Solutions

2.1

- $x = \sqrt{l^2 - r^2} = \sqrt{0.160^2 - 0.040^2} = 0.1549$ m.
- $|\dot{x}| = r\omega = 1.000$ m/s.

2.2

- Quarter-turn: $\ddot{x} = r\omega^2\lambda = 0.040 \times 625 \times 0.25 = 6.25$ m/s^2.
- Dead centre: $-r\omega^2(1+\lambda) = -31.25$ m/s^2.
- Ratio 5:1 - the fatigue file's range.

2.3

- $\omega = v/r = 7.2$ rad/s.
- Contact 0, centre 1.80, top 3.60 m/s.

2.4

- At quarter-turn both crank pin and piston move horizontally, so the perpendiculars to the rod's ends are parallel: the instant centre is at infinity.
- The rod is in pure translation: every point at 1.000 m/s.

exercises.lol exercises.com.cn