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# Silica Exposure and Lung Disease in the Mining Industry workshop

Reducing exposure of roof bolter operators  
to dust in coal mines and cab filtration for  
controlling dust exposure in metal non-  
metal mines

J. H. Fletcher & Co.  
October 23, 2020



# Presentation Summary

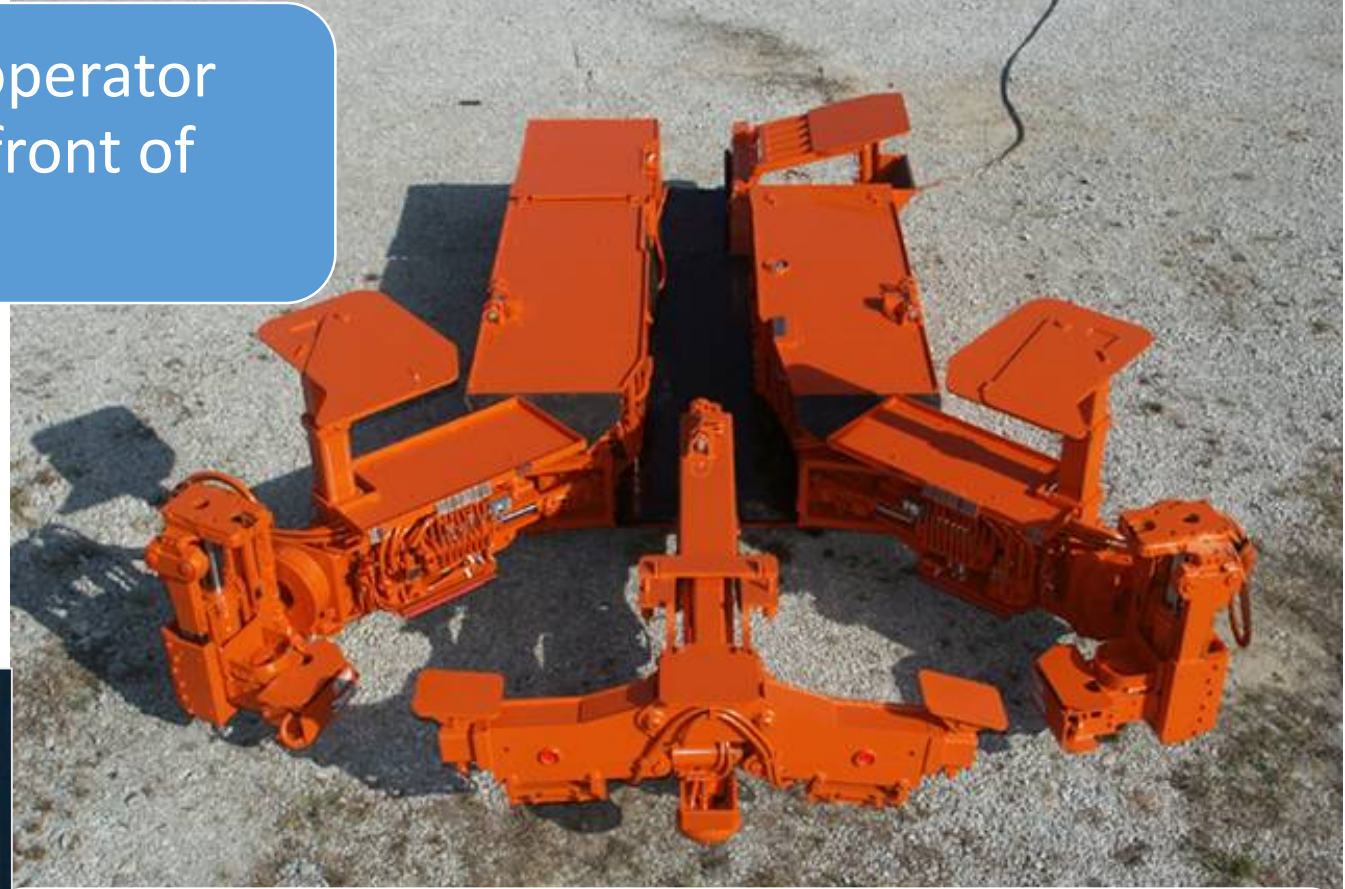
- MSHA Approved Roof Bolter Dust Collection System
- Wet Dust Box Update
- Canopy Air Curtains
- Computer Controlled Drilling and Drilling Parameters
- Remote Bolters
- Automatic Bolters
- Enclosed Cabs
- Cab ISO standards working group goals







Drill head near operator position on the front of booms.



J. H. Fletcher & Co, Roof Bolters. W/MSHA approved dust collection components and system.

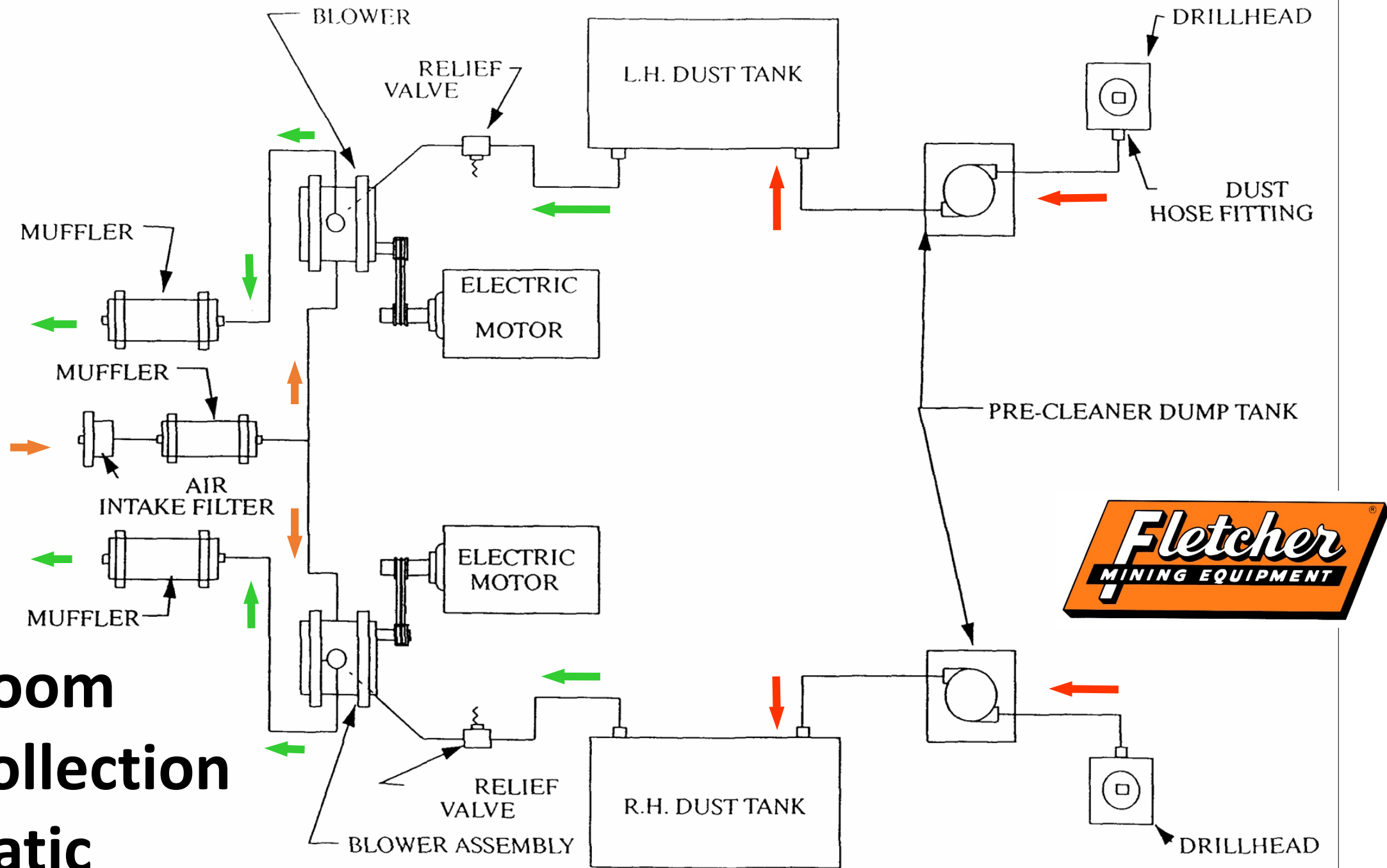


Different sizes and models of roof bolters needed due to conditions and bolting requirements.





# Dual Boom Dust Collection Schematic





Dual Cyclones

Final Filter

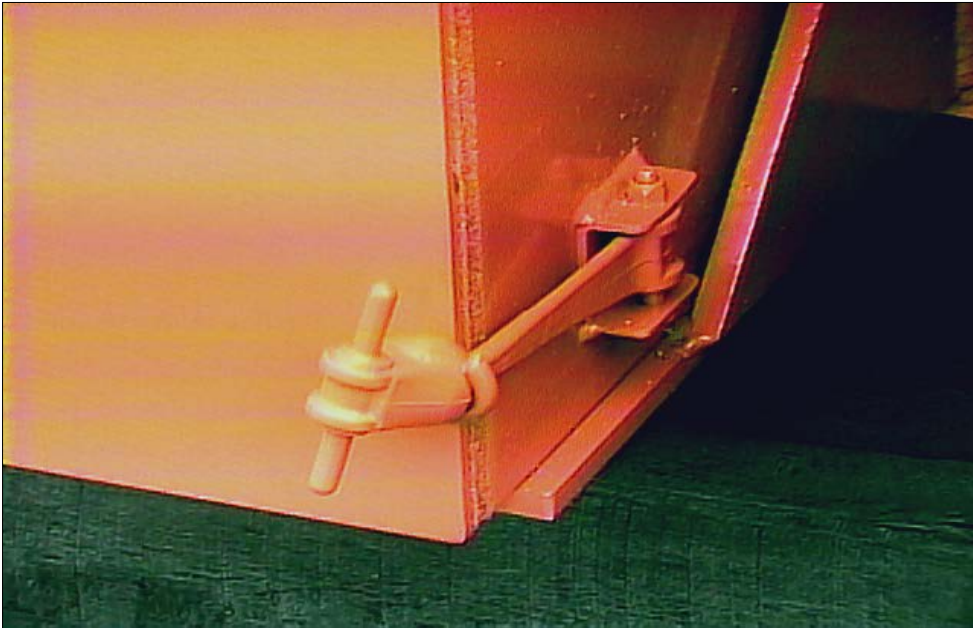
Dust Bag

Typical Dust Box  
with Dust Bag





# Dust Box Improvements



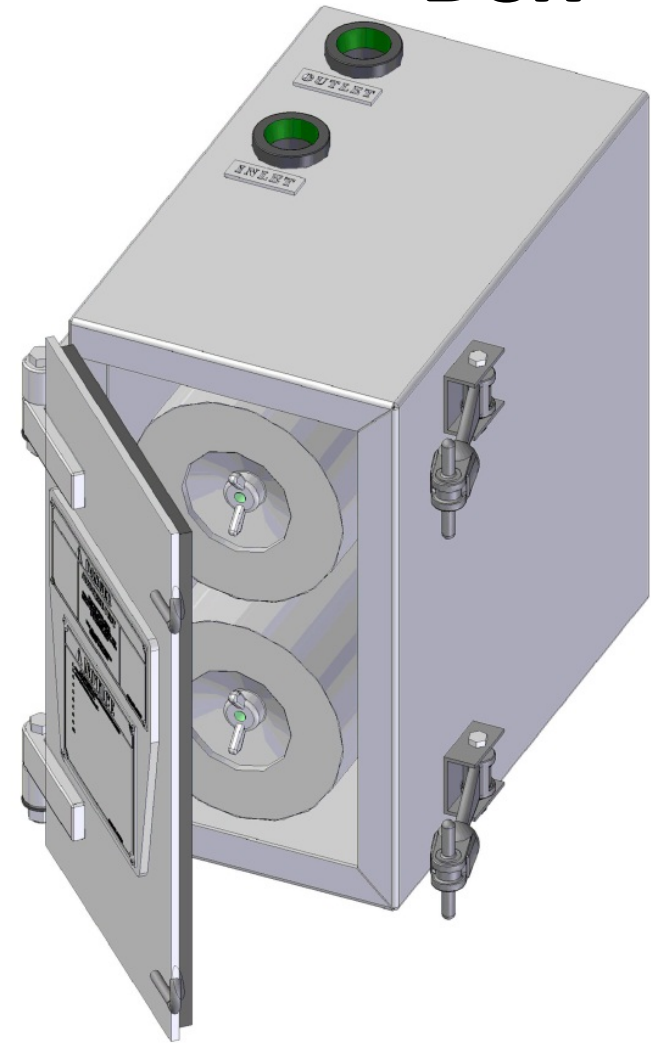




**Exhaust Water  
Conditioner**



**Precleaner**



**Final Filter  
Box**

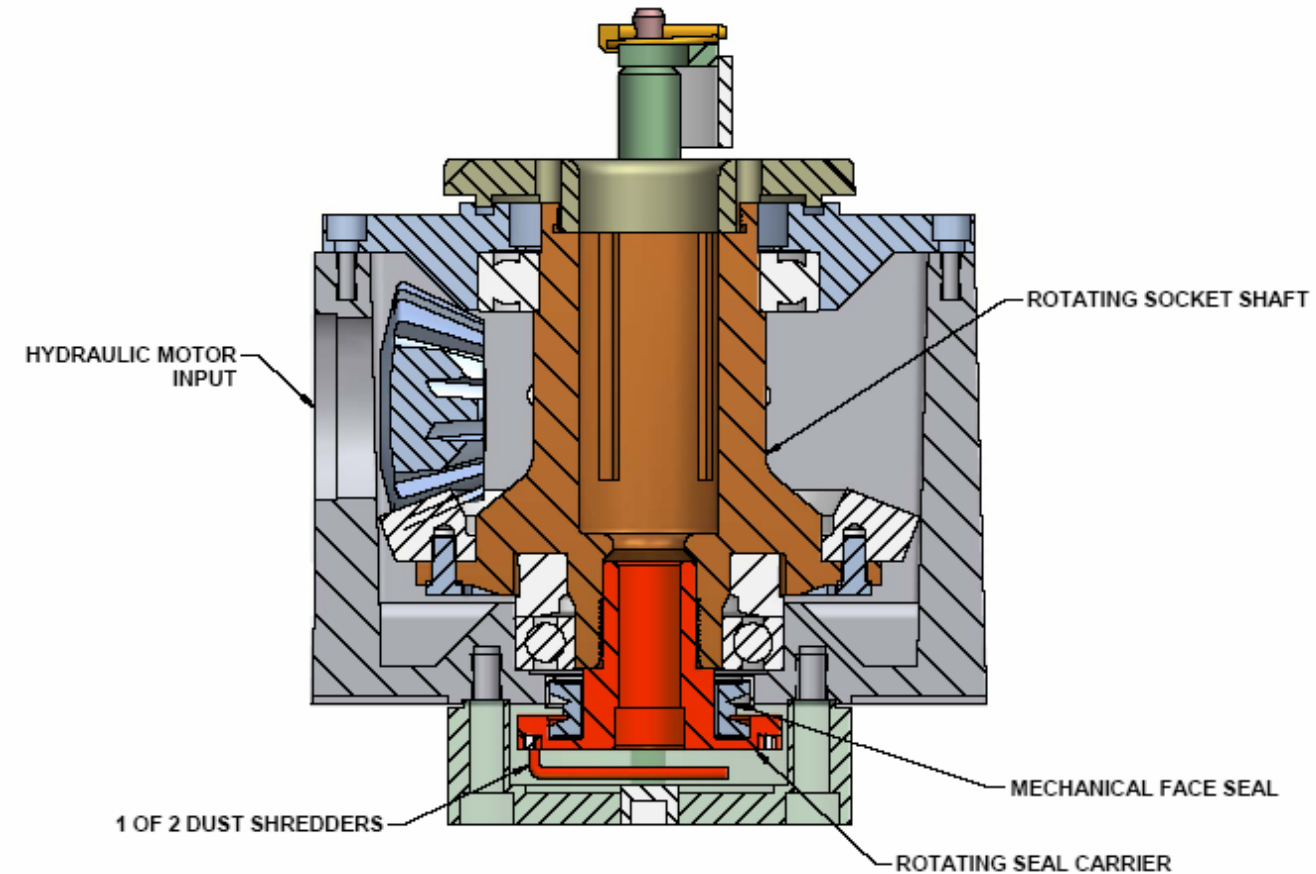
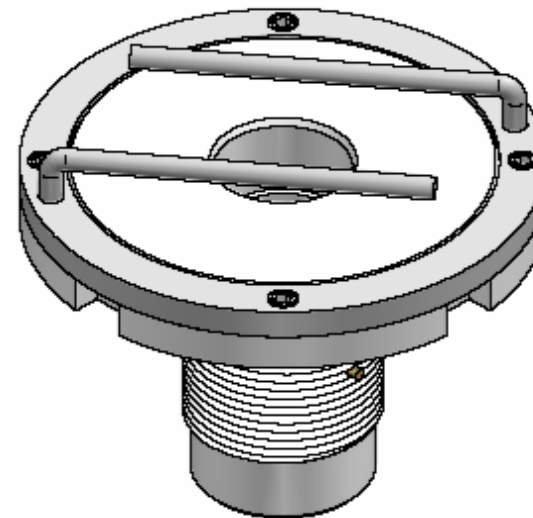
**Dust System Available Features**



# Patented Dust Agitator



DETAIL VIEW OF ROTATING SEAL CARRIER





**Warning and  
Instruction Tags  
on Dust Tank  
Door**

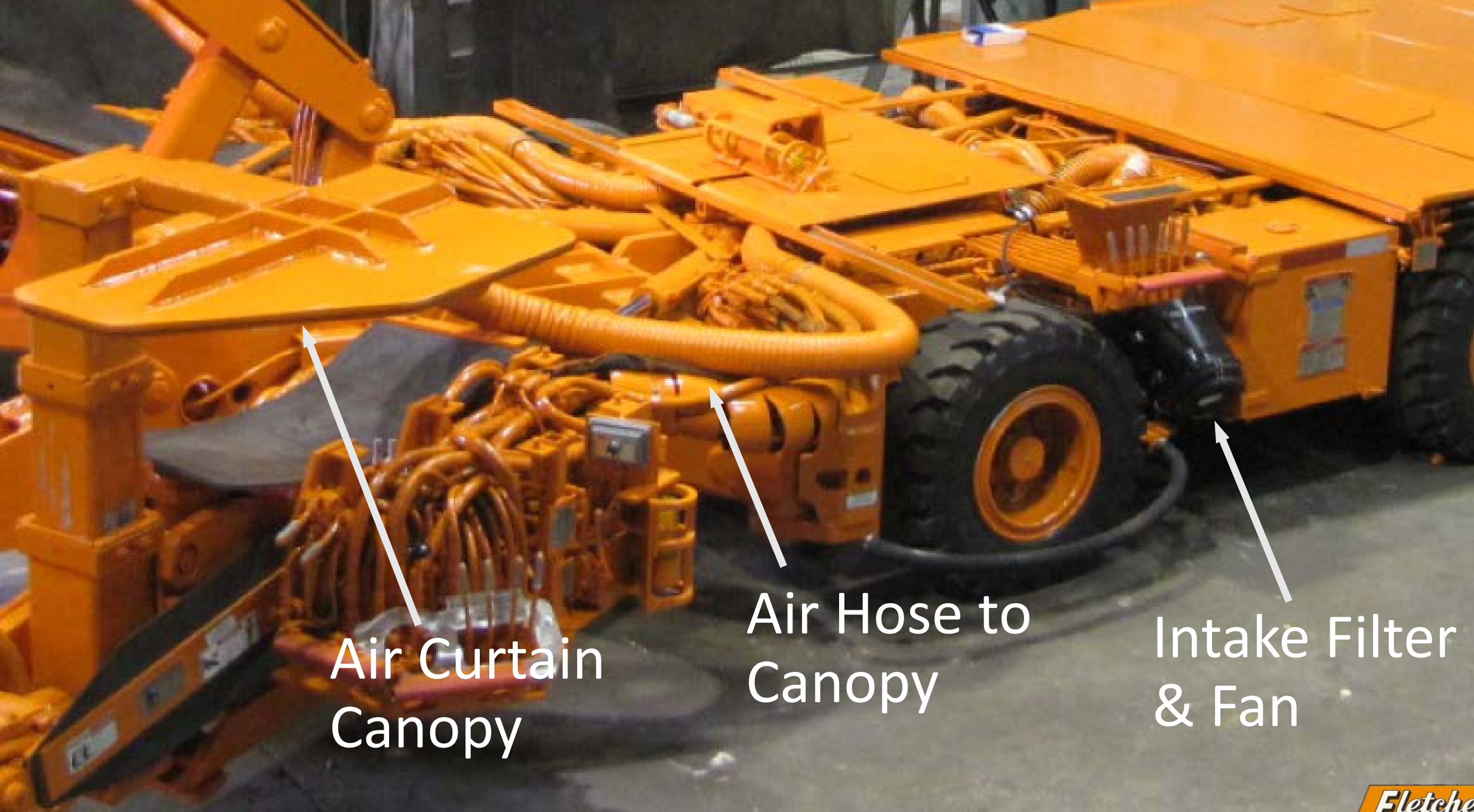




Wet Dust Box  
Improvements;

- Enlarged Dump Valve
- Water Resistant Filter
- Hopper Shape Status; MSHA has granted limited field approval to two mines.





Air Curtain  
Canopy

Air Hose to  
Canopy

Intake Filter  
& Fan



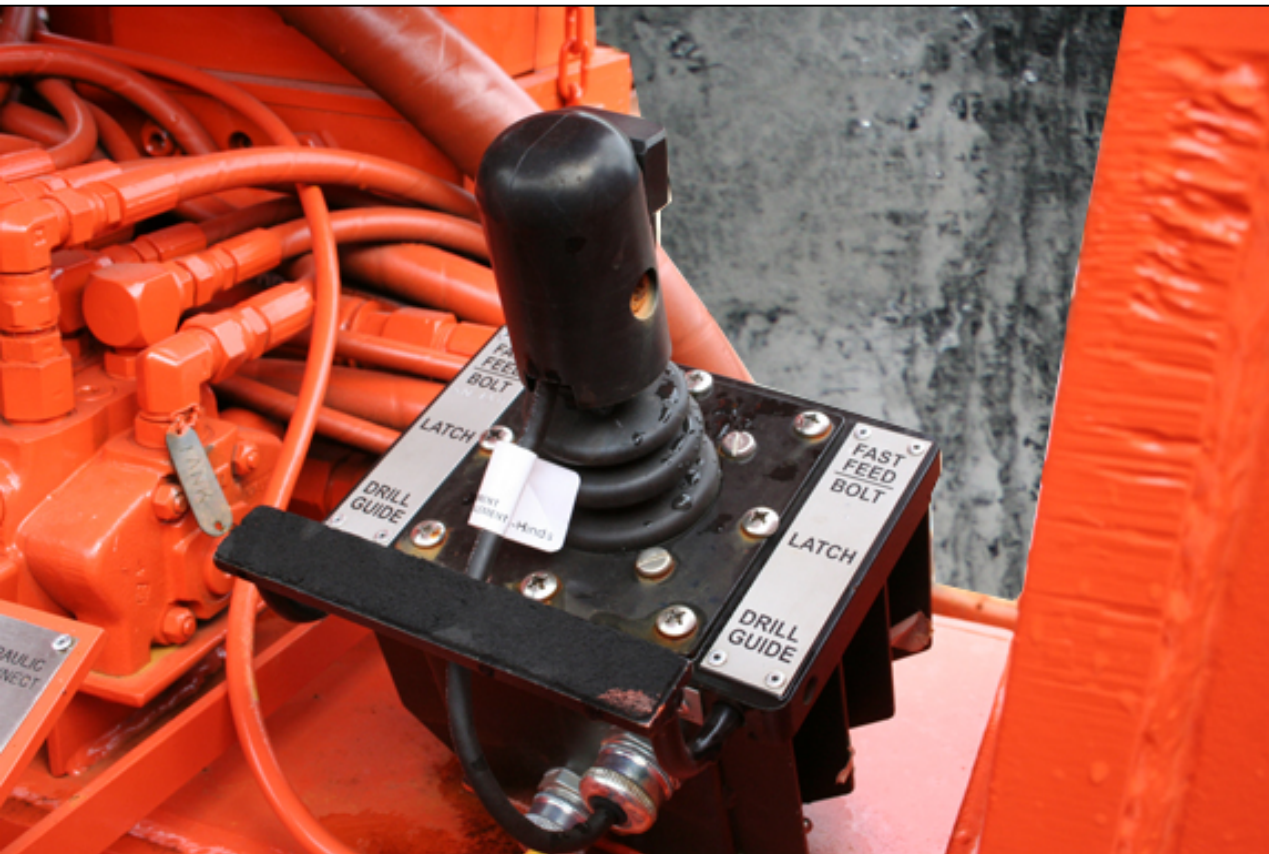
# Canopy Air Curtain







# Computer controlled drill, feedback system for optimizing drill cuttings





- Correct drilling parameters, manually drilling or computer controlled with feedback, are important.
  - Feed Pressure
  - Feed Speed
  - Rotation Speed
  - Vacuum
- Bits need to cut not grind.





Remote Roof Bolter w/Enclosed Cab







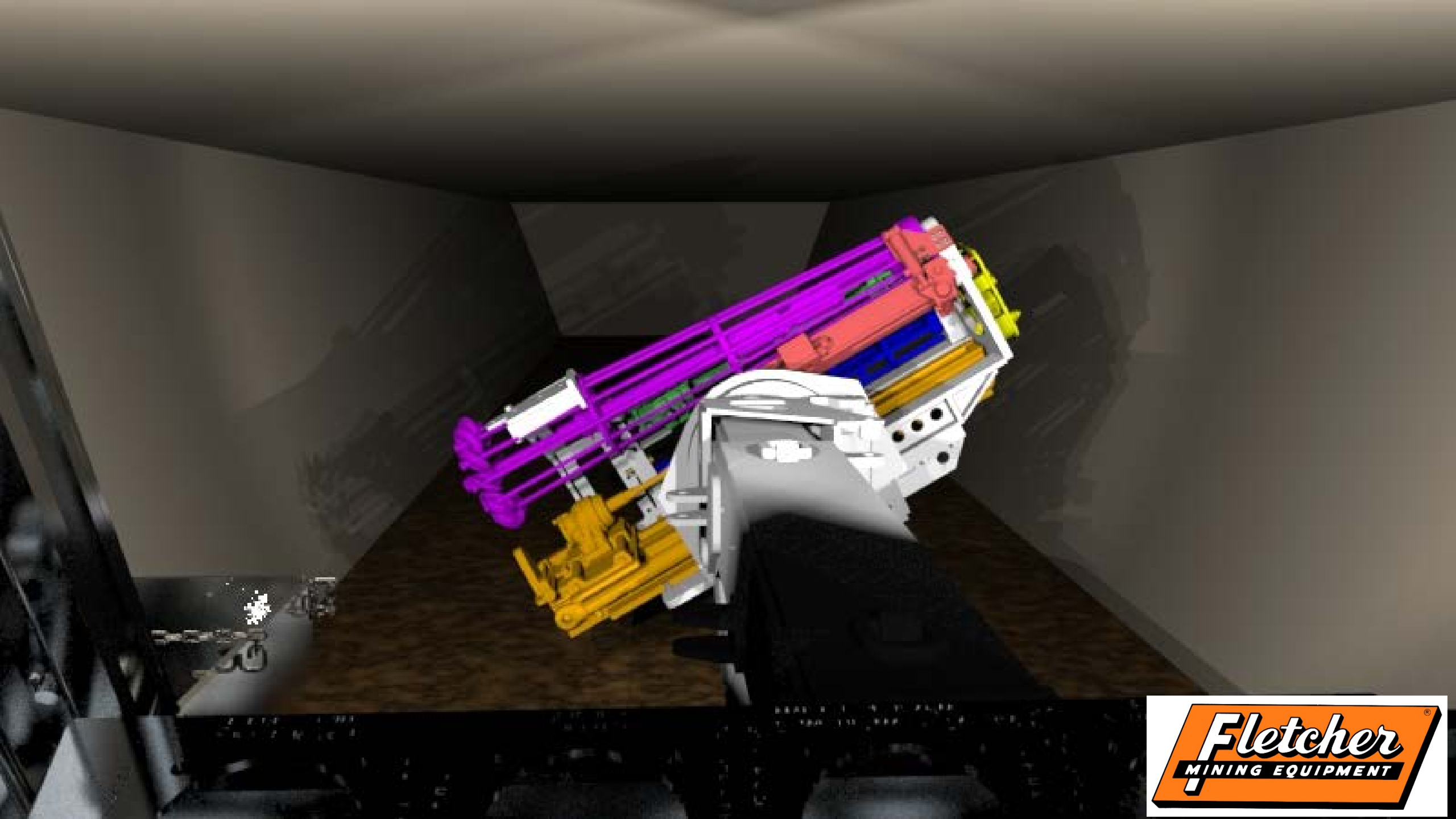
# Remote Roof Bolter Module



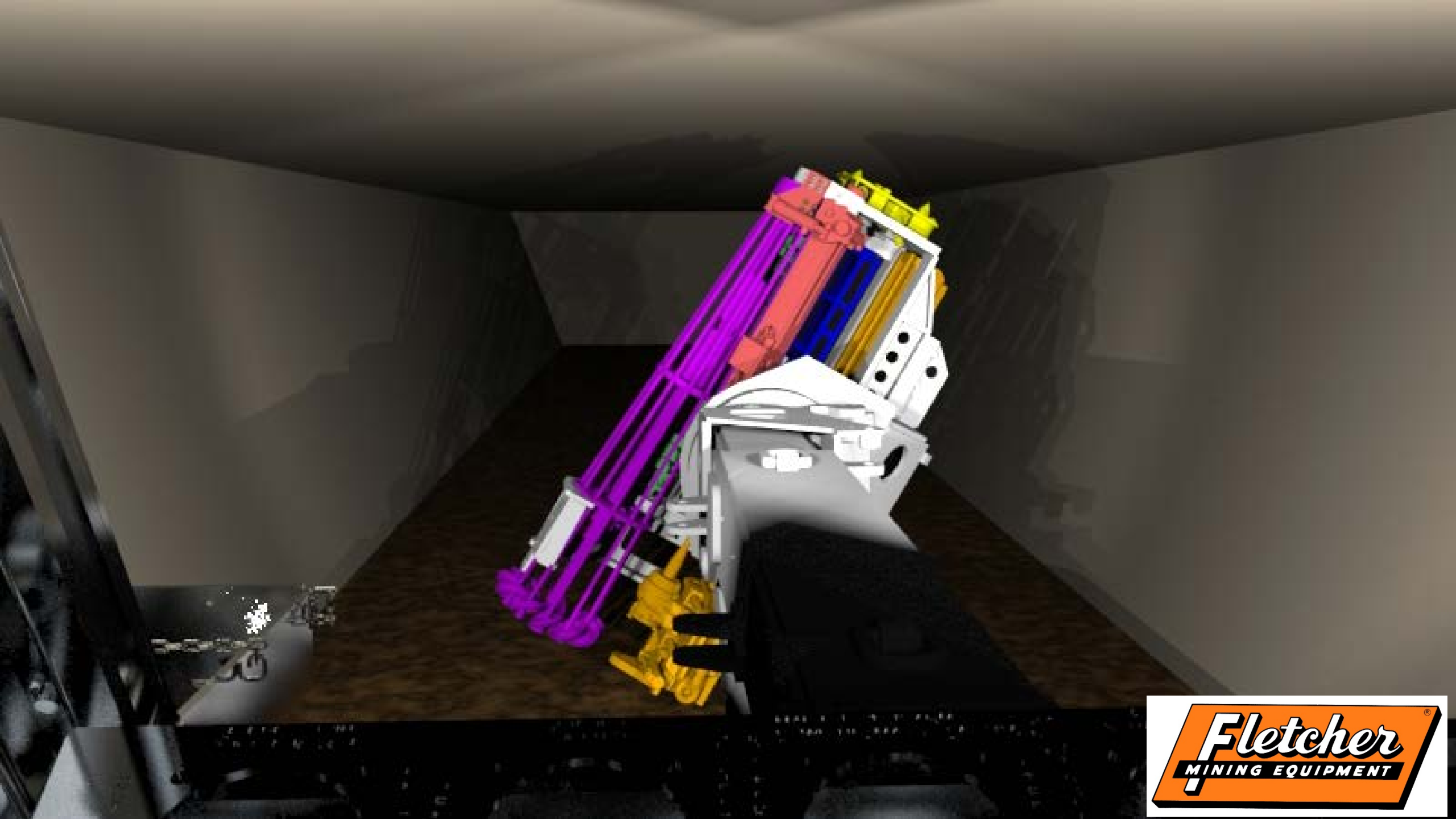


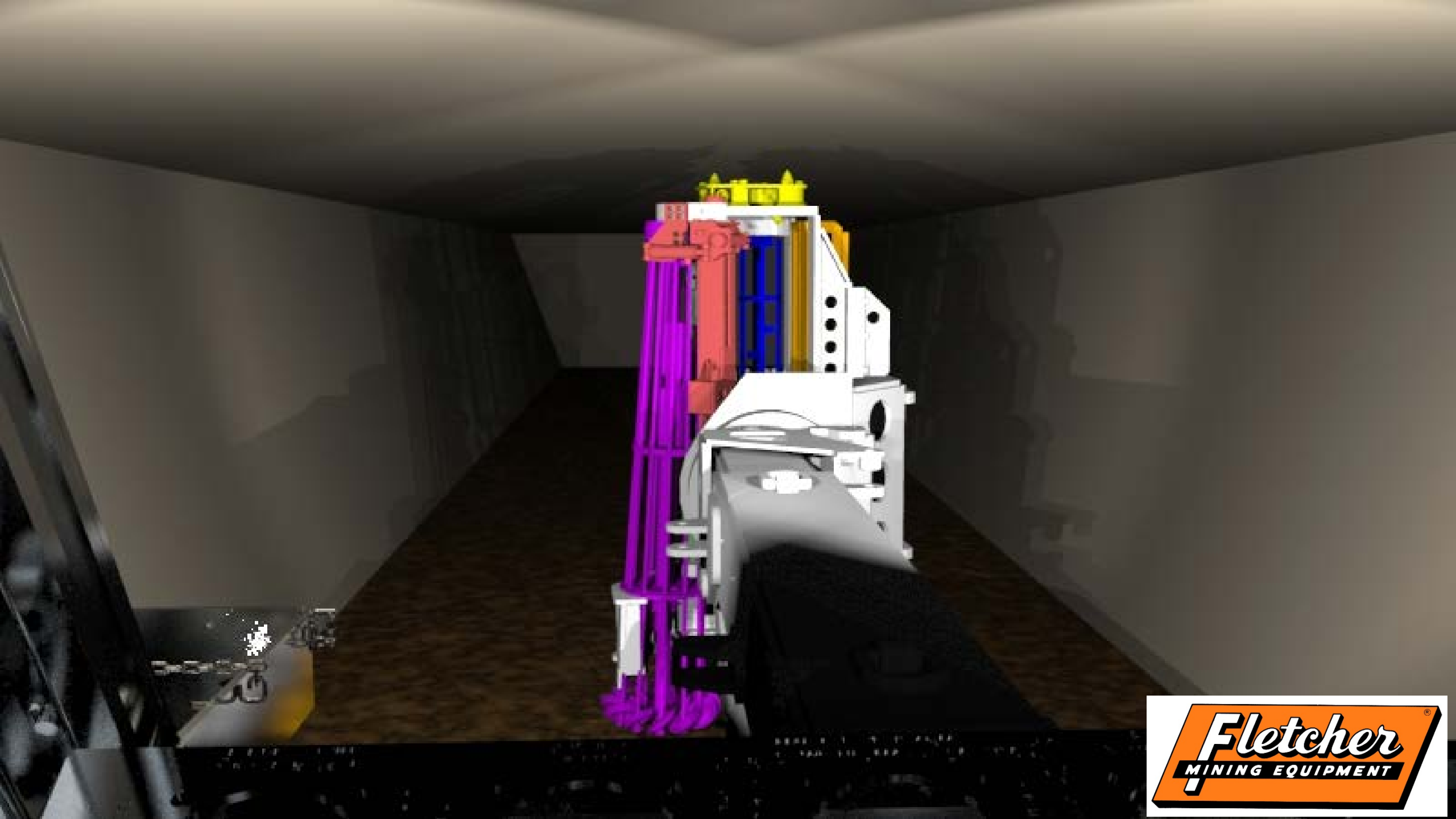
Automatic Bolt Module, view from cab









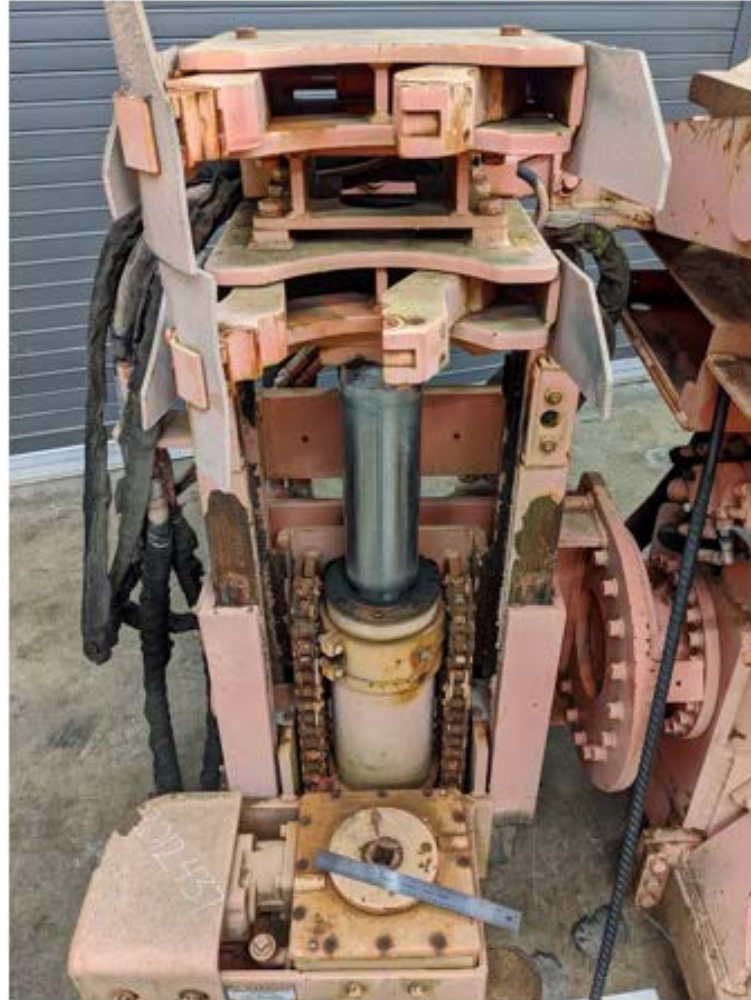


# Automatic roof bolter – Polish Copper Mine





ROBOTIC ARM  
ROOF BOLTER  
AND  
FOUNDATION  
GRANT -  
UK &  
FLETCHER





# Enclosed, Filtered, Pressurized Cabs NIOSH study



J.H. Fletcher Co. face drill and roofbolter machine were evaluated at two different underground limestone mines over four years.

# ISO 23875 CAB FILTRATION DRAFT STANDARD GOALS

Ambient CO<sub>2</sub> + 400 ppm maximum

120 seconds or less to clean cab to  $\leq 25 \text{ ug/m}^3$

Maintain cab pressure between 20 and 200 Pa

Cab pressure and CO<sub>2</sub> levels monitored with permanently installed monitoring system







*under control with Fletcher.....*



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