L1

L2

X

In order to solve for the acceleration of the piston, shown in Figure X above, we need to determine the acceleration of X (). In order to find this, we need to first form a closed vector loop which can be seen below in Equation 1:

By taking the derivative of (1) once, we can find the velocity, and twice, we can find the acceleration which can be seen below in Equations 1 and 2, respectively.

When the RPM = 19250, and the given properties are as follows:

|  |  |  |  |
| --- | --- | --- | --- |
| Engine Speed | Max Acceleration | Max Force | Max Internal Pressure |
| 19,250 RPM | 9843.9g | 21.245kN | 2.8165MPa |