

# **TITAN™ Tubing Elevator**

## **TEA100**

### **Data Book**

# **Warning**

**Improper use of tubing elevators may result in injury or death. Do Not Exceed Rated Load of 100 Tons. Follow safe practices listed in Data Book.**

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## **TITAN™ Tubing Elevator Description**

The TEA100 TITAN™ Tubing Elevator hangs from the elevator links which are attached to the traveling block of the service or drilling rig. The drawworks of the rig move the elevator up and down the rig's derrick to install and remove tubing. The elevator may also be used on or around the rig floor for handling tubing.

Each elevator is bored for one size of tubing, 2-3/8 non-upset, 2-3/8 upset, 2-7/8 non-upset, 2-7/8 upset, 3-1/2 non-upset, or 3-1/2 upset. The size is stamped 238N, 238U, 278N, 278U, 312N, or 312U on the right body indicating the appropriate size.

The elevator has a rated capacity of 100 tons for heavy duty use. It can be lifted by elevator links with diameters as large as 2-1/4 inches.

The TEA100 offers the following features:

- An integrated center latch mechanism consisting of a retainer, lock, retainer spring, and lock spring to provide simple, fast, and smooth operation.

- A flame hardened top surface and special heat treated alloy materials to provide long life.

- Fully compliant with API specification 8C PSL level 2.

## **Warranty**

### **What Is Covered**

GEARENCH™ tools are expressly warranted to you, the purchaser, to be free of defects in material and workmanship.

### **How Long Coverage Lasts**

This express warranty lasts for the lifetime of the GEARENCH tool. Warranty coverage ends when the tool becomes unusable for reasons other than defects in workmanship or material.

### **How Can You Get Warranty Service**

To obtain the benefit of this warranty, contact a GEARENCH sales representative in Clifton, Texas.

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### **What Will We Do To Correct Problems**

Warranted products will be repaired or replaced, at GEARENCH's option, and returned at no charge to you, the original purchaser; or, if after three attempts at repair or replacement during the warranty period, the product defect in material or workmanship persists, you can elect to receive a full refund of your original purchase price for the product.

### **What Is Not Covered**

Defects, failures or conditions that are due to normal wear and tear, abuse or misuse, are not covered by this limited warranty. In addition, this limited warranty is in lieu of all other warranties, express or implied, verbal or written. To the maximum extent allowed by law GEARENCH disclaims all implied warranties, including implied warranties of merchantability and/or fitness for a particular purpose. GEARENCH also specifically denies any liability for any incidental damages and/or consequential damages, including but not limited to property damage to property other than the product itself, loss of sales profits, down time, costs or any other damages measurable in money, whether or not included in the foregoing enumeration.

Please be advised that some states do not allow the exclusion or limitation of incidental or consequential damages, so this limitation or exclusion may not apply to you. This warranty gives you specific rights, and you may also have other rights, which vary from state to state, province to province, or country to country.

### **Are Personal Injuries Covered**

In the event you, someone working for you, or any other person sustain a personal injury as a result of using the GEARENCH tool, GEARENCH limits its potential liability for such a claim or injury to the fullest extent allowed by law, and disclaims and denies any liability for such personal injury.

Please be advised that some states do not allow the exclusion or limitation of liability for personal injuries, so the above limitation or exclusion may not apply to you, or the individual claiming injury.

**No Other Express Warranty Applies**

This GEARENCH LIMITED WARRANTY is the sole and exclusive warranty, express or implied for GEARENCH products. No employee, agent, dealer or other person is authorized to alter, modify, expand or reduce the terms of this warranty or to make any other warranty on behalf of GEARENCH.

**Law Applicable**

All matters related to the sale and/or use of the GEARENCH tool that is the subject of this limited warranty, along with the construction and enforcement of the terms of this limited warranty itself, shall be subject to the substantive and procedural laws of the state of Texas, not the conflicts of laws provisions of Texas, but rather the laws of Texas themselves.

**Forum Selection Clause**

Any dispute arising out of the sale and/or use of the GEARENCH tool that is the subject of this limited warranty shall be presented in the form of a claim or lawsuit to the offices of GEARENCH in Clifton, Bosque County, Texas. No claim or suit may be brought against GEARENCH, arising out of the sale and/or use of the tool, or arising out of the terms of this warranty, except in such forum. Purchase and/or use of the GEARENCH tool makes you subject to the benefits and limitations of this limited warranty. Accordingly, any writ, judgment or other enforcement, obtained from a jurisdiction, county, parish, state or federal court or other country, other than that from the forum identified above, shall be void and unenforceable against GEARENCH.

**Arbitration Clause**

In the event of dispute or claim arises out of the sale and/or use of the GEARENCH tool that is the subject of this limited warranty, or arises out of the interpretation or enforcement of the terms and conditions of this limited warranty, such dispute shall be submitted to binding arbitration pursuant to the rules of the American Arbitration Association. If required to accomplish the purpose of this Arbitration clause, the purchaser hereby expressly waives any right to demand trial by jury.

**Complete Agreement**

This express limited warranty contains the entire agreement regarding express or implied warranties related to the GEARENCH tool that is the subject of it. No writing or language contained in the purchase order or any other document of the purchaser, or invoice of GEARENCH or any intermediate seller, shall be construed as modifying, in any way, the rights and liabilities contained in this limited warranty. GEARENCH expressly disclaims any obligations expressed in any customer purchase order or document that are contrary to the terms and limitations of this warranty.

**Severability**

If any term or limitation contained in this limited warranty is deemed unenforceable by law, then the term shall be severed from the remaining portions of the limited warranty which shall remain enforceable.

All communications to GEARENCH regarding the use of the tool and any aspect of the sale of the tool of this limited warranty should be addressed to GEARENCH.

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## Safe Practices and Procedures

### Responsibility

It is the responsibility of the employer to train the employee in the proper selection and use of tubing elevators, and to ensure that they are selected and used in that manner. A part of the job instruction program should therefore be detailed training in the proper use of tubing elevators.

"Employers are responsible for the safe condition of tools and equipment used by employees, including tools and equipment which may be furnished by employees." - (Source: OSHA 1910.242A)

### Safety

While we pride ourselves on the quality and dependability we build into GEARENCH™ tools and products, we caution users that it is only prudent to know and follow the simple rules of safety when using our products, or anyone else's.

Always follow safe practices and procedures in accordance with the recommendations of OSHA, The National Safety Council (NSC), The Hand Tools Institute (HTI), The National Association of Chain Manufacturers (NACM), The International Association of Drilling Contractors (IADC), Etc. All applicable Governmental rules, regulations or restrictions, now in effect or which may be promulgated, take precedence over the suggestions in this publication. The information in this publication is designed to supplement standard safe practices and procedures, not in lieu of, or replacement thereof.



**Improper use of tubing elevators may result in injury or death. Follow safe practices listed below.** (Source OSHA.gov)

### Potential hazards when installing and removing production tubing include:

<b>Hazard</b>	<b>Possible Solution</b>
Getting pinched fingers and hands from tongs and slips	Keep all hands and fingers away from pinch points
Being struck by swinging tubing and tubing Elevators	Instruct workers to be alert when on the rig floor and pipe racking area.

**Hazard**

Getting caught between the joint and tongs tubing or stump

**Possible Solution**

Avoid placing hands on the end of the stump

Being struck by the tubing hanger wrench if it should slip

Use the correct tools for each task

Getting fingers and hands pinched and caught between tubing hanger and tubing head.

Inspect the tools before use.

**Potential hazards when raising or lowering traveling block and elevator:****Hazard**

Being struck by the elevator and traveling block as they are raised or lowered

**Possible Solution**

Instruct workers to stand clear of tong and slip area when lowering the elevator and traveling block

Getting fingers and hands pinched between elevators and tongs or tubing collar.

Use handles on elevators as they are descending into place over the tubing

**Potential hazards when latching or unlatching elevators onto the tubing:****Hazard**

Pinching hand or fingers in the elevator

**Possible Solution**

Ensure that workers are instructed in proper latching procedure

Being struck by elevators not securely latched

Inspect and maintain elevators



## Periodic Maintenance and Inspection Schedule

### Daily

1. Visually inspect elevator for signs of corrosion or damaged components.
2. Inspect for any visual evidence of external cracks. Visible cracks indicate potential failure points, and if they are discovered, the elevator should be immediately removed from service.
3. Examine link support arm surfaces for deformation. If the surfaces are excessively worn, the elevator needs repair. (See 'Inspection Wear Limits' for maximum allowable wear)
4. Test the operation of the elevator latch mechanism. If the Lock or Retainer appears to be too loose or too restricted, repair may be required.
5. **Do not grind or remove metal from any surface of the elevator. Contact GEARENCH™ for all suspected damage and repair.**
6. Proper lubrication involves greasing the hinge and retainer pins through their grease fittings. The lock pin should be oiled to maintain smooth operation.
7. After use, clean elevator. Remove all external dirt and grease.

### Semi-annually

1. Perform Daily Maintenance as required.
2. Inspect the following areas for wear and/or damage (See 'Inspection Wear Limits' for maximum allowable wear):
  - a. Bore
  - b. Hinge Pin and Hinge Pin Hole
  - c. Retainer Pin and Retainer Pin Hole
  - d. Lock Pin and Lock Pin Hole
  - e. Lug

### Annually

1. Perform Daily Maintenance as required.
2. Perform Semi-annual Maintenance as required.
3. Conduct NDT inspection (Magnetic Particle Inspection recommended) of all primary-load-carrying components (Left and Right Bodies, Retainer, Hinge Pin, and Retainer Pin) for cracks. If any cracks are discovered, contact GEARENCH.
4. Load test at full capacity (200,000 lbs) for five minutes. All tests should be logged and filed with original purchase order paperwork.

**NOTE: The TEA100 is a load bearing tool that is manufactured from alloy steel and heat treated to strict standards. Only welding to repair a worn bore is allowed provided that the welding is performed by a qualified welder using a qualified process for AISI 4318 material with a minimum strength of 110 ksi. Welding of the bore constitutes remanufacture and all testing shall be performed in accordance with API RP8B Any unauthorized welding repairs on the TEA100 will void both the warranty and the load rating.**

## **Inspection Wear Limits**

### **Link Support Arm**

- Nominal Arm Thickness – 3.000” (from contact area to top of body)
- Minimum Arm Thickness after wear – 2.938”

### **Bore (measured with bodies wedged apart to remove all slack in components)**

1. TEA100-238N – 2.512” (maximum localized length = 0.594)
2. TEA100-238U – 2.764” (maximum localized length = 0.648)
3. TEA100-278N – 3.013” (maximum localized length = 0.718)
4. TEA100-278U – 3.264” (maximum localized length = 0.773)
5. TEA100-312N – 3.639” (maximum localized length = 0.875)
6. TEA100-312U – 3.920” (maximum localized length = 0.937)

If localized portions of the bore are found to measure larger than the maximum bore allowance tabulated above, the bore need not be rejected provided that all of the following conditions are met:

- a) The depth of wear, grinding, or other damage in the localized portion(s) of the bore shall not exceed 1/8 inch (3.2 mm).
- b) The surface of all localized wear, grinding, or other damage, shall be blended back to the adjacent bore surface with a transition not less than a ratio of 3 to 1 (length to depth).
- c) After blending, the total length (measured around the bore surface) of all such areas of localized wear, grinding, etc., including transitions to the bore surface shall not exceed the maximum length shown above.

### **Hinge Pin**

- Large Diameter – 1.739”
- Small Diameter – 1.489”

### **Hinge Pin Hole (In the Right and Left Bodies)**

- Large Diameter – 1.763”
- Small Diameter – 1.509”

### **Retainer Pin**

- Diameter – 0.740”

### **Retainer Pin Hole (In the Left Body and the Retainer)**

- Diameter – 0.763”

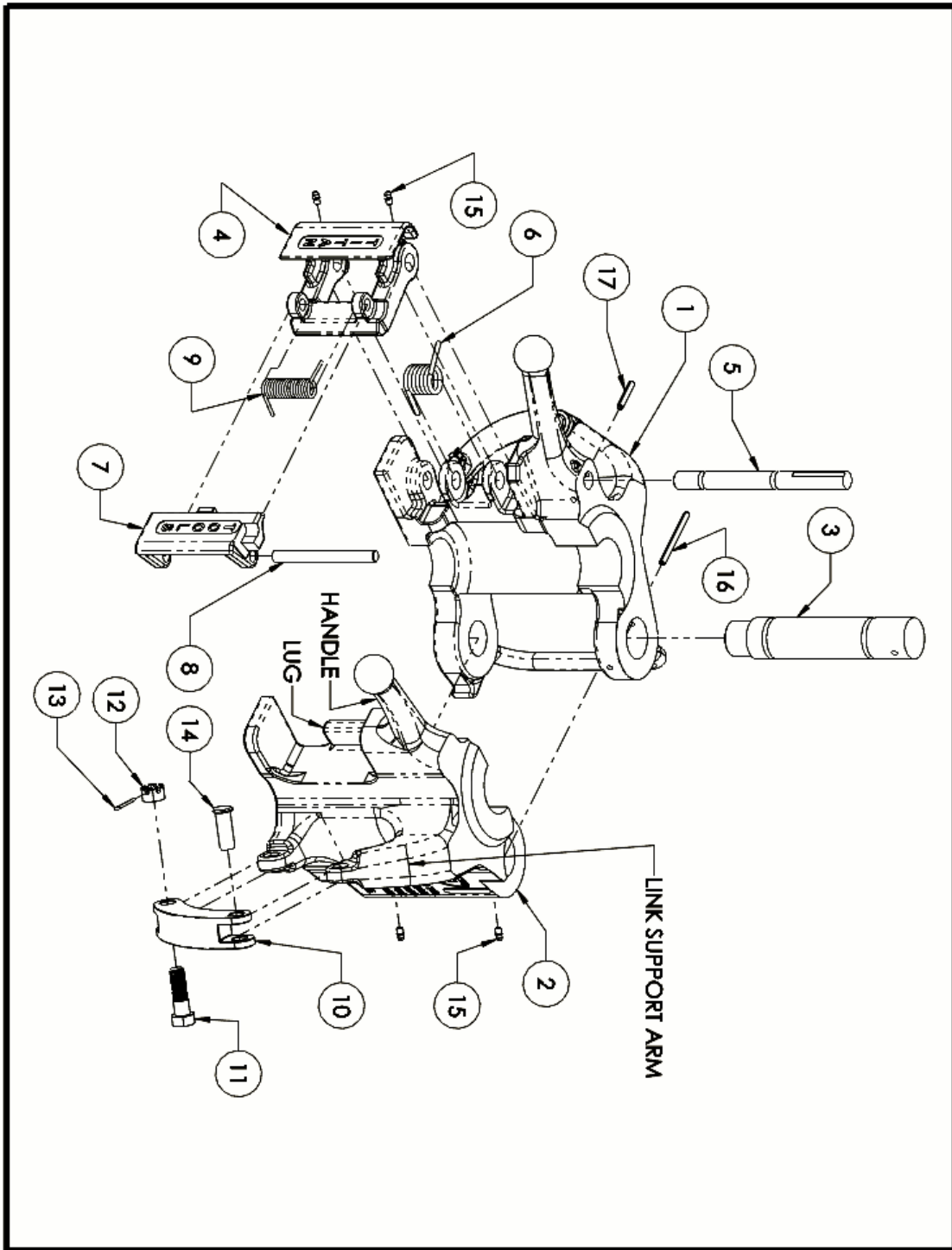
### **Lock Pin**

- Diameter – 0.491”

### **Lock Pin Hole (In the Retainer and the Lock)**

- Diameter – 0.513”

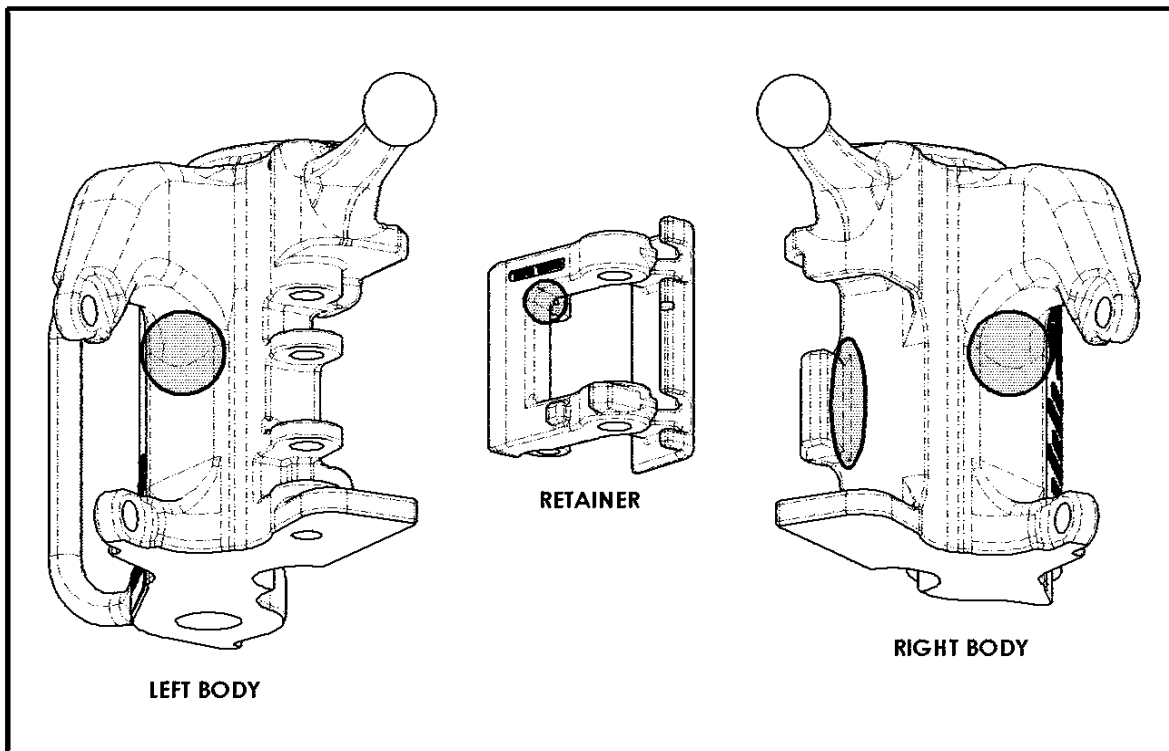
# Assembly Drawing



ITEM	QTY	PART NUMBER	DESCRIPTION
1	1	TEL100	LEFT BODY
2	1	TER100	RIGHT BODY
3	1	HP418	HINGE PIN
4	1	TEN100	RETAINER
5	1	HP419	RETAINER PIN
6	1	HS31	RETAINER SPRING
7	1	TEK100	LOCK
8	1	HP420	LOCK PIN
9	1	HS30	LOCK SPRING
10	2	BDT100	TIE BAR
11	2	HXS039	TIE BAR BOLT
12	2	HXN060	TIE BAR NUT
13	2	HXC008	COTTER PIN
14	2	HP396	TIE BAR RIVET
15	4	HXG006	GREASE FITTING
16	1	HXP010	SPRING PIN
17	1	HXP013	SPRING PIN

## Critical Area Drawing

The following drawing depicts the critical areas in the Left and Right Body halves and in the Retainer. The critical area for the Left Body half is underneath the link support arm and along its tangent surface. The critical areas for the Right Body half are underneath the link support arm, along its tangent surface, and the area along the retaining lug and its tangent surface. The critical areas for the Retainer are on the inside corners above and below the lug contact area and along their tangent surfaces. The Hinge Pin and Retainer Pin are not shown, but their entire surfaces shall be considered critical areas.



## Operation

To attach the elevator to the tubing, the elevator operator stands on one side of the tubing which is supported in a “spider” with the elevator on the opposite side of the tubing. The operator reaches around the tubing with one hand on either side of the tubing. The elevator is gripped by the handles of the elevator. The operator pulls the opened elevator to the tubing and then brings the two handles together so that the elevator is wrapped around the tubing. This action causes the Retainer to engage the locking lug on the Right Body half securing the elevator to the tubing. **It is important for the elevator operator to visually verify that the Retainer and Lock properly settle into the engaged position or premature release of the tubing could occur, resulting in bodily injury and/or dropping the tubing down the well requiring fishing of the dropped tubing string.**

To remove the elevator from the tubing, the tubing is landed in the “spider” and the elevator is then lowered a few inches below the coupling. The elevator operator holds the handle on the Right Body half with one hand and uses the other hand to pull on the elevator Lock. Pulling on the Lock causes it to rotate free of the Right Body half releasing the Retainer and fully opening the elevator in one smooth motion.

It is wise to practice connecting and disconnecting the elevator to and from the tubing to observe the Retainer and Lock operation, which helps to build familiarity, to develop a routine, and to know the lock is set.

# **WARNING:**

**Under no circumstances should the maximum working load of 100 Tons be exceeded.**

**This tool should not be used under heavy impact load conditions including but not limited to catching dropped tubing or running up against stuck tubing to break it loose.**

**This tool should only be used on tubing in a vertical direction. This tool should not be used on tubing in a horizontal direction including but not limited to lifting tubing off the ground.**

**The top surface of this tool should only contact square shoulders on a tubing string for lifting during operation. The top surface should not contact tapered surfaces on a tubing string for lifting during operation.**

## **Replacement Parts**

Repairs should only be made by GEARENCH™ or a repair facility authorized by GEARENCH.

## **Responsibility of Distributors**

GEARENCH DISTRIBUTORS ARE RESPONSIBLE FOR FORWARDING THIS DATA BOOK AND OTHER GEARENCH PRODUCT INFORMATION RELATING TO THE INDIVIDUAL PRODUCT, THROUGH THE CHANNELS OF DISTRIBUTION, DOWN TO AND INCLUDING THE INDIVIDUAL USING THE PRODUCT.

### **NOTE:**

**In view of the fact that the actual use determines whether safety requirements have been met, the ultimate responsibility to comply rests with the end user.**

## **Certificates**