

Safe Operation of a Multi-Station Ironworker / Punch & Shear Machine

Standard Operating Procedure (SOP)

1. Purpose

To prevent amputation, crush, and serious injury when using a combined punch and shear machine (commonly called an “ironworker” or “punch & shear”).

2. Scope

Applies to all single- and dual-cylinder hydraulic or mechanical ironworkers with punch, flat-bar shear, angle shear, section shear, and notcher stations.

3. Responsibilities

Operator: Must be trained, authorised, and never bypass guards.

Supervisor/PCBU: Ensure only authorised operators use the machine and that all guarding is in place and functional.

4. Major Hazards

- Amputation at punch, shear, or notcher stations
- Unintended stroke (repeat or runaway)
- Material kick-back or ejection
- Fingers trapped under hold-downs
- Sharp off-cuts

5. Mandatory Personal Protective Equipment (PPE)

- Safety glasses (AS/NZS 1337.1 medium impact)
- Hearing protection (Class 5 if >85 dB(A))
- Steel-cap boots
- Cut-resistant gloves (Level 5) ONLY when handling material – MUST be removed before pressing any pedal or button
- Close-fitting clothing – no loose sleeves

6. Training & Authorisation

Only persons who have:

- Completed specific ironworker training
- Been assessed competent on the exact machine
- Current authorisation recorded in the training register

may operate unsupervised.

7. Pre-Operation Checks

- All fixed guards, transparent punch stripper guards, and hold-down guards in place and undamaged
- Foot pedal fully shrouded and returns to raised position
- Two-hand “hold-to-run” control (if fitted) – anti-tie-down functional
- Emergency stop palm buttons (minimum two) tested
- Hydraulic oil level and no leaks
- Punch and die correctly aligned, seated, and secured (no oversize punch/die combination)
- Shear blades sharp, correct gap (5–10 % of material thickness), and securely bolted
- All stations clear of off-cuts
- Floor dry and free of trip hazards

8. Safe Operating Procedure

Set-Up (Only by authorised setter)

- Isolate and lock out before changing punches, dies, or shear blades.
- Use correct lifting equipment or two-person lift for tooling >15 kg.

Operation – ALL STATIONS

Hands or any body part must NEVER enter the point-of-operation zone while the machine can move.

Approved safeguarding methods (one must be in place at all times):

- A. Fully shrouded foot pedal + fixed guards that physically prevent fingers reaching the danger zone
- B. Two-hand hold-to-run control (both buttons held until cycle complete)
- C. Light curtain (correct safety distance per AS 4024 Table E.2) – tested daily

Station-specific rules

- Punch station: Use stripper guard; never punch material thicker than punch diameter; never punch two sheets stacked unless rated.
- Flat-bar / angle shear: Use hold-down; support long pieces; stand to the side.
- Section shear & notcher: Use supplied hold-downs; never reach past guards.
- Small pieces: Use pushers, magnetic holders, or dedicated jigs – never hold by hand.

9. Shut-Down & Cleaning

- Return ram to top position.
- Isolate at main switch.
- Remove all off-cuts and stack safely.

- Brush or vacuum swarf – never use compressed air near people.
- Apply light oil to shear blades and table.

10. Absolutely Prohibited Actions (Zero Tolerance)

- Removing, wedging, taping, or bypassing any guard or hold-down
- Placing hands past the guard line while machine is live
- Using the foot pedal without the full shroud/cover in place
- Punching holes closer than $1.5 \times$ material thickness to edge
- Shearing round bar or material that can roll unless specially fixtured
- Operating without current training/authorisation

11. Emergency Procedures

- Hit any red emergency stop immediately
- If someone is trapped: DO NOT reverse – isolate power first, then use manual lowering valve or jacks
- Call 111 for serious injury

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Date: 01 July 2026

