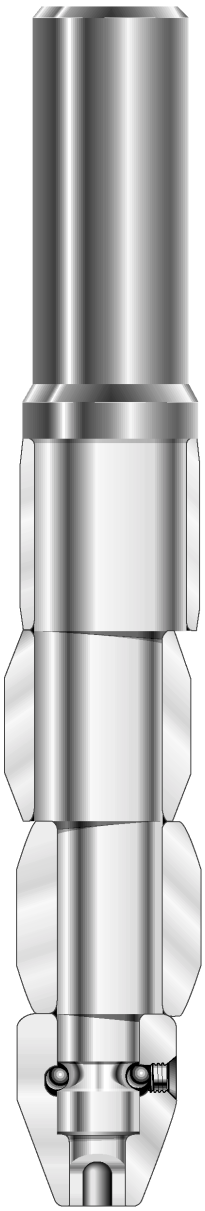


Bowen Tubing and Casing Rollers

Instruction Manual

NATIONAL OILWELL

Downhole Tools

Manual No. 5/6200

INSTRUCTION MANUAL

BOWEN TUBING AND CASING ROLLERS

(PATENTED)

INDEX

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

Seventeenth Printing, October 1987

INSTRUCTION MANUAL

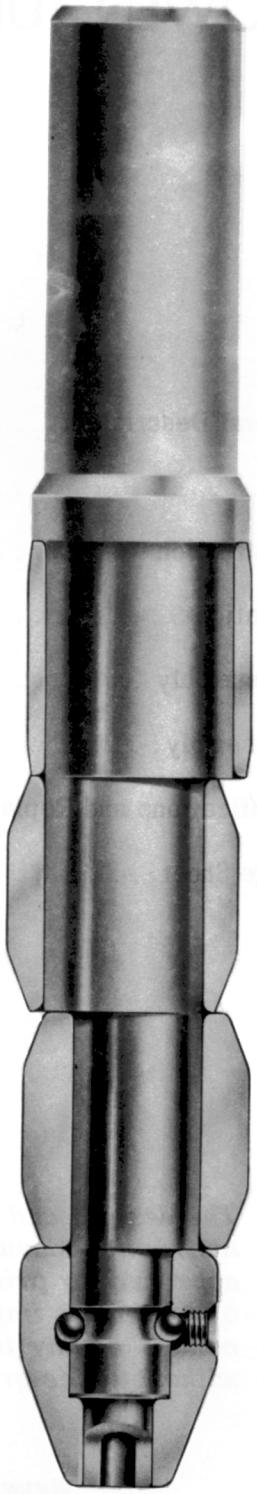
BOWEN TUBING AND CASING ROLLERS

(PATENTED)

GENERAL DESCRIPTION

The BOWEN TUBING and CASING ROLLER is specifically designed for reconditioning casing and differs from any other tool intended for this use in that it does not contain any small parts to be worn, broken or lost in the well.

The BOWEN TUBING and CASING ROLLER is extremely rugged yet simple in design. All moving parts are held in place on the Mandrel by large ball bearings running in deep grooves.



USE

The BOWEN TUBING and CASING ROLLER is used specifically to recondition and restore buckled, collapsed or dented well tubing and casings to their normal internal diameter and roundness. It is designed to enter into the smaller I.D. of the damaged casing. As it is rotated and forced downward, it exerts lateral pressure on the casing to restore it to its normal I.D.

CONSTRUCTION

The BOWEN TUBING and CASING ROLLER is manufactured from special alloy steels selected for their ability to resist wear. The Mandrel and all Rollers are case hardened for further wear qualities.

The BOWEN TUBING and CASING ROLLER consists of an eccentric Mandrel upon which are mounted a series of Rollers and a tapered Nose Cone. The upper end of the Mandrel is fitted with a threaded box connection for connection to the drill pipe. The tapered Nose Cone locks all Rollers in place on the Mandrel by large ball bearings running in deep grooves in the Mandrel and the Nose Cone.

The design of the BOWEN TUBING and CASING ROLLER permits the use of interchangeable Rollers to be used on each size Mandrel. (See Table) The large bearing areas between the Rollers and the eccentrics effectively reduce bearing pressures, therefore increasing tool life.

OPERATION

Make up the BOWEN TUBING and CASING ROLLER to either the drill collars or to the drill pipe; experience has shown that it is preferable to connect direct to the drill pipe.

The drill pipe and the roller are rotated slowly and lowered gradually through the casing until the damaged area is located and contacted. Upon contact with the collapsed casing, increase the rotary speed to 40-75 RPM, start circulation and lower slowly.

The reduced portion of the tapered Nose Cone readily enters between the walls of the collapsed casing. As the Mandrel is rotated and lowered, the eccentrics force the Nose Cone and Rollers outwardly against the casing walls with great lateral pressure restoring the casing to its normal I.D. and roundness.

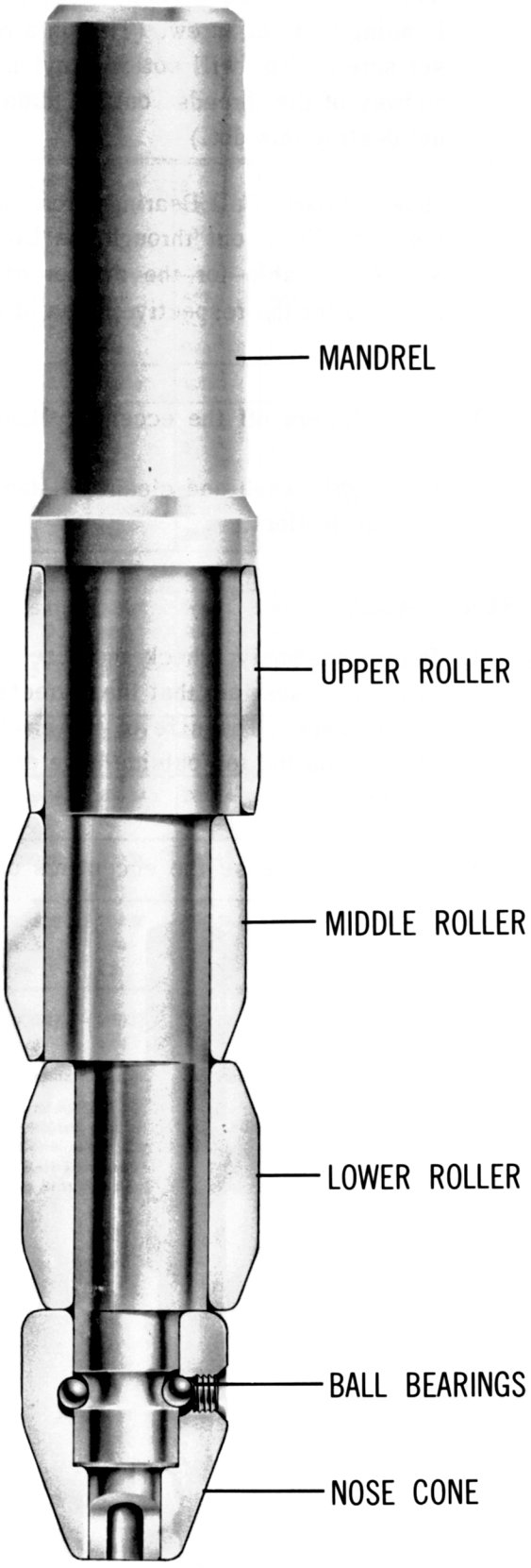
Moderate to heavy weight should be applied during operation. *The use of too little weight, with high rotational speeds should be avoided. Light weight with high speeds tends to wear the rollers without straightening the pipe.* If. insufficient weight is available in the running string, drill collars should be added. The best guide to the amount of weight and rotational speed to use is experience; as long as steady downward progress is made by the Casing Roller, the weight-speed ratio is giving the proper results.

Badly damaged casing will require the maximum amount of weight for the Roller to enter into and straighten the casing. The rugged construction of the BOWEN TUBING and CASING ROLLER allows the operator to apply the maximum amount of weight and torque without damage to the tool.

CIRCULATION MUST BE MAINTAINED DURING THE OPERATION!

DISASSEMBLY

The BOWEN TUBING and CASING ROLLER requires only a minimum of maintenance. Like any tool, it should be thoroughly cleaned and greased after use and before storage. To disassemble:



BOWEN CASING ROLLER

1. With an Allenhead wrench, remove the Loading Slot Set Screw. (This is a Nylok set screw. You will notice a nylon dot midway of the threads on one side. Do not destroy this dot.)

2. Shake or dump Ball Bearings from inside the Nose Cone out through the Loading Slot (see Table for the number of ball bearings for the respective sizes of Nose Cones).

3. Slide Rollers off the eccentric Mandrel.

4. Thoroughly wash and clean the Mandrel, and the Rollers.

REASSEMBLY

1. Before assembly, check the size of the Rollers to ascertain that the correct sizes are at hand. The size of the casing is stamped on the top outside edge of each Roller.

2. Thoroughly grease the eccentrics on the Mandrel and the interior of each roller—particularly, the ball bearing grooves on the Mandrel and inside the Nose Cone.

3. Slide the Rollers onto the Mandrel. Each Roller is made to close tolerance to the respective Mandrel eccentric so there should be no difficulty in proper assembling.

4. Slide Nose Cone in place on the Mandrel.

5. With the Casing Roller horizontal, drop Ball Bearings, one by one, into the loading slot. Rotating Nose Cone back and forth will help to distribute the bearings around the groove. (See Table for the proper number of ball bearings for the respective sizes of Nose Cones.)

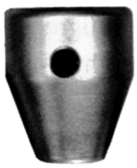
6. Insert and make up Loading Slot Set Screw into the Loading Slot. This is a Nylok set screw especially machined to seat into a shoulder. Make up tightly with an Allen wrench until it seats firmly.

MANDREL


TOP ROLLER


MIDDLE ROLLER


LOWER ROLLER


LOADING SLOT

NOSE CONE


BALL BEARINGS


LOADING SLOT SET SCREW

SPECIFICATIONS AND REPLACEMENT PARTS

BOWEN TUBING AND CASING ROLLERS

TO ROLL CASING SIZE		2-3/8 Tub.	2-7/8 Tub.	3-1/2 Tub.	4 3-1/2 L.P. 4 Tub.	4-1/2 4-3/4 5	5-1/2 5-3/4 6	6-5/8 7	7-5/8 8-5/8	9 9-5/8 10	10-3/4 11-3/4 12	13 13-3/8	16 18-5/8
TOP CONNECTION		1" DSS Hardy Griffin	1-13/16 F.J.	API 1-1/4 Reg.	EUE 1-1/2	API 2-3/8 Reg.	API 2-7/8 Reg.	API 3-1/2 Reg.	API 4-1/2 Reg.	API 4-1/2 Reg.	API 6-5/8 Reg.	API 6-5/8 Reg.	6-5/8 Reg.
CIRCULATION HOLE		3/8	3/8	5/16	1/4	1/2	5/8	1	1-1/4	1-1/2	1-3/4	2	2
LENGTH OF INDIVIDUAL ROLLERS		3	3	3	4	4	5	6	7	8	9	10	11
COMPLETE ASSEMBLY	Part No. ..	28802	26395	29046	28963	20660	20910	20920	20930	20940	20950	20960	20970
	Weight	11-1/4	40	22	41-1/4	60	128	171	256	392	890	1349	1690
REPLACEMENT PARTS													
MANDREL	Part No. ..	28803	26396	29051	28964	20661	20911	20921	20931	20941	20951	20961	20971
	Weight	6	22	12	26	33	68	80	116	160	600	950	1000
NOSE CONE	Part No. ..	28807	26400	29050	28965	20662	20912	20922	20932	20942	20952	20962	20972
	Weight	1	3	2-1/4	3-1/4	5-1/4	6	17	30	42	60	120	340
LOWER ROLLER	Part No. ..	28806	26399	29049	28966	20663	20913	20923	20933	20943	20953	20963	20973
	Weight	1-3/4	5	2-13/16	6-3/4	9	16	28	40	80	90	160	250
MIDDLE ROLLER	Part No. ..	28805	26398	29048	28967	20664	20914	20924	20934	20944	20954	20964	20974
	Weight	1-1/2	4	2-3/4	4	8	16	26	40	80	90	110	250
UPPER ROLLER	Part No. ..	28804	26397	29047	28968	20665	20915	20925	20935	20945	20955	20965	20975
	Weight	1	3	2	1-1/4	5	9	20	20	30	50	105	250
BALL BEARINGS	Part No. ..	17294	17294	27940	20666	20666	20666	20926	20936	20936	20936	20966	20966
	Weight	1/16	1/16	1/16	1/16	1/16	1/16	1/8	1/4	1/4	1/4	1/2	1/2
	No.Req'd..	9	13	8	7	9	13	15	12	16	24	21	27
LOADING SLOT SET SCREW	Part No. ..	28808	26401	29052	20667	20667	20667	20927	20937	20937	20937	20967	20967
	Weight	1/16	1/16	1/16	1/16	1/16	1/16	1/8	1/4	1/4	1/4	1/2	1/2

HOW TO ORDER:

Specify: (1) Name and Number of Assembly or Part.
(2) Casing O.D. and Weight.
(3) Top Connection, if other than Standard.

RECOMMENDED SPARES:

(1) 1 Middle Roller, each Casing Size.
(2) 1 Nose Cone, each Casing Size.
(3) 1 Set of Ball Bearings.
(4) 2 Loading Slot Set Screws.

NOTE: For prices, refer to Section 6200 of the Bowen Price Manual.

BOWEN TUBING AND CASING ROLLERS – RANGE SHEET

CASING		UPPER ROLLER			MIDDLE ROLLER			LOWER ROLLER			NOSE CONE			MEAN CASING DRIFT DIA. (TOOL ROLLS)
SIZE	WT.	PART NO.	O.D.	WT.	PART NO.	O.D.	WT.	PART NO.	O.D.	WT.	PART NO.	O.D.	WT.	
2 3/8	4.6	28804	1.750	1	28805	1.938	1½	28806	1.750	1¾	28807	1.562	1	1.901
2 7/8	6.4	26397	2.187	3	26398	2.360	4	26399	2.187	5	26400	1.875	3	2.347
3 ½	7.7	29047	2.812	2	29048	2.674	2¾	29049	2.812	2¾	29050	2.437	2¼	2.943
4	9.5	28968	3.219	1¼	28967	3.281	4	28966	3.219	6¾	28965	2.875	3¼	3.423

CASING		UPPER ROLLER			MIDDLE ROLLER			LOWER ROLLER			NOSE CONE			MEAN CASING DRIFT DIA. (TOOL ROLLS)
SIZE	WT.	PART NO.	O.D.	WT.	PART NO.	O.D.	WT.	PART NO.	O.D.	WT.	PART NO.	O.D.	WT.	
4½	9.5	20665	3.688	3½	20664	3.875	7½	20663	3.688	8	20662	3.125	5¼	4.032
	11.6					3.688	5½							3.938
	13.6					3.526	4½							3.859
4¾	15.75		3.688	3½		3.875	7¼		3.688	8				4.032
5	11.5		4.250	7½		4.250	10		4.250	12				4.500
	13.0					4.114	9							4.438
	15.0		4.000	5½		4.192	9½		4.000	10½				4.343
	17.7					3.976	8							4.234
	18.0					3.965	8							4.218
	21.0		3.688	3½		4.000	8		3.688	8				4.094
5½	13.0	20915	4.662	9	20914	4.802	14	20913	4.662	16	20912	3.750	6	4.982
	14.0					4.738	14							4.950
	15.0					4.666	13							4.912
	15.5		4.609	9		—	13		4.609	16				4.888
	17.0					4.554	11							4.830
	20.0		4.359	6		4.574	11		4.359	13				4.716
	23.0					4.358	10							4.608
5¾	14.0		4.875	12		5.082	17		4.875	19				5.228
	17.0					4.894	15							5.128
	19.5		4.662	9		4.894	15		4.662	16				5.028
	22.5					4.694	14							4.928
6	15.0		5.125	15		5.300	20		5.125	22				5.462
	16.0					5.250	19							5.438
	18.0					5.100	18							5.362
	20.0					4.956	16							5.290
	23.0		4.875	12		4.982	17		4.875	19				5.178
6⅝	17.0	20925	5.734	15	20924	5.910	24	20923	5.734	27	20922	5.000	17	6.072
	20.0					5.745	22							5.987
	22.0		5.609	13		5.745	22		5.609	25				5.927
	24.0					5.609	20							5.859
	26.0					5.478	18							5.793
	26.0					5.442	17							5.775
	28.0					5.350	16							5.729
	29.0		5.359	10		5.547	18		5.359	22				5.699
	32.0					5.375	16							5.613
7	17.0		6.250	24		6.202	29		6.250	36		5.500	22	6.476
	20.0					6.038	25							6.394
	22.0		6.000	20		6.164	26		6.000	32				6.336
	23.0					6.108	26							6.304
	24.0		6.000	20		6.048	25		6.000	32				6.274
	26.0		5.830	16		6.094	26		5.830	28				6.214
	28.0					5.970	25							6.152
	29.0					5.910	24							6.122

BOWEN TUBING AND CASING ROLLERS — RANGE SHEET (Continued)

CASING		UPPER ROLLER			MIDDLE ROLLER			LOWER ROLLER			NOSE CONE			MEAN CASING DRIFT DIA. (TOOL ROLLS)
SIZE	WT.	PART NO.	O.D.	WT.	PART NO.	O.D.	WT.	PART NO.	O.D.	WT.	PART NO.	O.D.	WT.	
7	30.0					5.854	23							6.092
	32.0		5.734	15		5.830	23		5.734	27		5.000	17	6.032
	35.0		5.609	13		5.776	22		5.609	25				5.942
	38.0					5.609	20							5.858
	40.0					5.442	17							5.774
7⅝	20.0	20935	6.500	23	20934	6.875	42	20933	6.500	43	20932	5.375	30	7.062
	24.0					6.676	39							6.963
	26.4					6.562	37							6.906
	29.7		6.188	18		6.686	42		6.188	40				6.812
	33.7					6.468	35							6.703
	39.0					6.188	30							6.563
8⅝	24.0	20935	7.562	44	20934	7.758	62	20933	7.562	67	20932	6.500	48	8.035
	28.0					7.594	56							7.955
	32.0		7.375	39		7.594	56		7.375	62				7.859
	36.0					7.402	54							7.763
	38.0					7.302	52							7.713
	40.0		7.125	38		7.452	54		7.125	58		6.000	40	7.663
	43.0					7.304	52							7.589
	44.0					7.250	44							7.563
	49.0					7.024	45							7.449
9	34.00	20945	8.000	44	20944	7.676	50	20943	8.000	74	20942	6.625	42	8.212
	38.00		7.718	37		7.768	52		7.718	67				8.118
	40.00					7.676	50							8.072
	45.00		7.343	27		7.812	54		7.343	57				7.954
	55.00					7.375	43							7.734
9⅝	29.30		8.500	58		8.720	82		8.500	88				8.985
	32.30					8.696	81							8.973
	36.00					8.438	75							8.843
	40.00		8.250	51		8.514	77		8.250	81				8.757
	43.00					8.354	70							8.677
	47.00		8.000	44		8.456	76		8.000	74				8.603
	53.50					8.164	63							8.457
10	33.00		8.812	70		9.050	91		8.812	100				9.306
10¾	32.75	20955	9.500	36	20954	9.728	78	20953	9.500	96	20952	8.250	60	10.114
	40.00					9.444	68							9.976
	40.50													9.972
	45.00					9.254	59							9.882
	45.50													9.872
	48.00					9.148	54							9.824
	51.00		9.250	27		9.294	60		9.250	87				9.772
	54.00					9.162	56							9.706
	55.50					9.114	50							9.682
11¾	38.0		10.250	36		10.896	122		10.250	128		8.750	80	11.072
	42.00					10.754	113							11.002
	47.00					10.594	108							10.922
	54.00					10.354	104							10.802
	60.00					10.138	95							10.694
12	40.00		10.750	90		10.862	120		10.750	150				11.306
13	40.00	20965	11.625	105	20964	11.846	118	20963	11.625	158	20962	10.00	120	12.360
	45.00					11.677	107							12.282
	50.00					11.534	100							12.204
	54.00					11.410	95							12.142
13⅜	48.00		12.000	75		12.024	118		12.000	178				12.637
	54.50					11.812	117							12.537
	61.00					11.625	107							12.437

BOWEN TUBING AND CASING ROLLERS – RANGE SHEET (Continued)

CASING		UPPER ROLLER			MIDDLE ROLLER			LOWER ROLLER			NOSE CONE			MEAN CASING DRIFT DIA. (TOOL ROLLS)
SIZE	WT.	PART NO.	O.D.	WT.	PART NO.	O.D.	WT.	PART NO.	O.D.	WT.	PART NO.	O.D.	WT.	
13 3/8	68.00		11.625	105		11.812	102		11.625	158				12.337
	72.00					11.677	97							12.269
	83.00					11.320	93							12.097
	85.00					11.288	90							12.081
16	55.00	20975	14.500	146	20974	14.844	250	20973	14.500	284	20972	14.00	340	15.297
	65.00					14.554	234							15.172
	75.00					14.344	220							15.047
	84.00					14.114	210							14.932
18 5/8	78.00		17.000	325		17.304	440		17.000	463				17.777
	87.50					17.104	392							17.104
	96.50					16.904	370							17.577

NATIONAL OILWELL

Downhole Tools

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