



Side Door Elevator Operation Manual

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Description of Change

Rev	Change
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GENERAL

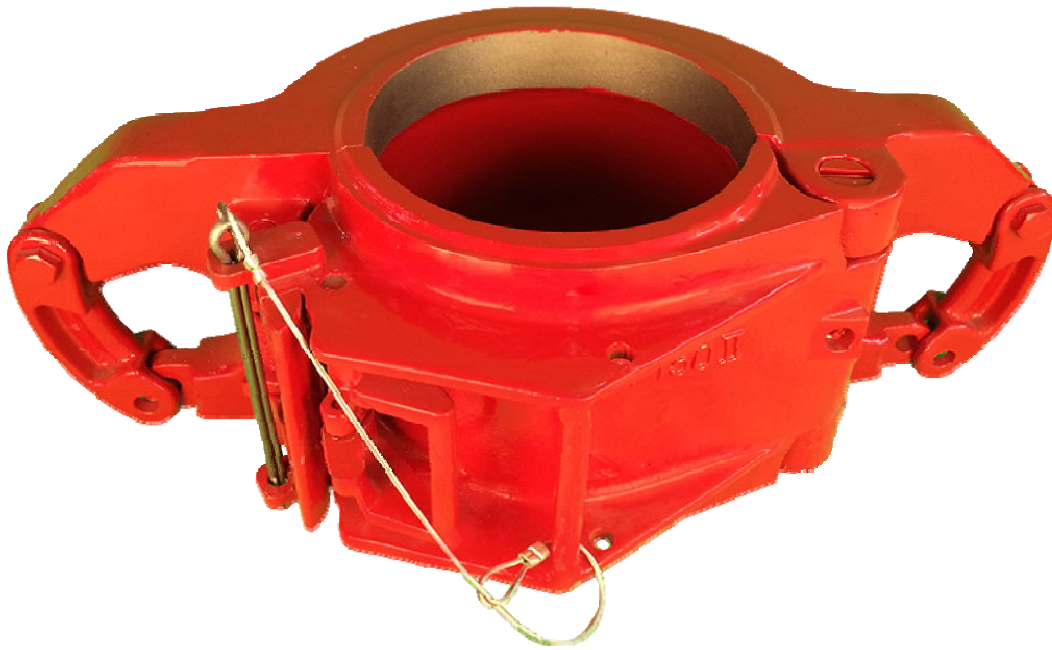


Figure 1

Texas International Oilfield Tools (TIOT) offers conventional side door elevators in two (2) different types: SLX and SX. See Specifications table on page 6 for load capacity and size ranges. The elevators hoist casing and drill collars. SLX and SX elevators should only be used with tubular having square shoulder connections or lifting plugs. The elevator has a simple, reliable door, latch and safety latch that simultaneously locks when the door closes. The safety pin is fixed with a cable onto the elevator to prevent loss. Ears are strategically placed to avoid picking up the tubular with the elevator inverted.

The SLX elevators (Figure 1 above) are designed for all size casing up to 42" with load rating from 100 to 500 ton. The shielded safety latch protects the latch from accidentally opening. To open, simply pull the safety pin, pull the latch lock handle out, and swing the elevator halves apart. Both latches operate from a single handle and automatically re-latch when the elevator door is closed.

The SX elevator (Figure 2), designed for handling large, collar type casing, is sturdier and has a safety latch requiring two (2) handed operation. The casing size ranges up to 36" with load rating of 350 and 500 tons.



Use the ears for lifting elevator – NOT the handles

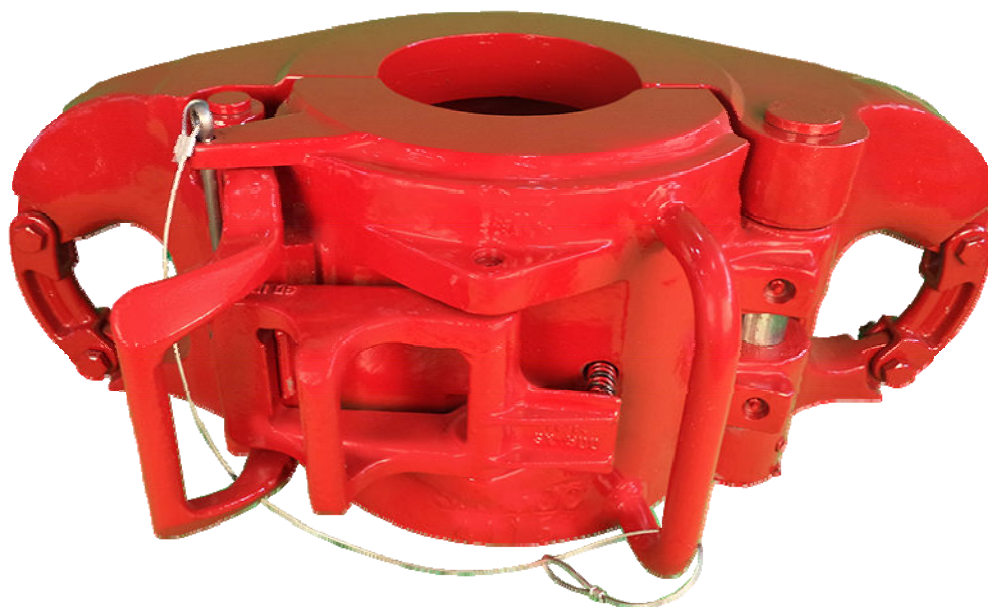


Figure 2

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

SPECIFICATIONS

SX Part Number		
Size Range	Frame PN + BC	Capacity
9-5/8" - 13-3/8"	T29964-XXX	500 Tons
9-5/8" - 13-3/8"	T29965-XXX	350 Tons
14" - 18-5/8"	T29966-XXX	350 Tons

BC= Bore code shown as XXX above

Table 2

SLX Part Number		
Size Range	Frame PN + BC	Capacity
2-3/8" - 2-7/8"	T33693-XXX	100 Tons
3-1/2" - 5-1/2"	T33854-XXX	100 Tons
4-1/2" - 8-5/8"	T31239-XXX	150 Tons
9-5/8" - 10-3/4"	T33950-XXX	150 Tons
11-3/4" - 13-5/8"	T33982-XXX	150 Tons
18-5/8" - 20"	T33632-XXX	150 Tons
5-1/2" - 7-5/8"	T41239-XXX	250 Tons
8-5/8" - 10-3/4"	T43950-XXX	250 Tons
11-3/4" - 13-5/8"	T43982-XXX	250 Tons
16" - 20"	T43632-XXX	250 Tons
6-5/8" - 9-7/8"	T53950-XXX	350 Tons
10-3/4" - 13-3/8"	T53982-XXX	350 Tons
42"	42ELEV	500 Tons

BC= Bore code shown as XXX above

Table 3

PREVENTIVE MAINTENANCE



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



When there is suspicion that the elevator has been **overloaded**, it should be pulled from operation for an Annual type PM

Normal wear in course of use will eventually reduce the elevator's capability. Inspect the bore, latch, latch pin and hinge pin regularly for wear. Cracks or the appearance of damage can indicate disrepair, even impending failure, and requires prompt attention. The elevator must be either pulled from operation immediately or repaired.

Daily (PM1) – While in use

- Apply EP 4 grease to grease ports, springs, and ears, as needed
- Inspect the contact surface of the ears. If surfaces are flattened or metal is rolled, the elevator should be pulled from operation for Annual (PM3)
- Verify safety pin is straight – if not, replace
- Check for wear on hinge pin by checking the vertical play between latch, body, and door
- Open and close the elevator 5 times slowly and 5 times quickly to ensure elevator works properly
- Visually check for damage and cracks – if found, pull from operation for repair.
- Check for corrosion on pins and springs – if found, replace
- Look for worn, damaged, loose or missing parts – replace or tighten

Semi-Annual (PM2)

- Try to open the latch by prying the latch between body and latch with a steel bar or screw driver – the latch lock prevents the latch from being opened (figures 3 and 4). If the elevator opens during pry test, pull from operation for repair
- Verify bore dimension is within API specification (see table 4)
- Remove coating and debris from critical areas
- Disassemble and perform Magnetic Particle Inspection (MPI) on critical areas as indicated on API Specification 8C
- Carry on daily PM

Annual (PM3)

- Repeat daily and semi-annual PMs
- Performance load test
- MPI critical areas twenty four (24) hours after load test

- Repair cast as needed - recommend repairs be done by TIOT



Proof of load test and MPI are required after remanufacture or a major weld repair in a critical area

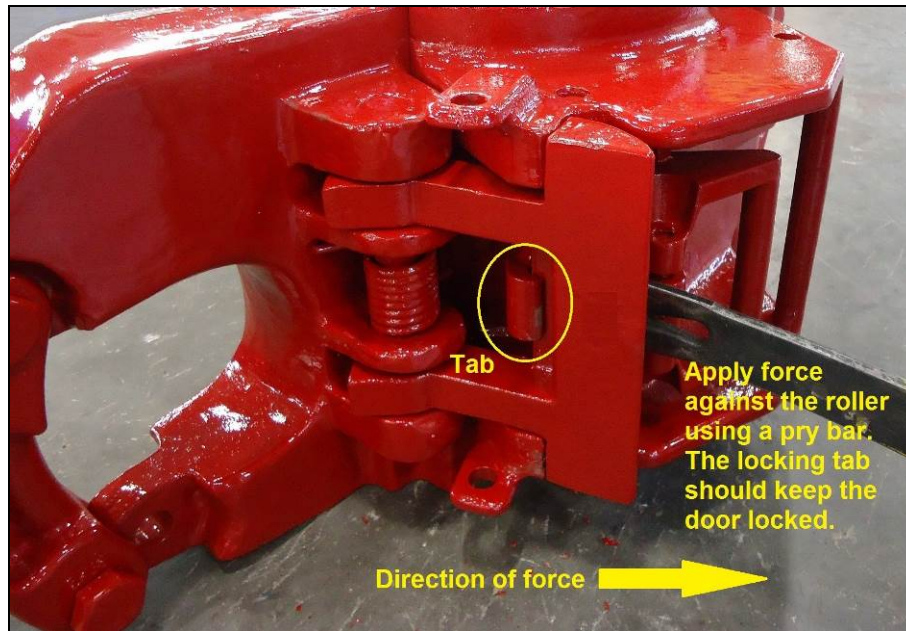


Figure 3: Pry Test Instruction SLX

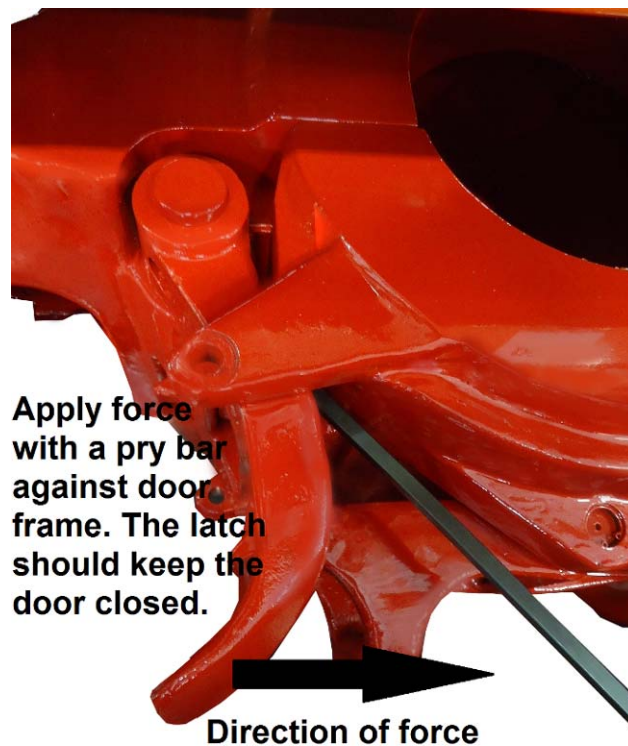


Figure 4: Pry Test Instruction SX

ELEVATOR WEAR LIMITS

The wear of the elevator bore affects its ability to support the required load. Elevators for which the bore measurements exceed the 'Maximum Allowable Wear' shown in tables 4 through 6 shall either be remanufactured or scrapped.

Drill Collars with Zip Lift Recess		
Collar OD	Bore Code	Maximum Allowable Wear (in)
4-1/8"	177	3.844
4-3/4"	435	4.406
5-1/4"	179	4.906
5-1/2"	180	5.156
5-3/4"	181	5.313
6"	362	5.563
6-1/4"	337	5.813
6-1/2"	373	6.063
6-3/4"	387	6.250
7"	361	6.500
7-1/4"	357	6.750
7-1/2"	188	7.000
7-3/4"	339	7.250
8"	336	7.500
8-1/4"	422	7.750
8-1/2"	426	8.000
9"	427	8.438
9-1/2"	370	8.938
9-3/4"	367	9.188
10"	195	9.438
10-3/4"	527	10.188
11"	419	10.438
11-1/4"	196	10.688

Table 4

Elevator Wear Limits continued

Plain Drill Collars with Lift Plug		
Collar OD	Bore Code	Maximum Allowable Wear (in)
3"	205	3.188
3-1/8"	206	3.313
3-1/4"	207	3.438
3-1/2"	209	3.688
3-3/4"	211	3.938
4"	213	4.188
4-1/8"	519	4.313
4-1/4"	548	4.438
4-1/2"	215	4.688
4-3/4"	354	4.969
5"	552	5.219
5-1/4"	219	5.469
5-1/2"	411	5.719
5-3/4"	222	6.031
6"	349	6.281
6-1/4"	348	6.531
6-3/8"	331	6.656
6-3/4"	338	7.063
7"	372	7.313
7-1/4"	335	7.563
7-1/2"	137	7.813
7-3/4"	550	8.063
8"	334	8.313
8-1/4"	347	8.563
8-1/2"	580	8.844
8-3/4"	226	9.094
9"	356	9.344
9-1/4"	227	9.594
9-1/2"	346	9.844
10	228	10.406
10-1/2"	229	10.906
11"	230	11.406

Table 5

Casing		
Casing Size (in)	Bore Code	Maximum Allowable Wear (in)
2 3/8	158	2.512
2 7/8	160	3.013
3 1/2	162	3.639
4 1/2	129	4.659
4 3/4	130	4.913
5	131	5.168
5 1/2	132	5.676
5 3/4	133	5.931
6	134	6.185
6 5/8	135	6.821
7	136	7.203
7 5/8	137	7.838
8 5/8	139	8.856
9	140	9.238
9 5/8	141	9.873
9 7/8	649	10.128
10	831	10.255
10 1/8	846	10.382
10 3/4	142	11.018
11 3/4	143	12.036
13 3/8	144	13.664
13 5/8	596	13.918
16	145	16.335
18	723	18.370
18 5/8	146	19.006
20	147	20.405
21 1/2	148	21.925
22	688	22.431
24	630	24.456
26	650	26.481
28	693	28.506
30	644	30.531

Table 6

Ear Radius (R) <i>based on tons</i>	Minimum (in)
100	1
150	1 1/2
250	1 7/8
350	1 7/8
500	2

Table 7

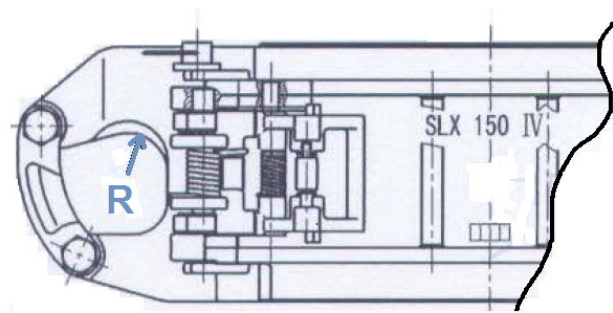


Figure 5

CRITICAL AREA MAP

Darken areas are defined as critical

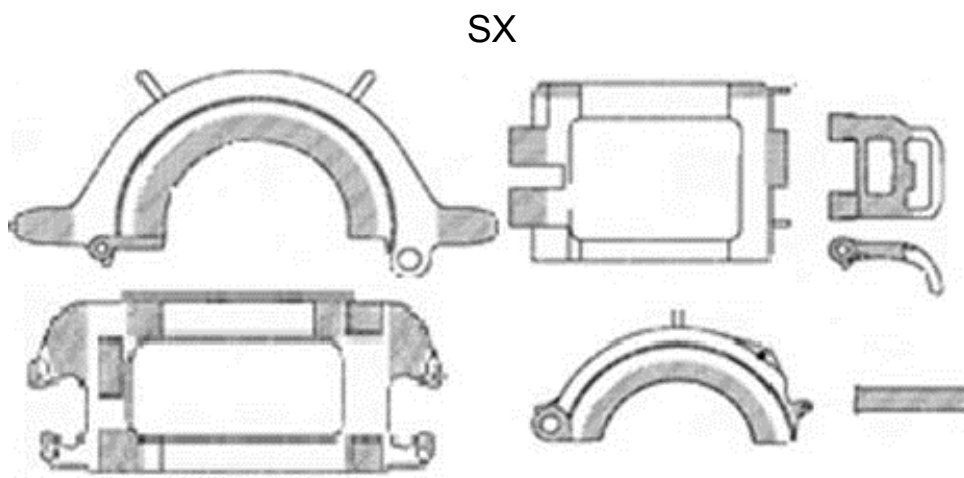


Figure 6

Elevator Type	SX 350/500
	Total Clearance (in)
Hinge Pin	0.030
Latch Pin	0.035

Table 8

SLX

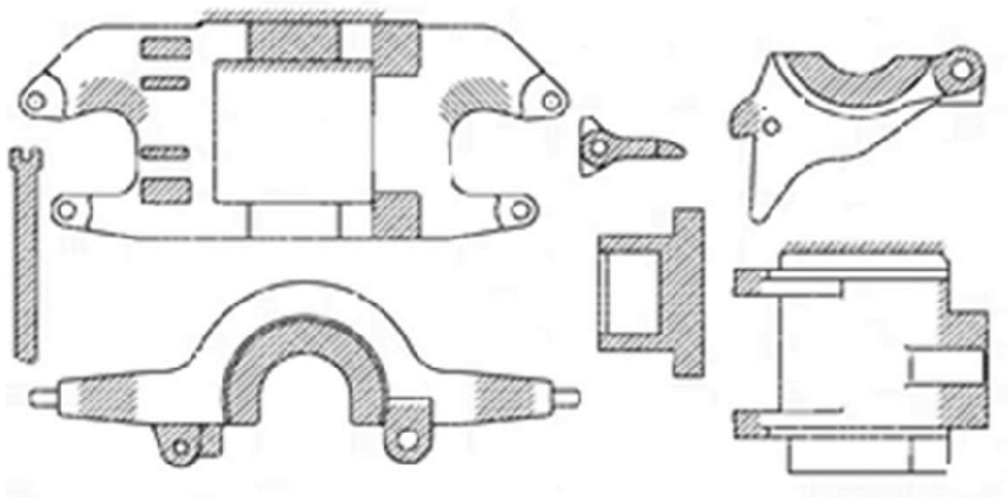


Figure 7

Elevator Type	SLX		
Capacity (in Tons)	100	150/250	350
Total Clearance (in)			
Hinge Pin	0.020	0.035	0.035
Latch Pin	0.020	0.030	0.035

Table 9

TROUBLESHOOTING

Failure Mode	Possible Cause	Possible Solution
Deformed pin holes	Overload	Scrap the tool
		Pull elevator from operation and carry on PM 3
	Wear	Verify pin clearance (see Tables 5 and 6)
Bent pins	Overload	Perform PM 3
Elevator does not open	Corrosion	Pry open, clean and lubricate.
	Overload	Carry on PM 3
		Scrap the tool
Elevator does not close	Oversized tubular	Select properly sized elevator
Elevator does not hang level	Link length difference	Use same length slings/links

Table 10

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
- Transport the unit on a suitable container or pallet

SPARE PARTS LIST

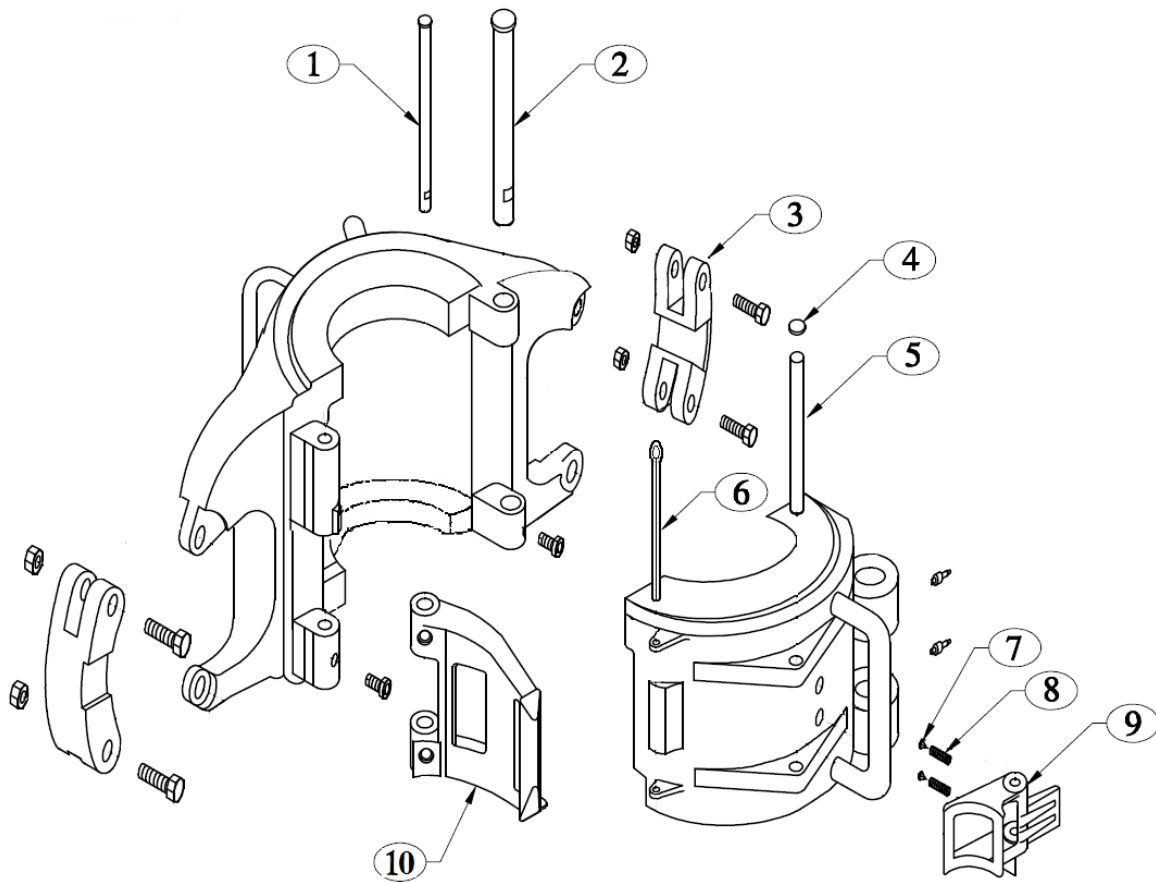


Figure 8



SX Spare Parts List					
#	Frame PN 		T29964	T29965	T29966
	Range (in)		9 5/8 - 13 3/8	9 5/8 - 13 3/8	14 - 18 5/8
	Capacity / Max Operational Load (Ton)		500	350	350
Component					
1	LATCH PIN	1	T29951		
2	HINGE PIN	1	T29956		
3	LINK BLOCK	2	T9519		
4	LATCH LOCK PIN RETAINER	1	T5302		
5	LATCH LOCK PIN	1	T6027		
6	SAFETY PIN	1	080070		
7	LATCH SPRING PLUG	2	T8024		
8	LATCH LOCK SPRING	2	T30657		
9	LATCH LOCK	1	T6021		
10	LATCH	1	T30597	T29945	T20005

Table 11

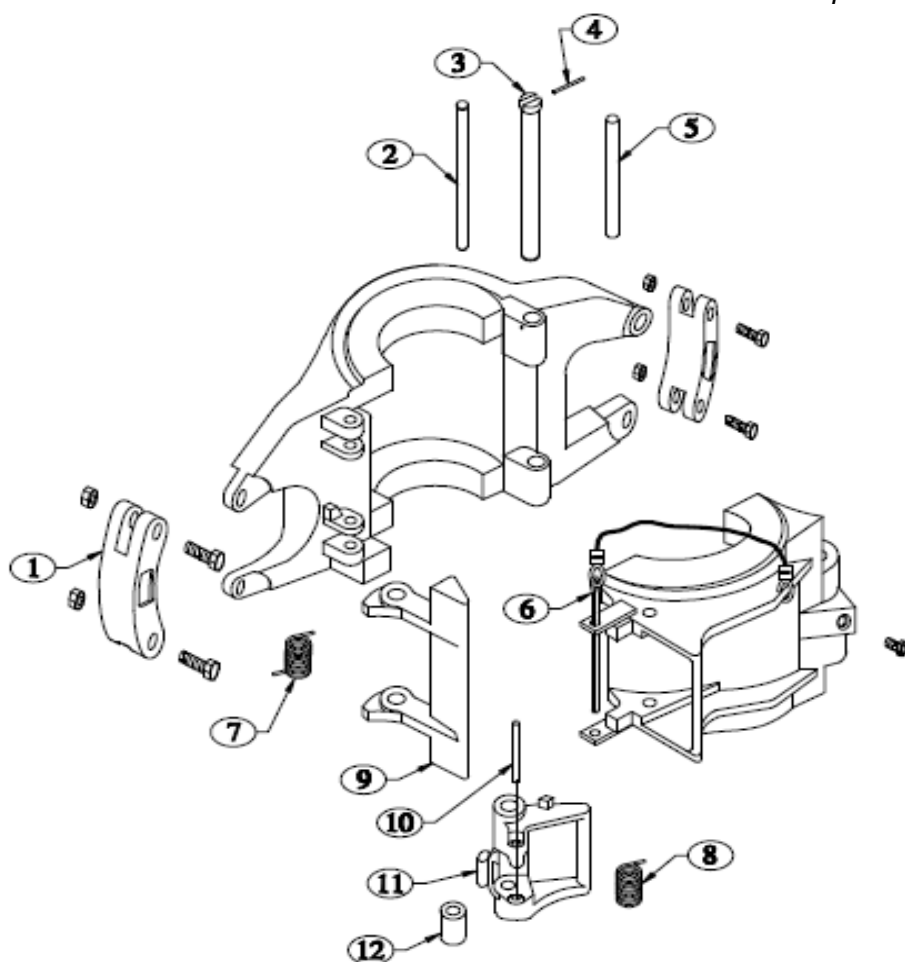


Figure 9



SLX 100 Spare Parts List				
#	Frame PN 	 Req	T33693	T33854
	Range (in)		2 3/8 - 2 7/8	3 1/2 - 5 1/2
Component				
1	LINK BLOCK	2	T32430	
2	LATCH PIN	1	T33700-4	T29980-3
3	HINGE PIN	1	T32424-5	T34613
4	HINGE PIN RETAINER	1	T34614	T32918
5	LATCH LOCK PIN	1	T33700-4	T29980-3
6	SAFETY PIN	1	080042	
7	LATCH LOCK SPRING	2	T33701	T33816
8	LATCH SPRING	2	T33703	T33818
9	LATCH LOCK	1	T33696	T33812
13	ROLLER PIN	2	T33698	T31584
11	LATCH	1	T33697	T33813
12	ROLLER	2	T33702	T33817

Table 12



SLX 150 Spare Parts List						
#	Frame PN 		T31239	T33950	T33982	T33632
	Range (in)	Req	4 1/2 - 8 5/8	9 5/8 - 10 3/4	11 3/4 - 13 3/8	16 - 20
Component						
1	LINK BLOCK	2	T9519			
2	LATCH PIN	1	T32424-3			T33645
3	HINGE PIN	1	T34611	T33953	T33985	T33646
4	HINGE PIN RETAINER	1	T32892			T32892
5	LATCH LOCK PIN	1	T29980-4			T50713
6	SAFETY PIN	1	080042			
7	LATCH LOCK SPRING	2	T31404			T33658
8	LATCH SPRING	2	T31383			T33657
9	LATCH LOCK	1	T31332			T33635
10	ROLLER PIN	2	T31584			
11	LATCH	1	T31331			T33634
12	ROLLER	2	T31407			

Table 13



SLX 250 Spare Parts List						
#	Frame PN 		T41239	T43950	T43982	T43632
	Range (in)	Req	5 1/2 - 7 5/8	8 5/8 - 10 3/4	11 3/4 - 13 5/8	16 - 18 5/8
Component						
1	LINK BLOCK	2	T9519			
2	LATCH PIN	1	T32424-3			T33645
3	HINGE PIN	1	T34611-1	T33953-1	T33985-1	T33346-1
4	HINGE PIN RETAINER	1	T32892			T31074
5	LATCH LOCK PIN	1	T29980-4	T29980-4	T50713-2	T32424-2
6	SAFETY PIN	1	080042			
7	LATCH LOCK SPRING	2	T31388			T33658
8	LATCH SPRING	2	T31383			T33657
9	LATCH LOCK	1	T31332			T33635
10	ROLLER PIN	2	T31584			
11	LATCH	1	T31331			T33634
12	ROLLER	2	T31407			

Table 14

SLX 350 Spare Parts List				
#	Frame PN 		T53950	T53982
	Range (in)	Req	6 5/8 - 9 7/8	10 3/4 - 13 3/8
Component				
1	LINK BLOCK	2	T9519	
2	LATCH PIN	2	T33645	T33613
3	HINGE PIN	1	T35009	T35001
4	HINGE PIN RETAINER	1	T35171	T35314
5	LATCH LOCK PIN	1	T32424-2	T33643
6	SAFETY PIN	1	080042	
7	LATCH LOCK SPRING	2	T33658	T33623
8	LATCH SPRING	1	T33657	T33628
9	LATCH LOCK	1	T33635	T33642
10	ROLLER PIN	1	N/A	T31584
11	LATCH	1	T33634	T33612
12	ROLLER	1	N/A	T31407
13*	HINGE PIN RETAINER RING	2	T35052	N/A
14*	LINK BLOCK PIN CLIP	2	T32051	N/A
15*	LATCH SPRING PIN	1	T32018	N/A

* Not shown

Table 15

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at Texas International Oilfield Tools.

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