specwarden

PFMEA Review Report

File: crankcase-machining-pfmea.xlsx

Date: May 20, 2026

Request ID: sample-report-pfmea

3	4	1
Major	Minor	OFI

Findings

P-001 · U-101 · AIAG FMEA-4 Chapter IV (PFMEA)

Row 25 · Process Function

● MAJOR

Required PFMEA field "Process Function" is empty on row 25. AIAG FMEA-4 Chapter IV requires every PFMEA row to describe the process step function so the failure mode can be traced to its process purpose.

→ Populate "Process Function" with the intended output of the process step, e.g., "Machine crankshaft bore to 60mm ±0.02mm diameter tolerance."

P-003 · D-101 · AIAG FMEA-4 §IV — PFMEA Scope

Row 12 · Failure Cause

“Design tolerance on bore diameter is too tight for standard honing process”

● MAJOR

PFMEA cause on row 12 blames a product design specification ("design tolerance") instead of a process parameter. This is process-to-product contamination — a PFMEA should identify process-side root causes only.

→ Reframe the cause as a process-side parameter: "Honing wheel wear exceeds 500-cycle replacement interval; bore diameter drifts outside ±0.02mm tolerance." Move the tolerance question to the DFMEA.

P-006 · D-102 · AIAG APQP & Control Plan, Chapter — Reaction Plan

Row 9 · Reaction Plan

● MAJOR

High-RPN PFMEA row 9 (RPN=180) is missing a Reaction Plan. Operators have no documented response when this failure mode is detected, creating a quality escape risk.

→ Add a Reaction Plan: "Quarantine all parts machined in the last 2 hours; notify quality supervisor; run 100% bore diameter check before re-starting production."

P-002 · U-102 · AIAG FMEA-4 §IV.RPN

Row 6 · RPN

“72”

MINOR

PFMEA RPN 72 ≠ S(8) × O(3) × D(4) = 96. An incorrect RPN understates risk and may cause this row to be deprioritized in action planning.

→ Correct RPN to 96. Re-evaluate whether the corrected RPN triggers a Recommended Action requirement.

P-004 · D-103 · AIAG FMEA-4 §IV — Prevention vs Detection Controls

Row 19 · Current Process Controls - Prevention

“100% inspection of finished parts”

MINOR

Prevention Control column on row 19 contains what appears to be a Detection control ("100% inspection"). In PFMEA, Prevention controls eliminate the cause; Detection controls discover the failure after it occurs. Misclassifying inflates the apparent prevention robustness.

→ Move "100% inspection of finished parts" to the Detection Controls column. Add a true Prevention control, e.g., "SPC chart on bore diameter — control limit triggers machine offset adjustment."

P-005 · M-101 · AIAG FMEA-4 §IV.Severity (PFMEA)

Row 3 · Failure Effect

“Operator safety risk — rotating part ejected if bore retains insufficient interf…”

MINOR

PFMEA row 3 has Severity 3 but the failure effect mentions "safety" — a safety or regulatory concern. PFMEA Severity should reflect the worst-case outcome to the end customer or operator.

→ Review whether Severity 3 is appropriate given the failure effect. A safety or regulatory impact typically warrants Sev ≥ 8. Consult the AIAG-VDA severity ranking table for PFMEA.

P-007 · D-004 · AIAG FMEA-4 §IV.Prevention Controls

Row 15 · Failure Cause

“Operator error”

MINOR

"Operator error" is a vague cause that does not identify the specific process variable that can be controlled or measured. PFMEA causes must name an actionable process parameter.

→ Rewrite as a specific process parameter: "Fixture clamping torque below 45 N·m minimum — part shifts during machining; bore position out of tolerance." This gives the process engineer a specific parameter to control.

P-008 · D-005 · AIAG FMEA-4 §IV.Detection Controls

Row 21 · Current Process Controls - Detection

“Check part”

○ OFI

"Check part" does not describe a detection method with enough specificity to assign a Detection rating. AIAG FMEA-4 §IV requires detection controls to name the measurement type, instrument, and sampling frequency.

→ Replace with: "CMM bore diameter measurement at 100% — 3-point bore gauge, measurement frequency every 10th part, results logged to SPC chart."