

MAHLE BFX-20

EN

Operation Manual
Brake Fluid Exchange Unit



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1. Information

1.1 Document warnings

Warning notices—Structure and meaning









Warning notices warn of dangers to the user or people in the vicinity. Warning notices also indicate the consequences of the hazard as well as preventive action. Warning notices have the following structure:

Warning symbol **KEY WORD – Nature and source of hazard!**
Consequences of hazard in the event of failure to observe action and information given.
 ➤ Hazard prevention action and information.

The key word indicates the likelihood of occurrence and the severity of the hazard in the event of non-observance:

Key word	Probability of occurrence	Severity of danger if instructions not observed
DANGER	Immediate impending danger	Death or severe injury
WARNING	Possible impending danger	Death or severe injury
CAUTION	Possible dangerous situation	Minor injury

Symbols in this documentation

Symbol	Designation	Explanation
	Attention	Warns about possible property damage.
	Information	Practical hints and other useful information.
1. 2.	Multi-step operation	Instruction consisting of several steps.
➤	One-step operation	Instruction consisting of one step.
⇒	Intermediate result	An instruction produces a visible intermediate result.
➔	Final result	There is a visible final result on completion of the instruction.
 WARNING	Warning	Hazard that can cause death or serious injury. Follow the instructions.
 CAUTION	Caution	Danger that can cause damage to the equipment. Follow the instructions.
	Warning	Health warning.
	Environmental	Dispose of waste in manner consistent with local regulations.
	Personal protection	Wear protective glasses.
	Personal protection	Wear protective gloves.

1.2 Important notes



Before start up, connecting and operating MAHLE products it is absolutely essential that the Original instructions/owner's manual and, in particular, the safety instructions are studied carefully. By doing so you can eliminate any uncertainties in handling MAHLE products and thus associated safety risks upfront; something which is in the interests of your own safety and will ultimately help avoid damage to the device. When a MAHLE product is handed over to another person, all documentation and information on its designated use must be handed over to the person. Contact MAHLE if you detect a problem that you cannot solve with this manual.

1.2.1 User group

The product may be used by skilled and instructed personnel only. Personnel scheduled to be trained, familiarized, instructed or to take part in a general training course may only work with the product under the supervision of an experienced person.

All work conducted on pressurized equipment may be performed by persons with sufficient knowledge and experience in the field of refrigeration, cooling systems and coolants and, also be aware of the risks involved in the use of pressurized devices.

1.2.2 Agreement

By using the product you agree to the following regulations:

Copyright

Software and data are the property of MAHLE or its suppliers and protected against copying by copyright laws, international agreements and other national legal regulations. Copying or selling of data and software or any part thereof is impermissible and punishable; in the event of any infringements MAHLE reserves the right to proceed with criminal prosecution and to claim for damages.

Liability

All data in this program is based—where possible—on manufacturer and importer details. MAHLE does not accept liability for the correctness and completeness of software and data; liability for damage caused by faulty software and data is ruled out. Whatever the event, MAHLE liability is restricted to the amount for which the customer actually pays for this product. This disclaimer of liability does not apply to damages caused by intent or gross negligence on the part of MAHLE.

1.3 Safety regulations

1.3.1 BFX-20

Always carefully study and follow all the safety regulations before using the MAHLE product. Correct use of the BFX-20 is important for your personal safety and for trouble-free functionality. Incorrect use can cause damage to the unit or lead to incorrect functionality.



Brake fluids are poisonous and may cause damage to health!

- Regular maintenance should be performed on the BFX-20 to ensure proper and safe operation.
- Improper handling may lead to damage to health or property.
- The brake maintenance device may only be operated by those trained to use it. Unauthorized persons are not permitted to operate it.
- Always check the brake fluid exchange unit, hoses, cables and plugs before use. Do not use the brake maintenance device if it is damaged. The device may only be repaired by a specialist. Never open the brake maintenance device yourself.
- The BFX-20 unit should not be exposed to excess moisture or be operated in wet areas.
- Do not make any changes to the design of the brake fluid exchange unit.



Pull out the plug before doing any work on the brake fluid exchange unit. Plug in the plug only when the brake fluid exchange unit is switched off.

- Avoid any contact with brake fluid.
- Wash skin immediately with water if it comes into contact with brake fluid.
- Remove contaminated clothes.
- Do not carry any cleaning cloths or other items soaked in brake fluid in your clothing.
- Clean any spills immediately. Brake fluid is corrosive and will damage the finish on most painted surfaces.



Wear suitable protective gloves to minimize the danger of injury from contact with skin.



Wear protective goggles to minimize the danger of injury from splashes.

- Always use vehicle specified brake fluid. Failure to do so may cause brake system damage. The unit is designed to use DOT specified brake fluid. Use of any other fluid type is not recommended and may void warranty.
- It is important to test drive every vehicle after the service to verify proper brake system operation. Failure to do so could result in undetected brake system failure.

1.4 Technical data

Feature	Value/Range
Max. container size	5 Liters
Working pressure	0.4-3.5 bar
Main voltage	115 VAC / 60Hz
Filling hose length	3.5 m
Unit dimensions	290 x 310 x 400 mm
Weight	30 kg
Noise	≤70 dB(A)

2. Product description

2.1 Application

BFX-20 is solely meant for filling and emptying brake fluid from brake and clutch systems in motorized vehicles. Any other use beyond this is regarded as improper and forbidden.

2.2 Improper use

⚠ Operating the device with fluids other than brake fluid can damage the brake fluid exchange device and is thus forbidden. In the event of improper use, MAHLE is not liable for any damage caused.

2.3 Operating principle

The brake fluid is withdrawn from the container by means of a pump and constantly pumped into the brake fluid vessel at a pressure of up to 3.5 bar. The used brake fluid can then be drained from the individual wheel brake cylinders until the new brake fluid comes out.

In doing so, you avoid having to transfer liquids and the brake fluid can be absorbed in water, unlike conventional systems.

The pump for filling the brake fluid vessel has a pump monitor. The pump switches off if pressure cannot be built up or if the pump suctions air.

2.4 Scope of delivery

Description
BFX-20 unit
Adapters
Fresh fluid bottle (1 gal)
Waste fluid bottle (1L)
Bleeder bottle (1L)
Operation manual

2.5 Description of unit

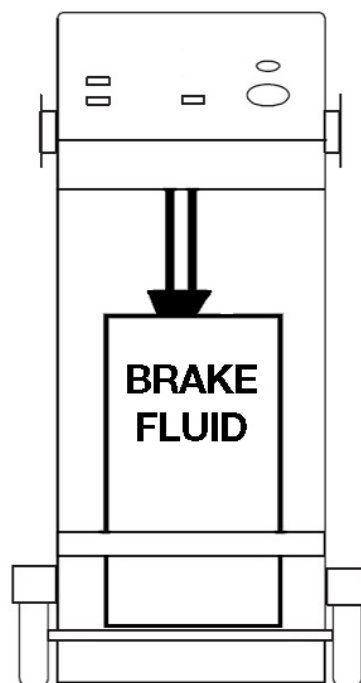


Fig. 1: Front view

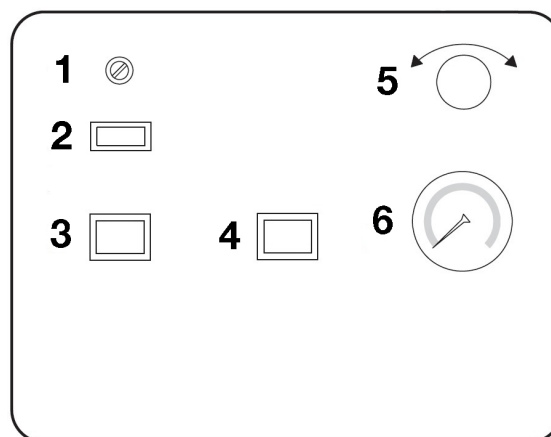


Fig. 2: Front control panel

- 1 Fuse (6.3A)
- 2 Start button (momentary)
- 3 Main exchange power switch
- 4 Empty master cylinder power switch
- 5 Pressure adjustment valve
- 6 Pressure gauge

2.6 Commissioning

i All the operations described in this section must be performed prior to first use.

2.6.1 Unpack unit

⚠ When removing the packaging, use care to ensure there is no damage caused to the BFX-20 unit or any of the included accessories.

i Do not unplug any electrical connections and only have internal components opened and repaired by trained customer service personnel.

i Contact customer service in the event of any transportation damage.

2.6.2 Unit setup

Place the brake maintenance device on a level surface. Make sure the filling hose is not under mechanical load caused by, for example, the vehicle being lifted up on a hydraulic ramp.

During operation and use, the workplace is the area surrounding the brake maintenance device. Otherwise, no permanent workplace for the brake maintenance device is foreseen.

2.7 Startup procedure

i This section describes the connection of the brake fluid exchange unit to the fresh fluid container as well as the procedure for bleeding air from the system prior to first use.

⚠ You must strictly obey all safety instructions described in Section 1.3 of this manual.

1. Prior to initial operation, ensure proper voltage is being supplied to the unit.
2. Position the unit on a firm and level surface.
3. Unscrew the lid of the new brake fluid container.
4. Place new fluid container in the holder of the unit.
5. Feed the suction hoses down to the base of the container. The depth can be adjusted by sliding the rubber cone up/down the hoses.
6. In order to bleed the brake fluid exchange unit, do not mount the adapter on the vehicle, but onto the fill hose and hold over a waste fluid bottle.
7. Press switch 3 (Fig. 2) to **ON** position.
8. Then press and hold switch 2 (Fig. 2) to **ON** position.
9. Hold adapter over the waste fluid bottle until brake fluid is dispensed without any air bubbles.
10. Disconnect adapter from fill hose while pump is running and press switch 3 to **OFF** position.

3. Operation

3.1 Removing brake fluid from reservoir

i The brake fluid exchange unit has a suction function for the content of the master cylinder reservoir. A filter is installed in the suction hose to keep large dirt particles away from pump.

1. Make sure the waste fluid bottle is empty and connected.
2. Unscrew lid of master cylinder reservoir.
3. Press switch 4 (Fig. 2) to **ON** position to turn on suction pump.
4. Hold the suction hose in the opening of the brake fluid master cylinder reservoir and remove the brake fluid.
5. Press switch 4 (Fig. 2) to **OFF** position to turn off suction pump.
6. Dispose of the waste brake fluid as indicated in the safety data sheet for the brake fluid.

3.2 Brake fluid exchange

- The safety instructions in the section "Safety Regulations" must be strictly observed.
 - Before starting service, please observe the vehicle manufacturer's instructions about the maximum filling pressure and specific working instructions.
 - In principle, for every type of vehicle, the instructions and guidelines stipulated by the manufacturer for the bleeding of the brake system shall always apply.
- i** The factory setting of the pressure control is a working pressure of 2 bar. This ensures that the brake fluid master cylinder reservoir is not deformed and that there are no leaks at the bleeders. A lower or higher working pressure can be set on the pressure adjustment valve.

1. Install the adapter included onto the opening of the brake fluid master cylinder.
2. Connect the fill hose to the previously mounted adapter.
3. Power on the brake fluid exchange unit with switch 3.
4. Press the START button (2) and hold it until the pressure has reached at least 0.5 bar. The operating pressure (max. 3.5 bar) can be adjusted to the desired operating pressure using the pressure control .
5. Check the master cylinder reservoir as to whether the adapter is connected properly and is leak-tight. If brake fluid escapes, switch off the brake fluid exchange unit immediately and find out the cause.
6. Now bleed the brakes one after the other beginning with the back right and ending with the front left brake. To do so, open the valve on each wheel brake cylinder. Collect the old brake fluid in the collecting bottle. The valve can be closed again as soon as the new brake fluid escapes from the drain hole bubble-free.
7. Turn off the brake fluid exchange unit by pressing switch 3.
8. Check the pressure gauge to see if the pressure has fallen.
9. Note: The brake fluid exchange unit usually decreases the existing pressure. However, if the pressure was reduced during the filling process, the pressure will still remain in the system. The pressure adjustment valve must first be released of pressure. To do so, turn the pressure adjustment to the right after switching off until the point of release has been reached. The working pressure falls to 0 bar.
10. Disconnect the pressure-free fill hose from the adapter.
11. The brake fluid master cylinder reservoir is now full to the top. Use the suction function to lower fluid level to MAX fill line.

⚠ If after the bleeding process or after changing brake fluid the pedal actuation on the brake or clutch pedal is too long, or the build up of pressure is too "soft", the braking or clutch system must be bled again after powerfully activating the brake or clutch several times.

4. Maintenance

⚠ Inform the manufacturer's service department if your brake fluid exchange unit still does not work properly even after following the previous instructions. You will receive fast and reliable assistance.

4.1 Troubleshooting

Problem	Cause	Correction
Pump not suctioning or releasing pressure	<ul style="list-style-type: none"> • Fluid container empty. • Pressure control closed or fully open. • Fill hose pinched. • Air in hose. • Filter on suction hose blocked. 	<ul style="list-style-type: none"> • Change containers/refill container. • Set correct working pressure. • Remove/fix hose pinch. • Bleed brake fluid exchange unit. • Clean filter.
Loud flowing noises	<ul style="list-style-type: none"> • Air in pressure control. 	<ul style="list-style-type: none"> • With fill hose closed, turn on device and adjust pressure a few times.
No power	<ul style="list-style-type: none"> • Fuse blown. 	<ul style="list-style-type: none"> • Replace fuse.

4.2 Disassembling control module

ⓘ If, after consulting the service department, a malfunction of the brake fluid exchange unit is determined, only the control unit needs to be sent in and the repaired.

⚠ Always disconnect power before working on the brake fluid exchange unit.

⚠ Never clean the brake fluid exchange unit with a steam cleaner.

⚠ Always keep the brake fluid exchange unit clean. Remove leaked brake fluid immediately.

⚠ Check the filter on the suction hose regularly and replace where necessary.

⚠ Disassembly or assembly work may only be carried out by a specialized technician.

1. Disconnect the unit from the power source by disconnecting the power cord.
2. Disconnect all hoses from the containers.
3. Make sure the hoses are empty. If not, close them with plugs.
4. Remove the screws on the side of the control unit.
5. Pull hoses and mains cable out of the casing. The control unit is now ready for dispatch.
6. The control unit is reassembled in reverse order.

5. Notes



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