



## Operation Manual

# Side Door Elevator

Type SLX, Type SX

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# Document Control

## Revision History

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# SAFETY

## **READ THIS MANUAL BEFORE USING EQUIPMENT**

Equipment supplied by Texas International Oilfield Tools is intended for installation and use in controlled environments involving hazardous operations and situations.

Only authorized and trained personnel shall install, maintain, operate and/or repair equipment supplied by Texas International Oilfield Tools, LTD. Equipment shall be used only for the purpose for which it is intended.

The User is responsible for ensuring the equipment is in safe working order prior to use. Texas International Oilfield Tools, LTD is not responsible for injuries or equipment damage that arises from equipment neglect or misuse.

The User is responsible for ensuring the safety of all personnel within the vicinity of the equipment. Texas International Oilfield Tools recommends a hazard assessment be performed by qualified safety representatives prior to using equipment. All personnel shall possess and use Personal Protective Equipment (PPE) and must be trained at minimum on rig safety, rig procedures, and equipment operation.

Specific detailed instructions and information about shop practices or procedures, operation and service, and safety criteria are not included. Notes, cautions, warnings, explanations, and information are provided herein to advise readers to take deliberate action to prevent damage to or failure of equipment and protect personnel from potential injury or lethal conditions. The information provided does not cover all possible hazards or consequences.

### **Hazard Labels Used in this Manual**



**DANGER** is represented by this hazard symbol and signifies the highest level of risk. Failure to observe and heed this information may result in serious bodily injury or death.



**WARNING** is represented by this hazard symbol and signifies potential hazards of medium risk. Failure to observe and heed this information may result in significant bodily injury, catastrophic equipment failure, and/or environmental contamination.



**CAUTION** is represented by this hazard symbol and signifies potential hazards of low risk. Failure to observe and heed this information may result in bodily injury and/or equipment damage.

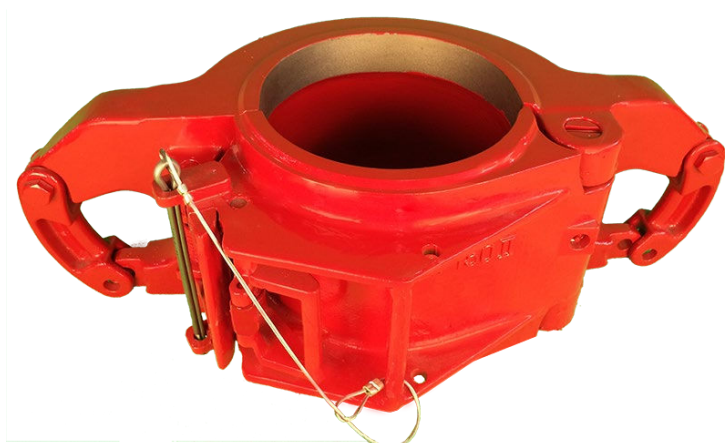


**NOTICE** symbol denotes items of importance unrelated to personal injury which highlight additional information provided to aid the user during installation, commissioning, operating, and/or maintaining equipment.

**Please pay close attention to these advisories.**

# INTRODUCTION

Texas International Oilfield Tools (TIOT) offers conventional side door elevators for hoisting casing and drill collars in two (2) different types: SLX and SX. (See Specifications Tables 1 & 2 on Page 6 for load capacity and size ranges.) SLX and SX elevators should only be used with tubulars having square shoulder connections or lifting plugs. These elevator types consist of a stationary body and hinged door that allows entry and exit of tubulars. The hinged door is secured using a latch and safety latch that simultaneously lock when the door is closed. A safety pin fixed with a lanyard onto the elevator is included as an added feature to further prevent accidental opening. Elevator ears are strategically placed to avoid picking up tubulars with the elevator inverted.



**FIGURE 1**

SLX elevators (Figure 1) are designed for all casing sizes up to 42” with load ratings from 100 to 500 tons.



**FIGURE 2**

SX elevators (Figure 2) are designed for handling large, collar type casing sizes up to 36” with load ratings of 350 and 500 tons.

# SPECIFICATIONS

| SLX Part Numbers |                |             |
|------------------|----------------|-------------|
| Size Range       | Frame Part No. | Load Rating |
| 2-3/8" – 2-7/8"  | T33693-XXX     | 100 Tons    |
| 3-1/2" – 5-3/4"  | T33854-XXX     | 100 Tons    |
| 4-1/2" – 9"      | T31239-XXX     | 150 Tons    |
| 9-5/8" – 10-3/4" | T33950-XXX     | 150 Tons    |
| 11-3/4" – 14"    | T33982-XXX     | 150 Tons    |
| 14" – 16"        | T34087-XXX     | 150 Tons    |
| 16" – 20"        | T33632-XXX     | 150 Tons    |
| 4-1/2" – 7-3/4"  | T41239-XXX     | 250 Tons    |
| 8-5/8" – 10-3/4" | T43950-XXX     | 250 Tons    |
| 11-3/4" – 14"    | T43982-XXX     | 250 Tons    |
| 16" – 20"        | T43632-XXX     | 250 Tons    |
| 22" – 24-1/2"    | T642540-XXX    | 250 Tons    |
| 26" – 30"        | T642580-XXX    | 250 Tons    |
| 4-1/2" – 6"      | T51239-XXX     | 350 Tons    |
| 6-5/8" – 9-7/8"  | T53950-XXX     | 350 Tons    |
| 10-3/4" – 14"    | T53982-XXX     | 350 Tons    |
| 42"              | 42ELEV         | 500 Tons    |

XXX Denotes Bore Size Code

**Table 1**

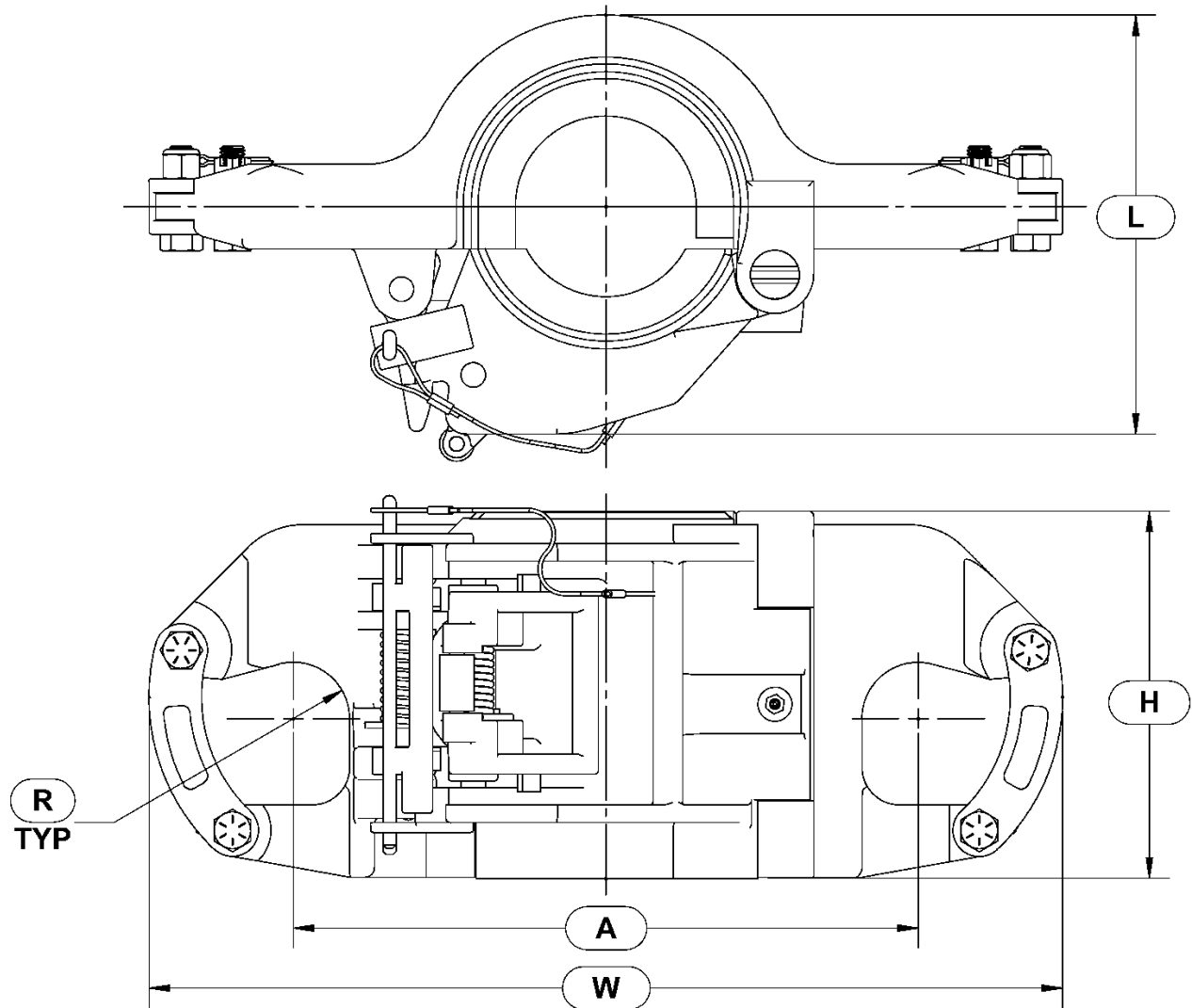
| SX Part Numbers |                |             |
|-----------------|----------------|-------------|
| Size Range      | Frame Part No. | Load Rating |
| 7" – 13-3/8"    | T29965-XXX     | 350 Tons    |
| 14" – 18-5/8"   | T29966-XXX     | 350 Tons    |
| 22" – 30"       | *              | 350 Tons    |
| 36"             | *              | 350 Tons    |
| 7" – 13-3/8"    | T29964-XXX     | 500 Tons    |
| 14"-18-5/8"     | *              | 500 Tons    |
| 22" – 30"       | *              | 500 Tons    |

XXX Denotes Bore Size Code

\*Contact TIOT

**Table 2**

## DIMENSIONS - SLX



**FIGURE 3**

| Size Range       | Capacity | A<br>(in/mm) | H<br>(in/mm) | L<br>(in/mm) | R<br>(in/mm) | W<br>(in/mm) |
|------------------|----------|--------------|--------------|--------------|--------------|--------------|
| 2-3/8" – 2-7/8"  | 100 Tons | 11.81 / 300  | 9.25 / 235   | 8.66 / 220   | 1.42 / 36    | 20.08 / 510  |
| 3-1/2" – 5-3/4"  | 100 Tons | 15.91 / 404  | 9.45 / 240   | 13.19 / 335  | 1.42 / 36    | 23.23 / 590  |
| 4-1/2" – 9"      | 150 Tons | 20.91 / 531  | 11.22 / 285  | 15.35 / 390  | 1.89 / 48    | 30.71 / 780  |
| 9-5/8" – 10-3/4" | 150 Tons | 22.68 / 576  | 11.02 / 280  | 17.13 / 435  | 1.89 / 48    | 32.09 / 815  |
| 11-3/4" – 14"    | 150 Tons | 27.01 / 686  | 11.69 / 297  | 19.21 / 488  | 1.89 / 48    | 36.93 / 938  |
| 14" – 16"        | 150 Tons | 30.75 / 781  | 12.21 / 310  | 21.73 / 552  | 1.89 / 48    | 41.02 / 1042 |
| 16" – 20"        | 150 Tons | 34.06 / 865  | 12.21 / 310  | 26.61 / 676  | 1.89 / 48    | 44.38 / 1127 |
| 4-1/2" – 7-3/4"  | 250 Tons | 20.47 / 520  | 11.81 / 300  | 16.14 / 410  | 2.17 / 55    | 29.53 / 750  |
| 8-5/8" – 10-3/4" | 250 Tons | 23.23 / 720  | 11.81 / 300  | 18.11 / 460  | 2.17 / 55    | 32.28 / 820  |
| 11-3/4" – 14"    | 250 Tons | 28.35 / 720  | 12.99 / 330  | 21.10 / 536  | 2.17 / 55    | 39.57 / 1005 |
| 16" – 20"        | 250 Tons | 35.35 / 898  | 13.39 / 340  | 29.92 / 760  | 2.36 / 60    | 46.85 / 1190 |
| 22" – 24-1/2"    | 250 Tons | 39.84 / 1012 | 13.78 / 350  | 34.69 / 881  | 2.36 / 60    | 51.18 / 1300 |
| 26" – 30"        | 250 Tons | 45.35 / 1152 | 13.78 / 350  | 40.75 / 1035 | 2.36 / 60    | 56.69 / 1440 |
| 4-1/2" – 6"      | 350 Tons | 19.29 / 490  | 13.78 / 350  | 12.99 / 330  | 2.36 / 60    | 29.33 / 745  |
| 6-5/8" – 9-7/8"  | 350 Tons | 24.80 / 630  | 13.78 / 350  | 17.52 / 445  | 2.36 / 60    | 35.04 / 890  |
| 10-3/4" – 14"    | 350 Tons | 29.92 / 760  | 14.96 / 380  | 22.24 / 565  | 2.36 / 60    | 39.96 / 1015 |

Dimensions are for reference only.

DIMENSIONS - SX

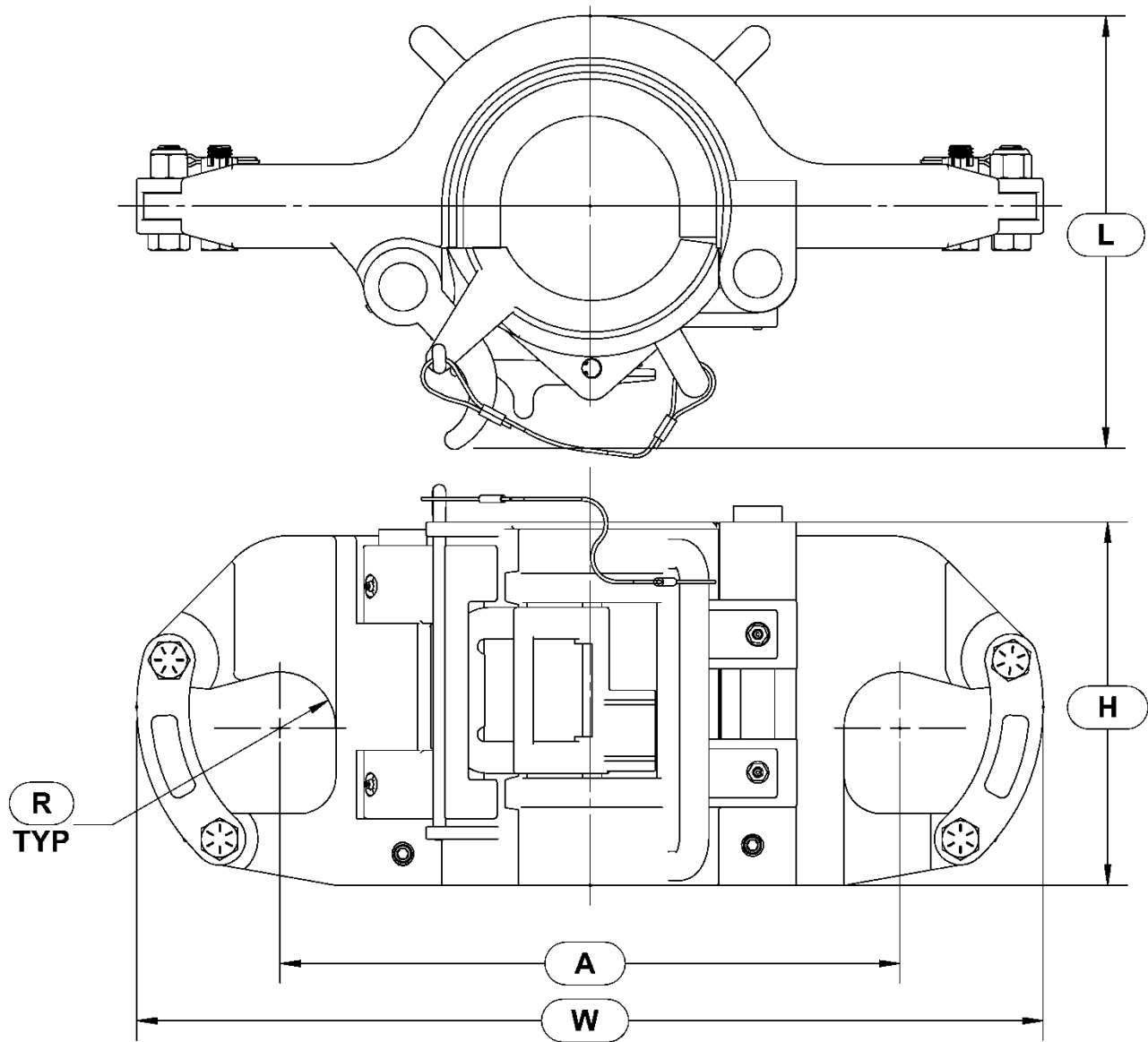


FIGURE 4

| Size Range    | Capacity | A<br>(in/mm) | H<br>(in/mm) | L<br>(in/mm) | R<br>(in/mm) | W<br>(in/mm) |
|---------------|----------|--------------|--------------|--------------|--------------|--------------|
| 7" – 13-3/8"  | 350 Tons | 26.51 / 673  | 15.31 / 389  | 25.43 / 646  | 2.01 / 51    | 40.79 / 1036 |
| 14" – 18-5/8" | 350 Tons | 33.48 / 851  | 15.35 / 390  | 32.68 / 830  | 2.05 / 52    | 47.83 / 1215 |
| 22" – 30"     | 350 Tons | 44.88 / 1140 | 16.34 / 415  | 43.31 / 1100 | 2.17 / 55    | 59.84 / 1520 |
| 36"           | 350 Tons | 51.81 / 1316 | 16.34 / 415  | 41.82 / 1240 | 2.56 / 65    | 69.09 / 1755 |
| 7" – 13-3/8"  | 500 Tons | 26.51 / 673  | 15.31 / 389  | 25.43 / 646  | 2.01 / 51    | 40.79 / 1036 |
| 14"-18-5/8"   | 500 Tons | 33.48 / 851  | 15.35 / 390  | 32.68 / 830  | 2.05 / 52    | 47.83 / 1215 |
| 22" – 30"     | 500 Tons | 44.88 / 1140 | 16.34 / 415  | 43.31 / 1100 | 2.17 / 55    | 59.84 / 1520 |

Dimensions are for reference only.

# INSPECTION & LUBRICATION



Normal wear during use will eventually reduce the elevator's capability. Cracks, wear beyond specified limits, or the appearance of damage indicates impending failure and must be replaced or repaired by an authorized TIOT service facility.



Elevators are manufactured from cast alloys that require special welding and heat treat procedures and must not be repaired in the field. Improper welding and heat treating can further damage the tool and increase the potential for equipment failure and bodily injury.



Elevators require load testing after manufacture and again after repairs. If the elevator is subjected to overloading, jarring, or impact, the elevator must be pulled from service, inspected for damage, repaired or scrapped, and must be load tested before and if returning the tool to service.



Remove the elevator from well center before performing any maintenance.



Routine lubrication and inspection are recommended, but criteria and frequency are only suggestions and should be adjusted according to the actual usage of the tool.



Lubricate the unit prior to and during use.



When using or storing the elevator, lubricate on a regular basis to protect the unit from conditions that can cause damage such as rust and corrosion.

## Inspection Criteria with Checklist

| PM1                      | Daily | Visual Inspection & Maintenance while tool is in use.                                                                                                                                                        |
|--------------------------|-------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <input type="checkbox"/> | 1.    | Apply EP 4 grease to grease ports, springs, and ears, as needed.                                                                                                                                             |
| <input type="checkbox"/> | 2.    | Open and close the elevator and number of times slowly and several times quickly to check functionality.                                                                                                     |
| <input type="checkbox"/> | 3.    | Inspect the contact surface of the ears. If surfaces are flattened or metal is rolled, pull the elevator from operation for PM3 inspection (below) and contact TIOT for replacement or repair, as necessary. |
| <input type="checkbox"/> | 4.    | Verify straightness of the safety pin – if bent, replace the pin.                                                                                                                                            |
| <input type="checkbox"/> | 5.    | Check for wear on hinge pin by checking the vertical play between latch, body, and door.                                                                                                                     |
| <input type="checkbox"/> | 6.    | Visually check for damage and cracks – if found, pull from operation for PM3 inspection (below) and contact TIOT for replacement or repair, as necessary.                                                    |
| <input type="checkbox"/> | 7.    | Check for corrosion on pins and springs – if found, replace the affected item(s).                                                                                                                            |
| <input type="checkbox"/> | 8.    | Look for worn, damaged, loose, or missing parts – replace or tighten, as necessary.                                                                                                                          |

**PM2      Bi-Annual      Perform PM1 plus the following additional inspections:**

- ☐ 1. Perform PM1.
- ☐ 2. Try to open the latch by prying the latch between body and latch with a steel bar or screwdriver – the latch lock prevents the latch from being opened (Figure 5 or Figure 6). If the elevator opens during pry test, pull from operation, and repair or replace, as necessary.
- ☐ 3. Verify bore dimension is within API specified limits (see Table 4, 5, or 6)
- ☐ 4. Disassemble and remove coating and debris from critical areas.
- ☐ 5. Perform Magnetic Particle Inspection (MPI) on critical areas as indicated in Figure 8 or Figure 9 and per API Specification 8C.
- ☐ 6. Contact TIOT for replacement or repair if indications are found.

**PM3      Annual      Perform PM1 and PM2 plus the following additional inspections:**

- ☐ 1. Perform PM1 and PM2.
- ☐ 2. Disassemble and remove coating and debris from critical areas.
- ☐ 3. Perform proof load test.
- ☐ 4. Twenty-four (24) hours after proof load test, perform Magnetic Particle Inspection (MPI) on critical areas as indicated in Figure 7 or Figure 8 and per API Specification 8C.
- ☐ 5. Contact TIOT for replacement or repair if indications are found.



Proof load test and MPI are always required after refurbishment or a major weld repair.

## Lubrication Checklist

### Daily and prior to use:

- ☐ 1. Grease hinge, latch, and latch lock pins.
- ☐ 2. Grease underside of elevator ears.
- ☐ 3. Grease top bore.
- ☐ 4. Grease springs.
- ☐ 5. Grease link retainer fasteners.

## Inspection and Lubrication Continued

### SLX Pry Bar Latch Test

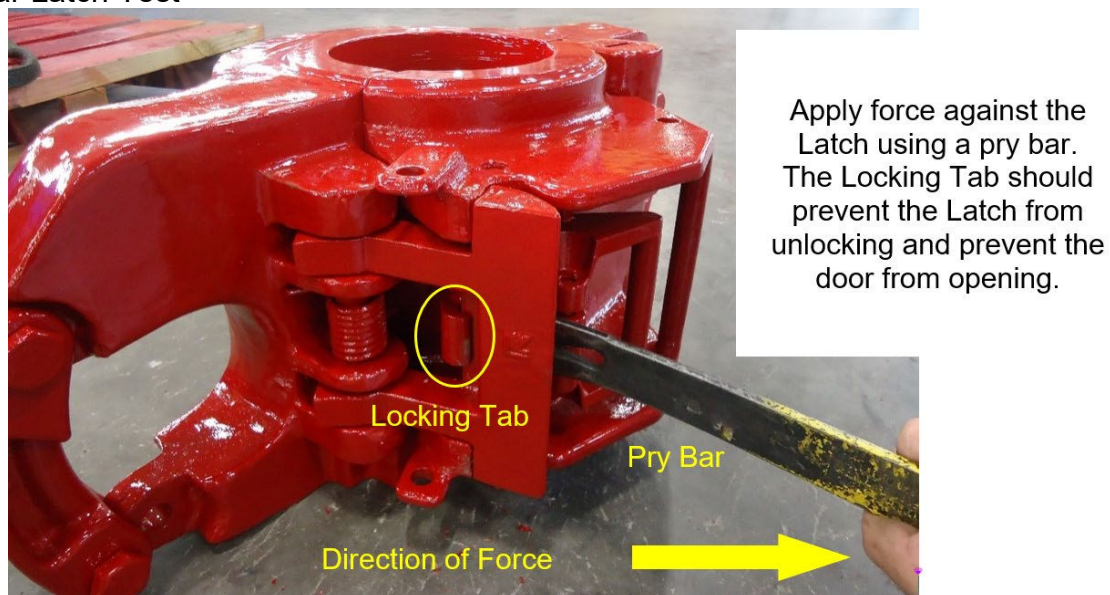


Figure 5

### SX Pry Bar Latch Test

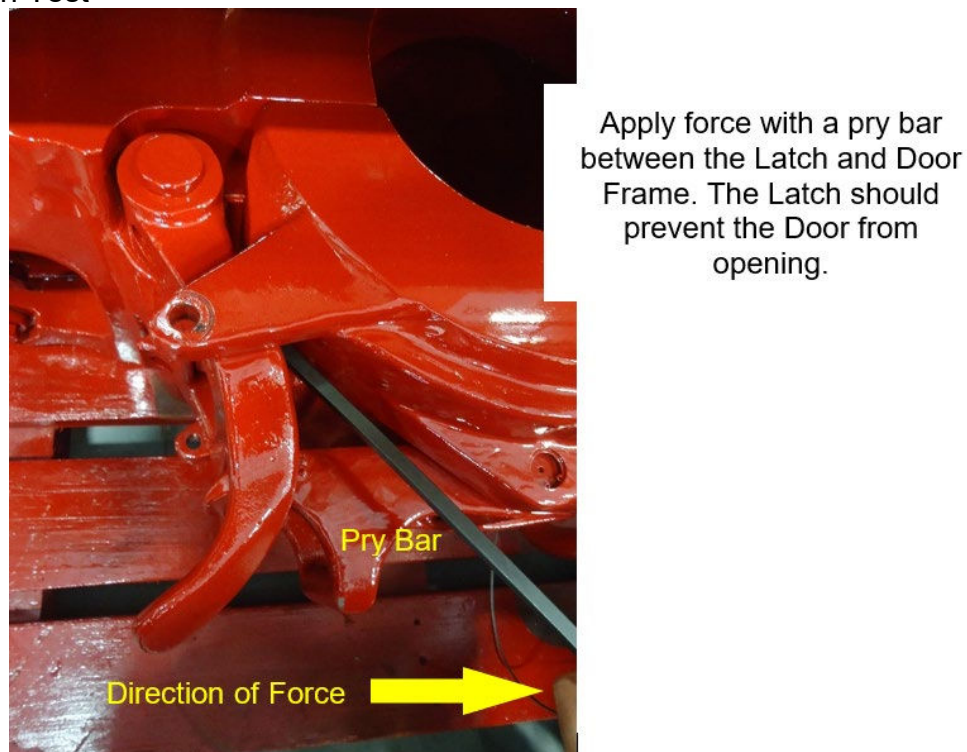


Figure 6

# ELEVATOR WEAR DATA

Wear in the bore affects the elevator’s ability to support rated loads. Elevators with bore measurements exceeding “Max Bore Diameter” limits shown in Tables 4 thru 6 shall be either remanufactured or scrapped. Contact TIOT for assistance in determining wear results.

| Maximum Allowable Wear Limit – Elevators for Drill Collar with Zip Lift Recess |                |                             |             |
|--------------------------------------------------------------------------------|----------------|-----------------------------|-------------|
| Collar OD                                                                      | Bore Size Code | Max Allowable Bore Diameter |             |
|                                                                                |                | Inches                      | Millimeters |
| 4-1/8"                                                                         | 177            | 3.844                       | 97.6        |
| 4-3/4"                                                                         | 435            | 4.406                       | 111.9       |
| 5-1/4"                                                                         | 179            | 4.906                       | 124.6       |
| 5-1/2"                                                                         | 180            | 5.156                       | 131.0       |
| 5-3/4"                                                                         | 181            | 5.313                       | 134.9       |
| 6"                                                                             | 362            | 5.563                       | 141.3       |
| 6-1/4"                                                                         | 337            | 5.813                       | 147.6       |
| 6-1/2"                                                                         | 373            | 6.063                       | 154.0       |
| 6-3/4"                                                                         | 387            | 6.250                       | 158.8       |
| 7"                                                                             | 361            | 6.500                       | 165.1       |
| 7-1/4"                                                                         | 357            | 6.750                       | 171.5       |
| 7-1/2"                                                                         | 188            | 7.000                       | 177.8       |
| 7-3/4"                                                                         | 339            | 7.250                       | 184.2       |
| 8"                                                                             | 336            | 7.500                       | 190.5       |
| 8-1/4"                                                                         | 422            | 7.750                       | 196.9       |
| 8-1/2"                                                                         | 426            | 8.000                       | 203.2       |
| 9"                                                                             | 427            | 8.438                       | 214.3       |
| 9-1/2"                                                                         | 370            | 8.938                       | 227.0       |
| 9-3/4"                                                                         | 367            | 9.188                       | 233.4       |
| 10"                                                                            | 195            | 9.438                       | 239.7       |
| 10-3/4"                                                                        | 527            | 10.188                      | 258.8       |
| 11"                                                                            | 419            | 10.438                      | 265.1       |
| 11-1/4"                                                                        | 196            | 10.688                      | 271.5       |

**Table 4**

## Elevator Wear Data Continued

| Maximum Allowable Wear Limit -Elevators for Plain Drill Collar with Lift Plug |                |                             |             |
|-------------------------------------------------------------------------------|----------------|-----------------------------|-------------|
| Collar OD                                                                     | Bore Size Code | Max Allowable Bore Diameter |             |
|                                                                               |                | Inches                      | Millimeters |
| 3"                                                                            | 205            | 3.188                       | 81.0        |
| 3-1/8"                                                                        | 206            | 3.313                       | 84.2        |
| 3-1/4"                                                                        | 207            | 3.438                       | 87.3        |
| 3-1/2"                                                                        | 209            | 3.688                       | 93.7        |
| 3-3/4"                                                                        | 211            | 3.938                       | 100.0       |
| 4"                                                                            | 213            | 4.188                       | 106.4       |
| 4-1/8"                                                                        | 519            | 4.313                       | 109.6       |
| 4-1/4"                                                                        | 548            | 4.438                       | 112.7       |
| 4-1/2"                                                                        | 215            | 4.688                       | 119.1       |
| 4-3/4"                                                                        | 354            | 4.969                       | 126.2       |
| 5"                                                                            | 552            | 5.219                       | 132.6       |
| 5-1/4"                                                                        | 219            | 5.469                       | 138.9       |
| 5-1/2"                                                                        | 411            | 5.719                       | 145.3       |
| 5-3/4"                                                                        | 222            | 6.031                       | 153.2       |
| 6"                                                                            | 349            | 6.281                       | 159.5       |
| 6-1/4"                                                                        | 348            | 6.531                       | 165.9       |
| 6-3/8"                                                                        | 331            | 6.656                       | 169.1       |
| 6-3/4"                                                                        | 338            | 7.063                       | 179.4       |
| 7"                                                                            | 372            | 7.313                       | 185.8       |
| 7-1/4"                                                                        | 335            | 7.563                       | 192.1       |
| 7-1/2"                                                                        | 137            | 7.813                       | 198.5       |
| 7-3/4"                                                                        | 550            | 8.063                       | 204.8       |
| 8"                                                                            | 334            | 8.313                       | 211.2       |
| 8-1/4"                                                                        | 347            | 8.563                       | 217.5       |
| 8-1/2"                                                                        | 580            | 8.844                       | 224.6       |
| 8-3/4"                                                                        | 226            | 9.094                       | 231.0       |
| 9"                                                                            | 356            | 9.344                       | 237.3       |
| 9-1/4"                                                                        | 227            | 9.594                       | 243.7       |
| 9-1/2"                                                                        | 346            | 9.844                       | 250.0       |
| 10"                                                                           | 228            | 10.406                      | 264.3       |
| 10-1/2"                                                                       | 229            | 10.906                      | 277.0       |
| 11"                                                                           | 230            | 11.406                      | 289.7       |

**Table 5**

| Maximum Allowable Wear Limit – Elevators for Casing |                |                             |             |
|-----------------------------------------------------|----------------|-----------------------------|-------------|
| Collar OD                                           | Bore Size Code | Max Allowable Bore Diameter |             |
|                                                     |                | Inches                      | Millimeters |
| 2-3/8"                                              | 158            | 2.512                       | 63.8        |
| 2-7/8"                                              | 160            | 3.013                       | 76.5        |
| 3-1/2"                                              | 162            | 3.639                       | 92.4        |
| 4-1/2"                                              | 129            | 4.659                       | 118.3       |
| 4-3/4"                                              | 130            | 4.913                       | 124.8       |
| 5"                                                  | 131            | 5.168                       | 131.3       |
| 5-1/2"                                              | 132            | 5.676                       | 144.2       |
| 5-3/4"                                              | 133            | 5.931                       | 150.6       |
| 6"                                                  | 134            | 6.185                       | 157.1       |
| 6-5/8"                                              | 135            | 6.821                       | 173.3       |
| 7"                                                  | 136            | 7.203                       | 183.0       |
| 7-5/8"                                              | 137            | 7.838                       | 199.1       |
| 8-5/8"                                              | 139            | 8.856                       | 224.9       |
| 9"                                                  | 140            | 9.238                       | 234.6       |
| 9-5/8"                                              | 141            | 9.873                       | 250.8       |
| 9-7/8"                                              | 649            | 10.128                      | 257.3       |
| 10"                                                 | 831            | 10.255                      | 260.5       |
| 10-1/8"                                             | 846            | 10.382                      | 263.7       |
| 10-3/4"                                             | 142            | 11.018                      | 279.9       |
| 11-3/4"                                             | 143            | 12.036                      | 305.7       |
| 13-3/8"                                             | 144            | 13.664                      | 347.1       |
| 13-5/8"                                             | 596            | 13.918                      | 353.5       |
| 16"                                                 | 145            | 16.335                      | 414.9       |
| 18"                                                 | 723            | 18.370                      | 466.6       |
| 18-5/8"                                             | 146            | 19.006                      | 482.8       |
| 20"                                                 | 147            | 20.405                      | 518.3       |
| 21-1/2"                                             | 148            | 21.925                      | 556.9       |
| 22"                                                 | 688            | 22.431                      | 569.7       |
| 24"                                                 | 630            | 24.456                      | 621.2       |
| 26"                                                 | 650            | 26.481                      | 672.6       |
| 28"                                                 | 693            | 28.506                      | 724.1       |
| 30"                                                 | 644            | 30.531                      | 775.5       |

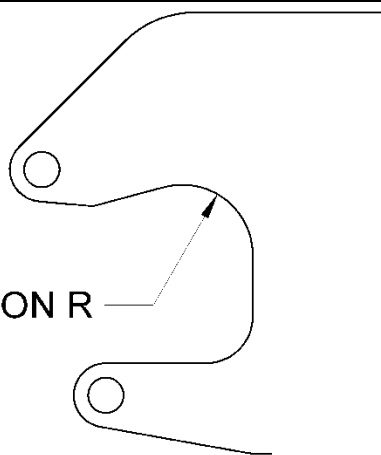
**Table 6**

## Elevator Wear Data Continued

| Maximum Elevator Ear Radius (R) |        |      |
|---------------------------------|--------|------|
| Elevator Capacity (Tons)        | R Inch | R mm |
| 100                             | 1.00   | 25.4 |
| 150                             | 1.50   | 38.1 |
| 250                             | 1.88   | 47.6 |
| 350                             | 1.88   | 47.6 |
| 500                             | 2.00   | 50.8 |

**Table 7**

DIMENSION R



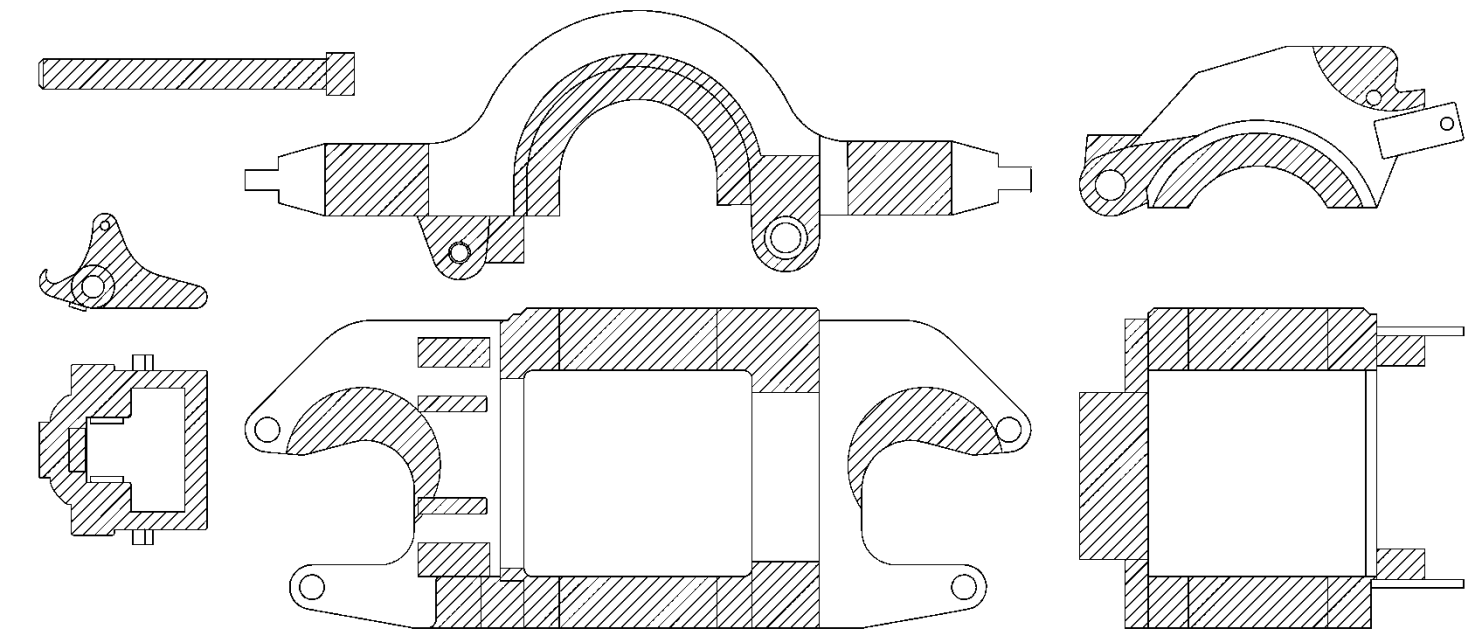
**Figure 7**

|                                                        |      | Maximum Allowable Wear Limits for Elevator Hinge Pins / Latch Pins |       |       |       |       |       |
|--------------------------------------------------------|------|--------------------------------------------------------------------|-------|-------|-------|-------|-------|
|                                                        |      | SLX                                                                |       |       |       | SX    |       |
| Elevator Capacity (Tons)                               |      | 100                                                                | 150   | 250   | 350   | 350   | 500   |
| Hinge Pin - Max Allowable Clearance Between Pin & Bore | Inch | 0.020                                                              | 0.035 | 0.035 | 0.030 | 0.030 | 0.030 |
|                                                        | mm   | 0.5                                                                | 0.9   | 0.9   | 0.8   | 0.8   | 0.8   |
| Latch Pin - Max Allowable Clearance Between Pin & Bore | Inch | 0.020                                                              | 0.030 | 0.030 | 0.035 | 0.035 | 0.035 |
|                                                        | mm   | 0.5                                                                | 0.8   | 0.8   | 0.9   | 0.9   | 0.9   |

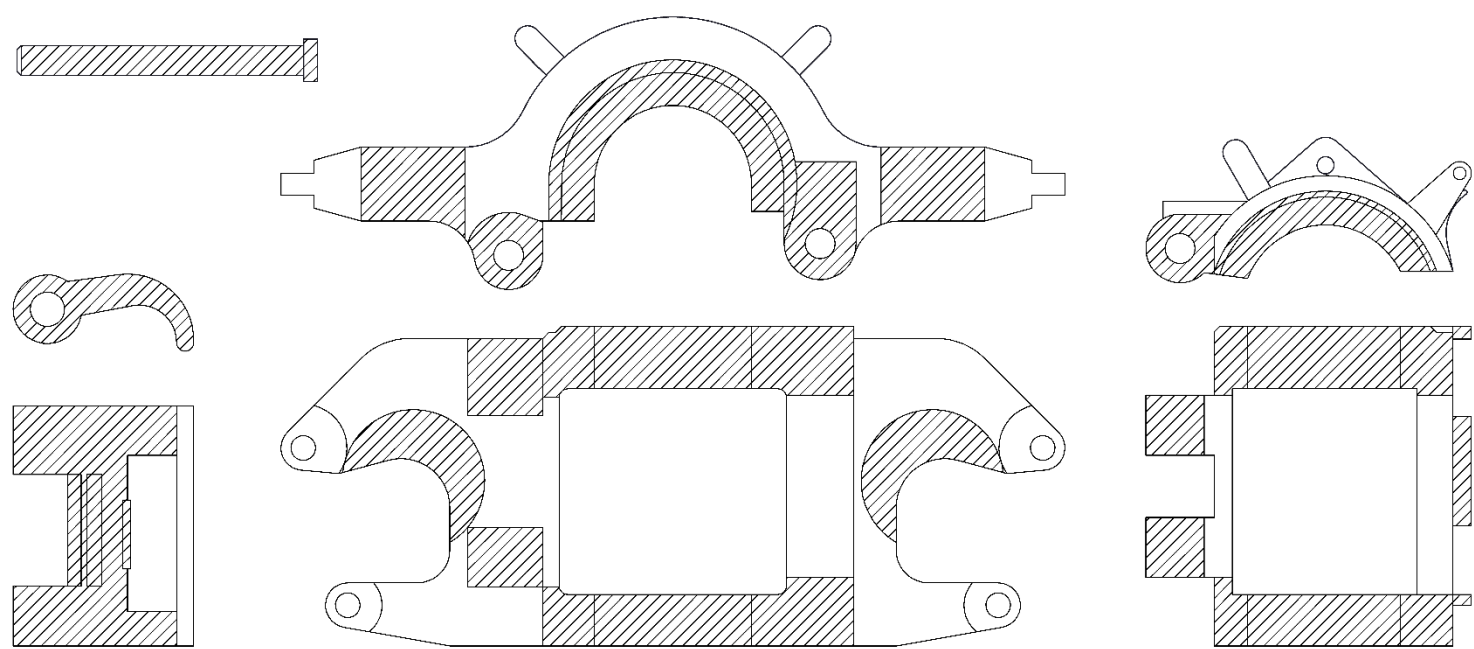
**Table 8**

# CRITICAL AREA MAPS

*Hatching denotes critical areas*



**SLX**  
**Figure 8**



**SX**  
**Figure 9**

# INSTALLATION



The elevator must be lifted by the ears only. Do not lift by the latch handles.

- ☐ Move the elevator to the rig floor lifting by the ears using a sling or chain. Secure the link retainer bolts with nuts before moving the elevator.
- ☐ Open the link retainers and remove the sling or chain.
- ☐ Move the elevator links into position on the ears.
- ☐ Close the link retainers and secure with the link retainer bolts, nuts, and new cotter pins.
- ☐ Lubricate the elevator as recommended in the Lubrication section.
- ☐ Open and close the elevator a few times to ensure it is operational and that the latch and safety latch perform as expected.
- ☐ Once the elevator is around the pipe and the latches are secured, install the safety pin before moving the elevator.

## OPERATION



Do not lift or use the elevator in an inverted orientation. The elevator ears are designed and positioned to prevent inverted lifting.



Handles are provided for handling elevators. Keep hands away from pinch points or areas that are not designated for handling.

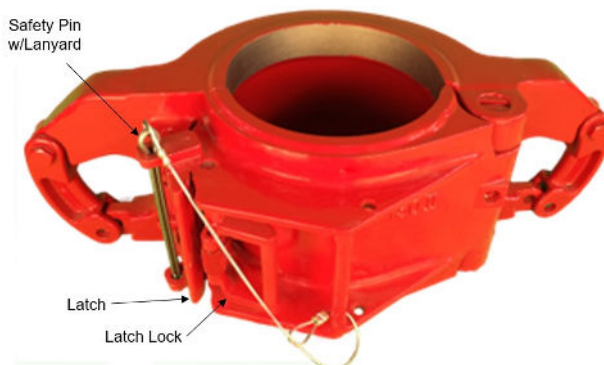


Use the elevator ears to lift the elevator. Do not use the elevator handles for lifting.



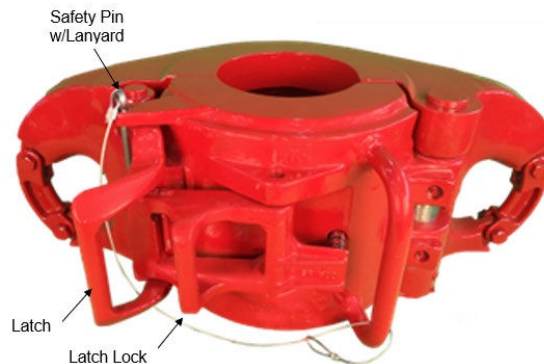
TIOT recommends a safety risk assessment be carried out prior to operation.

### Elevator Operation



**Figure 10 SLX Latch**

A shielded safety latch prevents the latch from accidental opening. To operate, the safety pin is removed, the latch lock handle is pulled out which simultaneously releases the safety latch, and the elevator halves are pulled apart to open. The latch and safety latch operate from a single handle and automatically re-latch when the elevator door is closed. The safety pin must be reinstalled each time the elevator is closed.



**Figure 11 SX Latch**

SX type elevators have a latch and safety latch requiring two (2) handed operation. To operate, the safety pin is removed, the safety latch handle is pulled out while the latch is simultaneously pulled, and the elevator halves are pulled apart to open. The latch and safety latch automatically re-latch when the elevator door is closed. The safety pin must be reinstalled each time the elevator door is closed.

## ASSEMBLY & DISASSEMBLY



Only trained knowledgeable personnel should perform assembly or disassembly of equipment.



Use caution when handling springs under tension and when lifting parts.



All disassembly and assembly should be performed away from well center in a clean and dry area.

### Assembly and Disassembly

- Assembly and disassembly should only be carried out for Inspection and Maintenance or for replacing non-load bearing parts.
- Welding, repairs, and replacement of load bearing parts should only be carried out by TIOT.

## TROUBLESHOOTING

| Issue                         | Possible Cause              | Potential Solution                                                                                                                   |
|-------------------------------|-----------------------------|--------------------------------------------------------------------------------------------------------------------------------------|
| Elevator does not open.       | Corrosion                   | Pry the elevator open, perform PM3.                                                                                                  |
|                               |                             | Scrap the tool.                                                                                                                      |
|                               | Overloading                 | Pull the elevator from service and perform PM3.                                                                                      |
|                               |                             | Scrap the tool.                                                                                                                      |
| Elevator does not close.      | Oversized tubular           | Select a proper size elevator.                                                                                                       |
| Elevator does not hang level. | Difference in link lengths. | Use matched sets of elevator links.                                                                                                  |
| Deformed pin holes            | Overloading                 | Pull the elevator from service and perform PM3.                                                                                      |
|                               | Wear                        | Verify pin clearances per the Wear Data in this manual. If the limits are exceeded, pull the elevator from service, and perform PM3. |
| Bent pins                     | Overloading                 | Pull the elevator from service and perform PM3.                                                                                      |

**Table 9**

## STORAGE AND TRANSPORTATION

- Unpainted surfaces should be coated with rust preventing agent.
- Prevent excessive exposure to water and moisture.
- Clean the tool after each use - steam clean as needed; remove mud, debris, and any other substances.
- Transport the unit on a suitable container or pallet.

## PARTS LIST – SLX

| SLX 100 PARTS |                         |     |                 |                 |
|---------------|-------------------------|-----|-----------------|-----------------|
| Size Range    |                         |     | 2-3/8" - 2-7/8" | 3-1/2" - 5-3/4" |
| Frame         |                         |     | T33693          | T33854          |
| Item No.      | Description             | Qty | Part Number     |                 |
| 1             | Hinge Pin               | 1   | T32424-5        | T34613          |
| 2             | Hinge Pin Retainer      | 1   | T34614          | T32918          |
| 3             | Latch Lock              | 1   | T33697          | T33813          |
| 4             | Latch Lock Pin          | 1   | T33700-4        | T29980-3        |
| 5             | Latch Lock Spring       | 1   | T33703          | T33818          |
| 6             | Latch                   | 1   | T33696          | T33812          |
| 7             | Latch Pin               | 1   | T33700-4        | T29980-3        |
| 8             | Latch Spring            | 1   | T33701          | T33816          |
| 9             | Latch Lock Roller       | 1   | T33702          | T33817          |
| 10            | Latch Lock Roller Pin   | 1   | T33698          | T31854          |
| 11            | Link Block              | 2   | T32430          | T32430          |
| 12            | Link Block Bolt         | 2   | 040044          | 040044          |
| 13            | Link Block Lock Nut     | 2   | 040141          | 040141          |
| 14            | Link Block Bolt Drilled | 2   | 040382          | 040382          |
| 15            | Link Block Slotted Nut  | 2   | T50510-C        | T50510-C        |
| 16            | Link Block Cotter Pin   | 2   | 080058          | 080058          |
| 17            | Safety Pin & Lanyard    | 1   | 080042          | 080042          |
| 18            | Grease Fitting          | 1   | 080013          | 080013          |

**Table 10**

## PARTS LIST – SLX (Cont.)

| SLX 150 PARTS |                         |     |             |                  |                   |           |           |
|---------------|-------------------------|-----|-------------|------------------|-------------------|-----------|-----------|
| Size Range    |                         |     | 4-1/2" – 9" | 9-5/8" - 10-3/4" | 11-3/4" - 13-5/8" | 14" – 16" | 16" – 20" |
| Frame         |                         |     | T31239      | T33950           | T33982            | T34087    | T33632    |
| Item No.      | Description             | Qty | Part Number |                  |                   |           |           |
| 1             | Hinge Pin               | 1   | T34611      | T33953           | T33985            | T33646    | T33646    |
| 2             | Hinge Pin Retainer      | 1   | T32892      | T32892           | T32892            | T32892    | T32892    |
| 3             | Latch Lock              | 1   | T31332      | T31332           | T31332            | T33635    | T33635    |
| 4             | Latch Lock Pin          | 1   | T29980-4    | T29980-4         | T29980-4          | T50713    | T50713    |
| 5             | Latch Lock Spring       | 1   | T31404      | T31404           | T31404            | T33658    | T33658    |
| 6             | Latch                   | 1   | T31331      | T31331           | T31331            | T33634    | T33634    |
| 7             | Latch Pin               | 1   | T32424-3    | T32424-3         | T32424-3          | T33645    | T33645    |
| 8             | Latch Spring            | 1   | T31383      | T31383           | T31383            | T33657    | T33657    |
| 9             | Latch Lock Roller       | 1   | T31407      | T31407           | T31407            | T31407    | T31407    |
| 10            | Latch Lock Roller Pin   | 1   | T31584      | T31584           | T31584            | T31584    | T31584    |
| 11            | Link Block              | 2   | T9519       | T9519            | T9519             | T9519     | T9519     |
| 12            | Link Block Bolt         | 2   | 040044      | 040044           | 040044            | 040044    | 040044    |
| 13            | Link Block Lock Nut     | 2   | 040141      | 040141           | 040141            | 040141    | 040141    |
| 14            | Link Block Bolt Drilled | 2   | 040382      | 040382           | 040382            | 040382    | 040382    |
| 15            | Link Block Slotted Nut  | 2   | T50510-C    | T50510-C         | T50510-C          | T50510-C  | T50510-C  |
| 16            | Link Block Cotter Pin   | 2   | 080059      | 080060           | 080061            | 080062    | 080063    |
| 17            | Safety Pin & Lanyard    | 1   | 080042      | 080042           | 080042            | 080042    | 080042    |
| 18            | Grease Fitting          | 1   | 080013      | 080013           | 080013            | 080013    | 080013    |

**Table 11**

## PARTS LIST – SLX (Cont.)

| SLX 250 PARTS |                         |     |                 |                  |               |            |
|---------------|-------------------------|-----|-----------------|------------------|---------------|------------|
| Size Range    |                         |     | 4-1/2" - 7-3/4" | 8-5/8" - 10-3/4" | 11-3/4" – 14" | 16" – 20"  |
| Frame         |                         |     | T41239          | T43950           | T43982        | T43632     |
| Item No.      | Description             | Qty | Part Number     |                  |               |            |
| 1             | Hinge Pin               | 1   | T34611-1        | T33953-1         | T33985-1      | T33346-1   |
| 2             | Hinge Pin Retainer      | 1   | T32892          | T32892           | T32892        | T31074     |
| 3             | Latch Lock              | 1   | T31332          | T31332           | T31332        | T33635     |
| 4             | Latch Lock Pin          | 1   | T29980-4-1      | T29980-4-1       | T50713-2-1    | T32424-2-1 |
| 5             | Latch Lock Spring       | 1   | T31388          | T31388           | T31388        | T43658     |
| 6             | Latch                   | 1   | T41331          | T41331           | T41331        | T33634     |
| 7             | Latch Pin               | 1   | T32424-4        | T32424-4         | T32424-4      | T33645     |
| 8             | Latch Spring            | 1   | T41383          | T41383           | T41383        | T33657     |
| 9             | Latch Lock Roller       | 1   | T31407          | T31407           | T31407        | T31407     |
| 10            | Latch Lock Roller Pin   | 1   | T31584          | T31584           | T31584        | T31584     |
| 11            | Link Block              | 2   | T9519           | T9519            | T9519         | T9519      |
| 12            | Link Block Bolt         | 2   | 040044          | 040044           | 040044        | 040044     |
| 13            | Link Block Lock Nut     | 2   | 040141          | 040141           | 040141        | 040141     |
| 14            | Link Block Bolt Drilled | 2   | 040382          | 040382           | 040382        | 040382     |
| 15            | Link Block Slotted Nut  | 2   | T50510-C        | T50510-C         | T50510-C      | T50510-C   |
| 16            | Link Block Cotter Pin   | 2   | 080064          | 080065           | 080066        | 080067     |
| 17            | Safety Pin & Lanyard    | 1   | 080042          | 080042           | 080042        | 080042     |
| 18            | Grease Fitting          | 1   | 080013          | 080013           | 080013        | 080013     |

**Table 12**

## PARTS LIST – SLX (Cont.)

| SLX 350 PARTS |                         |     |                 |               |
|---------------|-------------------------|-----|-----------------|---------------|
| Size Range    |                         |     | 6-5/8" - 9-7/8" | 10-3/4" – 14" |
| Frame         |                         |     | T53950          | T53982        |
| Item No.      | Description             | Qty | Part Number     |               |
| 1             | Hinge Pin               | 1   | T35009          | T35001        |
| 2             | Hinge Pin Retainer      | 1   | T35171          | T35314        |
| 3             | Latch Lock              | 1   | T33635          | T33642        |
| 4             | Latch Lock Pin          | 1   | T32424-2        | T33643        |
| 5             | Latch Lock Spring       | 1   | T33658          | T33623        |
| 6             | Latch                   | 1   | T33634          | T33612        |
| 7             | Latch Pin               | 1   | T33645          | T33613        |
| 8             | Latch Spring            | 1   | T33657          | T33628        |
| 9             | Latch Lock Roller       | 1   | *               | T31407        |
| 10            | Latch Lock Roller Pin   | 1   | *               | T31584        |
| 11            | Link Block              | 2   | T9519           | T9519         |
| 12            | Link Block Bolt         | 2   | *               | *             |
| 13            | Link Block Lock Nut     | 2   | *               | *             |
| 14            | Link Block Bolt Drilled | 2   | *               | *             |
| 15            | Link Block Slotted Nut  | 2   | *               | *             |
| 16            | Link Block Cotter Pin   | 2   | *               | *             |
| 17            | Safety Pin & Lanyard    | 1   | *               | *             |
| 18            | Grease Fitting          | 1   | 080013          | 080013        |

\*Contact TIOT

**Table 13**

PARTS DIAGRAM – SLX

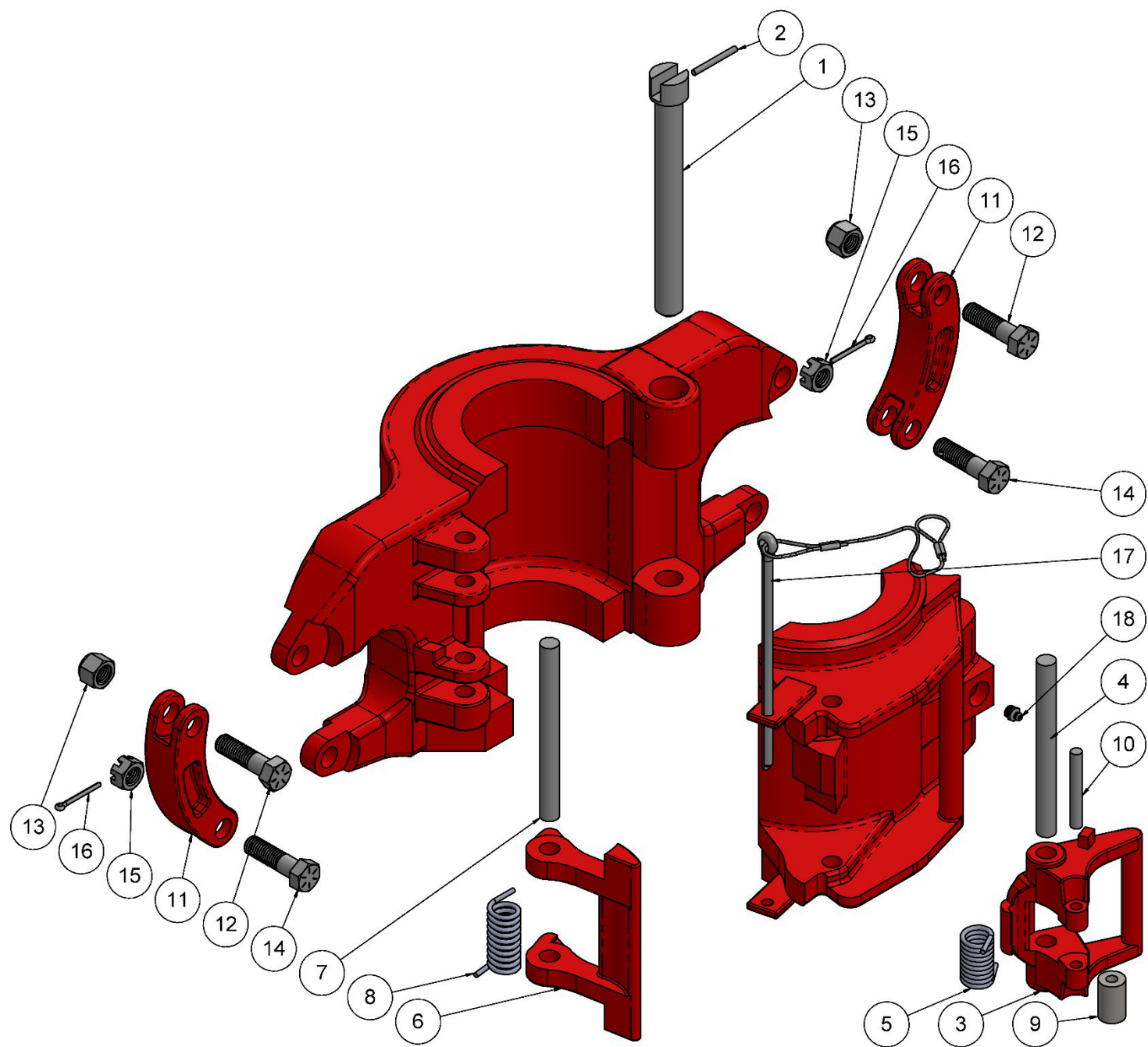


Figure 12 SLX

## PARTS LIST – SX

| SX PARTS   |                         |     |              |               |              |
|------------|-------------------------|-----|--------------|---------------|--------------|
| Size Range |                         |     | 7" - 13-3/8" | 14" - 18-5/8" | 7" - 13-3/8" |
| Frame      |                         |     | T29965       | T29966        | T29964       |
| Capacity   |                         |     | 350 Tons     | 350 Tons      | 500 Tons     |
| Item No.   | Description             | Qty | Part Number  |               |              |
| 1          | Hinge Pin               | 1   | T29956       | T29956        | T29956       |
| 2          | Hinge Pin Retainer      | 1   | *            | *             | *            |
| 3          | Latch                   | 1   | T29945       | T20005        | T30597       |
| 4          | Latch Pin               | 1   | T29951       | T29951        | T29951       |
| 5          | Latch Pin Retainer      | 1   | *            | *             | *            |
| 6          | Latch Lock              | 1   | T6021        | T6021         | T6021        |
| 7          | Latch Lock Pin          | 1   | T6027        | T6027         | T6027        |
| 8          | Latch Lock Pin Retainer | 1   | T5302        | T5302         | T5302        |
| 9          | Latch Lock Spring       | 2   | T30657       | T30657        | T30657       |
| 10         | Latch Lock Spring Plug  | 2   | T8024        | T8024         | T8024        |
| 11         | Link Block              | 2   | T9519        | T9519         | T9519        |
| 12         | Link Block Bolt         | 2   | *            | *             | *            |
| 13         | Link Block Lock Nut     | 2   | *            | *             | *            |
| 14         | Link Block Bolt Drilled | 2   | *            | *             | *            |
| 15         | Link Block Slotted Nut  | 2   | *            | *             | *            |
| 16         | Link Block Cotter Pin   | 2   | *            | *             | *            |
| 17         | Safety Pin & Lanyard    | 1   | 080070       | 080070        | 080070       |
| 18         | Grease Fitting          | 4   | 080013       | 080013        | 080013       |

\*Contact TIOT

**Table 14**

PARTS DIAGRAM – SX

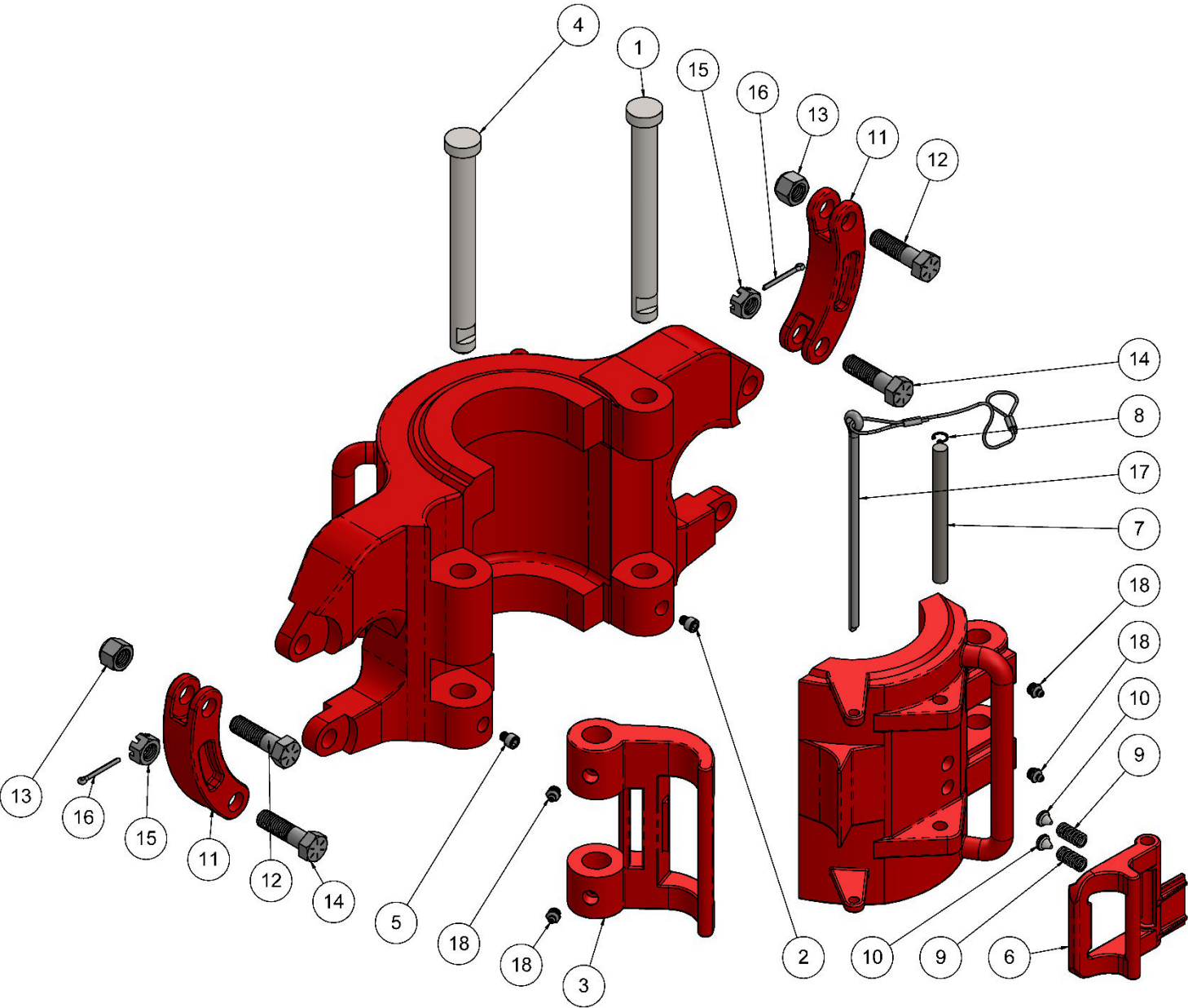


Figure 13 SX

Every Company has to have a Toolbox.

At Texas International Oilfield Tools,

*We provide the tools to fuel the  
World!*



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