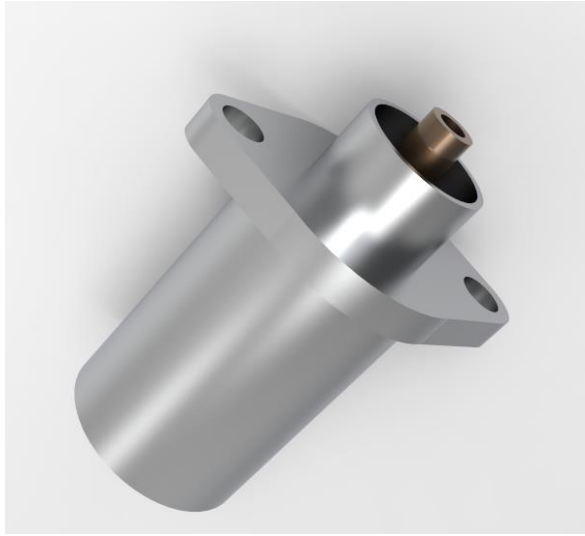


Case study

Fuel valve upgrade



Enhanced (3D CAD)

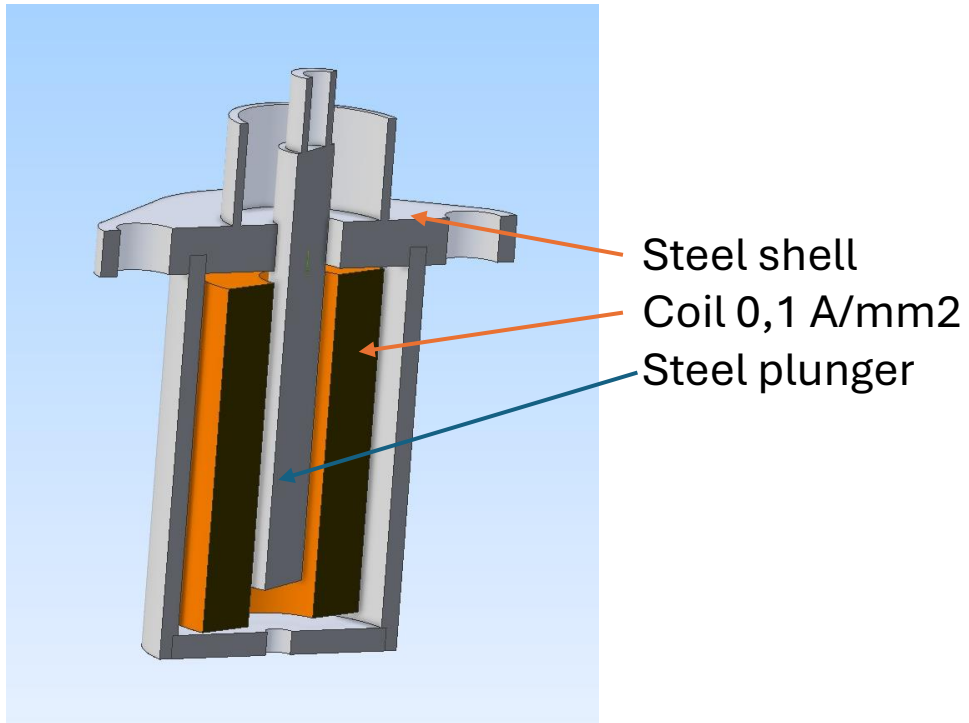
The original performance of the fuel valve is generally adequate, but in cases of prolonged inactivity the valve ceases to function due to a stuck plunger.

The suggested solution is to increase the flux in the circuit to achieve an increased retraction force on the plunger. The outer dimensions can not be changed, and the coil current can not be increased due to heat generation. The actuator is designed for 100% ED

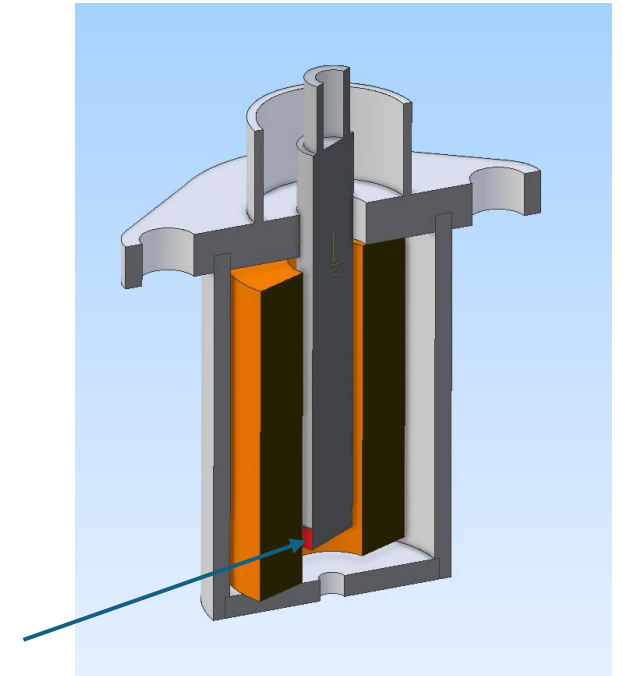


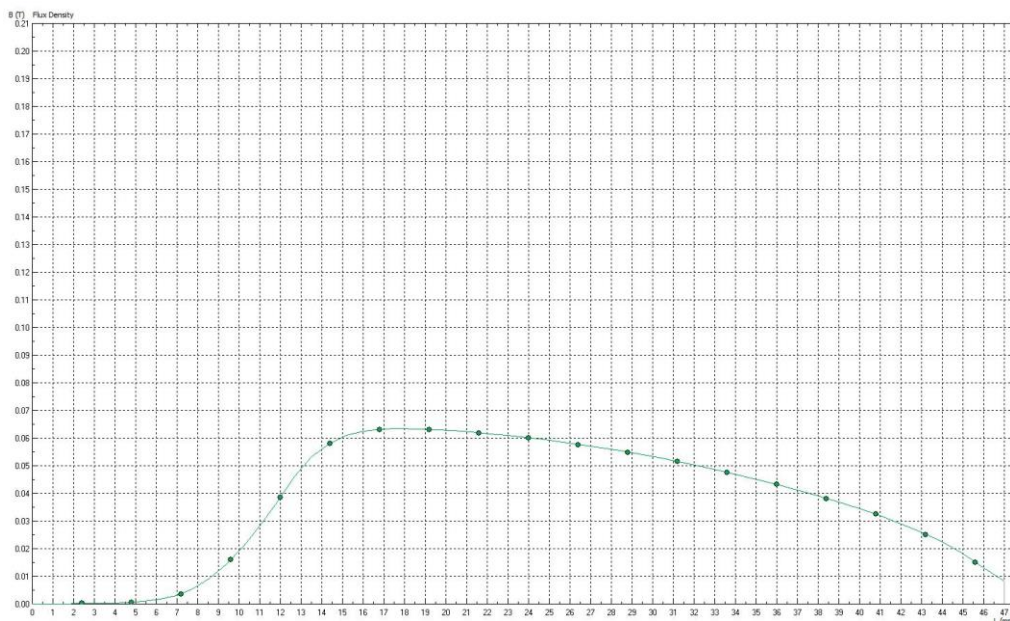
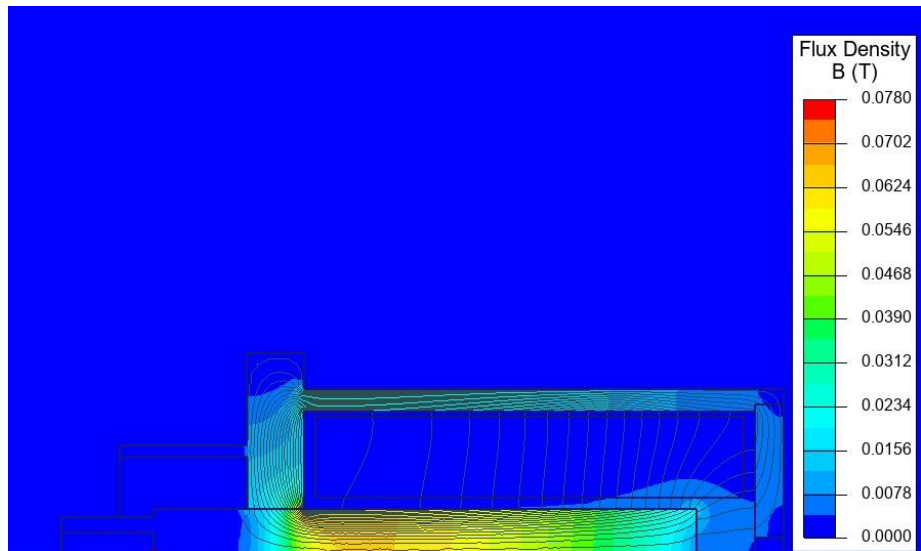
Original

- The force on a plunger in a solenoid is proportional to the flux gradient in the circuit. Without the possibility to increase the flux produced by the coil, another solution must be used. Adding a permanent magnet in the circuit can be a viable solution. 2 versions of the actuator is analyzed in Quickfield.



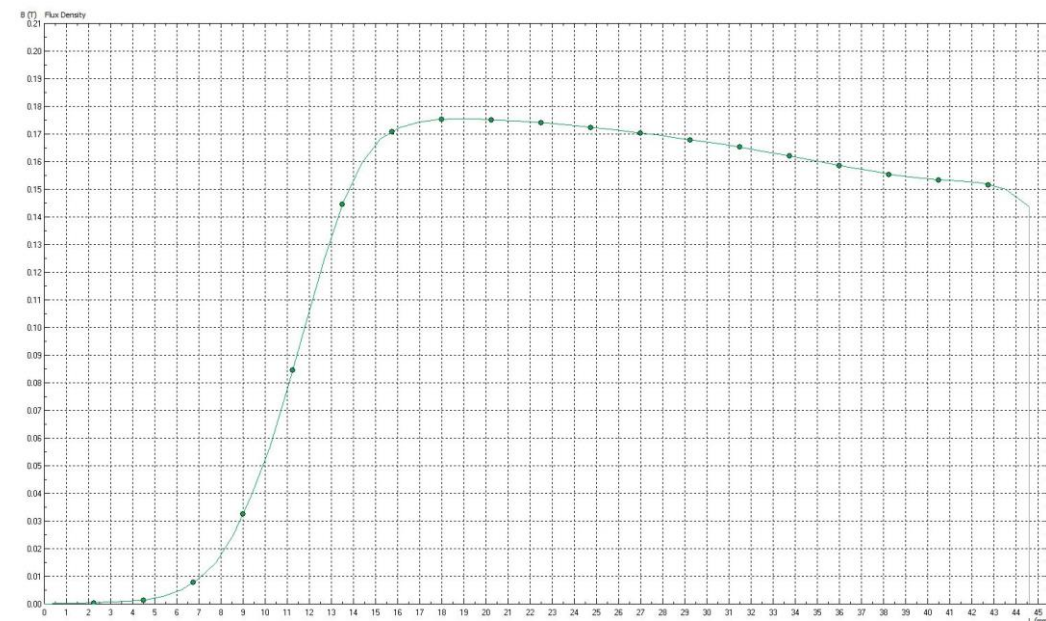
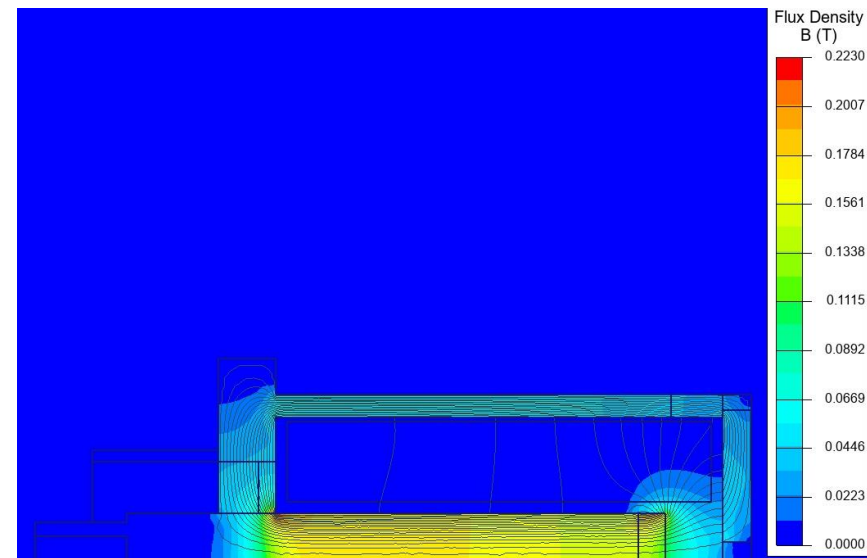
Permanent magnet





Original

A significant increase of flux, thus power is achieved by adding a magnet of moderate strenght to the circuit.



With permanent magnet

QuickField - Diesel actuator.pbm

File Edit View Problem Tools Window Help

Diesel actuator.pbm

- Diesel actuator.pbm - nonlinear magnetostatics problem
- Geometry: Diesel actuator.mod
- Data: Diesel actuator.dms
- Block Labels
 - air
 - Coil
 - Steel
- Edge Labels
- Vertex Labels
- Library Data: <none>
- Links:
 - No links

Diesel actuator enhanced.pbm

- Diesel actuator enhanced.pbm - nonlinear magnetostatics problem
- Geometry: Diesel actuator enhanced.mod
- Data: Diesel actuator enhanced.dms
- Block Labels
- Edge Labels
- Vertex Labels
- Library Data: <none>
- Links:
 - No links

