

# **INSTRUCTION MANUAL**

## **FORNEYLINK TOUCHSCREEN INTERFACE**

**MN-TA-1258.23.1**

**[WWW.FORNEYONLINE.COM](http://WWW.FORNEYONLINE.COM)**

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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://www.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!**



## FORNEYLINK TOUCHSCREEN INTERFACE



ForneyLink™ Touchscreen Interface is a powerful device which enables setup of testing protocol, real-time display of test data, and post-test data transfer.

The operator can navigate options for:

- Test Run
- Test Setup
- Machine Setup
- Calibration
- Reporting and Data Transfer
- Diagnostics

Provides simultaneous display of force, stress, and rate of load and displays a real-time graph of Load vs. Time, or Stress vs. Strain.

Paired with other Forney products, such as ForneyVault™, it can offer secure automatic cloud data management or fully integrate with most existing Lab Information Management Systems (LIMS). Please contact Forney for more information.

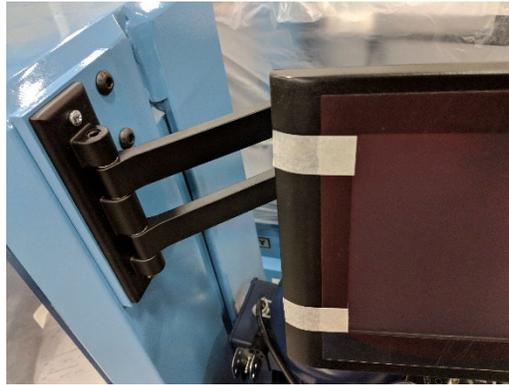
ForneyLink™ is equipped standard with WIFI, USB inputs, and (2) LAN ports. The power switch is located in the lower corner. Always turn off the ForneyLink™ system by momentarily pushing the power switch. This will initiate the operating system to shut down and prevent data loss or file corruption. Once the shutdown process has completed, the PWR LED will extinguish and line power can be disconnected. If installed in an area with poor power reliability, Forney recommends the use on an uninterruptable power supply. (UPS)

Power requirement: 100-240VAC, 1.5A, 50-60Hz



## FORNEYLINK TOUCHSCREEN INSTALLATION

The ForneyLink™ Touchscreen Interface will come with a standard mounting bracket and moveable arm to attach the device to load frames. Mounting holes are predrilled on Forney load frames.



If retrofitting to an older frame, it may be required to drill and tap mounting holes. The holes are 3/8"-16 thread and they are 1.75" apart (center to center).



Once the mounting bracket is mounted to the frame, fasten the ForneyLink™ to the bracket with the included mounting screws.



Next, connect the transducer cable to the transducer port located on the bottom of the ForneyLink™. Then connect the opposite end of the transducer wire to the pressure transducer of the compression machine. The pressure transducer should be installed prior to making this connection.



Finally, connect the 12VDC power adapter to both supply voltage and the DC IN connector located on the bottom of the ForneyLink™ Touchscreen Interface.



## DEVICE LOCATION

It is recommended that the device 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.

ForneyLink 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

The machine should be positioned allowing sufficient space at the side and rear for calibration or servicing working space.

A dedicated electric outlet is recommended to help ensure 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.**

## INITIAL 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.

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

# MACHINE CONTROL SYSTEM OVERVIEW

## Overview

The following sections describe the operation of the ForneyLink touchscreen with standard software installed. If your machine is equipped with ForneyVault®, the basic operation will be the same but you will notice many additional features.

Please contact Forney to learn more about these features.

## CONTROL SYSTEM | MAIN / TEST RUN SCREEN

The “Main/Test Run” screen is the base screen where testing is performed. It provides access to setup, calibration, and reporting.

The screenshot displays the Main/Test Run screen with the following elements:

- Top Left:** "Show Graph" button.
- Top Center:** "This Specimen" dropdown menu set to "4".
- Top Right:** "Cylinder" dropdown menu.
- Center:** "Load" field set to "-526 lbf" and "Stress" field set to "-42 psi". Below these are "Max Load" (0 lbf), "Max Stress" (0 psi), and "Ramp Rate" (0 psi/s) fields.
- Bottom Center:** A green bar with a yellow circle and a plus sign, followed by "± 0 %".
- Bottom Left:** "Start Test" and "Stop Test" buttons.
- Bottom Center:** A status bar showing "1:09:29 PM 9/29/2022" and a language dropdown set to "English".
- Bottom Right:** A row of buttons: "Diagnostics", "User Info", "Verify Calibration 9/29/2022", "Machine Setup", and "Generate Report Transfer".
- Right Panel:** A panel with a "Setup" button and a "Compression" dropdown menu. Below the menu are fields for "Preload" (500 psi), "Ramp Rate" (35 psi/s), and "Break Pct." (50 %). A checkbox "Ask for Break Type?" is checked.

### ForneyLink On-Screen Buttons

**Start Test** – When a test is ready, press this button to start the test. During Preload, this button will be yellow. When a test is running, this button will be green.

**Stop Test** – During preload or test mode, the **Stop Test** button can be pressed to stop the test. Once the **Stop Test** button has been pressed, the test has been terminated and the **Start Test** button will need to be pressed to restart the test.

**Load** – Displays active load. Also allows user to tare or zero the system load/stress. Press on the active load to tare.

**Show Graph** – Shows a graph of the test when pressed. Button changes to “Hide Graph” when a graph is displayed. Press the button to close the graph in this state.

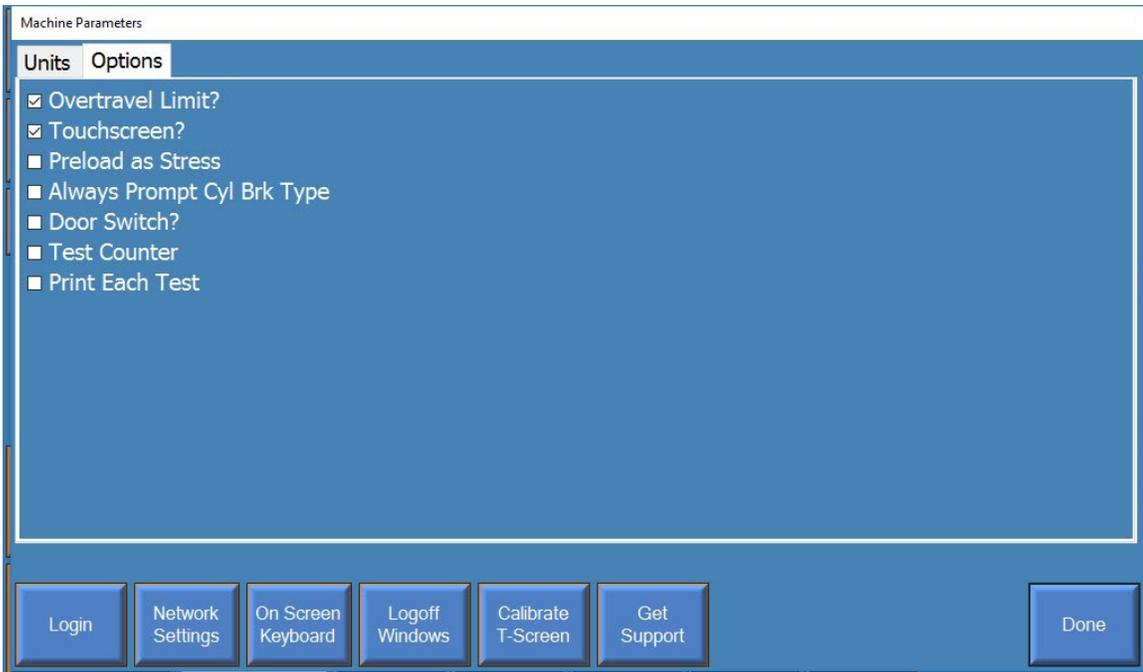
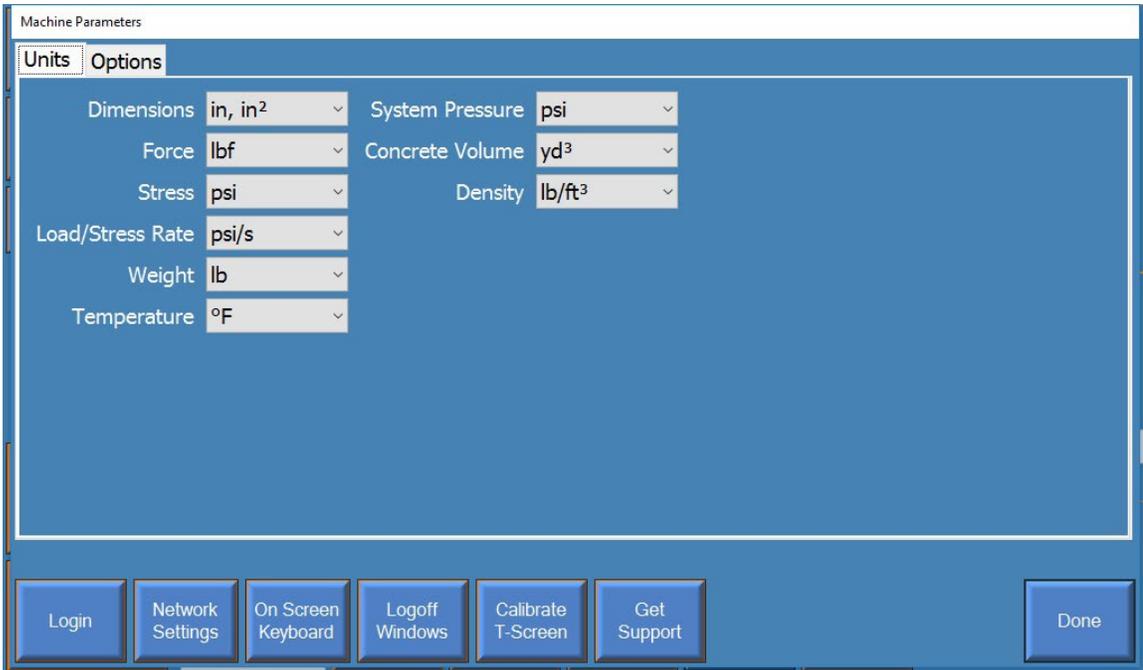
**User Info** – Allows the user to enter and store company name, address, and other reporting information.

The screenshot displays the 'User Information' dialog box within a software application. The dialog box is titled 'User Information' and contains the following fields and values:

- Machine Owner:
  - Name: Forney
  - Company: Forney, LP
  - Address1: 2050 Jackson's Pointe Court
  - Address2: (empty)
  - City: Zelienople
  - State: PA
  - ZIP: 16063
  - Phone: 724-346-7400
  - URL: https://forneyonline.com/

Buttons for 'Cancel' and 'Done' are located at the bottom of the dialog box. The background interface includes a 'Show Graph' button, 'This Specimen 5', 'Cylinder' dropdown, 'Load -526 lbf', 'DiamAvg 4 in', and a bottom navigation bar with buttons for 'Stop Test', 'English', 'Diagnostics', 'User Info', 'Verify Calibration 9/29/2022', 'Machine Setup', and 'Generate Report Transfer'.

**Machine Setup** – This brings up a screen that contains various units of measure and machine options. Select available units from the drop-down box for each unit. Recalibration is not required when changing units of measure.



**Verify Calibration** – This button allows access to the verification and calibration screens. Calibrating and verifying the machine allows accuracy exceeding ASTM E4 requirements. This menu is discussed in detail in the Calibration section.

**Generate Report/Transfer** – This button is used to reprint specimen reports, create summary reports, and transfer data files to an external USB flash drive.

## Display Fields

**Load** – This is the current live load measured at the machine’s main ram. This is a calculated value based on the hydraulic pressure at the ram, and the diameter of the ram. This value can be reset at any time (press live value to tare), other than when a test is running. Resetting the value allows for compensation for materials placed on the ram that do not exert force on the test specimen.

**Stress** – This is the current live stress measured at the machine’s main ram. This is a calculated value based on the calculated load and the surface area of the specimen (or other method per applicable ASTM or other standard). This value can be reset at any time (press live Load value to tare), other than when a test is running. Resetting the value allows for compensation for materials placed on the ram that do not exert force on the test specimen.

**Max Load** – This is the peak load encountered by the specimen since it was last reset. This value is reset at the beginning of every test.

**Stress at Break** – This is the peak stress encountered by the specimen since it was last reset. This value is reset at the beginning of every test.

**Ramp Rate** – This is a display of the current ramp rate during a test. Directly beside ramp rate is a bar graph to give visual indication of ramp rate. A bullseye indicator is in the center of the bar indicates exactly hitting the targeted rate of load. Yellow indicates a warning to the operator to manually adjust the rate control as it is close to exceeding the percent allowable limit (typically +/-20%) for rate. Red indicates exceeding the allowable range for rate control.

**This Specimen** – The ID for the currently running test, or the last completed test. This must be an integer on standard machines. ForneyVault® enabled machines have many more options for data storage hierarchy including projects and locations, samples, sets, etc. Please contact Forney to learn more. To change the ID, press on this field.

## Specimen Setup

**SPECIMEN DROP-DOWN BOX** – Select the specimen to be run. This allows access to various specimen setup input parameters. Care should be taken when entering the dimensions as specimen stress is calculated using this parameter.

**TEST DROP-DOWN BOX** – Select the test to be run. For most machines, the only test available will be compression. However, machines that have additional options, such as MOE will have additional test types, depending on the specimen type selected.

Care should also be taken when entering the following three important setup parameters:

1. **Break %** = Percentage of the peak load used to detect a specimen break. For example, if the **Break %** is set at 70%, and the system maximum load is 100,000 lbs., a drop to 70,000 lbs. or less would trigger break detection. (70% or below max load of 100,000 lbs.)

Care must be exercised if this setting is set too high or too low. For example, if 95% was selected, the system may stop the test when a chip breaks off a corner. Full breaking stress may never be reached. Alternatively, if the percent is too low, the system may never detect breakage. Forney recommends a **Break %** from 50% to 70% for most applications.

2. **Ramp Rate** = Target for bar. This value should be set based on testing standard.
3. **Preload** = This value is the load before data collection begins. During **Preload**, no break detection is applied. It is important to select a **Preload** value that is high enough so that break detection is not activated prematurely. In most applications **Preload**, should not be set lower than 1% of a testing machine's capacity. Note: ASMT C39 allows a fast advance up to 50% of the anticipated break strength before controlling at 35 psi/s.

## Other Parameters:

**Correction Factor** – Per ASTM 39, **Correction Factor** is only used for specimens that are not standard diameter vs. length. When required, the correction factor is applied to displayed values. A value of 1 should be used when diameter vs. length does not require applying a **Correction Factor**.

**Break Type** – Used to store the break type according to ASTM C39. When the checkbox “Ask for Break Type?” is selected the system will prompt the user to choose the break type at the end of each test.

Note: ForneyVault® enabled machines automatically get all specimen setup information as entered when the specimen was created in either the lab information management system or ForneyVault® web interface.

## CALIBRATION AND VERIFICATION

Before the machine can be used, it must be calibrated. While FORNEY machines are factory calibrated, ASTM E4 requires the machine to be re-calibrated in its final location. Verification is completed on the “Verify Calibration” screen. If necessary, calibration is performed by pressing the Calibrate Machine button on the verification screen. Please note the user must have the proper password to calibrate the machine. Please contact FORNEY technical support for the proper password.

The general process for verification is to apply load to an ASTM E74 certified load cell and verify the applied load matches the load on the machine indicator. The Capture Load button is pressed while watching the load cell to allow easy precise capture of load. Follow all regulations for verification as outlined in the most current version of ASTM E4 otherwise. Even if no adjustment to the calibration is necessary, the calibrator should still enter the calibration screen and press “Done” to update the calibration date.



The calibration procedure is to capture hydraulic pressure values at known load values. Choose 5 data points with the first always being zero. The calibrator should first go through and enter load values, shown in pounds force (lbf) below, before starting. The calibrator will then load the system using the manual hydraulic valve, applying load to the system to reach the preset load values. When the system is loaded to the appropriate points, the point button should be pressed, which records the psi value for that load, thus calibrating the system.

Point	psi	lbf
1	0	0
2	1,768.39	50,000
3	4,420.97	125,000
4	8,841.94	250,000
5	28,294.2	800,000

Calibration Date: 9/30/2022

All calibration points must have values. Each calibration point must be greater than the previous calibration point for both pressure and load. The number of points used is determined by calibration requirements for the tests performed. It is acceptable to use fewer than five points, but the unused point(s) must have values higher than the calibrated range. In the example above four points are used to calibrate a 250,000 lbf machine. The fifth point is chosen above 250,000 lbs. and maximum system pressure.

## Load Calibration:

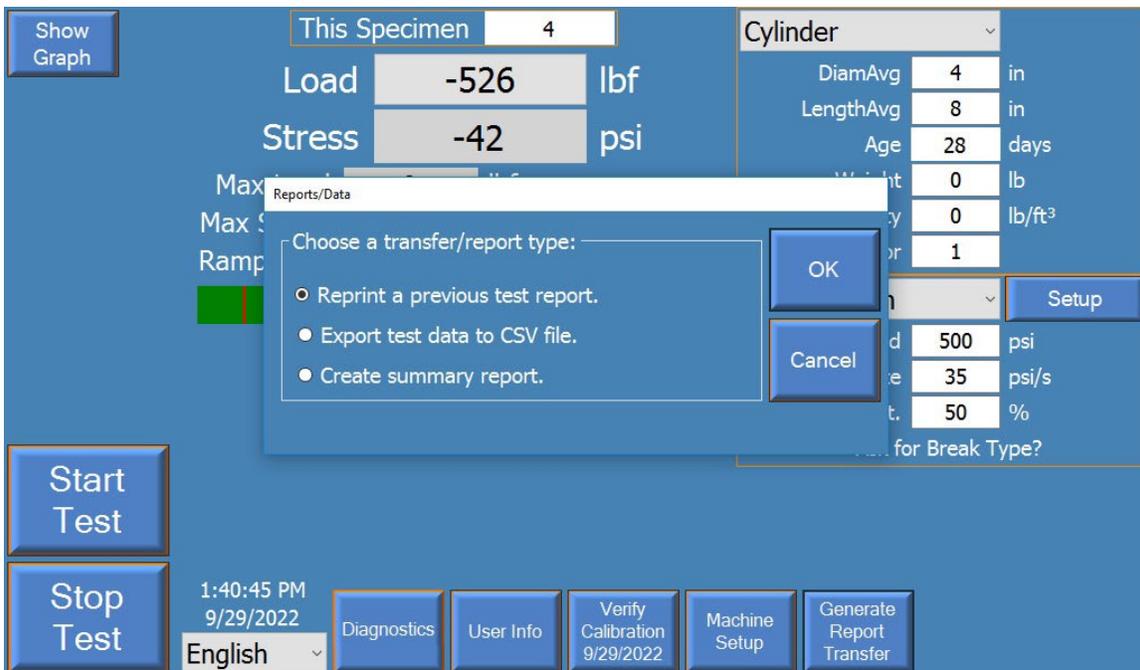
The calibrator will need an ASTM E74 certified load cell/readout to measure actual load while running the machine.

1. Load appropriate load cell for calibration range, allowing proper warm-up to manufacturer recommendations.
2. Select force values for the points used during calibration by pressing the boxes along the right side of the screen. This brings up a keypad to allow the operator to set the force values desired. The five force values used in the screenshot are 0 lbf, 50,000 lbf, 125,000 lbf, 250,000 lbf, and 800,000 lbf.
3. Use the manual loading valve and the hydraulic power unit to load the machine as necessary during calibration.
4. Advance until there is a gap of approximately 1/16" before touching the load cell and press the point 1 button. This will set the pressure for the first (zero) reading.
5. Advance until approaching the second load point and then slow the system. Moving slowly towards the next point, press the point 2 button just as the load reaches the desired force to set a pressure (psi) value for point 2.
6. Repeat this process until you have stored values for all calibration points. If using fewer than five points, make sure to assign logical pressure values to the load values outside of the calibrated range.
7. Use the Load reading to verify calibration.
8. The "Capture Load" button will take a snapshot of the live load during verification loading. To use, slow the machine during your verification readings and press this button while watching the load cell to record the load. This method is convenient for a single operator to get accurate verification readings.
9. Once verification is complete, write down the constants or take a photo of the screen. In the event of system failure, these values can be restored without requiring recalibration.
10. Exit back to the main screen.

## DATA LOGGING

Standard functionality includes data collection by the ForneyLink HMI for printing and transfer.

Press the Generate Report/Transfer button to manage logged data. Two data sets are stored on the machine. The summary data has summary information for each test performed, including peak break load, the test id, and basic specimen information. The second data set is the test data and contains the force-vs-time information for the complete test(s).



To retrieve test data or summary reports, an external USB drive, such as a USB thumb or USB flash drive must be attached to the touchscreen.

To generate a summary report, press the 'Create summary report' button and then select one or more stored summary data files for your report. Press the 'Generate Report/Transfer' button to generate the report.

Select Reprint a previous test report and then select the proper test ID to reprint a test report.

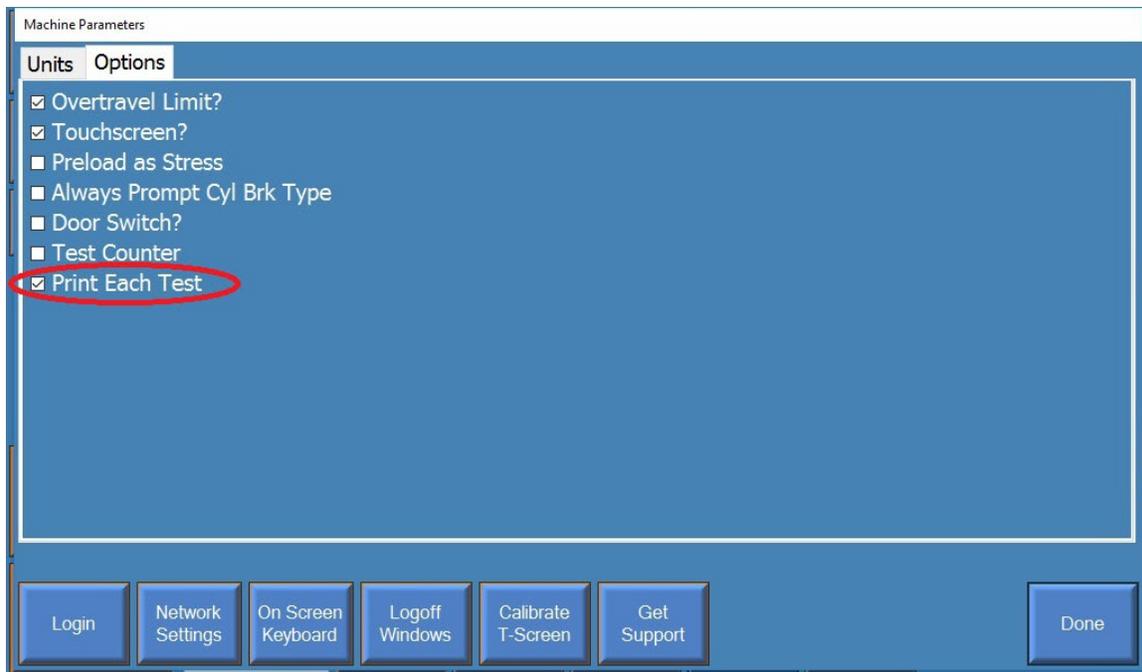
To retrieve detailed test data for a specimen, select "Export test data to CSV file." A CSV file or Comma-separated value file is a standard file that are standard with a wide variety of applications, such as Microsoft Excel.

## PRINTING

The system can be configured to print every test report. Most printers will be automatically setup by the operating system when connected. Some printer drivers will require remote assistance from Forney to install.

Please contact FORNEY Technical Support if your printer requires advanced setup.

The “Print Each Test” checkbox is found on the Options tab of Machine Setup. Select the checkbox to print each test



## QUICK GUIDE TO RUNNING A COMPRESSION TEST

1. Turn on power via rocker switch if not already running. Allow system to boot and manual hydraulic power unit to warm up. (in retract mode) if needed.
2. Check specimen and test type, change to desired specimen if needed. Make sure to check the specimen dimensions and set the **RAMP RATE, BREAK PERCENT, and PRELOAD.**
3. Load specimen in machine according to applicable standards.
4. Manually advance the piston until almost touching the specimen.
5. Press the active load value to tare.
6. Press the 'Start Test' button.
7. Apply pre-seating load if required per applicable standards.
8. Set valve to full advance to apply preload to applicable standards.
9. Set valve to metered advance and control at desired rate utilizing the bar graph to adjust to fast or slow rate as required until break occurs.

10. Select the ASTM C39 break type as shown in the screenshot below:



11. Record the Load at Break, or Stress at Break as desired, or simply move on to the next test if the data-logged results are used.
12. Clean out any debris from the broken specimen and repeat from step three to continue testing the specimen type.

**NOTES:**