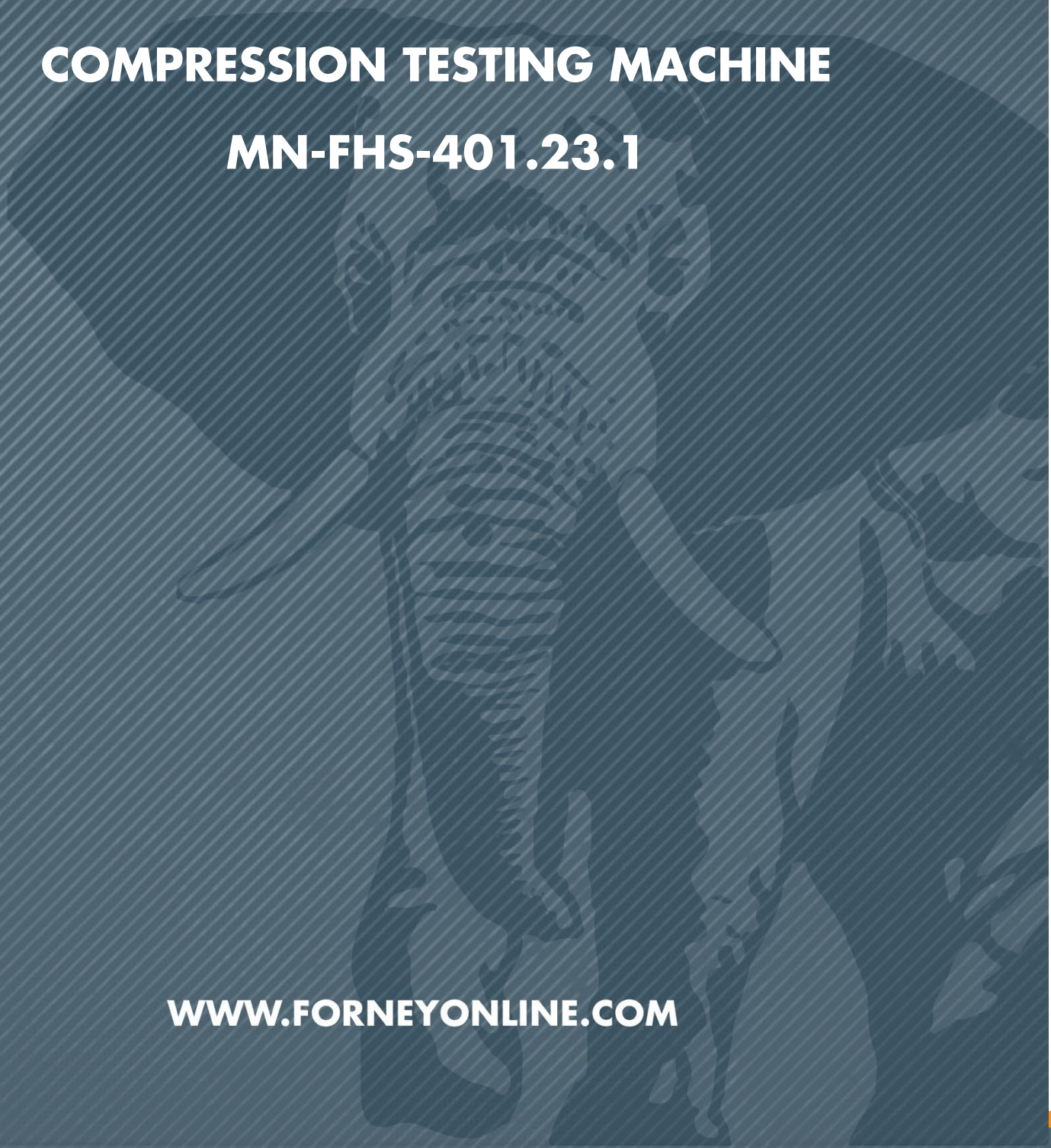
INSTRUCTION MANUAL

FHS-401

COMPRESSION TESTING MACHINE

MN-FHS-401.23.1



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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 inquires 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

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	4,500lbf - 450,000lbf
Vertical Opening	19"
Horizontal Opening	14"
Ram Diameter	10.5"
Piston Stroke	2.5"
Platen Hardness	60 HRC
Lower Platen Dimension	12.25" x 16.25”
Upper Platen Dimension	*See Available Accessories
Oil Reservoir Capacity	2 Gallons
Overall Width	34"
Overall Depth	22"
Overall Height	62"
Unit Weight	2,000lbs

FRAME

The load frame is manufactured from solid steel sides welded to top and bottom crossheads of solid steel plate. The hydraulic cylinder assembly is mounted to the bottom crosshead, with force being applied in an upward direction.

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.
- Machine can now be removed from pallet.
- 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

For proper operation, all machines should be accurately leveled and secured to the floor with anchor bolts. This is especially important when testing high strength concrete or utilizing pad caps. Forney recommends ½" diameter anchor bolts.

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 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

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. Details of adjustment procedures are described in the Machine Control Section of this manual.

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.

SAFETY FEATURES

Several safety features are incorporated to protect both operator and testing machine:

- The hydraulic power unit utilizes an adjustable high-pressure relief valve which protects the testing machine from becoming overloaded. This is factory preset and typically does not require any adjustment in the field. Please contact Forney support if the relief valve requires adjustment.

- Fragment guards with heavy-duty latches and hinges are mounted to both the front and rear of the compression frame. Fragment guards incorporate Lexan® inserts for complete operator protection from flying debris when testing explosive high-strength specimens. Lexan® also permits clear viewing of test in process.

- Piston over-travel limit switches come standard on all VFD machines. These switches prevent travel of the piston beyond the 2.5” stroke limit of the testing machine.

Piston over-travel limit switches are optional equipment on manually controlled machines but are strongly recommended. If not installed, travel must not exceed 2.5”. Hydraulic oil leaks and damage to machine parts can occur if the piston is overextended.

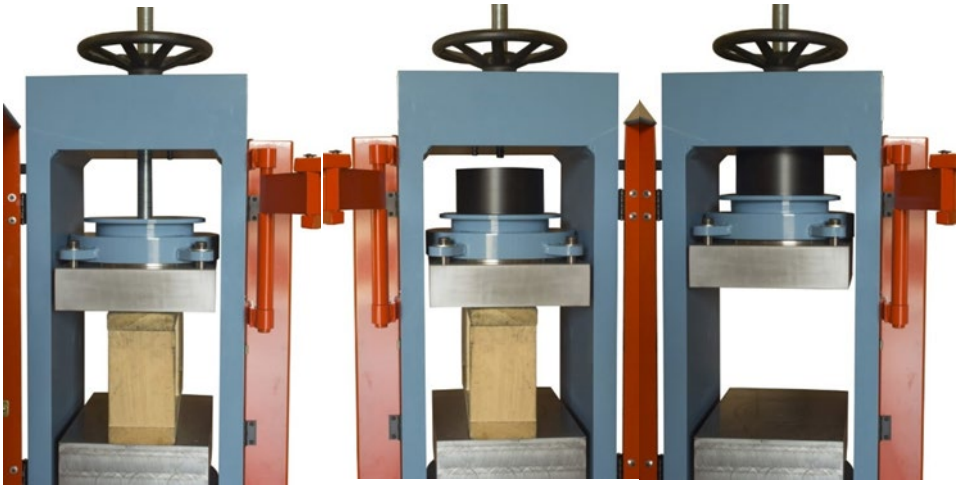
TESTING MACHINE ACCESSORIES

Method of Installation

All standard breaking heads for the FHS-401 Series Testing Machine are held in place by one of two methods:

<u>Method One</u> – Draw Rod Assembly (TM-3300-16)

All accessories can be mounted in the machine using the draw rod assembly. If the accessory has a holding stem, simply remove it by unthreading it counterclockwise and you will leave a hole that will accept the draw rod threads. When using a heavy accessory like a block breaking head, only use the draw rod method to safely raise and lower the accessory in the machine.



How to mount an accessory using the draw rod method

1) Stack the testing accessory and spacer (or spacers) on the machine's lower work platen. Spacers (with the center hold drilled) can be used to take up any extra daylight space for a given specimen type. Please note not to exceed 2.5" of piston travel during testing.

2) Loosen the set-screw and leave loosened (the set screw is not used when using the draw rod method). Slide the draw rod through the center hole in the top of the machine and then through the spacer (or spacers) that will be used with the testing accessory.

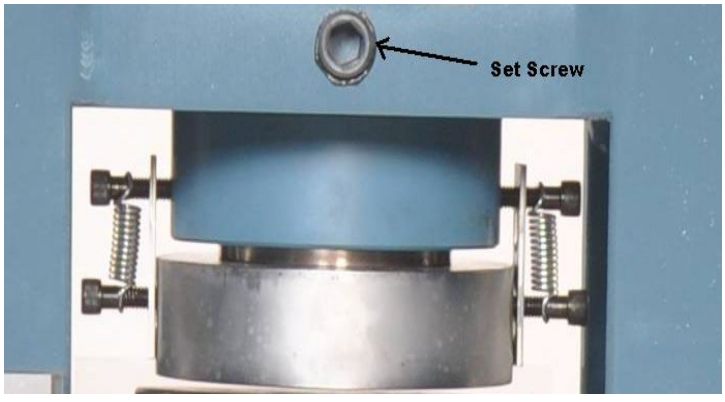
3) Thread the draw rod into the testing accessory by turning the T-Nut at the top of the draw rod clockwise, and securing it tightly into the accessory.

4) Turn the hand wheel clockwise while holding the T-Nut at the top of the draw rod firmly. Continue turning the hand wheel until the testing accessory and spacers are drawn up tightly to the top block of the frame.

Reverse above process to remove and change the accessory setup.

Method Two – Holding Stem and a Set-Screw

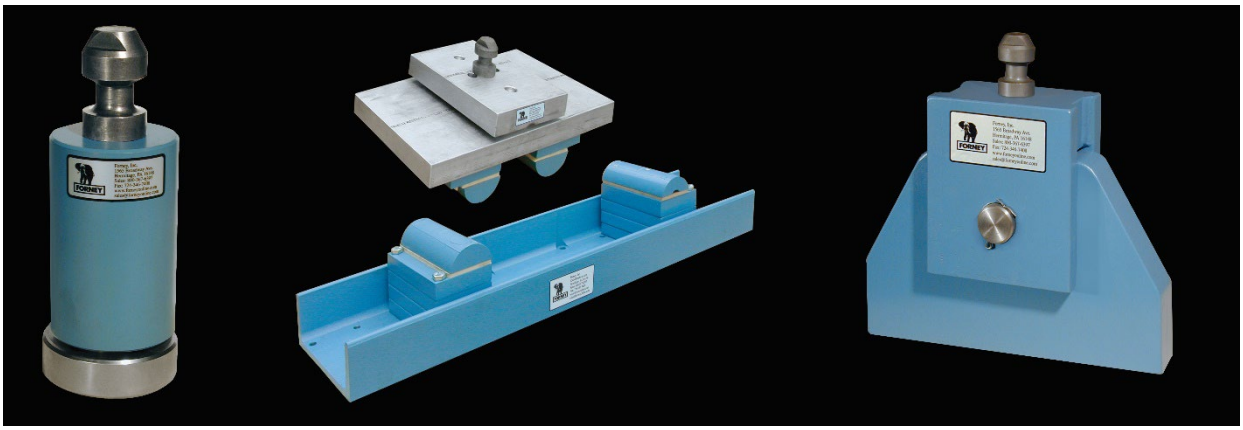
Place accessory (with the holding stem attached) firmly into the center hole of the frame, and tighten the set-screw against the holding stem, see photos below showing set screw and holding stem. There should not be any force during testing on the holding stem and set screw. The force should be between the frame and blue seat of the testing accessory.



Note Regarding Unbonded Capping:

The sudden release of energy (when the specimen breaks) associated with rubber pad caps can greatly reduce the life of hydraulic and mechanical components. Pad caps are not recommended for prolonged testing beyond 60% of the machine's maximum capacity.

Some common accessories available for your machine are displayed below for 2" cube, flexural beam, and cylinder splitting. Please contact FORNEY sales for any standard or non-standard application you require.



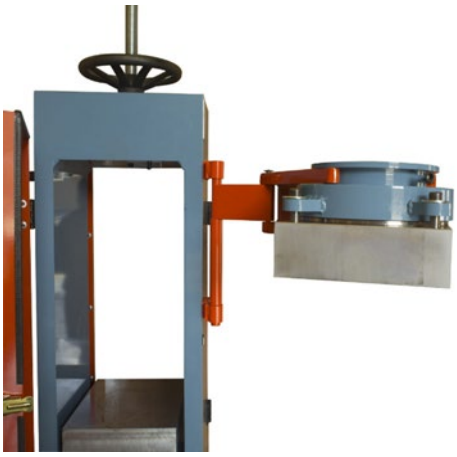
Block Platen Storage – Carrier Bracket Assembly (TA-0158-26 OPTIONAL)

An easy method of storage for the heavy-duty block platen is the FORNEY carrier bracket assembly. This bracket typically mounts off the back side of the machine and allows the block accessory to be moved out of the machine quickly, easily, and most importantly safely. To operate the carrier bracket:

1) Move the block accessory to the correct vertical position aligning the cutout of the accessory with the arm of the carrier bracket. If using spacers, it will be necessary to lower the accessory first, remove the spacers, and then re-attach the platen to the draw rod and move it into position.

2) Move the arm into position to grab the accessory and **be sure to tighten the lock screw down to prevent the block platen from falling out of the carrier bracket!**

Loosen the accessory from the draw rod by turning the T-bar end counterclockwise. Again, make sure the accessory is in the proper place inside the carrier bracket arm and the locking screw is tightened down prior to releasing accessory from the draw rod. Reference photos below showing proper alignment. Swing accessory out when locked in position.



PREVENTIVE MAINTENANCE

Keeping this unit clean and the oil free of dirt will increase the life of the pump, valve(s), and other hydraulic components. The oil reservoir has been filled prior to shipment with Dexron III Automatic Transmission Fluid. Oil capacity is approximately 2 gallons.

Testing accessories should be cleaned as needed. Spherical discs and seats should be disassembled, cleaned, and lubricated periodically with a light lubricant such as Dexron III ATF or spray lubricants. Do not use heavy lubricants, such as grease, as dust and debris will collect in it and prevent the unit from rotating properly.

The reservoir should be drained and replenished with clean oil at least once a year. The frequency of the oil change will depend greatly on the general working conditions, hours of use, and the overall cleanliness and care given to the system.

NOTE: The following operations should be performed with the power off and the piston retracted to effectively determine fluid level.

Checking & Maintaining the Oil Level

1. After locating the pump & motor assembly, find the fill plug on the top of the reservoir cover plate.
2. Check the oil level in the reservoir by removing the fill plug and inserting a dipstick in the reservoir. The system is full when the technician observes a reading 2 inches below the top of the tank when fully retracted. Overfilling may cause performance issues, leaking, and/or damage to the pump, motor, or valve(s).
3. When it is necessary to add oil to the reservoir, remove the cap and fill the reservoir to the proper level with Dexron III or VI Automatic Transmission Fluid (ATF). The reservoir capacity is about 2 gallons.

Draining & Cleaning the System

1. Disconnect the power and ensure the piston is retracted.
2. Thoroughly clean the pump exterior.

VFD Control System:

1. Disconnect the high-pressure line and set it in a clean bucket.
2. Remove the solenoid from the valve cartridge by unthreading the cap and then sliding it upward off of the valve.
3. If your system has a transducer attached to the high-pressure line, disconnect by unscrewing the signal cable.

Manual Control System:

1. Loosen the Allen head screws and remove the valve from the cover plate, to perform the following steps.

Continued…Common to Both Systems:

1. With all attachments now disconnected, remove the four bolts holding the reservoir to the shelf.
2. Remove the screws along the top plate of the reservoir.
3. Lift off the motor, top plate, and pumps as one unit and carefully rest the unit on its side on clean rags to soak up excess hydraulic fluid.
4. Check and clean the filter screen on the intake of the pump assembly at this time. A soft brush can remove any build up on the screen.
5. Drain the fluid from the reservoir.
6. Using a clean lint free cloth, wipe out any remaining fluid and debris from the bottom of the tank.
7. Once complete, partially fill the tank with approximately one gallon of clean fluid.
8. Reassemble the top assembly to the reservoir, changing the gasket if necessary.

How to Fill the Reservoir with Hydraulic Oil

1. On the back, top side of the reservoir, locate the plastic screw-in-plug. This is the fill hole for hydraulic oil. Clean the area around the plug to remove all dust and grit before removing the screw-in-plug. Any foreign particles in the oil could damage pump surfaces resulting in loss of performance.
2. Insert a clean funnel with filter.
3. Fill the reservoir with new Dexron III Automatic Transmission Fluid to approximately 2” below the top plate of the reservoir. Do not overfill as this can cause poor performance, leaking, and possibly damage to the system.
4. Replace the plug.

Test the system. Sometimes multiple starts and stops are needed to prime the pump following service.

Bleeding Air from The System

Upon initial startup, air can accumulate within the hydraulic system. The trapped air can cause the system to advance slowly or surge and make the motor become noisy. To remove the trapped air, try the following steps.

1. With oil in the unit and the machine ready to operate under zero load, advance the piston about 2” of travel and then retract to the starting position. This should be done several times to work the air out of the system. If this does not remove all trapped air, you can perform step #2.
2. With oil in the unit and the machine ready to operate under zero load, loosen a couple of turns, but do not remove, a hose fitting that is situated higher than the rest of the hose fittings in the system. Run the pump until a steady flow of oil, free of air bubbles is observed. Re-Tighten the fitting.

Replacement Parts

Please refer to the model and serial number of your testing machine when ordering parts. This information can be found on the metal information tag of the testing machine typically affixed to the upper left side of the frame.

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