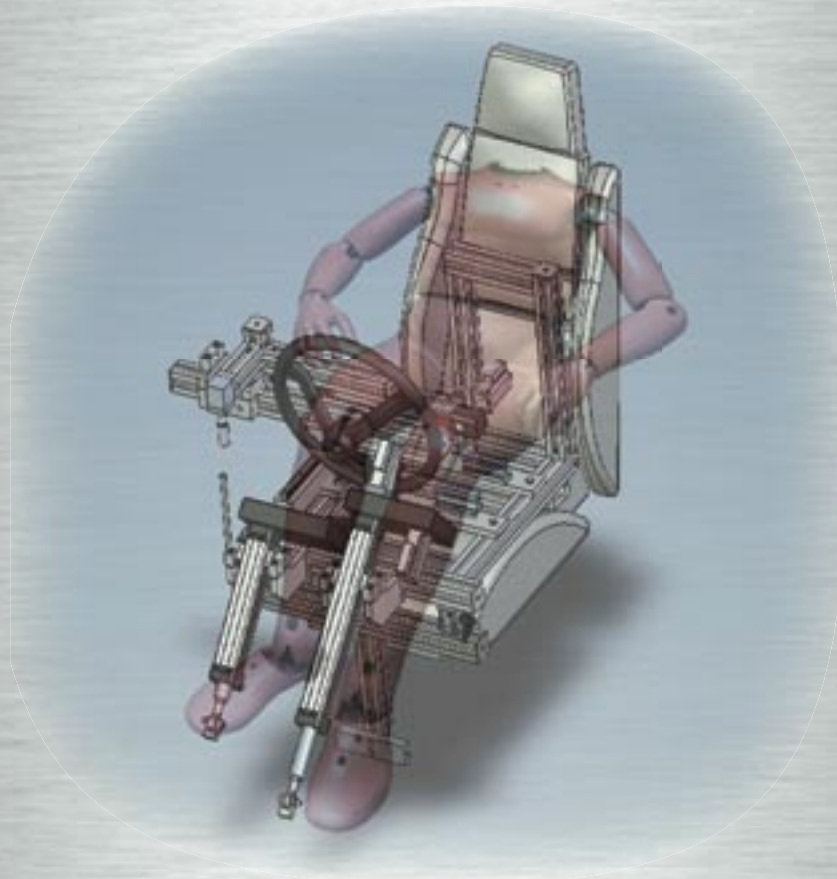


DYNO-DRIVER[®]



AUTOMĀTRICS[®]

Infinite Possibilities[™]

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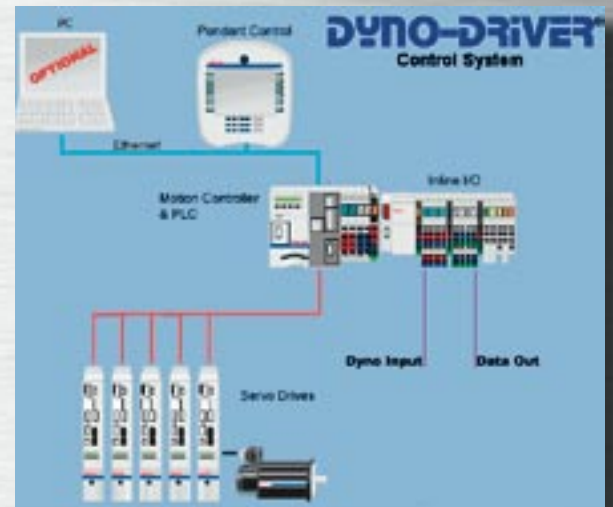
Computer - controlled, servo - actuated operator robot for chassis dynamometers

Innovation

The Dyno-Driver® has been engineered and designed to actuate each operation of the test vehicle on a dynamometer. It provides full operator management of either pre-defined or on-site programmed driving sequences. Each actuator is designed to be set to the axis of motion of each shifter and pedal, giving direct, simplified control and thus the most consistently accurate test results. The actuators are equipped with both force and position feedback circuits. This allows datalogging and alarm setting abilities. The data can be uploaded to a database server for further scrutiny.

Communications for closed loop operation and/or integration to other test equipment can be done by an analog DC voltage signal, Ethernet, Devicenet, serial and others.

System's calculations and motion controls are performed by the state of art PLC and Motion Controllers.



PC is not required to operate the system, it may be used to input and output data. There are no proprietary boards and the software is open source. The system is compact, lightweight and environment hardened. Off-the-Shelf components are extensively used to minimize custom made parts. Optional pendant and/or PC can be utilized for position teaching, program selection and other operational features.

Configurable

The Dyno-Driver® is designed to be configured to the size and layout of most vehicles. The use of extruded aluminum structural technology allows flexibility of adjustment and yet does not sacrifice strength and stability when secured in the vehicle. Three base set-ups are available; Automatic - console selector, Automatic – column selector, and Manual Transmission.

The pedal actuators are secured to each channel of the structure and can be easily added or changed-out depending on test requirements. Each pedal actuator is directly connected to each pedal so the actuator follows the full range of motion.

Available axis: Gas - Brake - Clutch - Gear Shift.

Installation in the vehicle and points teaching can be accomplished in matter of minutes instead of hours.



Full Control

The computer controls provide for quick and easy setup and adaptation to most vehicles. The control cabinet houses all control features and is connected to the Dyno-Driver® by a single multi-conductor umbilical cord to keep the test area clear, organized and tangle-free. Servo motor settings are retained during change-out between vehicles.

Vehicle Learning

- * Teaching of vehicle characteristics is accurate and done once. No fine tuning is required, provided the seat frame is utilized versus the seat itself.
- * On-screen menus can be developed for fast vehicle selection including different transmission configurations within a vehicle model.

Maintenance

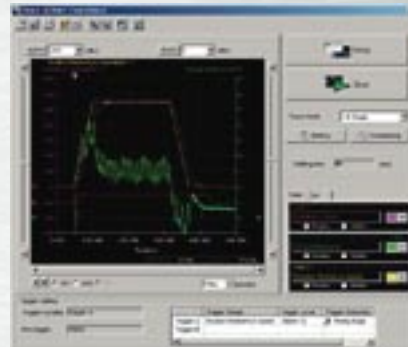
Each actuator is off-the-shelf and each bearing is fully sealed and lubricated for life. All sliding surfaces are engineered for dry service and require no scheduled maintenance but can be easily cleaned if needed.

All of the components are readily available directly from Automatrix and great majority of the components are off-the-shelf and can be easily obtained from most automation suppliers.



Typical test applications:

1. Emissions testing and certification
2. Life cycle testing
3. Laboratory testing
4. Research and development
5. Climate testing
6. Transmission testing
7. Brake testing
8. Mileage testing
9. Engine calibration
10. Remote vehicle operation



Installation

- * Flexibility of attachments allows easy and quick installation – estimated time: under 5 minutes.
- * Attachment points provide secure connection within the vehicle and keep the unit stable throughout all actuator motions.
- * All pedal actuators attach simply and securely to the car pedals. Actuators are easily located for LH or RH drives. No extra hardware required.
- * Shifter attachments connect simply and quickly and can easily be changed for LH or RH drives. No extra hardware required.
- * Controls attach with a main umbilical cord through the vehicle window. Doors can remain closed throughout testing cycle.
- * The Dyno-Driver® is easily taught through the control panel (teach pendant and/or PC/Laptop).

Safety Features

The Dyno-Driver® includes a safety feature for quick response to an emergency stop (E-stop) condition. See Specifications Chart for detailed information.

Once the control system recognizes the E-stop condition, the following steps are enacted to bring the vehicle to a non-powered state:

1. For manual transmissions:
 - a. Clutch actuator rapidly depresses clutch pedal
 - b. Electrical system is disabled on car and dynamometer is given signal to initiate it's own E-stop sequence
 - c. Shifter moves lever to neutral position
 - d. Gas pedal actuator rapidly retracts gas pedal
2. For automatic transmissions:
 - a. Shifter moves to neutral position
 - b. Electrical system is disabled on car and dynamometer is given signal to initiate it's own E-stop sequence
 - c. Gas pedal actuator rapidly retracts gas pedal

Control Scheme

- * Vehicle velocity control is closed-loop
- * Engine speed control is closed-loop
- * Throttle position control utilizes a profile based on driving sequences set from pre-defined road data
- * Clutch position control utilizes a profile based on driving sequences set from pre-defined road data and used in conjunction with throttle position control
- * Brake position control utilizes a profile based on driving sequences set from pre-defined road data and used in conjunction with throttle and clutch position control
- * Shifter patterns for manual transmissions are stored in the driver control computer and are utilized in conjunction with clutch and throttle position control



Software Features

- * Menu-driven operating platform
- * On-screen shifter pattern teaching procedure
- * Manual specification of operation
- * Operator-selectable sequence of events
- * No programming knowledge is required to write test sequences
- * Drive cycles can be developed using the included dialog system or can be downloaded from an external file or remote host computer
- * Test cycles can be started or stopped, with E-stop condition, at any point throughout the program
- * Shifter actuator forces are programmable
- * Repeating of shift sequences can be pre-set
- * Driver computer retains all vehicle specific data regarding actuator profiles
- * Drive cycle is retained in the dynamometer control system
- * Pre-defined drive cycles based on dyno sequences
 - o IM240/FTP
 - o ASM 50/15
 - o ASM 25/25
 - o Loaded Mode
 - o Idle / 2500 RPM
 - o Lug Down
- * Refer to your dyno software for an extensive list of drive record features employable by the Dyno-Driver®



Additional Options

An ignition key switch actuator is available for programmable ignition enable or disable.

Larger servos and different length actuators available for special applications.

Additional Axis are available upon request.

Full-auto integration to existing facilities.

Custom design and implementation of driver systems.