

Fayette County Health Center
100 New Salem Road, Room 167
Uniontown, PA 15401
February 4, 2009

Bureau of Mine Safety

724-439-7469
Fax 724-439-7324

Mr. Eli Schmader
Brookville Equipment Corporation
175 Evans Street
P. O. Box 130
Brookville, PA 15825

RE: Brookville Equipment Corporation Model 18M116D 18-Man Personnel Carrier equipped with a Cummins QSB4.5 110HP Engine with a M30 DST exhaust and emission control system.

Dear Mr. Schmader:

The standards and procedures for using diesel-powered equipment in Pennsylvania's underground bituminous coal mines are established by Article II-A of the Pennsylvania Bituminous Coal Mine Act (Act). Section 224-A of the Act establishes the Technical Advisory Committee on Diesel-Powered Equipment (TAC) whose duties include reviewing requests to use alternative technologies or methods to comply with the requirements of the Act. Any alternative technology or methods recommended by the advisory committee and approved by the Secretary shall not reduce or compromise the level of health and safety protection afforded by Article II-A.

On July 10, 2008 you requested modification of an approval for the Brookville Model 18M116D 18-Man Personnel Carrier. This modification requested a change to a Cummins QSB4.5 110HP Engine with a M30 DST exhaust and emission control system. You noted that this personnel carrier was previously approved with a Cummins 4BTA3.9C engine. You also requested evaluation of an alternate test procedure in lieu of the 5 minute test as required by Article IIA. On July 16, 2008 your request was forwarded to the TAC for evaluation.

On December 23, 2008 the TAC and the representatives of the Department traveled to Brookville to inspect and evaluate the equipment and emission system. Emissions testing of the engine and after-treatment system were performed, as well as exhaust gas temperature monitoring and stall test procedure. The results of the emission tests showed the engine was performing within MSHA's approval specifications. Monitoring of the exhaust gas temperature produced a high exhaust gas temperature reading of 175° F, which is well below the 302° F allowed by Section 203-A (b)(4) of Article II-A. The maximum surface temperature observed was 260° F at the end of the 5 minute CO test, and the maximum engine oil temperature recorded was 180° F.

The after-treatment system is fitted with a DST M-30 disposable filter. The filter is rated by MSHA at 98.5 % efficiency rating, which meets the requirements of Section 203-A (b) (1) of Article II-A. The engine and filter extrapolations show that the diesel power package will result in an average ambient concentration of .0311 mg/m³ of diesel particulate matter when diluted by 100% of the MSHA approval plate ventilation rate for this engine, which is well below the .12 mg/m³ requirement of Section 203-A (a)(1) Article II-A.

The Departments and the TAC's investigation and observations confirmed that the diesel power package is capable of meeting all the requirements of Section 203-A of Article II-A of the act without reducing or compromising the level of health or safety afforded by the act.

The need for the Alternate Test procedure was also evaluated. Both 5 minute and 90 second tests were observed and the results recorded.

The 5 minute CO test was conducted first without the use of an external water cooler for the transmission oil. The maximum transmission oil temperature observed was 220° F at the end of the 5 minute CO test. This was close to the transmission oil shut down temperature, and the manufacturer recommended that premature oil breakdown and ultimately transmission damage could occur under such stall conditions. This recommendation and observation showed the need for the Alternate 90 second CO Test Procedure so that damage to the transmission would not occur. The 90 second Alternate CO Test was conducted and the results recorded. Test results of both the required test and the alternate test provided comparable results.

On January 9, the TAC recommended final approval be granted to use the Cummins QSB4.5 110HP Engine with a M30 DST exhaust and emission control system in the 18M116D 18-Man Personnel Carrier. The TAC has determined that the Cummins QSB 4.5 110HP diesel engine (MSHA Approval No 07-ENA040006) with an M30 DST Management System meets all requirements of Section 203-A of Article II-A.

Based on the information provided and the TAC recommendation, the Department *approves* the Brookville Equipment Corporation Brookville Model 18M116D 18-Man Personnel Carrier equipped with a Cummins QSB4.5 110HP Engine with a M30 DST exhaust and emission control system and the attached 90 second Alternate Test procedure.

The General Specification Sheet (Attachment 1-Rev) is to be strictly adhered to.

Should you have any questions regarding this approval, contact my office at 724-439-7469.

Sincerely,

Joseph A. Scaffoni
Director
Bureau of Mine Safety

cc: Paul Borchick
Ron Bowersox

bcc: S. Gaida
A. Martin
M. McCaffrey
W. Bookshar
R. Ceschini
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P. Keruskin
C. Carson
D. Stalnaker
TAC file/cd

JAS/WBB/cd

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