



CARS Boost Restrictions and Use of the Pop-Off Valve

Boost restrictions are used in virtually all forms of International Motorsport where turbo-charged motors are allowed. Pop-off valves are deemed to be an effective way to ensure boost limits are not exceeded. Turbos are expensive and, when pushed beyond their design limits, become unreliable. The common stock-based turbos are reliable and efficient up to about 1.6 bar. To deliver in excess of 1.6 bar reliable turbos can get to be very expensive. It was to remove the need for these expensive turbos and to level the playing field a little, that the boost limit rule was put in place.

In 2019 CARS introduced a requirement that any driver with a speed factor of 70 or more is required to limit their boost to 1.5 bar (2.5 bar absolute). This is done by a combination of turbo capability and boost limits set in the ECU map.

In order to ensure that competitors stay within the 1.5 bar limit, a pop-off valve is required. The pop-off valve chosen by CARS is produced by Angle Consulting in the UK and is a version of the FIA homologated device that is used on FIA R5 class cars. There are currently several hundred of them in use worldwide. The Pop-Off valve is a simple spring-loaded relief valve, that is calibrated to relieve at 1.5 bar.

The pop-off valve is designed to open above 1.5 bar and to relieve or “dump” pressure. However, it takes a moment for the pressure to drop before the valve re-seats itself. The pressure must drop by 0.5 to 0.8 bar for the valve to re-seat. A quick lift of the throttle helps rapidly reduce the pressure and re-seat the valve.

The ideal way to operate with the pop-off valve installed is with a peak boost pressure just shy of the 1.5 bar relief pressure. The idea being that you want to avoid relieving through the pop-off valve. Angle have indicated that most teams tune their car so as not to open the pop-off valve at all.

When installing the pop-off valve it is important to consider the location in the induction tract and the Manifold Absolute Pressure (MAP) sensor as this may affect the EXACT value the MAP sensor sees so a little bit of experimentation may be required.

TEMPORARY SOLUTION TO RECENT CONCERN ABOUT POP-OFF VALVE PERFORMANCE – Sept 19th 2019

At a recent event there were concerns from some competitors that the pop-off valves were not performing properly. We are looking at the data from cars that had experienced issues, as well as examining and testing some valves to determine the underlying issue.

Until further notice we will not require competitors to have the pop-off valve installed. However, the boost limit of 1.5 bar is still required for competitors with a speed factor of 70 or above. CARS may ask for your data log to confirm operational boost pressures are within this limit.