Race Louvers Verification Tests

The purpose of verification testing is to document various different vehicles and how they respond to our hood extractors as compared to our wind tunnel test car. Using our custom probes and instrumentation previously tested in the wind tunnel we can test other cars without having to take every car to the wind tunnel. Below are vehicles that have been tested and how they compare to our wind tunnel data.

Updated: 11/12/19

2004 Audi A4 - Wind Tunnel Test Car, Baseline, Comparison Car.
Kit trim/size: RS, RT, RX trim. 340sqin. PN X.14.24.C
Car Prep: OE nose, OE radiator, OE engine, OE body except radiator sealed to oe grill, 4" flat splitter and rear wing.
Deviation from Wind Tunnel data. Radiator diff press: RS/RT/RX Baseline
Engine bay press: RS/RT/RX Baseline

2005 Nissan Altima - Development Car
Kit trim/size: RS, RT, RX trim. 340sqin. PN: X.14.24.C
Car Prep: OE nose, OE radiator, OE engine, OE body.
Deviation from Wind Tunnel data. Rad diff press: RS - 111% RT - 112% RX - 114%
Eng bay press: RS - 96% RT - 94% RX - 91%
Comments: Airflow in the radiator was higher by a fair amount while under hood pressure dropped slightly. This was mainly due to the Altima's transverse 4cyl which offered a fair amount of unrestricted room on the back side of the radiator as compared to the Audi's V6 which was very close to the radiator.

1993 Mustang
Kit trim/size: - RT trim center pair extractor kit. 196sqin. PN: RT.12.8.CP-Mustang-87-93
- RX trim side pair extractor kit. 234sqin. PN: RX.19.7.SP-Mustang-87-93
Car Prep: Stock car nose, grill ducted to radiator, airdam, 3" flat splitter, large core OE style radiator and rear wing.
Deviation from Wind Tunnel data. Radiator diff press: 146%
Engine bay press: 71%

Comments: This car had dual extractor kits installed, both kits were on the smaller side, total 430sqin vs the Audi's 340sqin, back side of the radiator is fairly open. Cooling improvements and underhood pressure reductions were likely from the less restrictive back side of the radiator coupled with an overall larger total extractor size. The front grill was also able to be restricted from 160sqin to about 135sqin and still maintain 210F temps on an 90deg day and 95sqin on a 70deg day which further improved front downforce.

1997 BMW M3

Kit trim/size: RS trim single center extractor kit. 340sqin. PN: RS.14.24.C-BMW-E36
Car Prep: OE nose, OE radiator, OE engine, OE body.
Deviation from Wind Tunnel data Radiator diff press: 98%
Engine bay press: 103%
Comments: This car performed very similar to our Audi with the same trim and size extractor. The back side of the radiator was a bit more unrestricted than the Audi but the front radiator shrouds were not as effective as having the radiator completely sealed to the grill as the Audi did.

2015 Mustang GT

Kit trim/size: RT trim single center extractor kit. 240sqin. PN: RT.12.20.C-Mustang-15-17
Car Prep: OE nose, OE radiator, OE engine, OE body.
Deviation from Wind Tunnel data Radiator diff press: 81%
Engine bay press: 116%
Comments: The Mustang GT performed similar to but slightly under our Audi. This is likely because the OE hood design limited the size of the extractor as well as the overflow bottle and cold air inlet tube were in the airflow path from the radiator to the extractor likely causing some restriction.

2014 Subaru BRZ

Kit trim/size: RT trim center pair kit. 280sqin. PN: RT.14.10.MP-BRZ-FRS-86-12-19
Car Prep: OE nose, OE radiator, OE engine, OE body.
Deviation from Wind Tunnel data Radiator diff press: 84%
Engine bay press: 112%
Comments: The BRZ performed similar to but lower than our Audi due to extractor size along with the factory airbox and air inlet tube likely posing a fair restriction.

2001 Miata NB

Kit trim/size: - RT trim single center kit. 270sqin. PN: RT.16.16.C.9B.8CR-Miata-NA-NB
- RS trim side pair kit. 234sqin. PN: RS.19.7.SP-Miata-NA-NB

Car Prep: OE nose, OE rad, front mount intercooler, OE engine with turbo kit, OE body.

Deviation from Wind Tunnel data Radiator diff press: 142%
Engine bay press: 75%

Comments: Total area of both kits is large, 504sqin compared to our 340sqin Audi. Large improvements in cooling airflow were noted as well as a reduction in underhood pressures likely due to the dual kits and larger total size. With the dual kits we were able to restrict the front grill opening to a point were the radiator differential pressure was back to stock and the grill opening was down to 110sqin vs the OE 165sqin, clearly showing significant front downforce is possible.

Conclusions: While these and many other cars physically appear different they are in fact very similar with regards to the cooling system airflow path and respond similarly to our extractors. Similar front grill opening for cooling air entry, similar front mount vertical radiator, similar engine mass just aft of the radiator restricting flow and similar cooling air exiting down below the vehicle.

Common things which affects performance from one vehicle to another is front grill size/location, how good the OE front radiator shrouds are and how restrictive the back side of the radiator is in regards to the exit airflow path.

As noted in development testing, wind tunnel testing and verified on the above vehicles, a more aggressive trim level and/or larger overall size yields more performance.

Race Louvers in all cases provide increased cooling airflow similar to our wind tunnel test car which verifies our claim of double the cooling airflow when compared to the competition. Further the engine bay pressure is significantly reduced similar to our wind tunnel data which verifies our claim of four times the front downforce when compared to the competition.

Race Louver equipped vehicles can restrict the front grill opening to a point where just enough cooling airflow is provided. This significantly decreases underhood pressure and as documented in the wind tunnel significantly increases front downforce. This allows the user to easily tune the car for more cooling, more downforce or anywhere in between.