

# ACF-3100

## OPERATION MANUAL



**MAHLE**

**MAHLE Aftermarket Inc., Service Solutions**

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Manual P/N: 035 82326 00

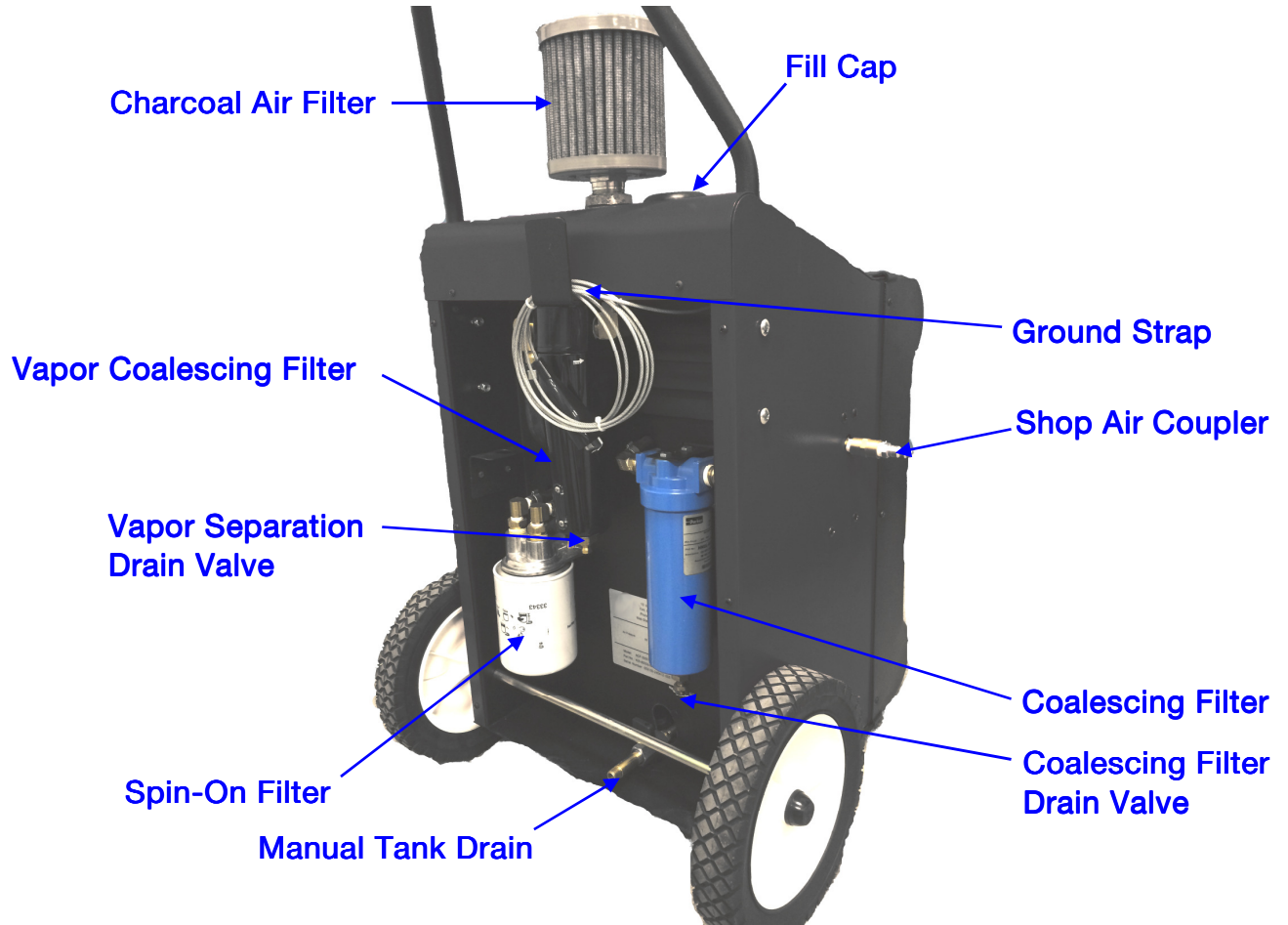
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# Components Description

Unpack all components and verify quantities per this illustration.

Contact MAHLE Service Solutions (MSS) if any items are missing.



# Safety Precautions

**WARNING: Failure to follow these precautions can result in serious injury or death.**

- Read and understand the Operation Manual completely before operating this unit.
- Always wear proper eye and skin protection when operating and maintaining this equipment.
- Always drain the flushing solvent before transporting the ACF-3100.
- Always keep the unit away from open flames and sparks.
- Only disassemble or reassemble unit parts when directed by an MSS representative.
- Comply with local, state and federal regulations for fluid disposal.
- **Material Safety Data Sheets (MSDS)** must be obtained on all chemicals and placed in a shop file for reference. Note: MSDS can be found on the MSS web site [www.servicesolutions.mahle.com](http://www.servicesolutions.mahle.com).



DO NOT allow the solvent to come in contact with any painted surfaces. In case of contact, immediately clean the surface with soap and water.



Failure to follow the precautions as outlined in the Operation Manual can result in damage to the engine, vehicle or equipment which will not be supported or covered under warranty.



Always operate unit in a well-ventilated area.



Always make sure unit is grounded properly before operation.

## NOTICE

### THIS MACHINE REQUIRES MAINTENANCE

**AFTER EACH VEHICLE:** Change spin-on filter and DRAIN the Motorcraft flushing fluid

**AFTER 25 VEHICLES:** Change carbon filter on top of unit and coalescing filter in BLACK canister on rear of unit

**AFTER 100 VEHICLES:** Change the coalescing filter in BLUE canister on rear of unit

**FAILURE TO FOLLOW THESE REQUIREMENTS COULD RENDER UNIT UNUSABLE AND POTENTIALLY VOID WARRANTY**

**MOTORCRAFT OIL FILTER:** FL1A

**ROTUNDA FILTER PACKAGE:** 357-305 800-40 00

OR

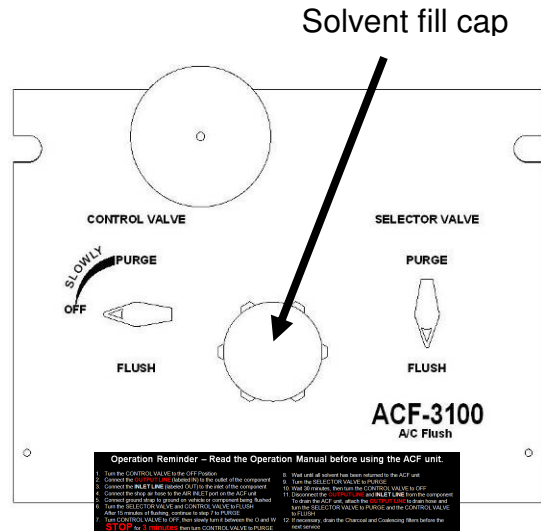
**MSS P/N:** 305 80040 00

**MOTORCRAFT FLUSH:**

YN-23

# Flush

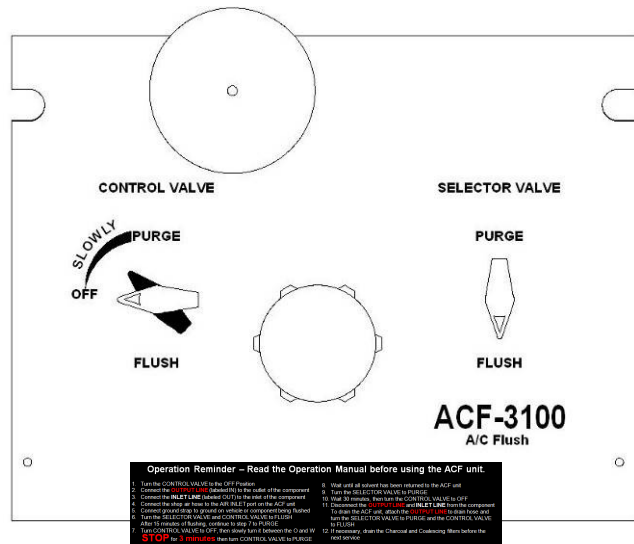
1. Verify that both the spin-on filter (MOTORCRAFT FL1A / WIX® 33343 / equivalent) filter and the Coalescing Filter are installed.
2. Turn the Control Valve to OFF.
3. Remove the solvent filling cap and pour one gallon (3.6 liters) of flushing solvent (Motorcraft® YN-23 or equivalent flushing solvent) into the ACF-3100 internal tank. Replace the solvent filling cap when done.
4. Install proper adapter fittings on the inlet and outlet ports of the component to be flushed and connect ground strap to adequate ground on vehicle or component being flushed.
5. Install fittings to do a reverse flush. Connect **RED** OUTPUT line from ACF-3100 to OUTPUT port on the component. Connect **BLACK** RETURN line from ACF-3100 to the INLET port of the component.
6. Connect shop air to Shop Air Coupler (with a minimum pressure of 90 psi).
7. Turn the Selector Valve to FLUSH.
8. Turn the Control Valve to FLUSH.
9. Flush the component for a minimum of 15 minutes to ensure a thorough cleaning.
10. Turn the Control Valve to OFF to end the flushing procedure.



**The component is now ready to be purged.**

# Purge

1. Slowly turn the Control Valve and stop half way and hold for 3 minutes as indicated to purge flushing solvent from component and lines. Proceed to the next step after 3 minutes.
2. Continue slowly turning the Control Valve towards PURGE. Wait one minute before proceeding with the next step.
3. Turn the Selector Valve to PURGE.
4. Purge the component for a minimum of 30 minutes to ensure that it is completely dry.
5. Turn the Control Valve to OFF.
6. Disconnect the “IN” and “OUT” hoses from the adapter fittings.
7. Disconnect the adapter fittings from the component.
8. Both the Vapor Coalescing Filter and standard Coalescing Filter will need to be drained periodically. Turn the drain valve at the bottom of the filter counter clockwise. A small amount of liquid may drain. Some shops may have a coalescing filter already inline, so the (blue) Coalescing filter may contain very little moisture. The Vapor Coalescing Filter should be drained after every service to ensure maximum performance.



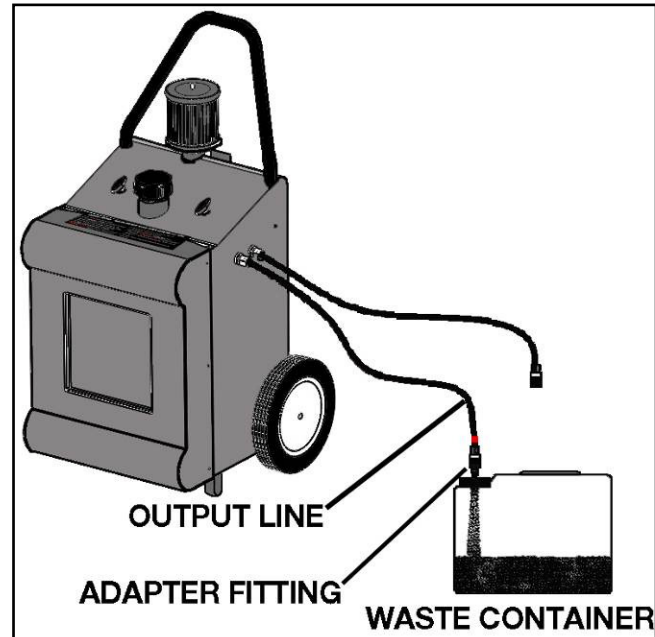
**Repeat the flush procedure on the next component until all components have been flushed.**

# Empty Solvent Tank

The flush solvent can only be used to flush one vehicle A/C system. Remove used flush solvent from the ACF-3100 as follows:

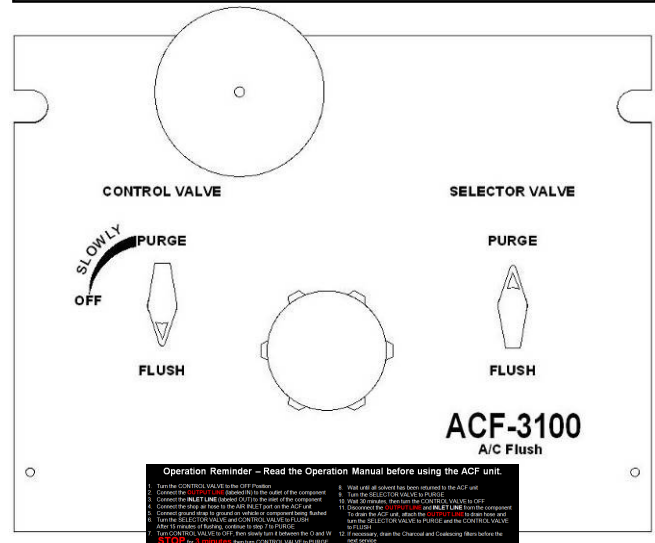
**IMMEDIATELY** remove solvent after every system flush. Leaving solvent in machine will saturate the charcoal filter.

1. Turn the Control Valve to OFF.
2. Attach the drain extension hose on the "IN" (or output) Hose and place it into a waste container.
3. Turn the Selector Valve to PURGE.
4. Turn the Control Valve to FLUSH.
5. Verify that the ACF-3100 is completely drained before continuing.
6. Open charcoal air filter drain until all moisture is drained and close valve.
7. Turn the Control Valve to OFF.
8. At this point the Spin-on Filter needs to be removed and replaced (Refer to the next page).



**\*Follow your local state, municipal or federal waste management authority or recycler to dispose the used flushing solvent and filters.**

**NOTE:** If preferred, there is a drain valve on the back side of unit. Place ACF-3100 unit on an elevated surface, place drain pan below drain and open valve. Operator will need to tilt unit back for maximum drain.



## Spin-on Filter Replacement

**NOTE: A spin-on filter (MOTORCRAFT FL1A / WIX® 33343 / equivalent) should be replaced after each flushing procedure. MSS is not responsible for damages caused by use of non-equivalent spin-on filters! Use MSS P/N: 026 80253 00 for optimum performance.**

1. Locate the spin-on filter on the rear of the ACF-3100.
2. Turn the filter counter-clockwise to remove.
3. Apply a small amount of lubricant to the filter gasket and install the new filter. Take caution to *hand tighten only*.



**\*Follow your local state, municipal or federal waste management authority or recycler to dispose the used flushing solvent and filters.**

## Charcoal Air Filter Replacement

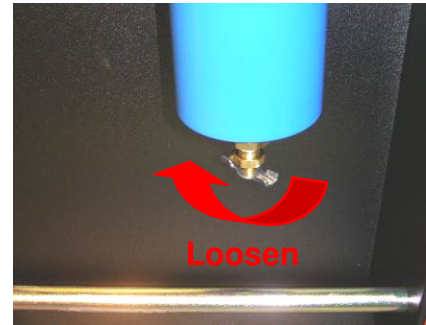
The charcoal air filter element (**Part Number: 026 80302 00**), located on the top of the unit, should be replaced after every 25 flush and purge services. It may be necessary to replace the element sooner if the operator notices a stronger than usual odor emitted from the unit during the purge process.

1. Turn the wing nut on the filter counterclockwise and remove the retaining plate.
2. Remove the old filter element and replace with a new one.
3. Replace retaining plate and finger-tighten the wingnut.



## Coalescing Filter Drain (Vapor and Water)

To drain the coalescing filter, turn the drain valve 90 degrees as shown in the figure to the right. Allow the filter to drain until most of the liquid has drained out. Drain (black) Vapor Coalescing filter after every service.



## Vapor Coalescing Filter Element Replacement

The coalescing filter element (**P/N: 026 80505 00**) must be replaced after every 25 flush and purge services. It may be necessary to replace the element sooner if the operator notices a stronger than usual odor emitted from the unit during the purge process.

1. Turn counterclockwise (1/8 turn) on the filter bowl to remove it.
2. Remove the filter element by turning it counterclockwise.
3. Replace the used element with a new one. ***Hand-tighten only.***
4. Replace the filter bowl by turning it clockwise.

## Coalescing Filter Element Replacement

The coalescing filter element (**Part Number: 026 80300 00**) must be replaced after every 100 flush and purge services. In some cases the element may need to be replaced sooner if the shop air supply contains high amounts of moisture, oil, debris, etc. A clogged element will restrict the airflow in the purge process and should be replaced immediately.

1. Turn counterclockwise on the filter bowl to remove it.
2. Remove the filter element by turning it counterclockwise.
3. Replace the used element with a new one. ***Hand-tighten only.***
4. Replace the filter bowl by turning it clockwise.

**Note: MSS P/N 305 80040 00 (or directly through Rotunda as P/N 357-305 800-40 00) can be purchased which includes 4 of the 026 80302 00, 4 of the 026 80505 00 and 1 of the 026 80300 00 to cover 100 services.**

# Troubleshooting Guide

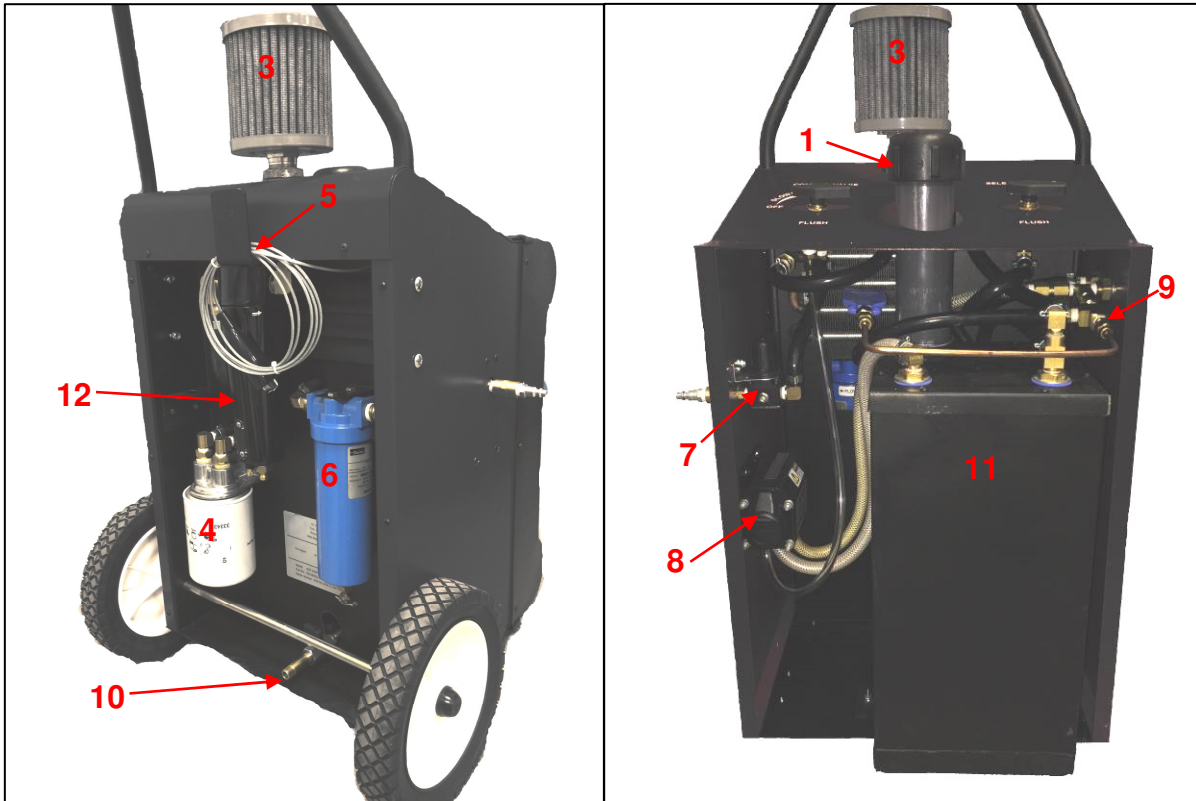
| Problem   | Possible Solution  |
|---|--|
| <p>The flush solvent does not pump adequately through the unit, but the pump action <b>can</b> be heard.</p>    | <p>There is insufficient flush solvent in the supply tank. To fix this problem simply add the correct amount of flush to the ACF-3100 storage tank.</p>  |
|   | <p>The Spin-on filter may be blocked. A new filter is required. Refer to page 7 to Replace Spin-on Filter.</p>   |
|   | <p>The pump may be defective. Remove the front cover and refer to the Parts Identification section to locate the pump for replacement (P/N 026 80667 00).</p>  |
|   | <p>The check valve on the fluid side is not operating properly. Remove the front cover and refer to the Parts Identification section to locate the check valve for replacement (P/N 022 80112 00).</p> |
| <p>The flush solvent does not pump adequately through the unit, but the pump action <b>cannot</b> be heard.</p> | <p>The pump may be defective. Remove the front cover and refer to the Parts Identification section to locate the pump for replacement (P/N 026 80667 00).</p>  |
|   | <p>The ACF-3100 air regulator is malfunctioning. Remove the front cover and refer to the Parts Identification section to locate the regulator for replacement (P/N 022 80116 00).</p>                  |
|   | <p>The shop air is below 90 psi. Adjust the shop air pressure to at least 90 psi.</p>  |
| <p>The solvent does not pump adequately through the system and escaping air can be heard.</p>                   | <p>The internal air hose supplying the air pump may be leaking. Re-secure, with a new hose clamp, or replace with a new hose if necessary.</p>   |
| <p>The purge process was not adequate.</p>  | <p>The shop air is below 90 psi. Adjust the shop air pressure to at least 90 psi.</p>  |
|   | <p>The coalescing filter may be clogged and need to be replaced. Refer to the Coalescing Filter Element Replacement section for instructions.</p>  |
|   | <p>The check valve on the air side is not operating properly. Remove the front cover and refer to the Parts Identification section to locate the check valve for replacement (P/N 022 80112 00).</p>   |

## Parts Identification

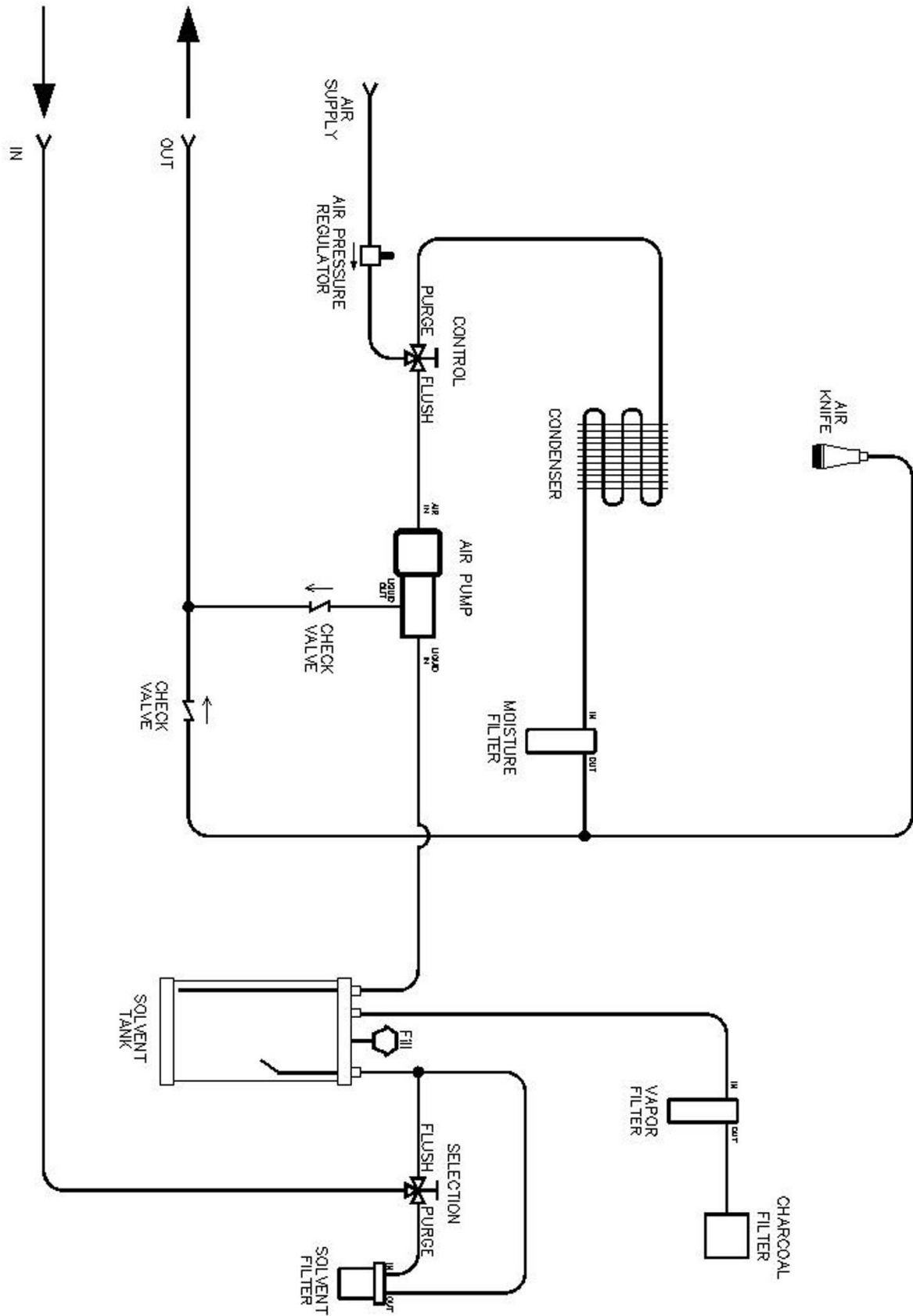


|    | Part Number  | Description                                      |
|----|--------------|--|
| 1  | 021 80174 00 | 2" Plastic Cap                                   |
| 2  | 022 80119 00 | 3-way ball valve                                 |
| 3  | 026 80302 00 | Charcoal Filter                                  |
| 4  | 026 80253 00 | Spin-on Filter (WIX® 33343)                      |
| 5  | 305 80004 00 | Ground Strap Assembly                            |
| 6  | 026 80300 00 | Coalescing Filter (Element only)                 |
| 7  | 022 80116 00 | Panel-mount Regulator (regulates down to 55 PSI) |
| 8  | 026 80667 00 | 2.0 GPM Air Pump                                 |
| 9  | 022 80112 00 | 1 PSI Check Valve                                |
| 10 | 023 80334 01 | Tank Drain Valve                                 |
| 11 | 060 81978 00 | ACF Storage Tank                                 |
| 12 | 026 80505 00 | Vapor Filter (Element only)                      |

*Front Cover Removed*



# Flow Diagram



## ACF Unit Usage and Filter Replacement Log

| Record Date of Vehicle Flush and Spin-On Filter Replaced |  |  |  |  | Date Charcoal Air Filter Replaced | Date Vapor Separation Filter Replaced | Date Coalescing Filter Replaced |
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| Record Date of Vehicle Flush and Spin-On Filter Replaced |  |  |  |  | Date Charcoal Air Filter Replaced | Date Vapor Separation Filter Replaced | Date Coalescing Filter Replaced |
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## ACF Unit Usage and Filter Replacement Log

| Record Date of Vehicle Flush and Spin-On Filter Replaced |  |  |  |  | Date<br>Charcoal Air<br>Filter<br>Replaced | Date Vapor<br>Separation<br>Filter<br>Replaced | Date<br>Coalescing<br>Filter<br>Replaced |
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| Record Date of Vehicle Flush and Spin-On Filter Replaced |  |  |  |  | Date<br>Charcoal Air<br>Filter<br>Replaced | Date Vapor<br>Separation<br>Filter<br>Replaced | Date<br>Coalescing<br>Filter<br>Replaced |
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# 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

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