



## Simple Downward Hide Puller

### Meat & Livestock Australia Technology Transfer Kits

*This Technology Transfer Kit is one in a series of Do-It-Yourself (DIY) resources prepared for the Australian meat industry to encourage the development of project engineering skills at meat processing sites while implementing simple but useful items of technology. This kit is designed to provide the essential information to allow processors to carry out suitable modifications and installations at their own sites to improve some aspects of their processing performance. As each processing site has unique design and construction features the information in this kit should be used as a guide only. Some modifications from this kit to ensure the successful application at individual sites are likely. No warranty is given on the outcome of the use of this kit or the information it contains.*

### DIY Kit # 3 – Simple Downward Hide Puller

The Simple Downward Hide Puller is used with on-rail beef dressing for a daily capacity of 120 cattle or less. The equipment is designed for retrofitting to on-rail dressing systems and for installing in place of a cradle, to convert cradle dressing to on-rail dressing.

Downward hide pulling has been proven to be a more hygienic technique than conventional flaying of the hide whether on the rail or on a cradle. Elevating the carcass to the rail and use of this simple hide puller allows small processors to become more productive and to improve their hygienic technique.

Small processors currently dressing on a cradle should already have a winch available to lift the carcass from the cradle to the rail after dressing. This winch becomes the basis of the Simple Downward Hide Puller. By utilising an existing winch, the cost of construction and installation is minimised.

This unit was constructed and installed at a small West Australian domestic abattoir that had previously been cradle dressing. The unit has successfully operated for some 3 years without problem, at a rate of up to 120 bodies per day. Subsequently, the Simple Downward Hide Puller has been installed in other small abattoirs.



Abattoirs with minimal engineering skills and facilities should be capable of constructing and commissioning the Simple Downward Hide Puller.

### Description

The Simple Downward Hide Puller consists of an electric winch with a rated capacity of 2 tonnes situated above the beef rail. The winch pulls steel cable through a floor-mounted pulley, which converts the winch's upward pull to a downward pull on the carcass. On the end of the winch cable are attached two chains each with a slip link on the end.

The winch cable passes through the floor-mounted pulley and up to the carcass. The slip links are used to form a noose in the end of each chain and the freed hide from each hind leg is passed through the noose and trapped by the tightening chains.

The removal of the hide is controlled with the winch hand control. Manual knife, or air knife, work is used as required to aid in the clean removal of the hide from the carcass.

Operators stand either side of the carcass on fixed height, or rise and fall platforms, to operate the hide puller.

To ensure the correct vertical pull, for the most effective hide removal, the pulley should be located approximately 950mm from the centreline of the rail.

### Benefits

Several advantages have been identified from using the Simple Downward Hide Puller with on-rail dressing, particularly when compared to cradle dressing. Cradle dressing involves removing the head, then lowering the carcass by a winch onto a cradle where most of the flaying is done with the carcass in a prone position. The carcass is then partly elevated to enable backing off; ie. complete removal of the hide. The carcass is finally re-hoisted to the rail.

Cradle dressing requires a very high skill level for flaying (knife-work). This work is extremely strenuous and is performed in an ergonomically poor position involving repeated bending while the carcass is on the cradle.

Hide to flesh contact is difficult to eliminate during flaying and re-hoisting of the carcase. Even when the operator's skill level is high it is difficult not to damage the hide with cuts or scores. Selvage is often lost from the carcase.

Altering a cradle dressing system to a basic on-rail system results in benefits in the areas of:

- Occupational Health and Safety.
- Increased productivity.
- Improved carcase hygiene.
- Increased yield remaining with the carcase
- Greater hide value through less damage

Additionally the head can be left on the carcase until the hide is removed, resulting in a reduction in work skinning the head.

Utilisation of the existing winch, which is presently used for lowering and hoisting the carcase to and from the cradle, for the downward hide puller minimises the cost to construct and install this system.

Small abattoirs, which are currently performing on-rail dressing without the use of a hide puller, can install this system and obtain the benefits of improved productivity and increased hide value. They can also realistic expect some achievement of the gains in carcase hygiene.

### Materials

The prototype constructed, installed and still in operation in Western Australia used the following materials. Prices are at 1997 costs when installed.

Material	Length	Quantity	Cost
380 PFC	500mm	2	\$120.35
10mm mild steel plate	1050mm x 600 mm	1	\$105.21
90mm x 10mm flat bar	345mm	4	\$ 19.98
12mm 304 stainless steel plate	300 mm diameter	2	\$ 55.00
168.3mm diameter/3.4mm wall 304 stainless steel pipe	800mm	1	\$ 91.60
63.5mm 304 stainless steel shaft	1000mm	1	\$129.00
UCP 210 NSK bearings		2	\$ 58.36
16mm Dynabolts	110mm	6	\$18.00
<b>Total</b>			<b>\$597.50</b>

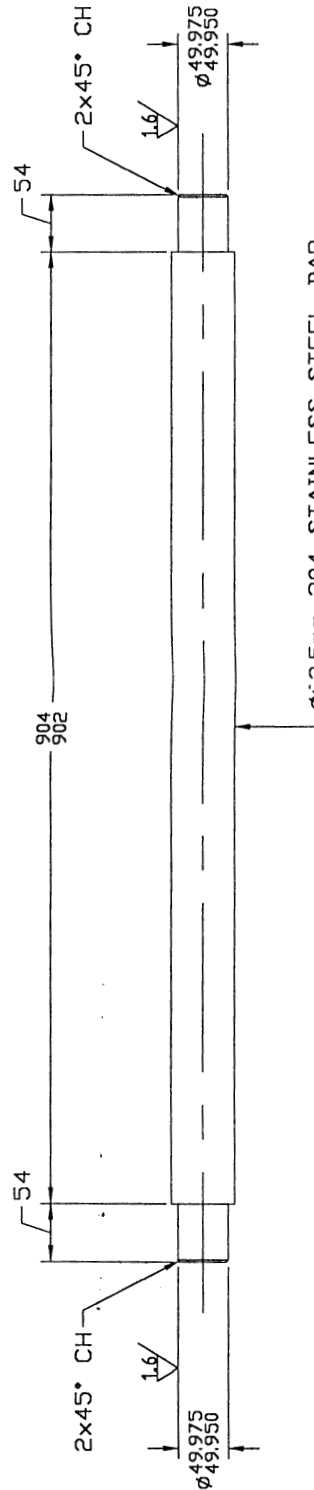
**Equipment already on-site:** 2 tonne winch with hand control  
2 chains with slip links (connected to winch chain)

**Suppliers:** Steelmark – Eagle & Globe and Midway Metals

### Drawings

The appended engineering drawings show:

- HID000 General arrangement
- HID001 Pulley general assembly
- HID002 Pulley spindle
- HID003 Pulley drum
- HID004 Pulley drum assembly
- HID005 Pulley roller base plate



CAD FILE: HID002 LAST EDIT: 20/03/1997-09.15

DRAWING No.		TITLE		3RD ANGLE PROJECTION U.M.O.		TOLERANCES		NAME		DATE		DRAWN		REVISION	
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ROOF BEAMS

2T

ELECTRIC WINCH

CHAIN CLAMPS


WINCH HOOK

RETURN PULLEY

RAISE  
LOWER  
PLATFORM

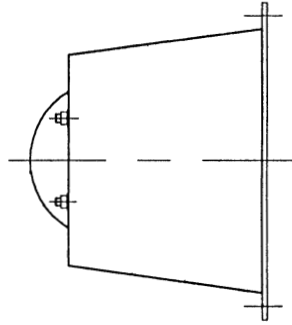
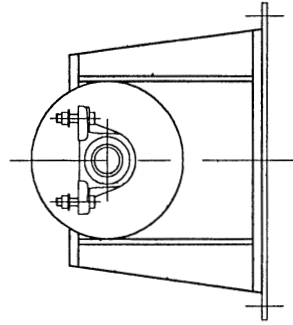
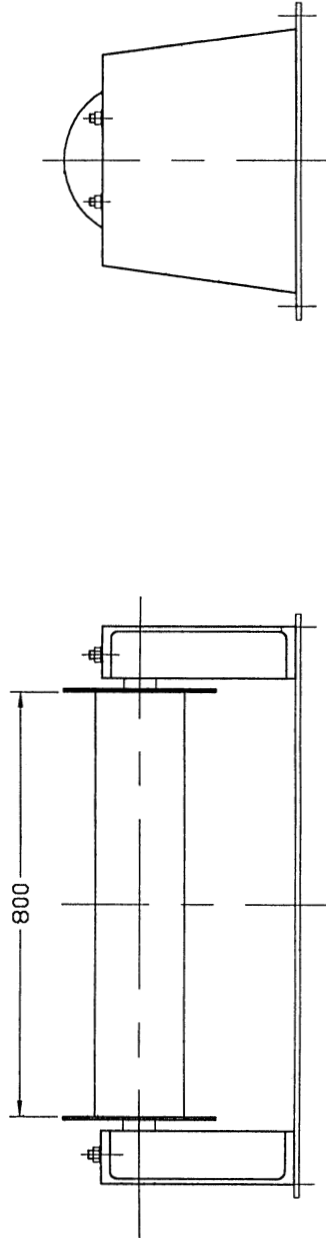
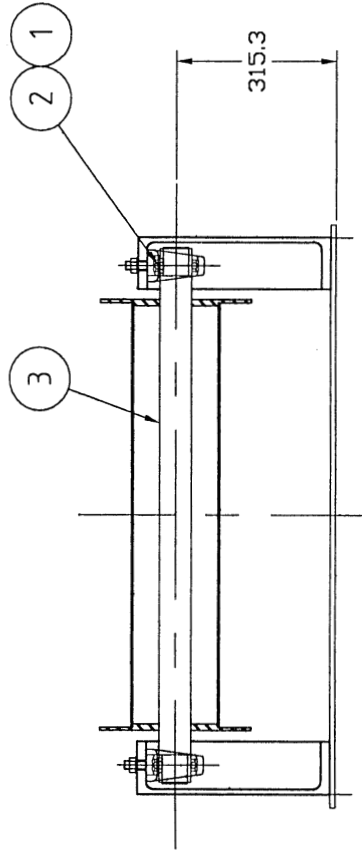
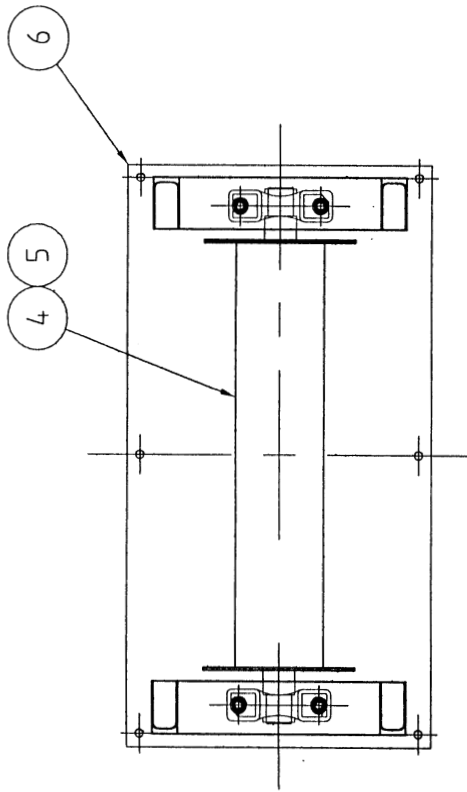
950

CAD FILE: HID000 LAST EDIT: 08/04/1997 - 16.33

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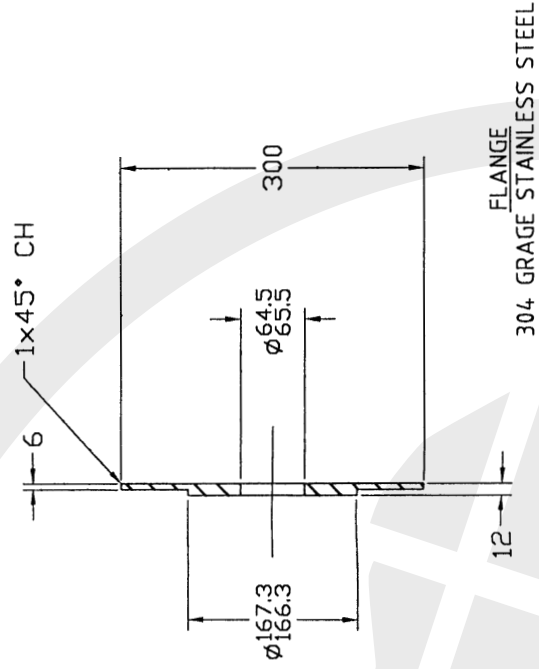
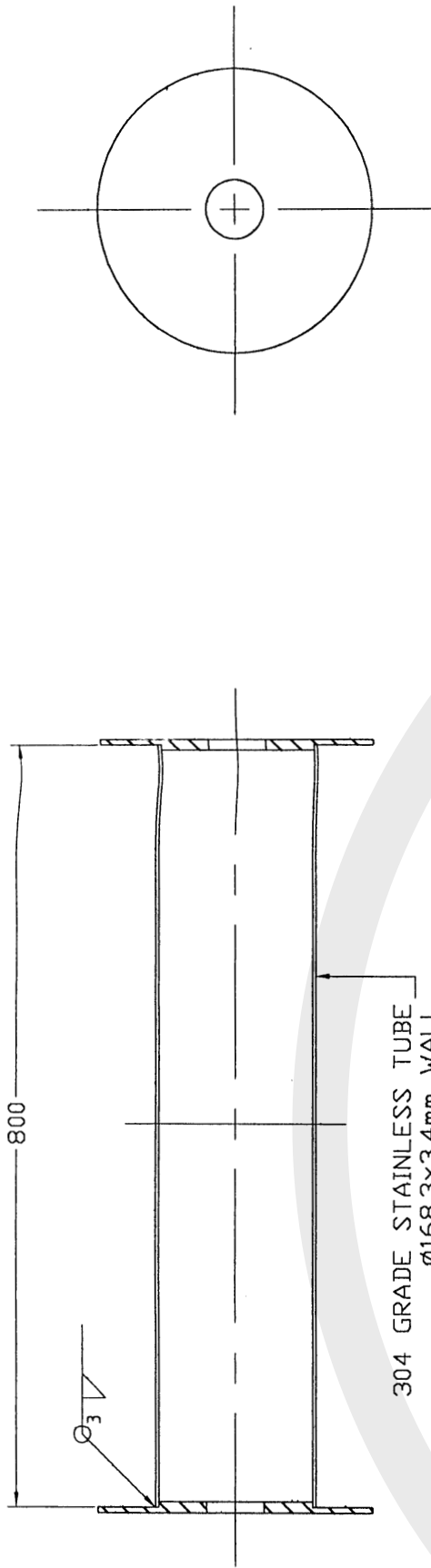
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5	DRUM ASSEMBLY			REFER DWG. BASE_04	
4	DRUM	304 STAINLESS STEEL	1	REFER DWG. BASE_03	20
3	SPINDLE	304 STAINLESS STEEL	1	REFER DWG. BASE_02	24
2	Y BEARING UNIT	UCP 210	2	Ø50mm SHAFT	2.7
1	M16x65 BOLT, NUT		4		
ITEM	DESCRIPTION	GRADE	QTY	REMARKS	WEIGHT




CAD FILE:base\_01 LAST EDIT:18/03/1997-17.25

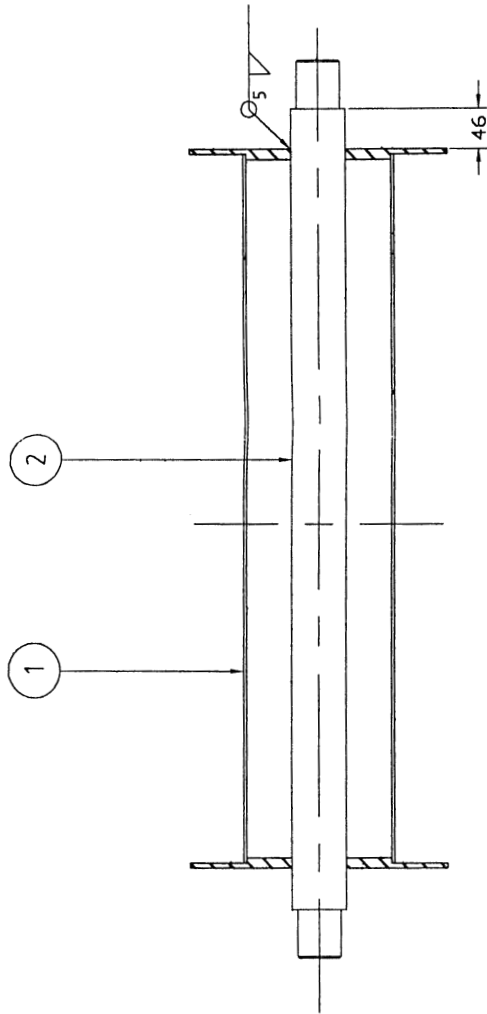
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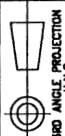
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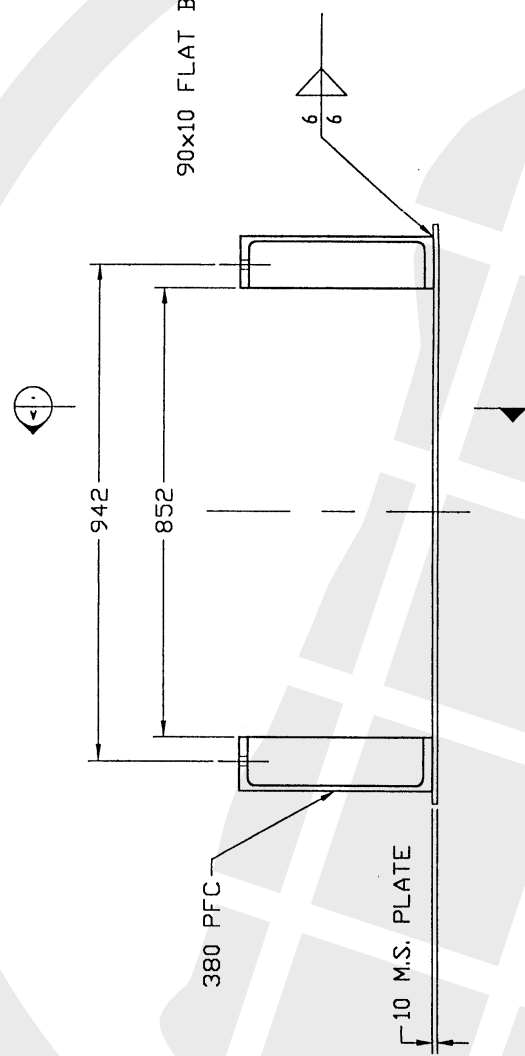
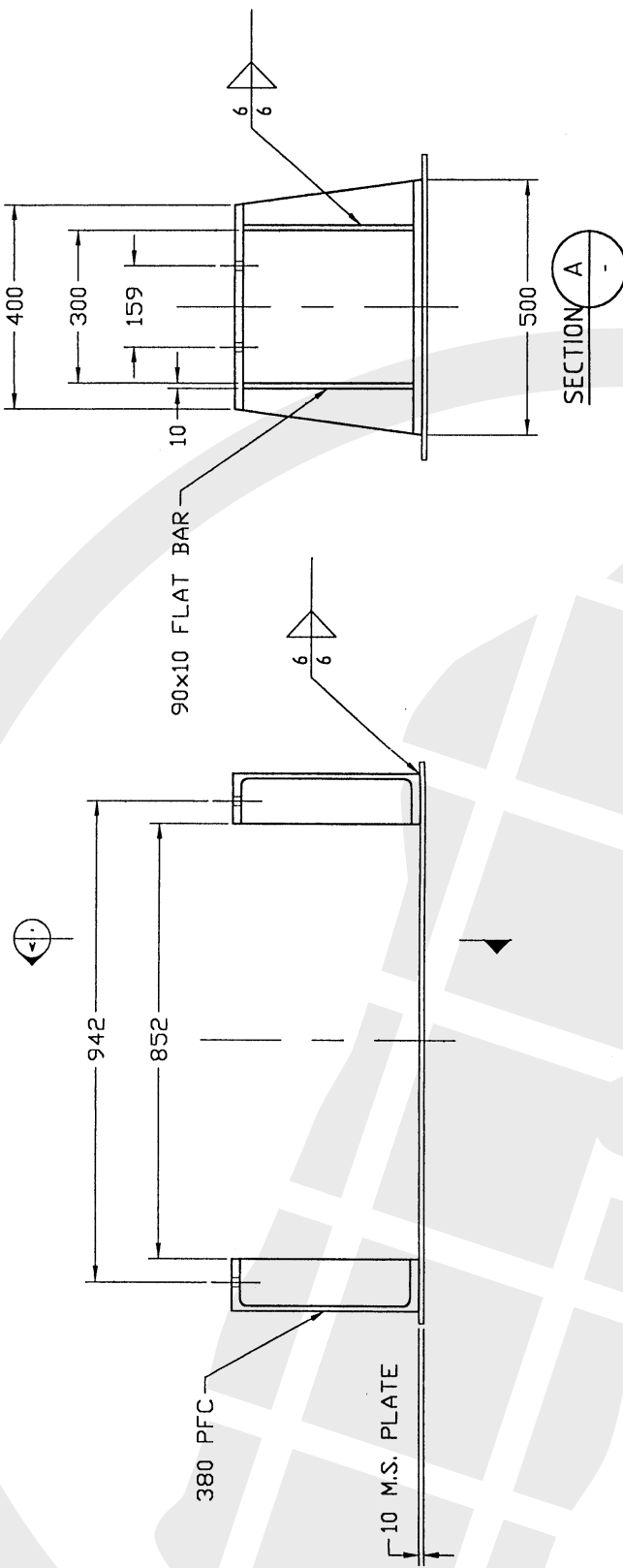
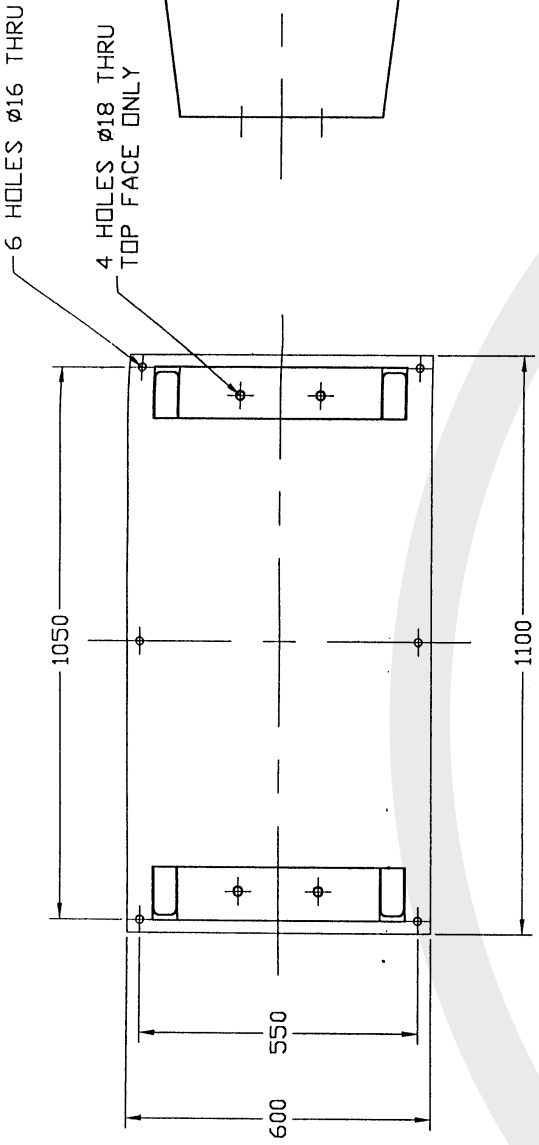
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2	SPINDLE	304	1	REFER DWG. BASE_02
1	WINCH DRUM	304	1	REFER DWG. BASE_03
ITEM	DESCRIPTION	GRADE	QTY	REMARKS




CAD FILE: HID004 LAST EDIT: 20/03/1997-09.2

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CAD FILE: HID005 LAST EDIT: 20/03/1997-09

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NAME	DATE		
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DRAWN	DRN. CHK		
ENGINEER	ENG. CHK		
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## Video presentation

Approximately 8.6 minutes of the hide puller in operation showing the important features of design, construction and operation are provided on the Meat and Livestock Australia Technology Transfer DIY Kits' Support Video. Footage relevant to the Simple Downward Hide Puller DIY Kit is approximately located between VCR real time counter units 13:20 to 22:00.

## Acknowledgments

Meat & Livestock Australia have prepared this kit with support from the Australian Meat Processors Corporation.

*Equipment design & project management*

Australian Meat Technology Pty Ltd

*Equipment construction, installation, commissioning and operation*

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