

TECHNICAL SPECIFICATION SHEET

BLACK GOLD HYDRAULIC ANCHOR

Description

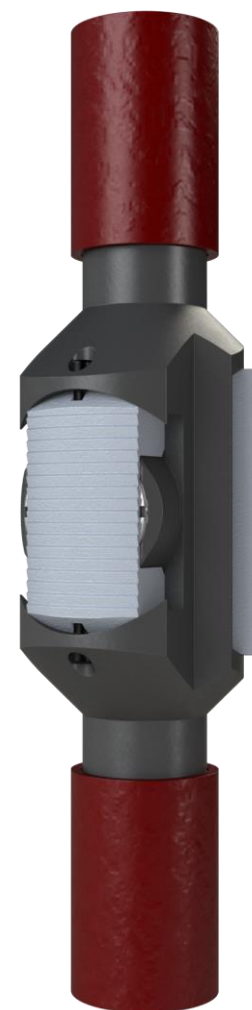
Black Gold's Hydraulic Anchor is simple to install and simple to extract with a strong holding power to maximise pump efficiency. Our engineered large bypass area eliminates gas problems and sand bridges, provides clearance for survey tools and allows capillary tubing to be banded alongside. There is no surface manipulation or pretension needed, the anchor utilizes the weight of the fluid column to set. This compensating anchor can reset itself downwards but will not move upwards when actuated, keeping the tubing in constant tension.

Features & Benefits

Simple to install, simple to extract	No surface manipulation or pretension needed
Sets and unsets automatically	Can only move downwards, keep tubing in constant tension
Strong holding power, maximizes pump efficiency	Large bypass for gas, solids, survey tools

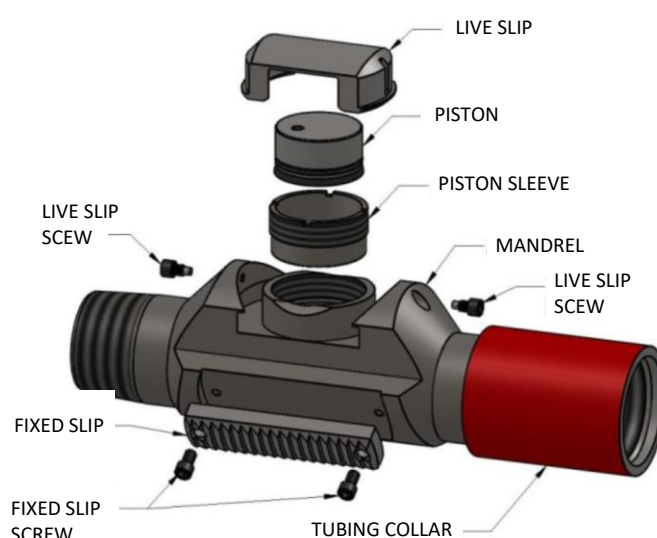
Anchor Specification

Casing Size Range	4.5", 5", 5-1/2", 7", 7-5/8", 8-5/8", 9-5/8"
Tubing Size Range	2-3/8", 2-7/8", 3-1/2"
Minimum Set Pressure	10 psi



Bill of Materials

Collar	Connects anchor to tubing joint, also known as tubing coupling
Crossover	Tubing adapter used to adapt larger anchor mandrel to smaller tubing (e.g. 3 1/2" to 2 7/8")
Fixed Slip	Stationary slips used to grip casing/liner
Live Slip	Dynamic slip actuated by tubing pressure to grip casing/liner
Mandrel	Body of the anchor
Piston	Pressure actuated to engage Live Slip to casing/liner
Pup Joint	Two foot Pup Joint used to assist in extraction of anchor and to mitigate rod cut on the anchor



For more information on Black Gold rod pumps & downhole products, contact:

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Anchor Installation Instructions

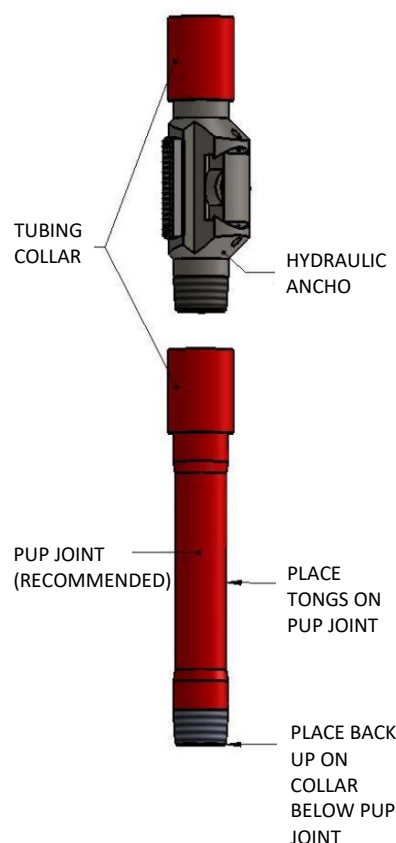
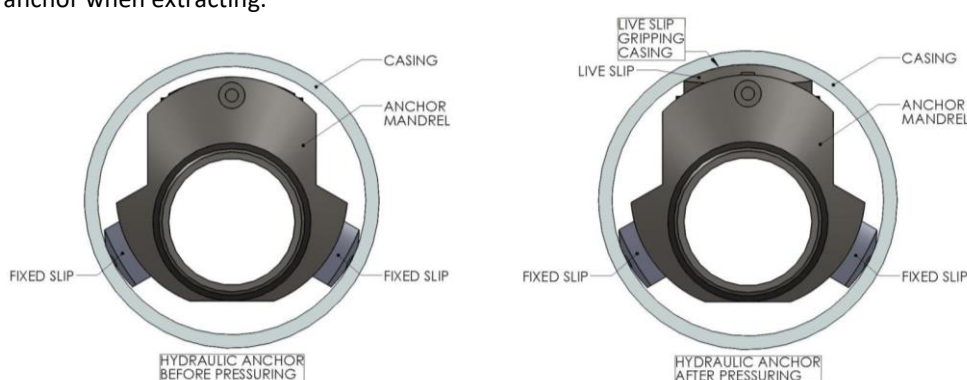
1. Attach anchor to the tubing string with the teeth of the fixed slips facing upward.
2. Connect the collar and remaining tubing string to the bottom of the anchor.
3. Place the anchor in the casing as close to the pump as well conditions permit.

Anchor Activation

Lower the anchor with tubing string into the well casing. The anchor utilizes the weight of the fluid column in the tubing string to actuate the piston, pressing the live slip against the casing/liner. When the pump is seated and the fluid level in the tubing string becomes higher than the fluid level in the annulus, the tubing will be anchored. The anchor holding power will be proportionate to the differential of the fluid levels in the tubing and casing annulus. The figure on the next page shows the hydraulic anchor before and after pressuring.

Anchor Extraction

To retrieve the anchor, unseat the pump. With pressure equalized across the piston and casing it is ready to be retrieved. For easy removal of the anchor from the tubing string, place the tongs on the Pup Joint and the back up on the collar directly below it. This eliminates the need to put wrenches onto the anchor when extracting.



BLACK GOLD HYDRAULIC “R” ANCHOR SIZING CHART

Casing Size	Casing Weight	Anchor OD	Tubing Size	Mandrel	Live Slip	Fixed Slip
4.5"	9.5#	4.009"	2 3/8"	45121360	651020103	650021044
4.5"	11.6#	3.913	2 3/8"	455121360	651020103	650021038
5"	13#	4.393"	2 3/8"	455121400	651020118	650021050
5"	15#	4.325"	2 3/8"	455121400	651020118	650021044
5 1/2"	15.5#	4.879"	2 3/8"	455121450	651020131	650021056
5 1/2"	15.5#	4.879"	2 7/8"	455122450	651020131	650021056
5 1/2"	17#	4.784"	2 3/8"	455121450	651020131	650021050
5 1/2"	17#	4.784"	2 7/8"	455122450	651020131	650021050
5 1/2"	20#	4.589"	2 3/8"	455121450	651020131	650021038
5 1/2"	20#	4.683"	2 7/8"	455122450	651020131	650021044
5 1/2"	23#	4.589"	2 3/8"	455121450	651020131	650021038
5 1/2"	23#	4.589"	2 7/8"	455122450	651020131	650021038
7"	23#	6.246"	2 7/8"	455122550	651021169	650022088
7"	23#	6.246"	3 1/2"	455123550	651021169	650022088
7"	26#	6.095"	2 7/8"	455122550	651021169	650022078
7"	26#	6.095"	3 1/2"	455123550	651021169	650022078
7"	29-32#	5.963"	2 7/8"	455122550	651021169	650022069
7"	29-32#	5.963"	3 1/2"	455123550	651021169	650022069
7 5/8"	29.7#	6.703"	2 7/8", 3 1/2"	455123625	651021169	650022069
7 5/8"	33.7#	6.609"	2 7/8", 3 1/2"	455123625	651021169	650022063
8 5/8"	32-36#	7.698"	2 7/8", 3 1/2"	455123688	651021219	650022125
9 5/8"	43.5-47#	8.499"	2 7/8", 3 1/2"	455123750	651021219	650022125
9 5/8"	53.5#	8.499"	2 7/8", 3 1/2"	455123750	651021219	650022113

Disclaimer: Black Gold is not responsible for any injuries or costs due to the mishandling or misuse of this product.



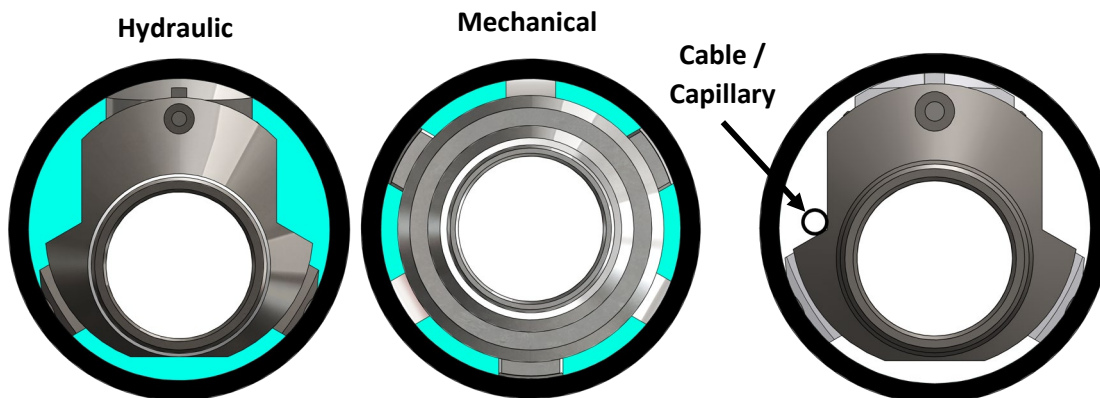
TECHNICAL INFORMATION SHEET

HYDRAULIC VS MECHANICAL TUBING ANCHOR

BYPASS AREA

Comparison

- An average of **240%** greater by-pass clearance than mechanical anchors
- Up to **1000%** greater by-pass clearance for larger hydraulic anchors
- Ample clearance for banding capillary tubing
- Will not allow sand bridges to build above the hydraulic anchor
- Will not allow gas slugs to form below the hydraulic anchor



Anchor Size	Bypass Area (in ²)	Anchor Size	Bypass Area (in ²)	Anchor Size	Bypass Area (in ²)
4.5" 9.5# 20	2.40	6.625" 24# 25	5.10	7.625" 24# 30	11.16
4.5" 10.5# 20	2.14	6.625" 24# 30	4.70	7.625" 26.4# 25	10.90
4.5" 11.6# 20	2.02	6.625" 28# 25	4.32	7.625" 26.4# 30	10.78
4.5" 13.5# 20	1.71	6.625" 28# 30	3.92	7.625" 29.7# 25	10.72
4.5" 15.1# 20	1.65	6.625" 32# 25	3.66	7.625" 29.7# 30	9.96
5" 11.5# 20	2.90	6.625" 32# 30	3.26	7.625" 33.7# 25	9.22
5" 13# 20	2.58	7" 17# 25	9.36	7.625" 33.7# 30	9.10
5" 15# 20	2.22	7" 17# 30	8.96	7.625" 39# 25	8.10
5" 18# 20	1.68	7" 20# 25	8.74	7.625" 39# 30	8.06
5.5" 14# 20	3.90	7" 20# 30	8.46	8.625" 24# 30	18.84
5.5" 14# 25	3.90	7" 23# 25	8.20	8.625" 28# 30	18.16
5.5" 15.5# 20	3.62	7" 23# 30	7.80	8.625" 32# 30	17.12
5.5" 15.5# 25	3.62	7" 26# 25	7.48	8.625" 36# 30	16.34
5.5" 17# 20	3.28	7" 26# 30	7.08	8.625" 40# 30	15.26
5.5" 17# 25	3.28	7" 29# 25	6.78	8.625" 44# 30	14.38
5.5" 20# 20	2.74	7" 29# 30	6.38	8.625" 49# 30	13.26
5.5" 20# 25	2.74	7" 32# 25	6.28	9.625" 36.0# 30	25.30
5.5" 23# 20	2.24	7" 32# 30	5.84	9.625" 40.0# 30	24.46
5.5" 23# 25	2.24	7" 35# 25	5.66	9.625" 43.5# 30	23.44
6.625" 20# 25	5.82	7" 35# 30	5.26	9.625" 47# 30	22.74
6.625" 20# 30	5.50	7.625" 24# 25	11.28	9.625" 53.5# 30	21.10

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