

ME-351 Design Tutorial 03

- The valve spring shown in figure has to be designed for infinite life to meet the specifications given. The valve will move downward by 8 mm when it is fully open. In the closed position a force of 160 N is required for proper seating and the rocker can exert a force of 400 N to open the valve by 8 mm. Assembly requirements dictate that the length of the spring (dimension A in figure) at installation is 43 mm. Also the value of C is 18 mm. The valve is operated 50 times in one sec. Refer to table 10-3 for choosing the appropriate material. Assume squared and ground ends. You should check for fatigue factor of safety, stability and spring surge. Assume peened material and note that the spring can be exposed to a temperature of up to 100°C during service. Ensure that the spring operates in its linear range and also does not clash before the valve opens fully. A typical valve spring is shown for guidance.

