

Exhaust

Fleetguard[®]

Fleetschool Fact Sheet

Stop Noise in its Tracks

Engine braking systems are used on heavy-duty diesel trucks with over 10 L displacements, supplemental to road wheel braking systems, producing distinctive staccato sounds through the exhaust.

Engine brakes convert diesel engines into air compressors. Braking horsepower increases with engine RPM. Optimum brake performance is obtained near rated engine RPM, when dropping back through the gears slowing down. Larger engines result in more powerful air compression improving vehicle slow down. Compression ratios of diesels are typically around 15:1. At the top of the piston stroke air occupies 1/15th the original volume, and is approx 500 psi. It takes power to compress air to high pressures; the engine crankshaft supplies this power from the vehicle momentum back through the drive train. Higher compression ratios produce higher cylinder pressures, absorbing more power. If a turbo provides more boost, the starting volume of air will be at a higher initial pressure, resulting in higher final pressure with more power absorption and better braking.

The same principle does not apply when we release throttle on non-engine brake equipped vehicles. During engine operation, valves (exhaust and inlet) remain closed at the top of the compression stroke, and start the power stroke coming off top dead centre. In a no-fuel condition (foot off throttle), the air pressure created exerts force on the piston back against the drive train as normal, however when pistons come off top dead centre, most compressed air power returns to the crankshaft in the drive rotation.

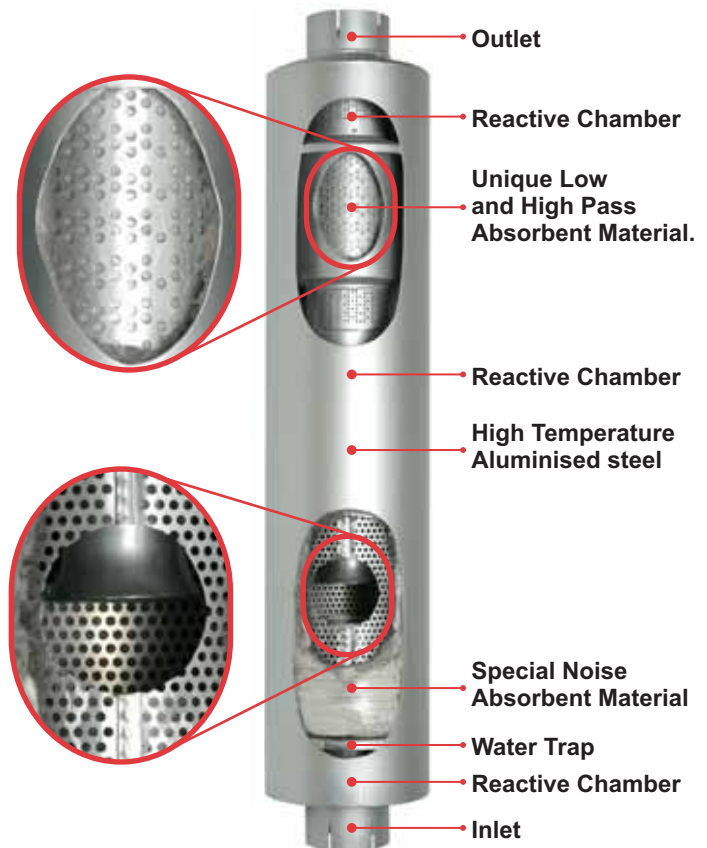
With engine brake active, exhaust valves open close to top dead centre of the compression stroke, releasing energy stored in air safely through the exhaust. Theoretically, no power returns to the crankshaft, and the engine provides retarding power.

Engine brakes used with a poorly muffled exhaust can sound offensive or illegal. Purpose designed mufflers can suppress combustion related sound waves from the engine along with noise from compressed air unloading into the exhaust system during engine braking.

Fleetguard's new 5" muffler 86786M (single use) and 86791M (for dual use) incorporates a combination reactive-absorptive design resulting in broadband attenuation, ideal for the frequencies generated in engine and engine brake exhaust emissions.

The combination muffler is a reactive chamber silencer with absorptive packs built in. These absorptive sections reduce high-frequency sound waves, while the reactive components of the muffler take care of the lower frequency noise. Noise and airflow entering the muffler also passes through a perforated diffuser before discharging into a plenum. This diffuser converts mid-frequency to high-frequency noise, which is more readily dissipated by the absorptive sections.

The muffler also incorporates a venturi shaped internal porting system that contributes to the reduction of exhaust back pressure, which in turn improves fuel economy. By designing specifically for engine brake application, this Fleetguard muffler affectively reduces exhaust noise while minimising exhaust system back pressure.



Reactive-Absorptive Mufflers by Fleetguard

- Can reduce engine braking noise by 58%. The effect of the new muffler has been dramatic, with independent testing showing engine brake noise to be reduced by up to 6.6 dBA, making it 58% quieter outside.
- Can reduce In Cabin noise by 45%. Independent testing has also shown that in-cab noise level has been reduced by up to 5.4 dBA.
- Easy installation. Can be fitted to existing trucks.
- Does not reduce engine power.
- Maintains fuel economy.
- 5" Versions are available.
 - For Single Muffler applications up to 500hp.* Part No. 86786M.
 - For Dual Muffler applications greater than 450hp - 600hp.* Part No. 86791M.

*Subject to Application.

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Air
Fleetschool Fact Sheet

Why Air? Clean, fresh air is essential for the proper operation of all engines. In fact, it's the most important component of the combustion process. Without it, the engine won't run. And if the air is dirty, the engine won't run for long. That's why it's so important to keep the air clean. This fact sheet explains how to do that.

What's New? This fact sheet has been updated with the latest information on air filtration. It includes new information on the benefits of air filtration, the types of air filters available, and how to choose the right one for your engine.

Key Features:

- **Engine Protection:** Air filters protect the engine from dirt and debris that can cause wear and tear.
- **Performance:** Clean air allows the engine to breathe, which improves performance and fuel economy.
- **Longevity:** Regular air filter changes can extend the life of your engine.

Coolant
Fleetschool Fact Sheet

A Premium Engine Coolant that works with ease, protecting your Enterprise, Engine & Environment

Why Coolant? Coolant is the lifeblood of your engine. It keeps the engine from overheating, which can cause serious damage. This fact sheet explains how to choose the right coolant for your engine and how to maintain it.

Key Features:

- **Engine Protection:** Coolant prevents overheating and corrosion.
- **Performance:** Coolant improves engine efficiency and fuel economy.
- **Longevity:** Coolant extends the life of your engine.

General
Fleetschool Fact Sheet

Stop the Drip – Forever!

Why are Coolant Additives Important? Coolant additives are essential for the proper operation of all engines. They help to prevent corrosion, scale, and sludge, which can cause engine failure.

Key Features:

- **Engine Protection:** Additives protect the engine from corrosion and scale.
- **Performance:** Additives improve engine efficiency and fuel economy.
- **Longevity:** Additives extend the life of your engine.

Fuel
Fleetschool Fact Sheet

Fuel Processing ON BOARD is the best security for continuous long running

Why Fuel Processing? Fuel processing is essential for the proper operation of all engines. It helps to remove impurities from the fuel, which can cause engine failure.

Key Features:

- **Engine Protection:** Fuel processing protects the engine from impurities.
- **Performance:** Fuel processing improves engine efficiency and fuel economy.
- **Longevity:** Fuel processing extends the life of your engine.

TEST YOUR KNOWLEDGE

1. The engine brake principle is similar to turning the diesel engine into a:
 - A Generator
 - B Compressor
 - C Rocket
2. Purpose designed mufflers for engine brake vehicles deal with noise suppression created by:
 - A Combustion
 - B Combustion and air unloading
 - C Air unloading
3. High frequency noise is taken care of by what in the purpose designed muffler:
 - A Absorptive sections
 - B Reactive sections
 - C Neither

1. B
2. B
3. A
ANSWERS

These and other Fleetschool Fact Sheets can be found on the Fleetguard Website at:

www.fleetguard.com/fleet/en/product_literature/en_lit_asia.jsp#fleetschool



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