Weekly Carbon Monoxide (CO) Checks – Repeatable Engine Load Test

(Hydrostatic Transmission)

Best Practice Series

BP-77

The following best practice tips are recommended to conduct accurate, reliable, and safe repeatable engine load tests on hydrostatic transmissions.

Prepare the Machine for Test

- Warm up the engine (Emissions change for cold and warm engines).
- Park the machine into an intake entry with machine facing the mine rib.
- Set brakes and chock the wheels.
- Sample undiluted exhaust emissions before they pass through any after treatment devices, such as catalytic converter, particulate trap, fume diluters, and water scrubber.

Conduct the Engine Load Test

- Make sure no personnel are in front or behind the machine.
- Apply full throttle for about 60 seconds to apply load to engine.
- Some methods of applying load:
  - Gradually adjust lever that controls speed and direction until engine speed falls below the engine rated speed.
  - Push against mine rib until engine speed falls below the engine rated speed.
  - Apply equipment hydraulics until engine speed falls below the engine rated speed.

- Sample, allowing reading to stabilize, and record measurement(s).
- Release throttle and shift transmission out of gear.
- Repeat the test using the same method every week for comparable results.
- Sample with CO measurement device at idle, prior to torque stall, to allow for quicker sampling and shorter stall tests.
- Use a tachometer to verify the engine speed at load which will help ensure weekly repeatability.

Evaluate and Interpret Findings

- Check for changes in CO concentration against the baseline you have established for the engine.
  - » Increases in CO concentration level above the established baseline indicate problems.
- Contact MSHA Technical Support for guidance on engine CO information.
- Maintain records to track engine performance for easy weekly comparison. For example:
  - » A chart of individual equipment emissions plotted over time (weekly); or
  - » A logbook to track each piece of equipment; or
  - » A logbook to track similar types of engines.

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