

Advantage Flush System (AFS)

OPERATION MANUAL



Accreditations
Pending

ATTENTION:
Read All Operating
Instructions Before Use.



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WARNINGS

Electric Shock Can Cause Injury Or Death

Install and maintain equipment in accordance with the National Electrical Code (NFPA 70) and Local Codes. Do not service or repair equipment with the power on. Do not operate equipment with protective insulators or covers removed. Service and repair to the equipment must be done by qualified and/or trained personnel only.

Grounding

All Advantage Flush Systems are equipped with grounded power cords and plugs. Properly grounded receptacles are required, and in some instances, a grounded plug adapter may be required to comply with your State and Local Electrical Codes.

Unplug power cord from the electrical outlet before working on the equipment.
Do not touch electrical hot parts.

Health Effects And First Aid Reference

Safety glasses and protective clothing are recommended when handling the Advantage Flush Solution. Reference M.S.D.S., Section VII.

Acute Exposure:

- **SKIN CONTACT:**

Remove contaminated clothing and shoes immediately; wash affected area with soap or mild detergent and large amounts of water. Reference M.S.D.S., Section VI.

- **EYE CONTACT:**

Wash eyes immediately with large amounts of water or normal saline. Reference M.S.D.S., Section VI.

- **INHALATION:**

Remove yourself from the exposed area to fresh air immediately. Reference M.S.D.S., Section VI.

- **INGESTION:**

Get medical attention immediately. Reference M.S.D.S., Section VI.

Advantage Flush Solution Storage And Disposal

Observe all Federal, State, and Local Regulations when storing and disposing of this substance. For assistance contact the District Director of the Environmental Protection Agency. Reference M.S.D.S., Section VII.

- **SMALL SPILLS:**

Take up with sand or other absorbent materials and place into containers for later disposal in accordance with Federal, State, and Local Regulations. Reference M.S.D.S., Section VII.

- **WARNING:**

Advantage Flush Solution is oil based and very slippery.

SPECIFICATIONS


Dimensions:	L: 26.5" x W: 22.5" x H: 47.5"
Dry Weight:	150 lbs.
Cabinet:	18 C.R.S. Powder Coated
Wheels:	3 1/2" Brake and Swivel Lock (front), 8" Rigid (rear)
Electrical Rating:	100/240 VAC 115 VAC, 50/60 HZ, 13.4 AMP 50/60 HZ 144.5/6.9 AMPS
Power Supply:	24 VDC, 2.0 AMP
Required Air Pressure:	80-125 PSI Incoming
Regulated Air Pressure:	75 PSI Filtered
C.F.M. Consumption:	± 10 C.F.M.
Pump (Pressure):	3/8" NPT Dual Diaphragm, Air Driven
Pump (Pressure):	± 24 Gallon / Service at 75 PSI Air Pressure
Pump (Recovery):	3/4" NPT Dual Diaphragm, Air Driven
Pump (Recovery):	± 22 Gallon / Service at 75 PSI Air Pressure
Filtration:	Pressure Side: 3 Micron Recovery Side: Ultra Fine 3 Micron
Control Panel:	4 Line, 20 Characters Display, Full Keyboard with: <ul style="list-style-type: none">• Alarm List• Programmable Heater Time Clock for Automatic Pre-Heating of Solution
External Hoses:	17' Hoses
External Fuses:	10/15 AMP
Tank:	15 Gallon Corrosive Resistant Solution Tank

GETTING STARTED

Shop Requirements:


100-240 VAC APPLICATION:

Requires 100-240 VAC, 14.5/6.9 AMPS rated grounded outlet.

 **WARNING:** Machine draws up to 14.5 AMP; therefore, do not overload circuit.


AIR SUPPLY:

80 PSI/5.6 BAR minimum at 10 CFM / 0.28 M3 min.

 **WARNING:** Pressure must not exceed 125 PSI / 8.6 BAR.

AIR FITTING:

Must have 1/4 NPTM threads.

 **NOTE:** Should you require any assistance contact your local distributor.

UNPACKING INSTRUCTIONS

Unpack and assemble your system immediately. Remove the Advantage Flush System from its shipping container. Look for any visible damage and report the damage to the freight carrier and your local distributor. It is recommended that photographs be used to support all damage claims. All damage claims must be submitted to your local distributor in writing.

When finished with unpacking and assembling the Advantage Flush System, complete and return the enclosed Limited Warranty Registration Card.

The following are included with your Advantage Flush System:

- A Standard Adapter Kit.
- Operation Manual.
- Limited Warranty Registration Card.

Other items required:

Advantage Flush Solution / Filter Pack.

Containing the following:

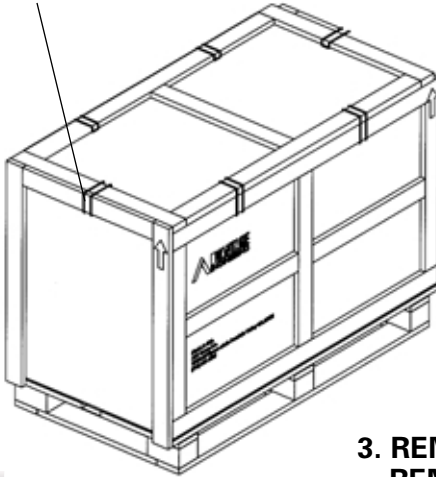
- One (1) box with forty (40) ultra fine 3 Micron filter elements and
- One (1) 3 micron spin-on filter, and
- Two (2) six (6) gallon containers of Advantage Flush Solution.

UNPACKING INSTRUCTIONS (continued)

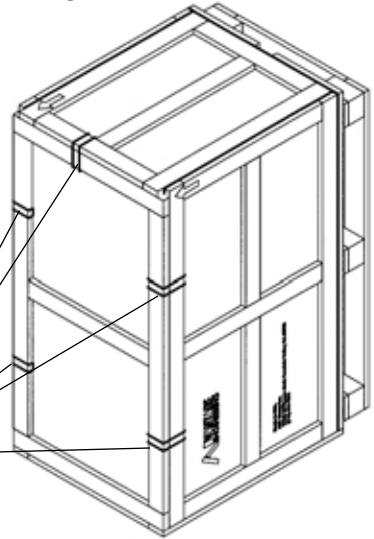
Tooling required for assembly/Unpacking:

- Flat Blade Screw Driver or Pry-Bar (to remove Cleats)

1. REMOVE BOTTOM CLEAT



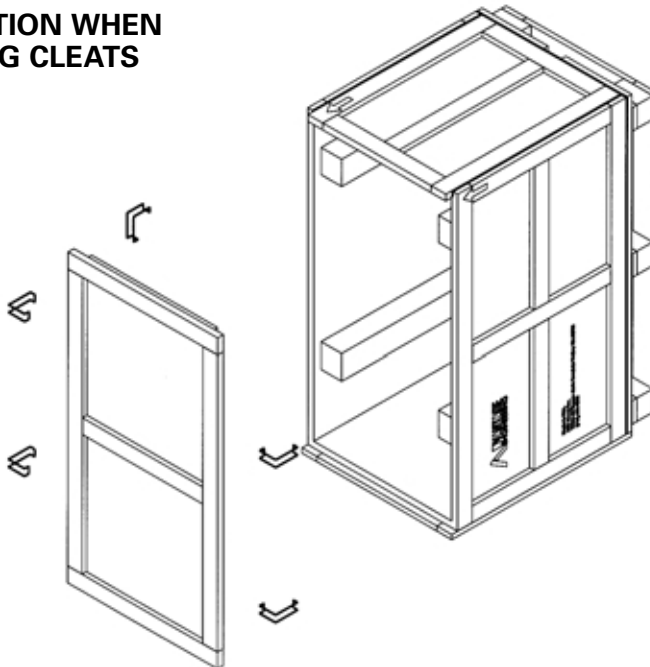
2. TILT UP




3. REMOVE REMAINING CLEATS



NOTE :
USE CAUTION WHEN
REMOVING CLEATS




PREPARING MACHINE FOR OPERATION

 **WARNING:** Do not connect any air or electrical supply to the machine before reading all of the instructions.

1. Unpack Standard Adapter Set. Mount Adapters on Adapter Rack per diagram.
2. Open back door of the machine. Locate and remove red oil filter adapter. Install the 3-micron spin-on filter in its place. Hand tighten.
3. Remove the clear 10" filter canister located on the front of the machine. Inspect for:
 - Black o-ring in place.
 - Damage, including small nicks.
 - Free of debris.

 **WARNING:** Do not put a filter element in this canister at this time.

4. Plug the machine into a VAC grounded power source. The electrical circuit must be separate from other equipment. If an extension cord is required, it must be rated up to 120 VAC, 15 AMP or + 200 VAC, 10 AMP.
5. Power up the machine by depressing the power switch located at the rear of the machine.
6. Connect the air supply (Not to exceed 125 PSI / 8.6 BAR) into quick disconnect, located at the rear of the machine, next to the pressure regulator.

 **WARNING: Do not adjust the pressure regulator.**
The pressure regulator has been pre-set at 75 PSI / 5.25 BAR.

PREPARING MACHINE FOR OPERATION (continued)

Check the display on the front of the machine.

The display panel will show the top portion of the “Main Menu” as seen below:

TTL SERVICES	=	0
MAINT IN 588 FLUSHES		
PACK SERVICES	=	0
TANK TEMP	=	LOW

The “Main Menu” also includes the following function items:

- 1. Program Reset:** Used to reboot system upon program lockout.
(See “Troubleshooting Guide”, “Flush cycle not working II”, Page 22)
- 2. Password Cycle:** To be used by Factory Representative only.
- 3. Date/Time:** Used to set Date and Time. (See Pages 8-9.)
- 4. Heater Time Set:** Used to set the Heater Time Clock. (See Pages 8-9.)
- 5. PLC/MTA Ver:** Displays Software set up and Version
- 6. Password Tech:** To be used by Factory Representative only.



NOTE:

If this “Main Menu” is not shown, unplug the machine, wait ten (10) seconds, check the power source, and then re-plug the machine into the power source. If you still have no display, call your local distributor.

PROGRAMMING CLOCK & HEATER TIME

Programming Clock

Return to the "Main Menu" by pressing the **[Main Menu]** Key, or go to the top of the "Main Menu" by using the cursor keys. Once you are at the top of the "Main Menu," then cursor down to **[Date-Time]**

1. CHANGE DATE:

[→] Cursor to the right. Use the numeric keypad and enter the correct date.

Example: (Year/Month/Day)

[Enter] Press the "Enter" key. **↵**

2. CHANGE TIME:

[→] Bring cursor to "Hour"Change "Hour" by using the numeric keypad.

[→] Bring cursor to "Minutes"Change "Minutes" by using the numeric keypad.

[→] Bring cursor to "Seconds"Change "Seconds" by using the numeric keypad.

[Enter] Press the "Enter" key. **↵**

[←] Cursor left.

[↓] Cursor down.

[↑] Cursor up.

This completes the Date/Time function. The clock is now set.

Programming Heater Time Clock

Return to the "Main Menu" by pressing the **[Main Menu]** Key, or go to the top of the "Main Menu" by using the cursor keys. Once you are at the top of the "Main Menu:"

[↓] Cursor down to Heater Time Set.

[Enter] Press the "Enter" key.

[Enter] Press the "Enter" key again.

[↓] Cursor down to line to be changed:

EXIT	
Mo-Fr	0600-2000
Sa	0600-2000
Su	0600-2000

PROGRAMMING CLOCK & HEATER TIME (continued)

Programming Heater Time Clock (continued)

Set heater time +/- 20 minutes before opening and to the exact closing time.

In colder climates, set the time up to 60 minutes before opening.

On the days when the shop is closed, match on and off times
(i.e. If the service department is closed on Sunday, program the time 0600-0600).

DAY OF THE WEEK	TIME
From-To	From-To
Mo - Fri	0600-1600
EXIT	-
	+

PAUSE

ABORT

FILL

[↓] Cursor to Time Object. Cursor will appear on 0600.

To change value on First Time Object use “+” [Fill] Key or “-” [Abort] Key

[→] Cursor to jump to next Time Object. Cursor will appear on 0600.

To change value on First Time Object use “+” [Fill] or “-” [Abort] Key

Repeat above instruction until all Time Objects are set to the required values.

Press “Exit” [Pause] Key

Press “Exit” [Pause] Key to return to “Main Menu”

UNDERSTANDING THE KEYBOARD

Function Keys

(1) FLUSH KEY:

Activates the flush cycle.

- Only operates when the display reads "Tank Temp Ready."
- Will not operate with alarms present.

(2) PAUSE KEY:

Pause is to stop the machine at any time, when needed.

- Also used to resume a cycle that has been stopped.

(3) ABORT KEY:

Cancels a cycle only after pressing the **[Pause]** key. The proper sequence for aborting a cycle is:

- 1) **[Pause]** key.
- 2) **[Abort]** key.
- 3) **[Fill]** key.

(4) FILL KEY:

Is used to fill the holding tank with Advantage Flush Solution during:

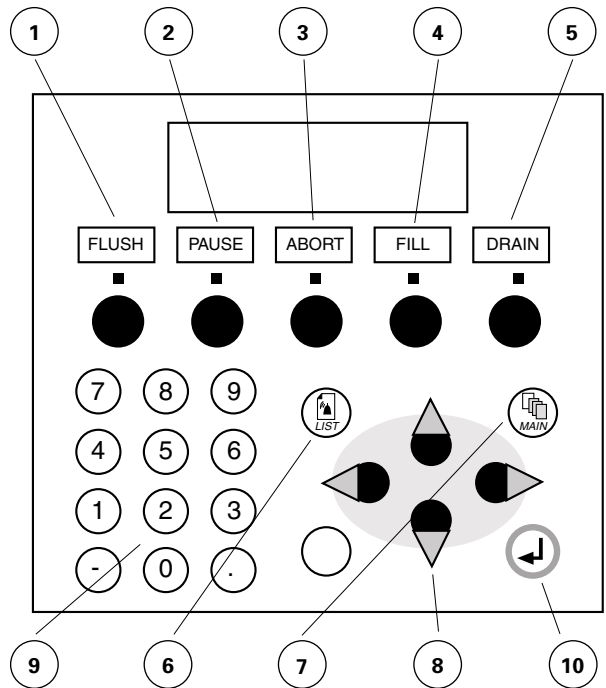
- Initial filling cycle.
- Refilling holding tank.
- Adding more solution when holding tank is low.
- Also used to ensure that the clear canister and hoses are completely drained of Advantage Flush Solution after a flush. This takes 45 seconds and can be repeated as often as needed.
- Also used after an "Abort Cycle" to ensure that all Advantage Flush Solution has been recovered from the vehicle's engine.
- You may press **[Fill]** key as many times as necessary in order to clear out all the Advantage Flush Solution from the canisters and hoses.

NOTE: Pressing the **[Fill]** key "recovers" the solution from any source outside of the Advantage Flush System and "fills" the holding tank. Outside source(s) include solution in canisters and hoses and the six (6) gallon Advantage Flush Solution containers.

(5) DRAIN KEY:

Drains all the Advantage Flush Solution from the holding tank.

- Only operates when the solution must be changed. (Solution is changed at a pre-set interval, usually 40 services.) (See "How to Change the Solution," Pages 16-17.)



(6) LIST KEY:

Turns off the audio alarm.

NOTE: You must follow the display's instructions after pressing the **[List]** key.

(7) MAIN MENU KEY:

Returns to top of "Main Menu" (Pack Count and Tank temp.) Not applicable if you are in the "Main Menu" function.

(8) CURSORS (ORANGE ARROW KEYS):

Used to scroll through the display.

(9) NUMBER PAD:

For setting clock, date, programming heater, troubleshooting, and service.

(10) ENTER KEY:

One of the [Enter] key functions is to Reset the system when at "Program Reset"

In the "Main Menu."

- Scroll down to "Program Reset" and press the **[Enter]** (Return) key. The **[Enter]** key is also used to:
- Enter data into system after input, as required.

NOTE: Other key's not utilized.

FILLING THE MACHINE FOR THE FIRST TIME

1. Unpack the two (2) six (6) gallon containers of Advantage Flush Solution.
2. Uncoil black hose from hose hanger.
3. Connect the 20" long black fill tube to the black hose. (Fill tube is located in upper adapter box.)

➔ **NOTE:** Listen for audible click to ensure proper connection.

4. Remove caps from all containers of Advantage Flush Solution. Place the fill tube into one of the full containers of Advantage Flush Solution until the fill tube hits the bottom of the container.
5. Press **[Fill]** key. The machine will automatically pump the Advantage Flush Solution into the holding tank. Pump makes a normal pulsating sound.

The display will show:

FILL CYCLE	0
PAUSE	

6. When the first container is empty, transfer the fill tube to the next container of Advantage Flush Solution. Repeat until two (2) containers are empty.

➔ **NOTE:** The fill cycle will automatically stop the once the required level of Advantage Flush Solution is in the holding tank. Do not interrupt this process.

The display will show:

FILLING COMPLETE
PRESS MAIN KEY
TO CONTINUE

7. Press the **[Main Menu]** key.

The display will show:

TTL SERVICES	=	0
MAINT IN 588 FLUSHES		
PACK SERVICES	=	0
TANK TEMP	=	LOW

➔ **NOTE:** If needed, press **[Fill]** key to completely remove any Advantage Flush Solution from clear canister and hoses.

9. Remove fill tube and return to upper adapter box.
10. Dispose of empty container according to Federal, State, and Local Regulations.


PREPARING TO PERFORM A FLUSH SERVICE

1. Allow the Advantage Flush Solution to automatically heat to $\pm 105^{\circ}$ F. The machine will heat up the solution automatically as long as the current time is within your time clock setting.

➔ **NOTE:** When operating temperature is reached the display will show “Tank Temp Ready.” The machine takes 15-40 minutes to heat the Advantage Flush Solution, depending on ambient temperature.

2. Install new ultra fine filter into the 10” clear canister, located on the front of the machine.


➔ **NOTE:** Check the canister and black o-ring for any nicks and/or debris. Clean or replace if necessary.

 **WARNING:** After completion of 40 flushes* you must change the solution. If the machine is attached (hooked-up) to a vehicle and the [Drain] key is pressed, all of the solution will be pumped into the vehicle’s engine, causing a severe overflow condition. Never press the [Drain] key when the system is attached to an engine. (See “How to Change the Solution,” pages 9-1 through 9-2).

* Dependent on software, solution change may be different (i.e. 20 or 30).


PERFORMING AN FLUSH SERVICE

1. Drain oil and remove oil filter from the engine.
2. Select proper oil filter adapter from adapter rack. (See “Engines Not Recommended”, Page 18 and “Adapters”, Pages 19-20 for additional information and diagrams.)


 **WARNING:** Adapters and mating engine oil filter port surface must be clean. Engine damage may occur by failing to clean these surfaces.


 **NOTE:** Use a solvent when cleaning adapters.

3. Attach oil filter port adapter to oil port by selecting the correct insert and lock it into the orifice on the adapter base; determine o-ring diameter, use larger diameter adapter plate if necessary, then attach to oil filter port. (See “Adapters”, Pages 19-20 for additional information.)
4. Select Oil Pan Adapter:
Use appropriate oil pan drain plug adapter. Thread it into the pan. Hand tight is sufficient. Attach the 90° adapter assembly to the drain pan plug turning until hand tight.
5. Lock wheel brakes, located on the front of the machine.

 **NOTE:** Check to ensure brakes are secure.

7. Connect the red hose to the oil filter adapter and the black hose to the oil pan adapter.

 **NOTE:** Listen to audible click to ensure proper connection.

 **WARNING:** To avoid engine overfill make sure the hoses are properly aligned and connected to ensure there are no twists or kinks of adapter hoses and red and/or black external hoses.

8. Press **[Flush]** key.
9. Check for leaks in all attachments.
 - If leaking air or fluid press the **[Pause]** key and eliminate the leaks.
 - Press the **[Pause]** key to continue the flush.

PERFORMING AN FLUSH SERVICE (continued)

⚠ WARNING: After pressing the **[Flush]** key, it should take approximately 30 seconds for solution to start returning from the engine to the Advantage Flush System. If no solution is flowing back to the Advantage Flush System, press the **[Pause]** key and check to ensure that all connections are secure before continuing the service.

Once the problem has been corrected, press the **[Pause]** key to continue the flush. If after an additional 20 to 30 seconds the solution is still not flowing back to the Advantage Flush System, press the **[Pause]** key immediately. Correct the problem before any further attempt is made to perform the service. (See table on "Avoiding Engine Overfill," page 21.)

10. The Advantage Flush System performs the service in four (4) stages.
- The first three stages consist of a 100 second flush and up to a 90 second recovery.
 - The fourth stage consists of a 100 second flush and up to a 180 second recovery.

	Flush	Recovery
STAGE I	100 seconds	up to 90 seconds
STAGE II	100 seconds	up to 90 seconds
STAGE III	100 seconds	up to 90 seconds
STAGE IV	100 seconds	up to 180 seconds

Flush Cycle: Heated and pressurized (± 42 PSI), solution is pumped with pulsating action through the oil filter port to the main bearings, rod bearings, oil galleys, camshaft bearings, and valve lifters. Solution flows to the oil pan and is vacuum extracted through the drain plug adapter to the Advantage Flush System. The Advantage Flush System filters the contaminated solution through ultra fine 3 micron filters.

Recovery Cycle: Vacuum extracts all of the solution from the engine and pumps it back to the holding tank.

Final Recovery Cycle: During the first 105 seconds of "Last" recovery the air is pumped through the oil filter port adapter to force excess fluid and sludge debris from the engine to the oil pan, where it is evacuated. You may notice that the pump sounds as if it is picking up speed. When the service is completed the buzzer will sound five (5) times and the display will show that the service is completed. Check the clear filter canister to make sure that it is empty of solution. If not press **[Fill]** key, which will cause the system to run a 45 second recovery cycle.

➡ NOTE: You can press the **[Fill]** key as often as required to recover all of the Advantage Engine Flush Solution in the 10" clear canister.

PERFORMING AN FLUSH SERVICE (continued)

11. Detach the red and black hose from the engine and rehang them.

➔ **NOTE:** Avoid dropping and or dragging the hose ends on the floor.
If the hose ends become dirty, clean with solvents.

12. Remove adapters from the engine.

13. Clean adapters with a clean rag or towel.

14. Return adapters to adapter rack.

15. Complete the oil change process.

16. Remove the ultra fine filter from the clear canister. Properly dispose of the used filter according to Federal, State, and Local Regulations.

The Advantage Flush System is now ready for the next service. (Refer back to Page 12.)

HOW TO CHANGE THE SOLUTION

➔ **NOTE:** After 40 services* the audible alarm sounds. The display will show:

**DESLUDGING CO ALARM
PUSH "LIST" HORN OFF**

* Dependent on software, solution change may be different (i.e. 20 or 30).

1. Press **[List]** Key. The display will show:

**GAS PRESET COUNT
CHANGE SOLUTION
"DRAIN" & "FILL"**

2. Uncoil hoses.
3. Obtain the oil filter adapter, located on the adapter rack.
4. Detach the clear hose assembly from the adapter by holding the metal retainer ring/collar and pushing the hose towards the ring, then immediately pull the hose away from the adapter.
5. Connect the clear hose assembly to the red external hose. Make sure the hose is properly connected and that you hear a positive clicking sound.
6. Insert oil filter adapter hose into the proper waste holding tank or container. It must hold at least 12.5 gallons or 48 liters for each tank of solution to be changed.
7. Secure or hold the hose in place. Once pressure is applied the hose will tend to move.
8. Press **[Drain]** key. The display will show:

**DRAIN CYCLE ALARM
"PAUSE"**

➔ **NOTE:**

Press **[Pause]** key to pause drain process at any time.

Press **[Pause]** key to resume the drain process.

Machine will automatically stop once the holding tank is completely drained.

Do not interrupt this process. The display will show:

**"DRAINING COMPLETED" "ALARM"
"READY TO FILL"
TO CONTINUE**

➔ **NOTE:** "Alarm" shows until alarm is corrected.

HOW TO CHANGE THE SOLUTION (continued)

9. Remove clear hose assembly from the red external hose, clean and re-install to the oil filter adapter.
10. Clean adapter with clean rag or towel and then return oil filter adapter to the adapter rack.
11. Remove old 3 micron spin-on filter located at the rear of the machine, dispose of filter according to Federal, State, and Local Regulations.
12. Install new 3 micron spin-on filter, secure in a hand tight manner. (Filter is included in the Advantage Filter Pack.)
13. Connect the 20" long black fill tube to the black hose (Fill tube is located in the upper adapter box.)

➔ **NOTE:** Listen for audible click to ensure proper connection.

14. Remove caps from two (2) containers of Advantage Flush Engine Solution. Place the fill tube into one of the full containers of Advantage Flush Solution until the fill tube hits the bottom of the container.

15. Press **[Fill]** key. The machine will automatically pump the Advantage Flush Solution into the holding tank.

Pump makes a normal pulsating sound. The display will show:

FILL CYCLE	ALARM
PAUSE	

16. When the first container is empty, transfer the fill tube to the next container of Advantage Engine Flush Solution. Repeat until all containers are empty.

➔ **NOTE:** The fill cycle will automatically stop once the required level of Advantage Engine Flush Solution is in the holding tank. Do not interrupt this process. The display will show:

FILLING COMPLETE
PRESS MAIN KEY
TO CONTINUE

17. Press the **[Main]** key. The display will show:

TTL SERVICES	=	40
SERVICE IN 548 FLUSHES		
PACK SERVICES	=	0
TANK TEMP	=	LOW

➔ **NOTE:** If needed, press **[Fill]** key to completely remove any Advantage Flush Solution from clear canister and hoses.

18. Remove the fill tube and return to adapter box.
19. Dispose of empty canisters according to Federal, State, and Local Regulations.
20. Clean inline strainer located in drain plug adapter.

SHUTTING OFF THE MACHINE

➔ **NOTE:** Do not shut off the power source to the Advantage Flush System during any operating cycle.

The Advantage Flush System is equipped with an energy saver time clock and should not be disconnected from electrical power during non-business hours. Machines can be programmed to pre-heat the Advantage Flush Solution before opening for business and shut heaters off after hours (See "Programming Clock and Heater Time Clock," Pages 8-9.)

➔ **NOTE:** If you have any questions or require any assistance contact your local distributor.

ENGINES NOT RECOMMENDED

The Advantage Flush Service is not recommended for the following engines:

Horizontal or opposed engines such as:

- Porsche 911, 912, and 914
- Volkswagen Vanagon
- Chevrolet Corvair
- Subaru with pancake motors

All rotary engines such as:

- Mazda RX-7

All dry sump motors such as:

- Mercedes Benz 6.9 (1975-1979)

Worn Engines:

The purpose of engine flushing is to remove sludge and contaminant build-up from the engine's internal oil system. It is not meant to be a corrective measure for needed mechanical repairs.

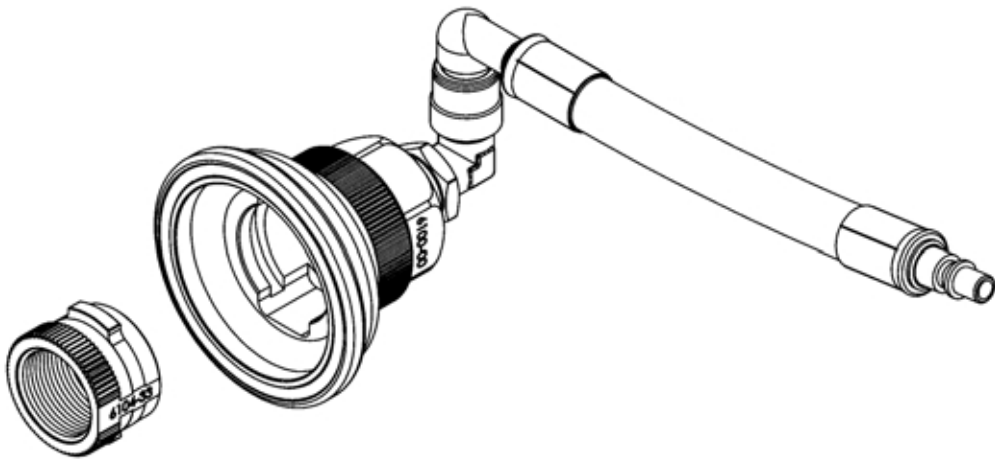
ADAPTERS

The Advantage Flush System, when attached to an engine, becomes a closed-loop, pressurized system that injects and extracts solution through the engine with a patented adapter system.

The Advantage Flush System is shipped with an adapter set that includes Oil Filter Port, or Upper Adapters for spin on filter applications and Oil Pan, or Lower Adapters.

Oil Filter Port Adapters

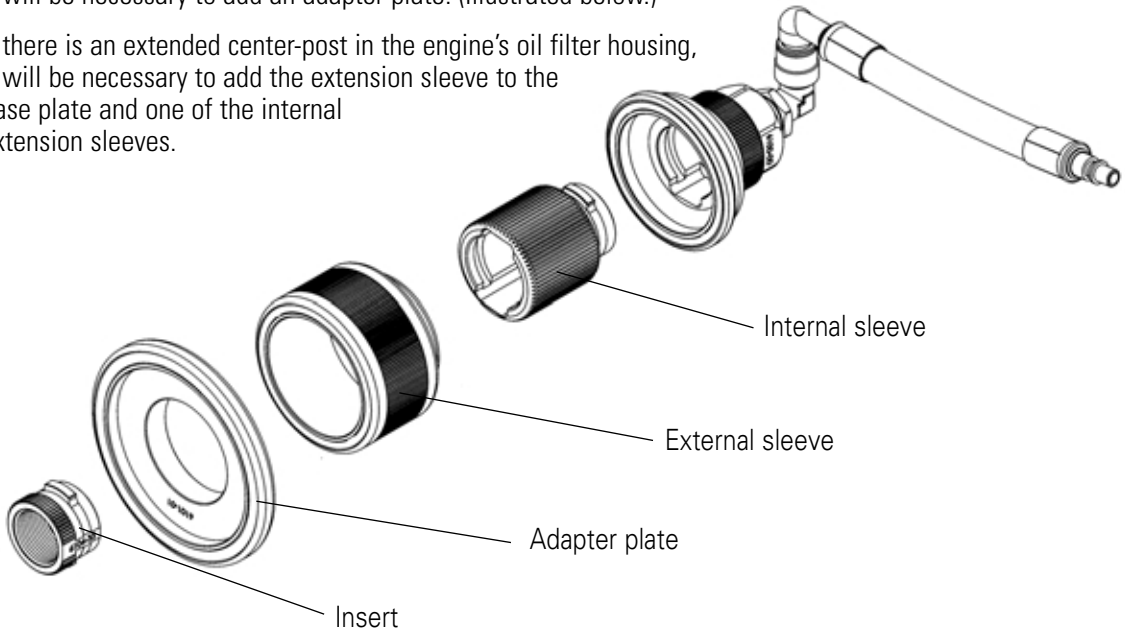
In all cases it will be necessary to use the oil filter base adapter when connecting to the oil filter port of the engine. Depending on the engine's oil filter housing, some combination of one or more of the other upper adapters will be necessary to produce an effective attachment to the engine. In 90% of the cases when a spin-on filter is used, the outer housing lip of the oil filter housing and the center post are level with each other. Take one of the upper adapter inserts and lock into the oil filter base adapter. This assembly is directly attached to the engine's oil filter housing (hand tighten).



ADAPTERS (continued)

If the outer lip of the engine's oil filter housing is larger in diameter than the oil filter base plate, it will be necessary to add an adapter plate. (Illustrated below.)

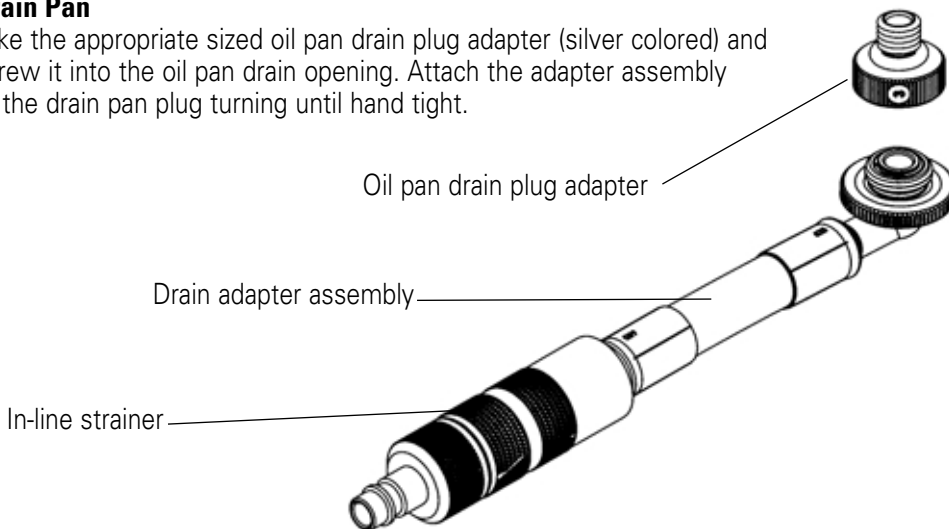
If there is an extended center-post in the engine's oil filter housing, it will be necessary to add the extension sleeve to the base plate and one of the internal extension sleeves.



Drain Pan Adapters

Drain Pan

Take the appropriate sized oil pan drain plug adapter (silver colored) and screw it into the oil pan drain opening. Attach the adapter assembly to the drain pan plug turning until hand tight.



TROUBLESHOOTING GUIDE

PROBLEM	CAUSE(S)	WHAT TO DO
No display	No power.	Check the wall receptacle for the proper voltage.
	Machine not plugged in.	Plug in.
	On/Off switch is not in the "On" position.	Turn the On/Off switch, located on the back of the machine, to the "On" position.
	Fuse blown.	Check the 5 AMP and 10-15 AMP Fuse, replace if blown. The fuses are located on the back of the machine above the On/Off Switch, lower fuse is 10-15 AMP, upper fuse is 5 AMP.
	Loose wires / bad connection	Check for security on all wires, if wire(s) are loose, <u>UNPLUG MACHINE</u> , tighten wire(s), and recheck.
Tank temperature low	Low voltage from wall outlet	Check voltage in shop. If voltage is lower than 92% of the normal required voltage, the unit will not heat properly.
	Amperage on extension cord not rated at 15 AMPS	Remove extension cord and replace with a cord that is 15 AMP rated, or plug directly into the wall power outlet.
	Machine is low in solution	1) Disconnect air, press the [Fill] key, check for "Low Fill Cycle". If counters run, let the counter run until cycle has completed. Wait 20-60 minutes for the machine to heat the solution. 2) If counter does not run, press the [Pause] key, then press the [Abort] key, then press the [Main Menu] key. Go to the program reset and press the [Enter] key. 3) Repeat Step 1 with air connected. If counters do not run, add one (1) six (6) gallon container of solution to the internal tank. Wait 20-60 minutes for the machine to heat solution.
	Bad mechanical relay.	Check for 24 VDC on purple and colored wires, located on mechanical relay(s). If 24 VDC is present, check for closed contact position. If contact is not closed, replace relay(s).
	No fluid circulation	No air pressure.
Internal 3 Micron Filter loose or not installed.		Make sure 3 Micron Filter is installed and hand tightened.

TROUBLESHOOTING GUIDE (continued)

PROBLEM	CAUSE(S)	WHAT TO DO
No fluid circulation (cont.)	Quick release fitting.	Check for proper connection between adapters and hose connection.
	Pump is not working.	Call your local distributor for assistance.
Filter canister empty. Fluid does not return to the unit.	Bad connection at the return quick connect;	Check the quick release connection on the oil pan adapter;
	Clogged return quick connect; Kinked recovery hose (Black); In-line strainer clogged.	Clean the quick connect; Check (black) hose for kinks; Clean in-line strainer.
Flush Cycle not working I.	Low tank temperature.	Wait for the tank temperature to be "Ready".
Flush Cycle not working II.	Program lockout.	Reset program. Press [Main Menu] . Use [Cursor] key to scroll down to "Program Reset" then press the [Enter] key.
	Last cycle was aborted.	Reset program or disconnect the air, press [Fill] key, and let cycle complete.
[Drain] key not working.	Pack services not at 40 count.	Wait until 40 count services are reached.
Ultra Fine Filter Canister leaking I	Canister not tightly closed	Press the [Pause] key to pause service. Using canister wrench, tighten canister, then press [Pause] key to resume service.
Ultra Fine Filter Canister leaking II	Dirty O-ring groove or dirty O-ring	Press the [Pause] key to pause service. Clean O-ring groove and O-ring, then press the [Pause] key to resume service.
	No O-ring or damaged O-ring	Press the [Pause] key to pause service. Replace the O-ring, then press the [Pause] key to resume service.
No solution flowing through the canister after the [Flush] key was pressed.	Hoses are not connected properly to adapters.	Press the [Pause] key to pause service. Disconnect and reconnect hose fitting adapters. Press [Pause] key to resume service.
	Drain plug adapter or inline strainer clogged with debris.	Press [Pause] key to pause service, Press [Abort] key, Press [Fill] key, disconnect adapter, clean out debris, press [Flush] key to flush.
No recovery, [Fill] key must be pressed several times.	Drain adapter is clogged with sludge or debris.	Clean and inspect adapter.

AVOIDING ENGINE OVERFILLS

The Advantage Flush System has been designed to be very operator friendly and fail-safe. The machine requires a reasonable level of care in handling and set-up, in order to eliminate the possibility of an engine overfill.


The two most likely reasons for an engine overfill are debris in the adapters and kinked hoses. Kinked hoses can be completely eliminated by positioning the machine and hoses in a manner such that the hose is not folding back on itself. Problems with debris can be reduced through care in handling and periodic inspection during the flushing process to ensure that canisters are filling with solution during the flush.

Listed below are typical problems, causes of engine overfills, and what can be done to “Cure” them.

PROBLEM: *Clogged or blocked drain plug adapter or hose quick release.*

CAUSE: Debris from engine or shop environment.

- CURE:**
- 1) Check adapter for debris before installation.
 - 2) During a flush, check canisters and adapter hoses to ensure proper flow. Stop flush and check for debris if flow appears low.

 **NOTE:** Older or poorly maintained cars may have large amounts of debris, so use more care throughout the process.

PROBLEM: *Blockage at hose quick release.*

CAUSE: Improper connection caused by debris or failure to completely seat the fittings.

CURE: Check for debris before installing. Ensure that a positive lock (Clicking sound) is achieved. Check “Rough” collar to ensure that it is completely seated against adapter nut (No visual gaps).

PROBLEM: *Drain plug adapter hose kinked.*

CAUSE: Installation and position of hoses and the machine.

CURE: Keep hose and machine aligned to avoid folding hoses. In tough situations a simple hook can be used to support the hose and ensure proper alignment.

PROBLEM: *Recovery pump not working.*

CAUSE: Faulty solenoid.

CURE: Open rear door. With flat head screwdriver turn bypass valve on solenoid body (Solenoid is identified by black wire) 90 degrees. If pump runs, open solenoid cap and check wire connection and voltage. If OK, check coil. If OK, change solenoid body.

PROBLEM: *Recovery pump not working.*

CAUSE: Failed pump (*).

CURE: After determining that solenoid is good, have pump removed and replaced.

PROBLEM: *Overfill will occur if operator hits the drain key after the 40th flush.*

CAUSE: Operator pushing incorrect keys and neglecting alarms

- CURE:**
- 1) Take your time and read the display.
 - 2) Drain old solution by following instructions on the machine.

PROBLEM: *Stiff or kinked hoses.*

CAUSE: Extremely tough shop environment with high turnover of personnel or personnel who handle equipment roughly.

CURE: Repair or replace damaged equipment.

(*) Note: A failed recovery pump is unlikely.

MAINTAINING THE ADVANTAGE FLUSH SYSTEM

The machine requires a routine maintenance to be performed by an authorized technician, after every 588* flushes. The Main Menu line item "MAINTENANCE IN" always displays the number of flushes remaining before the next required routine maintenance. The counter will automatically count down after each service is completed.

When the machine has only 20 flushes remaining.

The display will show:

TTL SERVICES	=	568
MAINT IN 20 FLUSHES		
PACK SERVICES	=	8
TANK TEMP	=	READY

After completion of every flush the alarm will sound and a message will appear.

The display will show:

MAINT IN 19 FLUSHES
LOCKOUT AT 0 COUNT
PRESS MAIN MENU
CALL SERVICE TECH.

Please contact you local distributor and set up an appointment for a routine maintenance before reaching 0 flushes as the machine will be disabled after 0 flushes is reached.

*588 or 999 services depending on software.



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