Safety Clamp
Operation Manual

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Revision History

Rev	Date	Reason
A	12/12/14	Issued for Use
B	5/29/15	Added Spare Parts List for HSCKIT and parts list for Type MP and T.
C	7/15/16	Revised Tables 2, 3, 4, 5, 6, and 13.
D	6/6/18	New hydraulic safety clamp handle design and pump no longer has a red shipping plug.
E	12/05/2023	Corrected Table 2, Updated Table 4

Description of Change

Rev	Change
B	Added Figures 8-10 and Table 11-13
C	Modified Tables 2, 3, and 4 by adding weights, Type MP insert quantity, and corrected note. Maximum was 10,000 (Table 5 & 6). Revised General section. Added Figure 3, 4, 5, 6, and 8. Changed Figure 10 (now #16) and Table 13.
D	New picture in Figures 7, 8, and 16, and added note to General section and statement to Options section. Removed reference to red pump shipping plug in Installation and Storage sections. Added MP connection instructions and clarified MP Installation instructions on page 10. Switched Table 2 and 3. Corrected sizing on T7624-5045 and T7624-5046. Updated Table 9, 10, 11 and 13.
E	T7624-5041 was shown to be 30 segments, Added T33025, T33032, & T33033

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GENERAL

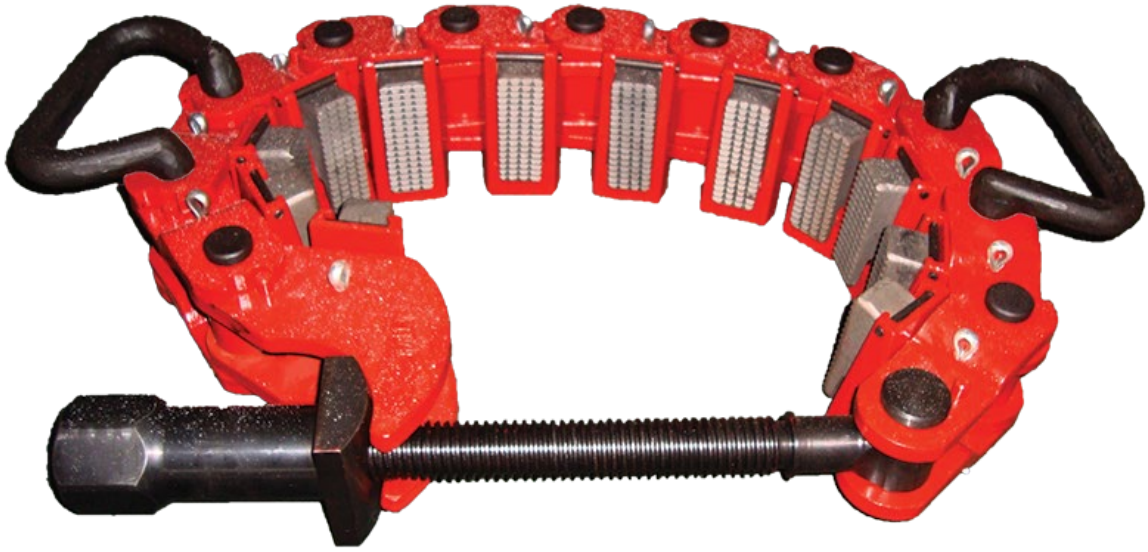

Figure 1 – MP safety clamp

Texas International Oilfield Tools (TIOT) offers safety clamps for tubing (T) and casing (C). Multipurpose (MP) safety clamps are adjustable to a variety of tubular. The clamp has its own box with a nut wrench and an allen wrench. Manual clamps are equipped with screw and nut combination. The nut secures the clamp around the pipe and should be tightened with the supplied nut wrench. The clamp grips uniformly by design. The individual links give the clamp flexibility to wrap around the pipe and the inserts are spring loaded. See Specification tables on pages 6 through 7 for size ranges.

The safety clamps are not designed to hold or hoist the string weight – use in conjunction with slips

NOTE

The maximum distance between clamp and slips is one quarter inch (¼") – the closer the better

The end user determines the clamping torque necessary to prevent marking/damaging tubular. Clamps are also available in an air over hydraulic configuration, which install easier and faster without a nut or wrench and use rig air (125 psi). The hydraulic safety clamp pressures up in seconds using a foot or hand actuated pump.

Ensure clamps are properly sized for the tubular in operation

Clamps are used in casing and/or tubing operations, as well as makeup and breakout in addition to the slips. The hose on the hydraulic units needs to be disconnected during makeup and breakout to allow rotation.

For hydraulic units - do not use the hose to transport the clamp

CONVENTIONS

IMPORTANT SYMBOL IDENTIFICATION	
	**WARNING** to Operators / Users
	**CAUTION** to Operators / Users
	**NOTIFICATION** to Operators / Users

Table 1

SAFETY

Texas International's equipment is used and installed in controlled rig environments involving hazardous operations and situations.

All personnel performing installation, operations, or maintenance on this clamp must have knowledge of rig procedure. All crew in the vicinity of operations should be trained on rig safety and tool operation.

SPECIFICATIONS

Type "C" Safety Clamp			
Size Range	Chain Link Qty*	Part Number**	Weight (lbs) ****
3-3/4" - 4-5/8"	7	T7624-5055	42
4-1/2" - 5-5/8"	8	T7624-5056	48
5-1/2" - 6-5/8"	9	T7624-5057	54
6-1/2" - 7-5/8"	10	T7624-5058	60
7-1/2" - 8-5/8"	11	T7624-5059	66
8-1/2" - 9-5/8"	12	T7624-5012	72
9-1/2" - 10-5/8"	13	T7624-5061	78
10-1/2" - 11-5/8"	14	T7624-5062	84
11-1/2" - 12-5/8"	15	T7624-5063	90
12-1/2" - 13-5/8"	16	T7624-5016	96
13-1/2" - 14-5/8"	17	T7624-5065	98
14-1/2" - 15-5/8"	18	T7624-5066	100
15-1/2" - 17"	19	T7624-5029	106
17-1/2" - 19"	21***	T7624-5097	108
20"	23	T7624-5032	118
21-1/2" - 22-5/8"	24	T7624-5034	123
24" - 24-1/2"	27	T7624-5039	141
26"	29	T7624-5041	157
28"	31***	T7624-5042	162
30"	33	T7624-5038	173
36"	40	T7624-5040	209
42"	46	T7624-5102	241

* an additional link may be used on air over hydraulic

** to order hydraulic clamp, end part number with 'HSC'

*** CALCULATED

**** nominal weight of clamp ONLY

Table 2

Type "T" Safety Clamp			
Size Range	Chain Link Qty*	Part Number**	Weight (lbs) ***
1-1/8" - 2"	4	T7624-5044	22
2-1/8" - 3-1/2"	5	T7624-5045	28
3-1/2" - 4-1/2"	6	T7624-5046	33

* an additional link may be necessary for air over hydraulic

** for hydraulic clamps, end part number with 'HSC'

*** nominal weight of clamp ONLY

Table 3

Type "MP" Clamp					
Size Range	Style	Link Qty*	Die/ Insert Qty	Part Number**	Weight (lbs) ***
2-7/8" - 4-1/8"	MP-S	7	8	T33030	69
4" - 5"		8	9	T33031	79
4-1/2" - 5-5/8"	MP-R	7	8	T33011	69
5-1/2" - 7"		8	9	T33012	79
6-3/4" - 8-1/4"		9	10	T33013	90
8" - 9-1/4"		10	11	T33014	100
9-1/4" - 10-1/2"		11	12	T33015	111

Table 4

Type "MP" Clamp					
Size Range	Style	Link Qty*	Die/ Insert Qty	Part Number**	Weight (lbs) ***
10-1/2" - 11-1/2"	MP-M	12	13	T33016	121
11-1/2" - 12-1/2"		13	14	T33017	131
12-1/2" - 13-5/8"		14	15	T33018	141
13-5/8" - 14-3/4"		15	16	T33019	151
14-3/4" - 15-7/8"		16	17	T33020	161
15-7/8" - 17"	MP-L	17	18	T33021	172
17" – 18-1/2"		18	19	T33022	182
18-1/8" - 19-3/8"		19	20	T33023	192
19-3/8" - 20-3/8"	MP-XL	19	20	T33024	192
20-3/8” – 21-1/2”		20	21	T33025	202
21-1/2” – 22-5/8”		21	22	T33032	212
22-5/8” – 23-3/4”		22	23	T33033	222
23-3/4" – 24-7/8"		23	24	T33034	232
29-3/8" – 30-1/2"		28	29	T33039	283

* an additional link may be necessary for air over hydraulic

** for hydraulic clamps, end part number with 'HSC'

*** nominal weight of clamp ONLY

Table 4 continued

Hydraulic Unit Ratings			
System/ Components	Minimum	Maximum	Operating
Input Pressure	110 psi	125 psi	X
Hose	X	20,000 psi	10,000 psi
Hydraulic Ram	X	5 tons	
Treadle/Foot Pump	X	8,200 psi	3,800 psi
Valve	X	6,000 psi	X

Table 5

INSTALLATION

To open the T and C type clamp, pull the hinge (T) pin (shown in Figure 12 - Item # 11). On the MP, loosen the nut (marked by arrow in Figure 2), releasing tension so it can swing open. Holding the handles, wrap the clamp around the pipe like a belt. Insert pin or on MP, push the screw back into the screw latch link segment, turning the nut to tighten. Use wrench to torque nut. The end user determines the clamping torque necessary to prevent marking/damaging tubular.

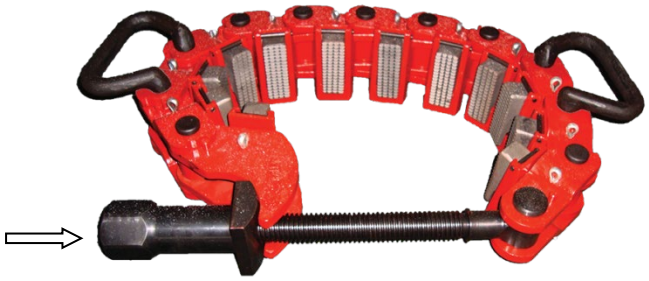

Figure 2: MP nut

With the clamp installed, the spring loaded tapered inserts are designed to firmly grip and wedge against the tubular as the load increases or as the tubular slips down. As the load increases, the spring tension and taper will result in a tighter grip that prevents further travel.

For Hydraulic units

Do not exceed the system's rated pressure

Rating	Mini mum	Maxi mum
Input Pressure	110 psi	125 psi
Hose	10,000 psi	X
Hydraulic Ram	X	5 tons
Treadle/Foot Pump	X	8,200 psi

Table 6 (same as 5)

Prior to using the hydraulic clamp, remove the shipping plug and replace with breather air vent on the foot or hand actuated pump. Prime the pump by holding down the bottom (marked PUMP) until the pull back ram moves, then release by pressing top marked RELEASE. Repeat. To connect the pump to the T and C type clamp, unscrew the set screw as shown in Figure 3 so that the rod end can be aligned with clamp end segment. Hand tighten pivot block screw in bottom - see Figure 4. Use wrench as

shown in Figure 5 to secure the pump to the clamp. Finalize the location of the rod end, using an allen wrench as shown in Figure 6 to tighten the set screw, closing the clamp with the hinge pin. To connect to the MP type clamp, remove the pin from the hydraulic cylinder rod end (shown in Figure 7), move the rod end into the end segment and secure it with the pin.

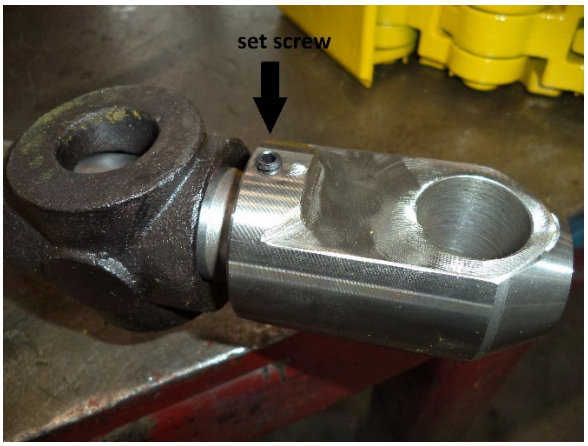

Figure 3: Set screw loosened

Figure 4: Pivot Block Screw

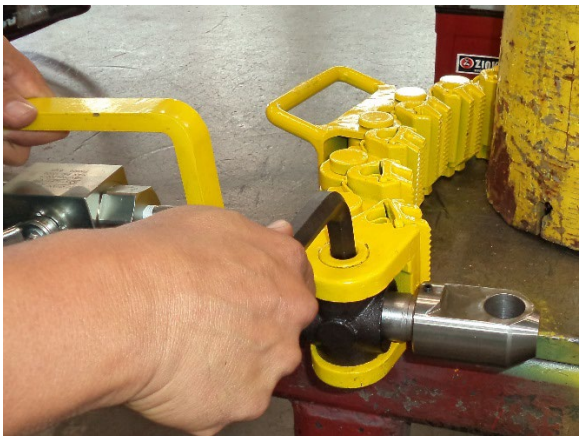

Figure 5: Tightening Pivot Block Screw

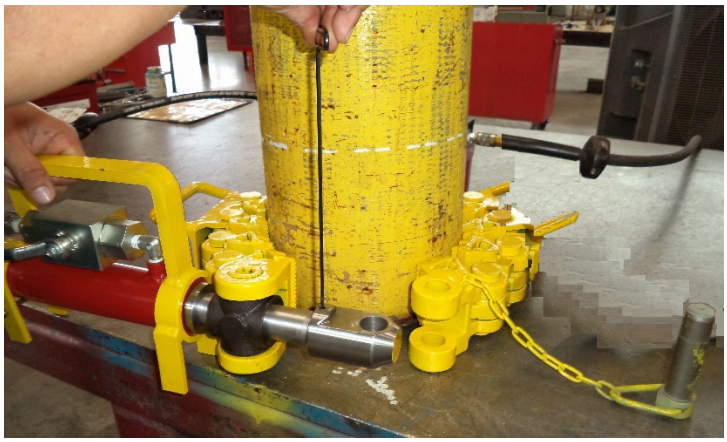

Figure 6: Tighten Set Screw

NOTE

The pump is preset to 3750 psi.

To install the T and C type clamp on the pipe, remove the hinge (T) pin (Item 10 in Figure 13). On the MP, remove (if needed) the pull back ram from the latch link segment shown in Figure 7. Wrap clamp like a belt using the handles around the pipe. Re-insert the pin on the T and C and on MP, push the pull back ram back into the latch link segment, keeping the thrust washer in the curve of the latch link segment. Depress the bottom (marked PUMP) of the foot or hand actuated pump to tighten clamp. When

the pump is not pressed, the cylinder will hold position. To avoid back pressure, the valve should be closed when pressure setpoint is reached. See Figure 8. The end user determines the clamping torque necessary to prevent marking/damaging tubular. Press the top pump edge (marked RELEASE) to release clamp.

Back pressure can damage system components, causing safety clamp to fail

A new handle design was put into service in January 2018 (see Figures 7, 8, and 16)

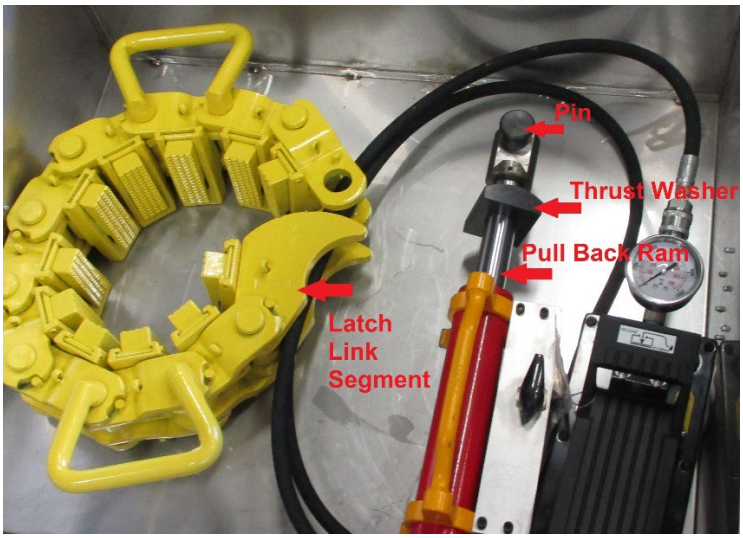

Figure 7: Air over hydraulic MP

Figure 8: Valve shown open

OPTIONS

Clamps can be shortened and lengthened depending on tubular size used. Clamps are tested before shipment at the largest size range. TIOT recommends removing or adding intermediate links starting from the center of the clamp. Begin by removing cotter pin (item 17 on Figure 12) from intermediate link pin (item 8 on Figure 12). Remove as many pins and links as necessary to shorten, or to lengthen, add pins and links. To add inserts, install spring first, then slide insert into slot compressing spring, and install cotter pin to hold spring/insert.

To prevent loss of the nut on Type C safety clamp, TIOT provides a lock screw secured with a set screw (part number T7624-MOD) shown in Figure 9. A housing is included and designed to tighten the nut using an impact wrench.

Figure 9 – Optional lock screw

PREVENTIVE MAINTENANCE

This is a suggested PM schedule. The tool owner has the responsibility to adjust the program according to actual tool usage

For hydraulic units, disconnect lines and drain system's pressure before maintenance.

Normal wear in course of use will eventually reduce the clamp's capability. Inspect the screw and nut regularly for wear. Cracks or the appearance of damage can indicate the need for repair, even impending failure, and requires prompt attention. If found, the clamp must be either pulled from operation immediately or repaired.

Daily – While in use

- Inspect the contact surface of the insert slots
- Examine hinge (T) pin, screw and nut for wear – if found, replace
- Clean inserts and inspect for wear and missing teeth – if found, replace
- Press inserts down and release - inserts should come up if springs are operational – replace springs if necessary
- Visually check for damage and cracks – if found, pull from operation for repair
- Look for worn, damaged, loose or missing parts – replace or tighten

For Hydraulic units ONLY:

- Inspect the hydraulic fluid reservoirs and refill as needed – ensure the system is retracted to prevent overfilling. Remove pump air vent and fill to ¾" of the opening
- Lubricate the RAM
- Inspect for air and fluid leaks
- Check hose for wear

Monthly *(for hydraulic units ONLY)*

- Change the hydraulic fluid - recommended fluid is 215 SSU @100F

Semi-Annual

- Check for corrosion and breakage on pins and springs – if found, replace
- Remove coating and debris from critical areas before disassembling to perform Magnetic Particle Inspection (MPI) on critical areas
- Carry on daily PM

WEAR LIMITS

The wear of the clamp affects its ability to support the required load. Clamps for which the pin clearance measurements are larger than the minimum shown in Table 7 require replacement.

	Total Clearance
Link	0.04
Handle	
Latch	

Table 7

CRITICAL AREA MAP

Darken/striped areas are defined as critical

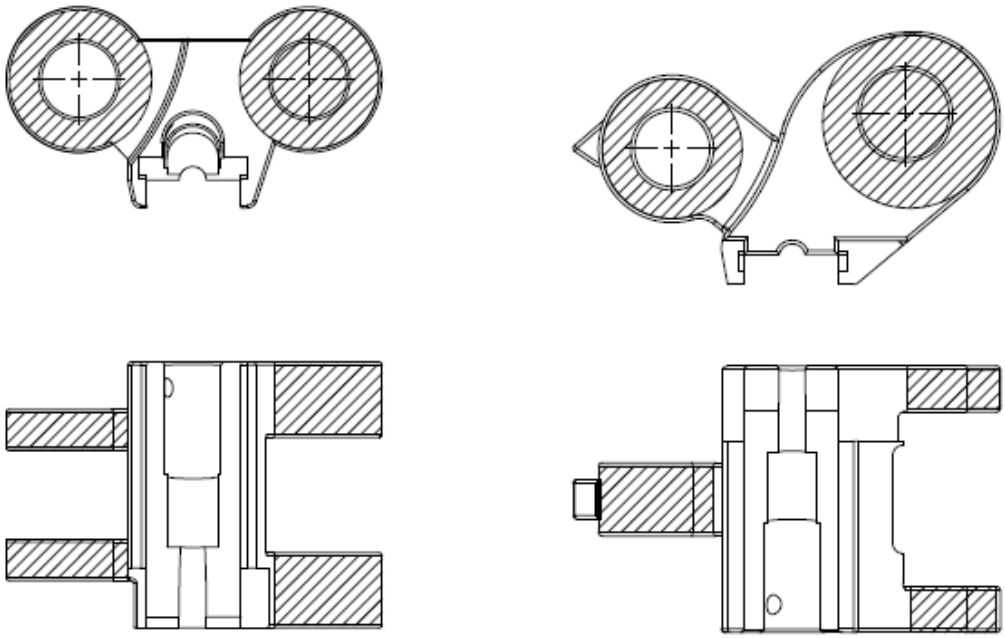

Figure 10

TROUBLESHOOTING

Failure Mode	Possible Cause	Possible Solution
Hydraulic Unit		
Clamp does not extend	Loose/faulty couplings	Secure/Tighten
		Clean/Replace
	Air supply	Verify air supply is at least 110 PSI
RAM operates slowly	Air supply	Verify air supply is at least 110 PSI
	Loose couplings	Secure/Tighten
	Hydraulic hose	Clean/replace intake filter
	Leakage	Tighten or replace
RAM does not retract	Malfunctioning	Repair/replace coupling or RAM
RAM does not fully extend	Reservoir overfilled	Depressurize and drain
	Fluid is low	Depressurize and fill
All Units		
Clamp does not open	Corrosion	Pry open, clean and lubricate
Bent/deformed pins	Wear	Verify pin clearance (see Table 7)
Clamp does not hold	Undersized tubular	Select properly sized clamp
Damaged tubing	Overtighten	End user to establish suitable torque range

Table 8

STORAGE AND TRANSPORTATION

- Unpainted surfaces should be coated with rust preventing agent
- Prevent excessive exposure to water and moisture
- Clean the tool after use - steam clean as needed; remove mud, debris and any other substances
- On Hydraulic units, coat the RAM with protective lubricant to prevent rust during long term storage, drain pressure from pump and install the shipping plug

PARTS LIST

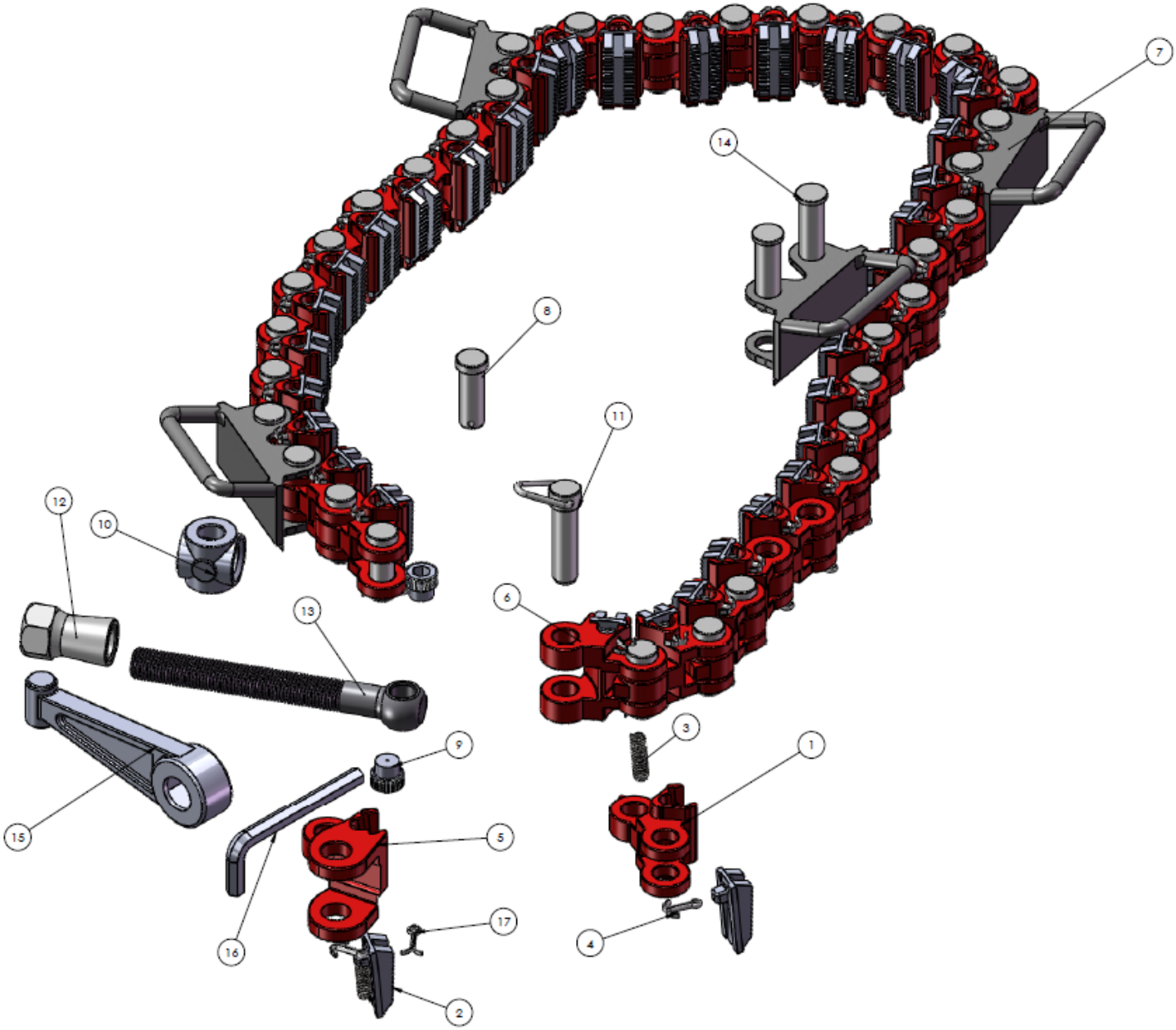

Figure 12 – Type C safety clamp

#	Component	Req	P/N
1	INTERMEDIATE LINK, TYPE C SAFETY CLAMP	AR	T7624-A-1
2	INSERT, TYPE C	AR	T7624-A-4
3	SPRING, TYPE C SAFETY CLAMP	AR	T7624-E-5
4	COTTER PIN	AR	T900620-65
5	END LINK SEGMENT, TYPE C SAFETY CLAMP	1	T7624-A-24
6	END LINK WITH PIN, TYPE C SAFETY CLAMP	1	T7624-A-3
7	HANDLE FOR TYPE C SAFETY CLAMP	AR	T7624-A-6
8	PIN FOR INTERMEDIATE LINK	AR	T7624-C-5
9	SCREW FOR PIVOT BLOCK	2	T7624-D-5
10	PIVOT BLOCK, TYPE C SAFETY CLAMP	1	T7624-A-5000
11	T PIN WITH CHAIN	1	T7624-F-5
12	NUT FOR TYPE C AND T SAFETY CLAMP	1	T7624-B-5
13	SCREW FOR TYPE C AND T SAFETY CLAMP	1	T7624-A-5
14	HANDLE LINK PIN FOR TYPE C SAFETY	AR	T7624-G-5
15	SAFETY CLAMP NUT WRENCH	1	T7624-A-25
16	ALLEN WRENCH FOR PIVOT BLOCK SCREW	1	T900533-12
17	COTTER PIN	AR	T900620-36
AR= AS REQUIRED			

Table 9 – Type C safety clamp

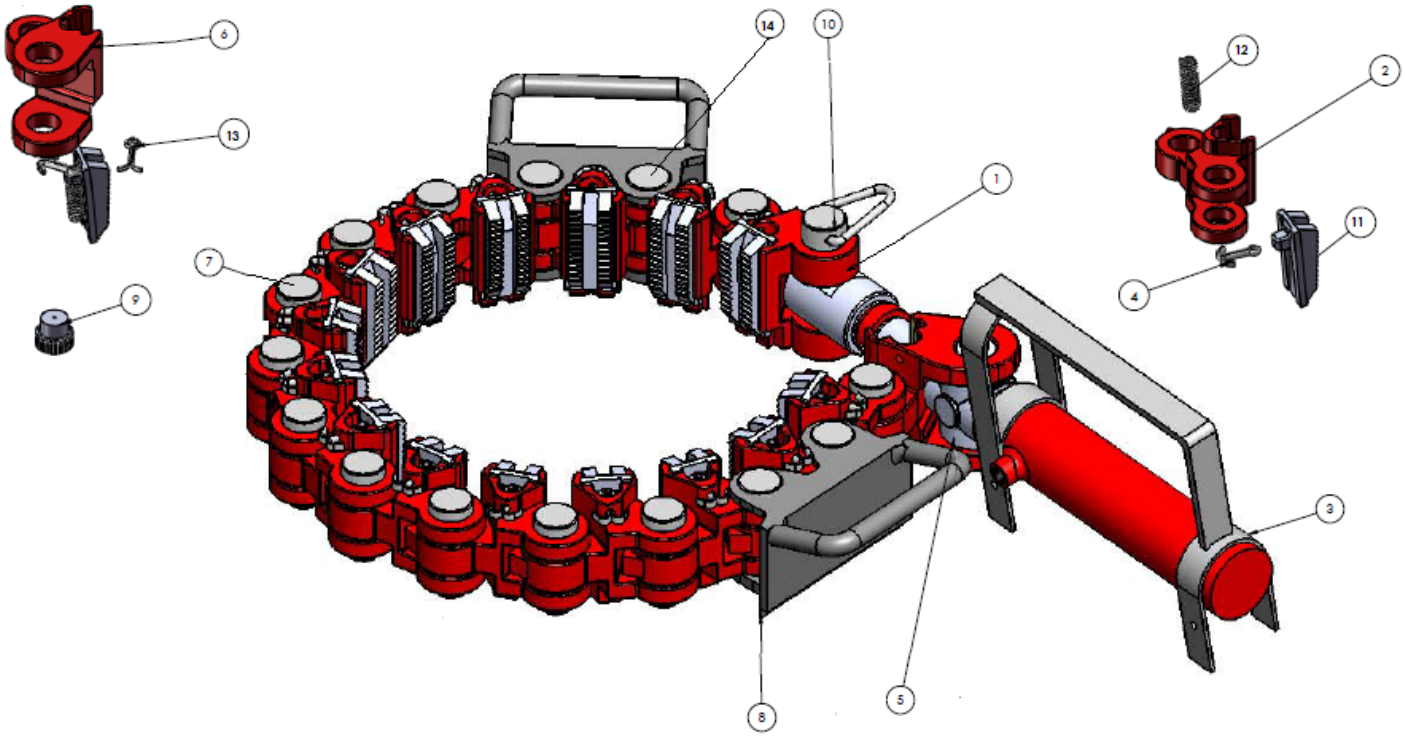

Figure 13 – Air over hydraulic type C safety clamp

Item #	Component	Req	P/N
1	END LINK WITH PIN, TYPE C SAFETY CLAMP	1	T7624-A-3
2	INTERMEDIATE LINK, TYPE C SAFETY CLAMP	AR	T7624-A-1
3	CONVERSION KIT (AIR OVER HYDRAULIC)	1	AHSCKIT
4	COTTER PIN	AR	T900620-65
5	PIVOT BLOCK, TYPE C SAFETY CLAMP	1	T7624-A-5000
6	END LINK SEGMENT, TYPE C SAFETY CLAMP	1	T7624-A-24
7	PIN FOR INTERMEDIATE LINK	AR	T7624-C-5
8	HANDLE FOR TYPE C SAFETY CLAMP	AR	T7624-A-6
9	SCREW FOR PIVOT BLOCK	2	T7624-D-5
10	T PIN WITH CHAIN	1	T7624-F-5
11	INSERT, TYPE C	AR	T7624-A-4
12	SPRING, TYPE C SAFETY CLAMP	AR	T7624-E-5
13	COTTER PIN	AR	T900620-36
14	HANDLE LINK PIN FOR TYPE C SAFETY CLAMP	AR	T7624-G-5
15*	ALLEN WRENCH FOR PIVOT BLOCK SCREW	1	T900533-12
16*	SAFETY CLAMP BOX > 16 segments		SCM-0321
	SAFETY CLAMP BOX < = 16 segments		SCM-0171

AR= AS REQUIRED

** not shown*

Table 10 – Air over hydraulic type C safety clamp

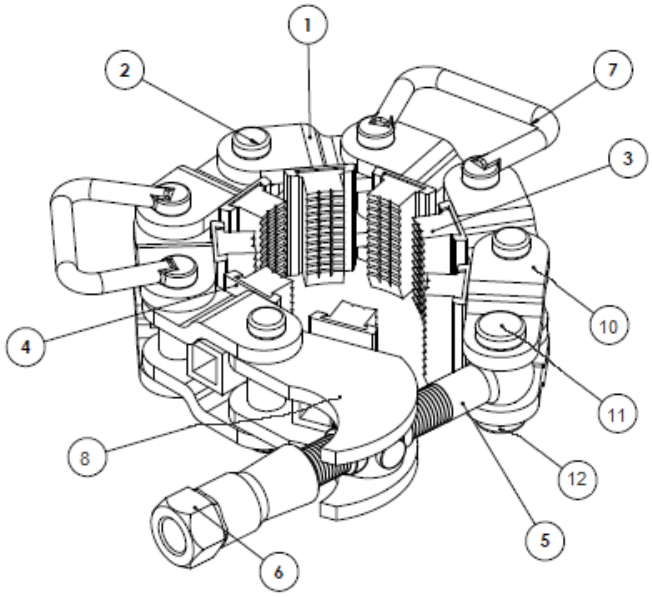

Figure 14 – MP Safety Clamp

Item #	Component	Req	P/N	Assembly P/N T3319	Assembly P/N T3324
1	LINK	AR	T3306	X	
2	INTERMEDIATE PIN	AR	T3307-1	X	
3	INSERT FOR MP-S	AR	T3333		
	INSERT FOR MP-R	AR	T3310		X
4	CARRIER FOR DIE	AR	T3309		X
5	CLAMP SCREW	1	T3302		
6	CLAMP NUT	1	T3303		
7	HANDLE	AR	T3305		
8	LATCH LINK SEGMENT	1	T3304		
10	BARS, LINK SIDE (PAIR)	1	T3318		
11	PIN FOR SCREW	1	T3308-1		
12	BUSHING FOR SCREW	1	T3315		
13*	CLAMP THRUST WASHER	1	T2714		X
14*	COTTER PIN FOR PINS	AR	T30050-10-0		
15*	SPRING FOR CARRIER	AR	T3311		X
16*	ROLL PIN FOR CARRIER	AR	T40040-16-0		
17*	COTTER PIN FOR LINKS	AR	T30050-30-0		
18*	NUT WRENCH	1	T3320		
19*	BOX	1	T7624-00		
20	CARRIER ASSEMBLY	AR	T3324	X	

* Not shown

AR= AS REQUIRED

Table 11 – MP Safety Clamp

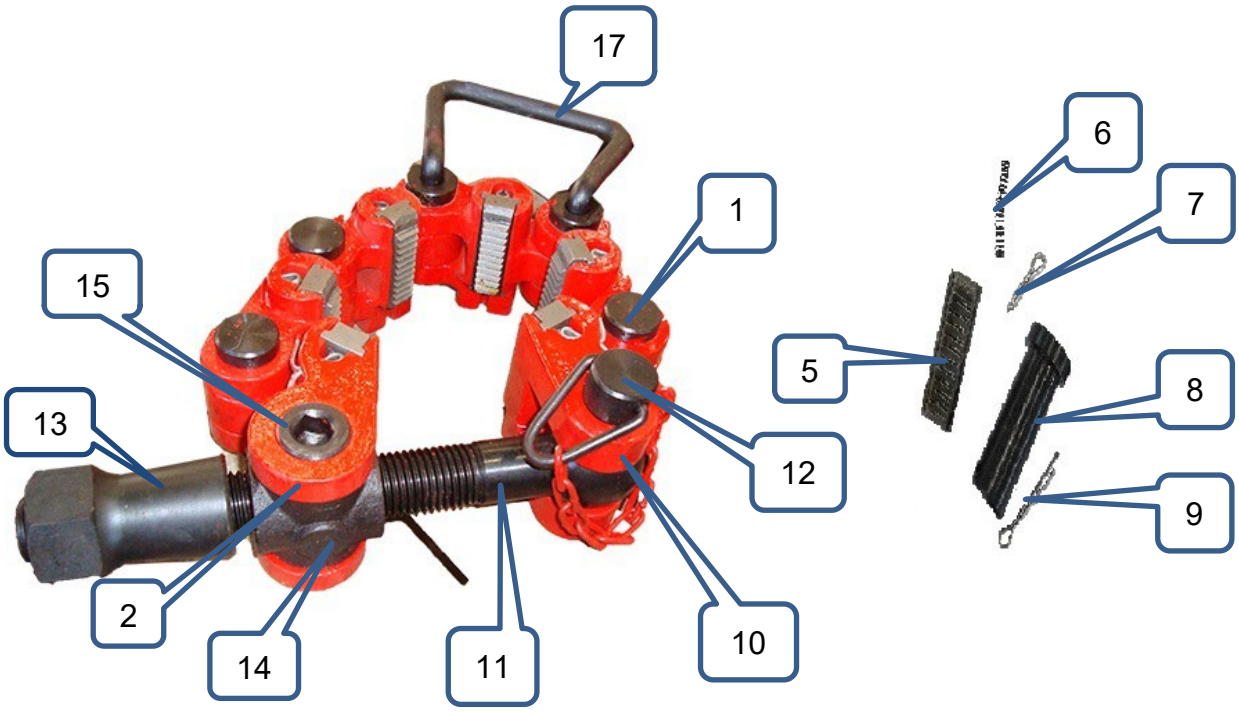

Figure 15 –Type T safety clamp

Item #	Component	Req	P/N
1	INTERMEDIATE LINK, TYPE T SAFETY CLAMP	AR	T7624-A-18
2	END LINK SEGMENT, TYPE T SAFETY CLAMP	1	T7624-A-19
3*	SAFETY CLAMP NUT WRENCH	1	T7624-A-25
4*	BOX (TYPE T)	1	T7624-A-9
5	INSERT, TYPE T	AR	T7624-A-21
6	SPRING, TYPE T SAFETY CLAMP	AR	T7624-B-21
7	COTTER PIN F/INSERTS	AR	T900620-52
8	PIN FOR INTERMEDIATE LINK	AR	T7624-C-5
9	COTTER PIN .187	AR	T900620-36
10	END LINK WITH PIN, TYPE T SAFETY CLAMP	1	T7624-A-20
11	SCREW FOR TYPE C AND T SAFETY CLAMP	1	T7624-A-5
12	T PIN WITH CHAIN	1	T7624-F-5
13	NUT FOR TYPE C AND T SAFETY CLAMP	1	T7624-B-5
14	PIVOT BLOCK, TYPE C SAFETY CLAMP	1	T7624-A-5000
15	SCREW FOR PIVOT BLOCK	2	T7624-D-5
16*	ALLEN WRENCH FOR PIVOT BLOCK SCREW	1	T900533-12
17	HANDLE FOR TYPE T SAFETY CLAMP	AR	T7624-5138

* Not shown
AR= AS REQUIRED

Table 12 – Type T safety clamp

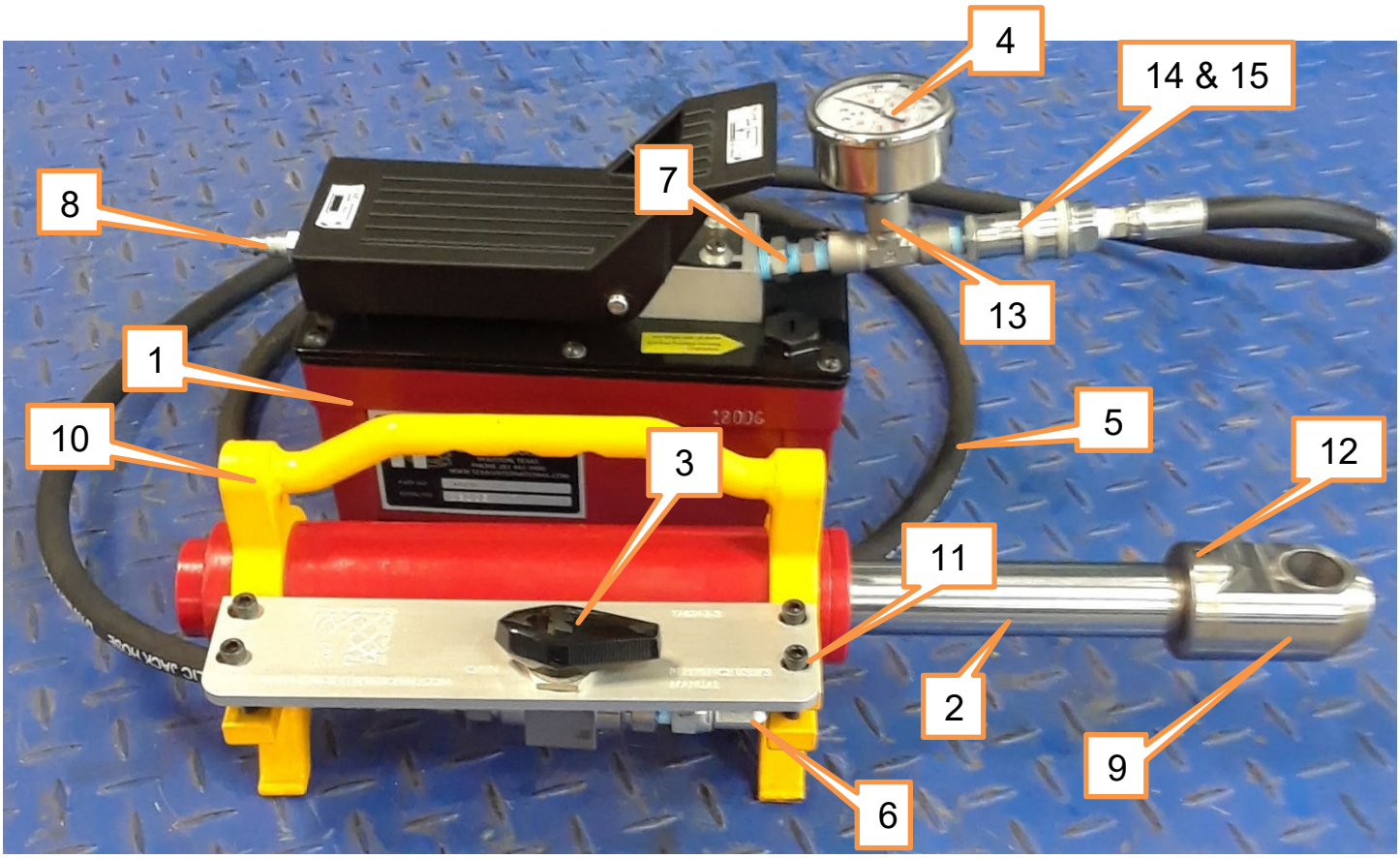

Figure 16 – AHSCKIT (shown with shipping plug installed)

Item #	P/N	Component	Qty
1	060062-38	Treadle Pump	1
2	33611-2VGA	Pull Back Ram	1
3	060117	Valve, 2 way	1
4	060047	Gage	1
5	050088	Hose	1
6	030359	Elbow	1
7	030136	Bushing, Pipe	2
8	030154	Coupling	1
9	T7624-H-1	Hydraulic Cylinder Rod End	1
10	T7624-Z-1	Hydraulic Cylinder Handle	1
11	040169	Screw, Socket Head	4
12	040181	Screw, Set	1
13	030360	Tee, Union	1
14	030137	Nipple, Pipe	1
15	030361	Quick connect	1

Table 13 – AHSCKIT

Every Company has to have a Toolbox.

At Texas International Oilfield Tools,

we provide the tools to fuel the world!