

# REAL

August 2020

# Torque

## Jacobs brakes, exhaust brakes and retarders.

**In this month's edition of Real Torque, we are going to take a look at auxiliary brakes.**

Contact maintenance for any questions on 0800 80 80 69

Most heavy vehicles on our roads have some type of auxiliary brake. North American vehicles often have a compression release brake which we know as the Jacobs Engine Brake or in trucker language: "The Jake Brakes". European vehicles usually have a retarder and exhaust brake. Japanese vehicles can be fitted with Jake Brakes, retarder, or more commonly, an exhaust brake.



### Why do we have auxiliary brakes?

Ultimately, it is the foot brake that brings the vehicle to a complete stop. When we use the foot brake for extended periods going down a hill or trying to slow down with a heavy load, the brake pads or shoes may get very hot, leading to premature brake wear.

When the brake pads or shoes rise to extreme temperatures, they suffer from brake fade. The hotter they get, the less effective they are.

Used correctly, auxiliary brakes can assist the foot brakes, slow the vehicle down by assisting the foot brakes, and helping them stay cool and ready to work at maximum efficiency. This also reduces wear and extends the life of brake components.



### Jake Brakes

When turned on by the driver, Jake Brakes release compressed air from the cylinder at the top of the pistons compression by opening the exhaust valves, slowing the vehicle down by absorbing the engine's energy.

Typical Jake Brakes have 3 settings corresponding to the number of cylinders that it works on: Low-Medium-High. Low uses 2 cylinders, medium uses 4 cylinders, and high uses all 6 cylinders of the engine. The higher the setting, the greater the slowing power.

What is the noise? Compression pressures of up to 1000PSI being instantly released out of the exhaust valve. There are different styles and manufacturers of compression release brakes, but the concept is the same.

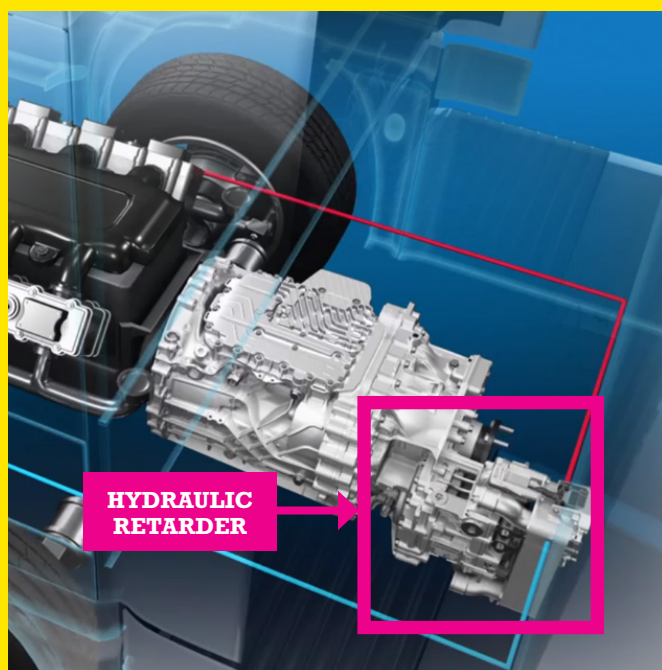
Jake Brakes work more efficiently at higher RPM so it helps to plan what gear you should be in before descending a hill on the engine brakes.

## Hydraulic Retarders

While there are different types of retarders, the most common type of retarder is the hydraulic retarder. Hydraulic retarders are a unit connected to the output shaft in the rear of the transmission which, when operated, convert the vehicles' motion into heat, producing a large amount of stopping power. They use a stator and rotor arrangement in a chamber. When applied, oil fills up the chamber and the rotor deflects oil against the vanes of the stator creating resistance.

Retarders usually have several stages, the higher the stage, the more oil gets put into the chamber, creating more braking power. When used correctly, they can reduce brake wear by up to 90%.

Hydraulic retarders produce a lot of heat while being used and while engine RPM does not effect stopping power, it is important to keep engine RPM above 1300RPM during operation to help keep the retarder cooled properly.



Take notice of how your auxiliary brakes are working. If you notice reduced performance of your auxiliary brake, irregular noises, or they are not working on all stages, contact the TR Maintenance Team on 0800 80 80 69.

### Want to know how to use your auxiliary brakes efficiently and reduce brake component wear?

TR Master Drive Services offer driver training to help you get the most out your vehicle. You can reach the TR Master Drive Team on 0800 637 000.

## Exhaust Brakes

Often found on medium to smaller sized vehicles, exhaust brakes utilize a flap arrangement just after the exhaust manifold or turbo.

When the exhaust brake is turned on, the flap closes and blocks off the exhaust, preventing exhaust gasses, escaping out the exhaust pipe.

Exhaust gasses get stuck and compressed in the exhaust manifold and cylinder, creating restriction and helping the engine slow the vehicle down. Exhaust flaps work well but have the least stopping power so it's important they are used within their limitations.



While engine brakes, retarders, and exhaust flaps provide wear free braking, they still require maintenance to stay in good working order.



### TR Tips

#### Tips and Tricks

- ▶ When using your retarder, try keep your engine RPM above 1300RPM to help cool it.
- ▶ Engine brakes can be noisy, so be aware of your surroundings and follow local rules when passing through towns.
- ▶ Strong auxiliary brakes can cause traction loss in wet or slippery conditions. Familiarise yourself with this before using them in these conditions.
- ▶ Auxiliary brakes won't work with the clutch or throttle pedal depressed.

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