

**Fayette County Health Center
100 New Salem Road, Room 167
Uniontown, PA 15401**

January 23, 2008

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 Brookville Model 20T193D 20-Ton Locomotive with a Cummins QSB 6.7 193HP diesel engine and a M267 DST Management System

Dear Mr. Schmader:

Article II-A of the Pennsylvania Bituminous Coal Mine Act (Act) establishes the standards and procedures for using diesel-powered equipment in Pennsylvania's underground bituminous coal mines. 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, 2007, you requested approval of the Brookville Model 20T 193D locomotive with a Cummins QSB 6.7 193HP engine and an M267 DST Management System. You noted that this locomotive was previously approved with a 5.9 L engine, and that particular engine was being replaced by the 6.1 L engine. You also requested evaluation of an alternate test procedure in lieu of the 5-minute test as required by Article II-A. On July 17, 2007, your request was forwarded to the TAC for evaluation.

On August 30, 2007, the TAC and representatives of the Department traveled to Brookville Corporation to inspect and evaluate the equipment and emission system. In several areas, the surface temperatures exceeded the allowable 302° F of the Act. Additionally, the exhaust gas temperatures measured at the end of the tailpipe were considerable higher than those indicated on the gage in the operator's compartment. Installation of a modified temperature probe corrected this problem.

On September 6, 2007, the TAC and representatives of the Department traveled to Emerald Mine to evaluate the changes made to correct the high surface temperatures. Re-evaluation showed temperatures were reduced to 280° F with a blanket-type insulating wrap. This wrap was accepted as a temporary solution until a permanent wrap could be made for the

turbo and turbo arm assembly. Emission testing showed that the engine and emission system were operating within the approval specifications. Exhaust gas temperatures were measured at 220° F and a smoke dot test produced a result between 0 and 1. Extrapolation of emission results showed an average ambient concentration of .034 mg/m³ at a filter efficiency of 96.9 percent. These are within the requirements of Article II-A.

The TAC reviewed the results of the ISO 8178 data for the Cummins QSB 6.7 193 HP engine and related information submitted by Brookville Equipment Corporation. Based upon this evaluation and determination, the TAC recommended that the Secretary *preliminarily approve* the Cummins QSB 6.7 193HP diesel engine equipped with an M30 DST Management System with the following stipulation:

- The blanket insulating wrap should be replaced with permanently insulated coated parts as soon as the parts become available and the BMS and the TAC are to be notified as soon as these parts are installed.
- During the interim period when the locomotive is used with the temporary wrap installed, the operator will include a visual inspection of the wrap in his pre-op checks and note the condition of the wrap on his pre-op checklist. Any damage to the wrap will require that the equipment be removed from service. If the surface temperatures cannot be maintained below 302° F, the BMS should be notified immediately.
- During each 100-hour inspection, the blanket-type wrap should be visually inspected and the surface temperature in the surrounding area measured with a heat gun to confirm that the surface temperatures are below 302° F. The results of this measurement should be entered in the 100 Hour Inspection Record.
- This recommendation is provided with the understanding that the General Specification Sheet be strictly adhered to.

On September 11, 2007, the Department issued a temporary approval granting the August 31 request of Mr. Grant Colbert, Cumberland Coal Resources, Inc.

On January 9, 2008, the TAC recommended final approval be granted to use the Cummins QSB 6.7 193HP diesel engine and a M30 DST Management System in the 20-Ton Brookville Locomotive. The TAC determined that the Cummins QSB 6.7 193HP diesel engine (MSHA Approval No. ENA060010 Part 7) with an M30 DST Management System meets all requirements of Section 203-A of Article II-A.

The Bureau received a recommendation for temporary approval from the TAC for the equipment and for the 90-second alternate test procedure. The recommendation included the following stipulations:

- During each 100-hour inspection the blanket-type wrap should be visually inspected and the surface temperature in the surrounding area measured with a heat gun to confirm that the surface temperatures are below 302° F. The results of this measurement should be entered in the 100-Hour Inspection Record.

- This recommendation is provided with the understanding that the General Specification Sheet be strictly adhered to. As discussed above, we are also recommending approval of an alternate test procedure for Sections 217-A and 218-A of the Act.

The TAC has indicated that the Cummins QSB 6.7 193HP diesel engine and a M30 DST Filter (M267 Total System) in the 20-ton locomotive meets all of the requirements of Section 203-A of Article II-A of the Act provided the stipulations are included and complied with. The TAC's evaluation is enclosed. You must comply with all provisions of your diesel-powered equipment package, including all training requirements.

Based on the information provided and the TAC recommendation, the Department *approves* the Brookville Equipment Corporation's Model 20T193D 20-Ton Locomotive with a Cummins QSB 6.7 193HP diesel engine and a M30 DST Filter (M267 Total System) with the following stipulations:

- The temporary "Fire Wrap" material wrap on the turbo arm bracket should be replaced with the permanent "Fire Wrap" part (as shown in Attachment 2) **on the first 100-hour maintenance performed after the part is delivered.** The installation of the permanent wrap shall be noted in the 100-hour maintenance record when it is installed. The BMS should be notified when this permanent part is installed.
- The General Specification Sheet (Attachment 1-Rev) is to be strictly adhered to.

The need for an Alternate Stall test was confirmed and recommended. A 90-second Alternate Stall Test was conducted and produced comparable emission results and was recommended for approval. The 90-second Alternate Test Procedure (Attachment 3) is also approved.

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

Sincerely,

Joseph A. Scaffoni
Director
Bureau of Mine Safety

Enclosures

cc: Ron Bowersox/TAC
Paul Borchick/TAC

bcc: W. Bookshar
A. Martin

M. McCaffrey
S. Gaida
R. Ceschini
M. Pacconi
P. Keruskin
C. Carson
P. Eckenrode
TAC file/ A. Gaida

JAS/WBB/adg

Director\Word 2008\L-to ES Brookville Final Approval 20T loco.doc

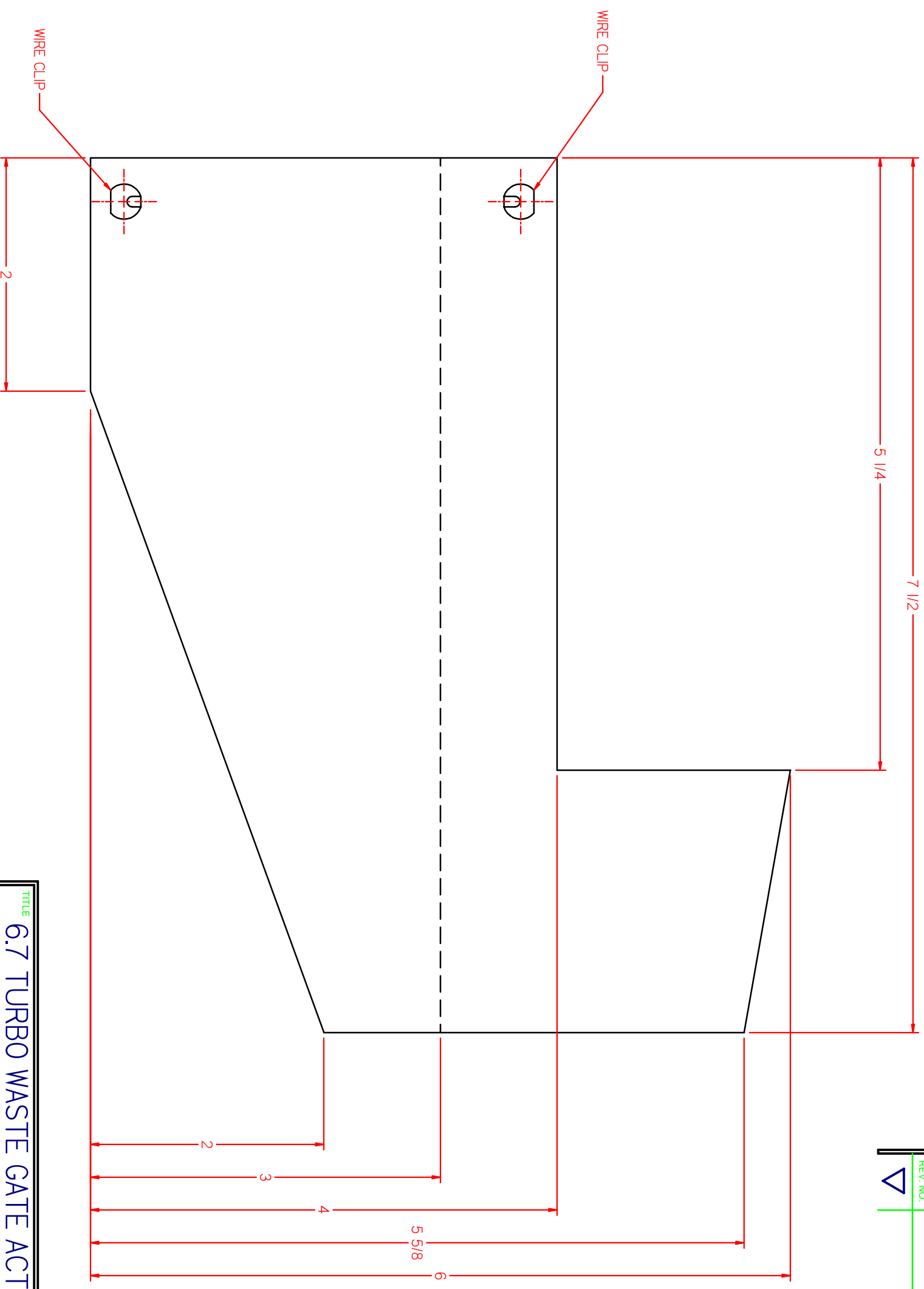
BROOKVILLE EQUIPMENT CORP.
MODEL 20T193D
20-Ton Diesel Locomotive
General Specifications of the Diesel-Powered Equipment Package

Engine Manufacturer		CUMMINS		
Engine Model		QSB6.7		
Horsepower		193 HP		
Rated Speed		2200 rpm		
Manufacturer's Maximum Recommended Exhaust Back-pressure (InH2O)		41 Inches Water Gauge		
Maximum Exhaust Out Temperature		865 deg F		
MSHA Engine Approval		MSHA Part 7		
MSHA Certification No.		07-ENA060010 (Part 7)		
Rated Speed		2200 RPM		
Rated Horsepower		193 HP		
Exhaust GAS Flow (SCFM)		1307 CFM @ 865 deg F @ 2200 rpm		
ISO 8178-1 Average DPM (gr/hr)		16.05 gr/hr (267.5 mg/min)		
Average Ambient DPM Level (mg/m3)		0.044 mg/m3		
MSHA Ventilation Rate (CFM)		8,500 CFM (Part 7)	CFM (Part 32)	
Pa. State Ventilation Rate (CFM)				
Emissions Control System			DST Management System	
Fuel Injection Pump	Make P/N	Bosch – Belt driven rotary fuel lift pump		
Oxidation Catalyst	Make P/N	Dry Systems Technologies M295-225-02		
Heat Exchanger	Make P/N	Dry Systems Technologies M90-301-01		
DPM Filter	Make	Dry Systems Technologies	Model	M267 (Total System)
	P/N	M30-411-01R	Filter Size	M30 (Filter) 16 x 12 in Outer 10 x 6 in Inner
	Air Rating (CFM)	2100 CFM	Filter Length	20 in
	Surface Area (in2)	42,231 in2		
	Efficiency			
	Recommended Exhaust Back-Pressure			Less than 41 Inches Water Gauge

1 2 3 4 5 6 7 8 9 10 11 12 13 14 15

REVISIONS


REV. NO.	DESCRIPTION	CHECKED	DATE



TITLE
6.7 TURBO WASTE GATE ACTUATOR BLANKET

SERIAL NUMBER	DATE	PART AUTHOR
DRAWN BRIAN CRAIG	XXXXXXXXXX	CAM MILLER
CHECKED	CHECKED DATE	MACHINED SURFACE FINISH
DRAWING BASED ON		125 Mu.in./ N8

BROOKVILLE EQUIPMENT CORP.



FRACTION	DECIMAL	ANGLE	HOLE DIAMETER TOLERANCES				SIZE	DRAWING NUMBER	REV.					
0-12"	±1/32"	±1/2°	0-.250"	+0.03"	-.002"	.250"-.500"	+0.05"	-0.03"	5.000"	+0.10"	-0.005"	B	8-9064	0
12-78"	±1/16"	±10"												
78"+	±1/8"													

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ALTERNATIVE STALL TEST PROCEDURE FOR PA STATE ACT 182, ARTICLE II-A
DIESEL-POWERED EQUIPMENT

ALTERNATE PROCEDURE, Section 217-A: (an alternative to items 8 through 14)

1. Place the equipment into an intake entry. Make sure no personnel are in front of or behind the equipment during test.
2. Set the brakes and chock the wheels.
3. Start the diesel engine and allow it to warm up to operating temperature.
4. Install the carbon monoxide CO sampling devices into the untreated exhaust gas port provided.
5. Allow CO sampling device to stabilize.
6. Put the transmission in high gear.
7. With brake still applied, put the engine at full throttle to induce converter stall for 90 seconds. Stop test immediately if any controls or indicators are not in their operating range, or if equipment moves while at stall.
8. Record three CO readings at 60, 75, and 90-second intervals during converter stall.
9. Return engine to low idle and put transmission in neutral. Allow the torque converter temperature to stabilize.
10. Take an average of the three readings.
11. Comply with record-keeping requirements pursuant to Section 214-A.

ALTERNATIVE PROCEDURE, Section 218-A: (an alternative to items 10-14)

1. Place the equipment into an intake entry. Make sure no personnel are in front of or behind the equipment during test.
2. Set the brakes and chock the wheels.
3. Start the diesel engine and allow it to warm up to operating temperature.
4. Install the carbon monoxide CO sampling device into the untreated exhaust gas port provided.
5. Allow CO sampling device to stabilize.
6. Put the transmission in high gear.
7. With brakes still applied, put the engine at full throttle to induce converter stall for 90 seconds. Stop test immediately if any controls or indicators are not in their operating range, or if equipment moves while at stall.
8. Record three CO readings at 60, 75, and 90-second intervals during converter stall.
9. Return engine to low idle and put transmission in neutral. Allow the torque converter temperature to stabilize.
10. Take an average of the three CO readings.
11. Install the carbon monoxide CO sampling device into the treated exhaust gas port provided.
12. Repeat steps (5) thru (10).
13. If CO reading for untreated exhaust gas is greater than twice the baseline established under 217-A(b), or if the CO reading for treated exhaust is greater than 100 ppm, the equipment has failed and must be serviced and retested before it is returned to regular service; and
14. Comply with record-keeping requirements pursuant to Section 214-A.