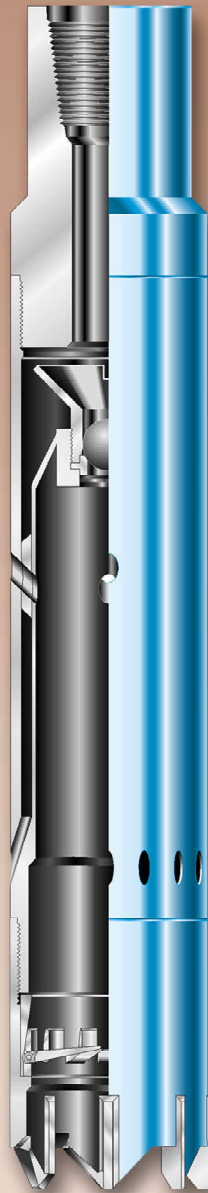


REVERSE CIRCULATION JUNK BASKET

Instruction Manual 3100



Reverse Circulation Junk Basket

Reverse Circulation Junk Basket

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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.

Nineteenth Printing, September 2005

General Description

Bowen Reverse Circulation Junk Baskets are designed to effectively catch junk by utilizing the reverse circulation principle. Small junk objects may be successfully deflected into this Junk Basket and retrieved, which would not be fished out by other junk baskets.

The tool's unique reverse circulation feature insures complete recovery of junk, and eliminates misruns. Its design also retains a drain through the tool that eliminates the possibility of pulling a wet string even though the inner barrel is plugged by the core. This tool may also be converted into an effective Fishing Magnet which still retains the reverse circulation feature.

Use

Bowen Reverse Circulation Junk Baskets are used to retrieve all types of junk that accumulates at the bottom of a well. This junk may be such objects as rock bit cones and bearings, broken slips, bits of wire line, various hand tools, slivers and debris from twisted-off drill strings, milling cuttings, etc.

In operation, the circulating fluid is jetted outwardly and downwardly against the full circumference of the hole, where it is deflected in a manner that directs all objects into the long hollow barrel of the basket.

Construction

Bowen Reverse Circulation Junk Baskets consist basically of a Barrel, a Top Sub, a Junk Catcher, a Shoe, and a Valve Assembly. A Lifting Sub is provided for ease of handling the Junk Basket and provides a storage place for the Steel Ball.

The reverse circulation is obtained by the unique construction of the Barrel, which is, in effect, a two-bowl assembly. With the Steel Ball in place in the Valve Seat, circulation fluid is directed around the Valve through the inner passages of the Barrel, is jetted outwardly and downwardly against the full circumference of the hole, flows in a continuous stream into the Barrel, up through the Barrel, then out the return ports at the upper end of the Barrel. (See illustration at top of page 3)

Bowen Reverse Circulation Junk Baskets are available in two types: Standard and W7R. Standard type Baskets are designed to retrieve the more popular sizes of bit cones. The W7R type Baskets are designed to retrieve W7R and other oversize bit cones.

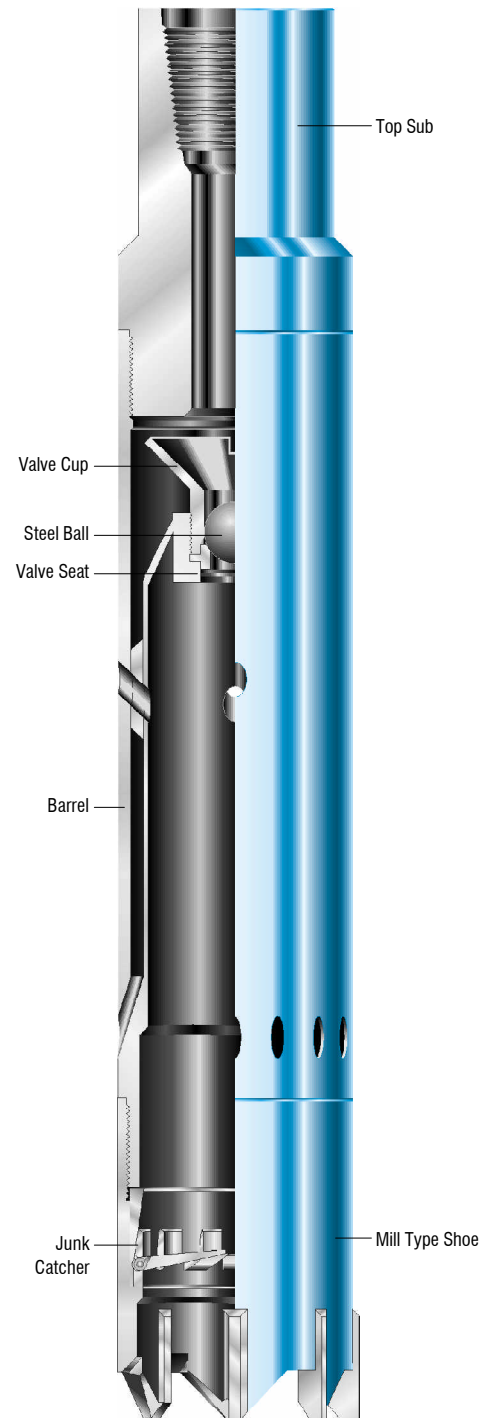
Accessories

Mill Shoes

Bowen Reverse Circulation Junk Baskets are furnished with a standard Type "A" Mill Shoe. This is a mill type with side wings. It is recommended that Itcoloy-faced Mill Shoes be considered.

The Type "B" Mill Shoe is similar in design to the Type "A" but is hard-faced with Itcoloy. Itcoloy is a material composed of sintered tungsten carbide in an extremely tough matrix which will effectively and rapidly mill up junk during the fishing operation.

The Type "C" Mill Shoe is a flat-bottomed shoe which is hard-faced with Itcoloy on the bottom, on the inner face and on the outer face. It will effectively mill up junk and is especially effective for cutting cores.



Bowen Reverse Circulation Junk Basket

Finger Shoes

When junk is lying loose on the bottom of the well or when junk is too large to pass through the Catchers, a Finger Shoe may be installed on the bottom of the Barrel in place of the Mill Shoe. When the Junk Basket engages the fish, combined rotating and lowering cause the long fingers to close in beneath the fish and retain it in the Barrel. Finger Replacements are easy and inexpensive to replace on the Shoe Body.

Magnet Inserts

Magnet Inserts are available to convert Bowen Junk Baskets into effective fishing magnets. The Magnet Insert is machined to fit into the recess normally occupied by the Catcher. The Magnet Insert is used especially when in hard-to-drill formations and to thoroughly clean the hole prior to diamond drilling. This arrangement provides a magnet that incorporates the advantages of reverse circulation.

Operation

First, determine that the Junk Basket is properly assembled and that all its parts are in good working condition.

Standard Style Baskets will retrieve all popular types of bit cones used to drill hole sizes within their ranges. See Table for dimensions.

W7R Style Baskets are required to retrieve W7R and other oversize types of bit cones.



Type A Mill Shoe



Type B Mill Shoe



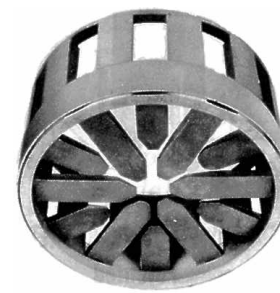
Type C Mill Shoe



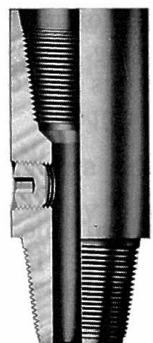
Finger Shoe



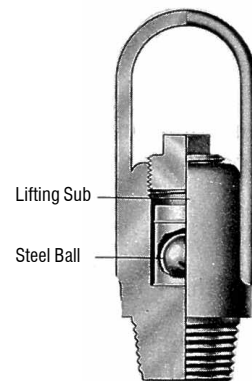
Magnet Insert



Standard Catcher



Window Sub



Lifting Sub

Selection of Shoe

If the fish is embedded in a hard formation and a core must be cut, the Junk Basket must be equipped with the proper Mill Type Shoe.

If the fish is laying loosely on the bottom of the hole, the Junk Basket may be equipped with either the proper Mill Type Shoe or the proper Finger Type Shoe.

Finger Type Shoes will normally retrieve larger objects than Mill Type Shoes, provided the junk is lying loose on the bottom and a core need not be taken.

Itcoloy-faced Shoes, with their hard, rugged and long lasting qualities, make possible the cutting away of protruding excess metal to allow free entry of the junk into the basket and the retention of the junk on the one run.

Remove the Lifting Sub and retain it and the Steel Ball at the derrick floor.

Using the Top Sub, connect the Junk Basket to the string and run it in the hole. If small junk particles are very prevalent in the hole, a Junk Sub should be installed on top of Top Sub.

Where a Window Sub is available, install on the top joint of drill pipe and connect the Kelly.

To Recover Fish when Basket is Equipped with Mill Type Shoe

When the Junk Basket is approximately ten feet off bottom, turn on the circulating pumps and maintain circulation for a few minutes to condition the mud. Turn off the circulating pumps.

Unscrew the Kelly from the string. Drop the Steel Ball down the drill pipe. Reconnect the Kelly. (Where a Window Sub is available, remove the plug from the sub and drop the Steel Ball down the drill pipe. Replace the plug in the Window Sub.)

Turn on the circulating pumps and while maintaining high pressure circulation, rotate the string slowly to the right and lower the Junk Basket to the bottom of the hole.

Continue righthand rotation and lowering until a core at least ten inches long has been cut.

NOTE: When using the Itcoloy-faced Shoes, maintain one ton of weight on the shoe and rotate the basket 50–150 rpm to insure proper milling.

Stop rotation and circulation and pull the Junk Basket from the hole.

To Recover Fish when Basket is Equipped with Finger Type Shoe

When the Junk Basket is approximately ten feet off bottom, turn on the circulating pumps and maintain circulation for a few minutes to condition the mud. Turn off the circulating pumps.

Unscrew the Kelly from the string. Drop the Steel Ball down the drill pipe. Reconnect the Kelly. (Where a Window Sub is available, remove the plug from the sub and drop the Steel Ball down the drill pipe. Replace the plug in the Window Sub.)

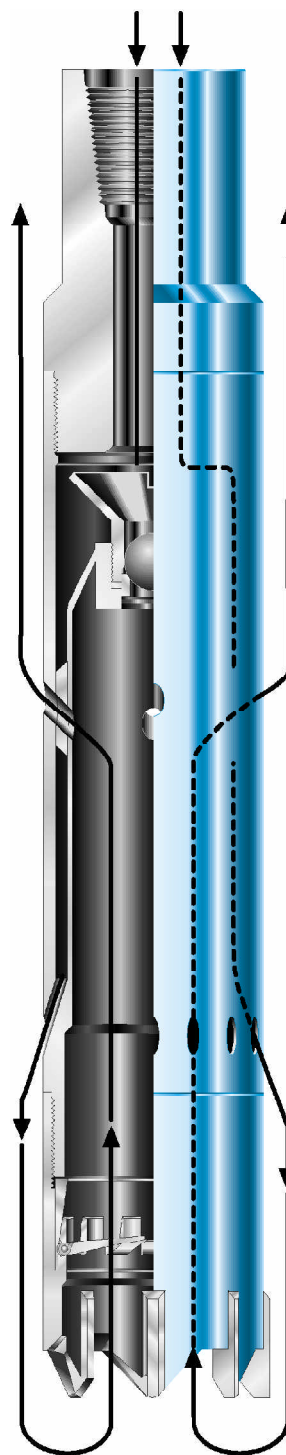
Turn on the circulating pumps and while maintaining high pressure circulation, rotate the string slowly to the right and lower it until approximately two tons of weight rest against the bottom of the hole.

Stop rotation and circulation and pull the Junk Basket from the hole.

To Remove the Fish or Core

Unscrew the Mill Type Shoe or the Finger Type Shoe from the Junk Basket and wash out the Barrel.

NOTE: The Junk Basket should be washed as soon as possible after being used. Pay particular attention to the space between the inner and outer barrels.



Flow Path Diagram

Precautions

Make sure that the inside diameters of the tool joints in the string are large enough to pass the Steel Ball.

Be sure to retain the Steel Ball at the surface while the Junk Basket is being lowered into the hole.

Explanation of Mechanism

Bowen Reverse Circulation Junk Baskets are designed to retrieve all types of small objects such as bit cones, tong pins, hammers, mill cuttings, and similar junk. Its unique principle of reverse fluid circulation insures more complete recovery of junk in the hole and eliminates misruns.

Function of Junk Basket in Recovering Fish with Mill Type Shoe

1. Turning on the circulation pumps and forcing circulation through the Junk Basket for a few minutes before dropping the Steel Ball flushes out any mud that may have gathered in the Barrel during the run in.
2. After the Steel Ball has been dropped down the drilling pipe, its downward progress will not be halted until it encounters the Valve Seat in the Junk Basket. Thereafter, when circulation is resumed, the fluid is forced through the inner passages of the Barrel and jetted outwardly and downwardly against the full circumference of the hole, where it is deflected in a manner that flushes all objects toward center. The fluid then flows in a continuous stream to the center of the Junk Basket and up through it and out the return ports in the upper end of the Barrel, thus giving a reverse circulation action.
3. Cutting a length of core allows the fish to ride past the Junk Catcher. The fingers on the Junk Catcher fold back while the core and fish are entering.

4. Pulling up the Junk Basket causes the fingers in the Junk Catcher to dig in and cut off a section of core, thus holding the fish and core securely in the Junk Basket Barrel.

Function of Junk Basket in Recovering Fish with Finger Type Shoe

1. Turning on the circulating pump and forcing circulation through the Junk Basket for a few minutes before dropping the Steel Ball flushes out any mud that may have gathered in the Barrel during the run in.
2. After the Steel Ball has been dropped down the drill pipe, its downward progress will not be halted until it encounters the Valve Seat in the Junk Basket. Thereafter, when circulation is resumed, the fluid is forced through the inner passages of the Barrel and jetted outwardly and downwardly against the full circumference of the hole where it is deflected in a manner that flushes all objects toward center. The fluid then flows in a continuous stream to the center of the Junk Basket and up through it and out the return ports in the upper end of the Barrel, thus giving a reverse circulation action.
3. Rotating to the right and lowering the Junk Basket to bottom causes the fingers of the Finger Type Shoe to close in beneath the fish.

Maintenance

To guard against misruns and to prolong the life of the tool, dismantle and thoroughly cleanse the Junk Basket after each job.

Disassembly

1. Unscrew the Top Sub.
2. Unscrew the Valve Assembly with the wrench provided.
3. Remove the Steel Ball and Valve Seat.
4. (a) Unscrew the Mill Type Shoe.
(b) Remove the Junk Catcher from the Shoe.
5. Finger Type Shoe:
(a) Unscrew the Finger Type Shoe from the Barrel.
(b) Unscrew the Finger Type Shoe Replacement from the Finger Type Shoe Body.
6. Wash out both the inside and the inner passages in the Barrel.
7. Check all parts carefully. Replace damaged parts with new ones.
8. Reassemble in the reverse order.
9. Store the Steel Ball in the Lifting Sub.
10. To prevent rust, apply either paint or grease.

Magnet Insert Assembly Installation

1. Remove Shoe from Barrel of the Junk Basket.
2. Remove Catcher from Shoe.
3. Install Magnetic Insert in Catcher recess.
4. Reassemble Junk Basket.

Maintenance

1. Thoroughly clean after use; make sure circulation hole is clean.
2. Store with Keeper in place to preserve magnetism.

Bowen Reverse Circulation Junk Baskets

Hole Size		3-3/4 to 4	4-1/8 to 4-1/2	4-5/8 to 5	5-1/8 to 5-1/2	5-5/8 to 6	6-1/8 to 6-1/2	6-5/8 to 7-3/8	7-1/2 to 8-1/4
O.D. of Barrel		3-5/8	4	4-1/2	4-7/8	5-1/8	5-3/4	6-1/4	7
Maximum Diameter of Fish		2-1/4	2-1/2	3-1/16	3-9/16	3-3/4	4-3/8	4-3/4	5-1/8
Top Connection		2-3/8	2-3/8	2-7/8	2-7/8	3-1/2	3-1/2	4-1/2	4-1/2
Number of Teeth on Mill		6	6	8	8	8	8	8	8
Complete Assembly	Part No.	6635	7295	4448	4572	2618	2670	2677	2554
	Weight	85	98	108	128	142	185	238	293

Replacement Parts

Top Sub	Part No.	6636	7296	4449	4573	2619	2671	2678	2493
	Weight	24	29	25	42	57	74	99	113
Barrel	Part No.	6637	7297	4450	4574	2620	2672	2679	2555
	Weight	48	51	54	57	62	85	108	136
Valve Cup	Part No.	6638	6638	4451	4451	2621	2621	2621	2570
	Weight	3	3	4	4	5	5	5	7
Steel Ball	Part No.	6640	6640	4453	4453	2623	2623	2623	2572
	Diameter	15/16	15/16	1-1/8	1-1/8	1-3/8	1-3/8	1-3/8	1-11/16
	Weight	3/16	3/16	1/4	1/4	1/2	1/2	1/2	3/4
Valve Seat	Part No.	6639	6639	4452	4452	2622	2622	2622	2571
	Weight	1/8	1/8	1/6	1/6	1/5	1/5	1/5	1/4
Junk Catcher Assembly*	Part No.	21795-W	21855-W	21780-W	18940-W	21735-W	28349-W	21750-W	21725-W
	Weight	1-1/4	1-1/2	2	3	3	4-1/2	4-1/2	7
Mill Shoe Type A	Part No.	6642-A	7299-A	4455-A	4576-A	2625-A	2676-A	2683-A	2556-A
	Weight	8	10	12	13	14	16	18	28
Pick Up Sub	Part No.	4568	4568	424	424	425	425	1849	1849
	Weight	9	9	12	12	17	18	45	45
Pipe Plug	Part No.	61520	61520	61520	61520	61521	61521	61522	61522
	Weight	1/2	1/2	1/2	1/2	1/2	1/2	1/2	1/2
	Thread	1-1/2" NPT	1-1/2" NPT	1-1/2" NPT	1-1/2" NPT	2" NPT	2" NPT	2-1/2" NPT	2-1/2" NPT

Mill Shoes

Mill Shoe Type B	Part No.	6642-B	7299-B	4455-B	4576-B	2625-B	2676-B	2683-B	2556-B
	Weight	8	10	12	13	14	16	18	28
Mill Shoe Type C	Part No.	6642-C	7299-C	4455-C	4576-C	2625-C	2676-C	2683-C	2556-C
	Weight	9	11	14	15	16	19	21	31

Finger Shoes

Maximum Diameter of Fish		3-1/4	3-3/4	4-1/16	4-1/2	4-3/4	5-17/32	5-29/32	6-3/4
Complete Assembly	Part No.	6643	7300	4456	4577	22208	22218	2739	2740
	Weight	16	20	24	27	30	36	42	60
Body	Part No.	6643-2	7300-2	4456-2	4577-2	22208-2	22218-2	2739-2	2740-2
	Weight	10	10	14	15	14	14	14	28
Replacement	Part No.	6643-1	7300-1	4456-1	4577-1	22208-1	22218-1	2739-1	2740-1
	Weight	6	8	10	12	16	22	28	32

Magnet Insert

To Fit Assembly No.		6635	7295	4448	4572	2618	2670	2677	2554
Total Pull In Lbs.		45 to 55	45 to 55	45 to 55	80 to 100	80 to 100	125 to 145	180 to 205	250 to 290
Magnet Insert Assembly	Part No.	61836	61848	61840	61850	61852	61866	61872	61876
Consisting of:	Weight	16	19	20	34	35	48	57	77
Magnetic Assembly	Part No.	61810	61812	61812	61814	61814	61816	61818	61820
	Weight	4	5	6	6	7	8	10	14
Adapter	Part No.	61837	61849	61841	61851	61853	61867	61873	61948
	Weight	12	14	14	28	28	40	47	63

How To Order:

- Specify: (1) Name and Number of Assembly or Part
(2) O.D. and Type of Shoe
(3) Top Connection Desired
(5)

Recommended Spare Parts:

- (1) 2 Junk Catchers
(2) 2 Mill Shoes
(3) 1 Valve Cup
(4) 1 Valve Seat
(5) 1 Steel Ball

Recommended Accessories:

- (1) 2 Finger Shoes
(2) 4 Finger Shoe Replacements
(3) 1 Magnet Insert

NOTE: Finger Shoe replacement is furnished with the same O.D. as standard Shoe unless otherwise specified.
* See Catcher Assembly Tables for parts breakdown.

Bowen Reverse Circulation Junk Baskets

Hole Size		8-3/8 to 9-1/2	9-5/8 to 10-5/8	10-3/4 to 11-5/8	11-3/4 to 12-1/2	12-5/8 to 13-5/8	13-3/4 to 16	16 to 17-1/2
O.D. of Barrel		7-7/8	9-1/8	10-1/8	11	11-7/8	13	15
Maximum Diameter of Fish		6-1/16	7-1/16	7-5/8	8-5/16	8-1/2	9-13/16	11
Top Connection		5-1/2	6-5/8	6-5/8	6-5/8	6-5/8	6-5/8	6-5/8
Number of Teeth on Mill		8	10	10	12	12	14	16
Complete Assembly	Part No.	2567	2659	2684	2690	2696	2702	2708
	Weight	374	441	576	665	797	932	1563

Replacement Parts

Top Sub	Part No.	2568	2660	2685	2691	2697	2703	2709
	Weight	154	179	203	226	257	286	530
Barrel	Part No.	2569	2661	2686	2692	2698	2704	2710
	Weight	166	193	279	322	399	462	734
Valve Cup	Part No.	2570	2662	2662	2662	2662	2662	2662
	Weight	7	9	9	9	9	9	9
Steel Ball	Part No.	2572	2665	2665	2665	2665	2665	2665
	Diameter.	1-11/16	2-1/4	2-1/4	2-1/4	2-1/4	2-1/4	2-1/4
	Weight	3/4	2	2	2	2	2	2
Valve Seat	Part No.	2571	2663	2663	2663	2663	2663	2663
	Weight	1/4	3/4	3/4	3/4	3/4	3/4	3/4
Junk Catcher Assembly*	Part No.	18725-W	14633-W	21755-W	21760-W	21840-W	21770-W	21775-W
	Weight	7-1/2	9	16	20	25	40	90
Mill Shoe Type A	Part No.	2574-A	2668-A	2689-A	2695-A	2701-A	2707-A	2713-A
	Weight	36	43	61	78	94	124	218
Pick Up Sub	Part No.	426	427	427	427	427	427	427
	Weight	55	79	79	79	81	83	83
Pipe Plug	Part No.	61523	61523	61523	61523	61523	61523	61523
	Weight	1/2	1/2	1/2	1/2	1/2	1/2	1/2
	Thread	3-1/2" NPT	3-1/2" NPT	3-1/2" NPT	3-1/2" NPT	3-1/2" NPT	3-1/2" NPT	3-1/2" NPT

Mill Shoes

Mill Shoe Type B	Part No.	2574-B	2668-B	2689-B	2695-B	2701-B	2707-B	2713-B
	Weight	36	43	61	78	94	124	218
Mill Shoe Type C	Part No.	2574-C	2668-C	2689-C	2695-C	2701-C	2707-C	2713-C
	Weight	39	48	68	83	102	131	225

Finger Shoes

Maximum Diameter of Fish		7-23/32	9	9-15/16	11	11-7/8	13	15-1/4
Complete Assembly	Part No.	2741	2742	2743	2744	2745	2746	2747
	Weight	81	102	135	154	213	276	351
Body	Part No.	2741-2	2742-2	2743-2	2744-2	2745-2	2746-2	2747-2
	Weight	37	50	64	83	124	154	191
Replacement	Part No.	2741-1	2742-1	2743-1	2744-1	2745-1	2746-1	2747-1
	Weight	44	52	64	71	89	122	160

Magnet Insert

To Fit Assembly No.		2567	2659	2684	2690	2696	2702	2708
Total Pull In Lbs.		310 to 360	620 to 720	620 to 720	930 to 1080	930 to 1080	1265 to 1440	1740 to 2050
Magnet Insert Assembly	Part No.	61953	61961	61963	61973	61975	61981	61985
Consisting of:	Weight	97	174	186	266	281	348	485
Magnetic Assembly	Part No.	61822	61826	61826	61828	61828	61830	61832
	Weight	18	24	36	45	60	82	131
Adapter	Part No.	61954	61966	61968	61974	61976	61982	61986
	Weight	79	150	150	221	221	266	354

How To Order:

- Specify: (1) Name and Number of Assembly or Part
(2) O.D. and Type of Shoe
(3) Top Connection Desired

Recommended Spare Parts:

- (1) 2 Junk Catchers
(2) 2 Mill Shoes
(3) 1 Valve Cup
(4) 1 Valve Seat
(5) 1 Steel Ball

Recommended Accessories:

- (1) 2 Finger Shoes
(2) 4 Finger Shoe Replacements
(3) 1 Magnet Insert

NOTE: Finger Shoe replacement is furnished with the same O.D. as standard Shoe unless otherwise specified.

* See Catcher Assembly Tables for parts breakdown.

Bowen Reverse Circulation Junk Baskets (W7R Type)

Hole Size		3-3/4 to 4-1/8	4-1/4 to 4-1/2	4-5/8 to 5	5-1/8 to 5-1/2	5-5/8 to 6	6-1/8 to 7	7-1/8 to 7-1/2
O.D. of Barrel		3-5/8	4-1/8	4-1/2	4-7/8	5-3/8	5-7/8	6-3/4
Max. Diameter of Fish		2-3/4	3	3-3/8	3-5/8	4-1/16	4-5/8	5-1/4
Top Connection		2-3/8	2-3/8	2-3/8	2-7/8	2-7/8	3-1/2	3-1/2
No. of Teeth on Mill		6	6	8	8	8	8	8
Complete Assembly	Part No.	7724	7727	7731	7734	7737	7743	7747
	Weight	78	85	95	108	141	173	223

Replacement Parts

Top Sub	Part No.	6636	7728	4449	4573	7738	7744	7748
	Weight	24	30	35	42	63	77	104
Barrel	Part No.	7725	7729	7732	7735	7739	7745	7749
	Weight	41	43	46	50	61	73	90
Valve Cup	Part No.	6638	6638	6638	4451	4451	2621	2621
	Weight	3	3	3	4	4	5	5
Steel Ball	Part No.	6640	6640	6640	4453	4453	2623	2623
	Weight	3/16	3/16	3/16	1/4	1/4	1/2	1/2
	Diameter	15/16	15/16	15/16	1-1/8	1-1/8	1-3/8	1-3/8
Valve Seat	Part No.	6639	6639	6639	4452	4452	2622	2622
	Weight	1/8	1/8	1/8	1/6	1/6	1/5	1/5
Junk Catcher Assembly*	Part No.	21810-W	21815-W	21805-W	18940-W	21820-W	21830-W	18935-W
	Weight	1-1/2	1-1/2	2	3	3	3-1/2	6
Mill Shoe Type A	Part No.	6982-A	6987-A	6960-A	6992-A	6997-A	7004-A	7009-A
	Weight	7	7-1/2	8-1/2	9-1/2	11	14	19
Pick Up Sub	Part No.	4568	4568	4568	424	424	425	425
	Weight	8	8	8	12	13	18	19
Pipe Plug	Part No.	61520	61520	61520	61520	61520	61521	61521
	Weight	1/2	1/2	1/2	1/2	1/2	1/2	1/2
	Thread	1-1/2" NPT	1-1/2" NPT	1-1/2" NPT	1-1/2" NPT	1-1/2" NPT	2" NPT	2" NPT

Mill Shoes

Mill Shoe Type B (Itcoloy Faced)	Part No.	6982-B	6987-B	6960-B	6992-B	6997-B	7004-B	7009-B
	Weight	7	7-1/2	8-1/2	9-1/2	11	14	19
Mill Shoe Type C (Itcoloy Faced)	Part No.	6982-C	6987-C	6960-C	6992-C	6997-C	7004-C	7009-C
	Weight	8	8-1/2	10	10-1/2	13	16	21

Finger Shoes

Max. Diameter of Fish		3-1/4	3-13/16	4-1/16	4-1/2	5	5-11/16	6-1/2
Complete Assembly	Part No.	7726	7730	7733	7736	7740	7746	7750
	Weight	15	19	24	27	33	41	52
Body	Part No.	7726-2	7730-2	7733-2	7736-2	7740-2	7746-2	7750-2
	Weight	9	11	14	15	17	19	23
Replacement	Part No.	7726-1	7730-1	7733-1	7736-1	7740-1	7746-1	7750-1
	Weight	6	8	10	12	16	22	29

Magnet Inserts

To Fit Assembly No.		7224	7727	7731	7734	7737	7743	7747
Total Pull in Lbs.		45 to 55	45 to 55	80 to 100	80 to 100	125 to 145	180 to 205	250 to 290
Magnet Insert Assembly	Part No.	61842	61838	61860	61856	61864	61870	61876
Consisting of:	Weight	16	16-1/2	29	32	45	55	73
Magnetic Assembly	Part No.	61812	61812	61814	61814	61816	61818	61820
	Weight	2	2-1/2	3	4	5	8	10
Adapter	Part No.	61843	61839	61861	61857	61865	61871	61948
	Weight	14	14	26	28	40	47	63

How To Order:

Specify: (1) Name and Number of Assembly or Part
(2) O.D. and Type of Shoe
(3) Top Connection Desired

Recommended Spare Parts:

(1) 2 Junk Catchers
(2) 2 Mill Shoes
(3) 1 Valve Cup
(4) 1 Valve Seat
(5) 1 Steel Ball

Recommended Accessories:

(1) 2 Finger Shoes
(2) 4 Finger Shoe Replacements
(3) 1 Magnet Insert

NOTE: Finger Shoe replacement is furnished with the same O.D. as standard Shoe unless otherwise specified.
* See Catcher Assembly Tables for parts breakdown.

Bowen Reverse Circulation Junk Baskets (W7R Type) (Continued)

Hole Size		7-5/8 to 8-1/2	8-5/8 to 9-1/2	9-5/8 to 10-3/8	10-1/2 to 11-5/8	11-3/4 to 13-3/8	13-1/2 to 15
O.D. Of Barrel		7-5/16	8-3/16	9-1/8	9-7/8	11	12-3/4
Max. Diameter of Fish		5-5/8	6-1/2	7-1/8	7-3/4	8-5/8	9-15/16
Top Connection		4-1/2	4-1/2	5-1/2	5-1/2	6-5/8	6-5/8
No. of Teeth on Mill		8	10	10	10	12	14
Complete Assembly	Part No.	7751	7754	7757	7760	7764	7767
	Weight	280	380	407	484	597	794

Replacement Parts

Top Sub	Part No.	7752	7755	2660	7761	2691	7768
	Weight	126	158	179	197	226	278
Barrel	Part No.	7753	7756	7758	7762	7765	7769
	Weight	115	145	164	210	277	390
Valve Cup	Part No.	2570	2570	2662	2662	2662	2662
	Weight	7	7	9	9	9	9
Steel Ball	Part No.	2572	2572	2665	2665	2665	2665
	Weight	3/4	3/4	2	2	2	2
	Diameter	1-11/16	1-11/16	2-1/4	2-1/4	2-1/4	2-1/4
Valve Seat	Part No.	2571	2571	2663	2663	2663	2663
	Weight	1/4	1/4	3/4	3/4	3/4	3/4
Junk Catcher Assembly*	Part No.	18936-W	18720-W	21835-W	18945-W	21840-W	21850-W
	Weight	7-1/2	8	9	16	21	40
Mill Shoe Type A	Part No.	7014-A	7019-A	7023-A	7028-A	7033-A	7038-A
	Weight	25	32	41	51	63	86
Pick Up Sub	Part No.	1849	1849	426	426	427	427
	Weight	45	46	59	59	79	83
Pipe Plug	Part No.	61522	61522	61523	61523	61523	61523
	Weight	1/2	1/2	1/2	1/2	1/2	1/2
	Thread	2" NPT	2" NPT	3-1/2" NPT	3-1/2" NPT	3-1/2" NPT	3-1/2" NPT

Mill Shoes

Mill Shoe Type B (Itcoloy Faced)	Part No.	7014-B	7019-B	7023-B	7028-B	7033-B	7038-B
	Weight	25	32	41	51	63	86
Mill Shoe Type C (Itcoloy Faced)	Part No.	7014-C	7019-C	7023-C	7028-C	7033-C	7038-C
	Weight	28	37	47	59	71	93

Finger Shoes

Max. Diameter of Fish		7-1/4	8-1/8	9	9-3/4	11	12-1/2
Complete Assembly	Part No.	7342	7343	7759	7763	7766	7770
	Weight	70	86	102	130	154	276
Body	Part No.	7342-2	7343-2	7759-2	7763-2	7766-2	7770-2
	Weight	33	41	50	61	83	154
Replacement	Part No.	7342-1	7343-1	7759-1	7763-1	7766-1	7770-1
	Weight	37	45	52	69	71	122

Magnet Inserts

To Fit Assembly No.		7751	7754	7757	7760	7764	7767
Total Pull In Lbs.		310 to	425 to	620 to	620 to	930 to	1265 to
		360	495	720	720	1080	1440
Magnet Insert Assembly Consisting of:	Part No.	61951	61957	61961	61963	61971	61981
	Weight	93	113	172	178	259	322
Magnetic Assembly	Part No.	61822	61824	61826	61826	61828	61830
	Weight	14	17	24	28	38	56
Adapter	Part No.	61952	61958	61966	61968	61972	61982
	Weight	79	96	150	150	221	266

How To Order:

Specify: (1) Name and Number of Assembly or Part
(2) O.D. and Type of Shoe
(3) Top Connection Desired

Recommended Spare Parts:

(1) 2 Junk Catchers
(2) 2 Mill Shoes
(3) 1 Valve Cup
(4) 1 Valve Seat
(5) 1 Steel Ball

Recommended Accessories:

(1) 2 Finger Shoes
(2) 4 Finger Shoe Replacements
(3) 1 Magnet Insert

NOTE: Finger Shoe replacement is furnished with the same O.D. as standard Shoe unless otherwise specified.
* See Catcher Assembly Tables for parts breakdown.

Bowen Junk Basket Catchers

Number of Junk Basket it will Fit		6635	7295	4448	4572	2618	2670	2677
Complete Assembly	Part No.	21795-W	21855-W	21780-W	18940-W	21735-W	28349-W	21750-W
	Weight	1-1/4	1-1/2	2	3	3	4-1/2	4-1/2

Replacement Parts

Body	Part No.	56357	68366	45591	45579	45559	45511	45584
	Weight	1/4	1/4	1/2	3/4	3/4	1	1-1/4
Finger Retainer	Part No.	56358	68367	45592	45580	45560	45519	45585
	Weight	1/16	1/16	1/8	1/8	1/4	1/4	1/4
Short Finger	Part No.	68368	68368	45574	45581	45558	45517	45517
	Weight	1/16	1/16	1/16	1/8	1/8	1/8	1/8
	No. Req'd.	4	4	5	6	5	8	6
Medium Finger	Part No.	—	—	—	—	—	—	—
	Weight	—	—	—	—	—	—	—
Long Finger	Part No.	68369	68369	45575	45582	45561	45516	45516
	Weight	1/16	1/8	1/8	1/8	1/8	1/4	1/4
	No. Req'd.	4	4	5	6	5	4	6
Pivot Pin	Part No.	45583	45583	45583	45583	—	—	—
	Weight	1/32	1/32	1/32	1/32	—	—	—
Torsion Spring	Part No.	45571	45571	45571	45571	45520	45520	45520
	Weight	1/32	1/32	1/32	1/32	1/16	1/16	1/16
	No. Req'd.	8	8	10	12	10	12	12
Retainer Screw	Part No.	42257	42257	42257	42257	42257	42257	42257
	Weight	1/32	1/32	1/32	1/32	1/32	1/32	1/32
	No. Req'd.	2	2	2	2	2	2	2

Catchers Continued

Number of Junk Basket it will Fit		2554	2567	2659	2684	2690	2696	2702
Complete Assembly	Part No.	21725-W	18725-W	14633-W	21755-W	21760-W	21840-W	21770-W
	Weight	7	7-1/2	9	16	20	25	124

Replacement Parts

Body	Part No.	45550	45505	45521	68116	45576	45593	64810
	Weight	2-1/2	2-1/2	3	6-1/2	7	9	12-1/2
Finger Retainer	Part No.	45551	45506	45530	68117	45578	45594	64811
	Weight	1/2	1/2	3/4	1-1/2	1-1/2	2	2-1/2
Short Finger	Part No.	45557	45508	45588	45507	45525	45507	666
	Weight	1/4	1/4	3/8	5/8	1/2	5/8	1-1/4
	No. Req'd.	6	6	6	6	8	8	8
Medium Finger	Part No.	—	—	—	—	45510	45510	—
	Weight	—	—	—	—	3/4	3/4	—
Long Finger	Part No.	45518	45507	45589	70277	45526	45526	667
	Weight	1/4	3/8	1/2	5/8	7/8	1-1/4	1-1/2
	No. Req'd.	6	6	6	6	4	4	8
Pivot Pin	Part No.	—	—	—	—	—	—	45603
	Weight	—	—	—	—	—	—	1/16
Torsion Spring	Part No.	45520	45509	45549	45509	45509	45509	45604
	Weight	1/16	1/16	1/16	1/16	1/16	1/16	1/8
	No. Req'd.	12	12	12	12	16	16	16
Retainer Screw	Part No.	42257	42257	42257	42257	42257	42257	42257
	Weight	1/32	1/32	1/32	1/32	1/32	1/32	1/32
	No. Req'd.	2	2	2	2	2	2	2

Bowen Junk Catchers (Continued)

Number of Junk Basket it will Fit		2708	7724	7727	7731	7734	7737	7743
Complete Assembly	Part No.	21775-W	21810-W	21815-W	21805-W	18940-W	21820-W	21830-W
	Weight	90	1-1/2	1-1/2	2	3	3	3-1/2

Replacement Parts

Body	Part No.	45605	45542	68370	45565	45579	45595	68377
	Weight	20	1/4	1/4	7/16	9/16	1/2	9/16
Finger Retainer	Part No.	45606	45538	68371	45566	45580	45596	68378
	Weight	3-1/4	1/16	1/16	1/8	3/16	1/8	3/16
Short Finger	Part No.	45607	45539	22132	45574	45581	45597	45597
	Weight	3	1/16	1/16	1/16	1/8	1/8	1/8
	No. Req'd.	8	5	5	6	6	6	6
Medium Finger	Part No.	—	—	—	—	—	—	—
	Weight	—	—	—	—	—	—	—
	No. Req'd.	—	—	—	—	—	—	—
Long Finger	Part No.	45608	45540	22131	45575	45582	45598	45598
	Weight	5	1/16	1/16	1/16	3/16	3/16	3/16
	No. Req'd.	8	5	5	6	6	6	6
Pivot Pin	Part No.	45609	45535	45583	45583	45583	45599	45599
	Weight	1/16	1/32	1/32	1/32	1/32	1/32	1/32
	No. Req'd.	3	10	10	12	3	12	12
Torsion Spring	Part No.	45610	45567	45567	45571	45571	45571	45571
	Weight	1/8	1/32	1/32	1/32	1/32	1/32	1/32
	No. Req'd.	16	10	10	12	12	12	12
Retainer Screw	Part No.	42257	42257	42257	42257	42257	42257	42257
	Weight	1/16	1/32	1/32	1/32	1/32	1/32	1/32
	No. Req'd.	1	2	2	2	1	2	2

Catchers Continued

Number of Junk Basket it will Fit		7747	7751	7754	7757	7760	7764	7767
Complete Assembly	Part No.	18935-W	18936-W	18720-W	21835-W	18945-W	21840-W	21850-W
	Weight	6	7-1/2	8	9	16	21	40

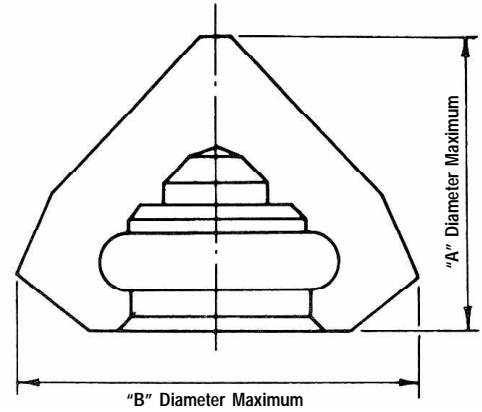
Replacement Parts

Body	Part No.	45513	45514	45515	70700	45522	45583	70703
	Weight	1-1/4	1-1/8	1-7/16	1-3/16	3-1/2	4	12-1/2
Finger Retainer	Part No.	45527	45528	45529	70701	45531	45594	64811
	Weight	3/8	3/8	1/2	3/8	1-3/16	1-1/2	2-1/2
Short Finger	Part No.	45517	45517	45508	45588	45507	45507	666
	Weight	1/4	3/8	3/8	1/2	3/4	3/4	1-1/4
	No. Req'd.	6	6	6	6	6	8	8
Medium Finger	Part No.	45516	—	—	—	—	—	—
	Weight	5/16	—	—	—	—	—	—
	No. Req'd.	3	—	—	—	—	—	—
Long Finger	Part No.	45518	45518	45507	45589	70277	45526	667
	Weight	3/8	1/2	1/2	5/8	1	1	1-1/2
	No. Req'd.	3	6	6	6	6	8	8
Pivot Pin	Part No.	—	—	—	—	—	—	45603
	Weight	—	—	—	—	—	—	1/16
	No. Req'd.	—	—	—	—	—	—	16
Torsion Spring	Part No.	45520	45520	45509	45549	45509	45529	45604
	Weight	1/16	1/16	1/16	1/16	1/16	1/16	1/8
	No. Req'd.	12	12	12	12	12	16	16
Retainer Screw	Part No.	42257	42257	42257	42257	42257	42257	42257
	Weight	1/32	1/32	1/32	1/32	1/32	1/32	1/32
	No. Req'd.	2	2	2	2	2	1	2

Rock Bit Cone Dimensions

The cone sizes shown are the nominal Hughes Christensen Company "cone dimensions" and are the maximum for the size indicated in the middle column. They may be used as a guide in junk fishing operations.

2 CONE BITS		SIZE	3 CONE BITS	
A	B		A	B
		3-3/4 to 4-1/8	1-31/32	2-45/64
		4-1/4 to 4-1/2	2-13/64	2-59/64
		4-5/8 to 5	2-11/32	3-13/64
		5-1/8 to 5-1/2	2-41/64	3-17/64
		5-5/8 to 6	3-1/8	4-1/64
		6-1/8 to 6-1/2	3-6/64	4-3/16
		6-5/8 to 7	3-7/16	4-9/16
		7-1/8 to 7-1/2	3-45/64	4-27/32
3-45/64	5-17/32	7-5/8 to 8	3-31/32	5-17/64
4-11/32	6-7/64	8-1/8 to 8-1/2	4-3/8	5-25/32
4-11/32	6-5/16	8-5/8 to 9	4-17/32	6-1/32
		9-1/8 to 9-1/2	4-9/16	6-13/32
4-7/8	7	9-5/8 to 9-7/8	4-15/16	6-41/64
5-23/64	7-19/32	10-1/2 to 11-1/2	5-27/64	7-5/32
5-63/64	8-27/64	11-3/4 to 12-1/2	6-1/8	7-61/64
		12-5/8 to 13-1/8	6-5/16	8-31/64
		13-1/2 to 14-1/4	7-1/32	8-13/16
		14-1/2 to 15	7-25/64	9-19/32
		16	9-27/32	10-1/8
		17 to 17-1/2	8-13/64	11-11/64
		18-1/2 to 18-7/8	8-25/32	11-23/64
		20	9-1/2	11-7/8
		22	10-15/32	14-1/64
		24	10-15/16	14-9/16
		26	12-19/64	14-31/64



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* Denotes Manufacturing and Engineering facilities

Downhole Solutions

Drilling Solutions

Engineering and Project Management Solutions

Lifting and Handling Solutions

Production Solutions

Supply Chain Solutions

Tubular and Corrosion Control Solutions

Well Service and Completion Solutions