AutoFil GenII

FLATPROOFING TECHNICAL MANUAL

We keep the world rolling.
No flats, smoother ride, more protection.

TyrFil™
A CARLISLE BRAND

This manual is intended to assist the tire fill technician in the operation of the AutoFil-GenII. It covers the basic operation of the machine, procedures for filling a pneumatic tire and general maintenance of the machine. Inside you will find the basic steps incorporated in the control, air/water valve procedure for filling a tire, general troubleshooting if problems occur and general procedures for fixing the machine if problems occur. Like any computerized machine there is a learning curve involved depending on the operator, our experience has led us to a conclusion that the curve is anywhere from one (1) month to three (3) months. If any mistakes are found in the manual, please contact us so that we can correct them.

Your cooperation is deeply appreciated.

THANK YOU AND WELCOME TO THE TEAM,

Carlisle TyrFil
Technical Services Department
Office: (800) 821-4147
Normal Hours of Operation: 8:30 AM – 4:30 PM EST

TABLE OF CONTENTS

DISCLAIMER 2

INTRODUCTION 4

I. REQUIREMENTS 5
- Technical Training 5
- Floor Space 5
- Equipment and Tools 5
- Supplies 6

II. SAFETY 7
- General Precautions 7
- Material Precautions 8
- Safety Supplies 8

III. PREPARATION 9
- Equipment Set-Up 9
- Additional Information 10

IV. AUTOFIL-GENII INTRODUCTION 11
- Main Interface Screen (Tire Filling) 11
- Setup Screen 12
- Maintenance Screen 12
- Recipe Screen 13
- Edit Recipe Screen 14
- Scale Calibration 15

V. AUTOFIL-GENII SAFE OPERATION & MAINTENANCE 16

VI. START UP DIRECTIONS 18

VII. TIRE FILLING DIRECTIONS 20
- Production Totals 21
- Notes 21
- Virgin Tire Filling 22
- Notes & Special Considerations 22

VIII. SHUTDOWN & CLEAN UP DIRECTIONS 23

INTRODUCTION

Flatproofed tires must be processed correctly to provide the customer with the maximum benefits of no flat tires: full tire life, consistent internal pressure, no rim slippage, improved safety, proper tire flex, cost savings, and retreadability.

The tire flatproofing process includes the following steps:

- Inspecting tires and wheels for defects
- Pre-stretching the tire overnight
- Pumping material through the valve stem into the tire replacing all of the air
- Pressurizing the tire to the recommended inflation pressure
- Curing at the proper time and temperature to ensure optimum filled tire performance

It is a precision process and should only be performed by a Carlisle TyrFil Certified Technician. Proper training and this Manual provide the necessary information to flatproof tires. This Manual is intended for use with the TyrFil AutoFil-GenII. As always, we remain available to assist you with all aspects of your flatproofing business. For any questions or problems, please call our ***Sales and Technical Center at (800) 821-4147.***

Disclaimer

This Carlisle TyrFil Flatproofing Technical Manual contains information pertaining to flatproofing tires with our manufactured products that have been installed through the Carlisle TyrFil approved processing systems.

This Manual contains information regarding the flatproofing process only, it does not contain other information which may be relevant with respect to the flatproofing process (for example, the tire manufacturer's specifications and information, workplace safety information, etc.). It is important that all flatproofing processors follow not only the safety procedures set forth in this Manual, but also standard safe operation and work conditions, and other safety procedures that may pertain to the facility in which the flatproofing is taking place, and the specific tire manufacturer's safety information.

Although this Manual has been developed for the purpose of instruction, the flatproofing processor must be properly trained in all phases of the job performance, which include, without limitation, installing TyrFil products into the tire in a safe manner, the proper use and operation of the equipment, and the proper maintenance of such equipment.

Carlisle TyrFil shall not be responsible for any injury or damage to persons or property in connection with the processing or use of our products. Further, Carlisle TyrFil shall not be responsible for any injury or damage to persons or property due to a customer's actions, the customer's disregard for the safety procedures set forth in this Manual or other safety procedures, the customer's failure to comply with the tire manufacturer's product guidelines, or due to a customer's failure to follow our instructions, verbal or written, pertaining to the flatproofing process.

Carlisle TyrFil's technical and sales staff make routine visits to its customer's locations for the purpose of reviewing processing rooms and conduct technical trainings. However, a customer should not rely on such visits as assurance that it has taken all safety and other precautions.

Carlisle TyrFil maintains a knowledgeable technical support staff who can assist our customers with any questions or troubleshooting that may be needed in connection with our products. Further, Carlisle TyrFil maintains an inventory of parts, and written technical and safety data on its products.

Any questions regarding information contained in this Manual, our products, or our recommended equipment should be directed to the Carlisle TyrFil Sales and Technical Center at (800) 821-4147.

I. REQUIREMENTS

Technical Training

Training by the Carlisle TyrFil Technical Department is essential to any successful flatproofing operation. All flatproofing technicians need to go through our certification process which includes training videos, demonstrations, hands-on practice, and a short quiz. All certified technicians will receive a certificate and uniform patches.

Floor Space

The volume of your business determines the amount of space required. Space must be provided for:

- Pumping area
- Tires and materials storage
- A temperature-controlled curing area

The minimum space required is 900 square feet (84 square meters), approximately the dimensions of a residential double garage. This area should be well-lit, well-ventilated, and heated (if necessary) to maintain a minimum of 72° F (22° C).

Equipment and Tools

AutoFil-GenII – The Carlisle TyrFil Patented AutoFil-GenII significantly reduces carbon footprint and saves money by recycling and using up to 65% reclaimed tire fill while reducing the petrochemicals (including oil) normally required to fill an Off-the-Road (OTR) tire. The AutoFil-GenII processes virgin PU grind and PU/rubber grind. Replacement parts for the AutoFil-GenII are readily available through Carlisle TyrFil. The AutoFil-GenII requires 3-phase electrical service of 480 VAC @75 Amps. If you have questions regarding the electrical requirements, please contact the technical department at (800) 821-4147.

Material Handling Equipment – A forklift will be required to handle large tires and position totes on the scales.

Miscellaneous Tools – Have available: a large pipe wrench, channel locks, vise grips, pliers, tote wrench, assorted screwdrivers, wrenches, hammers, and a valve core remover. You will need a ⅜-inch drill bit for venting the tires you are filling with recycled material. You will also need appropriately sized lag bolts for sealing the vent hole. For virgin filled tires, needles can still be utilized if desired. **Never use needles when filling with recycled media. A larger vent hole is required!**

Supplies

Product – Flatproofing materials are supplied in Intermediate Bulk Container (IBC) sets. Intermediate Bulk Containers are commonly known as “totes”. A kit or set is comprised of one ISO-side and one CAT-side. Each tote set is 4,500 lb/550 gal (2045.45 kg/2081.75 l).

Solvent – Isopropyl alcohol (99% pure) is the recommended solvent for cleaning tools. It can generally be purchased locally. Solvents should be stored in UL/FM (Underwriters’ Laboratory/Fire Marshall) approved containers and handled in accordance with all federal, state, and local regulations.

Self-locking plastic bags – These are used for retaining liquid batch samples while they cure.

Waste Container – Empty 5-gallon pails are useful for collecting waste material. Using a plastic liner makes disposal easier. *

Cleaning Rags – keep plenty of rags on hand for clean-up. A clean pumping operation is essential for proper tire processing. *

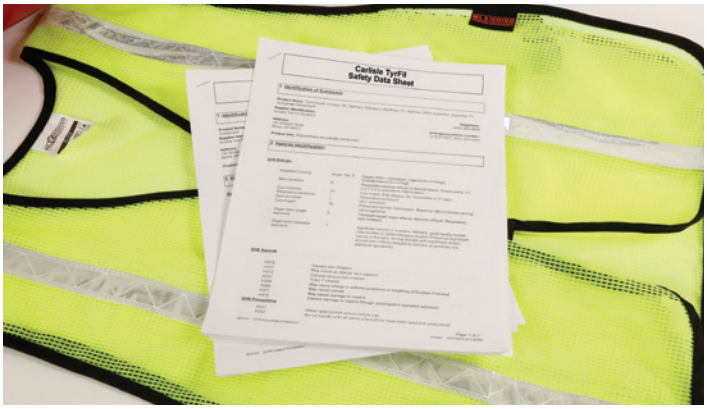
**** Be sure to follow all federal, state, and local regulations when disposing of any cured or uncured material or other related items.***

INTERMEDIATE BULK CONTAINERS (TOTES)

II. SAFETY

General Precautions

SAFETY SHOULD BE YOUR NUMBER ONE PRIORITY. IN ORDER TO PROMOTE SAFETY, CARLISLE TYRFIL WANTS TO EMPHASIZE THE FOLLOWING:



Safety Datasheets (SDS) identify the properties of ISO-side and CAT-side products and the precautions that should be taken when handling them. Safety Datasheets have been prepared in accordance with the U.S Department of Labor and the Occupational Safety and Health Administration (OSHA) for each product. Please read them carefully. In accordance with Federal law, these must be available to all employees on-site. If you do not have a copy, call immediately to have one faxed and/or mailed.

Operators must wear eye protection when using equipment. Gloves rated to withstand the chemical hazards are to be worn to prevent skin contact anytime a risk of exposure exists. Exposure to fumes must be limited using methods of control including proper ventilation.

Be sure to inspect all rims, lock rings, wheels, and associated restraining bolts for structural defects prior to filling. While filling, use a safety cage, or other OSHA approved restraining device to protect yourself. Flatproofing equipment should never be left unattended while the equipment is in operation. Please refer to other reference materials, such as from the Tire Association of North America (TANA) and OSHA, on proper tire preparation and handling.


SAFETY CAGE

Use extreme care when disconnecting any material supply hoses. Be sure to release the pressure and loosen the couplings slowly before disconnecting completely.

Spilled material must be cleaned promptly for easier clean up and to avoid falls. Cured urethane is extremely difficult to remove from concrete floors. Use a barrier such as cardboard or roofing felt in your flatproofing area to protect the floor and replace as needed.

In case of a liquid spill, soak up the spilled material with an oil absorbent, such as sawdust or vermiculite. Sweep it into a waste container and neutralize it with a decontamination solution (95% waste, 3% ammonia, 2% detergent). Spilled solvent (isopropyl alcohol) is a fire hazard and should be cleaned up promptly. Smoking, grinding, or open flames should not be permitted in the work area. Be sure to handle spills, clean-up, and disposal in accordance with all federal, state, and local regulations.

For a chemical emergency (spill, leak, fire, exposure or accident): call Chemtrec – day or night – from the United States or Canada (800) 424-9300

Minor spills or leaks (less than five (5) gallons) can be cleaned up according to instructions in the SDS.

Material Precautions

The ISO-side (isocyanate) is especially sensitive and will solidify from the slightest exposure to moisture or humidity. A desiccant is required on the ISO-side.

Material temperature should be at least 72˚ F (22˚ C) while processing. Cold materials become thick, which slows pumping and can result in inadequate mixing and poor/slow cure.


SAFETY CAGE

Safety Supplies

Signs – "No Smoking" signs should be posted due to hazards presented by chemicals.

Tire Cage – Tires should be filled in a tire cage. Tires over-pressurized with air or liquid can fail with explosive force. Cages are mandatory when working with TyrFil equipment. On wheels with split rim or lock ring assemblies, position the lock ring facing away from the operator and work area.

Fire Extinguisher – Extinguishers should be within easy reach as isopropyl alcohol is flammable and poses a fire hazard.

Eye Protection – Eye protection is essential and should be worn at all times as liquids, pressurized air, and solvents can accidentally be splashed in the eyes. Personal protective equipment requirements are described in the SDS.

Gloves – Natural rubber, latex, or neoprene gloves should be used to reduce skin contact and potential irritation caused by sensitization to flatproofing materials. Personal protective equipment requirements are described in the SDS.

Industrial First Aid Kit – Kits should be properly stocked and readily accessible for emergencies.

Respirator – Solvents, the tire filling process, and clean up can produce fumes. Good ventilation is required in work areas to prevent exposure to fumes. If adequate ventilation is not available, a respiratory protection program must be implemented. All cartridge/mask selections must be conducted by a qualified individual in accordance with a written respiratory protection program. Refer to the SDS.

Note: Compliance is unique at each pumping location and should be in accordance with all local, state, and federal regulations.

III. PREPARATIONS

Any pneumatic tire can be flatproofed regardless of pressure or rated load specifications. New tires provide the best long-term value, although used tires are often flatproofed.

All new tires should be pre-stretched before filling. Inflate new tires to maximum rated inflation pressure and maintain overnight. Tires grow during service and pre-stretching allows the tire to be filled to its capacity and will minimize long term carcass growth. Used tires do not need to be pre-stretched and typically take 15-20% more material than new tires.

Tires, especially used tires, should always be inspected prior to flatproofing. Flat tires should be repaired. To be effectively flatproofed, tires must be able to hold air for at least three hours and be free of cuts or other defects that reduce casing strength.

Wheels should be inspected for cracks, metal fatigue, and corrosion. Damaged or rusted wheels are a safety hazard and should be avoided.

Tires and wheels have recommended load carrying capacities. The load carrying capacities should not be exceeded. When calculating the load weight, take into consideration the extra weight of the flatproofing material.

A tire or wheel with a defect should not be used in flatproofing, as it could result in a premature tire or wheel failure. Allow time for drying if washing is required.

Tire contaminants, such as water, sealants, glycol, calcium chloride, soaps, waxes, or even dirt, must be removed before flatproofing.

For tube type tires, always use new properly sized tubes. Wheels that require the use of flaps to protect the tube during inflation and operation must be filled with the flap in place. If you remove the flap, the tube has a greater chance of rupturing during the flatproofing and curing process.

Tire and wheel assemblies should be at a minimum of 72˚ F (22˚ C) before processing. Cold tires will slow the curing process.

Equipment Set-up

1. **Arrange Totes and Drums –** Totes should be arranged with the ISO-side on the left and the CAT-side on the right. The chemical pumps on the pump cart of the AutoFil-GenII are labeled as to which hose goes to which side. Be sure to keep the tote hoses on their proper side when changing. It is a good idea to place roofing felt in the pumping area, especially around the tire being filled, for easier clean-up.

2. **Assemble Tools and Supplies –** Make certain all necessary tools (valve core remover, extra valves, screws, hammer, screwdriver, pliers, bags, etc.) are on hand. If possible, stage the tires to be filled in the vicinity of the processing room.

3. **Prepare Totes**
    a. Remove shipping cap. Remove foil if it is present.
    b. Liberally grease the threads on the tote connector and screw it onto the tote's ball valve and hand tighten. (DO NOT TIGHTEN WITH A WRENCH)
    c. Remove dust cap from kamlock on suction/supply hose.
    d. Apply grease to the tote connector and connect the kamlock to the tote connector. Lock kamlock in place by pulling back on the handles.
    e. Connect the supply/suction hose to the intake side of the pump. Lock the kamlock in place.
    f. Repeat for both ISO- and CAT-sides.

4. **Install Desiccant Cartridge –** It is essential that a desiccant is used on the ISO-side tote as the material is moisture sensitive. The CAT-side tote will need to be vented.

To Install the Desiccant Cartridge:

   a. Remove the white 2-inch center bung on the ISO-side tote.
   b. Apply grease liberally to the threads on the desiccant holder. This will make removal easier.
   c. Remove the seal on ends of the desiccant canister.
   d. Loosen top hose clamp on desiccant sleeve and insert desiccant container with inspection window facing forward and the arrow pointing down.
   e. Tighten hose clamp.

   Note: It is essential to change the cartridge when the desiccant in the inspection window turns from blue to pink, as moisture will contaminate the material.

5. **Connect Hoses –** Connect 1 ½" clear supply hoses from the AutoFil-GenII to the tote connectors. Make certain that the ISO-side hose is connected to the ISO-side tote and that the CAT-side hose to the CAT-side tote. Fully open ball valves when pumping. Ball valves should be closed when not in use.

Additional Information

Flatproofed tires are pressurized not with air, but with flatproofing material. It is important that before processing, you know the operating pressure of the tire. Refer to the manufacturer's data for the tire you are filling or the current Yearbook by the Tire and Rim Association, Inc., ETRTO Standards Manual or the JATMA Yearbook to determine proper pressurization for each tire. Tires must be correctly pressurized for optimum performance in ride, footprint, and durability. In no case should a tire be pressurized above the maximum pressure indicated on the tire sidewall.

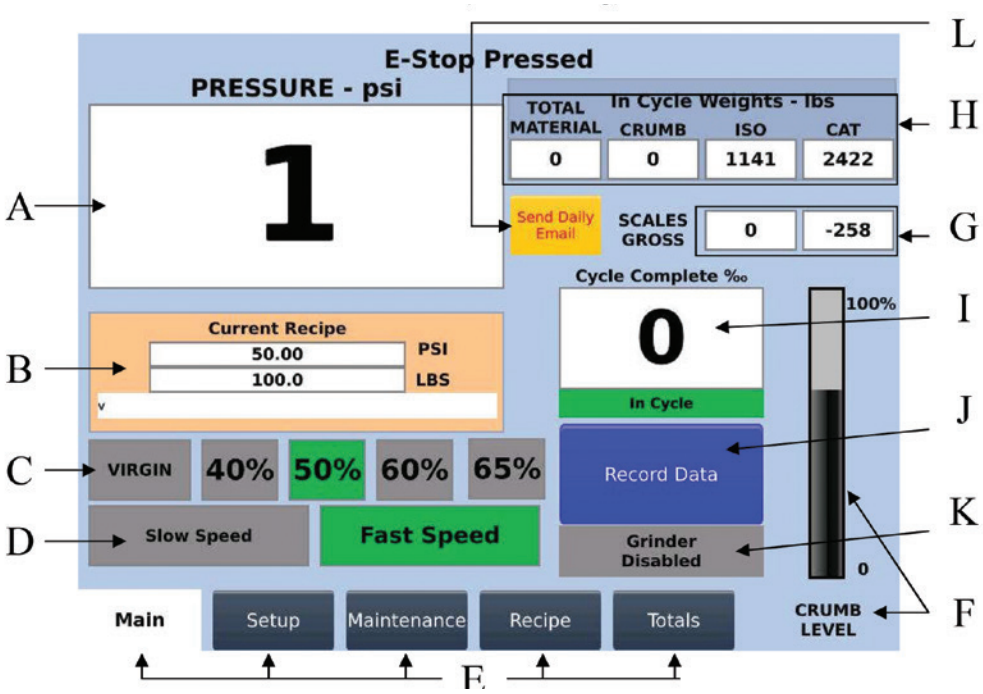
In addition to the pressure, you should know the estimated pounds of flatproofing material necessary to fill the tire as this information will need to be entered into the recipe database. Carlisle TyrFil has a Flatproofing Weight Chart in addition to a Computerized Flatproofing Estimator on www.CarlisleTyrFil.com to help you to approximate weights and costs for flatproofing tires.

Note: These provide only an estimate of the amount of pounds required to fill each tire. Use the following procedures when flatproofing tubeless tires.

IV. AUTOFIL-GENII INTRODUCTION

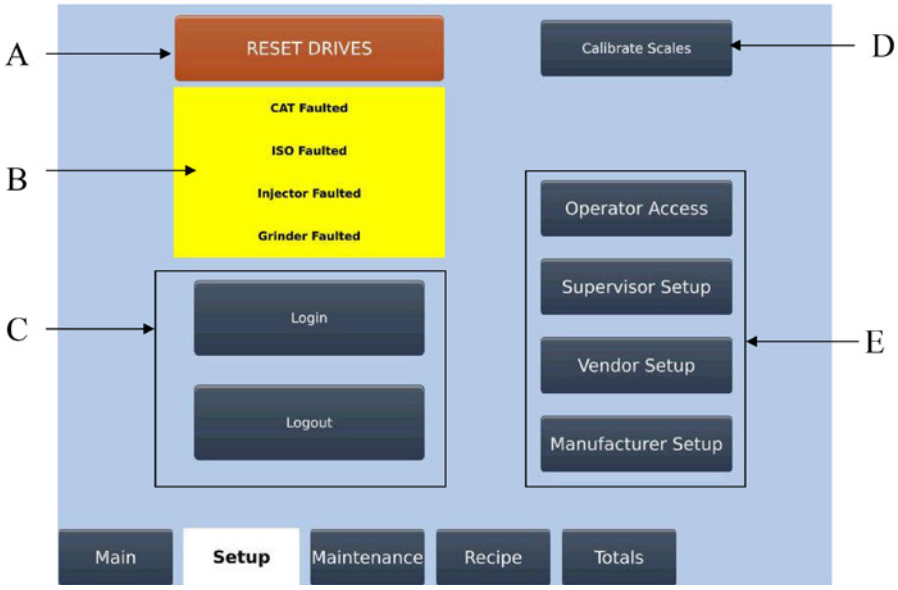
Main Interface Screen (Tire Filling)

The AutoFil-GenII was built from the ground up to provide a touch screen interaction with a crafted visual design for user input and monitoring. Above is the main interface screen (also referred to as an HMI) that you will be viewing while filling a tire. It is important that you become familiar with these menu screens and their associated functions. While it is possible to toggle between screens during the filling process, for example; you could enter the Maintenance screen to view live readings of the pound per minute delivery rate of the ISO, CAT, and Injector values or monitor the Amperage and Torque loads on the motor drives, it is recommended that you return to the Main screen for the duration or completion of the tire filling process.



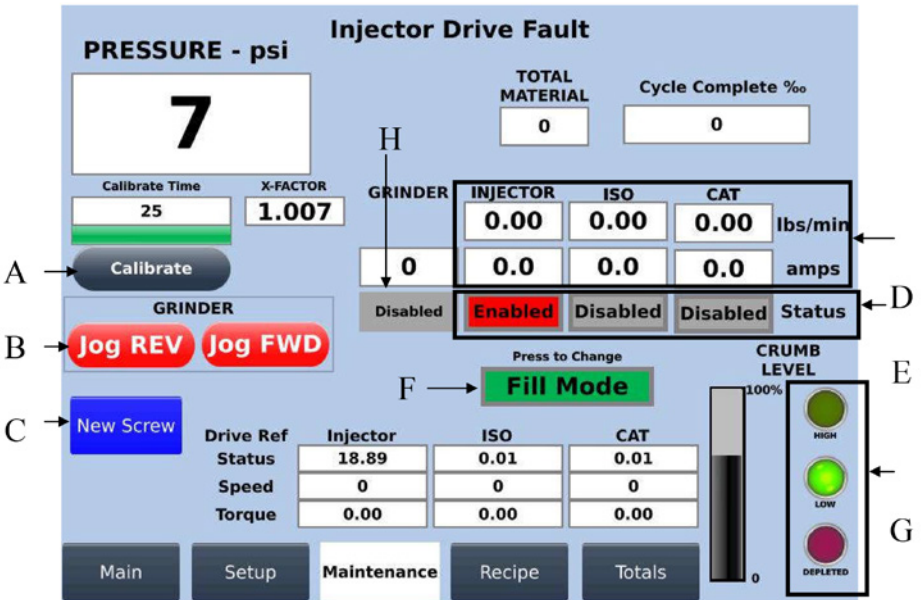
A. **Pressure Window:** When operating, the line pressure will be displayed. When stopped, the tire pressure will be displayed. All pressures are in PSI.
B. **Current Recipe:** The recipe should match the tire being filled. Recipes are selected from the recipe tab. Recipes contain the parameters of the tire being filled such as tire size, final weight, and pressure.
C. **Ratio Bar:** Options are: Virgin, 40% Grind, 50% Grind, 60% Grind, and 65% Grind.
D. **Speed Selection:** Choices are Slow Speed and Fast Speed. The output of material will vary from 20 lbs to 40 lbs per minute depending on the selected ratio.
E. **Screen Tabs:** Pressing the associated tab will take you to that screen.
F. **Crumb Level Display:** Indicates percentage of ground crumb in the hopper. When Crumb level drops to 20%, the injector speed will automatically shift to slow speed regardless of the speed selection and run for 30 seconds then stop. The grinder will continue to run.
G. **Gross Scale Weights:** These windows display the remaining weight in pounds of the ISO and CAT totes.
H. **Cycle Weights:** These windows will individually display the weight in pounds of the ISO/CAT and Crumb material used to fill the tire. The total material window displays the combined weight of the three products. Values are reset to zero when a new cycle begins.
I. **Cycle Window:** Displays the percentage, 0-100% of the filling cycle. Note: This must match the recipe.
J. **Record Data:** After the cycle is complete, pressing the Record Data Button saves the information to the production log which can then be emailed at the end of the day.
K. **Grinder Disable:** Has no touch user input function. This Icon serves as a status indicator and changes to “Grinder Enabled” when the grinder is in use.
L. **Send Daily Email:** Pressing this button sends the daily production logs to the designated email accounts.

Setup Screen



A. **Reset Drives:** Pressing this button clears the system faults.
B. **Display Window:** This field displays and motor faults with the machine. May include one or all drives in the system. By default, upon start up, a reset is required before the unit will function. Pressing the emergency stop button will also require a reset. ***Note: the drives will not reset as long as the emergency stop button is depressed.***
C. **Login/Logout:** This option requires an administrator or OEM password to change system parameters (for Carlisle TyrFil use only).
D. **Calibrate Scales:** Press this button to enter the scale calibration menu (see calibration page).
E. **Access & Setup:** These tabs are protected by password and require administrator privileges (for Carlisle TyrFil use only).

Maintenance Screen

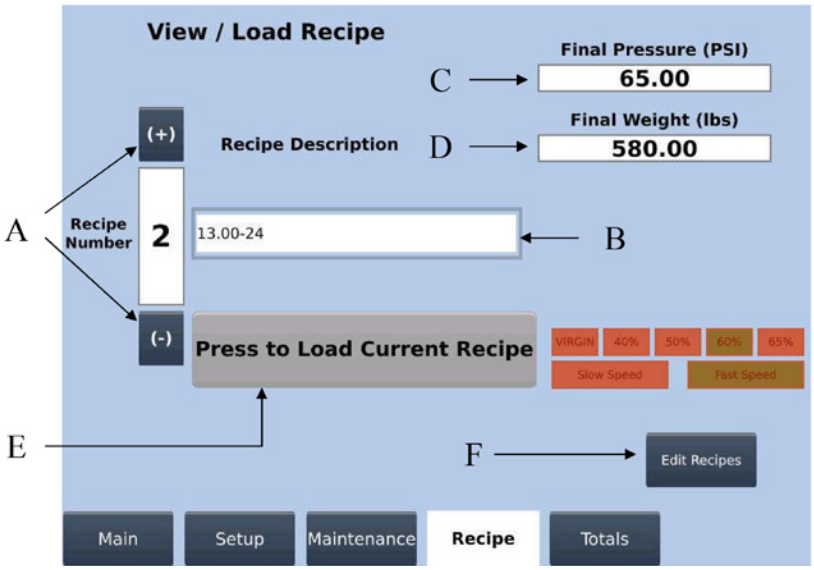


A. **Calibrate:** This button is used for Factory setup (for Carlisle TyrFil use only).
B. **Grinder Jog Buttons:** These buttons are momentary and are used for jogging the grinder in the forward or reverse direction when needed.
C. **New Screw:** When the injector screw is replaced, pressing this button will establish a short break-in routine for the new screw. This procedure will be described in the service manual.
D. **PPM/AMPS:** These windows will display live pound per minute delivery rates of the ISO and CAT pumps as well as the Injector. The AMP windows will display live amperage draws of the associated motors.
E. **Status Buttons:** Pressing these buttons will toggle between the function of Enable or Disable for the associated motors and/or pumps.
F. **Fill/Clean Mode:** Pressing this button will toggle between the Fill Mode or Clean Mode. During the Clean Mode the ISO gear pump is automatically disabled. When the “Clean Mode” is selected the unit defaults to a 60/40 crumb/CAT ratio. This ratio cannot be changed by the operator.
G. **Crumb Level Indicators:** These indicator lights will display the current level of crumb in the hopper.
H. **Status Indicator:** Indicates grinder status only. When grinder is operational, window will show enabled. Note: When enabled, the grinder will start and stop automatically depending on the crumb level in the hopper.

Recipe Screen

The recipe database contains all parameters for the tire sizes you will be flatproofing. These parameters include the tire size, net weight (TyrFil material), ratio, starting speed, and final pressure. You will need to enter a given recipe for each tire size you will be filling. One size does not fit all. Instructions for creating your recipe database will be covered on the next page.

A. **(+):** Advances to the next recipe in the database. Pressing the (-) recalls the former. Recipe number is displayed in the window between the plus and minus buttons.
B. **Recipe Description:** This window displays the recipe description of the tire you are filling. Typically, the tire size and type are used. Example: 13.00-R24 or 13.00-24 6-ply.
C. **Final Pressure:** Final tire pressure in PSI is displayed here.
D. **Final Weight:** Final weight will be the weight of the TyrFil material.
E. **Press to Load:** Pressing this button will load the displayed recipe for the tire filling cycle. If you are filling the same size tire, you do not need to re-enter the recipe. It will remain the same until it is changed.
F. **Edit Recipes:** Pressing this tab will open the dialog box for the recipe database. Recipes can be entered or changed on this screen.



Edit Recipe Screen

Pressing the “Edit Recipe” button will take you to the editing screen menu. This screen will be used to enter all tire parameters into the database or make changes to an existing recipe already in the database. The background screen color will change to orange to indicate the edit option is enabled. Once you have entered the recipes or made adjustments, press the “Save Button”. The “Save Button” must be pressed at the end for each recipe or change entered, otherwise they will be discarded.

1. To add a recipe, press the plus sign button **(+)** and select an open number slot. If an occupied slot is chosen, that recipe will be replaced.
2. Press the **Recipe Description** window to bring up the keyboard. Enter a tire size or other description that can be used to identify the same or similar tire for future filling.
3. Select the **TyrFil Ratio**, the options are: Virgin, 40%, 50%, 60%, or 65%.
4. Select the **Speed Setting** next, the options are: Slow Speed or Fast Speed. It is recommended to select Slow Speed for smaller sized tires. The filling speed can be adjusted manually on the main screen when filling the tire.
5. Tap the **Final Pressure** display window to bring up the keyboard and enter the final tire pressure as recommended by the tire manufacturer. ***NEVER EXCEED THE MAXIMUM TIRE PRESSURE AS INDICATED ON THE SIDEWALL.***
6. Repeat the same process for the **Final Weight** window. The weight in pounds should equal the amount of TyrFil material you will be using to fill the tire.
7. Once you have entered all parameters, press the **Save Button** to store the recipe in the assigned number slot.

If you have more recipes to add, repeat the above procedures. Once you have finished adding recipes, press the return button **(A)** to exit the edit screen menu.

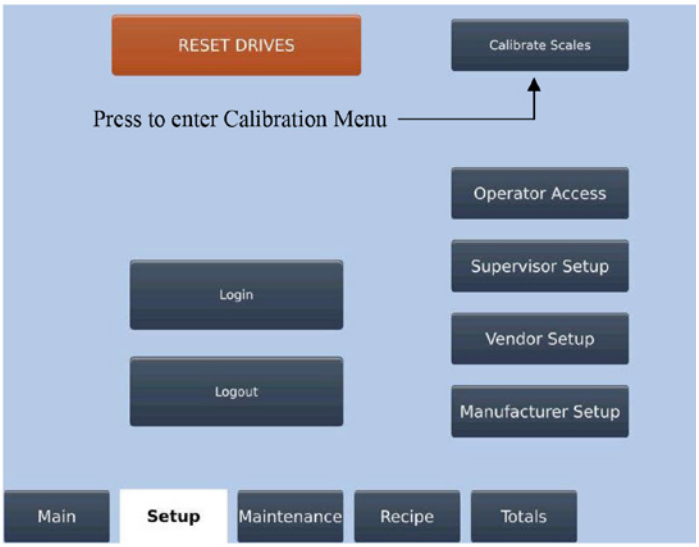
To edit a recipe, enter the editing menu and navigate to the numbered slot of the recipe you wish to modify. Make the necessary changes to the desired parameters. When finished, press the **Save Button**. Exit the menu.

Scale Calibration

The AutoFil-GenII is equipped with three scales: one for the ISO material, one for the CAT material, and one for weighing the tire as it is being filled.

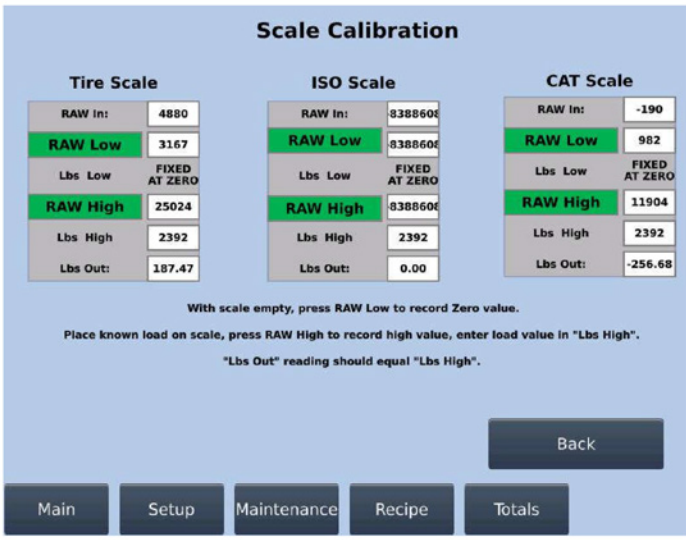
The scales will be correctly calibrated when your machine is installed. If calibration is needed, simply enter the **Scale Calibration** menu by selecting the **Setup** screen tab and then press the **Calibrate Scales** button. This will open the Calibration Menu.

Important: The scales should be balanced and not wobbly. There are adjustments to the legs that can be made to keep the scale(s) sturdy and flat. Do not place any objects under the legs or use the scale(s) on an uneven surface, as this can result in false readings. Avoid placing tools or other objects on the totes as this will affect their weights.



Determine which scale needs to be calibrated. Once the scale(s) have been identified, remove any objects from the scale. You will need an object with a known weight to properly proceed.

1. With the scale empty, press the **RAW Low** green tab to record the Zero value.
2. Place the known load on the center scale and then press the **RAW High** green tab.
3. Tap the **Lbs High** numeric window and enter the objects weight in this field. The **Lbs Out** window should equal **Lbs High**.
4. Repeat this procedure for the other scales if needed. Press the back button to exit the menu.



V. AUTOFIL-GENII SAFE OPERATION & MAINTENANCE

These instructions must be followed to ensure safe operation and maintenance of the AutoFil-GenII. This manual should be brought to the attention of all persons who operate or maintain this equipment.

Warning: The use of electrical machinery, like all other utilizations of concentrated high voltage or rotating equipment/parts, presents a potential hazard which can lead to a serious or fatal injury. All mechanical guards and safety switches must remain in place to ensure a safe operating environment. Operator(s) must use proper PPE gear during operation.

Installation of electrical services and/or maintenance should be performed only by qualified electrical and mechanical personnel familiar with NEMA safety standards, the NEC, and sound local practices. *Do not service the equipment while in use.* This manual is to be studied thoroughly by personnel responsible for the operation and maintenance of this equipment, and personnel must be familiar with the potential hazards involved. Keep this document for future reference.

The grinder section was designed to process used urethane (TyrFil) only. Do not attempt to grind tires, retread components, or natural or synthetic rubbers. Use of unapproved materials will void the warranty and possible damage the equipment. Used urethane materials must be cut into smaller pieces for better feeding. Your aiming for sizes no bigger than a standard football.

The urethane must be scanned prior to grinding with the metal detector (provided) and inspected for debris. To scan the chunk with the metal detector, turn on the metal detector. Keeping a 2-inch gap between the wand and the chunk, run the wand around the material a full 360-degrees. If the metal detector alarms, this piece contains metal and should be inspected further. All debris, especially metal, must be removed from the chunks selected for grinding. Keep in mind that other debris such as wood or plastic may be imbedded in the urethane. These chunks should be discarded. Soft durometer materials such as TyrFil Flex should not be processed.

To operate the grinder, turn on the main power switch on the control panel. The system will begin booting up. This will take about 45 seconds to complete. Select the **Setup** tab on the bottom menu of the HMI and then press the **Reset Drives** button. If the drives fail to reset, ensure the emergency button is not engaged.

Press the **Grinder Start** button under the HMI on the control panel. Once the grinder has started, observe the crumb level percentage gauge as shown in Figure 2A. If needed, used TyrFil material can be added at this time. The crumb level sensors detect the volume of crumb in the hopper. The level display is visible on the HMI's Main and Maintenance screen as indicated below. If the level of granulated crumb gets too low, the system will automatically reduce speed. If this is not corrected by adding more chunk for the grinder to process, the unit will stop.

Figure 2A

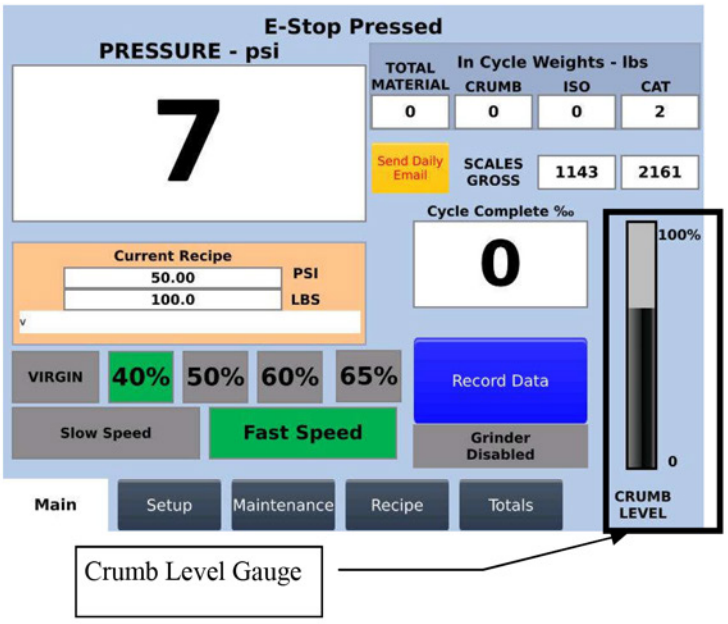
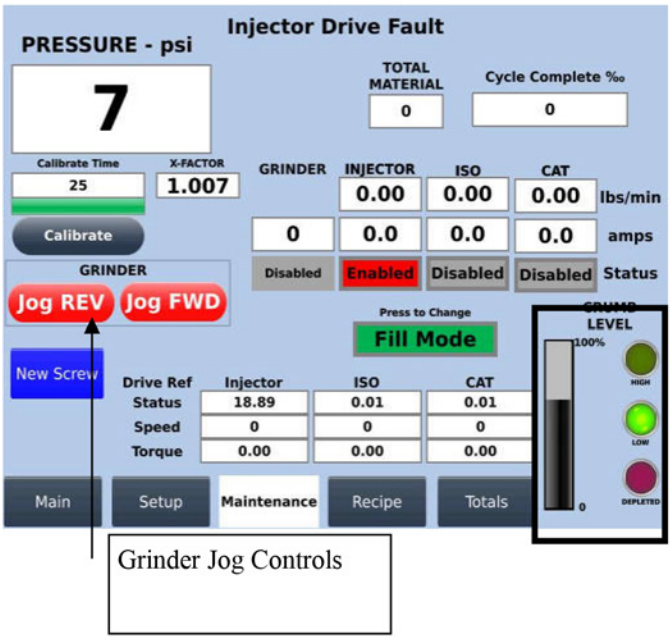


Figure 2A

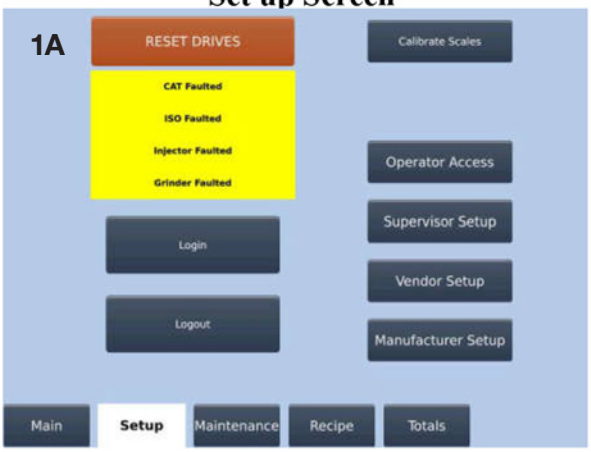


It may be necessary at some point during operation that the grinder will need to be stopped and the direction reversed. This will usually be required to facilitate the feeding of irregular sized urethane chunks that may get hung on or near the breaker bars. To reverse the grinder, press the **Grinder Stop** button on the control panel and select the Maintenance screen. Press the **Jog REV** button to reverse the grinder direction. The grinder will only operate as long as the button is pressed. Observe the camera screen during this process. Once the material has been dislodged, press the **Grinder Start** button to resume normal operation

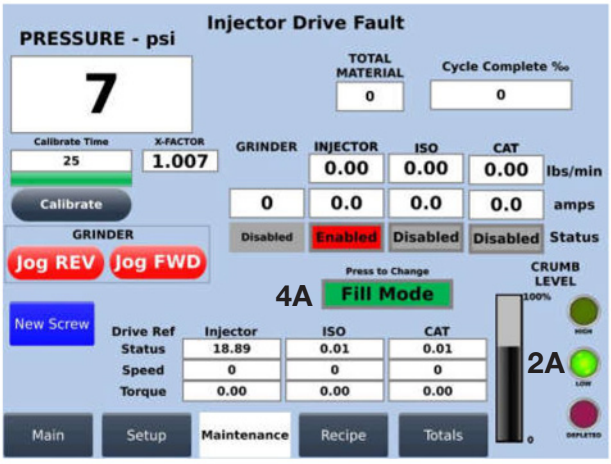
VI. START UP DIRECTIONS

1. Turn on the power switch. The system will begin booting up. This will take about 45 seconds to complete. **Important**: Do not place a tire in the safety cage or have anything else on the scale except the safety cage.
2. Select the **Setup** tab on the bottom menu of the HMI then press the **Reset Drives** button as indicated by the arrows in Figure 1A. If the drives fail to reset, ensure the emergency stop button is not engaged. If it is, disengage the emergency button and press the **Reset Drives** button again.
3. Press the **Grinder Start** button under the HMI on the control panel. Once the grinder has started, observe the crumb level percentage gauge as shown in Figure 2A. If needed, used TyrFil material can be added. ***Note: The grinder should always be enabled and running when filling tires. Starting the grinder now ensures the crumb in the hopper is loose and remains granulated. Once enabled, the grinder will start and stop automatically during the TyrFil process based on the crumb level in the hopper.***
4. Select the **Maintenance** tab from the bottom of the menu, Figure 3A. Confirm the **Fill Mode** is selected, and **Injector** tab is enabled. Next, under the CAT and ISO column, ensure the status shows **Disabled.**
5. Place a clean empty 5-gallon bucket under the injector barrel and press the jog button on the control panel door. Run the injector for approximately 1 minute or until dry granulated crumb flows freely from the barrel opening or the bucket is about 3/4 full. This step is to ensure granulated fill is not packed in the injector housing.
6. On the maintenance screen, enable the ISO and CAT pumps and once again confirm the **Fill Mode** is enabled as shown in Figure 4A.

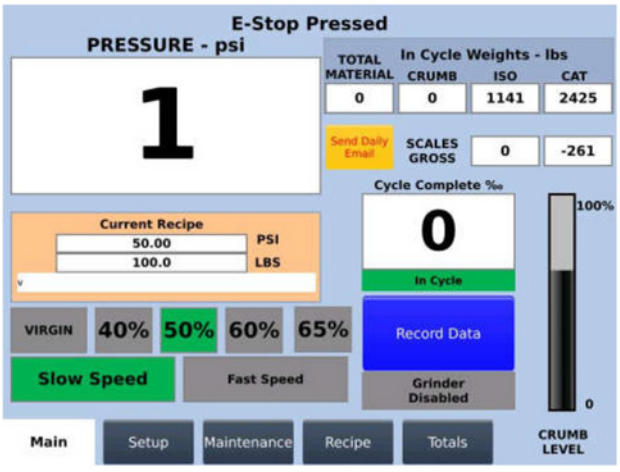
Set up Screen



Maintenance Screen

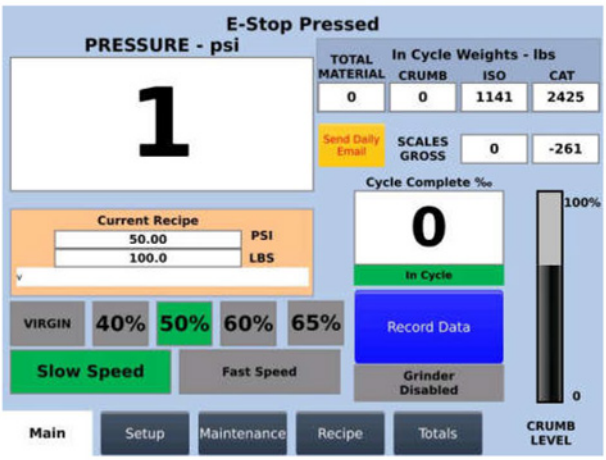


3A

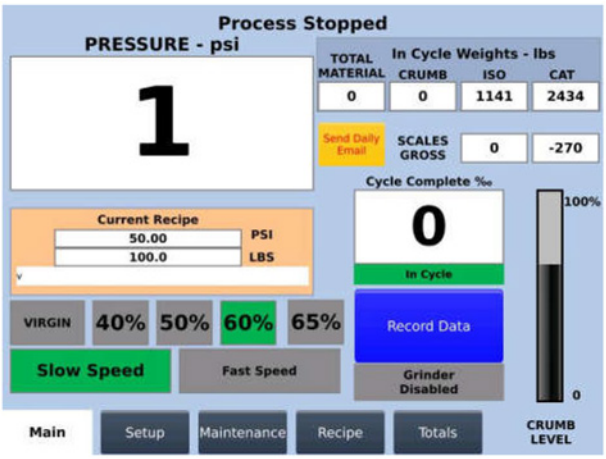


7. Assemble the manifold, mixing tube, and whip hose and then attach it to the injector barrel using one of the 3/4-inch ports. Open the manifold hand valve. The manifold hand valve will remain open until after the cleanup.
8. Switch to the main screen and select the 50/50 ratio. Then set the filling speed to slow.
9. Place a plastic garbage bag in the 5-gallon pail. Press the **Jog** button on the control panel and run until mixed TyrFil material flows from the barrel into the bucket.
10. Place the bell reducer on the barrel and attach the fill hose, drain valve, and fill gun.
11. Hold the fill gun over the waste container and press the **Jog** button. Run the machine until mixed TyrFil material flows from the fill gun into the waste container. You should see TyrFil material begin to emerge from the fill gun after approximately 10 seconds.
12. Select the **Recipe** tab and load the correct recipe from the database for the tire you are flatproofing. If the recipe is not present, you will need to create a new recipe (see recipe database section).
13. Place the tire inside the safety cage and connect the fill gun to the valve stem.
14. Press the **Cycle Reset** button on the control panel to zero out the scales.
15. Select slow speed and press the **Cycle Start** button to begin filling the tire. Observe the PSI window and note the pressure. Pressure will be high at first but then settle down. When the pressure stabilizes, press the **Fast Speed** button.

50/50 Ratio

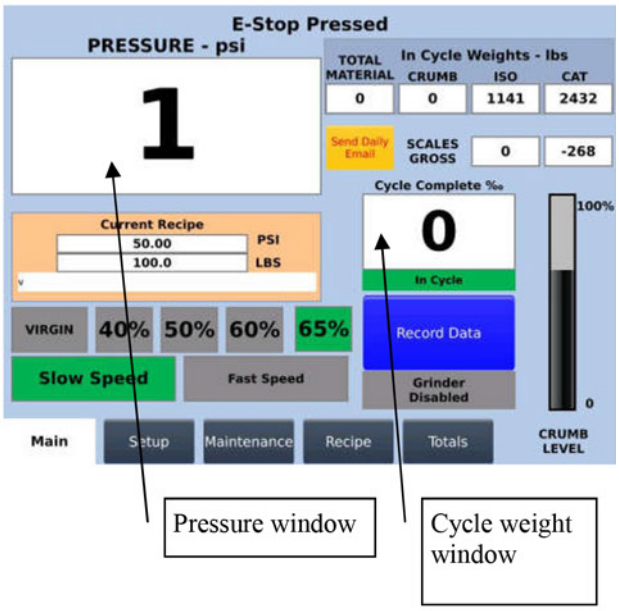


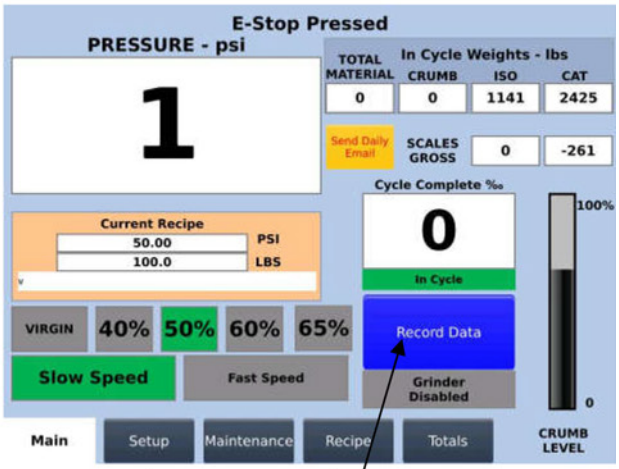
60/40 Ratio



VII. TIRE FILLING DIRECTIONS

1. Place the tire inside the safety cage and connect the fill gun to the valve stem.
2. Press the **Cycle Reset** button on the control panel to zero out the scales.
3. With the ratio set at 50% and slow speed selected, press the **Cycle Start** button to begin filling the tire. Observe the PSI window and note the pressure. Pressure will be high at first but then settle down. When the pressure stabilizes, press the **Fast Speed** button.
4. As the tire is filled, you will see the cycle progress on the main HMI screen. When the tire reaches a filled weight of 40%, a screen banner on the HMI screen will prompt you to acknowledge you have drilled a 3/8-inch or larger vent hole. If you have not already established a vent hole, please do it now. To acknowledge, press the **Start** button on the control panel door. If the tire reaches a filled weight of 50% and you have not acknowledged the vent hole banner, the fill cycle will stop. Pressing the **Start** button on the control panel will continue the filling cycle.
5. Continue to monitor the filling process percentage. To check the internal tire pressure, you must stop the filling process. Pressing the **Cycle Stop** button on the control panel door will pause the cycle and a pressure reading can be taken. To resume the cycle, press the **Cycle Start** button.
6. When the tire reaches 80% of the filled weight, another banner will appear on the HMI reminding you that the vent hole will need to be plugged soon. When material begins to exit the vent hole, the tire is full. Press the **Cycle Stop** button or tap the foot pedal to stop. Plug the vent hole. Observe the pressure reading on the HMI before continuing.
7. To pressurize the tire, select the **50% ratio** button then select **Slow Speed** and press the **Cycle Start** to continue. For small tires, you can press and hold the **Jog** button. When using the **Jog** button, the unit will run as long as the button is pressed. You can also use the foot pedal to jog the machine. Check the tire pressure frequently.
8. When the tire reaches the target pressure, press the **Record Data** button on the HMI screen. A red dialog box will appear asking you to confirm. Press the **YES** button to continue. The main HMI screen will return.

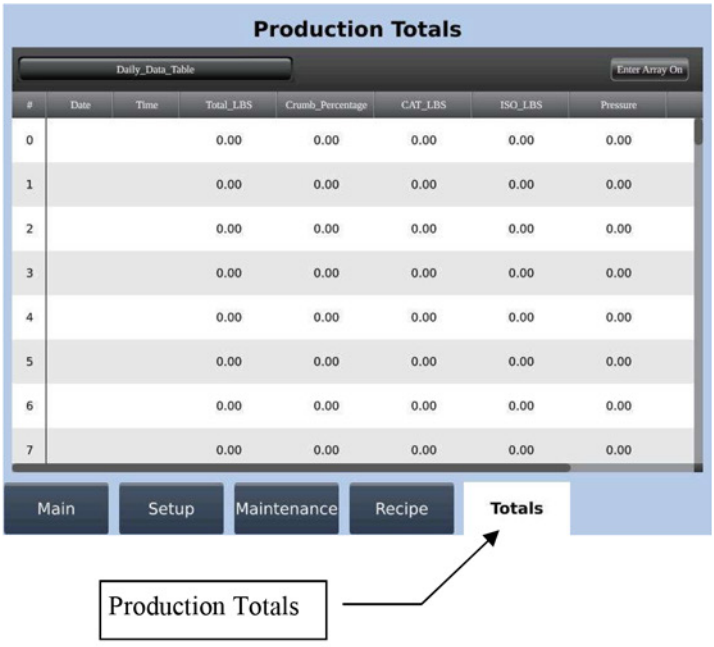




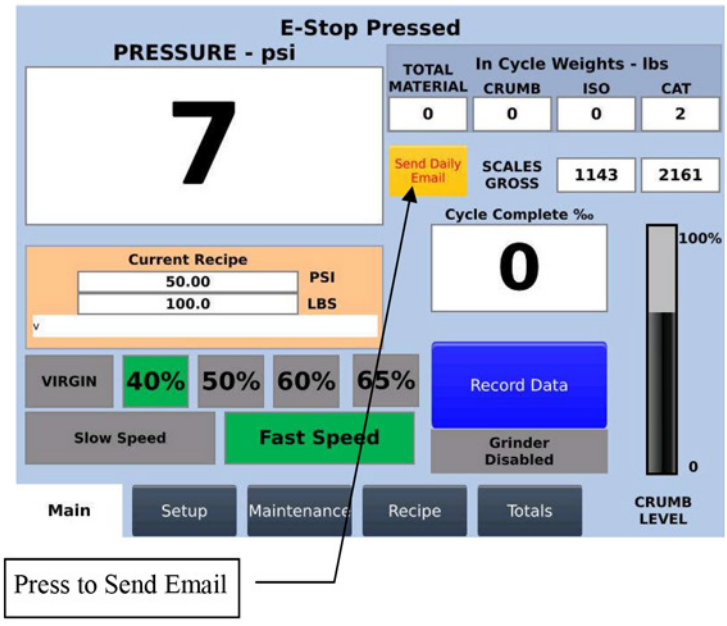
9. Insert the valve core into the valve stem. Open the drain valve on the barrel. Remove the fluid gun from the tire. Remove the tire from the safety cage and lay flat to cure.
10. If you have more tires to fill, repeat the Steps 1 through 9. Don't forget the recipe may need to be changed if filling different sized tires.

Production Totals

A list is created for each tire filled and compiled into a production log that can be emailed to select management staff. To view the production log, select the Total tab at the bottom of the HMI screen.



To email this production log, press the **Send Daily Email** button on the main HMI screen. This needs to be done only once per day at the end of your filling session and sending the file removes the production log from memory. Turning off the unit will not erase the production log. If the production log is not sent, any additional tires that are filled will be added to the current log.

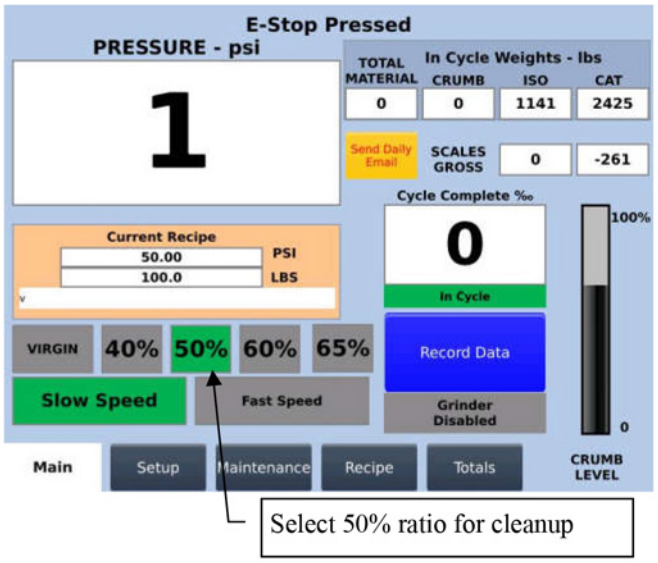


Notes: If at any time you accidentally press the **Cycle Reset** button, this will reset the tire weight scale calculations in addition to the ISO/CAT and Crumb weights so there will be more weight in the tire than indicated in the Cycle Complete window when you resume filling.

Open the drain valve quickly (about 2 seconds) every other tire to keep the drain valve clear and material from setting up.

The **Jog** button and the foot pedal are basically the same thing. During a filling cycle, if you press the **Jog** button or activate the foot pedal, the current filling cycle will stop. Pressing the **Cycle Start** button will resume the current fill cycle. The foot pedal is handy if you are near the tire observing the vent hole and need to stop the current filling cycle. You can do so by tapping the foot pedal once and releasing.

Virgin Tire Filling



Depending on the application, certain valve stem limitations or restrictions, virgin TyrFil will be required. The AutoFil-GenII is virgin ready with a few modifications. For virgin TyrFil operation, you will not need the use of the injector screw or the barrel attachments. The ISO/CAT manifold assembly in conjunction with a Haltec fluid gun and the associated valve stem adapters (included with your kit) will be all that is required. Please review the following procedure for virgin TyrFil applications.

1. Remove the manifold head, mixing tube, and fluid gun from the solvent container.
2. Complete the manifold/mixer assembly as you normally would and attach the Haltec fluid gun to the end of the whip hose. You will need to use the ¾" drain valve (top image) between the mixing tube and whip hose. Make certain these connections are tight to prevent leaks. Open the manifold hand valve.
3. Power up the AutoFil-GenII and allow the system to fully boot. Select the setup screen and reset the drives. Open the Recipe tab and select the correct recipe. If one is not present, you will need to create one.
4. Switch to the main screen on the HMI and select the virgin option then select **Slow Speed**.
5. Place the fluid gun over a waste container and press the **Jog** button or foot pedal. Run about a 1/2-gallon of product into the waste container to prime the manifold, mixer, and whip hose.
6. Place the tire in the safety cage with the valve stem between the 4 and 8 o'clock position.
7. Select the proper core holder and filling adapter for the valve stem.
8. Remove the core from the valve stem and load into the Haltec gun.
9. Connect the Fluid gun to the tire. If needed, an empty pail or other object of a similar height can be used to support the manifold while virgin filling.
10. Press the Cycle Reset button on the control panel to zero out the scale.
11. Press the Cycle Start button to begin filling the tire. From this point on, filling the tire is exactly the same as using the mixed media ratios.

Notes & Special Considerations

The manifold hand valve must remain open whenever the pumps is in use.

The weight of virgin material the pump will deliver to the tire is 20 pounds per minute on the slow setting and 36 pounds on the fast. The Jogging speed will remain the same depending on which speed setting is selected.

For small tires (under 150 lbs.), use the slow speed setting. For larger tires (over 150 lbs.), the fast speed may be chosen.

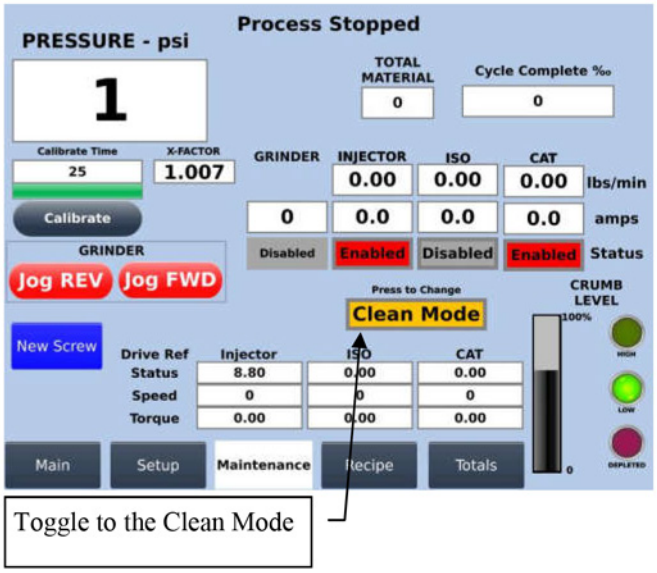
The same banners will appear on the HMI screen for establishing and plugging the vent hole. For small tires, you may use the needle if desired. For larger sized tires, a ¼-inch or larger drill bit may be used instead of the needle but be certain that air is escaping from the tire during this step. Be sure to use the appropriately sized nails or lag bolts when sealing the tire.

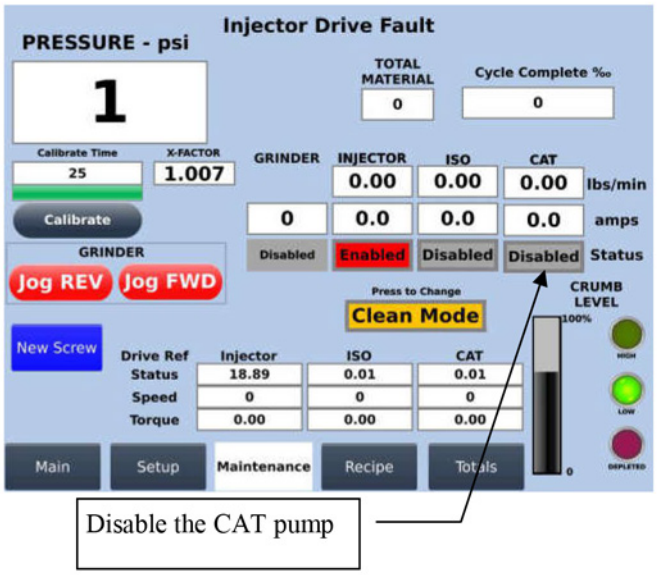
If you have both types of tires that need to be filled (virgin and mixed media) during a session, fill the virgin tires first and then proceed with the mixed ratio tires.

VIII. SHUTDOWN AND CLEANUP DIRECTIONS

When the last tire has been filled, you are ready to begin the clean up process. ***Note: the grinder should be enabled or started during the cleanup process.***

1. On the **Main** screen, select the 50% ratio. Press the **Send Daily Email** button. Then select the **Maintenance** screen tab.
2. Press the **Fill Mode** button to enter the **Clean Mode**. The ISO pump will be disabled.
3. With the fill gun over a waste container, press the **Jog** button or foot pedal and hold for 30 seconds. This step uses ground urethane and CAT-side material to flush the reactive components for the manifold assembly, barrel, dispensing hose, and fluid gun. Open the drain valve as well.
4. Close the manifold hand valve and connect an air hose to the accessory stem on the manifold.
5. While keeping the fluid gun over the waste container, slowly open the ¼-inch ball valve. Compressed air will force the remaining components out of the system into the waste container. To avoid atomizing spray during this step, keep the ball valve between ¼ to ½ opening. This process should take about 1-minute to complete.
6. Remove the air hose from the manifold and remove the fluid gun, dispensing hose, bell coupler, and drain valve. Clean the components and store in an approved container with solvent.





7. Disassemble the manifold, mixing tube, and whip hose. Clean the components and store in an approved container with solvent.
8. Back to the HMI, disable the CAT pump and with a waste container under the barrel. Press the **Jog** button or foot pedal and run ground urethane through the barrel for about 30-seconds. This step will remove any liquid CAT component residue from the barrel.
9. If you have not done so already, press the **Send Daily Email** button and turn off the main power to the AutoFil-GenII.

To ensure that the material does not solidify in the hoses and cylinders between uses, the pump needs to be operated once a week.

You have successfully shut down and cleaned the AutoFil-GenII. These important steps will allow you to be prepared and ready for the next time you fill a tire.

Visit www.CarlisleTyrFil.com for specs, weight charts, and more!

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