Proper Examination of Roof Bolter and Other Dust Control Systems

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MSHA
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NIOSH

Why Important

- Proper Examinations and Maintenance:
  - Evaluate and Optimize Dust Control Systems
  - Prevent Unhealthy Dust Levels
  - Protect Miners' Health
  - Lessen Downtime
  - May Increase Productivity

<u>It's the Right Thing to Do!</u>

Proper Examinations of Dust Controls

Required by Title 30 Code of Federal Regulations Section 75.362(a)(2):

"(2) A person designated by the operator shall conduct an examination to assure compliance with the respirable dust control parameters specified in the mine ventilation plan. In those instances when a shift change is accomplished without an interruption in production on a section, the examination shall be made anytime within 1 hour of the shift change. In those instances when there is an interruption in production during the shift change, the examination shall be made before production begins on a section. Deficiencies in dust controls shall be corrected before production begins or resumes. The examination shall include air quantities and velocities, water pressures and flow rates, excessive leakage in the water delivery system, water spray numbers and orientations, section ventilation and control device placement, and any other dust suppression measures required by the ventilation plan. Measurements of the air velocity and quantity, water pressure and flow rates are not required if continuous monitoring of these controls is used and indicates that the dust controls are functioning properly."

Section Dust Generation Sources

- Continuous Mining Machines
- Roof Bolting Machines
- Other Sources

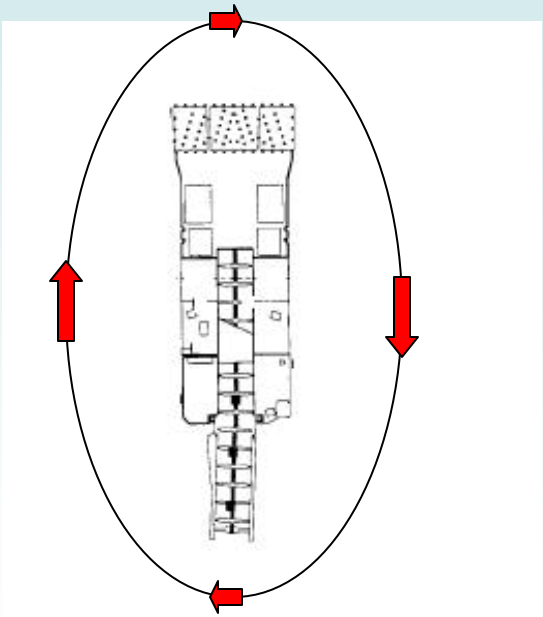
Continuous Mining Machines

- General Procedures for an On-Shift Examination of Dust Control Measures for Continuous Mining Machines.

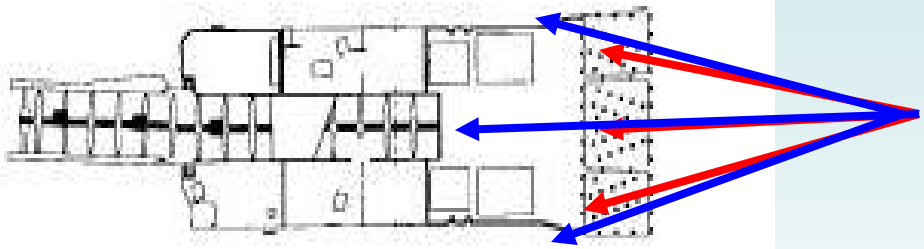
Checking Continuous Mining Machine Dust Control Systems

If the Machine Isn't Cutting Coal:

- Check for Safety
- Walk All the Way Around the Machine
  - Note General Condition
  - Housekeeping
  - Obvious Defects in the Machine



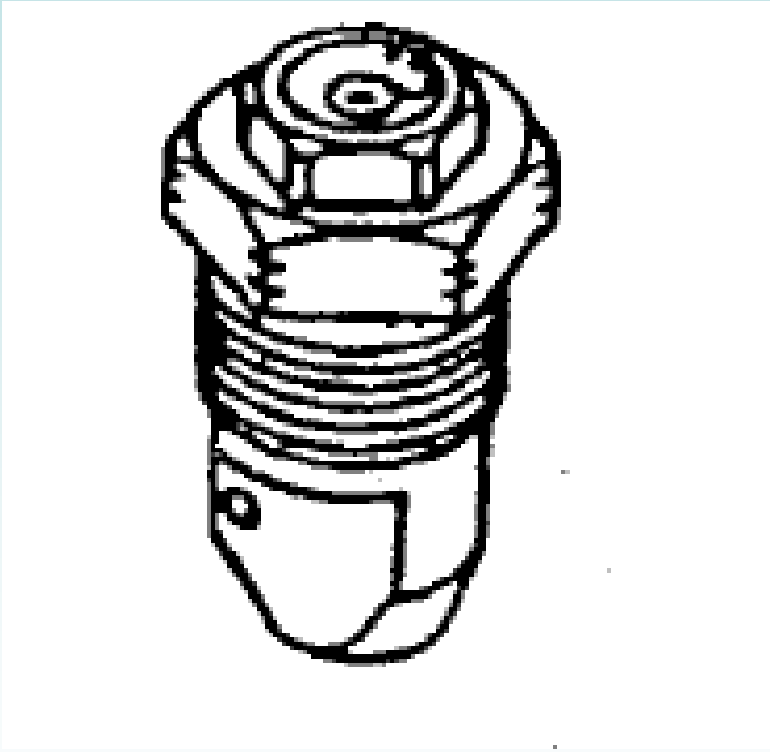
Checking Continuous Mining Machine Dust Control Systems



- Count the Number of Sprays and Compare with the Approved Ventilation Plan Requirements regarding Number, Location, and Angle (if applicable).

Checking Continuous Mining Machine Dust Control Systems

- Check Enough Sprays to Make Sure that the Sprays in Use are as Specified in the Approved Ventilation Plan.



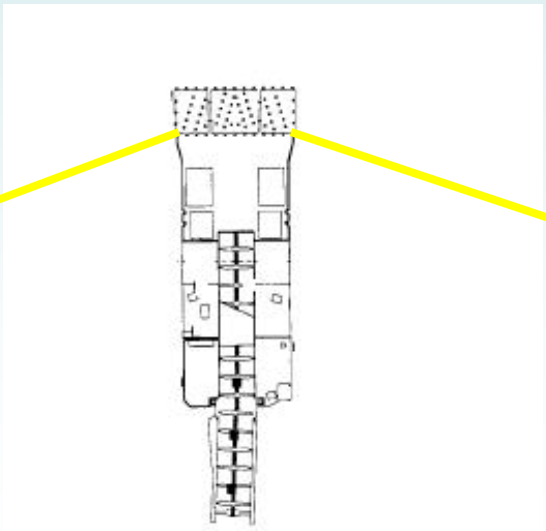
Checking Continuous Mining Machine Dust Control Systems

- Start the Machine and Count the Number of Operational Sprays.
- Compare Against the Requirements of the Approved Ventilation Plan.
- Deactivate the Machine and Prepare to Measure the Operating Spray Pressure.

Checking Continuous Mining Machine Dust Control Systems

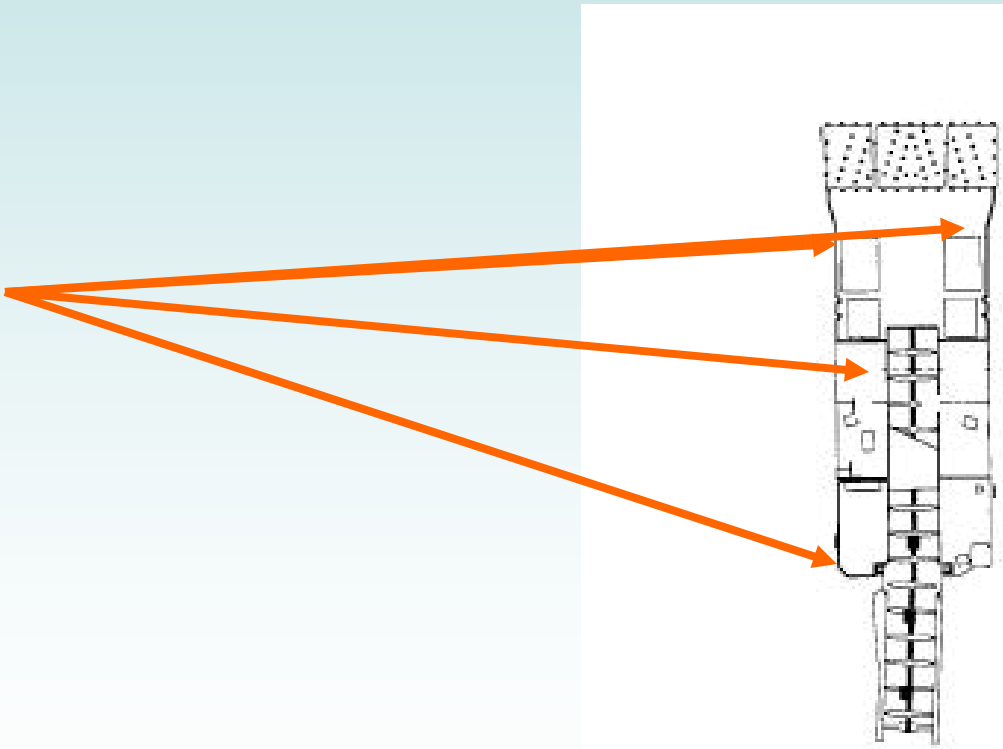
- Start the Continuous Mining Machine and Check the Operating Pressure of the Sprays.
- If Equipped w/Pressure Gauge, Check Pressure (If Correlated).
- Compare Against the Requirements of the Approved Ventilation Plan.

(Note the Scrubber – if applicable – Must be Operating During the Pressure Checks)



Checking Continuous Mining Machine Dust Control Systems

- Check the Scrubber Inlet(s), Ductwork, and Exhaust for Debris and Other Obstructions.



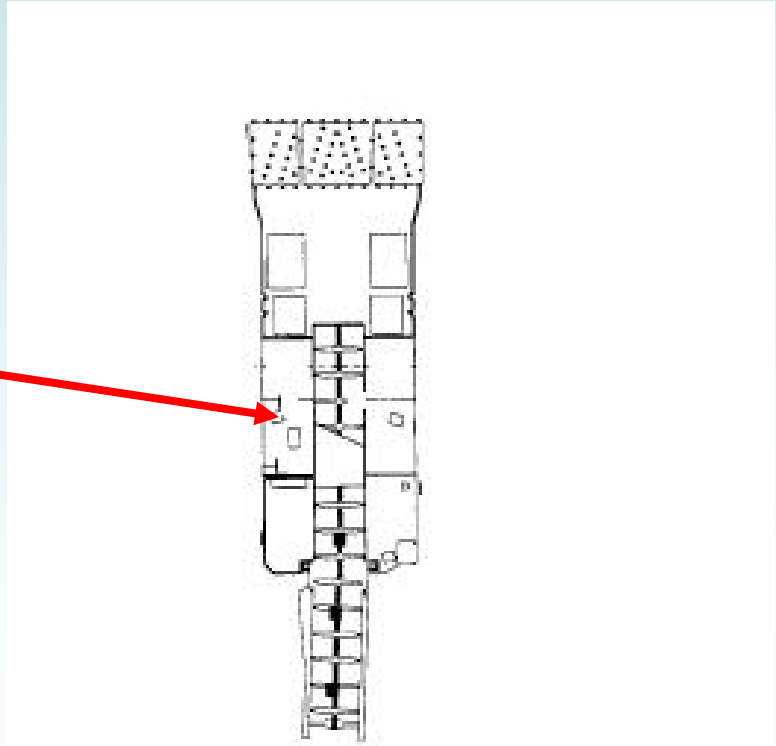
Checking Continuous Mining Machine Dust Control Systems

- Check (and clean) the Scrubber Screen.

  -Make Sure it is the Type Specified in the Approved Ventilation Plan.

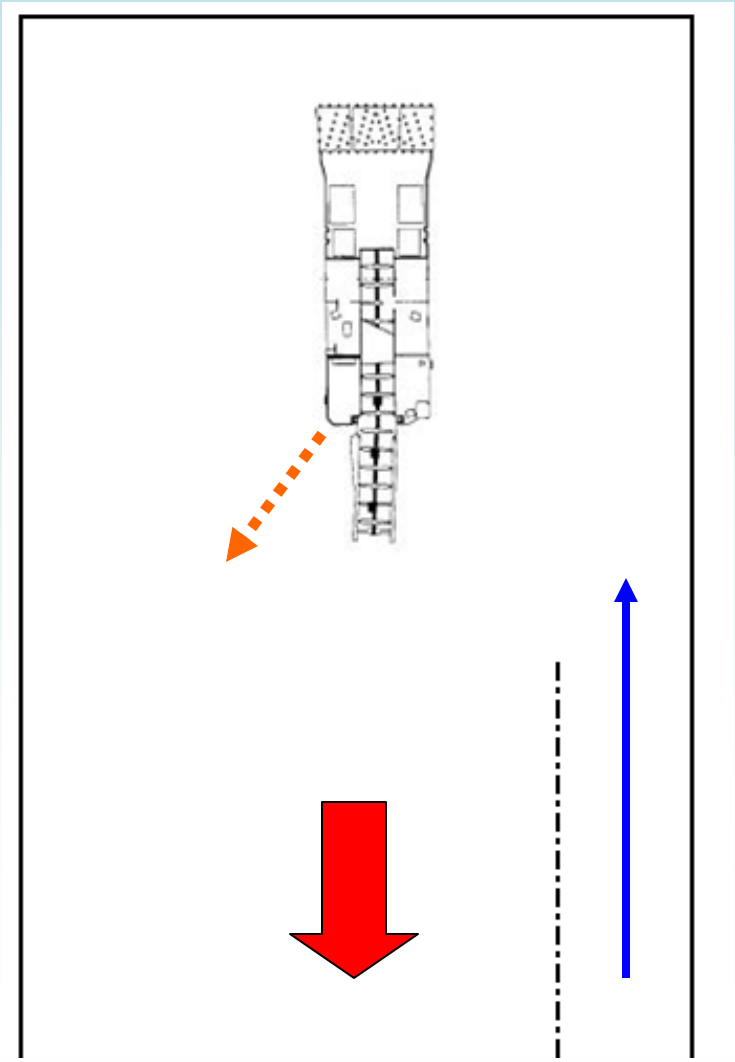
Checking Continuous Mining Machine Dust Control Systems

- Take a Centerline Reading of the Operating Scrubber Airflow, Correlate the Centerline Reading with a Full Traverse, and Compare with the Requirements of the Approved Ventilation Plan.



Checking Continuous Mining Machine Dust Control Systems

Face Blowing Ventilation



- Prior to Activating the Scrubber, Measure the Air Quantity Supplied Behind (or Through) the Face Ventilation Device.

  - For Optimum Dust Control With Face Blowing Ventilation it is **Essential** to Balance the Air Quantity Supplied with the Discharged Scrubber Quantity.

    *Too Much Air will Override the Scrubber and Cause Rollback

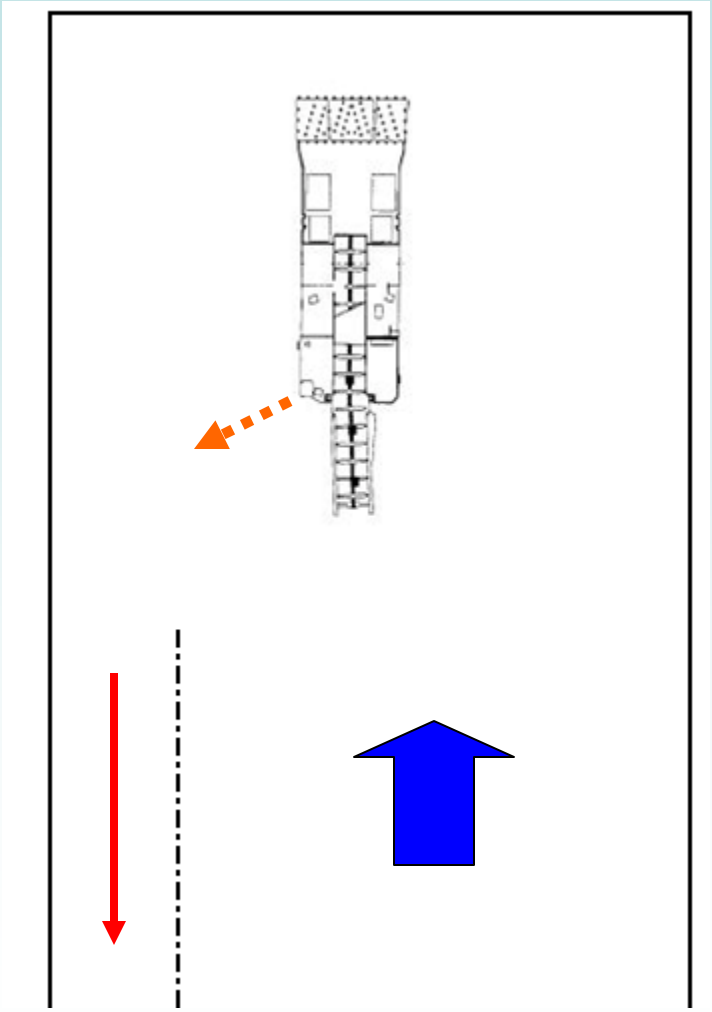
    *Too Little Air will Result in Recirculation

- The Proper Amount is Equal to the Scrubber Discharge Up to No More than 120% of the Scrubber Discharge.

Example: The Scrubber Discharges 8,000 CFM. The Proper Amount is between 8,000 CFM and 9,600 CFM.

Checking Continuous Mining Machine Dust Control Systems

Face Exhaust Ventilation



- Prior to Activating the Scrubber, Measure the Air Quantity Supplied Behind (or Through) the Face Ventilation Device.

  - For Optimum Dust Control With Face Exhaust Ventilation the Air Quantity Supplied by the Ventilating Device Should be the Same or Greater than the Discharged Scrubber Quantity.

Example: The Scrubber Discharges 8,000 CFM. The Proper Amount is 8,000+ CFM.

Checking Continuous Mining Machine Dust Control Systems

- Observe the Machine While Cutting Coal. Look for:

  -Dust Rollback

  -Recirculation

  -Clogged/Damaged Sprays

  -Chatter/Vibration from the Scrubber

  -Other Health/Safety Hazards

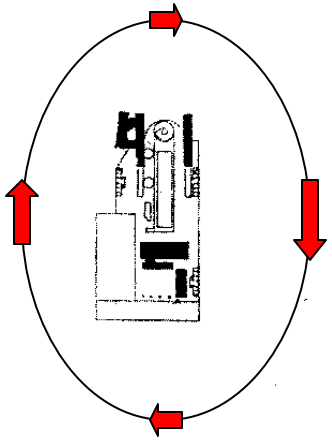
Roof Bolting Machines

- General Procedures for an On-Shift Examination of the Dry Dust Collection System and Other Dust Control Measures for Roof Bolting Machines.

Checking Dry Dust Collection Systems

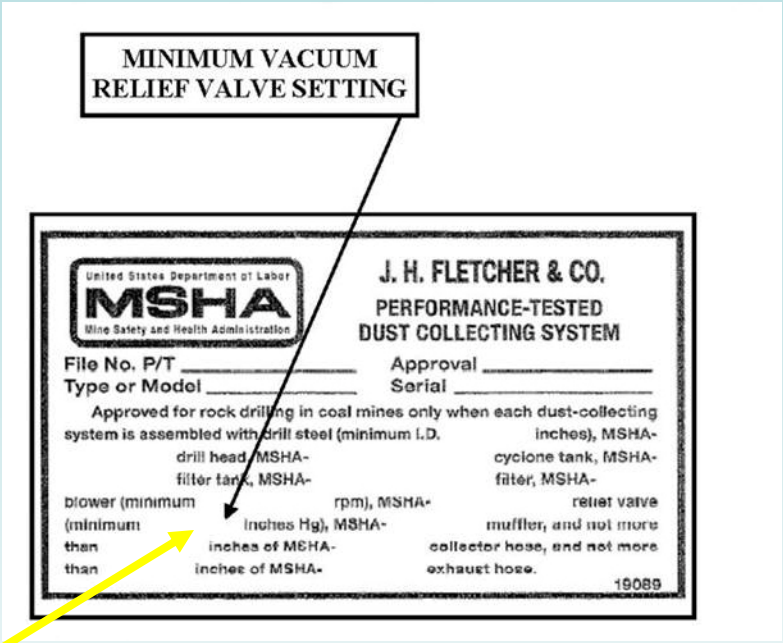
If the Machine Isn't Installing Bolts:

- Check for Safety
- Walk All the Way Around the Machine
  - –Note General Condition
  - –Housekeeping
  - –Obvious Defects in the Machine and the Dust Collection System



Checking Dry Dust Collection Systems

– Check the Collections System Approval Tag (Located in the Operator's Tramming Compartment).



Checking Dry Dust Collection Systems

The Approval Specifies the Approved Components Required for the Dry Dust Collection System.

Approval Number

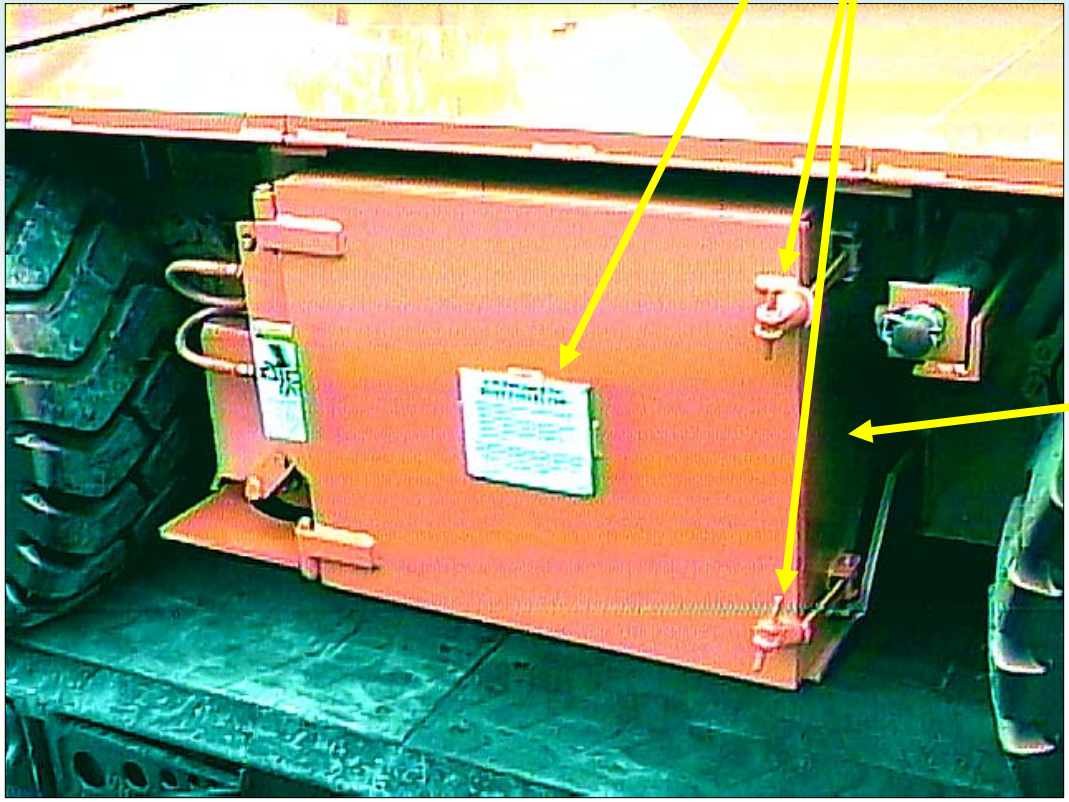
Vacuum Setting

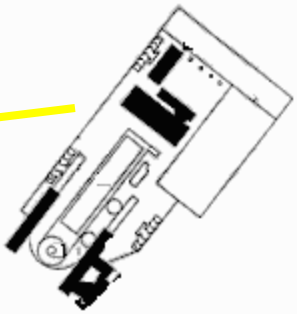
Approved Dust Hose

Checking Dry Dust Collection Systems

Check Exterior Dust Tank Door(s) for Damage.

Check Tank Latches for Damage.





Checking Dry Dust Collection Systems

Open The Dust Tank Doors and Check the Gaskets.

•Each Compartment and the Perimeter Must Be Separated with an Air-Tight Gasket.

Checking Dry Dust Collection Systems

- Check the Cyclone Separator Unit.
- Check Hose for Holes or Cracks.
- Clamps Must be Installed Tightly.

Checking Dry Dust Collection Systems

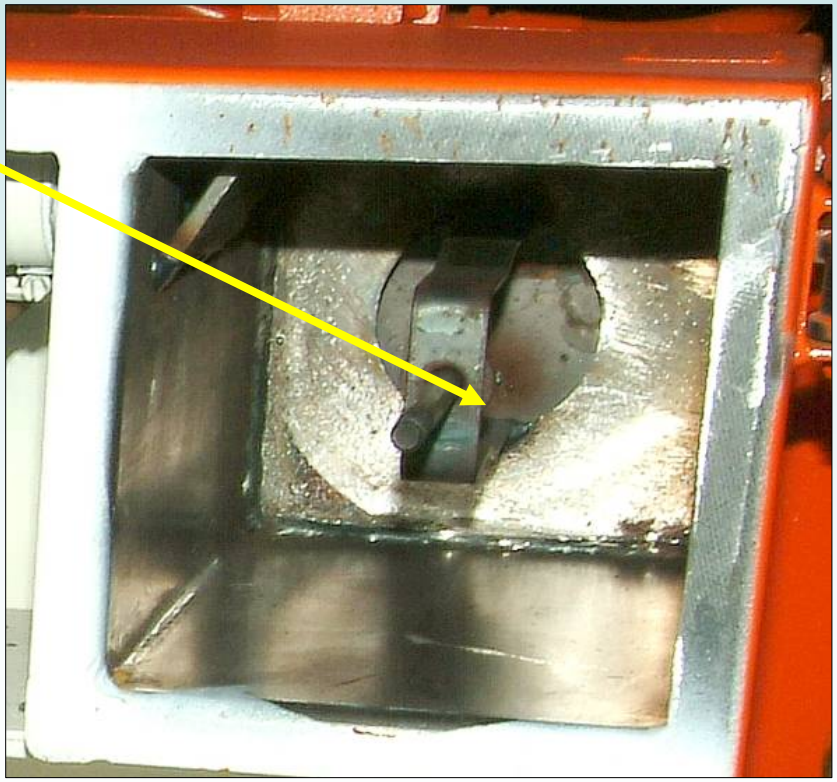
•Check the Gasket Seal Area for Contamination and Bypass.

•Remove the Filter(s).

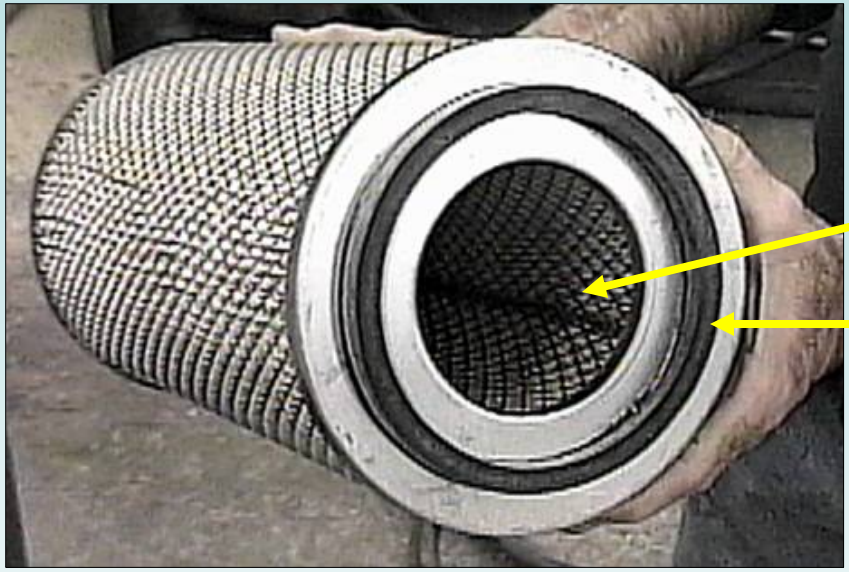
-Note Respirator Highly Recommended.

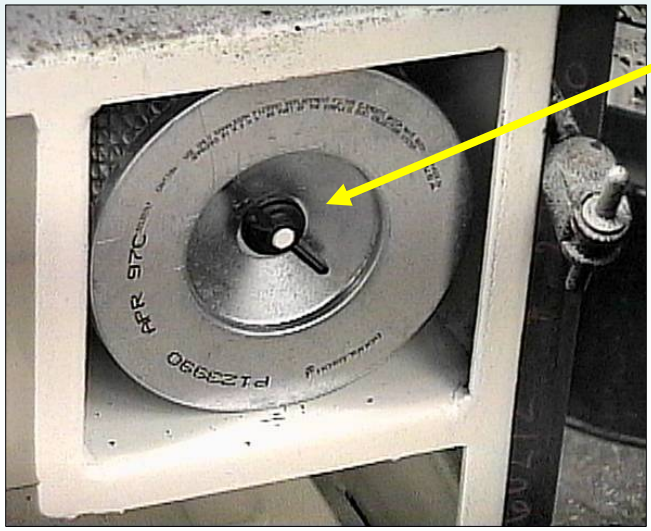
Checking Dry Dust Collection Systems

•Check the Area Inby the Filter for Contamination with Fine Dust Particles.



Checking Dry Dust Collection Systems





- Check the Filter Media Gasket for Defects, Deformation, and Loading.

- Reinstall the Filter.

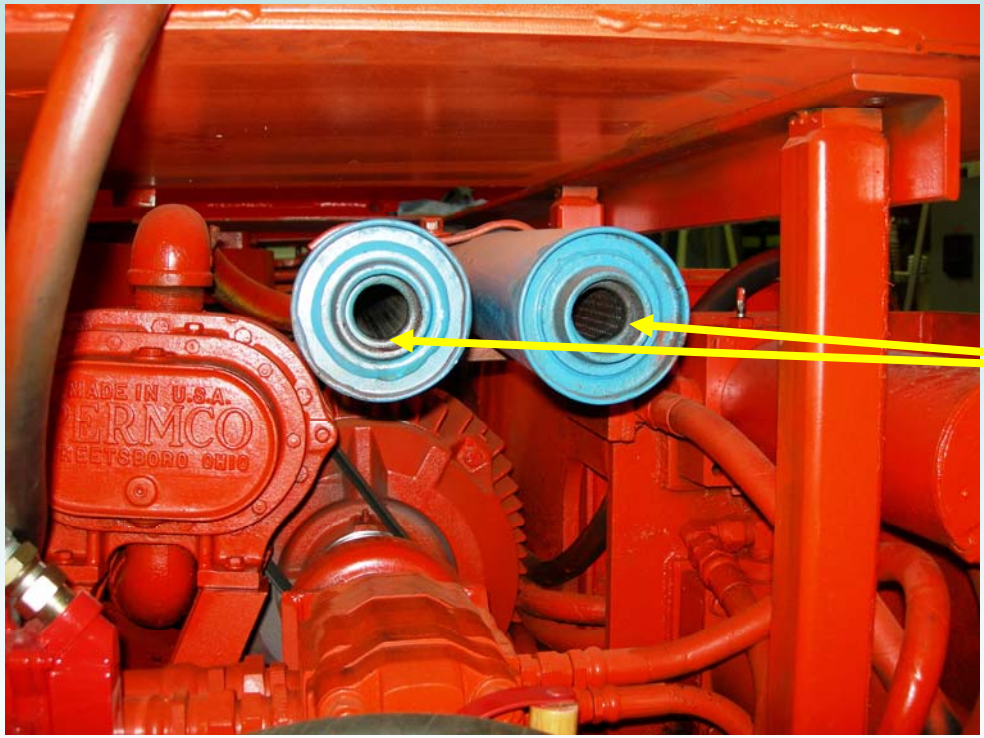
  - Hand tighten wing nut as tight as possible.

  - Dust leakage around nut is possible if not tight.

Checking Dry Dust Collection Systems

- Check the Skirt on the Pre-Cleaner (if Applicable).

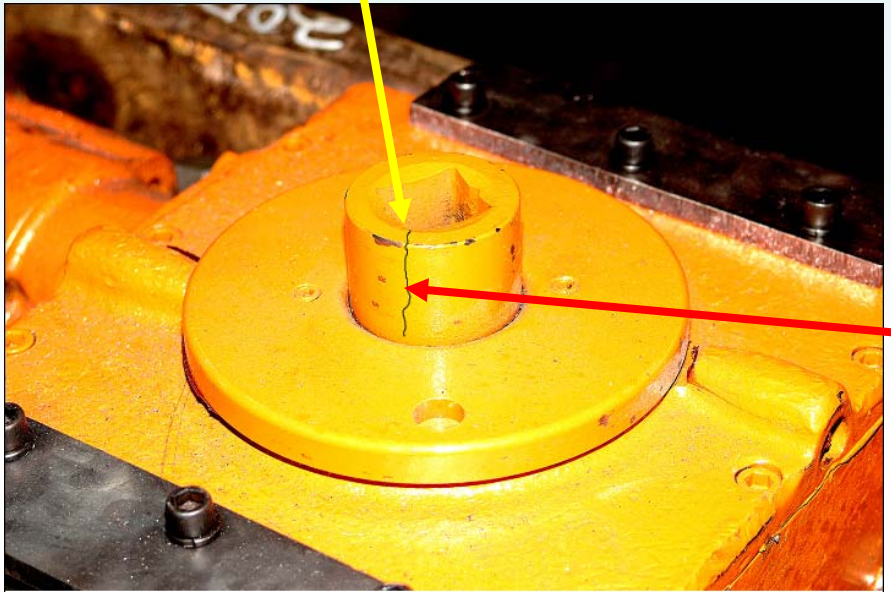
Checking Dry Dust Collection Systems



- Check the Exhaust Ports on the Muffler System for Build Up of Fine Dusts.

Checking Dry Dust Collection Systems

- Check the Drill Chuck for Cracks and Excessive Wear.



(Cracked Drill Chuck)

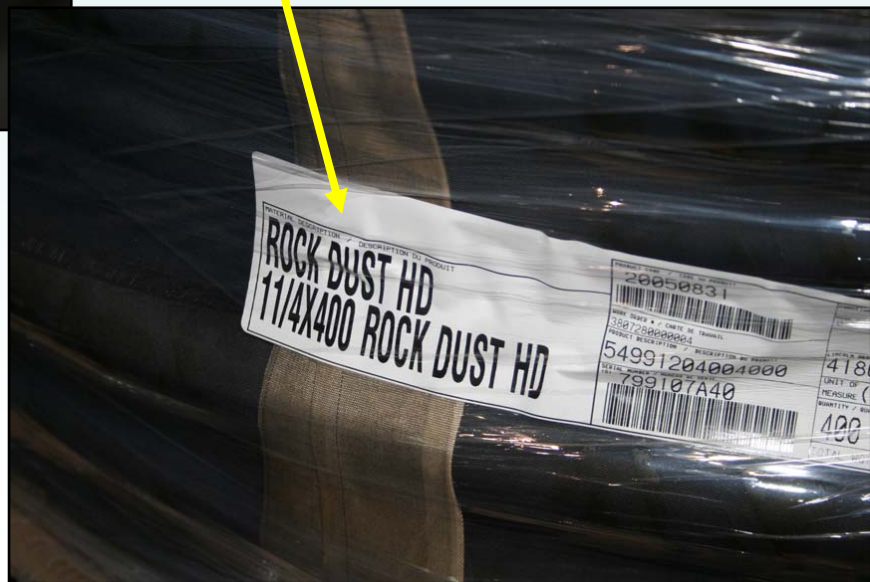
Checking Dry Dust Collection Systems

- Check the Vacuum Hose.

  - Only Approved Vacuum Hoses May be Used.

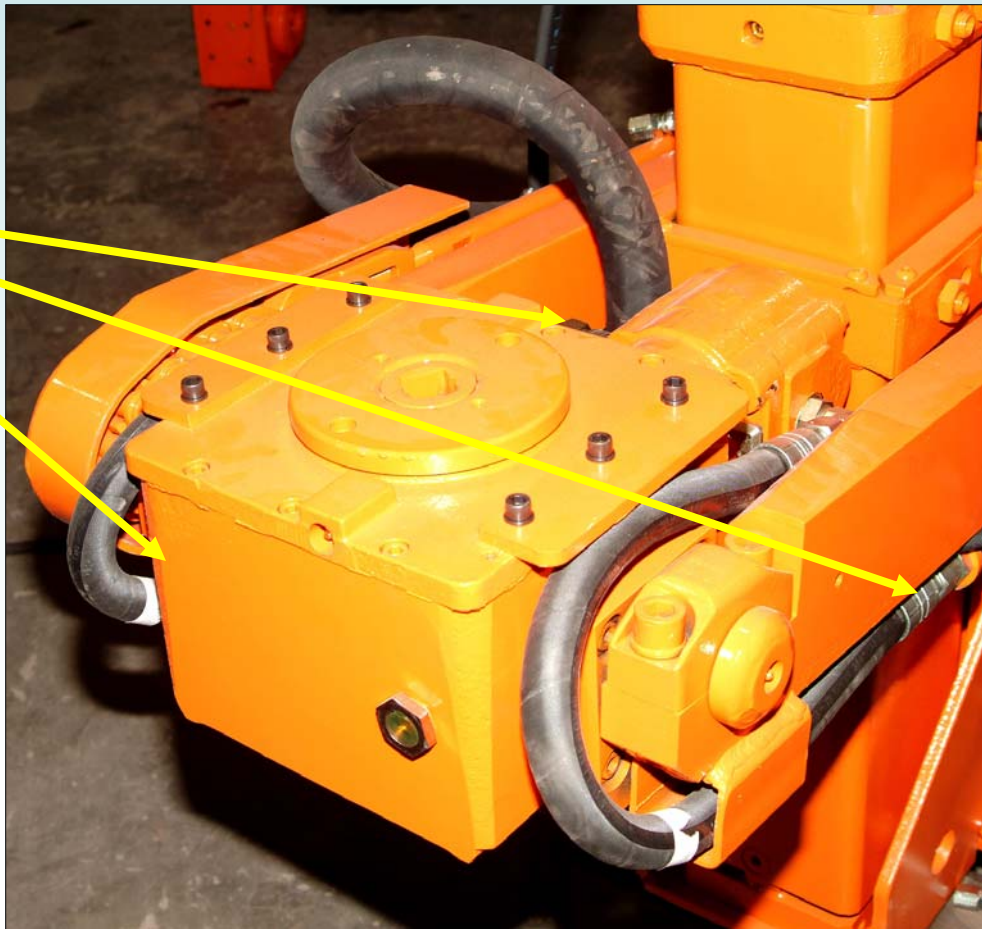
Checking Dry Dust Collection Systems

- Make Sure that the Vacuum Hose is Approved for Use.

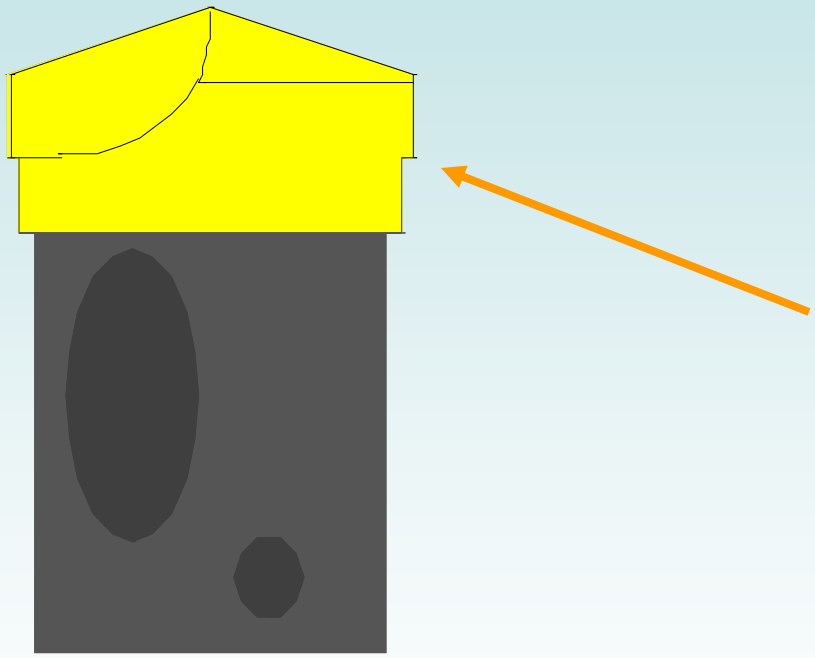


Checking Dry Dust Collection Systems

- Check that all Hose Connection Points are Clamped or Tightly Installed.

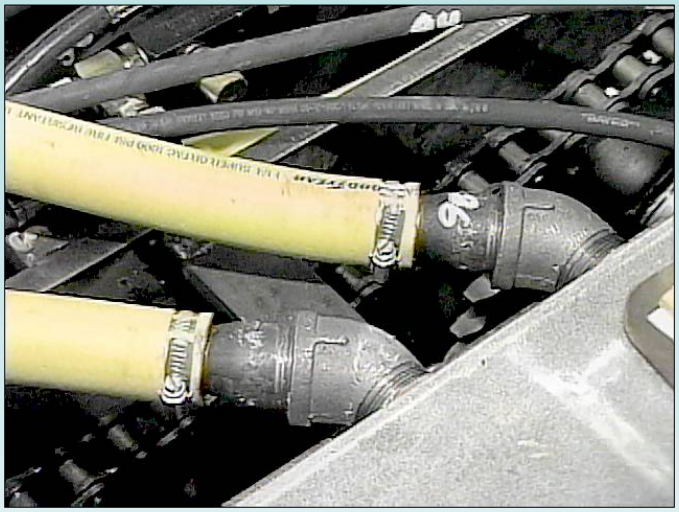


Checking Dry Dust Collection Systems

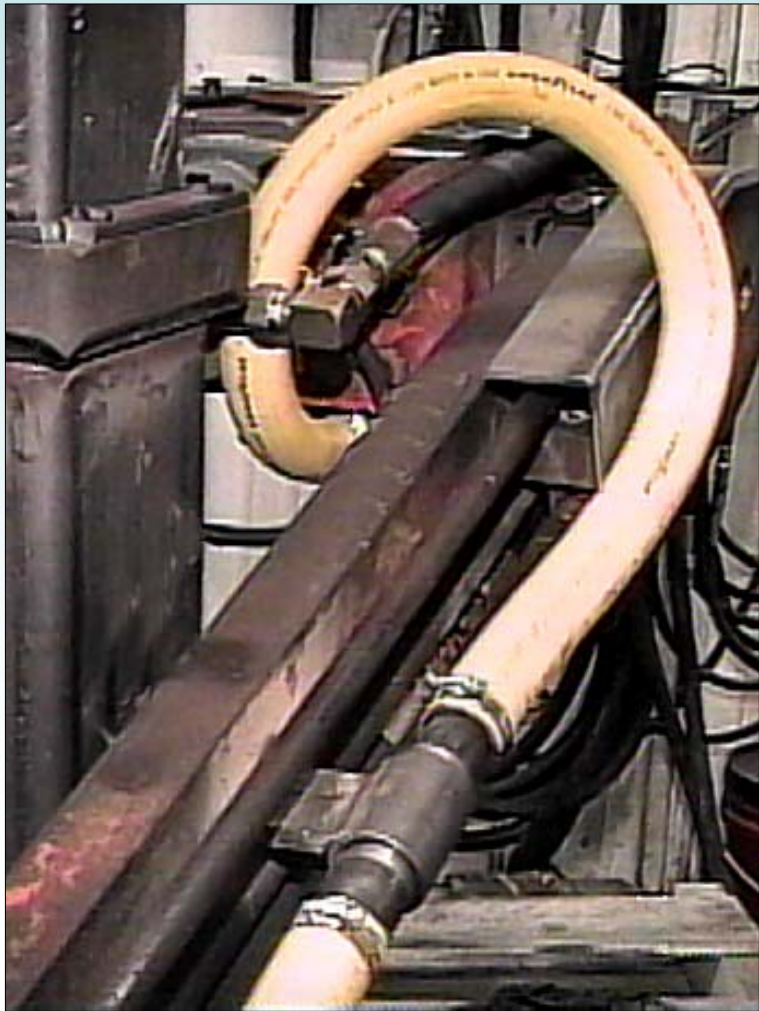


- Check that there is an Adequate Supply of Sharp Drill Bits.

Checking Dry Dust Collection Systems



- **No kinks in hoses**
- **Use only approved hose**
- **Make sure all clamps are tight**



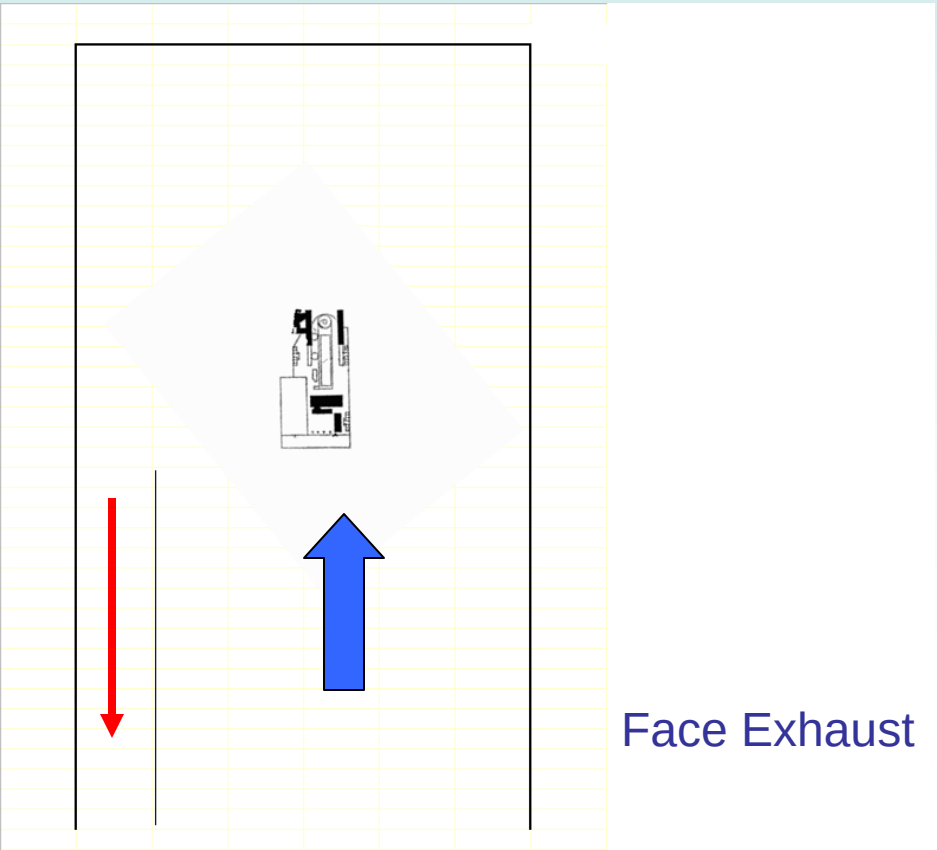
Check all visible Components for Obvious Defects.

Checking Dry Dust Collection Systems

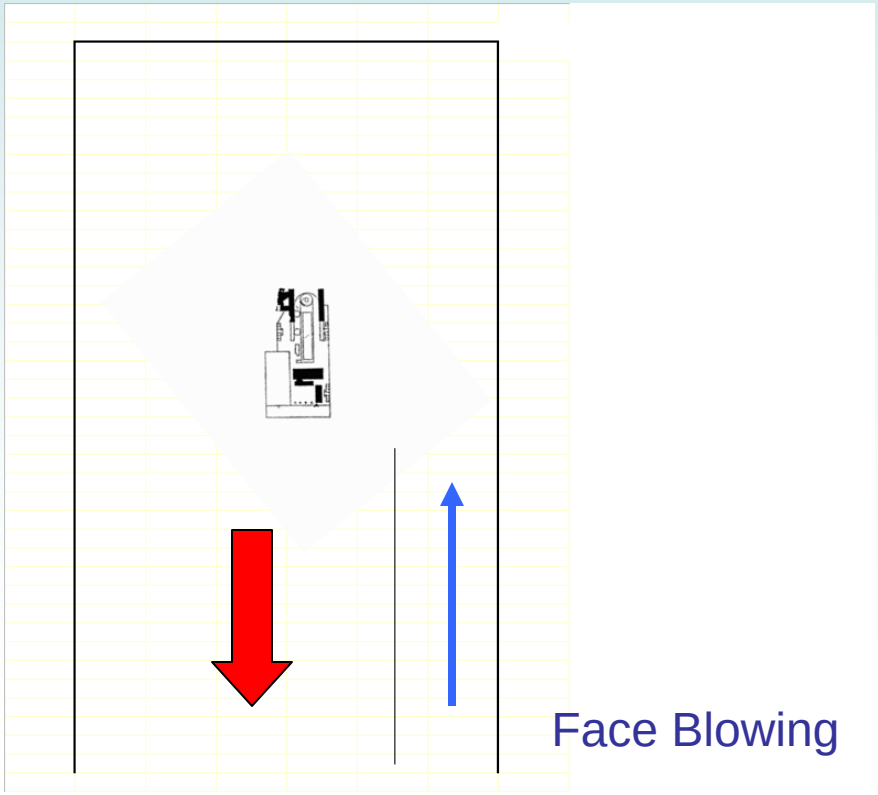
Start the Machine and Check the System Vacuum.

Other Roof Bolter Dust Controls

Check Ventilating Air Currents (if required)
by the Approved Ventilation Plan.



Face Exhaust



Face Blowing

Roof Bolter Dust Controls

- Observe the Machine While Roof Bolts are being Installed. Look for:

  -Fine Dust Coming from Muffler System

  -Dust Coming From the Drill Hole

  -Leaks

  -Other Health/Safety Hazards

Other Dust Sources

- Roadway Dust
  -Dry Roadways
  -Pre-Dumps
  -Dust Box/Tank Cleaning
- Track Haulage (Sand)
- Rock Dusting

Proper Examination of Respirable Dust Controls

- (g) *Certification.* (2) The certified person directing the on-shift examination to assure compliance with the respirable dust control parameters specified in the mine ventilation plan shall certify by initials, date, and time that the examination was made.

- Deficiencies in dust controls shall be corrected before production begins or resumes.

- Special Thanks to J. H. Fletcher & Co., NIOSH, Academy Staff, and the Mining Industry for Their Assistance and Permission to Use Their Images…

Questions?

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