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# BOGGS:

Goal is to increase productivity during 8-post rig testing by "eliminating setups to test, identifying tradeoffs in vehicle performance, identifying sensitivity of setup parameters, etc"

They use the simulation rig to develop a linear model that predicts actuator inputs and shock force during a test.

# KOWALCZYK:

The use of the shaker rig eliminates the complexity of non-linear computer symptoms. Better for most race teams. There are some limitations, look back at paper to expand.

# DODDS AND PLUMMER:

Talks about how much computers improve a learning system and efficiency of the shaker rig

Ability to reproduce all of the loads at all points is illusive, the linear behavior is being pursued with the time-domain modeling being considered as an alternative.

Focus for future development is largely on computing and control aspects

JAKOB THOUGHT: They have figured out ways in which to physically simulate the road conditions, they have set up ways to model more comprehensive programs in the future

# CVOK ET AL:

JAKOB THOUGHT: Why don’t they use linear motors for the whole car? Most of the actuators used now are hydraulic pistons. Possible gap: find why those are worse

Test three different types of actuators: servo-valve hydraulic cylinder, spindle equipped rotary servomotor, and linear servomotor// LINEAR SERVOMOTOR WINS bc highest bandwidth and acceleration and control system, low friction losses

# KHAN AND IQBAL:

Micro and meso scale devices can be characterized in the development testing

Velocity of the rig changes the excitation levels.

JAKOB THOUGHT: How does this compare to a multi thousand pound car? How will this force requirement change the way that the application works?

GOALS OF RESEARCHERS:

Increase productivity and efficiency

Find the best actuator that can perform to their specification

Facilitate the combination of the rig and computer systems, improve the technological model

Improve the linear-ness of these systems, make computations easier and more efficient for researchers

JAKOB THOUGHT: I would like to lean towards the choice of the actuator, it is most easily testable. I want to focus on whether or not people have sought out a better solution for actuators in the racing shaker rig in the modern day. What is the performance of them now, and would implementing a technology from a semi-related system increase x parameter.

# FUJIMOTO:

A high thrust-force linear actuator was designed and experimentally tested. The spiral design is state of the art and would be suitable for robot applications.

# RYDBERG:

Hydraulic servo systems are gaining acceptance in many industries. Hydraulic servo systems can operate at high precision, fast operation, and provide simple adjustments. These systems do come at increased costs, however.

# HAHN, PIEPENBRINK, LEIMBACH:

Servo-hydraulic actuators have been historically designed to operate with linear based controllers. Due to the nature of fluid dynamics, the behavior of actuators in non-linear. A controller is developed to compensate for the non-linearities.

# SOUTHWARD & BOGGS:

Experiments have shown that 8-post shaker rig provides more accurate results than 7-post configurations.

# JONSON & ENDERS:

The results from shaker rig testing and computer simulations did not correlate. Experimental tests concluded that energy losses such as friction within the suspension components were to blame. Results were more correlated after modeling friction and suspension bushings.