

Detroit Diesel Governor Booster Spring Tension Adjustment

NOTE: This information is also discussed in some (but not all) Detroit Diesel engine service manuals (Section 14.4)

Background information:

All Detroit Diesel Series 53, 71, and 92 engines are equipped with governor booster springs. The purpose of these springs is to reduce the force required to move the engine governor lever (connected to the engine fuel injection pump) from idle to full throttle. It reduces this force by helping to pull the engine governor toward the full throttle direction. (Without this spring, approximately 25-30 lbs “pull” would be required to increase engine RPM. With this spring, the “pull” force can be reduced to under 10 lbs.) The problem that is frequently encountered is that if this spring is not correctly adjusted, the governor force will not be reduced and the engine throttle will be more difficult to move from idle towards full throttle.

NOTE: The amount of force required to move the engine governor lever when the engine is operating is very much greater than the amount of force that exists when the engine is not running. Initial adjustment of the pivot pin should be done with the engine not running. Final adjustment of the governor booster spring should always be done while the engine is operating.

Booster spring adjustment:

There are two separate adjustments that must be made to correctly set the booster spring to achieve minimum governor tension. These two adjustments are: 1) spring tension and 2) pivot pin adjustment. The pivot pin must be correctly located prior to adjusting the spring tension. Failure to correctly adjust the pivot pin location first will automatically cause the spring tension to be incorrectly set.

NOTE: All of the adjustments should be made with the control cable (“Morse” cable) disconnected from the engine governor.

Pivot pin location adjustment:

- 1) The pivot pin is the metal piece which attaches the spring end to the engine governor lever. It is located in an elongated hole in the engine governor lever. The purpose of the spring is to adjust the point at which the spring begins to exert force on the engine governor lever. When correctly adjusted, the spring should not affect the engine governor lever at idle. That is, the engine governor lever should be able to be “locked” at idle without the engine running. (The official engineering expression for this is that the spring will travel “overcenter” on the governor lever). The spring should begin to pull on the governor lever when the lever has been moved approximately 1/4” to 1/2” away from its idle stop point.
 - a) If the governor lever is unable to be “locked” at idle, that is, the spring is always exerting force on the governor lever, the pivot point should be moved closer to the center of the engine

b) If the governor lever must be moved greater than 1/2" before the spring begins to pull on the lever, the pivot point should be moved away from the center of the engine.

Spring tension adjustment:

- 1) Once the pivot pin position is correctly established, the spring tension can be adjusted.
- 2) With the engine not running, verify that the spring will pull the governor lever all the way to full throttle. On some engines, where the spring tension is not enough or where the spring is worn out, the spring will not be able to pull the governor lever all the way to full throttle. Obviously, if this is true, the spring will not be reducing the governor force in the high RPM range, making throttle operation much more difficult. Adjust the spring tension so that a "reasonable" amount of force is applied to the engine governor lever.
- 3) Start the engine. Using hand pressure along, advance the engine governor lever from idle to approximately 3/4 engine speed (about 2100 RPM). Release the governor lever and ensure that it does return to idle. If it does, accelerate the engine again and tighten the spring tension until the spring tension exactly balances the governor lever and the engine does not return to idle. At this point, reduce the spring tension slightly so that the governor lever will slowly return to idle.
- 4) When this procedure has been completed, the governor lever should require a pull of no more than 10 lbs at any point to change engine speed.