

# Bicycle HandBrake Design FMEA excerpt (fictitious with errors for evaluation)

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Item	Function	Failure Mode(s)	Effect(s) of Failure	Cause(s) of Failure	Special Product Characteristic(s)	Current Design Controls (Prevention)	Current Design Controls (Detection)	Compensating Provisions	SEV	OCC	DET	Risk Priority	Recommended Actions	Actions Taken	SEV	OCC	DET	Risk Priority
Bicycle hand brake subsystem	Provide the correct level of friction between brake pad assembly and wheel rim to safely stop bicycle in the required distance, under all operating conditions.	Insufficient friction delivered by hand brake subsystem between brake pads and wheels	Bicycle wheel does not slow down when the brake lever is pulled potentially resulting in accident.	Cable Binds due to inadequate lubrication	Lube specification	Hand Brake Design Guide #123	Bicycle system durability test # 789	Design: Independent front / rear brake allows load sharing to stop safely Operator: apply brakes earlier if safety problem known	5	3	4	High	1. Redesign hand brake cable routing to reduce friction and make system insensitive to lubrication degradation	1. Cable routing redesigned to reduce friction	5	1	1	Low
		Requires high force on brake lever to stop bicycle	Brake lever can be closed with some difficulty, with rider experiencing hand fatigue, and bicycle safely stops	Brake lever high friction due to excessively high attaching hardware tightening spec	brake lever attaching hardware tightening specification	Bicycle torque requirements for all attaching hardware reviewed in design review	Bicycle system durability test # 789	Design: no design compensating provision Operator: visually close brake lever before riding the bicycle	5	4	3	High	None	N/A	5	3	2	High
	Brake system is easy to adjust and keep in optimal working order.	Brake system misadjusted by bicycle user	Brake system does not stop bicycle in required distance or is erratic, potentially resulting in accident.	Brake cable misadjusted by bicycle user	none	none	Bicycle system durability test # 789	none	5	4	5	High	1. Design a more robust brake cable adjustment system that is less sensitive to misadjustment. 2. Revise the bicycle durability test regimen to periodically check for brake cable misadjustment	1. Brake cable adjustment system redesigned and less sensitive to misadjustment 2. Periodic brake cable misadjustment checks added to durability test 789	3	2	1	Low

TRUNCATED