



Texas Oil Tools

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Product Service Bulletin

Product

3.06 Quad BOP, Shear Rams, & Booster Cylinders

Reference

Tech Manual 1184

Discussion

The O.D., Wall thickness, and Yield strength, and material used in coiled tubing continues to increase. In many cases it has increased beyond the capacity of the hydraulic system on the coiled tubing unit.

Extensive testing on Shearing Coiled Tubing was performed at the Conroe factory. The results have been tabulated and are presented here for your convenience. All tests were conducted at zero well pressure. Separate tests were conducted to confirm the additional pressure required to close the rams under well pressure. In each case, where multiple cuts were made, the highest observed pressure is the one shown. Wireline was placed inside the coiled tubing for many of the cuts. Both 7/32 and 15/32 line was used, in every case the wireline cut at a lower pressure than the tubing.

Column #4 records the part number of the Shear Blade used in the test. Part numbers 8011-3535, 8011-3537, 8011-3541 & 8011-3544 are the original style blades furnished with the 3.06 Quad BOP. Part number 8011-5536 and 8011-5545 are the new (1992) Multi-Cut/Multi-Size Shear Blades. The 8011-5545 blade cuts all sizes of wireline and coiled tubing through 1.75" coil tubing. This new blade is to be used **only** with the 1.75" Shear Ram Bodies, 8011-3644 and 8011-3744. The 8011-5536 blade is a direct Multi-Cut/Multi-Size replacement for the existing 8011-3535, 8011-3537 and 8011-3541 shear blades used to cut 1.00"- 1.50" coil sizes, and fits the existing Shear Ram Bodies, 8011-3642 and 8011-3742. No modification is required.

Column #3 records the type of material, 70, 80, or 100,000 yield. As additional samples of the higher strength material, and/or heavier wall thickness, becomes available this tabulation will be amended.

Column #5 records the hydraulic pressure required to cut the tubing (with zero well pressure). This is with the original 3" hydraulic cylinders, (no Booster). Column #6 adds the hydraulic pressure required to overcome a well pressure of 5,000psi. Column #7 adds the hydraulic pressure required to overcome the force of 10,000psi well pressure.

Column #8 EH34-BC01 Booster, does not require changing any BOP parts, limited hydraulic pressure, not certified for DNV. Hydraulic pressure shown is that required when the well pressure is 10,000 psi.

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Approved by:	Drawing: 9201-2691	

Column #9 EH34-BC03L, requires changing the Rod with Ram Guide, Piston, and Piston Guide. This conversion is type approved by DNV for service -32C. The hydraulic pressure shown is the pressure required when the well pressure is 10,000 psi. This unit is designed for hydraulic pressure of 3,000 psi W.P. and 4,500 psi test.

Column #10 EH34-BC05L, requires changing the Rod with Ram Guide, Piston, and Piston Guide. This conversion is type approved by DNV for service -32C. The hydraulic pressure shown is the pressure required when the well pressure is 10,000 psi. This unit is designed for hydraulic pressure of 1,500 psi W.P. and 3,000 psi test.

Refer to the appropriate Tech Manual for operating, ordering information, and part numbers for the BOP Ram Assemblies, and Booster Assemblies.

Column #11 lists the net force delivered to the blade; therefore, this force remains constant regardless of changing well pressure.

Column #12 lists the cross sectional area of the wall of the coiled tubing.

Column #13 F/As indicates the shear stress for the particular pipe/blade combination.

The last three columns can be used to approximate the pressure required to cut tubing that is not listed on the chart.

1	2	3	4	5	6	7	8	9	10	11	12	13
O.D.	Wall	Type Matl.	Blade Type	Hyd Psi 0 well	Hyd psi 5M well	Hyd psi 10M well	EH34-BC01 10M well	EH34-BC03L 10M well	EH34-BC05L 10M well	# Force	As	F/As
1.000	0.075	70	8011-3535	1,600	2,156	2,711	1,159	932	679	11,310	0.218	51,895
1.000	0.075	70	8011-5536	1,000	1,556	2,111	902	725	529	7,069	0.218	32,434
1.000	0.087	70	8011-3535	1,800	2,356	2,911	1,244	1,000	730	12,724	0.250	50,991
1.000	0.087	70	8011-5536	1,100	1,656	2,211	945	760	554	7,776	0.250	31,161
1.000	0.095	70	8011-3535	1,950	2,506	3,061	1,308	1,052	767	13,785	0.270	51,035
1.000	0.095	70	8011-5536	1,300	1,856	2,411	1,030	829	604	9,190	0.270	34,023
1.000	0.109	70	8011-3535	2,100	2,656	3,211	1,372	1,103	805	14,845	0.305	48,654
1.000	0.109	70	8011-5536	1,400	1,956	2,511	1,073	863	629	9,897	0.305	32,436
1.250	0.087	70	8011-3537	2,000	2,556	3,111	1,329	1,069	780	14,138	0.318	44,477
1.250	0.087	70	8011-5536	1,500	2,056	2,611	1,116	897	654	10,604	0.318	33,358
1.250	0.087	80	8011-5536	1,600	2,156	2,711	1,159	932	679	11,310	0.318	35,582
1.250	0.087	100	8011-5536	1,800	2,356	2,911	1,244	1,000	730	12,724	0.318	40,030
1.250	0.095	70	8011-3537	2,400	2,956	3,511	1,500	1,207	880	16,966	0.345	49,217
1.250	0.095	70	8011-5536	1,500	2,056	2,611	1,116	897	654	10,604	0.345	30,760
1.250	0.109	70	8011-5537	2,800	3,356	3,911	1,671	1,344	980	19,793	0.391	50,659
1.250	0.109	70	8011-5536	1,500	2,056	2,611	1,116	897	654	10,604	0.391	27,139
1.250	0.109	** 70	8011-5536	900	1,456	2,011	859	691	504	6,362	0.391	16,283
1.250	0.109	* 70	8011-5536	1,400	1,956	2,511	1,073	863	629	9,897	0.391	25,329
1.250	0.109	100	8011-55 36	2,100	2,656	3,211	1,372	1,103	805	14,845	0.391	37,994
1.250	0.134	70	8011-3537	3,150	3,706	4,261	1,821	1,464	1,068	22,267	0.470	47,397
1.250	0.134	70	8011-5536	2,400	2,956	3,511	1,500	1,207	880	16,966	0.470	36,112
1.250	0.156	70	8011-3537	3,600	4,156	4,711	2,013	1,619	1,181	25,448	0.536	47,464
1.250	0.175	70	8011-5536	3,000	3,556	4,111	1,757	1,413	1,030	21,207	0.591	35,882
1.250	0.175	70	8011-3537	3,950	4,506	5,061	2,163	1,739	1,268	27,923	0.591	47,245
1.500	0.095	70	8011-3541	2,700	3,256	3,811	1,629	1,310	955	19,086	0.419	45,517
1.500	0.095	70	8011-5536	1,700	2,256	2,811	1,201	966	705	12,017	0.419	28,659
1.500	0.109	70	8011-3541	2,900	3,456	4,011	1,714	1,378	1,005	20,500	0.476	43,038
1.500	0.109	70	8011-5536	1,900	2,456	3,011	1,287	1,035	755	13,431	0.476	28,197
1.500	0.125	70	8011-3541	3,500	4,056	4,611	1,971	1,585	1,156	24,742	0.540	45,821
1.500	0.125	70	8011-5536	2,100	2,656	3,211	1,372	1,103	805	14,845	0.540	27,492
1.500	0.134	70	8011-3541	3,800	4,356	4,911	2,099	1,688	1,231	26,862	0.575	46,713
1.500	0.134	70	8011-5536	2,750	3,306	3,861	1,650	1,327	968	19,440	0.575	33,805
1.500	0.156	70	8011-3541	4,250	4,806	5,361	2,291	1,842	1,344	30,043	0.659	45,611
1.500	0.156	70	8011-5536	3,200	3,756	4,311	1,842	1,481	1,080	22,621	0.659	34,343
1.750	0.109	70	8011-3544	3,200	3,756	4,311	1,842	1,481	1,080	22,621	0.562	40,255
1.750	0.109	70	8011-5545	2,450	3,006	3,561	1,522	1,224	892	17,319	0.562	30,820
1.750	0.134	70	8011-3544	3,950	4,506	5,061	2,163	1,739	1,268	27,923	0.680	41,045
1.750	0.134	70	8011-5545	3,000	3,556	4,111	1,757	1,413	1,030	21,207	0.680	31,173
1.750	0.156	70	8011-3544	4,600	5,156	5,711	2,441	1,963	1,431	32,517	0.781	41,625
1.750	0.156	70	8011-5545	3,550	4,106	4,661	1,992	1,602	1,168	25,095	0.781	32,123

NOTE: ** Cut with 20,000 # tension, * cut with 10,000 # tension.

The original Shear Ram Bodies were designed for one size Ram Body to accept three different Shear Blades for 1.00, 1.25 and 1.50 coiled tubing. A different Shear Blade was required for each size coiled tubing. We did not anticipate 1.75 coiled tubing.

Designing the Shear Rams for 1.75 coiled tubing required changing the location of the retaining bolt, therefore the blades for 1.00, 1.25 and 1.50 do not fit the Ram Body for 1.75. Ram Bodies for 1.75 are part #8011-3744 R.H. and 8011-3644 L.H.

This new Shear Blade 8011-5536 fits the original Ram Body Part #8011-3742 R.H. & 8011-3642 L.H., and cuts the sizes of pipe 1.00, 1.25 or 1.50 with or without wireline. It should not be used to cut 1.75.

The new Shear Blade 8011-5545 fits only the Ram Bodies part #8011-3744 R.H. and 8011-3644 L.H. for 1.75, however it is suitable for cutting all sizes tubing 1.00, 1.25, 1.50 and 1.75 with or without wireline.

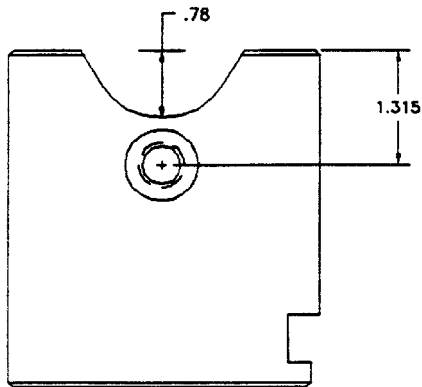
Unless otherwise specifically ordered to the contrary, all 3.06 BOPs shipped after 1 May 92 will be equipped with Ram Bodies 8011-3744 R.H. and 8011-3644 L.H. and Shear Blade 8011-5545.

When ordering Shear Blades REMEMBER:

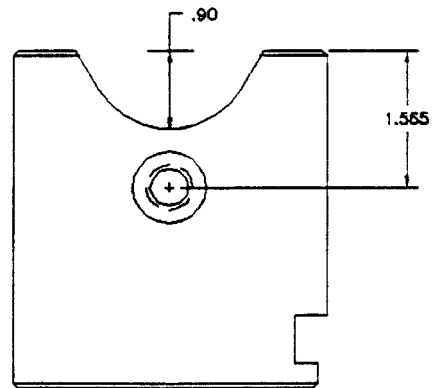
Part #8011-5536 cuts 1.00, 1.25 and 1.50, and fits only Ram Bodies 8011-3742 and 8011-3642.

Part #8011-5545 cuts 1.00, 1.25, 1.50 and 1.75, and fits only Ram Bodies 8011-3744 and 8011-3644.

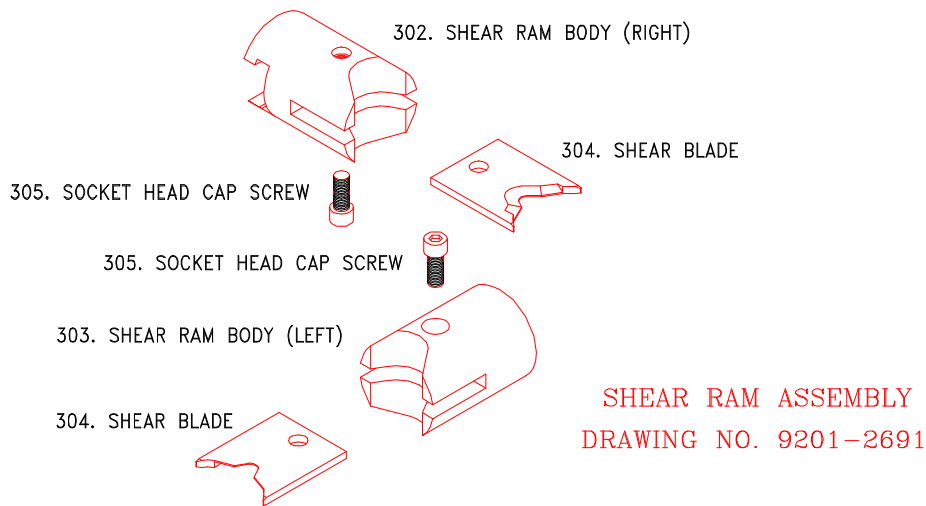
In case the part numbers on the Rams are not visible, the following dimension will aid in identification.



1.00 thru 1.50
Shear Ram Bodies
8011-3642 L.H.
8011-3742 R.H.



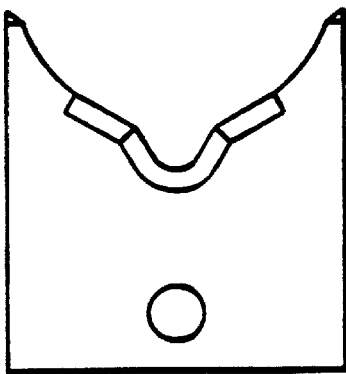
1.75
Shear Ram Bodies
8011-3644 L.H.
8011-3744 R.H.



CAUTION !!! SHEAR BLADES CAN BE INSTALLED WRONG !!!

NOTE: As illustrated, the beveled side of the blade faces away from the head of the Cap Screw. The sharper edge faces toward the head of the Cap Screw, and will be to the center of the Ram Body.

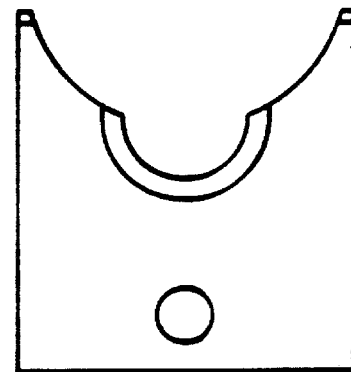
Both types of blades cut wireline equally well, and make multiple cuts. Only the Blade changes, the Ram Body does not change. The new blade 8011-5536 cuts all sizes of tubing from 1.00" dia. through 1.50" dia. and replaces the old blades 8011-3535, 8011-3537 and 8011-3541. The new blade 8011-5545 will cut 1.00" dia. through 1.75" dia. tubing, but requires using the 1.75" Shear Rams 8011-3644 and 8011-3744. This blade replaces the old 8011-3544 shear blade. The cut tubing is a star shape, but the O.D. is even less oversized than the older blade cut, resulting in easier fishing. The I.D. is not restricted, permitting circulation.



Part Nos.

8011-5536
8011-5545

Available Feb. 1992



Part Nos.

8011-3535, 8011-3537
8011-3541, 8011-3544