

# Conclusion

This thesis shows that this new design of the axial engine has advantages and disadvantages:

## **Advantages:**

1. The power to the weight ratio in the axial engine (barrel engine) is better than the conventional piston engine because this engine has few parts.

This can discuss as follow:

- In the axial engine “cam plate” there are only four cams (cam block) to operate the valve train for six pistons which can also do the same job for more than six piston.
- In the axial engine there’s no need for gears and belts to operate the cam block because it’s attached directly to the main shaft.
- Arranging the cylinders in circular shape occupies less volume than the line or V shape that leads to decrease the weight.
- The barrel engine doesn’t need flywheel because the cam plate does the job in addition to its main function.

2. The barrel engine may utilize a variable compression ratio device for adjusting the axial engine position of the cam plate with in the engine relative to the position.

### **Disadvantages:**

1. The cam plate of the axial engine has high frictional losses that need very efficient lubrication system.
2. The piston thrust force doesn't completely convert to rotational force which means that the force acting in the direction of Y axis has no any effect on the output power and absorbed by engine case.

After programming all the equations of the connecting rod bearing in Matlab taking in account that the engine rotating at speed of 1000 to 6000RPM using the conventional lubricant SAE 20w-50 with in temperature range from 80 to 130 c° and all condition which mention in chapter five it found that the optimum piston diameter is 6.2 cm for this axial engine.