

PETOL[®] HYDRA-TORK[®]

U8184

Operating Manual



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PETOL[®] U8184 HYDRA-TORK[®] Description

The U8184 PETOL[®] HYDRA-TORK[®] unit was designed for making up and breaking out downhole tools. It is rated for operation on 4" to 14-1/2" diameters with a maximum working load of up to 95,000 ft-lbs depending upon diameter. See the table on the following page for specific torque ratings. The unit may be operated in any position (horizontal or inclined) and is totally portable.

The PETOL Drill Pipe Tongs are adjusted to the different diameters within their range by adjusting the chain screw nut for fine adjustment and by adding or removing sections of chain for the coarse adjustment.

The U8184 also offers the following features:

The tong cylinder and backup tong are mounted on separate tracks for switching from make up to break out. The tong slides utilize lead screws for adjusting the position of the tongs. The lead screws are powered by a hydraulic motor. The tongs are raised and lowered by an auxiliary lift handle (included).

Two adjustable vee-saddles mounted on the hydra-tork base for support. The vee-saddles are also mounted on a track for easy adjustment.

The unit can be operated with any commercially available hydraulic power unit capable of delivering 5000 psi pressure.

Torque Rating

The following working load limits should always be observed. Exceeding these limits could result in breaking the tong chain resulting in damage to equipment and possible injury to personnel.

Diameter	Maximum Torque
4" – 4-1/8"	49,300 ft-lbs
4-1/4" – 4-3/8"	52,000 ft-lbs
4-1/2" – 4-5/8"	54,000 ft-lbs
4-3/4" – 4-7/8"	56,000 ft-lbs
5" – 5-1/8"	58,800 ft-lbs
5-1/4" – 5-3/8"	61,000 ft-lbs
5-1/2" – 5-5/8"	63,500 ft-lbs
5-3/4" – 5-7/8"	65,800 ft-lbs
6" – 6-1/8"	68,000 ft-lbs
6-1/4" – 6-3/8"	70,000 ft-lbs
6-1/2" – 6-5/8"	72,600 ft-lbs
6-3/4" – 6-7/8"	75,000 ft-lbs
7" – 7-1/8"	77,000 ft-lbs
7-1/4" – 7-3/8"	79,000 ft-lbs
7-1/2" – 7-5/8"	81,600 ft-lbs
7-3/4" – 7-7/8"	83,500 ft-lbs
8" – 8-1/8"	86,000 ft-lbs
8-1/4" – 8-7/8"	88,500 ft-lbs
9" – 9-7/8"	89,500 ft-lbs
10" – 10-7/8"	90,500 ft-lbs
11" – 11-7/8"	91,800 ft-lbs
12" – 12-7/8"	93,000 ft-lbs
13" – 13-7/8"	94,000 ft-lbs
14"	95,000 ft-lbs

PETOL® Limited Warranty

What Is Covered

PETOL® 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 PETOL 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 PETOL sales representative in Clifton, Texas.

PETOL 4450 S. Highway 6 · P.O. Box 192 · Clifton, TX 76634

What Will We Do To Correct Problems

Warranted products will be repaired or replaced, at PETOL'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 PETOL disclaims all implied warranties, including implied warranties of merchantability and/or fitness for a particular purpose. PETOL 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 PETOL tool, PETOL 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 PETOL LIMITED WARRANTY is the sole and exclusive warranty, express or implied for PETOL 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 PETOL.

Law Applicable

All matters related to the sale and/or use of the PETOL 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 PETOL tool that is the subject of this limited warranty shall be presented in the form of a claim or lawsuit to the offices of PETOL in Clifton, Bosque County, Texas. No claim or suit may be brought against PETOL, 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 PETOL 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 PETOL.

Arbitration Clause

In the event of dispute or claim arises out of the sale and/or use of the PETOL 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 PETOL 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 PETOL or any intermediate seller, shall be construed as modifying, in any way, the rights and liabilities contained in this limited warranty. PETOL 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 PETOL regarding the use of the tool and any aspect of the sale of the tool of this limited warranty should be addressed to PETOL.

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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 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[®] replacement parts - no other parts are of comparable strength, quality and interchangeability.

Safety

While we pride ourselves on the quality and dependability that we build into PETOL 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 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.

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.

Safety Sources and Publications

In the interest of Safety the following sources of Safety information is furnished:

The Hand Tools Institute (HTI)

25 North Broadway
Tarrytown, New York 10591
(914) 332-0040
www.hti.org

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

International Safety Council
1121 Spring Lake Drive
Itasca, Illinois 60143-3201
(630) 285-1121

Responsibility of Distributors

IT IS THE RESPONSIBILITY OF THE PURCHASERS OF PETOL[®] 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

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.

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 Loads / 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 can be caused by pulling or pushing on the tong in a direction that is not along a perpendicular plane, unlevelled mounting of the tong or 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 diameter of the part is not consistent within the width of the tong or vise jaw.

Environmental Conditions

Wrench chains operate in widely varying environments, from wet outdoor conditions to mildly or highly corrosive industrial atmospheres. They can also be exposed to abrasives such as sand or 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% and 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 Preventative.” This is an excellent rust and corrosion inhibitor for chains in storage.

Do not attempt to paint 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. Do not plate chains or chain components. Highly stressed alloy steel components are subject to hydrogen embrittlement caused by plating. Periodic relubrication of chains is the most important factor in extending the life of the chains. There is no lubricant that is ideal for all situations.

A heavy oil lubricant provides excellent protection during prolonged storage, but is messy to apply, will attract dirt and other contaminants and is messy to use. These contaminants could lead to premature abrasive wear of the moving components. When operating in dusty environments, lubricated chains will accumulate a paste like 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.

Light oil-based lubricants penetrate into articulated joints easily but can also be washed off or rubbed off during use. A light oil-based lubricant must have periodic reapplication of the lubricant to maintain coverage.

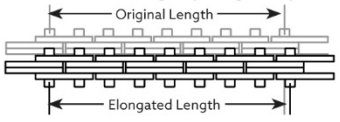
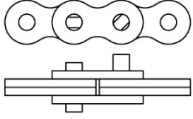
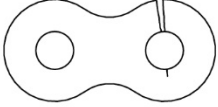
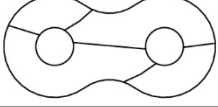
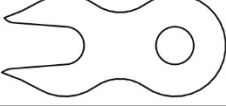
Specialty chain lubricants (wax-based) provide excellent lubrication. They have no oily residue. They are easy to apply. They can be more expensive than other lubricants and are subject to being washed off or worn off. Wax-based lubricants must have periodic reapplication of the lubricant to maintain coverage.

The frequency of relubrication is the most important factor. It will depend on frequency of use, length of storage between uses, exposure to dust and other contaminants, and exposure to salt water or other corrosion accelerants. The end user should establish a good preventative maintenance program for relubrication of all chains and articulated components.

Periodic Inspection List for PETOL® Special Chain

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® Replacement Parts - No other parts are of comparable strength, quality, and interchangeability.

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

Safety Precautions

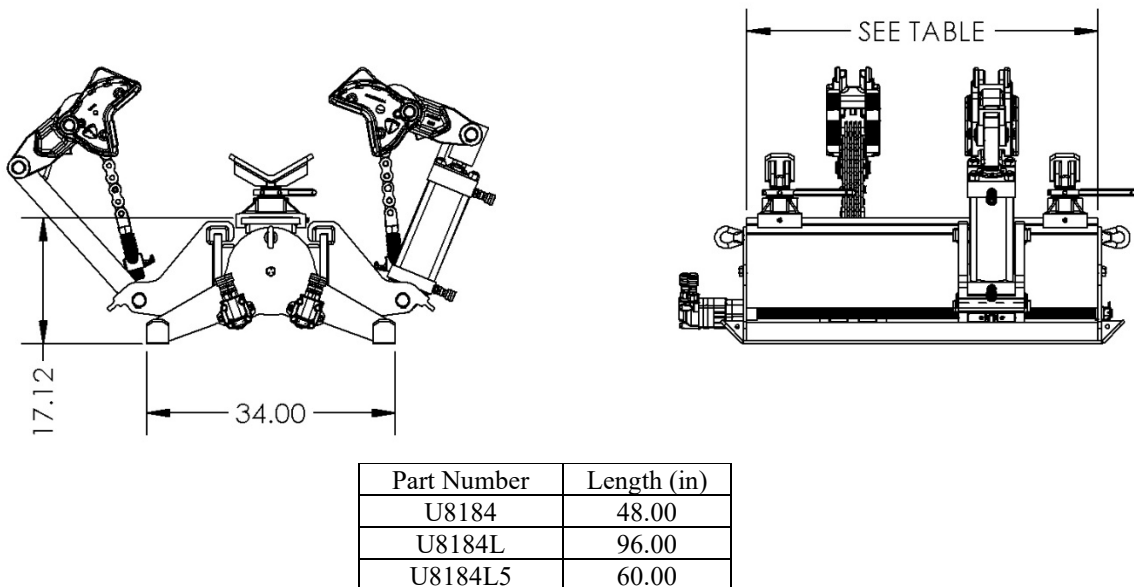
1. Always wear safety goggles to protect eyes.
2. Select the right tool for the job.
3. Keep tools in good condition.
4. Use tools correctly.
5. Keep tools in a safe place.
6. Wear protective clothing, gloves and safety shoes as appropriate.
7. Use lengths of assembled chain. Do not build lengths from 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 into 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 must not be reused.
12. Inspect chains frequently and regularly for link plate cracking, pin turning, pin protrusion and corrosion.
13. Use only PETOL replacement parts to ensure proper strength.

Installation

Location

The PETOL® HYDRA-TORK® Unit should be located in an area with adequate room to work the downhole tools. The unit may be located indoors or outdoors upon solid ground or a finished shop floor. No special foundation is required.

Dimensions



Setup

Locate the hydraulic power unit in a convenient location and connect the hoses to the hydraulic cylinder.

Operation

Controls

Use a hydraulic pressure gauge to indicate the current system pressure in psi. The torque produced by the PETOL[®] Drill Pipe Tongs is dependent on the hydraulic pressure and the diameter.

WARNING: Never operate the tong with a pressure higher than required to perform the make up or break out operation. Operation at excessive pressure may damage the downhole tool and/or injure personnel.

Torque – Pressure Conversion Formulas

The following formula is used to determine the hydraulic pressure required to produce a known torque:

$$P = T / (0.3967 * D + 19.845)$$

Where P is the pressure required in psi, T is the desired torque in foot-pounds and, D is the diameter at the tong with the cylinder attached in inches. To find the torque produced from an observed hydraulic pressure, use the following formula:

$$T = P * (0.3967 * D + 19.845)$$

Where P is the pressure required in psi, T is the produced torque in foot-pounds and, D is the diameter at the tong with the cylinder attached in inches.

Adjusting Tong Position

To adjust the tong position, connect the hydraulic power unit to the hydraulic motor on the side with the tong to be adjusted. Apply pressure to the motor until the tong is in the desired position.

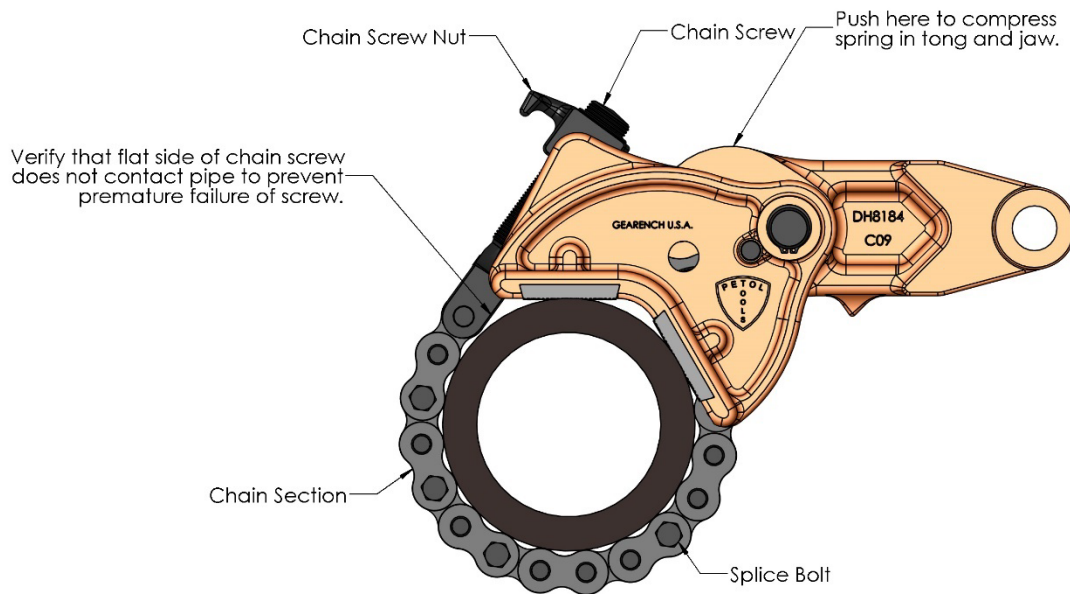
WARNING: Never apply more than 4500 psi to the hydraulic motors. Over-pressurizing a motor could result in damage to the motor and/or injure personnel.

Chain Selection

The following table indicates the chains required for various diameters. The chains are selected by adding or subtracting sections of chains.

Chain Part Number	Diameter Range
161-45-07D	4 – 4 1/2
161-45-09D	4 5/8 – 5 3/4
161-45-11D	5 7/8 – 7
161-45-13D	7 – 8 1/8
161-45-15D	8 1/8 – 9 1/4
161-45-17D	9 1/4 – 10 3/8
161-45-19D	10 3/8 – 11 1/2
161-45-21D	11 1/2 – 12 5/8
161-45-23D	12 5/8 – 13 3/4
161-45-25D	13 3/4 – 14
161-54-08D	4 1/4 – 5 1/8
161-54-10D	5 1/4 – 6 3/8
161-54-12D	6 1/2 – 7 5/8
161-54-14D	7 1/2 – 8 3/4
161-54-16D	8 5/8 – 9 7/8
161-54-18D	9 7/8 – 11
161-54-20D	10 7/8 – 12 1/8
161-54-22D	12 – 13 1/4
161-54-24D	13 1/8 – 14

Tong adjustment

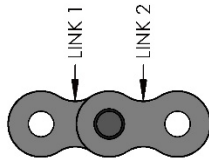


Warning! The pipe must NOT contact the side of the chain screw as shown above. Contact will cause premature breakage of the chain screw and could cause injury or death. If the chain screw contacts the pipe, the chain MUST be lengthened by adding 2 pitches of chain.

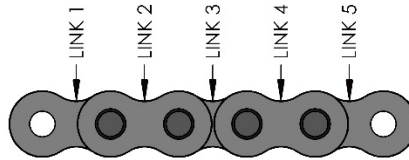
Add or remove chain sections as needed using the splice bolts in the chains. Push on the top of the jaw to fully compress the spring inside the jaw. Adjust the chain screw nut so that the chain is as tight as possible and fit into the lugs in the jaw.

Chain Identification Guide

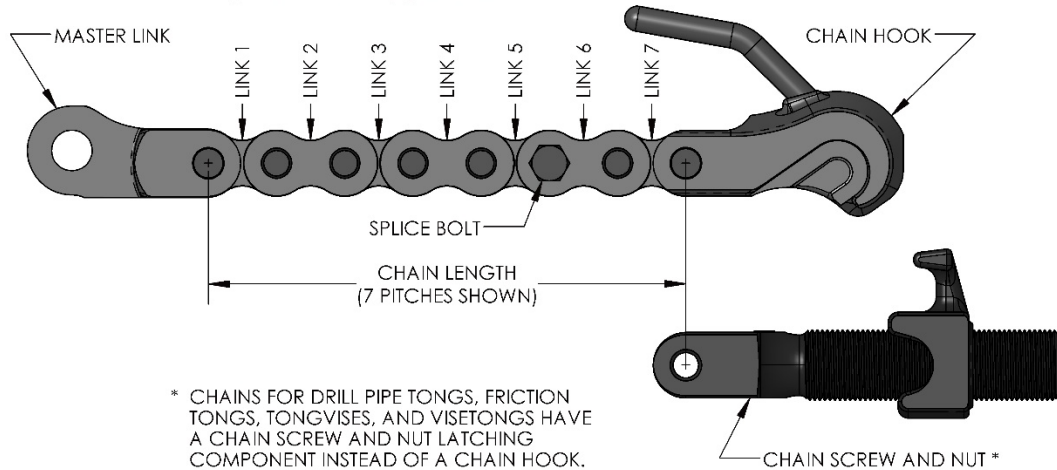
2 LINK SECTION



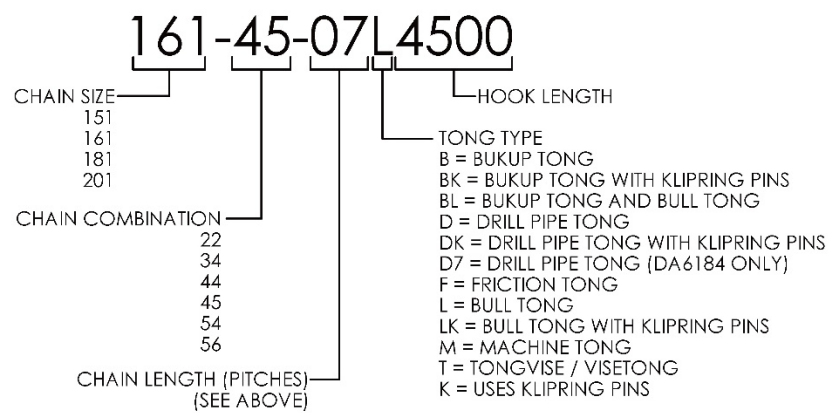
5 LINK SECTION



CHAIN ASSEMBLY



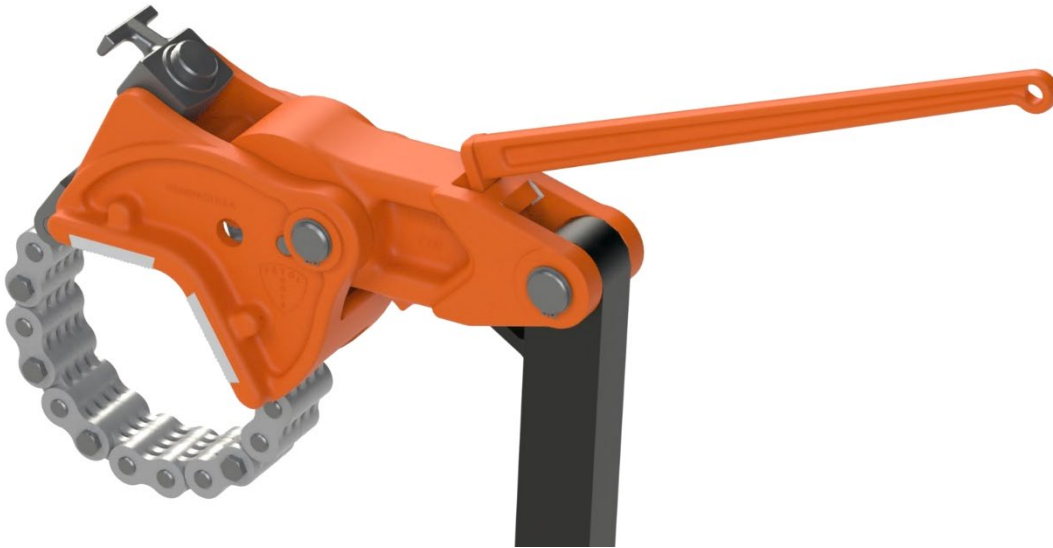
THIS IS WHAT A CHAIN PART NUMBER TELLS YOU



Loading

To load the downhole tool in the unit, adjust the vee-saddles to support the tool. Set the tool into the unit. Position the tongs for make up or break out as needed and set the tongs onto the tool using the tong lift handles as shown in the diagram below. Adjust the tongs as described and latch the tong chains.

CAUTION: The vee-saddles must be used to support the tool while torquing.



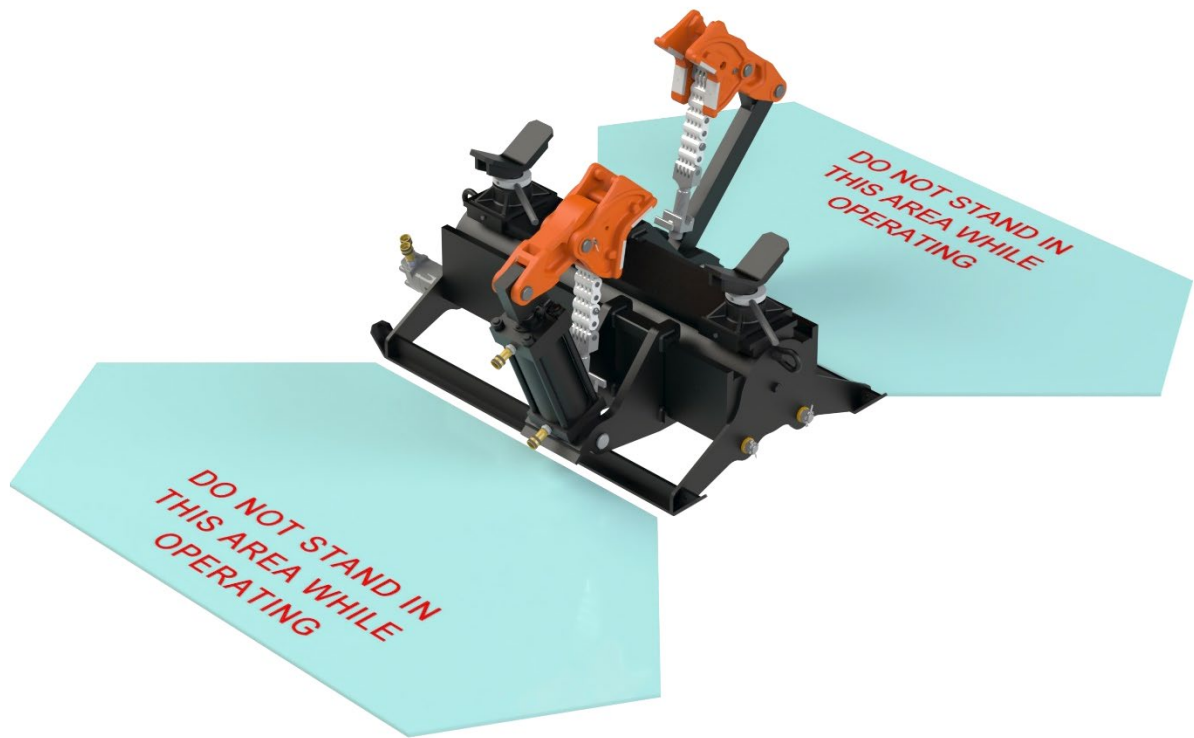
Breaking Out

Load the tool and adjust the tongs as described above. Fully ratchet the tong by extending the cylinder. Set the system pressure to a minimum. Retract the cylinder. When the tong stops, begin increasing the system pressure. Keep increasing the system pressure until the connection is broken loose **or the working load of the tong is reached. Do not exceed the rating of the tong. Consult with PETOL® as needed for help with the toughest break out jobs.** After the initial break out, ratchet the tong fully and then alternately extend and retract the cylinder until the connection is fully loosened.

Making Up

Load the tool and adjust the tong and vise as described above. Make up the connection hand tight using PETOL® - TITAN® Chain Tongs. Preset the system pressure to obtain the desired torque if possible. Retract the cylinder. If the cylinder fully retracts without stalling, cycle the tong (extend / retract). Continue until the cylinder stalls or until the desired pressure is obtained.

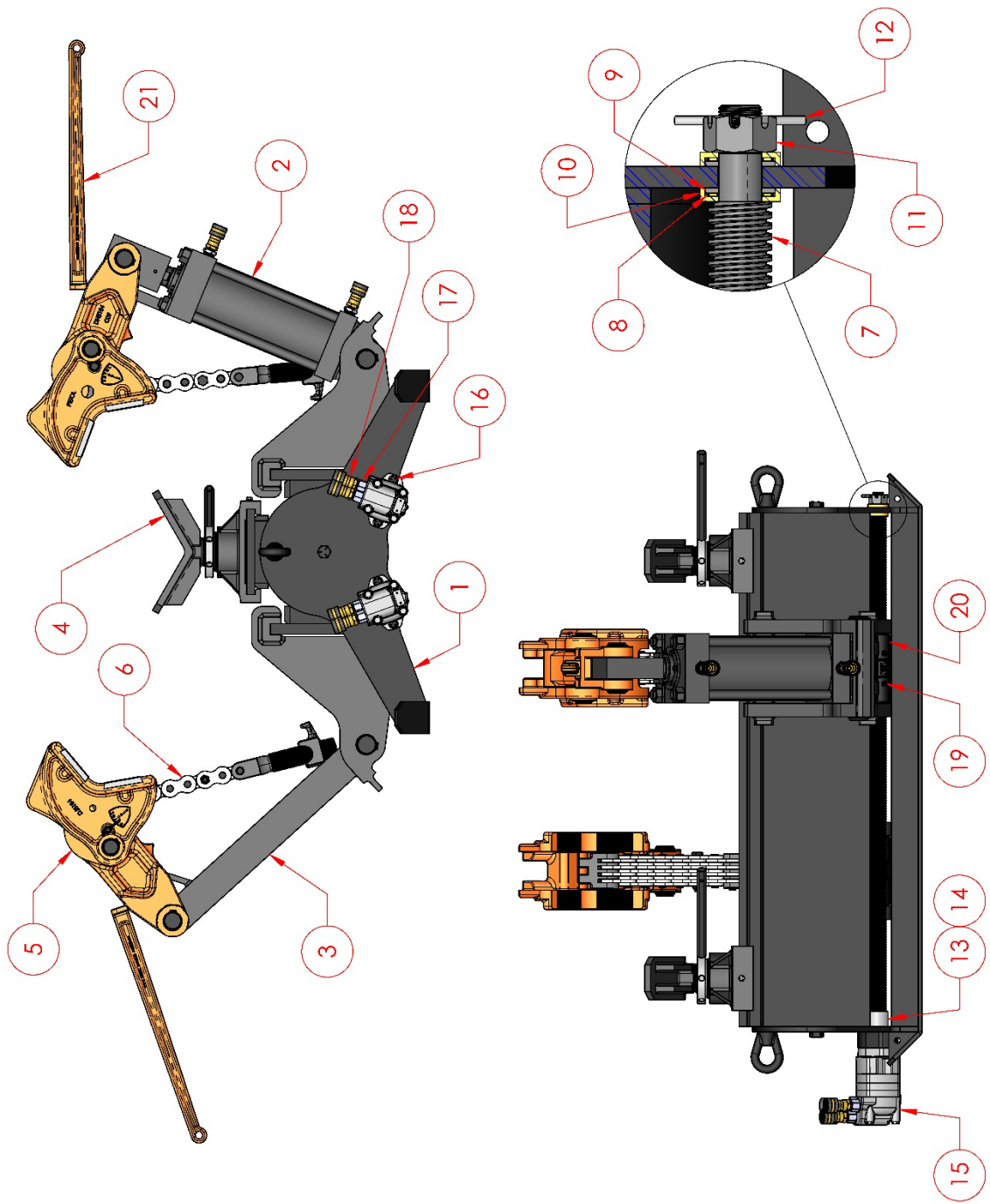
Warning: Do not stand in line with the tongs or chains during operation.



Parts List

The following drawings, diagrams, and parts lists describe all parts which may be needed as replacement items. Where appropriate, standard industrial and hydraulic components have been used. Should a standard industrial item need replacing, the item may be purchased locally. To assist you in obtaining parts, the OEM component manufacturer and model numbers are shown on the parts list. Of course, all replacement parts will be supplied by PETOL® if you prefer to order from us.

All tong, vise, and chain components are manufactured only by PETOL®. DO NOT ATTEMPT TO SUBSTITUTE THESE COMPONENTS. The unit will not work properly unless these components are matched to the specific application. Consult our factory as your requirement changes. Any non-PETOL substitutions of these components void all warranties and subject the user to assumption of liabilities resulting from subsequent use.



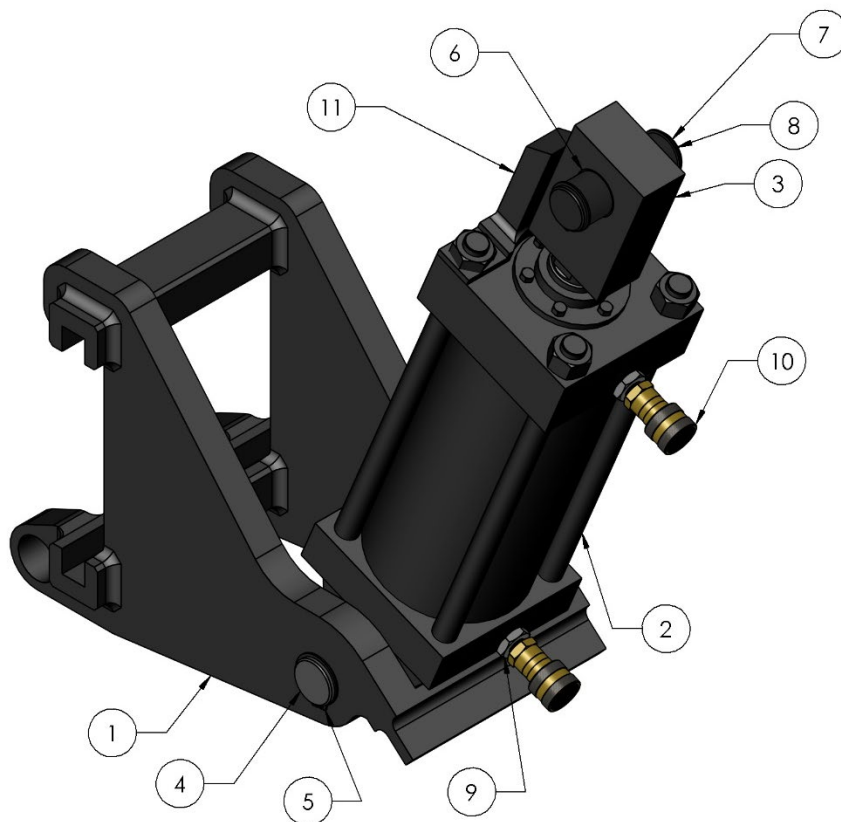
Final Assembly

Item	Qty	Part Number	Description	Notes
1	1	UB8184	Base assembly	U8184 only, see page 23
1	1	UB8184L	Base assembly	U8184L only, see page 23
1	1	UB8184L5	Base assembly	U8184L5 only, see page 23
2	1	UC8184	Cylinder assembly	See page 24
3	1	UK8184	Backup assembly	See page 25
4	2	UVSA-8184	Vee saddle assembly	See page 26
5	2	DA8184-C09U	Drill pipe tong assembly	See page 27
6	2	161-45-25D	Chain assembly	See page 28
7	2	US8184	Lead screw	U8184 only
7	2	US8184L	Lead screw	U8184L only
7	2	US8184L5	Lead screw	U8184L5 only
8	4	US8184-B1	Thrust bearing	Torrington NTA1625 (or equal)
9	4	US8184-B2	Thrust washer	
10	4	US8184-B3	Thrust cup	
11	2	HXN064	1-12UNF slotted nut	
12	2	HXC005	Cotter pin 7/32 x 2-1/4	
13	2	US8184-C	Shaft coupling	
14	2	HXWH808	Woodruff Key (type 808)	
15	2	UHCH-M27	Hydraulic motor	Char-Lynn 104-1001-006
16	4	HXS048	7/16-14UNC x 1-1/2 SHCS	
17	4	UHCH-F81	Fitting 5/8 O-ring x 3/8 NPT	Weatherhead C3269x10x6
18	4	UHCH-Q05	Quick coupler	Enerpac CR400 (or equal)
19	4	HXG001	Grease insert	
20	2	US8184-N	Lead screw nut	
21	2	ULH8184	Tong lift handle	



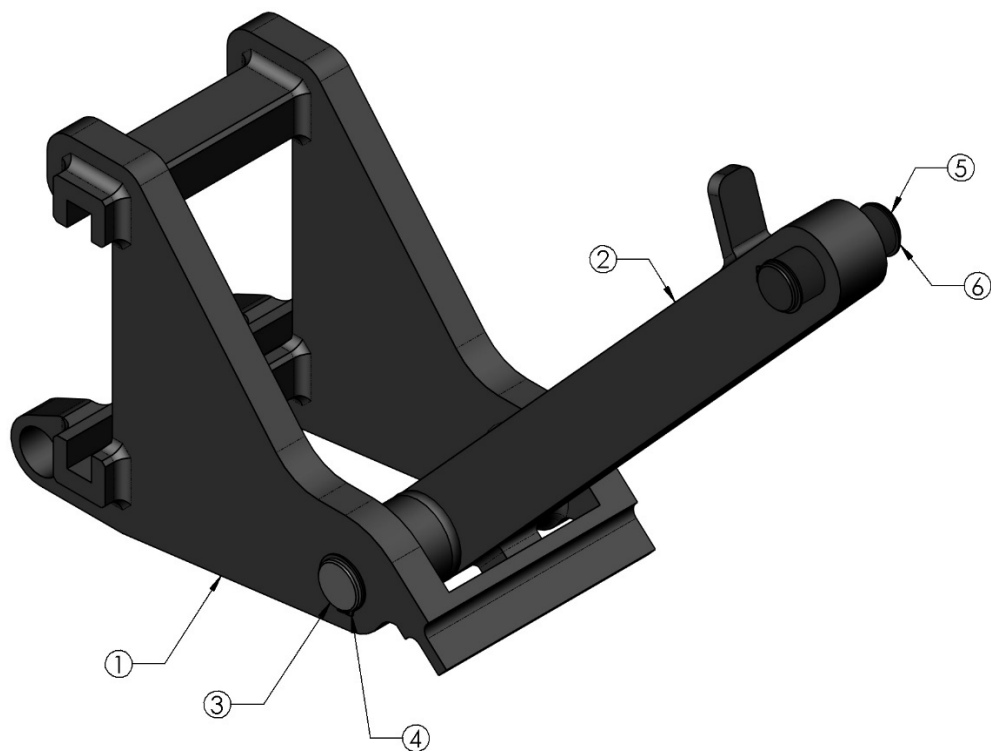
Base Assembly

Item	Qty	Part Number	Description	Notes
1	2	HXN048	Eye Nut	McMaster-Carr 3274T44 (or equal)
2	2	HXS026	Stud	3/4-10UNC x 3" long
3	2	HXS005	Hex Bolt	3/4-10UNC x 1-1/2" long



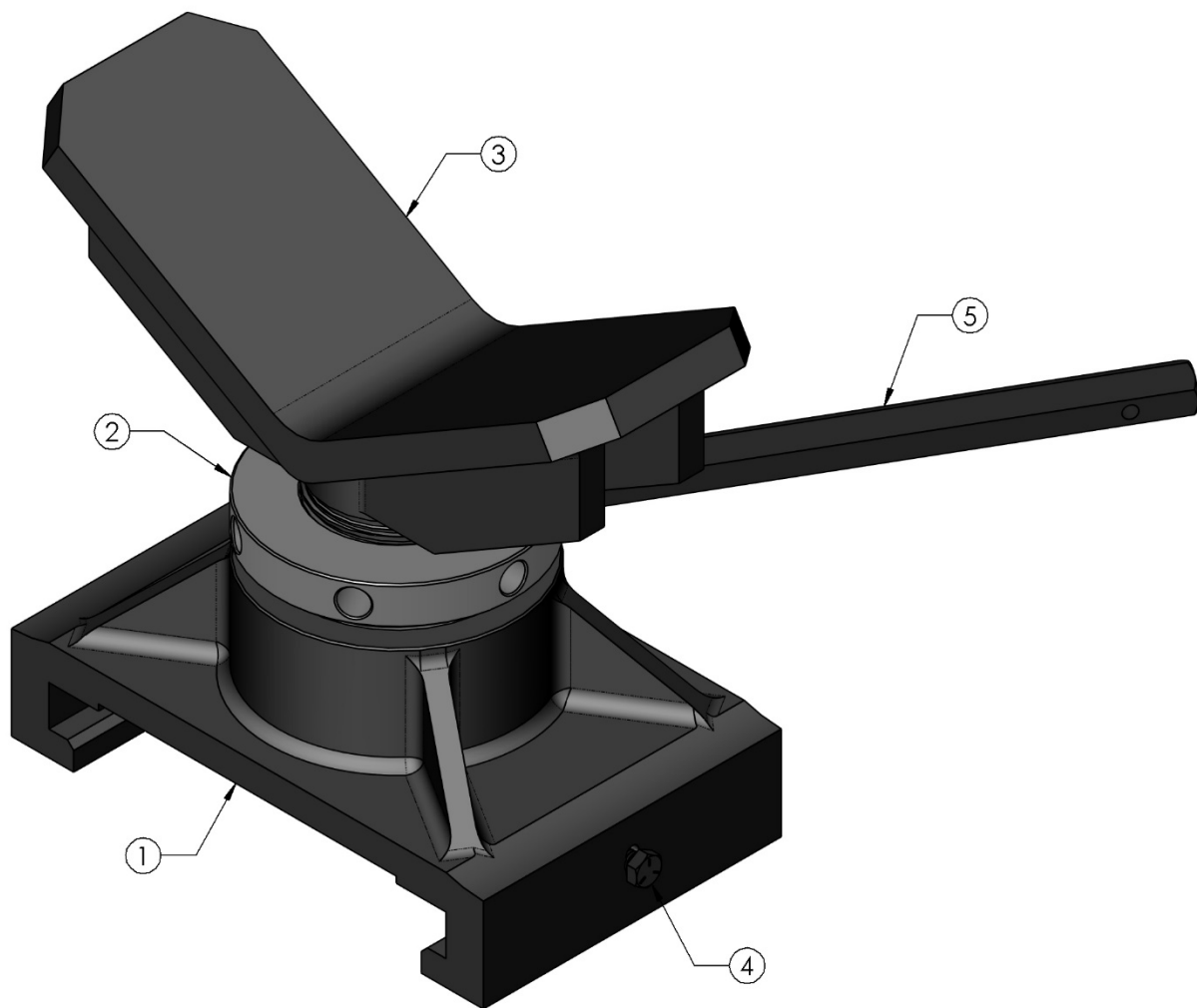
Cylinder Assembly

Item	Qty	Part Number	Description	Notes
1	1	UT8184	Tong slide	
2	1	UC8184-C	Cylinder	Vickers/Aeroquip TG10KACA1AA10000
3	2	UC8184-E	Rod eye	
4	1	HP376	Cylinder – arm pin	
5	2	HXRR175	Retaining ring	Waldes-Truarc 5100-175 (or equal)
6	1	UC8184-B	Rod eye bushing	
7	1	HP370	Cylinder – handle pin	
8	2	HXRR162	Retaining ring	Waldes-Truarc 5100-162 (or equal)
9	2	UHCH-F41	Reducer bushing 3/4 x 3/8	Weatherhead C3109x12x6 (or equal)
10	2	UHCH-Q05	Quick connector	Enerpac CR-400 (or equal)
11	1	UC8184-S	Tong stop	Torque cylinder nuts to 360 ft-lbs



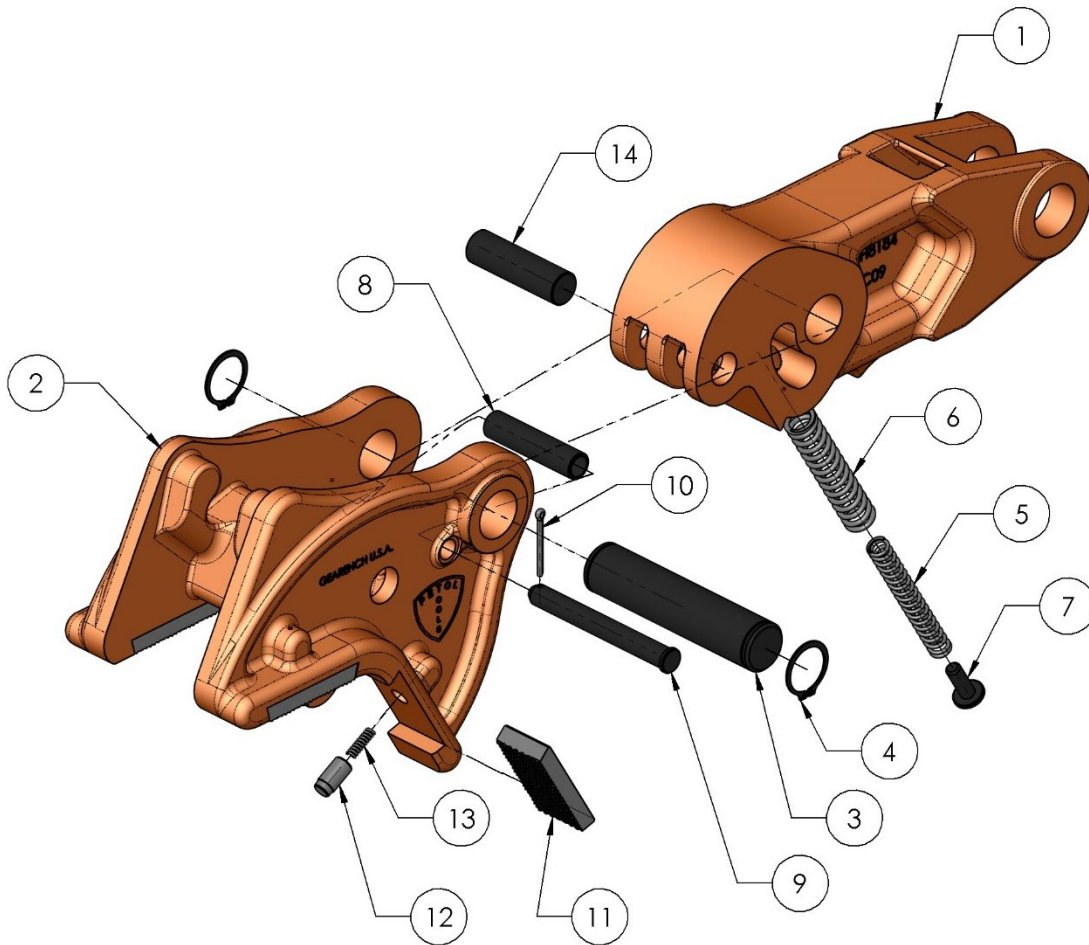
Backup Assembly

Item	Qty	Part Number	Description	Notes
1	1	UT8184	Tong slide	
2	1	UK8184-L	Link	
3	1	HP376	Link – arm pin	
4	2	HXRR175	Retaining ring	Waldes-Truarc 5100-175 (or equal)
5	1	HP370	Link – handle pin	
6	1	HXRR162	Retaining ring	Waldes-Truarc 5100-162 (or equal)



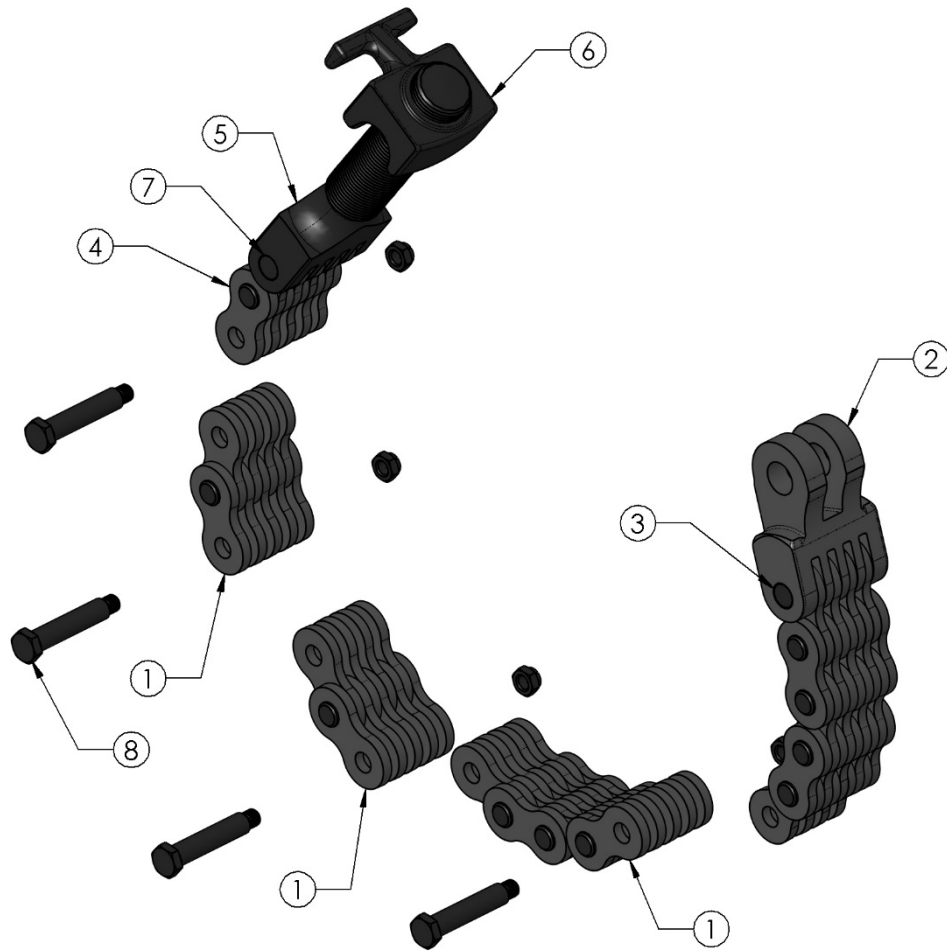
Vee Saddle Assembly

Item	Qty	Part Number	Description	Notes
1	1	UHVSB-8184	Base	
2	1	UHVSN-8184	Nut	
3	1	UHVSH-8184	Head	
4	1	HXS012	Hex Head Screw	5/16-18UNC x 7/8 long
5	1	HP951	Nut Lever	



PETOL® Drill Pipe Tong Assembly

Item	Qty	Part Number	Description	Notes
1	1	DH8184-C09U	Handle	
2	1	DJ8184	Jaw	
3	1	HP249	Jaw – handle pin	
4	2	HXRR150	Jaw – handle pin retaining ring	
5	1	HS09	Jaw spring	
6	1	HS18	Jaw spring	
7	1	HG09	Jaw spring guide	
8	1	HU36	Jaw spring pin bushing	
9	1	HP250	Jaw spring pin	
10	1	HXC003	Jaw spring pin cotter	
11	4	HI09D	Diamond point insert	
12	4	HP904	Insert key	
13	4	HS21	Insert key spring	
14	1	HP234	Master link – handle pin	



PETOL® Special Chain Parts List

Item	Qty	Part Number	Description
1	As req'd	161-45-02	Special chain only
1	As req'd	161-45-03	Special chain only
1	As req'd	161-45-05	Special chain only
1	As req'd	161-45-07	Special chain only
2	1	HM06-45	Master link
3	1	HP247	Master link – chain rivet
4	As req'd	161-45-02-HV08	Chain screw assembly
4	As req'd	161-54-03-HV08	Chain screw assembly
5	1	HV08-45	Chain screw only
5	1	HV08-54	Chain screw only
6	1	HN08	Chain screw nut
7	1	HP247	Chain screw – chain rivet
8	As req'd	HB52	Splice bolt and nut
8	As req'd	HXN016	Splice bolt nut only

Wear Limits

The following table indicates limiting diameters on the components of the PETOL® Drill Pipe Tong. When localized wear is beyond any one of the limits indicated, the component should be replaced.

Part Number	Description	Location	Limit Dimension
HP249	Jaw – handle pin	Pin body diameter	1.482 (min)
HP234	Master link – handle pin	Pin body diameter	0.978 (min)
HB52	Chain splice bolts	Bolt body diameter	0.611 (min)
161-45-XX	Chain links	Pin hole diameter	0.640 (max)
161-45-XX	Chain links	Pitch center – center	1.739 (max per pitch)
DH8184-C09U	Handle	Jaw pin hole diameter	1.525 (max)
DH8184-C09U	Handle	Chain pin hole diameter (master link)	1.025 (max)
DH8184-C09U	Handle	Load loop diameter	1.665 (max)
DJ8184	Jaw	Jaw pin hole diameter	1.525 (max)
HM06-45	Master link	Handle pin diameter	1.023 (max)
HM06-45	Master link	Chain pin diameter	0.641 (max)
HV08-45 HV08-54	Chain screw	Chain pin diameter	0.640 (max)