TECHNICAL MANUAL

7 5/8" CLINCHER UHT TONG
AND
7 5/8" OR 8 5/8" UHT BACKUP

Photo represents CLE7625UHT-02 with BUC8625-02

Illustration represents CLE7625UHT-08 with BUC8625-02

COVERS
TONG MODEL’s
CLE7625UHT-02 & -08

BACKUP MODELS
BUC7625-02 / BUC8625-02, -05 & -06

HANGER ASSEMBLIES
BUC7600 / BUC7600-02 / BUC7600-04
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AND
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This manual is not a controlled document and is subject to revision without notice. To receive updates and insure you have access to the latest information concerning the 7 5/8" CLINCHER UHT Tong and 7 5/8" or 8 5/8" UHT Backup, we request you complete this form and return the lower half to SUPERIOR Manufacturing and Hydraulics by mail or facsimile. Access to our manuals can also be acquired through our web site www.superior-manf.com. Select the tab ‘CLINCHER Products’, select the equipment from the list to get Specs page, select the tab ‘Download Manual’.

Name: ________________________________
Company: ______________________________
Address: ______________________________________
Address: ______________________________________
City: ____________________________ State: ______________________________
Postal Code: __________________________ Country: ______________________________
Telephone: __________________________ Fax: ______________________________

Tong Model No.: ______________ Serial No.: ______________
Backup Model No.: ______________ Serial No.: ______________
Assembly Date: ______________

7 5/8" CLINCHER UHT Tong and 7 5/8" or 8 5/8" UHT Backup
Technical Manual Registration Form

Name: ________________________________ | Return To:
Company: ________________________________ | SUPERIOR Mfg. & Hyd.
Address: ______________________________________ | 4225 Hwy. 90 East
Address: ______________________________________ | Broussard, LA 70518
City: ____________________________ | USA
Postal Code: __________________________ | Telephone: 337-837-8847
Country: __________________________ | Facsimile: 337-837-8839
Telephone: __________________________ | Web Site: www.superior-manf.com
Fax: ______________________________

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Backup Model No.: ______________ Serial No.: ______________
Assembly Date: ______________
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## 7 5/8" CLINCHER UHT TONG and 7 5/8" or 8 5/8" UHT BACKUP

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HAZARD WARNING

Nomenclature used in this manual:

**WARNING** concerns an operating procedure or practice that, if not strictly observed, can result in injury to personnel or loss of life

**Caution** concerns an operating procedure or practice that, if not strictly observed, can result in damage to or destruction of equipment

**Note** concerns an operating procedure or practice that needs highlighting

CLINCHER UHT Tongs and Backups are manufactured to provide a means of making up or breaking out high torque tubular connections. They utilize high pressure hydraulic fluid power which can cause the tong to move suddenly and with great force if the tong is not properly rigged up and operated. CLINCHER Tongs and Backups contain rotating and reciprocating parts which can severely or fatally injure personnel who are operating, repairing, or near this equipment during its operation. **WARNING:** Tongs and Backups are not to be operated by untrained personnel or personnel with diminished physical or mental capacity. No work of any type, including changing of dies, is to be carried out while the tong and backup are connected to any hydraulic power unit.

CLINCHER UHT Tongs and Backups are heavy tools. They should be suspended from a secure, high strength 7/8" IWRC minimum diameter wire cable with a 31 ton minimum breaking strength. The wire rope should be hung as close to the center of the wellbore as possible, without interfering with drilling equipment operation, to allow the tong to be readily swung into the working position. Vertical position control should be achieved by means of a CLINCHER hydraulically operated lift cylinder/spring hanger. **WARNING:** Users must insure the entire suspension system including cables, rig mounting points, lift cylinders, tong lifting brackets/bridles, winches, pulleys, counter weights, etc., are capable of handling the static weight of the tong and backup plus any loads which could be transferred to it during the makeup or breakout process PLUS any shock loads which may be seen during operation. This system must readily allow downward movement equal to a minimum of the thread makeup distance to avoid overloading the suspension system and/or damage to equipment.

A 1" IWRC minimum diameter wire cable with a 51.7 ton minimum breaking strength or better, should be attached at a 90 degree angle to the tong and at the same level to insure proper readout of torque indicator. A SNUBBING LINE should always be attached even when an integral backup is in use to provide additional safety in the event of a backup slippage. **WARNING:** Users must provide a means of safely controlling the tong and backup movements in all directions when it is in use. Failure to account for its size, weight, movement and the amount of torque developed could result in personnel injury or death.
HAZARD WARNING

CLINCHER Tongs and Backups utilize high pressure hydraulic fluids. Portions of the tong and backup, control valves, hydraulic lines and cylinders may contain high pressure fluid even when the power unit is de-energized and the fluid supply hoses are disconnected. During normal operation the temperature of the hydraulic fluids as well as hoses, piping, valves, etc., can rise to a level which can cause burns. **WARNING:** Personal protective gear including safety glasses, face shields, protective gloves and protective clothing must be worn to guard against the hazards of high pressure fluids. Tight fitting clothing is required to prevent entanglement in rotating components. These tools should be serviced by thoroughly trained and qualified hydraulic technicians using procedures to safely insure hydraulic pressure is bled from these circuits.

The CLINCHER UHT Tong is equipped with a door interlock system which prevents tong rotation whenever the door is open. This system is to be tested before each mobilization and at every shift change. Should this system be determined to be inoperative, the tong is to be removed from service and tagged as **in-operative** until repairs are made. **CAUTION:** Operating the tong with the door in the open position could result in severe damage to the equipment and will void all manufacturer warranties. **WARNING:** Operating the tong with the door open by means of a defective or bypassed door interlock system exposes the operator and nearby personnel to potentially fatal hazards.

No attempt should be made to operate the CLINCHER UHT Tong and Backup for any purpose other than which it is intended. This system is capable of generating very large clamping forces and torsional loads which, if improperly applied or controlled, could result in damage to the tubular, to the tong and backup, or could possibly result in injury or death of personnel. Do not attempt to operate the unit without correct dies and the proper size tubular being in the tong and backup. See Section 3 for more information concerning the selection and use of dies. **CAUTION:** Operating this equipment without the correct size, type, and orientation of dies can result in damage to the equipment or tubulars being handled.
HYDRAULIC PRODUCT SAFETY

WARNING: Valve lever (spool) may "stick" (not center) under certain conditions allowing the hydraulic equipment to continue to operate and could cause serious injury, death or equipment failure.

VALVE SAFETY: Read and follow instructions carefully. Failure to observe instructions and guidelines may cause serious injury, death or equipment failure. A sticking valve (spool bind) may be caused by one or more of the following factors:

DIRTY OIL: Oil must be filtered to a minimum of 25 microns. Filters should be changed regularly - spin-on types after 50 hours of initial use and then after every two hundred fifty hours of use. Use of a condition indicator is recommended. Consult your tractor or implement owner’s manual for filtration and changing recommendations for internal systems.

OIL REQUIREMENTS: Premium quality anti-wear type oil with a viscosity between 100 and 200 SSU at operating temperatures. Certain synthetic oils may cause spool seals to swell and the valve to stick. If in doubt, call CROSS Engineering.

IMPROPER HOOK UP OR MOUNTING: Always use the proper size fittings. Hook up "in" & "out" as noted on the valve body. Do not overtorque pipe fittings. Mounting surfaces should be flat and care should be used when tightening mounting bolts. Over-tightened bolts can cause spool bind and casting breakage. When hooking a valve in series, always use a power beyond sleeve. Consult your tractor or implement manual to make sure you have the proper quick disconnect line connected to the inlet of the remote valve.

MISAPPLICATION: Always use the proper valve for the job. CONVERTA, CD, CS or CA valves should never be used for metered heavy load lifting - loaders or similar applications. Use an open center valve for open center applications and a closed center valve for closed applications. If in doubt, check with your tractor dealer. Contact CROSS if the valve allows the hydraulic equipment to creep excessively.

MAINTENANCE: Make sure all bolts are tightened and torqued to the recommended specification. Bent or broken parts should not be used. Replace immediately. Always use exact replacements. Always protect valve spool from paint overspray. Faulty quick disconnects can cause high back pressures and sticking spools. Check quick disconnects periodically to make sure they are functioning properly. If valve spool does not center or appears to stick, do not use!

PUMPS & MOTORS SAFETY:
A relief or bypass in your hydraulic system is necessary to prevent pump from breakage due to overpressurization. Use correct fittings and proper oil as noted in the technical service manual packed with each unit. Change oil as recommended by your implement or tractor manufacturer.

CYLINDER SAFETY:
Check clevis clearances before, during and after extending the cylinder and before using the cylinder under pressure to avoid possible injury, or bent or broken rods caused by binding. Never operate a cylinder above recommended pressures. Never use a cylinder as a safety device when transporting equipment.

PINHOLE LEAKS:
If you observe a pinhole leak, discontinue use of the component. If oil has penetrated your skin or contacted your eye, seek medical attention immediately!
DESCRIPTION and APPLICATION

The CLINCHER UHT Tong and Backup system is an “open-throat” design in which the 7 5/8” tong and backup can handle tubulars as small as 2 1/16 inches to as large as 7 5/8 inches in diameter. The 8 5/8” backup can handle tubulars as small as 2 1/16 inches to as large as 8 3/4 inches in diameter. This system features two (2) jaws in the tong and three (3) jaws in the backup which encircle the pipe. Wrap around jaws and dies, combined with our low friction jaw technology, constant radial load cam system and compensating jaw design provide exceptional gripping capabilities with reduced pipe deformation, stress and marking. Using our non-marking aluminum die system or grit faced dies in the UHT Tong and Backup will now allow stainless steel corrosion resistant alloys (CRA) to be run as quickly and easily as a traditional tong runs conventional steel tubulars.

Notable Features and Benefits

- **Low Friction Jaws** increases cam angle efficiency to allow use of aluminum dies
- **Splined Die System** aligns the die with the tubular and more evenly distributes radial load, essentially wrapping the die around the tube reduces pipe stress, deformation and minimizes marking
- **Constant Cam Angle** insures an adequate radial load is available regardless of relative rotation to enhance performance on undersized pipe
- **Die Retention Method** provides an enhanced method of preventing equipment damage and die loss if the pipe is inadvertently moved while the tong or backup are still gripping the pipe

In addition to these unique features listed above, the CLINCHER UHT Tong and Backup System is also equipped with numerous standard features including:

- **Door Interlock** prevents tong ring gear rotation whenever the tong door is open but allows control and operation of backup and lift cylinder at all times
- **Encoder Adapter** accepts customer's turns encoder to signal to a torque/turn computer
- **Pressure Control Valve** adjustable pressure control valves allow the customer to limit the amount of pressure applied and torque developed
- **Tong Handles with Closed Covers** protects operators hands

The features described above are covered by US and foreign patents or pending US and foreign patents.
DESCRIPTION and APPLICATION

TONG APPLICATION

After completing the make-up or break-out cycle, the jaws are opened by reversing the tong motor to drive the ring gear and cam surfaces in the opposite direction until the reversing pin contacts the ring gear shoulder. Springs are used to return the jaws to their fully open position.

BACKUP APPLICATION

The CLINCHER UHT Backup’s front jaws are hydraulic cylinders. During a jaw closing cycle, the front jaws advance and clamp the pipe against the fixed rear jaw. Once locked on the pipe, pressure is locked in the backup cylinder by a load holding valve. When opening, the front jaws retract to allow the pipe to be removed.

The CLINCHER UHT LOCKJAW Backup has an “open throat” design with three jaws that encircle the pipe. The front jaws are operated by cam surfaces on the rear jaw cylinder. During a jaw closing cycle, the front jaws swing in and interlock as the rear die approaches the pipe. Once locked on the pipe, pressure is locked in the backup cylinder by a load holding valve. When opening the backup jaws, the cylinder operation is reversed to retract the rear die and unlock the jaws. Springs move the front jaws to their fully open position.
## SPECIFICATIONS

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<tr>
<td><strong>Maximum Torque</strong></td>
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</tr>
<tr>
<td>High Gear “UHT” Low Gear</td>
<td>3,500 ft.lbs./ 4,745.4 Nm</td>
</tr>
<tr>
<td><strong>Maximum Operation Pressure</strong></td>
<td>3,000 psi/207 Bar</td>
</tr>
<tr>
<td><strong>RPM @ 35 GPM/132.5 LPM</strong></td>
<td>Manual Gearbox</td>
</tr>
<tr>
<td><strong>Max. Recommended Flow Rate</strong></td>
<td></td>
</tr>
<tr>
<td>High</td>
<td>30,000 ft.lbs./40,674.6 Nm</td>
</tr>
<tr>
<td>Low</td>
<td></td>
</tr>
<tr>
<td><strong>Max. Recommended Flow Rate</strong></td>
<td></td>
</tr>
<tr>
<td>High</td>
<td>42 ft.lbs./ 57.1 Nm</td>
</tr>
<tr>
<td>Low</td>
<td>42 ft.lbs./ 57.1 Nm</td>
</tr>
<tr>
<td><strong>Handle Length UHT Tong</strong></td>
<td>37 1/4&quot; / 94.6 cm</td>
</tr>
<tr>
<td><strong>Handle Length UHT Backup</strong></td>
<td>32&quot; / 81.3 cm</td>
</tr>
<tr>
<td><strong>Overall Length UHT Tong</strong></td>
<td>54 5/8&quot; / 138.7 cm</td>
</tr>
<tr>
<td><strong>Overall Length UHT Backup</strong></td>
<td>49 3/8&quot; / 125.4 cm</td>
</tr>
<tr>
<td><strong>Overall Width w/o Handles / UHT Tong</strong></td>
<td>30 1/2&quot; / 77.5 cm</td>
</tr>
<tr>
<td><strong>Overall Width w/o Handles / UHT Tong &amp; UHT Backup</strong></td>
<td>35 1/4&quot; / 89.5 cm</td>
</tr>
<tr>
<td><strong>Overall Width w/ Handles</strong></td>
<td>35 1/2&quot; / 90.2 cm</td>
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<tr>
<td><strong>Overall Height UHT Tong</strong></td>
<td>35 7/16&quot; / 90.0 cm</td>
</tr>
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<td><strong>Overall Height w/ UHT Backup &amp; Hanger Bracket</strong></td>
<td>62 9/16&quot; / 158.6 cm</td>
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<tr>
<td><strong>Overall Height w/ UHT Backup &amp; Bail Assembly</strong></td>
<td>65 1/4&quot; / 165.7 cm</td>
</tr>
<tr>
<td><strong>Weight UHT Tong (approximate)</strong></td>
<td>2,392 lbs. / 1,087 kg</td>
</tr>
<tr>
<td><strong>Weight UHT Backup (approximate)</strong></td>
<td>808 lbs. / 367 kg</td>
</tr>
<tr>
<td><strong>Weight UHT Tong w/UHT Backup (approximate)</strong></td>
<td>3,200 lbs. / 1,455 kg</td>
</tr>
<tr>
<td><strong>Bottom Hanger (approximate)</strong></td>
<td>225 lbs. / 102 kg</td>
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<tr>
<td><strong>Tong Legs (approximate)</strong></td>
<td>50 lbs. / 23 kg</td>
</tr>
<tr>
<td><strong>Combined Weight Tong w/ UHT Backup w/ Hanger &amp; Legs (approximate)</strong></td>
<td>3,475 lbs. / 1,576 kg</td>
</tr>
<tr>
<td><strong>Tong Jaw Options</strong></td>
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</tr>
<tr>
<td><strong>1 Backup Jaw Size / BUC8625-02</strong></td>
<td>2 1/16&quot; thru 8 3/4&quot;</td>
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<tr>
<td><strong>Gripping Range for Dovetail Tong Jaws (under nominal jaw or adapter sizes)</strong></td>
<td>3/8&quot; / 1.5 cm undersize</td>
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(1) **CAUTION:** When using Low Friction Jaws, Tongs should be limited to 50% of maximum torque rating.

Operates using Steel Tooth Wrap Around Dies, Grit Faced Wrap Around Dies and Aluminum Wrap Around Dies

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<td>- Self Adjusting Brake</td>
<td>- Hydraulic Cage Plate Brake System</td>
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<td>- Handles Tong</td>
<td>- Electronic Solenoid Dump Valve</td>
</tr>
<tr>
<td>- 3 Point Lifting Bridle (f/CLE7625 UHT)</td>
<td>- Hydraulic Intensifier for Backup</td>
</tr>
<tr>
<td></td>
<td>- Shipping Stand, or Skid</td>
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<td></td>
<td>- Varying Outlets for Torque Turns Computer Sending Units</td>
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7 5/8" UHT TONG &
7 5/8" OR 8 5/8" UHT BACKUP
DIMENSIONS
## SPECIFICATIONS

**CLE7625UHT-08 / BUC8625-02**

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<th>Specification</th>
<th>High Gear</th>
<th>“UHT” Low Gear</th>
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<tr>
<td>Maximum Torque</td>
<td>3,500 ft.lbs.</td>
<td>4,745.4 Nm</td>
</tr>
<tr>
<td>RPM @ 35 GPM/132.5 LPM: Manual Gearbox</td>
<td>30,000 ft.lbs.</td>
<td>40,674.6 Nm</td>
</tr>
<tr>
<td>Max. Recommended Flow Rate: 35 GPM/132.5 LPM (Using Standard A-20 Valve Package)</td>
<td>42</td>
<td>7</td>
</tr>
<tr>
<td>Max. Recommended Flow Rate: 65 GPM/246 LPM (Using Optional A-35 Valve Package)</td>
<td>78</td>
<td>13</td>
</tr>
<tr>
<td>Handle Length UHT Tong</td>
<td>37 1/4&quot; / 94.6 cm</td>
<td></td>
</tr>
<tr>
<td>Handle Length UHT Backup</td>
<td>32&quot; / 81.3 cm</td>
<td></td>
</tr>
<tr>
<td>Overall Length UHT Tong</td>
<td>54 5/8&quot; / 138.7 cm</td>
<td></td>
</tr>
<tr>
<td>Overall Length UHT Backup</td>
<td>49 3/8&quot; / 125.4 cm</td>
<td></td>
</tr>
<tr>
<td>Overall Width UHT Tong w/o Handles</td>
<td>30 1/2&quot; / 77.5 cm</td>
<td></td>
</tr>
<tr>
<td>Overall Width UHT Tong w/ Handles</td>
<td>35&quot; / 88.9 cm</td>
<td></td>
</tr>
<tr>
<td>Overall Width UHT Tong w/ Handles &amp; UHT Backup</td>
<td>36 1/4&quot; / 92.1 cm</td>
<td></td>
</tr>
<tr>
<td>Overall Height UHT Tong w/ Bail Assembly</td>
<td>39 1/2&quot; / 100.3 cm</td>
<td></td>
</tr>
<tr>
<td>Overall Height UHT Backup</td>
<td>13 1/2&quot; / 34.3 cm</td>
<td></td>
</tr>
<tr>
<td>Overall Height UHT Tong w/ Backup &amp; Hanger Bracket</td>
<td>72 1/2&quot; / 184.1 cm</td>
<td></td>
</tr>
<tr>
<td>Weight UHT Tong (approximate)</td>
<td>2,392 lbs. / 1,087 kg</td>
<td></td>
</tr>
<tr>
<td>Weight UHT Backup (approximate)</td>
<td>808 lbs. / 367 kg</td>
<td></td>
</tr>
<tr>
<td>Weight UHT Tong w/UHT Backup (approximate)</td>
<td>3,200 lbs. / 1,455 kg</td>
<td></td>
</tr>
<tr>
<td>Bottom Hanger (approximate)</td>
<td>293 lbs. / 133 kg</td>
<td></td>
</tr>
<tr>
<td>Tong Legs (approximate)</td>
<td>77 lbs. / 35 kg</td>
<td></td>
</tr>
<tr>
<td>Combined Weight UHT Tong w/ Hanger &amp; Legs (approximate)</td>
<td>3,570 lbs. / 1,619 kg</td>
<td></td>
</tr>
<tr>
<td>Tong Jaw Options (1)</td>
<td>2 1/16&quot; thru 4 1/2&quot;</td>
<td></td>
</tr>
<tr>
<td>1 Backup Jaw Size / BUC7625-02</td>
<td>4 3/4&quot; thru 7 5/8&quot;</td>
<td></td>
</tr>
<tr>
<td>1 Backup Jaw Size / BUC8625-02</td>
<td>2 1/16&quot; thru 7 5/8&quot;</td>
<td></td>
</tr>
<tr>
<td>Gripping Range for Dovetail Tong Jaws (under nominal jaw or adapter sizes)</td>
<td>3/8&quot; / 1.5 cm undersize</td>
<td></td>
</tr>
</tbody>
</table>

(1) **CAUTION:** When using Low Friction Jaws, Tongs should be limited to 50% of maximum torque rating.

Operates using Steel Tooth Wrap Around Dies, Grit Faced Wrap Around Dies and Aluminum Wrap Around Dies

### Standard Equipment:
- Door Interlock
- Self Adjusting Brake
- Handles Tong
- Bail (/CLE7625UHT-08)

### Optional Equipment:
- Two Speed Hydraulic Motor
- Hydraulic Cage Plate Brake System
- Electronic Solenoid Dump Valve
- Hydraulic Intensifier for Backup
- Shipping Stand, or Skid
- Varying Outlets for Torque Turns Computer Sending Units
7 5/8" UHT TONG CLE7625UHT-08
& 8 5/8" UHT BACKUP BUC8625-02

DIMENSIONS
Many Clincher Tongs and Backups utilize jaws and/or adapters which accept Dovetail Inserts (AKA Pencil Dies or Strip Dies) to effectively grip tubulars. Jaw systems and jaw adapters are also available which accommodate Wrap-Around Fine Tooth Steel Dies, Grit Faced Dies and Aluminum Dies.

The appropriate jaws, die adapters and dies required for a specific tubular OD are also described in this section of the manual.

### Right: Table of Available Straight Tooth and Diamond Tooth Dies

<table>
<thead>
<tr>
<th>Thickness</th>
<th>Width</th>
<th>OAL</th>
<th>P/N Straight Tooth</th>
<th>P/N Diamond Tooth</th>
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<tr>
<td>3/8</td>
<td>5/8</td>
<td>3 1/2</td>
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<td>3 7/8</td>
<td>DTI1691</td>
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<tr>
<td>1</td>
<td>1 1/4</td>
<td>5</td>
<td>DTI1697</td>
<td>*</td>
</tr>
</tbody>
</table>

* Available upon request.

**Note:** Diamond Tooth Dies are used when a more aggressive bite is required.

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SUPERIOR Manufacturing & Hydraulics, Inc.
7 5/8” CLINCHER UHT Tong and UHT Backup
Revision: 04/04
CLINCHER WRAP AROUND DIES

Clincher Wrap Around Dies are available in three types:

- **Fine Toothed Steel Dies:** for low to ultra high torque applications on carbon steel tubulars including tubing, casing, and drill pipe
- **Smooth Faced Aluminum Dies:** for low to moderate torque applications on fiberglass and corrosion resistant alloy (stainless steel) tubulars
- **Grit Faced Dies:** for low to high torque applications on fiberglass and corrosion resistant alloy (stainless steel) tubulars where the use of steel dies is prohibited as well as on carbon steel tubulars where reduced marking is desired

CLINCHER Dies are designed to match the OD of the tubing, casing, coupling, or accessory being made up or broken out. Each die is stamped on the top or side to identify its size. Using Fine Toothed Steel Dies which are slightly larger than the tubular is acceptable provided the difference in diameters is less than 3/32" (0.093”). Aluminum and Grit Faced Dies should be matched with the specific tubular diameters required. **Note:** The use of improperly sized dies can result in reduced torque capacity, increased pipe marking, and reduced die life.

**CAUTION:** Do not attempt to grip tubular diameters which are larger than the dies being used. Failure to observe this precaution can result in damage to the tubular or tong jaws.

In emergencies where correct die sizes are unavailable, some operators have successfully used two different sizes of dies to accommodate unusual, nonstandard diameters.

CLINCHER Wrap Around Dies are manufactured in specific diameters to match standard tubing and casing diameters, API coupling diameters, selected work string connection diameters and certain commonly used premium connection coupling diameters. CLINCHER Wrap Around Dies should not be used on tubulars which are larger than the nominal die size. Steel Toothed Dies can be used on tubulars which are no smaller than 3/32" (0.093”) less than the nominal die size. Aluminum and Grit Faced Dies should be matched with the specific tubular diameters required.

**Note:** Fine Toothed Steel Dies are normally stocked in our Broussard, Louisiana facility. A partial listing of commonly manufactured sizes is shown below. Aluminum and Grit Faced Dies are normally made to order although a limited range of sizes and small quantities may be available from stock. Contact SUPERIOR Manufacturing & Hydraulics for information concerning availability of stock and special die sizes.
DIE Nomenclature for CLE7625 UHT Tong and BUC7625 or BUC8625 UHT Backup

BUC4500-xxxx  Fine Toothed Steel dies for jaws (2 reqd per tong) (Jaw CJ-76A)
CLE7625-xxxx  Fine Toothed Steel dies for jaws (2 reqd per tong) (Jaw CJ-76B)
BUC7625-xxxx  Fine Toothed Steel dies for jaws (2 reqd per tong) (Jaw CJ-76B)
BUC8625-xxxx  Fine Toothed Steel dies for jaws (3 reqd per backup)

BUCA4500-xxxx  Aluminum dies for jaws (2 reqd per tong) (Jaw CJ-LF-76A)
BUCA7625-xxxx  Aluminum dies for jaws (2 reqd per tong) (Jaw CJ-LF-76B)
BUCA8625-xxxx  Aluminum dies for jaws (3 reqd per backup)

BB4500-xxxx  Grit Faced dies for jaws (2 reqd per tong) (Jaw CJ-76A or CJ-LF-76A)
BB7625-xxxx  Grit Faced dies for jaws (2 reqd per tong) (Jaw CJ-LF-76B)
BB8625-xxxx  Grit Faced dies for jaws (3 reqd per backup)

ORDERING EXAMPLE: fine toothed steel dies are needed to run 2 7/8" OD tubing
Qty. two (2) BUC4500-2875 dies for jaws
Qty. three (3) BUC8625-2875 dies for jaws
(replace xxxx with size required in inches)

BUC4500-xxxx: Fine Toothed steel dies for UHT Tong
1.660 1.900 2.062 2.162 2.230 2.375 2.600 2.697 2.723 2.750 2.875 3.000 3.062

CLE7625-xxxx: Fine Toothed steel dies for UHT Tong
7.000 7.625

BUC7625-xxxx: Fine Toothed steel dies for 7 5/8" UHT Backup
4.900 4.921 4.935 4.961 5.000 5.005 5.125 5.137 5.150 5.215 5.250 5.290 5.313
5.439 5.470 5.500 5.530 5.563 5.570 5.587 5.620 5.695 5.750 5.780 5.826 5.866

BUC8625-xxxx: Fine Toothed steel dies for 8 5/8" UHT Backup
4.961 5.000 5.042 5.125 5.250 5.313 5.500 5.587 5.750 5.875 6.000 6.050 6.075
## CLINCHER WRAP AROUND DIES

BUCA7625-xxxx: Aluminum dies for 7 5/8" UHT Tong and 7 5/8" UHT Backup
1.900 2.250 2.375 2.400 2.679 2.707 2.735 2.776 2.875 2.910 3.062 3.125 3.130
4.968 5.000 5.012 5.150 5.181 5.250 5.350 5.500 5.550 5.563 5.577 5.590 5.650

BUCA8625-xxxx: Aluminum dies for 8 5/8" UHT Backup
2.375 2.700 2.875 3.297 3.500 3.890 4.000 4.250 4.500 4.875 5.000 5.010 5.150

BB7625-xxxx: Grit Faced dies for 7 5/8" UHT Tong and 7 5/8" UHT Backup
5.000 5.200 5.500 5.563 5.577 5.736 5.890 6.000 6.045 6.050 6.051 6.075 6.079

BB8625-xxxx: Grit Faced dies for 8 5/8" UHT Backup
6.625 7.000 7.625 7.644 7.681 8.750

Contact SUPERIOR Manufacturing & Hydraulics for information concerning availability of stock and special die sizes.
## Gripping range, jaw, adapters and dovetail die inserts for CLINCHER 7 5/8 UHT Tong and 7 5/8 UHT Backup

<table>
<thead>
<tr>
<th>Nominal Jaw and Dovetail Die Adapter Size</th>
<th>Jaw Assembly Part Number Manuf. Before 11/19/07</th>
<th>Dovetail Jaw part number</th>
<th>Dovetail Die Adapter part number</th>
<th>Jaw gripping range when dressed with 1 1/4&quot; wide xx.xx&quot; long dovetail strip dies with thickness of:</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>assembly consists of two jaws c/w pins, rollers, dovetail dies and die retainers</td>
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<td>maximum pipe OD for die &amp; jaw</td>
</tr>
<tr>
<td></td>
<td></td>
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<td></td>
<td>minimum undersized condition</td>
</tr>
<tr>
<td>7 5/8 x 2 7/8</td>
<td>CJDT76X02875L BUDT76-xxxxx</td>
<td>2.875</td>
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<td>maximum pipe OD for die &amp; jaw</td>
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<tr>
<td></td>
<td>Left 76X2875L</td>
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<td>minimum undersized condition</td>
</tr>
<tr>
<td></td>
<td>Rt 76X2875R</td>
<td></td>
<td></td>
<td>maximum pipe OD for die &amp; jaw</td>
</tr>
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<td>CJDT76X03125L BUDT76-xxxxx</td>
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<td>minimum undersized condition</td>
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<tr>
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<td>Rt 76X3125R</td>
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<td>maximum pipe OD for die &amp; jaw</td>
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<td>Rt 76X4000R</td>
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<td>maximum pipe OD for die &amp; jaw</td>
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<td>Rt xxx</td>
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P:\Manuals\Equip Manuals\Spreadsheets\CLE7625 Jaw Ranges rev2.xls
DT Jaw Ranges with 7.625 BU
Page 3 - 5
12/12/2007
<table>
<thead>
<tr>
<th>Nominal Jaw and Dovetail Die Adapter Size</th>
<th>Jaw Assembly Part Number Manuf. Before 11/19/07</th>
<th>dovetail jaw part number Manuf. Before 11/19/07</th>
<th>dovetail die adapter part number</th>
<th>nominal Jaw size</th>
<th>Jaw gripping range when dressed with 1 1/4&quot; wide xx.xx&quot; long dovetail strip dies with thickness of:</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>0.8125</td>
<td>0.75</td>
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<td></td>
<td></td>
<td></td>
<td></td>
<td>undersized</td>
<td>undersized</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>undersized (use this size for emergencies only)</td>
<td>undersized (use this size for emergencies only)</td>
</tr>
</tbody>
</table>

Note 1: All CJDT76X series of jaws may be used in CLE7625 UHT tongs.
Note 2: xxxxx indicates this size has not been designed at this time, but is available upon request.
<table>
<thead>
<tr>
<th>Jaw and Dovetail Assembly</th>
<th>Jaw &amp; Dovetail Assembly</th>
<th>Dovetail Jaw Die Adapter</th>
<th>Dovetail Die Adapter</th>
<th>Jaw Gripping Range when Dressed with 1 1/4&quot; wide xx.xx&quot; long Dovetail Strip Dies with Thickness of:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Jaw Size</td>
<td>Jaw</td>
<td>Dovetail Jaw Part Number</td>
<td>Dovetail Die Adapter Part Number</td>
<td>Undersized</td>
</tr>
<tr>
<td></td>
<td>Assembly</td>
<td>Manuf. After 11/19/07</td>
<td>Parts</td>
<td></td>
</tr>
<tr>
<td>Nominal Jaw Size</td>
<td>0.8125</td>
<td>0.75</td>
<td>0.6875</td>
<td>0.625</td>
</tr>
<tr>
<td>Undersized (use this size for emergencies only)</td>
<td>maximum pipe OD for die &amp; jaw</td>
<td>minimum undersized condition</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Undersized (use this size for emergencies only)</td>
<td>maximum pipe OD for die &amp; jaw</td>
<td>minimum undersized condition</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pipe OD Application</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>7 5/8 x 2 3/8 CJDTLF78X02375</td>
<td>Left 78X2375L</td>
<td>BUDT76-xxxxxx</td>
<td>2.375</td>
<td>1.750</td>
</tr>
<tr>
<td>Rt 78X2375R</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>7 5/8 x 2 7/8 CJDTLF78X02875</td>
<td>Left 78X2875L</td>
<td>BUDT76-xxxxxx</td>
<td>2.875</td>
<td>1.750</td>
</tr>
<tr>
<td>Rt 78X2875R</td>
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<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>7 5/8 x 3 1/8 CJDTLF78X03125</td>
<td>Left 78X3125L</td>
<td>BUDT76-xxxxxx</td>
<td>3.125</td>
<td>2.000</td>
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<tr>
<td>Rt 78X3125R</td>
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<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>7 5/8 x 3 3/8 CJDTLF78X03375</td>
<td>Left 78X3375L</td>
<td>BUDT76-xxxxxx</td>
<td>3.375</td>
<td>2.250</td>
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<tr>
<td>Rt 78X3375R</td>
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<td></td>
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<tr>
<td>7 5/8 x 3 1/2 CJDTLF78X03500</td>
<td>Left 78X3500L</td>
<td>BUDT76-03500</td>
<td>3.500</td>
<td>2.375</td>
</tr>
<tr>
<td>Rt 78X3500R</td>
<td></td>
<td></td>
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<td></td>
</tr>
<tr>
<td>7 5/8 x 4 CJDT78X04000</td>
<td>Left 78X4000L</td>
<td>BUDT76-xxxxxx</td>
<td>4.000</td>
<td>3.375</td>
</tr>
<tr>
<td>Rt 78X4000R</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>7 5/8 x 4 1/2 CJDT78X04500</td>
<td>Left 78X4500L</td>
<td>BUDT76-04500</td>
<td>4.500</td>
<td>3.875</td>
</tr>
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<td>Rt 78X4500R</td>
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<tr>
<td>Rt 78X4750R</td>
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<tr>
<td>7 5/8 x 5 CJDT78X05000</td>
<td>Left 78X5000L</td>
<td>BUDT76-05000</td>
<td>5.000</td>
<td>4.375</td>
</tr>
<tr>
<td>Rt 78X5000R</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>7 5/8 x 5 1/2 CJDT78X05500</td>
<td>Left 78X5500L</td>
<td>BUDT76-05500</td>
<td>5.500</td>
<td>4.875</td>
</tr>
<tr>
<td>Rt 78X5500R</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>7 5/8 x 6 CJDT78X06000</td>
<td>Left 78X6000L</td>
<td>BUDT76-xxxxxx</td>
<td>6.000</td>
<td>5.375</td>
</tr>
<tr>
<td>Rt 78X6000R</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>7 5/8 x 6 5/8 CJDT78X06250</td>
<td>Left 78X6250L</td>
<td>BUDT76-xxxxxx</td>
<td>6.625</td>
<td>5.500</td>
</tr>
<tr>
<td>Rt 78X6250R</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>7 5/8 x 7 CJDT78X07000</td>
<td>Left 78X7000L</td>
<td>BUDT76-07000</td>
<td>7.000</td>
<td>6.375</td>
</tr>
<tr>
<td>Rt 78X7000R</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>7 5/8 x 7 5/8 CJDT78X07250</td>
<td>Left 78X7250L</td>
<td>BUDT76-xxxxxx</td>
<td>7.625</td>
<td>6.500</td>
</tr>
<tr>
<td>Rt 78X7250R</td>
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</tr>
</tbody>
</table>
## Gripping range, jaw, adapters and dovetail die inserts for CLINCHER 7 5/8 UHT Tong and 7 5/8 UHT Backup

<table>
<thead>
<tr>
<th>Nominal Jaw and Dovetail Die Adapter Size</th>
<th>Jaw Assembly Part Number</th>
<th>dovetail jaw part number</th>
<th>dovetail die adapter part number</th>
<th>nominal jaw size</th>
<th>Jaw gripping range when dressed with 1 1/4&quot; wide xx.xx&quot; long dovetail strip dies with thickness of:</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td><strong>0.8125</strong></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>undersized</td>
</tr>
</tbody>
</table>

**Note 1:** All CJDT76X series of jaws may be used in CLE7625 UHT tongs.

**Note 2:** xxxxx indicates this size has not been designed at this time, but is available upon request.

---

### CLINCHER part number for 1 1/4" wide x 3 7/8" long straight toothed dovetail die inserts used in dovetail die adapters (2 pcs required per adapter or 6 pcs required per set of 3 adapters)

- DTI1661
- DTI1651
- DTI1642
- DTI1632
- DTI1622
- DTI1601
- DTI1612

### CLINCHER part number for 1 1/4" wide x 3 7/8" long diamond toothed dovetail die inserts used in dovetail die adapters (2 pcs required per adapter or 6 pcs required per set of 3 adapters)

- upon request
- upon request
- upon request
- DTI1632D
- DTI1622D
- DTI1601D
- DTI1612D

### CLINCHER part number for 1 1/4" wide x 5" long straight toothed dovetail die inserts used in dovetail jaw assembly (2 pcs required per jaw or 4 pcs required per jaw assembly)

- DTI1664
- DTI1693
- DTI1646
- DTI1633
- DTI1623
- DTI1602
- DTI1617

### CLINCHER part number for 1 1/4" wide x 5" long diamond toothed dovetail die inserts used in dovetail jaw assembly (2 pcs required per jaw or 4 pcs required per jaw assembly)

- upon request
- upon request
- upon request
- upon request
- DTI1623D
- DTI1602D
- DTI1617D
<table>
<thead>
<tr>
<th>Nominal Jaw Size</th>
<th>Jaw Assembly Part Number</th>
<th>dovetail jaw part number</th>
<th>dovetail die adapter part number</th>
<th>nominal jaw size</th>
<th>Jaw gripping range when dressed with 1/4&quot; wide xx xx&quot; long dovetail strip dies with thickness of:</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Manuf. Before 11/19/07</td>
<td>Manuf. Before 11/19/07</td>
<td>3 dovetail die adapters required to dress backup</td>
<td></td>
<td></td>
</tr>
<tr>
<td>7 5/8 x 2 7/8</td>
<td>CJDT76X02875</td>
<td>BUDT86-02875</td>
<td>2.875</td>
<td>0.8125</td>
<td>undersized (use this size for emergencies only)</td>
</tr>
<tr>
<td></td>
<td>Left 76X2875L</td>
<td>BUDT86-02875</td>
<td></td>
<td></td>
<td>undersized</td>
</tr>
<tr>
<td></td>
<td>Rt. 76X2875R</td>
<td></td>
<td></td>
<td></td>
<td>undersized</td>
</tr>
<tr>
<td>7 5/8 x 3 1/8</td>
<td>CJDT76X03125</td>
<td>BUDT86-03125</td>
<td>3.125</td>
<td>0.75</td>
<td>undersized (use this size for emergencies only)</td>
</tr>
<tr>
<td></td>
<td>Left 76X3125L</td>
<td>BUDT86-03125</td>
<td></td>
<td></td>
<td>undersized</td>
</tr>
<tr>
<td></td>
<td>Rt. 76X3125R</td>
<td></td>
<td></td>
<td></td>
<td>undersized</td>
</tr>
<tr>
<td>7 5/8 x 3 3/8</td>
<td>CJDT76X03375</td>
<td>BUDT86-03375</td>
<td>3.375</td>
<td>0.6875</td>
<td>undersized (use this size for emergencies only)</td>
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<tr>
<td></td>
<td>Left 76X3375L</td>
<td>BUDT86-03375</td>
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<td></td>
<td>undersized</td>
</tr>
<tr>
<td></td>
<td>Rt. 76X3375R</td>
<td></td>
<td></td>
<td></td>
<td>undersized</td>
</tr>
<tr>
<td>7 5/8 x 3 1/2</td>
<td>CJDT76X03500</td>
<td>BUDT86-03500</td>
<td>3.500</td>
<td>0.625</td>
<td>undersized (use this size for emergencies only)</td>
</tr>
<tr>
<td></td>
<td>Left 76X3500L</td>
<td>BUDT86-03500</td>
<td></td>
<td></td>
<td>undersized</td>
</tr>
<tr>
<td></td>
<td>Rt. 76X3500R</td>
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<td></td>
<td></td>
<td>undersized</td>
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<tr>
<td>7 5/8 x 4</td>
<td>CJDT76X04000</td>
<td>BUDT86-xxxxxx</td>
<td>4.000</td>
<td>0.5625</td>
<td>undersized (use this size for emergencies only)</td>
</tr>
<tr>
<td></td>
<td>Left 76X4000L</td>
<td>BUDT86-xxxxxx</td>
<td></td>
<td></td>
<td>undersized</td>
</tr>
<tr>
<td></td>
<td>Rt. 76X4000R</td>
<td></td>
<td></td>
<td></td>
<td>undersized</td>
</tr>
<tr>
<td>7 5/8 x 4 1/8</td>
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<td>BUDT86-04125</td>
<td>4.125</td>
<td>0.5</td>
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<tr>
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<td>Left xxxxx</td>
<td>BUDT86-04125</td>
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<td>undersized</td>
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<tr>
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<td>Rt. xxxxx</td>
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<td>undersized</td>
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<tr>
<td>7 5/8 x 4 1/2</td>
<td>CJDT76X04500</td>
<td>BUDT86-04500</td>
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<td>0.4375</td>
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<td>Left 76X4500L</td>
<td>BUDT86-04500</td>
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<td></td>
<td>undersized</td>
</tr>
<tr>
<td></td>
<td>Rt. 76X4500R</td>
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<td></td>
<td>undersized</td>
</tr>
<tr>
<td>7 5/8 x 4 5/8</td>
<td>CJDT76Xxxxxxx</td>
<td>BUDT86-04625</td>
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<td>0.375</td>
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<td>BUDT86-04625</td>
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<td></td>
<td>Rt. xxxxx</td>
<td></td>
<td></td>
<td></td>
<td>undersized</td>
</tr>
<tr>
<td>7 5/8 x 4 3/4</td>
<td>CJDT76Xxxxxxx</td>
<td>BUDT86-04750</td>
<td>4.750</td>
<td>0.25</td>
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<td>Left xxxxx</td>
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<td>7 5/8 x 5</td>
<td>CJDT76X05000</td>
<td>BUDT86-05000</td>
<td>5.000</td>
<td>0.25</td>
<td>undersized (use this size for emergencies only)</td>
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<td>Left 76X5000L</td>
<td>BUDT86-05000</td>
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<td></td>
<td>undersized</td>
</tr>
<tr>
<td></td>
<td>Rt. 76X5000R</td>
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<td></td>
<td></td>
<td>undersized</td>
</tr>
<tr>
<td>7 5/8 x 5 1/4</td>
<td>CJDT76Xxxxxxx</td>
<td>BUDT86-05250</td>
<td>5.250</td>
<td>0.125</td>
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<tr>
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<td>Left xxxxx</td>
<td>BUDT86-05250</td>
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<td>0.0625</td>
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<td>Left 76X5500L</td>
<td>BUDT86-05500</td>
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<td>undersized</td>
</tr>
<tr>
<td></td>
<td>Rt. 76X5500R</td>
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</tr>
</tbody>
</table>
### Gripping range, jaw, adapters and dovetail die inserts for CLINCHER 7 5/8 UHT Tong and 8 5/8 UHT Backup

<table>
<thead>
<tr>
<th>Nominal Jaw and Dovetail Die Adapter Size</th>
<th>Jaw Assembly Part Number</th>
<th>dovetail jaw part number</th>
<th>dovetail die adapter part number</th>
<th>nominal jaw size</th>
<th>Jaw gripping range when dressed with 1/4&quot; wide xx xx&quot; long dovetail strip dies with thickness of:</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Manuf. Before 11/19/07</td>
<td>Manuf. Before 11/19/07</td>
<td>3 dovetail die adapters</td>
<td></td>
<td>0.8125 0.75 0.6875 0.625 0.5625 0.5 0.4375 &amp;&amp; dovetail die thickness</td>
</tr>
<tr>
<td></td>
<td>assembly consists of two jaws c/w pins, rollers, dovetail dies and die retainers</td>
<td>assembly consists of two jaws c/w pins, rollers, dovetail dies and die retainers</td>
<td>required to dress backup</td>
<td></td>
<td>undersized undersized undersized undersized STANDARD oversized</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>(use this size for emergencies only) (use this size for emergencies only)</td>
</tr>
<tr>
<td>7 5/8 x 6</td>
<td>CJDT76X06000</td>
<td>Left 76X6000L</td>
<td>BUDT86-xxxxx</td>
<td>6.000</td>
<td>maximum pipe OD for die &amp; jaw</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Rt. 76X6000R</td>
<td></td>
<td>5.375 5.500 5.625 5.750 5.875 6.000 6.125 6.250 6.375 6.500</td>
<td>minimum undersized condition</td>
</tr>
<tr>
<td>7 5/8 x 6 1/4</td>
<td>CJDT76Xxxxxx</td>
<td>Left xxxx</td>
<td>BUDT86-06250</td>
<td>6.250</td>
<td>maximum pipe OD for die &amp; jaw</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Rt. xxxx</td>
<td></td>
<td>5.125 5.250 5.375 5.500 5.625 5.750 6.000 6.125 6.250 6.375 6.500</td>
<td>minimum undersized condition</td>
</tr>
<tr>
<td>7 5/8 x 6 3/8</td>
<td>CJDT76Xxxxxx</td>
<td>Left xxxx</td>
<td>BUDT86-06375</td>
<td>6.375</td>
<td>maximum pipe OD for die &amp; jaw</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Rt. xxxx</td>
<td></td>
<td>5.250 5.375 5.500 5.625 5.750 5.875 6.000 6.125 6.250 6.375 6.500</td>
<td>minimum undersized condition</td>
</tr>
<tr>
<td>7 5/8 x 6 1/2</td>
<td>CJDT76Xxxxxx</td>
<td>Left xxxx</td>
<td>BUDT86-06500</td>
<td>6.500</td>
<td>maximum pipe OD for die &amp; jaw</td>
</tr>
<tr>
<td>7 5/8 x 6 5/8</td>
<td>CJDT76X06625</td>
<td>Left 76X6625L</td>
<td>BUDT86-06625</td>
<td>6.625</td>
<td>maximum pipe OD for die &amp; jaw</td>
</tr>
<tr>
<td>7 5/8 x 7</td>
<td>CJDT76X07000</td>
<td>Left 76X7000L</td>
<td>BUDT86-07000</td>
<td>7.000</td>
<td>maximum pipe OD for die &amp; jaw</td>
</tr>
<tr>
<td>7 5/8 x 7 1/4</td>
<td>CJDT76Xxxxxx</td>
<td>Left xxxx</td>
<td>BUDT86-07250</td>
<td>7.250</td>
<td>maximum pipe OD for die &amp; jaw</td>
</tr>
<tr>
<td>7 5/8 x 7 1/2</td>
<td>CJDT76Xxxxxx</td>
<td>Left xxxx</td>
<td>BUDT86-07500</td>
<td>7.500</td>
<td>maximum pipe OD for die &amp; jaw</td>
</tr>
<tr>
<td>7 5/8 x 7 5/8</td>
<td>CJDT76X07625</td>
<td>Left 76212-7625L</td>
<td>BUDT86-07625</td>
<td>7.625</td>
<td>maximum pipe OD for die &amp; jaw</td>
</tr>
<tr>
<td>7 5/8 x 7 3/4</td>
<td>N/A</td>
<td>BUDT86-07750</td>
<td></td>
<td>7.750</td>
<td>maximum pipe OD for die &amp; jaw</td>
</tr>
<tr>
<td>7 5/8 x 7 13/16</td>
<td>N/A</td>
<td>BUDT86-07812</td>
<td></td>
<td>7.812</td>
<td>maximum pipe OD for die &amp; jaw</td>
</tr>
<tr>
<td>7 5/8 x 8</td>
<td>N/A</td>
<td>BUDT86-08000</td>
<td></td>
<td>8.000</td>
<td>maximum pipe OD for die &amp; jaw</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>6.875 7.000 7.125 7.250 7.375 7.500 7.625 7.750 7.875 8.000 8.125</td>
<td>minimum undersized condition</td>
</tr>
</tbody>
</table>
## Gripping range, jaw, adapters and dovetail die inserts for CLINCHER 7 5/8 UHT Tong and 8 5/8 UHT Backup

<table>
<thead>
<tr>
<th>Nominal Jaw and Dovetail Die Adapter Size</th>
<th>Jaw Assembly Part Number</th>
<th>Jaw gripping range when dressed with 1 1/4&quot; wide xx.xx&quot; long dovetail strip dies with thickness of:</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>0.8125 0.75 0.6875 0.625 0.5625 0.5 0.4375 &lt;&lt;dovetail die thickness</td>
</tr>
<tr>
<td></td>
<td></td>
<td>undersized undersized undersized undersized STANDARD Oversized &lt;&lt;pipe application</td>
</tr>
<tr>
<td></td>
<td></td>
<td>undersized (use this size for emergencies only)</td>
</tr>
<tr>
<td>7 5/8 x 8 1/4 N/A</td>
<td>BUDT86-08250</td>
<td>8.250 7.625 7.750 7.875 8.000 8.125 8.250 8.375 maximum pipe OD for die &amp; jaw</td>
</tr>
<tr>
<td></td>
<td></td>
<td>7.125 7.250 7.375 7.500 7.625 7.750 7.875 minimum undersized condition</td>
</tr>
</tbody>
</table>

Note 1: All CJDT76X series of jaws may be used in CLE7625 UHT tongs.
Note 2: xxxxx indicates this size has not been designed at this time, but is available upon request.
Note 3: Larger than 8 1/4" up to 8 3/4" use Wrap Around Die SDI86-xxxxx
<table>
<thead>
<tr>
<th>Nominal Jaw and Dovetail Die Size</th>
<th>Standard Jaw Gripping Range</th>
<th>Maximum Pipe OD for die &amp; jaw</th>
<th>Minimum Pipe OD for die &amp; jaw</th>
<th>Minimum Undersized Condition</th>
</tr>
</thead>
<tbody>
<tr>
<td>7 5/8 x 2 3/8 CJDT78X02375 Left 78X2375L BUDT86-xxxxx</td>
<td>2.375</td>
<td>7.125</td>
<td>7.250</td>
<td>7.375</td>
</tr>
<tr>
<td>7 5/8 x 2 7/8 CJDT78X02750 Left 78X2750L BUDT86-02792</td>
<td>2.792</td>
<td>7.500</td>
<td>7.625</td>
<td>7.750</td>
</tr>
<tr>
<td>7 5/8 x 3 1/8 CJDT78X03125 Left 78X3125L BUDT86-03125</td>
<td>3.125</td>
<td>8.000</td>
<td>8.125</td>
<td>8.250</td>
</tr>
<tr>
<td>7 5/8 x 3 3/8 CJDT78X03375 Left 78X3375L BUDT86-03375</td>
<td>3.375</td>
<td>8.500</td>
<td>8.625</td>
<td>8.750</td>
</tr>
<tr>
<td>7 5/8 x 4 CJDT78X04000 Left 78X4000L BUDT86-xxxxx</td>
<td>4.000</td>
<td>9.500</td>
<td>9.625</td>
<td>9.750</td>
</tr>
<tr>
<td>7 5/8 x 4 1/8 CJDT78X04125 Left 78X4125L BUDT86-04125</td>
<td>4.125</td>
<td>10.000</td>
<td>10.125</td>
<td>10.250</td>
</tr>
<tr>
<td>7 5/8 x 4 3/4 CJDT78X04750 Left 78X4750L BUDT86-04750</td>
<td>4.750</td>
<td>10.500</td>
<td>10.625</td>
<td>10.750</td>
</tr>
<tr>
<td>7 5/8 x 5 CJDT78X05000 Left 78X5000L BUDT86-xxxxx</td>
<td>5.000</td>
<td>11.000</td>
<td>11.125</td>
<td>11.250</td>
</tr>
<tr>
<td>7 5/8 x 5 1/4 CJDT78X05250 Left 78X5250L BUDT86-05250</td>
<td>5.250</td>
<td>11.500</td>
<td>11.625</td>
<td>11.750</td>
</tr>
<tr>
<td>7 5/8 x 5 1/2 CJDT78X05500 Left 78X5500L BUDT86-05500</td>
<td>5.500</td>
<td>12.000</td>
<td>12.125</td>
<td>12.250</td>
</tr>
<tr>
<td>7 5/8 x 6 CJDT78X06000 Left 78X6000L BUDT86-xxxxx</td>
<td>6.000</td>
<td>12.500</td>
<td>12.625</td>
<td>12.750</td>
</tr>
</tbody>
</table>

Notes:
- Standard jaw gripping range: when dressed with 1 1/4" wide x xx" long dovetail strip dies with thickness of: 0.8125, 0.75, 0.6875, 0.625, 0.5625, 0.5, 0.4375.
- Jaw gripping range when dressed with 1 1/4" wide x xx" long dovetail strip dies with thickness of: 0.8125, 0.75, 0.6875, 0.625, 0.5625, 0.5, 0.4375.
- Jaw gripping range when dressed with 1 1/4" wide x xx" long dovetail strip dies with thickness of: 0.8125, 0.75, 0.6875, 0.625, 0.5625, 0.5, 0.4375.
- Jaw gripping range when dressed with 1 1/4" wide x xx" long dovetail strip dies with thickness of: 0.8125, 0.75, 0.6875, 0.625, 0.5625, 0.5, 0.4375.
- Jaw gripping range when dressed with 1 1/4" wide x xx" long dovetail strip dies with thickness of: 0.8125, 0.75, 0.6875, 0.625, 0.5625, 0.5, 0.4375.
- Jaw gripping range when dressed with 1 1/4" wide x xx" long dovetail strip dies with thickness of: 0.8125, 0.75, 0.6875, 0.625, 0.5625, 0.5, 0.4375.
- Jaw gripping range when dressed with 1 1/4" wide x xx" long dovetail strip dies with thickness of: 0.8125, 0.75, 0.6875, 0.625, 0.5625, 0.5, 0.4375.
- Jaw gripping range when dressed with 1 1/4" wide x xx" long dovetail strip dies with thickness of: 0.8125, 0.75, 0.6875, 0.625, 0.5625, 0.5, 0.4375.
### Jaw, Adapter and Dovetail Die Insert Specifications

<table>
<thead>
<tr>
<th>Nominal Jaw and Dovetail Die Adapter Size</th>
<th>Jaw Assembly Part Number</th>
<th>Jaw gripping range when dressed with 1 1/4&quot; wide xx.xx&quot; long dovetail strip dies with thickness of:</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td><strong>0.8125</strong> <strong>0.75</strong> <strong>0.6875</strong> <strong>0.625</strong> <strong>0.5625</strong> <strong>0.5</strong> <strong>0.4375</strong> <strong>&lt;dovetail die thickness</strong></td>
</tr>
<tr>
<td></td>
<td></td>
<td><strong>undersized</strong> <strong>undersized</strong> <strong>undersized</strong> <strong>undersized</strong> <strong>undersized</strong> <strong>STANDARD</strong> <strong>oversized</strong></td>
</tr>
<tr>
<td></td>
<td></td>
<td><strong>&lt;pipe application</strong></td>
</tr>
<tr>
<td></td>
<td></td>
<td><strong>minimum undersized condition</strong></td>
</tr>
<tr>
<td></td>
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<td><strong>minimum undersized condition</strong></td>
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<tr>
<td></td>
<td></td>
<td><strong>minimum undersized condition</strong></td>
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<td><strong>minimum undersized condition</strong></td>
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<td><strong>minimum undersized condition</strong></td>
</tr>
<tr>
<td></td>
<td></td>
<td><strong>minimum undersized condition</strong></td>
</tr>
<tr>
<td>7 5/8 x 6 CJD78X06000 L BUDT86-xxxxx</td>
<td>6.000</td>
<td>10.750 11.000 11.250 11.375 11.500 max pipe OD for die &amp; jaw</td>
</tr>
<tr>
<td></td>
<td></td>
<td>5.375 5.500 5.625 5.750 5.875 6.000 6.125 min pipe OD for die &amp; jaw</td>
</tr>
<tr>
<td></td>
<td></td>
<td><strong>minimum undersized condition</strong></td>
</tr>
<tr>
<td>7 5/8 x 6 1/4 CJD76xxxxxx L BUDT86-06250</td>
<td>6.250</td>
<td>5.625 5.750 5.875 6.000 6.125 6.250 6.375 min pipe OD for die &amp; jaw</td>
</tr>
<tr>
<td></td>
<td></td>
<td><strong>minimum undersized condition</strong></td>
</tr>
<tr>
<td></td>
<td></td>
<td><strong>minimum undersized condition</strong></td>
</tr>
<tr>
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<td><strong>minimum undersized condition</strong></td>
</tr>
<tr>
<td></td>
<td></td>
<td><strong>minimum undersized condition</strong></td>
</tr>
<tr>
<td>7 5/8 x 7 CJD76X07000 L BUDT86-07000</td>
<td>7.000</td>
<td>6.375 6.500 6.625 6.750 6.875 7.000 7.125 min pipe OD for die &amp; jaw</td>
</tr>
<tr>
<td></td>
<td></td>
<td><strong>minimum undersized condition</strong></td>
</tr>
<tr>
<td>7 5/8 x 7 1/4 CJD76xxxxxx L BUDT86-07250</td>
<td>7.250</td>
<td>6.625 6.750 6.875 7.000 7.125 7.250 7.375 min pipe OD for die &amp; jaw</td>
</tr>
<tr>
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<td></td>
<td><strong>minimum undersized condition</strong></td>
</tr>
<tr>
<td>7 5/8 x 7 1/2 CJD76xxxxxx L BUDT86-07500</td>
<td>7.500</td>
<td>6.875 7.000 7.125 7.250 7.375 7.500 7.625 min pipe OD for die &amp; jaw</td>
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<tr>
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<td><strong>minimum undersized condition</strong></td>
</tr>
<tr>
<td>7 5/8 x 7 5/8 CJD76X07625 L BUDT86-07625</td>
<td>7.625</td>
<td>7.000 7.125 7.250 7.375 7.500 7.625 7.750 min pipe OD for die &amp; jaw</td>
</tr>
<tr>
<td></td>
<td></td>
<td><strong>minimum undersized condition</strong></td>
</tr>
<tr>
<td>7 5/8 x 7 3/4 N/A BUDT86-07750</td>
<td>7.750</td>
<td>7.125 7.250 7.375 7.500 7.625 7.750 7.875 min pipe OD for die &amp; jaw</td>
</tr>
<tr>
<td></td>
<td></td>
<td><strong>minimum undersized condition</strong></td>
</tr>
<tr>
<td>7 5/8 x 7 13/16 N/A BUDT86-07812</td>
<td>7.812</td>
<td>7.187 7.312 7.437 7.562 7.687 7.812 7.937 min pipe OD for die &amp; jaw</td>
</tr>
<tr>
<td></td>
<td></td>
<td><strong>minimum undersized condition</strong></td>
</tr>
<tr>
<td>7 5/8 x 8 N/A BUDT86-08000</td>
<td>8.000</td>
<td>7.375 7.500 7.625 7.750 7.875 8.000 8.125 min pipe OD for die &amp; jaw</td>
</tr>
</tbody>
</table>

**Notes:**
- Jaw assembly consists of two jaws c/w pins, rollers, dovetail dies and die retainers.
- 3 dovetail die adapters required to dress backup.
- This size used for emergencies only.
- Use this size for emergencies only, for undersized conditions.

**Pipe Application:**
- Rt. 78X5500R
- Rt. 78X6000R
- Rt. xxxxx

**Manuf. After:**
- 11/19/07

**Part Numbers:**
- BUDT86-xxxxx

**Die and Jaw Sizes:**
- Minimum undersized condition
- Maximum pipe OD for die & jaw
<table>
<thead>
<tr>
<th>Nominal Jaw and Dovetail Die Adapter Size</th>
<th>Jaw Assembly Part Number Manuf. After 11/19/07</th>
<th>Jaw gripping range when dressed with 1 1/4&quot; wide xx.xx&quot; long dovetail strip dies with thickness of:</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>dovetail jaw part number Manuf. After 11/19/07</td>
<td></td>
</tr>
<tr>
<td></td>
<td>dovetail die adapter part number</td>
<td>0.8125 0.75 0.6875 0.625 0.5625 0.5 0.4375 &lt;&lt;dovetail die thickness</td>
</tr>
<tr>
<td></td>
<td>3 dovetail die adapters required to dress backup</td>
<td>undersized undersized undersized undersized STANDARD oversized (use this size for emergencies only)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>&lt;&lt;pipe application</td>
</tr>
<tr>
<td></td>
<td></td>
<td>maximum pipe OD for die &amp; jaw</td>
</tr>
<tr>
<td></td>
<td></td>
<td>minimum undersized condition</td>
</tr>
<tr>
<td>7 5/8 x 8 1/4</td>
<td>N/A</td>
<td>CLINCHER part number for 1 1/4&quot; wide x 3 7/8&quot; long straight toothed dovetail die inserts used in dovetail die adapters (2 pcs required per adapter or 6 pcs required per set of 3 adapters)</td>
</tr>
<tr>
<td></td>
<td>BUDET86-08250</td>
<td>DTI1661 DTI1651 DTI1642 DTI1632 DTI1622 DTI1601 DTI1612</td>
</tr>
<tr>
<td></td>
<td></td>
<td>CLINCHER part number for 1 1/4&quot; wide x 3 7/8&quot; long diamond toothed dovetail die inserts used in dovetail die adapters (2 pcs required per adapter or 6 pcs required per set of 3 adapters)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>upon request upon request upon request DTI1622D DTI1622D DTI1601D upon request</td>
</tr>
<tr>
<td></td>
<td></td>
<td>CLINCHER part number for 1 1/4&quot; wide x 5&quot; long straight toothed dovetail die inserts used in dovetail jaw assembly (2 pcs required per jaw or 4 pcs required per jaw assembly)</td>
</tr>
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<td>DTI1664 DTI1693 DTI1646 DTI1633 DTI1623 DTI1602 DTI1617</td>
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<td>CLINCHER part number for 1 1/4&quot; wide x 5&quot; long diamond toothed dovetail die inserts used in dovetail jaw assembly (2 pcs required per jaw or 4 pcs required per jaw assembly)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>upon request upon request upon request upon request DTI1623D DTI1602D DTI1617D</td>
</tr>
</tbody>
</table>

Note 1: All CJDT76X series of jaws may be used in CLE7625 UHT tongs.
Note 2: xxxxx indicates this size has not been designed at this time, but is available upon request.
Note 3: Larger than 8 1/4" up to 8 3/4" use Wrap Around Die SDI86-xxxxx
<table>
<thead>
<tr>
<th>Nominal wraparound tong jaw and wraparound adapter size</th>
<th>Splined Jaw Assembly Number</th>
<th>Splined jaw part number</th>
<th>Splined jaw roller part number</th>
<th>Splined jaw pin part number</th>
<th>Top clip part number for tong jaws</th>
<th>Bottom clip part number for tong jaws</th>
<th>Available wraparound die series (two dies are required to dress tong jaws and three dies are required to dress backup for a total of five dies per tool - excludes any dies required for couplings)</th>
<th>fine tooth steel dies for tong</th>
<th>Grit faced dies for tong</th>
<th>Non-marking aluminum dies for tong</th>
</tr>
</thead>
<tbody>
<tr>
<td>7 5/8 x 4 1/2 - 2 3/8</td>
<td>CJ-76A</td>
<td>76015</td>
<td>76138</td>
<td>76013</td>
<td>BUC4520</td>
<td>BUC4531-S1</td>
<td>BUC4500-nnnnn BB7625-nnnnn BUCA7625-nnnnn</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>7 5/8 x 7 5/8 - 4 1/2</td>
<td>CJ-76B</td>
<td>76012</td>
<td>76136</td>
<td>76013</td>
<td>76017</td>
<td>76017</td>
<td>CLE7625-nnnnn BB7625-nnnnn BUCA7625-nnnnn</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>7 5/8 x 4 1/2 - 2 1/16</td>
<td>CJ-LF-76A</td>
<td>76015</td>
<td>76139 w/ Bushing 58079 (2 per roller)</td>
<td>76013</td>
<td>BUC4520</td>
<td>BUC4531-S1</td>
<td>BUC4500-nnnnn BB7625-nnnnn BUCA7625-nnnnn</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>7 5/8 x 7 5/8 - 2 3/8</td>
<td>CJ-LF-76B</td>
<td>76009</td>
<td>76137 w/ Bushing 20DU14 (5 per roller)</td>
<td>76013</td>
<td>76017</td>
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<td>CLE7625-nnnnn BB7625-nnnnn BUCA7625-nnnnn</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

-nnnnn indicates size being designated by replacing "nnnnn" sequence with size required (in inches) to three decimal places; i.e., 4.500 for 4 1/2" OD casing.

Note: CLINCHER wraparound dies are machined to specific casing, tubing, coupling or accessory diameter. Additional dies must be ordered to match specific coupling diameters associated with accessories or special clearance premium tubular connections.
SUPERIOR’s CLINCHER line of power tongs, backups, and accessories supplies the oil industry with equipment used when installing oil field tubing, casing, and drill pipe. These products are hydraulically powered wrenches which grip the exterior surface of the pipe and transmit torque to tighten or loosen the pipe’s threaded connection.

Traditionally, tongs employing a series of hardened steel dies with sharp teeth were used to grip oil field tubulars. Early steel die designs were made from strips of flat bar stock. These early dies ranged from approximately 3/4” to 1 1/2” in width and were approximately 4” long. They are known as strip dies because of their long narrow geometry. These dies were installed in a holder, known as a jaw, in sets of 2 or 4 and arranged in a v-block configuration. The jaws holding the strip dies are installed in opposed pairs in a power tong. As the tong is operated, a cam system generates radial loads which force the jaws to close on the pipe and cause the teeth of the die to penetrate the pipe’s surface.

In high torque applications the pipe is loaded on the leading edges of the jaws while the trailing edges are unloaded. Under these conditions, the strip die can severely mark the pipe because the strip die provides essentially only line contact. The limited contact area associated with strip dies can also lead to permanent pipe deformation under high torque conditions. In an effort to reduce the depth of the marks left by strip dies and increase the contact area, strip dies were modified to provide a contoured surface which matched the radius of the pipe.

In 1985 Superior introduced the CLINCHER Splined Tong Jaw and Wrap-Around Fine Toothed Steel Die system (ref. Figure 2). This wrap around die replaced the two traditional tong jaws and strip dies resulting in an increase in contact area to approximately 230 degrees or 64% of the circumference.

CLINCHER Wrap-Around Dies are fixed to the jaws by means of a patented spline arrangement which insures proper alignment and uniform distribution of radial loads (ref. Figure 3). This causes the torsional loads to be distributed across the entire die unlike the concentrated loading observed in strip dies. The increased contact area combined with the fine tooth pattern significantly reduces the marking of tubulars under high torque conditions when compared to the traditional die system. Simultaneously, the increased contact area reduces the stress in the tubular and the possibility of permanent deformation. In 1987, we introduced the CLINCHER Hydraulic Backup which also uses our Wrap-Around Die. When these dies are installed in CLINCHER Backups, CHROMEMASTER™ and LOCKJAW™ Tongs having 3 jaws, this contact area is increased to as much as 340 degrees or 94% of the tubular’s circumference.
In the last decade, the use of carbon steel tubulars has declined and the use of exotic stainless steel tubulars has increased. This change is in response to declining reserves of sweet, non-corrosive hydrocarbon reserves and the increase in production from hot, corrosive oil and gas reservoirs. Some of these corrosion resistant alloys (CRA) materials can have their corrosion resistance severely degraded if their surface is damaged and/or contaminated with small particles of iron or steel (ref. IADC/SPE Paper 36386). The marks left behind by traditional slips and elevators used to handle the tubulars or by the tong dies used to tighten the tubulars can also reduce the mechanical strength and lead to premature fatigue failures. Since these exotic CRA tubulars cannot be used with any type of toothed steel die it became necessary to develop a non-marking die.

CLINCHER Non-Marking Wrap-Around Dies are manufactured from a special aluminum alloy and are machined with a smooth face which matches the radius of the tubular. They grip the pipe and transmit torque without penetrating the pipe by using the frictional force developed between the die and the pipe. Standard tongs used by the oil industry do not develop enough radial load to allow non-marking dies to function. CLINCHER developed its CHROMEMASTER to allow non-marking dies to be used with standard tubing and casing tongs. The CHROMEMASTER works by increasing the amount of radial load applied to the pipe. Three wrap-around non-marking aluminum dies virtually encircle the pipe to reduce deformation and stress levels in the tubular. For more information on the CHROMEMASTER as well as the CLINCHER Hydraulic Power Tong which drives it and our CLINCHER Hydraulic Backup, contact Superior Manufacturing and Hydraulics.

For a given radial load, torque values for Non-Marking Dies can vary significantly from tube to tube because they are totally dependent upon the coefficient of friction. The presence of a small amount of varnish, moisture such as dew, or some other type of lubricant can reduce this value substantially. If this occurs, the torque values can be increased by the addition of CLINCHER silicon carbide screen cloth. The particles on this cloth are sized to span the film of lubricant between the pipe and the die to increase the coefficient of friction.

CLINCHER GRIT FACED™ Dies were developed to further enhance die torque capabilities for CRA tubulars and eliminate the need to install a new sheet of silicon carbide screen cloth for every connection. The CLINCHER GRIT FACED Dies are available for our CHROMEMASTER, CLINCHER Backups, CLINCHER LOW-FRICTION™ Tong Jaws, CLINCHER LOCKJAW Tongs and CLINCHER Bucking Units. GRIT FACED Dies typically provide at least twice the torque which can be achieved using aluminum dies with silicon carbide screen cloth. CLINCHER GRIT FACED Dies do not leave the tooth marks normally seen with conventional steel dies. Like the aluminum dies, GRIT FACED dies do not allow steel, iron, or carbon to contact the pipe body. The absence of teeth greatly reduces stress risers and crevices which have been observed to cause premature failures in CRA tubing strings.

First proven in critical North Sea applications, the CLINCHER GRIT FACED™ Die is rapidly becoming the standard die used with CRA strings around the world. When properly used GRIT FACED Dies will not leave any significant marks on the pipe. During recent lab tests the maximum depth of marks left after very high torque applications was 0.004 inches. It is our belief these results are considerably better than competitive systems as they are shallower, are in a random pattern which reduces stress risers in the tubulars, and they do not contaminate the CRA tubing with steel, iron, or carbon. GRIT FACED dies provide another major benefit. Running of the tubulars is faster, safer, and less tiring for operators because they do not have to replace six sheets of carbide paper every joint. Instead, we recommend one die be removed every 10 joints and replaced with a die which has been brushed to remove any accumulated dirt or paint.

The introduction of the GRIT FACED Die brings the number of tong dies available to three as shown in Figure 4. The aluminum is a non-marking die used on CRA tubulars at low to moderate torques, GRIT FACED Dies for CRA tubulars at low to high torques, and the fine tooth steel die is used in low to ultra high torque applications on carbon steel tubulars.

![Figure 4](CLINCHER_Dies_Aluminum_Die_Fine_Tooth_Steel_Grit_Faced.jpg)
Superior Manufacturing & Hydraulics is committed to continually improving our products and expanding our product lines. In early 1997 we introduced the CLINCHER LOCKJAW Tong. Like our other tongs, the LOCKJAW tong utilizes our Wrap-Around Die system (ref Figure 2). This is where the similarity with all other tongs ends. The LOCKJAW features a three jaw system which provides more than 300 degrees of die coverage to further reduce pipe marking under high torques. It also features our patented constant cam angle and a load control system which generates the radial loads required to use our Non-Marking Aluminum and GRIT FACED Dies without a CHROMEMASTER.

In October 1997, CLINCHER introduced its latest tong innovation to the industry. The CLINCHER LOW-FRICTION Jaw System now allows Non-Marking Aluminum and GRIT FACED Dies to be used in conventional CLINCHER Tongs which are not equipped with CHROMEMASTERS.

These innovations now allow a single tong and backup assembly to be used for running normal steel tubulars, drill pipe, or CRA tubulars. Eliminating the need for separate tong systems reduces capital and spare parts requirements for service companies using the conventional tongs. These mechanical systems will be easier to maintain and less prone to failure than old fashioned hydraulic systems to further reduce operating costs. The simple mechanical system reduces operator training and experience requirements when compared to other systems used with CRA tubulars. The CLINCHER LOCKJAW Tong and the CLINCHER Tong dressed with LOW-FRICTION Jaws are significantly lighter in weight than competitive systems which will reduce operator fatigue and improve safety. GRIT FACED Dies enhance job safety by reducing operator fatigue and eliminating the need to reach inside a tong and backup to replace the silicon carbide screen cloth at every connection. GRIT FACED dies can also reduce overall operating cost by reducing the time required to run casing and tubing strings.

CLINCHER GRIT FACED Die technology was recognized at the 1998 Offshore Technology Conference in Houston, Texas, where Superior Manufacturing & Hydraulics was presented with a Special Meritorious Award for Engineering Innovation by editors of Petroleum Engineer International.

GRIT FACED Inserts for Slips, Elevators and Safety Clamps

As part of our ongoing program providing tubular handling innovations to the oil field, SUPERIOR Manufacturing & Hydraulics is pleased to announce we are now providing inserts for slips, elevators, and safety clamps which feature our GRIT FACE Technology (ref. Figure 5).

This technology, field proven in tong applications, now provides the industry with handling tool inserts designed to protect CRA tubing and casing strings from the hazards associated with the use of conventional steel toothed inserts. A combination of exotic materials used in these new inserts protect CRA tubulars from contamination associated with conventional steel inserts.

GRIT FACED inserts are offered to fit almost all types of tubular handling tools. We provide our inserts for manual and power slips/elevators used to handle tubing, casing, drill pipe and drill collars. Safety clamp inserts are available for handling drill collars and downhole tools. Inserts are also available for manual tongs used with tubing, casing, and drill pipe.

Figure 5
Two different styles of GRIT FACED inserts are available. One has a cylindrical surface which has been coated with our grit material. This style insert, known as a “smooth” insert because it does not have any teeth, is used to handle most CRA tubular goods. The “smooth” insert will accommodate tubulars who’s OD is coated with moderate amounts of foreign materials such as pipe mill coatings. Our insert style has “teeth” which are coated with our grit material to protect the tubulars from iron contamination. The mud grooves and recesses between the teeth provide room to accommodate large amounts of foreign materials which are often found on the exterior of tubulars when removed from wells.

To insuff maximum effectiveness during use, both types of inserts must be periodically inspected and cleaned of foreign materials using a wire brush.

Our in-house laboratory testing, and tests performed by an independent third party have demonstrated the marks left on tubulars by both of our insert styles are almost negligible. While our GRIT FACE insert system is not totally non-marking, the depth of the imprint left on the tubular after the application of very heavy loads is significantly less than the depth of slip marks left by conventional inserts. Smooth style GRIT FACED inserts do not leave aligned “slip marks” which are known to reduce mechanical strength and lead to premature corrosion or fatigue failures in tubular goods. Figure 6 compares the marks left by “smooth” GRIT FACED inserts with standard toothed inserts. Close examination will show it is almost impossible to distinguish the impressions left by the GRIT FACED insert from the normal pipe mill surface imperfections. It is our belief these results are considerably better than competitive systems as they are shallower, are in a random pattern which reduces stress risers in the tubulars, and they do not contaminate the CRA tubing with steel, iron, or carbon. As an additional benefit, our GRIT FACE insert system does not require specially adapted handling tools so it can be used with almost all handling tools in use today.

![Typ. Pit Depth: 0.0025 – 0.003”](image1)

![Typ. Pit Depth: 0.005 – 0.006”](image2)

Comparison of marks left in 2 3/8" OD - 4.6 ppf 13% Cr 85 ksi Sy tubing by GRIT FACED inserts (left) and by conventional toothed inserts (right). Unretouched digital photo at approximately 1X.

**Figure 6**
ASSEMBLY TORQUE REQUIREMENTS

Fastener Lubrication and Make Up Torque Requirements

Most bolts, nuts and other threaded components are to be lubricated with Never-Seez or equivalent before assembly. Certain fasteners are to be assembled using permanent or removable Loctite as indicated in the assembly instructions and drawings. All tapered pipe threads are to be treated with a Teflon based pipe dope to assist in makeup and prevent leakage.

CAUTION: Do not use Teflon tape. Improper application of Teflon tape can cause joint failures. Teflon tape can release large particles which can plug small passages in hydraulic equipment.

All standard fasteners used in CLINCHER products are to be GRADE 8 or better. DO NOT SUBSTITUTE lessor grades of fasteners. All fasteners are to be made up to the torque charted below. Failure to properly assemble these fasteners can result in their loss, product malfunction and ultimately result in situations where personnel can be exposed to dangerous situations.

<table>
<thead>
<tr>
<th>Size</th>
<th>Application</th>
<th>Torque</th>
</tr>
</thead>
<tbody>
<tr>
<td>1/4 - 20 NC</td>
<td>door switch mounting bolts, tong clip bolts</td>
<td>14 ft lbs</td>
</tr>
<tr>
<td>3/8 - 16</td>
<td>bearing caps, door switch adj. sleeve</td>
<td>*1</td>
</tr>
<tr>
<td>Set Screws</td>
<td></td>
<td></td>
</tr>
<tr>
<td>3/8 - 16 NC</td>
<td>housing cover, brake bands, backup side plates,</td>
<td>38 ft lbs</td>
</tr>
<tr>
<td></td>
<td>tong &amp; backup clip bolts</td>
<td></td>
</tr>
<tr>
<td>1/2- 13 NC</td>
<td>top secondary bearing cap, cage plate bolts, locking pin,</td>
<td>93 ft lbs</td>
</tr>
<tr>
<td></td>
<td>ring gear key, motor mounts, backup halo, leg bolts</td>
<td></td>
</tr>
<tr>
<td>5/8 - 11 NC</td>
<td>tong plates, bearing caps, idler shaft bolts, cam follower nuts,</td>
<td>180 ft lbs</td>
</tr>
<tr>
<td></td>
<td>backup cyl. gland bolts, hanger bolts</td>
<td></td>
</tr>
<tr>
<td>1 - 12 NF</td>
<td>dumbell roller</td>
<td>*2</td>
</tr>
<tr>
<td>1 - 8 NC</td>
<td>UHT backup backing bolt</td>
<td>100 ft lbs</td>
</tr>
<tr>
<td>1 1/4 - 12 NF</td>
<td>backup bulkhead connector</td>
<td>100 ft lbs</td>
</tr>
<tr>
<td>1 1/2 - 12 NF</td>
<td>idler shaft</td>
<td>1,200 ft lbs</td>
</tr>
</tbody>
</table>

*1 Bearing Caps: Coat with removable Loctite, tighten until screw contacts bearing, back off 1 turn. Door Switch Adj. Sleeve: Coat with removable Loctite, tighten by hand until snug.

*2 Tighten until all slack is removed, but dumbell roller is still free to rotate by hand.

LUBRICATION STANDARDS

Bearings and gears must be lubricated to minimize friction, cool, exclude foreign matter and prevent corrosion. CLINCHER recommends using Texaco Marfak MP 2 or equivalent for all grease zerts, roller bearings and bushings. Gears located within the clutch housing or between the tong plates are to be heavily lubricated using PLUSCO 855 or equivalent.
OPERATIONAL INSTRUCTIONS

SUSPENSION

A) Tong should be hung by a 7/8” IWRC minimum O.D. wire cable with a 31 ton minimum breaking strength. It should be hung as close to the center of the drill rotary without interfering with operation of drill string and lifting equipment. It is recommended the operator make use of the Clincher Lift Cylinder. The Clincher Lift Cylinder incorporates a hydraulic cylinder and manual lift spring. The hydraulic cylinder portion is used to assist in the raising and lowering of the tong and backup while the spring allows for movement during make-up and break-out.

**WARNING:** The suspension system must allow the tong to easily move down a distance equivalent to the thread make-up length. If significant resistance is encountered the suspension system may be subject to load which could cause its failure, damage equipment, or expose personnel to severe or fatal hazards.

B) Assure that tong is suspended in level manner. Both tong and the backup must be level at the point they contact the tubular. Using adjustment screws and slots in rigid hanger assembly, adjust tong so that it hangs level on horizontal axis and is parallel to tubular on vertical axis.

C) Make certain that floor space is adequate to maneuver tong on and off pipe. The space must be clear of obstructions to allow safe and unrestricted operation.

D) Attach 1” IWRC minimum wire cable with a 51.7 ton minimum breaking strength or better, as a tong back up line at 90 degree angle to tong and at same level to insure proper readout of torque indicator. You should always have snubbing line attached. Use of a integral hydraulic backup is safer than manual backup, but operators should maintain additional safety of snubbing line to prevent injury in case of hydraulic failure or the failure of operator to have backup properly applied to tubular. This equipment generates extreme torque and should be used with caution.

**Jaw and Die Installation**

A) Be sure all power to unit is off and power unit itself is shut down.

B) Determine O.D. of tubular to be made-up or broken-out. Use proper dies to bite O.D. of tubular and insert as follows: Remove sliding head jaws (2) from cage plate pockets. Insert one jaw with proper dies into pocket assuring the jaw roller pin faces upward. Repeat procedure for other side.
OPERATIONAL INSTRUCTIONS

Hydraulic Lines

A) Be sure all power to unit is off and power unit itself is shut down.

B) Always inspect hoses prior to installation for abrasions, kinks, and other visible damage.

C) Install hydraulic supply hose and hydraulic return hose between tong and hydraulic power unit. Be advised that the standard installation on Clincher tong calls for 1" Hydraulic Supply hose and 1-1/4" Hydraulic Return hose. The differing hoses eliminates the possibility attaching the wrong hose to the wrong outlet while at the same time reducing back pressure in your hydraulic system.
TYPICAL SNUB LINE INSTALLATION

NOTE: SNUB LINE IS PERPENDICULAR TO AXIS OF TONG
TYPICAL TONG INSTALLATION

NOTE: TONG IS PERPENDICULAR TO TUBING
OPERATIONAL INSTRUCTIONS

Tong Operation

A. Insure proper dies are installed. Connect hydraulic hoses, verify reservoir is full of hydraulic fluid and insure suction valve is open.

B. Open bypass valve to hydraulic system, then check to make sure all hose connections are secure and hydraulic system is free of leaks.

C. Be certain door is completely closed before operation to insure safe operation. The Clincher CLE7625 UHT is equipped with a door switch, which prevents operation of the tong when door is even partially open.

D. Use power unit to start up procedure as outlined in your owners manual supplied by the manufacturer.

E. In the event hoses are not tightened securely, possible failures to hydraulic system can occur.
   1) If pressure supply hoses are restricted or flow is blocked, pressure will increase in the hydraulic power unit, resulting in increased RPM in the power unit.
   2) If return line hoses are restricted or flow is blocked, pressure will increase in the hydraulic power unit and the hydraulic system to the tong itself, resulting in the tong motor increasing to maximum pressure and possible motor seal failure.

F. After completion of A through E restart the power unit and allow engine to idle for approximately 10 minutes. Slowly close bypass valve to allow circulation of hydraulic oil through tong and hoses. Place shifting lever into low and rotate several times. Repeat in reverse. If correct jaw-die combination is installed, the unit is now ready to run pipe.

G. Adjust height of tong to proper height, using the control valve located all the way to the right of rear valve bank assembly.

H. Stand in the normal operators position, insert the locking pin into the rear cage plate hole (on operators side). This pin allows ring gear to rotate clockwise (make-up) and engage the cam to close jaws on pipe.

I. Swing tong and backup onto tubing, making sure to align tubing on rear jaw of backup. Close backup jaws by pushing middle control lever forward. The design of the Clincher Integral Backup centers pipe in the backup and tong. Close tong door.

J. Rotate ring gear clockwise by pushing motor control lever on the front valve bank assembly forward until jaws lock on pipe and continue to rotate until desired amount or torque is applied.

K. After correct amount of torque specific to that connection has been applied, release tong jaws by pulling back on motor control lever until jaws release and throat in cage plate is aligned with door opening. Open door.

L. Release backup by pulling back on right control lever on rear valve bank assembly until backup jaws are completely retracted.

M. High and low gear is adjusted by use of shifting lever PN 45060 (1st Generation Tongs) or Shift Assembly PN 45091 (2nd Generation Tongs), located to the left side of the shifting housing. With the lever in the upwards position the tong is in high gear. With the shifting lever in the downward position, the tong is in low gear.
MAINTENANCE INSTRUCTIONS

Clincher recommends that owners of Clincher Hydraulic Power Tongs, Backups, Chromemasters and accessories adapt a regularly scheduled maintenance program. Implementation of this type of program offers several benefits. First you increase the life of your equipment, secondly, you may find a problem before it escalates to a costly repair or down time on the job, and most importantly, prevent injury to operating personnel.

A major inspection (described at the end of this section) should be carried out if equipment is suspected to have been damaged during transit or is to be mobilized to a remote location where maintenance operations are difficult to carry out.

Routine Maintenance

Cleaning - Upon return from each and every job:

A) Pre-wash unit to remove majority of dirt and grease build up as to allow removal of dies, and inspection of overall condition of unit.

B) Remove and inspect dies from tong and backup. Note any missing or damaged die retainers, and die retainer bolts.

C) Remove side jaws from tong and inspect side jaw for missing or broken parts, damaged splines, broken ears (locking hooks on front portion of side jaws.)

D) Clean and inspect side jaws, jaw pins, jaw rollers for damage or excessive wear (cracks, breakage, and uneven wear patterns). Reassemble jaw sections replacing any damaged parts. Lubricate pins, and rollers and reinstall in tong.

E) Clean and inspect backup operating cylinder. Insure sline area is free from damage and any rust or dirt is removed. Replace any missing or damaged die retainer clips and die retainer bolts.

F) Inspect all hoses for wear, replace as necessary.

G) Inspect hanger assembly to assure all parts are returned and in operating condition. (*i.e. H-Plates, spring, leg springs, leg spring caps and pins.*)

H) Replace jaw, pins and rollers in tong.

I) Lubricate tong’s cam followers (upper and lower), dumbell roller shafts (upper and lower zerts), door shaft, center idler gear shaft (lower zert), outboard idler gear shafts (2, upper zerts), pinion gear, and secondary gear assemblies (Pinion gear and secondary gear assemblies are installed with sealed bearings. There is no provisions to grease these bearings. However, if replaced by non-sealed bearings, the 1/8” N.P.T. flush plugs should be replaced with zerts PN 1001 and both gear assemblies should be added to the regular lubrication schedule.), low gear housing, and shift housing (2 zerts each), and re-pack tong body cavity. Lubricate zerts in backup plates and pins.
MAINTENANCE INSTRUCTIONS

J) Install dies of a size needed for testing purposes, and attach hydraulic power unit to tong. Before energizing power unit make certain no one is working on tong or backup and all tools and parts are removed from the tong and backup.

K) Insert test mandrel of the exact same size as the dies which are installed in the tong and backup. **Caution:** Testing the function of the backup without the proper size dies installed and/or without the proper sized mandrel in place, you risk serious damage to the backup cylinder.

L) After power unit has reached operating R.P.M. and temperature, operate the backup control valve and close backup around test mandrel using sufficient flow and pressure to clamp mandrel and maintain pressure to backup. (Recommended operating pressure of 2,500 psi) Backup pressure gauge should match system operating pressure. After release of control valve you may experience a slight drop in backup pressure (up to 300 psi) this is normal. If backup pressure drops more than 300 psi within 2 minutes, you may be experiencing a hydraulic leak.

M) While maintaining pressure on backup visually inspect hoses, stainless steel lines, fittings, etc., for seepage of hydraulic fluid. Repair or replace parts causing leaks. If you see no visible external leaks and your backup is still losing pressure, there may be an internal leak in the operating cylinder or load holding valve allowing fluid to bypass the piston. It is recommended that the backup be returned to the manufacturer for repair.

N) If at this time your backup is functioning correctly, open and close unit several time to insure consistent operation.

O) With the proper dies installed in the tong and backup, and test mandrel locked in the backup, place reversing pin into the make-up position, set tong into low gear and operate tong through several cycles of locking, biting and torquing to required torque. Change reversing pin to break-out position and repeat. Repeat same procedure in high gear. **Note:** Torque developed in high gear is considerably less than torque developed in low gear.

P) Test door interlock system by opening door slightly with tong rotating. (Remove test mandrel for this procedure.) The tongs rotation should stop. If tong rotation fails to stop, close door, cease rotation, deactivate power unit, and inspect door interlock switch for damage. Insure that adjustment collar is oriented to allow wheel of door switch to fit into recess on collar. **Warning:** If door switch system is not functioning properly tong must not be used.

Q) Re-inspect tong and backup hydraulic system for leaks.

R) If at this time the unit is functioning as intended, replace all covers and grease splines in tong and backup (side jaws and back jaws), tape or grease spools on control valves (to prevent paint from adhering to polished spool surface), prime and paint unit for storage.
Recommended Lubrication Schedule Performed After Completion Of Each Job

Hydraulic Tong

a) Cam followers: upper and lower (all)
b) Dumbell roller shafts: upper and lower (all)
c) Door shaft: upper and lower
d) Center Idler shaft
e) Outboard Idler shafts (2)
f) Low gear housing (2 zerts)
g) Shift housing (2 zerts)
h) Re-pack tong cavity
i) Pinion and secondary gear shafts (if sealed bearings have been replaced by non-sealed bearings)
j) Jaw rollers and pins: Remove jaw pins and rollers, clean and lubricate with gear grease
k) Inspect hydraulic fluid for foreign material and contaminant. Filter or replace. Your must filter or replace entire system including power unit tank and lines along with tong to insure all contaminants are removed.

Annual Major Maintenance

Inspection and repair

Routine preventative maintenance will significantly extend the operating life of your equipment, reduce operating cost and avoid downtime. CLINCHER recommends a program of frequent routine inspection, and if equipment is suspected to have been damaged during transit or is to be mobilized to a remote location where maintenance operations are difficult to carry out, perform the following:

A) Visually inspect components on power tong or backup which could possibly have been damaged either during operation or transit. i.e. Damage to hanger assembly, hydraulic backup, mounting legs, or hydraulic valve assembly.

B) Check test date. Ensure that a load test and inspection was carried out within the last 9 months.

C) Check ring gear. Check for any signs of damage or wear.

D) Remove motor and valve assembly from the tong body.

E) Check motor seal. Apply hydraulic power, run motor and visually check motor seal for any signs of leakage.

F) Check drive gear, high and low pinion gears. Check for excessive sign of wear on motor gear.

G) Check condition of control valve spools. Activate valves and check for any sign of wear, pitting, or scoring of the chrome surface of spools. If spool is damaged in any way, the complete section must be changed out. Spools are not interchangeable.
MAINTENANCE INSTRUCTIONS

H) Check gear selector and shaft. Visually inspect the shifting shaft for alignment and straightness.

I) Check Hi/Low Gear assembly. Visually inspect high and low clutch and gears for any sign of chipped, broken, or worn teeth.

J) Check dumbell rollers, shafts and bushings. Check for excess movement on either bearings, bushings, shafts or dumbells.

K) Check idler gears and center pinion shaft gears and bearings. Check that there are no signs of worn, chipped, or broken teeth on idler and center pinion shaft gears.

L) Check door bearings. Visually check excess movement on bearings at door assembly. If excess movement is found door must be removed making careful note of bearing washer positions for reassembly.

M) Check door switch system. Visually check that door switch valve has sufficient strength to hold door in closed position. If this is not the case, then repairs are required.

N) Check door safety device. Functionally check tong door safety switch. Engage low gear, open tong door and push rotor control lever forward as if to rotate rotor. If safety device is operational then the rotor will not rotate.

O) Check lifting hanger test date. Check lifting hanger for damage. Ensure that a load test and inspection was carried out within the last 9 months.

P) Check condition of all hydraulic hoses and fittings. Visually inspect all hydraulic hoses fitted to the tong and in the backup for any signs of leaks, cuts, or wear.

Q) Reinstall all parts which were removed for inspection and/or damage. Connect to hydraulic power supply and function test operation of tong in high, low, forward, and reverse. Torque test utilizing appropriate dies and test mandrel. Test operation of lift cylinder.

R) Inspect power unit system according to manufactures specifications.

S) Lubricate tong and backup according to maintenance schedule preceding this section.

T) Paint, remembering to mask off surfaces not intending to paint with grease or masking tape.

U) Complete dated inspection report giving details of all duties performed along with complete list of items replaced.
DU® BEARING DRY WEAR PROCESS

1. Running-in completed. Low wear rate starts when up to 10% of the bronze is exposed.

2. Typical surface appearance when DU® bearing approaches its half life with 40% to 50% of the bronze exposed.

3. Bronze is beginning to smear near the end of DU’s useful life as a dry bearing. Over 75% of the bronze is visible at the surface.

For additional information about DU bearings, please contact Garlock Bearings Inc, 700 Mid Atlantic Parkway, Thorofare, New Jersey 08086. (609) 848-3200 FAX: (609) 848-5115
# TROUBLESHOOTING

## HYDRAULIC SYSTEM

### Hydraulic Pump Making Excessive Noise:

<table>
<thead>
<tr>
<th><strong>Problem</strong></th>
<th><strong>Solution</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>A) Restricted or clogged intake line</td>
<td>Clean line, check for contamination.</td>
</tr>
<tr>
<td>B) Contaminated fluid</td>
<td>Flush system, change fluid.</td>
</tr>
<tr>
<td>C) Restricted vent</td>
<td>Clean or replace air vent.</td>
</tr>
<tr>
<td>D) Air in fluid</td>
<td>Check for leaks and be certain fluid suction in tank is well below hydraulic fluid in reservoir.</td>
</tr>
<tr>
<td>E) Damaged or worn parts</td>
<td>Repair or replace damaged parts, check fluid for contamination.</td>
</tr>
<tr>
<td>F) Excessive RPM</td>
<td>Check PTO, gears, and recommended speed to assure proper pump is installed for operation.</td>
</tr>
<tr>
<td>G) Increased friction</td>
<td>Make sure pump has been assembled using correct torque values.</td>
</tr>
<tr>
<td>H) Damaged or worn relief valve.</td>
<td>Replace relief valve.</td>
</tr>
<tr>
<td>I) Damaged or worn check valve.</td>
<td>Replace check valve.</td>
</tr>
<tr>
<td>J) Restricted discharge</td>
<td>Check to make sure relief valve is set to proper pressure.</td>
</tr>
<tr>
<td>K) Valve system restricted</td>
<td>Inspect and repair or replace defective parts, check system for contamination.</td>
</tr>
</tbody>
</table>

### Excessive Wear to Hydraulic Components:

<table>
<thead>
<tr>
<th><strong>Problem</strong></th>
<th><strong>Solution</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>A) Fluid contamination</td>
<td>Flush fluid system, replace with new fluid.</td>
</tr>
<tr>
<td>B) Components misaligned</td>
<td>Inspect and realign.</td>
</tr>
<tr>
<td>C) High operating pressures</td>
<td>Gauge and set to proper pressure.</td>
</tr>
<tr>
<td>D) Exhausted fluid (depletion of additives)</td>
<td>Flush fluid system, replace with new fluid.</td>
</tr>
<tr>
<td>E) Air in fluid</td>
<td>Check for leaks, and be certain fluid suction in tank is well below hydraulic fluid in reservoir.</td>
</tr>
<tr>
<td>F) Shortened bearing life</td>
<td>Check alignment, insure proper lubrication to non-sealed bearings.</td>
</tr>
</tbody>
</table>
## TROUBLESHOOTING

### HYDRAULIC TONG SYSTEM

#### Slow Tong Speed:

<table>
<thead>
<tr>
<th>Problem</th>
<th>Solution</th>
</tr>
</thead>
<tbody>
<tr>
<td>A) Restricted supply line</td>
<td>Clear supply line and check intake on reservoir.</td>
</tr>
<tr>
<td>B) Low fluid level</td>
<td>Add fluid to proper volume.</td>
</tr>
<tr>
<td>C) Air leak</td>
<td>Locate and repair leak.</td>
</tr>
<tr>
<td>D) Pump speed insufficient</td>
<td>Assure proper pump speed for application.</td>
</tr>
<tr>
<td>E) Damaged or worn equipment</td>
<td>Isolate pump and check pressure to determine whether motor or pump is defective. Repair or replace defective part.</td>
</tr>
<tr>
<td>F) Pump not primed</td>
<td>Check fluid viscosity and restrictions of intake line. Replace fluid if inadequate for operating temperature.</td>
</tr>
<tr>
<td>G) Low or no flow from supply line</td>
<td>Check to assure couplings are securely fastened.</td>
</tr>
<tr>
<td>H) Hydraulic bypass valve malfunction</td>
<td>Inspect. Adjust unloading pressure. Replace or repair as necessary.</td>
</tr>
</tbody>
</table>

#### Insufficient Torque:

<table>
<thead>
<tr>
<th>Problem</th>
<th>Solution</th>
</tr>
</thead>
<tbody>
<tr>
<td>A) Door switch malfunctioning</td>
<td>Check to make sure door is completely closed. Inspect door switch and dump valve. Replace or repair door switch and/or dump valve.</td>
</tr>
<tr>
<td>B) Relief valve malfunctioning</td>
<td>Relief set too low, broken valve spring, contamination or defective seals.</td>
</tr>
<tr>
<td>C) Damaged or worn pump parts</td>
<td>Inspect, repair, or replace.</td>
</tr>
<tr>
<td>D) Slow pump speed</td>
<td>Assure proper pump speed for application.</td>
</tr>
<tr>
<td>E) Improper system fluid</td>
<td>Check fluid viscosity and replace fluid if inadequate for operating temperature.</td>
</tr>
<tr>
<td>F) Directional control valve set improperly</td>
<td>Check relief and directional control valve. Neutral should return slightly to reservoir.</td>
</tr>
</tbody>
</table>
TROUBLESHOOTING

HYDRAULIC TONG SYSTEM

Insufficient Torque:

**Problem**
G) Damage tong motor
H) Restriction of supply line, excessive back pressure
I) Defective gauge or load cell

**Solution**
Inspect, repair, or replace.

Check to assure couplings are securely fastened.

Inspect, repair, or replace. Assure unit has been calibrated to proper arm length. 
NOTE: When using Clincher integral backup system, it is the length of backup arm, NOT the tong arm length.

Difficulty Shifting Gears:

**Problem**
A) Broken key in shifting yoke
B) Worn or damaged shifting yoke pins
C) Insufficient lubrication
D) Detent ball bearing spring set too tight

**Solution**
Inspect and replace key stock in shifting yoke.
Inspect and replace broken or worn pins.
Pump grease into both zerts located on shift housing.
Inspect and relieve pressure by adjusting set screw on shifting gear PN 55084.

Failure to Grip Tubulars:

**Problem**
A) Jaws move out from neutral, but fail to penetrate pipe. Tong not perpendicular.
B) Jaws fail to move out of neutral. Brake band not tight enough, faulty cam followers, rust debris or damage to jaws.

**Solution**
Inspect die size and replace with correct dies for pipe. Wrong size dies for tubulars. Assure suspension of tong is perpendicular to tubulars. Adjust hanger as necessary.
Inspect for excessive wear on brake band. Inspect and replace defective cam followers. Remove rust and debris from jaws, and jaw pockets. Inspect jaw rollers and pins for wear, flats, and lubrication. Repair, replace, and lubricate as needed.
# TROUBLESHOOTING

## HYDRAULIC TONG SYSTEM

### Failure to Grip Tubulars:

<table>
<thead>
<tr>
<th>Problem</th>
<th>Solution</th>
</tr>
</thead>
<tbody>
<tr>
<td>C) Tong will not release from tubular. Brake band not tight enough,</td>
<td>Inspect for excessive wear on brake band. Inspect and replace defective cam followers.</td>
</tr>
<tr>
<td>defective cam followers in cage plate, insufficient lubrication to</td>
<td>Remove rust and debris from jaws, and jaw pockets. Inspect jaw rollers and pins for wear,</td>
</tr>
<tr>
<td>jaw pin and roller.</td>
<td>flats, and lubrication. Repair, replace, and lubricate as needed.</td>
</tr>
<tr>
<td>D) Tong motor runs but ring gear does not rotate. Broken gears or</td>
<td>Inspect and replace defective gears. Inspect and repair or replace defective shifting parts.</td>
</tr>
<tr>
<td>defective shift in hydraulic tongs system.</td>
<td></td>
</tr>
<tr>
<td>E) Tong binds under light load. Worn or damaged cam followers,</td>
<td>Inspect and replace defective parts.</td>
</tr>
<tr>
<td>dumbell roller bearing, or idler bearing.</td>
<td></td>
</tr>
<tr>
<td>F) Ring gear rotates while control lever is in neutral.</td>
<td>Replace control valve.</td>
</tr>
<tr>
<td>G) Shift will not stay in set position. Lost detent ball or spring.</td>
<td>Replace detent ball and spring.</td>
</tr>
<tr>
<td>H) Hydraulic fluid leaking from motor. Damaged or worn motor shaft seal.</td>
<td>Replace motor shaft seal.</td>
</tr>
</tbody>
</table>

## HYDRAULIC BACKUP SYSTEM

### Failure to hold tubulars:

<table>
<thead>
<tr>
<th>Problem</th>
<th>Solution</th>
</tr>
</thead>
<tbody>
<tr>
<td>A) Incorrect die for size tubular</td>
<td>Check pipe OD and match die size to pipe OD.</td>
</tr>
<tr>
<td>B) Dies have material compacted in tooth area; worn</td>
<td>Clean dies with wire brush and inspect. Replace with new dies if necessary.</td>
</tr>
<tr>
<td>teeth.</td>
<td></td>
</tr>
<tr>
<td>C) Power unit pressure set incorrectly</td>
<td>Inspect relief valve on power unit to make sure enough system pressure is being delivered to</td>
</tr>
<tr>
<td></td>
<td>backup.</td>
</tr>
<tr>
<td>D) Counter balance valve not holding pressure</td>
<td>Remove side plates on backup. Bench test and replace the defective counter balance valve.</td>
</tr>
<tr>
<td>E) Internal leakage in backup cylinder</td>
<td>Disconnect lines and bench test cylinder. Repair or replace as necessary.</td>
</tr>
<tr>
<td>F) Jaws will not retract. Counter balance valve is</td>
<td>Replace counter balance valve.</td>
</tr>
<tr>
<td>stuck.</td>
<td></td>
</tr>
<tr>
<td>G) External leakage of cylinder</td>
<td>Repair or replace cylinder.</td>
</tr>
<tr>
<td>H) Control valve set to neutral, but jaws extend.</td>
<td>Inspect control valve for damage and/or incorrect spool. Repair or replace as necessary.</td>
</tr>
</tbody>
</table>
### SECTION 7  RECOMMENDED 7 5/8" UHT TONG & 7 5/8" or 8 5/8" UHT BACKUP SPARE PARTS LIST

<table>
<thead>
<tr>
<th>Part Number</th>
<th>Quantity</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>12501437</td>
<td>1</td>
<td>Seal for Rineer Motor</td>
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<tr>
<td>76013</td>
<td>2</td>
<td>Standard, Low Friction &amp; Dovetail Jaw Pins</td>
</tr>
<tr>
<td>76138</td>
<td>2</td>
<td>Standard Jaw Rollers (2 3/8&quot; - 4 1/2&quot;)</td>
</tr>
<tr>
<td>76136</td>
<td>2</td>
<td>Standard Jaw Rollers (4 1/2&quot; - 7 5/8&quot;)</td>
</tr>
<tr>
<td>76139</td>
<td>2</td>
<td>Low Friction Jaw Rollers (2 1/16&quot; - 4 1/2&quot;)</td>
</tr>
<tr>
<td>58079</td>
<td>4</td>
<td>Garlock Bushings (for 76139)</td>
</tr>
<tr>
<td>76137</td>
<td>2</td>
<td>Low Friction Jaw Rollers (2 3/8&quot; - 7 5/8&quot;)</td>
</tr>
<tr>
<td>20DU14</td>
<td>10</td>
<td>Garlock Bushings (for 76137)</td>
</tr>
<tr>
<td>76014</td>
<td>2</td>
<td>Dovetail Jaw Rollers</td>
</tr>
<tr>
<td>1001</td>
<td>8</td>
<td>1/8 NPT Zerts</td>
</tr>
<tr>
<td>SLV1000-01</td>
<td>1</td>
<td>Door Switch Assembly</td>
</tr>
<tr>
<td>45072</td>
<td>1</td>
<td>Shifting Yoke</td>
</tr>
<tr>
<td>76061A</td>
<td>1</td>
<td>Large Brake Band Assy.</td>
</tr>
<tr>
<td>76061B</td>
<td>1</td>
<td>Small Brake Band Assy.</td>
</tr>
<tr>
<td>CM7656-01 or 73064</td>
<td>2</td>
<td>7 5/8&quot; Backup Die Clip</td>
</tr>
<tr>
<td>VA20-MRV-1 or DVG35-HMRV</td>
<td>1</td>
<td>A-20 Relief Cartridge</td>
</tr>
</tbody>
</table>
ACCESSORIES AND OPTIONS

Several different accessory items are available for the CLINCHER Tong and Backup to allow them to be customized to provide a system most appropriate for the end user’s application.

**CLE7625 UHT Tong Accessories**

- Compression Load Cell and Torque Gauge directly measures applied torque
- Tension Load Cell and Torque Gauge directly measures applied torque
- Solenoid Operated Module for Dump Valve allows computer to limit torque applied
- Adapter for Turns Proximity Switch allows computer to sense rotation
- Bail Assembly alternative lifting system
- Lift Cylinder with Integral Spring Hanger controls vertical position
- TSP-80 Tong Speed Control allows slow speed rotation with full torque
- 2 Speed Motors
- Alternate Motor Displacements

**BUC7625 or BUC8625 Backup Accessories**

- Backup Handles simplifies manipulation
- Shipping Skids and Cages simplify handling, transport and help guard against damage
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TOP VIEW

RING GEAR
P/N: 76057

RING GEAR KEY
P/N: 76053
WITH
1/2"-13 x 1 1/2" SHCS
P/N: 1106-A

TONG JAW
SEE JAW ASSEMBLY ILLUSTRATIONS

HIGH GEAR
P/N: 55119
SEE PINION GEAR ASSEMBLY

3/4" NPT FLUSH PLUG
P/N: 1610

PRIMARY INPUT GEAR
P/N: 55070
SEE SECONDARY GEAR ASSEMBLY

DRIVE GEAR
P/N: 55084-02
SEE SHIFT ASSEMBLY

CAM FOLLOWER
P/N: 1968
WITH
5/8" JAM NUT & 3/16" DRIVE ZERT
P/N: 1150 & P/N: 1004
&
CAM FOLLOWER SPACER
P/N: 76055-S1
(3) REQD. OF EACH

RATING GEAR
P/N: 76057

3/4" NPT FLUSH PLUG
P/N: 1610

HILS GEAR
P/N: 55119
SEE PINION GEAR ASSEMBLY

3/4" NPT FLUSH PLUG
P/N: 1610

DRIVE GEAR
P/N: 55084-02
SEE SHIFT ASSEMBLY

CAM FOLLOWER
P/N: 1968
WITH
5/8" JAM NUT & 3/16" DRIVE ZERT
P/N: 1150 & P/N: 1004
&
CAM FOLLOWER SPACER
P/N: 76055-S1
(3) REQD. OF EACH

TOP VIEW
GEAR TRAIN

RING GEAR
P/N: 76057

DUMBBELL ROLLER
P/N: 55025-A
(12) REQD.
SEE DUMBBELL ROLLER ASSEMBLY

TONG MID BODY
P/N: 76144

IDLER GEAR
P/N: 76049
SEE OUTBOARD IDLER ASSEMBLY

IDLER GEAR
P/N: 76049
SEE CENTER IDLER ASSEMBLY

LOW PINION GEAR
P/N: 55047
SEE PINION GEAR ASSEMBLY

SECONDARY INPUT GEAR
P/N: 55048
SEE SECONDARY GEAR ASSEMBLY

IDLER GEAR
P/N: 76049
SEE OUTBOARD IDLER ASSEMBLY

PINION GEAR
P/N: 55038
SEE PINION GEAR ASSEMBLY

NOTE:
DRAWING SHOWN WITHOUT LOW PINION GEAR
DUMBELL ROLLER ASSEMBLY

1/8" NPT ZERT
P/N: 1001

1"-12 LOW PROFILE NYLOCK NUT
P/N: 1213

THRUST WASHER
P/N: 55024-A

TAPERED BEARING
P/N: 1910-B

SPACER
P/N: 55027-D

DUMBELL ROLLER
P/N: 55025-B

TAPERED BEARING
P/N: 1910-B

THRUST WASHER
P/N: 55024-A

DUMBELL SHAFT
P/N: 76025-A
OPTIONAL S/S SHAFT
P/N: 2062

1"-12 LOW PROFILE NYLOCK NUT
P/N: 1213

1/8" NPT ZERT
P/N: 1001
Features and Benefits:
Proprietary sealed bearing with full compliment roller design offers greater load ratings than commercially available sealed ball bearings. The ported inner race allows the bearing to be relubricated without disassembly. Integral elastomeric seals allow grease to be displaced but prevent migration of contaminants into bearing.

Elastomeric seals are corrosion resistant and suitable for use in environments which are incompatible with traditional aluminum bearing shrouds.

Unique geometric design allows rollers to absorb thrust loads to maximize component life.

Nominal OD: 4.3307 inches
Nominal ID: 2.3622 inches
Nominal Ht: 1.4375 inches
static rating: 37540 lbs
dynamic rating: 29230 lbs
(1mm cycles, 33 1/3 RPM f/ 500 hrs.)

SECTION VIEW of typical application
Bottom Bearing Cap Application

Installation instructions for CLINCHER BEARING Part Number 1905

Gear Support Application
CENTER IDLER GEAR ASSEMBLY

- **EXTERNAL SNAP RING**
  - P/N: 1946

- **INTERNAL SNAP RING**
  - P/N: 1926

- **BEARING**
  - P/N: 1905

- **IDLER GEAR**
  - P/N: 76049

- **INTERNAL SNAP RING**
  - P/N: 1926

- **IDLER SHAFT**
  - P/N: 76051-01

- **BOTTOM TONG PLATE**

- **5/8" LOCK WASHER**
  - P/N: 1151
  - (3) REQD.

- **5/8"-11 x 2" HHCS**
  - P/N: 1160
  - (3) REQD.

- **1 1/2" LOCK WASHER**
  - P/N: 1223

- **1 1/2"-12 NUT**
  - P/N: 1222

- **1/8" NPT ZERT**
  - P/N: 1001
EXTERNAL SNAP RING  
N5100-100  
P/N: 1950

HIGH GEAR RETAINER  
P/N: 55122-01

HIGH GEAR  
P/N: 55119

BEARING  
P/N: 1902

PINION BEARING BUSHING  
P/N: 55047-1

LOW PINION GEAR  
P/N: 55047

PINION GEAR  
P/N: 55039-01

BEARING  
P/N: 1902

PINION GEAR ASSEMBLY

5/8" LOCK WASHER  
P/N: 1151  
(4) REQD.

5/8"-11 x 1 1/4" HHCS  
P/N: 1156  
(4) REQD.

1/8" NPT FLUSH PLUG  
P/N: 1607

3/8"-16 x 1/2" SET SCREW  
P/N: 1029  
(2) REQD.  
(Use Removable Loctite)

LOW PINION GEAR  
P/N: 55038

BOTTOM PINION BEARING CAP  
P/N: 55036

10/19/04

REV. # LOG # DATE

REF: S:Equip Manuals-Dwg1
CLE7625UHT-02/62Pinion Gear-wpg
<table>
<thead>
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<th>Item #</th>
<th>Qty</th>
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<th>Part Name</th>
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<td>55038-01</td>
<td>PINION GEAR</td>
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<td>1</td>
<td>55119</td>
<td>HIGH GEAR</td>
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<td>55047</td>
<td>LOW PINION GEAR</td>
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<td>2</td>
<td>1902</td>
<td>BEARING</td>
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<td>1</td>
<td>55036</td>
<td>BOTTOM PINION BEARING CAP</td>
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<td>55122-01</td>
<td>HIGH GEAR RETAINER</td>
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<td>55047-1</td>
<td>PINION BEARING BUSHING</td>
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<td>1950</td>
<td>EXT.SNAP RING -N5100-100</td>
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<tr>
<td>9</td>
<td>1</td>
<td>1607</td>
<td>1/8&quot; FLUSH PLUG</td>
</tr>
<tr>
<td>10</td>
<td>2</td>
<td>1029</td>
<td>3/8&quot;-16 X 1/2&quot; SET SCREW</td>
</tr>
<tr>
<td>11</td>
<td>4</td>
<td>1151</td>
<td>5/8 LW</td>
</tr>
<tr>
<td>12</td>
<td>4</td>
<td>1156</td>
<td>5/8&quot;-11 X 1 1/4&quot; HHCS</td>
</tr>
</tbody>
</table>

(USE REMOVABLE LOCTITE)
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Note: Flush Plug used when Encoder is not mounted. For Encoder mounting, see Figure of Secondary Gear w/Encoder.

SECONDARY GEAR ASSEMBLY
ENCODER ASSEMBLY

ENCODER ASSEMBLY NO. 55142

FOR SHIPMENT WITHOUT ENCODER:

★ COVER PLATE
P/N: 40034

★ ENCODER MOUNTING PLATE
P/N: 51075

★ 3/8"-16 x 1" SHCS
P/N: 1041
(2) REQD.

MFG. STARTING 11/21/02:
★ 3/8"-16 x 3/4" SHCS
P/N: 1040-A
(2) REQD.

1/2"-13 x 1" HHCS
P/N: 1110
1/2" LOCK WASHER
P/N: 1103
(3) REQD. OF EACH

★ ENCODER & MOUNTING SCREWS
(Supplied by Customer)
★ 3/8" #6-32 MACHINE SCREW
P/N: 1276
(4) REQD.

★ MFG. STARTING 04/07/04:
★ 1/2" #6-32 MACHINE SCREW
P/N: 1276-B
(4) REQD.

★ ENCODER MALE COUPLING
P/N: 55144
★ USE #10-32 x 1/4" SET SCREW
P/N: 1034

★ ENCODER COUPLING MOUNT
P/N: 51031
★ 1/2"-13 NUT
P/N: 1101

TOP SECONDARY BEARING CAP
P/N: 55143

LOW GEAR HOUSING COVER
TOP CAGE PLATE ASSEMBLY

- 1/2"-13 x 1" SHCS P/N: 1153 (3) REQD.
- 5/8"-11 x 1" SHCS P/N: 1153 (3) REQD.
- 1/2"-13 x 4 1/2" HHCS P/N: X2-46
- 3/8"-16 x 2 1/4" HHCS P/N: 1055 (2) REQD.
- 1/2"-13 x 8 1/2" HHCS P/N: 1108-M
- 1/2" HI COLLAR LOCK WASHER P/N: 210 (4) REQD. OF EACH
- EXTENSION SPRING P/N: BUC4019 (2) REQD.
- LOCKING PIN P/N: 76055-S1 (3) REQD.
- LOCKING PIN SPACER P/N: 76055-S1
- BRACE BAND LUG ASSEMBLY P/N: 76126
- JAW ASSEMBLY BOLT SIZE VARIES SEE JAW ASSEMBLIES
- BRACE BAND KEY P/N: 76127
- CAM FOLLOWER SPACER P/N: 76055-S1
- PIVOT PIN P/N: 76114 WITH 1/8" NPT ZERT (2) REQD.
- LOCKING PIN P/N: 14044 WITH FLUTED KNOB P/N: DK-28 SEE LOCKING PIN ASSEMBLY
- EXTENSION SPRING P/N: BUC4019 (2) REQD.
- LOCKING PIN Key P/N: 76127 1/2"-13 x 4 1/2" HHCS P/N: X2-45
- JAW ASSEMBLY BOLT SIZE VARIES SEE JAW ASSEMBLIES
- EXTENSION SPRING P/N: BUC4019 (2) REQD.
- JAW ASSEMBLY BOLT SIZE VARIES SEE JAW ASSEMBLIES
- LOCKING PIN P/N: 76055-S1 (3) REQD.
- LOCKING PIN SPACER P/N: 76055-S1
- BRACE BAND LUG ASSEMBLY P/N: 76126
- JAW ASSEMBLY BOLT SIZE VARIES SEE JAW ASSEMBLIES
- EXTENSION SPRING P/N: BUC4019 (2) REQD.
- JAW ASSEMBLY BOLT SIZE VARIES SEE JAW ASSEMBLIES
- LOCKING PIN P/N: 76055-S1 (3) REQD.
- LOCKING PIN SPACER P/N: 76055-S1
- BRACE BAND LUG ASSEMBLY P/N: 76126
- JAW ASSEMBLY BOLT SIZE VARIES SEE JAW ASSEMBLIES
- EXTENSION SPRING P/N: BUC4019 (2) REQD.
- JAW ASSEMBLY BOLT SIZE VARIES SEE JAW ASSEMBLIES
- LOCKING PIN P/N: 76055-S1 (3) REQD.
- LOCKING PIN SPACER P/N: 76055-S1
- BRACE BAND LUG ASSEMBLY P/N: 76126
- CAM FOLLOWER SPACER P/N: 76055-S1
- PIVOT PIN P/N: 76114 WITH 1/8" NPT ZERT (2) REQD.
- LOCKING PIN P/N: 14044 WITH FLUTED KNOB P/N: DK-28 SEE LOCKING PIN ASSEMBLY
- EXTENSION SPRING P/N: BUC4019 (2) REQD.
- JAW ASSEMBLY BOLT SIZE VARIES SEE JAW ASSEMBLIES
- EXTENSION SPRING P/N: BUC4019 (2) REQD.
- JAW ASSEMBLY BOLT SIZE VARIES SEE JAW ASSEMBLIES
- LOCKING PIN P/N: 76055-S1 (3) REQD.
- LOCKING PIN SPACER P/N: 76055-S1
- BRACE BAND LUG ASSEMBLY P/N: 76126
- JAW ASSEMBLY BOLT SIZE VARIES SEE JAW ASSEMBLIES
- EXTENSION SPRING P/N: BUC4019 (2) REQD.
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- LOCKING PIN P/N: 76055-S1 (3) REQD.
- LOCKING PIN SPACER P/N: 76055-S1
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- LOCKING PIN SPACER P/N: 76055-S1
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- LOCKING PIN P/N: 76055-S1 (3) REQD.
- LOCKING PIN SPACER P/N: 76055-S1
- BRACE BAND LUG ASSEMBLY P/N: 76126
- JAW ASSEMBLY BOLT SIZE VARIES SEE JAW ASSEMBLIES
- EXTENSION SPRING P/N: BUC4019 (2) REQD.
- JAW ASSEMBLY BOLT SIZE VARIES SEE JAW ASSEMBLIES
- LOCKING PIN P/N: 76055-S1 (3) REQD.
- LOCKING PIN SPACER P/N: 76055-S1
- BRACE BAND LUG ASSEMBLY P/N: 76126
- JAW ASSEMBLY BOLT SIZE VARIES SEE JAW ASSEMBLIES
- EXTENSION SPRING P/N: BUC4019 (2) REQD.
- JAW ASSEMBLY BOLT SIZE VARIES SEE JAW ASSEMBLIES
- LOCKING PIN P/N: 76055-S1 (3) REQD.
- LOCKING PIN SPACER P/N: 76055-S1
- BRACE BAND LUG ASSEMBLY P/N: 76126
- JAW ASSEMBLY BOLT SIZE VARIES SEE JAW ASSEMBLIES
- EXTENSION SPRING P/N: BUC4019 (2) REQD.
- JAW ASSEMBLY BOLT SIZE VARIES SEE JAW ASSEMBLIES
- LOCKING PIN P/N: 76055-S1 (3) REQD.
- LOCKING PIN SPACER P/N: 76055-S1
- BRACE BAND LUG ASSEMBLY P/N: 76126
- JAW ASSEMBLY BOLT SIZE VARIES SEE JAW ASSEMBLIES
- EXTENSION SPRING P/N: BUC4019 (2) REQD.
- JAW ASSEMBLY BOLT SIZE VARIES SEE JAW ASSEMBLIES
- LOCKING PIN P/N: 76055-S1 (3) REQD.
- LOCKING PIN SPACER P/N: 76055-S1
- BRACE BAND LUG ASSEMBLY P/N: 76126
- JAW ASSEMBLY BOLT SIZE VARIES SEE JAW ASSEMBLIES
- EXTENSION SPRING P/N: BUC4019 (2) REQD.
- JAW ASSEMBLY BOLT SIZE VARIES SEE JAW ASSEMBLIES
- LOCKING PIN P/N: 76055-S1 (3) REQD.
- LOCKING PIN SPACER P/N: 76055-S1
## Cage Plate / Ring Gear Assembly

**Assembly No. 76002**

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<td>76003</td>
<td>Top Cage Plate Weldment</td>
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<td>76056</td>
<td>Bottom Cage Plate</td>
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<td>3</td>
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<td>76057</td>
<td>Ring Gear</td>
</tr>
<tr>
<td>4</td>
<td>4</td>
<td>1108-M</td>
<td>SHCS 1/2&quot;-13 x 8 1/2&quot;</td>
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<td>5</td>
<td>4</td>
<td>210</td>
<td>1/2&quot; Hi Collar Lockwasher</td>
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<tr>
<td>6</td>
<td>4</td>
<td>76011-A</td>
<td>Cage Plate Spacer</td>
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<td>7</td>
<td>1</td>
<td>76053</td>
<td>Ring Gear Key</td>
</tr>
<tr>
<td>8</td>
<td>26</td>
<td>1968-ASY</td>
<td>1 1/2&quot; Cam Follower Assembly (CF 1 1/2-SB)</td>
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<tr>
<td>9</td>
<td>2</td>
<td>76114</td>
<td>Pivot Pin</td>
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<tr>
<td>10</td>
<td>2</td>
<td>1055</td>
<td>Door Spring #733 -- Ext</td>
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<tr>
<td>11</td>
<td>1</td>
<td>1001</td>
<td>1/8 NPT ZERT</td>
</tr>
<tr>
<td>12</td>
<td>4</td>
<td>1106-A</td>
<td>1 1/2&quot;-13 x 1 1/2&quot; SHCS</td>
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1 1/2" CAM FOLLOWER ASSEMBLY NO. 1968-ASY

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<td>1968</td>
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<td>1</td>
<td>1150</td>
<td>5/8&quot;-18 Jam Nut</td>
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<td>3</td>
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<td>1004</td>
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<tr>
<td>4</td>
<td>1</td>
<td>1151</td>
<td>5/8 LW</td>
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### LOCKING PIN ASSEMBLY

**ASSEMBLY NO. 14216**

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<td>14044</td>
<td>LOCKING PIN</td>
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<tr>
<td>2</td>
<td>1</td>
<td>X2-45</td>
<td>1/2-13 x 4 1/2 HHCS</td>
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<td>DK-28</td>
<td>FLUTED KNOB</td>
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<tr>
<td>4</td>
<td>1</td>
<td>76127</td>
<td>LOCKING PIN KEY</td>
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BOTTOM VIEW

5/8"-11 x 1 3/4" HHCS
P/N: 1158
(9) REQD.
CAGE PLATE SPACER
P/N: 76011-A
(4) REQD.
OUTBOARD IDLER SHAFT
P/N: 76050-01
SEE OUTBOARD IDLER ASSEMBLY
(2) REQD.
BOTTOM PINION BEARING CAP
P/N: 55036
SEE PINION GEAR ASSEMBLY

BOTTOM SECONDARY BEARING CAP
P/N: 55041
SEE SECONDARY GEAR ASSEMBLY

HANGER TOP PLATE IS NOT A COMPONENT OF TONG. IT IS A COMPONENT OF HANGER WELDMENT BUC7608-01. SEE HANGER ASSEMBLY ON MOUNTING KIT ILLUSTRATION.

WITHOUT HANGER PLATE:
5/8"-11 x 1 3/4" HHCS
P/N: 1158
5/8" LOCK WASHER
P/N: 1151
(9) REQD. OF EACH

5/8"-11 x 1" SHCS
P/N: 1153
(3) REQD.
BOTTOM CAGE PLATE
P/N: 76056

DUMBBELL SHAFT
P/N: 76025-A
(9) REQD.
SEE DUMBBELL ROLLER ASSEMBLY

5/8"-11 x 2 1/4" HHCS
P/N: 201
5/8" LOCK WASHER
P/N: 1151
(4) REQD. FOR EACH HANDLE

5/8"-11 x 1 1/2" HHCS
P/N: 76080
(16) REQD.

5/8"-11 x 2 3/4" HHCS
P/N: 203
5/8" LOCK WASHER
P/N: 1151
(7) REQD. OF EACH AND

5/8"-11 x 2 3/4" SHCS
P/N: 1064
5/8" HI COLLAR LW
P/N: 1152
(2) REQD. OF EACH

IDLER SHAFT
P/N: 76051-01
SEE CENTER IDLER ASSEMBLY

CAM FOLLOWER
P/N: 1968
WITH
5/8"-18 JAM NUT & 3/16" DRIVE ZERT
P/N: 1150
P/N: 1004
(16) REQD. OF EACH

LARGE BRAKE BAND ASSEMBLY
P/N: 76061A
WITH
3/8"-16 NYLOCK NUT
P/N: 213
LARGE BRAKE BAND ASSEMBLY
P/N: 76061A
WITH
3/8"-16 NYLOCK NUT
P/N: 1213
5/8"-11 x 2 1/4" HHCS
P/N: 76011-A
(4) REQD.
OUTBOARD IDLER SHAFT
P/N: 76050-01
SEE OUTBOARD IDLER ASSEMBLY
(2) REQD.
BOTTOM PINION BEARING CAP
P/N: 55036
SEE PINION GEAR ASSEMBLY

BOTTOM SECONDARY BEARING CAP
P/N: 55041
SEE SECONDARY GEAR ASSEMBLY

HANGER TOP PLATE IS NOT A COMPONENT OF TONG. IT IS A COMPONENT OF HANGER WELDMENT BUC7608-01. SEE HANGER ASSEMBLY ON MOUNTING KIT ILLUSTRATION.

WITHOUT HANGER PLATE:
5/8"-11 x 1 3/4" HHCS
P/N: 1158
5/8" LOCK WASHER
P/N: 1151
(9) REQD. OF EACH

5/8"-11 x 1" SHCS
P/N: 1153
(3) REQD.
BOTTOM CAGE PLATE
P/N: 76056

DUMBBELL SHAFT
P/N: 76025-A
(9) REQD.
SEE DUMBBELL ROLLER ASSEMBLY

5/8"-11 x 2 1/4" HHCS
P/N: 201
5/8" LOCK WASHER
P/N: 1151
(4) REQD. FOR EACH HANDLE

5/8"-11 x 1 1/2" HHCS
P/N: 76080
(16) REQD.

5/8"-11 x 2 3/4" HHCS
P/N: 203
5/8" LOCK WASHER
P/N: 1151
(7) REQD. OF EACH AND

5/8"-11 x 2 3/4" SHCS
P/N: 1064
5/8" HI COLLAR LW
P/N: 1152
(2) REQD. OF EACH

IDLER SHAFT
P/N: 76051-01
SEE CENTER IDLER ASSEMBLY

CAM FOLLOWER
P/N: 1968
WITH
5/8"-18 JAM NUT & 3/16" DRIVE ZERT
P/N: 1150
P/N: 1004
(16) REQD. OF EACH

LARGE BRAKE BAND ASSEMBLY
P/N: 76061A
WITH
3/8"-16 NYLOCK NUT
P/N: 213
LARGE BRAKE BAND ASSEMBLY
P/N: 76061A
WITH
3/8"-16 NYLOCK NUT
P/N: 1213
5/8"-11 x 2 1/4" HHCS
P/N: 76011-A
(4) REQD.
OUTBOARD IDLER SHAFT
P/N: 76050-01
SEE OUTBOARD IDLER ASSEMBLY
(2) REQD.
BOTTOM PINION BEARING CAP
P/N: 55036
SEE PINION GEAR ASSEMBLY

BOTTOM SECONDARY BEARING CAP
P/N: 55041
SEE SECONDARY GEAR ASSEMBLY

HANGER TOP PLATE IS NOT A COMPONENT OF TONG. IT IS A COMPONENT OF HANGER WELDMENT BUC7608-01. SEE HANGER ASSEMBLY ON MOUNTING KIT ILLUSTRATION.

WITHOUT HANGER PLATE:
5/8"-11 x 1 3/4" HHCS
P/N: 1158
5/8" LOCK WASHER
P/N: 1151
(9) REQD. OF EACH

5/8"-11 x 1" SHCS
P/N: 1153
(3) REQD.
BOTTOM CAGE PLATE
P/N: 76056

DUMBBELL SHAFT
P/N: 76025-A
(9) REQD.
SEE DUMBBELL ROLLER ASSEMBLY

5/8"-11 x 2 1/4" HHCS
P/N: 201
5/8" LOCK WASHER
P/N: 1151
(4) REQD. FOR EACH HANDLE

5/8"-11 x 1 1/2" HHCS
P/N: 76080
(16) REQD.

5/8"-11 x 2 3/4" HHCS
P/N: 203
5/8" LOCK WASHER
P/N: 1151
(7) REQD. OF EACH AND

5/8"-11 x 2 3/4" SHCS
P/N: 1064
5/8" HI COLLAR LW
P/N: 1152
(2) REQD. OF EACH

IDLER SHAFT
P/N: 76051-01
SEE CENTER IDLER ASSEMBLY

CAM FOLLOWER
P/N: 1968
WITH
5/8"-18 JAM NUT & 3/16" DRIVE ZERT
P/N: 1150
P/N: 1004
(16) REQD. OF EACH

LARGE BRAKE BAND ASSEMBLY
P/N: 76061A
WITH
3/8"-16 NYLOCK NUT
P/N: 213
LARGE BRAKE BAND ASSEMBLY
P/N: 76061A
WITH
3/8"-16 NYLOCK NUT
P/N: 1213
5/8"-11 x 2 1/4" HHCS
P/N: 76011-A
(4) REQD.
OUTBOARD IDLER SHAFT
P/N: 76050-01
SEE OUTBOARD IDLER ASSEMBLY
(2) REQD.
BOTTOM PINION BEARING CAP
P/N: 55036
SEE PINION GEAR ASSEMBLY

BOTTOM SECONDARY BEARING CAP
P/N: 55041
SEE SECONDARY GEAR ASSEMBLY

HANGER TOP PLATE IS NOT A COMPONENT OF TONG. IT IS A COMPONENT OF HANGER WELDMENT BUC7608-01. SEE HANGER ASSEMBLY ON MOUNTING KIT ILLUSTRATION.

WITHOUT HANGER PLATE:
5/8"-11 x 1 3/4" HHCS
P/N: 1158
5/8" LOCK WASHER
P/N: 1151
(9) REQD. OF EACH

5/8"-11 x 1" SHCS
P/N: 1153
(3) REQD.
BOTTOM CAGE PLATE
P/N: 76056

DUMBBELL SHAFT
P/N: 76025-A
(9) REQD.
SEE DUMBBELL ROLLER ASSEMBLY

5/8"-11 x 2 1/4" HHCS
1/4"-20 NYLOCK NUT
P/N: 212
(4) REQD.

SELF LUBRICATED VALVE
(Door Switch Assembly)
P/N: SLV1000-01

3/8"-16 x 1" HHCS
P/N: 1047
(2) REQD.

3/8" LOCK WASHER
P/N: 1027
(2) REQD.

Door Switch Base Assembly
P/N: 76128

1/4"-20 x 2 1/4" HHCS
P/N: 110
(4) REQD.

Door Switch Base Mount
P/N: 45067-S7
(2) REQD.
(Welded to Top Tong Plate)

(Welded to Door Switch Base)
SIDE HANDLE ASSEMBLY

WELDMENT NO. 76156

5/8"-11 x 2 1/4" HHCS
P/N: 201

5/8" LOCK WASHER
P/N: 1151

(4) REQD. OF EACH PER HANDLE

SIDE HANDLE WELDMENT
P/N: 76156

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BAIL ASSEMBLY

ASSEMBLY NUMBER 76121
FOR TONG MODEL CLE7625 UHT-08
THIS PAGE LEFT BLANK INTENTIONALLY
1. Connect the (2) legs for the front mount to (1) ring of 45103-C & the rear leg to the other ring.

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<th>Description</th>
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<td>45103-C</td>
<td>1&quot; A-345 Master Link Assembly</td>
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<td>55001-02</td>
<td>3/4&quot; x 6&quot; Turnbuckle</td>
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<tr>
<td>3</td>
<td>6</td>
<td>40027-S3</td>
<td>5/16&quot; Connecting Link</td>
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<td>4</td>
<td>2</td>
<td></td>
<td>5/16&quot; Chain Link (8 Links)</td>
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<td>3</td>
<td>40027-S4A</td>
<td>1/2&quot; Shackle</td>
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<td>1</td>
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<td>3</td>
<td>40027-S3B</td>
<td>3/8&quot; Connecting Link</td>
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<td>1 GROOVE</td>
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<td></td>
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<td>1.250 [31.8 MM]</td>
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<td>1.406 [35.7 MM]</td>
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<td>1.406 [35.7 MM]</td>
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Rev: 02/22/05

Page 9 - 26
75/8" UHT TONG JAW ASSEMBLY

FOR USE WITH:
BUC4500XXXX FINE TOOTH STEEL DIES
7 5/8" UHT TONG JAW ASSEMBLY

4 1/2" - 7 5/8" ASSEMBLY NO. CJ-76B

FOR USE WITH:
BUC7625XXXX  FINE TOOTH STEEL DIES
BB7625XXXX  GRIT FACE DIES (4 1/2" AND LARGER ONLY)
CAUTION!
When using Low Friction Jaws, tong torque should be limited to 50% of maximum torque rating.

FOR USE WITH:
BUC4500XXXX FINE TOOTH STEEL DIES
BUCA4500XXXX ALUMINUM DIES
BB4500XXXX GRIT FACE DIES

7 5/8" UHT TONG
LOW FRICTION JAW ASSEMBLY
2 1/16" - 4 1/2" ASSEMBLY NO. CJ-LF-76A
7 5/8" UHT TONG
LOW FRICITION JAW ASSEMBLY

FOR USE WITH:
BUCA7625XXXX ALUMINUM DIES

CAUTION!
When using Low Friction Jaws, tong torque should be limited to 50% of maximum torque rating.
CLE7625 7 5/8" UHT TONG JAWS

FOR 4 1/2" TO 7 5/8"
JAW MODEL NUMBER CJ-76B
ACCEPTS BUC7625XXXX STEEL DIES AND
ACCEPTS BB7625XXXX GRIT FACED DIES
(BB7625XXXX HAVE A LIMITED AVAILABILITY)

CLE7625 7 5/8" UHT TONG JAWS

FOR 2 3/8" TO 7 5/8"
JAW MODEL NUMBER CJ-LF-76B
ACCEPTS BUCA7625XXXX ALUMINUM DIES
PROVIDED TORQUE IS LIMITED TO 50% OF TONG’S MAXIMUM TORQUE RATING

CLE7625 7 5/8" UHT TONG JAWS

FOR 2 3/8" TO 4 1/2"
JAW MODEL NUMBER CJ-76A
ACCEPTS BUC4500XXXX STEEL DIES AND
ACCEPTS BB4500XXXX GRIT FACED DIES

CLE7625 7 5/8" UHT TONG JAWS

FOR 2 1/16" TO 4 1/2"
JAW MODEL NUMBER CJ-LF-76A
ACCEPTS BUCA4500XXXX ALUMINUM DIES
ALSO ACCEPTS BUC4500 AND BB4500 SERIES
DIES PROVIDED TORQUE IS LIMITED TO 50% OF TONG’S MAXIMUM TORQUE RATING

(ALL TYPES OF 7000 SERIES HAVE A LIMITED AVAILABILITY)
FOR MANUFACTURE STARTING 04/19/05

<table>
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<th>Size</th>
<th>Jaw Set Assembly Number with Reg. Pin</th>
<th>Left Jaw Weldment Part Number</th>
<th>Right Jaw Weldment Part Number</th>
<th>Dovetail Strip Die Part Number</th>
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<td>2 7/8&quot;</td>
<td>CJDT76X02875</td>
<td>76X2875L</td>
<td>76X2875R</td>
<td>DTI4004</td>
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<td>3 1/8&quot;</td>
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<td>76X3125R</td>
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<td>3 3/8&quot;</td>
<td>CJDT76X03375</td>
<td>76X3375L</td>
<td>76X3375R</td>
<td>DTI4004</td>
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<td>4&quot;</td>
<td>CJDT76X04000</td>
<td>76X4000L</td>
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<td>4 1/2&quot;</td>
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<td>76X4500R</td>
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FOR MANUFACTURE STARTING 11/22/05

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<th>Solid Left Jaw Part Number</th>
<th>Solid Right Jaw Part Number</th>
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<tr>
<td>7 5/8&quot;</td>
<td>CJDT76X07625</td>
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7 5/8" UHT TONG DOVETAIL JAW SET ASSEMBLY
SEE CHART FOR ASSEMBLY NUMBERS
**7 5/8” UHT TONG**  
**DOVETAIL LOW FRICTION**  
**JAW SET ASSEMBLY**  
SEE CHART FOR ASSEMBLY NUMBERS

<table>
<thead>
<tr>
<th>Jaw Set Assembly Number</th>
<th>Left Jaw Weldment Part Number</th>
<th>Right Jaw Weldment Part Number</th>
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**FOR MANUFACTURE STARTING 11/19/07**

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<td>9</td>
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**5/8" UHT TONG**  
**DOVETAIL LOW FRICTION**  
**JAW SET ASSEMBLY**  
SEE CHART FOR ASSEMBLY NUMBERS

---

4225 HWY. 90 EAST  
BROUSSARD, LA 70518  
(318) 837-8847

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SEE CHART FOR ASSEMBLY NUMBERS

FOR MANUFACTURE STARTING 11/19/07

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8 5/8" UHT BACKUP

TOP VIEW

LEFT SIDE COVER WELDMENT
P/N: BUC8608

BACKUP BODY WELDMENT
BUC8625-02 P/N: BUC8606
BUC8625-04 P/N: BUC8606-02
BUC8625-05 P/N: BUC8606-03
BUC8625-06 P/N: BUC8606-06

3/8"-16 x 3/4" HHCS SLOTTED SELF THR.
P/N: 1308 (12) REQD. OF EA.

1/8" NPT ZERT
P/N: 1001
ZERT PROTECTOR
P/N: CLEBU9602S10 (Component of Body Weldment)
(Welded to Top Plate)
(4) REQD. OF EACH

BACKING BOLT
P/N: BUC5556 (4) REQD.

RIGHT SIDE COVER WELDMENT
P/N: BUC8607

1/2" NPT BULKHEAD CONNECTOR
P/N: BUCST7623
WITH
1 1/4"-12 JAM NUT
P/N: 1219 (2) REQD. OF EACH

GAUGE 0-3000
P/N: BAC-3M25RCFF

GAUGE PROTECTOR
P/N: BUCS5505-S1 (Component of Body Weldment)
(Welded to Top Plate)
(4) REQD. OF EACH

HANGER WELDMENT
P/N: BUC7608-01
DETAILS - SEE FIGURE HANGER ASSEMBLY ON MOUNTING KIT ILLUSTRATION

3/8"-16 x 1 1/2" HHCS
P/N: 1049 (Component of Center Jaw Assy.)
8 5/8" UHT BACKUP
TOP VIEW WITHOUT TOP PLATE
BACKUP LEG  
P/N: BUC4502-S11
(Component of Body Weldment)  
(Welded to Bottom Plate)

(3) REQD.

1/8" NPT ZERT  
P/N: 1001
ZERT PROTECTOR  
P/N: CLEBU9602S10
(Component of Body Weldment)  
(Welded to Bottom Plate)

(4) REQD. OF EACH

1"-8 NUT  
P/N: 1210
(Component of Body Weldment)  
(Welded to Bottom Plate)

(4) REQD.

8 5/8" UHT BACKUP  
BOTTOM VIEW
### BILL OF MATERIALS

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<tr>
<th>Item</th>
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<td>3/8&quot; - 16 x 1 1/4&quot; SHCS</td>
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<td>4</td>
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<td>SPLINE JAW CLIPS</td>
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**8 5/8" UHT BACKUP CENTER JAW ASSEMBLY**

ASSEMBLY NO. BUC8620-01

**APPROX. WEIGHT (LBS.) = 36**
8 5/8" UHT BACKUP CYLINDER ASSEMBLY

ASSEMBLY NO. BUC8623-01

BILL OF MATERIALS

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<td>SPLINE JAW CLIP</td>
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<td>3/8&quot;-16 x 3/4&quot; SHCS</td>
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POLYPACK P/N: 25004500
POLYPACK P/N: 25005000
POLYPACK P/N: 37504750
POLYPACK P/N: 12502625
WEARBAND P/N: W47500625
BACKUP RING P/N: 8-231
SEAL KIT ASAP2226

APPROX. WEIGHT (LBS.) = 77.1
8 5/8" BACKUP

DOVETAIL DIE ADAPTER

3/8" LOCK WASHER
P/N: 134
(2) REQD.

3/8"-16 x 3/4" BUTTON HEAD CSX
P/N: 1061
(2) REQD.

1 1/4" x 3 7/8" DOVETAIL STRIP DIES
DT1601 - 1/2" Thick
DT1601D - 1/2" Thick Diamond
DT1622 - 9/16" Thick
DT1632 - 5/8" Thick
DT1642 - 11/16" Thick
DT1661 - 13/16" Thick
DT1662 - 1 1/4" Thick

DOVETAIL DIE ADAPTERS
P/N: BUDT86-03125 3 1/8" P/N: BUDT86-06375 6 3/8"
P/N: BUDT86-03375 3 3/8" P/N: BUDT86-06500 6 1/2"
P/N: BUDT86-03500 3 1/2" P/N: BUDT86-06625 6 5/8"
P/N: BUDT86-04125 4 1/8" P/N: BUDT86-07000 7"
P/N: BUDT86-04500 4 1/2" P/N: BUDT86-07250 7 1/4"
P/N: BUDT86-04625 4 5/8" P/N: BUDT86-07500 7 1/2"
P/N: BUDT86-04750 4 3/4" P/N: BUDT86-07625 7 5/8"
P/N: BUDT86-05000 5" P/N: BUDT86-07812 7 13/16"
P/N: BUDT86-05250 5 1/4" P/N: BUDT86-08000 8"
P/N: BUDT86-05500 5 1/2" P/N: BUDT86-08250 8 1/4"
P/N: BUDT86-060250 6 1/4"
LARGER THAN 8 1/4"
P/N: SD186-8500 8 1/2"
P/N: SD186-8625 8 5/8"
P/N: SD186-8750 8 3/4"

8 5/8" SPLINED DIE ADAPTER
P/N: 1036
(4) REQD.

DIE ADAPTER CLIP
7 5/8" - 5 1/2"
P/N: BUC7620
(2) REQD.
MOUNTING KIT ASSEMBLY
8 5/8" UHT BACKUP
TO 7 5/8" UHT TONG
ASSEMBLY NO. MK7600-02

NOT SHOWN:
A-35 VALVE PACKAGE
P/N: VP7625UHT-02
OR
A-20 VALVE PACKAGE
P/N: VP7625UHT

SEE VALVE BANK ASSEMBLY

TOP SPRING CAP
WELDMENT
P/N: BUC5571

H-PLATE ASSEMBLY
P/N: BUC5512
(2) REQD.

LEG COLLAR
P/N: 76043-S2
(Welded to Bottom Tong Plate)

HALO (LOADCELL BRACKET)
P/N: BUC4509

HANGER ASSEMBLY (INCLUDES)
ASSEMBLY NO. BUC7600-01

SPRING RETAINER PIN
P/N: BUC4516-P

5/8"-11 x 2 3/4" HHCS
P/N: 203
(7) REQD.
5/8" LOCK WASHER
P/N: 1151
(7) REQD.
(Component of Tong)

5/8"-11 x 2 3/4" SHCS
P/N: 1064
(2) REQD.
5/8" HI COLLAR
LOCK WASHER
P/N: 1152
(2) REQD.
(Component of Tong)

1/2"-13 NUT
P/N: 1101

1/2" LOCK WASHER
P/N: 1103

1/2"-13 x 4" HHCS
P/N: 1121

NOT SHOWN:
A-35 VALVE PACKAGE
P/N: VP7625UHT-02
OR
A-20 VALVE PACKAGE
P/N: VP7625UHT

HANGER WELDMENT
P/N: BUC7608-01

LEG ASSEMBLY (INCLUDES)
ASSEMBLY NO. BUC7670

BOTTOM SPRING CAP
WELDMENT
P/N: BUC4516-B

H-PLATE SPRING
P/N: BUC4511

NOT SHOWN
HALO (LOADCELL BRACKET)
P/N: BUC4509

NOTE:
5/8" HI COLLAR
LOCK WASHER
P/N: 1152
(2) REQD.
(Component of Tong)

TOP SPRING CAP
WELDMENT
P/N: BUC5571

MOUNTING KIT ASSEMBLY
8 5/8" UHT BACKUP
TO 7 5/8" UHT TONG
ASSEMBLY NO. MK7600-02

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# A20 Valve Bank Assembly

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<td>VA20-MOD</td>
<td>Work Section (MFG. AFTER 04/15/04)</td>
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<td>Logic Valve Assembly (MFG. AFTER 05/2006)</td>
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<td>VA20-AA440</td>
<td>Inlet Valve W/O Relief</td>
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<td>VA20-MRV-1</td>
<td>Relief Cartridge</td>
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<td>VA20-DA3</td>
<td>Work Section</td>
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<td>A20-V1526K-8</td>
<td>A20 8&quot; Handle</td>
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<td>HHCS 3/8&quot;-16 x 3 3/4&quot; (COMPONENT OF KIT P/N: 4 BANK)</td>
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<td>Lockwasher 3/8&quot; (COMPONENT OF KIT P/N: 4 BANK)</td>
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# A35 Valve Bank Assembly

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<td>Logic Valve Assembly (MFG. AFTER 05/2006)</td>
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<td>Inlet Valve W/O Relief</td>
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<td>Relief Cartridge</td>
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<td>Work Section</td>
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<td>Work Section</td>
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<td>1103</td>
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## Valve Bank Assembly

![Diagram of Valve Bank Assembly](image-url)
MOUNTING KIT ASSEMBLY
8 5/8" UHT BACKUP BUC8625-02
TO 7 5/8" UHT TONG CLE7625UHT-08
ASSEMBLY NO. MK7600-08
SUPPLY QUICK DISCONNECT

A-20 / A-35 DIRECTIONAL CONTROL VALVE W/ DA SECTION

A-20 / A-35 DIRECTIONAL CONTROL VALVE W/ SA SECTION
MANUFACTURE STARTING 12/29/03:
REPLACED W/ DA SECTION
IF LOAD HOLDING VALVE IS NOT USED, 1 PORT IS PLUGGED

COMMERCIAL A-20 / A-35 DIRECTIONAL CONTROL VALVE ASSEMBLY
WITH 4 BANKS (DA, SA, WDA, & MA)
AND RELIEF VALVE CARTRIDGE
AFTER 12/29/03
WITH 4 BANKS (DA, DA, WDA, & MA)
AND RELIEF VALVE CARTRIDGE

A-20 DIRECTIONAL CONTROL VALVE
MODIFIED W/ WDA SECTION
PERMANENTLY SHIFTED
BEFORE 04/15/04
P/N: 55201
AFTER 04/15/04
P/N: VA20-MOD

OR

A-35 DIRECTIONAL CONTROL VALVE
MODIFIED W/ WDA SECTION
PERMANENTLY SHIFTED
BEFORE 04/15/04
P/N: 4213
AFTER 04/15/04
P/N: VA35-MOD

LOGIC VALVE ASSY.
P/N: 86049

RETURN QUICK DISCONNECT

1 1/4"

BASIC HYDRAULIC SCHEMATIC

UHT TONG
UHT BACKUP

NOTE: NUMEROUS FITTINGS, HOSES, & NIPPLES ARE NOT ILLUSTRATED IN THIS SCHEMATIC
SUPPLY QUICK DISCONNECT

A-20 / A-35 DIRECTIONAL CONTROL VALVE
W/ DA SECTION

COMMERICAL A-20 / A-35 DIRECTIONAL CONTROL VALVE
ASSEMBLY
W/ 4 BANKS (DA, DA, LOGIC, & MA)
AND RELIEF VALVE CARTRIDGE

STANDARD MANIFOLD ASSEMBLY
P/N: BUC7699
P/N: BUC7699-S1

FLOW DIVIDER / COMBINE VALVE
P/N: 1763P0-002

P.O. CHECK VALVE
P/N: 7583P0-001

GAUGE
P/N: BAC-3M25OFF

LIFT CYLINDER

Pilot operated dump valve
W/ optional solenoid actuator
(SHOWN IN DUMP POSITION)
VA20 Valves use P/N: 58058
VA35 Valves use P/N: 58058-S

VA20 Valves use P/N: 2070

PILOT OPERATED DUMP VALVE
W/ OPTIONAL SOLENOID ACTUATOR
(SHOWN IN DUMP POSITION)
VA20 Valves use P/N: 58058
VA35 Valves use P/N: 2070

LOGIC VALVE ASSY.
P/N: SLV1000-01

DOOR SWITCH (NORMALLY CLOSED)
CAM VALVE
(SHOWN IN DOOR OPEN POSITION)
P/N: SLV1000-01

115 PSI CHECK VALVE

TONG MOTOR
RINEER GA-15 SERIES
21 CUBIC INCHES DISPLACEMENT

NOTE: NUMEROUS FITTINGS, HOSES, & NIPPLES
ARE NOT ILLUSTRATED IN THIS SCHEMATIC

BASIC HYDRAULIC SCHEMATIC
UHT TONG & UHT BACKUP
MANUFACTURE BEGINNING 02/2007

NOTE: NUMEROUS FITTINGS, HOSES, & NIPPLES
ARE NOT ILLUSTRATED IN THIS SCHEMATIC

SUPPLY QUICK DISCONNECT

A-20 / A-35 DIRECTIONAL CONTROL VALVE
W/ DA SECTION

A-20 / A-35 DIRECTIONAL CONTROL VALVE
W/ DA SECTION
IF LOAD HOLDING VALVE IS NOT
USED, 1 PORT IS PLUGGED

COMMERCIAL A-20 / A-35 DIRECTIONAL CONTROL VALVE
ASSEMBLY
W/ 4 BANKS (DA, DA, LOGIC, & MA)
AND RELIEF VALVE CARTRIDGE

STANDARD MANIFOLD ASSEMBLY
P/N: BUC7699
P/N: BUC7699-S1

FLOW DIVIDER / COMBINE VALVE
P/N: 1763P0-002

P.O. CHECK VALVE
P/N: 7583P0-001

GAUGE
P/N: BAC-3M25OFF

LIFT CYLINDER

Pilot operated dump valve
W/ optional solenoid actuator
(SHOWN IN DUMP POSITION)
VA20 Valves use P/N: 58058
VA35 Valves use P/N: 58058-S

VA20 Valves use P/N: 2070

LOGIC VALVE ASSY.
P/N: SLV1000-01

DOOR SWITCH (NORMALLY CLOSED)
CAM VALVE
(SHOWN IN DOOR OPEN POSITION)
P/N: SLV1000-01

115 PSI CHECK VALVE

TONG MOTOR
RINEER GA-15 SERIES
21 CUBIC INCHES DISPLACEMENT

NOTE: NUMEROUS FITTINGS, HOSES, & NIPPLES
ARE NOT ILLUSTRATED IN THIS SCHEMATIC

BASIC HYDRAULIC SCHEMATIC
UHT TONG & UHT BACKUP
MANUFACTURE BEGINNING 02/2007

NOTE: NUMEROUS FITTINGS, HOSES, & NIPPLES
ARE NOT ILLUSTRATED IN THIS SCHEMATIC

SUPPLY QUICK DISCONNECT

A-20 / A-35 DIRECTIONAL CONTROL VALVE
W/ DA SECTION

A-20 / A-35 DIRECTIONAL CONTROL VALVE
W/ DA SECTION
IF LOAD HOLDING VALVE IS NOT
USED, 1 PORT IS PLUGGED

COMMERCIAL A-20 / A-35 DIRECTIONAL CONTROL VALVE
ASSEMBLY
W/ 4 BANKS (DA, DA, LOGIC, & MA)
AND RELIEF VALVE CARTRIDGE

STANDARD MANIFOLD ASSEMBLY
P/N: BUC7699
P/N: BUC7699-S1

FLOW DIVIDER / COMBINE VALVE
P/N: 1763P0-002

P.O. CHECK VALVE
P/N: 7583P0-001

GAUGE
P/N: BAC-3M25OFF

LIFT CYLINDER

Pilot operated dump valve
W/ optional solenoid actuator
(SHOWN IN DUMP POSITION)
VA20 Valves use P/N: 58058
VA35 Valves use P/N: 58058-S

VA20 Valves use P/N: 2070

LOGIC VALVE ASSY.
P/N: SLV1000-01

DOOR SWITCH (NORMALLY CLOSED)
CAM VALVE
(SHOWN IN DOOR OPEN POSITION)
P/N: SLV1000-01

115 PSI CHECK VALVE

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21 CUBIC INCHES DISPLACEMENT

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BASIC HYDRAULIC SCHEMATIC
UHT TONG & UHT BACKUP
MANUFACTURE BEGINNING 02/2007

NOTE: NUMEROUS FITTINGS, HOSES, & NIPPLES
ARE NOT ILLUSTRATED IN THIS SCHEMATIC

SUPPLY QUICK DISCONNECT
7 5/8" UHT BACKUP

TOP VIEW
7 5/8" UHT BACKUP
TOP VIEW WITHOUT TOP PLATE
7 5/8" UHT BACKUP
BOTTOM VIEW
BILL OF MATERIALS

<table>
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<tr>
<th>Item</th>
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<td>Backup Ring</td>
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<td>Die Clip (Top)</td>
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<td>Die Clip (Bottom) (Welded to Item 1)</td>
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<td>3/8&quot;-16 x 3/4&quot; SHCS</td>
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<td>1008-B</td>
<td>1/4&quot;-20 x 1/4&quot; Set Screw</td>
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</tbody>
</table>

For Item 14 Only

7 5/8" UHT BACKUP CYLINDER ASSEMBLY

2nd GENERATION
ASSEMBLY NO. BUC7623

SEAL KIT NO. ASAP2226

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3/8" LOCKWASHER
P/N: 134
(2) REQD.

3/8"-16 x 3/4" BUTTON HEAD CSX
P/N: 1061
(2) REQD.

1 1/4" x 3 7/8" DOVETAIL STRIP DIES
DT1601 - 1/2" Thick
DT1601D - 1/2" Thick Diamond
DT1622 - 9/16" Thick
DT1632 - 5/8" Thick
DT1642 - 11/16" Thick
DT1661 - 13/16" Thick
DT1662 - 1 1/4" Thick

1 5/8" FLAT SHCS
P/N: 1036
(4) REQD.

3/8"-16 x 1 1/4" FLAT SHCS
P/N: BUA76-0550

DOVETAIL DIE ADAPTERS
P/N: BUDT76-03500 3 1/2"
P/N: BUDT76-04500 4 1/2"
P/N: BUDT76-04750 4 3/4"
P/N: BUDT76-05000 5"
P/N: BUDT76-05500 5 1/2"

DOVETAIL DIE ADAPTER
P/N: BUDT55-02875 2 7/8"
P/N: BUDT55-03125 3 1/8"
P/N: BUDT55-03375 3 3/8"
P/N: BUDT55-03500 3 1/2"
P/N: BUDT55-04000 4"
P/N: BUDT55-04125 4 1/8"
P/N: BUDT55-04500 4 1/2"
P/N: BUDT55-04750 4 3/4"
P/N: BUDT55-04875 4 7/8"
P/N: BUDT55-05000 5"
P/N: BUDT55-05250 5 1/4"
MOUNTING KIT ASSEMBLY
7 5/8" UHT BACKUP
TO 7 5/8" UHT TONG
ASSEMBLY NO. MK7600
**BILL OF MATERIALS**

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<th>Item</th>
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<td>PISTON</td>
<td>LCR121</td>
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<td>1 1/4&quot;-12 SLOTTED NUT</td>
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<td>1/2&quot; NPT FLUSH PLUG W/ 1/8&quot; ORIFICE</td>
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<td>1/2&quot; HALF COLLAR</td>
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<td>1/2&quot; x 120° HOSE ASSY, MNPT x FJIC SWVL</td>
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<td>3/8&quot; STREET EL W/ORIFICE</td>
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<td>QUICK DISCONNECT 1/2&quot; FEMALE SNAPSTONE</td>
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</tbody>
</table>

**SPECIFICATIONS**

- **MAXIMUM SPRING TRAVEL**: 11.9 in.
- **MAXIMUM ALLOWABLE STATIC LOAD**: 3,800 lbs.
- **MAXIMUM ALLOWABLE LOAD**: 7,812 lbs.
- **PRESSURE REQUIRED TO LIFT MAXIMUM ALLOWABLE LOAD**: 2,000 psi
- **MAXIMUM ALLOWABLE INTERNAL PRESSURE**: 3,000 psi
- **CYLINDER I.D.**: 3 in.
- **ROD O.D.**: 2 in.
- **STROKE**: 35.640 in.

**SEAL KIT P/N: ASAP300**

**DIMENSIONAL DATA**

- A: 3 1/2" x 3/4"
- B: 1 1/4"
- C: 9"
- D: 25" (WELDED TO SPRING HOUSING)
- E: 41 1/2"
- F: 74.800"
- G: 6 3/8"
The CLINCHER Tong and Backup are available in versions which accommodate compression load cells or tension style load cells. All information contained in this Technical Manual refers to products which utilize compression load cells. Contact SUPERIOR for information concerning products using tension load cells.

<table>
<thead>
<tr>
<th>Part Number</th>
<th>SM30-32-C</th>
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<tr>
<td>Torque Rating</td>
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<td>Handle Length</td>
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<td>Loadcell Type</td>
<td>Compression</td>
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<td>Loadcell Manufacturer</td>
<td>SUPERIOR MANUFACTURING &amp; HYDRAULICS</td>
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<tr>
<td>Loadcell Part Number</td>
<td>CLC200</td>
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<td>Torque Gauge Mfr.</td>
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<td>Gauge Mount</td>
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<td>Hose Length</td>
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<td>Assembly Documentation</td>
<td>Calibration Certificate</td>
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CLINCHER Load cells and Torque Gauges are produced by several manufacturers. The information provided by MD TOTCO or Acadiana Oilfield Instruments may not be applicable to all torque gauges or load cells. This reference information is provided with the permission of MD TOTCO and Acadiana Oilfield Instruments.
LOAD CELL SIZE | DIAPHRAGM P/N
--- | ---
6.44 SQ.IN. | CLC203
8.0 SQ.IN. | CLC205
12.0 SQ.IN. | CLC206
16.1 SQ.IN. | CLC207
25.0 SQ.IN. | CLC208

5/16"-18 x 1 1/4" SHCS
Use Never-Seez
Hand Tight

PISTON

RETAINER RING

DIAPHRAGM
P/N: SEE CHART

HOUSING

1/4" NPT FLUSH PLUG
Use Teflon Sealant

5/16"-18 x 1 1/4" SHCS
Use Never-Seez
Torque to 200 in.lbs.
(8) REQD. ON HOUSING

COMPRESSION LOAD CELL
To request copy of Compression Torque System Technical Manual, please contact:

Superior Manufacturing & Hydraulics
4225 Hwy. 90 East
Broussard, LA  70518
Phone: 337-837-8847
Fax: 337-837-8839
www.superior-manf.com
To request copy of Rineer Motor Service Manuals, please contact:

Superior Manufacturing & Hydraulics
4225 Hwy. 90 East
Broussard, LA  70518
Phone: 337-837-8847
Fax: 337-837-8839
www.superior-manf.com
To request copy of Valve Technical Data, please contact:

Superior Manufacturing & Hydraulics
4225 Hwy. 90 East
Broussard, LA 70518
Phone: 337-837-8847
Fax: 337-837-8839
www.superior-manf.com