



# STX-SPAN™ Systems Technical Manual

MAN-PAT-030 (R03)

## Owen Oil Tools

12001 CR 1000

Godley, Texas, 76044, USA

Phone: +1 (817) 551-0540

Fax: +1 (817) 551-1674

[www.corelab.com/owen](http://www.corelab.com/owen)

**Warning:** Use of Owen equipment contrary to manufacturer's specifications or operating instructions may result in property damage, serious injury or fatality. If you are not trained in the handling and use of explosive devices, do not attempt to use or assemble any Owen perforating systems or Owen firing devices.

This technology is regulated by and, if exported, was exported from the United States in accordance with the Export Administration Regulations (EAR). Diversion contrary to U.S. law is prohibited. Export and/or re-export of this technology may require issuance of a license by the Bureau of Industry and Security (BIS), U.S. Department of Commerce. Consult the BIS, the EAR, and/or Owen Compliance Services, Inc. to determine licensing requirements for export or re-export of this technology.

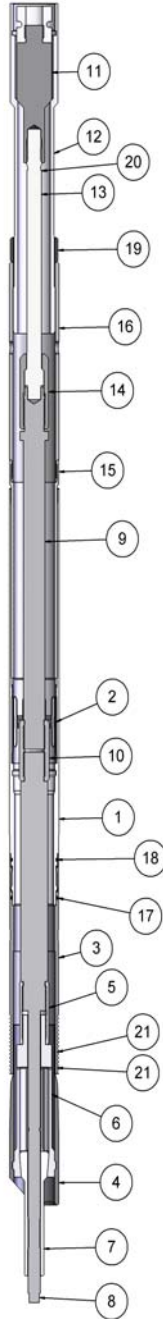
This document contains Confidential Information of Owen Oil Tools LP (Owen) and is furnished to the customer for information purposes only. This document must not be reproduced in any way whatsoever, in part or in whole, or distributed outside the customer organization, without first obtaining the express written authorization of Owen. This document is the property of Owen and returnable upon request of Owen.

© 2008 Owen Oil Tools

---



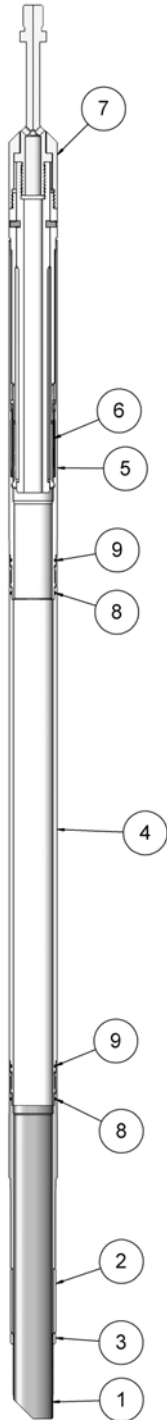
## 2.875 in STX, Lower Anchor Assembly



CASING O.D.	2-7/8"
CASING WT.	6.4-6.5
CASING I.D.	2.441
PATCH MAX. RUNNING O.D.	2.250
PATCH I.D. AFTER SETTING	1.800
PATCH BURST RATING (PSI)	5,400
PATCH COLLAPSE RATING (PSI)	5,900

ITEM	QTY	LOWER ANCHOR ASSEMBLY	STX-2875-0065-2100
1	1	LOWER SEAL BORE RECEIVER	STX-2875-0065-2130
2	1	LATCH COLLET (W/90 DEG WICKER)	STX-2875-0065-2551
3	1	BOX ELEMENT	PAT-2875-041
4	1	BOTTOM SWAGE	PAT-2875-045
5	1	RELEASE RING ( 30K )	PAT-2875-048A
6	1	COLLET	SET-2125-137
7	1	COLLET SUPPORT	SET-2125-140A
8	1	BOTTOM ROD	SET-2125-136
9	1	TOP ADAPTER ROD	SET-2125-132
10	1	ROD TANDEM CONNECTOR	SET-2125-133
11	1	BOTTOM ADAPTER	SET-2125-014
12	1	SLEEVE NUT	SET-2125-120
13	1	QUICK CHANGE ROD	SET-2125-130
14	1	QUICK CHANGE NUT	SET-2125-131
15	1	SECONDARY SETTING SLEEVE	SET-2125-122B
16	1	PRIMARY SETTING SLEEVE	SET-2125-122A
17	1	BOX O-RING	OOO-V569-136
18	1	PIN O-RING	OOO-V569-135
19	1	LOCK RING (SETTING SLEEVE)	SET-2125-121
20	0	LOCK RING (BOTTOM ADAPTER)	N/A

## 2.875 in STX, Stinger Sections

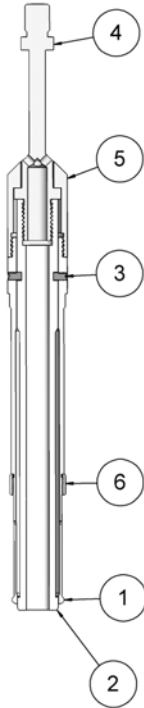


CASING O.D.	2-7/8"
CASING WT.	6.4-6.5
CASING I.D.	2.441
PATCH MAX. RUNNING O.D.	2.250
PATCH I.D. AFTER SETTING	1.800
PATCH BURST RATING (PSI)	5,400
PATCH COLLAPSE RATING (PSI)	5,900

ITEM	QTY	STANDARD STINGER SECTION	STX-2875-0065-2200
1	1	STANDARD STINGER (W/90 DEG WICKER)	STX-2875-0065-2230
2	1	SEAL STACK	STX-2875-0065-2500
3	1	SEAL RETAINER RING (W/90 DEG WICKER)	STX-2875-0065-2550
4	N	5 FT SECTION	PAT-2875-050
4	N	10 FT SECTION	PAT-2875-047
5	1	STANDARD SEAL BORE RECEIVER	STX-2875-0065-2530
6	1	LATCH COLLET (W/90 DEG WICKER)	STX-2875-0065-2551
7	1	LINEAR DEPLOYMENT TOOL	LDT-2875-0065-2100

ITEM	QTY	TOP STINGER SECTION	STX-2875-0065-2300
1	1	STANDARD STINGER (W/90 DEG WICKER)	STX-2875-0065-2230
2	1	SEAL STACK	STX-2875-0065-2500
3	1	SEAL RETAINER RING (W/90 DEG WICKER)	STX-2875-0065-2550
4	N	5 FT SECTION	PAT-2875-050
4	N	10 FT SECTION	PAT-2875-047
5	1	TOP SEAL BORE RECEIVER	STX-2875-0065-2330
6	1	LATCH COLLET (W/86 DEG WICKER)	STX-2875-0065-2552
7	1	LINEAR DEPLOYMENT TOOL	LDT-2875-0065-2100
8	N+2	BOX O-RING	OOO-V569-136

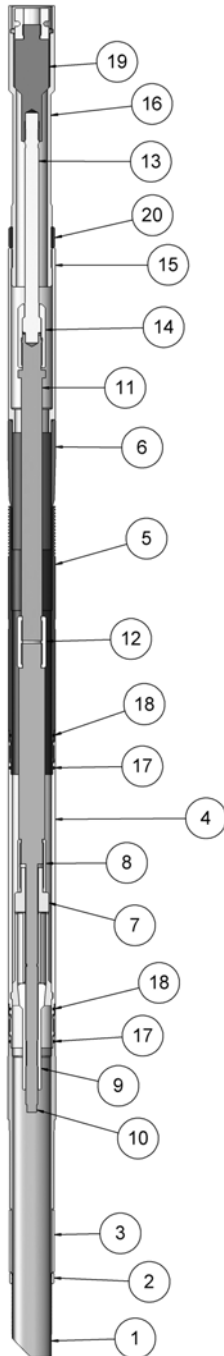
## 2.875 in STX, Linear Deployment Tool



CASING O.D.	2-7/8"
CASING WT.	6.4-6.5
CASING I.D.	2.441
PATCH MAX. RUNNING O.D.	2.250
PATCH I.D. AFTER SETTING	1.800
PATCH BURST RATING (PSI)	5,400
PATCH COLLAPSE RATING (PSI)	5,900

ITEM	QTY	LINEAR DEPLOYMENT TOOL	LDT-2875-0065-2100
1	1	SECTION DEPLOYMENT COLLET	LDT-2875-0065-2220
2	1	SECTION DEPLOYMENT MANDREL	LDT-2875-0065-2330
3	2	SHEAR SCREW, BRASS	LDT-2875-0065-2660
4	1	TOP CONNECTION	LDT-2875-0065-2110
5	1	SECTION DEPLOYMENT RETAINER	LDT-2875-0065-2550
6	1	COLLET NOSE GUIDE	LDT-2875-0065-2440

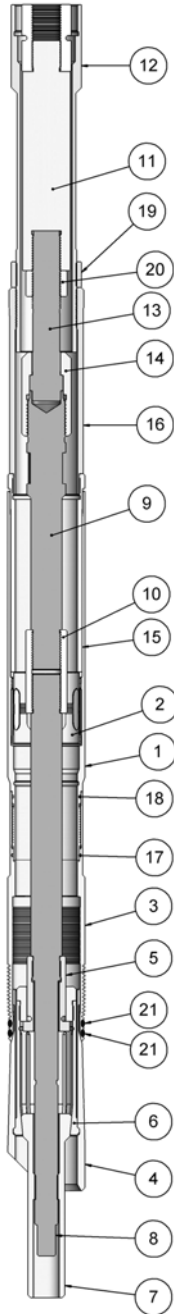
## 2.875 STX, Top Completion Assembly



CASING O.D.	2-7/8"
CASING WT.	6.4-6.5
CASING I.D.	2.441
PATCH MAX. RUNNING O.D.	2.250
PATCH I.D. AFTER SETTING	1.800
PATCH BURST RATING (PSI)	5,400
PATCH COLLAPSE RATING (PSI)	5,900

ITEM	QTY	TOP COMPLETION ASSEMBLY	STX-2875-0065-2400
1	1	TOP STINGER (W/86 DEG WICKER)	STX-2875-0065-2340
2	1	SEAL RETAINER RING (W/86 DEG WICKER)	STX-2875-0065-2554
3	1	SEAL STACK	STX-2875-0065-2500
4	1	PROFILE SUB	STX-2875-0065-2450
5	1	PIN ELEMENT	PAT-2875-040
6	1	TOP SWAGE	PAT-2875-044
7	1	COLLET	SET-2125-137
8	1	RELEASE RING	PAT-2875-048A
9	1	COLLET SUPPORT	SET-2125-140A
10	1	BOTTOM ROD	SET-2125-136
11	1	TOP ADAPTER ROD	SET-2125-132
12	1	ROD TANDEM CONNECTOR	SET-2125-133
13	1	QUICK CHANGE ROD	SET-2125-130
14	1	QUICK CHANGE NUT	SET-2125-131
15	1	SETTING SLEEVE	SET-2125-122
16	1	SLEEVE NUT	SET-2125-120
17	2	BOX O-RING	OOO-V569-136
18	2	PIN O-RING	OOO-V569-135
19	1	BOTTOM ADAPTER	SET-2125-014
20	1	LOCK RING (SETTING SLEEVE)	SET-2125-121

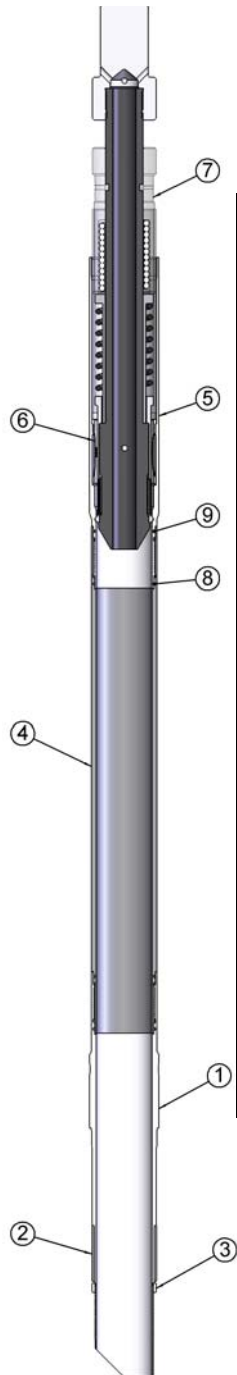
## 4.500 in STX, Lower Anchor Assembly



CASING O.D.	4-1/2"	
CASING WT.	11.6-12.6#	13.5#
CASING I.D.	3.958	3.920
PATCH MAX. RUNNING O.D.	3.800	3.718
PATCH I.D. AFTER SETTING	2.992	2.992
PATCH BURST RATING (PSI)	5,000	5,000
PATCH COLLAPSE RATING (PSI)	5,000	5,000

ITEM	QTY	LOWER ANCHOR ASSEMBLY	STX-4500-0126-1100	STX-4500-0135-2100
1	1	LOWER SEAL BORE RECEIVER	STX-4500-0126-1130	STX-4500-0135-2130
2	1	LATCH COLLET L/H (W/90 DEG WICKER)	STX-4500-0135-2553	
3	1	BOX ELEMENT	GTX-4500-0126-1410	GTX-4500-0135-2410
4	1	BOTTOM SWAGE	GTX-4500-0126-1310	GTX-4500-0135-2310
5	1	RELEASE RING ( 60K )	PAT-4500-047	
6	1	COLLET ASSEMBLY	SET-3250-447	
Incl. in	1	COLLET	SET-3250-442	
Item 6	1	END SUB	SET-3250-443	
7	1	COLLET SUPPORT	SET-3250-446A	
8	1	BOTTOM ROD	SET-3250-136	
9	1	TOP ADAPTER ROD	SET-3250-132	
10	1	ROD TANDEM CONNECTOR	SET-3250-133	
11	1	BOTTOM ADAPTER	SET-3250-431	
12	1	SLEEVE NUT	SET-3250-420	
13	1	QUICK CHANGE ROD	SET-3250-130	
14	1	QUICK CHANGE NUT	SET-3250-131	
15	1	SECONDARY SETTING SLEEVE	SET-3250-422B	
16	1	PRIMARY SETTING SLEEVE	SET-3250-442A	
17	1	BOX O-RING	OOO-V569-152	
18	1	PIN O-RING	OOO-V569-151	
19	1	LOCK RING (SETTING SLEEVE)	SET-3250-421	
20	1	LOCK RING (BOTTOM ADAPTER)	SET-3500-025	
21	2	ELASTOMER	GTX-4500-0126-6000	GTX-4500-151-70HSN

## 4.500 in STX, Stinger Sections



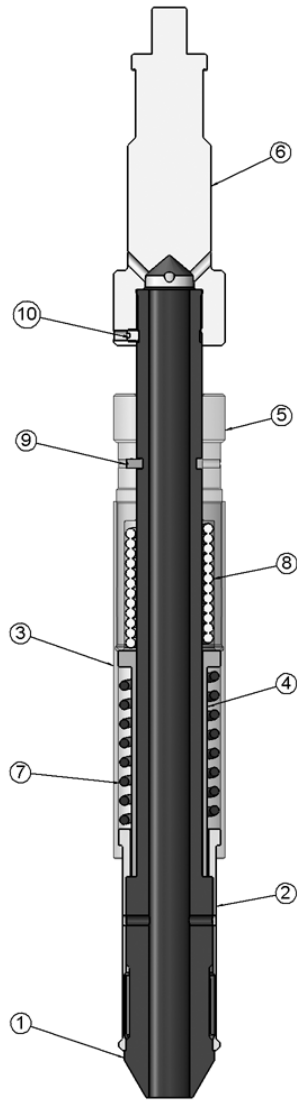
		CASING O.D.		4-1/2"	
		CASING WT.		11.6-12.6#	13.5#
		CASING I.D.		3.958	3.920
		PATCH MAX. RUNNING O.D.		3.800	3.718
		PATCH I.D. AFTER SETTING		2.992	2.992
		PATCH BURST RATING (PSI)		5,000	5,000
		PATCH COLLAPSE RATING (PSI)		5,000	5,000
ITEM	QTY	TOP STINGER SECTION	STX-4500-0126-1300	STX-4500-0135-2300	
1	1	STANDARD STINGER (W/90 DEG WICKER)	STX-4500-0126-1230	STX-4500-0135-2230	
2	1	SEAL STACK	STX-4500-0135-2500		
3	1	SEAL RETAINER RING (W/90 DEG WICKER)	STX-4500-0135-2550		
4	N	5 FT SECTION	GTX-4500-105	GTX-4500-105C	
4	N	10 FT SECTION	GTX-4500-110	GTX-4500-110C	
5	1	TOP SEAL BORE RECEIVER	STX-4500-0126-1330	STX-4500-0135-2330	
6	1	LATCH COLLET (W/77 DEG WICKER)	STX-4500-0135-2552		
7	1	DEPLOYMENT AND RETRIEVAL TOOL	DRT-4500-0135-1001		
8	N+2	BOX O-RING	OOO-V569-152		
9	N+2	PIN O-RING	OOO-V569-151		
ITEM	QTY	STANDARD STINGER SECTION	STX-4500-0126-1600	STX-4500-0135-2600	
1	1	STANDARD STINGER (W/90 DEG WICKER)	STX-4500-0126-1230	STX-4500-0135-2230	
2	1	SEAL STACK	STX-4500-0135-2500		
3	1	SEAL RETAINER RING (W/90 DEG WICKER)	STX-4500-0135-2550		
4	N	5 FT SECTION	GTX-4500-105	GTX-4500-105C	
4	N	10 FT SECTION	GTX-4500-110	GTX-4500-110C	
5	1	TOP SEAL BORE RECEIVER	STX-4500-0126-1530	STX-4500-0135-2530	
6	1	LATCH COLLET (W/90 DEG WICKER)	STX-4500-0135-2551		
7	1	DEPLOYMENT AND RETRIEVAL TOOL	DRT-4500-0135-1001		
8	N+2	BOX O-RING	OOO-V569-152		
9	N+2	PIN O-RING	OOO-V569-151		
ITEM	QTY	LOWER STINGER SECTION	STX-4500-0126-1200	STX-4500-0135-2200	
1	1	STANDARD STINGER LH (W/90 DEG WICKER)	STX-4500-0126-1220	STX-4500-0135-2220	
2	1	SEAL STACK	STX-4500-0135-2500		
3	1	SEAL RETAINER RING (W/90 DEG WICKER)	STX-4500-0135-2555		
4	N	5 FT SECTION	GTX-4500-105	GTX-4500-105C	
4	N	10 FT SECTION	GTX-4500-110	GTX-4500-110C	
5	1	STANDARD SEAL BORE RECEIVER	STX-4500-0126-1530	STX-4500-0135-2530	
6	1	LATCH COLLET (W/90 DEG WICKER)	STX-4500-0135-2551		
7	1	DEPLOYMENT AND RETRIEVAL TOOL	DRT-4500-0135-1001		
8	N+2	BOX O-RING	OOO-V569-152		
9	N+2	PIN O-RING	OOO-V569-151		

NOTE: "N"=PATCH LENGTH (IN FEET) DIVIDED BY 10

DIMENSIONAL DATA (INCHES)

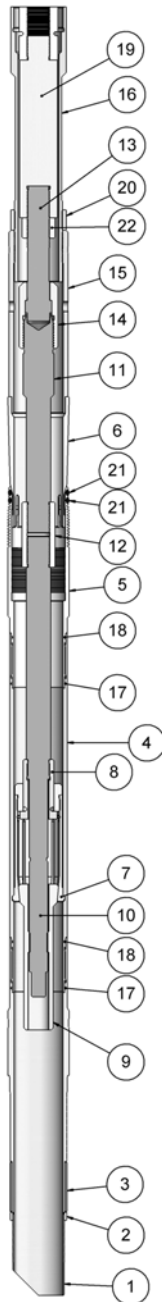


### 4.500 in STX, Deployment and Retrieval Tool



		CASING O.D.	4-1/2"	
		CASING WT.	11.6-12.6#	13.5#
		CASING I.D.	3.958	3.920
<b>ITEM</b>	<b>QTY</b>	<b>DEPLOYMENT AND RETRIEVAL TOOL</b>	<b>DRT-4500-0135-1001</b>	
1	1	INNER MANDREL	DRT-4500-0135-1010	
2	1	LOCKING COLLET	DRT-4500-0135-1020	
3	1	COLLET HOUSING	DRT-4500-0135-1030	
4	1	SPRING STOP	DRT-4500-0135-1040	
5	1	SCREW HOUSING	DRT-4500-0135-1050	
6	1	SUCKER ROD CONNECTION	DRT-4500-0135-1060	
7	1	SET SPRING	ST-010-4500-1001	
8	1	RELEASE SPRING	ST-010-4500-1002	
9	2	SHEAR SCREW, BRASS	LDT-2875-0065-2660	
10	1	SET SCREW	3/8"-16 X 3/8 LG	

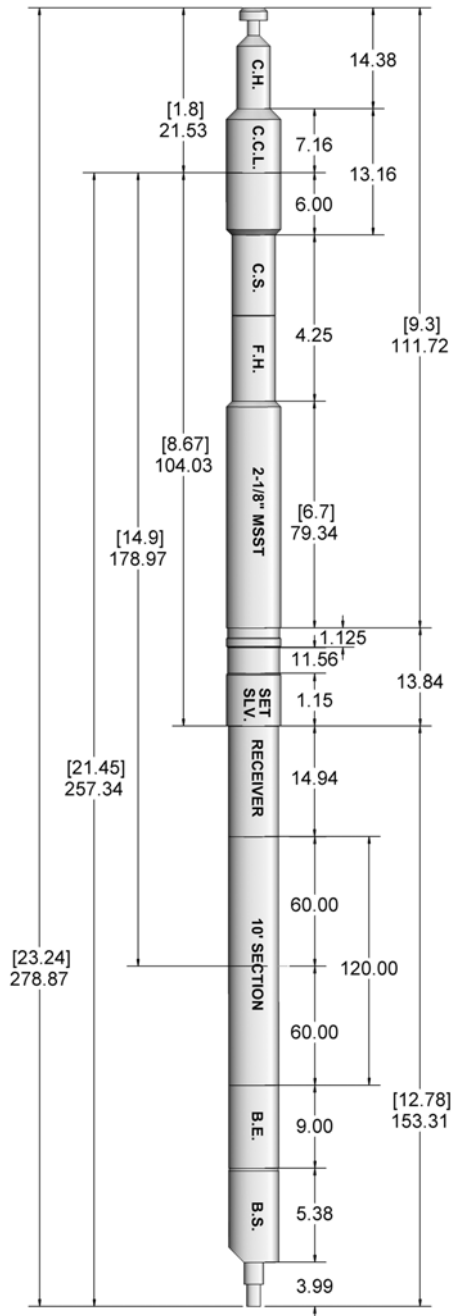
## 4.500 in STX, Top Completion Assembly



		CASING O.D.		4-1/2"	
		CASING WT.		11.6-12.6#	13.5#
		CASING I.D.		3.958	3.920
		PATCH MAX. RUNNING O.D.		3.800	3.718
		PATCH I.D. AFTER SETTING		2.992	2.992
		PATCH BURST RATING (PSI)		5,000	5,000
		PATCH COLLAPSE RATING (PSI)		5,000	5,000
ITEM	QTY	TOP COMPLETION ASSEMBLY	STX-4500-0126-1400	STX-4500-0135-2400	
1	1	TOP STINGER (W/77 DEG WICKER)	STX-4500-0126-1340	STX-4500-0135-2340	
2	1	SEAL RETAINER RING (W/77 DEG WICKER)	STX-4500-0135-2554		
3	1	SEAL STACK	STX-4500-0135-2500		
4	1	PROFILE SUB	STX-4500-0126-1450	STX-4500-0135-2450	
5	1	PIN ELEMENT	GTX-4500-0126-1210	GTX-4500-0135-2210	
6	1	TOP SWAGE	GTX-4500-0126-1110	GTX-4500-0135-2110	
7	1	COLLET ASSEMBLY	SET-3250-447		
Incl. In	1	COLLET	SET-3250-442		
item 7	1	END SUB	SET-3250-443		
8	1	RELEASE RING (60K)	PAT-4500-047		
9	1	COLLET SUPPORT	SET-3250-446A		
10	1	BOTTOM ROD	SET-3250-136		
11	1	TOP ADAPTER ROD	SET-3250-132		
12	1	ROD TANDEM CONNECTOR	SET-3250-133		
13	1	QUICK CHANGE ROD	SET-3250-130		
14	1	QUICK CHANGE NUT	SET-3250-131		
15	1	SETTING SLEEVE ASSEMBLY	SET-3250-122	SET-3250-422	
item	1	SETTING SLEEVE	SET-3250-124A	N/A	
15	1	BOTTOM GUIDE	SET-3250-125	N/A	
16	1	SLEEVE NUT	SET-3250-120	SET-3250-420	
17	2	BOX O-RING	OOO-V569-152		
18	2	PIN O-RING	OOO-V569-151		
19	1	BOTTOM ADAPTER	SET-3250-031	SET-3250-431	
20	1	LOCK RING (SETTING SLEEVE)	SET-3250-121	SET-3250-421	
21	2	ELASTOMER	GTX-4500-0126-6000	GTX-4500-151-70HSN	
22	1	LOCK RING (BOTTOM ADAPTER)	SET-3500-025	SET-3500-025	
23	1	CENTRALIZER (NOT SHOWN)	STX-4500-0126-0010	STX-4500-0135-0010	

## 2.875 in STX, Running Weights and Lengths

### Lower Anchor Assembly

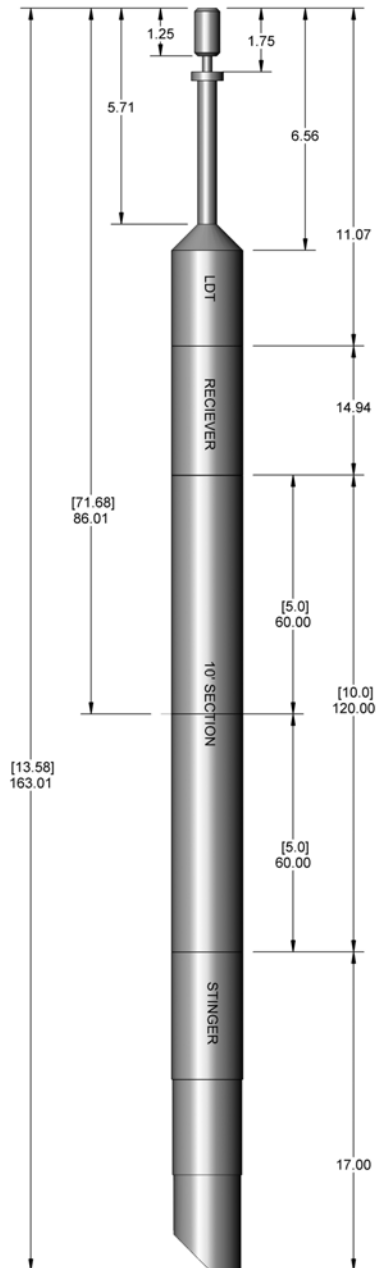


LOWER ANCHOR ASSEMBLY 2.875IN STX-SPAN WEIGHTS (LBS)	
DESCRIPTION	WEIGHT
CABLE HEAD	4.00
2-1/8 CCL	10.00
CONTACT SUB	1.00
FIRING HEAD	1.00
2-1/8 MSST	50.00
<b>TOTAL</b>	<b>66.00</b>

SET SLEEVE	4.5
BOTTOM SWAGE	1.7
BOTTOM ELEMENT	2.2
RECEIVER	1.3
10 FT. SECTION	32
TANDEM COUPLER	1
10 FT. ROD	29
Q.C. ROD	1
Q.C. NUT	1
TOP ROD	3
BOTTOM ROD	5
SLV. ADJ. NUT	4
SLV. LOCK RING	1
SET SLEEVE	3
COLLET ASSY.	2
COLLET SUPPORT	1
<b>TOTAL</b>	<b>92.70</b>

TOTAL WEIGHT 10-FT SET PATCH	158.70
EACH ADDITIONAL 10-FT LENGTH ADD	62.00

## 2.875 in STX, Running Weights and Lengths Stinger Sections and Deployment Tool

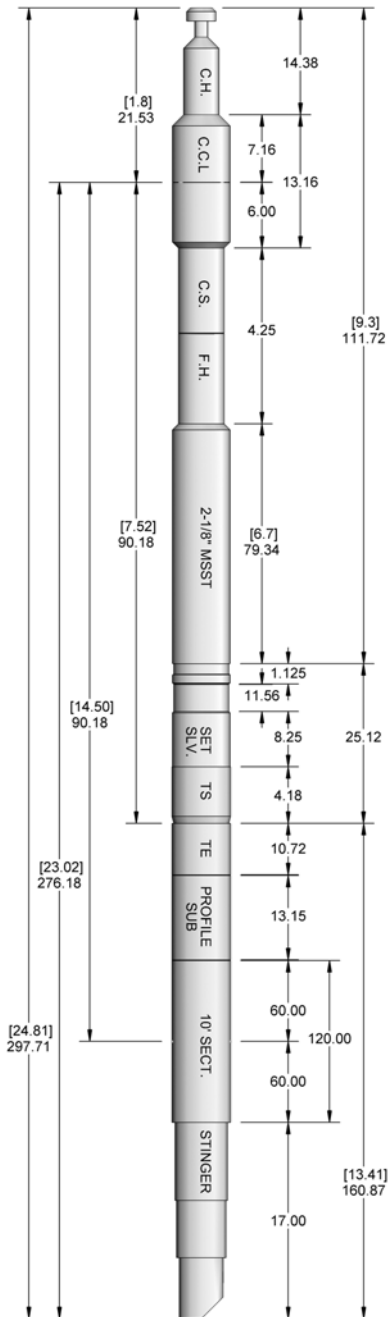


SECTION ASSEMBLY WITH DEPLOYMENT TOOL 2.875IN STX-SPAN WEIGHTS (LBS)	
DESCRIPTION	WEIGHT
LDT	4.75
RECEIVER	1.26
10 FT. SECTION	32.00
STINGER	3.60
<b>TOTAL</b>	<b>41.61</b>

EACH ADDITIONAL 10-FT LENGTH ADD	62.00
----------------------------------	-------

## 2.875 in STX, Running Weights and Lengths

### Top Completion Assembly

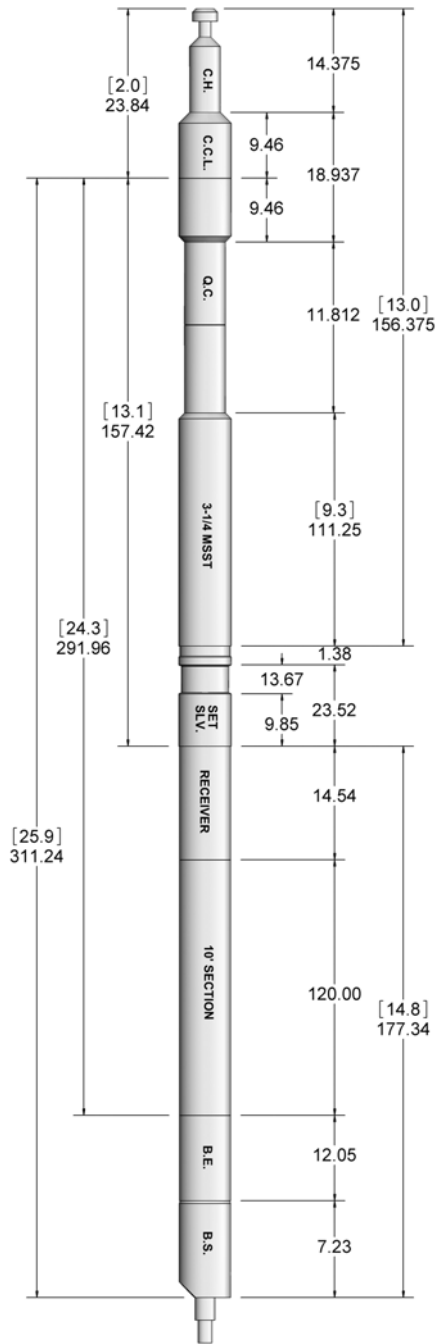


TOP COMPLETION ASSEMBLY 2.875IN STX-SPAN WEIGHTS (LBS)	
DESCRIPTION	WEIGHT
CABLE HEAD	4.00
2-1/8 CCL	10.00
CONTACT SUB	1.00
FIRING HEAD	1.00
2-1/8 MSST	50.00
<b>TOTAL</b>	<b>66.00</b>

SET SLEEVE	2.50
TOP SWAGE	1.50
TOP ELEMENT	3.50
PROFILE SUB	4.00
10 FT. SECTION	32.00
STINGER	4.00
TANDEM COUPLER	1.00
10 FT. ROD	29.00
Q.C. ROD	1.00
Q.C. NUT	1.00
TOP ROD	3.00
BOTTOM ROD	5.00
SLV. ADJ. NUT	4.00
SLV. LOCK RING	1.00
SET SLEEVE	3.00
COLLET ASSY.	2.00
COLLET SUPPORT	1.00
<b>TOTAL</b>	<b>98.50</b>

TOTAL WEIGHT 10-FT SET PATCH	164.50
EACH ADDITIONAL 10-FT LENGTH ADD	62.00

## 4.500 in STX, Running Weights and Lengths Lower Anchor Assembly



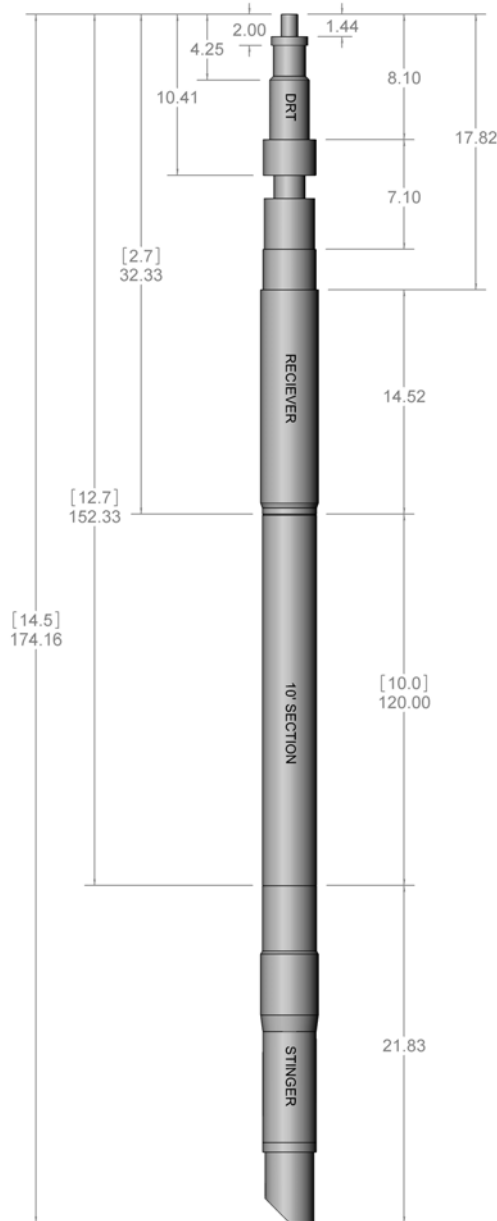
4.500IN STX-SPAN WEIGHTS (LBS)	
DESCRIPTION	WEIGHT
CABLE HEAD	4
3-1/4 CCL	36
3-1/4 Q.C.	14
3-1/4 MSST	206
<b>TOTAL</b>	<b>260</b>

BOTTOM SWAGE	6.34
BOTTOM ELEMENT	6.79
RECEIVER	8.29
10 FT. SECTION	97
TANDEM COUPLER	3
10 FT. ROD	105
Q.C. ROD	8
Q.C. NUT	10
TOP ROD	12
BOTTOM ROD	14
SLV. ADJ. NUT	8.6
SLV. LOCK RING	4
SET SLEEVE ASSEMBLY	14
COLLET ASSEMBLY	3.6
COLLET SUPPORT	3.8
<b>TOTAL</b>	<b>297.02</b>

TOTAL WEIGHT 10-FT SET SECTION	557.02
EACH ADDITIONAL 10-FT LENGTH ADD	205

## 4.500 in STX, Running Weights and Lengths

### Stinger Sections and Deployment Tool

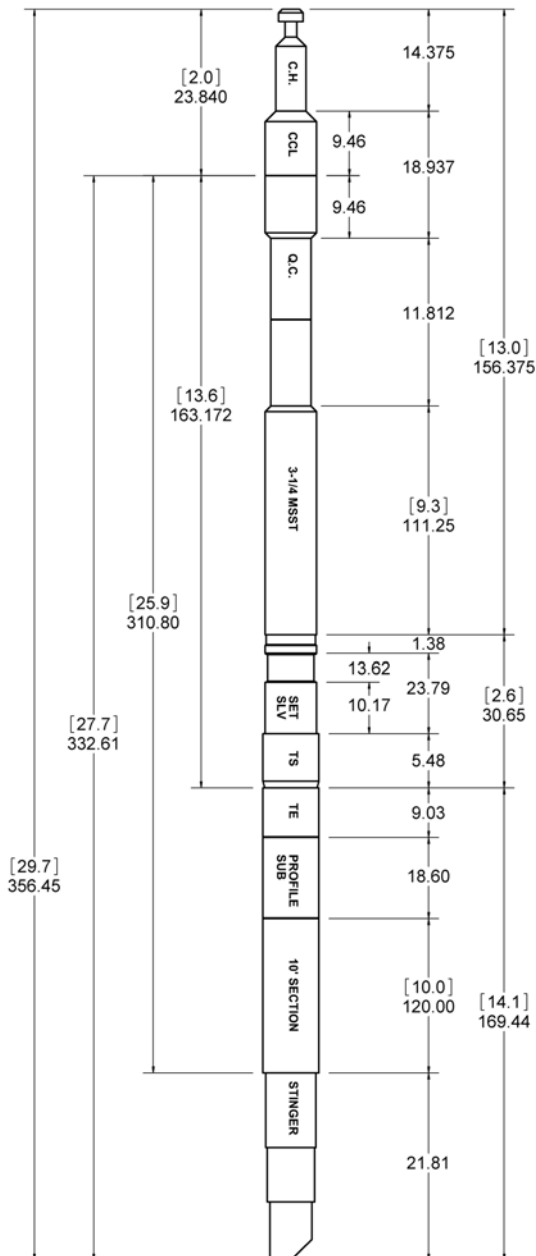


4.500IN STX-SPAN WEIGHTS (LBS)	
DESCRIPTION	WEIGHT
DEPLOYMENT AND RETRIEVAL TOOL	50.05
RECEIVER	8.29
10 FT. SECTION	97
STINGER	11.25
<b>TOTAL</b>	<b>166.59</b>

TOTAL WEIGHT 10-FT SET SECTION	166.59
EACH ADDITIONAL 10-FT LENGTH ADD	97

## 4.500 in STX, Running Weights and Lengths

### Top Completion Assembly



4.500IN STX-SPAN WEIGHTS (LBS)	
DESCRIPTION	WEIGHT
CABLE HEAD	4
3-1/4 CCL	36
3-1/4 Q.C.	14
3-1/4 MSST	206
<b>TOTAL</b>	<b>260</b>

TOP SWAGE	4.78
TOP ELEMENT	7
PROFILE SUB	13.33
STINGER	11.25
10 FT. SECTION	97
TANDEM COUPLER	3
10 FT. ROD	105
Q.C. ROD	8
Q.C. NUT	2
TOP ROD	12
BOTTOM ROD	14
SLV. ADJ. NUT	8.6
SLV. LOCK RING	1
SET SLEEVE	4
COLLET ASSEMBLY	3.6
COLLET SUPPORT	3.8
<b>TOTAL</b>	<b>298.36</b>

TOTAL WEIGHT 10-FT SET SECTION	558.36
EACH ADDITIONAL 10-FT LENGTH ADD	205



## 1.0 Pre-Assembly



**Warning:** *Make sure all tool parts and components have been thoroughly cleaned or serious damage and/or injury could occur!*



**Warning:** *Personal Protective Equipment (PPE) such as steel toed footwear, safety glasses, etc..., should be worn at all times!*



**Caution:** *Make sure to wrench only on wrenching surfaces (knurled areas) provided! Always file wrench marks and burrs and clean off debris!*



**Caution:** *Personnel installing X-SPAN™ Casing Patch systems must be trained and approved by Owen Oil Tools!*



**Note:** *Verify that the correct O-Ring and quantities are used as specified on the Bill of Materials (for example, 5 each etc...). Lay out all components on a clean surface.*

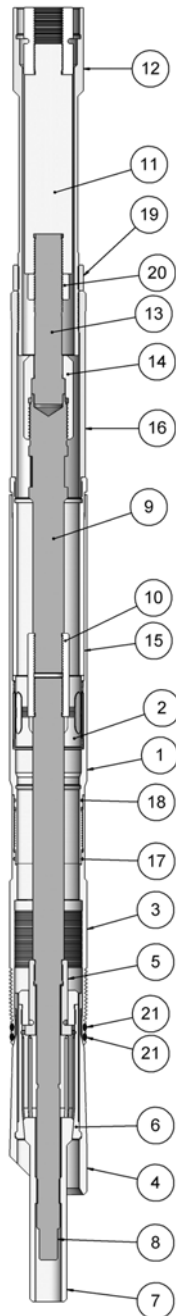


**Note:** *Make sure to lubricate all O-Rings and threaded surfaces.*



**Note:** *Removable thread loctite (medium) **must be** applied to all deployment rod connections, including Collet Support and Release Ring threads.*

## 2.0 Lower Anchor Assembly, Schematics and BOM



ITEM	QTY	LOWER ANCHOR ASSEMBLY
1	1	LOWER SEAL BORE RECEIVER
2	1	LATCH COLLET W/90 DEG WICKER
3	1	BOX ELEMENT
4	1	BOTTOM SWAGE
5	1	RELEASE RING ( 60K )
6	1	COLLET ASSEMBLY
Incl. In	1	COLLET
Item 6	1	END SUB
7	1	COLLET SUPPORT
8	1	BOTTOM ROD
9	1	TOP ADAPTER ROD
10	1	ROD TANDEM CONNECTOR
11	1	BOTTOM ADAPTER
12	1	SLEEVE NUT
13	1	QUICK CHANGE ROD
14	1	QUICK CHANGE NUT
15	1	SECONDARY SETTING SLEEVE
16	1	PRIMARY SETTING SLEEVE
17	1	BOX O-RING
18	1	PIN O-RING
19	1	LOCK RING (SETTING SLEEVE)
20	1	LOCK RING (BOTTOM ADAPTER)
21	2	ELASTOMER

## 3.0 Lower Anchor Assembly

### 3.1 Bottom Rod and Collet:

A. Slide the Collet (item #6) over the Bottom Rod (item #8), then screw the Release Ring (item #5) onto the Bottom Rod. Screw the 1/4-20x5/16 Set Screw into the Release Ring and tighten it into the recess provided on the Bottom Rod.

B. Slide the Collet down over the Release Ring. Screw the Rod Tandem Connector (item #10) onto the top of the Bottom Rod and wrench tight.

C. Vise rod assembly just above the Release Ring, then lightly lube the OD and ID of the Collet fingers. Thread the Collet Support (item #7) onto the Bottom Rod and into the Collet and screw the support far enough into the Collet (about half way) to allow the fingers of the Collet to move inwardly over the support.



D. Remove the assembly from vise. Now, slide the Bottom Swage (item #4), with the collet profile groove in the ID, over the top end of the Bottom Rod (item #8) and push it down over the Collet (item #6) until Collet fingers engage the profile inside the Swage. You may need to drop the assembly against a strike plate to engage the Collet fingers into the profile.

E. E. Screw the Collet Support (item #7) back out tight against the Collet. Make wrench tight.



**Caution: Be careful not to loosen the engagement of the Release Ring. The bottom end of the taper on the Collet Support should be near the bottom end of the Collet fingers as shown in the patch illustration!**



**Note: A Teflon zip tie lock can be used below the Collet Support on the Bottom Rod instead of thread lock if temperature permits.**

**3.2** Install 1 O-Ring (item #17) into the Box Element (item #3) and for GTX-SPAN™ systems, lightly grease 2 Elastomers (item #22) and install onto the Element. Make sure that the Elastomers are completely seated in their grooves.

**3.3 Optional-** 10 foot extensions can also be used in bottom anchor assembly; if 10 ft sections are required they are assembled between the Bottom Element (item #3) and the Lower Seal Bore Receiver (item #1). If 10 ft extensions are not required proceed to step 3.4

A. Install 1 O-Ring onto the pin-end and 1 O-Ring into the box-end of the 10 ft sections. Lightly grease the O-Rings and assemble the sections and snug up. Do not tighten excessively. The number of sections assembled will be determined by the lubricator length.

B. Lightly Grease the Box Element (item #3) connection and pin connection of the Section assembly and install using a strap wrench. Do not tighten excessively and keep pipe wrenches away from the X-SPAN™ sealing area.

C. Install O-Ring onto the pin-end of seal bore receiver. Lightly Grease the Box Element connection of the Section assembly and the pin connection of the receiver and install using a strap wrench. Do not tighten excessively and keep pipe wrenches away from the receiver.

D. If Rod Supports are required, slide them over the 10 ft rods. Screw Rod Tandem Connector (item #10) onto the top of the rods, then assemble and tighten the rods. Use loctite on couplings and wrench tight. A 10 ft Rod is required for each 10 ft Section.

E. Install and wrench tight Top Adapter Rod (item #9) to the top end of the rod assembly.

F. Slide the Rod assembly into the Section assembly.

G. Take the Bottom Rod Collet assembly and screw it wrench tight onto the Rod (loctite) that is inside the section. Slide the rods up into the section until the Bottom Swage (item #4) is in the run position inside the Bottom Element (item #?).



***Caution: Be extremely careful not to damage the Seal Bore Receiver when installing the Top Rod!***

**3.4** Install 1 O-Ring onto Pin connection of Lower Seal Bore Receiver (item #1). Lightly Grease the Box Element connection and pin connection of the Seal Bore Receiver and install using a strap wrench. Do not tighten excessively and keep pipe wrenches away from the receiver.

**3.5** Install the Secondary Setting Sleeve (item #15) into the Lower Seal Bore Receiver.

**3.6** Take the Bottom Rod Collet assembly and screw it wrench tight (loctite) onto the Top Adapter Rod (item #9)

**3.7** Slide the rods up into the section until the Bottom Swage (item #4) is in the run position inside the Box Element (item #3).

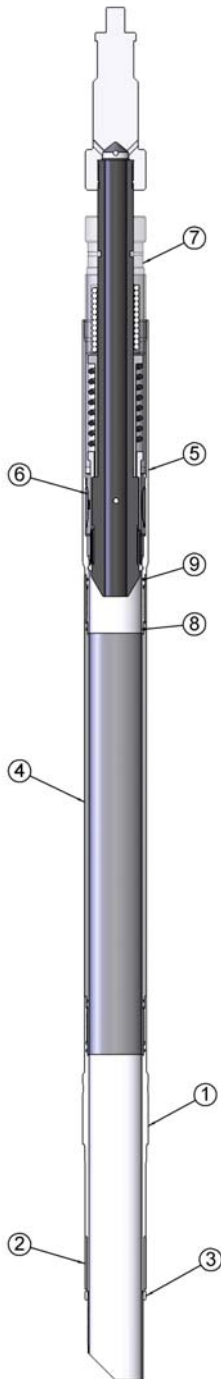


**Caution:** *Be extremely careful not to damage the Seal Bore Receiver when installing the Top Rod!*

**3.8** It may be possible to pick up a short assembly with the setting tool installed; the preferred method is to insert the complete assembled anchor BHA into the lubricator on the deck and then pick up the lubricator.

**3.9** Follow running procedures as per the type of setting tool being used.

### 4.0 Stinger Sections, Schematics and BOMs



TOP STINGER SECTION		
1	1	STANDARD STINGER (W/90 DEG WICKER)
2	1	SEAL STACK
3	1	SEAL RETAINER RING (W/90 DEG WICKER)
4	N	5 FT SECTION
4	N	10 FT SECTION
5	1	TOP SEAL BORE RECEIVER
6	1	LATCH COLLET (W/77 DEG WICKER)
7	1	LDT/DRT
8	N+2	BOX O-RING
9	N+2	PIN O-RING
STANDARD STINGER SECTION		
1	1	STANDARD STINGER (W/90 DEG WICKER)
2	1	SEAL STACK
3	1	SEAL RETAINER RING (W/90 DEG WICKER)
4	N	5 FT SECTION
4	N	10 FT SECTION
5	1	TOP SEAL BORE RECEIVER
6	1	LATCH COLLET (W/90 DEG WICKER)
7	1	LDT/DRT
8	N+2	BOX O-RING
9	N+2	PIN O-RING
LOWER STINGER SECTION		
1	1	STANDARD STINGER LH (W/90 DEG WICKER)
2	1	SEAL STACK
3	1	SEAL RETAINER RING (W/90 DEG WICKER)
4	N	5 FT SECTION
4	N	10 FT SECTION
5	1	STANDARD SEAL BORE RECEIVER
6	1	LATCH COLLET (W/90 DEG WICKER)
7	1	LDT/DRT
8	N+2	BOX O-RING
9	N+2	PIN O-RING

## 5.0 Stinger Section Assembly

**5.1** Apply a thin layer of grease on the Seal Stack area of Standard Stinger/Top Stinger/Lower Stinger., then install the Seal Stacks (item #2) into the Stinger in the order as packaged.



**Caution: Be sure to remove any excess grease from the Stinger!**

**5.2** Using loctite, install the Seal Retainer Ring (item #3) until it shoulders out on the buttress thread relief.



**Caution: Do not over tighten!**

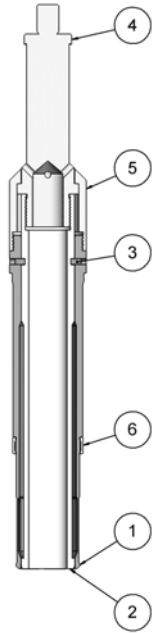
**5.3** Install 1 O-Ring into the box connection of a Standard Stinger/Top Stinger/Lower Stinger and in the Pin Connection of the Standard Seal Bore Receiver (item #5) or Top Seal Bore Receiver (item #5).

**5.4** Install 2 O-Rings onto the pin and box-end of the appropriate number of sections and assemble in a maximum of 30 foot (9m) lengths.

**5.5** Grease the pin connections of the sections and install the Standard Stinger/Top Stinger/Lower Stinger assembly using a strap wrench. Do not tighten excessively and keep pipe wrenches away from the stinger assembly.

**5.6** Grease the pin connection of the Standard Seal Bore Receiver or Top Seal Bore Receiver and install on the box connection of the Section Assembly using a strap wrench.

## 6.0 Linear Deployment Tool, Schematics and BOM



ITEM	QTY	LINEAR DEPLOYMENT TOOL
1	1	SECTION DEPLOYMENT COLLET
2	1	SECTION DEPLOYMENT MANDREL
3	2	SHEAR SCREW, BRASS
4	1	TOP CONNECTION
5	1	SECTION DEPLOYMENT RETAINER
6	1	COLLET NOSE GUIDE



## 7.0 Linear Deployment Tool Assembly

**7.1** Apply Loctite on Collet Nose Guide thread of the Collet and screw the Collet Nose Guide (item #6) on hand tight until it shoulders out.

**7.2** Insert the Section Deployment Collet (item #1) into the Standard Seal Bore Receiver or Top Seal Bore Receiver until it bottoms out.

**7.3** Assemble Section Deployment Mandrel (item #2) and Top Connection (item #4) with loctite and make wrench tight. Insert the Section Deployment Mandrel with Top connection assembly into the Section Deployment Collet. Line up the spot faces on the Section Deployment Mandrel with the tapped holes in the Section Deployment Collet and install 2 Brass Shear Screws (item #3).



*Note: Do not Drive Mandrel Assembly too far or you will have to disassemble and start again.*

**7.4** Install Section Deployment Retainer (item #5) onto Section Deployment Collet (item #1) with loctite and make wrench tight.

**7.5** Follow running procedures as per the type of setting tool being used.

## 8.0 Linear Deployment Tool Disassembly

**8.1** Remove the Section Deployment Retainer from the Section Deployment Collet. Remove the Top Connection from the Section Deployment Mandrel.

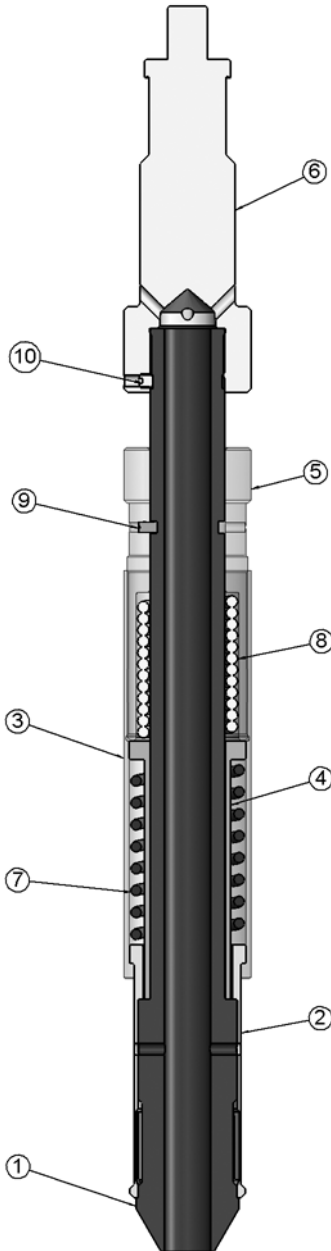
**8.2** Remove the Section Deployment Mandrel from the Section Deployment Collet by pulling the Mandrel out the bottom of assembly.

**8.3** Remove remnants of the Brass Shear Screws from the Section Deployment Mandrel and from the Section Deployment Collet. Clean all parts thoroughly before re-assembly.



***Caution: Always disassemble and clean the tool after every use! Do not store an assembled tool!***

## 9.0 Deployment and Retrieval Tool, Schematics and BOM



ITEM	QTY	DEPLOYMENT AND RETRIEVAL TOOL
1	1	INNER MANDREL
2	1	LOCKING COLLET
3	1	COLLET HOUSING
4	1	SPRING STOP
5	1	SCREW HOUSING
6	1	SUCKER ROD CONNECTION
7	1	SET SPRING
8	1	RELEASE SPRING
9	2	SHEAR SCREW, BRASS
10	1	SET SCREW

## 10.0 Deployment and Retrieval Tool- Assembly



*Note: Liberally apply grease to all IDs, ODs and threaded surfaces, except the OD of the Collet Housing.*

**10.1** Place the Collet Housing (item #3) onto an aluminum or wooden block, threaded end up, and then insert the Locking Collet (item #2).

**10.2** Put the Collet Housing/Locking Collet into a vise, near the lipped end of the housing.

**10.3** Insert the Inner Mandrel (item #1) into the Collet Housing/Locking Collet, until the holes in the mandrel align with those in the collet.

**10.4** Insert an appropriate size Phillips-head screwdriver, punch or similar, into the aligned holes until it sticks out the other side. This will hold the tool parts in place during assembly.

**10.5** Put the Set Spring (item #7) onto the Spring Stop (item #4), and then insert it, spring first, onto the threaded end of the Inner Mandrel.

**10.6** Insert the Release Spring (item #8) onto the threaded end of the Inner Mandrel, and push against the Spring Stop.

**10.7** Insert the Screw Housing (item #5) over the threaded end of the Inner Mandrel. Using a pipe wrench, thread the Screw Housing into the Collet Housing until it stops.



*Note: The holes in the Screw Housing should be aligned with the groove in the Inner Mandrel.*

**10.8** Screw in 2 Brass Shear Screws (item #9), evenly spaced, into the Screw Housing.

**10.9** Install the Sucker Rod Connection (item #6) onto the Inner Mandrel, then screw the Set Screw (item #10) into the Sucker Rod Connection.

**10.10** Finally, remove the screwdriver. The tool is now complete.

## 11.0 Deployment and Retrieval Tool- Disassembly

**11.1** Put the tool into a vise, near the lipped end of the Collet Housing.

**11.2** Remove the Set Screw from the Sucker Rod Connection, then remove the connection.

**11.3** Remove the Screw Housing.

**11.4** Remove the Release Spring.

**11.5** If you are using the tool for another run, stop disassembly at this point and reassemble from step 10.3. If not, proceed to the next step.

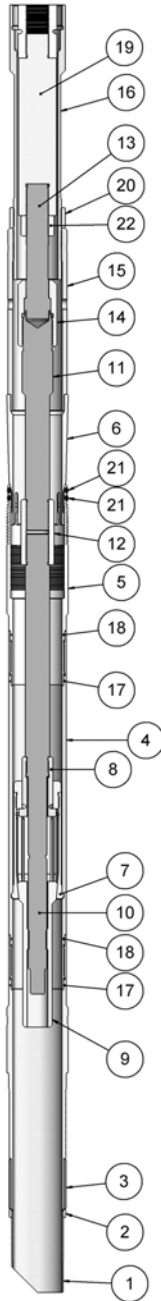
**11.6** Remove the Spring Stop and Set Spring.

**11.7** Remove the Inner Mandrel.

**11.8** Finally, take the Collet Housing/Locking Collet out of the vise. Place the assembly on an aluminum or wooden block, threaded end down, and use a rubber mallet to drive the Locking Collet out of the housing.

**11.9** Clean all parts thoroughly.

## 12.0 Top Completion Assembly, Schematics and BOM



ITEM	QTY	TOP COMPLETION ASSEMBLY
1	1	TOP STINGER (W/86 DEG WICKER)
2	1	SEAL RETAINER RING (W/86 DEG WICKER)
3	1	SEAL STACK
4	1	PROFILE SUB
5	1	PIN ELEMENT
6	1	TOP SWAGE
7	1	COLLET ASSEMBLY
Incl. In item 7	1	COLLET
	1	END SUB
8	1	RELEASE RING (60K)
9	1	COLLET SUPPORT
10	1	BOTTOM ROD
11	1	TOP ADAPTER ROD
12	1	ROD TANDEM CONNECTOR
13	1	QUICK CHANGE ROD
14	1	QUICK CHANGE NUT
15	1	SETTING SLEEVE
16	1	SLEEVE NUT
17	2	BOX O-RING
18	2	PIN O-RING
19	1	BOTTOM ADAPTER
20	1	LOCK RING (SETTING SLEEVE)
21	2	ELASTOMER

## 13.0 Top Completion Assembly

**13.1** Assemble the Top Stinger assembly as per steps 3.1 - 3.6.

**13.2** Install the pin and box O-Rings onto the appropriate length of sections and assemble (as determined by the Lubricator length).

### 13.3 Rod and Collet Assembly

A. Slide the Collet (item #7) over the Bottom Rod (item #10), then screw the Release Ring (item #8) onto the Bottom Rod. Screw the 1/4-15x5/16 Set Screw into the Release Ring and tighten it into the recess provided on the Bottom Rod.

B. Slide the Collet down over the Release Ring and then screw the Rod Tandem Connector (item #12) onto the top of the Bottom Rod and wrench tight.

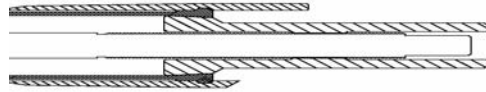
C. Vise the rod assembly just above the Release Ring, then lightly lube the OD and ID of the Collet fingers. Thread the Collet Support (item #9) onto the Bottom Rod and into the Collet and screw the support far enough into the Collet (about half way) to allow the fingers of the Collet to move inwardly over the support. Take the Bottom Rod Collet assembly and screw it wrench tight (loctite) onto the top adapter rod (Item #?).



D. Install the pin and box O-Rings onto the Profile Sub (item #4).

E. Remove the assembly from the vise. Now, slide the Profile Sub with the collet profile groove in the ID, over the top end of the Rods and push it down over the Collet (item #7) until the Collet fingers engage the profile inside the sub. You may need to drop the assembly against a strike plate to engage the Collet fingers into the profile.

F. Screw the Collet Support (item #9) back out tight against the Collet. Make wrench tight.



**Caution:** *Be careful not to loosen the engagement of the Release Ring. The bottom end of the taper on the Collet Support should be near the bottom end of the Collet fingers as shown in the illustration!*



**Note:** *A Teflon zip tie lock can be used below the Collet Support on the Bottom Rod instead of thread lock if temperature permits.*

**13.4** Install the O-Ring (item #18) into the Pin Element (item #5). For GTX-SPAN™ systems, lightly grease 2 Elastomers and install onto the Element. Make sure that the Elastomers are completely seated in their grooves, then make up the Element to the Profile Sub (item #4).

**13.5** Make up Profile Sub/Element with the Bottom Rod/Collet Assembly to the Section Assembly and tighten with strap wrench. Do not tighten excessively and keep pipe wrenches away from the element assembly.

**13.6** Insert the Top Swage (item #6) into the Pin Element.

**13.7** Install (item #17) O-Ring into box connection of the Top Stinger.

**13.8** Grease the pin connections of the sections and install the Top Stinger assembly into the section or Profile Sub, by using a strap wrench. Do not tighten excessively and keep pipe wrenches away from the stinger assembly.

**13.9** Tool assembly is ready for connection to setting tool.

**13.10** Follow running procedures as per the type of setting tool being used. A centralizer should be used with the setting tool.

