

 SCIROCCO

**Gruppe B**

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# Project Summary

This project is the development of aesthetic modifications and corresponding proposed mechanical alterations for a 2011 Volkswagen Scirocco. The package will include redesigned replacements for all body panels except for the doors and rear quarter panels, as well as the addition of pieces not included with the stock vehicle. A detailed plan for upgrading the Scirocco's powertrain and chassis will also be developed. Stylistically, all modifications will be centered around the theme of Group B rallying, a popular division of off-road racing during the 1980's that is known for almost unrestricted modification regulations, swarming crowds of fans, and no-holds-barred cars. The redesigned aftermarket items will include:

## Exterior

- Composite wide body kit. This includes redesigned front and rear bumpers, front fenders, and rocker panels, as well as the addition of rear fender flares
- Redesigned hood, roof, and rear hatch
- Rear spoiler
- Custom wheels
- Graphics

## Mechanical

- Sequential turbocharger kit
- Upgraded exhaust, valvetrain, electronics, engine internals, and brakes
- An additional, identically tuned engine mounted behind the rear axle
- A midship-mounted, horizontally opposed six-speed trans-axle with dual input bell housing adapter
- All wheel drive conversion
- Inboard, subframe mounted coilovers
- Custom wheels
- Additional performance parts

# Problem Statement

The current generation of Volkswagen Scirocco is a brand new breed of car; it was released in 2008 and continues production today. VW is a popular niche brand for tuning enthusiasts around the world, and yet their new, attractive sport compact has received little attention from aftermarket part manufacturers. This is due in part to its young age as well as the attention gleaned from its popular big brothers, the Jetta and Golf GTI. The Scirocco platform is an extremely potent base for modification. An aftermarket suite of parts can be added to it to not only to bring out the model's full, unexplored potential, but also to make a noteworthy example of an under-utilized vehicle among the tuning community.



Proposed performance tuning

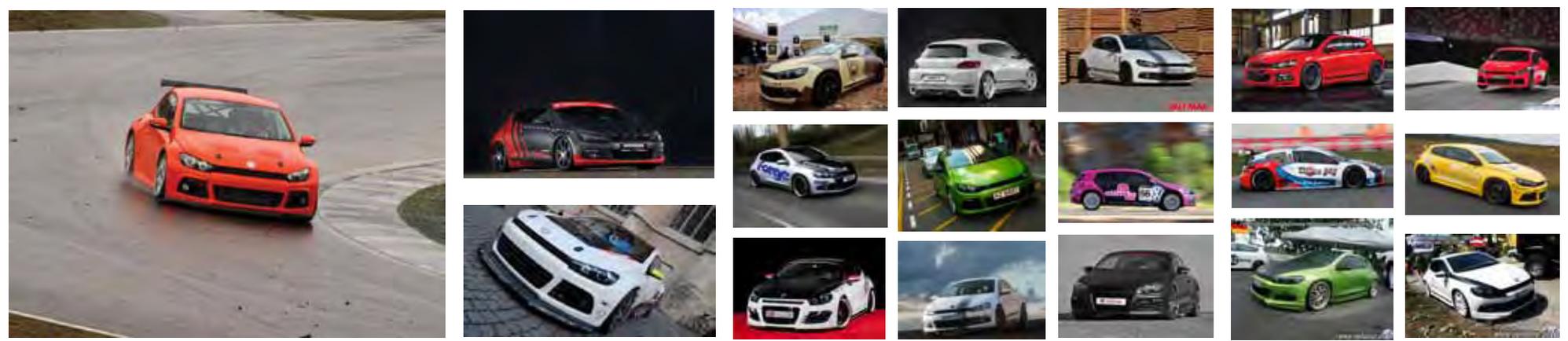
Replacement accessories

Redesigned body kit



# Background Information & Research

Volkswagen Scirocco - First produced from 1974-1992 and then re-designed and re-released in 2008, the Scirocco (named after a Mediterranean wind) has a pedigree of cars that include the Karmann Ghia and the VW Corrado. The new 3-door sport compact features a front engine, front wheel drive configuration and a forced induction intake.



Group B Rallying - A prolific period in rallying (point-to-point, all terrain sport compact racing) during the 80's that encouraged large amounts of automotive experimentation due to its lax regulations.



# Scirocco Concepts



# Rally Trends



# Mechanical



# VW Trends



# Goals

I intend the end result of this project to be a fully visualized aftermarket package for the Volkswagen Scirocco. The suite of parts will draw character from the cars of Group B and their avant-garde lighting, spoilers, intakes, and flairs. I hope to simultaneously imbue the car with an updated, contemporary style reminiscent of current racing and customization trends. A graphic treatment for the car that is complimentary to the form of the new body as well as reminiscent of Group B livery will also be developed. Mechanically, the car will share the experimental, uninhibited nature of the Group B cars, while being taken a step further to reflect on current advances in performance technology.

The deliverables of this project will include a mechanical package drawing accompanied by a detailed description of its performance modifications, and a presentation model constructed from a 1:10 scale Scirocco replica. These will be included in a final presentation that will also display the ideation and development of the project.



# Organizational Calendar

9/30 – Design brief resubmitting, continue work on ideation and initial concepts

10/7 – Ideate and sketch multiple views of vehicle

10/14 – Flesh out concepts and select two complete packages for development

10/21 – Preliminary critique: Assemble midterm presentation

10/28 – Begin sketch modeling and development drawings for chosen concepts

11/04 – Choose single concept and continue. Begin accessory design

11/11 – Development drawings and model. Finalize mechanical presentation

11/18 – Begin final renders and model

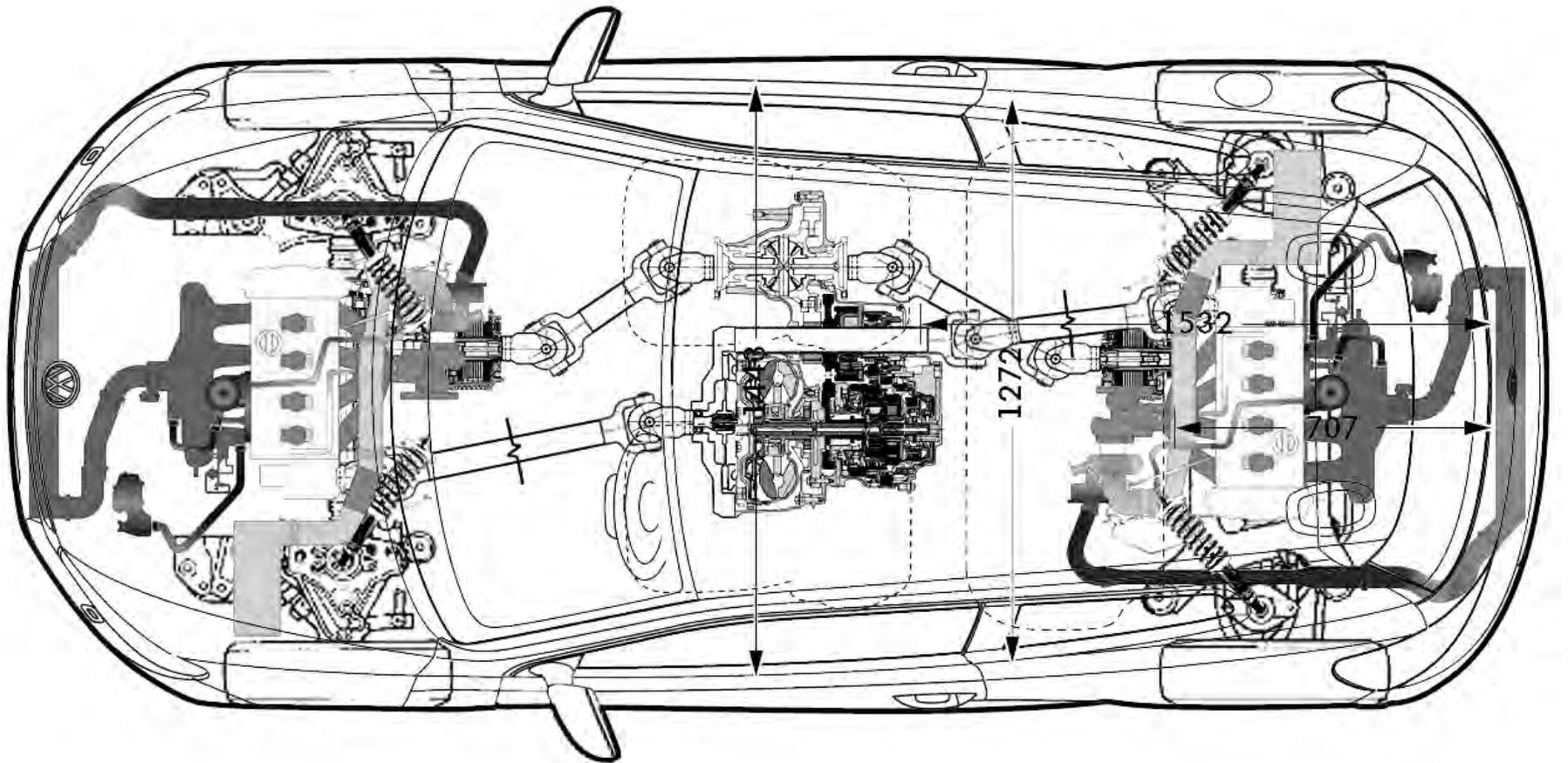
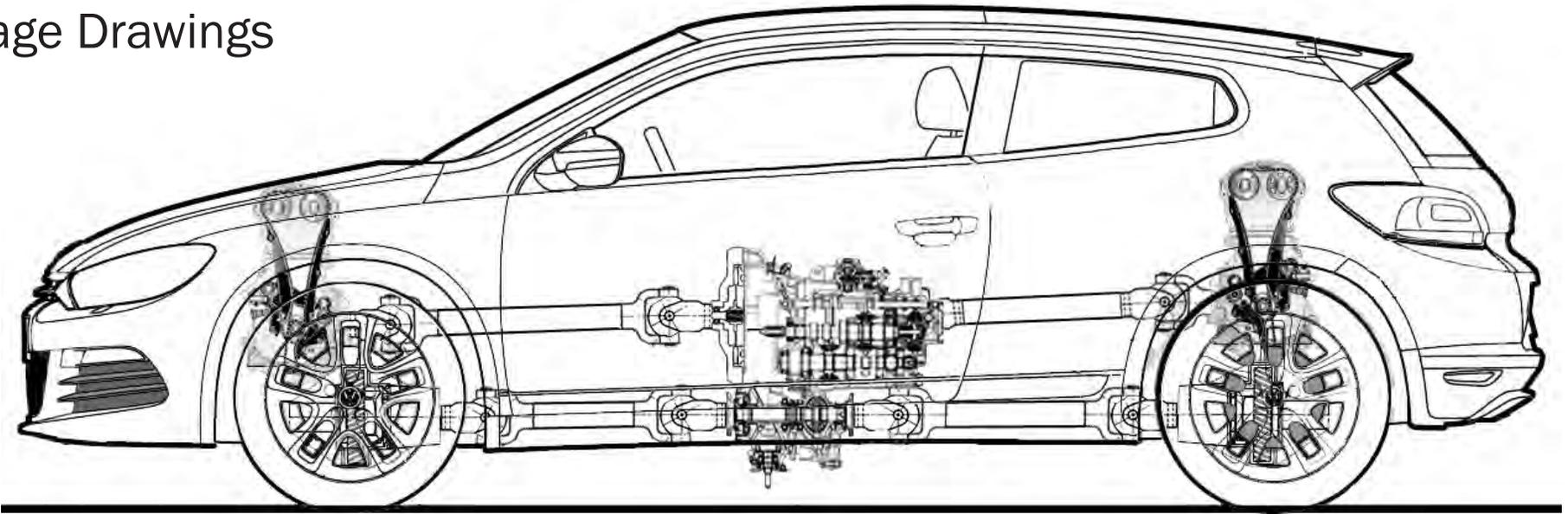
12/02 – Finish 2D deliverables and continue final model

12/08 – Critical review: Assemble 2D presentation. Complete final model

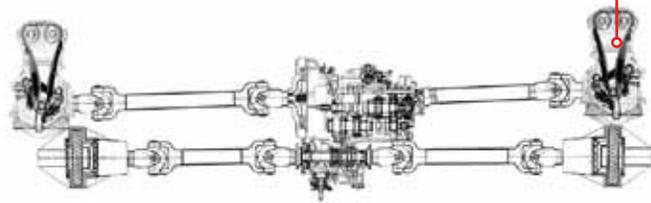
12/15 – ID View: Set up final view space



# Package Drawings



## Internals



### Additional inline four cylinder engine

- Doubles power output
- Mounted behind rear axle
- Tuned identically to front engine
- Provides 50/50 weight distribution
- Reminiscent of experimental engine swapping/moving of Group B

### x2 Sequential turbocharging system

- Upgrade to stock forced induction
- Increases power output and acceleration
- Eliminates turbo lag

### x2 Full engine systems upgrade

- Improved exhaust, valvetrain, electronics, internals
- Increases power output

### Six-speed manual DSG transaxle

- Mounted midship
- Racing clutch, short throw shifter
- Increases shifting responsiveness
- Maintains 50/50 weight distribution
- Halves weight and complication of two separate transmissions
- Provides center differential for all wheel drive system

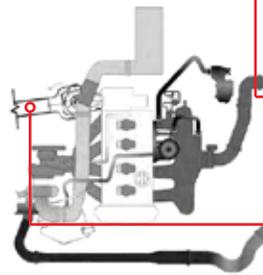
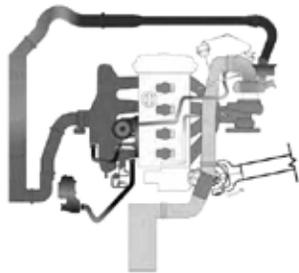
### Dual input bell housing adapter

- Links both engines to transaxle w/o connecting each other

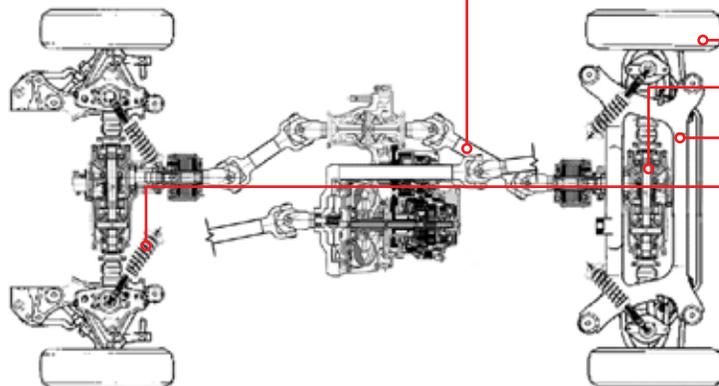
### x2 Carbon fiber torque tube

- Links engine to bell housing adapter w/o increasing weight

## Powertrain



## Drivetrain & Suspension



### x2 Carbon fiber driveshaft

- Links transaxle to differentials w/o increasing weight

### 4motion all wheel drive differentials

- Completes all wheel drive conversion

### Inboard coilover conversion

- Strut tower subframe brace mounts
- Increases rigidity, handling responsiveness
- Protects coilovers from road debris
- Eases ride height adjustment
- Reduces suspension assembly weight
- Reminiscent of Group B experimentation

### Widebody conversion

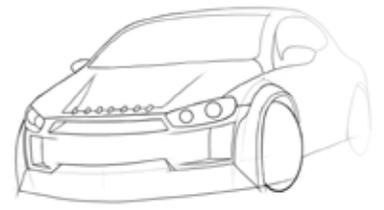
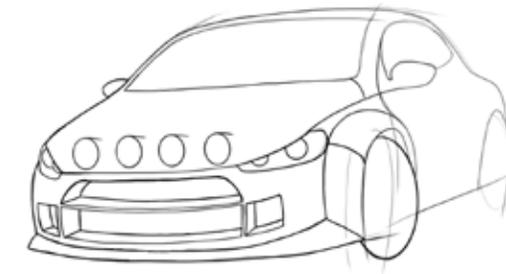
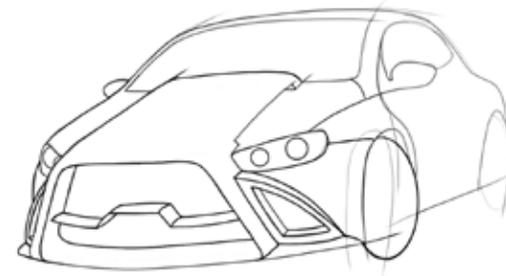
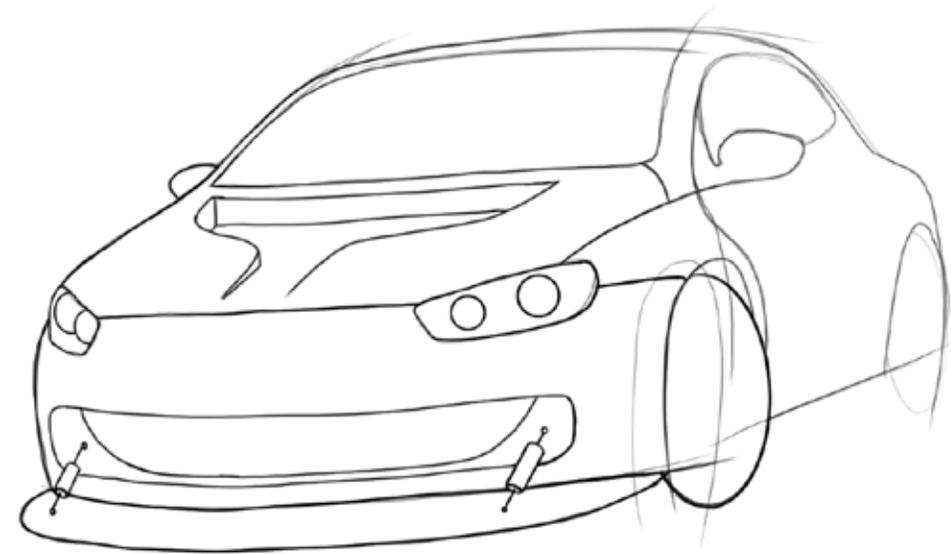
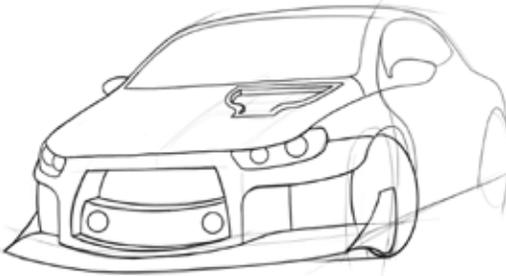
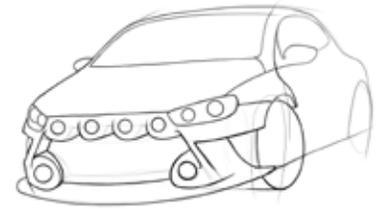
- Lowers center of gravity
- Increases contact patch width of tires
- Improves acceleration and handling

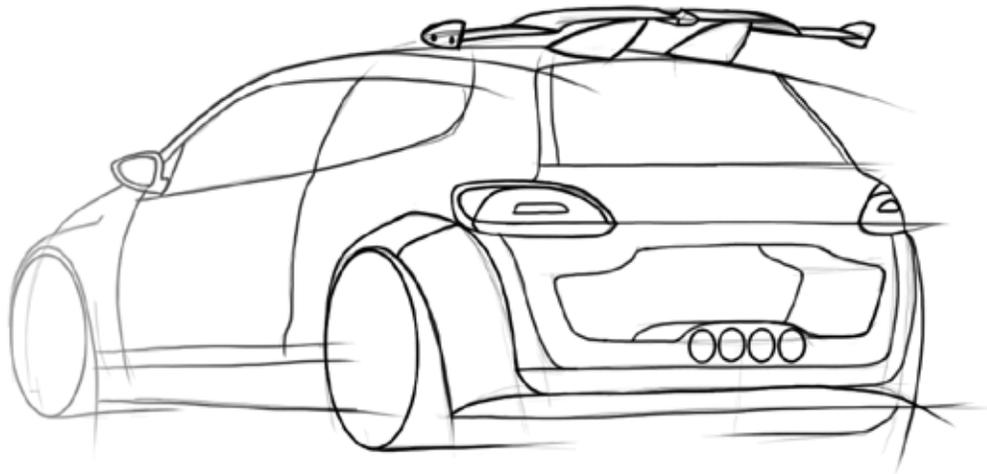
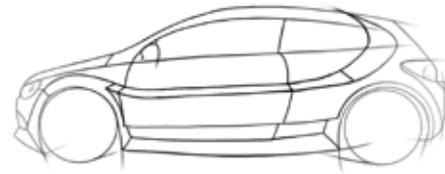
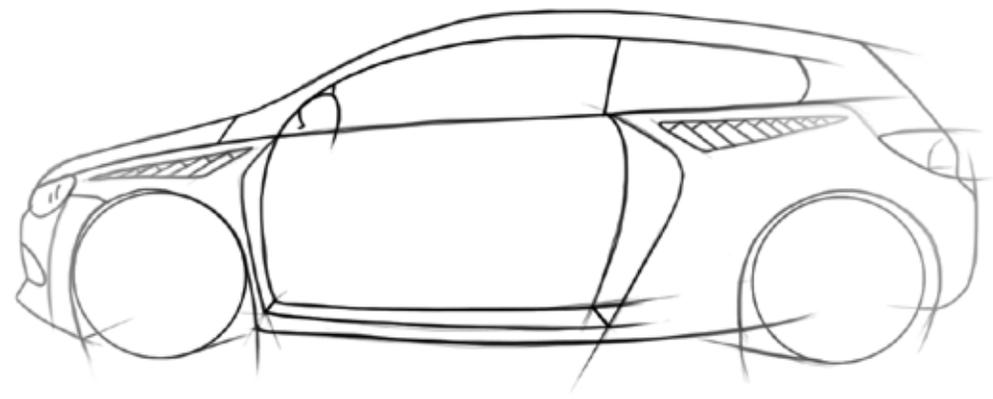
### Underpinning system upgrade

- Anti-roll bars, polyurethane bushings, six point roll cage, custom wheels, performance breaks
- Increases rigidity, handling responsiveness

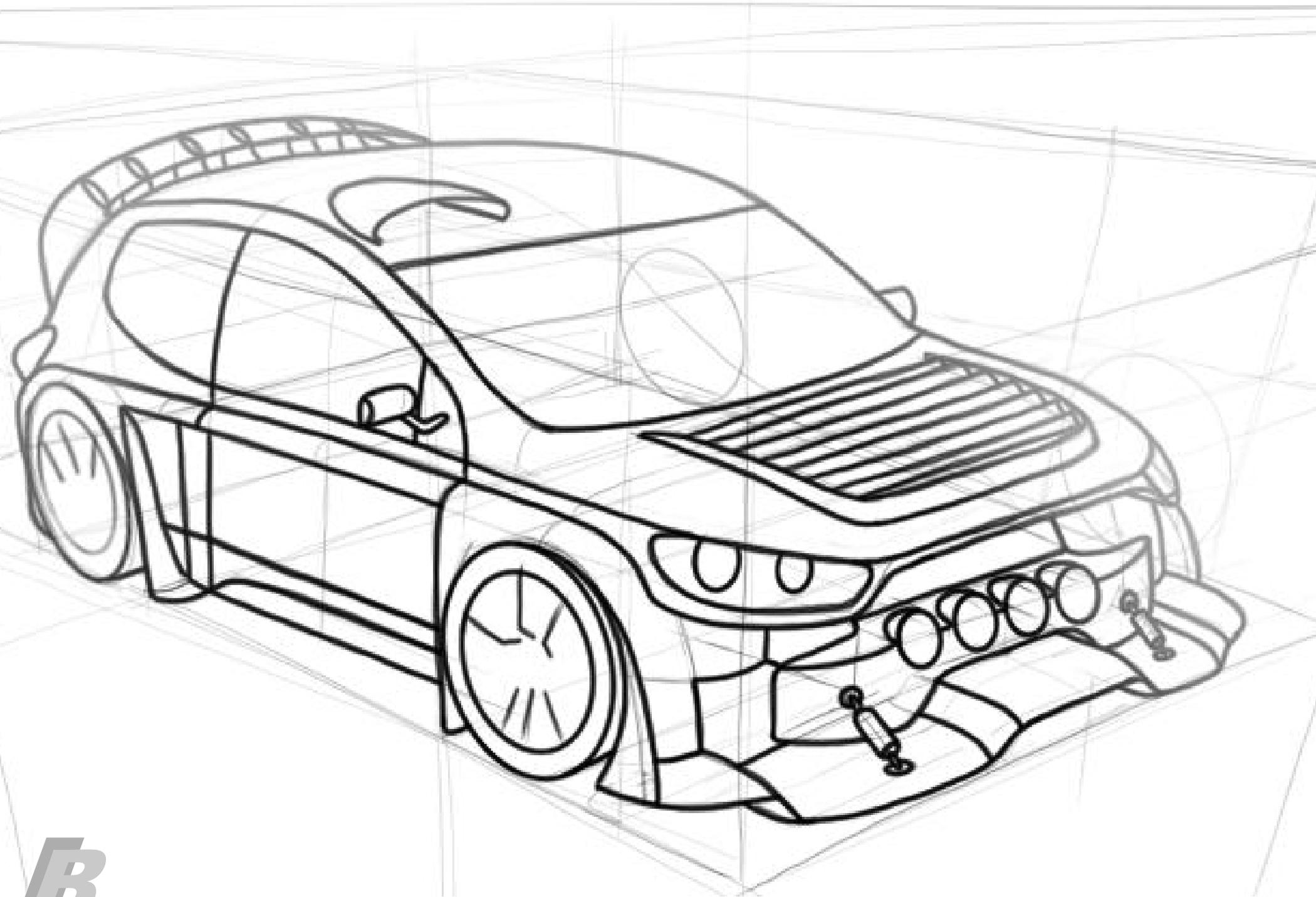


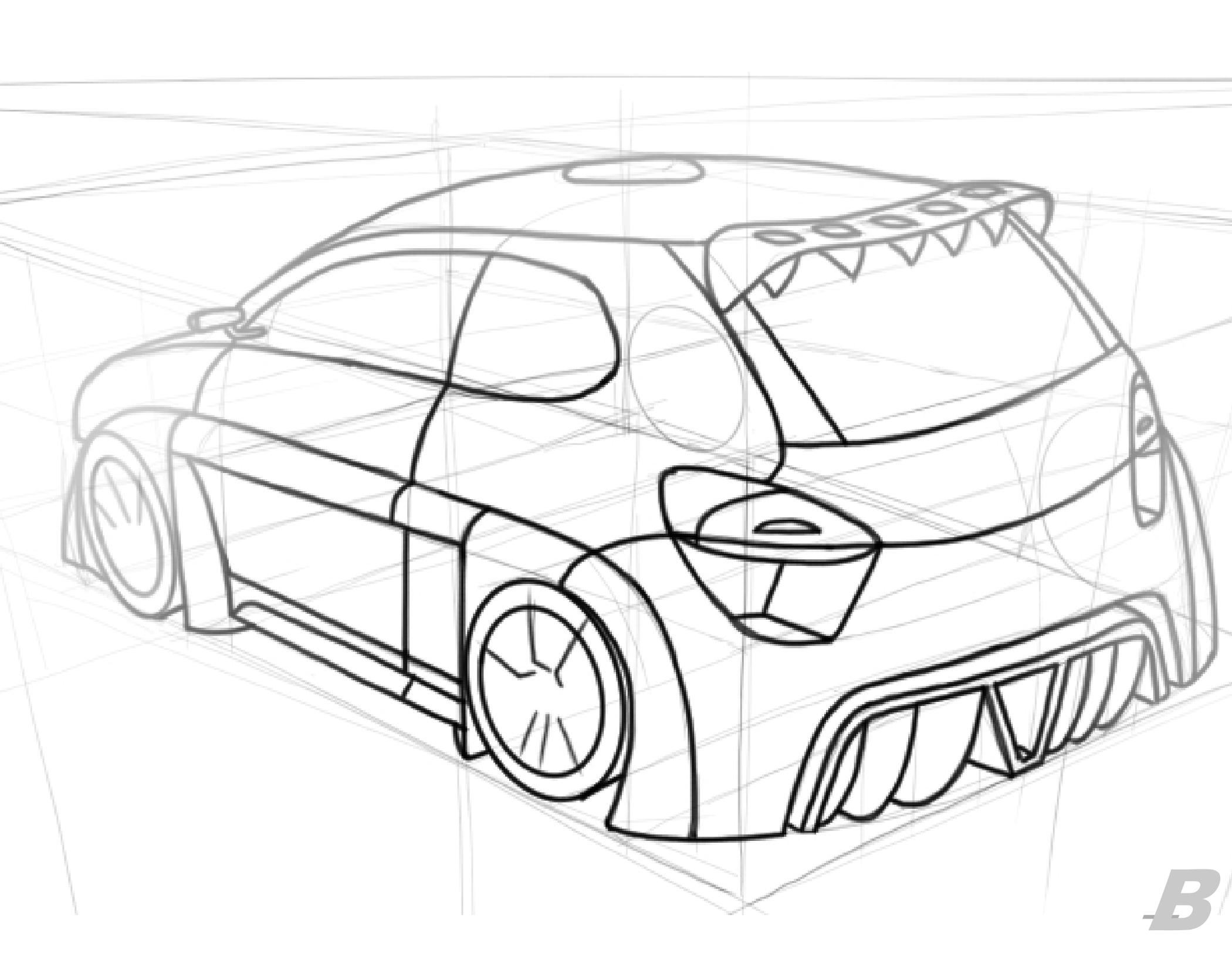
# Ideation

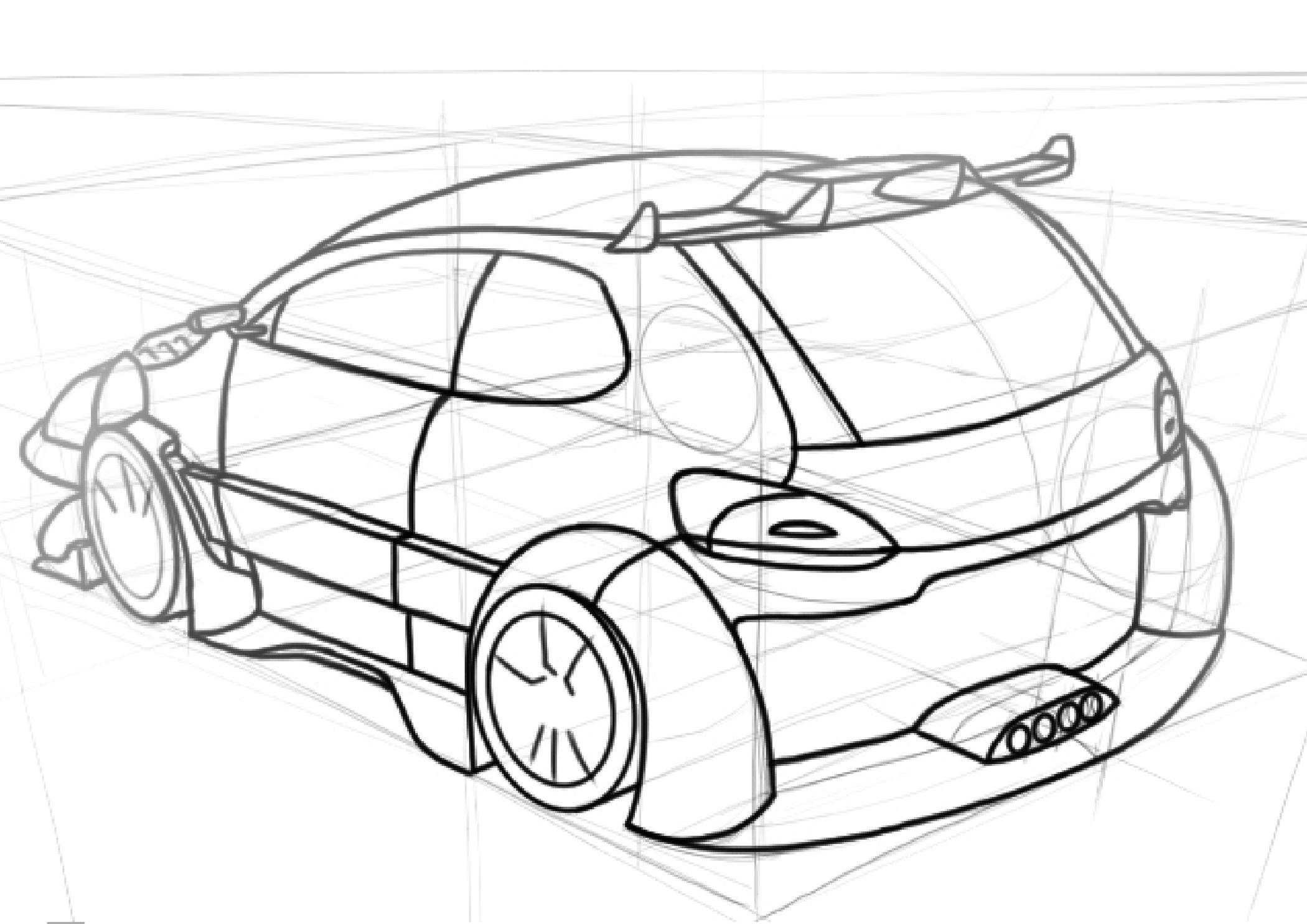


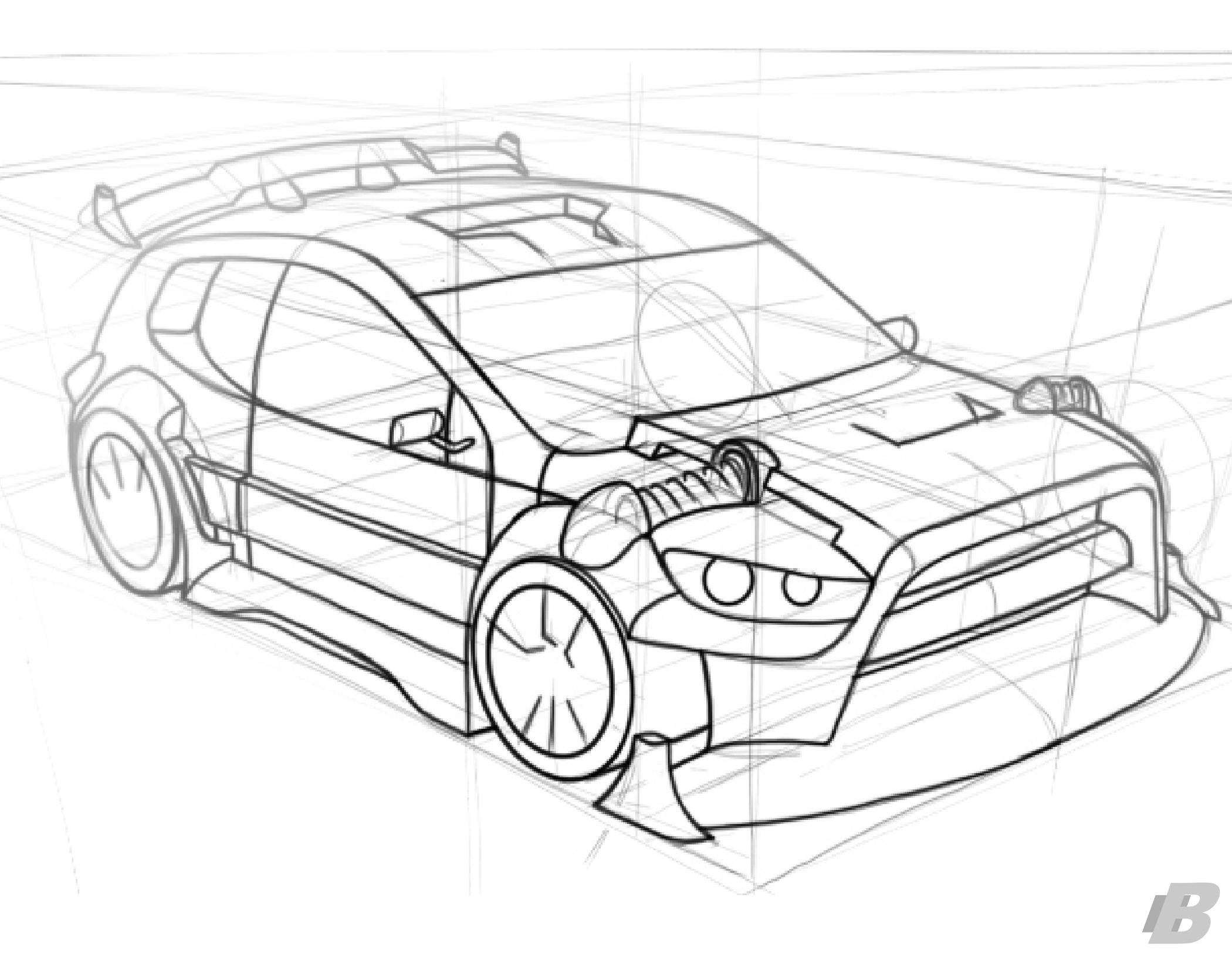


Development









# Model Development





# Scale Model



