

Australian Standard<sup>®</sup>

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**Underground mining—Winding  
suspension equipment**

**Part 2: Detaching hooks**

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The following interests are represented on Committee ME/18:

Australian Coal Association  
Australian Mining Industry Council  
Australasian Institute of Mining and Metallurgy  
Broken Hill Mining Managers Association  
Bureau of Steel Manufacturers of Australia  
Chamber of Mines of Western Australia  
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## PREFACE

This Standard was prepared by the Standards Australia Committee on Mining Equipment, to supersede (in part) AS 2133—1978, *Mine detaching hooks*, and Supplement No 1 (March 1978) to AS 2133—1978, *Mine detaching hooks inspection and maintenance*.

This Standard is one of a series of Standards for underground mine winding suspension equipment. The other Standards cover the following:

- (a) General requirements.
- (b) Rope cappings.
- (c) Conveyance shackles and chains.
- (d) Drawbars and connecting links for vertical shafts.
- (e) Swivels and swivel hooks.

Reference was made to the British Coal documents *Design Guide for Cage Suspension Gear* and *Procedure for Examining Cage Suspension Gear at Testing Centres*, in the preparation of Appendix A and Appendix B respectively.

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## STANDARDS AUSTRALIA

## Australian Standard

## Underground mining—Winding suspension equipment

## Part 2: Detaching hooks

**1 SCOPE.** This Standard specifies requirements for the design, manufacture, and testing of detaching hooks and the manufacture and testing of their associated catchplates/detaching bells for use with conveyances in underground vertical mine shafts.

General requirements are specified in AS 3637.1.

NOTE: Guidelines for the design of the hook region of detaching hooks and for the determination of permissible imperfections in components are given in Appendix A and Appendix B respectively.

**2 REFERENCED DOCUMENTS.** The following Standards are referred to in this Standard:

AS	
1567	Copper and copper alloys—Wrought rods, bars and sections
1654	Limits and fits for engineering
3637	Underground mining—Winding suspension equipment
3637.1	Part 1: General requirements

**3 DEFINITIONS.** For the purpose of this Standard, the definitions below apply.

**3.1 Detaching hook**—a device located between the end of a winding rope and a conveyance so that in the event of an overwind, an ascending drum wound conveyance is detached from the rope and held in the headframe.

**3.2 Catchplate/detaching bell**—an apparatus in a headframe which operates a detaching hook in the event of an overwind and from which the detached conveyance is suspended.

**3.3 Conveyance**—any car, carriage, cage, or skip in which persons, minerals, or materials are wound through a shaft and any counterweight.

**4 SIZE DESIGNATION.** The size designation for detaching hooks shall be the safe working load in tonnes. Detaching hooks should be manufactured to the following size designations:

2.0, 5.0, 8.0, 10.0, 12.5, 15, 20, 25, 30, 40.

## 5 MATERIALS.

**5.1 Component type designation.** The components of each of three common types of detaching hook currently in use, viz the Humble, King, and Ormerod hooks (see Figures 1, 2, and 3), shall be designated Type A or Type B in accordance with Table 1.

NOTE: Other designs of detaching hooks may be permitted.

**5.2 Type A components.** For requirements, see AS 3637.1.

**5.3 Type B components.** For requirements, see AS 3637.1.

**5.4 Shear pins.** Shear pins shall be manufactured from copper with mechanical properties complying with AS 1567 Grade 102(0) or equivalent.

**TABLE 1**  
**DETACHING HOOK AND CATCHPLATE/  
DETACHING BELL COMPONENT TYPES**

Component	Component type designation*		
	Type of detaching hook		
	Humble	King	Ormerod
Hook plates	A	A	A
Outer plates	A	A	—
Inner plate	—	—	A
Hinge pin and nut	A	B	A
Stop pin	—	—	A
Resetting pin	—	B	A
Catchplate	B	B	—
Detaching bell	—	—	B

\* Components not included (except shear pins) are designated Type B.

## 6 DESIGN.

**6.1 Static factor of safety.** For static factor of safety of detaching hook, see AS 3637.1.

**6.2 Fatigue reserve factor.** For fatigue reserve factor of detaching hook, see AS 3637.1.

**6.3 Shear pin.** The detaching hook shall incorporate a shear pin to prevent its detaching except when drawn into the catchplate/detaching bell.

**6.4 Locking.** The detaching hook shall remain open after detaching.

## 7 MANUFACTURE.

**7.1 General.** For general requirements of manufacture, see AS 3637.1.

**7.2 Gauging.** Hook plates shall be provided with a method of gauging permanent deformation due to attachment loads. This may consist of gauge marks located at the positions shown in Figure 4.

**7.3 Catchplates/detaching bells.** Catchplate/detaching bells which are manufactured as welded fabrications shall be stress-relieved at 550°C to 600°C.

**7.4 Shear pin.** The shear pin shall be accurately turned to provide a fit of Class H7/k6 in accordance with AS 1654.

**7.5 Gauge marks.** The distance between gauge marks on each load-carrying hook plate shall be permanently and legibly marked (see Clause 7.2).

## 8 TESTING.

**8.1 General.** Each detaching hook after manufacture shall be subjected to the proof load test specified in AS 3637.1. The detaching hook and the catchplate/detaching bell shall then be subjected to the detaching test, and subsequently each Type A component shall be subjected to a non-destructive test as specified in AS 3637.1.