensile strength	Ultimate	20,000	26,300	38,000	51,700	67,500
of 86,000 and yield of 70,000 psi	Torque*	70	140	171	381	570
Based on J & L Type 2	Yield	—	19,900	28,700	39,100	51,000
with ultimate tensile strength	Ultimate	—	30,600	44,200	60,100	78,500
of 100,000 and yield of 65,000 psi	Torque*	65	130	159	353	530
Based on J & L Type 1	Yield	—	20,900	30,300	41,200	53,800
with ultimate tensile strength	Ultimate	—	30,600	44,200	60,100	78,500
of 100,000 and yield of 65,000 psi	Torque*	68-1/2	136	168	372	560
Based on J & L Type 12	Yield	—	29,400	42,300	57,700	75,300
with ultimate tensile strength	Ultimate	—	37,700	53,000	72,000	94,200
of 120,000 and yield of 96,000 psi	Torque*	96	192	235	476	783

* Torque based on rod O.D. @ yield.

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* Denotes Manufacturing and Engineering facilities

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