



## Lead Seal Cementing Casing Patches

### LEAD SEAL CEMENTING CASING PATCHES

#### Overview

The Lead Seal Cementing Casing Patch forms a permanent sealed connection between two strings of casing and cements them together in a single operation. In addition to utilizing the field proven, compression-type lead seals of the Lead Seal Tubing and Casing Patch, the Lead Seal Cementing Casing Patch incorporates a valve system that allows the patch and running string to be cemented in place immediately after the lead seals have been compressed.

Lead Seal Cementing Casing Patches are available in popular casing sizes ranging from 2-3/8 to 13-3/8 inches. H<sub>2</sub>S service is available upon request.

#### Construction

The seal assembly is manufactured from pure, unalloyed, fully annealed lead that is particularly suited for use in wells that contain fluids or gases harmful to rubber or synthetic packers.

#### Assembly

After assembly, the lead seal cementing casing patch is made up to the bottom of the running string.

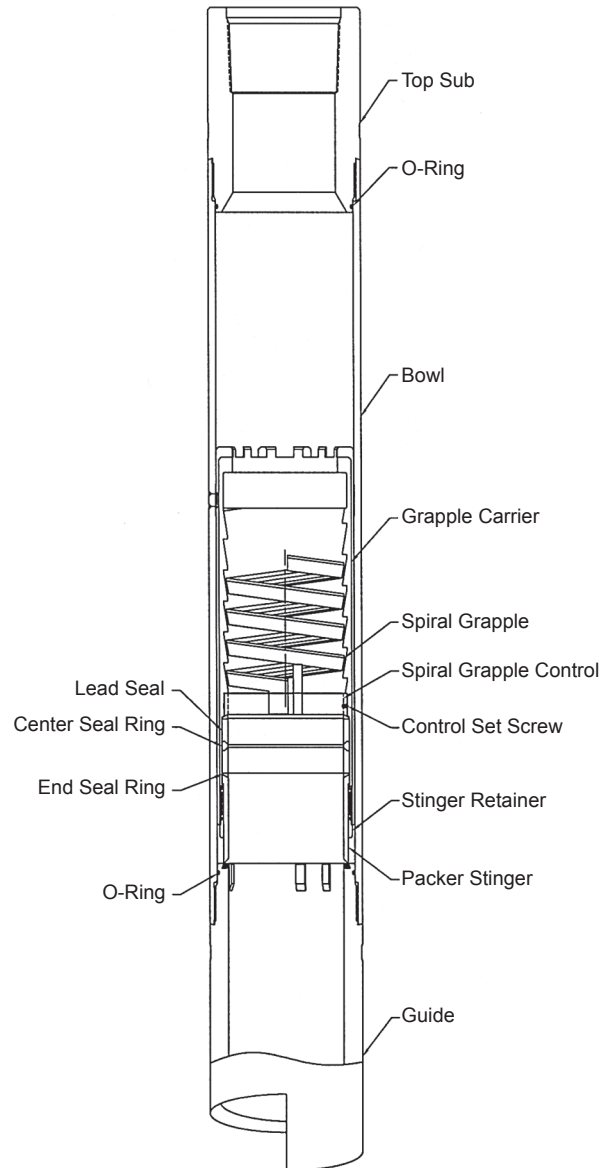
#### Operation

Properly cut and remove the damaged portion of casing from the hole. Prepare the top of the downhole casing for engagement and pack-off. Roll the casing if necessary to assure proper diameter and roundness.

Lower the string to the top of the prepared fish. Slowly rotate over the fish and apply an upward setting load. This will move the grapple and grapple carrier down and compress the lead seals against the guide to form the initial seal. Lower the running string to telescope the grapple carrier and stinger upward in the outer body to open the valve between the integral lead seal and the stinger. Immediately pump cement downhole. Cement will exit through the valve in the patch, placing cement around the outside of the patch and casing. After cement has been pumped, an upward load should be applied and maintained to the running string while the cement hardens.

#### When ordering, please specify:

- (1) Name and number of assembly or part
- (2) Casing O.D.
- (3) Size and type of connection



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O.D. CASING	2-3/8	2-7/8	3-1/2	4	4-1/2	5	5-1/2
O.D. PATCH	4-1/8	4-5/8	5-1/4	5-3/4	6-1/2	6-3/4	7-7/16
<b>COMPLETE ASSEMBLY</b>	<b>505-413</b>	<b>505-463</b>	<b>505-525</b>	<b>505-575</b>	<b>505-650</b>	<b>505-675</b>	<b>505-744</b>
Bowen No.	40514	41209	41210	40596	40619	40649	38179
<b>TOP SUB</b>	<b>AB12000</b>	<b>AB12001</b>	<b>AB12016</b>	<b>AB12002</b>	<b>AB12003</b>	<b>AB12004</b>	<b>AB12005</b>
Bowen No.	41092	41098	41104	41110	41116	41122	38415
<b>BOWL</b>	<b>AB1000</b>	<b>AB1001</b>	<b>AB1016</b>	<b>AB1002</b>	<b>AB1003</b>	<b>AB1004</b>	<b>AB1005</b>
Bowen No.	41093	41099	41105	41111	41117	41123	38416
<b>GRAPPLE CARRIER</b>	<b>AB2000</b>	<b>AB2001</b>	<b>AB2016</b>	<b>AB2002</b>	<b>AB2003</b>	<b>AB2004</b>	<b>AB2005</b>
Bowen No.	41095	41101	41107	41113	41119	41125	38417
<b>GRAPPLE</b>	<b>AA3000</b>	<b>AA3001</b>	<b>AB3016</b>	<b>AA3002</b>	<b>AA3003</b>	<b>AA3004</b>	<b>AA3005</b>
Bowen No.	17261	16143	26528	22403	13273	13283	12318
<b>GRAPPLE CONTROL</b>	<b>AA4000</b>	<b>AA4001</b>	<b>AB4016</b>	<b>AA4002</b>	<b>AA4003</b>	<b>AA4004</b>	<b>AA4005</b>
Bowen No.	17262	16144	26529	22404	13274	13284	12319
<b>GUIDE</b>	<b>AB5000</b>	<b>AB5001</b>	<b>AB5016</b>	<b>AB5002</b>	<b>AB5003</b>	<b>AB5004</b>	<b>AB5005</b>
Bowen No.	41094	41100	41106	41112	41118	41124	38421
<b>LEAD SEAL</b>	<b>AA6000</b>	<b>AA6001</b>	<b>AB6016</b>	<b>AA6002</b>	<b>AA6003</b>	<b>AA6004</b>	<b>AA6005</b>
Bowen No.	17264	16146	26531	22406	13276	13286	12324
No. Req'd	2	2	2	2	2	2	2
<b>END SEAL RING</b>	<b>AA7000</b>	<b>AA7001</b>	<b>AB7016</b>	<b>AA7002</b>	<b>AA7003</b>	<b>AA7004</b>	<b>AA7005</b>
Bowen No.	17265	16147	26532	22407	13277	13287	12322
No. Req'd	2	2	2	2	2	2	2
<b>CENTER SEAL RING</b>	<b>AA8000</b>	<b>AA8001</b>	<b>AB8016</b>	<b>AA8002</b>	<b>AA8003</b>	<b>AA8004</b>	<b>AA8005</b>
Bowen No.	17266	16148	26533	22408	13278	13288	12323
<b>PACKER STINGER</b>	<b>AB10000</b>	<b>AB10001</b>	<b>AB10016</b>	<b>AB10002</b>	<b>AB10003</b>	<b>AB10004</b>	<b>AB10005</b>
Bowen No.	41096	41102	41108	41114	41120	41126	38420
<b>STINGER RETAINER</b>	<b>AB11000</b>	<b>AB11001</b>	<b>AB11016</b>	<b>AB11002</b>	<b>AB11003</b>	<b>AB11004</b>	<b>AB11005</b>
Bowen No.	41097	41103	41109	41115	41121	41127	38419
<b>CONTROL SET SCREW</b>	<b>AA9000</b>	<b>AA9000</b>	<b>AA9000</b>	<b>AA9000</b>	<b>AA9000</b>	<b>AA9000</b>	<b>AA9000</b>
Bowen No.	12329	12329	12329	12329	12329	12329	12329
No. Req'd	2	2	2	2	2	2	2
<b>BOWL SEAL</b>	<b>568-237</b>	<b>568-240</b>	<b>568-246</b>	<b>568-250</b>	<b>568-255</b>	<b>568-258</b>	<b>568-260</b>
Bowen No.	30-15	30-18	30-24	30-28	30-33	30-36	30-38
No. Req'd	2	2	2	2	2	2	2

*Special Notes:*

(1) H<sub>2</sub>S service, available upon request.

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O.D. CASING	5-3/4	6	6-5/8	7	7-5/8	8-5/8	9-5/8
O.D. PATCH	7-3/4	8	8-5/8	9-1/8	9-7/8	11-1/8	11-15/16
<b>COMPLETE ASSEMBLY</b>	<b>505-775</b>	<b>505-800</b>	<b>505-863</b>	<b>505-913</b>	<b>505-988</b>	<b>505-1113</b>	<b>505-1194</b>
Bowen No.	41088	40679	40858	40859	40869	41004	41085
<b>TOP SUB</b>	<b>AB12006</b>	<b>AB12007</b>	<b>AB12008</b>	<b>AB12009</b>	<b>AB12010</b>	<b>AB12011</b>	<b>AB12012</b>
Bowen No.	41128	41134	41140	41146	41152	41158	41164
<b>BOWL</b>	<b>AB1006</b>	<b>AB1007</b>	<b>AB1008</b>	<b>AB1009</b>	<b>AB1010</b>	<b>AB1011</b>	<b>AB1012</b>
Bowen No.	41129	41135	41141	41147	41153	41159	41165
<b>GRAPPLE CARRIER</b>	<b>AB2006</b>	<b>AB2007</b>	<b>AB2008</b>	<b>AB2009</b>	<b>AB2010</b>	<b>AB2011</b>	<b>AB2012</b>
Bowen No.	41131	41137	41143	41149	41155	41161	41167
<b>GRAPPLE</b>	<b>AA3006</b>	<b>AA3007</b>	<b>AA3008</b>	<b>AA3009</b>	<b>AA3010</b>	<b>AA3011</b>	<b>AA3012</b>
Bowen No.	22413	13293	13303	12503	13073	13313	12478
<b>GRAPPLE CONTROL</b>	<b>AA4006</b>	<b>AA4007</b>	<b>AA4008</b>	<b>AA4009</b>	<b>AA4010</b>	<b>AA4011</b>	<b>AA4012</b>
Bowen No.	22414	13294	13304	12504	13074	13314	12479
<b>GUIDE</b>	<b>AB5006</b>	<b>AB5007</b>	<b>AB5008</b>	<b>AB5009</b>	<b>AB5010</b>	<b>AB5011</b>	<b>AB5012</b>
Bowen No.	41130	41136	41142	41148	41154	41160	41166
<b>LEAD SEAL</b>	<b>AA6006</b>	<b>AA6007</b>	<b>AA6008</b>	<b>AA6009</b>	<b>AA6010</b>	<b>AA6011</b>	<b>AA6012</b>
Bowen No.	22416	13296	13306	12506	13076	13316	12481
No. Req'd	2	2	2	2	2	2	2
<b>END SEAL RING</b>	<b>AA7006</b>	<b>AA7007</b>	<b>AA7008</b>	<b>AA7009</b>	<b>AA7010</b>	<b>AA7011</b>	<b>AA7012</b>
Bowen No.	22417	13297	13307	28656	13077	13317	12482
No. Req'd	2	2	2	2	2	2	2
<b>CENTER SEAL RING</b>	<b>AA8006</b>	<b>AA8007</b>	<b>AA8008</b>	<b>AA8009</b>	<b>AA8010</b>	<b>AA8011</b>	<b>AA8012</b>
Bowen No.	22418	13298	13308	12508	13078	13318	12483
<b>PACKER STINGER</b>	<b>AB10006</b>	<b>AB10007</b>	<b>AB10008</b>	<b>AB10009</b>	<b>AB10010</b>	<b>AB10011</b>	<b>AB10012</b>
Bowen No.	41132	41138	41144	41150	41156	41162	41168
<b>STINGER RETAINER</b>	<b>AB11006</b>	<b>AB11007</b>	<b>AB11008</b>	<b>AB11009</b>	<b>AB11010</b>	<b>AB11011</b>	<b>AB11012</b>
Bowen No.	41133	41139	41145	41151	41157	41163	41169
<b>CONTROL SET SCREW</b>	<b>AA9000</b>	<b>AA9000</b>	<b>AA9000</b>	<b>AA9000</b>	<b>AA9000</b>	<b>AA9001</b>	<b>P12003</b>
Bowen No.	12329	12329	12329	12329	12329	12484	12484
No. Req'd	2	2	2	2	2	2	2
<b>BOWL SEAL</b>	<b>568-262</b>	<b>568-263</b>	<b>568-265</b>	<b>568-267</b>	<b>568-270</b>	<b>568-449</b>	<b>568-450</b>
Bowen No.	30-40	30-41	30-43	30-45	30-48	27-76	27-77
No. Req'd	2	2	2	2	2	2	2

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<b>O.D. CASING</b>		10-3/4	11-3/4	13-3/8
<b>O.D. PATCH</b>		13-5/8	14-3/4	16-5/8
<b>COMPLETE ASSEMBLY</b>		<b>505-1363</b>	<b>505-1475</b>	<b>505-1663</b>
	Bowen No.	41086	41089	41087
<b>TOP SUB</b>		<b>AB12013</b>	<b>AB12014</b>	<b>AB12015</b>
	Bowen No.	41170	41176	41185
<b>BOWL</b>		<b>AB1013</b>	<b>AB1014</b>	<b>AB1015</b>
	Bowen No.	41171	41177	41182
<b>GRAPPLE CARRIER</b>		<b>AB2013</b>	<b>AB2014</b>	<b>AB2015</b>
	Bowen No.	41173	41179	41183
<b>GRAPPLE</b>		<b>AA3013</b>	<b>AA3014</b>	<b>AA3015</b>
	Bowen No.	13323	20858	18448
<b>GRAPPLE CONTROL</b>		<b>AA4013</b>	<b>AA4014</b>	<b>AA4015</b>
	Bowen No.	13324	20859	18449
<b>GUIDE</b>		<b>AB5013</b>	<b>AB5014</b>	<b>AB5015</b>
	Bowen No.	41172	41178	41184
<b>LEAD SEAL</b>		<b>AA6013</b>	<b>AA6014</b>	<b>AA6015</b>
	Bowen No.	13326	20861	18451
	No. Req'd	2	2	2
<b>END SEAL RING</b>		<b>AA7013</b>	<b>AA7014</b>	<b>AA7015</b>
	Bowen No.	13327	20862	18452
	No. Req'd	2	2	2
<b>CENTER SEAL RING</b>		<b>AA8013</b>	<b>AA8014</b>	<b>AA8015</b>
	Bowen No.	13328	20863	18453
<b>PACKER STINGER</b>		<b>AB10013</b>	<b>AB10014</b>	<b>AB10015</b>
	Bowen No.	41174	41180	41186
<b>STINGER RETAINER</b>		<b>AB11013</b>	<b>AB11014</b>	<b>AB11015</b>
	Bowen No.	41175	41181	41187
<b>CONTROL SET SCREW</b>		<b>AA9001</b>	<b>AA9001</b>	<b>AA9001</b>
	Bowen No.	12484	12484	12484
	No. Req'd	2	2	2
<b>BOWL SEAL</b>		<b>568-455</b>	<b>568-453</b>	<b>568-459</b>
	Bowen No.	27-82	27-80	27-86
	No. Req'd	2	2	2

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