

Lubricants in the Manufacturing of Middle Bulkhead LR

Introduction

The **Middle Bulkhead LR (Left/Right)** is a key structural element within the vehicle body, located between the front and rear sections to provide rigidity, crash resistance, and load distribution. Manufacturing this bulkhead involves **blanking, deep drawing, stamping, piercing, trimming, welding, and assembly** of high-strength or advanced high-strength steels (AHSS). Each of these processes generates significant friction, heat, and tool wear, making lubricants an essential part of ensuring quality and efficiency.

1. Why Lubricants Are Vital in Middle Bulkhead Production

During production, lubricants contribute to:

- **Die & Tool Protection:** Reduce wear, galling, and premature failure of forming tools.
- **Accurate Forming:** Ensure smooth metal flow, preventing cracks, wrinkles, or springback.
- **Surface Quality:** Maintain smooth, defect-free surfaces critical for welding and coating.
- **Easy Cleaning:** Low-residue lubricants minimize degreasing before painting or e-coating.
- **Corrosion Protection:** Temporary rust inhibitors safeguard semi-finished bulkheads during handling and storage.

2. Types of Lubricants Used in Middle Bulkhead Manufacturing

Process Stage	Typical Lubricant	Key Benefits
Blanking & Stamping	Water-soluble emulsions or semi-synthetic stamping oils	Reduced die wear, consistent forming, easy wash-off
Deep Drawing/Forming	Heavy-duty water-based or dry-film drawing lubricants	Smooth metal flow on AHSS, prevents tearing/galling

Trimming & Piercing	Light cutting oils or water-miscible coolants	Clean edges, reduced burrs, extended tool life
Welding Preparation	Low-residue lubricants	Prevents weld defects, ensures strong joints
Assembly Fitment	Specialty greases with anti-wear and anti-squeak agents	Smooth fitment of brackets, lower NVH (noise/vibration)
Corrosion Protection	Solvent-cutback or oil-based rust preventives	Protects bulkheads during storage and transport

3. Benefits for Manufacturers

- **Longer Tool Life:** Lower maintenance costs and downtime.
 - **Improved Accuracy:** Precise forming and reduced springback.
 - **Better Weld & Paint Results:** Cleaner surfaces improve downstream quality.
 - **Reduced Cleaning Costs:** Easy-to-remove lubricants cut chemical use.
 - **Enhanced Reliability:** Corrosion resistance ensures bulkhead integrity.
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4. Current Trends in Bulkhead Lubrication

- **Dry-Film & Pre-Coated Sheets:** Reduce liquid oil usage and eliminate degreasing steps.
- **Eco-Friendly Lubricants:** Biodegradable, non-chlorinated, and low-VOC formulations.
- **Automated Application Systems:** Roller and spray technologies ensure precise coverage and reduce waste.

- **Minimum Quantity Lubrication (MQL):** Efficient micro-lubrication for machining operations, lowering fluid consumption.



PRESS TYPE	: CLEARING 400-ton mechanical press.
PART DESCRIPTION	: MIDDLE BULKHEAD L/R.
MATERIAL	: CR DQ GALVANIZED 60G/60G COIL.
MATERIAL THICKNESS	: 0.635 – 0.660mm thick.
PROCESS	: 12-stage progressive die – “2 off”.
IRMCO LUBRICANT USED	: IRMCO FLUIDS® 980 109@20% or EV1@20%
LUBRICANT APPLICATION	: Spray applied to the top of coil entering every stroke.
PROCESS SPEED	: 23 SPM.



BENEFIT
REPLACING COOLANT
PARTS NOT WASHED AND PACKED IMMEDIATELY, COMPLETELY DRY
TOOL MAINTENANCE ELIMINATED