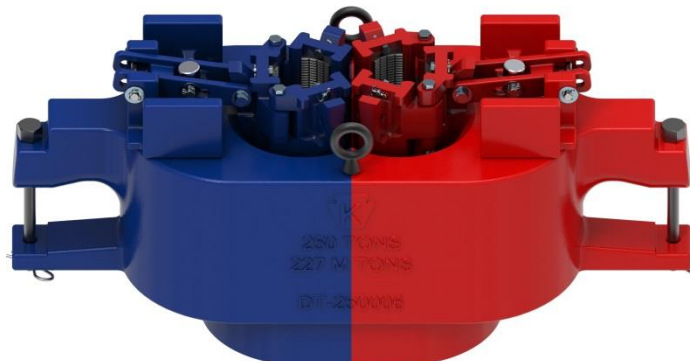




THE KET DUAL TOOL ELEVATOR & ELEVATOR OPERATING PROCEDURE MANUAL



DUAL ELEVATOR/SPIDER

SAFETY INSTRUCTIONS

⚠ WARNING



To reduce the risk of injury, everyone using, installing, performing maintenance, changing accessories on, or working near this tool must read and understand these instructions before performing any such task.

The most important safety device for this tool is **YOU**. Your good judgment is the best protection against injury.

Operating Hazards

- ⚠ Do not overload the elevator. Overloading the recommended rating could cause serious injury or death.
- ⚠ Do not use undersized pipe. Using undersized pipe could cause an inadequate load bearing area and uneven stress distribution. Both of which may result in injury or death.
- ⚠ Do not use oversized pipe. Using oversized pipe could make it difficult or impossible for the elevator to catch the pipe.
- ⚠ Always insure that the elevator and slips are correct for the tubular it is to be used on. Failure to use the proper elevator and slips could result in injury or death.
- ⚠ When opening the tool box make sure that the door is secured with the safety mechanism. Failure to do so could result in injury or death.
- ⚠ Insure that the tool joint or collar O.D. of the pipe is correct. Failure to maintain adequate contact area could result in injury or death.
- ⚠ During use, the elevator should never be run into the tool joints or couplings inducing any type of shock load into the equipment. Shock loads are an impact-type force applied over a short instant of time. In shock loading, the energy of the applied force is ultimately absorbed, or transferred, to the elevator designed to resist the force. The application of shock loads to an elevator can cause shock/fatigue stress loading potentially resulting in premature stress/fatigue failure.

Workplace Hazards

- ⚠ Keep hands / fingers clear of elevator/spider bore when installing the elevator on the pipe.
- ⚠ Always use the proper tools and wear eye, head and hand protection when servicing this elevator.
- ⚠ Maintain a balanced body position and secure footing.
- ⚠ For professional use only.

Maintenance Hazards

- ⚠ Use only Keystone Energy Tools parts.
- ⚠ KET equipment is made of cast alloy heat treated steel and should never be welded on in the field. Improper welding can cause cracks or brittleness in the casting which could result in drastic weakening or failure of the equipment. Any welding or machining must be performed by an authorized KET or API Certified Repair Center
- ⚠ Improper welding and/or re-machining of cast alloy heat treated steel can cause personal injury, property damage or death.

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1.0 Introduction

This technical manual contains operation and maintenance instructions for Keystone “Dual Tool” air operated elevator and spider with assembly drawings and complete parts breakdown. It provides a guide for proper field use, disassembling, and repair.

The Keystone “Dual Tool” elevator and spider is designed to be used on tubing providing the ability to run two strings at one time. It also has the capabilities to operate one joint of tubing at a time.

The dual tool elevator and spider abolishes the chances of bent tubing during operations.

The “Dual Tool” elevator and spider incorporates a three-slip interlocking gripping mechanism assuring of uniform grip with minimum marking to the tubular. All Keystone elevators, spiders, and slips are made up of high alloy, heat treated, steel construction, and designed to meet or exceed API specifications.

The “Dual Tool” Spider quickly separates by removing one bolt, creating an open hole that provides quick passage for specific production equipment like packers, centralizers, etc.

The “Dual Tool” elevator and spider includes a safety feature to eliminate the accidental unset of a string when working with limited string weight, by using a low-pressure regulator set to 75-80 psi. If the pressure regulator is not set to the proper pressure the slips can accidentally release a string of tubular when the weight is limited.

⚠WARNING: During use, the elevator should never be run into the tool joints or couplings inducing any type of shock load into the equipment. Shock loads are an impact-type force applied over a short instant of time. In shock loading, the energy of the applied force is ultimately absorbed, or transferred, to the elevator designed to resist the force. The application of shock loads to an elevator can cause shock/fatigue stress loading potentially resulting in premature stress/fatigue failure.

The “Dual Tool” elevator and spider incorporate a size range as illustrated in the table provided. **See figure 1**

Figure 1

Model	Tons	Range
Elevator	250	1.660” – 4 1/2’
Spider	250	1.660” – 4 1/2”
Slip Assy	125 ea.	3-1/2” & 4 1/2”

NOTE: WARNING labels have been installed at critical areas on the tool. Familiarize yourself with their message and locations before proceeding to operate equipment.

See Safety Instructions Page 4



Pay attention: do not place your hands between moving parts.



CE Marking

The tool complies with the Machinery Directive 98/37/EC and 2006/42/EC

This operating manual is a part of the technical documentation for the product.

The EC Declaration of Conformity is delivered together with the product. Keep these instructions and the associated documents for later use.

Description	Part Number	WEIGHT (LBS)
TOOLBOX ASSEMBLY	DT-250285	1170.00
DUAL TOOL ELEVATOR ASSEMBLY	DT-250006	1139.00
DUAL TOOL SPIDER ASSEMBLY	DT-250000	1172.00
LIFTING SLING	DT-250262	20.00
DUAL TOOL HOSE SET	DT-250460	15.00

2.0 Installation

1. Dual automatic spider-elevator box lifted by four point slings to rig floor

When unloading the tool box make sure that you securely attached the J-Leg safety mechanism to keep the door open. Failure to do so could cause injury or death. **See Figure 2.**

Before removing the console, elevator, or spider you need to unload all the accessories first which consist of the boards & stands, hoses, spreader bars, & scaffolding. Place these items to the side but keep them readily available for later use. **See Figure 3.**

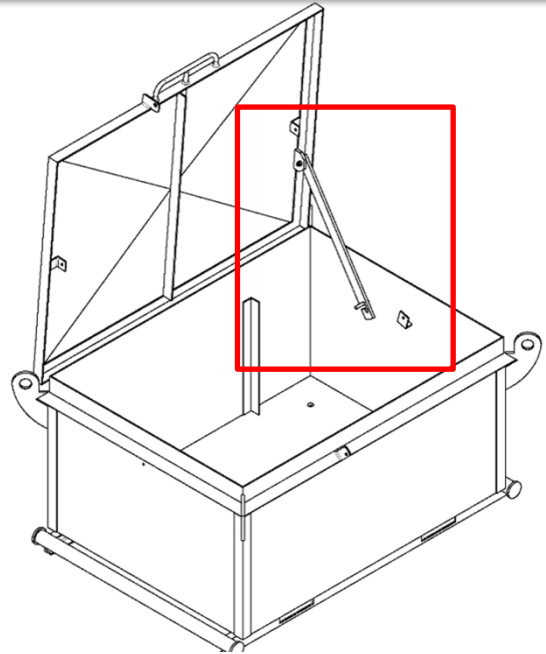


Figure 2

2. Remove control console from tool box by shackling air-hoist to lift bridle on side of console

First you need to remove the control console and communicate with the driller as to where it needs to be placed.

Attach main air supply hose to console.

The console operation air pressure needs to be set to 75 to 80 PSI. In order to preclude accidental dropping of pipe prior to attaining weight on string. Failure to do so could result in injury or death.

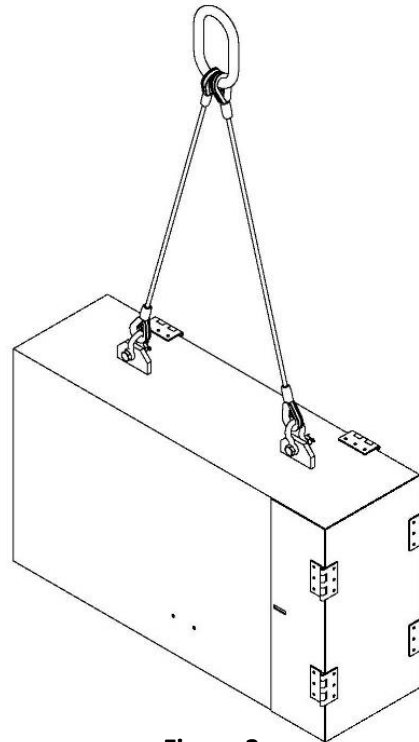


Figure 3

2.0 Installation

3. Installing the Air Hoses

Attach the elevator's air hoses and spider's air hoses to the control console.

Each hose is a different color so that when you hook the hose to control console you know just by its color which one is controlling the elevator or spider cylinders. Each end of the hose will have a color green, yellow, blue, and red on each end. It will be up to the operator which side will control the elevator and spider. See Figure 4.

The name plates will be in a bag for the operator to install. You will also have up & down plates for clarification once you hook the hoses up to your desired position. See Figure 5.

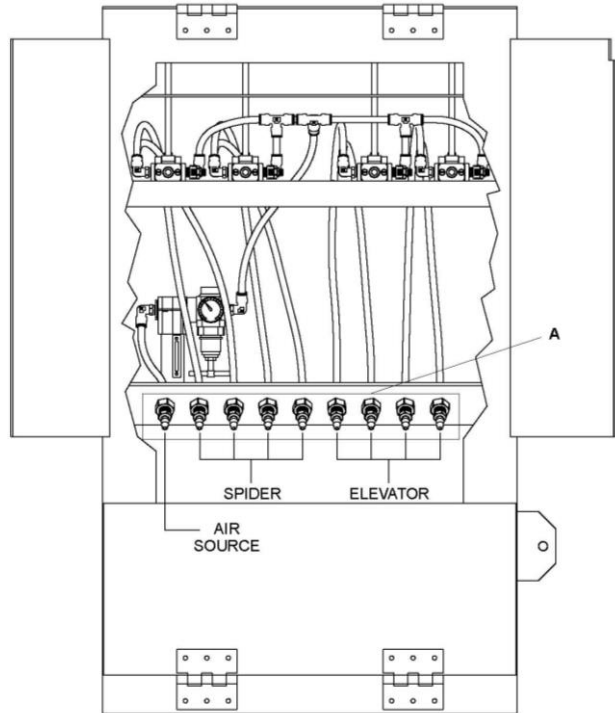


Figure 4

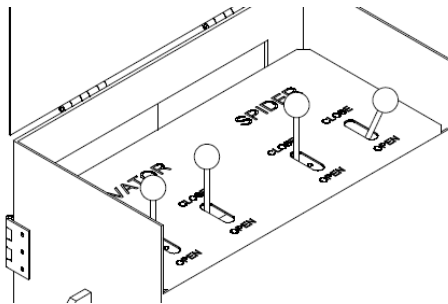
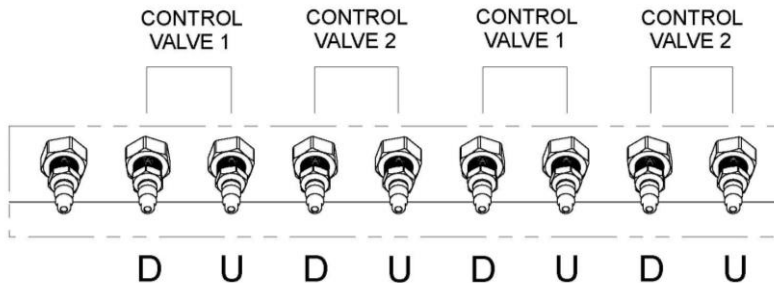


Figure 5

U = SLIPS UP

D = SLIPS DOWN



Detail A

2.0 Installation

4. Rigging up Dual Elevator

The elevator should be unloaded before the spider but increase the orientation of the box requires the removal of the spider first then simply set the spider aside out the way while rigging up the elevator.

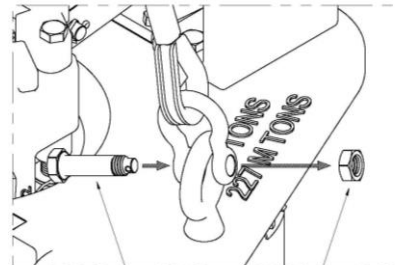
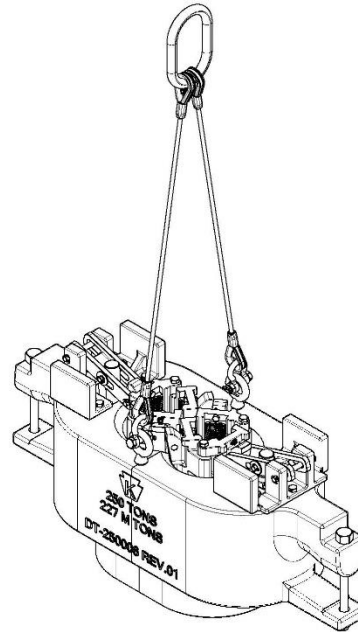
To lift the elevator out of the toolbox attached the air-hoist to the lift bridle on the dual elevator and remove from the box. Remove the link bolts ($\frac{3}{4}$ " x 10" safety bolts with pull pins) completely out of the ears and hoist the elevator up to attached it to the rig bails. At this point you need to re-install both of the link bolts to ensure that the elevator is secured in the rig bails. Failure to do so could result in injury or death. **See Figure 6.**

Slack off on the air-hoist. Remove the lifting bridle by removing the shackles from the lifting eyes on the elevator. At this point remove the lifting eyes from the elevator and screw them into the spider you will need this for lifting the spider later. Failure in removing of the lifting eyes will help prevent injury or death.

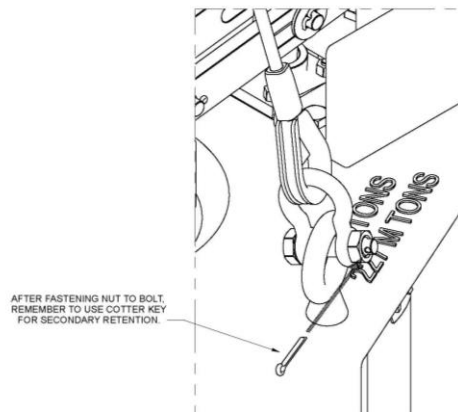
To ensure the elevator operates correctly attached the air hoses to the elevator and operate it to check for proper function.

To install the air hoses for the elevator follow the below instructions;

Roughly half way up the length of one bail use a rope and duct tape to secure the hoses to the bail. The driller will then pick the elevator all the way to the top of the derrick. At this point the derrick man will then secure the hoses half way down the derrick (**see figure 7**). Once the hoses are secured to the derrick the hoses connect to the bail can be cut loose. Keep the slack of the hoses between the derrick and the elevator loose so that it has enough travel for the operation up and down from the rig floor to the top of the derricks (**see figure 7**).



PLACE BOLT THROUGH SHACKLE AND LIFTING EYE AS SHOWN. FASTEN CORRESPONDING NUT.



AFTER FASTENING NUT TO BOLT, REMEMBER TO USE COTTER KEY FOR SECONDARY RETENTION.

Figure 6

2.0 Installation

5. Installing Elevator Air Hoses

To install the air hoses for the elevator follow the below instructions;

Roughly half way up the length of one bail use a rope and duct tape to secure the hoses to the bail. The driller will then pick the elevator all the way to the top of the derrick. At this point the derrick man will then secure the hoses half way down the derrick (**see figure 7**). Once the hoses are secured to the derrick the hoses connect to the bail can be cut loose. Keep the slack of the hoses between the derrick and the elevator loose so that it has enough travel for the operation up and down from the rig floor to the top of the derricks (**see figure 7**).

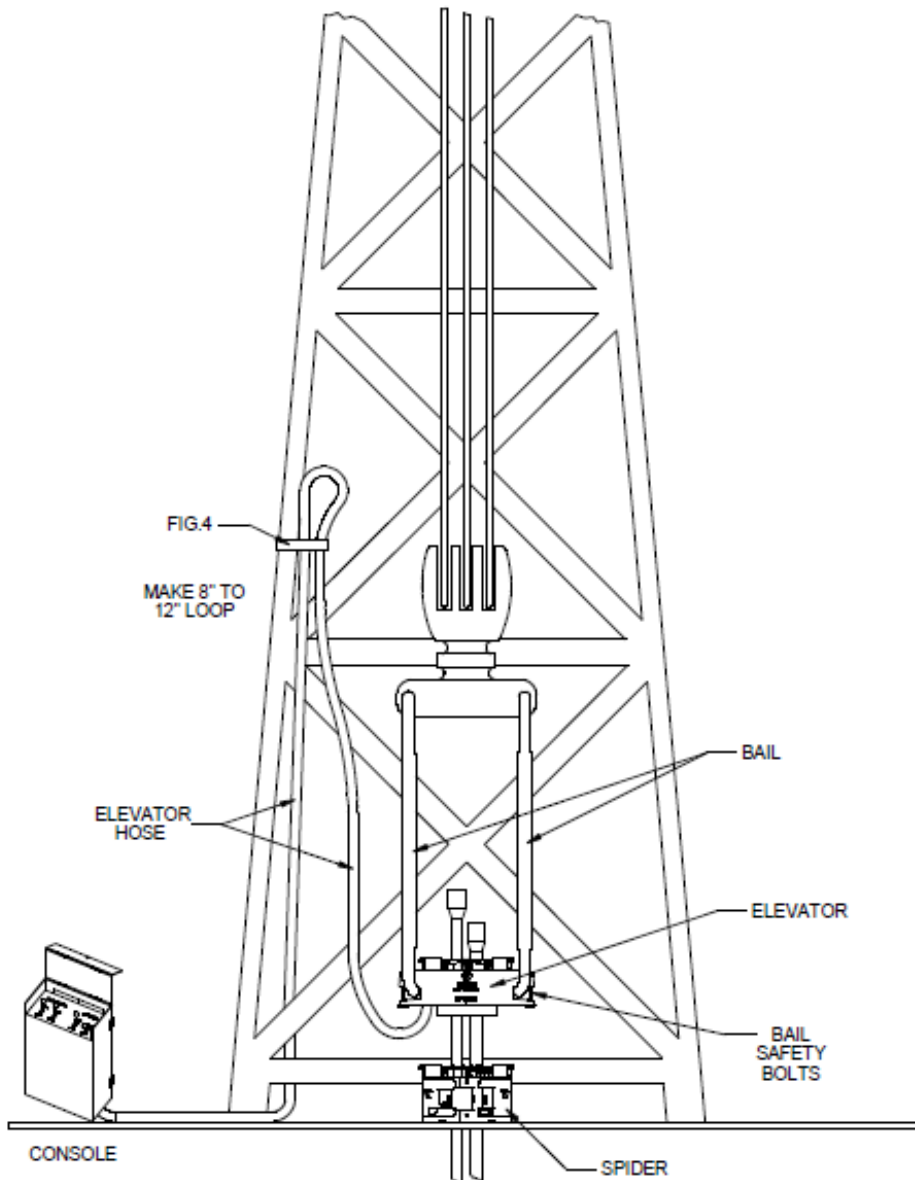


Figure 7

2.0 Installation

Before tying the elevator to the derrick please discuss this procedure with him prior to doing so. The driller should assume at an appropriate point in the derrick. The driller should hoist the blocks sufficiently to pull on stand. The derrick man should take several wraps on the air lines, the driller will then slack the blocks off to approximately 5' off the rig floor. At this time the derrick man can feed extra hose down to the elevator or pull line up in order to pull any excess slack from the elevator and attain the final tie off adjustment. Then tie the lines off to the derrick.

Rigging Up Dual Spider

Close the blind rams.

Remove the inner bushings.

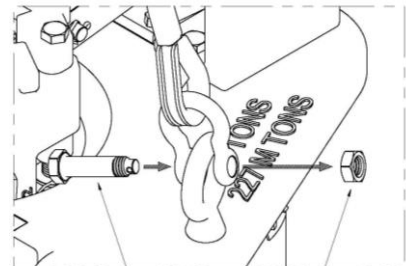
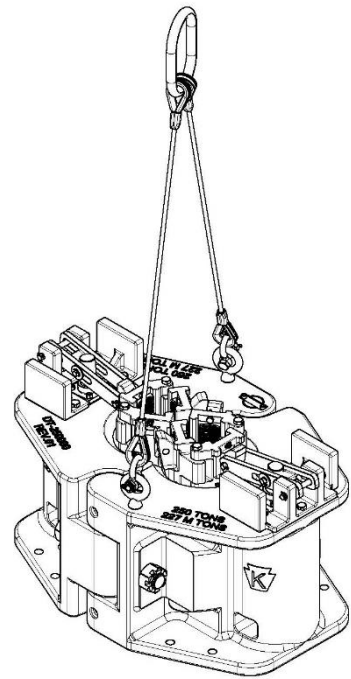
Hoist the spider with the air hoist attached to the spider bridle and center to the rig rotary. Remove the spiders lift bridle and set aside.

Connect the spiders air hoses to the spider and operate the spider to confirm proper function.

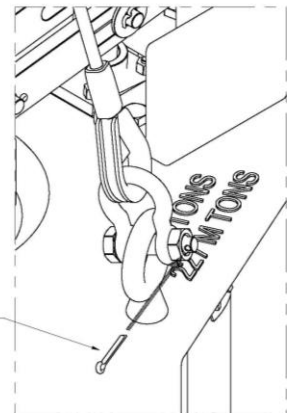
A single string can be run with dual spider.

Insure lower operational air pressure (75 to 80 PSI) on the low-pressure regulator to the spiders slips so slips cannot be accidentally unset while working with limited string weight. Failure to do use could result in injury or death.

Install the spiders divider pins after the dual packer has been run. Ensure that the keeper pins and latches are secure.

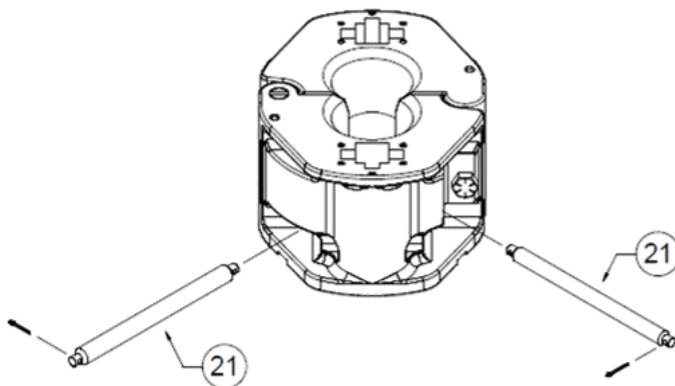


PLACE BOLT THROUGH SHACKLE AND LIFTING EYE AS SHOWN. FASTEN CORRESPONDING NUT.

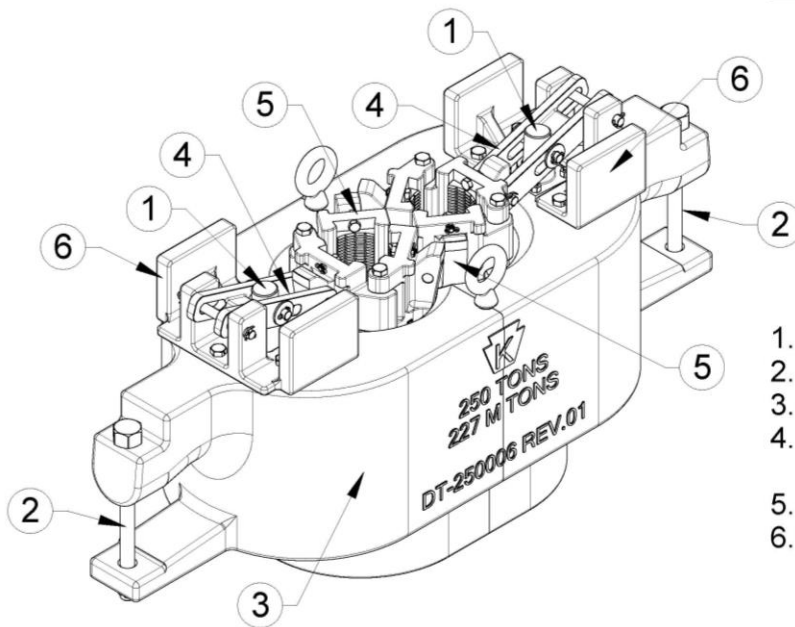
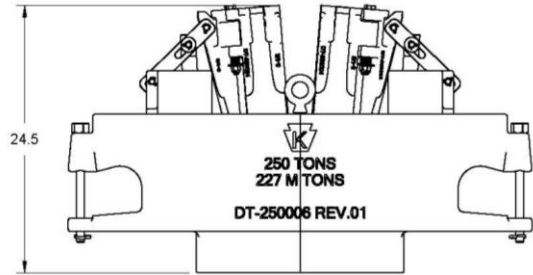
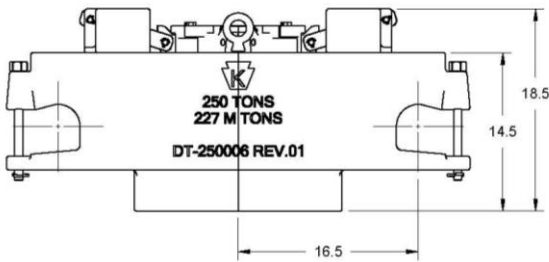
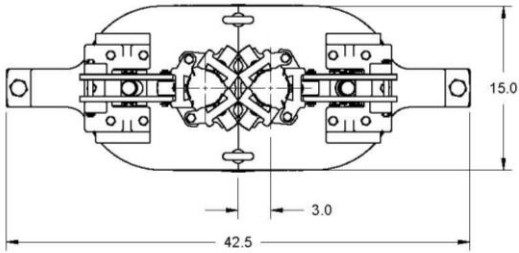


AFTER FASTENING NUT TO BOLT, REMEMBER TO USE COTTER KEY FOR SECONDARY RETENTION.

Figure 8

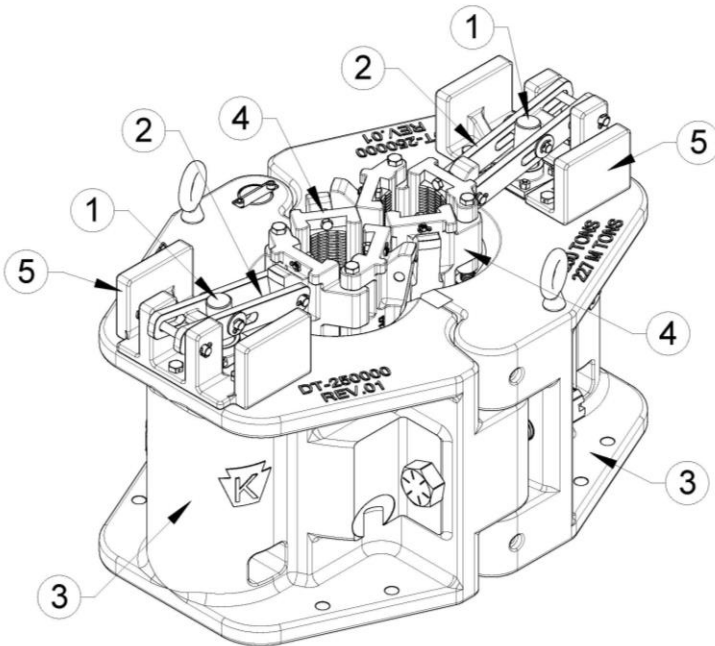
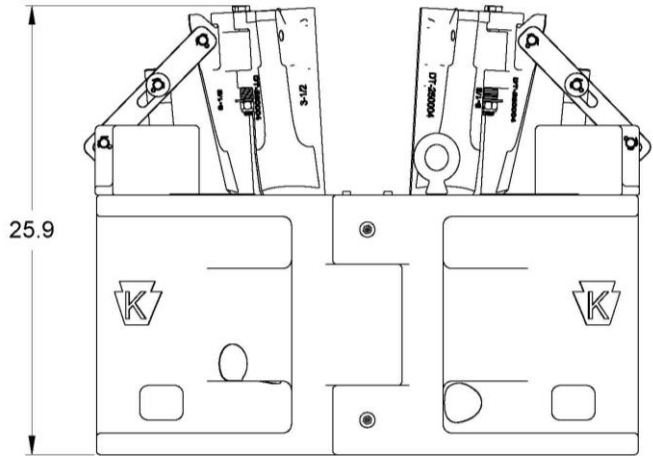
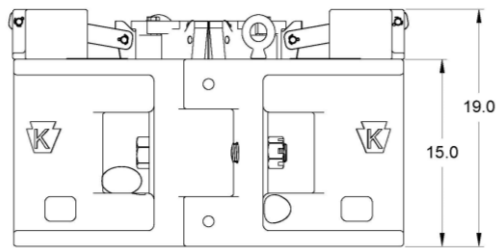
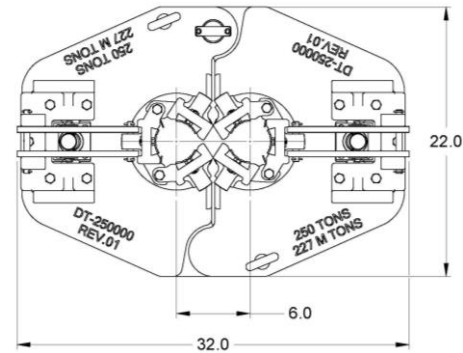


3.0 Elevator Technical Drawings



- 1. AIR CYLINDER
- 2. BAIL SAFETY BOLT
- 3. ELEVATOR BOWL
- 4. SLIP & CYLINDER LIFTING ARM
- 5. SLIP ASSEMBLY (x6)
- 6. STABILIZER BRACKET

3.0 Spider Technical Drawings



1. AIR CYLINDER
2. SLIP & CYLINDER LIFTING ARM
3. SLIP BOWL
4. SLIP ASSEMBLY (x6)
5. STABILIZER BRACKET

4.0 Maintenance

To ensure optimum performance from the dual tool elevator, perform the prescribed maintenance actions in **Figure 9**.

ACTION	FREQUENCY	Fig #
Clean and grease elevator and spider bore tapers	Daily During Use	11
Clean and grease the slip backs	Daily During Use	10
Check insets for wear and replace as necessary	Weekly	11
Grease hinge pins, remove inserts and grease insert slots	Weekly	11
Check for worn cylinder lifting pins, replace as necessary	Weekly	11
Check for worn lifting arm and slip pin, replace as necessary	Weekly	11
Check cylinder for leaks and wear, replace as necessary	Weekly	11
Magnetic Particle Examine critical areas	Monthly During Use	19
Clean thoroughly removing any coatings, disassemble, and MPI 100%	Annually	-

Figure 9

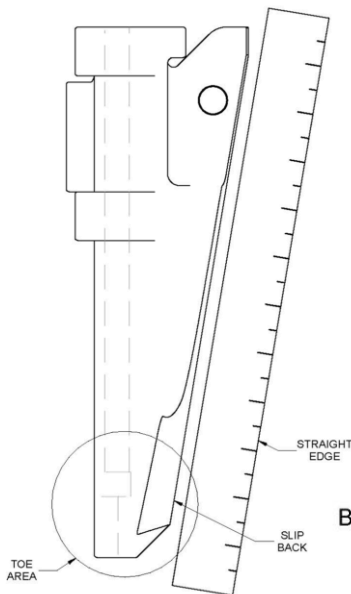


Figure 10

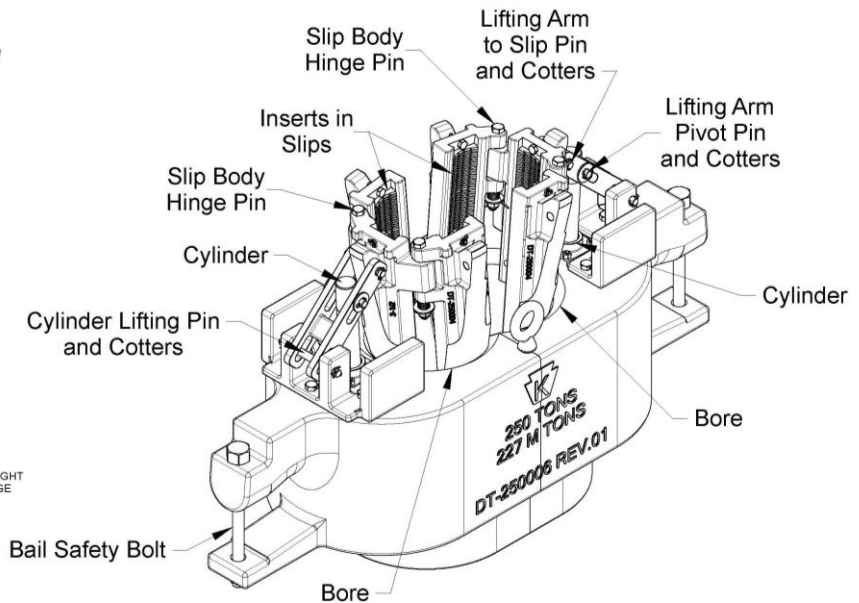


Figure 11

4.0 Maintenance

To ensure optimum performance from the dual tool spider, perform the prescribed maintenance actions in **Figure 12**.

ACTION	FREQUENCY	Fig #
Clean and grease elevator and spider bore tapers	Daily During Use	14
Grease both fittings for the hinge pin	Daily During Use	14
Clean and grease the slip backs	Daily During Use	16
Check insets for wear and replace as necessary	Weekly	14
Grease hinge pins, remove inserts and grease insert slots	Weekly	14
Check for worn cylinder lifting pins, replace as necessary	Weekly	14
Check for worn lifting arm and slip pin, replace as necessary	Weekly	14
Check cylinder for leaks and wear, replace as necessary	Weekly	14
Magnetic Particle Examine critical areas	Monthly During Use	20
Clean thoroughly removing any coatings, disassemble, and MPI 100%	Annually	-

Figure 12

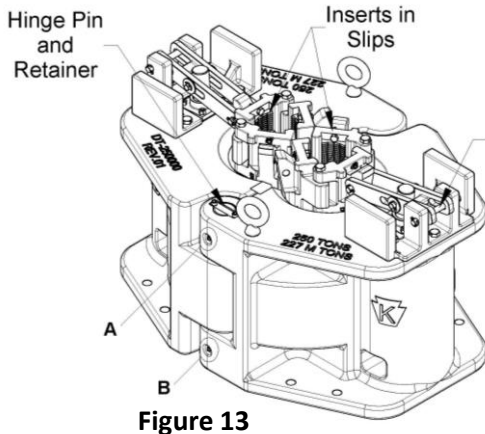


Figure 13

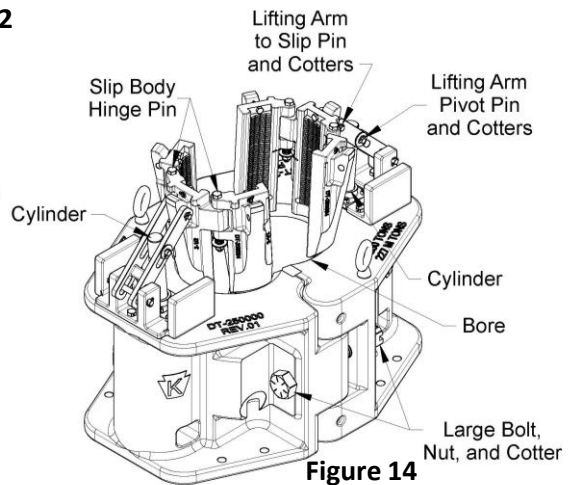


Figure 14

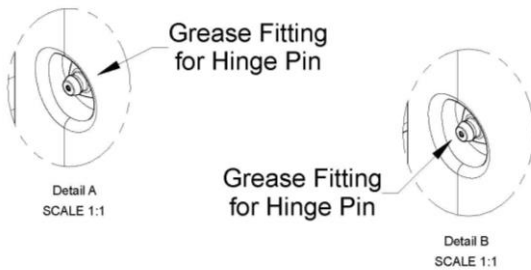


Figure 15

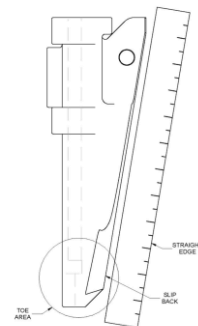
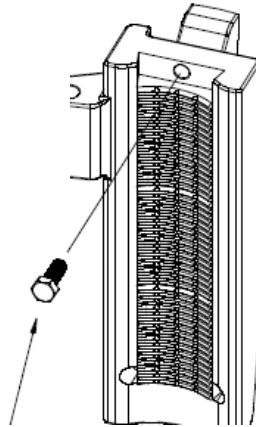


Figure 16

5.0 Repair

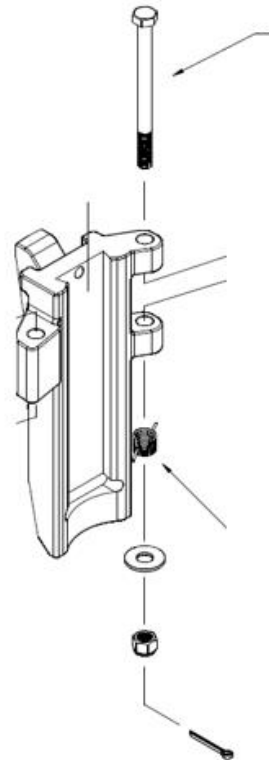
Replacing Worn Inserts

1. Remove the insert retainer bolts and cotters at the top of the slip.
2. Remove the inserts by sliding it out of the top of the slip. Tapping the insert from the bottom may be required.
3. Install new inserts by sliding them into the die slot from the top of the slip. Ensure the die slot is clean before installing new inserts.
4. Install the top retainer bolts and cotter key.



Replacing Slip Hinge Pins

1. Remove the slip from the elevator or spider by removing the lifting arm pivot pin from the middle slip.
2. Remove the hinge pin cotters and castle nuts.
3. Remove the hinge pins by taking pulling out of the slip.
4. Install new slip hinge pin.
5. Install the spring between the two segments as prescribed below.
 - Install the hinge pin through the slip.
 - Slip the spring onto the bottom of the hinge pin between the two segments.
 - Bring the spring up as high possible
 - slide a washer over the hinge pin and tighten the lock nut and install the cotter pin.



5.0 Repair

The examination methodology and acceptance criteria affecting the type and degree of discontinuities associated with the above identified critical and non-critical areas are defined below. (Reference ASTM E125). Use the defined methodology to examine the subject tool and acceptance criteria to evaluate all identified discontinuities.

Methodology

Subject the above identified critical area to a 100% magnetic particle examination. Such an examination is only to be performed after the areas have been final heat treated and machined. Machined surfaces shall be examined by the wet florescent method., whereas all other surfaces shall be examined by the wet or dry method. Magnetic particles examinations are to be performed in accordance with ASTM E709. Examiners must be certified Level II (as a minimum) in accordance with the American Society of Nondestructive Testing ASNT-TC-1A. Examinations can only be performed 24-hours after load testing.

Use the reference photographs described in ASTM E125 to evaluate identified discontinuities. These photographs contain actual discontinuities identified in accordance with ASTM E709 using a peak magnetizing current of 600 to 800 amps and a prod spacing of 4" to 6".

NOTE: the white discontinuities in the photographs are a result of painting the casting area with a slurry of lamp-black in kerosene, gasoline, or alcohol. The black line discontinuities are a result of applying reg magnetic powder to the casting surface and photographing the magnetic particle discontinuities.

Each reference photograph from ASTM E125 is identified with a number that corresponds to the severity degree identified in Figure ##. It is understood that it is impossible to rigidly interpret magnetic particle discontinuities on castings to a set of reference photographs. As a result, KET will work closely with the purchases to reach an agreement on the identified discontinuities. However, in cases where agreement cannot be obtained, the KET interpretation shall prevail.

5.0 Repair

ACCEPTANCE CRITERIA - Figure 17 below defines the discontinuity types illustrated in the referenced photos of ASTM E125.

DISCONTINUITY		
TYPE	DESCRIPTION	DEFINITION
I	Crack, Hot Tears	Ragged lines of variable width. May appear as a single jagged line or exists in groups. They may or may not have a definite line of continuity. They usually originate at the casting surface and generally become smaller as they go deeper.
II	Shrinkage	Appears as a jagged area of irregular patches. Shrinkage is a subsurface discontinuity that may be brought to the surface by machining or other methods of metal removal.
III	Inclusions	Isolated, irregular or elongated variations of magnetic particles occurring singly, in a linear distribution or scattered at random in feathery streaks. The indications are the result of the presence of sand, slag or oxides in the surface metal.
IV	Internal Chills, Unfused Caplets	A uniform line or band outlining the object and indicating lack of fusion between the metal object and the casting.
V	Porosity	Appears as rounded and elongated clusters of magnetic particles of various sizes; scattered at random.

Figure 17

The below **figure 18** provides a summary of the types and severity of discontinuities identified in API Specification 7K.

DISCONTINUITY SEVERITY		
DISCONTINUITY TYPE	CRITICAL AREAS	NON-CRITICAL AREAS
I	None	Degree 1
II	Degree 2	Degree 2
III	Degree 2	Degree 2
IV	Degree 1	Degree 1
V	Degree 1	Degree 2

Figure 18

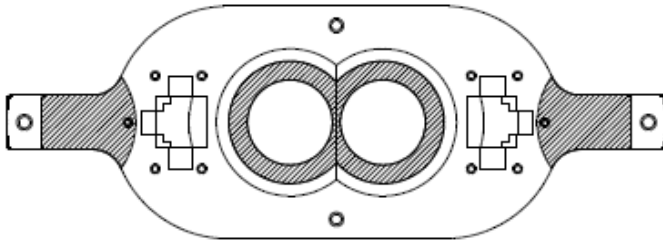
Only those discontinuities with major dimensions greater than 1/16” and associated with a surface rupture shall be considered relevant. Inherent discontinuities not associated with a surface rupture are considered non-relevant. If magnetic particle discontinuities greater than 1/16” are believed to be non-relevant, they shall be examined by liquid penetrant surface NDE or remove and re-inspected to prove their non-relevancy.

DISCONTINUITY REPAIR

If the relevant discontinuities are discovered upon inspection, removal of these discontinuities is acceptable through grinding and blending. However, grinding should not exceed 3/16” deep or 25% of the material thickness on cast surfaces. Machined surface discontinuities or discontinuities beyond acceptance depths should be evaluated by KET or a KET authorized repair facility.

5.0 ELEVATOR BOWL CRITICAL AREA DRAWINGS

AREAS HATCHED ARE CONSIDERED CRITICAL AREAS. AREAS NOT HATCHED ARE CONSIDERED NON-CRITICAL AREAS.



CONSIDERED CRITICAL AREAS.
AREAS NOT HATCHED ARE
CONSIDERED NON-
CRITICAL AREAS.

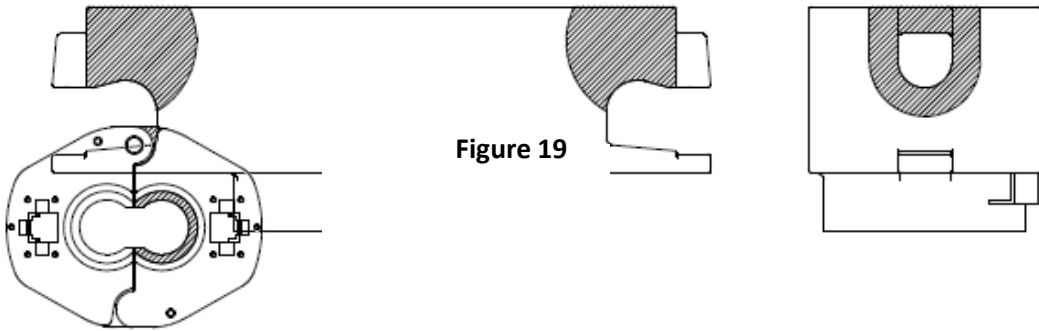


Figure 19

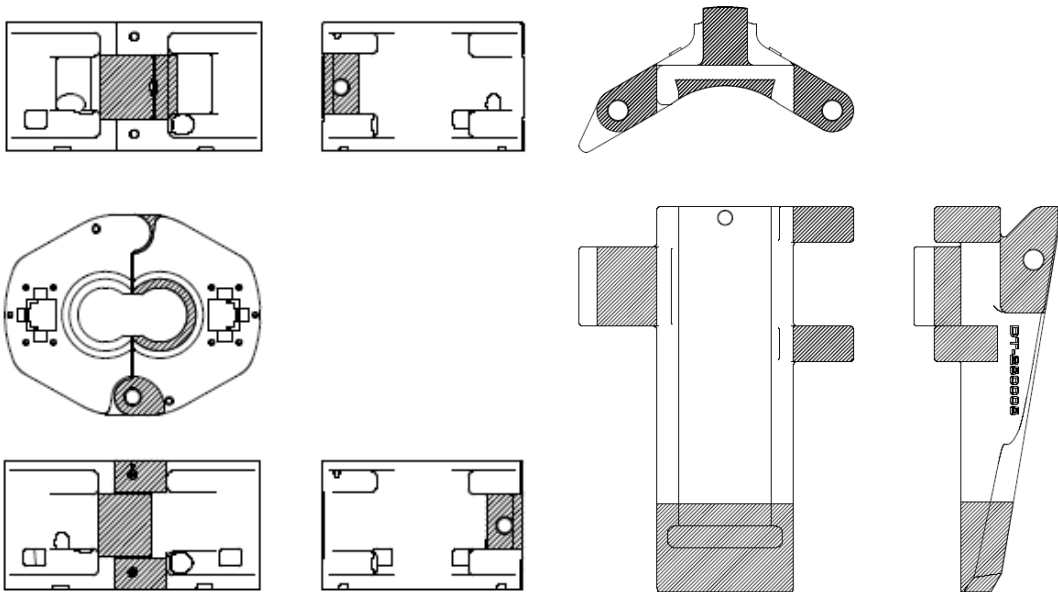


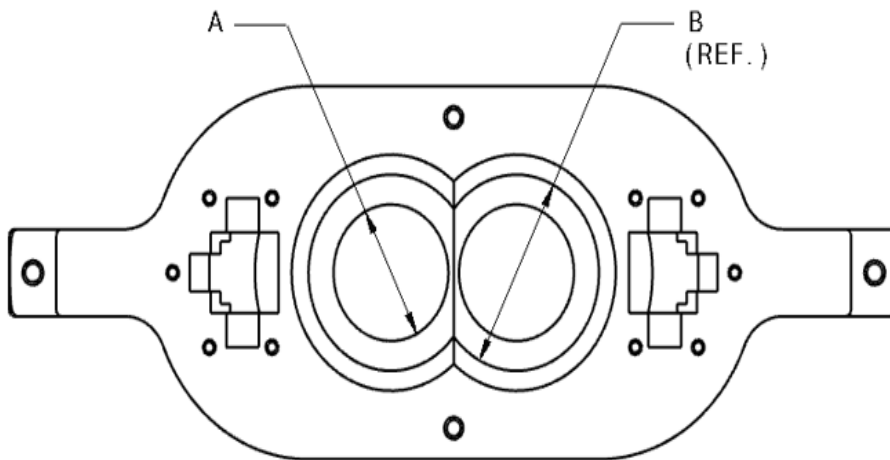
Figure 20

Figure 21

5.0 Wear Data for Dual String Elevator Bowl

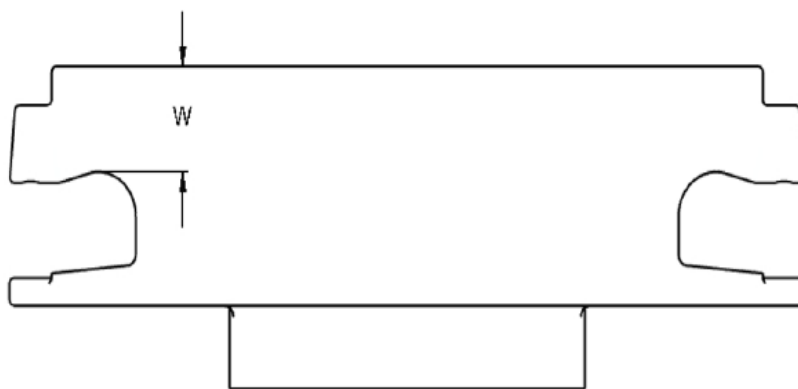
PART NUMBER	DT-250006
RATED CAPACITY	250 TON

MAX THRU BORE (A)	5.750
MAX TOP BORE (B)	8.200



LIFTING EARS

DIMENSION (W) MIN	4.250
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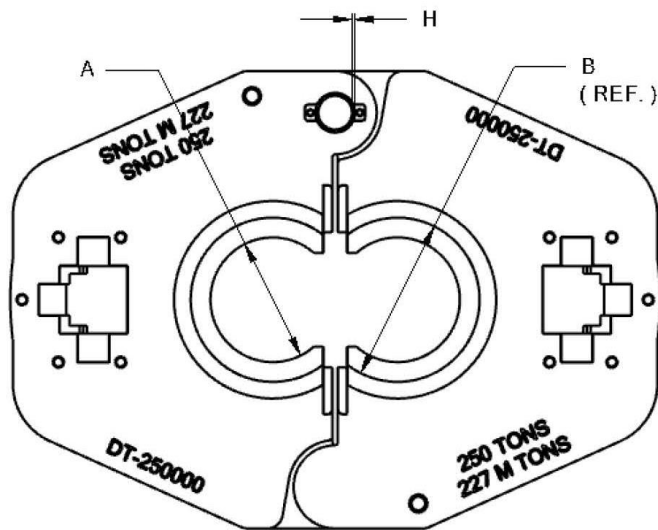


5.0 Wear Data for Dual String Slip Bowl

PART NUMBER	DT-250000
RATED CAPACITY	250 TONS

STANDARD PINS

HINGE PIN PART NUMBER	DT-250009
TOTAL CLEARANCE (H)	0.045
HINGE PIN MIN DIA. NEW	1.869
BORE MAX DIA. NEW	1.885
BOR DIA. MAX WORN	1.900
MAX THRU BORE (A)	6.250
MAX TOP BORE (B)	8.200



5.0 Wear Data for 3 1/2" & 4 1/2" Slip Body

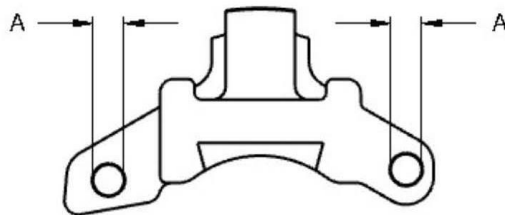
SIZE	3 1/2"—4 1/2"
RATED CAPACITY	125 TONS

3 1/2" Slip Body

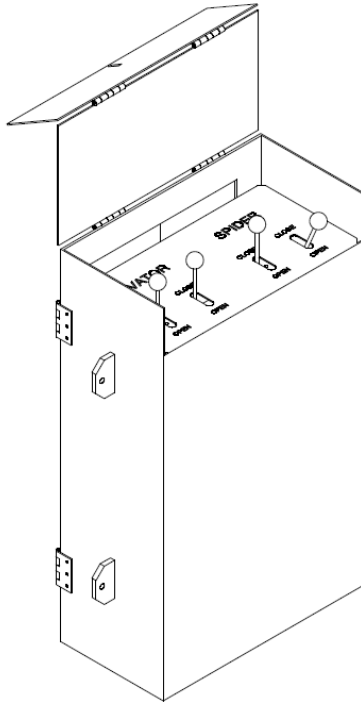
SLIP BODY PART NUMBER	DT-250420
HINGE PIN PART NUMBER	DT-250015
HINGE PIN MIN DIA. NEW (A)	0.490
BORE MAX DIA. NEW	0.570
BOR DIA. MAX WORN	0.625

4 1/2" Slip Body

SLIP BODY PART NUMBER	DT-250423
HINGE PIN PART NUMBER	DT-250015
HINGE PIN MIN DIA. NEW (A)	0.490
BORE MAX DIA. NEW	0.570
BOR DIA. MAX WORN	0.625

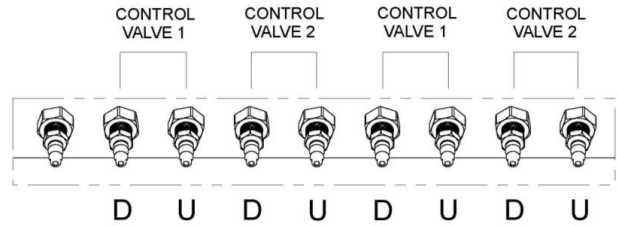


6.0 Control Panel Item Breakdown List

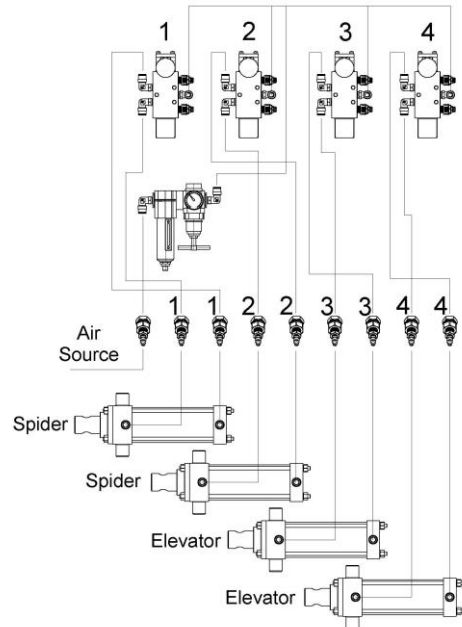
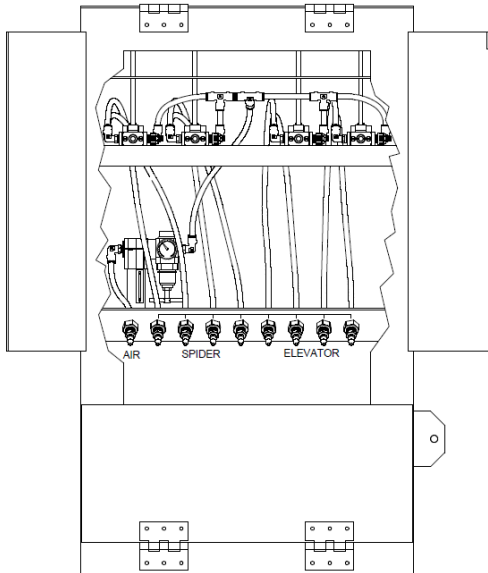


U = SLIPS UP

D = SLIPS DOWN



Detail A



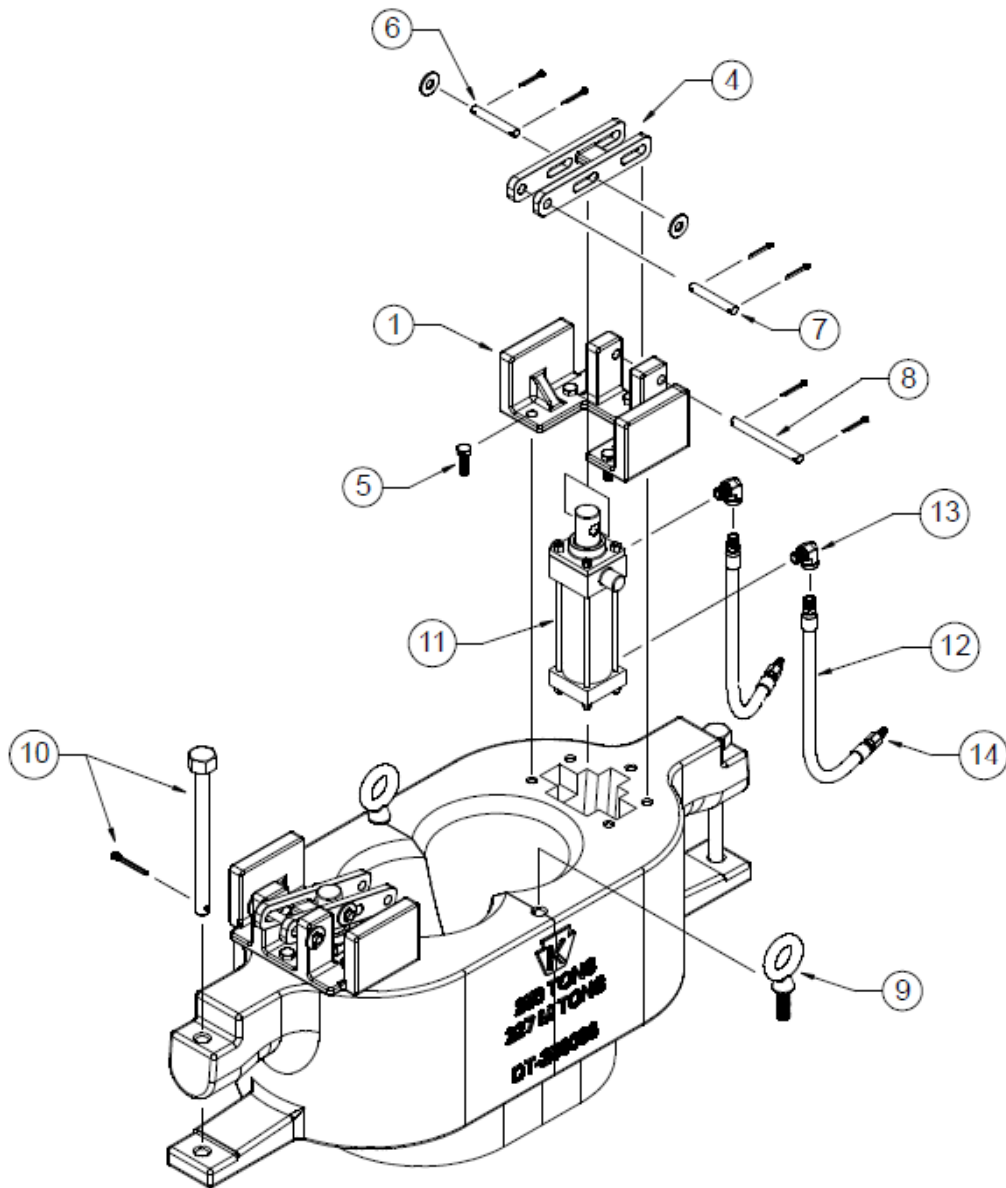
6.0 Control Panel Part Description

P/N	QTY	DESCRIPTION
DT-250276	4	HAND CONTROL VALVES
DT-250278	14	PTC TUBE X 90 DEG MALE CONNECTOR
DT-250275	1	DUAL TOOL CONTROL CONSOLE WELDMENT
DT-250277	8	MUFFLER WITH FLOW CONTROL
DT-250278	3	PTC TEE
DT-250280	9	PTC BULKHEAD
DT-250281	9	MALE QUICK CONNECT

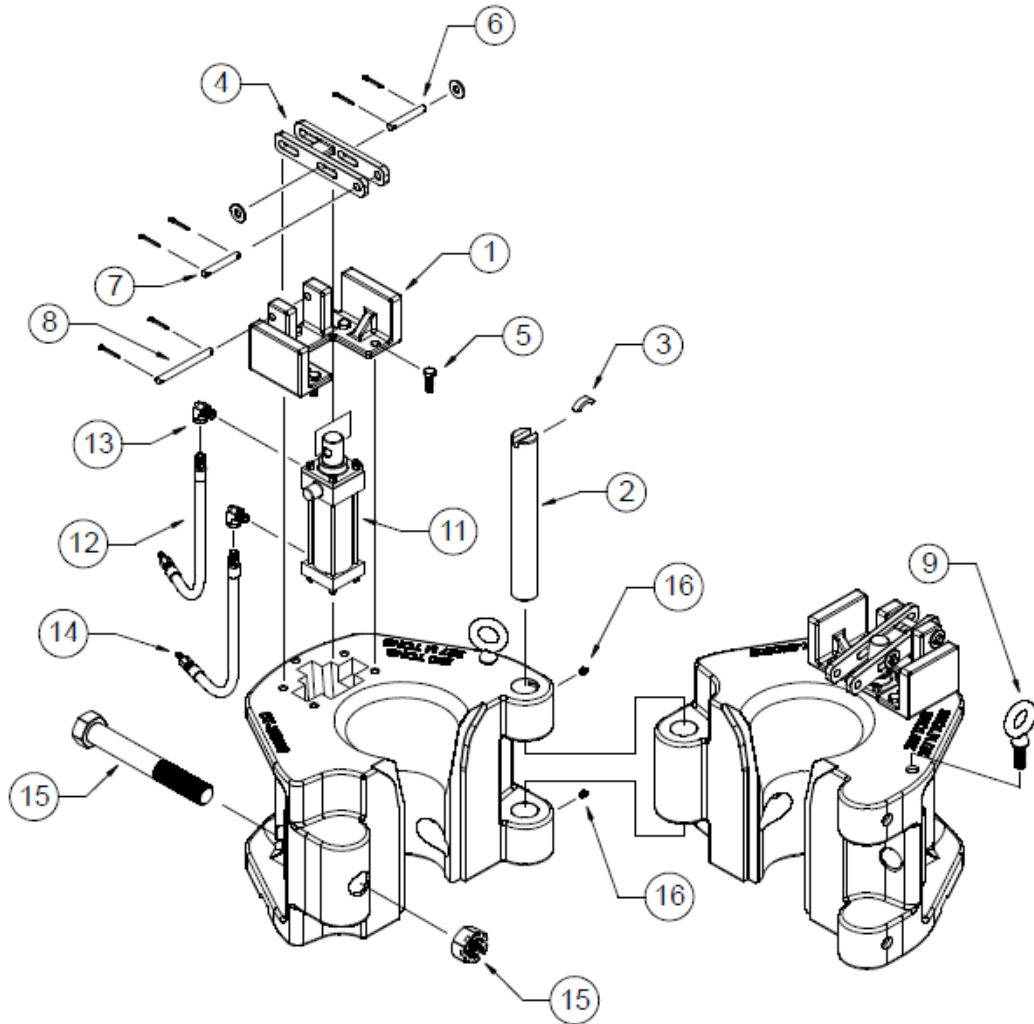
Accessories

P/N	QTY	DESCRIPTION
DT-250285	1	TOOL BOX WELDMENT
DT-250260	2	SCAFOLDING
DT-250265	2	PINS FOR SCALFOLDING
DT-250261	1	SPREADER BAR
DT-250262	1	LIFTING SLING
DT-250440	1	4 EACH -130' UMBOLICAL
DT-250450	1	4 EACH - 20' UMBILICAL HOSE SET

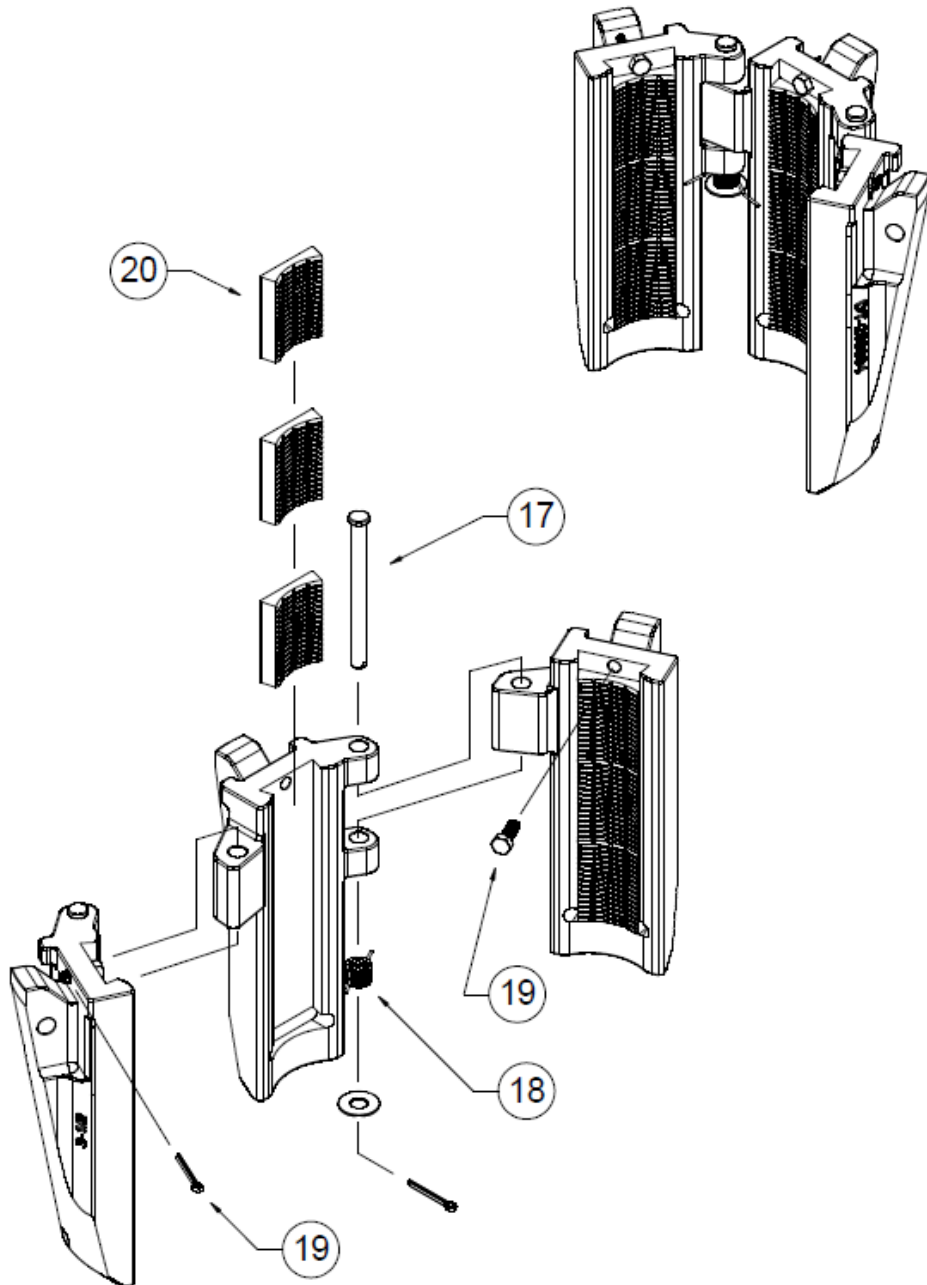
6.0 Elevator Part Description Breakdown



6.0 Spider Part Description Breakdown



6.0 Slip Part Description Breakdown



6.0 Part Description Breakdown

ITEM	PART NUMBER	DESCRIPTION
1	DT-250008	STABILIZER BRACKET
2	DT-250009	SLIP BOWL HINGE PIN
3	DT-250009-RT	HINGE PIN RETAINER
4	DT-250010	SLIP & CYLINDER LIFTING ARM
5	DT-250011	STABILIZER BRACKET BOLT
6	DT-250012	LIFTING ARM PIVOT PIN & COTTER
7	DT-250013	LIFTING ARM TO SLIP PIN & COTTER
8	DT-250014	CYLINDER LIFTING PIN & COTTER
9	DT-250018	LIFTING EYE BOLT
10	DT-250019	BAIL SAFETY BOLT & COTTER
11	DT-250025	AIR CYLINDER
12	DT-250026	AIR HOSE ASSEMBLY
13	DT-250027	90 DEGREE HOSE FITTING
14	DT-250028	MALE QUICK CONNECT FITTING
15	DT-250024	LARGE BOLT & NUT FOR SLIP BOWL
16	E940308-1	1/8" NPT GREASE ZERT
17	DT-250015	SLIP BODY HINGE PIN & COTTER
18	DT-250017	SLIP BODY HINGE SPRING
19	DT-250022	INSERT RETAINER PIN & COTTER
20	SEE BELOW	INSERT SEE BELOW
21	DT-250020	1.5" SLIP BODY INTERNAL ROLLER GUIDE
21	DT-250022	1.75" SLIP BODY INTERNAL ROLLER GUIDE

ITEM	PART NUMBER	DESCRIPTION
20	DT-6601	3 1/2" x 3 1/2" DUAL TOOL INSERT (REF 6466010)
20	DT-6602	3 1/2" x 2 7/8" DUAL TOOL INSERT (REF 6466020)
20	DT-6603	3 1/2" x 2 3/8" DUAL TOOL INSERT (REF 6466030)
20	DT-6604	3 1/2" x 1.900 (1 1/2) DUAL TOOL INSERT (REF 6466040)
20	DT-6605	3 1/2" x 1.660 (1 1/4) DUAL TOOL INSERT (REF 6466050)
20	DT-6608	4 1/2" x 4 1/2" DUAL TOOL INSERT
20	DT-6610	4 1/2" x 4" DUAL TOOL INSERT

CERTIFICATE OF WARRANTY AND GUARANTEE OF QUALITY

KET warrants all materials and products manufactured to be free from defects in material and workmanship, under normal use and service, when installed, used, and serviced in the manner provided and intended by the seller for a period of twelve (12) months after delivery. Seller's obligation under this warranty is expressly limited to repair or replacement, at its option, of any materials or products, returned to the seller's plant in New Iberia, Louisiana and which are determined by the seller to be defective. All freight charges for return and reshipment shall be paid by the customer. A new warranty period shall not be established for repaired or replaced material or products; such items shall remain under warranty only for the remainder of the warranty period on the original materials or products. This is the sole warranty of the seller and no other warranty is either expressed or implied, in fact or by law, including any warranty at to the merchantability or fitness for a particular use or purpose.

In case of goods or parts not wholly of seller's manufacture, seller shall make available to the customer whatever warranty or guarantee is extended to seller for such goods or parts by the supplier or manufacturer thereof.

Seller will not assume responsibility or liability for any repairs, rebuilding, welding or heat treating done to its material or products outside of seller's plant, such work shall void all warranties. All parts used in the manufacture and /or final assembly of seller's materials or products are necessary for both safety and operational performance. Omission of any part or failure to replace any worn part may result in the malfunction and a consequent safety hazard for which seller disclaims any responsibility or liability for injuries or damage as a result thereof.

Buyer's sole and only remedy in regard to any defective materials or products shall be the repair or replacement thereof as herein provided, and seller shall not be liable for any consequential, special, incidental or punitive damages resulting from or caused by any defective materials, products or supplies.



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Revision History

Rev	Date	Changes	By
02	02/21/2021	Added revision history	Cody H.
03	07/12/2021	Updated format	Cody H.
04	09/12/2022	Updated slip wear data	Cody H.
05	09/22/2023	Updated format and re-organized information to provide a clearer manual	Cody H.
06	04/8/2024	Added warning about shock loading	Cody H.