

INSTRUCTION MANUAL

LT-60

COMPRESSION TESTING MACHINE

MN-LT-60.21.1

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SUPPORT & CONTACT INFORMATION

Support Ticket:

The fastest way to get technical help is through our support ticketing system. Click this link to complete the form and our support team will get you answers ASAP:

<https://forneyonline.com/customer-service/>

General Phone Support:

We still believe in service defined by a helpful voice at the other end of the phone. Our technical team is available for unlimited general product support inquiries on all the equipment we manufacture. Reach us via phone or email: Monday – Friday 8:00 AM to 5:00 PM Eastern

Phone: 724-346-7400 | Toll-Free: 800-367-6397

We offer unlimited Remote Technical Support for all Forney Testing Machines during the two-year warranty period. Please have your machine model and serial number available. After that period, we continue to offer General Phone Support, but Remote Technical Support invoices at \$150 per occurrence.

For ForneyVault® subscribers, post warranty remote technical support fees are waived for the life of your subscription.

Explore Our Knowledge Base:

Browse our knowledge base for informative articles to help you use, maintain, and troubleshoot Forney testing machines: <https://knowledge.forneyonline.com/>

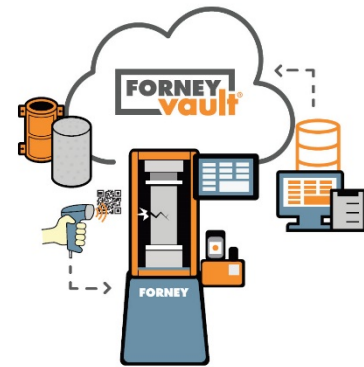
FORNEYVAULT – Essential Concrete Testing Platform

Make your machine smart – enable two-way data communication by accessing information and making it available for the testing process. Connect your machine seamlessly to LIMS packages, QC software and other third-party software participating on the ForneyVault platform.

ForneyVault enabled machines help control the workload, and make your technicians smarter and more productive, with fewer costly errors.

A smart machine can:

- Enable intelligent workflows
- Enable Bar Code Scanning capability to identify the specimen to be tested
- Validate specimen geometry
- Calculate proper preload settings – based on actual and/or expected strength
- Calibration Monitor provides notification of impending calibration requirements
- Discard Dashboard provides context enabled specimen management for untested specimen disposal decisions.
- Notify you that a correction factor should be used
- Notify you of individual low breaks
- Notify you of excessive variance among several specimens



Learn more @ [ForneyVault.com](https://forneyvault.com)

Get More Out of Your Materials Testing Lab

WARRANTY POLICY

SALES TERMS AND CONDITIONS

1. **Definitions:** As used in these Terms and Conditions, "Machinery" means any equipment, material, product, motor, article or item quoted or sold by or through Forney and/or listed on any document attached hereto or prepared in connection herewith. "Forney" means Forney, its affiliates and any entity for whom Forney acts as agent in connection with the sale of Machinery. "Purchaser" means all persons and entities acquiring Machinery from or through Forney.
2. **Offer and Acceptance:** These Terms and Conditions constitute an offer to sell Machinery and/or services which may be accepted only in accordance with these Terms and Conditions and without modification, addition, deletion or alteration. In the event that any correspondence, form documents (e.g., purchase order or acknowledgment forms) or sale terms submitted by or on behalf of Purchaser contain terms in addition to or different from those set forth herein, those additional or different terms are hereby rejected. Forney's willingness to contract with Purchaser is expressly conditioned on Purchaser's acceptance of the terms set forth below, which shall be deemed to constitute a counter-offer to any conflicting terms submitted by Purchaser.
3. **Duration of Offer:** Any quotations or offers extended by Forney are subject to immediate acceptance and prior sale. Forney reserves the right to withdraw, change or alter any quotation or offer submitted by it at any time prior to written acceptance.
4. **Delivery and Delay:** The shipping date or dates that may be set forth in any correspondence or document from Forney are approximate only and Forney shall not be liable for failure to deliver, delay in delivery or any other hindrance of performance occasioned by causes beyond Forney's control including, without limitation, strikes, labor shortages, labor stoppages, lockouts or other labor troubles, material shortages, fires, riots, floods, embargoes, war or other outbreak of hostilities, acts of God, inability to obtain shipping space, machinery breakdown, delays of carriers or suppliers, governmental acts and regulations and actions by Purchaser. In the event of such delay or hindrance, Forney shall be entitled to an extension of time commensurate with the delay or hindrance. Unless expressly agreed to the contrary by Forney in writing, all sales of Machinery by Forney are made "as is, where is" and shipped F.O.B. point of shipment; all risks of loss or damage in transit shall be borne exclusively by Purchaser; and all deliveries of Machinery to a common carrier or licensed trucker shall constitute delivery to Purchaser. Unless expressly agreed to the contrary by Forney in writing, Purchaser shall be solely and exclusively responsible for all costs and risks of loss or damage associated with the loading, shipment, transport, unloading, assembly and installation of all Machinery acquired from Forney. FORNEY SHALL NOT BE LIABLE FOR ANY DAMAGES ATTRIBUTABLE TO DELAYED SHIPMENT OR LATE DELIVERY INCLUDING, WITHOUT LIMITATION, INDIRECT, SPECIAL, INCIDENTAL OR CONSEQUENTIAL DAMAGES RELATING THERETO.

5. **Cancellation by Purchaser:** Upon cancellation by Purchaser of all or any part of a Purchase Order or other commitment to purchase from Forney, liquidated damages shall be payable by Purchaser as follows: Full cost to Forney of (i) all amounts expended or committed by Forney to acquire the Machinery ordered by Purchaser and to assemble the Machinery for shipment; (ii) all work in process relating to Purchaser's order; (iii) all equipment costs incurred by Forney in connection with Purchaser's order, including commitments made for the use of such equipment; (iv) all engineering, travel and rental costs incurred as a result of Purchaser's order; and (v) an amount equal to 30% of the aggregate of (i), (ii), (iii) and (iv) above for administrative overhead.
6. **Transportation and Insurance Charges:** Except as may be specifically agreed to in writing by Forney, Forney shall not be responsible for freight, transportation, insurance, shipping, storage, handling, demurrage or similar charges. If such charges are by the terms of any quotation or offer extended by Forney included in the price of the Machinery, any increase in the applicable rates which becomes effective after the date of Forney's quotation or order shall be to the account of Purchaser.
7. **Taxes and Permits:** All sales, excise, gross receipts, value added or similar taxes, whether presently in force or hereafter enacted, shall be deemed extra charges and Purchaser agrees to pay the same at applicable rates. All licenses and permits, whether federal, state, local or those of a foreign government shall be obtained by Purchaser at Purchaser's expense. Purchaser shall be solely and exclusively responsible for all trade tariffs, import/export permits, charges and taxes, customs duties, stamp duties, registration fees, clearances and other consents arising from or connected with the purchase of any Machinery being acquired from Forney.
8. **Spare Parts:** Spare parts are not included in any quotation or offer of Forney unless expressly provided for in writing. At the request of Purchaser, spare parts shall be quoted separately, if available to Forney.
9. **Installment Delivery:** Forney reserves the right to deliver the Machinery in installments. Delay in the delivery of any installment shall not relieve Purchaser of its obligation to accept remaining deliveries of Machinery.
10. **Change Orders:** In the event that Purchaser desires to alter any Purchase Order previously submitted, Purchaser shall submit to Forney a written change order which shall become effective only upon written acceptance by an authorized officer of Forney.
11. **Modifications:** No modifications to these Terms and Conditions shall be effective unless agreed to in writing by an authorized officer of Forney. Any attempt to modify these Terms and Conditions by an instrument or form not executed by an authorized officer of Forney shall be ineffective.

12. **Governing Law:** The transaction between Forney and Purchaser contemplated by any quotation or Purchase Order shall be governed by and construed in accordance with the laws of the Commonwealth of Pennsylvania. All matters dealt with by any quotation or Purchase Order to which Forney is a party shall be governed by the Uniform Commercial Code, as in force in the Commonwealth of Pennsylvania on the effective date of the acceptance of the quotation or Purchase Order by Purchaser. In no event shall provisions of the United Nations Convention on Contracts for the International Sale of Goods apply to or govern the provisions of any agreement involving the sale of Machinery by Forney.
13. **Terms of Payment:** Unless Forney has specifically agreed to the contrary in writing, fifty (50) percent of the purchase price shall be paid by Purchaser immediately after Purchaser's acceptance of Forney's quotation or offer; and the remaining fifty (50) percent must be received by Forney prior to shipment of the Machinery. In the event that payment is not received when due, an interest charge of 1-1/2% per month will be charged on the overdue amount.
14. **Return Privilege:** Subject to the following provisions of this paragraph 14, any Machinery that is purchased from Forney's inventory "as is, where is" may be returned freight prepaid within 15 days of initial receipt for a refund of the purchase price if (i) the Machinery fails to conform to Forney's description in a respect material to its operation, and (ii) Forney has been informed in advance of the alleged nonconformity and has authorized the return in writing. Subject to paragraph 16 below, if applicable, the foregoing shall be the sole and exclusive remedy with respect to any issue or claim arising from any Machinery sold by Forney and shall not apply if the Machinery has been (i) damaged by Purchaser or subjected to misapplication, neglect or abnormal conditions of operation, (ii) damaged in transit, or (iii) sold directly from auctions, private users' plants, or any other sale or trade other than from Forney's stock. All returns shall be subject to a twenty-five percent (25%) restocking charge.
15. **Compliance with Safety Regulations:** In the event Forney performs installation or engineering services at the facility of Purchaser, Purchaser shall be solely and exclusively responsible for ensuring that working conditions at Purchaser's facility comply with all applicable federal, state and local safety rules and regulations, including but not limited to those promulgated under the Occupational Safety and Health Act of 1970 (collectively, the "Safety Regulations"). Purchaser shall be liable for all fines and penalties of whatsoever kind or nature in the event that said working conditions do not comply with such Safety Regulations. It is the duty of Purchaser to inspect all Machinery purchased from Forney, to provide proper safety devices to safeguard the operators from harm and to ensure compliance with all applicable Safety Regulations. Forney makes no representations or warranties that any Machinery sold by it complies with the Safety Regulations and specifically disclaims any liabilities arising from noncompliance.
16. **Forney F, FHS and LT Series Testing Machines Limited Warranty:** With respect to Testing Machines that have been manufactured by Forney only, and not with respect to any other

Machinery quoted or sold by Forney or its affiliates, Forney warrants to Purchaser that for a period of two (2) years from the date of shipment, the Machinery will be substantially free of defects in materials and workmanship. In the event such Machinery is found to have a material defect in materials or workmanship, Forney shall remedy said defect by exercising one of the following three options, the choice of which shall be exclusively that of Forney. The options are: (a) Return of the Machinery to Forney for a refund of the purchase price paid by Purchaser; (b) Return of the Machinery to Forney for rebuilding by Forney, provided that Forney will rebuild the Machinery during regular working hours and will not be responsible for overtime or special rates; or (c) Replacement of the Machinery or components. Forney shall not be responsible for paying overtime or special rates to rebuild the Machinery. In the event that the option initially selected by Forney is not effective in remedying the defect, Forney retains the right to select either or both of the remaining options. Purchaser's damages for any breach by Forney of its obligations to remedy defects pursuant to this Paragraph 16 shall not exceed the cost of such remedial effort.

17. Other Forney Manufactured Items Limited Warranty: With respect to other items that have been manufactured by Forney only, and not with respect to any other Machinery quoted or sold by Forney or its affiliates, Forney warrants to Purchaser that for a period of (90) days from the date of shipment, the Machinery will be substantially free of defects in materials and workmanship. In the event such Machinery is found to have a material defect in materials or workmanship, Forney shall remedy said defect by exercising one of the following three options, the choice of which shall be exclusively that of Forney. The options are: (a) Return of the Machinery to Forney for a refund of the purchase price paid by Purchaser; (b) Return of the Machinery to Forney for rebuilding by Forney, provided that Forney will rebuild the Machinery during regular working hours and will not be responsible for overtime or special rates; or (c) Replacement of the Machinery. Forney shall not be responsible for paying overtime or special rates to rebuild the Machinery. In the event that the option initially selected by Forney is not effective in remedying the defect, Forney retains the right to select either or both of the remaining options. Purchaser's damages for any breach by Forney of its obligations to remedy defects pursuant to this Paragraph 17 shall not exceed the cost of such remedial effort.

18. Items not manufactured by Forney Limited Warranty: With respect to items that have not been manufactured by Forney, and not with respect to any other Machinery quoted or sold by Forney or its affiliates, Forney will pass on to the customer the benefit of any warranty Forney received from the original equipment manufacturer.

- a. In order to obligate Forney under this Limited Warranty, Purchaser must notify Forney in writing within ten (10) days of the appearance of the defect, provide full details concerning the defect, and discontinue use of the Machinery. Upon receipt of this information, Forney will provide service instructions or shipping instructions. If shipping instructions are provided by Forney, Purchaser shall send the Machinery in accordance with those instructions and with freight charges prepaid by Purchaser. If Forney determines that repairs are warranted under the terms of this Limited

Warranty because of defects, Forney will provide repair services at its place of business and the cost of such repair services and return freight charges will be paid by Forney; provided, however, that Forney may instead refund the purchase price in lieu of making such repairs. If Forney determines that the alleged defects are not covered by this Limited Warranty, the cost of its repair services and return freight charges will be paid by Purchaser. This Limited Warranty shall not apply if the Machinery has been assembled, installed, used, altered or handled in a manner contrary to any written instructions provided with the Machinery or if the Machinery has otherwise been subjected to misuse, neglect or abnormal conditions of operation.

19. **Machine Safety and Indemnification:** By accepting a quotation or "Offer to Sell" from Forney, Purchaser acknowledges and agrees that Forney has made no representations or warranties concerning the safety of the Machinery being sold, either on its own behalf or for anyone possessing an interest in the Machinery. Purchaser further acknowledges and agrees that Machinery sold by Forney may not include necessary safety equipment to permit safe operation or to comply with local, state, Federal, industry and/or other applicable Safety Standards or requirements. Before placing the Machinery in use, Purchaser agrees to utilize such safety equipment and give operators such instructions and/or warnings as may be necessary to permit safe operation and to comply with all local, state, federal, industry and/or other applicable Safety Standards, requirements and regulations. Purchaser further agrees to indemnify and hold Forney harmless from and against any and all claims and liabilities which may be incurred by Forney, including any and all costs and attorney fees, based in whole or in part on the failure to comply with applicable Safety Standards and/or the failure to provide safety equipment, instructions and/or warnings necessary to operate the Machinery safely.
20. **Warranties and Remedies Exclusive; Further Warranties and Remedies Disclaimed:** EXCEPT FOR THE LIMITED WARRANTY PROVIDED PURSUANT TO PARAGRAPH 16 THROUGH 19 ABOVE, FORNEY MAKES NO REPRESENTATIONS OR WARRANTIES, EXPRESS OR IMPLIED, WRITTEN OR ORAL, WITH RESPECT TO THE CONDITION, PERFORMANCE OR SHIPMENT OF ANY MACHINERY SOLD BY IT OR ANY COMPONENTS THEREOF, WHETHER OR NOT THE MACHINERY OR COMPONENTS HAVE BEEN REBUILT, ENGINEERED OR DESIGNED IN WHOLE OR IN PART BY FORNEY OR ANY AFFILIATE OF FORNEY. FORNEY SPECIFICALLY DISCLAIMS, AND PURCHASER HEREBY WAIVES, ANY WARRANTIES OF MERCHANTABILITY OR FITNESS FOR PARTICULAR PURPOSE. It is specifically understood and agreed that except to the extent provided in paragraph 16 through 19 above, Forney shall have no liability, whether claimed in contract, equity, tort (including negligence) or otherwise, for or resulting from defaults in workmanship or materials or failure of performance of any Machinery sold by it.
21. **Limitation of Liability:** Forney shall not be liable for any special, incidental, indirect or consequential damages, or for any equivalent proximate damages, arising out of or connected with any Machinery sold or services provided by it, regardless of whether any such liability shall be claimed in contract, equity, tort (including negligence) or otherwise. By

way of example of the foregoing limitation of liability, but without limiting in any manner its scope or application, Forney shall not be liable for all or any part of any of the following, no matter how claimed, computed or characterized:

- a. Loss of profits or revenue, loss of return on investment, cost of capital, loss of operating time or production, loss or reduction of use or value of any facilities or replacement products, or increased costs of operation or maintenance; (b) damages incurred in the unloading, assembly or installation of the Machinery; (c) damages relating to the operation of the Machinery or to any products manufactured in whole or in part with the use of the Machinery; or (d) interruption of business. The limitation of liability contained in this Paragraph 21 shall be effective without regard to Forney's performance or failure or delay of performance under any other terms and conditions, including those contained in Paragraph 16 through 19 hereof.
22. **Indemnification:** In consideration of Forney's agreeing to sell items of Machinery to Purchaser and/or to provide services to Purchaser, and intending to be legally bound hereby, Purchaser covenants and agrees to indemnify and hold Forney and its affiliates harmless from and against any and all claims, demands, actions, causes of action, damages, costs and expenses, including attorney's fees, which arise directly or indirectly from Forney's sale of Machinery and/or services to Purchaser. Without limitation as to the foregoing, Purchaser's indemnity shall encompass and include any and all incidental, special, direct, indirect and consequential damages incurred by it including, without limitation, lost profits, damage to reputation, injury to persons (including death) and damage to property.
23. **Dispute Resolution and Venue:** The sole and exclusive means of resolving any dispute which may arise from Forney's sale of Machinery and/or services to Purchaser shall be the submission of such dispute to arbitration under the auspices of the American Arbitration Association in Pittsburgh, Pennsylvania.

WARNINGS / CAUTIONS

ONLY QUALIFIED PERSONNEL MAY OPERATE EQUIPMENT TAKING NOTE OF THE FOLLOWING

MOVING PARTS CAN CRUSH AND CUT – Keep hands clear of moving parts while operating machinery!

WEAR SAFETY GLASSES WHILE OPERATING EQUIPMENT – Always wear safety glasses while operating machinery!



MACHINE SPECIFICATIONS

Load Capacity Range	600lbf - 60,000lbf
Vertical Opening	23.5"
Horizontal Opening	13.0"
Ram Diameter	6"
Piston Stroke	6"
Platen Hardness	60 HRC
Lower Platen Dimension	6.5" Diameter
Upper Platen Dimension	See Available Accessories
Oil Reservoir Capacity	5 Gallons
Overall Width	30"
Overall Depth	24"
Overall Height	68"
Unit Weight	1478lb Frame + 556lb Console

INSTALLATION PROCEDURES

Inspection

Upon receiving shipment of your new machine, before uncrating or unpacking, inspect the crates/boxes for signs of freight/handling damage.

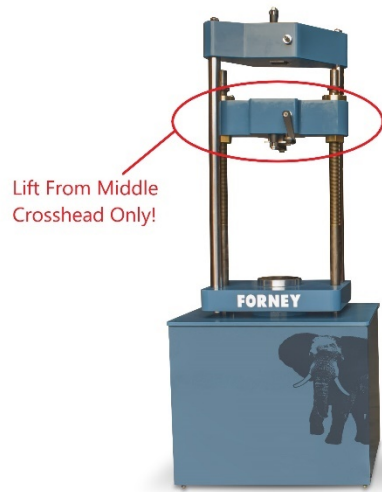
If container shows visible signs of damage, please note damage to freight carrier at time of delivery. If severe damage to package or machine is discovered during delivery, refuse delivery due to freight damage.

Uncrating

To properly uncrate your new Forney Testing Machine, follow these steps:

- Remove metal straps around crate/box with suitable cutters (shears) if banded.
- Remove top of box/crate.
- Remove wooden braces on the top and sides of the machine if braced.
- If crated, remove the sides of the crate, if boxed, remove the entire box.
- If accessories are included, unband/unbrace and remove accessories.
- Cut all remaining bands, remove all wooden braces on pallet.
- Do not remove wooden braces from inside the compression area of the machine until machine is in permanent position.

- Approximate weight of the LT-60 frame is 1,460lbs. Lift the LT-60 frame from the Middle CROSSHEAD ONLY! Failure to comply could result in pulling the piston out of the main cylinder and damage to other components. The middle crosshead is shown below:



- Remove the side panels of the console to reveal two lifting holes. These holes are 1/2"-13 holes for eye bolts. Alternatively, a 3/8" steel bar can be inserted through both holes to lift. The console should be lifted just slightly above ground level and carefully guided as it is moved into position.
- Locate the packing list and check parts and units against the packing list to make sure the shipment is complete.

Machine Location

It is recommended that the machine be located in an area where the atmosphere is free from acidic or contaminating fumes, which could possibly accelerate corrosion to, machined surfaces or electrical contacts.

The machine should be located in a temperature-controlled indoor environment where humidity or condensation is within the following limits:

Temperature Range = 41F (5C) to 104F (40C)

Recommended Humidity = 30% to 70% RH

A special foundation is typically not required on the LT-60 machine. The foundation should be rated to accommodate the estimated 1,460lbs of the frame and 600lbs of the console. The typical configuration for the LT-60-VFD is shown below with the frame on the left and console on the right. Forney recommends fastening the machine to the floor. Two $\frac{3}{4}$ " diameter holes are provided in the base for this purpose in addition to the four leveling feet.

After installing the machine, it will need to be leveled. To level, place a level (carpenters, bricklayers, etc) along frame of testing machine. The machine should be level to within 0.010" IN 12". If machine is found to be out of level, determine which direction is out and adjust the leveling feet accordingly. The LT-60 is equipped with four industrial leveling feet to ensure proper leveling in both directions.

A dedicated electric outlet is recommended to help insure that proper electric is provided to the unit. Please check stamped identification plate for voltage and current requirements.

NOTE: GFCI protected outlets should not be used. Nuisance tripping will occur due to the high frequency switching of the VFD drive.

CLEANING

To protect your new testing machine during shipping and through extended periods of exposure to the elements; a rust-preventative has been applied to the external surfaces of the machine.

After positioning/installing your machine, and prior to making the hydraulic connections, the rust inhibitor can be removed.

- 1) Dampen a clean, dry cloth with a suitable, safety solvent.

i.e. CRC Quick Clean or similar (use rubber gloves)

NOTE: Do not soak cloth or rub painted surfaces vigorously, as the solvent may attack the paint.

- 2) Gently wipe the surfaces until tackiness is gone, gently wipe with a dry cloth.

To reduce particle contamination after testing, a dry wipe down should be done.

Solvent need not be used unless an accumulation of particles is present, and otherwise hard to remove.

CALIBRATION

PLEASE REFER TO CA-0399-LT-60 MANUAL FOR PERFORMING ADJUSTMENTS TO CALIBRATION.

In accordance with ASTM E-4, testing machines are calibrated and verified annually. All Forney testing machines are calibrated at the factory following the guidelines of the most current revision of ASTM E-4.

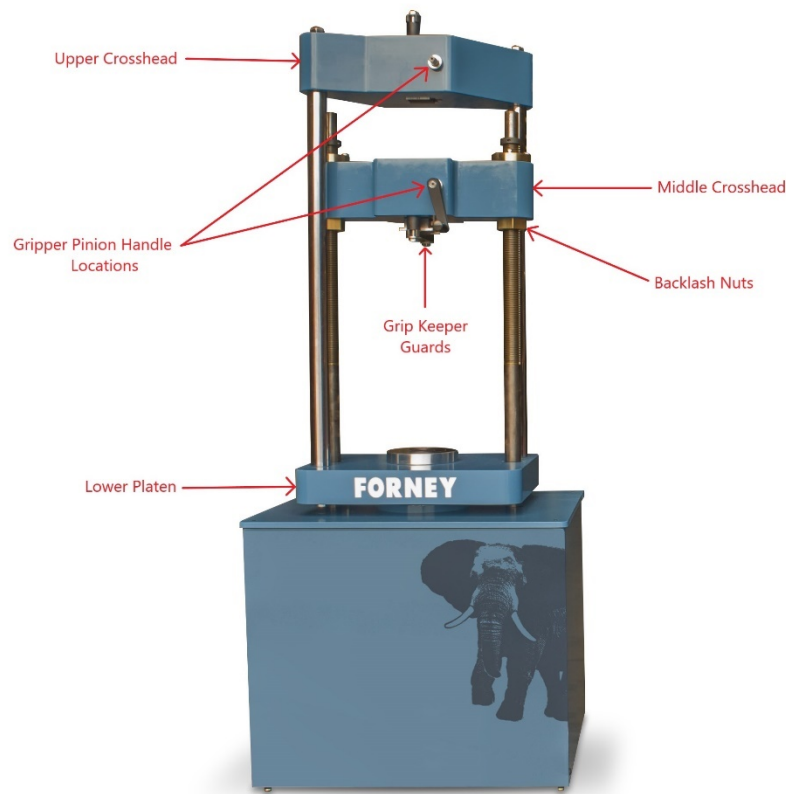
During the calibration, all safety devices and accuracy adjustments are pre-set to give maximum performance and safe operation.

Even though the machines are completely serviced and calibrated at the factory, ASTM requires that machines be calibrated after transportation and final installation to ensure the calibration constants are accurate in the new environment.

ON-SITE CALIBRATION – A complete on-site calibration service is available from Forney through our Authorized Service Providers. Forney recommends the use of their Factory-Trained Authorized Service Providers for all calibration services. These Representatives are trained to perform ASTM E-4 calibration procedures, with instruments conforming to ASTM E-74 standards. They are also qualified to perform various preventative maintenance procedures. Procedures, which combined with annual calibration, will greatly reduce the possibility of down-time of your machine.

Please contact FORNEY Technical Support for a list of Authorized Service Providers.

TESTING MACHINE OVERVIEW



The LT-60 is capable of both compression testing and tensile testing depending on the configuration. The tensile testing area is between the upper crosshead and the middle crosshead. The compression area is between the middle crosshead and the lower platen. The middle crosshead is fixed during testing, but it is moveable during setup via the Acme threaded rods. You can move this middle crosshead to any convenient position before testing, but exercise care while moving this crosshead to not move it beyond its threaded travel length or against the upper stops.

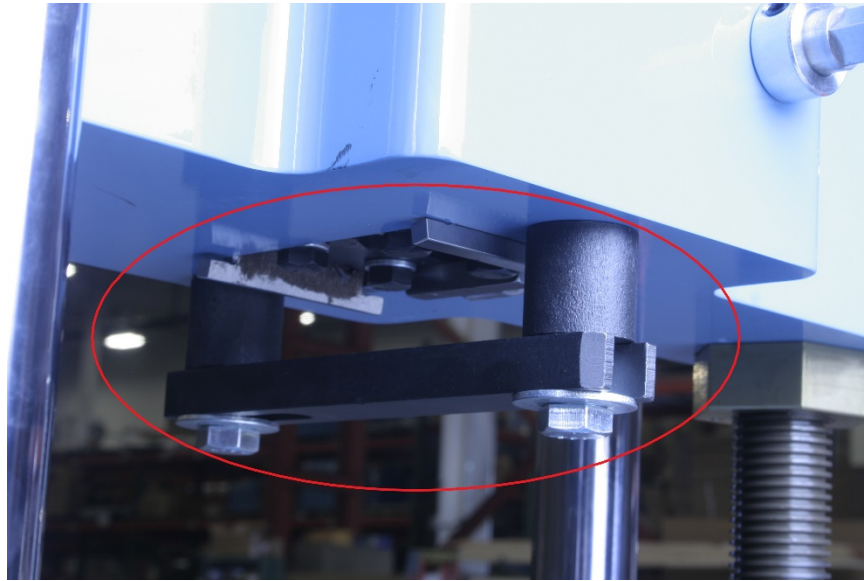
The middle crosshead is only moveable while not running a test. To move the middle crosshead, first loosen the two Backlash nuts. These are only hand tightened and should loosen easily. If moving the crosshead down, make sure to turn each one down enough so the

crosshead does not reach them before finishing the movement. Next, press and hold the 'Crosshead Up or Down' button on the HMI display to move the crosshead into the desired position. Once the desired position is reached, hand tighten the Brass Acme Nuts against the crosshead.

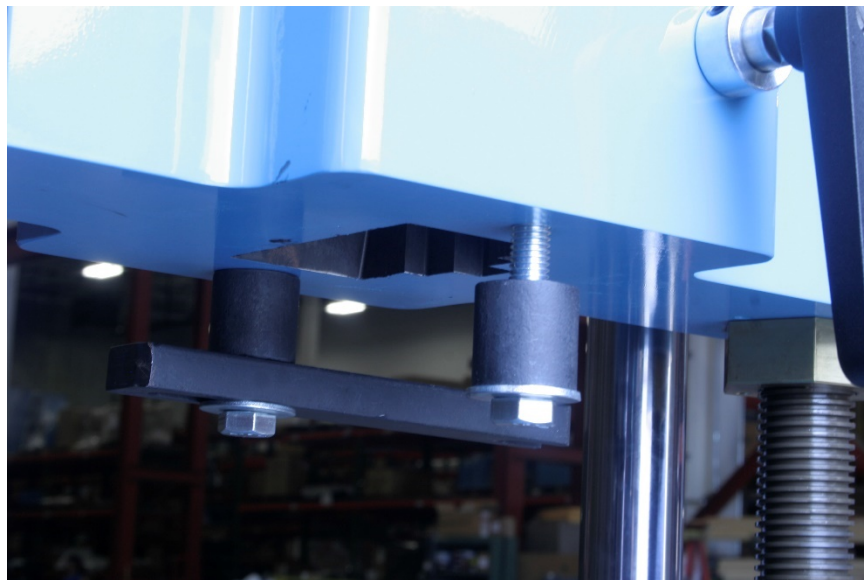
If any noise occurs during positioning of the middle crosshead, it would be an indication lubrication is needed. See maintenance procedures regarding lubrication of the Acme threaded rods.

TENSILE TESTING

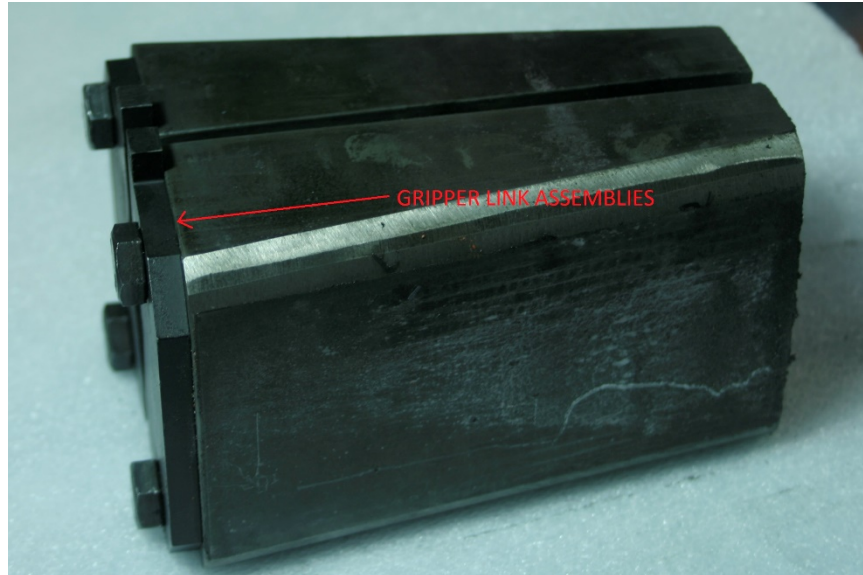
The machine must have the tensile grip keeper guards installed which keep the grip/shim/rack system inside the crosshead during tensile testing and prevent any of these items from coming out of the machine following a test:



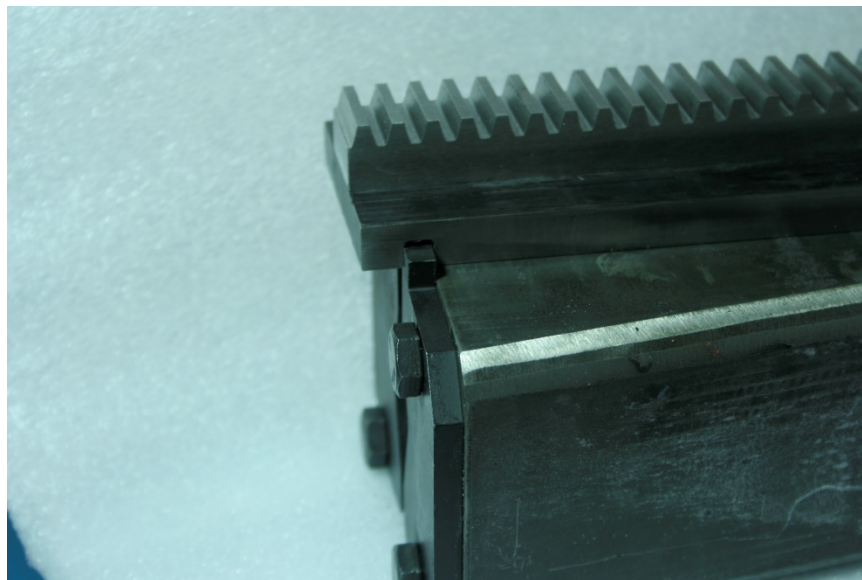
First install the grip keeper guards and hand tighten the bolts, this system should only be hand tightened as the operator will routinely slide open the grip keeper guard to load and unload specimens and different grips. Once installed, slide open the grip keeper guard:



The grip/shim/rack systems then need to be assembled and put in the upper and lower grip slots. Select the proper grippers and bolt the link assemblies to the top of the grips. The tabs will face the same direction:



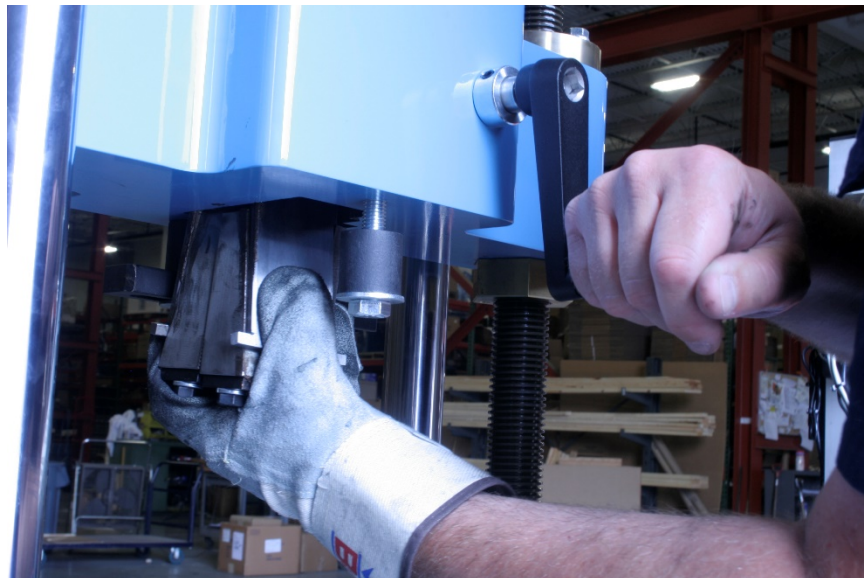
Then place the rack plate into the slot of the gripper link assemblies making sure to get the tab into the slot:



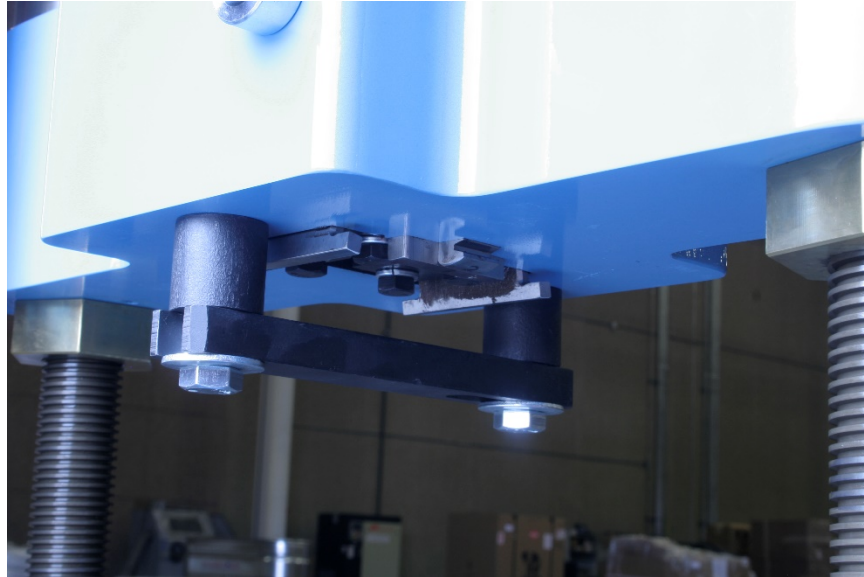
Then add a light coating of anti-seize compound (Part # LA-0842) to the back of each gripper and add the shims to the assembly with the chamfered end facing out on each side. Note the anti-seize compound should go between the gripper and shim only. Anti-seize compound can be reused for 10 tests and then scraped off and recoated for each subsequent 10 tests.



Finally place this assembly (one in the top and one in the bottom) into the machine and rotate the handle to grab the assembly and pull it up into position:

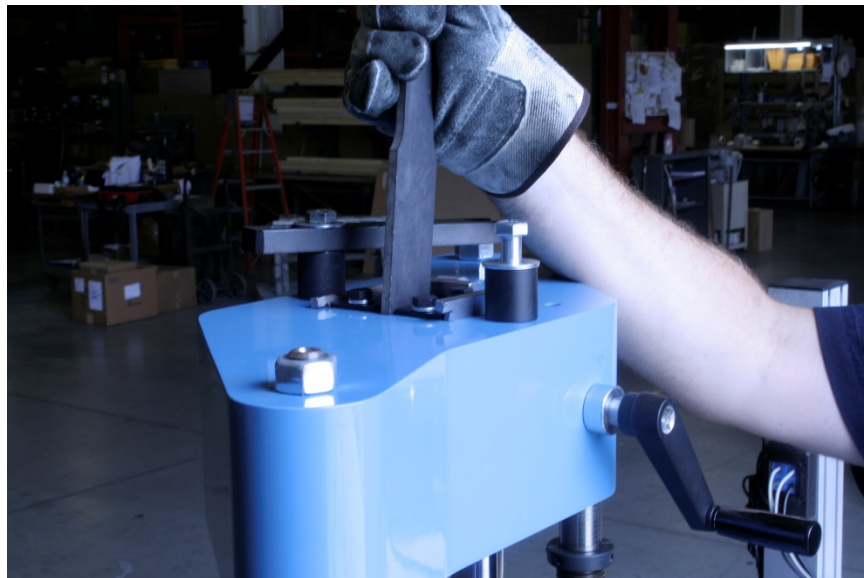


Close the gripper guard assembly:



The handle should now be able to move the grips up or down in the slots. Move the handle to the upper crosshead.

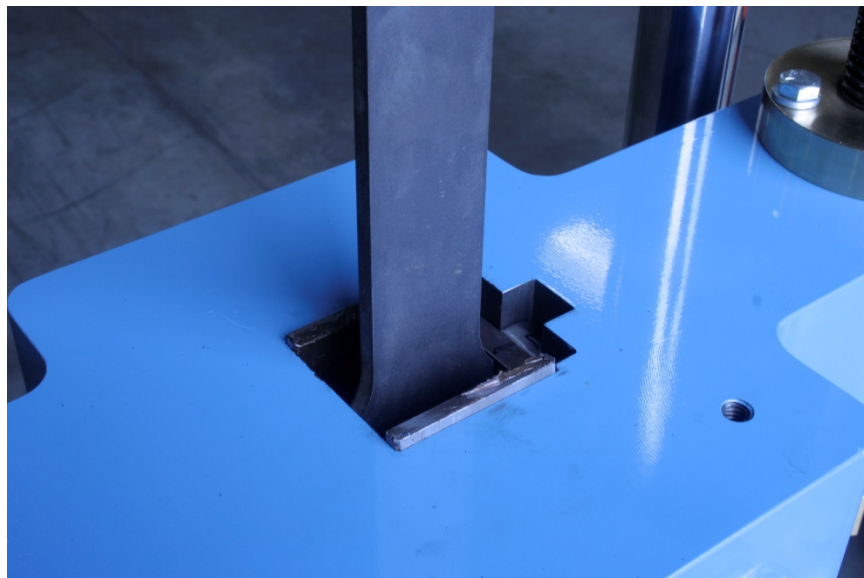
It is easiest to load a sample from the top. Slide open the grip keeper guard, separate the grips, and pass the tensile specimen down through the center of the grips. Use the handle to open the grips and separate them with either the specimen to be tested or a pry bar.



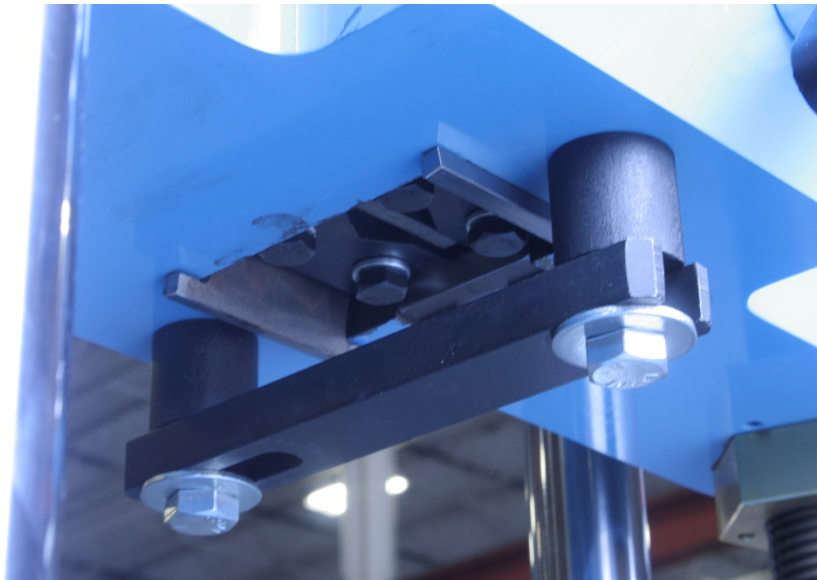
A proper grip is achieved when the grip contains approximately 3.5" length of tensile specimen filling the grip AND the grip is contained in the crosshead. Turn the handle to grip the specimen. Ideally the grips will be fully inside the crosshead while gripping a specimen.



It is ok for the grips to protrude slightly out of the top (towards the grip keeper guard) while gripping. The grip should never come out of the bottom of the upper crosshead during gripping or testing! Check the grip model and specimen size if this occurs. These rules apply oppositely to the middle crosshead. The grip can come slightly out of the bottom but never the top of the middle crosshead.



Once the upper grip is set, slide the top grip keeper guard closed and hand tighten the bolts. Move the handle to the middle crosshead and open the grips. Advance the piston or adjust the middle crosshead as needed to allow a proper 3.5" grip on the bottom portion of the specimen. Repeat the gripping process and turn the handle to grip the specimen. Slide the bottom grip keeper guard closed and hand tighten the bolts.



If any slippage occurs, sometimes it is necessary to hold the handle in the grip position on the middle crosshead and start the test until the teeth of the gripper set in the specimen. The handle should be removed after the teeth set and the test is underway.

ALWAYS REMOVE THE HANDLE AFTER THE GRIPS ARE SET!!!

Proceed with testing per the CA-0399-LT-60 console instructions.

Note: Gripper shims are expandable items; they will score, bend and break from use, and will have to be replaced.

PROPER GRIP AND SPACER SELECTION

Caution:

It is extremely important that the correct grips be used during a tensile test. Failure to select the correct grips will result in major damage to the testing machine's gripping assembly and/or crosshead area.

GRIP SELECTION CHART

Specimen Grips for Various Size Specimens (4 required):

	Test Specimen Dimensions	Specimen Type
Part #	SAE Units	
TA-0184-20	0.25" to 0.75" diameter	Round
TA-0184-21	0.75" to 1.25" diameter*	Round
TA-0184-30	1" x 2" flat specimen	Flat

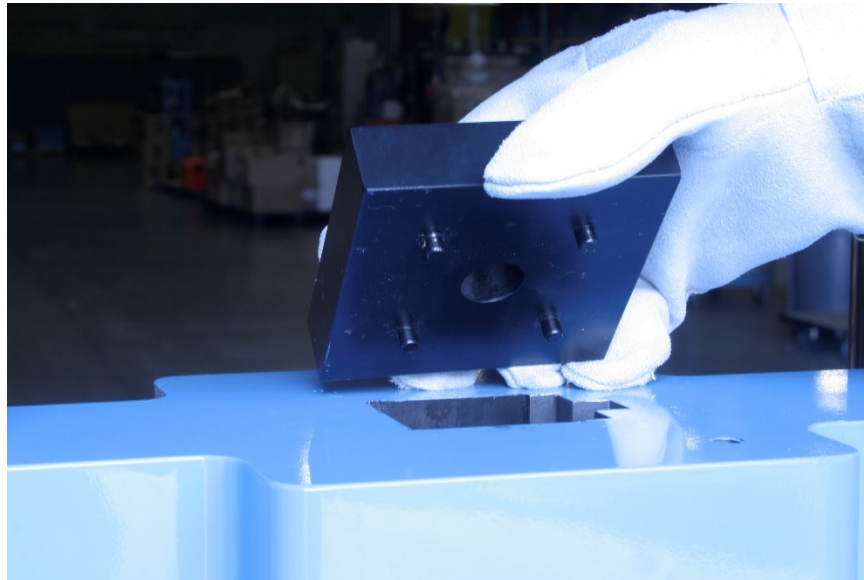
*Note: make sure specimen material strength does not exceed machine capacity

COMPRESSION TESTING

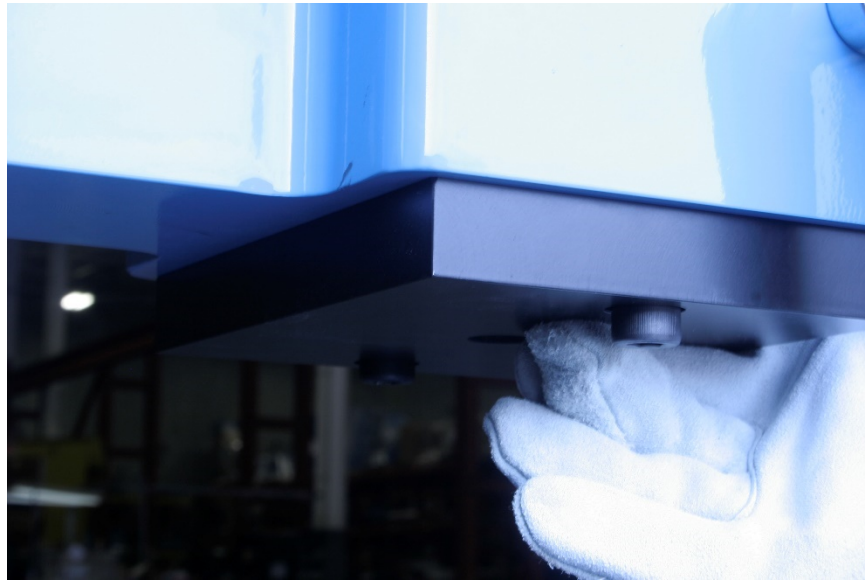
Compression testing is performed by installing the custom tooling made to center compression breaking heads in the middle crosshead. The installed accessory is shown in the image below.



Start by removing any installed grips and the grip keeper guards from the middle crosshead. Then, place the upper alignment plate on top of the middle crosshead. It has pins to center it in the crosshead slot.



Next, install the bottom alignment plate on the bottom of the middle crosshead using the two mounting holes and socket head cap screws. These holes align with the same holes used for the grip keeper guards. Tighten the socket head cap screws with an Allen wrench.



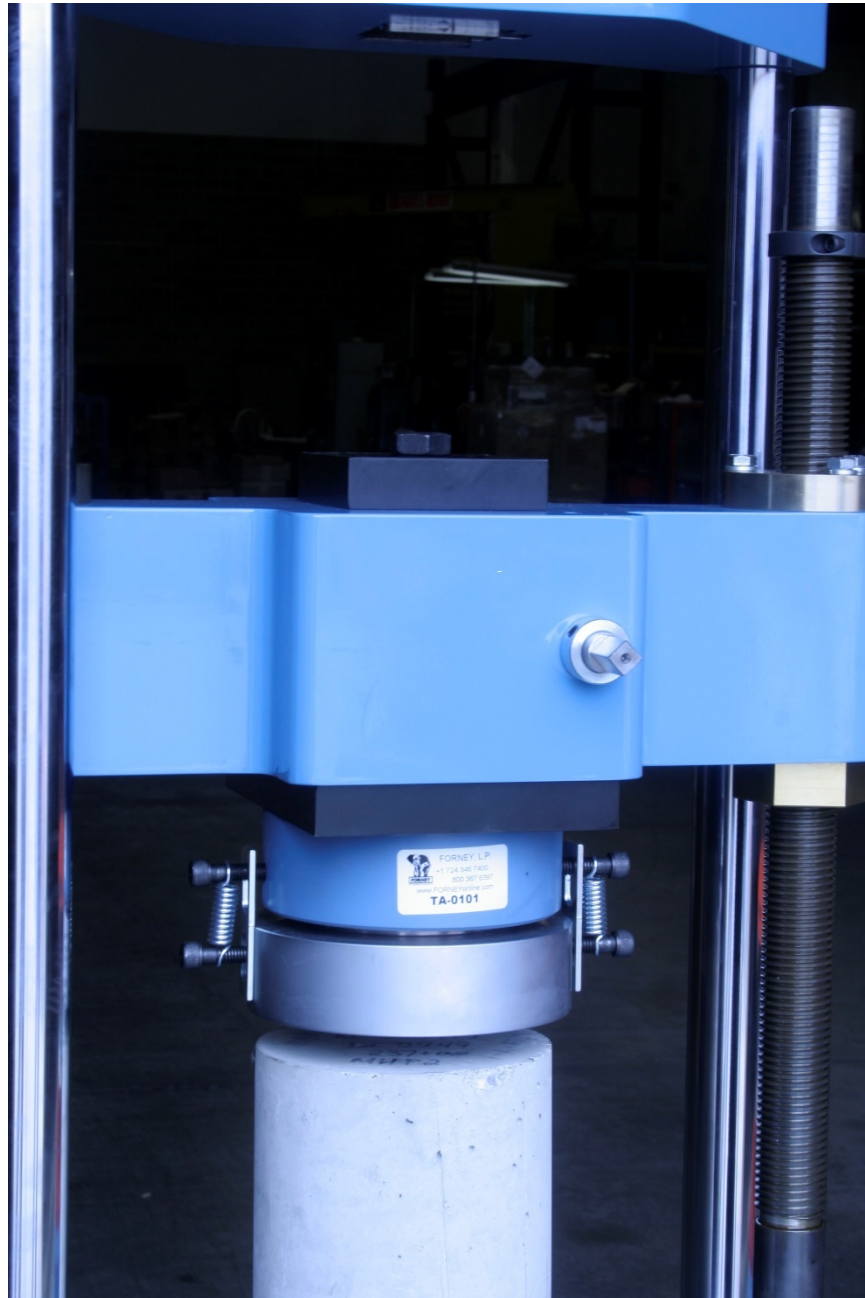
Then place the $\frac{3}{4}$ "-10 x 8" length hex head bolt through the center hole of each plate. This bolt will thread into the top of the breaking head and hold it in place for compression testing.



Next, place a concrete cylinder (or spacer stack) in the frame and place the breaking head on top of the cylinder. Then, using either the piston advance or the moveable crosshead function, bring the breaking head into position to thread the bolt into the top center hole of the breaking head.



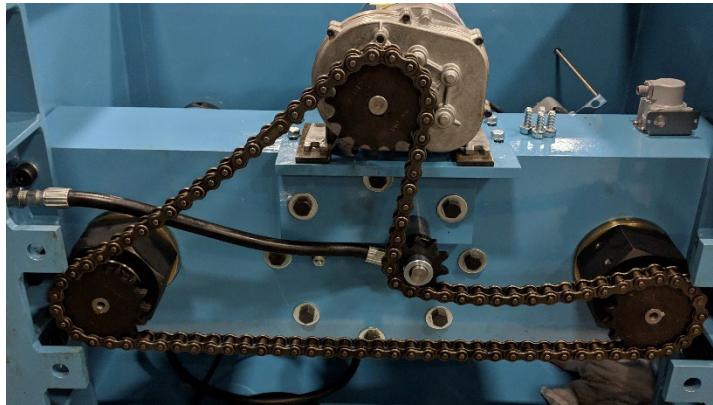
Tighten this bolt fully, so no daylight exists between the blue seat of the breaking head and lower black alignment plate. The finished assembly is shown the image below.



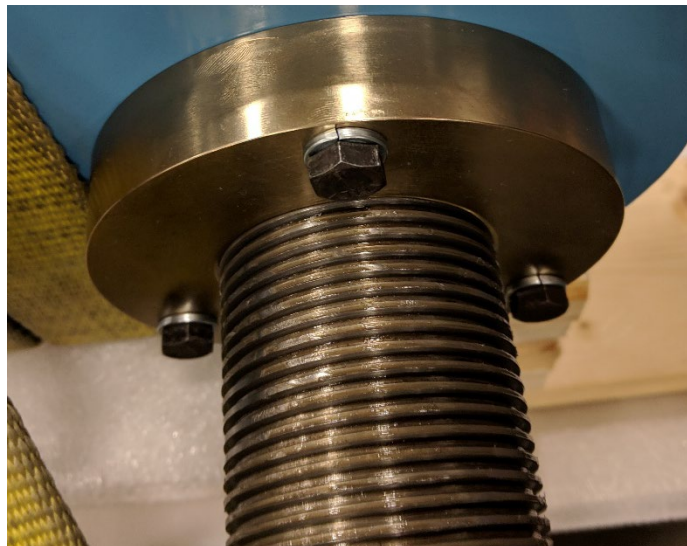
Finally, proceed with the compression testing portion in the CA-0399-LT-60 manual. Note many different compression breaking heads can easily be installed using this method.

PREVENTATIVE MAINTENANCE

Periodic maintenance is required to ensure trouble free operation. The chain drive should be lubricated with either chain oil, or a suitable spray lubricant such as Teflon based silicone spray every 3 to 6 months.



The Acme threaded rods also require lubrication to ensure trouble free operation. Periodically wipe out debris from the threads with a clean lint free cloth and lubricate with a light lubricant such as Teflon based silicone spray. Usage and overall lab cleanliness will determine frequency of this operation, but it should be completed at least once a year. Forney does not recommend heavy grease lubricants as these trap dirt and debris and put extra strain on the gear motor and drive system.



NOTES: