Engineering Change Orders

Document 3A: Engineering Change Order - Design Modification

OMEGA MANUFACTURING CORP

Engineering Change Order

ECO Information	
ECO Number:	ECO-2025-0067
Date Initiated:	January 16, 2025
Initiated By:	Tom Wilson, Design Engineer
Priority:	🟡 Medium
Status:	Pending Customer Approval

PART INFORMATION

Field	Current	New
Part Number	OM-4472-C	OM-4472-C
Part Name	Hydraulic Valve Body	Hydraulic Valve Body
Revision	Rev B	Rev C

CUSTOMER IMPACT

- **Customer:** Caterpillar Inc.
- **Contract:** CAT-2024-HV892
- **Affected Quantity:** 1,200 units remaining in current order

REASON FOR CHANGE

⚠️ **Field failure analysis indicates stress concentration at radius transition causing premature cracking after 800 hours operation.**

Failure Details:

- Customer reported 3 failures in December 2024
- Root cause: Inadequate fillet radius causing stress concentration
- Impact: Premature component failure affecting equipment uptime

DESCRIPTION OF CHANGE

1. 🔧 **Increase fillet radius** from R2.0mm to R3.5mm at location A-A
2. ➕ **Add stress relief groove** 0.5mm deep x 2.0mm wide at critical section
3. 📋 **Update material specification** from 6061-T6 to 7075-T6 aluminum

ENGINEERING ANALYSIS

Analysis Type	Result
FEA Analysis	40% reduction in stress concentration
Expected Life	Increase from 800hrs to 2,000+ hrs
Material Cost	Increase: $3.50 per unit
Machining Time	Increase: 8 minutes per unit

AFFECTED DOCUMENTS

Document	Current Rev	New Rev
Drawing: DWG-OM-4472-C	Rev B	Rev C
Specification: SPEC-4472-HV	Rev A	Rev B
Work Instruction: WI-4472-MACH	Rev C	Rev D
Quality Plan: QP-4472	Rev B	Rev C

COST IMPACT

Item	Cost
Material cost increase (1,200 units)	$4,200
Tooling modification	$2,800
Additional machining time	$1,920
Total cost impact	**$8,920**

SCHEDULE IMPACT

- **Tooling modification time:** 5 days
- **First article approval:** 3 days
- **Customer delivery impact:** ✅ No impact to customer delivery dates

APPROVAL WORKFLOW

Role	Approver	Status	Date
Design Engineer	T. Wilson	✅ Approved	1/16/2025
Manufacturing Engineer	S. Patel	✅ Approved	1/17/2025
Quality Manager	J. Kim	✅ Approved	1/17/2025
Program Manager	A. Rodriguez	✅ Approved	1/18/2025
Customer Approval	Caterpillar Inc.	🟡 Pending	-

IMPLEMENTATION PLAN

1. 📤 **Submit ECO to customer for approval** (1/19/2025)
2. 🔧 **Modify tooling upon customer approval** (5 days)
3. 🏭 **Produce first article samples** (2 days)
4. 📋 **Submit first article to customer** (3 days)
5. ✅ **Implement on production upon approval**

EFFECTIVITY

- **Effective with:** Part Serial Number 2025-001201 and subsequent
- **Existing inventory:** Use as-is with customer concession
- **New production:** Incorporate all changes

ECO Status: 🟡 Pending Customer Approval
Customer Response Due: January 30, 2025