

TECHNICAL DATA - LINER EQUIPMENT

SUBJECT:

"EZ" DUAL CONE LINER HANGER

TECH UNIT: 250.05

TECHNICAL DATA SECTION 250.05



A Business Unit of Smith International, Inc.

COMPLETION SYSTEMS



REV: A

APPROVED BY:

DATE:

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SUBJECT:

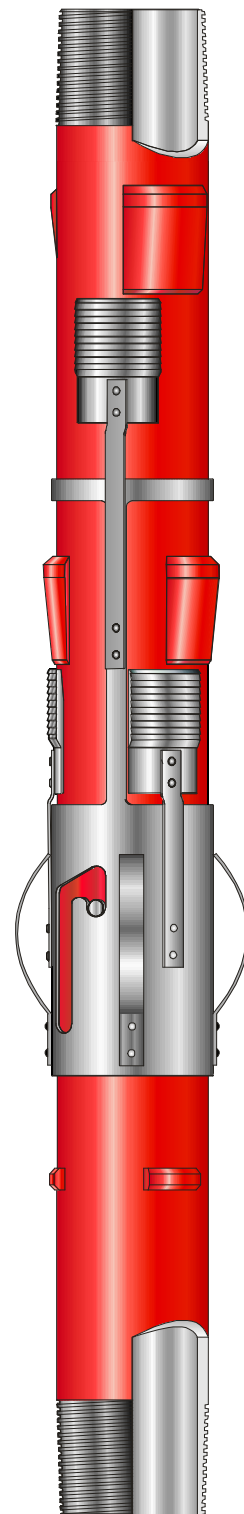
"EZ" DUAL CONE LINER HANGER

TECH UNIT: 250.05

The **Mechanical Set Liner Hanger** is comprised of the hanger body or mandrel, one or more sets of cone pads, slips and a cage assembly to carry the slips. The cage contains a "J" slot and drag springs to control movement of the slips into contact with the cones. A lug on the hanger body controls the cage "J" slot. A gage ring protects the slips when running the hanger into the wellbore.

Mechanical set hangers use either casing or heavy wall tubing for the body. "Casing body" hanger cone pads, "J" lug, and gage rings are welded to the body. "Solid body" hangers are machined from heavy wall tubing; "J" lug, gage ring, and cone pads are machined, integral features.

Mechanical hangers are set by manipulation of the work string: rotation to the right for "right hand" set hangers, or to the left for special order "left hand" set. Setting requires a quarter turn at the hanger to position the cones with the slips. With the cones and slips aligned, downward motion (slack off) bring the cones and slips into contact thus moving the slips into the wall of the supporting casing. Liner weight is transferred through the slips into the supporting casing setting the hanger.



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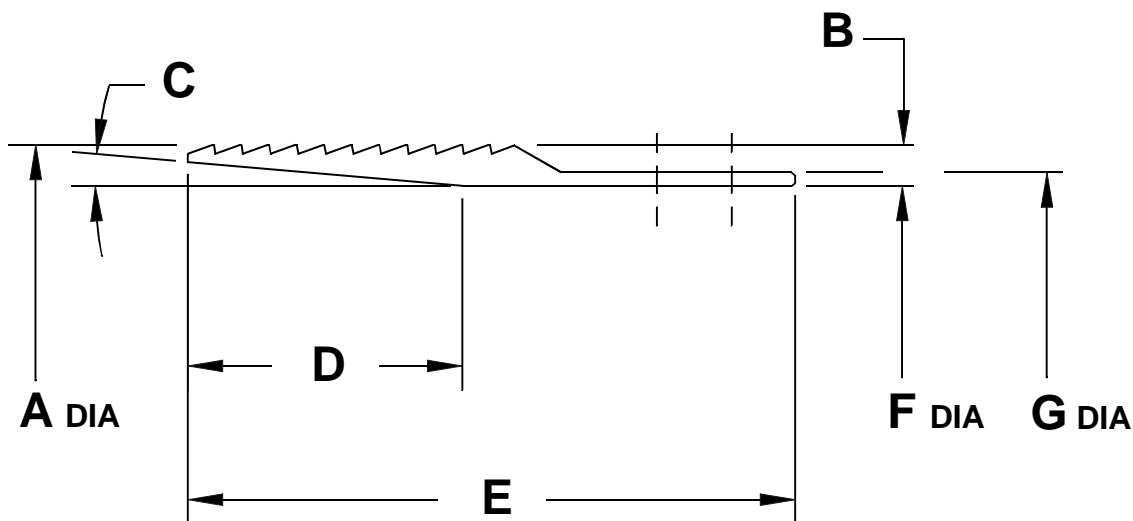


TECHNICAL DATA - LINER EQUIPMENT

SUBJECT:

**EZ SLIP
DIMENSIONAL DATA**

TECH UNIT: 250.05



Notes:

1. All Slips Are 60 Degrees In Width.
2. Slips Are Manufactured From AISI 1018/1020 Materials, Heat Treated To Rc 55-60 With A Case Depth of 0.020" to 0.030".

Size & Wt. Range	Part No. 10500-	A	B	C	D	E	F	G
2-7/8" x 5" 13-24.2#	514	4.250	0.400	10	1.701	4.25	3.450	3.72
3-1/2" x 5" 11.5-18#	506	4.375	0.315	5	2.172	4.62	3.745	3.93
3-1/2" x 5-1/2" 14-23#	507	4.875	0.350	5	2.572	5.12	4.175	4.40
4" x 5-1/2" 14-17#	507	4.875	0.350	5	2.572	5.12	4.175	4.40
4-1/2" x 7" 17-38#	505	6.000	0.500	10	2.042	5.25	5.000	5.37
5" x 7" 17-38#	503	6.000	0.375	5	2.686	5.75	5.250	5.50
5" x 7-5/8" 24-39#	504	6.875	0.530	10	2.042	5.25	5.815	6.18
5-1/2" x 7" 17-26#	518	6.375	0.625	5	1.971	11.50	5.750	6.23
5-1/2" x 7-5/8" 24-39#	502	6.875	0.375	5	2.486	5.50	6.125	6.37
7" x 9-5/8" 32-53.5#	500	8.750	0.530	10	2.042	5.25	7.690	8.06
7-5/8" x 9-5/8" 32-53.5#	501	8.750	0.375	5	2.686	5.75	8.000	8.25
9-5/8" x 11-3/4" 42-65#	509	10.750	0.375	5	2.686	5.75	10.000	10.25
9-5/8" x 13-3/8" 48-85#	508	12.500	0.937	10	4.069	9.00	10.625	11.37
10-3/4" x 13-3/8" 48-85#	510	12.500	0.500	7	2.688	6.00	11.500	11.87



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TECHNICAL DATA - LINER EQUIPMENT

SUBJECT:

**"EZ" Liner Hanger
Slip Area Chart**

TECH UNIT: 250.05

Hanger Size (Liner x Csg.)	Casing Weight	Effective Slip Area (sq. inches)	Hanger Size (Liner x Csg.)	Casing Weight	Effective Slip Area (sq. inches)
2-7/8" x 5"	13#	1.99	4-1/2" x 7"	17#	3.92
	15#	2.37		20#	4.63
	18#	3.19		23#	5.41
	20.3#	2.23		26#	6.19
	20.8#	2.77		29#	3.78
	21.4#	2.95		32#	4.57
	23.2#	3.45		35#	5.35
	24.2#	3.72		38#	6.07
3-1/2" x 5"	11.5#	3.28	5" x 7"	17#	5.81
	13#	4.12		20#	7.24
	15#	3.06		23#	6.54
	18#	4.72		26#	8.12
3-1/2" x 5-1/2"	14#	4.35	5" x 7-5/8"	29#	6.58
	15.5#	5.22		32#	8.15
	17#	6.04		35#	6.40
	20#	4.40		38#	7.87
	23#	5.93		26.4#	5.30
4" x 5-1/2"	14#	4.35	29.7#	6.24	
	15.5#	5.22	33.7#	4.84	
	17#	6.04	39#	6.24	

Hanger Size (Liner x Csg.)	Casing Weight	Effective Slip Area (sq. inches)	Hanger Size (Liner x Csg.)	Casing Weight	Effective Slip Area (sq. inches)
5-1/2" x 7"	17#	4.40	9-5/8" x 11-3/4"	42#	13.19
	20#	5.93		47#	9.83
	23#	4.63		54#	13.64
	26#	6.30		60#	11.04
5-1/2" x 7-5/8"	24#	5.73	9-5/8" x 13-3/8"	65#	13.89
	26.4#	6.86		48#	24.73
	29.7#	8.75		54.5#	21.98
	33.7#	5.94		61#	23.81
	39#	8.75		68#	25.65
7" x 9-5/8"	32.3#	8.66	10-3/4" x 13-3/8"	72#	22.31
	36#	8.49		77#	23.63
	40#	7.59		80.7#	24.73
	43.5#	8.61		85#	25.76
	47#	7.26		48#	15.65
7-5/8" x 9-5/8"	53.5#	9.12	54.5#	11.71	
	32.3#	9.49	61#	14.33	
	36#	6.92	68#	16.97	
	40#	9.13	72#	12.18	
	43.5#	11.16	77#	14.07	
	47#	8.20	80.7#	15.65	
53.5#	11.96	85#	17.13		

NOTE: EFFECTIVE SLIP AREA BASED ON NOMINAL ID OF CASING.



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TECHNICAL DATA - LINER EQUIPMENT

SUBJECT:

**"EZ" Liner Hanger
Cone OD Chart**

TECH UNIT: 250.05

Hanger size	Casing Wt. Raange	Cone OD (Inches)
2-7/8" x 5"	13-18#	4.08
	20.3-24.2#	3.81
3-1/2" x 5"	11.5-13#	4.25
	15-18#	4.08
3-1/2" x 5-1/2"	14-17#	4.68
	20-23#	4.45
4 x 5-1/2"	14-17#	4.68
4-1/2" x 7"	17-26#	6.05
	29-38#	5.68
5" x 7"	17-20#	6.18
	23-26#	6.05
	29-32#	5.87
	35-38#	5.68
5" x 7-5/8"	24-29.7#	6.50
	33.7-39#	6.25
5-1/2" x 7"	17-20#	6.21
	23-26#	6.05
5-1/2" x 7-5/8"	24-29.7#	6.62
	33.7-39#	6.37
7" x 9-5/8"	32.3#	8.68
	36-43.5#	8.43
	47-53.5#	8.25
7-5/8" x 9-5/8"	32.3#	8.68
	36-43.5#	8.50
	47-53.5#	8.31
9-5/8" x 11-3/4"	42#	10.81
	47-54#	10.62
	60-65#	10.43
9-5/8" x 13-3/8"	48#	12.25
	54.5-68#	12.00
	72-85#	11.75
10-3/4" x 13-3/8"	48#	12.37
	54.5-68#	12.12
	72-85#	11.87



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REV: A

APPROVED BY: JOHN YOKLEY

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TECHNICAL DATA - LINER EQUIPMENT

SUBJECT: "EZRD/EZLD" Dual Cone, Casing Body
Liner Hanger Bypass Area

TECH UNIT: 250.05

Hanger Size	Csg. Wt.	Upper Cone		Lower Cone	
		Bypass Unset (sq. in.)	Bypass Set (sq. in.)	Bypass Unset (sq. in.)	Bypass Set (sq. in.)
4" x 5-1/2"	14#	4.91	3.64	4.52	3.43
	15.5#	4.42	3.40	4.03	3.19
	17#	3.97	3.18	3.58	2.96
4-1/2" x 7"	17#	11.25	8.83	10.39	7.97
	20#	10.41	8.42	9.55	7.56
	23#	9.50	7.96	8.64	7.10
	26#	8.61	7.52	7.75	6.66
	29#	9.41	7.07	8.55	6.21
	32#	8.55	6.63	7.69	6.77
	35#	7.69	6.20	6.83	5.34
5" x 7"	38#	6.90	5.81	6.04	4.95
	17#	8.76	6.97	7.94	6.52
	20#	7.92	6.55	7.10	6.10
	23#	7.64	6.10	6.82	5.65
	26#	6.74	5.65	5.92	4.83
	29#	6.69	5.20	5.87	4.38
	32#	5.82	4.77	5.00	3.95
	35#	5.92	4.42	5.17	3.71
5" x 7-5/8"	38#	5.12	4.02	4.39	3.30
	24#	12.35	9.56	11.41	8.62
	26.4#	11.74	9.25	10.80	8.31
	29.7#	10.71	8.74	9.77	7.80
	33.7#	10.79	8.15	9.85	7.21
5-1/2" x 7"	39#	9.31	7.42	8.37	6.48
	17#	7.62	5.67	7.08	5.13
	20#	6.42	5.25	5.88	4.71
	23#	6.29	4.79	5.75	4.25
	26#	5.40	4.35	4.86	3.81



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TECHNICAL DATA - LINER EQUIPMENT

**SUBJECT: "EZR/EZLD" Dual Cone, Casing Body
Liner Hanger Bypass Area**

TECH UNIT: 250.05

Hanger Size	Csg. Wt.	Upper Cone		Lower Cone	
		Bypass Unset (sq. in.)	Bypass Set (sq. in.)	Bypass Unset (sq. in.)	Bypass Set (sq. in.)
5-1/2" x 7-5/8"	24#	9.67	7.50	8.85	7.06
	26.4#	9.06	7.19	8.24	6.74
	29.7#	8.03	6.68	7.21	6.23
	33.7#	8.13	6.09	7.31	5.27
	39#	6.67	5.36	5.85	4.54
7" x 9-5/8"	32.3#	14.80	12.57	13.72	11.49
	36#	15.36	12.01	14.28	10.93
	40#	14.16	11.41	13.08	10.33
	43.5#	13.05	10.86	11.97	9.78
	47#	13.22	10.35	12.14	9.27
	53.5#	11.24	9.36	10.16	8.28
7-5/8" x 9-5/8"	32.3#	11.21	8.98	10.28	8.42
	36#	11.30	8.42	10.37	7.86
	40#	10.10	7.82	9.17	6.89
	43.5#	9.00	7.27	8.07	6.34
	47#	9.39	6.91	8.55	6.07
	53.5#	7.41	5.92	6.57	5.08
9-5/8" x 11-3/4"	42#	14.22	11.87	13.29	11.31
	47#	14.36	11.14	13.43	10.68
	54#	12.30	10.11	11.37	9.55
	60#	12.22	9.38	11.29	8.82
	65#	10.71	8.62	9.78	8.06
9-5/8" x 13-3/8"	48#	31.67	27.11	29.55	24.99
	54.5#	32.06	26.11	29.94	23.99
	61#	30.08	25.13	27.96	23.01
	68#	28.13	24.15	26.01	22.03
	72#	29.14	23.49	27.02	21.37
	77#	27.74	22.79	25.62	20.67
	80.7#	26.59	22.21	24.47	20.09
	85#	25.52	21.68	23.40	19.56



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COMPLETION SYSTEMS



SUBJECT:

DUAL CONE "EZ" LINER HANGER
HANGING CAPACITIES

TECH UNIT: 250.05

**FOR DUAL CONE "EZ" LINER HANGER
HANGING CAPACITIES
GO TO APPROPRIATE CHART IN
TECH UNIT 250.01
AND MULTIPLY THE HANGING CAPACITY FOR
SINGLE CONE EZ LINER HANGERS X 2**



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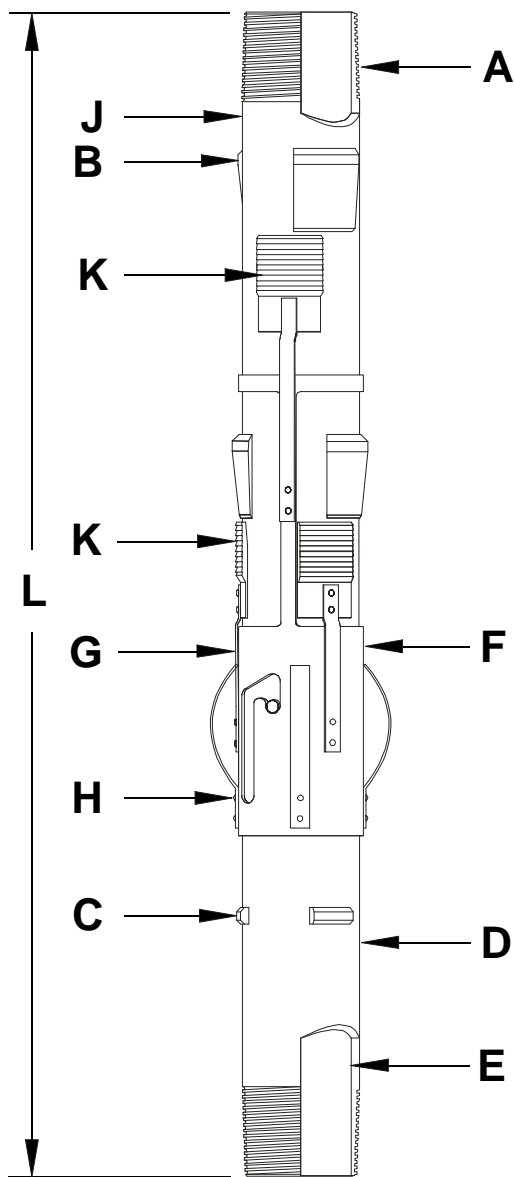


TECHNICAL DATA - LINER EQUIPMENT

SUBJECT:

**4" X 5-1/2" EZ LINER HANGER
DIMENSIONAL DATA**

TECH UNIT: 250.05



Notes:

1. All Dimensions Are Given In Inches.
2. Unless Otherwise Noted All Dimensions Are "Nominal", Exclusive of Design Tolerances.
3. EZLD has a Left Hand cage. Right hand illustrated.

Liner Size x Casing	Liner Hanger Dimensions										
	A	B	C	D	E	F	G	H	J	K	L
4" x 5-1/2" 14-17#	4.00	4.68	4.65	4.00	See Chart on page 10	4.25	4.44	4.77	3.87	4.57	52.5



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TECHNICAL DATA - LINER EQUIPMENT

SUBJECT:

**4" X 5-1/2" EZ LINER HANGER
RATING DATA**

TECH UNIT: 250.05

4" x 5-1/2" "EZxD" Dual Cone, Casing Body Liner Hanger

<i>Liner Wt.</i>	<i>Min. Liner I.D.</i>	<i>Max. Liner I.D.</i>	<i>Burst Press.</i>	<i>Collapse Press.</i>	<i>Tensile</i>
9.5#	3.453	3.636	8,008	3,602	206,360
11.0#	3.381	3.573	9,799	5,949	250,052
11.6#	3.333	3.531	10,993	8,119	278,682
14.8#	3.245	3.454	13,182	12,097	330,137

***Burst, Collapse and Tensile Ratings Shown Are Based On P-110 Casing.
For Other Liner Grades Use The Following Multipliers:***

Grade	Multiplier
<i>H-40</i>	<i>0.364</i>
<i>J-55</i>	<i>0.500</i>
<i>C-75</i>	<i>0.682</i>
<i>L/N-80</i>	<i>0.727</i>
<i>C-90</i>	<i>0.818</i>

Grade	Multiplier
<i>C-95</i>	<i>0.864</i>
<i>P-105</i>	<i>0.955</i>
<i>P-110</i>	<i>1.000</i>
<i>Q-125</i>	<i>1.136</i>

Bypass Area (Square Inches)

Csg. Wt. Range: Tool OD	14-17# 4.68		
Csg. Wt.	14#	15.5#	17#
Csg. ID	5.012	4.950	4.892
Upper Cone			
Unset	4.91	4.42	3.97
Set	3.64	3.40	3.18
Lower Cone			
Unset	4.52	4.03	3.58
Set	3.43	3.19	2.96
Gauge Ring (4.65" OD)	3.54	5.21	4.76



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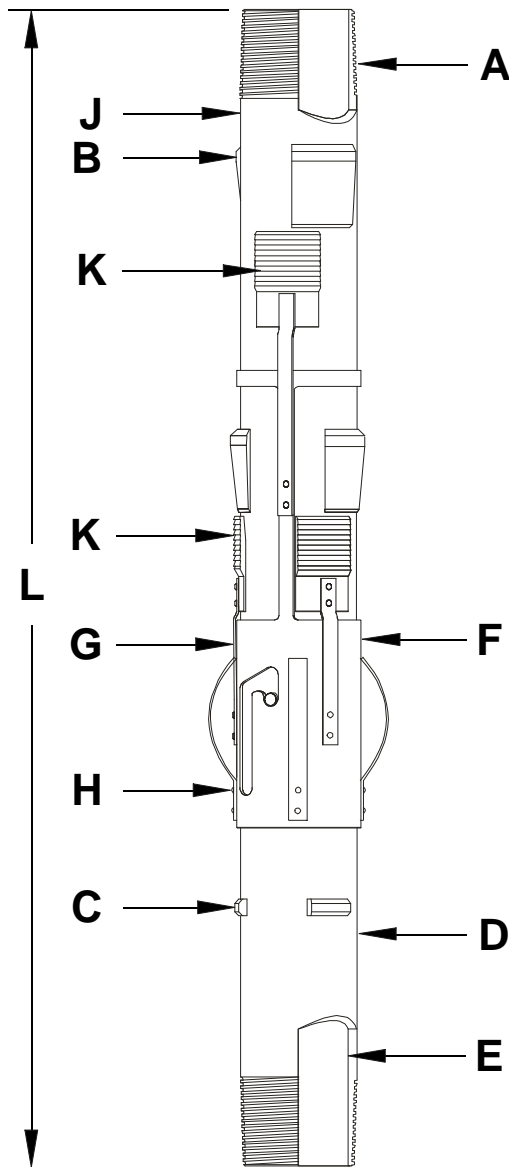


TECHNICAL DATA - LINER EQUIPMENT

SUBJECT:

**4-1/2" X 7" EZ LINER HANGER
DIMENSIONAL DATA**

TECH UNIT: 250.05



Notes:

1. All Dimensions Are Given In Inches.
2. Unless Otherwise Noted All Dimensions Are "Nominal", Exclusive of Design Tolerances.
3. EZLD has a Left Hand cage. Right hand illustrated.

Liner Size x Casing	Liner Hanger Dimensions										
	A	B	C	D	E	F	G	H	J	K	L
4-1/2" x 7" 17-26#	4.50	6.05	5.63	4.50	See Chart on page 12	5.00	5.25	5.58	4.50	5.50	52.5
4-1/2" x 7" 29-38#	4.50	5.68	5.63	4.50		5.00	5.25	5.58	4.50	5.50	52.5



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TECHNICAL DATA - LINER EQUIPMENT

SUBJECT:

**4-1/2" X 7" EZ LINER HANGER
RATING DATA**

TECH UNIT: 250.05

4-1/2" x 7" "EZxD" Dual Cone, Casing Body Liner Hanger

Liner Wt.	Min. Liner I.D.	Max. Liner I.D.	Burst Press.	Collapse Press.	Tensile
9.5#	3.995	4.186	8,770	4,500	235,631
10.5#	3.957	4.153	9,580	5,560	259,405
11#	3.931	4.130	10,140	6,570	275,864
11.6#	3.905	4.108	10,690	7,580	291,522
12.75#	3.863	4.071	11,590	9,210	317,666
13.5#	3.825	4.038	12,410	10,690	340,785
15.1#	3.731	3.955	14,420	14,340	398,100
16.9#	3.645	3.892	16,260	17,010	440,810
18.8#	3.545	3.793	18,390	19,010	506,540
21.6#	3.405	3.670	21,390	21,730	585,845

**Burst, Collapse and Tensile Ratings Shown Are Based On P-110 Casing.
For Other Liner Grades Use The Following Multipliers:**

Grade	Multiplier
<i>H-40</i>	<i>0.364</i>
<i>J-55</i>	<i>0.500</i>
<i>C-75</i>	<i>0.682</i>
<i>L/N-80</i>	<i>0.727</i>
<i>C-90</i>	<i>0.818</i>

Grade	Multiplier
<i>C-95</i>	<i>0.864</i>
<i>P-105</i>	<i>0.955</i>
<i>P-110</i>	<i>1.000</i>
<i>Q-125</i>	<i>1.136</i>

Bypass Area (Square Inches)

Csg. Wt. Range: Tool OD	17-26# 6.05				29-38# 5.68			
	17#	20#	23#	26#	29#	32#	35#	38#
Csg. ID	6.538	6.456	6.366	6.276	6.184	6.094	6.004	5.92
Upper Cone								
Unset	11.25	10.41	9.50	8.61	9.41	8.55	7.69	6.90
Set	8.83	8.42	7.96	7.52	7.07	6.63	6.20	5.81
Lower Cone								
Unset	10.39	9.55	8.64	7.75	8.55	7.69	6.83	6.04
Set	7.97	7.56	7.10	6.66	6.21	6.77	5.34	4.95
Gauge Ring (5.63" OD)	17.37	16.53	15.63	14.73	13.83	12.96	12.11	11.32



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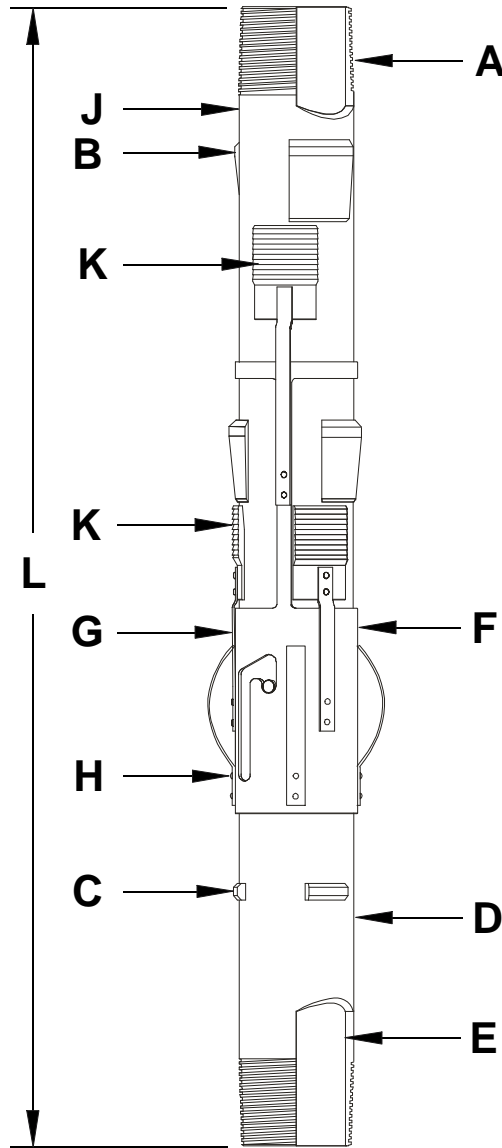


TECHNICAL DATA - LINER EQUIPMENT

SUBJECT:

**5" X 7" EZ LINER HANGER
DIMENSIONAL DATA**

TECH UNIT: 250.05



Notes:

1. All Dimensions Are Given In Inches.
2. Unless Otherwise Noted All Dimensions Are "Nominal", Exclusive of Design Tolerances.
3. EZLD has a Left Hand cage. Right hand cage illustrated.

Liner Size x Casing	Liner Hanger Dimensions										
	A	B	C	D	E	F	G	H	J	K	L
5" x 7" 17-20#	5.00	6.18	5.68	5.00	See Chart on page 14 page 15	5.46	5.71	6.04	4.98	5.73	53.5
5" x 7" 23-26#	5.00	6.05	5.68	5.00		5.46	5.71	6.04	4.98	5.73	53.5
5" x 7" 29-32#	5.00	5.87	5.68	5.00		5.46	5.71	6.04	4.98	5.73	53.5
5" x 7" 35-38#	5.00	5.68	5.68	5.00		5.29	5.54	5.87	4.81	5.56	53.5



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TECHNICAL DATA - LINER EQUIPMENT

SUBJECT:

**5" X 7" EZ LINER HANGER
RATING DATA**

TECH UNIT: 250.05

5" x 7 17-32#" "EZxD" Dual Cone, Casing Body Liner Hanger

Liner Wt.	Min. Liner I.D.	Max. Liner I.D.	Burst Press.	Collapse Press.	Tensile
11.5#	4.465	4.665	8,470	4,150	249,592
13#	4.399	4.607	9,740	5,840	296,052
15#	4.313	4.532	11,400	8,850	355,269
18#	4.181	4.417	13,940	13,470	444,180
20.3#	4.089	4.336	15,710	16,490	505,432
20.8#	4.061	4.312	16,250	17,000	523,363
21.4#	4.031	4.285	16,820	17,550	543,417
23.2#	3.949	4.214	18,400	19,020	595,550
24.2#	3.905	4.175	19,250	19,800	623,815
26.7#	3.781	3.983	21,640	21,950	759,137

**Burst, Collapse and Tensile Ratings Shown Are Based On P-110 Casing.
For Other Liner Grades Use The Following Multipliers:**

Grade	Multiplier
H-40	0.364
J-55	0.500
C-75	0.682
L/N-80	0.727
C-90	0.818

Grade	Multiplier
C-95	0.864
P-105	0.955
P-110	1.000
Q-125	1.136

Bypass Area (Square Inches)

Csg. Wt. Range: Tool OD	17-20#		23-26#		29-32#		
	6.18		6.05		5.87		
Csg. Wt.	17#	20#	23#	26#	29#	32#	
Csg. ID	6.538	6.456	6.366	6.276	6.184	6.094	
Upper Cone	Unset	8.76	7.92	7.64	6.74	6.69	5.82
	Set	6.97	6.55	6.10	5.65	5.20	4.77
Lower Cone	Unset	7.94	7.10	6.82	5.92	5.87	5.00
	Set	6.52	6.10	5.65	4.83	4.38	3.95
Gauge Ring (5.63" OD)	13.75	12.91	12.00	11.11	10.21	9.34	



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COMPLETION SYSTEMS



TECHNICAL DATA - LINER EQUIPMENT

SUBJECT:

**5" X 7" EZ LINER HANGER
RATING DATA**

TECH UNIT: 250.05

5" x 7 35-38#" "EZxD" Dual Cone, Casing Body Liner Hanger

Liner Wt.	Min. Liner I.D.	Max. Liner I.D.	Burst Press.	Collapse Press.	Tensile
11.5#	4.465	4.665	5,000	870	118,694
13#	4.399	4.607	6,320	1,780	165,155
15#	4.313	4.532	8,040	3,645	224,371
18#	4.181	4.417	10,685	7,565	313,282
20.3#	4.089	4.336	12,525	10,900	374,535
20.8#	4.061	4.312	13,085	11,920	392,466
21.4#	4.031	4.285	13,685	13,020	412,520
23.2#	3.949	4.214	15,325	15,995	464,652
24.2#	3.905	4.175	16,205	16,960	492,918
26.7#	3.781	3.983	18,690	19,285	628,239

***Burst, Collapse and Tensile Ratings Shown Are Based On P-110 Casing.
For Other Liner Grades Use The Following Multipliers:***

Grade	Multiplier
H-40	0.364
J-55	0.500
C-75	0.682
L/N-80	0.727
C-90	0.818

Grade	Multiplier
C-95	0.864
P-105	0.955
P-110	1.000
Q-125	1.136

Bypass Area (Square Inches)

Csg. Wt. Range: Tool OD	35-38#		
	5.68		
Csg. Wt.	35#	38#	
Csg. ID	6.004	5.920	
Upper Cone	Unset	5.92	5.12
	Set	4.42	4.02
Lower Cone	Unset	5.17	4.39
	Set	3.71	3.30
Gauge Ring (5.63" OD)	8.49	7.70	



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COMPLETION SYSTEMS

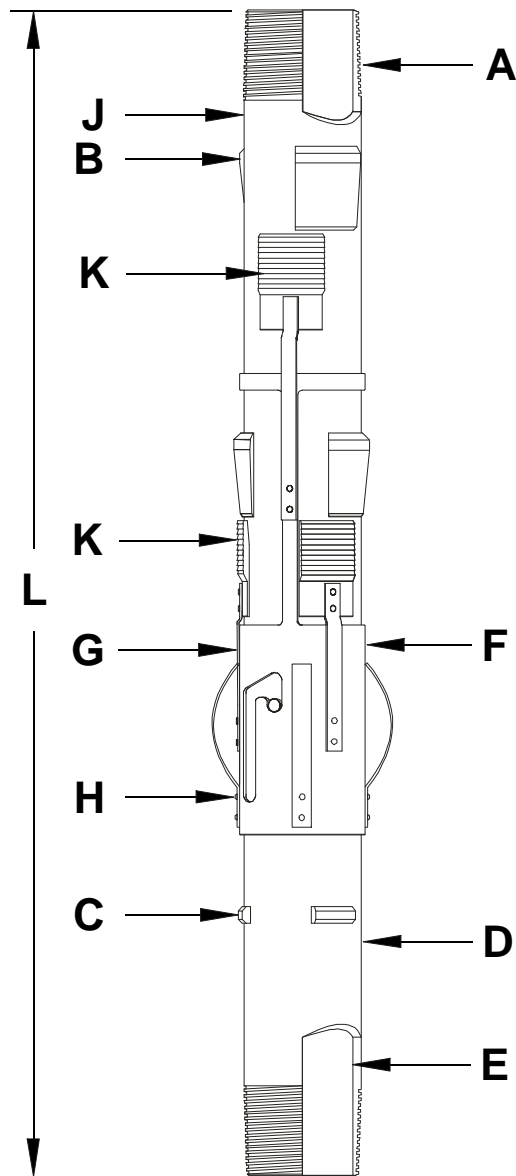


TECHNICAL DATA - LINER EQUIPMENT

SUBJECT:

**5" X 7-5/8" EZ LINER HANGER
DIMENSIONAL DATA**

TECH UNIT: 250.05



Notes:

1. All Dimensions Are Given In Inches.
2. Unless Otherwise Noted All Dimensions Are "Nominal", Exclusive of Design Tolerances.
3. EZLD hangers have Left Hand cage. Right hand cage illustrated.

Liner Size x Casing	Liner Hanger Dimensions										
	A	B	C	D	E	F	G	H	J	K	L
5" x 7-5/8" 24-29.7#	5.00	6.50	6.14	5.00	See Chart on page 17	5.54	5.79	6.12	5.00	6.06	52.5
5" x 7-5/8" 33.7-39#	5.00	6.25	6.14	5.00		5.54	5.79	6.12	5.00	6.06	52.5



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COMPLETION SYSTEMS



TECHNICAL DATA - LINER EQUIPMENT

SUBJECT:

**5" X 7-5/8" EZ LINER HANGER
RATING DATA**

TECH UNIT: 250.05

5" x 7-5/8" "EZxD" Dual Cone, Casing Body Liner Hanger

Liner Wt.	Min. Liner I.D.	Max. Liner I.D.	Burst Press.	Collapse Press.	Tensile
11.5#	4.465	4.665	8,470	4,150	279,000
13#	4.399	4.607	9,740	5,840	326,000
15#	4.313	4.532	11,400	8,850	385,400
18#	4.181	4.417	13,940	13,470	474,300
20.3#	4.089	4.336	15,710	16,490	535,500
20.8#	4.061	4.312	16,250	17,000	553,400
21.4#	4.031	4.285	16,820	17,550	573,500
23.2#	3.949	4.214	18,400	19,020	625,500
24.2#	3.905	4.175	19,250	19,800	653,900

***Burst, Collapse and Tensile Ratings Shown Are Based On P-110 Casing.
For Other Liner Grades Use The Following Multipliers:***

Grade	Multiplier
<i>H-40</i>	<i>0.364</i>
<i>J-55</i>	<i>0.500</i>
<i>C-75</i>	<i>0.682</i>
<i>L/N-80</i>	<i>0.727</i>
<i>C-90</i>	<i>0.818</i>

Grade	Multiplier
<i>C-95</i>	<i>0.864</i>
<i>P-105</i>	<i>0.955</i>
<i>P-110</i>	<i>1.000</i>
<i>Q-125</i>	<i>1.136</i>

Bypass Area (Square Inches)

Csg. Wt. Range: Tool OD	24-29.7#			33.7-39#	
	6.5			6.25	
Csg. Wt.	24#	26.4#	29.7#	33.7#	39#
Csg. ID	7.025	6.969	6.875	6.765	6.625
Upper Cone					
Unset	12.35	11.74	10.71	10.79	9.31
Set	9.56	9.25	8.74	8.15	7.42
Lower Cone					
Unset	11.41	10.80	9.77	9.85	8.37
Set	8.62	8.31	7.80	7.21	6.48
Gauge Ring (5.63" OD)	18.78	18.16	17.14	15.96	14.49



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COMPLETION SYSTEMS

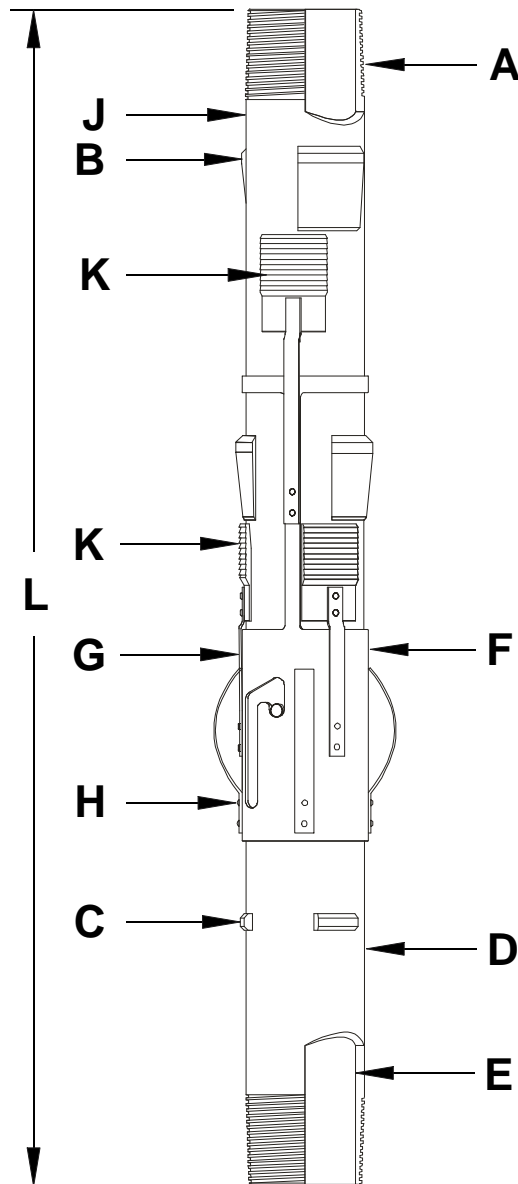


TECHNICAL DATA - LINER EQUIPMENT

SUBJECT:

**5-1/2" X 7-5/8" EZ LINER HANGER
DIMENSIONAL DATA**

TECH UNIT: 250.05



Notes:

1. All Dimensions Are Given In Inches.
2. Unless Otherwise Noted All Dimensions Are "Nominal", Exclusive of Design Tolerances.
3. EZLD has a Left Hand cage. Right hand cage illustrated.

Liner Size x Casing	Liner Hanger Dimensions										
	A	B	C	D	E	F	G	H	J	K	L
5-1/2" x 7-5/8" 24-29.7#	5.50	6.62	6.37	5.50	See Chart on page 19	5.98	6.23	6.56	5.48	6.23	58.5
5-1/2" x 7-5/8" 33.7-39#	5.50	6.37	6.37	5.50		5.98	6.23	6.56	5.48	6.23	58.5



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COMPLETION SYSTEMS



TECHNICAL DATA - LINER EQUIPMENT

SUBJECT:

**5-1/2" X 7-5/8" EZ LINER HANGER
RATING DATA**

TECH UNIT: 250.05

5-1/2" x 7-5/8" "EZxD" Dual Cone, Casing Body Liner Hanger

Liner Wt.	Min. Liner I.D.	Max. Liner I.D.	Burst Press.	Collapse Press.	Tensile
14#	4.917	5.128	5,935	1,465	308,400
15.5#	4.855	5.074	6,885	2,310	356,000
17#	4.797	5.023	7,785	3,335	400,400
20#	4.683	4.923	9,545	5,485	486,400
23#	4.575	4.829	11,200	8,490	565,600
26#	4.453	4.722	13,085	11,920	653,900
28.4#	4.345	4.628	14,740	14,925	729,800

***Burst, Collapse and Tensile Ratings Shown Are Based On P-110 Casing.
For Other Liner Grades Use The Following Multipliers:***

Grade	Multiplier
H-40	0.364
J-55	0.500
C-75	0.682
L/N-80	0.727
C-90	0.818

Grade	Multiplier
C-95	0.864
P-105	0.955
P-110	1.000
Q-125	1.136

Bypass Area (Square Inches)

Csg. Wt. Range: Tool OD	24-29.7#			33.7-39#	
	6.62			6.37	
Csg. Wt.	24#	26.4#	29.7#	33.7#	39#
Csg. ID	7.025	6.969	6.875	6.765	6.625
Upper Cone					
Unset	9.67	9.06	8.03	8.13	6.67
Set	7.50	7.19	6.68	6.09	5.36
Lower Cone					
Unset	8.85	8.24	7.21	7.31	5.85
Set	7.06	6.74	6.23	5.27	4.54
Gauge Ring (6.37" OD)	18.78	18.16	17.14	15.96	14.49



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COMPLETION SYSTEMS

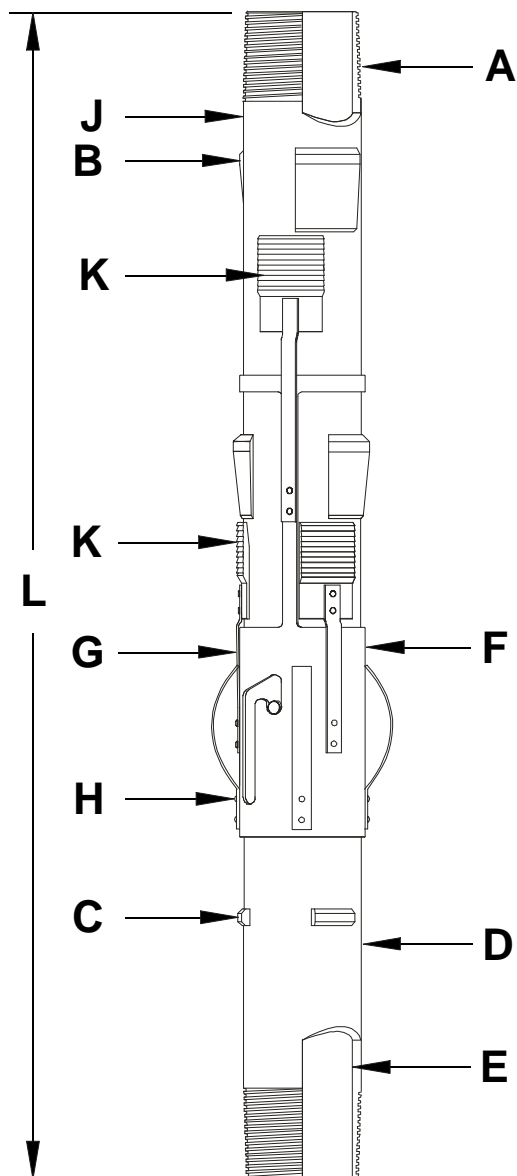


TECHNICAL DATA - LINER EQUIPMENT

SUBJECT:

**7" X 9-5/8" EZ LINER HANGER
DIMENSIONAL DATA**

TECH UNIT: 250.05



Notes:

1. All Dimensions Are Given In Inches.
2. Unless Otherwise Noted All Dimensions Are "Nominal", Exclusive of Design Tolerances.
3. EZLD has a Left Hand cage. Right hand cage illustrated.

Liner Size x Casing	Liner Hanger Dimensions										
	A	B	C	D	E	F	G	H	J	K	L
7" x 9-5/8" 32.3#	7.00	8.68	8.18	7.00	See Chart on page 21	7.56	7.81	8.14	7.00	8.060	58.0
7" x 9-5/8" 36-43.5#	7.00	8.43	8.18	7.00		7.56	7.81	8.14	7.00	8.060	58.0
7" x 9-5/8" 47-53.5#	7.00	8.25	8.18	7.00		7.56	7.81	8.14	7.00	8.060	58.0



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TECHNICAL DATA - LINER EQUIPMENT

SUBJECT:

**7" X 9-5/8" EZ LINER HANGER
RATING DATA**

TECH UNIT: 250.05

7" x 9-5/8 32.3-53.5#" "EZxD" Dual Cone, Casing Body Liner Hanger

<i>Liner Wt.</i>	<i>Min. Liner I.D.</i>	<i>Max. Liner I.D.</i>	<i>Burst Press.</i>	<i>Collapse Press.</i>	<i>Tensile</i>
17#	6.443	6.666	6,350	1,800	394,340
20#	6.361	6.594	7,480	2,980	476,822
23#	6.271	6.515	8,720	4,440	566,292
26#	6.181	6.437	9,950	6,230	653,572
29#	6.089	6.356	11,220	8,530	743,096
32#	5.999	6.277	12,460	10,780	829,317
32# SD	6.030	6.277	12,460	10,780	829,317
35#	5.909	6.199	13,700	13,030	913,390
38#	5.825	6.125	14,850	15,130	992,179
41#	5.725	6.038	16,220	16,980	1,083,599
44#	5.625	5.950	17,600	18,280	1,174,740

***Burst, Collapse and Tensile Ratings Shown Are Based On P-110 Casing.
For Other Liner Grades Use The Following Multipliers:***

Grade	Multiplier
<i>H-40</i>	<i>0.364</i>
<i>J-55</i>	<i>0.500</i>
<i>C-75</i>	<i>0.682</i>
<i>L/N-80</i>	<i>0.727</i>
<i>C-90</i>	<i>0.818</i>

Grade	Multiplier
<i>C-95</i>	<i>0.864</i>
<i>P-105</i>	<i>0.955</i>
<i>P-110</i>	<i>1.000</i>
<i>Q-125</i>	<i>1.136</i>

Bypass Area (Square Inches)

Csg. Wt. Range: Tool OD	32.3# 8.68	36-43.5# 8.43			47-53.5# 8.25	
Csg. Wt.	32.3#	36#	40#	43.5#	47#	53.5#
Csg. ID	9.001	8.921	8.835	8.755	8.681	8.535
Upper Cone						
Unset	14.80	15.36	14.16	13.05	13.22	11.24
Set	12.57	12.01	11.41	10.86	10.35	9.36
Lower Cone						
Unset	13.72	14.28	13.08	11.97	12.14	10.16
Set	11.49	10.93	10.33	9.78	9.27	8.28
Gauge Ring (8.18" OD)	20.47	19.33	18.13	17.00	16.00	14.00



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COMPLETION SYSTEMS

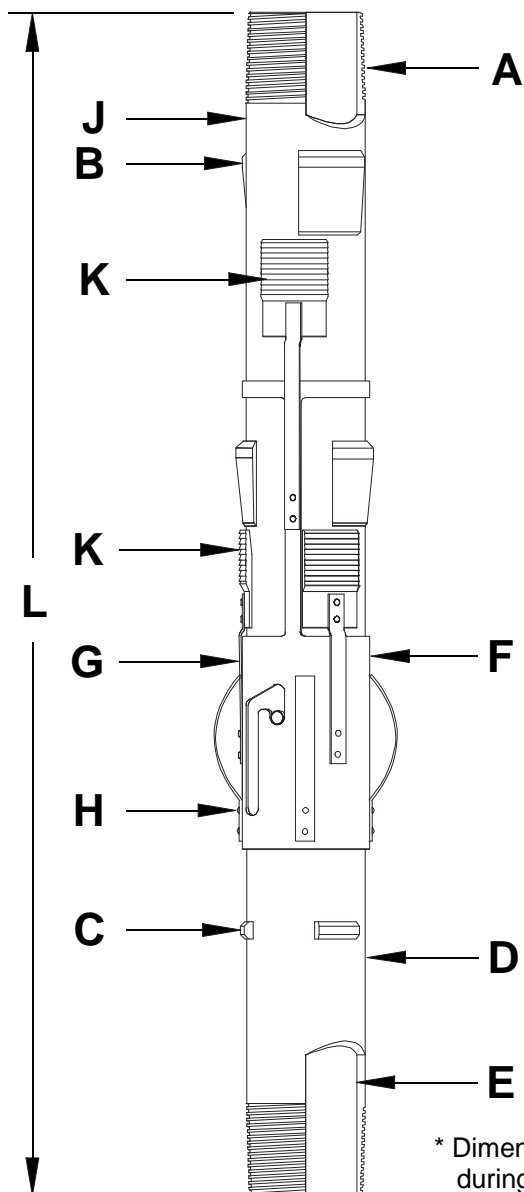


TECHNICAL DATA - LINER EQUIPMENT

SUBJECT:

**7-5/8" X 9-5/8" EZ LINER HANGER
DIMENSIONAL DATA**

TECH UNIT: 250.05



* Dimension prior to grinding during final assembly

Notes:

1. All Dimensions Are Given In Inches.
2. Unless Otherwise Noted All Dimensions Are "Nominal", Exclusive of Design Tolerances.
3. EZLD has a Left Hand cage. Right hand cage illustrated.

Liner Size x Casing	Liner Hanger Dimensions										
	A	B	C	D	E	F	G	H*	J	K	L
7-5/8" x 9-5/8" 32.3#	7.62	8.68	8.31	7.62	See Charts on page 23 page 24	8.10	8.35	8.68	7.60	8.35	62.0
7-5/8" x 9-5/8" 36-43.5#	7.62	8.50	8.31	7.62		8.10	8.35	8.68	7.60	8.35	62.5
7-5/8" x 9-5/8" 47-53.5#	7.62	8.31	8.31	7.62		7.91	8.16	8.49	7.43	8.18	58.5



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COMPLETION SYSTEMS



TECHNICAL DATA - LINER EQUIPMENT

SUBJECT:

**7-5/8" X 9-5/8" EZ LINER HANGER
RATING DATA**

TECH UNIT: 250.05

7-5/8" x 9-5/8 32.3-43.5#" "EZxD" Dual Cone, Casing Body Liner Hanger

Liner Wt.	Min. Liner I.D.	Max. Liner I.D.	Burst Press.	Collapse Press.	Tensile
24#	6.930	7.176	7,282	2,745	541,259
26.4#	6.874	7.127	7,991	3,582	601,808
29.7#	6.780	7.045	9,182	4,987	702,207
33.7#	6.670	6.949	10,575	7,359	818,270
39#	6.530	6.826	12,348	10,582	964,649
45.3#	6.340	6.660	13,918	13,436	1,158,057
47.1#	6.280	6.608	14,754	14,955	1,217,663
51.2#	6.156	6.499	17,084	17,792	1,341,091
52.8#	6.106	6.455	17,718	18,385	1,390,333

***Burst, Collapse and Tensile Ratings Shown Are Based On P-110 Casing.
For Other Liner Grades Use The Following Multipliers:***

Grade	Multiplier
H-40	0.364
J-55	0.500
C-75	0.682
L/N-80	0.727
C-90	0.818

Grade	Multiplier
C-95	0.864
P-105	0.955
P-110	1.000
Q-125	1.136

Bypass Area (Square Inches)

Csg. Wt. Range:	32.3#	36-43.5#		
Tool OD	8.68	8.43		
Csg. Wt.	32.3#	36#	40#	43.5#
Csg. ID	9.001	8.921	8.835	8.755
Upper Cone				
Unset	11.21	11.30	10.10	9.00
Set	8.98	8.42	7.82	7.27
Lower Cone				
Unset	10.28	10.37	9.17	8.07
Set	8.42	7.86	6.89	6.34
Gauge Ring (8.31" OD)	15.11	13.98	12.78	11.68



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COMPLETION SYSTEMS



TECHNICAL DATA - LINER EQUIPMENT

SUBJECT:

**7-5/8" X 9-5/8" EZ LINER HANGER
RATING DATA**

TECH UNIT: 250.05

7-5/8" x 9-5/8 47#-53.5#" "EZxD" Dual Cone, Casing Body Liner Hanger

<i>Liner Wt.</i>	<i>Min. Liner I.D.</i>	<i>Max. Liner I.D.</i>	<i>Burst Press.</i>	<i>Collapse Press.</i>	<i>Tensile</i>
24#	6.930	7.176	5,246	1,004	320,514
26.4#	6.874	7.127	5,972	1,493	381,063
29.7#	6.780	7.045	7,190	2,639	481,462
33.7#	6.670	6.949	8,615	9,405	597,525
39#	6.530	6.826	10,428	7,092	743,905
45.3#	6.340	6.660	12,034	10,012	937,312
47.1#	6.280	6.608	12,889	11,566	996,918
51.2#	6.156	6.499	15,273	15,989	1,120,346
52.8#	6.106	6.455	15,921	16,690	1,169,588

***Burst, Collapse and Tensile Ratings Shown Are Based On P-110 Casing.
For Other Liner Grades Use The Following Multipliers:***

Grade	Multiplier
<i>H-40</i>	<i>0.364</i>
<i>J-55</i>	<i>0.500</i>
<i>C-75</i>	<i>0.682</i>
<i>L/N-80</i>	<i>0.727</i>
<i>C-90</i>	<i>0.818</i>

Grade	Multiplier
<i>C-95</i>	<i>0.864</i>
<i>P-105</i>	<i>0.955</i>
<i>P-110</i>	<i>1.000</i>
<i>Q-125</i>	<i>1.136</i>

Bypass Area (Square Inches)

Csg. Wt. Range: Tool OD	47- 53.5# 8.25	
Csg. Wt.	47#	53.5#
Csg. ID	8.681	8.535
Upper Cone Unset	9.39	7.41
Set	6.91	5.92
Lower Cone Unset	8.55	6.57
Set	6.07	5.08
Gauge Ring (8.31" OD)	10.66	8.69



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COMPLETION SYSTEMS

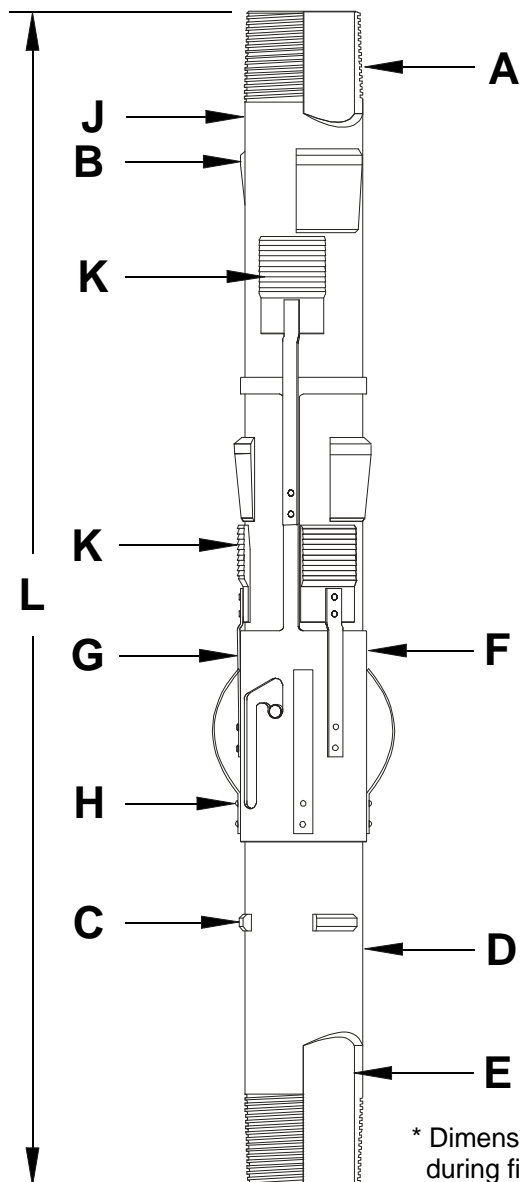


TECHNICAL DATA - LINER EQUIPMENT

SUBJECT:

**9-5/8" X 11-3/4" EZ LINER HANGER
DIMENSIONAL DATA**

TECH UNIT: 250.05



* Dimension prior to grinding during final assembly

Notes:

1. All Dimensions Are Given In Inches.
2. Unless Otherwise Noted All Dimensions Are "Nominal", Exclusive of Design Tolerances.
3. EZLD has a Left Hand cage. Right hand cage illustrated.

Liner Size x Casing	Liner Hanger Dimensions										
	A	B	C	D	E	F	G	H*	J	K	L
9-5/8" x 11-3/4" 42#	9.62	10.81	10.41	9.62	See Charts on page 26 page 27	10.12	10.38	10.71	9.60	10.35	68.0
9-5/8" x 11-3/4" 47-54#	9.62	10.62	10.41	9.62		10.12	10.38	10.71	9.60	10.35	68.0
9-5/8" x 11-3/4" 60-65#	9.62	10.43	10.41	9.62		10.00	10.25	10.58	9.50	10.25	63.5



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COMPLETION SYSTEMS



TECHNICAL DATA - LINER EQUIPMENT

SUBJECT:

**9-5/8" X 11-3/4" EZ LINER HANGER
RATING DATA**

TECH UNIT: 250.05

9-5/8" x 11-3/4 42-54#" "EZxD" Dual Cone, Casing Body Liner Hanger

Liner Wt.	Min. Liner I.D.	Max. Liner I.D.	Burst Press.	Collapse Press.	Tensile
32.3#	8.875	9.175	6,006	1,519	689,369
36#	8.795	9.105	6,808	2,232	799,918
40#	8.709	9.030	7,670	3,203	917,424
43.5#	8.629	8.960	8,472	4,149	1,026,220
47#	8.555	8.895	9,214	5,025	1,126,487
53.5#	8.530	8.768	10,678	7,546	1,320,285
53.5# SD	8.409	8.768	10,678	7,546	1,320,285
58#	8.309	8.680	11,680	9,368	1,452,936

***Burst, Collapse and Tensile Ratings Shown Are Based On P-110 Casing.
For Other Liner Grades Use The Following Multipliers:***

Grade	Multiplier
H-40	0.364
J-55	0.500
C-75	0.682
L/N-80	0.727
C-90	0.818

Grade	Multiplier
C-95	0.864
P-105	0.955
P-110	1.000
Q-125	1.136

Bypass Area (Square Inches)

Csg. Wt. Range:	42#	47-54#	
Tool OD	10.81	10.62	
Csg. Wt.	42#	47#	54#
Csg. ID	11.084	11.000	10.880
Upper Cone			
Unset	14.22	14.36	12.30
Set	11.87	11.14	10.11
Lower Cone			
Unset	13.29	13.43	11.37
Set	11.31	10.68	9.55
Gauge Ring (10.41" OD)	19.61	18.15	16.09



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COMPLETION SYSTEMS



TECHNICAL DATA - LINER EQUIPMENT

SUBJECT:

**9-5/8" X 11-3/4" EZ LINER HANGER
RATING DATA**

TECH UNIT: 250.05

9-5/8" x 11-3/4 60-65#" "EZxD" Dual Cone, Casing Body Liner Hanger

Liner Wt.	Min. Liner I.D.	Max. Liner I.D.	Burst Press.	Collapse Press.	Tensile
32.3#	8.875	9.175	5,056	897	524,356
36#	8.795	9.105	5,866	1,413	634,906
40#	8.709	9.030	6,737	2,162	752,412
43.5#	8.629	8.960	7,548	3,056	861,208
47#	8.555	8.895	8,298	3,944	961,474
53.5#	8.530	8.768	9,777	5,909	1,155,273
53.5# SD	8.409	8.768	10,678	7,546	1,155,273
58#	8.309	8.680	10,790	7,750	1,287,924

***Burst, Collapse and Tensile Ratings Shown Are Based On P-110 Casing.
For Other Liner Grades Use The Following Multipliers:***

Grade	Multiplier
H-40	0.364
J-55	0.500
C-75	0.682
L/N-80	0.727
C-90	0.818

Grade	Multiplier
C-95	0.864
P-105	0.955
P-110	1.000
Q-125	1.136

Bypass Area (Square Inches)

Csg. Wt. Range:	60-65#	
Tool OD	10.43	
Csg. Wt.	60#	65#
Csg. ID	10.772	10.682
Upper Cone		
Unset	12.22	10.71
Set	9.38	8.62
Lower Cone		
Unset	11.29	9.78
Set	8.82	8.06
Gauge Ring (10.41" OD)	14.25	12.74



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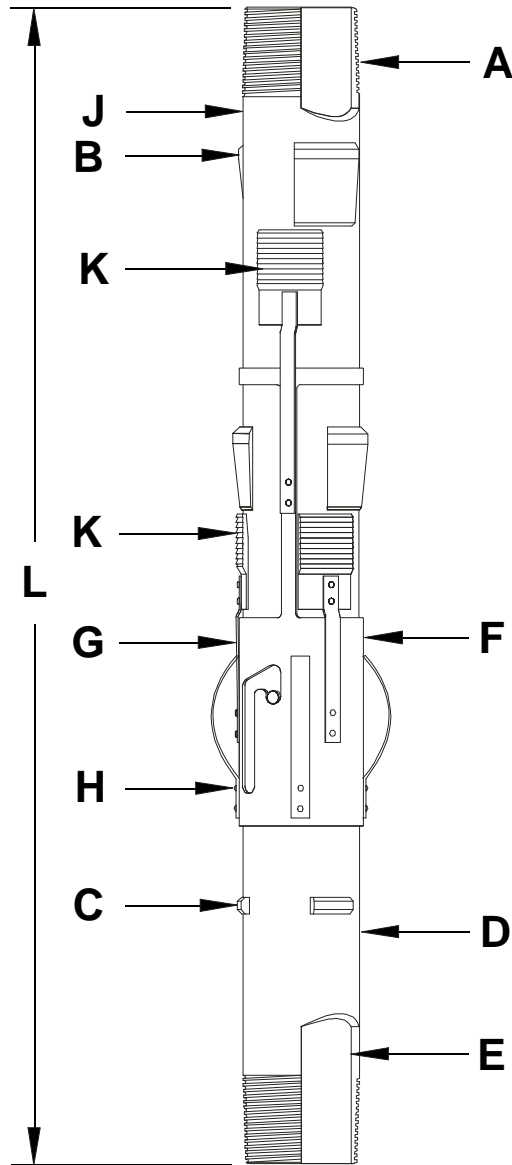


TECHNICAL DATA - LINER EQUIPMENT

SUBJECT:

**9-5/8" X 13-3/8" EZ LINER HANGER
DIMENSIONAL DATA**

TECH UNIT: 250.05



Notes:

1. All Dimensions Are Given In Inches.
2. Unless Otherwise Noted All Dimensions Are "Nominal", Exclusive of Design Tolerances.
3. EZLD has a Left Hand cage. Right hand cage illustrated.

Liner Size x Casing	Liner Hanger Dimensions										
	A	B	C	D	E	F	G	H	J	K	L
9-5/8" x 13-3/8" 48#	9.62	12.25	11.62	9.62	See Chart on page 29	10.50	10.75	11.08	9.63	11.50	75.0
9-5/8" x 13-3/8" 54.5-68#	9.62	12.00	11.62	9.62		10.50	10.75	11.08	9.63	11.50	75.0
9-5/8" x 13-3/8" 72-85#	9.62	11.75	11.62	9.62		10.50	10.75	11.08	9.63	11.50	75.0



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TECHNICAL DATA - LINER EQUIPMENT

SUBJECT:

**9-5/8" X 13-3/8" EZ LINER HANGER
RATING DATA**

TECH UNIT: 250.05

9-5/8" x 13-3/8 48-85#" "EZxD" Dual Cone, Casing Body Liner Hanger

<i>Liner Wt.</i>	<i>Min. Liner I.D.</i>	<i>Max. Liner I.D.</i>	<i>Burst Press.</i>	<i>Collapse Press.</i>	<i>Tensile</i>
32.3#	8.875	9.175	6,240	1,708	689,369
36#	8.795	9.105	7,040	2,470	799,918
40#	8.709	9.030	7,900	3,480	917,424
43.5#	8.629	8.960	8,700	4,430	1,026,220
47#	8.555	8.895	9,440	5,310	1,126,487
53.5#	8.530	8.768	10,900	7,930	1,320,285
53.5# SD	8.409	8.768	10,900	7,930	1,320,285
58#	8.309	8.680	11,900	9,750	1,452,936

***Burst, Collapse and Tensile Ratings Shown Are Based On P-110 Casing.
For Other Liner Grades Use The Following Multipliers:***

Grade	Multiplier
<i>H-40</i>	<i>0.364</i>
<i>J-55</i>	<i>0.500</i>
<i>C-75</i>	<i>0.682</i>
<i>L/N-80</i>	<i>0.727</i>
<i>C-90</i>	<i>0.818</i>

Grade	Multiplier
<i>C-95</i>	<i>0.864</i>
<i>P-105</i>	<i>0.955</i>
<i>P-110</i>	<i>1.000</i>
<i>Q-125</i>	<i>1.136</i>

Bypass Area (Square Inches)

Csg. Wt. Range:	48#	54.5#-68#			72#-85#			
Tool OD	12.25	12.00			11.75			
Csg. Wt.	48#	54.5#	61#	68#	72#	77#	80.7#	85#
Csg. ID	12.715	12.615	12.515	12.415	12.347	12.275	12.215	12.159
Upper Cone								
Unset	31.67	32.06	30.08	28.13	29.14	27.74	26.59	25.52
Set	27.11	26.11	25.13	24.15	23.49	22.79	22.21	21.68
Lower Cone								
Unset	29.55	29.94	27.96	26.01	27.02	25.62	24.47	23.40
Set	24.99	23.99	23.01	22.03	21.37	20.67	20.09	19.56
Gauge Ring (11.62" OD)	43.12	41.13	39.15	37.20	35.87	34.48	33.33	32.25



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