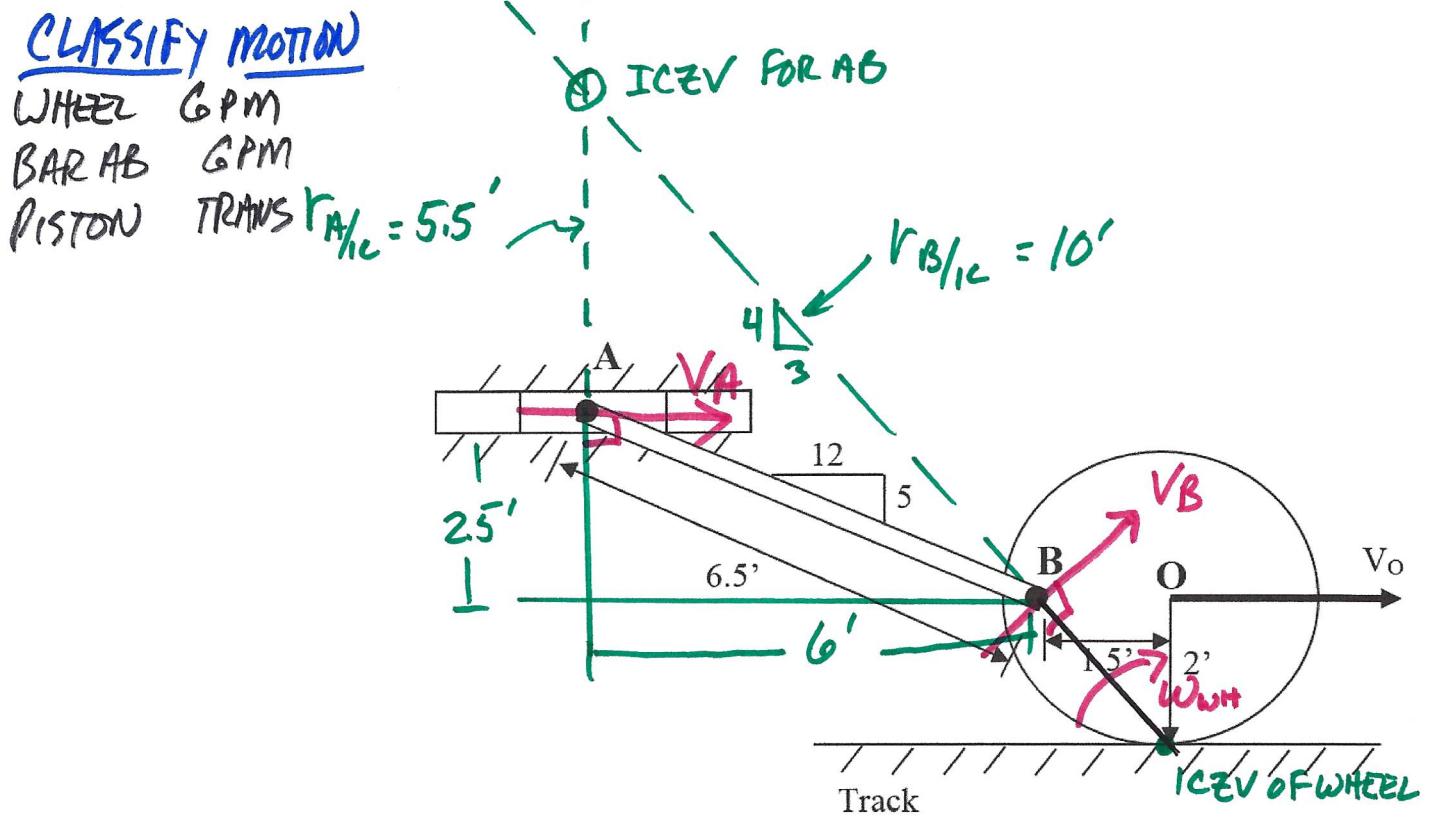


Rigid Body Kinematics IV – Problem 4

For the train wheel shown, use ICZV to find the velocity of the piston at A relative to the track and the angular velocity of the push arm AB when the velocity of the train is  $V_o = 80 \text{ fps}$ . Assume no slip.



$$V_o = \omega_{WH} r_{O/c} \Rightarrow BO = \omega_{WH}(2) \quad \omega_{WH} = 2\pi 40 \text{ rps} \rightarrow$$

$$V_B = \omega_{WH} r_{B/c} = 40(2.5) = 100 \text{ Fps}$$

$$V_B = \omega_{AB} r_{B/c_{AB}} \Rightarrow 100 = \omega_{AB}(10) \quad \underline{\omega_{AB} = 10 \text{ rps}}$$

$$V_A = \omega_{AB} r_{A/c_{AB}} = 10 \text{ rps}(5.5') = \underline{\underline{55 \text{ Fps}}} \rightarrow$$