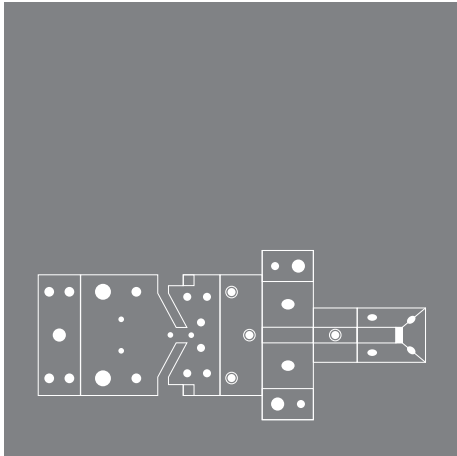


BALLUFF

sensors worldwide

Progressive Die Protection for Tool Rooms

Stop tooling damage from misfeeds



Stop the Press Before Damage Occurs

In most tool rooms, tool and die makers are spending the majority of their time fighting fires and repairing damaged tooling, such as: sheared punches, snapped pilots, bent strippers, cracked sections, and smashed stop blocks. Management demands for faster repairs to meet manufacturing schedules and idle welders puts added pressure on the tool room's limited resources. Damaged tooling coming into the tool room is routinely blamed on a variety of issues like misfeeds, part out detection, and wiring damage.

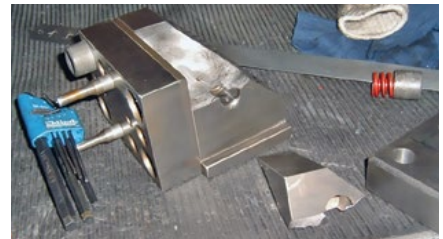
With Die Protection, the goal is to identify an issue with enough time to stop the press before tooling damage can occur. Sensors are used to detect issues like short feed, over feed, slug stacking, or part ejection failure. In order to utilize the solutions presented in this guide, a press controller capable of accepting sensor inputs is required. Balluff is an experienced die protection partner for this industry and provides a wide range of technologies for die protection applications.

Are you repairing tooling due to any of these issues?

- Sheared punches
- Snapped pilots
- Bent strippers
- Cracked sections
- Short feed
- Long feed
- Slug stacking
- Part ejection failure



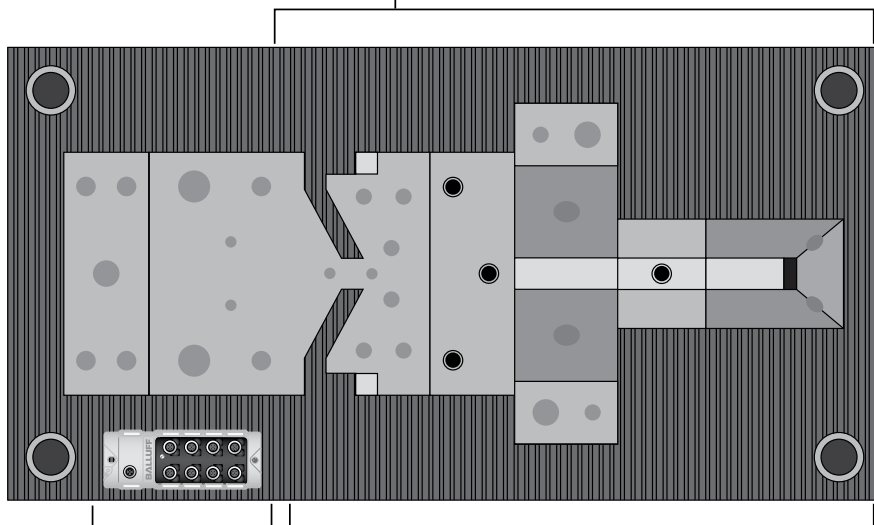
Ten hit pile-up destroyed the stripper window and caused major tooling repair.



Cracked tooling from a feed issue caused lost production and increased tool room stress.

Misfeed Detection

- Slip during feed progression
- Short feed and long feed
- Sticking pierce or punch



Die Connections

- Damaged cables
- Damaged connectors
- Forgot to disconnect

Slug and Scrap Out

- Slug stacking
- Not ejected every stroke
- Nuisance stops

Part Out

- Parts don't leave
- Missed part detection
- Conveyor system off

Application

Considerations

Misfeed

Physical Feed Detection

- Contacts end of strip
- Allows for coil memory
- Detects short feed

Feature Feed Detection

- Detects from side or under strip
- Uses form, hole, or slot
- Detects long feed or short feed

Through-beam Sensors for Feed

- Detects over feed and short feed
- Uses two sensors in one place
- Detects from top, side, or bottom

PlungerProx Sensors

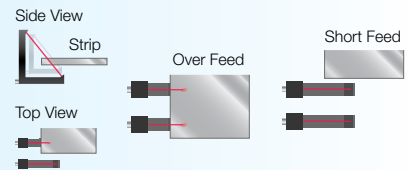
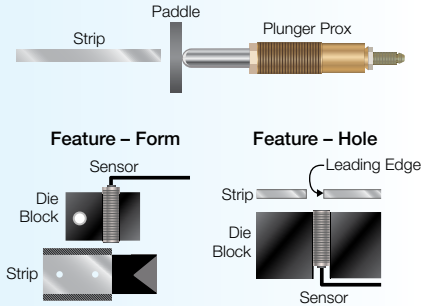
- Precise and adjustable
- Survives overfeed
- Variable tip configurations

BES Global Inductive Sensors

- Watch feature leading edge
- Distances vary by material, sensor size, feed tolerances
- Typically cable-out sensors

BGL Fork and BWL Angle Sensors

- Burn through lube with infrared
- Easy through-beam alignment
- Rugged housings



Part Out

Ejected Part Out Detection

- Works with unpredictable trajectory
- Utilizes an array of sensors
- Detects motion

Gravity Part Out Detection

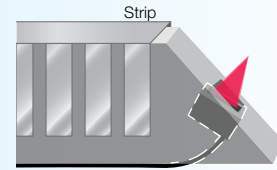
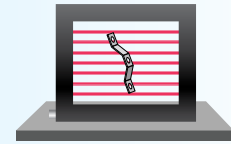
- Used for predictable exit
- Protect during installation
- Install to look up and out

BOW Windows and BLG Arrays

- Variable sizes and shapes
- No hung part nuisance stops
- Small and fast parts

BOS 5K Global Diffuse Photo Sensors

- Burn through lube with infrared
- Typically cable-out sensors
- Variety of styles and distances



Slug and Scrap Out

Small Slug Out Detection

- Verifies slugs leave the die
- Allows for 2-3 slugs to stack
- Stops major slug stacking issues

Scrap Out Detection

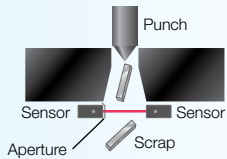
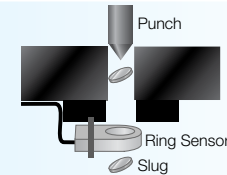
- Verifies scrap leaves the die
- Detects random shapes
- Recognizes stacking or tangling

BES IKV Inductive Ring Sensors

- Variety of inside diameters
- Delay output for fast parts
- Metal-free mounting

BOS 5K Through-beam with Apertures

- Through-beam burns through lube
- Apertures add precision
- Low chance of part contact



Die Connections

Sensor Connectors and Cables

- Prevent breaks in standard cables
- Protects with channels
- Stop replacing good sensors, with broken cables

Sensor Junction Boxes

- Easily repair sensor cables
- Uses one connection to die
- Easily troubleshoot wiring

BCC High Durability Cables

- Stainless braids
- Flexible conduit
- Connectors vs cable out

BPI Quick Disconnect Blocks

- M12 connectors for sensors
- M23 umbilical connectors
- Typical for die protection

