

**ROCKY MOUNTAIN MASTER MECHANICS ASSOCIATION  
MAY 3 & 4, 2012  
SHERIDAN, WYOMING**

**Scott Anderson, Chairman  
Miles Dockter, Secretary Treasurer**

**Kelly Hardy, Vice-Chairman Mobile  
Mike Lucy, Vice-Chairman Plant**

The Anti-Trust Statement was read.

Next meeting November 29 and 30, 2012 Rapid City, South Dakota Holiday Inn

Spring meeting April 25 and 26, 2013 Rapid City, South Dakota Holiday Inn

\$1000.00 scholarships were offered to the following individuals;

|                      |                         |
|----------------------|-------------------------|
| Matthew Landenberger | Underwood, North Dakota |
| Nathan Tryon         | Gillette, Wyoming       |
| Ethan Barthel        | Gillette, Wyoming       |
| Cody Koenig          | Beulah, North Dakota    |
| Trapper Rieniets     | Gillette, Wyoming       |

**SENSEAR**

Jane Haynie

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[www.sensear.com](http://www.sensear.com)

- Developers of technology that protects your hearing while allowing you to hear.
- Based in Australia and originally developed in the coal mining industry
- Main goal was to reduce the cost of hearing loss due to workplace noise
- Has been on the market for five years with worldwide availability
- Provides three things other hearing protection does not
  - Single protection to 85dB, dual to 120 dB
  - Ability to communicate
  - Awareness of surroundings
- Complete communication
  - Face to face
  - Short range (head set to head set)

- Long Range (via radio or blue tooth)

## OPEN DISCUSSION

- Problems with 24 H&M circle drives , especially the rear drive
  - Pinion and seal failures common
  - Several locations have auto lube on pinion gear
  - Make sure motors match gear case
- Circle shoe bolts breaking
  - One location drills out first section of threads to prevent sections from acting as a double nut
- Some older 24's had flow dividers between circle drive motors that caused problems
- Tier II 12V 4000 problems were brought up
  - Broken turbo bolts
  - Rear cover leaks
  - Injector harness problem
  - No solutions given
- What type of platforms are being used on 16 & 24 M's
  - Several locations using OEM platforms
  - There are companies making platforms and lifts
    - L&H in Gillette, Wyoming
    - Power Step in Duluth, Minnesota
    - [www.accessinnovations.com](http://www.accessinnovations.com) is a website to check out
- Anyone using bolt in bed liners?
  - Not sure
  - Life was short
- What are procedures for changing rollers on dozers?
  - Jacks
  - Blocking
- Undercarriage
  - How many hours are people getting?
    - 4000
    - Depends on site materials
    - Depends on operating methods
    - 7500
  - Every mile machine is roaded takes 1% of life
  - Locking out third gear helps

- Several locations downloading forward to reverse travel
- Use of double flange rollers in center locations suggested
- Make sure rebuilder is getting center dimension of Idler correct
- Shimming of front bogies has helped to reduce wear
- Installation of weight on ripper helps to even out wear
- Several sites using swing roller frames
  - Some being rebuilt by vendors
  - Some being rebuilt on site
    - Feel it costs less to do it themselves
  - Suggestion to develop rebuild specifications to suit your needs
- 3500 Engine Issues
  - Lots of locations only doing initial valve adjustment after rebuild
    - Their feeling is more harm than good is done by follow up adjustments
  - Other locations anywhere from 2000 to 6000 hours on adjustments
    - Some locations have limited number of technicians doing adjustments
  - Most getting 18000 to 20000 hours on 3516's
    - 12000 to 15000 on 3508's
  - Oil coolers
    - Mesabi working on developing coolers
    - Positech has limited number of coolers available
  - Anyone having injector seal problems?
    - Yes, lots of locations
    - Suggestion to replace o-rings on reman injectors with updated o-rings
  - Several locations specifying how their rebuilds are done
    - New camshafts and followers
    - New valves, keepers, rotators, springs
      - Having valves ground or lapped to insure proper seating
  - Fuel burn becoming more popular as measure of engine life
- Anyone using B&G and how are they doing?
  - Yes, for 3508's
    - Getting good hours, 15,000
  - Positive comments on their balancing, runs smoother than dealer rebuilds
  - Overall results on 3508's has been positive

- Their 3516's having same issues as Cat dealers
  - Head gaskets, turbos, injectors, water grommets
- Distance to their location causes warranty concerns
- 789, 793 Concerns
  - Differential housing cracks around drain hole and lube ports
  - Coolant tank baffle between engine and cooler sides breaking free and allowing transfer between sections
- What is everyone getting for chain life on loaders?
  - 3500 hours on fronts, then rotating to rear for total of 15,000 hours
  - No further comments
- Tires
  - Rumors of tire shortage again
  - Is cracking around flange a concern
    - Some say yes, some say no
- Spray Solvents
  - What are people using?
  - Whatever MSHA allows
  - Citrus based products
- Recent MSHA inspection update
  - Looking for flammable liquids on wires
  - Equipment chained down when hauling
  - Dust entry into cabs
  - Seat belts
    - Must be changed out if older than 3 years
  - Air tank/vessels must be recertified every 3to5 years

## R J MANN EMISSION TESTING EQUIPMENT

[www.rjmann.com](http://www.rjmann.com)

Benjamin Connolly, [benjaminconnolly@rjmann.com](mailto:benjaminconnolly@rjmann.com)

Brian Gifford, [briangifford@rjmann.com](mailto:briangifford@rjmann.com)

- Company offers several combustion/emissions analyzers that can be used for engine maintenance and tuning and emissions compliance.
- As industry moves into Tier IV usage testing and tuning along with the logging and storage of emissions data will become more common.
- The company offers several models of analyzers

- Testo 350
  - 10 different pre-set sensors available
  - Can test both pre and post catalyst gases
  - Can be hooked directly to laptop or PC
  - Has wireless capability using Bluetooth
- Testo 340
  - More mobile than the Testo 350
  - Does not have all the features of the 350
  - Used primarily for engine tuning
- They also have thermal, acceleration, velocity and vibration monitoring equipment available.

#### ENERPAC DOZER LIFT SYSTEM

[www.enerpac.com](http://www.enerpac.com)

Tyson Wiegel, [tyson.wiegel@enerpac.com](mailto:tyson.wiegel@enerpac.com)

Mike Beres, [mike.beres@enerpac.com](mailto:mike.beres@enerpac.com)

[www.fairmontsupply.com](http://www.fairmontsupply.com)

Heidi Gross, [heidigross@fairmontsupply.com](mailto:heidigross@fairmontsupply.com)

Zeke Mader, [zekemader@fairmontsupply.com](mailto:zekemader@fairmontsupply.com)

- Design considerations were
  - Synchronous lifting
  - Modular design
    - One system for several machine models
  - Ease of use
    - Single operator
    - Easy to position jacks
  - Safety
    - No one under load
    - Stop alarms
    - E-stops
    - Mechanical locks
  - Closed loop design
    - Stroke and load readings
    - Visual lock indicators
    - Auto cycle

- 6000 psi maximum pressure
- 110 ton each working load
- 196 ton each maximum load
- Fork pockets for initial placement
  
- Casters for fine positioning
  - Hand pump to retract casters
  - Casters include brakes
- 25 gallon reservoir capacity
- 1.8 in/min lifting time
- \$200,000.00 for system
- 12 week delivery

#### LIQUID FIRE SUPPRESSION – FIREMASTER

[www.firemasterweb.com](http://www.firemasterweb.com)      [www.ansul.com](http://www.ansul.com)

Jim Clausen, [jclausen@firemaster-mpc.com](mailto:jclausen@firemaster-mpc.com)

- Why liquid fire suppression?
  - Length of hoses not as critical as with dry chemical system
  - It is easier to push liquid than powder
  - Straight line installation
    - Simple, neat less intrusive on machine
  - Cost virtually equal to dry chemical installation
  - 15 times more knockdown compared to dry chemical
  - Not applicable with electrical/electronic components
  - Detection is infrared
  - Longer discharge time
    - Fire is completely out not knocked down
- Nozzle caps are rated at 3600 psi before coming off
  - Groove on cap locks into groove on nozzle
    - Groove is not for lanyard

## VISION X LED LIGHTING – GLACIER PRODUCTS

[www.visionxusa.com](http://www.visionxusa.com)    [glacierprod@aol.com](mailto:glacierprod@aol.com)

Matt Aley            406-861-1413

- What is LED lighting
  - Light emitting diode
  - No bulbs or ballasts
  - Very low maintenance
  - Lumen output can be factory adjusted
  - Normally set up to mimic midday light
  - Help to reduce eye fatigue
- Large variety
  - Headlights to 1000 watts
  - Light plants
  - Shovels and draglines
- Labeled as to type and beam configuration
- 3 year warranty

## CATERPILLAR 657 G ISSUES

- Input yoke failures
  - Updated with hardened splines
  - Covered under publication SEPD 1401
- C 18 engine vibration
  - Driveline alignment has been an issue
    - Alignment tool is available
  - History of early motor mount failure
    - New style mounts being released
- Main hydraulic valve body cracking
  - Not sure of cause
    - Suspect possible valve sticking causing over pressurization
    - Would like to see more examples of failure
- Front and rear clutch assembly failures
  - No answer would like to have failed components for study
- Rear transmission accessibility
  - Suggestion from group to raise engine an inch or two

- Locations have built tooling to remove without removing pack
- Air To Air After Cooler failures (ATAAC)
  - Cracking
  - Mounts failing
  - Continuously dirt air filters is an indication
  - No solution at this time
- C18 turbo failures
  - Updated after August of 2009
  - Improved gasket, mounting nuts and studs
- Engine oil pan gasket leaks
  - Original fiber gasket inadequate
  - New gasket available
- Piston failures
  - Have gone to a skirt guided piston
- Camshaft lobe and lifter wear
  - Cam lobe and lifter are now nitrite coated
- Bowl lift cylinder load check valve failing
  - Updated valves available
- Wiring problems
  - There are numerous service magazine articles regarding wiring updates
- Caterpillar representatives asked for input on design of new model scraper
  - Improve serviceability
  - Vertical hitch pin issues
  - Improve fuel delivery capability
  - Cab accessibility
    - New machine will have power step
  - Better lighting
  - Fall protection tie-offs
  - Eliminate air system
    - Go to hydraulic brakes

## 16M AND 24M ISSUES

- Why the M series
  - Machine safety
  - Operator Environment



- Integrated electronics
- Joystick controls
- Enhanced engine and powertrain management
- Electro-Hydraulic controls
- Ease of service
- Admitted ease of service was one area that needed improvement
- 16M moldboard wear
  - Complaint that set screws and wear strips need constant adjustment
  - Solution in certain applications is to install bronze wear strips and shims, publication SEPD 1358
- Request to make circle drive easier to remove
  - Will install section in drawbar to enhance removal by end of 2012
    - Update will be available
- Early articulation cylinder bearing failures
  - New bushings and seals have been developed
- Early service brake failures
  - Engine compression brake added, 16 & 24
  - Over filled tandems found to be issue
  - Incorrect oil viscosity causing problems
- 24M engine enclosure high heat
  - Have developed venture stack to pull heat from enclosure
  - Field publication has been released
- Engine oil leaks
  - Valve cover gasket leaking
    - SEPD 1380 improved gasket
    - SEPD 1306 heat shield update
  - Flywheel housing leaks
    - Added counter bore to allow installation of missing bolt
- High exhaust temperatures
  - ATAAC cracking and leaking
    - Redesign in the works
- 24M Vibration
  - Cat feels excessive vibration due to high idle speed which over speeds the drive train mass and effects the gear train dynamics
    - Are considering lowering high idle from 2250 rpm to 2100 rpm
    - Adding a dual engine dampener
    - Engines will also have a compression brake

- Group currently working on serviceability
  - Two of items being addressed are transmission and final drive/differential removal and installation
- Questions?
  - Will tandems be made easier to remove?
    - It is being evaluated
  - What is being done regarding circle shoe bolt breakage?
    - Publication available regarding updated bolts and structural washer
  - Any plans to update fuel tanks, leakage, bulging during fueling?
    - Yes, tank will be thicker with new vent.
    - Able to withstand 150GPM during fueling
  - Circle drive failures
    - Have found that improper circle adjustment is cause
  - Concern expressed that fenders hamper access to engine/drive train

