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FSAE Pedal Box: Controlling Stop and Go

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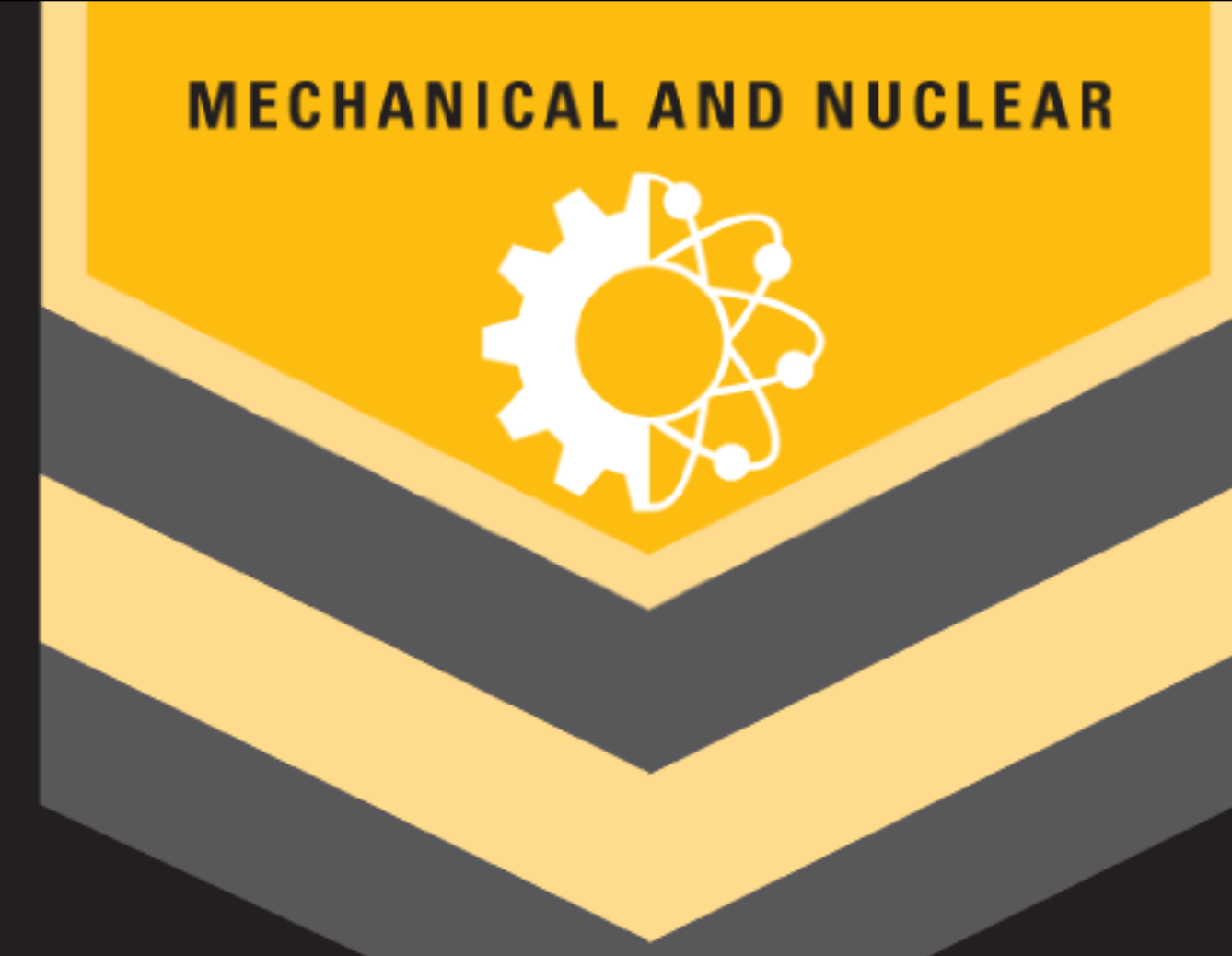
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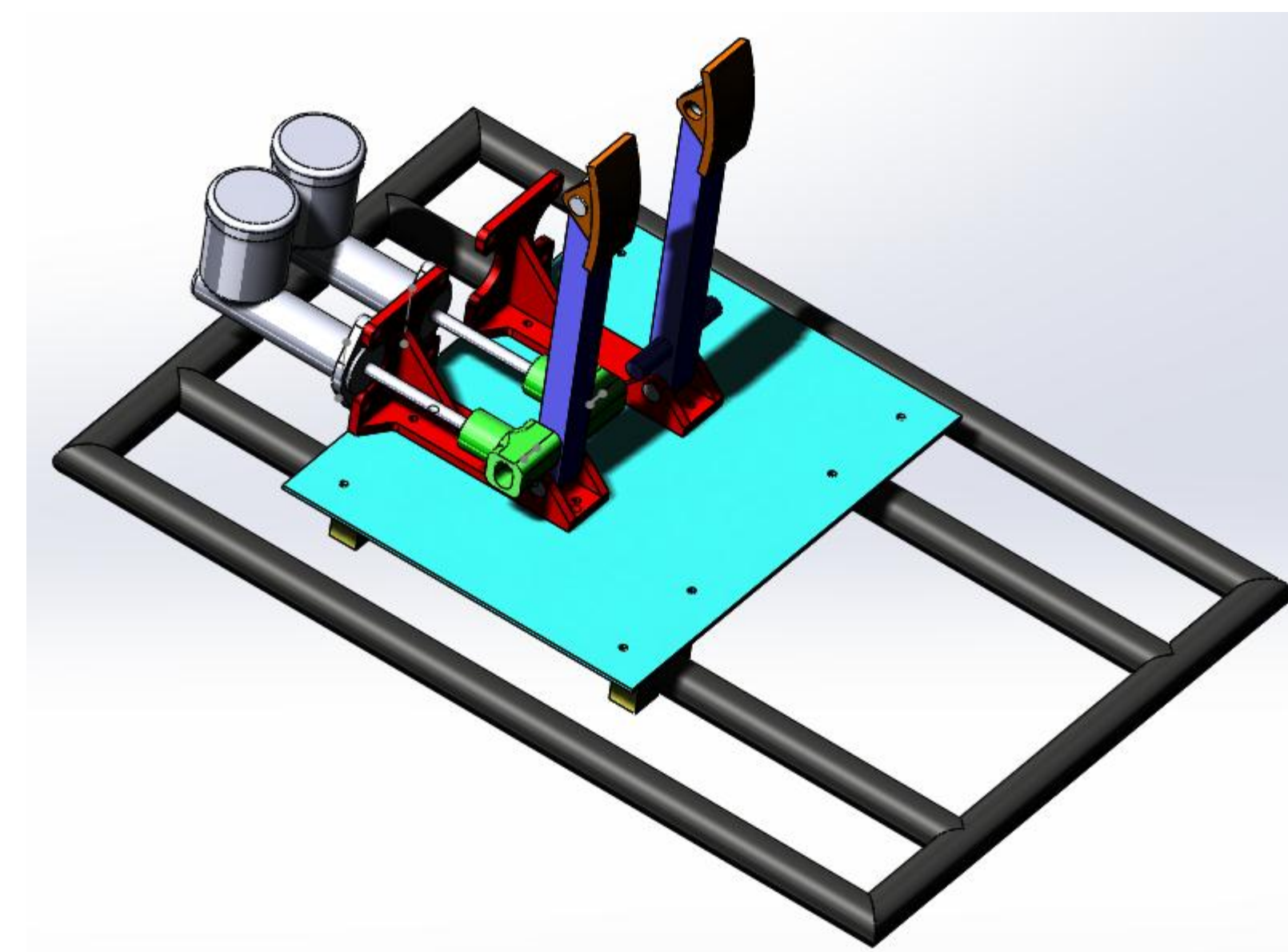


FSAE Pedal Box

Controlling Stop and Go



Stop and Go



A pilot can do three things to control the course of the racecar: turn, brake, and accelerate.

Problem!

We have steering. We need stop and go in a controllable manner.

Solution!

Add foot controls.

Pedals are an effective and simple means to control inputs to the engine and brakes, and while freeing up the hands for shift controls and steering.

Pedal Adjustability

Chris is tall, Tyler is vertically challenged. Both want to pilot the racecar

Problem!

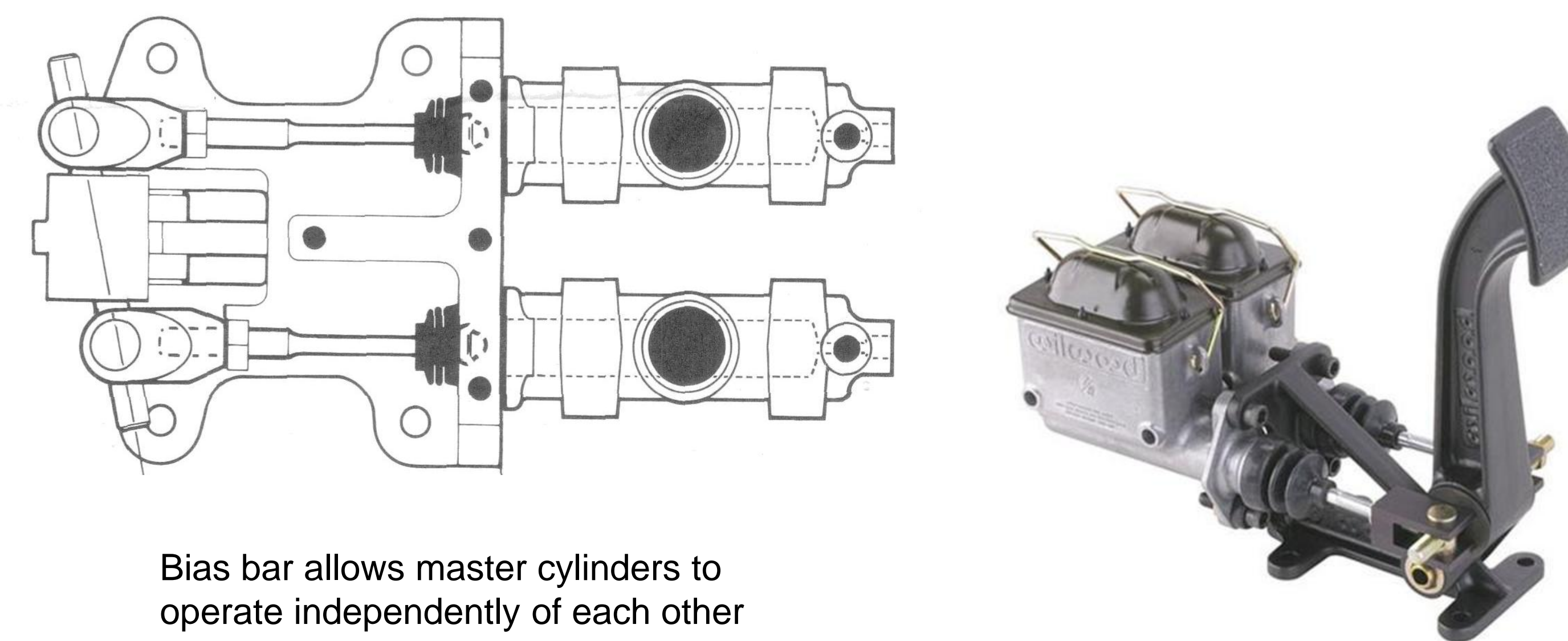
People come in all sizes.
The seat in the racecar is not adjustable.

Solution!

Move the pedals!

The racecar is so light that the pilot constitutes a good portion of the weight of the car. Moving that much weight around in the car will make the vehicle's handling characteristics change.

The simplest way to accommodate all drivers is to install adjustable pedals, so we did. The illustration to the left shows our pedal apparatus. Stanchion clamps and a pair of guide rods hold the pedal platform in place and allow quick adjustment of pedal position.



Bias bar allows master cylinders to operate independently of each other with the same brake pedal input.

Brake Biasing



The Bull's-eye marks the center of gravity of the racecar. When we hit the brakes this moves forward and unloads the rear tires. What a mess this can make!

Problem!

When we use the brakes, the rear tires lock up and we lose control of the car.

Solution!

Send less braking force to the rear axle and more to the front axle

While skidding around is entertaining, it's not safe and definitely not fast. We solved this problem by using a brake biasing rod. This allows us to send different brake pressure to the front axle and rear axle of the car. Since the rear of the car has less traction, it takes less braking force to stop the wheels (which creates a skid, which is bad). The bias rod allows for a lower force on the rear of the car which brings the point of lockup roughly equal to the front.



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