

EBS PRODUCTS

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OPERATIONS MANUAL



EC-1 Coolant Flush

#1000-0070

1-1-16

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I. SAFETY INFORMATION

1.01 IMPORTANT SAFETY NOTICE

For your safety, read this manual thoroughly before operating your EBS Coolant Fluid Service equipment. Always refer to and follow the safety messages and applicable service procedures provided by the manufacturer of the vehicle being serviced. Only properly trained professional automotive technicians should perform the service. *Improper use and operation of this product can result in injury.*

- Safety Symbols



Risk of Fire

Mandatory Eye Protection



Risk of Entanglement



Mandatory Protective Gloves



Dangerous Fumes



Mandatory Protective Clothing

1.02 IMPORTANT SAFETY INSTRUCTIONS



WARNING



Insure both ambient and electromechanical ventilation of work area. Exhaust gases, moving parts, hot surfaces, and hot potent chemicals may *cause injury*. When using chemicals always refer to the MSDS sheets and local laws for proper emergency medical treatment, cleanup, handling, and storage requirements. Wear safety glasses (user and bystanders), chemical resistant gloves, and protective clothing when servicing a vehicle with the EBS Coolant Flush equipment.

Keep yourself, clothing, adapters and service hoses clear of moving parts.

Treatment methods are as follows:

Eyes: Flush eyes with plenty of water.

Skin: Wash with soap and water.

Inhalation: Move to uncontaminated area.

Ingestion: If large amount, get medical attention. Keep pets and children away from any chemicals.

If any irritation persists, get medical attention.



WARNING



Flammable coolant fluid chemical and vapors can ignite and *cause injury*.

- Avoid exposure to flames, sparks, hot engine parts, and other ignition sources.
- Keep a fully charged fire extinguisher nearby with a class B rating suitable for chemical, and electrical fires.



WARNING



Risk of burns. Many coolant systems maintain residual pressure and high temperature fluids in components, with the risk of expelling pressurized fluids, even after the service has been completed.

- Do not touch hot exhaust systems, manifolds, engines, radiators, etc.
- Verify that EBS Coolant Flush equipment is off before connecting or disconnecting lines and adapter hoses.
- Keep the service hoses away from hot or moving engine parts. Hoses can split or burst.
- Tighten all connections properly.



WARNING

Engine has moving parts. Risk of entanglement.

- **Do not place tools on fenders of other places in engine compartment.**
- *Moving components can cause injury.*



WARNING

Risk of injury.



- **Loop the power cord loosely in its proper location when machine is not in use.**
- **Do not operate equipment with a damaged power cord or hoses, or if the equipment has been dropped or damaged, until it has been examined by a qualified service representative.**
- **Care should be taken to arrange the power cord and service hoses so that they will not be tripped over or pulled.**
- **Never pull on the power cord or service hoses to transport the EBS Coolant Flush system. Damage may occur to these components, or machine may tip over.**
- **Keep area of operation clear of unnecessary tools and equipment. Utilize storage area on the top of the machine.**
- **Never leave the machine running unattended.**
- **The EBS Coolant Flush system is not designed for any other purpose than the servicing of vehicle coolant fluid.**



CAUTION



Risk of equipment damage.

- **Servicing, transporting, or storing this machine in an attitude other than the normal operating position can result in fluid spillage and/or component damage.**
 - **Use only the manufacturer's recommended attachments.**
 - **Periodically clean the machine by wiping down with a clean, soft, dry cloth.**
- Improper operation of equipment may result in damage to machine or components.*

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EC-1 #1000-0070- Coolant Service Specifications

- ⇒ A self-contained coolant extraction, flush and change service equipment – reverse flow
- ⇒ Adapter set covers 99% of vehicles
- ⇒ A valve on the adapter allows for regular coolant flow to check thermostat operation and flushing material function. The engine does not have to be at operating temperature to perform the service.

- ⇒ 110 vac powered, fuse protected, converted to 12 vdc operation
- ⇒ 22 ft. power cord with power cord holder attached to cabinet
- ⇒ Easy to use, 3 position electrical switch controls the service
- ⇒ A reverse flow through the cooling system provided by a combination of pressure (25 psi) at the engine and vacuum at the radiator
- ⇒ Separate fill and vacuum pumps each rated at one gallon per minute pumping capacity to provide a flow of approximately 1 gallon per minute through the vehicle's cooling system.
- ⇒ A priming valve between service hoses to quickly prime pumps or empty remaining new fluid to the waste tank if desired.
- ⇒ The ends of the adapters are marked to show proper attachment
- ⇒ All quick connects on hoses are double shut off
- ⇒ A controllable handgun wand for vacuuming coolant from the vehicle's radiator and hoses
- ⇒ Equipment cabinet made from heavy-duty industrial grade polyethylene to provide for the safe and secure containment of 8 gallon new and 8 gallon waste tanks within the equipment
- ⇒ Cabinet contains a built-in sturdy handle to assist in movement of the equipment
- ⇒ Locking front wheels and large 8" rear wheels provide ease of movement
- ⇒ Easy top fill of new coolant tank
- ⇒ A third 12 vdc, 3.7 gallon per minute rated pump , switched on the rear of the equipment for emptying the waste tank
- ⇒ Additional utility items include, protective gloves, overflow tube clamp, and extension hoses



Machine Dimensions:

Height	44 inches
Depth	23 inches
Width	24 inches
Machine Weight	88 lbs.

Shipping Weight	132 lbs.
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III. OPERATING PROCEDURES

3.01 CONTROL PANEL OVERVIEW



Figure 1

<u>KEYS NAME/FUNCTION</u>	<u>DETAILS</u>
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SELECTOR SWITCH	To select either “ FILL FLUSH ” or “ VAC ” function
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FILL – FLUSH FUNCTION	Moves New Fluid from the New Fluid Tank to the Fill Hose and Vacuums Old Fluid thru the vacuum hose to the Waste Tank of the Equipment. Can be used for Filling alone. Can be used for priming all pumps.
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VAC FUNCTION

Provides vacuum to the Vac Line for removing old fluid from the vehicles coolant system

3.02 TOOL USAGE



CAUTION

- Frequently inspect and clean any adapters and tools used.
- The use of any other accessories/adapters not specified in this manual may create a hazard.
- Read, understand and follow Safety Instructions in the front pages of this manual and on product safety labels

3.03 IDENTIFYING THE COOLANT SYSTEM FLUID REQUIREMENTS

Identify the coolant system type and the OEM coolant fluid specification of the vehicle to be serviced before performing any set up or servicing procedure on vehicle.

All vehicle coolant systems can be serviced with the EBS Coolant Service equipment.

THERE ARE FOUR OR MORE MAJOR TYPES OF COOLANT FLUIDS USED IN COOLANT SYSTEMS

Follow the vehicle manufacturer's recommendation for coolant type. Per various coolant experts some (minimal) mixing will not compromise the effectiveness of each coolant's inhibitor package. However we recommend in the event that a different coolant is recommended than what is in the New Fluid tank that that fluid be removed by transfer to the locations new fluid supply or the equipment's waste tank using the PRIME valve on the equipment's hose manifold. **Note that the black PRIME valve is always off or perpendicular to the FILL and VAC hose connections except when priming the pumps or emptying the New Fluid Tank.**



WARNING

- Only use coolant fluids in the EBS Coolant Service Equipment. Other fluids such as power steering fluid, transmission fluid, brake fluid, etc. will damage pumps, fittings and other parts of the equipment. This is not covered under the equipment warranty.

3.04 VEHICLE AND EQUIPMENT PREPARATION – Call 877-955-0515 for any questions

Vehicle Preparation

1. Insure vehicle is safely parked and engine is off.
2. Repair any leaks or malfunction prior to coolant fluid service.
3. Refer to manufacturer's maintenance manual for compliance with manufacturer's precautions or recommendations prior to exchanging coolant fluid.
4. Wear appropriate protective clothing and goggles.

Equipment Preparation

1. Place equipment in a safe area at the front of the vehicle perpendicular to the vehicle's direction and lock equipment wheels.
2. Turn all switches to the "OFF" position.
3. Plug machine into a grounded 110 VAC electrical outlet. Extension cords must be rated at 15 amps and grounded.

4. Turn equipment on. Verify that the light on the main “Power” switch is illuminated and no equipment pumps turn on.
5. Prime pumps if necessary by: **Turn Black PRIME valve on hose manifold parallel – see Fig.2 then turn Fill-Flush on for 3 or 4 seconds – turn Fill-Flush off. Turn PRIME valve back to perpendicular when prime is complete – see Fig. 3.**



Fig. 2



Fig. 3

Empty WASTE TANK – (if no waste fluid is present proceed to ‘FILL NEW FLUID Tank ’ below).

1. Connect WASTE HOSE to quick connect at rear of machine
2. Connect WASTE HOSE extension PLUG to other end of WASTE HOSE and insert securely in a proper waste coolant receptacle.
3. Turn Waste Pump switch on rear of machine on. Check for flow and security of Waste Hose.
4. Turn Waste Pump switch to OFF when waste tank is emptied.

Fill NEW FLUID TANK – (if NEW FLUID Tank contains the proper amount and type of coolant for servicing the vehicle proceed to "VEHICLE SERVICING" below).

1. Remove the New Fluid filler spout cover in the top tool tray.
2. Carefully fill the New Fluid tank, with coolant fluid, to the desired level as shown on the tank fluid level marking.

3.05 VEHICLE SERVICING

Attaching FILL and VAC Service Hoses to Equipment Service Receptacles

1. Connect FILL (clear) and VAC (blue) hose quick connects to service plugs at top right of machine – see Fig. 3. Note FILL and VAC service hoses match the color from the equipment and the PRIME VALVE IN Fig. 3 is in the SERVICE position.

Preparing Vehicle for Service



WARNING



Risk of burns. Hot components can cause injury or discomfort.

- Wear gloves, goggles and protective clothing when working near hot engine components.

1. Turn engine off and allow engine to cool before carefully removing radiator cap.
2. Connect VAC TUBE into end of VAC HOSE
2. Turn VAC on and vacuum coolant fluid in radiator to below upper radiator hose level.
3. Carefully remove upper radiator hose at the radiator, use VAC function to further lower fluid level in hose to reduce spillage if desired.
4. Attach adapter replacement hose to the radiator inlet tube and secure with hose clamp - see Fig. 4.



Fig. 4



Fig. 5

6. Insert appropriate size hose adapter into adapter replacement hose connected to the radiator inlet tube – see instruction #5 above. Note the ends of the adapter insert indicate which side of the adapter – see figure 5 – to connect. Secure all attachments with screw clamps provided - see figure 4.
7. Insert the “to Engine” side of the adapter into the radiator hose (coming from engine) – note the ends of the adapter insert indicate which side of the adapter – to connect - see figure 5. Secure all attachments with screw clamps provided - see figure 4.
8. Do not attach any equipment hoses to the adapter at this time - leave as in figure 4.

Cooling System Cleaning/Flushing

1. Add flush chemical to radiator, turn SELECTOR Switch to FILL/FLUSH, use fill gun to fill radiator, turn FILL/FLUSH switch to off when full. Replace radiator cap.
2. Turn lever on RAD side of adapter parallel to the valve – see Fig. 6. This will allow for normal coolant flow.



Fig. 6

3. Turn engine on and check for leaks. There should be no flow of coolant until the engine reaches operating temperature and the thermostat opens. When it opens you will see coolant flow from the engine to the radiator – this checks thermostat operation. Run engine for 10 to 15 minutes, or as recommended by the flush chemical directions, to allow flush chemical to do its job. Turn engine off once the desired cleaning time is completed.

Fig. 7

Cooling System Fluid Flush/Replacement

4. Connect Fill and Vac hoses from equipment's Service Connections on side of equipment to the Service Hose Adapter. **The FILL hose (clear) and VAC hoses (blue – note – its red in Fig.8).** Close ball valve on Service Hose Adapter identified with "to RAD" - See Figure 7 and 8.

**Fig.8**

5. Turn VAC on and vacuum coolant fluid from Overflow Tank - then turn function switch to OFF. Clamp overflow hose between radiator and Overflow Tank.
6. Turn SELECTOR Switch to FILL/FLUSH. Check for new fluid flow from the equipment towards the engine and waste fluid from the Radiator towards the equipment. Monitor fluid levels by watching the New Fluid level decrease and the Waste Fluid level increase. Turn FILL/FLUSH switch OFF when approximately One Gallon of New Fluid remains in the New Fluid tank. This is used to top off radiator and fill vehicle Overflow Tank to the proper level.

Completing Coolant Service

1. Turn FUNCTION Switch to Vac for 4 to 5 seconds to remove any residual pressure from cooling system. Turn FUNCTION Switch Off. Carefully open and remove radiator cap.
2. Remove FILL and Vac Service hoses from Service Hose adapter. Connect vacuum wand to end of VAC hose. Turn SELECTOR Switch to Vac and vacuum coolant fluid in radiator to below upper radiator hose level.
3. Carefully remove radiator adapter hose from radiator and use VAC function to remove any coolant from hose to prevent spilling.
4. Remove remainder of adapters and reconnect vehicle hoses and clamps.
5. Attach FILL GUN to FILL hose. Turn SELECTOR Switch to FILL/FLUSH and fill vehicle Radiator and Overflow Tank to proper levels.
6. Turn FILL/FLUSH OFF and replace Radiator cap.
7. Start engine and check for leaks. Service is complete.

Call 877-955-0515 for any equipment, service or maintenance questions

IV PARTS LIST

EBS Coolant Equipment Parts List

<u>PART #</u>	<u>DESCRIPTION</u>
1000-0070	EBS Coolant Service Equipment
1000-0170	EBS Adapter Small Sizes 1", 1.25", 1.375" and 1.5"
1000-0171	EBS Adapter Large Size 1.75", 2.0", 2.25", and 2.5"
2220-1030	7 GALL. WASTE TANK
1520-0041	TOP HAT BRAKET (POWER CORD HOLDER)
1520-0040	POWER CORD (22Ft)
1520-0010	POWER CORD CONNECTOR
1410-0140	ABS CAP
1400-0021	SWIVEL FITTING 3/8" MNPT X 3/8" FNPT
1400-0022	LOW PROFILE FILTER 3/8" MNPT X 3/8" MNPT
1400-0001	FILL NEW TANK PUMP
1400-0002	WASTE PUMP
1520-0031	POWER SUPPLY
1520-0011	FUSE
1430-0040	FUNCTION SWITCHES
1520-0020	ON/OFF SWITCH
1430-0010	TOUCH PAD
2220-0015	BLACK CART DOOR 19" X 21" X 6 mm.
1400-0117	HOSE CLAMP
1330-2110	FILL GUN
1420-0010	HOSE PINCH
1400-0121	HOSE CLAMPS
1410-0010	HOSE STEP ADAPTERS
1400-0020	MINIATURE FLOW BALL VALVE

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Please contact EBS Technical Support at 877-955-0515 for conformation of proper part #'s for replacement or repair and other parts not listed on the Parts List

Warranty Information
LIMITED TWO (2) YEAR WARRANTY
EBS COOLANT SERVICE Equipment

EBS warrants only to the original Purchaser that under normal use, care and service, the Coolant Service Equipment (except as otherwise provided herein) shall be free from defects in material and workmanship for two year from the date of original purchase. External hoses, remote control modules, adapters and all other attachments, supplies and consumables (except as otherwise provided herein) are warranted for 90 calendar days from the date of original invoice. Filter elements are not warranted.

PURCHASER'S TECHNICIAN MUST HAVE TELEPHONE COMMUNICATIONS WITH EBS TECHNICAL SUPPORT TO DIAGNOSE THE PROBLEM AND DETERMINE IF THE PROBLEM IS A WARRANTY ISSUE BEFORE ANY WARRANTY REPAIRS CAN BE MADE. SELLER'S OBLIGATIONS UNDER THIS WARRANTY ARE LIMITED SOLELY TO THE REPAIR OR, AT SELLER'S OPTION, REPLACEMENT OF EQUIPMENT OR PARTS WHICH TO SELLER'S SATISFACTION ARE DETERMINED TO BE DEFECTIVE AND WHICH ARE NECESSARY, IN SELLER'S JUDGEMENT, TO RETURN THE EQUIPMENT TO GOOD OPERATING CONDITION. NO OTHER WARRANTIES EXPRESS OR IMPLIED OR STATUTORY, INCLUDING WITHOUT LIMITATION ANY IMPLIED WARRANTY OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE, SHALL APPLY AND ALL SUCH WARRANTIES ARE HEREBY EXPRESSLY DISCLAIMED.

This warranty does not cover (and separate charges for parts, labor and related expenses shall apply to) any damage to, malfunctioning, inoperability or improper operation of the

equipment caused by, resulting from or attributable to (A) abuse, misuse or tampering-**the use of the equipment with non coolant fluids is misuse**; (B)alteration, modification or adjustment of the Equipment by anyone other than Seller's authorized representatives; (D) improper or negligent use, application, operation, care, cleaning, storage or handling; (E) fire, water, wind, lightning or other natural causes; (F)adverse environmental conditions, including, without limitation, excessive heat, moisture, corrosive elements, or dust or other air contaminants, radio frequency interference, electric power failure, power line voltages beyond those specified for the equipment, unusual physical, electrical or electromagnetic stress, and/or any other condition outside of Seller's environmental specifications; (G) use of the Equipment in combination or connection with other equipment, attachments, supplies or consumables not manufactured or supplied by Seller; or (H) failure to comply with any applicable federal, state or local regulation. Repairs or replacements qualifying under this Warranty will be performed on regular business days during Seller's normal working hours within a reasonable time following Purchaser's request. All requests for Warranty service must be made during the stated Warranty period. This warranty is non-transferable.