The flow of an Oldroyd-B liquid in a straight, circular, tube oscillating longitudinally and torsionally at different frequencies is examined. The flow does not start from rest but is assumed to be fully established. We obtained analytical solutions for the velocity components which were assumed to have the frequencies of the velocities of the corresponding boundary components. We also obtained analytical expressions for the shear-stresses and drag on the cylinder. The velocity components and work done are displayed graphically using particular values of the flow parameters.