CANplus® Actuator Installation Instructions

Introduction

The ***CANplus® Actuator*** adds SAE J1939 throttle control to mechanically governed engines allowing the CANplus 750 control panel full electronic throttle control. During the calibration process, the actuator maps throttle position to engine speed using *Electronic Engine Controller 1* (EEC1) messages. In normal operation, the actuator servos to the throttle position corresponding to the requested speed. Combining the actuator with the mechanical governor creates a reliable adjustable speed droop governor.

Installation and Calibration

The panel RPM MUST be calibrated to engine BEFORE calibrating actuator.

The actuator installation requires setting the limit switches and performing a calibration operation.

Mounting

1. Disconnect the battery ground terminal.
2. Mount the actuator enclosure higher than the throttle cable end, and wiring, to prevent water running down the cable or harness and filling the enclosure.
3. The actuator pulls the throttle linkage to increase engine speed. Reversing throttle direction requires swapping two pairs of wires in the actuator. (See Wiring Schematic)
4. Connect the cable-housing end to an appropriate rigid attachment point. The cable must be inline with the throttle linkage travel to avoid binding. Binding or excessive non-linear travel can damage the actuator.
5. Connect the actuator cable to the linkage but leave the connection loose. The actuator must be on the idle limit switch and the linkage against the idle stop for proper calibration.
6. Maintain clear access to the enclosure cover. The cover must be removed anytime calibration is required to enable setting of limit switches.
7. Remove the engine harness terminator (6 position Deutsch DT) and install onto the actuator harness.
8. Connect the actuator harness in place of the engine harness terminator.
9. Reconnect the battery ground terminal.

Limit Switch Adjustment

10. Remove the six cover screws.
11. Remove the hex key wrench from the white actuator traveler. This has been secured at the factory to prevent loss. We suggest you re secure after calibration process.
12. Remove the dust cover on the actuator calibration connector and connect the actuator calibration kit. (5 position GT connector and 2 rocker switches)
13. While holding down both calibration switches on the same side, (either direction), Crank and Start engine. Release switches. Note: Engine should stay running through balance of calibration process. If Screw block was not at idle position it should have moved to idle position when powered up.
14. Using either one of the rocker switches you should be able to move the cable from idle to full throttle position and back. Make certain that you have sufficient cable to be able to tighten set

screw and that the pins in screw block will contact the limits switches at both extremes. This will be setting your stroke. With engine at idle secure cable with set screw.

Note

Both limit switches must be set to calibrate the actuator.
Assure the limit switches are properly set without linkage binding.

15. Increase the engine speed to the desired maximum. Ensure that pin contacts limit switch.
16. Move back to idle and ensure that pin contacts limit switch.

Warning!

Do not bend the limit switch levers or push the nail head past the lever!
Doing so will damage the limit switch and cause the actuator to fail!

17. Verify the limit switch setting by retracting and extending the actuator fully. Adjust the limit switch as necessary.

Calibration

18. Adjust the actuator to approximately half stroke.
19. Press and hold both switches, on the same side, until the actuator begins to move towards the idle position (approximately 2 seconds). When it starts moving release the rocker switches. At this point the IOX, (Actuator ECM), takes over. Put the teaching switches down and let it work.
20. The actuator maps the throttle position to engine speed.
    a. The actuator retracts fully and then extends fully. It must contact limit switch at both extremes.
    b. The actuator retracts fully and waits approximately 20 seconds for the engine speed to stabilize.
    c. The actuator extends one-tenth of the stroke and waits for the engine speed to stabilize.
    d. The actuator continues to extend in one-tenth stroke steps for the full stroke.
    e. The actuator returns to idle. At this point the calibration is complete.
21. Turn the engine off.

Finishing Up

22. Restart the engine, verify the actuator works properly and recalibrate as necessary.
23. Turn the engine off.
24. Return the hex key to the actuator to the white traveler and reinstall the cover.
25. Unplug the calibration switches and connect the dust cap.

Note

Changes to the throttle linkage require resetting the limit switches and recalibration.
Use marking paint on the cable setscrew and conduit nuts.

Leave the teaching switches and instructions with operator in case unit needs to be calibrated again.

Congratulations!

The actuator installation is complete! The actuator adjusts throttle position based on TSC1 messages and the mechanical governor droop determines the load dependent speed.