

## MAHLE CFF-1HD

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Operation Manual  
Commercial Fluid Filtration System





**EVERY PERSON WHO OPERATES THIS  
EQUIPMENT NEEDS TO KNOW AND  
UNDERSTAND ALL OF THE INFORMATION IN  
THIS MANUAL – FAILURE TO DO SO COULD  
RESULT IN SERIOUS INJURY OR DEATH.**

**READ THIS MANUAL  
CAREFULLY AND  
RETAIN FOR YOUR  
RECORDS**

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# 1. Warranty

## **MSS One-Year Limited Warranty**

(Applies only to equipment owned and operated in North America)

During the One-Year Warranty period, MAHLE Aftermarket Inc., Service Solutions (MSS) is solely responsible for costs associated with parts and labor for repairs needed due to defects in material and/or workmanship. MSS is not responsible for the costs associated with repairs needed due to improper use or a lack of normal maintenance. MSS's goal is to provide a timely turn-around of the covered product requiring warranty repair.

**The Customer is responsible to ASSIST AND PARTICIPATE with MSS Technical Support in the over-the-phone diagnosis process of:**

- A) Determining that a legitimate failure has occurred and that the complaint is not just the result of inadequate training and/or improper use that could be easily remedied by over-the-phone instructions.**
- B) Determining the nature of the failure and that it is reasonable for MSS Technical Support to judge over the phone that the failure is warrantable.**
- C) Determining the parts necessary to make the repairs so that those parts can be shipped via the appropriate expedited method at the expense of MSS if the failure is warrantable.**

During the One Year Warranty period for failures that are deemed by MSS to be warrantable, MSS is solely responsible for providing Field Repair Service within a reasonable period of time after a warrantable failure is reported. Field Repair Service is generally available in all areas within 150 miles of major metropolitan areas of the US. A reasonable period of time will depend on the location of the customer and the time of the year. MSS maintains a large network of Service Providers in the US. When Field Repair Service is needed, in most locations near a major US metropolitan area, and during most times of the year, a reasonable period of time for Field Service is 24 to 48 hours after parts are received by the Customer.

Since repair parts from MSS will normally arrive 24 to 48 hours after the Customer reports a failure, the Customer may at his sole option and discretion, choose to make the necessary repairs, with over-the-phone support from MSS Technical Support so as to minimize downtime. In such case, MSS will compensate the Customer or the Customer's employee as appropriate for the time necessary to make repairs if the failure is covered by warranty.

It is the Customer's responsibility to maintain the MSS Equipment according to instructions in the MSS Operation Manual for the covered product as well as to operate the equipment in a commercially reasonable manner as generally described in the MSS Operation Manual. MSS provides free Technical Support over toll-free telephone lines in the US to assist the customer in this regard for the life of the covered product.

The Customer should review the legal Warranty Disclaimer for more details of coverage and limitations.

Ancillary accessories such as Refrigerant Identifiers, Leak Detector Lights and Leak Detectors must be returned to MSS for repair or replacement with a new or refurbished unit, at MSS's sole discretion, in case of a warrantable defect.

## WARRANTY DISCLAIMER FOR PRODUCTS OF MAHLE AFTERMARKET INC., SERVICE SOLUTIONS (MSS)

### 1. MSS'S WARRANTY

This is to certify that MAHLE Aftermarket Inc., MSS Division warrants to the first retail purchaser only, the described new product manufactured by it to be free from defects in materials and workmanship, when properly maintained, **under normal use and service for a period of ONE YEAR**. All spare parts supplied by MSS will have a 90 day warranty. This warranty includes the reasonable cost of parts and materials as well as non-overtime labor. MSS shall be the sole judge of whether failure is warrantable.

### 2. PURCHASER'S REMEDY

**Purchaser's sole and exclusive remedy under this warranty shall be limited to the repair or replacement, at MSS's option, of any defective part of the product. Purchaser shall call MSS Technical Support who will assist Purchaser in diagnosing the problem and, if deemed necessary, will immediately ship replacement parts for installation by Purchaser if so requested. If Purchaser requests Factory service, repairs under this warranty shall only be made at a location designated by MSS.**

### 3. DURATION

This warranty will expire one year from date of delivery to the first retail purchaser.

### 4. PURCHASER'S DUTIES

- (a) Register product with MSS by returning completed Warranty Registration within 90 days of delivery of unit.
- (b) Transportation Expense: Transportation expenses to and from the MSS's facility are to be borne by the Purchaser.
- (c) Notice of breach: Purchaser shall give written notice to MSS of any alleged refusal or failure of MSS to repair or replace as promised by this warranty no later than fifteen days after the Purchaser learns of such alleged failure or refusal.

### 5. DISCLAIMER

THE EXPRESS WARRANTY HEREIN IS IN LIEU OF ANY AND ALL OTHER WARRANTIES, EXPRESSED OR IMPLIED. NO IMPLIED WARRANTY OF MERCHANTABILITY IS MADE AND THERE ARE NO WARRANTIES WHICH EXTEND BEYOND THE DESCRIPTION ON THE FACE HEREOF.

### 6. EXCLUSIONS

The warranty and obligations stated here shall not apply to:

- (a) Any product not registered within 90 days of delivery.
- (b) Any product repaired or altered without prior approval of MSS so as to affect adversely its stability or reliability.
- (c) Any product subjected to misuse, abuse or accident as well as products used in a manner contrary to written instructions or normal operating procedure.
- (d) Any damage to product during original shipment or subsequent shipments to MSS's facility for service.
- (e) Portions of products which are subject to warranties, if any, given by their manufacturers. MSS does not adopt these warranties.

### 6. EXCLUSIONS (Continued)

- (f) Parts, accessories or other items manufactured by others which are used or installed on the product as a result of Purchaser's specifications.
- (g) Used items furnished by the Purchaser for installation on the product.
- (h) Items which are not defective, but must be replaced during the warranty period as a result of fair wear and tear or scheduled maintenance.
- (i) Hoses, field service couplings, adapters, gaskets and O-rings carry a ninety day warranty.
- (j) Filters, vacuum pump oil and compressor oil are considered consumables and are not covered by any warranty.
- (k) The Warranty may be considered void if evidence of any refrigerant system sealer is found in any of the internal components of an MSS recovery/recycling machine.
- (l) Refrigerant loss is not covered. The Purchaser is responsible for detecting system leaks and advising MSS of same if warrantable repair is required.
- (m) Calibration of equipment, having integrated solid-state controls and load cells for weighing fluids, is not covered beyond the initial setup and commissioning of the equipment. The requirement for calibration of load cell controls is considered normal maintenance and is dependent on many factors, the main one being the care taken when moving the equipment about the shop.

### 7. EXCLUSION OF LOST PROFITS AND OTHER CONSEQUENTIAL DAMAGES

MSS will have no liability for any lost profit, cargo loss, usage loss or other consequential damages alleged to have been caused by any defect in the product or any failure of MSS to meet any obligation under this agreement including the obligation to repair and replace set forth in Paragraph 2.

### 8. LIMITATIONS OF ACTIONS

No action for breach of this warranty shall commence more than one year after the accrual of the cause of action.

### 9. MERGER

This written warranty is the complete, final and exclusive agreement of the parties with respect to the quality or performance of the goods and any and all warranties and representations, except warranty extensions, if any, in writing as applicable.

### 10. NO ORAL MODIFICATIONS OR WAIVERS

No modification of this warranty or waiver of its terms shall be binding on either party unless approved in writing by an authorized official of the parties.

### 11. GOVERNING LAW

This warranty and the rights and duties of the parties under this warranty shall be governed by the law of Pennsylvania, the state of the MSS's principle place of business.

#### MAHLE Aftermarket Inc., Service Solutions

10 Innovation Drive  
York, PA 17402 USA  
800-468-232

## 2. Safety Precautions

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### 2.1 General safety

- ⚠ Before attempting to operate this equipment, thoroughly read and understand this manual to avoid injury.
- ⚠ Completely remove all tape and packaging. Inspect the equipment immediately upon delivery.
- ⚠ Keep this manual. If you need to replace the manual, call customer service at 1-800-468-2321 option 1 or visit [www.servicesolutions.mahle.com](http://www.servicesolutions.mahle.com) for a digital copy.
- ⚠ Read all product safety labels.
- ⚠ Refer to appropriate regulations for environmental and workplace safety rules.

### 2.2 Warnings

- ⚠ **To avoid serious injury or death**, read this manual carefully before operating this unit. Contact the manufacturer using contact information on the back cover of this manual if you have any questions.
- ⚠ **Eye protection**: Proper eye protection must be worn when operating the CFF-1HD.
- ⚠ **Avoid fluid spillage**: When disconnecting the quick disconnect fittings, wrap a shop rag around fitting to catch any residual fluids.
- ⚠ **Scalding hazard**: When diesel fuel is circulated through an operating engine, it can become very hot. Do not allow fuel to come into contact with eyes or unprotected skin. Allow engine and fuel to cool to ambient temperature before replacing fuel filter or performing service operations which could result in spillage of fuel from the system.

- ⚠ **Fire Prevention**: Heated fuel can form combustible vapor mixtures in the area around the fuel source, To eliminate the potential for fire, keep open flames, sparks or other potential ignition sources away from work area. Do not smoke during filter replacement or other service operations
- ⚠ **Inhalation Precaution**: Always perform engine or vehicle fuel system maintenance in a well ventilated area that is free of bystanders
- ⚠ **The ignition key must be in the off position**, unless otherwise directed. To avoid unintentional engine start up, use a lockout key and/or signage to alert personnel that work is being performed.
- ⚠ **The CFF-1HD may be used with diesel fuel**. Do not use the CFF-1HD with gasoline or any other combustible fluid.
- ⚠ **To be used for offline, secondary filtration only**; not for inline filtration.
- ⚠ **The CFF-1HD should only be used with petroleum based oils**; Hydraulic, gear, turbine, transmission and engine.
- ⚠ **Never mix oil types**; be sure to thoroughly flush the system before processing different fluids.
- ⚠ **Engine fluids (oil, fuel, and coolant) may be a hazard to human health and the environment**. Handle all fluids and other contaminated materials (such as filters and rags) in accordance with applicable regulations. Recycle or dispose of engine fluids, filters, and other contaminated materials according to applicable regulations.
- ⚠ Failure to understand and obey these warnings may result in personal injury and / or property damage.

## 3. Symbols Use

### 3.1 Signal words

Signal words call attention to a safety message or messages, or a property damage message or messages, and designate a degree or level of hazard seriousness. Signal words used in this manual include:

Keyword	Probability of occurrence	Severity of danger if instructions not observed
<b>DANGER</b>	<b>Immediate</b> impending <b>danger</b>	<b>Death</b> or <b>severe</b> injury.
<b>WARNING</b>	<b>Possible</b> impending <b>danger</b>	<b>Death</b> or <b>severe</b> injury
<b>CAUTION</b>	Possible <b>dangerous situation</b>	<b>Minor</b> injury
<b>NOTICE</b>	Possible <b>damage to property</b>	<b>Possible property damage</b>

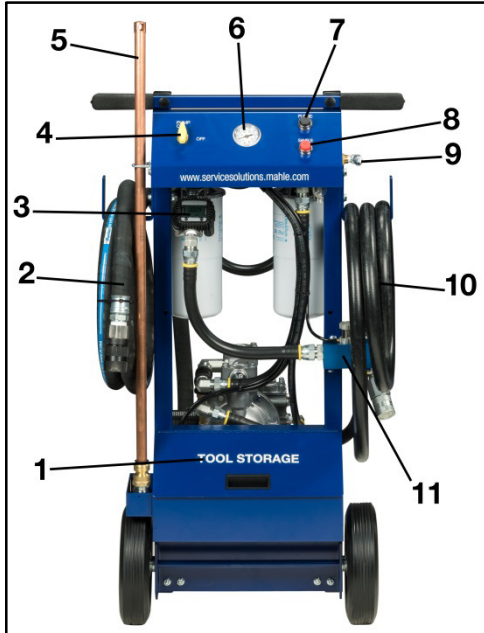
## 4. Specifications

### 4.1 CFF-1HD

Model CFF-1HD	US units	Metric units
Air supply	125 PSIG	8.6 bar
Height	49 in	124.5 cm
Width	26 in	66.0 cm
Depth	32 in	81.3 cm
Net weight	150 lb	68.0 kg

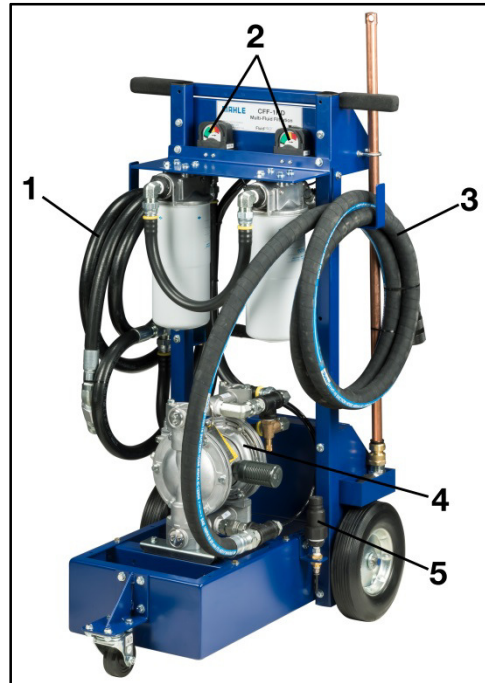
## 5. Product Description

### 5.1 Component identification



**Fig. 1: Component identification – back view**

- 1 Tool storage
- 2 Suction hose
- 3 Flow meter
- 4 On/Off switch (air valve)
- 5 Draw tube
- 6 Pressure gauge
- 7 Purge button
- 8 Sample button
- 9 Air inlet connection
- 10 Discharge hose
- 11 Sampler port



**Fig. 2: Component identification –left view**

- 1 Discharge hose
- 2 Differential gauges
- 3 Suction hose
- 4 Diaphragm pump
- 5 Purge nipple

### 5.2 Features

⚠ The CFF-1HD is not approved for use with gasoline or any other flammable liquid.

The CFF-1HD is designed to:

- Filter hydraulic fluids and engine oil.
  - Automatically capture a sample of the fluid for analysis.
- ❶ The CFF-1HD features the patented “Spill Free” connection for a “No Mess” operation.
  - ❶ The CFF-1HD is fully pneumatic so has no electric connection.
  - ❶ The CFF-1HD is portable for use anywhere.



## 6. Operation

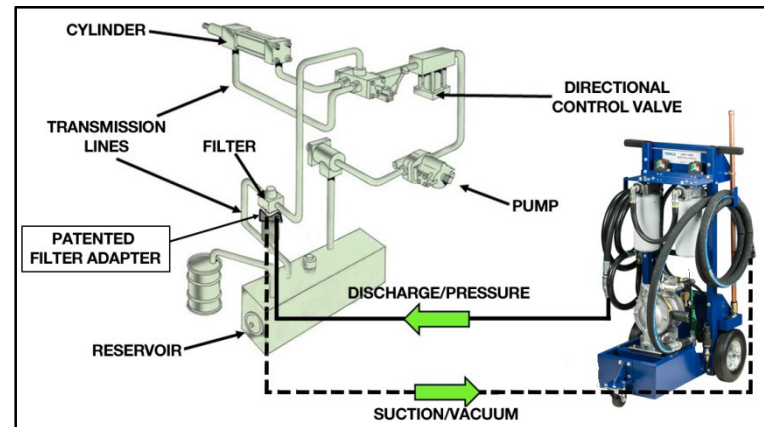
⚠ **WARNING** - This section discusses the appropriate and safe methods for using the equipment. Always ensure proper understanding of the equipment function prior to use to avoid injury.

### 6.1 Hydraulic filtration - Step 1: Filtering hydraulic tank or drum

- ❶ Follow these instructions to filter the fluid in a hydraulic system tank or drum.
  1. Connect the draw tube to the **BLACK** coupler on the suction hose.
  2. Insert draw tube into the hydraulic tank or drum that needs to be filtered.
  3. Connect the fill adapter to the discharge hose with the **SILVER** coupler
  4. Place the discharge adapter into the same tank or drum as the suction tube.
    - ❶ Note: When placing the discharge adapter in the tank make sure the adapter is above the fluid level. This will ensure minimum fluid mixing when filtering and keep the dirty and clean filtered fluid separated.
  5. Reset flow meter to 0. Note the size of the tank or drum being filtered.
  6. Connect air supply to the machine.
  7. Open air valve to start the filtration pump.
    - ❶ Note: There are two differential gauges one mounted above each filter. Each gauge monitors the filter below. When gauge reaches the red it's time to change the filter.
  8. When the flow meter reaches the fluid amount in the tank or drum allow the machine to run 20% longer to ensure all fluid has been filtered.

### 6.2 Hydraulic filtration - Step 2: Filtering hydraulic system

- ❶ Follow these instructions to filter the fluid in the hydraulic system.
  1. Locate the hydraulic oil filter on the oil return line to the oil tank
  2. Remove the oil filter and install the filter adapter hand tight only onto the oil filter housing.
  3. Replace all other Hydraulic filters
  4. Connect the **BLACK** couple on the suction hose to the **BLACK** nipple on the adapter (adapter sold separately). Connect the **SILVER** coupler on the discharge hose to the **SILVER** nipple on the adapter.
  - ❶ **NOTE:** When filtering the hydraulic system the pump on the CFF-1HD will not be running. The pump on your system will push the oil through the machine
  5. Run all hydraulic components in all directions in order to flush all cylinders and other components including final drive units.
  6. It may be necessary to secure the machine to your equipment when filtering the final drive units.



**Fig. 3: Hydraulic system filtration**

### 6.3 Engine oil filtration

- ❶ Follow these instructions to filter engine oil in engine.
- 1. If needed, replace engine oil filter by following the instructions in step 2.
- 2. Purge the engine oil from the filter before replacing by:
  - a. Connect the silver coupler to the inlet connection on engine (Inlet nipple and adapter sold separately).
  - b. Connecting the black coupler to the black nipple on the machine.
  - c. Pressurize and hold the purge button down until the pressure gauge reads 50 psi, then release.
  - d. When pressure drops to 0 psi, repeat this process 2 more times.
- ⚠ NOTE: The pressure may not reach 50 psi; if this is the case; just hold the button down for 1 minute. This will purge the oil filters and eliminate any spills when replacing the oil filters. Also note the air introduced will be ventilated through the crank case vent.
- 3. Connect the suction hose with the **BLACK** coupler to engine's oil pan via MAHLE drain nipple and adapter.
- 4. Connect the discharge hose with the **SILVER** couple to the engine via MAHLE inlet nipple and adapter.
- 5. Reset flow meter to 0.
- 6. Start pump.
- 7. When flow meter reaches 10 quarts over the amount of oil the engine holds "Turn off" the pump.
- 8. Disconnect from engine.
- 9. Check oil level.

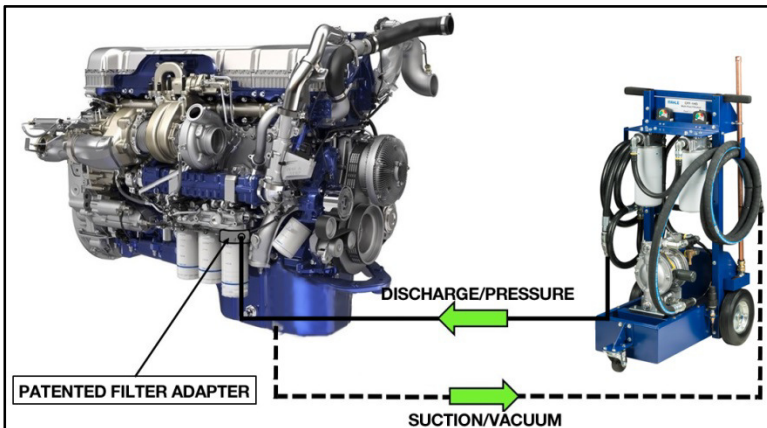


Fig. 4: Engine oil filtration

## 7. Replacement Parts

- ❶ When filtering hydraulic oil, a filter adapter plate will be needed.
- ❷ Note: If MAHLE quick disconnect fittings need to be ordered, see retrofit adapter order list on website at: <http://www.servicesolutions.mahle.com>

Part description	Part number
Big (5.5") filter adapter plate*	370 80351 00
Hydraulic oil filter nipple plate for 1-1/2"-16 thread*	370 80353 00
Small filter adapter plate**	370 80350 00
Hydraulic oil filter nipple plate for 1-1/2"-16 thread**	370 80352 00
Engine oil drain adapter***	370 80355 00
Engine oil inlet adapter***	370 80354 00
3/4" x 1" high flow nipple	370 80322 00
3/4" x 1" high flow coupler	370 80323 00
10micron water separation filter	370 80324 00
Diesel fuel filter kit	370 80325 00
Hydraulic fluid filter kit	370 80326 00
Automatic trans. fluid filter kit	370 80327 00
Engine oil filter kit	370 80328 00
Gear oil filter kit	370 80329 00

\*Both items needed for filtering hydraulic systems using larger filter

\*\*Both items needed for filtering hydraulic systems using smaller filter

\*\*\*Both items needed when filtering engine oil with the MAHLE quick disconnect fittings on the engine

## 8. Notes

# MAHLE

**MAHLE Aftermarket Inc.**

10 Innovation Drive  
York, PA 17402 U.S.A.

Phone: (800) 468-2321

Fax: (717) 755-8304

E-mail: [tech.mss@us.mahle.com](mailto:tech.mss@us.mahle.com)

[www.servicesolutions.mahle.com](http://www.servicesolutions.mahle.com)