



**SAFE PRACTICES  
AND  
PROCEDURES  
MANUAL**

Form SHPG53 Rev. 09/13/17



**WARNING - IMPROPER USE OF TOOLS  
MAY RESULT IN SERIOUS INJURY!  
READ THIS MANUAL PRIOR TO USE**

**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. GEARENCH • 4450 South Hwy. 6 • P. O. Box 192 • Clifton, TX 76634

**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

**RESPONSIBILITY, REPLACEMENT PARTS, SAFETY & SAFE PRACTICES**

**RESPONSIBILITY**

"It is the responsibility of the employer to train the employee in the proper selection and usage of tools, chains, etc., and to ensure that they are selected and used in that manner. In many instances, injury results because it is assumed that anybody knows how to use common hand tools. Observations and the record show that this is not the case. A part of every job instruction program should therefore be detailed training in the proper use of hand tools (and of all other special tools and equipment needed to accomplish the job)." (Source – NATIONAL SAFETY COUNCIL)

"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)

**REPLACEMENT PARTS**

Use only PETOL™ & TITAN™ replacement parts – no other parts are of comparable strength, quality and interchangeability.

**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.

**SAFE PRACTICES (Source – The National Safety Council)**

Failure to observe one or more of the following five safe practices accounts for most hand and powered tool accidents:

1. ALWAYS WEAR SAFETY GOGGLES TO PROTECT EYES
2. SELECT THE RIGHT TOOL FOR THE JOB
3. KEEP TOOLS IN GOOD CONDITION
4. USE TOOLS CORRECTLY
5. KEEP TOOLS IN A SAFE PLACE

Safety Goggles must always be worn by persons in any area where hand and powered tools are being used.

Never apply excess leverage to a wrench or tool by means of a "Cheater Bar." Never strike wrenches and tools with hammers or other objects.

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 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 that 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 or this limited warranty should be addressed to GEARENCH.

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All tools should be kept clean, inspected on a regular basis, and replaced when they show signs of wear.

Be especially careful not to place yourself in a position that could result in bodily injury in the event of a failure. Brace yourself firmly and pull rather than push when wrenching. (If necessary to push, do so with the flat of the hand rather than gripping around the wrench.)

Never stand under or near loads being hoisted off the ground.

READ SAFE PRACTICES AND PROCEDURES MANUAL, CATALOG INFORMATION AND PRODUCT LABELING PRIOR TO OPERATION.

Spinning and drill pipe chain, cathead chain, and the PETOL Connecting Link attachment are designed for the specific purpose for which the name indicates. Chains and attachments that are to be used for any other purpose should be selected in accordance with the recommendations of ASTM, NACM, Rigger's Handbook, and the commercial chain manufacturer's technical manuals.

**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.

**SAFETY SOURCES AND PUBLICATIONS**

In the interest of safety GEARENCH recommends the following sources of safety related information:

HTI - The Hand Tools Institute  
25 North Broadway • Tarrytown, New York 10591  
(914)332-0040 • fax (914)332-1541 • www.hti.org

The National Safety Council (NSC)  
1121 Spring Lake Drive • Itasca, Illinois 60143-3201  
(630)285-1121 • fax (630)285-1434 • www.nsc.org

International Safety Council  
1121 Spring Lake Drive • Itasca, Illinois 60143-3201  
(630)285-1121 • fax (630)285-1434 • www.nsc.org

**RESPONSIBILITY OF DISTRIBUTORS**

IT IS THE RESPONSIBILITY OF THE PURCHASERS OF GEARENCH PRODUCTS TO CONVEY THE INFORMATION IN THIS PUBLICATION, AND ANY OTHER INFORMATION RELATING TO THE INDIVIDUAL PRODUCT, THROUGH THE CHANNELS OF DISTRIBUTION, DOWN TO AND INCLUDING THE INDIVIDUAL USING THE PRODUCT.

The service life of leaf chains can be altered by a variety of adverse operating conditions. The following information discusses the most important of these conditions for consideration when operating or scheduling replacement of leaf chain systems.

**OVERLOADING / SHOCK LOAD / SIDE LOADING**

- Attempting to “inch” loads which are beyond the rated capacity of the tool.
- Striking the tool with a hammer or other object while force is being exerted in an attempt to loosen a frozen joint.
- Side pull on the chain. Side pull can be caused by pulling or pushing on the tong in a direction that is not along a perpendicular plane, unlevel mounting of the vise, inadequate support of the part being broken out, and improper seating of the part being broken out in the tong or vise. Improper seating will occur when the O.D. of the part is not consistent within the width of the tong or vise jaw.

**ENVIRONMENTAL CONDITIONS**

Wrench and vise chains operate in widely varying environments, from wet outdoor conditions to mildly to highly corrosive industrial atmospheres. They can also be exposed to abrasives such as sand and grit.

The possible effects include:

- Moisture - corrosion and rust reduce chain strength by causing pitting and cracking.
- Temperature - very cold temperatures reduce chain strength by embrittlement.
- Chemical Solutions or Vapors - Corrosive attack of the chain components grain structure and / or the mechanical connections between the chain components (crevice corrosion) may occur. Cracking often is microscopic. Propagation to complete failure can be eventual or sudden.
- Abrasives - Accelerated wearing and scoring of the articulating chain members (pins and plates) may occur, with a corresponding reduction in chain strength. Due to inaccessibility of the bearing surfaces (pin surfaces and plate apertures), wear and scoring are not readily noticeable.

These conditions, when coupled with normal chain wear and inherent residual stress (normally in the chain as constructed), can result in environmentally assisted failure.

It is impossible to predict chain life under complex conditions, as the degree of hostility and its effects are dependent on many variables such as temperature, time of exposure, concentration of corrosive atmosphere or medium, degree of abrasive wear, etc...Establishing the degree and frequency of unpredictable dynamic loading is also difficult.

**NORMAL LIFE EXPECTANCY**

A leaf chain's normal life expectancy can be expressed as a maximum percent of elongation. This is generally between 2% to 3% of pitch. As the chain flexes back and forth, the bearing joints (pins and inside link plates) gradually wear from articulation.

As with all steel bearing surfaces, the precision, hardened steel joints of leaf chain require a constant film of oil between mating parts to prevent wear and to resist corrosion.

**LUBRICATION**

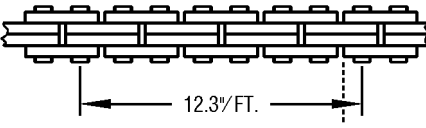
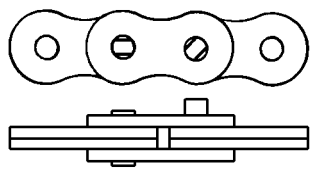
One of the most important but often overlooked factors is adequate lubrication. In addition to reducing internal friction, maintaining a film of oil on all chain surfaces will inhibit rusting and corrosion. This is important as corrosion of highly stressed hardened steel chain components can cause a major reduction in the load capacity of leaf chain and result in link plate cracking.

Protection from corrosion is important in storage as well as in service. The factory lubricant applied to PETOL™ Chain is a “Fingerprint Neutralizing Water Displacing Corrosion Preventive.” This is an excellent rust and corrosion inhibitor for chains in storage. When installing these chains new, do not attempt to steam clean or degrease this lubricant. A grade of SAE30 or 40 weight, nondetergent motor oil should be used as supplemental lubricant and a film of this oil should be maintained on all surfaces and internal bearing joints. Also, do not attempt to paint new chains. Though painting may help inhibit corrosion, it will seal off critical clearances and restricts oil from reaching the pin surfaces where it is needed for good joint lubrication.


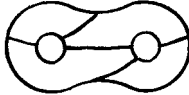



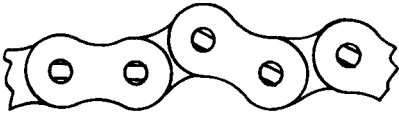
When operating in dusty environments, lubricated chains will accumulate a pastelike buildup of grime. At periodic intervals, this buildup should be removed by cleaning and the chain should be immediately relubricated. Do not use caustic or acid type cleaners; use a stiff brush and a certified safe petroleum base solvent.

**PERIODIC INSPECTION LIST FOR PETOL™ SPECIAL CHAIN**

1. PRIOR TO EACH USE, LEAF CHAIN AND TOOLS SHOULD BE INSPECTED FOR SERVICEABILITY AND LUBRICATION.
2. USE ONLY PETOL™ & TITAN™ REPLACEMENT PARTS – NO OTHER PARTS ARE OF COMPARABLE STRENGTH, QUALITY, AND INTERCHANGEABILITY.

APPEARANCE AND / OR SYMPTOM	PROBABLE CAUSE	CORRECTION
<p>Excessive Length (Elongation)</p> 	<p>Normal Wear</p> <p>Permanent deformation (stretch) from overload</p>	<p>Replace chain</p> <p>Replace chain and correct cause of overload</p>
<p>Abnormal Protrusion of Pins</p> 	<p>Overloading</p> <p>Inadequate lubrication</p> <p>Side Loading</p>	<p>Replace chain and correct cause of overload</p> <p>Replace chain and improve lubrication</p> <p>Replace chain and correct cause of side load</p>

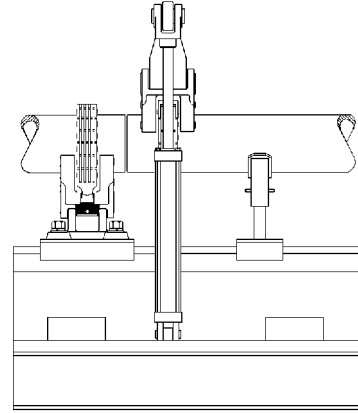
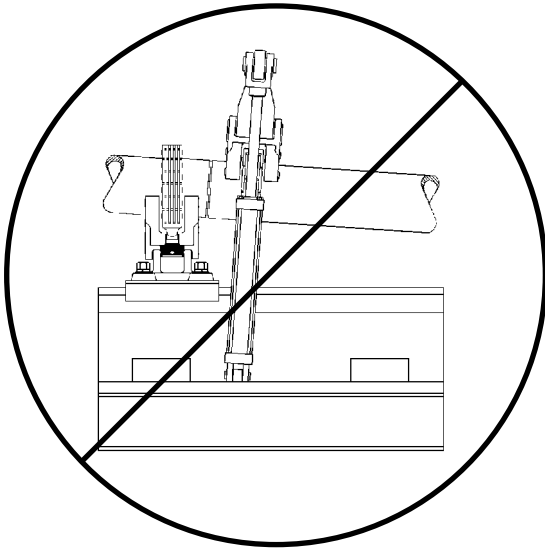
### PERIODIC INSPECTION LIST FOR PETOL™ SPECIAL CHAIN (continued)

APPEARANCE AND / OR SYMPTOM	PROBABLE CAUSE	CORRECTION
<p>Cracked Plates (Fatigue)</p> 	<p>Overloading Side Loading</p>	<p>Replace chain and correct cause of overload Replace chain and correct cause of side load</p>
<p>Arc-Like Cracked Plates (Stress Corrosion)</p> 	<p>Severe rusting or exposure to acidic or caustic medium, plus static stress at press fit between pin and plate.</p>	<p>Replace chain and protect from hostile environment</p>
<p>Enlarged Holes</p> 	<p>Overloading</p>	<p>Replace chain and correct cause of overload</p>
<p>Cracked Plates (Corrosion Fatigue) Perpendicular to Pitch Line, plus rust or other evidence of chemical corrosion</p> 	<p>Corrosive Environment</p>	<p>Replace chain and protect from hostile environment</p>
<p>Fractured Plates (Tension Mode)</p> 	<p>Overloading</p>	<p>Replace chain and correct cause of overload</p>
<p>Tight Joints</p> 	<p>Dirt or foreign substance packed in joints Corrosion and rust Bent pins</p>	<p>Clean and relube Replace chain and protect from hostile environment Replace chain</p>

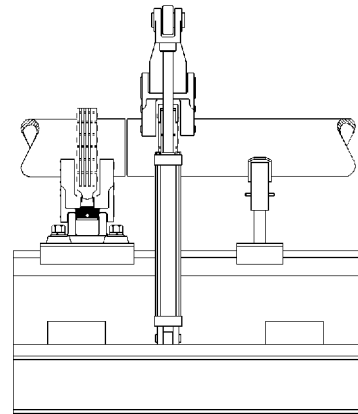
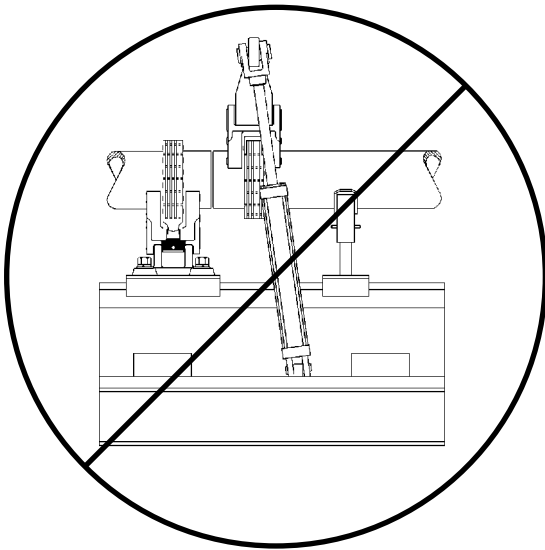
# Safety Precautions

1. Always wear safety goggles to protect eyes.
2. Select the right tool for the job.
3. Keep tools in good condition.
4. Use tools correctly.
5. Keep tools in a safe place.
6. Wear protective clothing, gloves and safety shoes as appropriate.
7. Use lengths of assembled chain. Do not build lengths from individual components.
8. Do not attempt to rework damaged chain by replacing only the components obviously faulty. The entire chain may be compromised and should be discarded.
9. Never electroplate assembled leaf chains or components. Plating will result in failure from hydrogen embrittlement.
10. Do not weld any chain or component. Welding spatter should never be allowed to come in contact with chain or components.
11. Leaf chains are manufactured exclusively from heat-treated steels and therefore must not be annealed. If heating a chain with a cutting torch is absolutely necessary for removal, the chain should not be reused.
12. Inspect chains frequently and regularly for link plate cracking, pin turning, pin protrusion and corrosion.
13. Use only PETOL™ & TITAN™ replacement parts to ensure proper strength.

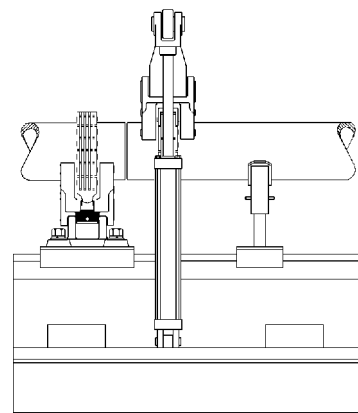
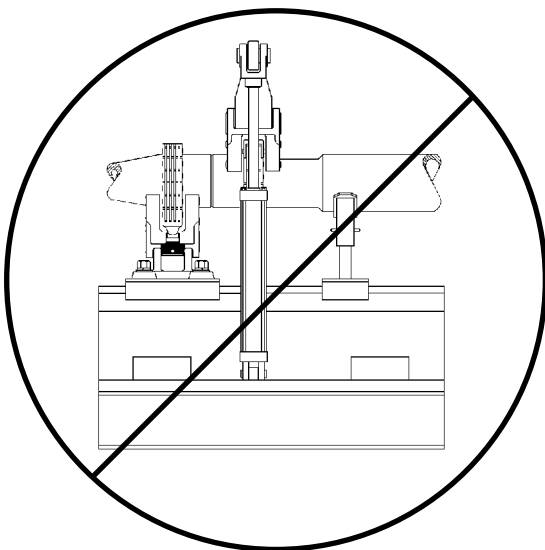
### COMMON CAUSES AND CORRECTION OF SIDE LOADING



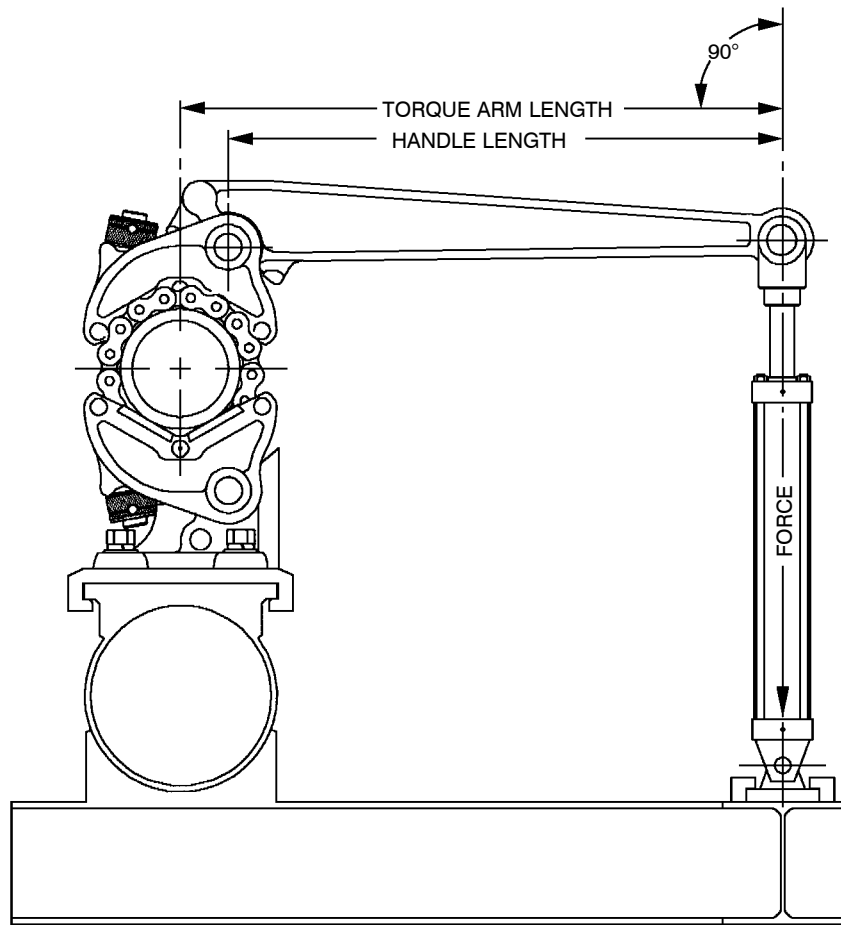
INADEQUATE SUPPORT OF WORKPIECE



FORCE BEING APPLIED IS NOT IN LINE WITH TONG



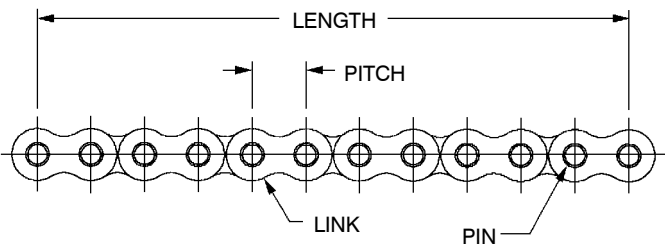
IMPROPER SEATING OF THE PART DUE TO AN INCONSISTENT O.D.



$$\text{TORQUE (FT.-LBS.)} = \text{FORCE (LBS.)} \times \text{LENGTH (IN)} / 12$$

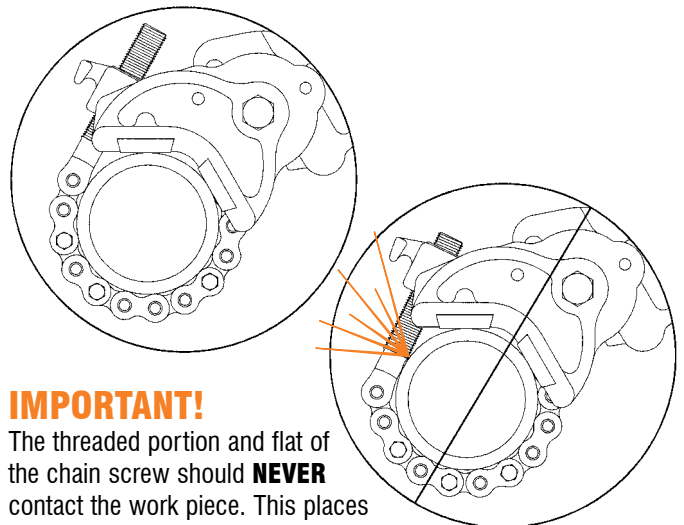
WORKING LOAD IS THE MAXIMUM FORCE THAT MAY BE APPLIED TO A TOOL DURING OPERATION. DO NOT EXCEED THE PUBLISHED WORKING LOADS.

**CHAIN DETAIL**



$$\text{ELONGATION (\%)} = \frac{\text{ACTUAL LENGTH}}{\text{ORIGINAL LENGTH}} \times 100$$

**PROPER CHAIN ADJUSTMENT for PETOL™ DRILL PIPE TONGS**



**IMPORTANT!**

The threaded portion and flat of the chain screw should **NEVER** contact the work piece. This places an additional load on the chain screw which could result in breakage. Only the end radius of the chain screw should contact the work piece, if at all. Such contact can be prevented by adding a 2 link section of chain.