



4WD Catch Cans and Engine Breathers – AXT Turbo talk

One of the most common engine modifications done today is the fitment of a engine oil catch-can. This is done for a number of reasons, the most common being to reduce the engine oil fuming. The reduction in fuming is caused by allowing the PCV system to cool the engine crankcase air to a level, where the oil condensate is captured in a remote canister. In most vehicles, this condensate cools in the intake air charge and is burnt in the combustion process.

As an engine ages, excess condensate is created, resulting in oil contamination of the intake system, as too much oil is being forced through the system.

The catch can allows this excessive condensate a place to accumulate, reducing the intake contamination, and resulting in a much cleaner aesthetic appearance. Unfortunately, there are few instructions from manufacturers on fitting catch-cans, and next to no factory support for fitment of these devices.

The purpose of the PCV system is to allow for the air movement and displacement created by the movement of the pistons. As each piston moves up and down, it pushes a large amount of hot oil-laden air around inside the engine.

While this aids the lubrication, it means that as the air heats up and cools down, it needs somewhere to go. On a healthy engine, a small amount of air is exchanged, much like a person breathing, throughout each engine revolution. The small amount of oil laden air is recirculated through the intake system, to be burnt, along with the fuel. This is very minor, but still taken into account with the engine tuning.

Fresh air is drawn in from the air filter, to maintain the pressure internally, at the designed optimum level.

Most PCV (Positive Crankcase Ventilation) systems are now designed to actually require an amount of vacuum on the PCV Valve located in the rocker cover, as this increases the engine efficiency, as a slight vacuum reduces the pumping losses associated with the air-movement.

Every engine is designed to work on slightly different pressure and fuming levels, as this will change with engine capacity, cylinders, maximum revs and other design characteristics. Some engines are also specifically designed to allow for the engine to actually allow a very minor amount of pressure to pass the piston sealing rings, in an effort to reduce engine friction, and improve engine efficiency.

This is achieved by allowing the “compression rings” to flex slightly, so when on an induction stroke, the oil-laden air internally lubricates the cylinder walls. On the compression stroke, the ring flexes against the cylinder wall, increasing the sealing surface, but in the process, allowing a small amount of gases past the rings and into the bottom end of the engine. These gases are then circulated through into the PCV system, creating additional gases that need to go through combustion.

All the superheated air and combustion gases create additional carbon contamination in the engine oil, which adds wear and tear to the engine, resulting in more gases passing the sealing rings, further increasing the gases that need to pass through the PCV system. (This is one of the reasons that frequent engine oil changes ensure an engine has much improved longevity.)

Need more help? For more information or help with your 4wd or turbo issues, contact the team at AXT Turbo by simply clicking on the chat pop up or call us on 03 9793 7740 or go to <http://axtturbo.com.au/x11-distributors> to find a local AXT X Turbo exclusive agent in your area.

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