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ADL-Lite Dyno Valve Control Kit for Stuska Globe Valve. Includes:
Control Panel, Worm-Drive 12V Motor, Remote optical pickup & cable, hardware.

This system attaches to your existing Stuska flow control globe valve and existing plumbing and provides a significant improvement over hand controlling your dyno. It will automatically load the engine as you pickup the throttle, until a stable Engine speed is reached. You can change the engine speed by turning the LOAD Knob. It will unload the engine as you smoothly pull back the throttle to an idle. Torque sweeps are easy to make and anyone in your shop can now 'run the dyno'.

Note: This ADL Lite version is not as Fast or as Precise as our Full ADL Control system. It is not expandable like the full version to programmed Simulations. All dyno controls will become unstable at speeds where engine has a steep torque rise when coming 'on the cam'. You can sweep through this range, but not hold steady.

Installation:

This is a kit where you need to wire your 12 Volt battery power and the worm drive motor with #12, or larger, wire. You will need to install the ROS optical pickup and a patch to sense the engine's rotation (once/rev). You will also need to fabricate a secure bracket so that the worm drive can turn your Stuska gate valve. We provide the special coupling that will screw onto the rising valve stem.

For the quickest installation, you can mount the Worm-Drive motor on your current hand valve location. Latter you can move the valve close to the brake for better control response. You need to have the water supply as close as practical to minimize water flow inertia. Keep the total length of water lines from water supply to dyno as short as possible. Long lines will cause the control to be sluggish, unstable.

This system works with the rising Stem Stuska Globe Valve. We supply mounting plates for the motor that can resist twisting force as the valve is opened and closed. Make sure the packing is not too tight or too loose.

The system uses a ROS Reflective Optical Sensor to see a special retro-reflecting patch on any part turning at engine speed. This can be on your front dampener, flywheel, coupling, or drive shaft. Use the Retro-reflective tape provided. The ROS has a Red beam for alignment and can be mounted 2" to 18" from the target. Mount the ROS slightly off angle so that it will not sense any direct reflection from a shiny surface.

There are LED indicators on the ROS and an Orange LED on the control panel. The LEDs will flash when it senses the moving edge of the Retro-reflective patch. It will not flash when not moving. When the engine is running these LEDs should be ON continuously. The ADL-Lite requires a reliable sensing of engine rotation.

The system provides a switched output that closes whenever the UP or DOWN rocker switch is pushed. Use this to interface to your data collection system.

ADL Lite Dyno Control Operation:

Turn the E-Stop knob (to pop-up) to ON. The valve motor will quickly open some and then turn to close. It is seeking where the valve stops turning as it closes and then the Green light turns ON. The system now knows where the valve is closed.

The trigger LED indicates when the optical sensor sees the moving edge of a retro-reflective patch on a rotating surface. The trigger LED may flicker under 950 RPM and be on steady when the engine is running higher.

The Power On Green LED indicates other diagnostic functions. It will blink off when the motor moves to close the valve and come back ON for normal operation.

The Valve will close whenever the engine RPM is less than 950 RPM. At any time the engine is running you can Command the Valve to seek its closed position by turning the Load Knob momentarily to Zero and note the Green LED turn off.

The Valve can be turned manually with the Load knob, only when the engine is stopped, by turning the RATE Knob to Zero and then Pushing either the UP or DWN sweep switch. Use this mode to test the valve for proper operation.

The unit can actuate a remote 12V Emergency Stop Relay to enable/disable the engine ignition and fuel system. You can use common automotive 12V relay(s).

The system provides an isolated switch output to be used by a data collection system. Anytime the UP or DWN sweep switch is pushed this output will drop from open circuit to less than 5 ohms, for low power signal switching only.

When the engine is loaded (part or full) you can adjust the engine RPM by simply turning the LOAD knob. The RATE Knob sets the Rate-of-Change of the LOAD auto-sweep when the UP or DWN switch is pushed. The Load Sweep Rate scale is linear from 0 to 10. For steady state (static) tests, turn the RATE knob to zero (for No Sweep). If using the Test Output Switch when you push either UP or DWN switch you will command your data system to record.

Make sure that the Globe valve packing is not too tight, preventing the motor from turning the valve and/or seeking the closed position. Make sure there is no binding when the worm drive tries to turn the valve. Use the Manual valve function to exercise the motor valve and sense possible binding. The Special coupling will work with the Stuska rising stem valve to full opening. Flats provided for 1/2" wrench.

There are natural delays in loading/un-loading because of water flow and the time needed to move the valve. Pick up the throttle smoothly to prevent over-revving. Also pull back the throttle smoothly to let the dyno water drain and prevent the engine from having an excessive load at idle (too much water in the brake).

If the Tach signal is lost, while the engine is under load, the valve will move to close. Always use a Rev-Limiter on any engine dyno. The Valve will close when there is no tach signal (lost) or the engine speed is less than 950 RPM.

Turning the Load Knob to zero will also command the valve to close.

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DC Battery power: Use #12 wire to your 12V Battery supply. Run #10 or larger for longer than usual cable runs. Best performance comes having 12 to 14+Volts to drive the motor valve. A weak battery voltage will cause the valve to run slower at reduced control performance. You can run as high as 16Volts for better response.

Application of the Optical Tach pickup. We supply a retro-reflective optical detector to sense each turn of the dyno. Optionally, you can also use a sensor that can provide a clean voltage pulse (0 to +V) indicating every turn of the dyno. These can be light beam breaker or active magnetic sensors providing a (0-5V) pulse output. The pulse width needs to be more than 1 millisecond and more than +1.5 Volts.

A 25 foot long wire cable is provided with a phone connector to interface with a sensor. White = +5V Power, Black & Shield = Ground, Green = +1.5V Pulse on edge sense. Optionally, use the **Tach Pulse IN** for 0 to +5V pulses (5 to 95% duty cycle).

Applying the ROS optical sensor: The ADL-Lite needs to reliably sense every turn of the engine dyno. The supplied optical reflective sensor sends out a Red collimated light beam and a sensitive detector senses light reflected back from a surface. The ADL-Lite ROS sensor gap can to be between 2" and 18" for maximum flexibility.

A piece of special retro-reflective tape is provided. The ADL Triggers on the moving transition edge of the reflector tape. The tape can be on the drive coupling or drive shaft, on the flywheel, on the front dampener, or anything large enough to reliably detect each turn of the engine/dyno. Mount the sensor slightly off-angle to avoid any direct reflection from a shiny surface.

The ADL-Lite panel has an orange trigger LED indicator. The trigger LED will flash ON only when the ROS sensor 'sees' the moving edge of the retro-reflective patch. You can easily test the sensor while the red beam is on the reflective patch. Just pass you hand to break the beam and then see the trigger LED flash for a moment. The reflective tape/patch is on any engine moving part. The trigger LED should be ON continuously when sensing the engine is running.

Make sure the sensor and cable will be protected from damage. Make sure ROS lense and the reflective patch is clean of any dirt. Periodically test for proper sensor operation by breaking the beam, with your hand, while the red beam is ON .then stationary reflective patch.

Turn the engine over by hand to see the Trigger LED flash ON & OFF.

Press on the valve adapter provided over the Worm Drive gear and use just one 10-32 set screw and Locktite adhesive to secure.

When mounting the Adapter to the Valve shaft you can use adhesive type Locktite 271 or if you can through drill and drive in a pin to lock in place. Do not use a set screw as these will eventually loosen.

DEPAC ADL-Lite Dyno Control Kit contents:

ADL-Lite operator control panel.

Worm Drive motor for 12 to 16VDC

Adapter Coupler to connect worm drive to Stuska Style Globe valve (1" or 1 ¼")

Two plates (3" x 5.25") to facilitate mounting the motor drive to the Stuska Globe valve.

Two 10-32 long cap screws to mount motor to plates.

Optical reflective sensor with connector and 25' of shielded cable.

2 each Wire Nuts, 15 Amp ATO fuses

Common Sense needs to be provided by the user/operator.....