

# */// Race Louvers*

Professional R&D - Wind Tunnel Tested - Track Proven

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## Track Tests



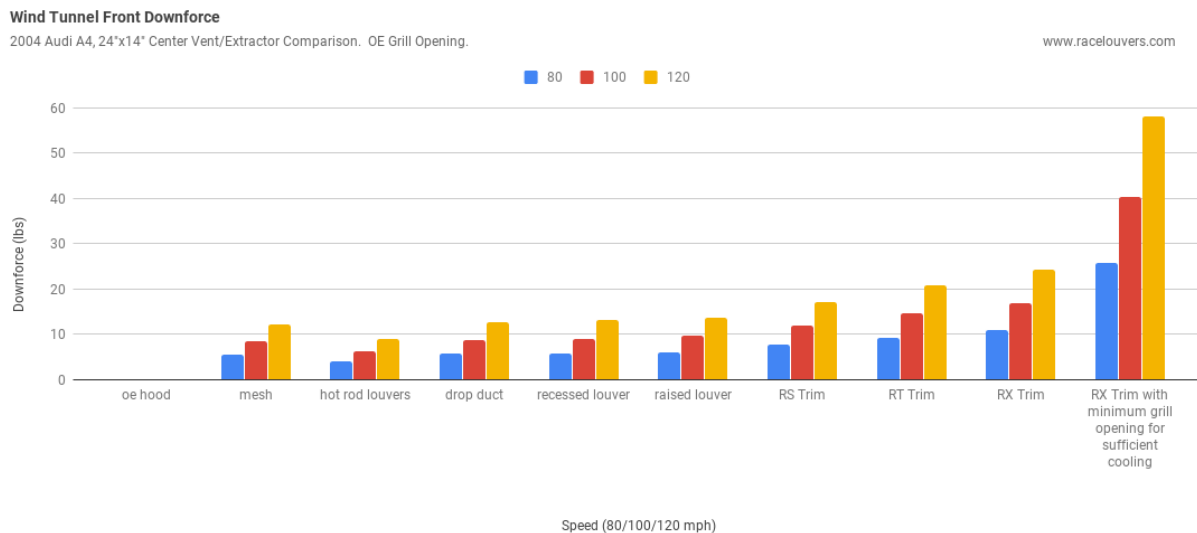
## Audi A4 Track Test

Special thanks to David Pisotti for the use of his well build Audi A4 both at the track and wind tunnel.

During our wind tunnel testing we explored the option of sealing up the nose to only enough opening to provide sufficient cooling. Reducing the front grill opening to 110sqin yielded 40lbs of front downforce at 100 mph in the tunnel test when using a single set of RX Race Louvers. This was verified during track testing as we ran the car with the same grill opening size as the wind tunnel test and coolant temperatures never exceed the 195 deg thermostat rating in 80 degree ambient temperatures. We even reduced the grill opening to 90 sqin and still did not exceed 195 degree coolant temperatures likely increasing front downforce.

#### Results:

- 40 lbs of front downforce verified using Race Louvers and Grill Blockers.
- 195 degree coolant temperatures maintained during the event.



## Race Louvers Track Test Data

Driver David Pisoli Test date 5/4/19  
 Racing class HPOE Test track Homestead-Miami Speedway  
 Car year/make/model Audi A4 Weather Part cloudy 75°F  
 Thermostat rating 195° Splitter type/size 4" flat Front of radiator sealed to nose Yes Back of radiator open to engine bay Yes Wing type/size AD Hardman  
 Other brand hood vent — Other aero aids Air dam Aero

Race Louver part(s) being tested: RX 14.24.0 Center Louver  
 Primary objective (circle): more cooling / more front downforce / combination

**~~Baseline session 1 or previous track data~~ (No Race Louvers or Grill Blockers)**

Average coolant temps — Front grill opening size (sq in) —  
 Best lap — 2nd best lap — 3rd best lap — Average lap —

**Session 1**

Car setup changes (circle): Race Louvers / Grill Blockers / Other side nose tape  
 Front grill opening size (sq in) 110 sq in Wing angle 0° Suspension adjustments — Average coolant temps 190°F Best lap —  
 2nd best lap — 3rd best lap — Average lap —  
\* 65 deg

**Session 2**

Car setup changes (circle): Race Louvers / Grill Blockers / Other side nose tape bottom tape  
 Front grill opening size (sq in) 90 sq in Wing angle 0° Suspension adjustments — Average coolant temps 190°F Best lap —  
 2nd best lap — 3rd best lap — Average lap —  
\* 75 deg

**Session 3**

Car setup changes (circle): Race Louvers / Grill Blockers / Other Same type  
 Front grill opening size (sq in) 90 sq in Wing angle 0° Suspension adjustments — Average coolant temps 190°F Best lap —  
 2nd best lap — 3rd best lap — Average lap —  
\* Sunny ~ 80°F

**Conclusion/comments**

more front grill restriction could have been used but ran out of time.

## Race Louvers Track Test Post Event Download

Driver David Asotti Test date 5/4/19  
 Racing class HPDE Test track North Highlands  
 Car year/make/model Audi A4 Weather Part cloudy 28°F

Interviewer/Date Al Watson 5/4/19

Session/comments \_\_\_\_\_

Session/comments \_\_\_\_\_

Session/comments \_\_\_\_\_

Session/comments \_\_\_\_\_

Conclusions 1) The 40 lbs of front down force achieved in the wind tunnel with 110sqin grill opening was verified all while still running on the 195° thermostat. More front downforce was possible as we were able to further reduce the grill opening size and still not have temps exceed the 195° point. 40 lbs of front down force and sufficient cooling from a single set of Race Louvers.



## Mustang Track Test

Special thanks to Ryan Walton for successful testing of a set of Race Louvers on his fox mustang american iron road race car.

Walton is a previous class champion and his fox mustang is well developed making the pair a great choice for testing. Prior to testing the mustang already had a G-stream wing, a front splitter, a GT nose trimmed to supply just enough cooling and a set of morgan aero hood vents. The car was well balanced and had been raced in this configuration for many events. The only changes to the car for testing were the addition of a single center RX trim Race Louvers hood louvers and a new GT nose with the smaller untrimmed OE grill opening. Grill blockers were not used as the OE GT grill opening was too small and required slight trimming vs being too large and requiring restriction.

#### Results:

- **Added Race Louvers.** Single center RX trim Race Louver replaced the morgan aero hood vents.
- **Added 4 Degrees of Wing.** More wing angle was needed to balance the car, settling on +4 degrees, indicating an increase in front downforce from the Race Louvers and smaller grill opening.
- **Reduced lap times by 1.4 seconds.** While adding wing angle in each test session to balance the car Walton was able to maintain the same 1:56.200 lap times while the rest of the run group lost lap time from a group average best lap of 1:54.935 during qualifying to a slower 1:56.481 during the race due to increasing track temperatures realizing a gain of 1.4 seconds for Walton once the car was dialed in plus double wins.

## Race Louvers Track Test Data

Driver Ryan Walton Test date 4-6-19  
 Racing class AI Test track Bethan Willow  
 Car year/make/model 1989 Ford Mustang Weather 53° - 72°  
 Thermostat rating 160 Splitter type/size wood 5" Front of radiator sealed to  
 nose yes Back of radiator open to engine bay yes Wing type/size Custom 62"  
 Other brand hood vent Morgan servo 8 Other aero aids fender vents side skirts

Race Louver part(s) being tested: RX 24x16 Center vents  
 Primary objective (circle): more cooling more front downforce combination

### Baseline session 1 or previous track data (No Race Louvers or Grill Blockers)

Average coolant temps 180 Front grill opening size (sq in) 112 176  
 Best lap 1:56.26 2nd best lap 1:56.54 3rd best lap 1:56.67 Average lap \_\_\_\_\_

### Session 2

Car setup changes (circle): Race Louvers/Grill Blockers/Other \_\_\_\_\_ 53°  
 Front grill opening size (sq in) 112 Wing angle 0 Suspension adjustments \_\_\_\_\_  
 Average coolant temps 210 Best lap 1:56.26  
 2nd best lap 1:56.34 3rd best lap 1:56.67 Average lap 1:56.48

### Session 3

Car setup changes (circle): Race Louvers/Grill Blockers/Other \_\_\_\_\_  
 Front grill opening size (sq in) 112 Wing angle 2 Suspension 63°  
 adjustments \_\_\_\_\_ Average coolant temps 220 Best lap 1:56.22  
 2nd best lap 1:56.67 3rd best lap 1:56.96 Average lap 1:56.62

### Session 3

Car setup changes (circle): Race Louvers/Grill Blockers/Other Opened Air intake 72°  
 Front grill opening size (sq in) 132 Wing angle 4 Suspension adjustments \_\_\_\_\_  
 Average coolant temps 225 Best lap 1:56.29  
 2nd best lap 1:56.51 3rd best lap 1:56.92 Average lap 1:56.57

Conclusion/comments 40 more rear wing. I was not able to  
keep the coolant temps down with out cutting the  
bumper back out to 176 sq in.

## Race Louvers Track Test Post Event Download

Driver Ryan Walton  
 Racing class AI  
 Car year/make/model 1989 Mustang

Test date 4/6/19  
 Test track Bottom Willow  
 Weather 53° → 72° F  
Sunny

Interviewer/Date Al Watson 4/9/19

Session/comments Test car raced with previous setup for several years. Driver was top and previous class champion. Car already had generic hood vents, GT nose with opening trimmed just enough for cooling, car was well balanced and neutral handling.

Session/comments Warmup session yielded an oversteering condition and good temps. Setup was the same with only changes being a Race Louvers hood extractor and a new GT nose with smaller OE opening. Best lap 1:56.267

Session/comments Qualifying Session 2 degrees of rear wing was added to help the oversteering condition. Track temps were increasing along with coolant temps but still ok. Car still slightly oversteering. Best lap 1:56.227. Average best lap of run group was 1:54.935.

Session/comments Race session 2 more degrees of wing was added for a total change of 4 degrees to help oversteer. GT nose opening was trimmed slightly for cooling. Track temps and coolant temps were up but still good. Car was now fairly balanced and neutral. Best lap 1:56.292. Average best lap of run group was 1:56.481.

Conclusions

- 1) The addition of rear wing angle to balance the car was a clear indication of more front downforce from the Race Louvers and Grill size.
- 2) Although the OE nose required slight trimming for cooling, its size reduction from previous GT nose aided in front downforce when combined with Race Louvers.
- 3) Net lap time reduction of 1.4 seconds. While the field lost about 1.4 seconds from Qual to Race the test car was able to maintain the same lap time netting an overall gain.



## BMW E36 Track Test

Special thanks to Matt Wasilewski and his ST/TT4 - GTS2 BMW for testing our new Nasa ST/TT3-6 Spec Race Louver extractor kit.

Wasilewski is a top running ST/TT4 - GTS2 with his well sorted BMW. Testing was at Nasa Mid Atlantics Hyperfest held at VIR in May and some comparisons were made from a previous event at VIR in March. The only changes to the car were replacing the existing unknown brand hood louvers with some of Our new ST/TT3-6 Spec Race Louvers designed to meet the new ST/TT hood vent rules as well as adding some front grill tape. The rear wing was not changed in anticipation of added front downforce as the car has always had some understeer. The car performed well, was fast and seemed to be more neutral.

#### Results:

- **Added Race Louvers.** Our new Nasa ST/TT4 spec Race Louvers replaced the unknown brand louvers.
- **Added some front grill tape.** Front grill tape was added to control cooling airflow to only what is needed to increase front downforce. 50 sqin of grill restriction yielded 190-200 deg coolant temps in 90 deg ambient temps.
- **Car balance improved.** Front grip increased curing a previous understeering condition.
- **Improved Lap times.** Set and reset VIR's TT4 lap record, now 2:02.745. Lap times remained similar to a previous 65 deg VIR event while the rest of the field seemed to slow in the 90 deg heat.

# Race Louvers Track Test Data

Driver Anthony Wozniak Test date 19-20 MAY 14  
 Racing class TT4 / GTS-2 Test track VIR  
 Car year/make/model 93 / BMW / 325i Weather 80° High Sunny  
 Thermostat rating 25°C Splitter type/size 4 in Full Flat <sup>to Front of car</sup> Front of radiator sealed to nose yes Back of radiator open to engine bay yes Wing type/size Banner-Weld 65" width  
 Other brand hood vent N/A Other aero aids N/A  
 Race Louver part(s) being tested: NASA ST Legal Mid and Center Louvers  
 Primary objective (circle): more cooling / more front downforce / combination

Baseline session 1 or previous track data (No Race Louvers or Grill Blockers)

Average coolant temps 2-190-200 Front grill opening size (sq in) Full open 7 180 in<sup>2</sup>  
 Best lap 2:03.07 2nd best lap 2:05.5 3rd best lap 2:06.5 Average lap 2:03.3

## Session 2

Car setup changes (circle): Race Louvers/Grill Blockers/Other  
 Front grill opening size (sq in) Blocked to about 120 in<sup>2</sup> Wing angle 0° Suspension adjustments N/A Average coolant temps 190-200 Best lap 2:02.7  
 2nd best lap 2:02.7 3rd best lap 2:03.1 Average lap 2:02.8

## Session 3

Car setup changes (circle): Race Louvers/Grill Blockers/Other  
 Front grill opening size (sq in) Blocked to about 120 in<sup>2</sup> Wing angle 0° Suspension adjustments N/A Average coolant temps 190-200 Best lap 2:06.9  
 2nd best lap 2:07.1 3rd best lap 2:07.7 Average lap 2:07.2

## Session 3

Car setup changes (circle): Race Louvers/Grill Blockers/Other  
 Front grill opening size (sq in) \_\_\_\_\_ Wing angle \_\_\_\_\_ Suspension adjustments \_\_\_\_\_ Average coolant temps \_\_\_\_\_ Best lap \_\_\_\_\_  
 2nd best lap \_\_\_\_\_ 3rd best lap \_\_\_\_\_ Average lap \_\_\_\_\_

Conclusion/comments A Super Hot Week and Where Everyone was a few seconds off Pace from March. I was able to match my personal Best TT/ST4 Lap time. even!! The car did feel more neutral, as I have always suffered from understeer. Also, even w/ the R/L blocked off I ran my consistent 190-200°F. It not for the units I know I would be running hotter. Will Test more in July @ Pitt Race

## Race Louvers Track Test Post Event Download

Driver Matt Wasilewski Test date 5/19/19  
 Racing class TT4 / GTS2 Test track VIR  
 Car year/make/model BMW E36 Weather 90° Sunny

Interviewer/Date 5/21/19 Al Watson

Session/comments Set TT4 session / Set record 2:02.789. P1.  
New ST/TT3-6 spec louvers and some front grill restriction  
has seemed to cure some understeer the car traditionally  
had.

Session/comments Set GTS2 race car was maintaining 190-200°F  
temps with louvers and some grill restriction in 90° sunny  
temps. Took lead of race but oil on track caused a wreck  
which ended the race and took a DNF.

Session/comments Sun TT4 session, car repaired, reset record  
2:02.785. No understeer, car neutral. Coolant temps maintained  
around 200° w/grill restriction.

Session/comments Sun GTS2 race. Louvers + grill restriction  
maintained 190-200°F temps all race. Understeer gone.  
Front grill opening about 50 sq in less than previous in 90° heat

Conclusions 1) Added center and side ST/TT3-6 spec Race Louvers and  
grill restriction.  
2) 200° Temps maintained even with front grill restriction in 90° heat  
3) Understeer cured indicating added front downforce  
4) Lap times similar to 65 mph VIR event, while the field  
seemed to be slower in the heat, 90°, indicating faster  
lap times.



## Mustang Track Test

## Fahrenheit 240 - Cooling a Classic

Race Louvers and Black Helmet Racing team up to produce a custom size hood extractor without compromising the '98 Cobras unique hood aesthetics. Sean Thibodaux has been tracking, modifying and racing his 1998 Cobra for a number of years with the SCCA and got to the point where the 95F desert heat was taking its toll as coolant temps were typically around 230F and starting to creep into the 240F range as the car and driver got faster. The radiator had already been upgraded and the front grill was sealed to the radiator so what was next? Hood venting was on Sean's radar but couldn't figure out how to get one on his hood without getting crazy, excessively cutting it up and losing the unique look until he found Race Louvers. We not only offer many types and sizes of hood extractors but also the ability to custom design them in various sizes. The '98 Cobra hood offered a unique challenge as Sean wanted to retain the OEM aesthetic side vents. The hood also had an unusual raised bubble in the center that didn't help matters. Since the optimum location for good hood extraction is in the center of the hood just aft of the radiator it was decided to cut out the center bubble and custom size an extractor to fill in the hole. After a bunch of measuring, We came up with a few options and sent Sean templates to test fit. Once a template was selected we added in our RT track trim louver design, did some laser cutting, powder coating and shipped it out. Sean then did some OT in the home shop and had them installed in no time. The end result was a cool running classic '98 Cobra. While the extractor was on the small side to fit between the OEM aesthetic vents it was still able to knock 20F off the coolant temps. Now that coolant temps are under 210F mid summer Sean will have the ability to add some downforce in the cool fall weather by sealing up the front grill and look for some improved laptimes.



## Subaru BRZ Rally Test

Race Louvers, road course to rally. Similar to splitters on road course cars that block the natural cooling airflow path out the bottom of the car, rock guards skid plates and heavy grill mesh restrict cooling air on rally cars as well, race louvers help restore cooling by providing extraction of heated air out of the hood.

Special thanks to Escudería Boricua Rally Team for providing us another data point once again showing proper hood extraction can help in many forms of motorsports. Due to cool weather, flats and a wet muddy weekend data was limited. Look for an update next summer when heat load is at its maximum.

The natural cooling airflow path in production cars is air entering the front grill, thru the radiator and out the bottom of the car. Once rock guards and skid plates are added it restricts this airflow path reducing cooling. Further heavy screens and grill mesh installed on the front grill also restrict cooling airflow. Race Louvers provide another airflow path and extract heated air up and out of the hood more than doubling the cooling airflow than the competition. This allows rally teams to run the car with significant protective devices from rocks, gravel, etc and still maintain sufficient cooling.





## Mustang Track Test

Track testing a fox mustang with some Race Louvers and Grill Blockers. This American Iron mustang is our low budget but well sorted shop car. Prior to testing the car had a common plywood splitter, air dam, ducted nose opening to the radiator, some diy canards and a APR GTC-300 rear wing. Although the weather did not give us the best test weekend we did confirm two things. One, when using Race Louvers the front grill opening can be reduced to gain front downforce while still maintaining reasonable coolant temperatures. Two, that added front downforce requires some rear grip typically achieved with some added rear wind angle and this combination results in reduced lap times. Saturday was dry, partly cloudy and 75 degrees and we spend the day establishing how much more we could restrict the front grill opening and we were able to get it down to 95 sqin from 135sqin. Sunday was light rain all day and not the best testing situation but we did compare qualifying with Race Louvers and Grill Blockers vs no hood vents and the usual larger grill opening in the race and was able to see a solid half second difference. While not a significant improvement it was still a gain.

#### Results:

- **Added Race Louvers.** Pair of small center and a pair of side Race Louvers.
- **Reduced front grill opening.** Grill blockers were used to reduce front grill opening from 135 sqin to 95 sqin while maintaining 215 deg coolant temps.
- **Added 3 degrees of wing.** More wing angle was needed to balance the car, settling on +3 degrees, indicating an increase in front downforce from the Race Louvers and smaller grill opening.
- **Reduced lap times.** half of a second in the rain.

## Race Louvers Track Test Data

Driver Al Watson Test date 5/4/19  
 Racing class American Iron Test track NSRP Lightning  
 Car year/make/model 193 Mustang Weather part cloudy 75°F

Thermostat rating 180° Splitter type/size 3" flat Front of radiator sealed to nose Yes Back of radiator open to engine bay Yes Wing type/size 6TC 300 - 5° center  
 Other brand hood vent 4 small dip duct types with 1/2" wicker Other aero aids Carards/Air dam

Race Louver part(s) being tested: K8, 12.8 CF centers + RK, 19.7 SF sides  
 Primary objective (circle): more cooling / more front downforce / combination

### Baseline session 1 or previous track data (No Race Louvers or Grill Blockers)

Average coolant temps 225°F Front grill opening size (sq in) 135 sq in  
 Best lap      2nd best lap      3rd best lap      Average lap     

### Session 2 Practice

Car setup changes (circle): Race Louvers/Grill Blockers/Other 6" side blockers  
 Front grill opening size (sq in) 95 sq in Wing angle -2° center Suspension adjustments      Average coolant temps 195°F Best lap       
 2nd best lap      3rd best lap      Average lap       
\* 65 Deg

### Session 3 Qualifying

Car setup changes (circle): Race Louvers/Grill Blockers/Other 6" side blockers  
 Front grill opening size (sq in) 95 sq in Wing angle -2° center Suspension adjustments      Average coolant temps 200°F Best lap       
 2nd best lap      3rd best lap      Average lap       
\* 75 Deg

### Session 3 Race, 30 min.

Car setup changes (circle): Race Louvers/Grill Blockers/Other 6" side blockers  
 Front grill opening size (sq in) 95 sq in Wing angle -2° center Suspension adjustments      Average coolant temps 215°F Best lap       
 2nd best lap      3rd best lap      Average lap       
\* 80 Deg

Conclusion/comments 3 degrees of wing was added and balance of car good with new hood louvers. was able to significantly reduce the front grill opening to and run similar temps. No lap times compared as following day called for rain.

## Race Louvers Track Test Data

Driver Al Watson Test date 5/5/19  
 Racing class American Iron Test track Norfolk  
 Car year/make/model '93 Mustang Weather Light Rain all day 60°F  
 Thermostat rating 180° Splitter type/size 3" flat Front of radiator sealed to nose Yes Back of radiator open to engine bay Yes Wing type/size ERC-300  
 Other brand hood vent — Other aero aids Curbs/Air dam

Race Louver part(s) being tested: RC.12.8.01 centers / RX.19.7.5P sides  
 Primary objective (circle): more cooling / more front downforce / combination

~~Baseline session 1 or previous track data (No Race Louvers or Grill Blockers)~~

Average coolant temps +170°F Front grill opening size (sq in) —  
 Best lap — 2nd best lap — 3rd best lap — Average lap —

~~Session 1 Qualifying~~

Car setup changes (circle): Race Louvers/Grill Blockers/Other 6" side blockers  
 Front grill opening size (sq in) 75 sq in Wing angle -2° center Suspension adjustments — Average coolant temps 170°F Best lap 1:34.263  
 2nd best lap 1:36.053 3rd best lap 1:36.306 Average lap 1:35.541 (top 3)  
\*Top 5 lap avg = 1:36.053 Grill blockers removed.

~~Session 2 Race~~

Car setup changes (circle): Race Louvers/Grill Blockers/Other All Race Louvers removed and holes sealed flat sheets.  
 Front grill opening size (sq in) 135 sq in Wing angle -5° center Suspension adjustments — Average coolant temps 170°F Best lap 1:35.163  
 2nd best lap 1:35.833 3rd best lap 1:36.774 Average lap 1:35.925 (top 3)  
\*Top 5 lap avg = 1:36.402

## Session 3

Car setup changes (circle): Race Louvers/Grill Blockers/Other —  
 Front grill opening size (sq in) — Wing angle — Suspension adjustments — Average coolant temps — Best lap —  
 2nd best lap — 3rd best lap — Average lap —

Conclusion/comments Not the best way to compare especially in the rain, but this does indicate more front downforce from Race Louvers with Grill Blockers from needing more rear wing to balance the car, and that added downforce reduces lap times, 4 tenths on this day.

