Parameter (P) Diagram Example

Noise Factors

1. Piece to Piece Variation	2. System Interactions	3. Customer Usage	4. Degradation / Deterioration Over Time	5. External Environment
Half shaft splines	Improper park lock cable adj,	Park actuator wear	Wire insulation wear	Excessive High / Low Temps
Park mechanism actuator	Contactor box feedback	Poor service practices		Humidity
Mounting Points (PCU)	Improper voltage from HV battery			Salt
Mounting Points (motor gear box)	Improper voltage from LV battery			Common chemicals
	Voltage spikes / dirty voltage			Water / Dust / Debris
	Improper coolant flow rate			EMI (noise)
	Improper coolant temp			Vibration
	Signal Noise			

Potential Causes

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Desired Inputs

- Accelerator inputs
- DC Voltage
- Contactor box
- AC Voltage
- MCP
- Gear selector
- BCM

Design Input (Detail)

"SYSTEM"

Control Factors

- Specifications
- Corporate standard (WCR)
- Design validation testing
- Gov't regulations
- IEC
- FMVSS
- UL

Design Controls

Desired Outputs

- Provide torque to half shafts
- Lock half shafts in park
- Charge HV battery
- Provide 12 volt power

Design Function

Error States (Undesired Outputs)

- Incorrect torque supply
- Incorrect half shaft lock
- HV Battery incorrectly charged
- Incorrect power supply to 12 volt

Failure Modes

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