

# ***Increasing Efficiency and Safety with Underground Scaling***



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# ***Rock forms - Igneous***

<http://library.thinkquest.org/05aug/00461/igneous.htm>



**Mount Rushmore – Igneous rock**



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# Rock forms - Sedimentary

<http://triusenergy.com>

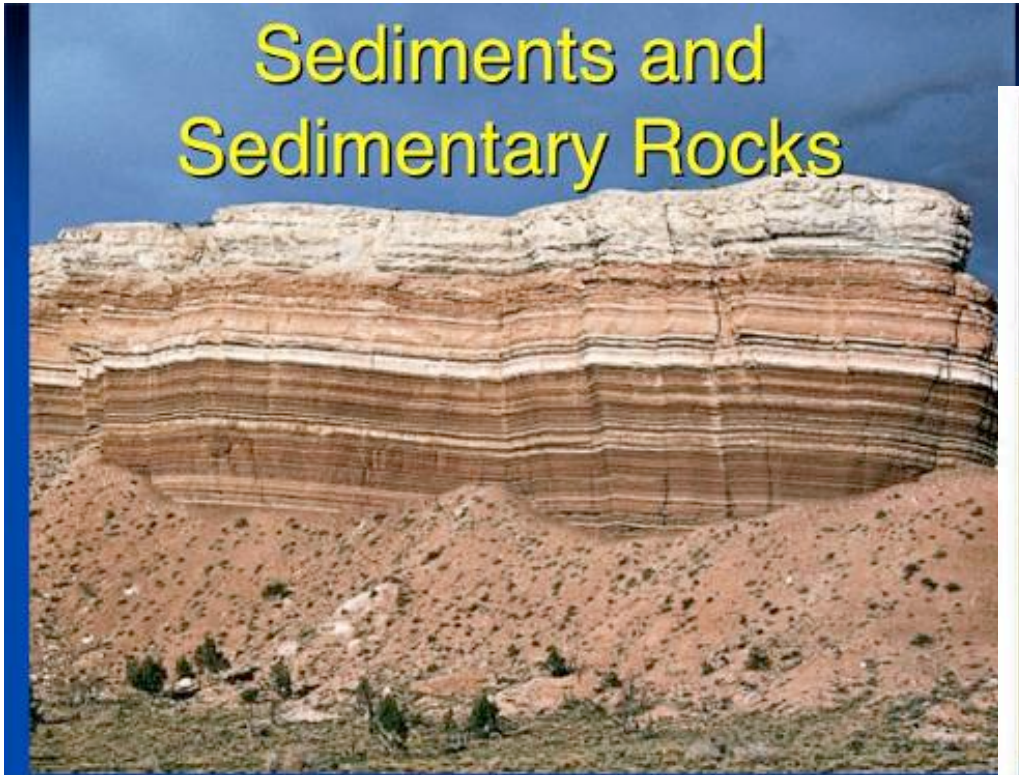


FIGURE 5.2 Compositional classification of sedimentary rocks. (Photos by H. Busch)

<http://jove.geol.niu.edu/>



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# Rock forms - Metamorphic



<http://www.bcssa.org/>



<http://geomaps.wr.usgs.gov/parks>



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# Jointing common in rock forms

Cubic jointing



<http://www.geocities.com>



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# Jointing common in rock forms



Slab jointing



<http://blogs.discovermagazine.com>

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# Jointing common in rock forms

Wedge jointing

<http://cruisetalk.org/gallery>



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# Jointing common to rock forms

Slab jointing



Mixed jointing



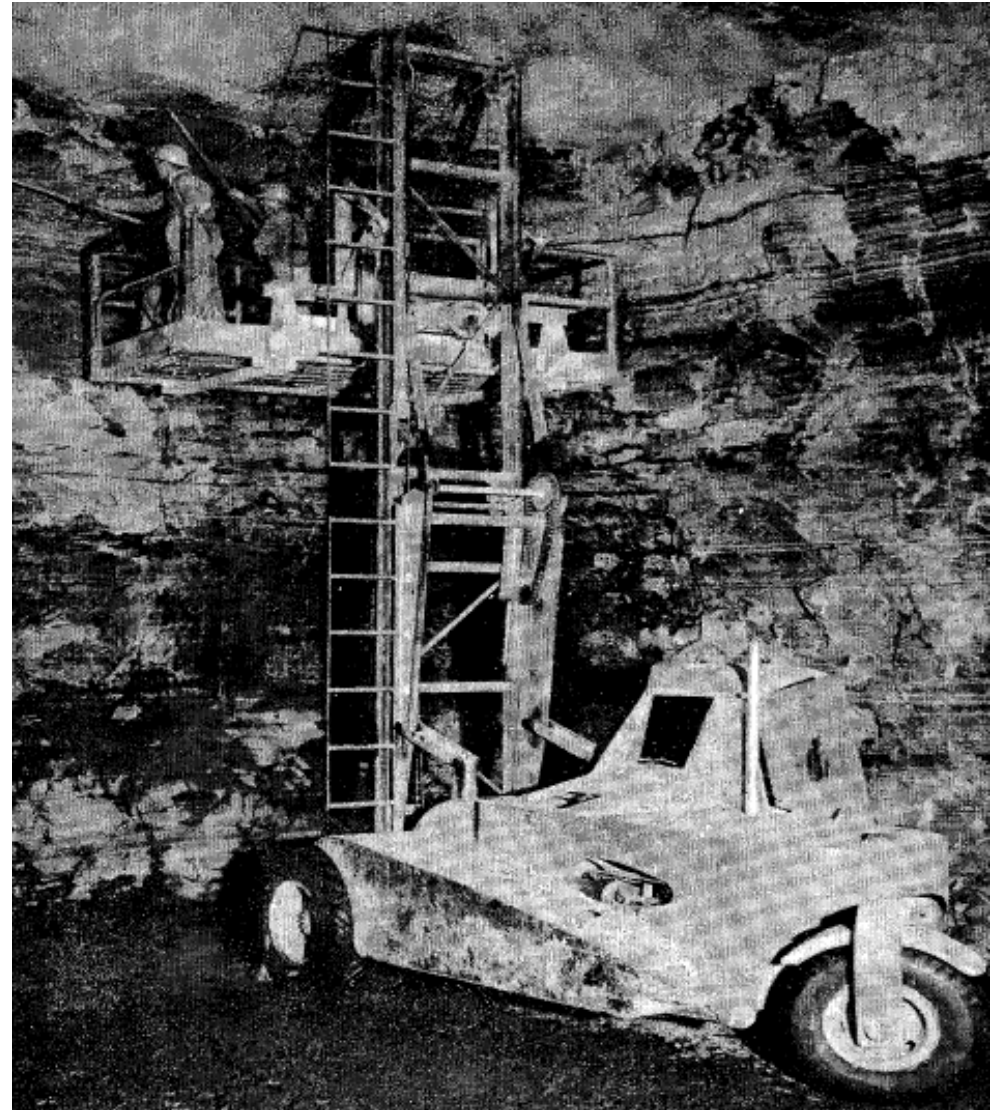
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# Scaling with a pry bar from a platform

Scaling from a high reach platform is not safe for the miner, material overhead is too unpredictable in size and direction of fall.

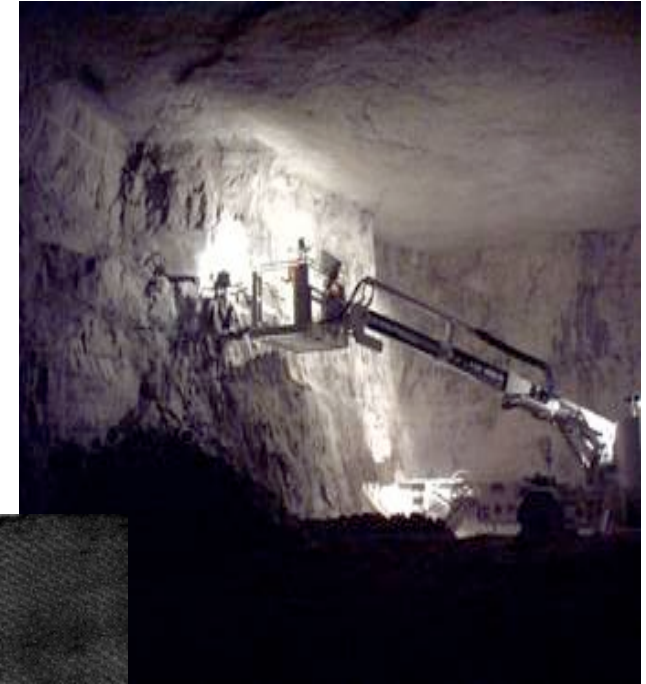


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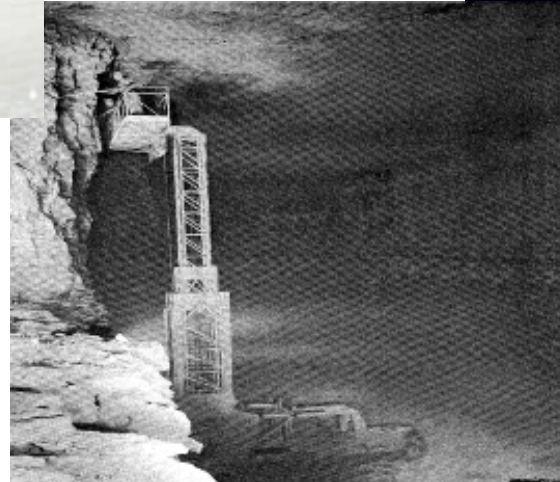


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# A scissorlift is for lifting people and equipment, not scaling.



Designed for lift capacity not impact.



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# “A bolter is meant to bolt: a Scaler is meant to scale”

Cut bolting time in half by bolting not scaling.



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# Mechanized Scalers

Taking equipment meant for agriculture or construction does not always work. Keeping the comfort and safety of the operator in mind is important.



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# Mechanized Scalers should be

Purpose built for scaling with visibility and safety key factors in the design criteria.

Engineered to provide a safe and efficient method of mine scaling is what is needed today.



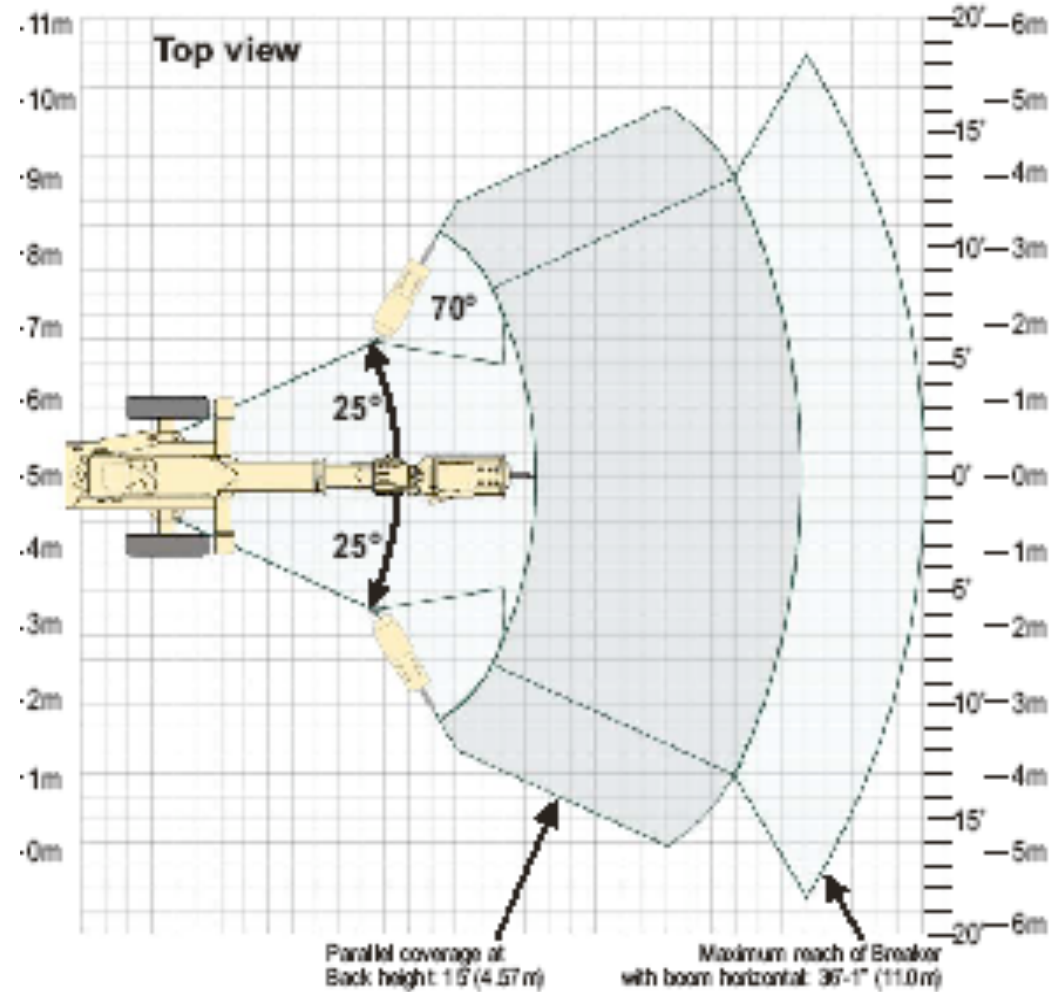
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# Coverage of drift width is important

Side to side swing and the extension of the telescopic boom should cover the full width of the drift minimizing vehicle movement and therefore lost scaling time.



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# The Hydraulic Breaker must be adjusted to the material to be worked

Anti Blank firing to protect the front head and tool

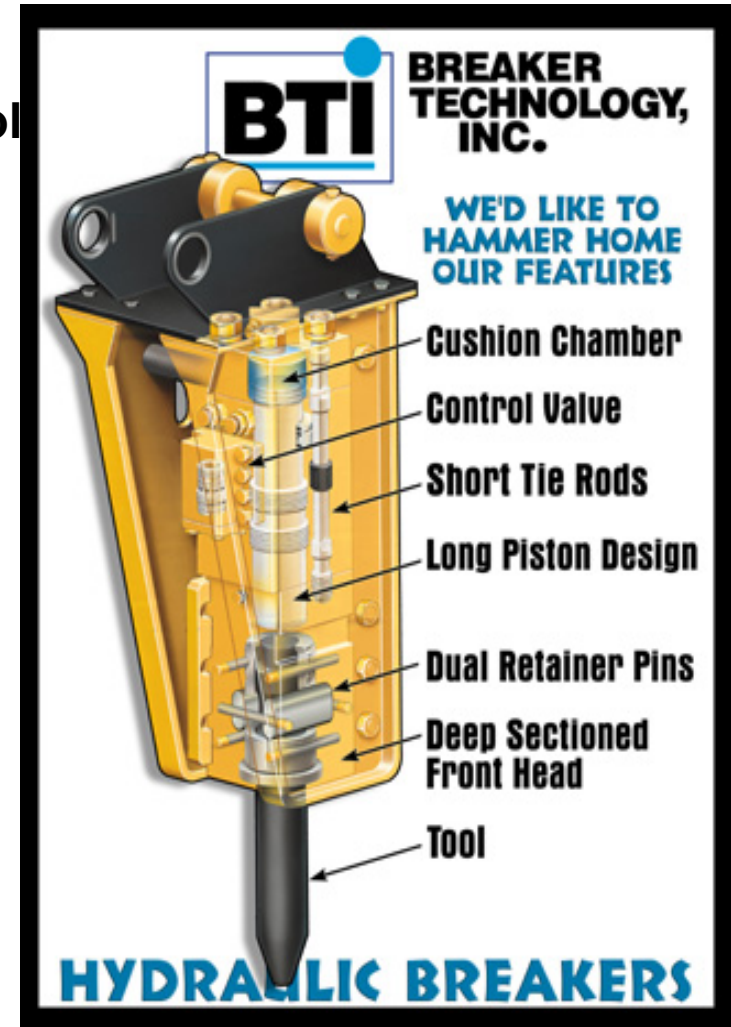
Cushion Chamber to absorb vibration to vehicle

Adjustable energy level for material to be scaled

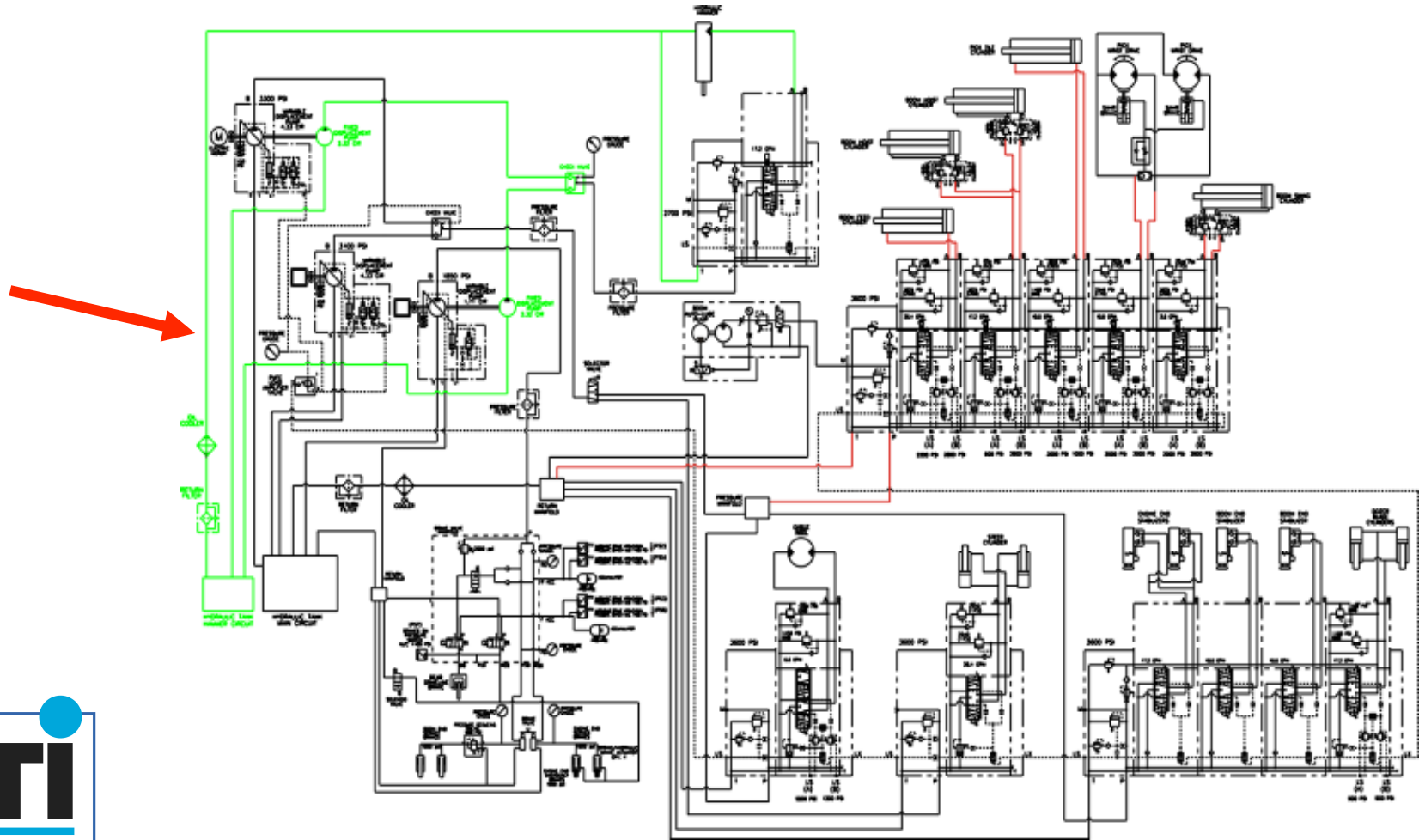


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# Separate Hydraulic Circuit for Breaker minimizes contamination

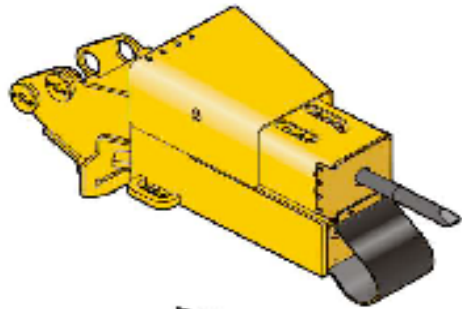


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# Hydraulic feed system adds value



## ● TB335 BREAKER

### Specifications

Impact Energy: 850 ft/lbs (1,152 Joules)

CIMA Rating: 365 ft/lbs (495 Joules)

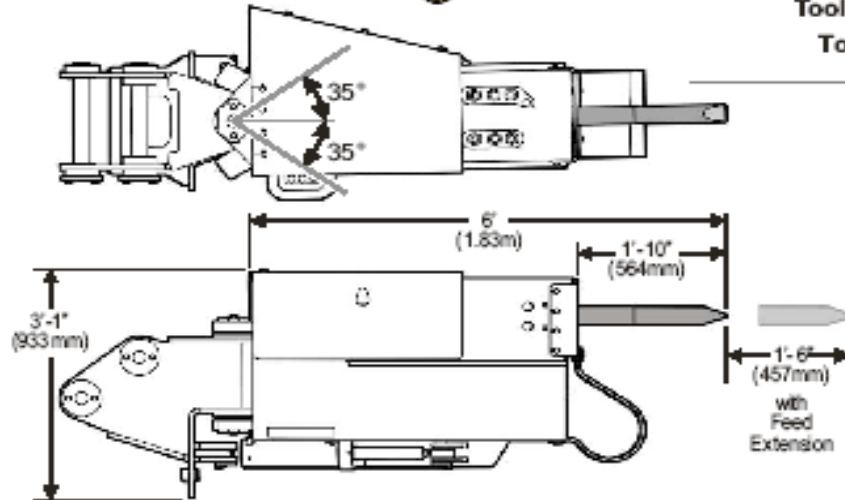
Blow Frequency: 640 - 1060 /minute

Flow Rate: 11 - 17 US gal/min (41 - 64 l/min)

Working Pressure: 1,400 - 2,275 psi (98 - 156 bar)

Tool Diameter: 3.0 in (75mm)

Tool Weight: 50 lb (22.6 kg)



- 18 " of extension on breaker
- 35 degrees swing either side of centre
- Design minimizes over scaling



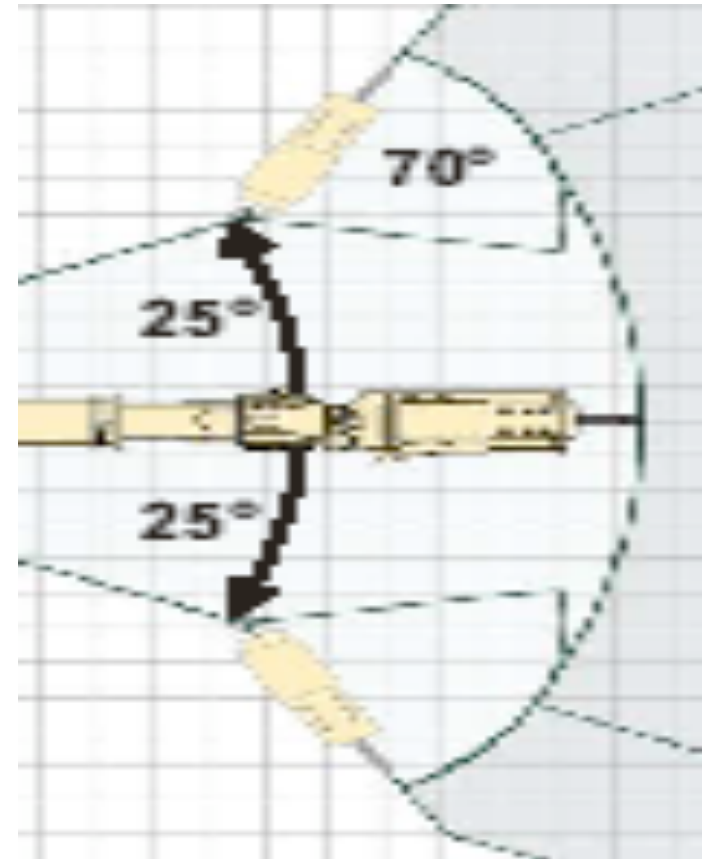
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# Breaker feed swing improves coverage of drift

Breaker feed swing adds to the boom swing permitting full drift coverage one setting of vehicle.



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# Vibratory Pick most effective and efficient



Narrow design excellent operator visibility

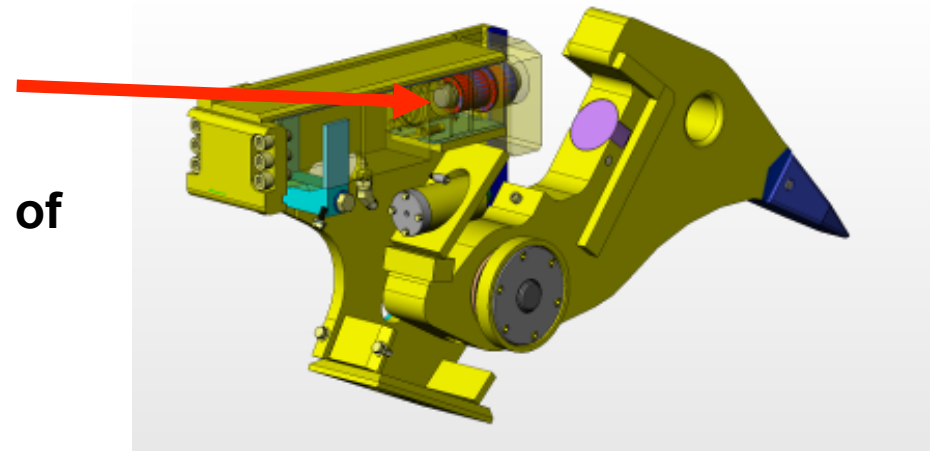
Head design quickly removes loose

Shock absorbing system eliminates vibration to carrier

Replaceable engaging tooth, varied widths

Hydraulic Breaker sealed inside body

Breach system allows quick inspection of striker plate for ease of replacement.



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# Acknowledgements

Engineering Programme at Concordia University – Rock forms

Paavo Harkko – Operating Principles for Mechanized Scaling

CIM Magazine – Tools of the Trade Supplement

“ A bolter is meant to bolt; A Scaler is meant to scale”

Western Mining Resource Centre Colorado School of Mines

Bell Equipment – photo of three wheeled Scaler.

Graymont Mine – photo of Komatsu backhoe

Sandvik/Tamrock Roof Bolter - Photo



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# QUESTIONS



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