

Jacobs Exhaust Brake™

**Jake
Brake®**

**on board
for downhill
control.**

**Operator's
Manual**



Jacobs Vehicle Systems™

the 1990s, the number of publications on the topic has increased steadily. The number of publications in the field has increased from 10 in 1990 to 100 in 2000, and is expected to reach 150 in 2005.

The present study is a review of the literature on the topic of the effects of the environment on the development of the brain. The review is based on a search of the literature in the field of environmental neurotoxicology, and is intended to provide a comprehensive overview of the current state of knowledge in this area.

The review is organized into three main sections. The first section discusses the general principles of environmental neurotoxicology, and the second section discusses the specific effects of environmental factors on the development of the brain. The third section discusses the implications of the findings for public health and policy.

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Jacobs Vehicle Systems™

Introduction

Thank you for choosing the Jacobs Exhaust Brake™.

This operator's manual is designed to provide Jacobs Exhaust Brake users and owners with detailed information about our product. In order to maximize the benefits and capabilities of your Jacobs Exhaust Brake, we recommend that you read this manual carefully and keep it in your vehicle at all times.

This owner's manual covers these topics:

- Operating your vehicle with the Jacobs Exhaust Brake
- What to expect from your Jacobs Exhaust Brake
- Troubleshooting
- Important information about transmissions
- Product registration

This manual does not include installation procedures. These technical instructions are shipped with each Jacobs Exhaust Brake and are maintained by your local dealer/installer. To request your own copy, write us at:

Customer Support Group
Jacobs Vehicle Equipment Company
22 East Dudley Town Road
Bloomfield, CT 06002

Owner's Information

IMPORTANT !

Information in this manual is written for a person with some mechanical ability. Like any operator's manual, not all the steps are described. For example, steps on how to drive a vehicle are steps any adult with basic mechanical ability can perform. Read and follow these instructions as well as vehicle instructions. Follow all State laws and other applicable laws about your vehicle. If there are problems or questions, consult a Jacobs professional.

THE RESPONSIBILITY OF THE OWNER:

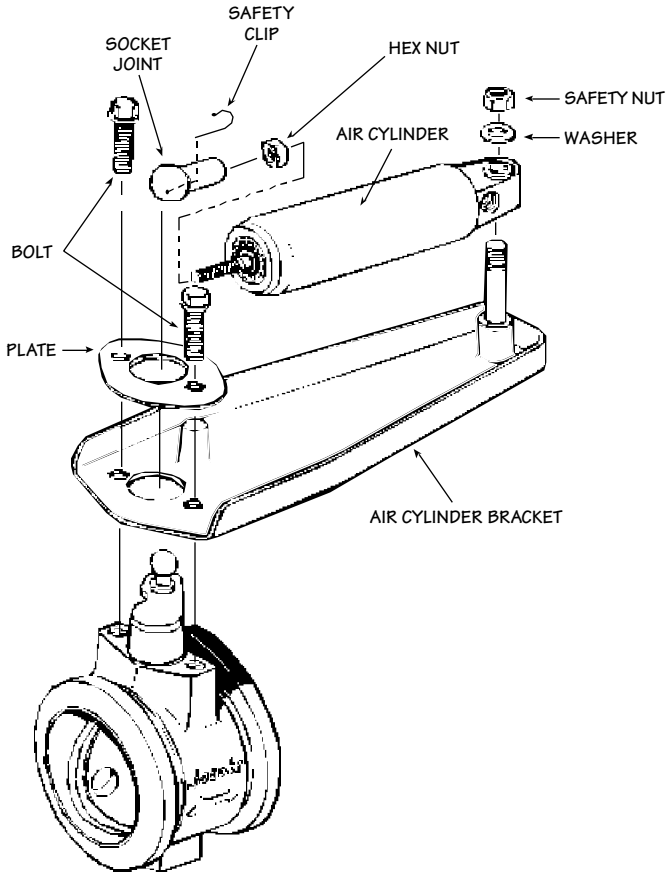
1. Follow all instructions.
2. Inspect and check the vehicle, even when your Jacobs Exhaust Brake™ was installed at the store where it was purchased.
3. Carefully read and follow all safety related instructions.
4. Check and inspect your vehicle according to the "Safe Operation Practices for Your Vehicle".
5. Complete all necessary maintenance on the unit.
- 2 6. Know how to operate your vehicle and your Jacobs Exhaust Brake.
7. Show anyone that uses the vehicle how to use the equipment correctly.
8. There are laws that apply to the use of your vehicle. Follow all applicable laws and regulations.
9. Most Jacobs Exhaust Brake units are sold installed. For these units, it is the responsibility of the Owner to carefully check and test the vehicle and its Jacobs exhaust brake according to applicable instructions in this manual.

Start driving carefully and slowly. Learn to drive with your new Jacobs Exhaust Brake in a level area with minimum traffic before operating on active roads. Read and follow all instructions in this manual.

There are obvious risks in operating any motor vehicle. Despite all precautions and use of all safety equipment, injuries can occur. These are the responsibility of the owner. Remember the risks of driving at night, in wet or icy weather or on hills are greater than at other times. Keep your eyes on the road and surrounding traffic, be prepared to stop to prevent an accident. Learn the rules of the road and follow all laws and regulations. Keep all equipment in place and working for your safety and the safety of others.

How the Jacobs Exhaust Brake™ Works

The Jacobs Exhaust Brake is a supplementary braking system used to help slow your vehicle. A vehicle retarding system allows the driver to stabilize or reduce the speed of the vehicle, particularly on a long decline. This slowing power is achieved by restricting the flow of exhaust gases, thereby increasing back pressure inside the engine. This increased back pressure creates resistance against the pistons in the engine, slowing the crankshaft's rotation and ultimately helping to slow your vehicle.



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WARNING !

The Jacobs Exhaust Brake is not intended for use as the vehicle's service or secondary (emergency) braking system. Your vehicle's service brakes must be applied to bring the vehicle to a complete stop.

Operating Your Jacobs Exhaust Brake™

Before starting your engine, make sure the Jacobs Exhaust Brake dash switch is in the OFF position.

To activate your Jacobs Exhaust Brake, turn the dash switch ON. Whenever you need to slow your vehicle, the Jacobs Exhaust Brake will be active only when your feet are off the clutch and accelerator pedals.

During vehicle operation, the Jacobs Exhaust Brake dash switch may stay ON. Your Jacobs Exhaust Brake will activate after removing your foot from the accelerator and clutch whenever the dash switch is ON.

Engine speed has a major influence on retarding performance.

CAUTION !

Engine speed must never exceed the maximum allowable RPM. Consult your dashboard label for the maximum allowable RPM for your vehicle.

When engine speed is maintained at the maximum allowable level, your Jacobs Exhaust Brake will operate at peak performance.

- 4** If you do not have a dashboard label, contact Jacobs Technical Support at 860-243-7777. Please have your engine make and model available.

CAUTION !

Overspeeding can result in engine damage.

Once you have determined the safe speed for your vehicle on a down grade, maintain higher RPMs for more controlled retarding. Downshifting of manual transmissions is suggested to achieve maximum allowable RPM.

WARNING !

The Jacobs Exhaust Brake is a retarding device intended to help control vehicle speed. It is not a vehicle stopping device. On an uphill climb with the Jacobs Exhaust Brake ON, taking your foot off the accelerator will result in rapid vehicle slow down due to uphill grade and retarding power. Operation on wet, slick or icy roads is not recommended. Use the Jacobs Exhaust Brake ONLY when you have good, dry traction with the road. Before shutting off your engine, always turn your Jacobs Exhaust Brake dash switch OFF. Your Jacobs Exhaust Brake should also be turned off when the engine is left idling for an extended period of time (longer than 3 minutes).

What to Expect from Your Jacobs Exhaust Brake™

Now that you are familiar with the proper operating procedures for your Jacobs Exhaust Brake, there are a number of ways to “cross-check” for proper mechanical operation.

WHEN THE JACOBS EXHAUST BRAKE IS ACTIVATED:

1. You may notice a slight change in the sound of the engine.
2. Because grades and vehicle loads differ, you may or may not “feel” the Jacobs Exhaust Brake's retarding power. However, as long as the Jacobs Exhaust Brake is activated and blocking the exhaust flow, back pressure will cause a retarding effect on the drive wheels.
3. Exhaust smoke should appear normal.
4. Engine temperature should remain in the normal operating range.
5. Pyrometer should indicate normal exhaust temperatures.

WHEN THE JACOBS EXHAUST BRAKE IS DEACTIVATED:

1. The throttle should respond normally.
2. A possible change in RPM may occur.
3. The exhaust may emit a light puff of smoke.
4. Engine temperature should remain constant.
5. Pyrometer should indicate normal exhaust temperatures.

Safe Operation Practices for Your Vehicle

PREPARATION

1. Read all vehicle operating and service instruction books carefully. Also, read and follow the Jacobs Exhaust Brake™ Operator's Manual. Be thoroughly familiar with the controls and the proper use of the equipment.
2. Never allow children, inexperienced or unlicensed persons to operate the vehicle. Be sure all operators are thoroughly instructed in safe operation.
3. Thoroughly inspect the vehicle prior to use.
4. Never operate the Jacobs Exhaust Brake on wet or icy road surfaces. Always be sure of your traction.
5. Always operate your vehicle in conformity with posted rules and regulations and applicable traffic regulations.

OPERATION

1. Do not alter the Jacobs Exhaust Brake orifice or overspeed the engine.
- 6** 2. Stop the engine when leaving the vehicle. Turn off the Jacobs Exhaust Brake.
3. After any malfunction or vehicle accident, stop the engine and thoroughly check and inspect the vehicle and Jacobs Exhaust Brake for any damage. Repair the damage before resuming use.
4. If the vehicle—including its engine or brake system—starts to vibrate or operate abnormally, stop and check immediately for the cause. Improper operation is generally a warning of trouble.
5. Exercise extreme caution when descending steep or long slopes.
6. Never operate the vehicle without safety devices, such as brakes and lights in place and working. These items are for your safety and the safety of others. Repair or replace if inoperative or damaged.
7. Use your vehicle only for the purpose for which it was intended. Do not run the engine indoors or in any location without adequate ventilation.

MAINTENANCE AND STORAGE

1. Check vehicle and related equipment at frequent intervals for proper operation. Improper vehicle maintenance may damage the engine or Jacobs Exhaust Brake™.
2. Keep all nuts, bolts and screws tight to help maintain the vehicle in safe working condition.
3. Store the vehicle properly when not in use.
4. When cleaning, repairing or inspecting your vehicle, make certain all parts have cooled and all moving parts have stopped. Check Jacobs Exhaust Brake function frequently for deterioration and service, or replace if required. Check that replacement parts conform to Jacobs' recommendations or specifications.
5. Periodically take your vehicle to an authorized service facility for a maintenance check.

Important Transmission Information

Maximum Jacobs Exhaust Brake™ performance is related to the type of transmission your vehicle is equipped with.

1. Manual transmissions should be down shifted to the lowest gear possible, without exceeding the maximum RPM limit of the engine. This will maximize the Jacobs Exhaust Brake's retarding effect.
2. Automatic transmissions and their effect on Jacobs Exhaust Brake performance vary. For further information, we encourage you to contact your Jacobs Exhaust Brake dealer.

For more detailed transmission information, please refer to Jacobs' Application Notes 93-1. Contact Jacobs Technical Support at 860-243-7777 for your free copy.

Know Your Product

If you understand the unit and how it operates, you will get the best performance and safety. Learn the location and the function of the controls. To help prevent an accident, follow the operating instructions and the safety rules. Keep this manual for future reference.

Troubleshooting

In all cases where you encounter problems with your Jacobs Exhaust Brake™, we encourage you to immediately contact your dealer.

To assist in troubleshooting, refer to the following "Cause, Test & Correct" scenarios:

1. Jacobs Exhaust Brake will not activate

CAUSE	Dash switch OFF
TEST	Actuate switch
CORRECT	Turn switch ON

CAUSE	Circuit breaker open/fuse blown
TEST	Reset breaker/replace fuse
CORRECT	Replace as necessary

2. Jacobs Exhaust Brake will not deactivate

CAUSE	Defective dash, throttle or clutch switch
TEST	Shut off electrical power, observe air cylinder
CORRECT	Replace defective switches

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3. Intermittent ON/OFF action

CAUSE	Loose electrical connection
TEST	Visually inspect & test with meter
CORRECT	Tighten connection

CAUSE	Defective or misadjusted switches; (dash, clutch, or throttle)
TEST	Manually operate switch
CORRECT	Adjust or replace switch(es) & observe effect

4. Brake actuates with dash switch OFF

CAUSE	Defective dash switch
TEST	Disconnect switch to see if problem ceases
CORRECT	Replace switch

Questions may be referred to your dealer or the Jacobs Technical Support at 860-243-7777. Please have your Vehicle Owner's Manual on hand to help us answer your questions.

Jacobs Vehicle Systems
22 East Dudley Town Road
Bloomfield, CT 16002

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www.jakebrake.com

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