



REBCO OIL TOOLS

EXCEEDING EXPECTATIONS ONE
TOOL AT A TIME

Lock Mandrels



SECTION XIV: LOCK MANDRELS

PRODUCT DESCRIPTION: LOCK MANDRELS

LOCK MANDRELS were designed to land and set into downhole pre-positioned Landing Nipples (see [Section XIII](#)) in the well. The Lock Mandrels can be Selective or No-Go type depending on flow control accessory type attached to it.

The following pages will list some of the most common types of LOCKS for Landing Nipples and Tubing, offered by **Rebco**.

Rebco Type '**ROTR**', '**ROTRN**', '**ROTX**', '**ROTXN**', Lock Mandrels are offered with following features.

Product Code	Size Range	Feature
10	1.25" - 4.81"	Standard
17	1.78" - 2.87"	Interference Hold Down
18	3.31" - 4.81"	Safety Spring

TUBING MANDRELS are designed to lock and pack off Wireline retrievable flow controls in wells that do not have Landing Nipples.



SECTION XIV: LOCK MANDRELS

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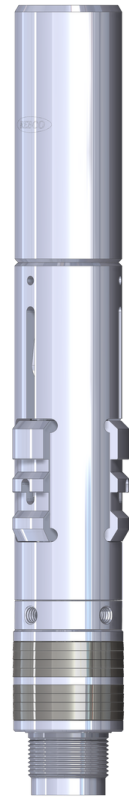


SECTION XIV: LOCK MANDRELS

Type 'ROTR' Lock Mandrel Assembly: 1.500" – 4.813"

Rebco Type 'ROTR' Lock Mandrel is a Selective Set Lock to be set in Type 'ROTR' Landing Nipple of the same Size.

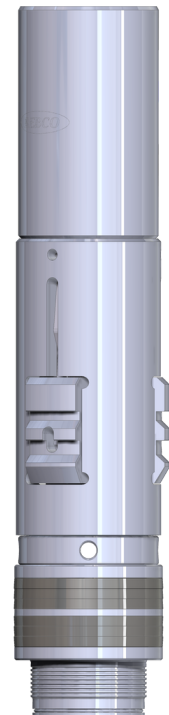
Lock Mandrels with Safety Spring, and Interference Hold Down are available, see [PRODUCT 17](#) and [18](#)



TECHNICAL DATA					
NIPPLE SEAL BORE	1.500"	1.710"	1.781"	1.875"	2.000"
ASSEMBLY NUMBER	10132015030	10132017130	10132017830	10132018730	10132020030
ENGINEERING DATA:					
LOCK ID	.62"	.75"	.88"	.88"	.88"
PACKING OD	1.500"	1.710"	1.781"	1.875"	2.000"
LENGTH	13.4"	13.4"	13.4"	13.4"	13.4"
MATERIAL *	Norm Alloy	Norm Alloy	Norm Alloy	Norm Alloy	Norm Alloy
BOTTOM THREAD	1 1/8" - 16	1 1/8" - 16	1 3/8" - 14	1 3/8" - 14	1 3/8" - 14
RUNNING TOOL - 'ROTR'	41132015000	41132017100	41132017800	41132018700	41132020000
PULLING TOOL - 'ROTGR'	40051315000	40051315000	40051317800	40051318700	40051318700

Product Code: 10

TECHNICAL DATA					
NIPPLE SEAL BORE	2.125"	2.188"	2.313"	2.562"	2.750"
ASSEMBLY NUMBER	10132021230	10132021830	10132023130	10132025630	10132027530
ENGINEERING DATA:					
LOCK ID	.88"	1.12"	1.12"	1.38"	1.50"
PACKING OD	2.125"	2.188"	2.313"	2.562"	2.750"
LENGTH	13.4"	13.8"	13.8"	13.3"	13.7"
MATERIAL *	Norm Alloy	Norm Alloy	Norm Alloy	Norm Alloy	Norm Alloy
BOTTOM THREAD	1 3/8" - 14	1 3/4" - 12	1 3/4" - 12	2"-12 SLB	2 1/4"-12 SLB
RUNNING TOOL - 'ROTR'	41132021200	41132021800	41132023100	41132025600	41132027500
PULLING TOOL - 'ROTGR'	40051318700	40051321800	40051323100	40051323100	40051327500

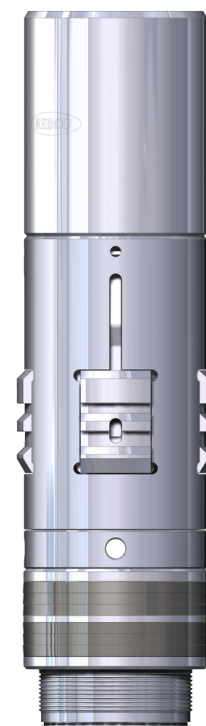




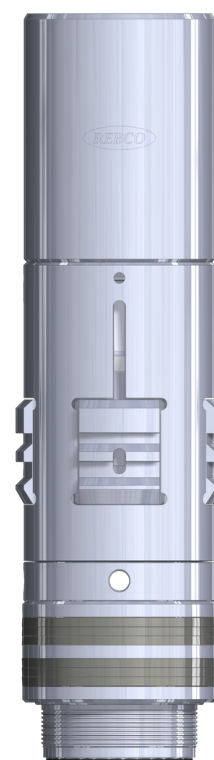
SECTION XIV: LOCK MANDRELS

Type 'ROTR' Lock Mandrel Assembly:

TECHNICAL DATA					
NIPPLE SEAL BORE	2.813"	2.875"	3.125"	3.437"	3.688"
ASSEMBLY NUMBER	10132028130	10132028730	10132031230	10132034330	10132036830
ENGINEERING DATA:					
LOCK ID	1.50"	1.50"	1.94"	1.94"	2.38"
PACKING OD	2.813"	2.875"	3.125"	3.437"	3.688"
LENGTH	13.7"	13.7"	13.7"	14.2"	14.37"
MATERIAL *	Norm Alloy	Norm Alloy	Norm Alloy	Norm Alloy	Norm Alloy
BOTTOM THREAD	2 1/4"-12 SLB	2 1/4"-12 SLB	2 5/8"-12 SLB	2 3/4"-12 SLB	3 1/16"-12 SLB
RUNNING TOOL - 'ROTR'	41132028100	41132028700	41132031200	41132034300	41132036800
PULLING TOOL - 'ROTGR'	40051327500	40051327500	40051331200	40051331200	40051336804



TECHNICAL DATA					
NIPPLE SEAL BORE	3.813"	4.125"	4.313"	4.562"	4.813"
ASSEMBLY NUMBER	10132038130	10132041230	10132043130	10132045630	10132048130
ENGINEERING DATA:					
LOCK ID	2.12"	2.75"	2.62"	2.85"	3.12"
PACKING OD	3.813"	4.125"	4.313"	4.562"	4.813"
LENGTH	14.77"	14.38"	14.39"	14.92"	14.6"
MATERIAL *	Norm Alloy	Norm Alloy	Norm Alloy	Norm Alloy	Norm Alloy
BOTTOM THREAD	3 1/16"-12 SLB	3 1/4"-12 SLB	3 1/4"-12 SLB	3 3/4"-12 SLB	4"-12 SLB
RUNNING TOOL - 'ROTR'	41132038100	41132041200	41132043100	41132045600	41132048100
PULLING TOOL - 'ROTGR'	40051336804	40051436804	40051336804	40051345600	40051345600



* Norm Alloy is suitable for H2S Service (NACE MR-01-75, Latest Revision)

NOTE: Lock Mandrels Sizes 3.437" - 4.813" without Safety Spring ([Product 18](#)) are Special Order Locks



SECTION XIV: LOCK MANDRELS

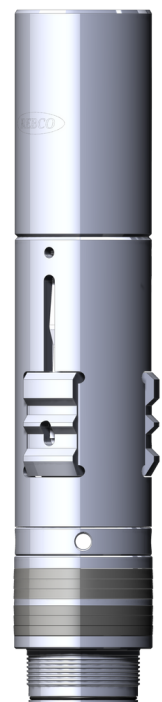
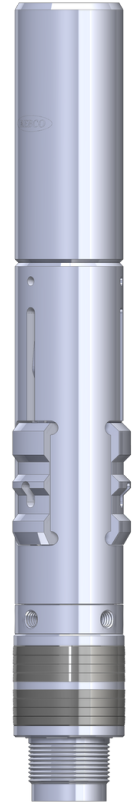
Type 'ROTRN' Lock Mandrel Assembly: 1.500" – 4.813"

Rebco Type 'ROTRN' Lock Mandrel has chamfered Keys, and when a Bottom Sub is added, it becomes a No-Go Lock Mandrel. It is to be landed in a Type 'ROTRN' Landing Nipple of the same size.

Lock Mandrels are available in a variety of Materials, suitable to down-hole conditions.

Product Code: 10

Lock Mandrels with Safety Spring, and Interference Hold Down are available, see [PRODUCT 17](#) and [18](#)



TECHNICAL DATA

NIPPLE SEAL BORE	1.500"	1.710"	1.781"	1.875"	2.000"
ASSEMBLY NUMBER	10131015030	10131017130	10131017830	10131018730	10131020030

ENGINEERING DATA:

LOCK ID	.62"	.75"	.88"	.88"	.88"
PACKING OD	1.500"	1.710"	1.781"	1.875"	2.000"
LENGTH	13.4"	13.4"	13.4"	13.4"	13.4"
MATERIAL *	Norm Alloy	Norm Alloy	Norm Alloy	Norm Alloy	Norm Alloy
BOTTOM THREAD	1 1/8" - 16	1 1/8" - 16	1 3/8" - 14	1 3/8" - 14	1 3/8" - 14
RUNNING TOOL - 'ROTR'	41132015000	41132017100	41132017800	41132018700	41132020000
PULLING TOOL - 'ROTGR'	40051315000	40051315000	40051317800	40051318700	40051318700

TECHNICAL DATA

NIPPLE SEAL BORE	2.125"	2.188"	2.313"	2.562"	2.750"
ASSEMBLY NUMBER	10131021230	10131021830	10131023130	10131025630	10131027530

ENGINEERING DATA:

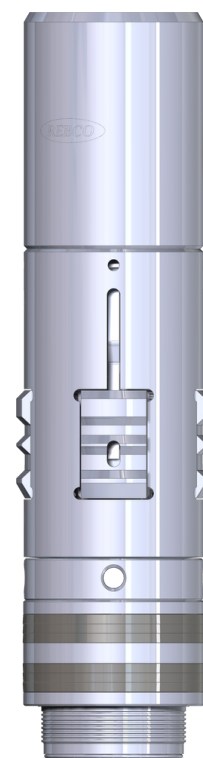
LOCK ID	.88"	1.12"	1.12"	1.38"	1.50"
PACKING OD	2.125"	2.188"	2.313"	2.562"	2.750"
LENGTH	13.4"	13.8"	13.8"	13.3"	13.7"
MATERIAL *	Norm Alloy	Norm Alloy	Norm Alloy	Norm Alloy	Norm Alloy
BOTTOM THREAD	1 3/8" - 14	1 3/4" - 12	1 3/4" - 12	2" - 12 SLB	2 1/4" - 12 SLB
RUNNING TOOL - 'ROTR'	41132021200	41132021800	41132023100	41132025600	41132027500
PULLING TOOL - 'ROTGR'	40051318700	40051321800	40051323100	40051323100	40051327500



SECTION XIV: LOCK MANDRELS

Type 'ROTRN' Lock Mandrel Assembly:

TECHNICAL DATA					
NIPPLE SEAL BORE	2.813"	2.875"	3.125"	3.437"	3.688"
ASSEMBLY NUMBER	10131028130	10131028730	10131031230	10131034330	10131036830
ENGINEERING DATA:					
LOCK ID	1.50"	1.50"	1.94"	1.94"	2.38"
PACKING OD	2.813"	2.875"	3.125"	3.437"	3.688"
LENGTH	13.7"	13.7"	13.7"	14.2"	14.37"
MATERIAL *	Norm Alloy	Norm Alloy	Norm Alloy	Norm Alloy	Norm Alloy
BOTTOM THREAD	2 1/4"-12 SLB	2 1/4"-12 SLB	2 5/8"-12 SLB	2 3/4"-12 SLB	3 1/16"-12 SLB
RUNNING TOOL - 'ROTR'	41132028100	41132028700	41132031200	41132034300	41132036800
PULLING TOOL - 'ROTGR'	40051327500	40051327500	40051331200	40051331200	40051336804



TECHNICAL DATA					
NIPPLE SEAL BORE	3.813"	4.125"	4.313"	4.562"	4.813"
ASSEMBLY NUMBER	10131038130	10131041230	10131043130	10131045630	10131048130
ENGINEERING DATA:					
LOCK ID	2.12"	2.75"	2.62"	2.85"	3.12"
PACKING OD	3.813"	4.125"	4.313"	4.562"	4.813"
LENGTH	14.77"	14.38"	14.39"	14.92"	14.6"
MATERIAL *	Norm Alloy	Norm Alloy	Norm Alloy	Norm Alloy	Norm Alloy
BOTTOM THREAD	3 1/16"-12 SLB	3 1/4"-12 SLB	3 1/4"-12 SLB	3 3/4"-12 SLB	4"-12 SLB
RUNNING TOOL - 'ROTR'	41132038100	41132041200	41132043100	41132045600	41132048100
PULLING TOOL - 'ROTGR'	40051336804	40051436804	40051336804	40051345600	40051345600



* Norm Alloy is suitable for H2S Service (NACE MR-01-75, Latest Revision)

NOTE: Lock Mandrels Sizes 3.437" - 4.813" without Safety Spring ([Product 18](#)) are Special Order Locks. ALL Lock Mandrels are available in a variety of Materials, suitable for down-hole conditions.



SECTION XIV: LOCK MANDRELS

Type 'ROTR' and Type 'ROTRN' Lock Mandrel Assembly with Interference Hold Down

Rebco Lock Mandrels with Interference Hold Down feature provide positive latching structure which minimizes the possibility of the lock mandrel accidentally unlocking due to vibration at high flow rates.

Lock Mandrels with Interference Hold Down safety feature are available in a variety of Materials, suitable to down-hole conditions.

Product Code: 17

TECHNICAL DATA

NIPPLE SEAL BORE		1.781"	1.875"	2.000"	2.125"	2.188"	2.313"
ASSEMBLY NUMBER	ROTR	17132017830	17132018730	17132020030	17132021230	17132021830	17132023130
	ROTRN	17131017830	17131018730	17131020030	17131021230	17131021830	17131023130

ENGINEERING DATA:

LOCK ID	.88"	.88"	.88"	.88"	1.12"	1.12"
PACKING OD	1.781"	1.875"	2.000"	2.125"	2.188"	2.313"
BOTTOM THREAD	1 3/8" - 14	1 3/8" - 14	1 3/8" - 14	1 3/8" - 14	1 3/4" - 12	1 3/4" - 12
LENGTH	13.4"	13.4"	13.4"	13.4"	13.8"	13.8"
MATERIAL *	Norm Alloy	Norm Alloy	Norm Alloy	Norm Alloy	Norm Alloy	Norm Alloy
REDRESS KIT	10132024178	10182024187	10132024200	10132024212	10132024218	10182024231
RUNNING TOOL - 'ROTR'	41132017800	41132018700	41132020000	41132021200	41132021800	41132023100
PULLING TOOL - 'ROTRGR'	40051317800	40051318700	40051318700	40051318700	40051321800	40051323100



'ROTR' Lock

TECHNICAL DATA

NIPPLE SEAL BORE		2.562"	2.750"	2.813"	2.875"
ASSEMBLY NUMBER	ROTR	17132025630	17132027530	17132028130	17132028730
	ROTRN	17131025630	17131027530	17131028130	17131028730

ENGINEERING DATA:

LOCK ID	1.38"	1.50"	1.50"	1.50"
PACKING OD	2.562"	2.750"	2.813"	2.875"
BOTTOM THREAD	2"-12 SLB	2 1/4"-12 SLB	2 1/4"-12 SLB	2 1/4"-12 SLB
LENGTH	13.3"	13.7"	13.7"	13.7"
MATERIAL *	Norm Alloy	Norm Alloy	Norm Alloy	Norm Alloy
REDRESS KIT	10132024256	10182024275	10182024281	10182024287
RUNNING TOOL - 'ROTR'	41132025600	41132027500	41132028100	41132028700
PULLING TOOL - 'ROTRGR'	40051323100	40051327500	40051327500	40051327500



'ROTRN' Lock

* Norm Alloy is suitable for H2S Service (NACE MR-01-75, Latest Revision)



SECTION XIV: LOCK MANDRELS

Type 'ROTR' and Type 'ROTRN' Lock Mandrel Assembly with Safety Spring

Rebco Lock Mandrels with Safety Spring and Shear Pin(s) feature holds the Key Expander Sleeve locked under flowing conditions.

Lock Mandrels (PRODUCT CODE 18) in addition to Safety Spring and Shear Pin(s), have Expander Sleeve (DET 2) and Key Retainer (DET 3) different than the ones used in Product Code 10 Lock Mandrels.

Product Code: 18

NOTE: When ordering, Rebco will supply these Lock Mandrels as a first option. Lock Mandrels shown in Product Code 10 within the same Size Range itemized below are not stocked.

TECHNICAL DATA

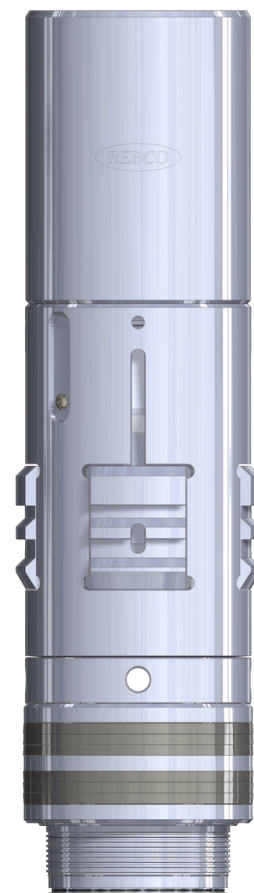
NIPPLE SEAL BORE		3.437"	3.688"	3.813"	4.125"	4.313"
ASSEMBLY NUMBER	ROTR	18132034330	18132036830	18132038130	18132041230	18132043130
	ROTRN	18131034330	18131036830	18131038130	18131041230	18131043130

ENGINEERING DATA:

LOCK ID	1.94"	2.38"	2.12"	2.75"	2.62"
PACKING OD	3.437"	3.688"	3.813"	4.125"	4.313"
BOTTOM THREAD	2 3/4"-12 SLB	3 1/16"-12 SLB	3 1/16"-12 SLB	3 1/4"-12 SLB	3 1/4"-12 SLB
LENGTH	14.2"	14.37"	14.77"	14.38"	14.39"
MATERIAL *	Norm Alloy	Norm Alloy	Norm Alloy	Norm Alloy	Norm Alloy

ACCESSORIES:

REDRESS KIT	Mandrel	10132024343	10132024368	10132024381	10132024412	10132024431
	Safety	18132024343	18132024368	18132024381	18132024412	18132024431
RUNNING TOOL - 'ROTR'		41132034300	41132036800	41132038100	41132041200	41132043100
PULLING TOOL - 'ROTRN'		40051331200	40051336804	40051336804	40051436804	40051336804



'ROTR' Lock



SECTION XIV: LOCK MANDRELS

Type 'ROTR' and Type 'ROTRN' Lock Mandrel Assembly with Safety Spring:

TECHNICAL DATA

NIPPLE SEAL BORE		4.562"	4.813"
ASSEMBLY NUMBER	ROTR	18132045630	18132048130
	ROTRN	18131045630	18131048130

ENGINEERING DATA:

LOCK ID	2.85"	3.12"
PACKING OD	4.562"	4.813"
BOTTOM THREAD	3 3/4"-12 SLB	4"-12 SLB
LENGTH	14.92"	14.6"
MATERIAL *	Norm Alloy	Norm Alloy

ACCESSORIES:

REDRESS KIT	Mandrel	10132024456	10132024481
	Safety	18132024456	18132024481
RUNNING TOOL - 'ROTR'		41132045600	41132048100
PULLING TOOL - 'ROTRN'		40051345600	40051345600

* Norm Alloy is suitable for H2S Service (NACE MR-01-75, Latest Revision)

Lock Mandrels with [Safety Spring and Shear Pin\(s\)](#) feature are available in a Variety of Materials, suitable for down-hole conditions.



'ROTRN' Lock



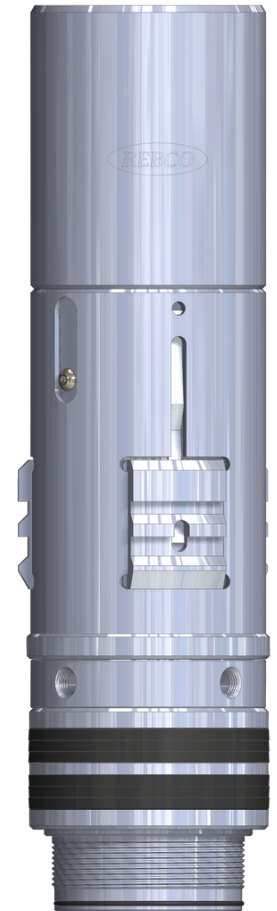
SECTION XIV: LOCK MANDRELS

Type 'ROTRQ' Lock Mandrel Assembly with Safety Spring and Shear Pin(s)

Rebco Type 'ROTRQ' Lock Mandrels with Safety Spring and Shear Pin(s) are Top No-Go Lock Mandrels designed to land and lock Sub-Surface Safety Valves in Type 'ROTRQ' Landing Nipples.

Other Sizes (not listed) are available, please inquire

TECHNICAL DATA				
NIPPLE SEAL BORE	3.813"	4.125"	4.562"	6.000"
ASSEMBLY NUMBER	18131238130	18131241230	18131245630	18131260030
ENGINEERING DATA:				
LOCK ID	2.62"	2.75"	3.12"	4.125"
FISHING NECK ID	3.12"	3.12"	4.00"	5.38"
PACKING OD (Max)	3.83"	4.14"	4.58"	6.018"
NO-GO RING OD	3.86"	4.19"	4.63"	6.10"
LENGTH	14.37"	19.6"	14.69"	14.18"
MATERIAL *	Norm Alloy	Norm Alloy	Norm Alloy	Norm Alloy
BOTTOM THREAD	3 1/16"-12 SLB	3 1/4"-12 SLB	4"-12 SLB	5 1/16"-8 SLB
RUNNING TOOL - Type 'ROTRX'	41131838113	41131841210	41131845611	41131860010
PULLING TOOL - 'ROTGR'	40051336804	40051436804	40051345600	40051359600



Large Size Lock Mandrels are available, please Inquire.



6"



SECTION XIV: LOCK MANDRELS

Type 'ROTX' Lock Mandrel Assembly: 1.250" – 4.562"

Rebco Type 'ROTX' Lock Mandrel is a Selective Set Lock to be set in Type 'ROTX' Landing Nipple of the same Size.

Lock Mandrels are available in a variety of Materials, suitable for down-hole conditions.

Product Code: 10

Lock Mandrels with Safety Spring, and Interference Hold Down are available, see PRODUCT 17 and 18

TECHNICAL DATA

NIPPLE SEAL BORE	1.250"	1.500"	1.625"	1.875"
ASSEMBLY NUMBER	10182012530	10182015030	10182016230	10182018730

ENGINEERING DATA:

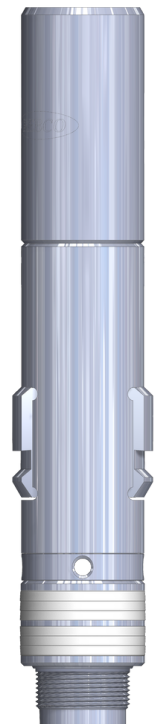
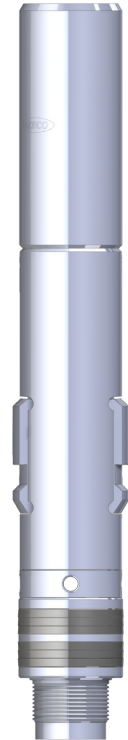
LOCK ID	.62"	.75"	.75"	1.00"
FISHING NECK ID	.88"	1.06"	1.06"	1.38"
PACKING OD	1.250"	1.500"	1.625"	1.875"
LENGTH	13.32"	13.44"	13.44"	13.38"
MATERIAL *	Norm Alloy	Norm Alloy	Norm Alloy	Norm Alloy
BOTTOM THREAD	7/8" - 20	1 1/8" - 16	1 1/8" - 16	1 3/8" - 14
RUNNING TOOL - 'ROTX'	41182012500	41182015000	41182016200	41182018700
PULLING TOOL - 'ROTGR'	40051312500	40051315000	40051315000	40051318700

TECHNICAL DATA

NIPPLE SEAL BORE	2.313"	2.750"	2.813"	2.875"
ASSEMBLY NUMBER	10182023130	10182027530	10182028130	10182028730

ENGINEERING DATA:

LOCK ID	1.38"	1.75"	1.75"	1.75"
FISHING NECK ID	1.81"	2.31"	2.31"	2.31"
PACKING OD	2.313"	2.750"	2.813"	2.875"
LENGTH	13.50"	13.75"	13.75"	13.75"
MATERIAL *	Norm Alloy	Norm Alloy	Norm Alloy	Norm Alloy
BOTTOM THREAD	1 3/4" - 12	2 1/4"-12 SLB	2 1/4"-12 SLB	2 1/4"-12 SLB
RUNNING TOOL - 'ROTX'	41182023100	41182027500	41182028100	41182028700
PULLING TOOL - 'ROTGR'	40051323100	40051327500	40051327500	40051327500





SECTION XIV: LOCK MANDRELS

Type '**ROTX**' Lock Mandrel Assembly: **3.313" – 4.562"**

Product Code: 18

Safety Spring Feature is a positive locking feature preventing the Lock Mandrel to unlock due to some forces caused by well conditions.

Shear Pin is installed prior to running the Lock into the well, once set, the Shear Pin lodges itself between the Expander Sleeve and Key Retainer, creating positive feature.

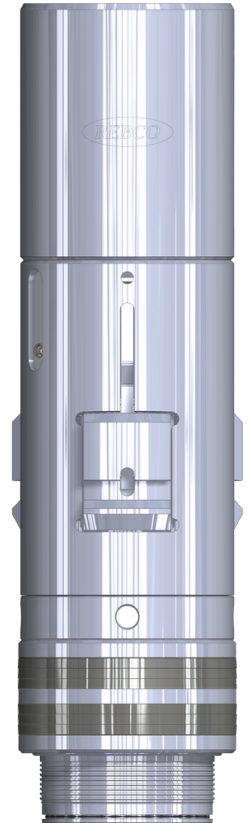
TECHNICAL DATA

NIPPLE SEAL BORE	3.313"	3.813"	4.313"	4.562"
ASSEMBLY NUMBER	18182033130	18182038130	18182043130	18182045630

ENGINEERING DATA:

LOCK ID	2.12"	2.62"	2.62"	3.12"
FISHING NECK ID	2.62"	3.12"	3.12"	4.00"
PACKING OD	3.313"	3.813"	4.313"	4.562"
LENGTH	14.51"	14.25"	14.39"	14.69"
MATERIAL *	Norm Alloy	Norm Alloy	Norm Alloy	Norm Alloy
BOTTOM THREAD	2 3/4"-12 SLB	3 1/16"-12 SLB	3 1/4"-12 SLB	4" – 12 SLB
RUNNING TOOL - ' ROTX '	41182033100	41182038100	41182043100	41182045600
PULLING TOOL - ' ROTGR '	40051331202	40051336804	40051436804	40051345600

* Norm Alloy is suitable for H2S Service (NACE MR-01-75, Latest Revision)



Rebco offers Check Set Tools (Product Code 41) for all '**ROTX**', '**ROTXN**', '**ROTR**' and '**ROTRN**' Type Locks

Check Set Tool is used to "Check" the proper setting of the Lock in the Landing Nipple.

See **Section II - C: SPECIALTY SERVICE TOOLS**





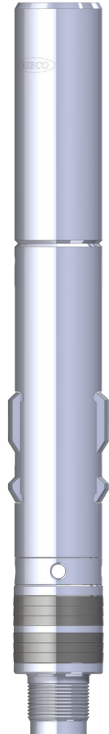
SECTION XIV: LOCK MANDRELS

Type 'ROTXN' Lock Mandrel Assembly: 1.250" – 4.562"

Rebco Type 'ROTXN' Lock Mandrel has chamfered keys, and when a Bottom Sub is added, it becomes a No-Go Lock Mandrel. It is to be landed in a Type 'ROTXN' Landing Nipple of the same size.

Product Code: 10

TECHNICAL DATA				
NIPPLE SEAL BORE	1.250"	1.500"	1.625"	1.875"
ASSEMBLY NUMBER	10181012530	10181015030	10181016230	10181018730
ENGINEERING DATA:				
LOCK ID	.62"	.75"	.75"	1.00"
FISHING NECK ID	.88"	1.06"	1.06"	1.38"
PACKING OD	1.250"	1.500"	1.625"	1.875"
LENGTH	13.32"	13.44"	13.44"	13.38"
MATERIAL *	Norm Alloy	Norm Alloy	Norm Alloy	Norm Alloy
BOTTOM THREAD	7/8" - 20	1 1/8" - 16	1 1/8" - 16	1 3/8" - 14
RUNNING TOOL - 'ROTX'	41182012500	41182015000	41182016200	41182018700
PULLING TOOL - 'ROTGR'	40051312500	40051315000	40051315000	40051318700



TECHNICAL DATA				
NIPPLE SEAL BORE	2.313"	2.750"	2.813"	2.875"
ASSEMBLY NUMBER	10181023130	10181027530	10181028130	10181028730
ENGINEERING DATA:				
LOCK ID	1.38"	1.75"	1.75"	1.75"
FISHING NECK ID	1.81"	2.31"	2.31"	2.31"
PACKING OD	2.313"	2.750"	2.813"	2.875"
LENGTH	13.31"	13.75"	13.75"	13.75"
MATERIAL *	Norm Alloy	Norm Alloy	Norm Alloy	Norm Alloy
BOTTOM THREAD	1 3/4" - 12	2 1/4"-12 SLB	2 1/4"-12 SLB	2 1/4"-12 SLB
RUNNING TOOL - 'ROTX'	41182023100	41182027500	41182028100	41182028700
PULLING TOOL - 'ROTGR'	40051323100	40051327500	40051327500	40051327500



* Norm Alloy is suitable for H2S Service (NACE MR-01-75, Latest Revision)



SECTION XIV: LOCK MANDRELS

Type 'ROTXN' Lock Mandrel Assembly: 3.313" – 4.562"

Product Code: 18

Safety Spring Feature is a positive locking feature preventing the Lock Mandrel to unlock due to some forces caused by well conditions.

Shear Pin (**DET 11**) is installed prior to running the Lock into the well, once set, the Shear Pin lodges itself between the Expander Sleeve (**DET 2**) and Key Retainer (**DET 3**), creating Positive feature.

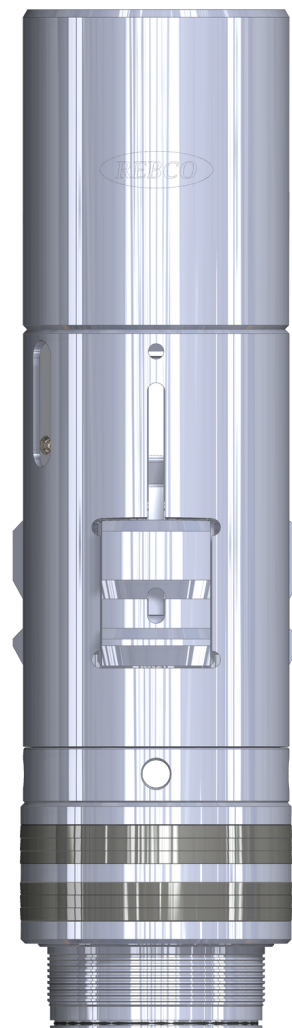
TECHNICAL DATA

NIPPLE SEAL BORE	3.313"	3.813"	4.313"	4.562"
ASSEMBLY NUMBER	18181033130	18181038130	18181043130	18181045630

ENGINEERING DATA:

LOCK ID	2.12"	2.62"	2.62"	3.12"
FISHING NECK ID	2.62"	3.12"	3.12"	4.00"
PACKING OD	3.313"	3.813"	4.313"	4.562"
LENGTH	14.51"	14.25"	14.39"	14.69"
MATERIAL *	Norm Alloy	Norm Alloy	Norm Alloy	Norm Alloy
BOTTOM THREAD	2 3/4"-12 SLB	3 1/16"-12 SLB	3 1/4"-12 SLB	4" – 12 SLB
RUNNING TOOL - 'ROTX'	41182033100	41182038100	41182043100	41182045600
PULLING TOOL - 'ROTG'	40051331200	40051336804	40051436804	40051345600

* Norm Alloy is suitable for H2S Service (NACE MR-01-75, Latest Revision)





SECTION XIV: LOCK MANDRELS

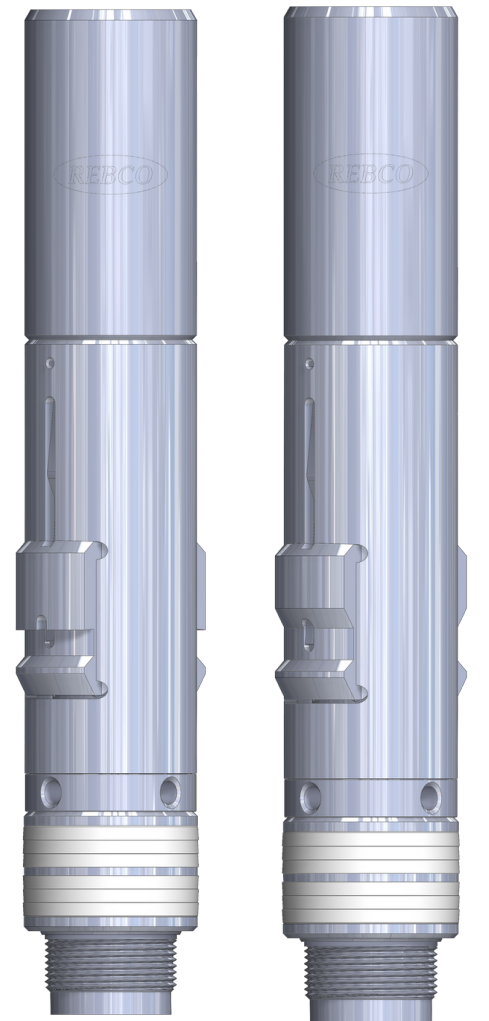
Type 'ROTX' and Type 'ROTXN' Lock Mandrel Assembly with Interference Hold Down

Rebco Lock Mandrels with Interference Hold Down feature provide positive latching structure which minimizes the possibility of the lock mandrel accidentally unlocking due to vibration at high flow rates.

Lock Mandrels with **Interference Hold Down** safety feature are available in a variety of Materials and Sizes, suitable to down-hole conditions.

Product Code: 17

TECHNICAL DATA			
NIPPLE SEAL BORE		1.875"	2.313"
ASSEMBLY NUMBER	ROTX	17182018730	17182023130
	ROTXN	17181018730	17181023130
ENGINEERING DATA:			
LOCK ID		1.00"	1.38"
PACKING OD		1.875"	2.313"
BOTTOM THREAD		1 3/8" - 14	1 3/4" - 12
LENGTH		13.4"	13.31"
MATERIAL *		Norm Alloy	Norm Alloy
REDRESS KIT		10182024187	10182024231
RUNNING TOOL - 'ROTR'		41182018700	41182023100
PULLING TOOL - 'ROTGR'		40051318700	40051323100



'ROTX' Lock

'ROTXN' Lock

Helpful Hint: Illustration of the Lock Mandrel KEY Profile types



Type 'ROTX'



Key Type 'ROTXN'



Key Type 'ROTR'



Key Type 'ROTRN' Key

Product Code: 10

Additional types of Lock Mandrels offered by **Rebco**: 'H', 'J', 'N', 'P', 'Q', 'S', 'T'

NOTE: When ordering specify: Type, Size, Material, Service, Position (as in 'S' and 'T' Locks) and any accessories required.



SECTION XIV: LOCK MANDRELS

Type 'ROTS-1' & 'ROTS-2' Lock Mandrel Sub-Assembly: 1.660" – 4.50"

Rebco Type 'ROTS-1' & 'ROTS-2' Lock Mandrel Sub-Assembly is a Selective Non Flowing Lock. Lock Mandrel Sub-Assembly has Dogs (DET 2) facing both ways, up facing Dogs prevent Lock moving upward, and down facing prevent the Lock moving downward.

Product Code: 10

NOTE: Required Running and Pulling Tools with appropriate Probes are shown in ENGINEERING DATA for Type of Accessories attached to the Lock Mandrel Sub-Assembly.

Rebco Type 'ROTS-1' and 'ROTS-2' Lock Mandrel Sub-Assemblies are available in variety of Materials, suitable for down-hole conditions.

TECHNICAL DATA

NOMINAL SIZE		1.660"	1.900"	2 1/16"	2 3/8"
SEAL BORE SIZE		1.18" - 1.25"	1.43" - 1.50"	1.56" - 1.62"	1.78" - 1.87"
SUB ASSEMBY	TYPE of LOCK - (DET 2)	'ROTS-1'	'ROTS-2'	'ROTS-2'	'ROTS-2'
	SUB-ASS'Y NUMBER	10141201660	10142201900	10142202060	10142202370

ENGINEERING DATA:

MAXIMUM OD	1.156"	1.406"	1.531"	1.750"
FISHING NECK SIZE	.875"	1.187"	1.187"	1.375"
MINIMUM ID	.50"	.75"	.75"	.88"
LENGTH	6.94"	7.69"	7.56"	9.12"
MATERIAL	Alloy	Alloy	Alloy	Alloy

TECHNICAL DATA

NOMINAL SIZE		2 7/8"	3 1/2"	3 1/2"	4 1/2"
SEAL BORE SIZE		2.25" - 2.31"	2.56"	2.75" - 2.81"	3.68" - 3.81"
SUB ASSEMBY	TYPE of LOCK - (DET 2)	'ROTS-2'	'ROTS-2'	'ROTS-2'	'ROTS-1'
	SUB-ASS'Y NUMBER	10142202870	10142202560	10142203500	10141204500

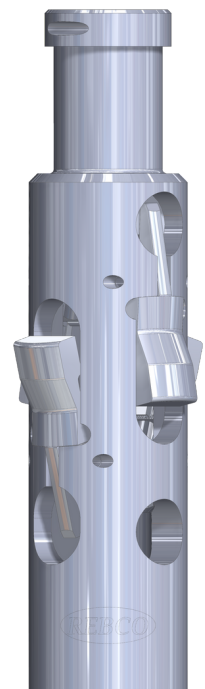
ENGINEERING DATA:

MAXIMUM OD	2.188"	2.500"	2.688"	3.562"
FISHING NECK SIZE	1.750"	1.750"	2.313"	3.125"
MINIMUM ID	1.19"	1.20"	1.44"	2.06"
LENGTH	9.38"	10.47"	10.47"	12.06"
MATERIAL	Alloy	Alloy	Alloy	Alloy

For Type 'ROTTs' Lock Sub-Assemblies, see Product Code 10, SECTION XIV, Page XIV-22



'ROTS-1'



'ROTS-2'



SECTION XIV: LOCK MANDRELS

Type 'ROTW-1' & 'ROTW-2' Lock Mandrel Sub-Assembly: 1.660" – 4.50"

Rebco Type 'ROTW-1' & 'ROTW-2' is a Top No-Go, Non Flowing Lock. Lock Mandrel Sub-Assembly has Locks (Dogs) which prevent upward movement and a No-Go shoulder that seats in the upper part of a seating product to prevent downward movement.

NOTE: Required Running and Pulling Tools with appropriate Probes are shown in ENGINEERING DATA for Type of Accessories attached to the Lock Mandrel Sub-Assembly.

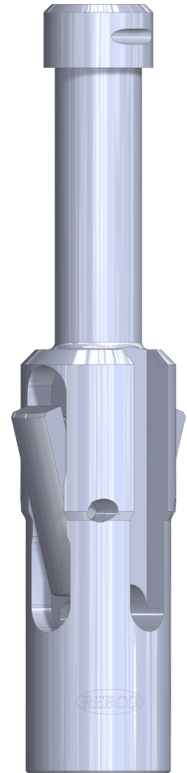
Rebco Type 'ROTW-1' and 'ROTW-2' Lock Mandrel Sub-Assemblies are available in variety of Materials, suitable for down-hole conditions.

TECHNICAL DATA

NOMINAL SIZE		1.660"	1.900"		2 1/16"
SEAL BORE SIZE		1.18"	1.43"	1.50"	1.56"
SUB ASSEMBY	TYPE of LOCK - (DET 2)	'ROTW-1'	'ROTW-2'		'ROTW-2'
	SUB-ASS'Y NUMBER	10171201180	10172201430	10172201500	10172201560

ENGINEERING DATA:

MAXIMUM OD (No-Go)	1.240"	1.490"	1.552"	1.615"
FISHING NECK SIZE	.875"	1.187"	1.187"	1.187"
MINIMUM ID	.50"	.75"	.75"	.75"
LENGTH	6.12"	6.62"	6.44"	6.44"
MATERIAL	Alloy	Alloy	Alloy	Alloy



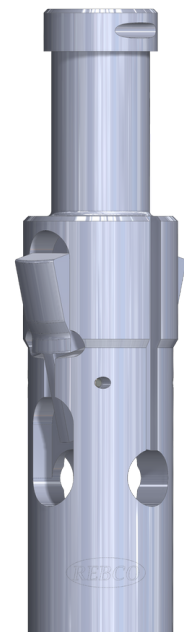
'ROTW-1'

TECHNICAL DATA

NOMINAL SIZE		2 3/8"		2 7/8"	
SEAL BORE SIZE		1.78" - 1.81"	1.87"	2.25"	2.31"
SUB ASSEMBY	TYPE of LOCK - (DET 2)	'ROTW-2'		'ROTW-2'	
	SUB-ASS'Y NUMBER	10172202370	10172201870	10172202250	10172202310

ENGINEERING DATA:

MAXIMUM OD	1.865"	1.928"	2.303"	2.365"
FISHING NECK SIZE	1.375"	1.375"	1.750"	1.750"
MINIMUM ID	.88"	.88"	1.19"	1.19"
LENGTH	7.53"	7.53"	7.69"	7.69"
MATERIAL	Alloy	Alloy	Alloy	Alloy



'ROTW-2'



SECTION XIV: LOCK MANDRELS

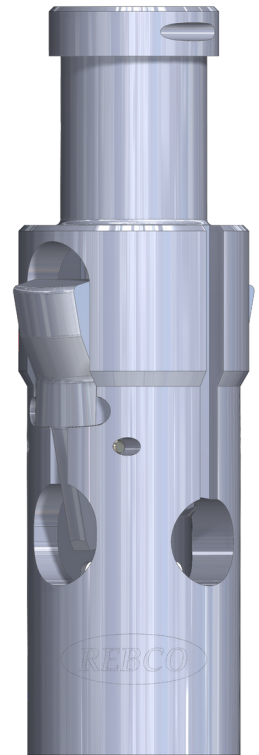
Type 'ROTW-1' & 'ROTW-2' Lock Mandrel Sub-Assembly:

TECHNICAL DATA

NOMINAL SIZE	3 1/2"			
SEAL BORE SIZE	2.56"	2.75"	2.81"	2.87"
SUB ASSEMBY	TYPE of LOCK - (DET 2)	'ROTW-2'		
	SUB-ASS'Y NUMBER	10172202560	10172202750	10172202810

ENGINEERING DATA:

MAXIMUM OD (No-Go)	2.625"	2.802"	2.865"	2.915"
FISHING NECK SIZE	1.750"	2.313"	2.313"	2.313"
MINIMUM ID	1.20"	1.44"	1.44"	1.44"
LENGTH	8.25"	10.47"	10.47"	10.47"
MATERIAL	Alloy	Alloy	Alloy	Alloy



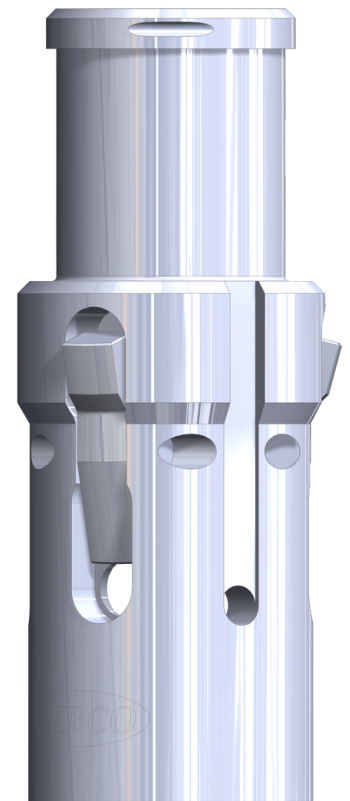
'ROTW-2'

TECHNICAL DATA

NOMINAL SIZE	4 1/2"		
SEAL BORE SIZE	3.68"	3.75"	3.81"
SUB ASSEMBY	TYPE of LOCK - (DET 2)	'ROTW-1'	
	SUB-ASS'Y NUMBER	10171203680	10171203750

ENGINEERING DATA:

MAXIMUM OD (No-Go)	3.740"	3.802"	3.864"
FISHING NECK SIZE	3.125"	3.125"	3.125"
MINIMUM ID	2.06"	2.06"	2.06"
LENGTH	9.93"	9.93"	9.93"
MATERIAL	Alloy	Alloy	Alloy



'ROTW-1'



SECTION XIV: LOCK MANDRELS

Type 'ROTZ-1' & 'ROTZ-2' Lock Mandrel Sub-Assembly: 1.660" – 4.50"

Rebco Type 'ROTZ-1' & 'ROTZ-2' is a Bottom No-Go, Non Flowing Lock. Lock Mandrel Sub-Assembly has Locks (Dogs) facing up which prevent upward movement, but depends on **accessory** No-Go shoulder to prevent the Lock Mandrel from downward movement. The Lock Mandrel can be used in a Bottom No-Go type Nipple only.

Product Code: 10

NOTE: Required Running and Pulling Tools with appropriate Probes are shown in **ENGINEERING DATA** for Type of **Accessories** attached to the Lock Mandrel Sub-Assembly.

Rebco Type 'ROTZ-1' and 'ROTZ-2' Lock Mandrel Sub-Assemblies are available in variety of Materials, suitable for down-hole conditions.

TECHNICAL DATA

NOMINAL SIZE	1.660"	1.900"	2 1/16"	2 3/8"
SEAL BORE SIZE	1.18" - 1.25"	1.43" - 1.50"	1.56"	1.78" - 1.87"
SUB ASSEMBY	TYPE of LOCK - (DET 2)	'ROTZ-1'	'ROTZ-2'	'ROTZ-2'
	SUB-ASS'Y NUMBER	10221201660	10222201900	10222202060

ENGINEERING DATA:

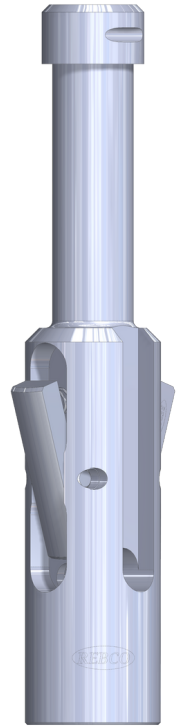
MAXIMUM OD	1.156"	1.406"	1.531"	1.750"
FISHING NECK SIZE	.875"	1.187"	1.187"	1.375"
MINIMUM ID	.87"	.75"	.75"	.88"
LENGTH	6.12"	6.62"	6.44"	7.53"
MATERIAL	Alloy	Alloy	Alloy	Alloy

TECHNICAL DATA

NOMINAL SIZE	2 7/8"	3 1/2"	3 1/2"	4 1/2"
SEAL BORE SIZE	2.25" - 2.31"	2.56"	2.75" - 2.81"	3.68" - 3.81"
SUB ASSEMBY	TYPE of LOCK - (DET 2)	'ROTZ-2'	'ROTZ-2'	'ROTZ-1'
	SUB-ASS'Y NUMBER	10222202870	10222202560	10222203500

ENGINEERING DATA:

MAXIMUM OD	2.188"	2.500"	2.688"	3.562"
FISHING NECK SIZE	1.750"	1.750"	2.313"	3.125"
MINIMUM ID	1.19"	1.20"	1.44"	2.06"
LENGTH	7.69"	8.25"	10.47"	9.93"
MATERIAL	Alloy	Alloy	Alloy	Alloy



'ROTZ-1'



'ROTZ-2'

Type 'ROTG', 'ROTN', 'ROTL', and 'ROTR' Lock Mandrel Sub-Assemblies:

Type 'ROTG', 'ROTN', 'ROTL', and 'ROTR' Lock Mandrel Sub-Assemblies are devices used to position and secure Wireline retrievable downhole equipment into pre-set Tubing Nipples with appropriate profiles.

These Locks have External Fishing Neck and large flow areas for use in high volume completions. The Latch with Collet type locking fingers prevent upward movement, while **No-Go** shoulders prevent downward movement.

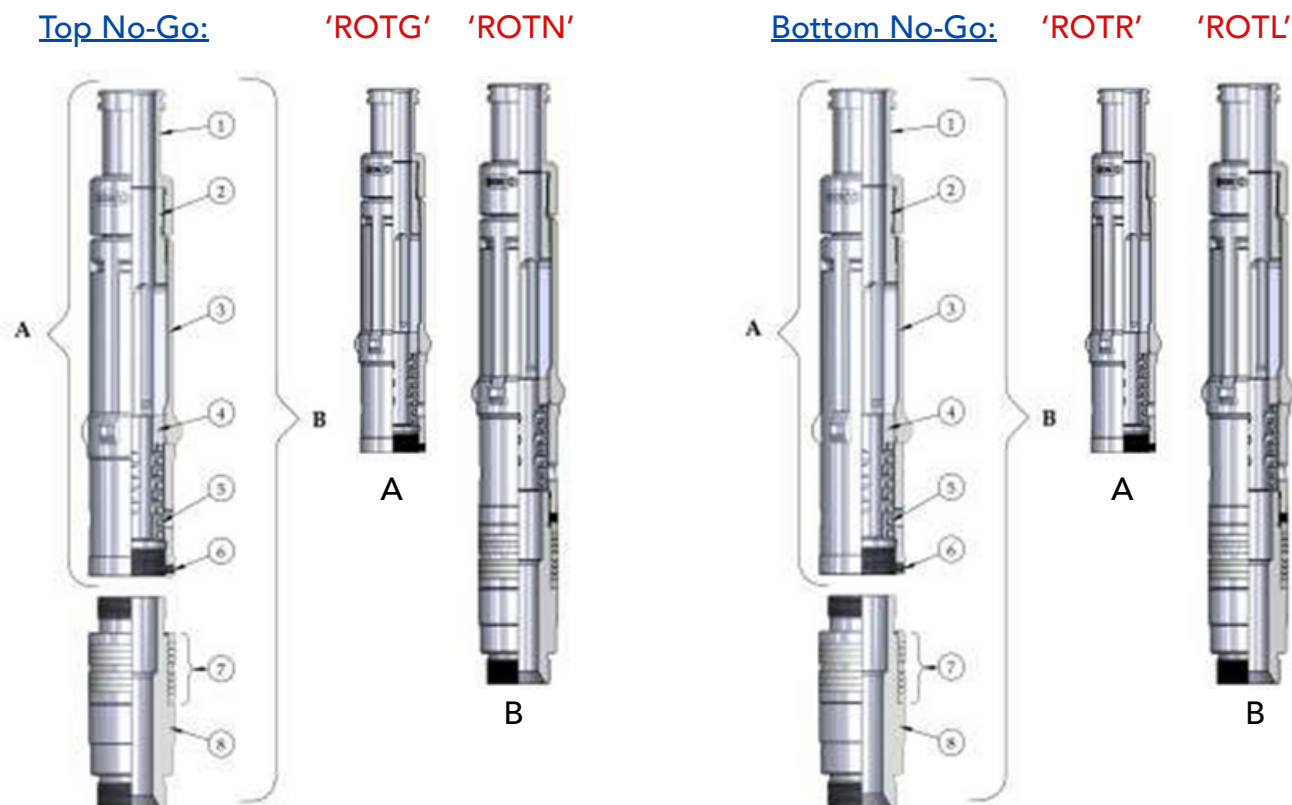


Table 1: Running and Pulling Tools required

LOCK SIZE		TO RUN		TO PULL	
NOM	SEAL BORE	RUNNING TOOL 'ROTC-1'	SHANK 'BN-1'	PULLING TOOL 'ROTRB'	PROBE 'BN-1'
2 3/8"	1.781	2 3/8" 41021202370	2 3/8" 81101852301	2" 4013012000	2 3/8" 41011012370
	1.812				
	1.875				
2 7/8"	2.25	2 7/8" 41021202870	2 7/8" 81101852701	2 1/2" 4013012500	2 7/8" 41011012870
	2.312				



SECTION XIV: LOCK MANDRELS

Type 'ROTG' & 'ROTN' (Top No-Go) Lock Mandrel Sub-Assembly: 2 3/8" – 2 7/8"

Rebco Type 'ROTG' and 'ROTN' are Top No-Go, Lock Mandrel Sub-Assembly to be set into Type 'BF' and Type 'BJ' Landing nipples, and Type 'BL' Sliding Sleeve.

Type 'ROTG' Lock is basically a Type 'ROTN' Lock Sub-Assembly less the Packing Unit and Packing Mandrel.

Product Code: 10

TECHNICAL DATA

NOMINAL SIZE		2" (2 3/8")			2 1/2" (2 7/8")	
SEAL BORE SIZE		1.781"	1.812"	1.875"	2.250"	2.312"
LOCK MANDREL SUB ASSEMBLY	TYPE 'ROTG' (DET 1-6) SUB-ASS'Y NUMBER	10052017803	10052018103	10052018703	10052022503	10052023103
	TYPE 'ROTN' (DET 1-8) SUB-ASS'Y NUMBER	10102017803	10102018103	10102018703	10102022503	10102023103

ENGINEERING DATA:

MAXIMUM OD (No-Go)			1.802"	1.865"	1.925"	2.302"	2.364"
FISHING NECK SIZE (ID)			1.375"	1.375"	1.375"	1.750"	1.750"
TYPE 'ROTG'	BOTTOM THREAD	BOX	1.406" - 14	1.406" - 14	1.406" - 14	1.813" - 14	1.813" - 14
TYPE 'ROTN'		PIN	1.470" - 14	1.470" - 14	1.470" - 14	1.802" - 14	1.802" - 14
MINIMUM ID		TYPE 'ROTG'	.807"	.807"	.807"	1.12"	1.12"
		TYPE 'ROTN'	.807"	.807"	.807"	1.12"	1.12"
LENGTH		TYPE 'ROTG'	12.75"	12.75"	12.75"	12.75"	12.75"
		TYPE 'ROTN'	17.38"	17.38"	17.38"	17.38"	17.38"
MATERIAL			Norm Alloy	Norm Alloy	Norm Alloy	Norm Alloy	Norm Alloy

Tools Required: For Running and Pulling, with [Accessories](#) - SEE PAGE (XIV-17) above

Lock Mandrel Sub-Assemblies are available in variety of Materials, suitable for down-hole conditions.



SECTION XIV: LOCK MANDRELS

Type 'ROTR' & 'ROTL' (Bottom No-Go) Lock Mandrel Sub-Assembly: 2 3/8" – 2 7/8"

Rebco Type 'ROTR' and 'ROTL' are Bottom No-Go, Lock Mandrel Sub-Assembly to be set into Type 'BR' Landing nipple.

Type 'ROTR' Lock is basically a Type 'ROTL' Lock Sub-Assembly less the Packing Unit and Packing Mandrel.

Product Code: 10

TECHNICAL DATA

NOMINAL SIZE		2" (2 3/8")			2 1/2" (2 7/8")
SEAL BORE SIZE		1.781"	1.812"	1.875"	2.250"
LOCK MANDREL SUB ASSEMBLY	TYPE 'ROTR' (DET 1-6) SUB-ASS'Y NUMBER	10132017803	10132018103	10132018703	10132022503
	TYPE 'ROTL' (DET 1-8) SUB-ASS'Y NUMBER	10082017803	10082018103	10082018703	10082022503

ENGINEERING DATA:

MAXIMUM OD (No-Go)			1.771"	1.802"	1.865"	2.245"
FISHING NECK SIZE (ID)			1.375"	1.375"	1.375"	1.750"
TYPE 'ROTR'	BOTTOM THREAD	BOX	1.406" - 14	1.406" - 14	1.406" - 14	1.813" - 14
TYPE 'ROTL'		PIN	1.470" - 14	1.470" - 14	1.470" - 14	1.802" - 14
MINIMUM ID		TYPE 'ROTR'	.807"	.807"	.807"	1.12"
		TYPE 'ROTL'	.807"	.807"	.807"	1.12"
LENGTH		TYPE 'ROTR'	12.75"	12.75"	12.75"	12.75"
		TYPE 'ROTL'	17.38"	17.38"	17.38"	17.38"
MATERIAL			Norm Alloy	Norm Alloy	Norm Alloy	Norm Alloy

Tools Required: For Running and Pulling, with [Accessories](#) - SEE PAGE (XIV-17) above

Lock Mandrel Sub-Assemblies are available in variety of Materials, suitable for down-hole conditions.



SECTION XIV: LOCK MANDRELS

Type 'ROTF', 'ROTM', 'ROTE', and 'ROTK' Lock Mandrel Sub-Assemblies

Type 'ROTF', 'ROTM', 'ROTE', and 'ROTK' Lock Mandrel Sub-Assemblies are devices used to position and secure Wireline retrievable downhole equipment into pre-set Tubing Nipples with appropriate profiles.

The Locks provide a large flow areas through internal Fishing Neck. The Latch with Collet type locking fingers prevent upward movement, while No-Go shoulders prevent downward movement.

Type 'ROTF' & 'ROTM' (Top No-Go) Lock Mandrel Sub-Assembly: 2.750" – 3.812"

Rebco Type 'ROTF' and Type 'ROTM' are Top No-Go, Lock Mandrel Sub-Assembly to be set into Type 'BF' and Type 'BJ' Landing nipples, and Type 'BL' Sliding Sleeve.

Type 'ROTF' Lock is basically a Type 'ROTM' Lock Sub-Assembly less the Packing Unit and Packing Mandrel

TECHNICAL DATA

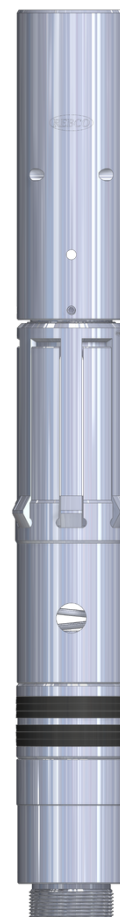
NOMINAL SIZE		3 1/2"	
SEAL BORE SIZE		2.75"	2.81"
LOCK MANDREL SUB ASSEMBLY	TYPE 'ROTF' (DET 1-6) SUB-ASS'Y NUMBER	10252027503	10252028103
	TYPE 'ROTM' (DET 1-8) SUB-ASS'Y NUMBER	10092027503	10092028103

ENGINEERING DATA:

MAXIMUM OD (No-Go)			2.803"	2.872"
FISHING NECK SIZE (ID)			2.31"	2.31"
TYPE 'ROTF'	BOTTOM THREAD	BOX	2 21/64" - 16	2 21/64" - 16
TYPE 'ROTM'		PIN	2 7/64" - 11 1/2	2 7/64" - 11 1/2
MINIMUM ID		TYPE 'ROTF'	1.84"	1.84"
		TYPE 'ROTM'	1.75"	1.75"
LENGTH		TYPE 'ROTF'	16.81"	16.81"
		TYPE 'ROTM'	22.74"	22.74"
MATERIAL			Norm Alloy	Norm Alloy
Running/Pulling Tool - 'ROTGS'			40051427500	40051427500
Running/Pulling Prong - 'ROTM'			41092750	41092810



Type 'ROTF'



Type 'ROTM'



SECTION XIV: LOCK MANDRELS

Type 'ROTF' & 'ROTM' (Top No-Go) Lock Mandrel Sub-Assembly:

TECHNICAL DATA					
NOMINAL SIZE			4 1/2"		
SEAL BORE SIZE			3.688"	3.750"	3.812"
LOCK MANDREL SUB ASSEMBLY	TYPE 'ROTF' (DET 1-6) SUB-ASS'Y NUMBER		10252036803	10252037503	10252038103
	TYPE 'ROTM' (DET 1-8) SUB-ASS'Y NUMBER		10092036803	10092037503	10092038103
ENGINEERING DATA:					
MAXIMUM OD (No-Go)			3.740"	3.802"	3.864"
FISHING NECK SIZE (ID)			3.12"	3.12"	3.12"
TYPE 'ROTF'	BOTTOM THREAD	BOX	3 3/8" - 8	3 3/8" - 8	3 3/8" - 8
TYPE 'ROTM'		PIN	3 1/32" - 12	3 1/32" - 12	3 1/32" - 12
MINIMUM ID		TYPE 'ROTF'	2.75"	2.75"	2.75"
		TYPE 'ROTM'	2.43"	2.43"	2.43"
LENGTH		TYPE 'ROTF'	20.56	20.94"	20.50"
		TYPE 'ROTM'	25.96"	25.96"	25.96"
MATERIAL			Norm Alloy	Norm Alloy	Norm Alloy
Running/Pulling Tool - 'ROTGS'			40051436804	40051436804	40051436804
Running/Pulling Prong - 'ROTM'			41094500	41094500	41094500



Type 'ROTF'



Type 'ROTM'

Rebco Type 'ROTF' and 'ROTM' Lock Mandrel Sub-Assemblies are available in variety of Materials, suitable for down-hole conditions.



SECTION XIV: LOCK MANDRELS

Type 'ROTE' & 'ROTK' (Bottom No-Go) Lock Mandrel Sub-Assembly: 2.750" – 3.812"

Rebco Type 'ROTE', and Type 'ROTK' are Bottom No-Go, Lock Mandrel Sub-Assembly to be set into Type 'BR' Landing nipple.

Type 'ROTK' Lock is basically a Type 'ROTE' Lock Sub-Assembly less the Packing Unit and Packing Mandrel.

TECHNICAL DATA

NOMINAL SIZE		3 1/2"	
SEAL BORE SIZE		2.75"	2.81"
LOCK MANDREL SUB ASSEMBLY	TYPE 'ROTE' (DET 1-6) SUB-ASS'Y NUMBER	10042027503	10042028103
	TYPE 'ROTK' (DET 1-8) SUB-ASS'Y NUMBER	10242027503	10242028103

ENGINEERING DATA:

MAXIMUM OD		BODY	2.71"	2.71"
		Packing Unit	2.750"	2.812"
FISHING NECK SIZE (ID)			2.31"	2.31"
TYPE 'ROTE'	BOTTOM THREAD	BOX	2 21/64" - 16	2 21/64" - 16
TYPE 'ROTK'		PIN	2 7/64" - 11 1/2	2 7/64" - 11 1/2
MINIMUM ID		TYPE 'ROTE'	1.84"	1.84"
		TYPE 'ROTK'	1.75"	1.75"
LENGTH		TYPE 'ROTE'	16.78"	16.78"
		TYPE 'ROTK'	22.74"	22.74"
MATERIAL			Norm Alloy	Norm Alloy

Running/Pulling Tool - 'ROTGS'	40051427500	40051427500
Running/Pulling Prong - 'ROTM'	41092750	41092810



Type 'ROTE'



Type 'ROTK'



SECTION XIV: LOCK MANDRELS

Type 'ROTE' & 'ROTK' (Bottom No-Go) Lock Mandrel Sub-Assembly:

TECHNICAL DATA					
NOMINAL SIZE			4 1/2"		
SEAL BORE SIZE			3.688"	3.750"	3.812"
LOCK MANDREL SUB ASSEMBLY	TYPE 'ROTE' (DET 1-6) SUB-ASS'Y NUMBER		10252036803	10252037503	10252038103
	TYPE 'ROTK' (DET 1-8) SUB-ASS'Y NUMBER		10092036803	10092037503	10092038103
ENGINEERING DATA:					
MAXIMUM OD		BODY	3.62"	3.62"	3.62"
		Packing Unit	3.688"	3.750"	3.812"
FISHING NECK SIZE (ID)			3.12"	3.12"	3.12"
TYPE 'ROTE'	BOTTOM THREAD	BOX	3 3/8" - 8	3 3/8" - 8	3 3/8" - 8
TYPE 'ROTK'		PIN	3 1/32" - 12	3 1/32" - 12	3 1/32" - 12
MINIMUM ID		TYPE 'ROTE'	2.75"	2.75"	2.75"
		TYPE 'ROTK'	2.43"	2.43"	2.43"
LENGTH		TYPE 'ROTE'	16.39"	16.39"	16.39"
		TYPE 'ROTK'	20.57"	20.57"	20.57"
MATERIAL			Norm Alloy	Norm Alloy	Norm Alloy
Running/Pulling Tool - 'ROTGS'			40051436804	40051436804	40051436804
Running/Pulling Prong - 'ROTM'			41094500	41094500	41094500



Type 'ROTE'



Type 'ROTK'

Rebco Type 'ROTE', and 'ROTK' Lock Mandrel Sub-Assemblies are available in variety of Materials for down-hole conditions.



SECTION XIV: LOCK MANDRELS

Type 'ROTD' Collar Lock Mandrel Sub-Assembly: 2 3/8" – 3 1/2"

Rebco Type 'ROTD' Collar Lock Mandrel Sub-Assembly is designed to be set in API Tubing Collars. The Tubing is sealed off by adding the Type 'ROTD' Element Assembly, and variety of Sub-Assemblies to suit application; capable to hold pressure differentials in both directions.

TECHNICAL DATA				
NOMINAL SIZE		2"	2 1/2"	3"
SUB-ASSEMBLY NUMBER		10032020030	10032025030	10032030030
ENGINEERING DATA:				
MAXIMUM OD	BODY	1.84"	2.28"	2.84"
	DOGS EXPANDED	2.11"	2.55"	3.11"
MINIMUM ID		.94"	1.38"	1.75"
FISHING NECK SIZE		1.38"	1.81"	2.31"
BOTTOM THREAD - BOX		1 5/16" - 18	1 21/32" - 14	2 1/8" - 12
LENGTH		13.50"	13.50"	13.88"
MATERIAL		Norm Alloy	Norm Alloy	Norm Alloy
RUNNING TOOL - 'ROTDO'		4103202000	4103202500	4103203000
PULLING TOOL - 'ROTGSL'		4005140817800	4005140821800	4005140827500

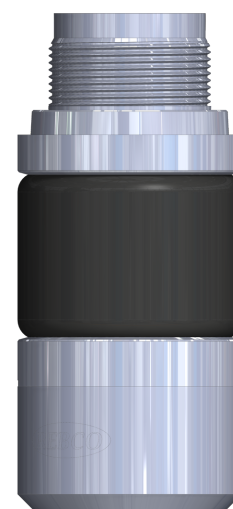
Product Code: 10



Product Code: 310

Rebco Type 'ROTD' Element Assembly (DET 8) is available as a Redress Kit.

TECHNICAL DATA			
NOMINAL SIZE	2"	2 1/2"	3"
ELEMENT ASSEMBLY NUMBER	310032048	310032053	310032057
ENGINEERING DATA:			
OD - ELEMENT EXPANDED	2.125"	2.625"	3.203"
MINIMUM ID	.94"	1.38"	1.75"
THREAD CONNECTIONS	1 5/16" - 18	1 21/32" - 14	2 1/8" - 12
LENGTH	5.06"	5.06"	5.06"
MATERIAL	Norm Alloy	Norm Alloy	Norm Alloy





SECTION XIV: LOCK MANDRELS

Type '**ROTTs**' Collar Lock Mandrel Sub-Assembly: 2 3/8" – 3 1/2"

Rebco Type '**ROTTs**' Collar Lock Mandrel Sub-Assembly is designed to be set in **API** Tubing Collars.

Type '**ROTTs**' Collar Lock Mandrel is basically the same as Type '**ROTS-2**' Lock Mandrel Sub- Assembly (**Product 10**); with modified Keys (**DET 2**) to be able to locate in the Tubing Collars.

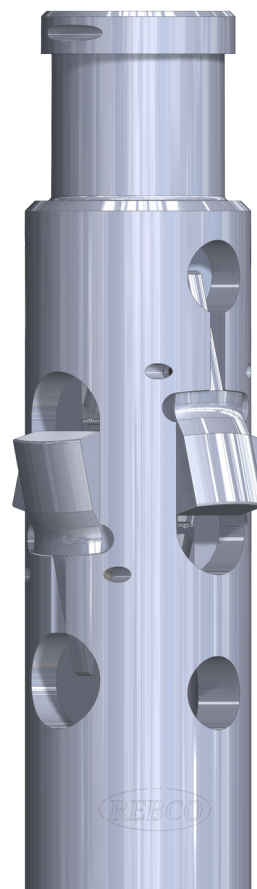
Product Code: 10

TECHNICAL DATA

NOMINAL SIZE		2 3/8"	2 7/8"	3 1/2"
SUB ASSEMBY	TYPE of LOCK - (DET 2)	'ROTTs'	'ROTTs'	'ROTTs'
	SUB-ASS'Y NUMBER	1015142202370	1015142202870	1015142203500

ENGINEERING DATA:

MAXIMUM OD	1.750"	2.188"	2.688"
FISHING NECK SIZE	1.375"	1.750"	2.313"
MINIMUM ID	.88"	1.19"	1.44"
LENGTH	9.12"	9.38"	10.47"
MATERIAL	Alloy	Alloy	Alloy





SECTION XIV: LOCK MANDRELS

Type 'ROTW' Tubing Slip Mandrel Sub-Assembly: 1 3/4" – 4 1/2"

Rebco Type 'ROTW' Slip Mandrel Sub-Assembly is to be set into the Tubing without Nipples. The Element Sub-Assembly is designed to pack off the tubing ID.

NOTE: Type 'ROTW' Mandrel, attached with various types of Equalizing Sub-Assemblies, is designed to hold pressure from below only.



TECHNICAL DATA

NOMINAL SIZE	1 3/4"	2"	2 1/2"	3 1/2"
SUB-ASSEMBLY NUMBER	10172017500	10172020000	10172025000	10172030000

ENGINEERING DATA:

MAXIMUM OD	SLIPS RETRACTED	1.59"	1.86"	2.31"	2.84"
	SLIPS EXPANDED	1.82"	2.09"	2.53"	3.08"
ELEMENT OD		1.609"	1.859"	2.297"	2.843"
MINIMUM ID		.56"	.69"	.88"	1.38"
FISHING NECK OD		1.187"	1.375"	1.750"	2.313"
RUNNING NECK ID		.69"	.80"	.98"	1.89"
BOTTOM THREAD - PIN		7/8" - 14	1" - 14	1 1/4" - 12	1 1/2" - 12
LENGTH		15.56"	18.88"	19.38"	20.26"
MATERIAL		Alloy	Alloy	Alloy	Alloy

RUNNING TOOL - 'ROTW'	4117201500	4117202025	4117202025	4117203000
PULLING TOOL - 'ROTRB'	4013011500	4013012000	4013012500	4013013000

Product Code: 91

Rebco Type 'ROTW' Element Sub-Assembly (DET 7) is available as a Redress Kit.

TECHNICAL DATA

NOMINAL SIZE	1 3/4"	2"	2 1/2"	3 1/2"
ELEMENT SUB-ASSEMBLY NUMBER	9109201750	9109202000	9109202500	9109203000

ENGINEERING DATA:

MAXIMUM OD	1.609"	1.924"	2.309"	2.843"
PIN THREAD	1 3/16" - 16	1 3/8" - 12	1 3/4" - 12	2 1/4" - 12
LENGTH	4.27"	5.48"	5.50"	5.53"
MATERIAL	Alloy	Alloy	Alloy	Alloy





SECTION XIV: LOCK MANDRELS

Type 'ROTW' Tubing Slip Mandrel Sub-Assembly:

TECHNICAL DATA		
NOMINAL SIZE		4"
SUB-ASSEMBLY NUMBER		10172040000
ENGINEERING DATA:		
MAXIMUM OD	SLIPS RETRACTED	3.78"
	SLIPS EXPANDED	4.03"
ELEMENT OD		3.781"
MINIMUM ID		1.75"
FISHING NECK OD		2.750"
RUNNING NECK ID		1.91"
BOTTOM THREAD - PIN		2 7/8" - 12
LENGTH		24.9"
MATERIAL		Alloy
RUNNING TOOL - 'ROTW'		4117203500
PULLING TOOL - 'ROTRB'		4013013500



Product Code: 91

Rebco Type 'ROTW' Element Sub-Assembly (DET 11) is available as a Redress Kit.

TECHNICAL DATA	
NOMINAL SIZE	4"
ELEMENT SUB-ASSEMBLY NUMBER	9109204000
ENGINEERING DATA:	
MAXIMUM OD	3.70"
PIN THREAD	3 3/16" - 12
LENGTH	5.47"
MATERIAL	Alloy

