



Deton Engineering – Risk Assessment

Hydraulic Rail Bender



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1. Introduction to the Deton Group of Companies

Deton Engineering (Pty) Ltd., was established in 1973 by Hercules du Preez, the first product being the Hercules Jack for mining applications.

From this date, Deton Engineering has specialised in the production of products with safety and efficiency in mind, especially for applications in the Mining and Industrial industries. The Deton Group is continuously focussed on the monitoring and improvement of production, reduced downtime, improved safety, and the servicing and support of our products which has made Deton a leader in its field.

Within the Deton Group of Companies are the following companies whose processes are incorporated in our Quality Management System –

Deton Engineering (Pty) Ltd. – Deton Engineering manufactures Jacks, Rail Benders, Snatch Blocks, Pulleys, Hercules Jack and related products for the Mining and Industrial markets.

Wearresist SA (Pty) Ltd. – Wearresist manufactures, sells and applies a range of wear-resistant coatings, based upon a resin matrix with a 90% alumina content, targeted at the Mining and Industrial markets.

Ceramic Linings (Pty) Ltd. – Ceramic Linings manufacture and market alumina ceramic tiles for high abrasion, high impact and high temperature applications. The products compliment the Wearresist products and can be used in conjunction in such environments.

Cutlass Products (Pty) Ltd. – Cutlass manufacture and market a range of corrosion and abrasion resistant products, aimed at the general Industrial market.

Densit S.A. (Pty) Ltd. – Densit supplies and applies a range of branded wear-resistant products to the general industrial markets, under license from Densit Norway.



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2. Details of Deton Engineering

This Risk Assessment refers to our Alberton based Head Office and Workshops, the details of which are –

6 Barium Street
Alrode Ext. 7
Alberton

P.O. Box 123920
Alrode
1450

Telephone: (011) 908-1922
E-mail: info@deton.co.za

Facsimile: (011) 864-5386
Website: www.deton.co.za

3. Scope of Quality Management System (SABS ISO 9001:2008)

The manufacture and repair of Hercules Jacks, Snatch Blocks, explosive boxes, mining equipment, rail benders, pipe splitters, railway rolling stock and re-railing equipment for mining, agriculture, postal and transport industries, the manufacture of corrosion-coating resins and wear-resistant linings, including the Cutlass range of epoxy products.

4. Risk Assessment Team


As a result of Deton Engineering's commitment to our customers, this Risk Assessment was conducted in order to ensure that all potential health, safety and related hazards are identified, the risks evaluated and controls implemented to ensure that the products are safe and without risk to our customers, as far as is reasonably practicable.

This Risk Assessment was compiled by the following team -

HP du Preez	Chairman
A du Preez	Managing Director
W Germishuizen	Sales & Marketing
I Gasa	Production Foreman
J Downward	Production & Operations
S Barley	Quality & Risk



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5. Excerpt from Mine Safety Act (Act 29 of 1996)

Section 21 of the Mine Safety Act states the following -

21.(1) *Any person who -*

- (a) *designs, manufactures, repairs, imports or supplies any article for use at a mine must ensure, as far as reasonably practicable -*
 - (i) *that the article is safe and without risk to health and safety when used properly and*
 - (ii) *that it complies with all requirements in terms of this Act;*


21.(2) *Any person who bears a duty in terms of sub-section (1) is relieved of that duty to the extent that is reasonable in the circumstances, if -*

- (a) *that person designs, manufactures, repairs, imports or supplies an article for or to another person; and*
- (b) *that person provides a written undertaking to take specified steps sufficient to ensure, as far as reasonably practicable, that the article will be safe and without risk to health and safety when used properly and that it complies with all prescribed requirements*





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6. Scope of Risk Assessment

The scope of this Risk Assessment is limited to the Deton Engineering Hydraulic Rail Benders and their application in a mining environment.

The objective of this Risk Assessment is to, as far as is reasonably practicable -

- identify all potential health, safety and related risks that the Hydraulic Rail Bender could pose to the end-user
- measure the level of risk of the identified risks
- to recommend controls to alleviate or minimise the risks

The aim of this Risk Assessment is to provide end-users with detailed information that will permit them to use the Hydraulic Rail Bender in a manner that is safe and provide optimal utilisation.





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7. Format of Risk Assessment

The Risk Assessments are reflected in tabular format, with the specific aspects listed under the following main headings -

Potential Hazard - what could go wrong?

Consequences & Impact - what could happen if the instance occurred?

Recommendations & Controls - what measures are in place or should be taken?

The aspects are then rated in terms of -

Likelihood (What are the chances of the incident occurring, probability?)

LIKELIHOOD	Index Value	Result
Most likely	5	<input type="text"/>
Highly likely	4	
Likely	3	
Unlikely	2	
Highly unlikely	1	

Risk (What level of risk/element of danger would this incident expose you to?)

RISK	Index Value	Result
Very high risk	5	<input type="text"/>
High risk	4	
Medium risk	3	
Low risk	2	
Very low risk	1	

Severity (What could the severity of this incident be in terms of injuries, damage)?

SEVERITY	Index Value	Result
Extremely severe	5	<input type="text"/>
Quite severe	4	
Severe	3	
Not too severe	2	
Negligible	1	

From the above results, the "Risk Result" is tabulated as follows -

$$\text{RISK RESULT} = \text{LIKELIHOOD} \times \text{RISK} \times \text{SEVERITY}$$



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7. Format of Risk Assessment (cont.)

The figure obtained (the Risk Result) is then classified as follows -

- 61 + High risk requiring immediate corrective action
- 39 - 60 High risk requiring corrective action (identified in RED)
- 21 - 40 Substantial risk with corrective action needed
- 6 - 20 Possible risk, must be brought to people's attention
- 5 Risk tolerable

This is reflected as "RR" on the accompanying Risk Assessment Charts.

8. Inspection of Used Hydraulic Rail Benders by Customer

Due to the working environment, the load factors placed upon the products and the safety critical nature of the product, Deton Engineering recommends that all Hydraulic Rail Benders are subject to regular inspection.

The inspection should pay attention to the following factors -

ITEM	INSPECTION
Rail Bender Frame	Check for obvious damage to 'teeth' that hook on to rail
	Check frame for any obvious twisting or deformation
Cylinder	Check for damage to head that may cause head to slip off rails
	Check for leaks caused by damage to piston/seals
Pump	Check correct lever is available and not damaged
	Check hose from pump to cylinder is undamaged
	Check pressure release operates freely

In order to ensure that the product's integrity is maintained, Deton Engineering recommend that use is made of Deton Engineering approved components only and that all repairs are performed by Deton Engineering.



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9.1 Risk Assessment – Receipt of Hydraulic Rail Benders by Customer

ITEM	POTENTIAL HAZARD	CONSEQUENCES & IMPACT	RATINGS				RECOMMENDATIONS and CONTROLS
			L	R	S	RR	
1	Broken/Missing Components	<ul style="list-style-type: none"> Hydraulic Rail Bender cannot operate efficiently – EFFICIENCY Hydraulic Rail Bender could slip off rails during rail bending – INJURY Shaft nut could shear – INJURY 	1	3	3	9	RECOMMENDATIONS <ul style="list-style-type: none"> Segregate product and return to Deton Engineering CONTROLS <ul style="list-style-type: none"> Full final inspection using Checklist Despatch inspection
2	Wrong Product	<ul style="list-style-type: none"> Lost production – EFFICIENCY 	1	1	2	2	RECOMMENDATIONS <ul style="list-style-type: none"> reject delivery or segregate for collection by Deton Engineering CONTROLS <ul style="list-style-type: none"> Despatch inspection
3	Wrong Quantity	<ul style="list-style-type: none"> Lost production - EFFICIENCY 	1	1	2	2	RECOMMENDATIONS <ul style="list-style-type: none"> reject delivery or accept and contact Deton Engineering regarding shortfall CONTROLS <ul style="list-style-type: none"> Despatch inspection



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9.2 Risk Assessment – Effective Use of Hydraulic Rail Bender by Customer

ITEM	POTENTIAL HAZARD	CONSEQUENCES & IMPACT	RATINGS				RECOMMENDATIONS and CONTROLS
			L	R	S	RR	
1	'Teeth' of Hydraulic Rail bender not placed fully over rails	<ul style="list-style-type: none"> Rail Bender slips off rails, necessitating restarting of process – EFFICIENCY Rail Bender slips off rails – INJURY 	2	2	3	12	RECOMMENDATIONS <ul style="list-style-type: none"> Staff must be trained in correct application of Hydraulic Rail Bender Operation of Hydraulic Rail Bender must be supervised Check 'teeth' of Rail Bender are securely located over rails CONTROLS <ul style="list-style-type: none"> Compulsory training and supervision
2	Object placed between head of cylinder and rail	<ul style="list-style-type: none"> Object slips out, necessitating restarting of process – EFFICIENCY Object slips out hitting Operator – INJURY / DEATH 	3	4	4	48	RECOMMENDATIONS <ul style="list-style-type: none"> Staff must be trained in correct application of Hydraulic Rail Bender Operation of Hydraulic Rail Bender must be supervised DO NOT PLACE OBJECT BETWEEN CYLINDER HEAD AND RAILS CONTROLS <ul style="list-style-type: none"> Compulsory training and supervision



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ITEM	POTENTIAL HAZARD	CONSEQUENCES & IMPACT	RATINGS				RECOMMENDATIONS and CONTROLS
			L	R	S	RR	
3.	Operator pumping Hydraulic Rail Bender stands over head/ rail area	<ul style="list-style-type: none"> Trapped object slips upwards, hitting Operator - INJURY / DEATH 	3	4	4	48	<p>RECOMMENDATIONS</p> <ul style="list-style-type: none"> Staff must be trained in correct application of Hydraulic Rail Bender Operation of Hydraulic Rail Bender must be supervised DO NOT PLACE OBJECT BETWEEN CYLINDER HEAD AND RAILS Operator must stand clear of cylinder/rail area <p>CONTROLS</p> <ul style="list-style-type: none"> Compulsory training and supervision
4	Operator uses 'Pinch Bar' or similar item instead of proper lever	<ul style="list-style-type: none"> Item does not function properly, necessitating replacement with proper lever - EFFICIENCY Item slips off pump, injuring Operator - INJURY 	3	3	3	27	<p>RECOMMENDATIONS</p> <ul style="list-style-type: none"> Staff must be trained in correct application of Hydraulic Rail Bender Operation of Hydraulic Rail Bender must be supervised Ensure that use is made of proper lever to operate Hydraulic Rail Bender <p>CONTROLS</p> <ul style="list-style-type: none"> Compulsory training and supervision



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9.3 Risk Assessment - Possible Malfunction

ITEM	POTENTIAL HAZARD	CONSEQUENCES & IMPACT	RATINGS				RECOMMENDATIONS and CONTROLS
			L	R	S	RR	
1.	Hydraulic Rail Bender 'teeth' cannot securely locate on rail	<ul style="list-style-type: none"> Hydraulic Rail Bender will not locate onto rails - EFFICIENCY Rail Bender can slip off rails if energised - INJURY 	2	3	4	24	<p>RECOMMENDATIONS</p> <ul style="list-style-type: none"> Regularly inspect Hydraulic Rail Benders in working environment - check 'teeth' for obvious damage, check frame for obvious damage/distortion Send to Deton Engineering for repair <p>CONTROLS</p> <ul style="list-style-type: none"> User education
2.	Hydraulic Rail Bender does not function	<ul style="list-style-type: none"> Replacement of Rail Bender with functioning unit - EFFICIENCY 	2	3	4	24	<p>RECOMMENDATIONS</p> <ul style="list-style-type: none"> Regularly inspect Hydraulic Rail Benders in working environment - check oil levels in pump, check for leaks Send to Deton Engineering for repair <p>CONTROLS</p> <ul style="list-style-type: none"> Failure of hydraulics will result in unit not functioning User education



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ITEM	POTENTIAL HAZARD	CONSEQUENCES & IMPACT	RATINGS				RECOMMENDATIONS and CONTROLS
			L	R	S	RR	
3	Use of 'Pirate' parts in repair of Hydraulic Rail Bender	<ul style="list-style-type: none"> Item does not function properly, necessitating replacement with proper lever - EFFICIENCY Item fails under pressure, injuring Operator - INJURY 	2	3	3	18	RECOMMENDATIONS <ul style="list-style-type: none"> Send to Deton for repair or contact Deton for approved parts