Mouser 500 Engineering Challenge

Damper Temperature Control for 7 Post Testing

Dampers

The racecar uses 4 shock absorbers similar to those found on a passenger car. While on track the dampers dissipate energy in the form of heat. The rear dampers on the car get quite warm during normal operation due to the high loads going through them as well as their proximity to the engine.

7 Post Testing

7 post testing involves installing the racecar on a test rig that can move each wheel independently. The rig also loads the car to simulate the down force that is on the car while on track. This testing allows us to do an accurate simulation of a specific race track while controlling conditions. This setup allows us to test many different damper packages quickly. The car does not need a driver for this test or to have a running engine.

Current Testing

At the 7-post test, we try to keep the damper at a constant temperature (range 30˚-80˚C depending on the front or rear) to be as true to the on-track conditions. At the test facility, we warm the rear dampers in an oven before testing. Once on the car, we use a heat gun and thermocouple attached to the damper to maintain temperature.

Limitations

During a test run, the car moves up and down a lot – making it hard to keep anything attached to the car. There is not a lot of room and many moving parts around the dampers. The dampers need to be easily removed.

Goal

We wish to be better able to control the temperature on the rear dampers in order to more accurately evaluate the changes we are making.

The Mouser 500 Engineering Challenge

This project will be some type of insulation pad that we can wrap around the main body of the damper to heat and/or cool the damper while maintaining it at 80˚C +/- 5˚C. We need 2 separate insulation pads with a single control unit.

Temperature will be set with an adjustable control and have a display of actual damper temp.