



SECTION XIV: LOCK MANDRELS

2013

JP042613

REBCO

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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.



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A. For LANDING NIPPLES

Product Code: 10

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**

NIPPLE SEAL BORE	1.500"	1.710"	1.781"	1.875"	2.000"
ASSEMBLY NUMBER	10132015030	10132017130	10132017830	10132018730	10132020030

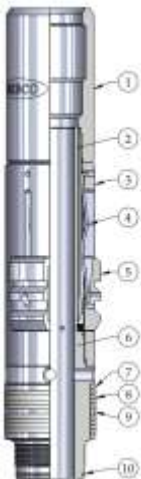


DET	PART NAME	QTY	PART NO	PART NO	PART NO	PART NO	PART NO
1	FISHING NECK	1	1013184	1018259	1013508	101361	101370
2	EXPANDER SLEEVE	1	1013187	101325	101367	101386	101367
3	KEY RETAINER SLEEVE	1	1013190	101326	1013505	101388	101366
4	SPRING	3	900045	900045	900045	900046	900046
5	KEY	3	1013181	101327	1013998	101375	101389
6	PACKING MANDREL	1	1013178	101324	1013507	101363	101371
7	FEMALE ADAPTER	2	2100212	101323	1013506	1014162	1121418
8 *	'V' PACKING	Noted	1862110 (6)	1862125 (7)	1862119 (7)	186213 (8)	1862116 (8)
9	CENTRE ADAPTER	1	9121422	91211177	1011145	110143	1121419
REDRESS KIT (* Included as part of Kit)			10132024150	10132024171	10132024178	10182024187	10132024200

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
WEIGHT lbs (kg)	3.9 (1.77)	4.3 (1.95)	4.8 (2.20)	5.6 (2.54)	6.0 (2.72)

NIPPLE SEAL BORE	2.125"	2.188"	2.313"	2.562"	2.750"
ASSEMBLY NUMBER	10132021230	10132021830	10132023130	10132025630	10132027530



DET	PART NAME	QTY	PART NO	PART NO	PART NO	PART NO	PART NO
1	FISHING NECK	1	101390	101350	101350	1013102	101373
2	EXPANDER SLEEVE	1	101392	101351	101351	1013103	101378
3	KEY RETAINER SLEEVE	1	101391	1013453	101353	1013104	10131979
4	SPRING	3	900046	900060	900060	900060	900060
5	KEY	3	101394	1013758	101355	1013108	10131964
6	PACKING MANDREL	1	101393	1013452	101357	1013107	101380
7	FEMALE ADAPTER	2	1015206	1014703	101358	100556	220317
8 *	'V' PACKING	Noted	1862126 (8)	1862127 (8)	186214 (7)	1862118 (8)	186212 (8)
9	CENTRE ADAPTER	1	1015104	1014702	10141162	91211116	10181063
10 *	'O' RING SEAL	1	NONE	NONE	NONE	911221103006	911221103306
REDRESS KIT (* Included as part of Kit)			10132024212	10132024218	10182024231	10132024256	10182024275

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
WEIGHT lbs (kg)	6.2 (2.8)	7.3 (3.30)	9.2 (4.10)	10.2 (4.6)	11.3 (5.10)



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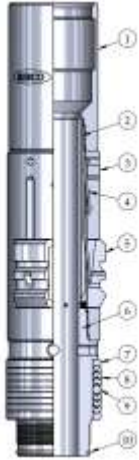
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Type 'ROTR' Lock Mandrel Assembly: Continued

NIPPLE SEAL BORE	2.813"	2.875"	3.125"	3.437"	3.688"
ASSEMBLY NUMBER	10132028130	10132028730	10132031230	10132034330	10132036830

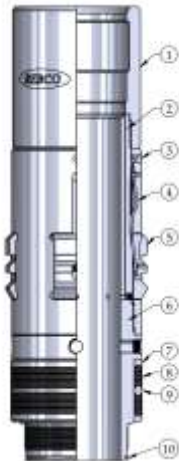


DET	PART NAME	QTY	PART NO	PART NO	PART NO	PART NO	PART NO
1	FISHING NECK	1	101373	101373	1013163	1013143	1013114
2	EXPANDER SLEEVE	1	101378	101378	1013166	1013148	1013120
3	KEY RETAINER SLEEVE	1	10131977	101384	1013175	1013152	1013122
4	SPRING	Noted	900060 (3)	900060 (3)	900042 (4)	900042 (4)	900042 (4)
5	KEY	Noted	10131961 (3)	101382 (3)	1013172 (4)	1013150 (4)	1013116 (4)
6	PACKING MANDREL	1	101380	101380	1013169	1013140	1013118
7	FEMALE ADAPTER	2	1018562	2214625	1013158	1013153	1013244
8 *	'V' PACKING	8	186211	186215	1862129	1862130	1862123
9	CENTRE ADAPTER	1	1018561	2214626	1013157	1013155	91211108
10 *	'O' RING SEAL	1	911221103306	911221103306	911221103706	911221103806	911221103906
REDRESS KIT (* Included as part of Kit)			10182024281	10182024287	10132024312	10132024343	10132024368

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
WEIGHT lbs (kg)	11.6 (5.30)	12.0 (5.5)	16.7 (7.57)	19.1 (8.70)	18.2 (8.3)

NIPPLE SEAL BORE	3.813"	4.125"	4.313"	4.562"	4.813"
ASSEMBLY NUMBER	10132038130	10132041230	10132043130	10132045630	10132048130



DET	PART NAME	QTY	PART NO	PART NO	PART NO	PART NO	PART NO
1	FISHING NECK	1	10131999	10131987	1013430	10132006	10131170
2	EXPANDER SLEEVE	1	10132019	1013439	1013433	10132020	10131171
3	KEY RETAINER SLEEVE	1	10132018	10132017	1013432	10132010	10131174
4	SPRING	4	900042	900042	900062	900062	900062
5	KEY	4	10132002	10131988	1013427	10132009	10131175
6	PACKING MANDREL	1	10132001	10131989	1013431	10132008	10131172
7	FEMALE ADAPTER	2	10141340	11200152	1013658	12062047	10142008
8 *	'V' PACKING	Noted	1862122 (6)	1862127 (8)	1862124 (8)	1862121 (8)	1862133 (10)
9	CENTRE ADAPTER	1	10141341	10141672	1013965	11200190	10142009
10 *	'O' RING SEAL	1	911221103906	911221104106	911221104106	911221104306	911221104406
REDRESS KIT (* Included as part of Kit)			10132024381	10132024412	10132024431	10132024456	10132024481

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
WEIGHT lbs (kg)	24.8 (11.0)	22.0 (9.9)	28.6 (13.0)	29.4 (13.4)	31.8 (14.40)

* 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



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REBCO

Product Code: 10

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.

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



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

DET	PART NAME	QTY	PART NO	PART NO	PART NO	PART NO	PART NO
1	FISHING NECK	1	1013184	1018259	1013508	101361	101370
2	EXPANDER SLEEVE	1	1013187	101325	101367	101386	101367
3	KEY RETAINER SLEEVE	1	1013190	101326	1013505	101388	101366
4	SPRING	3	900045	900045	900045	900046	900046
5	KEY	3	1013511	101359	1013514	1013110	101365
6	PACKING MANDREL	1	1013178	101324	1013507	101363	101371
7	FEMALE ADAPTER	2	2100212	101323	1013506	1014162	1121418
8 *	'V' PACKING	Noted	1862110 (6)	1862125 (7)	1862119 (7)	186213 (8)	1862116 (8)
9	CENTRE ADAPTER	1	9121422	91211177	1011145	110143	1121419
REDRESS KIT (* Included as part of Kit)			10132024150	10132024171	10132024178	10182024187	10132024200

ENGINEERING DATA:

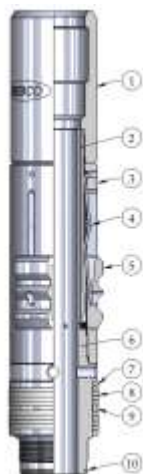
LOCK ID	.62"	.75"	.88"	.88"	.88"
PACKING OD	1.500"	1.710"	1.781"	1.875"	2.000"
LENGTH	13.4"	13.4"	13.4"	13.4"	13.4"
MATERIAL *	Norm Alloy	Norm Alloy	Norm Alloy	Norm Alloy	Norm Alloy
BOTTOM THREAD	1 1/8" - 16	1 1/8" - 16	1 3/8" - 14	1 3/8" - 14	1 3/8" - 14
RUNNING TOOL - 'ROTR'	41132015000	41132017100	41132017800	41132018700	41132020000
PULLING TOOL - 'ROTGR'	40051315000	40051315000	40051317800	40051318700	40051318700
WEIGHT lbs (kg)	3.9 (1.77)	4.3 (1.95)	4.8 (2.20)	5.6 (2.54)	6.0 (2.72)

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

DET	PART NAME	QTY	PART NO	PART NO	PART NO	PART NO	PART NO
1	FISHING NECK	1	101390	101350	101350	1013102	101373
2	EXPANDER SLEEVE	1	101392	101351	101351	1013103	101378
3	KEY RETAINER SLEEVE	1	101391	1013453	101353	1013104	10131979
4	SPRING	3	900046	900060	900060	900060	900060
5	KEY	3	1013495	1013454	101354	1013105	10131973
6	PACKING MANDREL	1	101393	1013452	101357	1013107	101380
7	FEMALE ADAPTER	2	1015206	1014703	101358	100556	2203463
8 *	'V' PACKING	Noted	1862126 (8)	1862127 (8)	186214 (7)	1862118 (8)	186212 (8)
9	CENTRE ADAPTER	1	1015104	1014702	10141162	91211116	10181063
10 *	'O' RING SEAL	1	NONE	NONE	NONE	911221103006	911221103306
REDRESS KIT (* Included as part of Kit)			10132024212	10132024218	10182024231	10132024256	10182024275

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
WEIGHT lbs (kg)	6.2 (2.8)	7.3 (3.30)	9.2 (4.10)	10.2 (4.6)	11.3 (5.10)





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Type 'ROTRN' Lock Mandrel Assembly: Continued

NIPPLE SEAL BORE	2.813"	2.875"	3.125"	3.437"	3.688"
ASSEMBLY NUMBER	10131028130	10131028730	10131031230	10131034330	10131036830

DET	PART NAME	QTY	PART NO	PART NO	PART NO	PART NO	PART NO
1	FISHING NECK	1	101373	101373	1013163	1013148	1013114
2	EXPANDER SLEEVE	1	101378	101378	1013166	101325	1013120
3	KEY RETAINER SLEEVE	1	10131977	101384	1013175	1013152	1013122
4	SPRING	Noted	900060 (3)	900060 (3)	900042 (4)	900042 (4)	900042 (4)
5	KEY	Noted	10131970 (3)	10131967 (3)	1013193 (4)	1013151 (4)	1013115 (4)
6	PACKING MANDREL	1	101380	101380	1013169	1013140	1013118
7	FEMALE ADAPTER	2	1018562	2214109	1013158	1013153	101932
8 *	'V' PACKING	8	186211	186215	1862129	1862130	1862123
9	CENTRE ADAPTER	1	1018561	2214108	1013157	1013155	91211108
10 *	'O' RING SEAL	1	911221103306	911221103306	911221103706	911221103806	911221103906
REDRESS KIT (* Included as part of Kit)			10182024281	10182024287	10132024312	10132024343	10132024368

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
WEIGHT lbs (kg)	11.6 (5.30)	12.0 (5.5)	16.7 (7.57)	19.1 (8.70)	18.2 (8.3)

NIPPLE SEAL BORE	3.813"	4.125"	4.313"	4.562"	4.813"
ASSEMBLY NUMBER	10131038130	10131041230	10131043130	10131045630	10131048130

DET	PART NAME	QTY	PART NO	PART NO	PART NO	PART NO	PART NO
1	FISHING NECK	1	10131999	10131987	1013430	10132006	10131170
2	EXPANDER SLEEVE	1	10132019	1013439	1013433	10132020	10131171
3	KEY RETAINER SLEEVE	1	10132018	10132017	1013432	10132010	10131174
4	SPRING	4	900042	900042	900062	900062	900062
5	KEY	4	10132004	1013441	1013428	10131694	10131173
6	PACKING MANDREL	1	10132001	10131989	1013431	10132008	10131172
7	FEMALE ADAPTER	2	1014497	11200152	1013429	12062047	10142008
8 *	'V' PACKING	Noted	1862122 (6)	1862127 (8)	1862124 (8)	1862121 (8)	1862133 (10)
9	CENTRE ADAPTER	1	1014496	10141672	1013309	11200190	10142009
10 *	'O' RING SEAL	1	911221103906	911221104106	911221104106	911221104306	911221104406
REDRESS KIT (* Included as part of Kit)			10132024381	10132024412	10132024431	10132024456	10132024481

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
WEIGHT lbs (kg)	24.8 (11.0)	22.0 (9.9)	28.6 (13.0)	29.4 (13.4)	31.8 (14.40)

* 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



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REBCO

Product Code: 17

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.

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 - 'ROTRN'	40051317800	40051318700	40051318700	40051318700	40051321800	40051323100



'ROTR' Lock

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 - 'ROTRN'	40051323100	40051327500	40051327500	40051327500

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



'ROTRN' Lock



SECTION XIV: LOCK MANDRELS

2013

JP042613

REBCO

Product Code: 18

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.

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.

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
WEIGHT lbs (kgs)	19.1 (8.70)	18.2 (8.3)	24.8 (11.0)	22.0 (9.9)	28.6 (13.0)

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 - 'ROTGR'		40051331200	40051336804	40051336804	40051436804	40051336804



'ROTR' Lock

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
WEIGHT lbs (kgs)	29.4 (13.4)	31.8 (14.40)

ACCESSORIES:

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

2013

JP042613

REBCO

Product Code: 18

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.

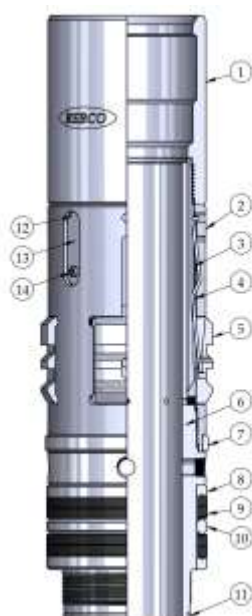
Other Sizes (not listed) are available, please inquire

NIPPLE SEAL BORE	3.813"	4.125"	4.562"	6.000"
ASSEMBLY NUMBER	18131238130	18131241230	18131245630	18131260030

DET	PART NAME	QTY	PART NO	PART NO	PART NO	PART NO
1	FISHING NECK	1	1018326	1013437	1018537	10131161
NS *	SET SCREW	1	None	None	None	185507120500
2	KEY RETAINER SLEEVE	1	1013796	1013438	1013423	10131164
3	EXPANDER SLEEVE	1	1018760	1013439	1018772	10131160
4	SPRING	Noted	900042 (3)	900042 (4)	900042 (4)	9000185 (4)
5	KEY	Noted	10132941 (3)	1013440 (4)	1013422 (4)	10131158 (4)
6	PACKING MANDREL	1	1018627	1013442	1018540	10131162
7	NO-GO RING	1	1013797	1013441	1013424	10131157
8	FEMALE ADAPTER	2	10141340	11200152	1206277	10131165
9 *	'V' PACKING	6	1862122	1862127	1862121	1862154
10	CENTRE ADAPTER	1	10141341	10141672	11200167	10131163
11 *	'O' RING SEAL	1	911221103906	911221104106	911221104406	911221115806
12	SHEAR PIN	2	9111430300	9111440260	9111440260	9111440367
13	SPRING	2	900043	900822	900822	900822
14	BUTTON HEAD SCREW	2	18531220	18533250	18533250	18533250
REDRESS KIT (* Included as part of Kit)			10182024381	18131224412	18131224456	18131224600

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
WEIGHT lbs (kg)	24.8 (11.0)	22.0 (9.9)	28.6 (13.0)	55.1 (24.99)



Large Size Lock Mandrels are available, please Inquire.



5.875"



5.963"



SECTION XIV: LOCK MANDRELS

2013

JP042613

REBCO

Product Code: 10

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.

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



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

DET	PART NAME	QTY	PART NO	PART NO	PART NO	PART NO
1	FISHING NECK	1	1018139	1018440	1018445	1018449
2	EXPANDER SLEEVE	1	1018141	1018443	1018443	1018452
3	KEY RETAINER SLEEVE	1	1018142	1018442	1018448	1018453
4	SPRING	2	900045	900061	900061	900046
5	KEY	2	1018143	1018441	1018447	1018450
6	PACKING MANDREL	1	1018140	1018444	1018446	1018451
7	FEMALE ADAPTER	2	1014582	2100228	10141648	10141009
8*	'V' PACKING	6	1862111	1862110	1862128	186213
9	CENTRE ADAPTER	1	1014581	9121422	1014603	110143
REDRESS KIT (* Included as part of Kit)			10182024125	10182024150	10182024162	10182024187

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
WEIGHT lbs (kg)	2.1 (.95)	4.1 (1.9)	4.6 (2.1)	5.1 (2.3)

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



DET	PART NAME	QTY	PART NO	PART NO	PART NO	PART NO
1	FISHING NECK	1	1018454	1018706	1018706	1018706
2	EXPANDER SLEEVE	1	1018455	1018708	1018708	1018708
3	KEY RETAINER SLEEVE	1	1018456	1018893	10181122	1018705
4	SPRING	Noted	900046 (2)	900047 (3)	900047 (3)	900047 (3)
5	KEY	Noted	1018457 (2)	10181105 (3)	10181121 (3)	1018707 (3)
6	PACKING MANDREL	1	1018458	1018704	1018704	1018704
7	FEMALE ADAPTER	2	1014517	2203463	1018562	2214109
8*	'V' PACKING	6	186214	186212	186211	186215
9	CENTRE ADAPTER	1	1014223	10181063	1018561	2214108
10*	'O' RING SEAL	1	None	911221103306	911221103306	911221103306
REDRESS KIT (* Included as part of Kit)			10182024231	10182024275	10182024281	10182024287

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
WEIGHT lbs (kg)	7.0 (3.2)	9.6 (4.4)	10.2 (4.6)	11.2 (5.1)



SECTION XIV: LOCK MANDRELS

2013

JP042613

REBCO

Product Code: 10 and 18 Continued

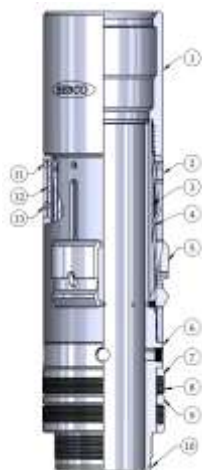
Type 'ROTX' Lock Mandrel Assembly: 3.313" – 4.562" Product Code 18

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.

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

DET	PART NAME	QTY	PART NO	PART NO	PART NO	PART NO
1	FISHING NECK	1	1018426	1018326	1013430	1018537
2	EXPANDER SLEEVE	1	1018427	1018760	1013433	1018772
3	KEY RETAINER SLEEVE	1	1018428	1018752	1013432	1018756
4	SPRING	Noted	900042 (3)	900042 (3)	900062 (4)	900042 (4)
5	KEY	Noted	1018530 (3)	1018687 (3)	10184313 (4)	1018806 (4)
6	PACKING MANDREL	1	1018424	1018627	1013431	1018540
7	FEMALE ADAPTER	2	2200437	10141340	1013429	12062047
8 *	'V' PACKING	Noted	1862131 (8)	1862122 (6)	1862124 (6)	1862121 (6)
9	CENTRE ADAPTER	1	10182069	1014496	1013309	11200190
10 *	'O' RING SEAL	1	911221103706	911221103906	911221104106	911221104406
11 *	SHEAR PIN	Noted	9110130235 (1)	9110130235 (1)	9110130235 (2)	9110130235 (1)
12	SPRING	Noted	900043 (1)	900043 (1)	900043 (2)	900043 (1)
13 *	RETAINER SCREW	Noted	18531220 (1)	18531220 (1)	18530220 (2)	18531220 (1)
REDRESS KIT (* Included as part of Kit)			10182024331	10182024381	10182024431	10182024456



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 - 'ROTR'	40051331202	40051336804	40051436804	40051345600
WEIGHT lbs (kg)	14.7 (6.7)	17.2 (7.80)	28.6 (13.0)	25.8 (11.7)

* 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

2013

JP042613

REBCO

Product Code: 10

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.



NIPPLE SEAL BORE	1.250"	1.500"	1.625"	1.875"
ASSEMBLY NUMBER	10181012530	10181015030	10181016230	10181018730

DET	PART NAME	QTY	PART NO	PART NO	PART NO	PART NO
1	FISHING NECK	1	1018139	1018440	1018445	1018449
2	EXPANDER SLEEVE	1	1018141	1018443	1018443	1018452
3	KEY RETAINER SLEEVE	1	1018142	1018442	1018448	1018453
4	SPRING	2	900045	900061	900061	900046
5	KEY	2	10181250	1018498	1018494	1018495
6	PACKING MANDREL	1	1018140	1018444	1018446	1018451
7	FEMALE ADAPTER	2	1014582	2100228	10141648	10141009
8 *	'V' PACKING	6	1862111	1862110	1862128	186213
9	CENTRE ADAPTER	1	1014581	9121422	1014603	110143
REDRESS KIT (* Included as part of Kit)			10182024125	10182024150	10182024162	10182024187

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
WEIGHT lbs (kg)	2.1 (.95)	4.1 (1.9)	4.6 (2.1)	5.1 (2.3)

NIPPLE SEAL BORE	2.313"	2.750"	2.813"	2.875"
ASSEMBLY NUMBER	10181023130	10181027530	10181028130	10181028730



DET	PART NAME	QTY	PART NO	PART NO	PART NO	PART NO
1	FISHING NECK	1	1018454	1018706	1018706	1018706
2	EXPANDER SLEEVE	1	1018455	1018708	1018708	1018708
3	KEY RETAINER SLEEVE	1	1018456	1018893	10181122	1018705
4	SPRING	Noted	900046 (2)	900047 (3)	900047 (3)	900047 (3)
5	KEY	Noted	1018496 (2)	1018485 (3)	1018895 (3)	10181135 (3)
6	PACKING MANDREL	1	1018458	1018704	1018704	1018704
7	FEMALE ADAPTER	2	1014517	2203463	1018562	2214109
8 *	'V' PACKING	6	186214	186212	186211	186215
9	CENTRE ADAPTER	1	1014223	10181063	1018561	2214108
10 *	'O' RING SEAL	1	None	911221103306	911221103306	911221103306
REDRESS KIT (* Included as part of Kit)			10182024231	10182024275	10182024281	10182024287

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
WEIGHT lbs (kg)	7.0 (3.2)	9.6 (4.4)	10.2 (4.6)	11.2 (5.1)

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



SECTION XIV: LOCK MANDRELS

2013

JP042613

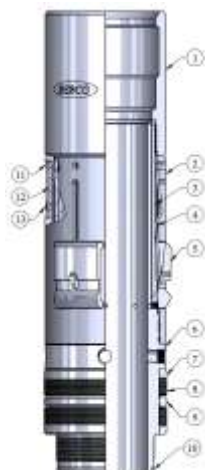
REBCO

Product Code: 10 and 18 Continued

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.



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

DET	PART NAME	QTY	PART NO	PART NO	PART NO	PART NO
1	FISHING NECK	1	1018426	1018326	1013430	1018537
2	EXPANDER SLEEVE	1	1018427	1018760	1013433	1018772
3	KEY RETAINER SLEEVE	1	1018428	1018752	1013432	1018756
4	SPRING	Noted	900042 (3)	900042 (3)	900062 (4)	900042 (4)
5	KEY	Noted	1018492 (3)	1018689 (3)	1018104313 (4)	1018807 (4)
6	PACKING MANDREL	1	1018424	1018627	1013431	1018540
7	FEMALE ADAPTER	2	2200543	10141340	1013429	12062047
8 *	'V' PACKING	6	1862131	1862122	1862124	1862121
9	CENTRE ADAPTER	1	1018962	1014496	1013309	11200190
10 *	'O' RING SEAL	1	911221103706	911221103906	911221104106	911221104406
11 *	SHEAR PIN	Noted	9110130235 (1)	9110130235 (1)	9110130235 (2)	9110130235 (1)
12	SPRING	Noted	900043 (1)	900043 (1)	900043 (2)	900043 (1)
13 *	RETAINER SCREW	Noted	18531220 (1)	18531220 (1)	18530220 (2)	18531220 (1)
REDRESS KIT (* Included as part of Kit)			10182024331	10182024381	10182024431	10182024456

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'	40051331200	40051336804	40051436804	40051345600
WEIGHT lbs (kg)	14.7 (6.7)	17.0 (7.7)	28.6 (13.0)	25.8 (11.7)

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



SECTION XIV: LOCK MANDRELS

2013

JP042613

REBCO

Product Code: 17

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.



'ROTX' Lock



'ROTXN' Lock

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 - 'ROTX'	41182018700	41182023100
PULING TOOL - 'ROTRGR'	40051318700	40051323100

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

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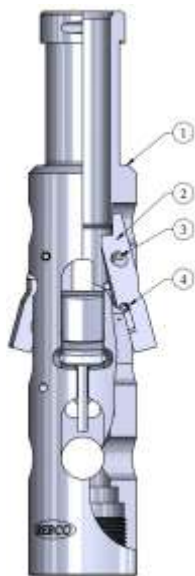
Product Code: 10

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.

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.



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) SUB-ASS'Y NUMBER	'ROTS-1' 10141201660	'ROTS-2' 10142201900	'ROTS-2' 10142202060	'ROTS-2' 10142202370

DET	PART NAME	QTY	PART NO	PART NO	PART NO	PART NO
1	LOCK MANDREL	1	1950177300	1770143100	1770130400	1770115400
2	LOCK (DOG)	4	1950189600	1880158800	1950190000	1770115300
3	LOCK PIN	4	18870404803	18870210883	18870210883	18870210883
4	LOCK SPRING	4	9000152	9000167	9000167	9000153

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"
WEIGHT lbs (kg)	1.0 (.45)	2.32 (1.05)	2.4 (1.09)	2.9 (1.32)
MATERIAL	Alloy	Alloy	Alloy	Alloy

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) SUB-ASS'Y NUMBER	'ROTS-2' 10142202870	'ROTS-2' 10142202560	'ROTS-2' 10142203500	'ROTS-1' 10141204500

DET	PART NAME	QTY	PART NO	PART NO	PART NO	PART NO
1	LOCK MANDREL	1	1770123900	2670143000	2110144400	2100129500
2	LOCK (DOG)	(Noted)	1880159400 (4)	2440135600 (4)	2440135600 (4)	2010164900 (6)
3	LOCK PIN	(Noted)	18870712703 (4)	18870712703 (4)	18870712703 (4)	18870814006 (6)
4	LOCK SPRING	(Noted)	9000154 (4)	9000155 (4)	9000155 (4)	9000151 (6)

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"
WEIGHT lbs (kg)	4.2 (1.91)	6.6 (3.0)	7.8 (3.54)	12.6 (5.72)
MATERIAL	Alloy	Alloy	Alloy	Alloy

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



SECTION XIV: LOCK MANDRELS

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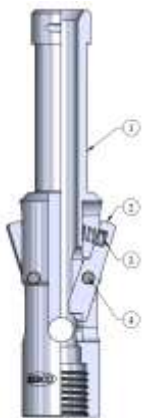
Product Code: 10

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.

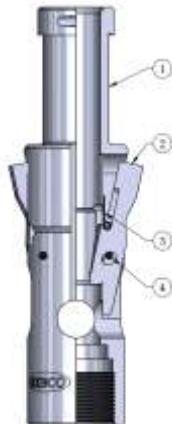


NOMINAL SIZE		1.660"	1.900"		2 1/16"
SEAL BORE SIZE		1.18"	1.43"	1.50"	1.56"
SUB ASSEMBLY	TYPE of LOCK - (DET 2)	'ROTW-1'	'ROTW-2'		'ROTW-2'
	SUB-ASS'Y NUMBER	10171201180	10172201430	10172201500	10172201560

DET	PART NAME	QTY	PART NO	PART NO	PART NO	PART NO
1	LOCK MANDREL	1	1950177600	1880166900	1880199600	1880167000
2	LOCK (DOG)	2	1950189600	1880158800	1880158800	1770130300
3	LOCK SPRING	2	9000152	9000167	9000167	9000167
4	LOCK PIN	2	18871405663	18871510463	18871510463	18871510463

ENGINEERING DATA:

	1.660"	1.900"	1.900"	2 1/16"
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"
WEIGHT lbs (kg)	.8 (.40)	1.9 (.86)	1.92 (.87)	2.0 (.91)
MATERIAL	Alloy	Alloy	Alloy	Alloy



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

DET	PART NAME	QTY	PART NO	PART NO	PART NO	PART NO
1	LOCK MANDREL	1	1770120800	2040182000	1880167100	2230101500
2	LOCK (DOG)	2	1770115300	1770115300	1880159400	1880159400
3	LOCK SPRING	2	9000153	9000153	9000154	9000154
4	LOCK PIN	2	18870210883	18870210883	18870712303	18870712303

ENGINEERING DATA:

	2 3/8"	2 3/8"	2 7/8"	2 7/8"
MAXIMUM OD (No-Go)	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"
WEIGHT lbs (kg)	2.3 (1.05)	2.4 (1.10)	3.4 (1.50)	3.6 (1.60)
MATERIAL	Alloy	Alloy	Alloy	Alloy



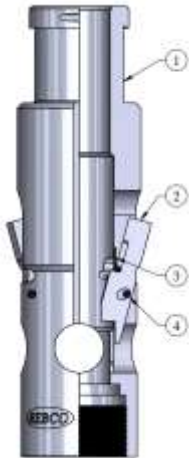
SECTION XIV: LOCK MANDRELS

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

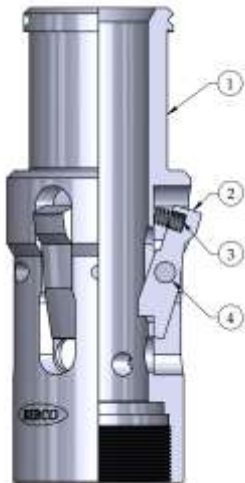


NOMINAL SIZE		3 1/2"			
SEAL BORE SIZE		2.56"	2.75"	2.81"	2.87"
SUB ASSEMBY	TYPE of LOCK - (DET 2)	'ROTW-2'			
	SUB-ASS'Y NUMBER	10172202560	10172202750	10172202810	10172202870

DET	PART NAME	QTY	PART NO	PART NO	PART NO	PART NO
1	LOCK MANDREL	1	2690180000	2440136000	2440133620	5660172200
2	LOCK (DOG)	2	2440135600	2440135600	2440135600	2440135600
3	LOCK SPRING	2	9000155	9000155	9000155	9000155
4	LOCK PIN	2	18870712303	18870712703	18870712703	18870712703

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"
WEIGHT lbs (kg)	5.1 (2.30)	8.4 (3.80)	8.8 (4.00)	9.0 (4.08)
MATERIAL	Alloy	Alloy	Alloy	Alloy



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	10171203810

DET	PART NAME	QTY	PART NO	PART NO	PART NO
1	LOCK MANDREL	1	2010165000	1990114200	2010137500
2	LOCK (DOG)	3	2010164900	2010164900	2010164900
3	LOCK SPRING	3	9000151	9000151	9000151
4	LOCK PIN	3	18870814006	18870814006	18870814006

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"
WEIGHT lbs (kg)	12.4 (5.60)	12.5 (5.67)	12.6 (5.72)
MATERIAL	Alloy	Alloy	Alloy



SECTION XIV: LOCK MANDRELS

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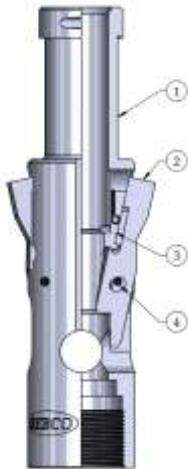
Product Code: 10

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.

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.

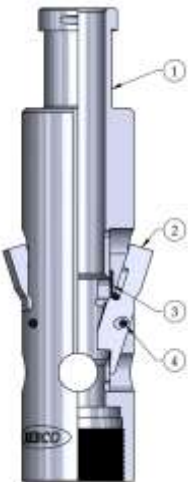


NOMINAL SIZE		1.660"	1.900"	2 1/16"	2 3/8"
SEAL BORE SIZE		1.18" - 1.25"	1.43" - 1.50"	1.56"	1.78" - 1.87"
SUB ASSEMBY	TYPE of LOCK - (DET 2)	'ROTZ-1'	'ROTZ-2'	'ROTZ-2'	'ROTZ-2'
	SUB-ASS'Y NUMBER	10221201660	10222201900	10222202060	10222202370

DET	PART NAME	QTY	PART NO	PART NO	PART NO	PART NO
1	LOCK MANDREL	1	1960120100	1880167600	1880167700	1770152800
2	LOCK (DOG)	2	1950189600	1880158800	1770130300	1770115300
3	LOCK PIN	2	18871504633	18871504633	18871504633	18870210883
4	LOCK SPRING	2	9000152	9000167	9000167	9000153

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"
WEIGHT lbs (kg)	.8 (.35)	1.8 (.82)	1.9 (.86)	2.2 (1.00)
MATERIAL	Alloy	Alloy	Alloy	Alloy



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-2'	'ROTZ-1'
	SUB-ASS'Y NUMBER	10222202870	10222202560	10222203500	10221204500

DET	PART NAME	QTY	PART NO	PART NO	PART NO	PART NO
1	LOCK MANDREL	1	1880167800	2630150700	2440135910	2220115400
2	LOCK (DOG)	(Noted)	1880159400 (2)	2440135600 (2)	2440135600 (2)	2010164900 (3)
3	LOCK SPRING	(Noted)	9000154 (2)	9000155 (2)	9000155 (2)	9000151 (3)
4	LOCK PIN	(Noted)	18870712303 (2)	18870712303 (2)	18870712703 (2)	18870814006 (3)

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"
WEIGHT lbs (kg)	3.2 (1.50)	5.0 (2.25)	8.00 (3.65)	12.0 (5.45)
MATERIAL	Alloy	Alloy	Alloy	Alloy



SECTION XIV: LOCK MANDRELS

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JP042613

REBCO

Product Code: 10

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.

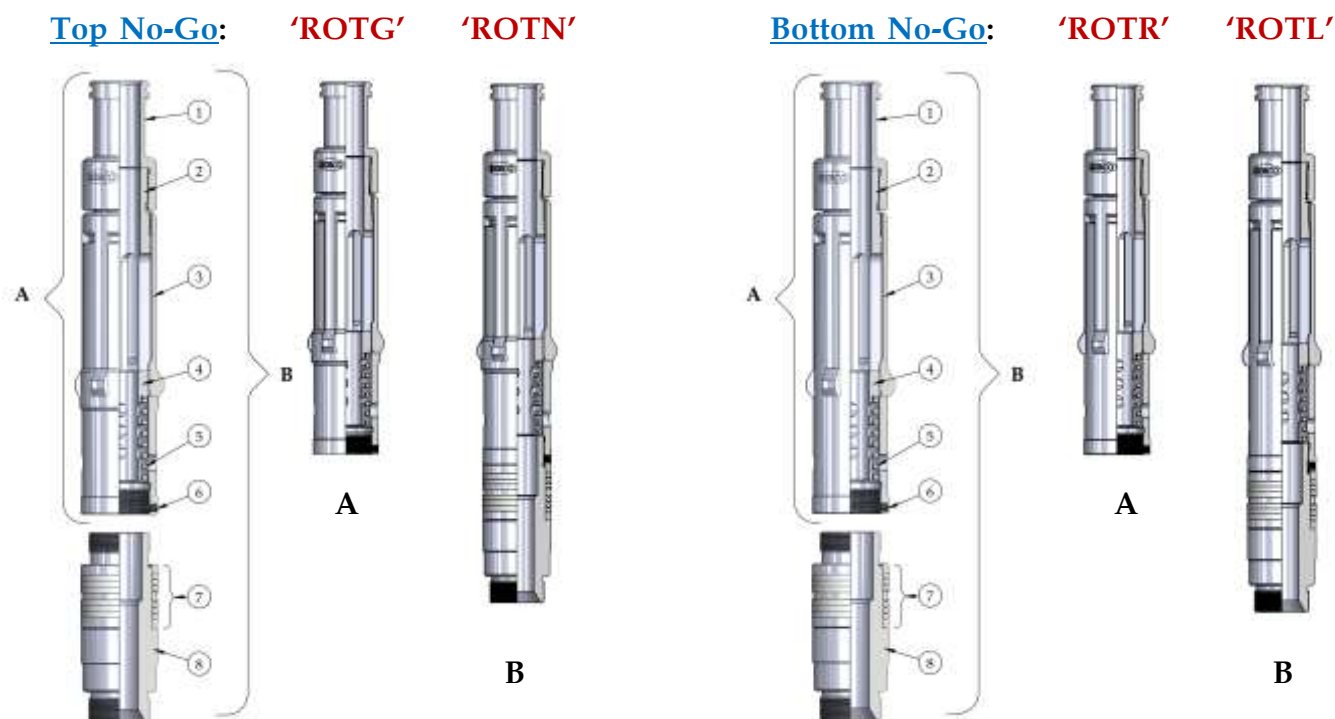


Table 1: Running and Pulling Tools required

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"	2.250	2 7/8" 41021202870	2 7/8" 81101852701	2 1/2" 4013012500	2 7/8" 41011012870
	2.312				



SECTION XIV: LOCK MANDRELS

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JP042613

REBCO

Product Code: 10

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

Rebco Type 'ROTG' and Type '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.

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 ASSEMBY	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

DET	PART NAME	QTY	PART NO	PART NO	PART NO	PART NO	PART NO
TYPE 'ROTG' (DET 1-6) LOCK MANDREL SUB-ASSEMBLY							
1	FISHING NECK	1	2260182403	2260182403	2260182403	2260182603	2260182603
2	LATCH MANDREL	1	2260182903	2260182803	2260182303	2260184003	2260182303
3	LATCH	1	2040165305	2040165305	2040165305	2020172105	2020172105
4	PLUNGER	1	2240151903	2240151903	2240151903	2260185903	2260185903
5	SPRING	1	9000239	9000239	9000239	9000240	9000240
6 *	SET SCREW	2	185506210250	185506210250	185506210250	185506210250	185506210250

TYPE 'ROTN' (DET 1-6, 7,8)			LOCK MANDREL SUB-ASSEMBLY				
7	PACKING MANDREL	1	2020173103	2020173103	2020173103	2260186903	2260186903
8 *	PACKING UNIT	1 Set	186010117801	186010118101	186010118701	186010122501	186010123101

Re Dress Kit (* Included as Part of Kit)							
NOTE: For Packing Unit (DET 8) - only 'V' Packing							
TYPE 'ROTG' (DET 3)			10052024237	10052024237	10052024237	10052024287	10052024287
TYPE 'ROTN' (DET 3 and 'V' Packing)			10102024178	10102024181	10102024187	10102024225	10102024231

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	BOX	1.406" - 14	1.406" - 14	1.406" - 14	1.813" - 14	1.813" - 14
	THREAD	PIN	1.470" - 14	1.470" - 14	1.470" - 14	1.802" - 14	1.802" - 14
TYPE 'ROTN'			.807"	.807"	.807"	1.12"	1.12"
			.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"
WEIGHT lbs (kg)	TYPE 'ROTG'		3.9 (1.80)	3.9 (1.80)	3.9 (1.80)	5.8 (2.65)	5.8 (2.65)
	TYPE 'ROTN'		6.7 (3.04)	6.7 (3.04)	6.7 (3.04)	8.9 (4.04)	8.9 (4.04)
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.



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JP042613

REBCO

Product Code: 10

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

Rebco Type 'ROTR' and Type '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.

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 ASSEMBY	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

DET	PART NAME	QTY	PART NO	PART NO	PART NO	PART NO
TYPE 'ROTR' (DET 1-6)		LOCK MANDREL SUB-ASSEMBLY				
1	FISHING NECK	1	2260182403	2260182403	2260182403	2260182603
2	LATCH MANDREL	1	2260189303	2260189303	2260189303	2260189903
3	LATCH	1	2040165305	2040165305	2040165305	2020172105
4	PLUNGER	1	2240151903	2240151903	2240151903	2260185903
5	SPRING	1	9000239	9000239	9000239	9000240
6 *	SET SCREW	2	185506210250	185506210250	185506210250	185506210250

TYPE 'ROTL' (DET 1-6, 7,8)		LOCK MANDREL SUB-ASSEMBLY				
7	PACKING MANDREL	1	2020173103	2100194303	2830132903	2260186903
8 *	PACKING UNIT	1 Set	186010117801	186010118101	186010118701	186010122501

Re Dress Kit (* Included as Part of Kit)					
NOTE: For Packing Unit (DET 8) - only 'V' Packing					
TYPE 'ROTR' (DET 3)		10052024237	10052024237	10052024237	10052024287
TYPE 'ROTL' (DET 3 and 'V' Packing)		10102024178	10102024181	10102024187	10102024225

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	BOX	1.406" - 14	1.406" - 14	1.406" - 14	1.813" - 14
	THREAD		PIN	1.470" - 14	1.470" - 14	1.470" - 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"
WEIGHT lbs (kg)	TYPE 'ROTR'		3.9 (1.80)	3.9 (1.80)	3.9 (1.80)	5.8 (2.65)
	TYPE 'ROTL'		6.7 (3.04)	6.7 (3.04)	6.7 (3.04)	8.9 (4.04)
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

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JP042613

REBCO

Product Code: 10

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.

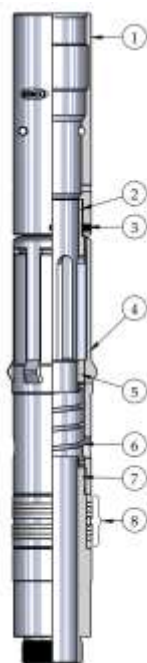
Type '**ROTF**' & '**ROTM**' (Top No-Go) Lock Mandrel Sub-Assembly: 2.750" – 3.812"

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.



Type '**ROTF**'



Type '**ROTM**'

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

DET	PART NAME	QTY	PART NO	PART NO
TYPE ' ROTF ' (DET 1-6) LOCK MANDREL SUB-ASSEMBLY				
1	FISHING NECK	1	2190138703	2190138703
2	LATCH MANDREL	1	2190138803	2190138403
3 *	SET SCREW	4	185506210250	185506210250
4	LATCH	1	2190139003	2190139003
5	PLUNGER	1	2190138503	2190138503
6	SPRING	1	9000163	9000163

TYPE ' ROTM ' (DET 1-6, 7,8)		LOCK MANDREL SUB-ASSEMBLY		
7	PACKING MANDREL	1	2190138603	2190138603
8 *	PACKING UNIT	1 Set	186010127501	186010128101

Re Dress Kit (* Included as Part of Kit)				
NOTE: For Packing Unit (DET 8) - only 'V' Packing				
TYPE ' ROTF ' (DET 3)		10252024275	10252024281	
TYPE ' ROTM ' (DET 3 and 'V' Packing)		10092024275	10092024281	

ENGINEERING DATA:

MAXIMUM OD (No-Go)		2.803"	2.872"
FISHING NECK SIZE (ID)		2.31"	2.31"
TYPE ' ROTF '	BOTTOM	BOX	2 21/64" - 16
	THREAD	PIN	2 7/64" - 11 1/2
MINIMUM ID	TYPE ' ROTF '		1.84"
	TYPE ' ROTM '		1.75"
LENGTH	TYPE ' ROTF '		16.81"
	TYPE ' ROTM '		22.74"
WEIGHT lbs (kg)	TYPE ' ROTF '		20.9 (9.48)
	TYPE ' ROTM '		14.4 (6.55)
MATERIAL		Norm Alloy	Norm Alloy

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



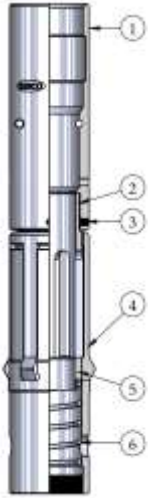
SECTION XIV: LOCK MANDRELS

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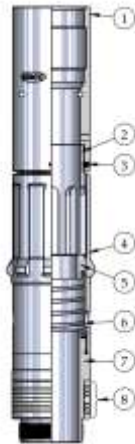
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REBCO

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



Type 'ROTF'



Type 'ROTM'

NOMINAL SIZE		4 1/2"		
SEAL BORE SIZE		3.688"	3.750"	3.812"
LOCK MANDREL SUB ASSEMBY	TYPE 'ROTF' (DET 1-6)			
	SUB-ASS'Y NUMBER	10252036803	10252037503	10252038103
SUB ASSEMBY	TYPE 'ROTM' (DET 1-8)			
	SUB-ASS'Y NUMBER	10092036803	10092037503	10092038103

DET	PART NAME	QTY	PART NO	PART NO	PART NO
TYPE 'ROTF' (DET 1-6)					
LOCK MANDREL SUB-ASSEMBLY					
1	FISHING NECK	1	2210189303	2210189303	2210189303
2	LATCH MANDREL	1	2230120103	2340107703	2220130303
3 *	SET SCREW	4	185506210250	185506210250	185506210250
4	LATCH	1	2290126303	2290126303	2290126303
5	PLUNGER	1	2310161703	2310161703	2310161703
6	SPRING	1	9000164	9000164	9000164

TYPE 'ROTM' (DET 1-6, 7,8)		LOCK MANDREL SUB-ASSEMBLY			
7	PACKING MANDREL	1	2230120203	2340106703	2230120303
8 *	PACKING UNIT	1 Set	186010136801	186010137501	186010138101

Re Dress Kit (* Included as Part of Kit)

NOTE: For Packing Unit (DET 8) - only 'V' Packing

TYPE 'ROTF' (DET 3)	10252024368	10252024375	10252024381
TYPE 'ROTM' (DET 3 and 'V' Packing)	10092024368	10092024375	10092024381

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 BOX	3 3/8" - 8	3 3/8" - 8	3 3/8" - 8
TYPE 'ROTM'	THREAD 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"
WEIGHT lbs (kg)	TYPE 'ROTF'	14.39 (6.53)	14.45 (6.55)	14.45 (6.55)
	TYPE 'ROTM'	19.24 (8.73)	19.85 (9.00)	19.86 (9.01)
MATERIAL		Norm Alloy	Norm Alloy	Norm Alloy

Running/Pulling Tool - 'ROTGS'	40051436804	40051436804	40051436804
Running/Pulling Prong - 'ROTM'	41094500	41094500	41094500

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



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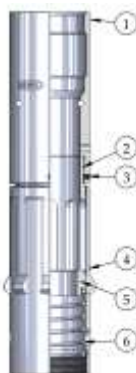
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REBCO

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.



Type 'ROTE'



Type 'ROTK'

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

DET	PART NAME	QTY	PART NO	PART NO
TYPE 'ROTE' (DET 1-6)		LOCK MANDREL SUB-ASSEMBLY		
1	FISHING NECK	1	2190138703	2190138703
2	LATCH MANDREL	1	2220132303	2220132303
3 *	SET SCREW	4	185506210250	185506210250
4	LATCH	1	2190139003	2190139003
5	PLUNGER	1	2190138503	2190138503
6	SPRING	1	9000163	9000163

TYPE 'ROTK' (DET 1-6, 7,8)		LOCK MANDREL SUB-ASSEMBLY		
7	PACKING MANDREL	1	2190138603	2190138603
8 *	PACKING UNIT	1 Set	186010127501	186010128101

Re Dress Kit (* Included as Part of Kit)			
NOTE: For Packing Unit (DET 8) - only 'V' Packing			
TYPE 'ROTE' (DET 3)		10252024275	10252024281
TYPE 'ROTK' (DET 3 and 'V' Packing)		10092024275	10092024281

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	BOX	2 21/64" - 16	2 21/64" - 16
TYPE 'ROTK'	THREAD	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"
WEIGHT lbs (kg)	TYPE 'ROTE'		9.88 (4.48)	9.88 (4.48)
	TYPE 'ROTK'		15.02 (6.81)	15.09 (6.84)
MATERIAL		Norm Alloy		Norm Alloy

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



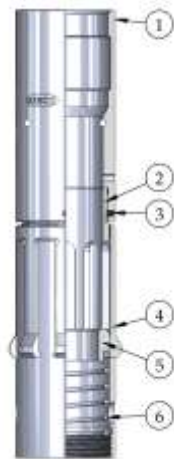
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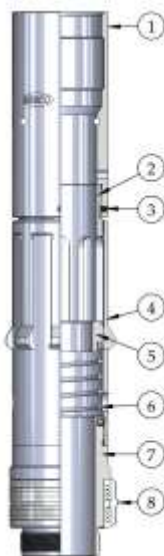
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Type 'ROTE' & 'ROTK' (Bottom No-Go) Lock Mandrel Sub-Assembly: Continued



Type 'ROTE'



Type 'ROTK'

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
LOCK MANDREL SUB ASSEMBLY	TYPE 'ROTK' (DET 1-8)			
	SUB-ASS'Y NUMBER	10092036803	10092037503	10092038103

DET	PART NAME	QTY	PART NO	PART NO	PART NO
TYPE 'ROTE' (DET 1-6)		LOCK MANDREL SUB-ASSEMBLY			
1	FISHING NECK	1	2210189303	2210189303	2210189303
2	LATCH MANDREL	1	2230120103	2340107703	2220130303
3 *	SET SCREW	4	185506210250	185506210250	185506210250
4	LATCH	1	2290126303	2290126303	2290126303
5	PLUNGER	1	2310161703	2310161703	2310161703
6	SPRING	1	9000164	9000164	9000164

TYPE 'ROTK' (DET 1-6, 7,8)		LOCK MANDREL SUB-ASSEMBLY			
7	PACKING MANDREL	1	2230120203	2340106703	2230120303
8 *	PACKING UNIT	1 Set	186010136801	186010137501	186010138101

Re Dress Kit (* Included as Part of Kit)

NOTE: For Packing Unit (DET 8) - only 'V' Packing

TYPE 'ROTE' (DET 3)	10252024368	10252024375	10252024381
TYPE 'ROTK' (DET 3 and 'V' Packing)	10092024368	10092024375	10092024381

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	BOX	3 3/8" - 8	3 3/8" - 8	3 3/8" - 8
TYPE 'ROTK'	THREAD	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"	
WEIGHT lbs (kg)	TYPE 'ROTE'	14.25 (6.46)	14.25 (6.46)	14.25 (6.46)	
	TYPE 'ROTK'	19.1 (8.66)	19.67 (8.92)	19.67 (8.92)	
MATERIAL		Norm Alloy	Norm Alloy	Norm Alloy	

Running/Pulling Tool - 'ROTGS'	40051436804	40051436804	40051436804
Running/Pulling Prong - 'ROTM'	41094500	41094500	41094500

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



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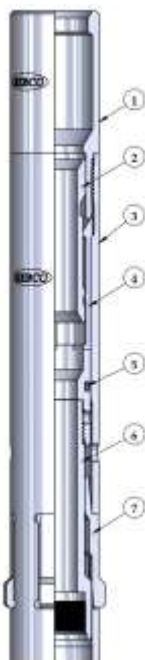
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B. For TUBING

Product Code: 10

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.



NOMINAL SIZE	2"	2 1/2"	3"
SUB-ASSEMBLY NUMBER	10032020030	10032025030	10032030030

DET	PART NAME	QTY	PART NO	PART NO	PART NO
1	FISHING NECK	1	3100383	3100356	31003129
2	LOCKING SLEEVE	1	3100319	310032	31003120
3	SLEEVE	1	3100379	3100357	31003121
4	COLLET LOCK	1	3100346	310037	31003122
5 *	'O' RING SEAL	1	911221121806	911221122306	911221122806
6	LOCK MANDREL	1	3100368	3100358	31003123
7	DOGS	4	330326	330313	3100317
REDRESS KIT (* Included as part of Kit)			10032024200	10032024250	10032024300

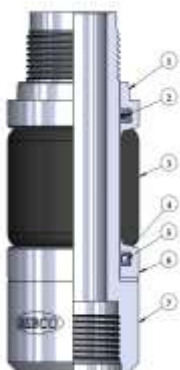
ENGINEERING DATA:

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
WEIGHT lbs (kg)		5.37 (2.44)	7.13 (3.23)	10.5 (4.76)

RUNNING TOOL - 'ROTDO'	4103202000	4103202500	4103203000
PULLING TOOL - 'ROTGSL'	4005140817800	4005140821800	4005140827500

Product Code: 310

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



NOMINAL SIZE	2"	2 1/2"	3"
ELEMENT ASSEMBLY NUMBER	310032048	310032053	310032057

DET	PART NAME	QTY	PART NO	PART NO	PART NO
1	'O' RING CAGE	1	3100399	31003105	31003117
2	'O' RING SEAL	2	911221121906	911221122406	911221122806
3	ELEMENT	1	9109515	9109513	9109509
4	RING	2	9315120	9315170	9315126
5	RING	2	9315122	9315127	9315130
6	ELEMENT EXPANDER	1	3100393	3100388	31003134
7	PACKING MANDREL	1	31003110	31003116	31003119

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



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REBCO

Product Code: 10

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

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

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



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

DET	PART NAME	QTY	PART NO	PART NO	PART NO
1	LOCK MANDREL	1	1770115400	1770123900	2110144400
2	LOCK (DOG)	4	1770115310	1880159410	2440135610
3	LOCK PIN	4	18870210883	18870712703	18870712703
4	LOCK SPRING	4	9000153	9000154	9000155

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"
WEIGHT lbs (kg)	2.9 (1.32)	4.2 (1.91)	7.8 (3.54)
MATERIAL	Alloy	Alloy	Alloy



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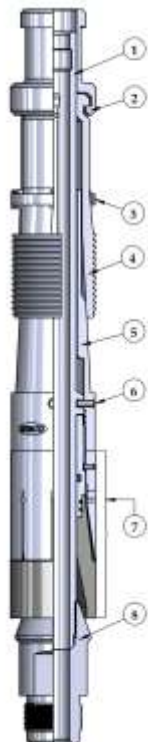
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Product Code: 10

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.



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

DET	PART NAME	QTY	PART NO	PART NO	PART NO	PART NO
1	MAIN MANDREL	1	1017102	101781	101787	101791
2	SLIP CARRIER	1	1017209	101783	10019	101789
3	BAND	1	1017208	10014	100111	100122
4	SLIPS	3	1017155	101777	10178	101785
5	SLIP MANDREL	1	1017154	1017151	1017150	101790
6	SHEAR PIN	2	9110120312	9110130438	9110130500	9110130500
7	ELEMENT SUB-ASS'Y	1	9109201750	9109202000	9109202500	9109203000
8	ELEMENT EXPANDER	1	1017103	101782	101788	101792

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	
WEIGHT lbs (kg)	4.0 (1.8)	7.0 (3.2)	12.2 (5.6)	15.4 (7.0)	

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.



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

DET	PART NAME	QTY	PART NO	PART NO	PART NO	PART NO
1 & 6	SUB-ASSEMBLY	1	10172024	10172019	10172010	10172021
2	ELEMENT CAP	1	1017175	1017166	1017169	1017180
3	PIN	2	18840202501	18840202501	18840203121	18840203121
4	'O' RING SEAL	3	911221102006	911221112006	911221121806	911221122406
5	ELEMENT CAP LINER	1	1017174	1017167	1017168	1017176

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
WEIGHT lbs (kg)	.8 (.36)	1.3 (.60)	1.6 (.73)	2.7 (1.25)



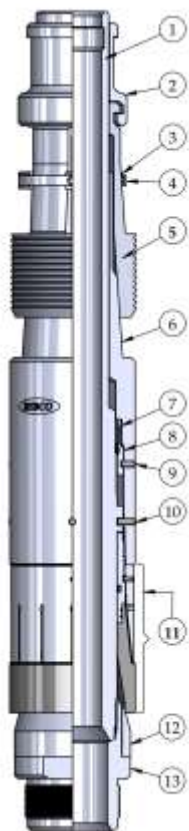
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Type 'ROTW' Tubing Slip Mandrel Sub-Assembly: Continued



NOMINAL SIZE	4"
SUB-ASSEMBLY NUMBER	1017204000

DET	PART NAME	QTY	PART NO
1	MAIN MANDREL	1	1017127
2	SLIP CARRIER	1	1017120
3	BAND	1	100144
4	SCREW	4	185212210250
5	SLIPS	3	1017122
6	SLIP MANDREL	1	1017121
7	COLLET	1	1017123
8	BOWL	1	1017124
9	SHEAR PIN	2	9110130437
10	SHEAR PIN	4	9110130562
11	ELEMENT SUB-ASS'Y	1	9109204000
12	BUSHING		1017126
13	ELEMENT EXPANDER	1	1017125

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
WEIGHT lbs (kg)		37.4 (16.9)

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.



NOMINAL SIZE	4"
ELEMENT SUB-ASSEMBLY NUMBER	9109204000

DET	PART NAME	QTY	PART NO
1 & 6	SUB-ASSEMBLY	1	10172032
2	ELEMENT CAP	1	1017180
3	PIN	4	18840203121
4	'O' RING SEAL	3	911221123206
5	ELEMENT CAP LINER	1	1017179

ENGINEERING DATA:

MAXIMUM OD	3.70"
PIN THREAD	3 3/16" - 12
LENGTH	5.47"
MATERIAL	Alloy
WEIGHT lbs (kg)	4.2 (1.91)