Fuel linkage and its effect in engine performance

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Diesel engine Fuel linkage is a linear type linkage. It confirms the same arc travel for Governor/Actuator and Fuel valve instantaneously when they are coupled together.

Same travelled arc does not mean that their degree of travel or amount of travel are same. Degree of travel depends on the effective radius of the link that was coupled with Governor/Actuator terminal shaft/ output shaft and Fuel valve shaft.

If the radius for both link are same than the degree of travel are also same i.e. 1 degree travel in Governor/Actuator is equal to 1 degree travel to fuel valve. The correct linkage system confirm correct amount of fuel delivery in specific time and precise engine response during engine acceleration/ deceleration etc. with fuel delivery.

Incorrect fuel linkage can caused engine trouble. Specifically incorrect effective length Governor/Actuator and fuel valve link.

A correct linkage is the fig B, where min to max opening of Governor Output shaft will exactly open Fuel valve at min and max respectively.

Fig A – for a specific Governor output more Fuel valve travel than the specified. It will increase gain in the linkage system and engine will be more responsive that may cause instability of the engine.

Fig C – For a specific Governor output less fuel valve travel than the specified. It will decrease gain in fuel linkage and engine will be less responsive. May cause slow or sluggish engine response.

Linear linkage is used in a controlling system so that a given movement in the Governor will provide a proportional change in the fuel in prime mover. Mis-adjusted linkage can appear as a Governor problem.

Defect in linkage system like binding, worn out of joints (swivel, pin, bush, eyelet etc.), lost motion due to worn out section etc. will be also occurred trouble in controlling of engine like hunting, sudden rejection of load, maximum load attenuation etc.

For healthy controlling of engine, fuel linkage system must be correct and free from any defect.