



Mexico City Campus
School of Design, Engineering and Architecture
Department of Mechatronics Engineering

Advisors
Dr. Martín Rogelio Bustamante Bello
Ing. Javier Izquierdo Reyes

Electrical Mechanical Project

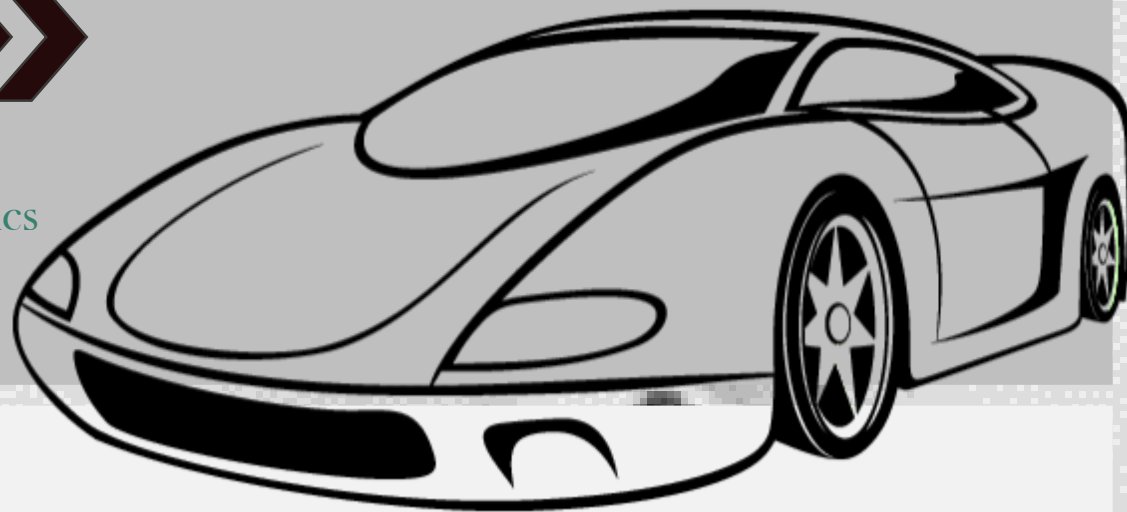
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IME	Miguel Ángel Avilés Cabrera	A01333189
IME	Juan Escalona Santiago	A01332691
IME	Diego Arroyo Jiménez	A01332722
IME	Diego López Bernal	A01332642

TECHNICAL JUSTIFICATION



- Current systems with high price and invasive for passengers
AB Dynamics SR60 Torus Steering Robot | Perrone Robotics
- Development of automotive industry with a trend in autonomous cars..



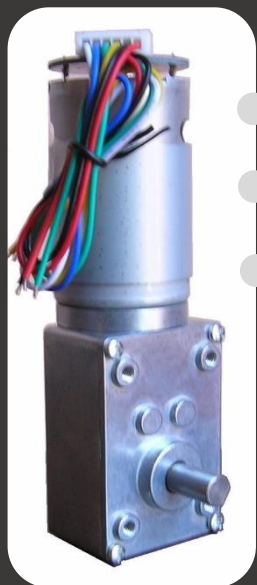
OBJECTIVES

Redesign an auxiliary system in the control of the steering that implies a smaller space in comparison to the previous prototypes, without compromising the safety of the pilot and the passengers.

- Reduce installation space
- Reduce weight
- Homogenize materials
- Universality of the model
- Reduce dimensions
- Reduce wear of parts
- Make the prototype less invasive

DEVELOPMENT

SELECTION OF MOTOR & MATERIALS

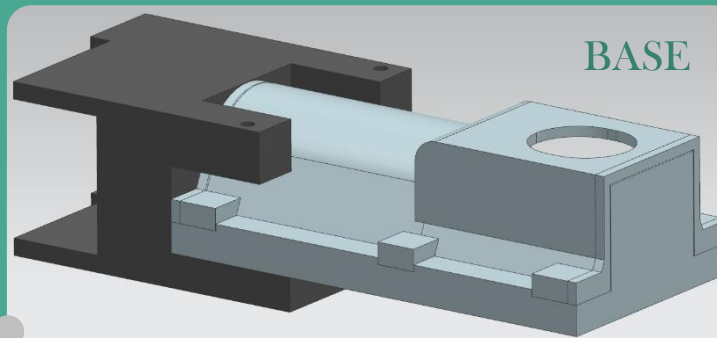
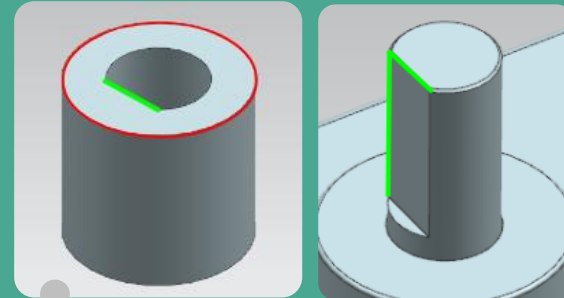
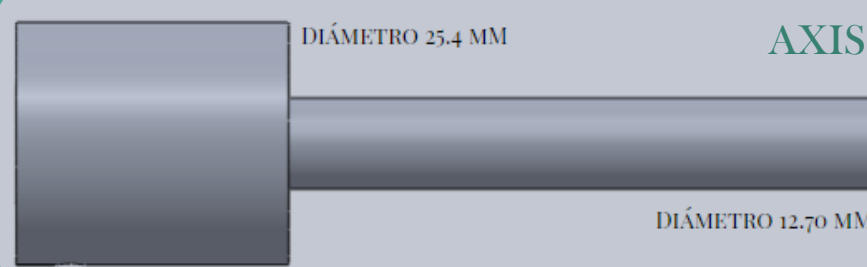


- Required torque (2.94 Nm)
- Reduction in wear between gears
- Reduction in weight and dimensions
- Selection of Aluminum 1100 for:
 - Pinion
 - Gear Crown
 - Axis
 - Structure A

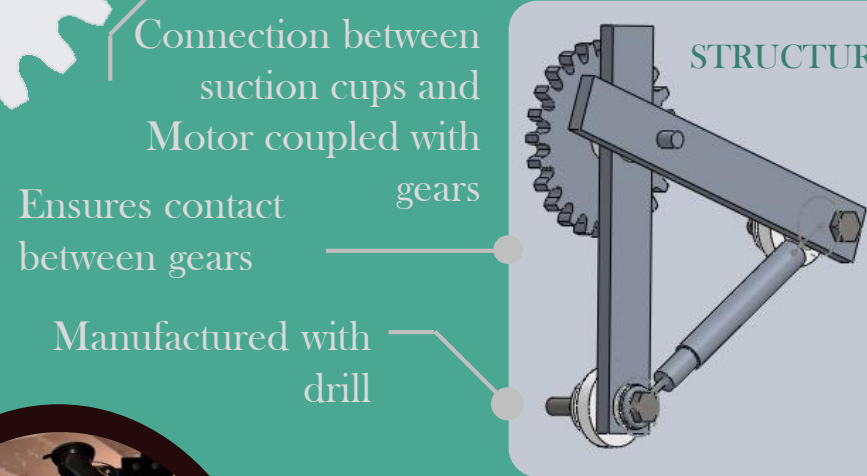
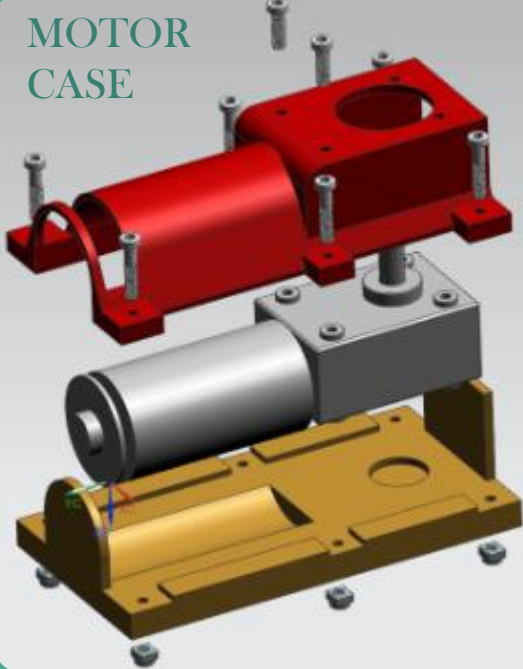
Material	Deformación
Aluminio 1100 (Original)	$2.131 \times 10^{-4} \text{ mm}$
ABS	$7.35 \times 10^{-3} \text{ mm}$
Nylamid	$1.779 \times 10^{-3} \text{ mm}$
Aluminio 6061	$2.504 \times 10^{-4} \text{ mm}$
Aluminio 6063	$2.101 \times 10^{-4} \text{ mm}$
Aluminio 7075	$2.053 \times 10^{-4} \text{ mm}$

Pinion and Gears made in CNC VF-2 HAAS

MANUFACTURE OF PROTOTYPE 3.0



Designed in NX
Printed in 3D with ABS y PLA materials



Ensures contact between gears

Manufactured with drill



ESCAPE 2011



MAZDA 6 2018



FOCUS 2013



CONCLUSION

It was possible to design and manufacture a functional prototype capable of changing the position of the car steering wheel. Making considerable improvements in: **Reduction of dimensions and weight; reduction in wear; homogenization of materials; universality; greater visibility; easy installation; security; esthetic.**

