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Transportation

**Federal Railroad
Administration**

BIODIESEL INTERCITY PASSENGER RAIL REVENUE SERVICE TEST

Office of Research
and Development
Washington, DC 20590



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13. ABSTRACT (Maximum 200 words) Amtrak, with the support of the Federal Railroad Administration, operated a P-32 passenger locomotive in revenue service for a period of 12 months, on a blend of 20 percent pure biodiesel and 80 percent #2 ultra-low sulfur diesel (ULSD) fuel. The GE P-32 locomotive used in the biodiesel demonstration was a Tier 0 12-cylinder engine built in 1991. The locomotive was operated on the Heartland Flyer route, providing passenger train service between Oklahoma City, OK, and Fort Worth, TX. Following the in-service trial, the locomotive underwent emissions testing at the GE Transportation's locomotive emissions test facility in Erie, PA. The locomotive was tested for emissions according to Federal Test Procedure outlined in 40 CFR Part 92. The test results showed that operating the P-32 passenger locomotive on B20 biodiesel blended fuel for 12 months did not adversely affect the emissions of the locomotive. In addition, tear-down inspection of four of the twelve engine power assemblies showed that B20 biodiesel fuel did not have any adverse effects on the engine components.				
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Executive Summary

The use of B20 (20 percent biodiesel blended with 80 percent diesel fuel) biodiesel fuel was successfully demonstrated in revenue passenger rail service for a period of 12 months in the locomotive of the Amtrak Heartland Flyer train. The Federal Railroad Administration (FRA) awarded a grant to Amtrak under agreement number DTFR53-09-G-00038 for the Biodiesel Passenger Rail Revenue Service Trial (revenue service trial) that tested 20 percent beef tallow biodiesel and 80 percent #2 ultra-low sulfur diesel (ULSD) fuel in a passenger locomotive. The Amtrak Heartland Flyer train provides passenger service from Oklahoma City, OK, to Fort Worth, TX. The train consists of one locomotive and three to four coach and baggage cars. The Heartland Flyer provides one daily roundtrip between the two cities, for a total of 412 miles.

Amtrak selected a 3200 horsepower General Electric P32-8 engine, manufactured in 1991 as the test locomotive, and designated it Engine #500. The engine is certified as a U.S. Environmental Protection Agency (EPA) Tier 0 engine. Three hundred and thirty one round trips totaling 136,372 route miles were made using B20 on Engine #500 during the revenue service trial. The biodiesel for the B20 blend was produced from Texas-native feedstock (beef tallow) by BQ9000-registered Direct Fuels of Euless, TX. Approximately 178,946 gallons of the mixed B20 fuel were delivered to Engine #500.

Prior to the commencement of the biodiesel trial, all fuels used were evaluated to ensure that they met their respective American Society for Testing and Materials (ASTM) specification before and after blending (i.e., the diesel fuel, the B100 biodiesel, and the B20 biodiesel were all tested). The B20 and ULSD fuels were tested monthly during the trial. Engine lubrication oil was also subjected to testing prior to the trial and routinely throughout the trial period. The analyses of the ULSD, B100, B20, and used engine oil were within applicable ASTM specifications.

The On Time Performance (OTP) values during the revenue service trial for fiscal year 2010 and 2011 were 81.4 percent and 86.9 percent, respectively. OTP metrics for the Heartland Flyer for the fiscal year prior to the trial was 83.8 percent. No adverse effects to OTP were attributed to the use of B20.

Upon completion of the revenue service trial, the locomotive was tested for emissions at the GE Transportation Locomotive Emissions Test Facility in Erie, PA. Engine emissions testing was performed, according to Code of Federal Regulations (CFR) 40 Part 92, for hydrocarbons (HC), carbon monoxide (CO), oxides of nitrogen (NO_x), and particulate matter (PM) under line haul and switch duty cycles. The particulate and gaseous emissions were measured at low idle, idle, dynamic brake (DB), and notches 1 through 8. Duty cycle composite emission test results using both the EPA certification fuel (diesel fuel) and B20 were well below limits for HC, CO, NO_x, and PM established by EPA for Tier 0 locomotive engines. An approximately 5 percent increase in NO_x was identified in the use of B20 compared with diesel fuel. However, this increase in NO_x was expected and was within the range identified by other biodiesel emission testing results that were published¹. Moreover, the increase in NO_x from the B20 use was below the EPA established limits for that category of engine.

¹ Fritz, S.G., "Evaluation of Biodiesel Fuel in an EMD GP38-2 Locomotive," NREL/SR-510-33436 (May 2004)

Smoke opacity was also measured. Smoke opacity measurements using both the diesel fuel and the B20 were well below limits established by EPA for Tier 0 locomotive engines. In addition to the emissions testing, the fuel consumption of the engine was also recorded. The emissions test results indicated that it was possible to achieve full power using B20 biodiesel fuel. No loss in horsepower was observed at low idle, idle, DB, or notches 1 through 8.

Following the emissions testing, the engine was inspected. Engine #500 had two new power assemblies installed prior to the revenue service trial. The power assemblies were removed and inspected to determine engine wear and identify deposits that could be attributed to the alternative use of B20 fuel. The levels of piston deposits, surface sludge, ring and liner wear, as well as connecting rod bearing condition were inspected and evaluated. Chevron Oronite performed the tear-down inspections of the two power assemblies and concluded that there were no abnormal conditions related to engine deposits or engine wear as a result of the biodiesel use.

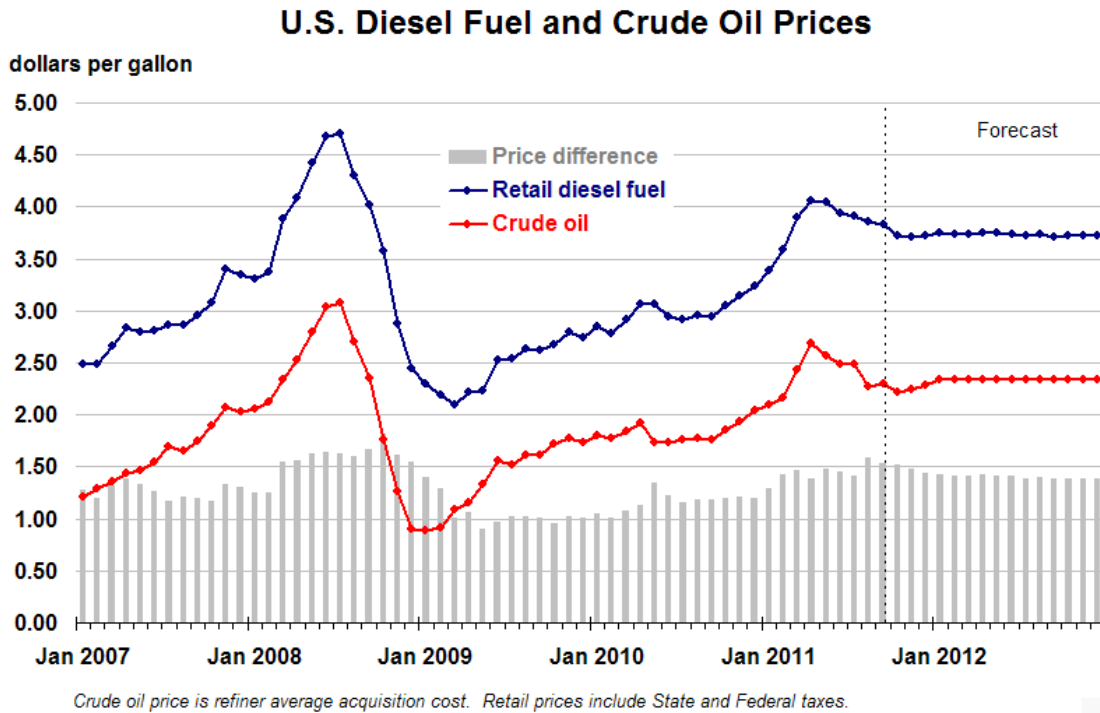
The revenue service trial, emissions testing, and engine inspection all demonstrate that it is feasible to operate a passenger locomotive engine on B20 biodiesel fuel and achieve full engine power, meet the established EPA standards for gaseous and particulate emissions, and not adversely impact the engine. Additional research is needed to determine performance in colder environments, availability and cost of B20 biodiesel fuel, possible long-term engine durability problems, and original equipment manufacturer (OEM) warranty issues with the use of such fuels.



Figure 1: Biodiesel Passenger Rail Revenue Service Trial Locomotive Engine #500 on the Heartland Flyer Service.

1. Introduction

The rising cost of diesel fuel and energy security highlighted the need for domestically produced and sustainable fuels, such as biofuels, for transportation. Biofuels are transportation fuels such as biodiesel or ethanol that are made from biomass materials and are usually blended with petroleum-based fuel. In 2008, the on-highway retail price for #2 diesel fuel was \$4.70. This was the highest price for diesel fuel in decades. Figure 2 below shows the retail cost of diesel fuel during the past 4 years.



Source: Short-Term Energy Outlook, October 2011



Figure 2: Retail Cost of #2 Diesel Fuel².

As seen in the graph, the high cost of diesel in 2008, and current trend of the cost hovering just under \$4/gallon, has prodded the transportation industry to find alternative options for fuel.

This project was funded by FRA to assess the feasibility of using B20 biodiesel fuel in a passenger locomotive in revenue service. For this test, the B20 biodiesel used was a blend of 20 percent pure biodiesel and 80 percent ULSD. The biodiesel revenue service trial was first proposed by the Oklahoma Department of Transportation (DOT) and initiated by the National Railroad Passenger Corporation (Amtrak) on February 27, 2010. Oklahoma DOT was successful in using B20 biodiesel fuel in its off-road vehicles and proposed that Amtrak try such fuels in the Heartland Flyer passenger locomotive. The Texas Department of Transportation also supported this revenue service trial.

² <http://www.eia.gov/emeu/steo/pub/gifs/fig3.png>. Energy Outlook Source Book 2011

The Biodiesel Passenger Rail Revenue Service Test fit well into Amtrak's environmental sustainability program and promoted research of alternative options for rail transportation fuel.

The revenue service portion of the trial was completed on May 15, 2011. This revenue service trial was designed to demonstrate the use of B20 beef-tallow-based biodiesel. This report outlines the 12-month revenue service trial of the Heartland Flyer train operating on B20 biodiesel, the associated engine emissions testing and the tear-down inspection of the locomotive engine power assemblies. The revenue service trial was intended to be a demonstration of biodiesel in a passenger locomotive in revenue service and not an evaluation of biodiesel as a locomotive fuel.

2. Background

Amtrak operates intercity passenger rail service across the United States. Amtrak operates the Heartland Flyer (Train numbers 821/822), under State-funded contracts with the Oklahoma and Texas Departments of Transportation, to provide daily service (7 days/week) with regularly scheduled station stops in Oklahoma City, Norman, Purcell, Pauls Valley, and Ardmore, OK, and Gainesville and Fort Worth, TX. The distance between Fort Worth and Oklahoma City is 412 miles round trip. The Heartland Flyer made 443 round trips during the revenue service trial. Three hundred and thirty one round trips totaling 136,372 route miles were made using B20 on Engine #500. Actual equipment mileage during this time period totaled 152,622 miles. Preventative maintenance, service and inspection, equipment modifications, or track outages took place on those days when Engine #500 was not in service on the Heartland Flyer route.

The biodiesel revenue service trial was initiated by a proposal Oklahoma DOT made to Amtrak regarding the use of B20 biodiesel in the Heartland Flyer train. Amtrak and FRA saw merit in the idea and formed a steering committee that included representatives from Amtrak, FRA, Oklahoma DOT, GE Transportation Services (GE), Electro-Motive Diesel, and biodiesel fuel suppliers. The steering committee met monthly via teleconference to develop the biodiesel revenue service test implementation plan. The test implementation plan called for fuel and oil analyses, emissions testing, and engine inspection along with the revenue service test. For this demonstration, Amtrak selected Engine #500. Engine #500 is a 3200 hp GE P32-8 manufactured in 1991. During the trial, a P42 locomotive was placed in the consist for service protection or to provide head end power if there were more than three coach cars in the train consist. The Heartland Flyer train consist is normally operated with one P42 4250 HP GE locomotive, one nonpower control unit, two bilevel coach cars, and one bilevel snack/coach car. Additional cars may be added to the train depending on ridership.

The biodiesel fuel used in Engine #500 was derived from animal fats, beef tallow in this case. Beef tallow is a byproduct of meat processing and is typically used in the production of some soaps. The beef tallow undergoes a transesterification process that yields biodiesel as an end product. In this process, the beef tallow is reacted with an alcohol, like methanol, in the presence of a catalyst to produce glycerin and fatty-acid methyl esters (FAME), also known as biodiesel³. The biodiesel source (B100) for the B20 blend was Texas-native feedstock (beef tallow) produced by BQ9000-registered Direct Fuels of Euless, TX, the same fuel supplier that provides the ULSD regularly used for other Amtrak locomotives fueled in Fort Worth, TX. Quick Fuel Fleet Services, arranged with the biodiesel fuel supplier to mix the proper allocation of B100 and red dyed ULSD for daily mobile refueling of Engine #500 in Fort Worth.

Prior to starting the in-service test, two new power assemblies, which would be inspected at the end of the trial, were installed on Engine #500. Being new, these two assemblies were the “baseline” to evaluate the engine wear from 12 months of biodiesel use. Biodiesel has solvent properties that may cause it to react adversely with a variety of materials (rubber, plastics, and metals) found in locomotive engines. GE performed emissions testing of Engine #500 using B20 biodiesel.

³ <http://www.biodiesel.org/docs/ffs-production/production-fact-sheet.pdf?sfvrsn=4>

GE's participation in the revenue service trial and performance of the emissions tests does not indicate approval for use of biodiesel blends in GE locomotives. Failure to adhere to the approved fuels cited in the locomotive manufacturer's operations and maintenance instructions may result in the engine warranty being voided, if fuel related failure occurs.



Figure 3: Fueling of Engine #500 in Fort Worth, TX.

3. Methodology

Amtrak operated the Heartland Flyer in normal passenger service while using B20 biodiesel fuel and maintaining normal operating and safety procedures and practices. The test locomotive was fueled in the “direct to train” (DTL) method by which the engine’s fuel tank is filled via a fuel truck containing splash-blended biodiesel. Thus, there were no modifications required to the railroad facility infrastructure to accommodate use of the new fuel. Amtrak performed required maintenance and inspection on the locomotive during the test period in accordance with Amtrak’s maintenance and inspection practices. During the revenue service trial, Engine #500 was subject to preventive maintenance inspections occurring every 92 days. This service inspection required the unit to be taken out of service and shipped to Chicago where this work was completed. Inspection of the locomotive was conducted every 92-days. Routine maintenance, unscheduled necessary repairs, equipment modifications, and infrequent track outages did result in Engine #500 being out of service for periods of time during the field trial and resulted in some difficulty in maintaining a working fuel and engine oil sampling schedule.

In addition to the regularly scheduled inspections, each locomotive unit was inspected daily in accordance with CFR Title 49 Parts 229.21 and 236.587, and a Maintenance Analysis Program Equipment Condition Report (MAP100) form was completed. The MAP100 form included any comments regarding equipment or failures en route observed by the train crew. Discussions with Amtrak mechanical department representatives and a review of the mechanical documentation determined that no mechanical repairs or maintenance have been required as a result of the alternative use of B20 biodiesel fuel during the trial.

The rest of this section of the report provides details on the fuel sampling, emissions testing, and engine tear-down inspection.

3.1 Fuel and Engine Oil Analyses

Prior to the commencement of the biodiesel trial, the fuels used—ULSD diesel fuel and B100 biodiesel fuel—were evaluated to ensure that they met their respective specifications, as determined by ASTM, before blending. Throughout the revenue service trial, the blended fuel was periodically tested to ensure that the blended product met the ASTM specification for B20. Any changes to the fuel supply required a new and complete evaluation of the new supply before use.

The ULSD diesel fuel used to produce the B20 biodiesel fuel blend was tested according to ASTM D975 fuel specifications (see Table 1).

Table 1: ASTM D-975, ULSD Diesel Fuel Specifications.

TEST	DESCRIPTION	ASTM	SPECIFICATION	UNITS
1	API Gravity	D-287	30 min	
2	Distillation	D-86		
	Initial Boiling Point		345 typical	°F
	10% Recovered Volume		420 typical	°F
	50% Recovered Volume		500 typical	°F
	90% Recovered Volume		540 min / 640 max	°F
	Final Boiling Point		670 typical	°F
	Total Recovered Volume		98.0 min	Volume %
3	Cetane Index	D-976	40 min	
4	Water and Sediment	D-1796	0.0500 max	Volume %
5	Sulfur Content	D-5453	15 max	ppm
6	Viscosity @ 40 °C	D-445	1–9 min / 4.1 max	cSt
7	Cloud Point	D-2500	Report	°F
8	Flash Point	D-93	126 min	°F
9	Lubricity by HFRR	D-6079	520 max	microns

The B100 fuel was tested according to ASTM D6751 fuel specifications (see Table 2); certain parameters of the tested supply failed to meet those standards. A new batch of B100 was then tested and found to be in accordance with all criteria of ASTM D6751. This new batch was used for the blending of the B20 biodiesel fuel.

Table 2: ASTM D6751, B100 Biodiesel Fuel Specifications.

TEST	DESCRIPTION	ASTM	SPECIFICATION	UNITS
1	Flash Point	D-93	130 min	°C
2	Water and Sediment	D-2709	0.0500 max	Volume %
3	Kinematic Viscosity @ 40 °C	D-445	1.9–6.0	cSt
4	Sulfated Ash	D-874	0.020 max	Weight %
5	Sulfur	D-5453	15 max	ppm
6	Copper Strip Corrosion	D-130	No. 3 max	Rating
7	Cetane Index	D-976	47 min	
8	Cloud Point	D-2500	Report	°C
9	Carbon Residue	D-4530	0.0050 max	Weight %
10	Acid Number	D-664	0.50 max	Mg KOH/g
11	Free Glycerin	D-6584	0.020 max	Volume %
12	Total Glycerin	D-6584	0.240 max	Volume %
13	Phosphorous	D-4951	0.0010 max	Weight %
14	Distillation Temperature	D-1160	360 max	°C
15	Calcium and Magnesium	EN14538	5 max	ppm
16	Sodium and Potassium	EN14538	5 max	ppm
17	Oxidation Stability	EN14112	3 min	Hours

Once blended, the B20 fuel was tested according to ASTM D7467 specifications (see Table 3). As with the B100, certain parameters of the initial B20 sample did not meet ASTM D7467 specifications. Anomalies in the test results of the B100 and B20 biodiesel fuel initial samples are discussed further in the Results section of this report.

Table 3: ASTM D7476, B20 Biodiesel Fuel Specifications.

TEST	DESCRIPTION	ASTM	SPECIFICATION	UNITS
1	Flash Point	D-93	52 minimum	°C
2	Water and Sediment	D-2709	0.0500 maximum	Volume %
3	Kinematic Viscosity @ 40 °C	D-445	1.9–4.1	cSt
4	Ash Content	D-482	0.01 maximum	Weight %
5	Sulfur	D-5453	15 maximum	ppm
6	Copper Strip Corrosion	D-130	No. 3 maximum	Rating
7	Centane Index	D-976	40 minimum	
8	Cloud Point	D-2500	Report	°C
9	Carbon Residue 10%	D-524	0.3500	Weight %
10	Aromaticity	D-1319	35 maximum	Volume %
11	Acid Number	D-664	0.3 maximum	Mg/KOH
12	Free Glycerin	D-6584	Report	Volume %
13	Total Glycerin	D-6584	Report	Volume %
14	Distillation Temperature 90%	D-86	343 maximum	°C
15	Biodiesel Content	D-7371	6–20	Volume %
16	Oxidation Stability	EN14112	6 minimum	Hours
17	Lubricity	D-6070	520 maximum	microns

A new batch of the B100 and B20 biodiesel fuel were sampled, retested, and determined to be within tolerance of all applicable ASTM specifications prior to the commencement of the revenue service trial (see Section 4).

During the field trial, Direct Fuels tested the B100 fuel supply weekly and certificates of analysis were made available to the fuel driver with every load delivered to Amtrak. The ULSD fuel was also tested. All ULSD samples, with the exception of one sample collected near the end of the trial, were within relevant testing specifications. The analytical testing of the B20 blend was conducted on a monthly basis by ANA Laboratories, per ASTM D7467; the blend was determined to be within the limits of specification.

Engine lubrication oil was subjected to testing prior to commencement of the field trial and during the trial. Engine used oil was tested for metals, fuel and water, oxidation, nitration, soot, and sulfate by ANA Laboratory. In addition to the aforementioned tests, the used oil samples were tested by Chevron Oronite for base number (ASTM D4739), acid number (ASTM D664), pentane insolubles using the Locomotive Maintenance Officer Association (LMOA) method (ASTM D7317), viscosity increase (ASTM D445), oxidation, wear metals (ASTM D5185), fuel dilution (ASTM D3524) and biodiesel dilution using Chevron Oronite proprietary methods. The engine oil was changed every 92 days during scheduled PM servicing.

3.2 Locomotive Exhaust Emissions Testing

The locomotive exhaust emissions were analyzed following the commencement of the revenue service test. The exhaust emissions testing were done in accordance with the Federal Test Procedures outlined in 40 CFR Part 92, "Emission Standards for Locomotives and Locomotive Engines." The B20 revenue service test locomotive was taken to the GE Locomotive Emissions Testing Facility in Erie, PA, for the emissions testing. Once at GE, the locomotive was inspected and loaded to determine its powering cycle. Engine #500's fuel supply system was disconnected and a system capable of measuring the net rate at which fuel is supplied to the engine was connected. The engine was operated for a period of time in all its powering modes (low idle, idle, DB, and notches 1–8), simulating in-service load conditions. Engine #500 power output produced by the alternator/generator at each throttle setting was recorded as measurements of current flow through the electrical resistance bank.

Following the loading tests, the engine exhaust was sampled and tested for various gaseous and particulate emissions. The emissions were measured over two steady-state test cycles, simulating line haul and switch engine duty cycle of the locomotive. The duty cycle simulations for the emissions testing consisted of operating Engine #500 at different power levels, from low idle to notch 8. Switch engine operations were simulated by operating the engine in steady-state conditions much of the time in low idle, idle, and low power notches. Line haul operations were simulated by operating the engine in steady-state condition in the high power notches, particularly notch 8.

Two sets of emissions tests were completed on the locomotive, one using the B20 fuel available in the onboard fuel tank, and the other using EPA locomotive certification petroleum diesel fuel stored at the facility. ULSD fuel normally used in service on the Heartland Flyer route was not used as the conventional fuel for the emissions test. The locomotive emissions testing facility at GE does not normally have a supply of ULSD on site, and the fuel storage logistics and environmental, health, and safety concerns related to temporary storage of ULSD at the GE testing facility for this particular test prevented its use during testing. Samples of B20 and the certification diesel fuels were collected for analysis at the GE testing facility. Gaseous emission and particulate matter sampling, as well as smoke opacity and fuel consumption testing were performed as part of the test protocol.

The gaseous emissions were sampled and measured continuously throughout the test; whereas, the particulate emission was sampled beginning 10 seconds after the start of the engine throttle setting (e.g., idle, notch 1, etc.) and ended 6 minutes after the start of the throttle setting. To analyze the emissions, raw exhaust is sampled, via probes, directly from the exhaust stream during each engine throttle setting (see Figure 3). The probes are connected to gas analyzers that measure the amount of gaseous emissions in the probe. This information is fed to data analyzer systems and recorded. A portion of the exhaust stream is channeled through a special section for the particulate matter analyses and diluted with ambient air. Particulates from the exhaust stream were collected on pre-measured and pre-conditioned filters following dilution with ambient air of the raw exhaust sample. The filters were measured to determine the amount of particulate emitted with each throttle setting of the engine by comparing its weight after the test with its initial pre-measured weight.

During the emissions test, the fuel flow rate for each throttle setting was measured continuously. Also, the smoke opacity was measured continuously as each throttle setting was engaged. The smoke opacity measurements were taken at steady-state, 30-second peak, and 3-second peak intervals. Results of the emission testing using the B20 biodiesel fuel and EPA certification fuel were compared against one another and against EPA emission limits for Tier 0 locomotive engines. Results of the certification fuel and the B20 testing are discussed further in the Results section of this report.

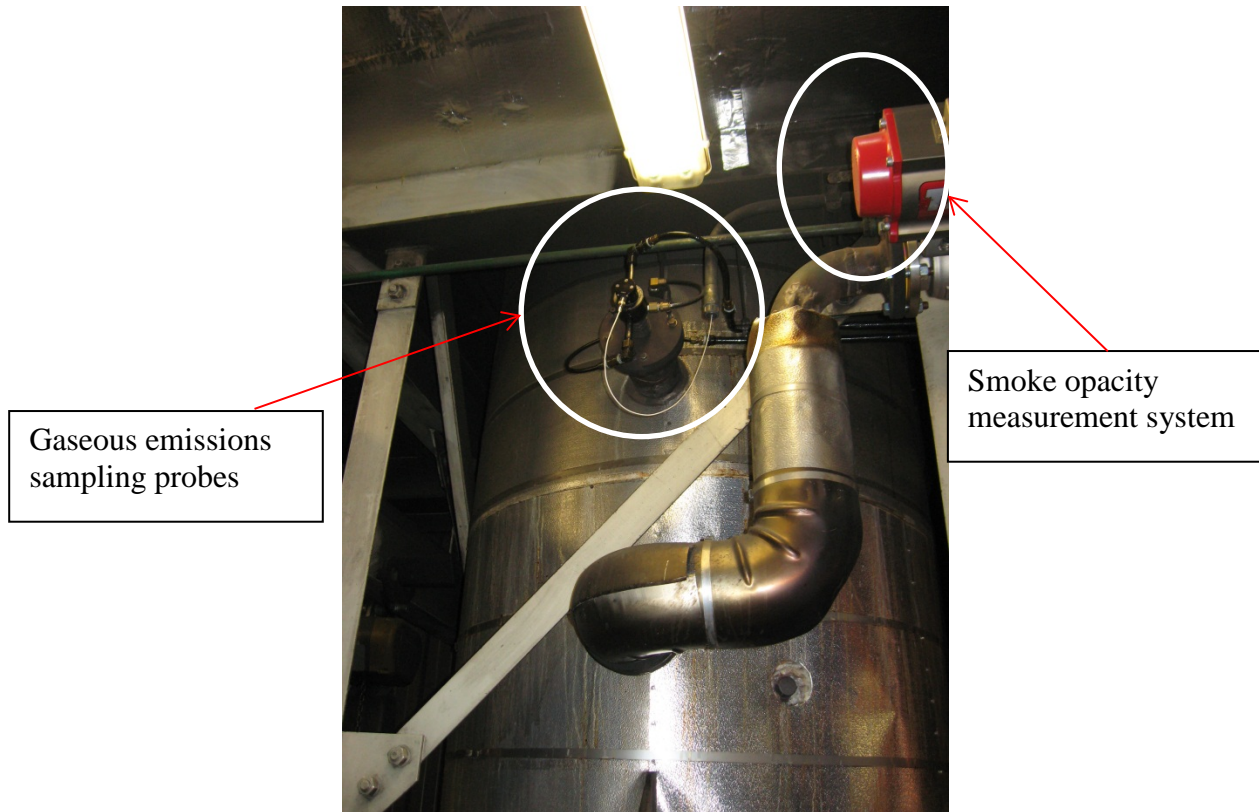


Figure 4: Gaseous Emissions Sampling Probes.

3.3 Engine Power Assembly Mechanical Tear-Down and Inspection

Amtrak removed two power assemblies from Engine #500 and replaced them with two new units (baseline units). These two new power assemblies were the baseline units to assess the effects of biodiesel on the engine after 12 months of using B20 fuel. They were installed in position 2 of the engine on the right and left side, 2R and 2L. Following the revenue service trial and the engine exhaust emissions testing, the two baseline units were removed and inspected. The inspections were conducted to identify any adverse effects of the B20 fuel on engine components such as the connecting rods, bearing, pistons, and piston rings, to name a few that were expected to be directly or indirectly impacted. General engine condition—engine cleanliness (rocker box and crankcase)—was evaluated; a visual inspection of the locomotive was made, and a review of operational history was conducted. The power assemblies were photographed during the post-revenue service inspection.



Figure 5: Amtrak personnel removing the 2R power assembly for inspection.

Amtrak maintenance facility personnel removed the baseline units, and Chevron Oronite, who also conducted analyses at their laboratory, inspected them. Additionally, 5R and 5L power assemblies were removed. These power assemblies were not newly installed but were removed and inspected to better assess the wear of baseline power assemblies, 2R and 2L.



Figure 6: 2R Power assembly cylinder with piston removed.



Figure 7: Chevron Oronite personnel measuring the surface area of 2R power assembly cylinder liner to categorize wear.

4. Results

The Amtrak Heartland Flyer passenger train was tested in revenue service using B20 blend of biodiesel fuel for a period of 12 months. During that period, fuel consumption data was recorded. Following the revenue service trial of B20 biodiesel, the engine underwent emissions testing, and four of its power assemblies were put through tear down inspections.

4.1 Revenue Service Trial Results

At the end of the revenue service trial, 178,946 gallons of B20 fuel had been delivered to locomotive Engine #500. The cost variance comparing the price of biodiesel to regular ULSD #2 during the trial period totaled \$21,175. During the revenue service trial, the cost of B20 ranged from \$0.00 to \$0.31/ gallon more than ULSD #2. On average, this was a \$0.13/gallon price difference for biodiesel versus the cost of #2 ULSD diesel fuel. Documentation supporting fuel delivery dates, quantity of fuel delivered, cost of fuel, etc. can be found in Appendix A.

Daily inspections of Engine #500 while in revenue service were documented on the MAP100. The 92-day preventative maintenance inspection scope of work performed on this locomotive is outlined in a 12-page form completed and maintained by Amtrak titled “P32 92-Day PM Inspection WMS Template ID: 58537.” Copies of both of these forms are appended to this report. Based on review of this documentation and interview with Amtrak Mechanical personnel, no adverse mechanical impacts attributable to alternative fuel use were identified during the trial period. Samples of the 92-Day Inspection and MAP100 forms are included in Appendix B and C, respectively.

OTP during the revenue service trial for FY10 and FY11 were 81.4 percent and 86.9 percent, respectively. OTP metrics for the Heartland Flyer for the fiscal year prior to the trial was 83.8 percent. Therefore, using biodiesel to power Engine #500 did not impact its service performance.

Discussion of the results for tests conducted during and after the revenue service trial is outlined in the following subsections.

4.2 Fuel and Engine Oil Analyses Results

Each of the fuels (i.e., diesel fuel and biodiesel fuel) used to develop B20 biodiesel fuel was evaluated before blending to ensure that it met its individual ASTM specification. Once blended, the B20 fuel was subject to periodic testing to ensure that the blended product met the ASTM biodiesel specification.

During the field trial, Direct Fuels tested the B100 fuel supply weekly, per ASTM D6751 specifications, and certificates of analysis were made available to Amtrak. Samples of the certificates provided by Direct Fuels to Amtrak are found in Appendix D. The ULSD fuel was also tested, per ASTM D975 specifications. Results from those tests are provided in Appendix E. All ULSD samples were within testing specifications with the exception of one sample collected near the end of the trial. This sample identified a slightly higher lubricity value; however, the follow up sample was within tolerance.

Initial samples of B100 and B20, collected and analyzed before the start of the revenue service trial, did not conform to their respective ASTM standards (D6751 and D7467). The initial

baseline B100 samples contained unacceptable concentrations of free and total glycerin (see Table 4). The test results indicated that the samples had a 0.230 percent volume of free glycerin and 0.250 percent volume of total glycerin, which is above the allowed maximum of 0.020 and 0.240 percent volume for free and total glycerin, respectively, per ASTM D6584 specifications for determining glycerin content. The presence of high levels of glycerin in the final product of B100 can result in fuel separation, material incompatibility, and/or fuel injector carbon buildup⁴.

Table 4: ANA Laboratory Test Results for B100 Biodiesel Fuel Initial Sample.

	Description	ASTM	Spec.	Results	Units
1)	Flash Point	D-93	130 min	165	°C
2)	Water and Sediment	D-2709	0.0500 max	<0.0150	Vol %
3)	Kinematic Viscosity @ 40 °C	D-445	1.9–6.0	4.62	cSt
4)	Sulfated Ash	D-482	0.020 max	0.001	wt %
5)	Sulfur	D-5453	15 max	0.0005	ppm
6)	Copper Strip Corrosion	D-130	No. 3 max	1a	Rating
7)	Cetane Index	D-976	47 min	60.3	
8)	Cloud Point	D-2500	Report	17	°C
9)	Carbon Residue	D-524	0.0050 max	0.0031	wt %
11)	Acid Number	D-664	0.50 max	0.30	mg KOH/g
12)	Free Glycerin	D-6584	0.020 max	0.23	Vol %
13)	Total Glycerin	D-6584	0.240 max	0.250	Vol %
14)	Phosphorous	D-4951	0.0010 max	<0.0001	wt %
14)	Distillation Temp 90%	D-86	343 max	341	°C
15)	Calcium and Magnesium	EN14538	5 max	<1	ppm
16)	Sodium and Potassium	EN14538	5 max	<1	ppm
17)	Oxidations and Stability	EN14112	3 min	>10	Hours

⁴Mike Beauchaine, *Measuring Water, Methanol and total Glycerin in B100 Samples*, <http://www.biodieselmagazine.com/articles/1663/measuring-water-methanol-and-total-glycerin-in-b100-samples/> (May 25, 2007).

As outlined in Table 5, new B100 samples were determined to be within tolerance of all ASTM specifications prior to the commencement of the trial. The testing was done by ANA Laboratories.

Table 5: ANA Laboratory B100 Baseline Sample Second Test Results.

Test	Description	ASTM	Spec.	Results	Units
1)	Flash Point	D-93	130 min	146	°C
2)	Water and Sediment	D-2709	0.0500 max	0.0100	Vol %
3)	Kinematic Viscosity @ 40 °C	D-445	1.9–6.0	4.67	cSt
4)	Sulfated Ash	D-482	0.020 max	0.001	wt %
5)	Sulfur	D-5453	15 max	0.0007	ppm
6)	Copper Strip Corrosion	D-130	No. 3 max	1a	Rating
7)	Cetane Index	D-976	47 min	59.1	
8)	Cloud Point	D-2500	Report	17	°C
9)	Carbon Residue	D-524	0.0050 max	0.049	wt %
11)	Acid Number	D-664	0.50 max	0.28	mg KOH/g
12)	Free Glycerin	D-6584	0.020 max	0.00	Vol %
13)	Total Glycerin	D-6584	0.240 max	0.00	Vol %
14)	Phosphorous	D-4951	0.0010 max	<0.0001	wt %
14)	Distillation Temperature 90%	D-86	360 max	331	°C
15)	Calcium and Magnesium	EN14538	5 max	<1	ppm
16)	Sodium and Potassium	EN14538	5 max	<1	ppm
17)	Oxidations and Stability	EN14112	3 min	>10	Hours

The initial baseline B20 sample was found to be unacceptable for aromaticity (see Table 6 below). High levels of aromatics in the fuel can impact the emissions of the locomotive. Therefore, it was imperative that the B20 samples meet the ASTM standards during and after the revenue service trial. The aromatic content was measured at 46.6 percent volume of the fuel, whereas the ASTM specification for B20 fuel required a maximum of 35 percent aromatic content by volume of the fuel.

Table 6: ANA Laboratory B20 Baseline Sample Test Results.

Test	Description	ASTM	Spec.	Results	Units
1)	Flash Point	D-93	52 min	72	°C
2)	Water and Sediment	D-2709	0.0500 max	<0.0010	Vol %
3)	Kinematic Viscosity @ 40 °C	D-445	1.9–4.1	3.19	cSt
4)	Ash Content	D-482	0.01 max	0.003	wt %
5)	Sulfur	D-5453	15 max	9	ppm
6)	Copper Strip Corrosion	D-130	No. 3 max	1a	Rating
7)	Cetane Index	D-976	40 min	45.6	
8)	Cloud Point	D-2500	Report	-6	°C
9)	Carbon Residue 10%	D-524	0.3500 max	0.1010	wt %
10)	Aromaticity	D-1319	35 max	46.6	Vol %
11)	Acid Number	D-664	0.3 max	0.12	mg KOH/g
12)	Free Glycerin	D-6584	Report	0.07	Vol %
13)	Total Glycerin	D-6584	Report	0.07	Vol %
14)	Distillation Temperature 90%	D-86	343 max	336	°C
15)	Biodiesel Content	D-7371	6–20	17.4	Vol %
16)	Oxidation Stability	EN14112	6 min	>10	Hours
17)	Lubricity	D-6079	520 max	207	microns

Testing of subsequent batches of B20 fuel showed conformance with the ASTM standards, as can be seen in Table 7 below.

Table 7: ANA Laboratory B20 Baseline 2nd Sample Test Results.

Test	Description	ASTM	Spec.	Results	Units
1)	Flash Point	D-93	52 min	74	°C
2)	Water and Sediment	D-2709	0.0500 max	<0.0010	Vol %
3)	Kinematic Viscosity @ 40 °C	D-445	1.9–4.1	3.14	cSt
4)	Ash Content	D-482	0.01 max	0.003	wt %
5)	Sulfur	D-5453	15 max	9	ppm
6)	Copper Strip Corrosion	D-130	No. 3 max	1a	Rating
7)	Cetane Index	D-976	40 min	53.3	
8)	Cloud Point	D-2500	Report	-7	°C
9)	Carbon Residue 10%	D-524	0.3500 max	0.040	wt %
10)	Aromaticity	D-1319	35 max	31	Vol %
11)	Acid Number	D-664	0.3 max	0.19	mg KOH/g
12)	Free Glycerin	D-6584	Report	0.0	Vol %
13)	Total Glycerin	D-6584	Report	0.0	Vol %
14)	Distillation Temperature 90%	D-86	343 max	331	°C
15)	Biodiesel Content	D-7371	6–20	20	Vol %
16)	Oxidation Stability	EN14112	6 min	>10	Hours
17)	Lubricity	D-6079	520 max	195	microns

All revenue service B100 test results appear to be within specification, and copies of B100 sampling results can be found in Appendix F. Copies of the B20 analytical results can be found in Appendix G; all samples conformed to the applicable ASTM testing standards.

Samples of used oil from the engine were collected and analyzed. ANA Laboratory tested the engine used oil for metals, fuel and water, oxidation, nitration, soot, and sulfate. Baseline and follow up sampling results from ANA Laboratory are contained in Appendix H. In addition to the aforementioned tests, the used oil samples were tested by Chevron Oronite for base number (BN) (ASTM D4739), acid number (AN) (ASTM D664), pentane insolubles by LMOA method (ASTM D7317), viscosity increase (ASTM D445), oxidation, wear metals (ASTM D5185), fuel dilution (ASTM D3524), and biodiesel dilution by proprietary methods used by Chevron Oronite. The oil used in Engine #500 was 20W-40 multigrade generation 5 locomotive oil. Used oil samples were collected approximately every 15 days.

Tests for the acidic and basic content of the used oil can indicate whether the engine oil underwent degradation while in service. According to the Chevron Oronite report contained in Appendix I, the BN retention was good, dropping to a low of 7.37 mmKOH/g⁵. AN rose slightly over this same time period to 4.18 mm KOH/g before dropping. The change in acid number could be attributed to a change in the oil, though this could not be confirmed. The ASTM D7317 and ASTM D445 specifications determined the pentane insolubles in the used oil and kinematic viscosity of the used oil, respectively. Analyses of the used oil showed that coagulated insolubles by the LMOA method remained low with a maximum of 2.6 percent weight, whereas the analyses of the viscosity of the engine used oil showed no significant increase in its viscosity.

Oxidation of the engine oil was measured by infrared method. Oxidation was under control and remained low for the duration of the test. Wear metals (iron, copper, and lead) were measured using the inductively coupled plasma method. For all three, the levels were very low and well within the condemning limits. Fuel dilution (total) and biodiesel dilution were also monitored. As an acidic material, biodiesel dilution in the oil may be problematic because it can be corrosive to metallic surfaces. For the duration of the test, both total fuel dilution and biodiesel dilution were very low and, in many observations, were below measurement limit⁶. Results from Chevron Oronite analyses are contained in Appendix I.

In summary, all samples of used oil collected and analyzed during the trial were routinely within tolerance of ASTM specifications and/or recommended values and are contained within Appendices D and J. These results indicate that in this revenue service trial, the biodiesel did not adversely affect the operations of the engine.

⁵ Van Slyke, P. and Anderson, D., FR-861 Amtrak General Electric Transportation Evaluation of a B-20 Biodiesel in a General Electric P-32 Locomotive, March 2010-June 2011. Chevron Oronite Company LLC, Richmond CA.

⁶ Van Slyke, P. and Anderson, D., FR-861 Amtrak General Electric Transportation Evaluation of a B-20 Biodiesel in a General Electric P-32 Locomotive, March 2010-June 2011. Chevron Oronite Company LLC, Richmond CA.

4.3 Locomotive Exhaust Emissions Test Results

Engine Exhaust Emissions testing was performed for HC, CO, NO_x, and PM under line haul and switch duty cycles, according to 40 CFR Part 92. The particulate and gaseous emissions were measured at low idle, idle, DB, and notches 1–8. Smoke opacity measurements were also taken according to 40 CFR Part 92, using both the EPA certification fuel and the B20 biodiesel.

4.3.1 Gaseous and Particulate Emission Test Results

Duty cycle composite emission test results using both the EPA certification fuel and B20 were well below limits established by EPA for Tier 0 engines for the gaseous emissions: HC, CO, NO_x, and PM. There was an approximately 5 percent increase in NO_x emissions observed in the use of B20 compared with the EPA diesel certification fuel. However, this increase in NO_x was expected and was within the range identified by other published emission test results of B20 fuel use⁷.

There were no significant differences identified in the emission results when comparing the certification fuel with B20 for PM, HC, and CO, except at low idle. Results for PM, HC, and CO at low idle showed an increase in emissions using B20 in comparison to EPA diesel certification fuel. Fuel consumption values also showed an increase at low idle with B20 compared with the diesel fuel. However, the disparity in the results between the B20 and certification fuel for the gaseous and particulate emissions, as well as the fuel consumption values, were not replicated at idle, DB, or notches 1–8. There was no clear explanation for this anomaly. GE, who performed the emissions testing on Engine #500, suggested that the disparity could have been caused as much by an engine operating issue as by the fuel difference. No loss in horse power was observed at low idle, idle, dynamic brake, or notches 1–8. The following graphs in Figures 7, 8, 9, 10, 11, and 12, and Tables 8 and 9 show the results from the gaseous, particulate matter, and smoke opacity emissions testing, as well as the results of fuel consumption and engine performance assessments.

⁷ Fritz, S., “Evaluation of Biodiesel Fuel in an EMD GP38-2 Locomotive.” National Renewable Energy Laboratory Report No. NREL/SR-510-33436. (May 2004)

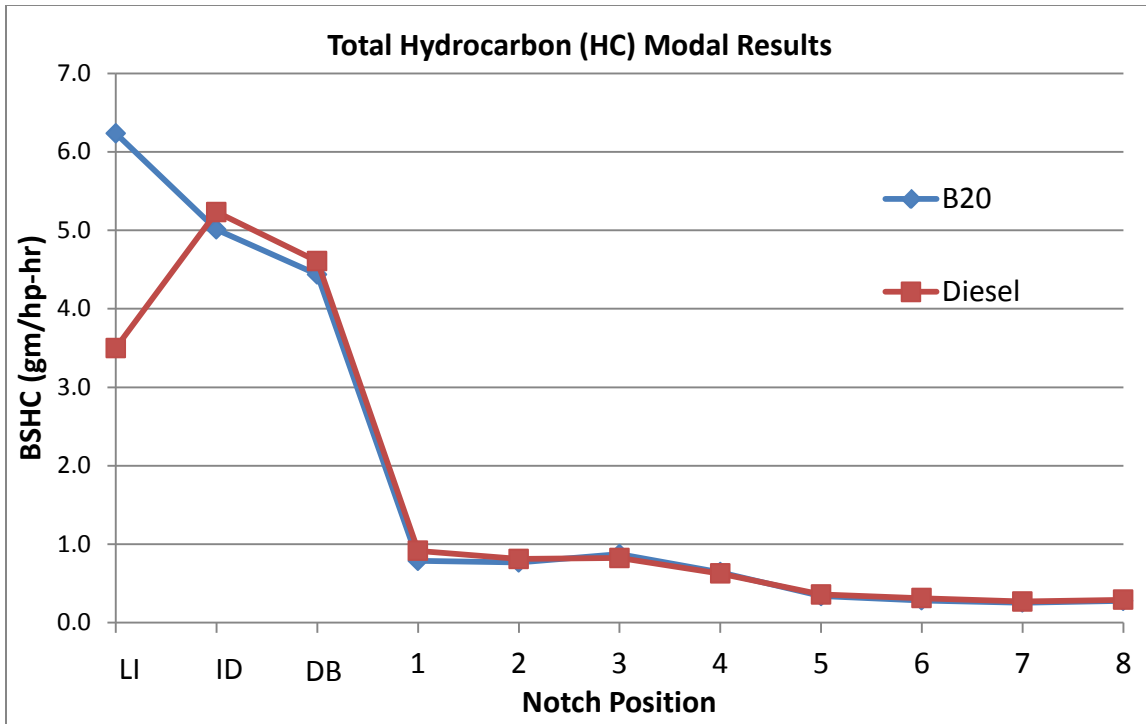


Figure 8: Total Hydrocarbon (HC) Emissions Test Results.

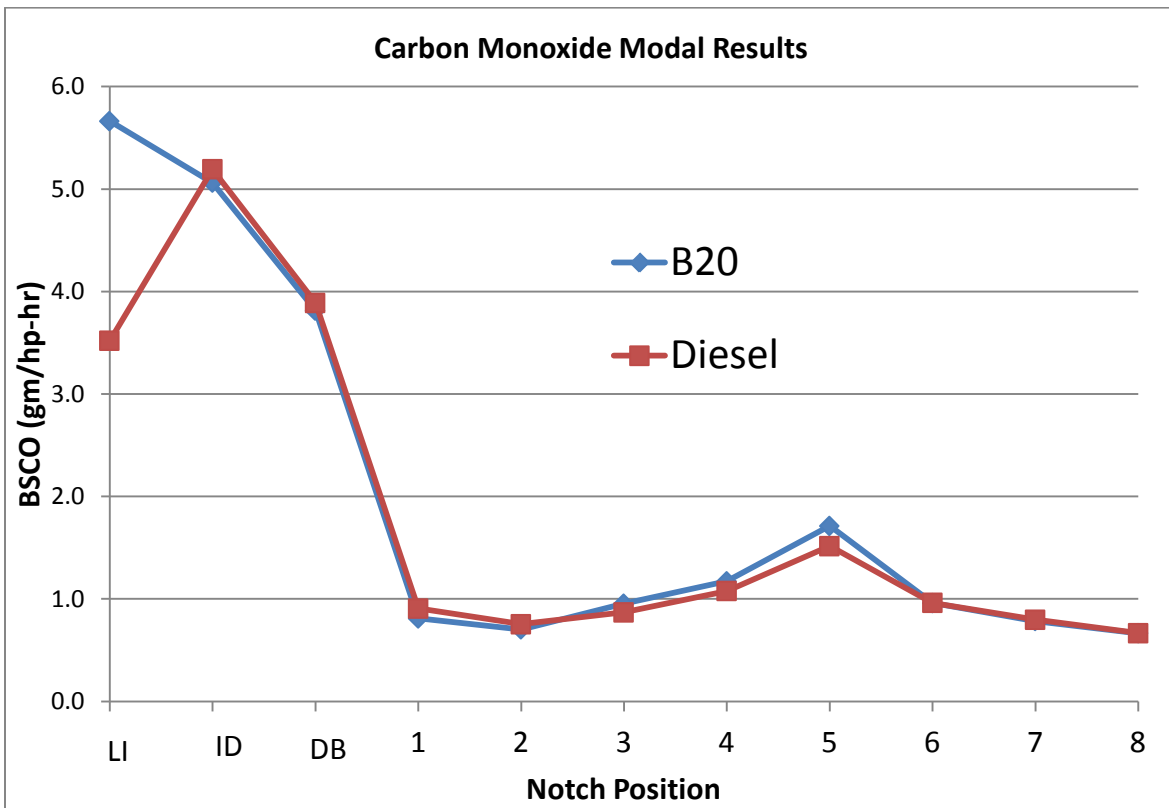


Figure 9: Carbon Monoxide (CO) Emissions Test Results.

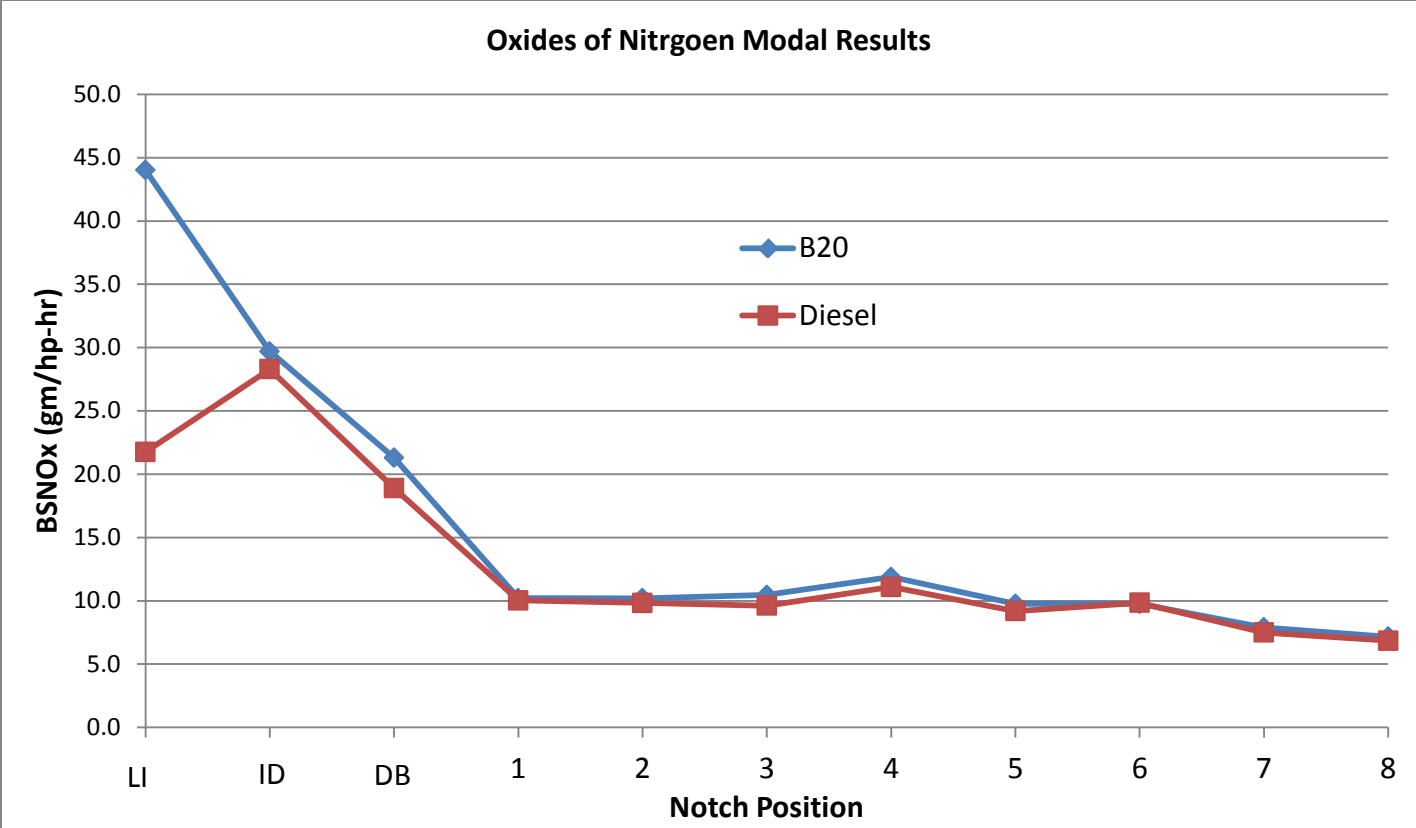


Figure 10: Oxides of Nitrogen (NOx) Emissions Test Results.

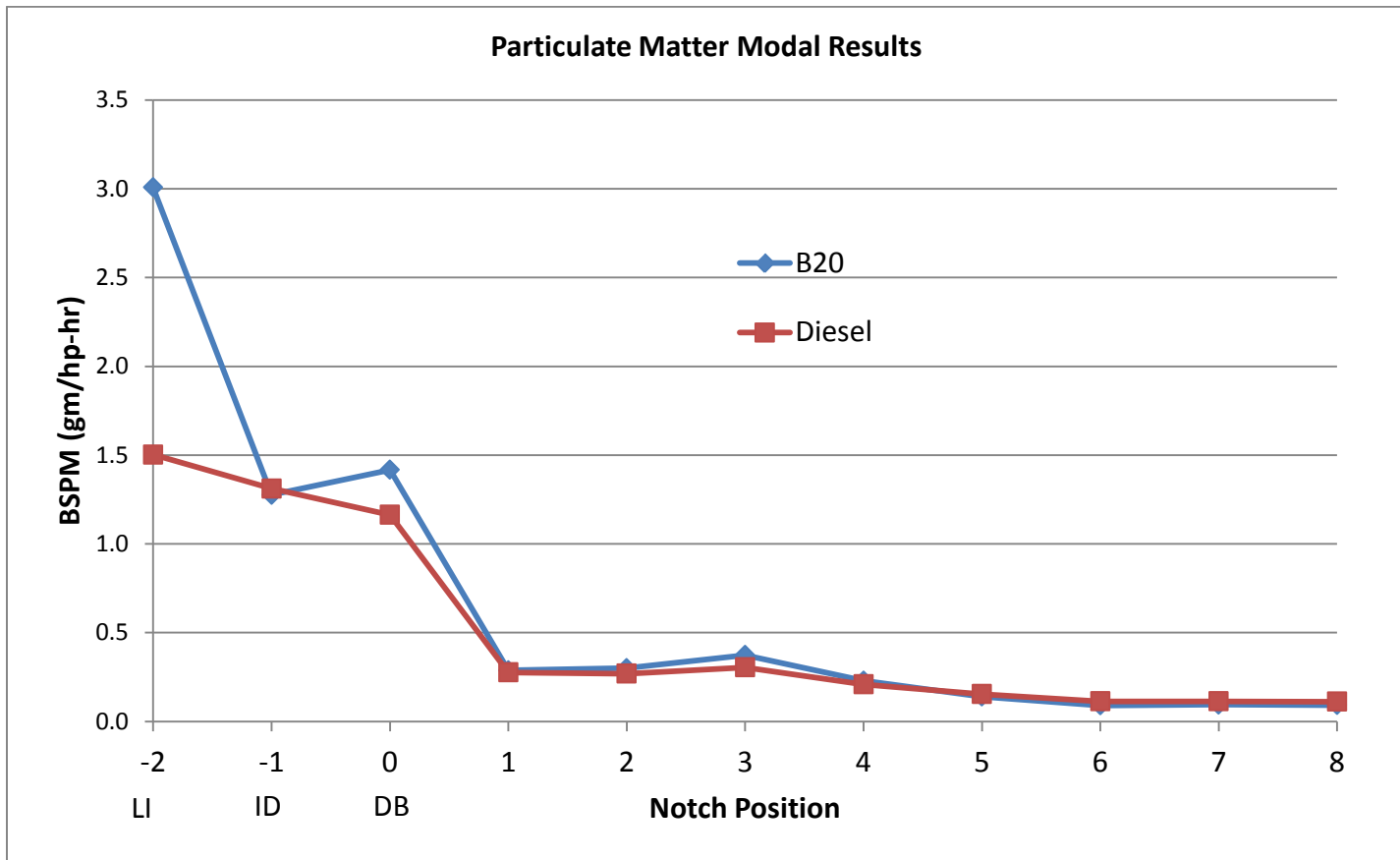


Figure 11: Particulate Matter Emissions Test Results.

As can be seen in the preceding graphs (Figures 8–11) and Table 8 below, the emissions of Engine #500 using B20 biodiesel fuel compares favorably with the certification diesel fuel. The gaseous and particulate emissions from Engine #500 were significantly lower than the EPA emissions limits for a Tier 0 engine, specifically for HC, CO, and PM. The measured NOx emission of the engine on B20 was slightly higher than the measured NOx emission of the engine on certification diesel fuel, but ultimately did not exceed the EPA limits.

Table 8: Modal Emissions Results.

Line Haul Duty Cycle Results				
	BSHC	BSCO	BSNO _x	BSPM
	(gm/hp-hr)			
B20 Fuel	0.38	0.90	8.3	0.13
EPA Certification (Diesel) Fuel	0.39	0.80	7.9	0.14
Tier 0 Limit	1.00	5.00	9.5	0.60
Switch Duty Cycle Results				
	BSHC	BSCO	BSNO _x	BSPM
	(gm/hp-hr)			
B20 Fuel	0.68	1.2	10.7	0.26
EPA Certification (Diesel) Fuel	0.68	1.2	10.0	0.24
Tier 0 Limit	2.10	8.00	14.0	0.72

Also measured was the smoke opacity of the engine on B20 and certification fuel. As mentioned previously, high aromaticity in the B20 fuel can affect the emissions of the engine by increasing the smoke opacity. Table 9 below shows the smoke opacity results. The percent opacity was measured at various time intervals. For each notch position of the engine, the opacity of the emitted smoke was recorded at 3 seconds peak interval, 30 seconds peak interval, and steady state. Data was again collected for the B20 biodiesel and certification diesel fuel. The test results show that the B20 fuel performed comparably with the diesel fuel, and below the EPA limit for Tier 0 engines.

Table 9: Smoke Opacity Emissions Test Results.

Smoke Opacity Test Results			
	Steady-State	30-Second Peak	3-Second Peak
	% Opacity		
B20 Fuel	12	16	35
Diesel Fuel	11	15	34
Tier 0 Limit	30	40	50

Notwithstanding the disparity in emissions and fuel consumption observed at low idle between the B20 and diesel fuel test results, Engine #500 performed well. The fuel consumption and engine performance results indicated that Engine #500 performed as well on the B20 biodiesel as it did on the diesel fuel. Engine #500 was able to make full horsepower using B20 biodiesel as it did using diesel fuel (see Figure 12).

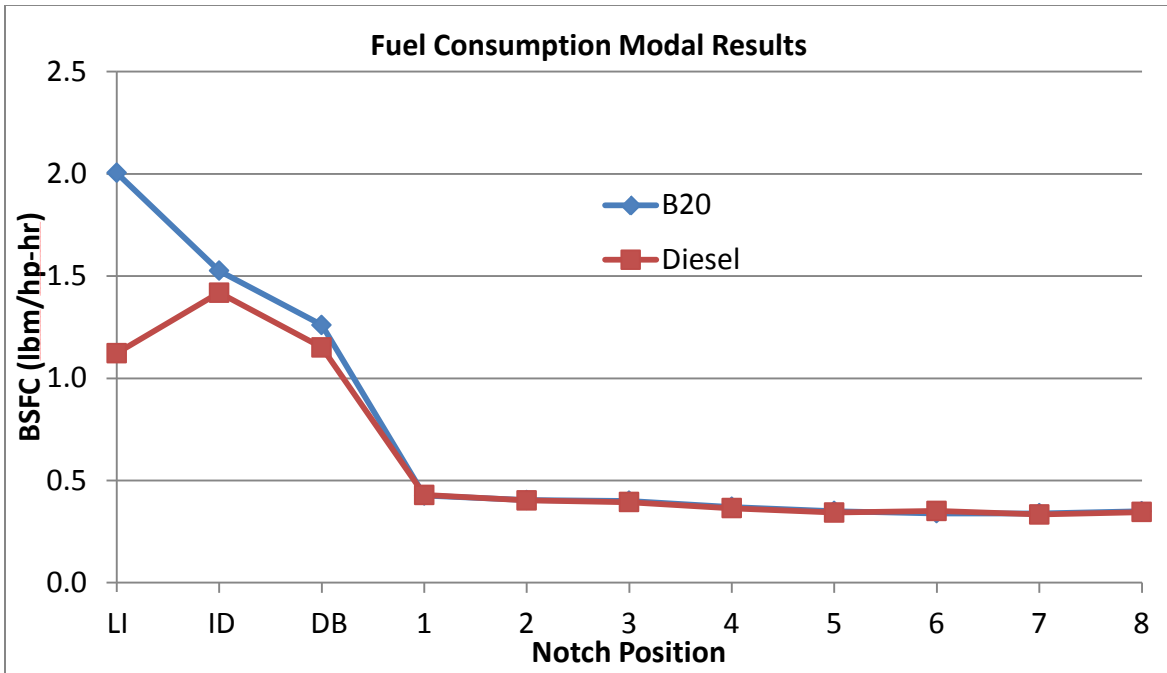


Figure 12: Fuel Consumption of Engine #500.

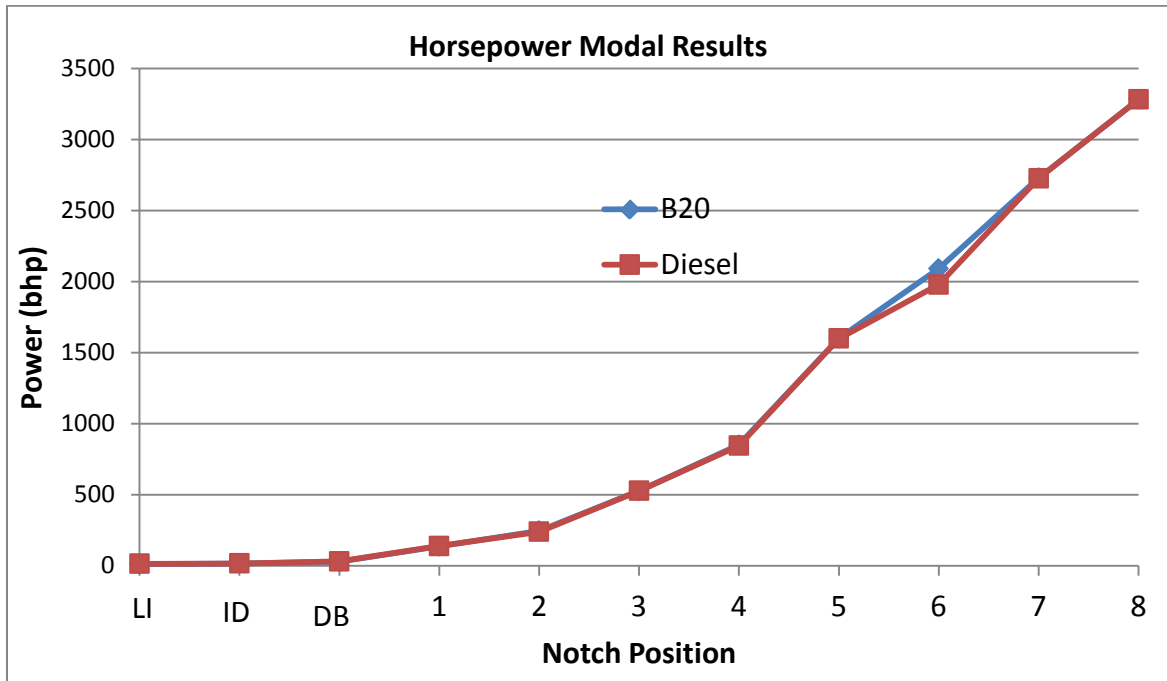


Figure 13: Engine #500 Powering Performance.

The test result presented in Figure 13 reinforces the locomotive engineers' assertion that they were able to achieve the full power at notch 8 during the revenue service trial. GE's report to Amtrak on the emissions testing is contained in Appendix J.

4.4 Engine Power Assembly Mechanical Tear-Down and Inspection Results

Following the emissions testing of Engine #500, a mechanical inspection to evaluate the engine for deposits and wear was performed by Chevron Oronite personnel. According to Chevron Oronite, the results of the testing showed no abnormal conditions related to engine deposits or engine wear. The condition of the parts was deemed comparable to normal conditions as experienced on passenger and freight locomotive operations. The engine parts inspected showed normal piston deposits. The liner wear was minimal. Piston rings also showed low wear and were in serviceable condition. The engine bearings showed normal wear and even loading with no evidence of corrosion. Even though the inspection of the 2R and 2L connecting rod bearings showed normal wear, there was some evidence of small pitting which was determined not to be caused by corrosion; further investigation was deemed necessary.

Inspection of Engine #500 after 12 months of B20 biodiesel use showed that the two new power assemblies had moderate piston deposits and a very clean engine surface lacking any sludge or deposit depth. A close up of the interior of the power assembly cylinder can be seen in the figures below.



Figure 24: Interior views of power assembly cylinder showing buildup.

The buildup seen was categorized as normal buildup from engine combustion. See Figure 14 above. The connecting rod of the power assembly can be seen in Figures 15(a) and 15(b) below. The striation marks observed in Figure 15(b) on the right has been classified as uniform wear.



Figure 15(a): 2R Power assembly connecting rod.

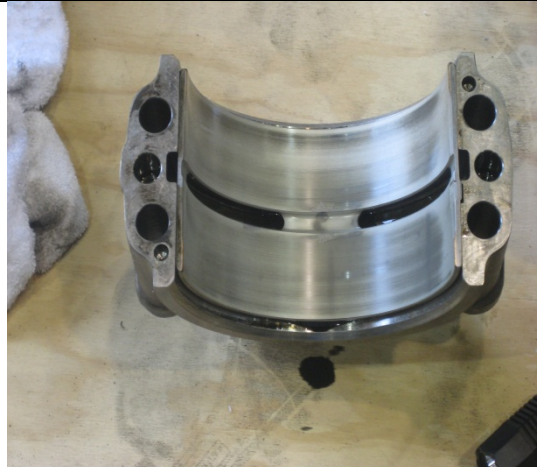


Figure 15(b): Close up of 2R connecting rod.

Appendix I contains the report submitted to Amtrak by Chevron Oronite. The report addresses the following conclusions:

- Used oil analysis exhibited good viscosity control.
- Used oil analysis exhibited good base retention and acid control.
- Used oil analysis exhibited good oxidation control.
- Used oil exhibited very low wear metals (Pb, Cu, Fe) indicating low wear.

5. Conclusion

The Amtrak revenue service trial of B20 biodiesel was listed as number 23 on Time Magazine's Top 50 Inventions of 2010 list. At the end of the revenue service trial, 35,789 gallons, or 20 percent, of the total fuel volume used during this test was produced from a nonpetroleum, renewable, and sustainable source of fuel. For the biodiesel revenue service trial, the test locomotive was provided, through DTL fueling methods, a total of 178,946 gallons of B20 biodiesel fuel that reliably met ASTM specifications for biodiesel. Existing infrastructure and vehicles were used for the trial. No engine modifications were required or performed on locomotive Engine #500, and no capital improvements were required to accommodate delivery of fuel. For these reasons, DTL fueling method may be the preferred fueling method when considering further use of B20 biodiesel fuel.

No adverse impact related to B20 fuel use was observed on OTP during 331 roundtrips from Oklahoma City, OK, to Fort Worth, TX (a total of 136,372 route miles). A total of 152,622 equipment miles was logged during this period using B20. No additional maintenance performed on Engine #500 was attributed to alternative use of B20 fuel.

During the course of the trial, the cost of B20 biodiesel ranged from \$2.16/gallon to \$3.70/gallon compared with ULSD #2, which ranged from \$2.14/gallon to \$3.52/gallon. The cost variance of B20 in comparison to ULSD ranged from \$0.00/gallon to \$0.31/gallon. On average, this was a \$0.13/gallon price difference between biodiesel and ULSD diesel fuel. This market fluctuation may have been partially caused by changes in State law related to tax exemption of B20 that resulted in changes to supply and demand.

Emissions testing was performed for HC, CO, NO_x, and PM under line haul and switch duty cycles. The particulate and gaseous emissions were measured at low idle, idle, DB, and notches 1–8 and were found to be below the limits set by the EPA for a Tier 0 class of locomotive engines. Similarly, smoke opacity measurements using both the EPA certification fuel and the B20 biodiesel fuel were below limits established by EPA for Tier 0 locomotive engines. An approximately 5 percent increase in NO_x was identified in the use of B20 compared with diesel fuel. However, this increase in NO_x was expected and was within the range identified by other emissions testing results published using B20 fuel. While some previous engine emissions testing of B20 biodiesel has shown (according to published reports) HC, CO, and PM reductions, the emissions testing conducted for this research effort did not indicate reductions using B20 in comparison to conventional petroleum diesel fuel for this particular locomotive. However, the emission testing did demonstrate that the alternative fuel tested well below EPA Tier 0 emission limits for locomotive engines. Moreover, test results indicated that it was possible to achieve full power using B20. Inspection of the baseline power assembly units and engine oil analyses showed that 12 months of B20 biodiesel use by Engine #500 resulted in normal wear of the baseline units.

Additional research is needed to determine performance in colder environments, availability and cost of B20 biodiesel fuel, long-term engine durability issues, and OEM warranty issues with the use of such fuels. An increase in domestic production of biofuels such as biodiesel could result in biodiesel fuel cost reduction, which may be an incentive to adopt B20 biodiesel as an alternative fuel for rail transportation.

6. References

1. Beauchaine, M., “Measuring Water, Methanol and total Glycerin in B100 Samples,” <http://www.biodieselmagazine.com/articles/1663/measuring-water-methanol-and-total-glycerin-in-b100-samples/> (May 25, 2007).
2. *Biodiesel Production*. National Biodiesel Board. <http://www.biodiesel.org/docs/ffs-production/production-fact-sheet.pdf?sfvrsn=4>
3. Fritz, S., “Evaluation of Biodiesel Fuel in an EMD GP38-2 Locomotive.” National Renewable Energy Laboratory Report No. NREL/SR-510-33436. (May 2004).
4. Glenn, Doug, “Emission Testing of Amtrak Unit #500.” GE Transportation (May 25, 2011).
5. Van Slyke, P., Anderson, D., “FR-861 Amtrak General Electric Transportation Evaluation of a B20 Biodiesel in a General Electric P-32 Locomotive - March 2010 – June 2011.” Chevron Oronite Company LLC, Industrial Engine Oils, Richmond, California.

Appendix A—Fuel Delivery Summary, Quantities, Cost

Appendix B—92-Day Scope of Work

Appendix C—Map 100 Forms

Appendix D—Biofuel Certificates of Analysis (Direct Fuels)

Appendix E—Ultra-Low Sulfur Diesel (ULSD) Sampling Results

Appendix F—B100 Sampling Results

Appendix G—B20 Biodiesel Sampling Results

Appendix H—Used Oil Sampling Results

**Appendix I—Chevron Oronite Tear-Down Inspection of Engine #500
Power Assemblies**

Appendix J—Emissions Testing of Amtrak Unit #500 (GE Report)

Abbreviations and Acronyms

ASTM	American Society for Testing and Materials
B100	100% Biodiesel
B20	20% Biodiesel and 80% ULSD
BQ9000	National Biodiesel Accreditation Program
CFR	Code of Federal Regulations
CO	Carbon Monoxide
cSt	CentiStokes
Cu	Copper
DOT	Department of Transportation
DB	Dynamic Brake
E500	Engine #500
EHS	Environmental Health and Safety
EPA	U.S. Environmental Protection Agency
Fe	Iron
FRA COTR	Federal Railroad Administration/Contracting Officer's Technical Representative
FTP	Federal Test Procedures
FY	Fiscal Year
GE	General Electric
HCS	Hydrocarbons
HP	Horsepower
MAP100	Maintenance Analysis Program Equipment Condition Report
mg/KOH	Milligrams/Potassium Hydroxide
NOx	Oxides of Nitrogen
OTP	On Time Performance
P32-8	GE 3200 HP Diesel Locomotive
Pb	Lead
ULSD	Ultra Low Sulfur Diesel

						Bio				ULSD		
Location	Total Gallons	Date	Fuel Index	Ticket #	Qty	\$/gal	Amt Due	Train #	Loco #	Comp \$/gal	Delta	\$ Difference
FORT WORTH, TX	1,408	27-Feb-10	2.1325	5210	1,408	2.2325	3,143.36	822	500	2.2325	0	0
FORT WORTH, TX	952.9	1-Mar-10	2.1325	5225	952.9	2.2325	2,127.35	822	500	2.2325	0	0
FORT WORTH, TX	19,206.50	1-Mar-10	2.1325	5223	1,000.20	2.2325	2,232.95	21	184			
FORT WORTH, TX	19,206.50	1-Mar-10	2.1325	5224	1,273.80	2.2325	2,843.76	22	191			
FORT WORTH, TX	19,206.50	2-Mar-10	2.1256	302184	1,500	2.2256	3,338.40	22	184			
FORT WORTH, TX	19,206.50	2-Mar-10	2.1256	302131	300	2.2256	667.68	821	131			
FORT WORTH, TX	19,206.50	2-Mar-10	2.1256	302050	1,000	2.2256	2,225.60	21	50			
FORT WORTH, TX	19,206.50	2-Mar-10	2.1256	302077	961	2.2256	2,138.80	Spare	77			
FORT WORTH, TX	19,206.50	3-Mar-10	2.1646	5237	1,100.40	2.2646	2,491.97	21	56			
FORT WORTH, TX	19,206.50	3-Mar-10	2.1646	5236	285.4	2.2646	646.31684	22	77			
FORT WORTH, TX	19,206.50	3-Mar-10	2.1646	5241	900.3	2.2646	2,038.82	22	50			
FORT WORTH, TX	19,206.50	4-Mar-10	2.1958	304050	800	2.2958	1,836.64	Spare	50			
FORT WORTH, TX	19,206.50	4-Mar-10	2.1958	304056	1,400	2.2958	3,214.12	22	56			
FORT WORTH, TX	19,206.50	4-Mar-10	2.1958	304092	1,154	2.2958	2,649.35	21	92			
FORT WORTH, TX	19,206.50	5-Mar-10	2.1727	305092	1,330	2.2727	3,022.69	22	92			
FORT WORTH, TX	19,206.50	5-Mar-10	2.1727	305164	1,100	2.2727	2,499.97	21	164			
FORT WORTH, TX	19,206.50	6-Mar-10	2.2147	5242	1,102.10	2.3147	2,551.03	21	121			
FORT WORTH, TX	19,206.50	6-Mar-10	2.2147	5243	1,194.80	2.3147	2,765.60	22	164			
FORT WORTH, TX	19,206.50	7-Mar-10	2.2147	5244	1,100	2.3147	2,546.17	21	156			
FORT WORTH, TX	19,206.50	7-Mar-10	2.2147	5245	1,403.60	2.3147	3,248.91	22	121			
FORT WORTH, TX	19,206.50	7-Mar-10	2.2147	5246	300.9	2.3147	696.49323	821	131			
FORT WORTH, TX	2,406.60	3-Mar-10	2.1646	5238	1,199.60	2.2646	2,716.61	822	500	2.2646	0	0
FORT WORTH, TX	2,406.60	5-Mar-10	2.1727	305500	1,207	2.2727	2,743.15	822	500	2.2727	0	0
FORT WORTH, TX	19,351.90	8-Mar-10	2.2147	5250	1,162	2.3147	2,689.68	21	144			
FORT WORTH, TX	19,351.90	8-Mar-10	2.2147	5253	1,250.70	2.3147	2,895.00	22	156			
FORT WORTH, TX	19,351.90	8-Mar-10	2.2147	5252	550.3	2.3147	1,273.78	821	131			
FORT WORTH, TX	19,351.90	9-Mar-10	2.2139	5257	1,000.80	2.3139	2,315.75	21	177			
FORT WORTH, TX	19,351.90	9-Mar-10	2.2139	5256	1,298.10	2.3139	3,003.67	22	144			
FORT WORTH, TX	19,351.90	10-Mar-10	2.1913	5262	1,200.70	2.2913	2,751.16	21	195			
FORT WORTH, TX	19,351.90	10-Mar-10	2.1913	5261	1,463.20	2.2913	3,352.63	22	177			
FORT WORTH, TX	19,351.90	11-Mar-10	2.2133	5267	1,400.10	2.3133	3,238.85	SPR	168			
FORT WORTH, TX	19,351.90	11-Mar-10	2.2133	5268	1,100.80	2.3133	2,546.48	21	120			
FORT WORTH, TX	19,351.90	11-Mar-10	2.2133	5270	1,554.40	2.3133	3,595.79	22	195			
FORT WORTH, TX	19,351.90	12-Mar-10	2.2196	5279	206.6	2.3196	479.22936	SPR	121			
FORT WORTH, TX	19,351.90	12-Mar-10	2.2196	5276	1,000.80	2.3196	2,321.46	21	186			
FORT WORTH, TX	19,351.90	12-Mar-10	2.2196	5280	1,100.40	2.3196	2,552.49	22	170			
FORT WORTH, TX	19,351.90	13-Mar-10	2.2065	5284	1,137.30	2.3065	2,623.18	21	156			
FORT WORTH, TX	19,351.90	13-Mar-10	2.2065	2271	1,322.80	2.3065	3,051.04	22	186			
FORT WORTH, TX	19,351.90	14-Mar-10	2.2065	2273	1,370.40	2.3065	3,160.83	22	156			
FORT WORTH, TX	19,351.90	14-Mar-10	2.2065	2274	1,232.50	2.3065	2,842.76	21	137			
FORT WORTH, TX	4,738.90	8-Mar-10	2.2147	5251	1,501.80	2.3147	3,476.22	822	500	2.3147	0	0
FORT WORTH, TX	4,738.90	10-Mar-10	2.1913	5260	1,204.20	2.2913	2,759.18	822	500	2.2913	0	0

						Bio				ULSD		
Location	Total Gallons	Date	Fuel Index	Ticket #	Qty	\$/gal	Amt Due	Train #	Loco #	Comp \$/gal	Delta	\$ Difference
FORT WORTH, TX	4,738.90	12-Mar-10	2.2196	5277	1,405.80	2.3196	3,260.89	822	500	2.3196	0	0
FORT WORTH, TX	4,738.90	13-Mar-10	2.2065	5285	627.1	2.3065	1,446.41	822	500	2.3065	0	0
FORT WORTH, TX	21,054.10	15-Mar-10	2.2065	5290	1,100.30	2.3065	2,537.84	21	144			
FORT WORTH, TX	21,054.10	15-Mar-10	2.2065	5293	1,296.30	2.3065	2,989.92	22	137			
FORT WORTH, TX	21,054.10	15-Mar-10	2.2065	5294	600.2	2.3065	1,384.36	821	131			
FORT WORTH, TX	21,054.10	16-Mar-10	2.1621	316821	900	2.2621	2,035.89	821	131			
FORT WORTH, TX	21,054.10	16-Mar-10	2.1621	316021	925	2.2621	2,092.44	21	170			
FORT WORTH, TX	21,054.10	16-Mar-10	2.1621	316SPR	350	2.2621	791.735	SPR	168			
FORT WORTH, TX	21,054.10	16-Mar-10	2.1621	316022	1,100	2.2621	2,488.31	22	144			
FORT WORTH, TX	21,054.10	17-Mar-10	2.2223	317022	1,400	2.3223	3,251.22	22	170			
FORT WORTH, TX	21,054.10	17-Mar-10	2.2223	317021	1,100	2.3223	2,554.53	21	184			
FORT WORTH, TX	21,054.10	17-Mar-10	2.2223	317821	463	2.3223	1,075.22	821	131			
FORT WORTH, TX	21,054.10	18-Mar-10	2.2438	5303	1,250.30	2.3438	2,930.45	22	184			
FORT WORTH, TX	21,054.10	18-Mar-10	2.2438	5302	1,250.30	2.3438	2,930.45	21	121			
FORT WORTH, TX	21,054.10	19-Mar-10	2.2235	5310	949.6	2.3235	2,206.40	21	90			
FORT WORTH, TX	21,054.10	19-Mar-10	2.2235	5315	1,250.30	2.3235	2,905.07	22	121			
FORT WORTH, TX	21,054.10	20-Mar-10	2.1878	5317	1,211	2.2878	2,770.53	21	137			
FORT WORTH, TX	21,054.10	20-Mar-10	2.1878	5318	1,501.70	2.2878	3,435.59	22	90			
FORT WORTH, TX	21,054.10	20-Mar-10	2.1878	5319	892.5	2.2878	2,041.86	821	131			
FORT WORTH, TX	21,054.10	21-Mar-10	2.1878	5325	1,000.60	2.2878	2,289.17	821	131			
FORT WORTH, TX	21,054.10	21-Mar-10	2.1878	5324	1,312.40	2.2878	3,002.51	22	137			
FORT WORTH, TX	21,054.10	21-Mar-10	2.1878	5322	1,200.60	2.2878	2,746.73	21	63			
FORT WORTH, TX	2,816.80	15-Mar-10	2.2065	5291	1,198.30	2.3065	2,763.88	822	500	2.3065	0	0
FORT WORTH, TX	2,816.80	17-Mar-10	2.2223	317822	627	2.3223	1,456.08	822	500	2.3223	0	0
FORT WORTH, TX	2,816.80	19-Mar-10	2.2235	319822	991.5	2.3235	2,303.75	822	500	2.3235	0	0
FORT WORTH, TX	21,551.40	22-Mar-10	2.1878	322063	1,113	2.2878	2,546.32	22	63			
FORT WORTH, TX	21,551.40	22-Mar-10	2.1878	322004	1,100	2.2878	2,516.58	21	4			
FORT WORTH, TX	21,551.40	22-Mar-10	2.1878	322131	300	2.2878	686.34	821	131			
FORT WORTH, TX	21,551.40	23-Mar-10	2.195	323082	1,200	2.295	2,754.00	21	82			
FORT WORTH, TX	21,551.40	23-Mar-10	2.195	323131	600	2.295	1,377.00	821	131			
FORT WORTH, TX	21,551.40	23-Mar-10	2.195	323004	1,200	2.295	2,754.00	22	4			
FORT WORTH, TX	21,551.40	24-Mar-10	2.2161	324170	800	2.3161	1,852.88	spare	170			
FORT WORTH, TX	21,551.40	24-Mar-10	2.2161	324082	1,200	2.3161	2,779.32	22	82			
FORT WORTH, TX	21,551.40	24-Mar-10	2.2161	324155	1,200	2.3161	2,779.32	21	155			
FORT WORTH, TX	21,551.40	25-Mar-10	2.1841	325124	1,254	2.2841	2,864.26	21	124			
FORT WORTH, TX	21,551.40	25-Mar-10	2.1841	325155	1,300	2.2841	2,969.33	22	155			
FORT WORTH, TX	21,551.40	25-Mar-10	2.1841	325170	300	2.2841	685.23	spare	170			
FORT WORTH, TX	21,551.40	26-Mar-10	2.1896	5333	1,314.60	2.2896	3,009.91	22	124			
FORT WORTH, TX	21,551.40	26-Mar-10	2.1896	5329	1,001	2.2896	2,291.89	21	90			
FORT WORTH, TX	21,551.40	27-Mar-10	2.1992	5337	918.1	2.2992	2,110.90	21	79			
FORT WORTH, TX	21,551.40	27-Mar-10	2.1992	5338	1,428.80	2.2992	3,285.10	22	90			
FORT WORTH, TX	21,551.40	27-Mar-10	2.1992	5339	147.1	2.2992	338.21232	822	170			

						Bio				ULSD		
Location	Total Gallons	Date	Fuel Index	Ticket #	Qty	\$/gal	Amt Due	Train #	Loco #	Comp \$/gal	Delta	\$ Difference
FORT WORTH, TX	21,551.40	27-Mar-10	2.1992	5336	506.9	2.2992	1,165.46	21	148			
FORT WORTH, TX	21,551.40	28-Mar-10	2.1992	5345	1,199.60	2.2992	2,758.12	821	170			
FORT WORTH, TX	21,551.40	28-Mar-10	2.1992	5341	1,256.10	2.2992	2,888.03	21	113			
FORT WORTH, TX	21,551.40	28-Mar-10	2.1992	5342	1,326.20	2.2992	3,049.20	22	79			
FORT WORTH, TX	21,551.40	28-Mar-10	2.1992	5343	886	2.2992	2,037.09	22	148			
FORT WORTH, TX	2,948.10	22-Mar-10	2.1878	322500	1,482	2.2878	3,390.52	822	500	2.2878	0	0
FORT WORTH, TX	2,948.10	24-Mar-10	2.2161	324500	782	2.3161	1,811.19	822	500	2.3161	0	0
FORT WORTH, TX	2,948.10	26-Mar-10	2.1896	5331	684.1	2.2896	1,566.32	821	500	2.2896	0	0
FORT WORTH, TX	8,847	29-Mar-10	2.1992	32921	997	2.2992	2,292.30	21	2			
FORT WORTH, TX	8,847	29-Mar-10	2.1992	32922	1,200	2.2992	2,759.04	22	113			
FORT WORTH, TX	8,847	30-Mar-10	2.2468	33021	1,100	2.3468	2,581.48	21	175			
FORT WORTH, TX	8,847	30-Mar-10	2.2468	33022	1,400	2.3468	3,285.52	22	2			
FORT WORTH, TX	8,847	30-Mar-10	2.2468	330SPR	1,368	2.3468	3,210.42	SPR	131			
FORT WORTH, TX	8,847	31-Mar-10	2.2496	33121	1,300	2.3496	3,054.48	21	146			
FORT WORTH, TX	8,847	31-Mar-10	2.2496	33122	501	2.3496	1,177.15	22	23			
FORT WORTH, TX	8,847	31-Mar-10	2.2496	331822	981	2.3496	2,304.96	822	170			
FORT WORTH, TX	1,584	29-Mar-10	2.1992	329821	795	2.2992	1,827.86	821	500	2.2992	0	0
FORT WORTH, TX	1,584	31-Mar-10	2.2496	331821	789	2.3496	1,853.83	821	500	2.3496	0	0
FORT WORTH, TX	10,982.10	1-Apr-10	2.2687	575	1,345.90	2.3662	3,184.67	21	39			
FORT WORTH, TX	10,982.10	1-Apr-10	2.2687	576	1,400	2.3662	3,312.68	22	146			
FORT WORTH, TX	10,982.10	1-Apr-10	2.2687	577	344.2	2.3662	814.44604	821	170			
FORT WORTH, TX	10,982.10	2-Apr-10	2.3211	582	1,258	2.4186	3,042.60	22	39			
FORT WORTH, TX	10,982.10	2-Apr-10	2.3211	583	135	2.4186	326.511	21	73			
FORT WORTH, TX	10,982.10	2-Apr-10	2.3211	584	82.9	2.4186	200.50194	822	170			
FORT WORTH, TX	10,982.10	2-Apr-10	2.3211	585	891.8	2.4186	2,156.91	SPR	168			
FORT WORTH, TX	10,982.10	2-Apr-10	2.2311	587	560.9	2.3286	1,306.11	SPR	168			
FORT WORTH, TX	10,982.10	3-Apr-10	2.3228	595	1,277.20	2.4203	3,091.21	21	73			
FORT WORTH, TX	10,982.10	3-Apr-10	2.3228	596	982.1	2.4203	2,376.98	22	142			
FORT WORTH, TX	10,982.10	4-Apr-10	2.3228	602	1,201.70	2.4203	2,908.47	21	23			
FORT WORTH, TX	10,982.10	4-Apr-10	2.3228	604	1,502.40	2.4203	3,636.26	22	142			
												0
FORT WORTH, TX	2,673.90	2-Apr-10	2.3211	586	1,298.40	2.4186	3,140.31	821	500	2.3286	0	.09
FORT WORTH, TX	2,673.90	3-Apr-10	2.3228	563	788.3	2.4203	1,907.92	821	500	2.4203	0	0
FORT WORTH, TX	2,673.90	4-Apr-10	2.3228	603	587.2	2.4203	1,421.20	821	500	2.4203	0	0
FORT WORTH, TX	19,188.40	5-Apr-10	2.3228	605	1,194.60	2.4203	2,891.29	22	23			
FORT WORTH, TX	19,188.40	5-Apr-10	2.3228	606	1,243.80	2.4203	3,010.37	21	1			
FORT WORTH, TX	19,188.40	5-Apr-10	2.3228	607	548.2	2.4203	1,326.81	SPR	168			
FORT WORTH, TX	19,188.40	6-Apr-10	2.3725	610	978.1	2.47	2,415.91	21	127			
FORT WORTH, TX	19,188.40	6-Apr-10	2.3725	613	1,184.70	2.47	2,926.21	22	1			
FORT WORTH, TX	19,188.40	7-Apr-10	2.3654	614	1,304.30	2.4629	3,212.36	21	83			
FORT WORTH, TX	19,188.40	7-Apr-10	2.3654	615	929.1	2.4629	2,288.28	22	127			
FORT WORTH, TX	19,188.40	7-Apr-10	2.3654	615-2	951.6	2.4629	2,343.70	22	24			

						Bio				ULSD		
Location	Total Gallons	Date	Fuel Index	Ticket #	Qty	\$/gal	Amt Due	Train #	Loco #	Comp \$/gal	Delta	\$ Difference
FORT WORTH, TX	19,188.40	8-Apr-10	2.333	620	472	2.4305	1,147.20	22	170			
FORT WORTH, TX	19,188.40	8-Apr-10	2.333	621	1,209.40	2.4305	2,939.45	21	119			
FORT WORTH, TX	19,188.40	8-Apr-10	2.333	623	1,123.70	2.4305	2,731.15	SPR	83			
FORT WORTH, TX	19,188.40	9-Apr-10	2.3193	626	1,346.80	2.4168	3,254.95	21	47			
FORT WORTH, TX	19,188.40	9-Apr-10	2.3193	627	1,197.80	2.4168	2,894.84	22	119			
FORT WORTH, TX	19,188.40	9-Apr-10	2.3193	628	509.9	2.4168	1,232.33	821	168			
FORT WORTH, TX	19,188.40	10-Apr-10	2.3179	639	1,194	2.4154	2,883.99	21	196			
FORT WORTH, TX	19,188.40	10-Apr-10	2.3179	639-A	1,105.50	2.4154	2,670.22	22	47			
FORT WORTH, TX	19,188.40	10-Apr-10	2.3179	640	208.2	2.4154	502.88628	821	168			
FORT WORTH, TX	19,188.40	11-Apr-10	2.3179	645	1,286.10	2.4154	3,106.45	21	137			
FORT WORTH, TX	19,188.40	11-Apr-10	2.3179	647	1,200.60	2.4154	2,899.93	22	196			
FORT WORTH, TX	17,678.30	12-Apr-10	2.3179	652	180.4	2.4154	435.73816	21	71			
FORT WORTH, TX	17,678.30	12-Apr-10	2.3179	654	1,121.70	2.4154	2,709.35	22	137			
FORT WORTH, TX	17,678.30	12-Apr-10	2.3179	655	1,008.50	2.4154	2,435.93	21	71			
FORT WORTH, TX	17,678.30	12-Apr-10	2.3179	657	309.5	2.4154	747.5663	SPR	83			
FORT WORTH, TX	17,678.30	13-Apr-10	2.3193	659	1,139.10	2.4168	2,752.98	21	163			
FORT WORTH, TX	17,678.30	13-Apr-10	2.3193	661	1,150.20	2.4168	2,779.80	22	71			
FORT WORTH, TX	17,678.30	14-Apr-10	2.3199	665	1,206.70	2.4174	2,917.08	22	163			
FORT WORTH, TX	17,678.30	14-Apr-10	2.3199	666	1,229	2.4174	2,970.98	21	43			
FORT WORTH, TX	17,678.30	15-Apr-10	2.3513	674	1,199.30	2.4488	2,936.85	22	42			
FORT WORTH, TX	17,678.30	15-Apr-10	2.3513	675	1,137	2.4488	2,784.29	21	162			
FORT WORTH, TX	17,678.30	15-Apr-10	2.3513	677	487.6	2.4488	1,194.03	SPR	168			
FORT WORTH, TX	17,678.30	16-Apr-10	2.3625	683	1,097.90	2.46	2,700.83	21	186			
FORT WORTH, TX	17,678.30	16-Apr-10	2.3625	684	1,242.60	2.46	3,056.80	22	162			
FORT WORTH, TX	17,678.30	17-Apr-10	2.3311	698	1,261.10	2.4286	3,062.71	21	190			
FORT WORTH, TX	17,678.30	17-Apr-10	2.3311	699	1,425.30	2.4286	3,461.48	22	186			
FORT WORTH, TX	17,678.30	17-Apr-10	2.3311	700	286.1	2.4286	694.82246	821	83			
FORT WORTH, TX	17,678.30	18-Apr-10	2.3311	707	1,151.40	2.4286	2,796.29	21	189			
FORT WORTH, TX	17,678.30	18-Apr-10	2.3311	708	1,044.90	2.4286	2,537.64	22	190			
FORT WORTH, TX	3,926.40	5-Apr-10	2.3639	608	574.2	2.4614	1,413.34	821	500	2.4203	0.0411	23.60
FORT WORTH, TX	3,926.40	6-Apr-10	2.3954	612	186.7	2.4929	465.42	821	500	2.47	0.0229	4.28
FORT WORTH, TX	3,926.40	7-Apr-10	2.3854	616	951.1	2.4829	2,361.49	821	500	2.4629	0.02	19.02
FORT WORTH, TX	3,926.40	8-Apr-10	2.3586	622	739.4	2.4561	1,816.04	821	500	2.4305	0.0256	18.93
FORT WORTH, TX	3,926.40	9-Apr-10	2.351	629	522.1	2.4485	1,278.36	821	500	2.4168	0.0317	16.55
FORT WORTH, TX	3,926.40	10-Apr-10	2.3522	640	600.6	2.4497	1,471.29	821	500	2.4154	0.0343	20.60
FORT WORTH, TX	3,926.40	11-Apr-10	2.3522	646	352.3	2.4497	863.03	821	500	2.4154	0.0343	12.08
FORT WORTH, TX	4,341	12-Apr-10	2.3179	656	765.8	2.4154	1,849.71	821	500	2.4154	0	0
FORT WORTH, TX	4,341	13-Apr-10	2.3193	660	195.6	2.4168	472.72608	821	500	2.4168	0	0
FORT WORTH, TX	4,341	14-Apr-10	2.3199	667	960.2	2.4174	2,321.19	821	500	2.4174	0	0
FORT WORTH, TX	4,341	15-Apr-10	2.3513	676	627.6	2.4488	1,536.87	821	500	2.4488	0	0
FORT WORTH, TX	4,341	16-Apr-10	2.3625	685	602.4	2.46	1,481.90	821	500	2.46	0	0
FORT WORTH, TX	4,341	17-Apr-10	2.3311	700	654.9	2.4286	1,590.49	821	500	2.4286	0	0

						Bio				ULSD		
Location	Total Gallons	Date	Fuel Index	Ticket #	Qty	\$/gal	Amt Due	Train #	Loco #	Comp \$/gal	Delta	\$ Difference
FORT WORTH, TX	4,341	18-Apr-10	2.3311	706	534.5	2.4286	1,298.09	821	500	2.4286	0	0
FORT WORTH, TX	18,954.40	19-Apr-10	2.3311	710	1,089	2.4286	2,644.75	21	51			
FORT WORTH, TX	18,954.40	19-Apr-10	2.3311	712	1,049.80	2.4286	2,549.54	22	189			
FORT WORTH, TX	18,954.40	20-Apr-10	2.2847	721	1,117.30	2.3822	2,661.63	21	65			
FORT WORTH, TX	18,954.40	20-Apr-10	2.2847	722	442.7	2.3822	1,054.60	22	168			
FORT WORTH, TX	18,954.40	20-Apr-10	2.2847	722	1,140	2.3822	2,715.71	22	51			
FORT WORTH, TX	18,954.40	21-Apr-10	2.3109	735	1,025	2.4084	2,468.61	21	152			
FORT WORTH, TX	18,954.40	21-Apr-10	2.3109	738	1,310	2.4084	3,155.00	22	65			
FORT WORTH, TX	18,954.40	22-Apr-10	2.3518	744	1,350.90	2.4493	3,308.76	22	83			
FORT WORTH, TX	18,954.40	22-Apr-10	2.3518	745	1,151.40	2.4493	2,820.12	21	68			
FORT WORTH, TX	18,954.40	22-Apr-10	2.3518	743	472.4	2.4493	1,157.05	821	83			
FORT WORTH, TX	18,954.40	23-Apr-10	2.3515	753	1,215.90	2.449	2,977.74	22	68			
FORT WORTH, TX	18,954.40	23-Apr-10	2.3515	754	0.2	2.449	0.4898	21	189			
FORT WORTH, TX	18,954.40	23-Apr-10	2.3515	754	1,134	2.449	2,777.17	21	150			
FORT WORTH, TX	18,954.40	24-Apr-10	2.387	764	397.2	2.4845	986.8434	821	83			
FORT WORTH, TX	18,954.40	24-Apr-10	2.387	767	1,336	2.4845	3,319.29	22	150			
FORT WORTH, TX	18,954.40	24-Apr-10	2.387	768	1,334.90	2.4845	3,316.56	21	52			
FORT WORTH, TX	18,954.40	24-Apr-10	2.387	771	192.9	2.4845	479.26005	SPR	93			
FORT WORTH, TX	18,954.40	25-Apr-10	2.387	776	1,392.80	2.4845	3,460.41	22	52			
FORT WORTH, TX	18,954.40	25-Apr-10	2.387	775	1,252.80	2.4845	3,112.58	21	42			
FORT WORTH, TX	18,954.40	25-Apr-10	2.387	773	549.2	2.4845	1,364.49	SPR	93			
FORT WORTH, TX	18,530.20	26-Apr-10	2.387	777	1,165.40	2.4845	2,895.44	22	42			
FORT WORTH, TX	18,530.20	26-Apr-10	2.387	778	1,077.20	2.4845	2,676.30	21	72			
FORT WORTH, TX	18,530.20	27-Apr-10	2.3749	784	1,005.90	2.4724	2,486.99	21	43			
FORT WORTH, TX	18,530.20	27-Apr-10	2.3749	787	1,316.60	2.4724	3,255.16	22	72			
FORT WORTH, TX	18,530.20	28-Apr-10	2.3684	795	1,060.50	2.4659	2,615.09	21	115			
FORT WORTH, TX	18,530.20	28-Apr-10	2.3684	799	186.2	2.4659	459.15058	22	83			
FORT WORTH, TX	18,530.20	28-Apr-10	2.3684	800	1,284.40	2.4659	3,167.20	22	42			
FORT WORTH, TX	18,530.20	29-Apr-10	2.369	810	1,333	2.4665	3,287.84	22	115			
FORT WORTH, TX	18,530.20	29-Apr-10	2.369	811	1,005	2.4665	2,478.83	21	78			
FORT WORTH, TX	18,530.20	30-Apr-10	2.4007	825	1,477.30	2.4982	3,690.59	22	78			
FORT WORTH, TX	18,530.20	30-Apr-10	2.4007	826	365.3	2.4982	912.59246	21	38			
FORT WORTH, TX	18,530.20	30-Apr-10	2.4007	828	1,110.80	2.4982	2,775.00	21	38			
FORT WORTH, TX	18,530.20	1-May-10	2.4439	837	427	2.5414	1,085.18	821	42			
FORT WORTH, TX	18,530.20	1-May-10	2.4439	838	1,569.50	2.5414	3,988.73	22	38			
FORT WORTH, TX	18,530.20	1-May-10	2.4439	840	382.3	2.5414	971.57722	SPR	93			
FORT WORTH, TX	18,530.20	1-May-10	2.4439	842	1,297.10	2.5414	3,296.45	21	185			
FORT WORTH, TX	18,530.20	2-May-10	2.4439	845	1,303.30	2.5414	3,312.21	21	115			
FORT WORTH, TX	18,530.20	2-May-10	2.4439	844	1,163.40	2.5414	2,956.66	22	185			
FORT WORTH, TX	3,059.50	20-Apr-10	2.329	720	856.5	2.4265	2,078.30	821	500	2.38	0.0443	37.94
FORT WORTH, TX	3,059.50	21-Apr-10	2.352	737	600.3	2.4495	1,470.43	821	500	2.41	0.04105	24.64
FORT WORTH, TX	3,059.50	22-Apr-10	2.3832	743	600.1	2.4807	1,488.67	821	500	2.45	0.0314	18.84

						Bio				ULSD		
Location	Total Gallons	Date	Fuel Index	Ticket #	Qty	\$/gal	Amt Due	Train #	Loco #	Comp \$/gal	Delta	\$ Difference
FORT WORTH, TX	3,059.50	23-Apr-10	2.3882	752	367.8	2.4857	914.24	821	500	2.45	0.0367	13.50
FORT WORTH, TX	3,059.50	24-Apr-10	2.417	770	634.8	2.5145	1,596.20	821	500	2.48	0.03	19.04
FORT WORTH, TX	4,186.20	26-Apr-10	2.387	779	961	2.4845	2,387.60	821	500	2.4845	0	0
FORT WORTH, TX	4,186.20	27-Apr-10	2.3749	786	775.7	2.4724	1,917.84	821	500	2.4724	0	0
FORT WORTH, TX	4,186.20	28-Apr-10	2.3684	796	644.1	2.4659	1,588.29	821	500	2.4659	0	0
FORT WORTH, TX	4,186.20	29-Apr-10	2.369	812	620.6	2.4665	1,530.71	821	500	2.4665	0	0
FORT WORTH, TX	4,186.20	30-Apr-10	2.4007	822	564.9	2.4982	1,411.23	821	500	2.4982	0	0
FORT WORTH, TX	4,186.20	1-May-10	2.4439	837-A	619.9	2.5414	1,575.41	821	500	2.5414	0	0
FORT WORTH, TX	22,084.10	3-May-10	2.4673	848	1,387.20	2.5648	3,557.89	22	115			
FORT WORTH, TX	22,084.10	3-May-10	2.4673	849	1,176	2.5648	3,016.20	21	78			
FORT WORTH, TX	22,084.10	3-May-10	2.4673	852	519.8	2.5648	1,333.18	SPR	93			
FORT WORTH, TX	22,084.10	4-May-10	2.4973	858	1,185.80	2.5948	3,076.91	21	201			
FORT WORTH, TX	22,084.10	4-May-10	2.4973	859	1,326.60	2.5948	3,442.26	22	78			
FORT WORTH, TX	22,084.10	4-May-10	2.4973	860	700.3	2.5948	1,817.14	821	43			
FORT WORTH, TX	22,084.10	5-May-10	2.4153	870	1,276.50	2.5128	3,207.59	22	201			
FORT WORTH, TX	22,084.10	5-May-10	2.4153	869	1,228.60	2.5128	3,087.23	21	6			
FORT WORTH, TX	22,084.10	5-May-10	2.4153	869-A	641	2.5128	1,610.70	821	93			
FORT WORTH, TX	22,084.10	6-May-10	2.3388	876	995.9	2.4363	2,426.31	21	43			
FORT WORTH, TX	22,084.10	6-May-10	2.3388	877	505.5	2.4363	1,231.55	821	43			
FORT WORTH, TX	22,084.10	6-May-10	2.3388	877-A	335.6	2.4363	817.62228	821	93			
FORT WORTH, TX	22,084.10	6-May-10	2.3388	878	1,256	2.4363	3,059.99	22	6			
FORT WORTH, TX	22,084.10	7-May-10	2.2638	884	1,304.10	2.3613	3,079.37	21	151			
FORT WORTH, TX	22,084.10	7-May-10	2.2638	885	587	2.3613	1,386.08	821	43			
FORT WORTH, TX	22,084.10	7-May-10	2.2638	885-A	531.9	2.3613	1,255.98	821	93			
FORT WORTH, TX	22,084.10	7-May-10	2.2638	886	1,075.70	2.3613	2,540.05	22	42			
FORT WORTH, TX	22,084.10	8-May-10	2.2519	891	1,188.60	2.3494	2,792.50	21	168			
FORT WORTH, TX	22,084.10	8-May-10	2.2519	892	345.9	2.3494	812.65746	821	43			
FORT WORTH, TX	22,084.10	8-May-10	2.2519	892-A	412.7	2.3494	969.59738	821	93			
FORT WORTH, TX	22,084.10	8-May-10	2.2519	893	1,340.20	2.3494	3,148.67	22	151			
FORT WORTH, TX	22,084.10	9-May-10	2.2519	896	1,043.80	2.3494	2,452.30	21	203			
FORT WORTH, TX	22,084.10	9-May-10	2.2519	897	362.5	2.3494	851.6575	821	93			
FORT WORTH, TX	22,084.10	9-May-10	2.2519	898	1,356.90	2.3494	3,187.90	22	168			
FORT WORTH, TX	655.5	3-May-10	2.4673	850	655.5	2.5648	1,681.23	821	500	2.5648	0	0
FORT WORTH, TX	22,994.70	10-May-10	2.2519	902	1,132.40	2.35	2,663.29	22	203			
FORT WORTH, TX	22,994.70	10-May-10	2.2519	903	1,195.60	2.35	2,811.93	21	141			
FORT WORTH, TX	22,994.70	10-May-10	2.2519	904	745.2	2.35	1,752.64	821	43			
FORT WORTH, TX	22,994.70	10-May-10	2.2519	904-A	354.4	2.35	833.51336	821	93			
FORT WORTH, TX	22,994.70	11-May-10	2.2851	914	1,072.70	2.39	2,558.50	21	15			
FORT WORTH, TX	22,994.70	11-May-10	2.2851	915	1,278.80	2.39	3,050.07	22	141			
FORT WORTH, TX	22,994.70	11-May-10	2.2851	916	141.2	2.39	336.77612	821	93			
FORT WORTH, TX	22,994.70	12-May-10	2.2959	923	808.3	2.4	1,936.61	21	46			
FORT WORTH, TX	22,994.70	12-May-10	2.2959	924	959.1	2.4	2,297.91	SPR	13			

						Bio				ULSD		
Location	Total Gallons	Date	Fuel Index	Ticket #	Qty	\$/gal	Amt Due	Train #	Loco #	Comp \$/gal	Delta	\$ Difference
FORT WORTH, TX	22,994.70	12-May-10	2.2959	925	1,366	2.4	3,272.80	22	15			
FORT WORTH, TX	22,994.70	12-May-10	2.2959	926	493.7	2.4	1,182.86	821	43			
FORT WORTH, TX	22,994.70	13-May-10	2.3146	936	1,307.60	2.41	3,157.33	22	46			
FORT WORTH, TX	22,994.70	13-May-10	2.3146	937	1,262.50	2.41	3,048.43	21	113			
FORT WORTH, TX	22,994.70	13-May-10	2.3146	938	928.1	2.41	2,240.99	821	93			
FORT WORTH, TX	22,994.70	14-May-10	2.2767	944	1,243.70	2.38	2,955.90	21	76			
FORT WORTH, TX	22,994.70	14-May-10	2.2767	945	435.7	2.38	1,035.53	821	43			
FORT WORTH, TX	22,994.70	14-May-10	2.2767	946	1,373.80	2.38	3,265.11	22	113			
FORT WORTH, TX	22,994.70	14-May-10	2.2767	947	479.2	2.38	1,138.91	821	93			
FORT WORTH, TX	22,994.70	15-May-10	2.1997	953	1,128.50	2.3	2,595.21	21	168			
FORT WORTH, TX	22,994.70	15-May-10	2.1997	954	1,411.40	2.3	3,245.80	821	43			
FORT WORTH, TX	22,994.70	15-May-10	2.1997	955	1,181.30	2.3	2,716.64	22	76			
FORT WORTH, TX	22,994.70	16-May-10	2.1997	956	1,270.40	2.3	2,921.54	22	168			
FORT WORTH, TX	22,994.70	16-May-10	2.1997	957	340.4	2.3	782.81788	821	93			
FORT WORTH, TX	22,994.70	16-May-10	2.1997	958	1,084.70	2.3	2,494.48	21	99			
FORT WORTH, TX	948.2	11-May-10	2.2851	916-A	948.2	2.3826	2,259.18	821	500	2.39	0.0074	7.01668
FORT WORTH, TX	22,704.80	17-May-10	2.1997	963	1,161	2.3	2,669.95	21	15			
FORT WORTH, TX	22,704.80	17-May-10	2.1997	964	565.7	2.3	1,300.94	821	93			
FORT WORTH, TX	22,704.80	17-May-10	2.1997	965	1,404.30	2.3	3,229.47	22	99			
FORT WORTH, TX	22,704.80	18-May-10	2.1317	974	1,184.60	2.23	2,643.67	21	91			
FORT WORTH, TX	22,704.80	18-May-10	2.1317	976	1,342.30	2.23	2,995.61	22	15			
FORT WORTH, TX	22,704.80	18-May-10	2.1317	977	1,129.10	2.23	2,519.81	821	43			
FORT WORTH, TX	22,704.80	19-May-10	2.108	981	968.1	2.21	2,137.56	21	123			
FORT WORTH, TX	22,704.80	19-May-10	2.108	982	1,198	2.21	2,645.18	22	91			
FORT WORTH, TX	22,704.80	19-May-10	2.108	983	700.2	2.21	1,546.04	SPR	13			
FORT WORTH, TX	22,704.80	20-May-10	2.0923	990	1,209	2.19	2,650.49	21	145			
FORT WORTH, TX	22,704.80	20-May-10	2.0923	991	1,197.40	2.19	2,625.06	22	123			
FORT WORTH, TX	22,704.80	20-May-10	2.0923	992	1,232.90	2.19	2,702.89	821	93			
FORT WORTH, TX	22,704.80	21-May-10	2.0512	1000	1,293.10	2.15	2,781.72	21	175			
FORT WORTH, TX	22,704.80	21-May-10	2.0512	1001	1,325.20	2.15	2,850.77	22	145			
FORT WORTH, TX	22,704.80	21-May-10	2.0512	1002	644.1	2.15	1,385.59	821	43			
FORT WORTH, TX	22,704.80	22-May-10	2.0418	1012	1,180.40	2.14	2,528.18	21	76			
FORT WORTH, TX	22,704.80	22-May-10	2.0418	1013	816	2.14	1,747.71	821	93			
FORT WORTH, TX	22,704.80	22-May-10	2.0418	1015	1,303.30	2.14	2,791.41	22	175			
FORT WORTH, TX	22,704.80	23-May-10	2.0418	1020	1,120.20	2.14	2,399.24	21	49			
FORT WORTH, TX	22,704.80	23-May-10	2.0418	1021	1,313.80	2.14	2,813.90	22	76			
FORT WORTH, TX	22,704.80	23-May-10	2.0418	1022	416.1	2.14	891.20298	821	43			
FORT WORTH, TX	3,562.30	24-May-10	2.0418	1035	1,207.10	2.14	2,585.37	21	80			
FORT WORTH, TX	3,562.30	24-May-10	2.0418	1037	1,451.70	2.14	3,109.25	22	49			
FORT WORTH, TX	3,562.30	24-May-10	2.0418	1038	903.5	2.14	1,935.12	821	43			
FORT WORTH, TX	22,079	24-May-10	2.0418	1034	1,207.10	2.1393	2,582.35	21	80			
FORT WORTH, TX	22,079	24-May-10	2.0418	1037	1,451.70	2.1393	3,105.62	22	49			

						Bio				ULSD		
Location	Total Gallons	Date	Fuel Index	Ticket #	Qty	\$/gal	Amt Due	Train #	Loco #	Comp \$/gal	Delta	\$ Difference
FORT WORTH, TX	22,079	24-May-10	2.0418	1038	903.5	2.1393	1,932.86	821	43			
FORT WORTH, TX	22,079	25-May-10	2.0479	1045	1,299.10	2.1454	2,787.09	21	117			
FORT WORTH, TX	22,079	25-May-10	2.0479	1047	689.9	2.1454	1,480.11	821	93			
FORT WORTH, TX	22,079	25-May-10	2.0479	1049	1,442.50	2.1454	3,094.74	22	80			
FORT WORTH, TX	22,079	26-May-10	2.0171	1054	1,287.10	2.1146	2,721.70	21	115			
FORT WORTH, TX	22,079	26-May-10	2.0171	1055	1,346.60	2.1146	2,847.52	22	117			
FORT WORTH, TX	22,079	26-May-10	2.0171	1056	768.7	2.1146	1,625.49	821	43			
FORT WORTH, TX	22,079	26-May-10	2.0171	1058	544.9	2.1146	1,152.25	SPR	13			
FORT WORTH, TX	22,079	27-May-10	2.0632	1065	1,219.70	2.1607	2,635.41	821	93			
FORT WORTH, TX	22,079	27-May-10	2.0632	1067	1,460.50	2.1607	3,155.70	22	115			
FORT WORTH, TX	22,079	28-May-10	2.1329	1069	1,662.10	2.2304	3,707.15	22	55			
FORT WORTH, TX	22,079	28-May-10	2.1329	1070	1,261.90	2.2304	2,814.54	21	205			
FORT WORTH, TX	22,079	28-May-10	2.1329	1072	554.6	2.2304	1,236.98	821	43			
FORT WORTH, TX	22,079	29-May-10	2.134	1074	750.8	2.2315	1,675.41	SPR	93			
FORT WORTH, TX	22,079	29-May-10	2.134	1075	1,265.10	2.2315	2,823.07	22	205			
FORT WORTH, TX	22,079	29-May-10	2.134	1076	1,255.90	2.2315	2,802.54	21	11			
FORT WORTH, TX	22,079	30-May-10	2.134	1078	1,239	2.2315	2,764.83	21	133			
FORT WORTH, TX	22,079	30-May-10	2.134	1079-A	468.3	2.2315	1,045.01	821	43			
FORT WORTH, TX	1,919.90	29-May-10	2.134	1077	953.9	2.2315	2,128.63	821	500	2.2315	0	0
FORT WORTH, TX	1,919.90	30-May-10	2.134	1079	966	2.2315	2,155.63	821	500	2.2315	0	0
FORT WORTH, TX	21,542.60	31-May-10	2.134	1085	661.3	2.2315	1,475.69	SPR	11			
FORT WORTH, TX	21,542.60	31-May-10	2.134	1086	1,381	2.2315	3,081.70	22	133			
FORT WORTH, TX	21,542.60	31-May-10	2.134	1087	960.6	2.2315	2,143.58	21	67			
FORT WORTH, TX	21,542.60	1-Jun-10	2.134	1091	1,239.60	2.2315	2,766.17	21	113			
FORT WORTH, TX	21,542.60	1-Jun-10	2.134	1093	1,426.50	2.2315	3,183.23	22	135			
FORT WORTH, TX	21,542.60	2-Jun-10	2.0968	1099	1,256.80	2.1943	2,757.80	21	96			
FORT WORTH, TX	21,542.60	2-Jun-10	2.0968	1101	1,424.50	2.1943	3,125.78	22	113			
FORT WORTH, TX	21,542.60	2-Jun-10	2.0968	1102	544.2	2.1943	1,194.14	SPR	11			
FORT WORTH, TX	21,542.60	3-Jun-10	2.1401	1103	1,241.30	2.2376	2,777.53	21	196			
FORT WORTH, TX	21,542.60	3-Jun-10	2.1401	1105	1,142.90	2.2376	2,557.35	22	96			
FORT WORTH, TX	21,542.60	3-Jun-10	2.1401	1106	982.2	2.2376	2,197.77	SPR	11			
FORT WORTH, TX	21,542.60	4-Jun-10	2.1578	1111	350.9	2.2553	791.38477	821	43			
FORT WORTH, TX	21,542.60	4-Jun-10	2.1578	1112	1,380.50	2.2553	3,113.44	22	196			
FORT WORTH, TX	21,542.60	4-Jun-10	2.1578	1113	1,448.30	2.2553	3,266.35	21	87			
FORT WORTH, TX	21,542.60	5-Jun-10	2.0772	1117	1,266.70	2.1747	2,754.69	22	87			
FORT WORTH, TX	21,542.60	5-Jun-10	2.0772	1118	1,230.80	2.1747	2,676.62	21	160			
FORT WORTH, TX	21,542.60	6-Jun-10	2.0772	1121	1,331.50	2.1747	2,895.61	21	62			
FORT WORTH, TX	21,542.60	6-Jun-10	2.0772	1122	1,410.30	2.1747	3,066.98	22	160			
FORT WORTH, TX	21,542.60	6-Jun-10	2.0772	1123	862.7	2.1747	1,876.11	SPR	11			
FORT WORTH, TX	3,806.20	1-Jun-10	2.134	1092	966.8	2.2315	2,157.41	821	500	2.2315	0	0
FORT WORTH, TX	3,806.20	2-Jun-10	2.0968	1100	969.4	2.1943	2,127.15	821	500	2.1943	0	0
FORT WORTH, TX	3,806.20	3-Jun-10	2.1401	1104	757.2	2.2376	1,694.31	821	500	2.2376	0	0

						Bio				ULSD		
Location	Total Gallons	Date	Fuel Index	Ticket #	Qty	\$/gal	Amt Due	Train #	Loco #	Comp \$/gal	Delta	\$ Difference
FORT WORTH, TX	3,806.20	4-Jun-10	2.1578	1110	582.1	2.2553	1,312.81	821	500	2.2553	0	0
FORT WORTH, TX	3,806.20	5-Jun-10	2.0772	1116	530.7	2.1747	1,154.11	821	500	2.1747	0	0
FORT WORTH, TX	19,162.40	7-Jun-10	2.0772	1124	1,254.10	2.1747	2,727.29	21	21			
FORT WORTH, TX	19,162.40	7-Jun-10	2.0772	1126	1,416.50	2.1747	3,080.46	22	62			
FORT WORTH, TX	19,162.40	8-Jun-10	2.0828	1130	522.8	2.1803	1,139.86	821	43			
FORT WORTH, TX	19,162.40	8-Jun-10	2.0828	1129	1,471.90	2.1803	3,209.18	22	21			
FORT WORTH, TX	19,162.40	8-Jun-10	2.0828	1127	1,025.70	2.1803	2,236.33	21	14			
FORT WORTH, TX	19,162.40	9-Jun-10	2.0687	1131	1,337.10	2.1662	2,896.43	22	182			
FORT WORTH, TX	19,162.40	10-Jun-10	2.1065	1146	1,176.50	2.204	2,593.01	22	14			
FORT WORTH, TX	19,162.40	10-Jun-10	2.1065	1147	1,235.50	2.204	2,723.04	21	135			
FORT WORTH, TX	19,162.40	11-Jun-10	2.1213	1159	1,402.10	2.2188	3,110.98	22	135			
FORT WORTH, TX	19,162.40	11-Jun-10	2.1213	1158	1,354.70	2.2188	3,005.81	21	113			
FORT WORTH, TX	19,162.40	11-Jun-10	2.1213	1157	263.9	2.2188	585.54132	821	n/a			
FORT WORTH, TX	19,162.40	12-Jun-10	2.1078	1162	1,523.20	2.2053	3,359.11	22	113			
FORT WORTH, TX	19,162.40	12-Jun-10	2.1078	1163	1,299.50	2.2053	2,865.79	21	203			
FORT WORTH, TX	19,162.40	13-Jun-10	2.1078	1165	408.5	2.2053	900.86505	821	43			
FORT WORTH, TX	19,162.40	13-Jun-10	2.1078	1166	1,019	2.2053	2,247.20	21	203			
FORT WORTH, TX	19,162.40	13-Jun-10	2.1078	1168	1,463.10	2.2053	3,226.57	22	61			
FORT WORTH, TX	19,162.40	13-Jun-10	2.1078	1169	988.3	2.2053	2,179.50	11	yard			
FORT WORTH, TX	4,056.60	7-Jun-10	2.0772	1125	813.9	2.1747	1,769.99	821	500	2.1747	0	0
FORT WORTH, TX	4,056.60	8-Jun-10	2.0828	1128	771.7	2.1803	1,682.54	821	500	2.1803	0	0
FORT WORTH, TX	4,056.60	9-Jun-10	2.0687	1132	639.4	2.1662	1,385.07	821	500	2.1662	0	0
FORT WORTH, TX	4,056.60	10-Jun-10	2.1065	1148	627.6	2.204	1,383.23	821	500	2.204	0	0
FORT WORTH, TX	4,056.60	11-Jun-10	2.1213	1157	624.3	2.2188	1,385.20	821	500	2.2188	0	0
FORT WORTH, TX	4,056.60	12-Jun-10	2.1078	1161	579.7	2.2053	1,278.41	821	500	2.2053	0	0
FORT WORTH, TX	5,819.20	14-Jun-10	2.1078	1173	1,312.40	2.2053	2,894.24	21	203			
FORT WORTH, TX	5,819.20	14-Jun-10	2.1078	1175	1,715	2.2053	3,782.09	22	203			
FORT WORTH, TX	5,819.20	15-Jun-10	2.1222	1176	1,297.20	2.2197	2,879.39	21	69			
FORT WORTH, TX	5,819.20	15-Jun-10	2.1222	1178	1,494.60	2.2197	3,317.56	22	181			
FORT WORTH, TX	1,586.50	14-Jun-10	2.1078	1174	956.1	2.2053	2,108.49	821	500	2.2053	0	0
FORT WORTH, TX	1,586.50	15-Jun-10	2.1222	1177	630.4	2.2197	1,399.30	821	500	2.2197	0	0
FORT WORTH, TX	2,768.80	16-Jun-10	2.2109	1182	630.6	2.3084	1,455.68	821	500	2.2619	0.0465	29.3229
FORT WORTH, TX	2,768.80	17-Jun-10	2.241	1184	626.3	2.3385	1,464.60	821	500	2.2989	0.0396	24.80148
FORT WORTH, TX	2,768.80	18-Jun-10	2.271	1190	789	2.3685	1,868.75	821	500	2.3432	0.0253	19.9617
FORT WORTH, TX	2,768.80	19-Jun-10	2.271	1194	722.9	2.3685	1,712.19	821	500	2.3273	0.0577	41.71133
FORT WORTH, TX	19,748	21-Jun-10	2.2298	1204	1,433.80	2.3273	3,336.88	21	204			
FORT WORTH, TX	19,748	21-Jun-10	2.2298	1205	1,464.70	2.3273	3,408.80	22	151			
FORT WORTH, TX	19,748	22-Jun-10	2.2357	1207	1,280.90	2.3332	2,988.60	21	83			
FORT WORTH, TX	19,748	22-Jun-10	2.2357	1208	1,453.40	2.3332	3,391.07	22	204			
FORT WORTH, TX	19,748	22-Jun-10	2.2357	1209	225.6	2.3332	526.36992	SPR	11			
FORT WORTH, TX	19,748	23-Jun-10	2.2151	1211	1,232.20	2.3126	2,849.59	21	169			
FORT WORTH, TX	19,748	23-Jun-10	2.2151	1212	1,499.30	2.3126	3,467.28	22	22			

						Bio				ULSD		
Location	Total Gallons	Date	Fuel Index	Ticket #	Qty	\$/gal	Amt Due	Train #	Loco #	Comp \$/gal	Delta	\$ Difference
FORT WORTH, TX	19,748	23-Jun-10	2.2151	1213	434.5	2.3126	1,004.82	821	43			
FORT WORTH, TX	19,748	24-Jun-10	2.1756	1215	1,395.80	2.2731	3,172.79	21	87			
FORT WORTH, TX	19,748	24-Jun-10	2.1756	1216	1,339.60	2.2731	3,045.04	22	169			
FORT WORTH, TX	19,748	25-Jun-10	2.1691	1217	1,322.50	2.2666	2,997.58	21	150			
FORT WORTH, TX	19,748	25-Jun-10	2.1691	1219	1,584.50	2.2666	3,591.43	22	87			
FORT WORTH, TX	19,748	26-Jun-10	2.2273	1221	353	2.3248	820.6544	SPR	11			
FORT WORTH, TX	19,748	26-Jun-10	2.2273	1223	1,502.90	2.3248	3,493.94	21	203			
FORT WORTH, TX	19,748	26-Jun-10	2.2273	1224	251	2.3248	583.5248	22	160			
FORT WORTH, TX	19,748	27-Jun-10	2.2273	1225	416.7	2.3248	968.74416	821	43			
FORT WORTH, TX	19,748	27-Jun-10	2.2273	1226	1,535.20	2.3248	3,569.03	21	25			
FORT WORTH, TX	19,748	27-Jun-10	2.2273	1227	1,022.40	2.3248	2,376.88	22	25			
FORT WORTH, TX	4,581.50	21-Jun-10	2.2948	1202	792.4	2.3923	1,895.66	821	500	2.3273	0.065	51.506
FORT WORTH, TX	4,581.50	22-Jun-10	2.2604	1206	986.2	2.3579	2,325.36	821	500	2.3332	0.0247	24.35914
FORT WORTH, TX	4,581.50	23-Jun-10	2.2662	1213	624.1	2.3637	1,475.19	821	500	2.3126	0.0511	31.89151
FORT WORTH, TX	4,581.50	24-Jun-10	2.2334	1214	910.2	2.3309	2,121.59	821	500	2.2731	0.0578	52.60956
FORT WORTH, TX	4,581.50	25-Jun-10	2.2271	1220	636.9	2.3246	1,480.54	821	500	2.2666	0.058	36.9402
FORT WORTH, TX	4,581.50	26-Jun-10	2.2753	1222	631.7	2.3728	1,498.90	821	500	2.3248	0.048	30.3216
FORT WORTH, TX	3,855	28-Jun-10	2.2753	1229	983.9	2.3728	2,334.60	821	500	2.3248	0.048	47.2272
FORT WORTH, TX	3,855	29-Jun-10	2.333	1233	634.8	2.4305	1,542.88	821	500	2.3187	0.1118	70.97064
FORT WORTH, TX	3,855	30-Jun-10	2.2817	1237	737	2.3792	1,753.47	821	500	2.2544	0.0999	73.6263
FORT WORTH, TX	3,855	1-Jul-10	2.2568	1244A	512.3	2.3543	1,206.11	821	500	2.2226	0.1317	67.46991
FORT WORTH, TX	3,855	2-Jul-10	2.1891	1247A	358.9	2.2866	820.66074	821	500	2.1536	0.133	47.7337
FORT WORTH, TX	3,855	3-Jul-10	2.1703	1253A	327.7	2.2678	743.15806	821	500	2.135	0.1328	43.51856
FORT WORTH, TX	3,855	4-Jul-10	2.1703	1258	300.4	2.2678	681.24712	821	500	2.135	0.1328	39.89312
FORT WORTH, TX	3,082.70	5-Jul-10	2.1703	1262	634.8	2.2678	1,439.60	821	500	2.135	0.1328	84.30144
FORT WORTH, TX	3,082.70	7-Jul-10	2.1985	1275	633.6	2.296	1,454.75	821	500	2.1514	0.1446	91.61856
FORT WORTH, TX	3,082.70	8-Jul-10	2.2425	1277	545.3	2.34	1,276.00	821	500	2.2051	0.1349	73.56097
FORT WORTH, TX	3,082.70	9-Jul-10	2.2682	1283	631.1	2.3657	1,492.99	821	500	2.2393	0.1264	79.77104
FORT WORTH, TX	3,082.70	10-Jul-10	2.277	1289	550.4	2.3745	1,306.92	821	500	2.2393	0.1352	74.41408
FORT WORTH, TX	3,082.70	11-Jul-10	2.277	1294	87.5	2.3745	207.76875	821	500	2.2504	0.1241	10.85875
FORT WORTH, TX	5,059.30	12-Jul-10	2.277	1297	202.5	2.3745	480.83625	821	500	2.2504	0.1241	25.13025
FORT WORTH, TX	5,059.30	12-Jul-10	2.277	1299	773.9	2.3745	1,837.63	821	500	2.2504	0.1241	96.04099
FORT WORTH, TX	5,059.30	13-Jul-10	2.2456	1301	635.4	2.3431	1,488.81	821	500	2.2141	0.129	81.9666
FORT WORTH, TX	5,059.30	14-Jul-10	2.287	1305	784.2	2.3845	1,869.92	821	500	2.2634	0.1211	94.96662
FORT WORTH, TX	5,059.30	15-Jul-10	2.2753	1309A	1,080.60	2.3728	2,564.05	821	500	2.251	0.1218	131.61708
FORT WORTH, TX	5,059.30	16-Jul-10	2.292	1312	652.6	2.3895	1,559.39	821	500	2.246	0.1435	93.6481
FORT WORTH, TX	5,059.30	17-Jul-10	2.2829	1318	432.2	2.3804	1,028.81	821	500	2.2343	0.1461	63.14442
FORT WORTH, TX	5,059.30	18-Jul-10	2.2829	1323A	497.9	2.3804	1,185.20	821	500	2.2343	0.1461	72.74319
FORT WORTH, TX	4,267.40	19-Jul-10	2.2829	1325	783.7	2.3804	1,865.52	821	500	2.2343	0.1461	114.49857
FORT WORTH, TX	4,267.40	20-Jul-10	2.284	1330	987.1	2.3815	2,350.78	821	500	2.2412	0.1403	138.49013
FORT WORTH, TX	4,267.40	22-Jul-10	2.251	1345-A	975.7	2.3485	2,291.43	821	500	2.2023	0.1462	142.64734
FORT WORTH, TX	4,267.40	23-Jul-10	2.3158	1353	884.8	2.4133	2,135.29	821	500	2.2807	0.1326	117.32448

						Bio				ULSD		
Location	Total Gallons	Date	Fuel Index	Ticket #	Qty	\$/gal	Amt Due	Train #	Loco #	Comp \$/gal	Delta	\$ Difference
FORT WORTH, TX	4,267.40	24-Jul-10	2.299	1358	636.1	2.3965	1,524.41	821	500	2.2668	0.1297	82.50217
FORT WORTH, TX	2,668.30	26-Jul-10	2.299	1364	980.8	2.3965	2,350.49	821	500	2.2668	0.1297	127.20976
FORT WORTH, TX	2,668.30	27-Jul-10	2.2973	1373	985.3	2.3948	2,359.60	821	500	2.2623	0.1325	130.55225
FORT WORTH, TX	2,668.30	28-Jul-10	2.277	1375	702.2	2.3745	1,667.37	821	500	2.2332	0.1413	99.22086
FORT WORTH, TX	1,133.70	7-Aug-10	2.3942	1397-A	506.6	2.4917	1,262.30	821	500	2.38	0.1117	56.58722
FORT WORTH, TX	1,133.70	8-Aug-10	2.3942	1399-A	627.1	2.4917	1,562.55	821	500	2.38	0.1117	70.04707
FORT WORTH, TX	4,236.20	9-Aug-10	2.3942	1403	568.3	2.4917	1,416.03	821	500	2.38	0.1117	63.47911
FORT WORTH, TX	4,236.20	11-Aug-10	2.373	1411	845.9	2.4705	2,089.80	821	500	2.3511	0.1194	101.00046
FORT WORTH, TX	4,236.20	12-Aug-10	2.3116	1414-A	916.5	2.4091	2,207.94	821	500	2.2973	0.1118	102.4647
FORT WORTH, TX	4,236.20	13-Aug-10	2.2589	1417	994.9	2.3564	2,344.38	821	500	2.2252	0.1312	130.53088
FORT WORTH, TX	4,236.20	14-Aug-10	2.2535	1424	416.6	2.351	979.4266	821	500	2.2196	0.1314	54.74124
FORT WORTH, TX	4,236.20	15-Aug-10	2.2535	1428	494	2.351	1,161.39	821	500	2.2196	0.1314	64.91116
FORT WORTH, TX	3,792.20	16-Aug-10	2.2535	1432-A	915.5	2.351	2,152.34	821	500	2.2196	0.1314	120.2967
FORT WORTH, TX	3,792.20	17-Aug-10	2.251	1436	396.1	2.3485	930.24085	821	500	2.2129	0.1356	53.71116
FORT WORTH, TX	3,792.20	18-Aug-10	2.2839	1441-A	237.7	2.3814	566.05878	821	500	2.2571	0.1243	29.54611
FORT WORTH, TX	3,792.20	19-Aug-10	2.2862	1444-A	911.2	2.3837	2,172.03	821	500	2.2598	0.1239	112.89768
FORT WORTH, TX	3,792.20	20-Aug-10	2.2658	1448	717	2.3633	1,694.49	821	500	2.2361	0.1272	91.2024
FORT WORTH, TX	3,792.20	21-Aug-10	2.24	1456-A	476.1	2.3375	1,112.88	821	500	2.2036	0.1339	63.74
FORT WORTH, TX	3,792.20	22-Aug-10	2.24	1460	138.6	2.3375	323.9775	821	500	2.2036	0.1339	18.55
FORT WORTH, TX	4,075.30	23-Aug-10	2.24	1463	767.8	2.3375	1,794.73	821	500	2.2036	0.1339	102.8
FORT WORTH, TX	4,075.30	24-Aug-10	2.2273	1469-A	780.2	2.3248	1,813.81	821	500	2.185	0.1398	109.07
FORT WORTH, TX	4,075.30	25-Aug-10	2.1989	1476	627.4	2.2964	1,440.76	821	500	2.1553	0.1411	88.52
FORT WORTH, TX	4,075.30	26-Aug-10	2.2448	1479	635.1	2.3423	1,487.59	821	500	2.2032	0.1391	88.34
FORT WORTH, TX	4,075.30	27-Aug-10	2.277	1482	633.5	2.3745	1,504.25	821	500	2.247	0.1275	80.77
FORT WORTH, TX	4,075.30	28-Aug-10	2.3048	1487	452.8	2.4023	1,087.76	821	500	2.2833	0.119	53.88
FORT WORTH, TX	4,075.30	29-Aug-10	2.3048	1493	178.5	2.4023	428.81055	821	500	2.2833	0.119	21.24
FORT WORTH, TX	2,207.10	30-Aug-10	2.3048	1496	787.3	2.4023	1,891.33	821	500	2.2833	0.119	93.68
FORT WORTH, TX	2,207.10	31-Aug-10	2.287	1503-A	784.1	2.3845	1,869.69	821	500		0.1238	0.1238
FORT WORTH, TX	2,207.10	1-Sep-10	2.2433	1514	635.7	2.3408	1,488.05	821	500	2.2091	0.1317	83.72
FORT WORTH, TX	2,816.90	7-Sep-10	2.287	1545-A	378.7	2.3845	903.01015	821	500	2.2634	0.1211	45.86
FORT WORTH, TX	2,816.90	8-Sep-10	2.2951	1551	607.6	2.3926	1,453.74	821	500	2.2747	0.1179	71.63
FORT WORTH, TX	2,816.90	9-Sep-10	2.3225	1558	580.7	2.42	1,405.29	821	500	2.2798	0.1402	81.41
FORT WORTH, TX	2,816.90	10-Sep-10	2.32	1560	600.5	2.4175	1,451.71	821	500	2.2764	0.1411	84.73
FORT WORTH, TX	2,816.90	11-Sep-10	2.3513	1563-A	649.4	2.4488	1,590.25	821	500	2.3185	0.1303	84.61
FORT WORTH, TX	4,000.60	13-Sep-10	2.3513	1574	793.1	2.4488	1,942.14	821	500	2.3185	0.1303	103.34
FORT WORTH, TX	4,000.60	14-Sep-10	2.363	1579	780.2	2.4605	1,919.68	821	500	2.3301	0.1304	101.73
FORT WORTH, TX	4,000.60	15-Sep-10	2.3618	1582-A	747.5	2.4593	1,838.33	821	500	2.3259	0.1334	91.71
FORT WORTH, TX	4,000.60	16-Sep-10	2.3514	1586	495.2	2.4489	1,212.70	821	500	2.323	0.1259	62.34
FORT WORTH, TX	4,000.60	17-Sep-10	2.323	1590	547.6	2.4205	1,325.47	821	500	2.2865	0.134	73.37
FORT WORTH, TX	4,000.60	18-Sep-10	2.3284	1594	521.2	2.4259	1,264.38	821	500	2.2904	0.1355	70.62
FORT WORTH, TX	4,000.60	19-Sep-10	2.3284	1599	115.8	2.4259	280.91922	821	500	2.2904	0.1355	15.69
FORT WORTH, TX	3,936.70	20-Sep-10	2.3284	1604	788	2.4259	1,911.61	821	500	2.2904	0.1355	106.77

						Bio				ULSD		
Location	Total Gallons	Date	Fuel Index	Ticket #	Qty	\$/gal	Amt Due	Train #	Loco #	Comp \$/gal	Delta	\$ Difference
FORT WORTH, TX	3,936.70	21-Sep-10	2.3606	1615	782	2.4581	1,922.23	821	500	2.3309	0.1272	99.47
FORT WORTH, TX	3,936.70	22-Sep-10	2.3386	1621-A	632	2.4361	1,539.62	821	500	2.3053	0.1308	82.66
FORT WORTH, TX	3,936.70	23-Sep-10	2.3321	1630-A	472	2.4296	1,146.77	821	500	2.2975	0.1321	62.35
FORT WORTH, TX	3,936.70	24-Sep-10	2.3363	1637	631.9	2.4338	1,537.92	821	500	2.2963	0.1373	86.88
FORT WORTH, TX	3,936.70	25-Sep-10	2.3565	1644-A	444.3	2.454	1,090.31	821	500	2.3228	0.1312	58.29
FORT WORTH, TX	3,936.70	26-Sep-10	2.3565	1646-A	186.5	2.454	457.671	821	500	2.3228	0.1312	24.46
FORT WORTH, TX	2,184.70	27-Sep-10	2.3565	1653	788.4	2.454	1,934.73	821	500	2.3228	0.1312	103.43
FORT WORTH, TX	2,184.70	28-Sep-10	2.3493	1657	436.5	2.4468	1,068.03	821	500	2.3182	0.1286	56.13
FORT WORTH, TX	2,184.70	29-Sep-10	2.349	1660-A	192.9	2.4465	471.92985	821	500	2.317	0.1295	24.98
FORT WORTH, TX	2,184.70	30-Sep-10	2.4403	1672-A	766.9	2.5378	1,946.24	821	500	2.3892	0.1486	113.96
FORT WORTH, TX	1,195.40	2-Oct-10	2.5099	1683-A	1,195.40	2.6074	3,116.89	821	500	2.4815	0.1259	150.5
FORT WORTH, TX	3,883.60	4-Oct-10	2.5099	1691-A	760.3	2.6074	1,982.41	821	500	2.4815	0.1259	95.72
FORT WORTH, TX	3,883.60	6-Oct-10	2.5045	1698-A	784.5	2.602	2,041.27	821	500	2.476	0.126	98.84
FORT WORTH, TX	3,883.60	7-Oct-10	2.5095	1703-A	785.8	2.607	2,048.58	821	500	2.4777	0.1293	101.6
FORT WORTH, TX	3,883.60	8-Oct-10	2.4856	1706	752.9	2.5831	1,944.82	821	500	2.4265	0.1566	117.9
FORT WORTH, TX	3,883.60	9-Oct-10	2.506	1710	417.9	2.6035	1,088.00	821	500	2.4486	0.1549	64.73
FORT WORTH, TX	3,883.60	10-Oct-10	2.506	1721	382.2	2.6035	995.0577	821	500	2.4486	0.1549	59.2
FORT WORTH, TX	3,072.20	11-Oct-10	2.506	1731	736.1	2.6035	1,916.44	821	500	2.4486	0.1549	114.02
FORT WORTH, TX	3,072.20	12-Oct-10	2.5123	1739	496.6	2.6098	1,296.03	821	500	2.4382	0.1716	85.21
FORT WORTH, TX	3,072.20	13-Oct-10	2.4966	1743-A	283	2.5941	734.1303	821	500	2.4196	0.1745	49.38
FORT WORTH, TX	3,072.20	14-Oct-10	2.5277	1746-A	774.5	2.6252	2,033.22	821	500	2.4541	0.1711	132.51
FORT WORTH, TX	3,072.20	15-Oct-10	2.5186	1749-A	610.2	2.6161	1,596.34	821	500	2.4418	0.1743	106.35
FORT WORTH, TX	3,072.20	16-Oct-10	2.4826	1759	171.8	2.5801	443.26118	821	500	2.3971	0.183	31.43
FORT WORTH, TX	3,025.40	18-Oct-10	2.4826	1766	985.6	2.5801	2,542.95	821	500	2.3971	0.183	180.36
FORT WORTH, TX	3,025.40	19-Oct-10	2.5143	1773-A	441.4	2.6118	1,152.85	821	500	2.4361	0.1757	75.55
FORT WORTH, TX	3,025.40	20-Oct-10	2.4593	1774-A	263.8	2.5568	674.48384	821	500	2.3671	0.1897	50.04
FORT WORTH, TX	3,025.40	21-Oct-10	2.5145	1781-A	397	2.612	1,036.96	821	500	2.4381	0.1739	69.03
FORT WORTH, TX	3,025.40	22-Oct-10	2.491	1786-A	308.2	2.5885	797.7757	821	500	2.4078	0.1807	55.69
FORT WORTH, TX	3,025.40	23-Oct-10	2.5239	1790-A	220	2.6214	576.708	821	500	2.4448	0.1766	38.85
FORT WORTH, TX	3,025.40	24-Oct-10	2.5239	1795-A	409.4	2.6214	1,073.20	821	500	2.4448	0.1766	72.3
FORT WORTH, TX	1,636.20	25-Oct-10	2.5239	1797-A	320.9	2.6214	841.20726	821	500	2.4448	0.1766	56.67
FORT WORTH, TX	1,636.20	26-Oct-10	2.533	1807	493.7	2.6305	1,298.68	821	500	2.4451	0.1854	91.53
FORT WORTH, TX	1,636.20	27-Oct-10	2.5223	1815-A	278.2	2.6198	728.82836	821	500	2.4329	0.1869	51.99
FORT WORTH, TX	1,636.20	28-Oct-10	2.5069	1822-A	356.1	2.6044	927.42684	821	500	2.4117	0.1927	68.62
FORT WORTH, TX	1,636.20	29-Oct-10	2.5098	1832-A	187.3	2.6073	488.34729	821	500	2.4133	0.194	36.33
FORT WORTH, TX	521.5	1-Nov-10	2.4974	1844	521.5	2.5949	1,353.24	22	500	2.3976	0.1973	102.89
FORT WORTH, TX	895	30-Nov-10	2.6484	0051-A	895	2.7459	2,457.58	821	500	2.5105	0.2354	210.68
FORT WORTH, TX	2,425	2-Dec-10	2.6676	68	447.8	2.7651	1,238.21	821	500	2.545	0.2201	98.56
FORT WORTH, TX	2,425	3-Dec-10	2.6837	75	1,006.30	2.7812	2,798.72	821	500	2.571	0.2102	211.52
FORT WORTH, TX	2,425	4-Dec-10	2.7319	78	625.2	2.8294	1,768.94	821	500	2.6192	0.2102	131.41
FORT WORTH, TX	2,425	5-Dec-10	2.7319	0081-A	345.7	2.8294	978.12358	821	500	2.6192	0.2102	72.66
FORT WORTH, TX	1,453.30	6-Dec-10	2.7319	84	837.8	2.8294	2,370.47	821	500	2.6192	0.2102	176.1

						Bio				ULSD		
Location	Total Gallons	Date	Fuel Index	Ticket #	Qty	\$/gal	Amt Due	Train #	Loco #	Comp \$/gal	Delta	\$ Difference
FORT WORTH, TX	1,453.30	7-Dec-10	2.71	89	502.4	2.8075	1,410.49	821	500	2.5983	0.2092	105.1
FORT WORTH, TX	1,453.30	8-Dec-10	2.6976	98	113.1	2.7951	316.12581	821	500	2.5856	0.2095	23.69
FORT WORTH, TX	2,651.10	13-Dec-10	2.7029	115	774.6	2.8004	2,169.19	821	500	2.5911	0.2093	162.12
FORT WORTH, TX	2,651.10	14-Dec-10	2.7079	0120-A	233.7	2.8054	655.62198	821	500	2.598	0.2074	48.46
FORT WORTH, TX	2,651.10	15-Dec-10	2.7104	124	708.1	2.8079	1,988.27	821	500	2.5993	0.2086	147.7
FORT WORTH, TX	2,651.10	16-Dec-10	2.725	0133-A	130.2	2.8225	367.4895	821	500	2.6184	0.2041	26.57
FORT WORTH, TX	2,651.10	17-Dec-10	2.7155	0141-A	592.9	2.813	1,667.83	821	500	2.6064	0.2066	122.49
FORT WORTH, TX	2,651.10	18-Dec-10	2.6799	0144-A	211.6	2.7774	587.69784	821	500	2.5789	0.1985	42
FORT WORTH, TX	2,210.90	20-Dec-10	2.6799	0150-A	1,003.70	2.7774	2,787.68	821	500	2.5789	0.1985	199.23
FORT WORTH, TX	2,210.90	23-Dec-10	2.7882	0170-A	684.3	2.8857	1,974.68	821	500	2.6662	0.2195	150.2
FORT WORTH, TX	2,210.90	24-Dec-10	2.8	173	250.4	2.8975	725.534	821	500	2.6926	0.2049	51.3
FORT WORTH, TX	2,210.90	25-Dec-10	2.8	178	272.5	2.8975	789.56875	SPR	500	2.6926	0.2049	55.83
FORT WORTH, TX	152.8	27-Dec-10	2.8	179	152.8	2.8975	442.738	SPR	500	2.6926	0.2049	31.3
FORT WORTH, TX	1,715.40	14-Jan-11	2.8772	2124	732.7	2.9747	2,179.56	821	500	2.7948	0.1799	131.81
FORT WORTH, TX	1,715.40	15-Jan-11	2.8968	2126	535.3	2.9943	1,602.85	821	500	2.8277	0.1666	89.18
FORT WORTH, TX	1,715.40	16-Jan-11	2.8968	2129	447.4	2.9943	1,339.65	821	500	2.8277	0.1666	74.53
FORT WORTH, TX	3,315.90	18-Jan-11	2.8987	232	851.5	2.9962	2,551.26	821	500	2.8265	0.1697	144.49
FORT WORTH, TX	3,315.90	19-Jan-11	2.8938	235	159.4	2.9913	476.81322	821	500	2.8228	0.1685	26.85
FORT WORTH, TX	3,315.90	20-Jan-11	2.9026	245	831.5	3.0001	2,494.58	821	500	2.8306	0.1695	140.93
FORT WORTH, TX	3,315.90	22-Jan-11	2.8982	2168	799.7	2.9957	2,395.66	821	500	2.83	0.1657	132.51
FORT WORTH, TX	3,315.90	23-Jan-11	2.8982	2180-A	673.8	2.9957	2,018.50	821	500	2.83	0.1657	111.64
FORT WORTH, TX	2,323.70	26-Jan-11	2.8628	2201	1,010.70	2.9603	2,991.98	821	500	2.7838	0.1765	178.38
FORT WORTH, TX	2,323.70	27-Jan-11	2.9086	2205	524.7	3.0061	1,577.30	821	500	2.851	0.1551	81.38
FORT WORTH, TX	2,323.70	29-Jan-11	2.9142	2217	788.3	3.0117	2,374.12	821	500	2.8597	0.152	119.82
FORT WORTH, TX	500	30-Jan-11	2.9142	2221	500	3.0117	1,505.85	822	500	2.8597	0.152	76
FORT WORTH, TX	404.4	31-Jan-11	2.9142	2224	404.4	3.0117	1,217.93	822	500	2.8597	0.152	61.46
FORT WORTH, TX	787.5	3-Feb-11	3.0022	2241	787.5	3.0997	2,441.01	822	500	2.9258	0.1739	136.94
FORT WORTH, TX	756.5	5-Feb-11	2.9576	2258	756.5	3.0551	2,311.18	821	500	2.8765	0.1786	135.11
FORT WORTH, TX	3,646.10	7-Feb-11	2.9576	2263	987.9	3.0551	3,018.13	821	500	2.8765	0.1786	176.43
FORT WORTH, TX	3,646.10	8-Feb-11	2.9577	2269	646.1	3.0552	1,973.96	821	500	2.8775	0.1777	114.81
FORT WORTH, TX	3,646.10	9-Feb-11	2.9859	255	480.7	3.0834	1,482.19	821	500	2.9064	0.177	85.08
FORT WORTH, TX	3,646.10	11-Feb-11	2.9802	257	520	3.0777	1,600.40	821	500	2.8976	0.1801	93.65
FORT WORTH, TX	3,646.10	12-Feb-11	2.9715	264	1,011.40	3.069	3,103.99	821	500	2.8859	0.1831	185.18
FORT WORTH, TX	3,812.10	14-Feb-11	2.9715	271	999.3	3.069	3,066.85	821	500	2.8859	0.1831	182.97
FORT WORTH, TX	3,812.10	16-Feb-11	3.021	280	910.4	3.1185	2,839.08	821	500	2.9165	0.202	183.9
FORT WORTH, TX	3,812.10	17-Feb-11	3.0651	284	298.6	3.1626	944.35236	821	500	2.9685	0.1941	57.95
FORT WORTH, TX	3,812.10	18-Feb-11	3.0351	288	525.6	3.1326	1,646.49	821	500	2.9306	0.202	106.17
FORT WORTH, TX	3,812.10	19-Feb-11	3.0259	292	487.6	3.1234	1,522.97	821	500	2.923	0.2004	97.71
FORT WORTH, TX	3,812.10	20-Feb-11	3.0259	298	590.6	3.1234	1,844.68	821	500	2.923	0.2004	118.35
FORT WORTH, TX	3,485.40	22-Feb-11	3.0446	303	1,049.40	3.1421	3,297.32	821	500	2.975	0.1671	175.35
FORT WORTH, TX	3,485.40	23-Feb-11	3.0775	308	496.9	3.175	1,577.66	821	500	2.9944	0.1806	89.74
FORT WORTH, TX	3,485.40	25-Feb-11	3.1763	316	1,056.20	3.2738	3,457.79	821	500	3.0848	0.189	100.62

						Bio				ULSD		
Location	Total Gallons	Date	Fuel Index	Ticket #	Qty	\$/gal	Amt Due	Train #	Loco #	Comp \$/gal	Delta	\$ Difference
FORT WORTH, TX	3,485.40	26-Feb-11	3.2327	318	456.2	3.3302	1,519.24	821	500	3.1552	0.175	79.83
FORT WORTH, TX	3,485.40	27-Feb-11	3.2327	324	426.7	3.3302	1,421.00	821	500	3.1552	0.175	74.67
FORT WORTH, TX	459.9	28-Feb-11	3.2327	329	459.9	3.3302	1,531.56	821	500	3.1552	0.175	80.48
FORT WORTH, TX	2,789.10	1-Mar-11	3.231	331	540.9	3.3285	1,800.39	821	500	3.1505	0.178	96.2802
FORT WORTH, TX	2,789.10	2-Mar-11	3.2982	336-A	324.8	3.3957	1,102.92	821	500	3.247	0.1487	48.29776
FORT WORTH, TX	2,789.10	3-Mar-11	3.3278	338-A	509.6	3.4253	1,745.53	821	500	3.282	0.1433	73.02568
FORT WORTH, TX	2,789.10	4-Mar-11	3.366	341	150.4	3.4635	520.91	821	500	3.2815	0.182	27.3728
FORT WORTH, TX	2,789.10	5-Mar-11	3.3914	345-A	754.3	3.4889	2,631.68	821	500	3.3153	0.1736	130.94648
FORT WORTH, TX	2,789.10	6-Mar-11	3.3914	348	509.1	3.4889	1,776.20	821	500	3.3153	0.1736	88.37976
FORT WORTH, TX	2,905.30	7-Mar-11	3.3914	351-A	285	3.4889	994.34	821	500	3.3153	0.1736	49.476
FORT WORTH, TX	2,905.30	9-Mar-11	3.3083	358-A	1,007.50	3.4058	3,431.34	821	500	3.2153	0.1905	191.92875
FORT WORTH, TX	2,905.30	11-Mar-11	3.351	368-A	822.9	3.4485	2,837.77	821	500	3.2549	0.1936	159.31344
FORT WORTH, TX	2,905.30	12-Mar-11	3.3436	272-A	373.5	3.4411	1,285.25	821	500	3.2475	0.1936	72.3096
FORT WORTH, TX	2,905.30	13-Mar-11	3.3436	377-A	416.4	3.4411	1,432.87	821	500	3.2475	0.1936	80.61504
FORT WORTH, TX	3,289.60	15-Mar-11	3.3583	383	956.7	3.4558	3,306.16	821	500	3.2707	0.1851	177.08517
FORT WORTH, TX	3,289.60	17-Mar-11	3.3231	390	984.8	3.4206	3,368.61	821	500	3.2172	0.2034	200.30832
FORT WORTH, TX	3,289.60	19-Mar-11	3.3541	397-A	1,348.10	3.4516	4,653.10	821	500	3.2567	0.1949	262.74469
FORT WORTH, TX	3,797.90	21-Mar-11	3.3541	403	773.6	3.4516	2,670.16	821	500	3.2567	0.1949	150.77464
FORT WORTH, TX	3,797.90	22-Mar-11	3.3614	408	240.5	3.4589	831.87	821	500	3.2675	0.1914	46.0317
FORT WORTH, TX	3,797.90	23-Mar-11	3.3802	413	792.3	3.4777	2,755.38	821	500	3.2888	0.1889	149.66547
FORT WORTH, TX	3,797.90	25-Mar-11	3.3907	2184	987.3	3.4882	3,443.90	821	500	3.2843	0.2039	201.31047
FORT WORTH, TX	3,797.90	27-Mar-11	3.3871	429	1,004.20	3.4846	3,499.24	22	500	3.2842	0.2004	201.24168
FORT WORTH, TX	2,880.70	5-Apr-11	3.4704	461	559.7	3.5679	1,996.95	SPR	500	3.3834	0.1845	103.26465
FORT WORTH, TX	2,880.70	6-Apr-11	3.4934	464-A	327.5	3.5909	1,176.02	821	500	3.3939	0.197	64.5175
FORT WORTH, TX	2,880.70	7-Apr-11	3.5058	467-A	596.6	3.6033	2,149.73	821	500	3.4023	0.201	119.9166
FORT WORTH, TX	2,880.70	8-Apr-11	3.5231	471-A	389.7	3.6206	1,410.95	821	500	3.415	0.2056	80.12232
FORT WORTH, TX	2,880.70	9-Apr-11	3.6073	472	493.6	3.7048	1,828.69	821	500	3.5233	0.1815	89.5884
FORT WORTH, TX	2,880.70	10-Apr-11	3.6073	476	513.6	3.7048	1,902.79	821	500	3.5233	0.1815	93.2184
FORT WORTH, TX	3,222	11-Apr-11	3.6073	480	304.1	3.7048	1,126.63	821	500	3.5233	0.1815	55.19415
FORT WORTH, TX	3,222	13-Apr-11	3.483	488-A	1,010.50	3.5805	3,618.10	821	500	3.366	0.2145	216.75225
FORT WORTH, TX	3,222	14-Apr-11	3.512	491-A	573.2	3.6095	2,068.97	821	500	3.3995	0.21	120.372
FORT WORTH, TX	3,222	15-Apr-11	3.5077	494	438.3	3.6052	1,580.16	821	500	3.3967	0.2085	91.38555
FORT WORTH, TX	3,222	17-Apr-11	3.5311	501-A	895.9	3.6286	3,250.86	821	500	3.4306	0.198	177.3882
FORT WORTH, TX	2,941.40	18-Apr-11	3.5311	504-A	102.4	3.6286	371.57	1	500	3.4306	0.198	20.2752
FORT WORTH, TX	2,941.40	19-Apr-11	3.4937	508	998.6	3.5912	3,586.17	821	500	3.3847	0.2065	206.2109
FORT WORTH, TX	2,941.40	21-Apr-11	3.5256	513	1,026.20	3.6231	3,718.03	821	500	3.4151	0.208	213.4496
FORT WORTH, TX	2,941.40	23-Apr-11	3.5238	519	814.2	3.6213	2,948.46	821	500	3.4026	0.2187	178.06554
FORT WORTH, TX	2,694.80	25-Apr-11	3.5238	528-A	1,009.90	3.6213	3,657.15	821	500	3.4026	0.2187	220.86513
FORT WORTH, TX	2,694.80	26-Apr-11	3.5086	529	500.2	3.6061	1,803.77	821	500	3.3855	0.2206	110.34412
FORT WORTH, TX	2,694.80	27-Apr-11	3.5313	532-A	423.7	3.6288	1,537.52	821	500	3.4153	0.2135	90.45995
FORT WORTH, TX	2,694.80	28-Apr-11	3.5674	536	70.6	3.6649	258.74	821	500	3.4417	0.2232	15.75792
FORT WORTH, TX	2,694.80	29-Apr-11	3.5687	540-A	690.4	3.6662	2,531.14	821	500	3.4445	0.2217	153.06168

						Bio				ULSD		
Location	Total Gallons	Date	Fuel Index	Ticket #	Qty	\$/gal	Amt Due	Train #	Loco #	Comp \$/gal	Delta	\$ Difference
FORT WORTH, TX	826.6	1-May-11	3.6003	547-A	826.6	3.6978	3,056.60	821	500	3.481	0.2168	179.20688
FORT WORTH, TX	2,991	2-May-11	3.6003	550-A	98.3	3.6978	363.49	821	500	3.481	0.2168	21.31144
FORT WORTH, TX	2,991	3-May-11	3.5832	552	965.6	3.6807	3,554.08	821	500	3.4566	0.2241	216.39096
FORT WORTH, TX	2,991	5-May-11	3.4936	558	953.7	3.5911	3,424.83	821	500	3.3439	0.2472	235.75464
FORT WORTH, TX	2,991	6-May-11	3.323	560-A	81.9	3.4205	280.14	821	500	3.1222	0.2983	24.43077
FORT WORTH, TX	2,991	7-May-11	3.3008	563	891.5	3.3983	3,029.58	821	500	3.0861	0.3122	278.3263
FORT WORTH, TX	3,502	9-May-11	3.3008	571-A	845.2	3.3983	2,872.24	821	500	3.0861	0.3122	263.87144
FORT WORTH, TX	3,502	10-May-11	3.3882	576	527.2	3.4857	1,837.66	821	500	3.2047	0.281	148.1432
FORT WORTH, TX	3,502	11-May-11	3.3778	580-A	304.3	3.4753	1,057.53	821	500	3.2386	0.2367	72.02781
FORT WORTH, TX	3,502	13-May-11	3.2998	585	1,005.90	3.3973	3,417.34	821	500	3.1422	0.2551	256.60509
FORT WORTH, TX	3,502	14-May-11	3.3238	588	350.4	3.4213	1,198.82	821	500	3.1749	0.2464	86.33856
FORT WORTH, TX	3,502	15-May-11	3.3238	592	469	3.4213	1,604.59	821	500	3.1749	0.2464	115.5616
FORT WORTH, TX	94.2	16-May-11	3.3238	596	94.2	3.4213	322.29	821	500	3.1749	0.2464	23.21088
											\$0.129 avg cost	
											difference of B20	
											compared to ULSD	



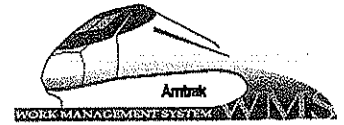
Maintenance Analysis Program

WMS Work Order: 2256919

P32 92-DAY PM INSPECTION

From Work Order:

WMS Template ID: 58537



Print Date: 8/23/2010

W/O Type: Preventive Maint.	Equip Class:
Maint Type: Quarterly Inspection-Loco	Equip Type: P32-8

P32-8					
Unit: 500	W/O Ceate Date: 5/16/10 12:43 am	W/O Due Date: 08/14/2010	W/O Status Date: 8/4/10 8:18 pm	W/O Status By: SIMP3519	W/O Status: Closed

TASK # 1 WHEELHOUSE: INSPECT WHEELS

Task RESCEN:	Task FIS Loc:	Task Function:	Task Work Element:	Task Status By:	Facility:	Task Status Date:	Task Status:
4671	5114	1863	500	SIMP3519	CSX	08/04/2010	Closed

Job # 1 INSPECT WHEELS, COUPLERS, PLOW & TMs

Signature(s):	Date:	<input checked="" type="checkbox"/>
---------------	-------	-------------------------------------

Foreman Signatures required only once for each job.

Procedure:

DXBHWHLHSE - INSPECT WHEELS, COUPLERS, PLOW

10.00	Wheel Inspection, Gauging and Reporting per procedure	DXBH-02-0004	
20.00	Inspect Traction Motors and Gear Cases per procedure	DXBH-02-0007	
30.00	Inspect Plow Height and Brake Hoses per procedure	DXBH-01-0003	
40.00	Coupler Height Inspection per procedure	DXBH-03-0002	
50.00	Periodic Coupler Inspection and Gauging per procedure	DXBH-03-0004	
60.00	Daily Coupler Inspection per procedure	DXBH-03-0001	
70.00	Record any defects on MAP-9 and attach to this work order. Document in WMS all failure modes and unacceptable conditions identified.		

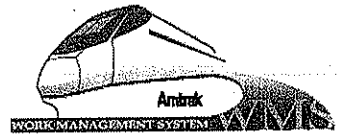
Note - If you have any questions or concerns regarding the contents of this Work Order, please contact the Fleet Manager: **Mike Scaringe** ATS 825-0230



Maintenance Analysis Program

WMS Work Order: 2256919

Unit: 500



Print Date: 8/23/2010

TASK # 2 SPOT #5-1: INBOUND INSPECTION

Task RESCEN:	Task FIS Loc:	Task Function:	Task Work Element:	Task Status By:	Facility:	Task Status Date:	Task Status:
4671	5114	1863	500	SIMP3519	CSX	08/04/2010	Closed

Job # 1 LOCOMOTIVE TEST READINGS

Signature(s):

Date:



Initial/Signature/Check

Foreman Signatures required only once for each job.

Procedure:

DXBDQIOTEST - INBOUND/OUTBOUND TEST READINGS

10.00 Perform Self Load Test and Record INBOUND Test Readings per procedure DXBD-04-0020 below:

20.00	UNITS	INBOUND	OUTBOUND
LOAD REGULATOR	[%]	_____	_____
OIL TEMPERATURE	[DEG F]	_____	_____
WATER TEMPERATURE	[DEG F]	_____	_____
ENGINE SPEED	[RPM]	_____	_____
BATTERY VOLTAGE	[VOLTS]	_____	_____
GROSS HORSE POWER	[HP]	_____	_____
THROTTLE POSITION	[VOLTS]	_____	_____
ALTERNATOR VOLTAGE (P42)	[VOLTS]	_____	_____
ALTERNATOR CURRENT	[AMPS]	_____	_____

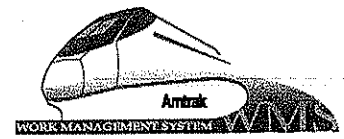
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Maintenance Analysis Program

WMS Work Order: 2256919

Unit: 500



Print Date: 8/23/2010

TASK # 2 SPOT #5-1: INBOUND INSPECTION

Task RESCEN:	Task FIS Loc:	Task Function:	Task Work Element:	Task Status By:	Facility:	Task Status Date:	Task Status:
4671	5114	1863	500	SIMP3519	CSX	08/04/2010	Closed

Job # 1 LOCOMOTIVE TEST READINGS

Signature(s):

Date:



Initial/Signature/Check

Foreman Signatures required only once for each job.

30.00	UNITS	INBOUND	OUTBOUND
1001 OUTSIDE AIR TEMPERATURE [DEG F]			
2003 INPUT FOR TRACTION [HP]			
2004 AUXILLARY LOAD [HP]			
2008 GOVERNOR PISTON GAP [INCHES]			
2012 MAIN ALT. GND LEAKAGE [mA]			
2015 AIR COMPRESSOR SPEED [RPM]			
2016 TM#1 CURRENT [A]			
2017 TM #2 CURRENT [A]			
2018 TM #3 CURRENT [A]			
2019 TM #4 CURRENT [A]			
2031 AUX ALT. FIELD [A]			
2032 HP DETERIORATION [%]			
3001 INTAKE AIR MANIFOLD [PSI]			
3002 BAROMETER [PSI]			
3007 COP [PSI]			
2013 GRID BLOWER #1 [RPM]			
2014 GRID BLOWER #2 [RPM]			
40.00			
TURBO AIR PRESSURE [PSI]			
FUEL OIL PRESSURE [PSI]			
LUBE OIL PRESSURE [PSI]			

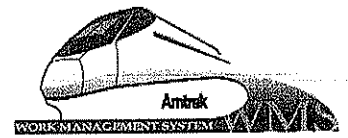
Note - If you have any questions or concerns regarding the contents of this Work Order, please contact the Fleet Manager: Mike Scaringe ATS 825-0230



Maintenance Analysis Program

WMS Work Order: 2256919

Unit: 500



Print Date: 8/23/2010

TASK # 2 SPOT #5-1: INBOUND INSPECTION

Task RESCEN:	Task FIS Loc:	Task Function:	Task Work Element:	Task Status By:	Facility:	Task Status Date:	Task Status:
4671	5114	1863	500	SIMP3519	CSX	08/04/2010	Closed

Job # 1 LOCOMOTIVE TEST READINGS

Signature(s):	Date:	<input checked="" type="checkbox"/>
		Initial/Signature/Check

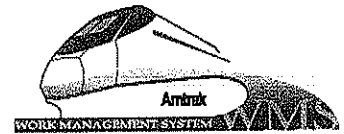
Foreman Signatures required only once for each job.

50.00 HEP Operational Test		INBOUND	OUTBOUND
A) Set up HEP Normal:			
B) Record the following Monitor Parameters While in HEP Normal Mode:			
2005 Engine Speed (900+5-6) RPM		<input type="text"/>	<input type="text"/>
2177 HEP Voltage (480 +/-24)		<input type="text"/>	<input type="text"/>
5011 HEP Alternator Field AMPS		<input type="text"/>	<input type="text"/>
5012 HEP Phase A to ground Volts		<input type="text"/>	<input type="text"/>
5013 HEP Phase B to ground Volts		<input type="text"/>	<input type="text"/>
5014 HEP Phase C to ground Volts		<input type="text"/>	<input type="text"/>
5015 HEP Phase A Current AMPS		<input type="text"/>	<input type="text"/>
5016 HEP Phase B Current AMPS		<input type="text"/>	<input type="text"/>
5017 HEP Phase C Current AMPS		<input type="text"/>	<input type="text"/>
5018 HEP Output (8.0 +/- .4) V/Hz		<input type="text"/>	<input type="text"/>
60.00 C) Set up For HEP Standby:			
D) Record the following Parameters While in HEP Standby Mode			
		INBOUND	OUTBOUND
2005 Engine Speed (900+5-6) RPM		<input type="text"/>	<input type="text"/>
2177 HEP Voltage (480 +/-24)		<input type="text"/>	<input type="text"/>
5011 HEP Alternator Field AMPS		<input type="text"/>	<input type="text"/>
5012 HEP Phase A to ground Volts		<input type="text"/>	<input type="text"/>
5013 HEP Phase B to ground Volts		<input type="text"/>	<input type="text"/>
5014 HEP Phase C to ground Volts		<input type="text"/>	<input type="text"/>
5015 HEP Phase A Current AMPS		<input type="text"/>	<input type="text"/>
5016 HEP Phase B Current AMPS		<input type="text"/>	<input type="text"/>
5017 HEP Phase C Current AMPS		<input type="text"/>	<input type="text"/>
5018 HEP Output (8.0 +/- .4) V/Hz		<input type="text"/>	<input type="text"/>
*Phase to ground volts should be 277 +/-14			

Note - If you have any questions or concerns regarding the contents of this Work Order, please contact the Fleet Manager: Mike Scaringe ATS 825-0230



Maintenance Analysis Program
WMS Work Order: 2256919
Unit: 500



Print Date: 8/23/2010

TASK # 2 SPOT #5-1: INBOUND INSPECTION

Task RESCEN:	Task FIS Loc:	Task Function:	Task Work Element:	Task Status By:	Facility:	Task Status Date:	Task Status:
4671	5114	1863	500	SIMP3519	CSX	08/04/2010	Closed

Job # 2 INBOUND: P32 92D ELECTRICAL INSPECTION

Signature(s): _____ Date: _____

Foreman Signatures required only once for each job.

Procedure:

DXBHQELINB - P32 92D ELECT. INBOUND INSP

10.00 Record INBOUND Parameters	
15.00 Check for correct Panel #'s software versions	
18.00 Check for Control Circuit Grounds with Test Light per procedure DXBH-04-0003	
20.00 Perform Self Load Test and Record Parameters per procedure DXBH-04-0028	
30.00 Inspect Electrical Cabinet Doors (With Latches) per procedure DXBH-06-0001	
40.00 Radio Operational Check per procedure DXBH-08-0002	
45.00 Radio Wattage Test per procedure DXBH-08-0003	
50.00 Check Throttle and Reverser Lock for Proper Operation per procedure DXBH-19-0006	
60.00 Inspect Event Recorder Light. per procedure DXBH-12-0001	
70.00 Download Event Recorder History per procedure DXBH-11-0010	
80.00 CAB Recorder Download per procedure DXBH-11-0007	
90.00 HEP Operational Test per procedure DXBH-04-0011	
100.00 Check H.E.P. Line Voltage and Perform Load Test. Verify Operation of HVAC, Heaters, and Refrigerator per procedure DXBH-04-0005	
105.00 Power Test per procedure DXBH-09-0004	
110.00 Automatic CAB Self Test per procedure DXBH-15-0009	
120.00 Check Electrical Equipment Control Air Pressure per procedure DXBH-04-0004	
130.00 Propulsion Rectifier Panel Inspection per procedure DXBH-04-0017	
140.00 Inspect and Test Onboard Hot Box Detection System per procedure DXBH-12-0002	
150.00 Check Emergency Shutdown Devices per procedure DXBH-19-0007	
160.00 Test Interior and Exterior Lighting per procedure DXBH-05-0001	
180.00 Inspect Cab Signal Bars and Perform Self Test per procedure DXBH-11-0005	
190.00 Trainline, Cables and Receptacle Inspection per procedure DXBH-04-0001	
200.00 Record all defects MAP-9	

Job # 3 INBOUND: P32 92D MECHANICAL INSPECTION

Signature(s): _____ Date: _____

Foreman Signatures required only once for each job.

Procedure:

DXBHQMEINB - P32 92D MECH INBOUND INSP

10.00 Alerter Test per procedure DXBH-12-0012.	
20.00 Main and Control Air Reservoir Leakage Test, and Safety Valve Test per procedure DXBH-21-0006.	
30.00 Operating Cab Inspection per procedure DXBH-15-0001	

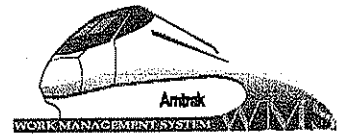
Note - If you have any questions or concerns regarding the contents of this Work Order, please contact the Fleet Manager: Mike Scaringe ATS 825-0230



Maintenance Analysis Program

WMS Work Order: 2256919

Unit: 500



Print Date: 8/23/2010

TASK # 2 SPOT #5-1: INBOUND INSPECTION

Task RESCEN:	Task FIS Loc:	Task Function:	Task Work Element:	Task Status By:	Facility:	Task Status Date:	Task Status:
4671	5114	1863	500	SIMP3519	CSX	08/04/2010	Closed

Job # 3 INBOUND: P32 92D MECHANICAL INSPECTION

Signature(s):

Date:



Initial/Signature/Check

Foreman Signatures required only once for each job.

40.00	Check Operation of Sanding System per procedure	DXBH-01-0004	
50.00	Inspect All Safety Appliances per procedure	DXBH-01-0002	
60.00	Air Dryer System Check per procedure	DXBH-21-0002	
70.00	Inspect and Test Salem Air Dryer per procedure	DXBH-21-0013	
80.00	Test Air Brake Cut Out Cock Handles for Proper Locking per procedure	DXBH-10-0004	
90.00	Inspect Snyder II Fuel System, Fuel Tank, Level Indicators, and Ecology Tank per procedure	DXBH-18-0002	
100.00	Inspect Carbody Screens per procedure	DXBH-01-0007	
110.00	Inspect Running Gear per procedure	DXBH-02-0001	
120.00	Perform Sequential Fuel System Test (Pop Test) per procedure	DXBH-19-0008	
130.00	Check Cooling Water Level per procedure	DXBH-23-0001	
140.00	Check Main Engine Oil Level per procedure	DXBH-19-0002	
150.00	Main machinery Space Vibration and Noise Check per procedure	DXBH-19-0004.	
160.00	Check for Fuel, Oil, Water and Exhaust Leaks per procedure	DXBH-19-0003	
170.00	Check Air Compressor Oil Level per procedure	DXBH-21-0001	
180.00	Clean Cooling Radiators With Compressed Air per procedure	DXBH-23-0003	
200.00	REVIEW ATTACHED OIL ANALYSIS HISTORY REPORT; NOTIFY SUPERVISOR OF ANY ABNORMAL OR CRITICAL RESULTS.		
220.00	"Record any defects on MAP-9 and attach to this work order. Document in WMS all failure modes and unacceptable conditions identified."		

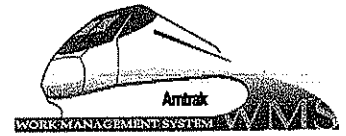
Note - If you have any questions or concerns regarding the contents of this Work Order, please contact the Fleet Manager: Mike Scaringe ATS 825-0230



Maintenance Analysis Program

WMS Work Order: 2256919

Unit: 500



Print Date: 8/23/2010

TASK # 3 FUELHOUSE: FUELHOUSE SERVICING

Task RESCEN:	Task FIS Loc:	Task Function:	Task Work Element:	Task Status By:	Facility:	Task Status Date:	Task Status:
4671	5114	1863	500	SIMP3519	CSX	08/04/2010	Closed

Job # 1 FUEL HSE: P32 OIL SAMPLES & DRAIN ECO TANK

Signature(s):

Date:



Initial/Signature/Check

Foreman Signatures required only once for each job.

Procedure:

DXBHOILSMPL - P32 15D OIL SMPL DRAIN ECO TNK

10.00 Main Engine Oil Sample per procedure DXBH-19-0005	
20.00 Take Air Compressor Oil Sample per procedure DXBH-21-0005	
30.00 Drain Ecology Tank per procedure DXBH-13-0001	
40.00 QUALITY CHECKPOINT: ENSURE OIL SAMPLES ARE SUBMITTED TO SUPERVISOR ENSURE OIL LEVEL AND COOLING WATER LEVEL IS SUFFICIENT	

Job # 2 P32 DAILY CLEAN, FUEL & SAND

Signature(s):

Date:



Initial/Signature/Check

Foreman Signatures required only once for each job.

Procedure:

DXBHDLAFUEL - P32 DAILY CLEAN, FUEL, SAND

10.00 CHECK FUEL LEVEL, BRING TO FULL MARK.	
20.00 Check Sand Level per procedure DXBH-01-0005	
30.00 SUPPLY TOOLBOX WITH HAMMER, WRENCH, CHISEL, 1 MAIN RESERVOIR HOSE, 2 BRAKE PIPE HOSES AND GLAD HAND SEALS. SUPPLY SPARE FUSEES, HEP AND M.U. CABLES, AND HEADLIGHT LAMPS AS NECESSARY.	
40.00 CLEAN ENGINE ROOM AND WALKWAYS OF DIRT, OIL OR DEBRIS. ENSURE THAT PASSAGEWAYS, FLOORS AND COMPARTMENTS ARE FREE OF TRIPPING HAZARDS.	
50.00 CLEAN THE TOILET AND TOILET AREA, REMOVE ALL TRASH.	
60.00 Dump and Recharge Toilet per procedure DXBH-13-0002	
70.00 CLEAN AND SUPPLY CAB REFRIGERATOR WITH WATER. SUPPLY CAB WITH 6 CREW KITS AND ONE LARGE GARBAGE BAG. ENSURE AMPLE SUPPLY OF TOILET PAPER.	
80.00 CLEAN & WASH THE CAB AREA: WASH CAB CONSOLE & DASH. EMPTY ASH TRAYS. CLEAN WINDSHIELD, WINDOWS & MIRRORS. CLEAN AND MOP CAB FLOOR IF NECESSARY. REMOVE ALL TRASH.	
90.00 RECORD ANY DEFECTS ON MAP-9.	
100.00 QUALITY CHECKPOINT: ENSURE MR AIR TANKS ARE DRAINED...	

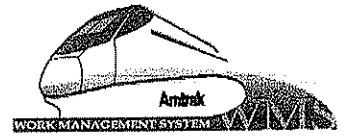
Note - If you have any questions or concerns regarding the contents of this Work Order, please contact the Fleet Manager: Mike Scaringe ATS 825-0230



Maintenance Analysis Program

WMS Work Order: 2256919

Unit: 500



Print Date: 8/23/2010

TASK # 4 SPOT #5-3: TOP & BOTTOM INSPECTION

Task RESCEN:	Task FIS Loc:	Task Function:	Task Work Element:	Task Status By:	Facility:	Task Status Date:	Task Status:
4671	5114	1863	500	SIMP3519	CSX	08/04/2010	Closed

Job # 1 P32 92D ELECTRICAL TOP & PIT INSPECTION

Signature(s):

Date:



Initial/Signature/Check

Foremen Signatures required only once for each job.

Procedure:

DXBHQELTOPBOT - P32 92D ELECT. INSP

20.00	Check Electric and Pneumatic Switch Gear and Control Equipment per procedure DXBH-04-0016	
40.00	Renew HVAC Filters per procedure DXBH-07-0005	
50.00	Inspect Slip Ring Brushes per procedure DXBH-04-0022	
60.00	Inspect Support Bearing and Speed Sensors per procedure DXBH-12-0003	
70.00	Traction Motor Inspection per procedure DXBH-09-0012	
80.00	VERIFY TRACTION MOTOR SERIAL NUMBERS; MOTORS WITH SERIAL NUMBERS OLDER THAN 54 MONTHS NEED TO BE REPLACED. RECORD SERIAL NUMBERS ON MAP-9 FORM AND UPDATE/VERIFY RECORD IN WMS.	
90.00	"Record any defects on MAP-9 and attach to this work order. Document in WMS all failure modes and unacceptable conditions identified."	

Job # 2 P32 92D MECHANICAL TOP & PIT INSPECTION

Signature(s):

Date:



Initial/Signature/Check

Foreman Signatures required only once for each job.

Procedure:

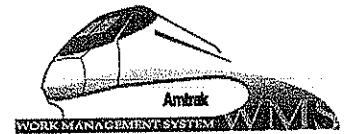
DXBHQMETOPBOT - P32 92D MECH INSP

10.00	Install New Fuel Filters and Prime Fuel System per procedure DXBH-18-0004	
20.00	Install New Engine Air Intake Baggy Filters per procedure DXBH-19-0010	
30.00	Inspect Crankcase Breather Pipe (Eductor Tube) per procedure DXBH-19-0014	
35.00	Check Governor Oil Level and Bring to Full Mark per procedure DXBH-19-0001	
40.00	Ensure Winter-Summer Air Intake Door is Properly Positioned per procedure DXBH-09-0001	
50.00	CLEAN ENGINE ROOM & AIR-COMPRESSOR ROOM WALKWAYS OF DIRT, OIL OR DEBRIS.	
60.00	Replace Air Compressor Intake Filters per procedure DXBH-21-0015	
70.00	Inspect Axle Alternator per procedure DXBH-02-0006	
80.00	Inspect Traction Motor Gear Case Oil Level per procedure DXBH-09-0017	
85.00	Quarterly Draft Gear Inspection per procedure DXBH-03-0005	
90.00	Inspect Brake Shoes per procedure DXBH-10-0003	
100.00	Fuel Tank Inspection per procedure DXBH-01-0010	
110.00	Remove and clean any debris collected between the top of the retention tank and cable tray.	
120.00	Record any defects on MAP-9 and attach to this work order. Document in WMS all failure modes and unacceptable conditions identified.	

Note - If you have any questions or concerns regarding the contents of this Work Order, please contact the Fleet Manager: Mike Scaringe ATS 825-0230



Maintenance Analysis Program
WMS Work Order: 2256919
Unit: 500



Print Date: 8/23/2010

TASK # 5 SPOT #5-2: GAGE, SERVICE & WASH

Task RESCEN:	Task FIS Loc:	Task Function:	Task Work Element:	Task Status By:	Facility:	Task Status Date:	Task Status:
4871	5114	1863	500	SIMP3519	CSX	08/04/2010	Closed

Job # 1 P32 92D ELECTRICAL SERVICE

Signature(s):

Date:



Initial/Signature/Check

Foreman Signatures required only once for each job.

Procedure:

DXBHQELSERV - P32 92D ELECT. SERVICE

10.00 Battery inspection and specific gravity check. per procedure DXBH-04-0010	
20.00 Inspect, Clean and Fill Batteries per procedure DXBH-04-0009	
30.00 VERIFY AEI TAG MATCHES UNIT #, USE AEI READER. CHECK BOTH SIDES	

Job # 2 P32 92D GAUGE, MECH SERVICE & WASH

Signature(s):

Date:



Initial/Signature/Check

Foreman Signatures required only once for each job.

Procedure:

DXBHQMESERV - P32 92D MECH SERVICE

30.00 Drain and Clean Fuel Filter Tank per procedure DXBH-18-0003	
40.00 Remove Baggy Filters and Inspect Engine Air Intake Hatch per procedure DXBH-19-0009	
50.00 Drain Condensate from Compressor Intercooler, Aftercooler, and Final Filters per procedure DXBH-21-0004	
60.00 Renew Control Compartment Canister Air Filters, Four Each per procedure DXBH-01-0006	
70.00 Inspect and Clean Equipment Spin Filters per procedure DXBH-09-0009	
80.00 If this 92 day PM is being performed with a 184 or 368 day PM, see the work order(s) for additional tasks at this spot.	
90.00 PRESSURE WASH EXTERIOR FRONT & REAR OF LOCOMOTIVE. PRESSURE WASH THE TRUCKS.	

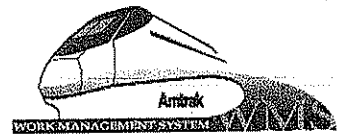
Note - If you have any questions or concerns regarding the contents of this Work Order, please contact the Fleet Manager: Mike Scaringe ATS 825-0230



Maintenance Analysis Program

WMS Work Order: 2256919

Unit: 500



Print Date: 8/23/2010

TASK # 6 SPOT #5-4: OUTBOUND THE LOCOMOTIVE

Task RESCEN:	Task FIS Loc:	Task Function:	Task Work Element:	Task Status By:	Facility:	Task Status Date:	Task Status:
4671	5114	1863	500	SIMP3519	CSX	08/04/2010	Closed

Job # 1 P32 92D OUTBOUND TESTING

Signature(s):

Date:



Initial/Signature/
Check

Foremen Signatures required only once for each job.

Procedure:

DXBHQOUTB - P32 92D OUTBOUND TEST

10.00	Record OUTBOUND Test Readings.	
20.00	Qualcomm System Test per procedure DXBH-08-0001	
30.00	Cut-Out Valve Seal Inspection per procedure DXBH-10-0008	
40.00	Locomotive Daily Air Brake Departure Test per procedure DXBH-10-0001	
50.00	APPLY NEW MAP 101 CARD.	
60.00	Record any defects on MAP-9 and attach to this work order. Document in WMS all failure modes and unacceptable conditions identified.	
70.00	"QUALITY CHECKPOINT: VERIFY THAT THE RECORDED OUTBOUND READINGS ARE WITHIN THE SPECIFIED/ACCEPTABLE RANGE OF VALUES. IF READINGS ARE NOT WITHIN SPECIFICATIONS, TAKE PROPER CORRECTIVE ACTION."	

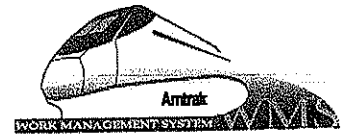
Note - If you have any questions or concerns regarding the contents of this Work Order, please contact the Fleet Manager: Mike Scaringe ATS 825-0230



Maintenance Analysis Program

WMS Work Order: 2256919

Unit: 500



Print Date: 8/23/2010

TASK # 7 SUPERVISOR TASK

Task RESCEN:	Task FIS Loc:	Task Function:	Task Work Element:	Task Status By:	Facility:	Task Status Date:	Task Status:
4671	5114	1863	500	SIMP3519	CSX	08/04/2010	Closed

Job # 1 P32 92D PM DISPATCH

Signature(s):

Date:



Initial/Signature/Check

Foreman Signatures required only once for each job.

Procedure:

DXBDQSUP - P32/P42 92D PM DISPATCH

10.00	ENSURE THAT ALL PM WORK ORDERS ARE CLOSED ON THE SAME DATE AS WRITTEN ON THE UNIT'S BLUE FORM (MAP 816).	
20.00	MAKE SURE ALL DEFECTS HAVE BEEN RECORDED ON MAP-9 FORM THEN DISPOSITIONED AND SIGNED OFF WHEN COMPLETED. ATTACH THE MAP-9 FORMS. OUTBOUND THE LOCOMOTIVE OR SEND TO TRACK 9 IF FURTHER REPAIRS ARE NEEDED.	
30.00	ENSURE ALL DEFECTS ARE TO BE RECORDED ON THE MAP-9 FORM THEN DISPOSITIONED AND SIGNED OFF WHEN COMPLETED. ATTACH THE MAP-9 FORMS. OUTBOUND THE LOCOMOTIVE OR SEND TO TRACK 9 IF FURTHER REPAIRS ARE NEEDED.	
40.00	GENERAL FOREMAN: _____ DATE: _____	

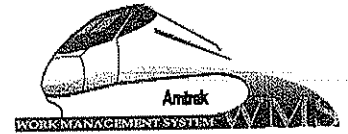
Note - If you have any questions or concerns regarding the contents of this Work Order, please contact the Fleet Manager: Mike Scaringe ATS 825-0230



Maintenance Analysis Program

WMS Work Order: 2256919

Unit: 500



Print Date: 8/23/2010

Non-Serial Components

- 1 / Part / 2656886562 / Truck/WheelSet/Suspension / Wheelset, Loco W/O Disc / TOO SMALL TO TRU
- 4 / Part / 2656886562 / Truck/WheelSet/Suspension / Wheelset, Loco W/O Disc / FINISHED RIM SIZE 2
- 2 / Part / 2656886562 / Truck/WheelSet/Suspension / Wheelset, Loco W/O Disc / TOO SMALL TO TRU
- 3 / Part / 2656886562 / Truck/WheelSet/Suspension / Wheelset, Loco W/O Disc / FINISHED RIM SIZE 2

Serial Components

- AMT4587 - z - Component / z-TM Combo / Part / 2656884002 / Truck/WheelSet/Suspension / Traction Motor Combo / 10B97051092 /
- AMT3593 - z - Component / z-TM Combo / Part / 2656884002 / Truck/WheelSet/Suspension / Traction Motor Combo / 08B93100565 / TM Combo #3
- AMT2382 - z - Component / z-TM Combo / Part / 2656884002 / Truck/WheelSet/Suspension / Traction Motor Combo / 08C99010044 / TM Combo #4
- AMT3709 - z - Component / z-TM Combo / Part / 2656884002 / Truck/WheelSet/Suspension / Traction Motor Combo / 10F96061166 / TM Combo #2

There are no Work Order Notes.

Note - If you have any questions or concerns regarding the contents of this Work Order, please contact the Fleet Manager: Mike Searinge ATS 825-0230



Maintenance Analysis Program Equipment Condition Report – MAP 100

Train Number:	Locomotive Number:	Position in Consist:
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Use Separate Report for Each Unit in Consist. Each locomotive unit, self-propelled car and turboliner shall be inspected in accordance with CFR Title 49 Part 229.21, and 236.587, and MAP 101 must be signed.

Signature of Employee making daily mechanical inspections.	Occupation	Place	Date	Time
------------------------------------------------------------	------------	-------	------	------

Seal Numbers

Train Control Cutout Cock:	Speedometer Overspeed:
Alertor Cutout Cock:	Speed Control Switch:
ACSES Cutout Cock:	ATC Switch:
Car Door Override Switch:	Event Recorder:

Cab Signal / IITS Test / ACSES Test

AMTRAK

F End: _____ R End: _____

BN/SF (IITS)

C.S./ IITS Departure Test	C.S. Daily Or After Trip Test	<input type="checkbox"/> Receiver bars OK <input type="checkbox"/> Penalty warning less than 8 sec.		
ACSES Departure Test	ACSES Daily or After Trip Test			
Signature of Employee making C.S./ IITS Test	Occupation	Place	Date	Time

Locomotive Calendar Day Air Brake Test:

F End: _____ R End: _____

Signature of Employee making air test.	Occupation	Place	Date	Time
Signature of Supervisor approving unit for service and all work above.	Occupation	Place	Date	Time

Condition of Equipment

Speed Indicator:	Crossing Bell:	
H.E.P./M.A.:	Horn:	
Dynamic Braking:	Cab Signals:	
Brakes & Rigging:	Speed Control:	
Radio:	Deadman/Alertor:	
Sanders:	Wipers:	
Brake Pipe Pressure: _____ PSI:	Main Reservoir Pressure: _____ PSI:	
Radio Serial Number: _____ F End: _____	R End: _____	
Failures Enroute	Engr. Init.	Repaired by

The above work has been performed, except as noted, the report is approved, and this unit is available for service.

Signature of Locomotive Engineer	Location	Date	Time

Use Reverse Side for additional comments or details

Instructions: Complete form, obtain signatures and make one copy. Original is to be retained in the Locomotive Cab and the copy is to be retained at the location performing the inspection.

ANA LABORATORIES, INC.

130 Harding Avenue, Suite B, Bellmawr, NJ 08031

(856) 931-0011 * (800) 648-2625

Unit: 16THST
 System: RAIL
 Lubricant: 6E
 Id./Type: 16THST
 Make:
 Model:

SAMPLE SEVERITY

N

SAMPLE DATA		ELEMENTAL ANALYSIS														OIL QUALITY																														
LAB #	DATE TAKEN/TESTED	HRS/MI OIL UNIT	VALUES EXPRESSED IN PARTS PER MILLION (PPM) BY WEIGHT														FUEL	VISCOSITY cSt @ 40C	VISCOSITY cSt @ 100C	WATER % by volume	SOLIDS	GLYCOL																								
R09M017548	12/23/2009	0 M	Iron	3	Chromium	0	Lead	0	Copper	0	Tin	0	Aluminum	1	Nickel	0	Silver	0	Silicon	4	Boron	0	Sodium	6	Magnesium	18	Calcium	60	Barium	0	Phosphorus	0	Zinc	0	Titanium	0	Vanadium	0	Potassium	0	0.00	138.50	15.40	0.01	0.00	N

ADDITIONAL TESTS		SULFATE		
LAB #	TBN Mg/G	Pentane Insolubles Mg/G	OXIDATION	NITRATION
R09M017548	16.0	0.7	0.00	2.20

ANALYSIS RECOMMENDATIONS	
R09M017548	ANALYSIS FOR YOUR REFERENCE AND TO ESTABLISH BASE LINE.

CLIENT: AMTRAK CLIENT ID: AMTRAKTX

AMTRAK

ATTN TIM COOPER
 400 SOUTH HOUSTON ST.- STE. 100
 DALLAS, TX 75202

ANA LABORATORIES, INC.

130 Harding Avenue, Suite B, Bellmawr, NJ 08031

(856) 931-0011 * (800) 648-2625

Unit: 500
 System: RAIL
 Lubricant: 6R
 Id./Type: 500
 Make: N
 Model: N

SAMPLE SEVERITY

SAMPLE DATA		ELEMENTAL ANALYSIS VALUES EXPRESSED IN PARTS PER MILLION (PPM) BY WEIGHT														OIL QUALITY											
LAB #	DATE TAKEN/TESTED	HRS./OIL UNIT	Iron	Chromium	Lead	Copper	Tin	Aluminum	Nickel	Silver	Silicon	Boron	Sodium	Magnesium	Calcium	Barium	Phosphorus	Zinc	Titanium	Vanadium	Potassium	FUEL	VISCOSITY cSt @ 40C	VISCOSITY cSt @ 100C	WATER % by volume	SOLIDS	GLYCOL
R10C009153	3/8/2010	0 M	7	0	2	2	0	4	0	0	8	1	5	13	4471	0	0	3	0	1	2	0.00	15.69	0.00	0.00	0.00	N
	3/12/2010	0 M																									

ADDITIONAL TESTS			
LAB #	TBN Mg/g	TAN Mg/g	Pentane Insolubles
R10C009153	0.0	0.0	0.000

ANALYSIS RECOMMENDATIONS			
LAB #	OXIDATION	NITRATION	SULFATE
R10C009153	0.00	0.00	0.00

LAB # R10C009153
 ANALYSIS RECOMMENDATIONS
 R10C009153 NO CORRECTIVE ACTION NEEDED!

CLIENT: AMTRAK CLIENT ID: AMTRAKFTX

AMTRAK
 FORT WORTH
 ATTN: TIM COOPER
 400 SOUTH HOUSTON ST. - STE 100
 DALLAS, TX 75202

ANA LABORATORIES, INC.

130 Harding Avenue, Suite B, Bellmawr, NJ 08031

(856) 931-0011 * (800) 648-2625

Unit: 500
 System: RAIL
 Lubricant: 6R
 Id./Type: 500
 Make: N
 Model: N

SAMPLE SEVERITY

SAMPLE DATA		ELEMENTAL ANALYSIS VALUES EXPRESSED IN PARTS PER MILLION (PPM) BY WEIGHT														OIL QUALITY												
LAB #	DATE TAKEN/TESTED	HRS/MI OIL UNIT	Iron	Chromium	Lead	Copper	Tin	Aluminum	Nickel	Silver	Silicon	Boron	Sodium	Magnesium	Calcium	Barium	Phosphorus	Zinc	Titanium	Vanadium	Potassium	FUEL	VISCOSITY cSt @ 40C	VISCOSITY cSt @ 100C	WATER % by volume	SOLIDS	GLYCOL	
R10C017331	3/18/2010	0 M	6	0	0	1	0	2	0	0	5	0	4	12	4592	0	0	0	0	0	1	1	0.00	15.15	0.00	0.00	0.00	N
	3/24/2010	0 M																										

ADDITIONAL TESTS			
LAB #	TBN Mg/G	Pentane Insolubles Mg/G	SULFATE
R10C017331	0.0	0.000	0.00

LAB # R10C017331
 ANALYSIS RECOMMENDATIONS
 NO CORRECTIVE ACTION NEEDED!

CLIENT: AMTRAK CLIENT ID: AMTRAKFTX

AMTRAK
 FORT WORTH
 ATTN: TIM COOPER
 400 SOUTH HOUSTON ST. - STE 100
 DALLAS, TX 75202

ANA LABORATORIES, INC.

130 Harding Avenue, Suite B, Bellmawr, NJ 08031

(856) 931-0011 * (800) 648-2625

Unit: 500
 System: RAIL
 Lubricant: 6R

SAMPLE SEVERITY

N

SAMPLE DATA		ELEMENTAL ANALYSIS VALUES EXPRESSED IN PARTS PER MILLION (PPM) BY WEIGHT															OIL QUALITY											
LAB #	DATE TAKEN/TESTED	HRS/MI OIL UNIT	Iron	Chromium	Lead	Copper	Tin	Aluminum	Nickel	Silver	Silicon	Boron	Sodium	Magnesium	Calcium	Barium	Phosphorus	Zinc	Titanium	Vanadium	Potassium	FUEL	VISCOSITY cSt @ 40C	VISCOSITY cSt @ 100C	WATER % by volume	SOLIDS	GLYCOL	
R10D005337	4/2/2010 4/9/2010	0 M 0 M	7	0	1	1	0	2	0	0	12	0	5	12	4314	0	22	0	0	0	1	1	0.00	15.39	0.00	0.00	0.00	N

ADDITIONAL TESTS						
LAB #	TBN Mg/G	TAN Mg/G	Pentane Insolubles	OXIDATION	NITRATION	SULFATE
R10D005337	0.0	0.0	0.000	0.00	0.00	0.00

LAB #		ANALYSIS RECOMMENDATIONS	
R10D005337	NO CORRECTIVE ACTION NEEDED!		

CLIENT: AMTRAK CLIENT ID: AMTRAKFTX

AMTRAK
 FORT WORTH
 ATTN: TIM COOPER
 400 SOUTH HOUSTON ST. - STE 100
 DALLAS, TX 75202

ANA LABORATORIES, INC.

130 Harding Avenue, Suite B, Bellmawr, NJ 08031

(856) 931-0011 * (800) 648-2625

Unit: 500
 Id./Type: RAIL
 Make: Model:
 Lubricant: 6R
 System: RAIL
 SAMPLE SEVERITY: **N**

SAMPLE DATA		ELEMENTAL ANALYSIS														OIL QUALITY																																
LAB #	DATE TAKEN/TESTED	HRS/MI OIL UNIT	VALUES EXPRESSED IN PARTS PER MILLION (PPM) BY WEIGHT														FUEL	VISCOSITY cst. @ 40C	VISCOSITY cst. @ 100C	WATER % by volume	SOLIDS	GLYCOL																										
R10D006460	4/6/2010	0 M	Iron	3	Chromium	0	Lead	2	Copper	0	Tin	0	Aluminum	1	Nickel	0	Silver	0	Silicon	0	Boron	0	Sodium	5	Magnesium	3	Calcium	4053	Barium	0	Phosphorus	0	Zinc	0	Titanium	0	Vanadium	1	Potassium	2	FUEL	0.00	134.20	15.00	0.00	0.40	N	
	4/12/2010	0 M																																														

ADDITIONAL TESTS		SULFATE			
LAB #	TBN Mg/G	TAN Mg/G	Pentane Insolubles	OXIDATION	NITRATION
R10D006460	9.0	1.6	1.200	9.30	10.30
				7.00	

ANALYSIS RECOMMENDATIONS	
LAB #	R10D006460
NO CORRECTIVE ACTION NEEDED!	

CLIENT: AMTRAK CLIENT ID: AMTRAKFTX

AMTRAK
 FORT WORTH
 ATTN: TIM COOPER
 400 SOUTH HOUSTON ST. - STE 100
 DALLAS, TX 75202

ANA LABORATORIES, INC.

130 Harding Avenue, Suite B, Bellmawr, NJ 08031

(856) 931-0011 * (800) 648-2625

Unit: 500
 System: RAIL
 Lubricant: 6R
 Id./Type: 500
 Make:
 Model:

SAMPLE SEVERITY

N

SAMPLE DATA		ELEMENTAL ANALYSIS VALUES EXPRESSED IN PARTS PER MILLION (PPM) BY WEIGHT																OIL QUALITY										
LAB #	DATE TAKEN/TESTED	HRS/MI OIL UNIT	Iron	Chromium	Lead	Copper	Tin	Aluminum	Nickel	Silver	Silicon	Boron	Sodium	Magnesium	Calcium	Barium	Phosphorus	Zinc	Titanium	Vanadium	Potassium	FUEL	VISCOSITY cSt @ 40C	VISCOSITY cSt @ 100C	WATER % by volume	SOLIDS	GLYCOL	
R10D013212	4/16/2010	0 M	8	0	0	1	0	2	0	0	2	0	6	11	3897	0	0	0	0	0	1	2	0.00	134.80	15.05	0.00	0.60	N
R10D013212	4/23/2010	0 M																										
ADDITIONAL TESTS		TBN Mg/G	TAN Mg/G	Pentane Insolubles	OXIDATION	NITRATION	SULFATE																					
R10D013212		7.0	4.9	1.200	15.40	4.20	12.30																					
ANALYSIS RECOMMENDATIONS																												
R10D013212	NO CORRECTIVE ACTION NEEDED!																											

CLIENT: AMTRAK CLIENT ID: AMTRAKFTX

AMTRAK
 FORT WORTH
 ATTN: TIM COOPER
 400 SOUTH HOUSTON ST. - STE 100
 DALLAS, TX 75202

ANA LABORATORIES, INC.

130 Harding Avenue, Suite B, Bellmawr, NJ 08031

(856) 931-0011 * (800) 648-2625

Unit: 500
 Id./Type: RAIL
 Make:
 Model:

System: 6R
 Lubricant:

SAMPLE SEVERITY: N

SAMPLE DATA		ELEMENTAL ANALYSIS VALUES EXPRESSED IN PARTS PER MILLION (PPM) BY WEIGHT														OIL QUALITY											
LAB #	DATE TAKEN/TESTED	HRS/MI OIL UNIT	Iron	Chromium	Lead	Copper	Tin	Aluminum	Nickel	Silver	Silicon	Boron	Sodium	Magnesium	Calcium	Barium	Phosphorus	Zinc	Titanium	Vanadium	Potassium	FUEL	VISCOSITY cst @ 40C	VISCOSITY cst @ 100C	WATER % by volume	SOLDS	GLYCOL
R10E000789	4/26/2010	0 M	12	0	1	2	0	3	0	0	10	0	8	11	4751	0	0	0	0	1	0	0.00	135.20	15.74	0.00	0.50	N
	5/3/2010	0 M																									

ADDITIONAL TESTS			
LAB #	TBN Mg/G	TAN Mg/G	Pentane Insolubles
R10E000789	6.0	1.5	1.100

ADDITIONAL TESTS		
OXIDATION	NITRATION	SULFATE
6.60	6.60	5.30

ANALYSIS RECOMMENDATIONS	
R10E000789	NO CORRECTIVE ACTION NEEDED!

CLIENT: AMTRAK CLIENT ID: AMTRAKFTX

AMTRAK
 FORT WORTH
 ATTN: TIM COOPER
 400 SOUTH HOUSTON ST. - STE 100
 DALLAS, TX 75202

ANA LABORATORIES, INC.

130 Harding Avenue, Suite B, Bellmawr, NJ 08031

(856) 931-0011 * (800) 648-2625

Unit: 500
 System: RAIL
 Lubricant: 6R
 Id./Type: 500
 Make:
 Model:

SAMPLE SEVERITY

N

SAMPLE DATA		ELEMENTAL ANALYSIS VALUES EXPRESSED IN PARTS PER MILLION (PPM) BY WEIGHT														OIL QUALITY												
LAB #	DATE TAKEN/TESTED	HRS/MI OIL UNIT	Iron	Chromium	Lead	Copper	Tin	Aluminum	Nickel	Silver	Silicon	Boron	Sodium	Magnesium	Calcium	Barium	Phosphorus	Zinc	Titanium	Vanadium	Potassium	FUEL	VISCOSITY cSt @ 40C	VISCOSITY cSt @ 100C	WATER % by volume	SOLIDS	GLYCOL	
R10E007828	5/6/2010	0 M	10	0	0	2	0	2	0	0	6	0	4	12	4026	0	52	2	0	1	1	0.00	130.60	15.17	0.00	0.50	N	
	5/13/2010	0 M																										

LAB #	ADDITIONAL TESTS			NITRATION	SULFATE
	TBN Mg/G	TAN Mg/G	Pentane Insolubles		
R10E007828	7.0	0.9	1.300	2.50	0.20

LAB #	ANALYSIS RECOMMENDATIONS
R10E007828	NO CORRECTIVE ACTION NEEDED!

CLIENT: AMTRAK CLIENT ID: AMTRAKFTX

AMTRAK
 FORT WORTH
 ATTN: TIM COOPER
 400 SOUTH HOUSTON ST. - STE 100
 DALLAS, TX 75202

ANA LABORATORIES, INC.

130 Harding Avenue, Suite B, Bellmawr, NJ 08031

(856) 931-0011 * (800) 648-2625

Unit: 500
 Id./Type: RAIL
 Make: Model:
 Lubricant: 6R
 System: RAIL
 SAMPLE SEVERITY: N

SAMPLE DATA		ELEMENTAL ANALYSIS VALUES EXPRESSED IN PARTS PER MILLION (PPM) BY WEIGHT														OIL QUALITY												
LAB #	DATE TAKEN/TESTED	HRS/MI OIL UNIT	Iron	Chromium	Lead	Copper	Tin	Aluminum	Nickel	Silver	Silicon	Boron	Sodium	Magnesium	Calcium	Barium	Phosphorus	Zinc	Titanium	Vanadium	Potassium	FUEL	VISCOSITY cst. @ 40C	VISCOSITY cst. @ 100C	WATER % by volume	SOLDS	GLYCOL	
R10F011423	6/10/2010	0 M	5	0	0	1	0	3	0	0	12	10	4	15	5728	0	0	0	0	0	0	1	0.00	136.40	15.09	0.00	0.10	N
	6/17/2010	0 M																										

ADDITIONAL TESTS			
LAB #	TBN Mg/G	TAN Mg/G	Pentane Insolubles
R10F011423	10.0	0.7	1.200

ADDITIONAL TESTS		
OXIDATION	NITRATION	SULFATE
5.10	6.90	3.30

ANALYSIS RECOMMENDATIONS	
LAB #	
R10F011423	NO CORRECTIVE ACTION NEEDED!

CLIENT: AMTRAK CLIENT ID: AMTRAKFTX

AMTRAK
 FORT WORTH
 ATTN: TIM COOPER
 400 SOUTH HOUSTON ST. - STE 100
 DALLAS, TX 75202

ANA LABORATORIES, INC.

130 Harding Avenue, Suite B, Bellmawr, NJ 08031

(856) 931-0011 * (800) 648-2625

Unit: 500
 Id./Type: RAIL
 Make: Model:
 System: 6R
 Lubricant: 6R
 SAMPLE SEVERITY: N

SAMPLE DATA		ELEMENTAL ANALYSIS VALUES EXPRESSED IN PARTS PER MILLION (PPM) BY WEIGHT														OIL QUALITY											
LAB #	DATE TAKEN/TESTED	HRS/MI OIL UNIT	Iron	Chromium	Lead	Copper	Tin	Aluminum	Nickel	Silver	Silicon	Boron	Sodium	Magnesium	Calcium	Barium	Phosphorus	Zinc	Titanium	Vanadium	Potassium	FUEL	VISCOSITY cst. @ 40C	VISCOSITY cst. @ 100C	WATER % by volume	SOLIDS	GLYCOL
R10F015803	6/20/2010 6/25/2010	0 M 0 M	10	1	0	0	1	0	6	0	0	0	4	19	59	0	30	0	0	0	1	0.00	15.01	0.00	0.20	N	

ADDITIONAL TESTS			
LAB #	TBN Mg/G	TAN Mg/G	Pentane Insolubles
R10F015803	9.0	1.1	0.000
			OXIDATION 0.00
			NITRATION 0.00
			SULFATE 0.00

ANALYSIS RECOMMENDATIONS	
LAB #	R10F015803
	NO CORRECTIVE ACTION NEEDED!

CLIENT: AMTRAK CLIENT ID: AMTRAKFTX

AMTRAK
 FORT WORTH
 ATTN: TIM COOPER
 400 SOUTH HOUSTON ST. - STE 100
 DALLAS, TX 75202

ANA LABORATORIES, INC.

130 Harding Avenue, Suite B, Bellmawr, NJ 08031

(856) 931-0011 * (800) 648-2625

SAMPLE SEVERITY

N

Unit: Lubricant
 System: RAIL
 Id./Type: 500 6R
 Make:
 Model:

SAMPLE DATA		ELEMENTAL ANALYSIS VALUES EXPRESSED IN PARTS PER MILLION (PPM) BY WEIGHT														OIL QUALITY												
LAB #	DATE TAKEN/TESTED	HRS/MI OIL UNIT	Iron	Chromium	Lead	Copper	Tin	Aluminum	Nickel	Silver	Silicon	Boron	Sodium	Magnesium	Calcium	Barium	Phosphorus	Zinc	Titanium	Vanadium	Potassium	FUEL	VISCOSITY cSt @ 40C	VISCOSITY cSt @ 100C	WATER % by volume	SOLIDS	GLYCOL	
R10G003583	6/30/2010	0 M	7	0	0	4	0	3	0	0	4	7	4	11	5075	0	0	0	0	0	0	1	0.00	134.80	14.97	0.00	0.20	N
R10F015803	7/7/2010	0 M	10	1	0	1	0	6	0	0	17	10	4	19	5905	0	30	0	0	0	1	0.00	15.01	15.09	0.00	0.20	N	
R10F01423	6/25/2010	0 M	5	0	0	1	0	3	0	0	12	10	4	15	5728	0	0	0	0	0	1	0.00	136.40	15.09	0.00	0.10	N	
R10E007828	6/17/2010	0 M	10	0	0	2	0	2	0	0	6	0	4	12	4026	0	52	2	0	1	1	0.00	130.60	15.17	0.00	0.50	N	
R10E007828	5/6/2010	0 M																										
R10E007828	5/13/2010	0 M																										

ADDITIONAL TESTS		TBN Mg/G	TAN Mg/G	Pentane Insolubles	OXIDATION	NITRATION	SULFATE
R10G003583	9.0	0.7	1.300	4.80	6.00	3.10	
R10F015803	9.0	1.1	0.000	0.00	0.00	0.00	
R10F01423	10.0	0.7	1.200	5.10	6.90	3.30	
R10E007828	7.0	0.9	1.300	1.40	2.50	0.20	

ANALYSIS RECOMMENDATIONS	
R10G003583	NO CORRECTIVE ACTION NEEDED!
R10F015803	NO CORRECTIVE ACTION NEEDED!
R10F01423	NO CORRECTIVE ACTION NEEDED!
R10E007828	NO CORRECTIVE ACTION NEEDED!

CLIENT: AMTRAK CLIENT ID: AMTRAKFTX

AMTRAK
 FORT WORTH
 ATTN: TIM COOPER
 400 SOUTH HOUSTON ST. - STE 100
 DALLAS, TX 75202

Since services are based on samples and information supplied by others, and since corrective action, if any, is necessarily taken by others, these services are rendered without any warranty or liability. * These tests are accredited and meet the requirements of ISO-17025 verified by the ANSIC-ASQ National Accreditation Board/ACLASS Accreditation# AT-1471.

Recommendation/Corrective Action | NO CORRECTIVE ACTION NEEDED!

R10G009185	Physical Tests	OX	0	NOx	1.1	Sulfur	0	4e	n/a	6u	14u	21u	38u	70u	ISO/NAS										
R10G009185	Physical Tests	Fuel(%)	0	Water(%) *	0	Water(ppm) *	0.01	Soot *	0.1	Glycol *	N	Viscosity Index	n/a												
R10G009185	Oil Quality	K *	0	V *	1	MO *	75	MG *	10	CA *	4417	7	121	0	74	TAN *	0.7	15.1	Visc@100C *	137.3	Visc@40C *				
R10G009185	Metals (PPM) *	FE	7	CR	0	PB	2	CU	1	SN	0	AL	0	NI	1	AG	0	SI	3	B	7	NA	4	TI	0

<p>ANA LABORATORIES, INC. TEST REPORT 130-B Harding Ave, Belmar, New Jersey 08031-2409 (800) 648-2625 (856) 931-0011 Fax (856) 931-5205</p>	<p>I</p>	User ID: AMTRAKFTX Location: FORT WORTH Company: AMTRAK Unit ID: NOUNIT
		History is for location: AMTRAKFTX Attention: TIM COOPER Lab #: R10G009185 Address: 400 SOUTH HOUSTON ST - STE 100 DALLAS, TX 75202 System Make: System Model: Phone Number: (214)752-1167
Lab # R10G009185 Sample Date 07/16/2010 Process Date 07/16/2010 Mile/Hr/Sys 0 miles OH/Add 0 OH/Drained 0 FF Filtr No BY Filtr No	Serving Customers Since 1973	

ANA LABORATORIES, INC.
 130-B HARDING AVE, BELLMAWR, NEW JERSEY 08031-2409
 (800) 648-2625 (856) 931-0011 FAX (856) 931-5205
 SERVING CUSTOMERS SINCE 1973

Lab#: R10G013559 Unit: 500 System: Rail
 Make: Model: Lab Severity: NORMAL

SAMPLE DATA ELEMENTAL ANALYSIS(Parts Per Million By Weight)

LAB#	SAMP DT	PROC	DTE	CR	PB	CU	SN	AL	NI	AG	SI	B	NA	MG	CA	BA	P	ZN	TI	V	K
R10E007828	5/6/2010	5/13/2010	10	0	0	2	0	2	0	0	6	4	12	4026	0	52	2	0	1	1	1
R10F014423	6/10/2010	6/17/2010	5	0	0	1	0	3	0	0	12	10	4	15	5728	0	0	0	0	1	1
R10F015803	6/20/2010	6/29/2010	10	1	0	1	0	6	0	0	17	10	4	19	5906	0	30	0	0	0	1
R10G003583	6/30/2010	7/7/2010	7	0	0	4	0	3	0	0	4	7	4	11	5075	0	0	0	0	0	1
R10G013559	7/20/2010	7/23/2010	24	0	0	1	0	5	0	0	11	7	7	16	4636	0	37	4	0	0	6

OIL QUALITY

LAB#	T/OIL	T/SYS	ADD	CHG	FF	BY	Fuel(%)	Visc@100C	Visc@40C	Water%	Water(ppm)	Soot	Glycol
R10E007828	0M	0M	0Q	NO	NO	NO	NO	15.17	130.6	0	0.01	0.5	N
R10F014423	0M	0M	0Q	NO	NO	NO	NO	15.09	136.4	0	0.01	0.1	N
R10F015803	0M	0M	0Q	NO	NO	NO	NO	15.01	N/A	0	0	0.2	N
R10G003583	0M	0M	0Q	NO	NO	NO	NO	14.97	134.8	0	0.01	0.2	N
R10G013559	0M	0M	0Q	NO	NO	NO	NO	15.22	137.1	0	0.01	0.4	N

ADDITIONAL TESTS PARTICLE COUNT

LAB#	TBN	TAN	OX	NOX	Sulfur	Index	4µ	6µ	14µ	21µ	38µ	70µ	ISO/NAS
R10E007828	7.1	0.9	1.4	2.5	0	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
R10F014423	9.6	0.7	5.1	6.9	0	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
R10F015803	8.8	1.1	0	0	0	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
R10G003583	8.6	0.7	4.8	6	0	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
R10G013559	7.9	1.4	1.1	4.3	0	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

ANALYSIS RECOMMENDATIONS

LAB#	RECOMMENDATION
R10E007828	NO CORRECTIVE ACTION NEEDED!
R10F014423	NO CORRECTIVE ACTION NEEDED!
R10F015803	NO CORRECTIVE ACTION NEEDED!
R10G003583	NO CORRECTIVE ACTION NEEDED!
R10G013559	NO CORRECTIVE ACTION NEEDED!

CUSTOMER INFORMATION

Equipment(History) is for Location: AMTRAKTX
 AMTRAK
 FORT WORTH
 400 SOUTH HOUSTON ST. - STE 100
 DALLAS, TX 75202
 TIM COOPER
 (214)752-1167

ANA LABORATORIES, INC.
TEST REPORT

130-B Harding Ave, Bellmawr, New Jersey 08031-2409
(800) 648-2625 (856) 931-0011 Fax (856) 931-5205

Company: AMTRAK
Unit ID: 500
Location: FORT WORTH
Attention: TIM COOPER
Address: 400 SOUTH HOUSTON ST. -
STE 100
DALLAS, TX 75202
Phone Number: (214)752-1167

User ID: AMTRAKFTX
History is for location: ALL
Lab #: R10J002825

Analyst: RBR
Test Type:

Lab #	Sample Date	Process Date	Mile/Hr/Sys	Mile/Hr/CH	OH/ADD	OH/Drained	FF Ftr	BY Ftr				
R10J002825	08/30/2010	09/07/2010	0 miles	0 miles	0	No	No	No				
R10H014378	08/20/2010	08/26/2010	0 miles	0 miles	0	No	No	No				
R10H008696	08/10/2010	08/16/2010	0 miles	0 miles	0	No	No	No				
R10G013559	07/20/2010	07/23/2010	0 miles	0 miles	0	No	No	No				
R10G003583	06/30/2010	07/07/2010	0 miles	0 miles	0	No	No	No				
Metals (PPM) *	FE	CR	PB	CU	SN	AL	NI	AG	SI	B	NA	TI
R10G003583	7	0	0	4	0	3	0	0	4	7	4	0
R10G013559	24	0	0	1	0	5	0	0	11	7	7	0
R10H008696	10	1	2	1	0	3	1	0	7	7	5	0
R10H014378	9	1	1	1	0	2	1	0	4	5	5	0
R10J002825	4	0	0	1	0	2	0	0	2	4	4	0
OH Quality	K ^a V ^a	MO ^a	MG ^a CA ^a	BA ^a	PA ^a	ZN ^a	TBN ^a	TAN ^a	Visc@100C ^a	Visc@40C ^a		
R10G003583	1	0	87	11	5075	0	0	8.6	0.7	14.97	134.8	
R10G013559	6	0	89	16	4636	0	37	4	7.9	1.4	15.22	137.1
R10H008696	0	2	78	15	4988	1	39	3	8.5	1.8	17.06	136.4
R10H014378	0	1	71	12	4463	2	53	1	8.7	1.2	15.33	139.3
R10J002825	1	0	58	9	4136	0	0	0	9	2.9	15.41	140
Physical Tests	Fuel(%)	Water(%) ^a	Water(ppm) ^a	Soot ^a	Glycol ^a	Viscosity Index						
R10G003583	0	0	0.01	0.2	N	n/a						
R10G013559	0	0	0.01	0.4	N	n/a						
R10H008696	0	0	0.01	0.3	N	n/a						
R10H014378	0	0	0.01	0.6	N	n/a						
R10J002825	0	0	0.01	0.5	N	n/a						
Physical Tests	Ox	NOx	Sulfur	4u	6u	14u	21u	38u	70u	ISO/NAS		
R10G003583	4.8	6	0	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	
R10G013559	1.1	4.3	0	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	
R10H008696	8.8	2.7	0	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	
R10H014378	8.9	2.5	0	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	
R10J002825	8.4	0	0	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	
Recommendation/Corrective Action												
R10G003583	NO CORRECTIVE ACTION NEEDED											
R10G013559	NO CORRECTIVE ACTION NEEDED											
R10H008696	NO CORRECTIVE ACTION NEEDED											
R10H014378	NO CORRECTIVE ACTION NEEDED											
R10J002825	NO CORRECTIVE ACTION NEEDED											

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ANA LABORATORIES, INC.
TEST REPORT

130-B Harding Ave, Bellmawr, New Jersey 08031-2409
(800) 648-2625 (856) 931-0011 Fax (856) 931-5205

TEST REPORT

130-B Harding Ave, Bellmawr, New Jersey 08031-2409
(800) 648-2625 (856) 931-0011 Fax (856) 931-5205

Serving Customers Since 1973

User ID: AMTRAKFTX
History is for location: ALL

Company: AMTRAK
Unit ID: 500

Location: FORT WORTH
Unit Make:
Unit Model:

Address: 400 SOUTH HOUSTON ST. -
System ID: RAH

STE 100
DALLAS, TX 75202
System Make:
System Model:

Analys: RBR
Test Type: RBR

Phone Number: (214)752-1167

Lab #: R10L004236

Lab #	Sample Date	Process Date	Mile/Hr/Sys	Mile/Hr/Oil	Oil/Ad	Oil/Drained	FF Ppt	BY PHT
R10J018135	09/23/2010	09/30/2010	0 miles	0 miles	0	No	No	No
R10K004683	10/05/2010	10/08/2010	0 miles	0 miles	0	No	No	No
R10K010234	10/18/2010	10/18/2010	0 miles	0 miles	0	No	No	No
R10K018231	10/23/2010	10/28/2010	0 miles	0 miles	0	No	No	No
R10L004236	11/01/2010	11/05/2010	0 miles	0 miles	0	No	No	No

Mileals (P/P/M) *	RE	CR	PIB	CU	SN	AL	MI	AG	SI	B	NA	TI
R10J018135	8	0	0	0	3	0	0	0	0	0	0	0
R10K004683	23	0	2	4	0	7	0	0	12	8	7	0
R10K010234	10	0	2	1	0	2	0	0	1	1	4	0
R10K018231	12	0	1	1	0	2	0	0	11	4	4	0
R10L004236	11	0	0	1	0	2	0	0	3	5	5	0

Oil Quality	K*	V*	MQ*	MG*	CA*	BA*	P*	ZN*	TBN*	TAN*	Visc@100C*	Visc@40C*
R10J018135	2	0	74	10	5247	0	0	6.7	1.3	15.41	133.3	133.3
R10K004683	8	0	79	22	5283	0	99	84	9	5.6	15.41	141.5
R10K010234	1	0	68	9	4297	0	33	0	7.9	3.4	15.33	138.7
R10K018231	1	1	79	13	4534	0	124	0	7.9	1.2	15.46	140.4
R10L004236	1	0	64	10	4344	0	29	2	7.5	4.5	15.37	139.1

Physical Tests	Fuel (%)	Water (%) *	Water (ppm) *	Soot *	(Clycol) *	Viscosity Index
R10J018135	0	0	0.01	0.5	N	n/a
R10K004683	0	0	0.01	0.7	N	n/a
R10K010234	0	0	0.01	0.8	N	n/a
R10K018231	0	0	0.01	0.5	N	n/a
R10L004236	0	0	0.01	0.6	N	n/a

Physical Tests	Ox	NON	Sulfur	4u	6u	14u	21u	38u	70u	ISO/NAS
R10J018135	9.9	9.4	0	n/a	n/a	n/a	n/a	n/a	n/a	n/a
R10K004683	13.4	11.6	0	n/a	n/a	n/a	n/a	n/a	n/a	n/a
R10K010234	12	10.5	0	n/a	n/a	n/a	n/a	n/a	n/a	n/a
R10K018231	10.6	9.3	0	n/a	n/a	n/a	n/a	n/a	n/a	n/a
R10L004236	45.6	1.1	0	n/a	n/a	n/a	n/a	n/a	n/a	n/a

Recommmendation/Corrective Action

NO CORRECTIVE ACTION NEEDED!

R10J018135

NO CORRECTIVE ACTION NEEDED!

R10K004683

NO CORRECTIVE ACTION NEEDED!

R10K010234

NO CORRECTIVE ACTION NEEDED!

R10K018231

NO CORRECTIVE ACTION NEEDED!

R10L004236

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R10K010234 | NO CORRECTIVE ACTION NEEDED! Recommendation/Corrective Action

R10K010234	Physical Tests	Ox	NOX	10.5	0	n/a	n/a	6u	14u	21u	38u	70u	ISO/NAS
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R10K010234	Physical Tests	Fuel(%)	Water(%)	Water(ppm)	Soot	Glycol	Viscosity Index
		0	0	0.01	0.8	N	n/a

R10K010234	OH Quality	K	V	MO	MG	CA	BA	P	ZN	TBN	TAN	Visc@100C	Visc@40C
		1	0	68	9	4297	0	33	0	7.9	3.4	15.33	138.7


R10K010234	Metals (PPM)	FE	CR	PB	CU	SN	AL	NI	AG	SI	B	NA	TI
		10	0	2	1	0	2	0	0	1	4	0	0

R10K010234	Sample Date	10/18/2010	Process Date	10/18/2010	Mile/Hr/Sys	0 miles	Mile/Hr/Oh	0 miles	OH/ADD	0	OH/DRAIN	0	FF Filt	0	BY Filt	No
------------	-------------	------------	--------------	------------	-------------	---------	------------	---------	--------	---	----------	---	---------	---	---------	----

ANA LABORATORIES, INC. TEST REPORT 130-B Harding Ave, Ballmann, New Jersey 08031-2409 (800) 648-2625 (856) 931-0011 Fax (856) 931-5205		User ID: AMTRAKTX History is for location: AMTRAKTX Attention: TIM COOPER Location: DALLAS Unit Make: Unit Model: System ID: RAIL	Lab #: R10K010234 Address: 400 SOUTH HOUSTON ST. STE 100 DALLAS, TX 75202	Test Type: Analyst: RBR Phone Number: (214)752-1167 System Make: System Model:
		Company: AMTRAK Unit ID: 500		

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Lab #	Sample Date	Process Date	Mile/Hr/Sys	Mile/Hr/Oil	Oil/Add	Oil/Drained	FF Filt	BY Filt			
R10M008816	12/08/2010	12/13/2010	0 miles	0 miles	0	No	No	No			
R10M018972	12/10/2010	12/29/2010	0 miles	0 miles	0	No	No	No			
R11B000881	01/27/2011	02/01/2011	0 miles	0 miles	0	No	No	No			
R11B019761	02/22/2011	02/25/2011	0 miles	0 miles	0	No	No	No			
R11C004847	03/02/2011	03/07/2011	0 miles	0 miles	0	No	No	No			
Metals (PPM) * FE	CR	PB	CU	SN	AL	NI	AG	SI	B	NA	TI
R10M008816	4	0	1	2	0	0	0	0	1	4	0
R10M018972	3	0	1	0	2	0	0	5	0	6	0
R11B000881	6	0	1	0	3	0	0	3	0	6	0
R11B019761	6	0	0	0	2	0	0	6	0	5	0
R11C004847	7	0	0	1	0	0	0	4	0	4	0
OH Quality	Kc	Vs	MO	MG	CA	BA	ZN	TBN	TAN	Visc@100C	Visc@40C
R10M008816	2	0	84	16	5521	0	42	6	15	3.3	15.22
R10M018972	2	0	79	15	5486	0	0	0	9.8	2.6	15.34
R11B000881	3	0	80	14	6531	0	3	0	8.6	2.8	14.98
R11B019761	2	0	60	6	4616	0	13	0	8.5	3.6	15.06
R11C004847	0	1	73	16	4837	0	0	0	9.3	3.1	15.21
Physical Tests	Fuel (%)	Water (%) *	Water (ppm) *	Soot *	Glycol *	Viscosity Index					
R10M008816	0	0	0.01	0.3	N	n/a					
R10M018972	0	0	0.01	0.3	N	n/a					
R11B000881	0	0	0.01	0.6	N	n/a					
R11B019761	0	0	0.01	0.6	N	n/a					
R11C004847	0	0	0.01	0.2	N	n/a					
Physical Tests	Ox	NOx	Sulfur	4u	6u	14u	21u	38u	70u	ISO/NAS	
R10M008816	2	1.6	0	n/a	n/a	n/a	n/a	n/a	n/a	n/a	
R10M018972	2.2	1.2	0	n/a	n/a	n/a	n/a	n/a	n/a	n/a	
R11B000881	2.6	1.7	0	n/a	n/a	n/a	n/a	n/a	n/a	n/a	
R11B019761	9.2	10.3	0	n/a	n/a	n/a	n/a	n/a	n/a	n/a	
R11C004847	8.7	9.2	0	n/a	n/a	n/a	n/a	n/a	n/a	n/a	
Recommendation/Corrective Action											
R10M008816	NO CORRECTIVE ACTION NEEDED										
R10M018972	NO CORRECTIVE ACTION NEEDED										
R11B000881	NO CORRECTIVE ACTION NEEDED										
R11B019761	NO CORRECTIVE ACTION NEEDED										
R11C004847	NO CORRECTIVE ACTION NEEDED										

	ANALABORATORIES, INC. TEST REPORT 130-B Harding Ave, Bellmawr, New Jersey 08031-2409 (800) 648-2625 (856) 931-0011 Fax (856) 931-5205	Serving Customers Since 1973
	Company: AMTRAK Unit ID: 500 Location: FORT WORTH Attention: TIM COOPER Address: 400 SOUTH HOUSTON ST. - STE 100 DALLAS, TX 75202 System Make: System Model: Phone Number: (214) 752-1167	User ID: AMTRAKFTX History is for location: ALL Lab #: R11C004847

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Lab #	Sample Date	Process Date	Mile/Hr/Sys	Mile/Hr/Oil	Oil/Add	Oil/Drained	FF Filter	BY Filter
R11C004847	03/02/2011	03/07/2011	0 miles	0 miles	0	No	No	No
R11C013115	03/09/2011	03/17/2011	0 miles	0 miles	0	No	No	No
R11D018074	04/15/2011	04/26/2011	0 miles	0 miles	0	No	No	No
R11E001514	04/26/2011	05/03/2011	0 miles	0 miles	0	No	No	No
R11E012255	05/05/2011	05/17/2011	0 miles	0 miles	0	No	No	No
Metals (PPM) * FE CR PB CU SN AL NI AG SI B NA TI								
R11C004847	7	0	0	1	0	0	4	0
R11C013115	9	0	1	0	0	0	4	0
R11D018074	3	0	0	0	0	0	6	0
R11E001514	4	0	0	0	2	0	5	0
R11E012255	4	0	0	2	0	0	3	0
OH Quality								
R11C004847	0	1	73	16	4837	0	0	0
R11C013115	2	0	77	9	4530	0	0	0
R11D018074	2	1	87	17	5725	0	0	0
R11E001514	4	0	104	17	4860	0	0	0
R11E012255	7	0	91	24	4676	0	0	0
Physical Tests								
R11C004847	0	0	0	0	0.01	0.2	N	n/a
R11C013115	0	0	0	0	0.01	0.3	N	n/a
R11D018074	0	0	0	0	0.01	0.3	N	n/a
R11E001514	0	0	0	0	0.01	0.3	N	n/a
R11E012255	0	0	0	0	0.01	0.4	N	n/a
Recommendation/Corrective Action								
R11C004847	NO	NO	NO	NO	NO	NO	NO	NO
R11C013115	NO	NO	NO	NO	NO	NO	NO	NO
R11D018074	NO	NO	NO	NO	NO	NO	NO	NO
R11E001514	NO	NO	NO	NO	NO	NO	NO	NO
R11E012255	NO	NO	NO	NO	NO	NO	NO	NO

ANA LABORATORIES, INC.
 130-B Harding Ave, Bellmawr, New Jersey 08031-2409
 (800) 648-2625 (856) 931-0011 Fax (856) 931-5205

TEST REPORT

Serving Customers Since 1973

User ID: AMTRAKFTX
 History is for location: ALL
 Lab #: R11E012255

Company: AMTRAK
 Location: FORT WORTH
 Attention: TIM COOPER
 Address: 400 SOUTH HOUSTON ST -
 STE 100
 DALLAS, TX 75202

System Make:
 System Model:
 Phone Number: (214)752-1167

ANALYSTS MAINTENANCE LABS, INC.
ISO 17025 ACCREDITED TESTING LAB
 2450 HASSELL RD, HOFFMAN ESTS., IL 60195
 (PH) (800) 222-0071 (FX) (847) 884-8098

AMTRAK - FORT WORTH
 WILLIAM SHAFFER
 1001 JONES STREET
 FORT WORTH TX 76102

Lab Number: 9481
 Logged Date: 25-JAN-10
 Sample Drawn: 25-JAN-10L
 Report Date: 09-FEB-10
 Record Ref.#: 9585352

Unit ID: UNSPECIFIED
 Sample ID: DIESEL FUEL SAMPLE
 Worksite:
 Time On Fluid:

Mfg.: DOES NOT APPLY
 Model:
 PQ No.: B03013648
 Time On System:

Requirements for:
 Amtrak SMP22403 diesel 2 ultralow sulfur

TESTING PERFORMED:

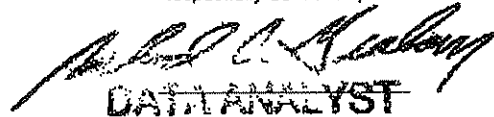
	MEASURED	MIN	MAX
D86 - Distillation, Deg F			
- Initial Boiling Pt. Temp.	352		
- Evaporated - 5% temp	388		
- 10 % temp	404	401	460
- 20 % temp	426		
- 30 % temp	453		
- 40 % temp	477		
- Evaporated - 50 % temp	501	471	540
- 60 % temp	523		
- 70 % temp	546		
- 80 % temp	572		
- Evaporated - 90 % temp	604	560	640
- 95 % temp	629		
- End Point - FBPs temp.	653		
- Recovery - % vol	98.9		
- Residue - % vol	0.9		
- Loss - % vol	0.2		
Viscosity @ 40°C, cSt - D445	2.3	1.9	4.1
API Gravity @ 60 °F - D1298	39.5	32	38
Cetane Index (Calc.) - D976	53.6	40	47
Cloud Point, °F - D2500	3		
Pour Point, °F - D97	-6		
Flash Point PMCC, °F - D93	140	125	
Water & Sediment, %vol. - D1796	<.05		.05
Lubricity by HFRR, D6079			
Wear Scar Diameter, mm	0.370		.450
Wear Scar--Major Axis, mm	0.42		
Wear Scar--Minor Axis, mm	0.32		
Wear Scar Description	N/A		
Analysis (sample) temp, °C	60.0		
Total Sulfur by UVF, D5453, mg/kg	3.9		15

Lab#: 9461 Dated: 26-JAN-10 ...Continued

RECOMMENDATIONS / COMMENTS:

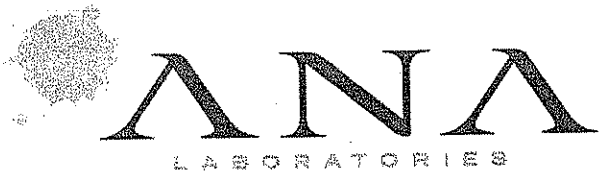
ANALYSIS INDICATES ABNORMAL FUEL CONDITIONS! FOR THE TESTS PERFORMED, THIS SAMPLE DOES NOT MEET AMTRAK SMP 22403 REQUIREMENTS! The API gravity and the calculated cetane index do NOT meet the SMP requirement. This condition should not adversely affect fuel performance. Fuel is SUITABLE for use. AMTRAK should contact Mechanical Desk and fuel supplier. Identify and RESAMPLE original fuelling source.

Respectfully Submitted,



DATA ANALYST

Analysts, Inc.



130-B, HARDING AVE. BELLMAWR, NJ 08031
 P.O. BOX 727 BELLMAWR, NJ 08099-0029
 PHONE: 1-800-648-2625 or 856-931-0011
 FAX: 856-931-5205
 EMAIL: lab@analaboratories.com

Lab Number: S10B13055
 Customer I.D: AMTRAKFTX
 Source: Fort Worth
 Sample Date: N/A
 Product Type: Fuel
 Report Date: 3/4/2010

AMTRAK
 ATTENTION:
 TIM COOPER
 400 SOUTH HOUSTON ST. STE. 100
 DALLAS, TX 75202

TEST DESCRIPTION	ASTM	SPECIFICATION	RESULT	UNITS
1) Api Gravity	D-287	30 minimum	38.4	°
2) Distillation	D-86			
Initial Boiling Point		345 (typical)	356	Degrees Fahrenheit
10 % Recovered Volume		420 (typical)	402	Degrees Fahrenheit
50 % Recovered Volume		500 (typical)	502	Degrees Fahrenheit
90 % Recovered Volume		540 minimum / 640 maximum	612	Degrees Fahrenheit
Final Boiling Point		670 (typical)	660	Degrees Fahrenheit
Total Recovered Vol.	D-86	98.0 minimum	98.0	volume %
3) Cetane Index	D-976	40 minimum	51.7	
4) Water and Sediment	D-1796	0.0500 maximum	<0.0010	volume %
5) Sulfur content	D-5453	15 maximum	6	parts per million
6) Viscosity @ 40 degrees C	D-445	1.9 minimum / 4.1 maximum	2.54	cSt
7) Cloud Point	D-2500	Report	9	Degrees Fahrenheit
8) Flash Point	D-93	126 minimum	159	Degrees Fahrenheit
9) Lubricity by HFRR	D-6079	520 maximum	273	microns

Comment: All test results are within specifications.



130-B, HARDING AVE. BELLMAWR, NJ 08031
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 EMAIL: lab@analaboratories.com

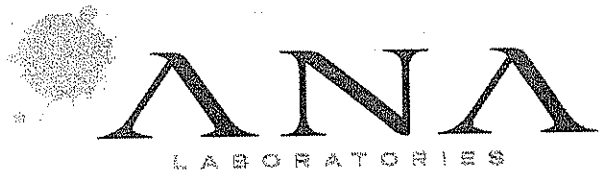
Lab Number: S10D5339
 Customer I.D: AMTRAKFTX
 Source: N/A
 Sample Date: 4/1/2010
 Product Type: Fuel
 Report Date: 4/19/2010

AMTRAK
 ATTENTION:
 TIM COOPER
 400 SOUTH HOUSTON ST. STE. 100
 DALLAS, TX 75202

TEST DESCRIPTION	ASTM	SPECIFICATION	RESULT	UNITS
1) Api Gravity	D-287	30 minimum	38.4	°
2) Distillation	D-86			
Initial Boiling Point		345 (typical)	350	Degrees Fahrenheit
10 % Recovered Volume		420 (typical)	390	Degrees Fahrenheit
50 % Recovered Volume		500 (typical)	502	Degrees Fahrenheit
90 % Recovered Volume		540 minimum / 640 maximum	582	Degrees Fahrenheit
Final Boiling Point		670 (typical)	626	Degrees Fahrenheit
Total Recovered Vol.	D-86	98.0 minimum	98.9	volume %
3) Cetane Index	D-976	40 minimum	50.8	
4) Water and Sediment	D-1796	0.0500 maximum	<0.0010	volume %
5) Sulfur content	D-5453	15 maximum	8	parts per million
6) Viscosity @ 40 degrees C	D-445	1.9 minimum / 4.1 maximum	2.39	cSt
7) Cloud Point	D-2500	Report	12	Degrees Fahrenheit
8) Flash Point	D-93	126 minimum	150	Degrees Fahrenheit
9) Lubricity by HFRR	D-6079	520 maximum	257	microns

Comment: All test results are within specifications.

For ANA LABORATORIES, INC.



130-B, HARDING AVE. BELLMAWR, NJ 08031
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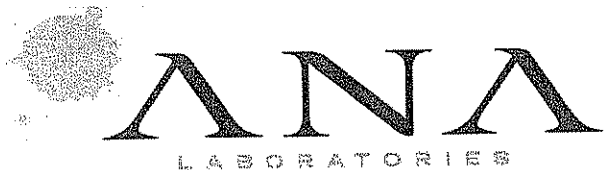
Lab Number: S10D5340
 Customer I.D: AMTRAKFTX
 Source: 500
 Sample Date: 4/2/2010
 Product Type: Fuel
 Report Date: 4/19/2010

AMTRAK
 ATTENTION:
 TIM COOPER
 400 SOUTH HOUSTON ST. STE. 100
 DALLAS, TX 75202

TEST DESCRIPTION	ASTM	SPECIFICATION	RESULT	UNITS
1) Api Gravity	D-287	30 minimum	32.2	°
2) Distillation	D-86			
Initial Boiling Point		345 (typical)	380	Degrees Fahrenheit
10 % Recovered Volume		420 (typical)	430	Degrees Fahrenheit
50 % Recovered Volume		500 (typical)	560	Degrees Fahrenheit
90 % Recovered Volume		540 minimum / 640 maximum	640	Degrees Fahrenheit
Final Boiling Point		670 (typical)	676	Degrees Fahrenheit
Total Recovered Vol.	D-86	98.0 minimum	98.8	volume %
3) Cetane Index	D-976	40 minimum	45.2	
4) Water and Sediment	D-1796	0.0500 maximum	<0.0010	volume %
5) Sulfur content	D-5453	15 maximum	9	parts per million
6) Viscosity @ 40 degrees C	D-445	1.9 minimum / 4.1 maximum	3.10	cSt
7) Cloud Point	D-2500	Report	6	Degrees Fahrenheit
8) Flash Point	D-93	126 minimum	152	Degrees Fahrenheit
9) Lubricity by HFRR	D-6079	520 maximum	189	microns

Comment: All test results are within specifications.

For ANA LABORATORIES, INC.



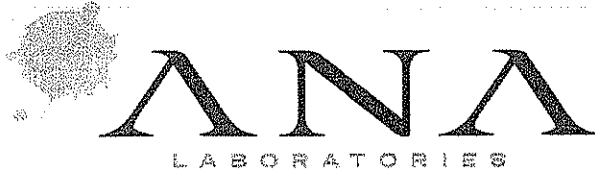
130-B, HARDING AVE. BELLMAWR, NJ 08031
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 PHONE: 1-800-648-2625 or 856-931-0011
 FAX: 856-931-5205
 EMAIL: lab@analaboratories.com

Lab Number: S10D18980
 Customer I.D: AMTRAKFTX
 Source: 500
 Sample Date: 4/17/2010
 Product Type: Fuel
 Report Date: 5/10/2010

AMTRAK
 ATTENTION:
 TIM COOPER
 400 SOUTH HOUSTON ST. STE. 100
 DALLAS, TX 75202

TEST DESCRIPTION	ASTM	SPECIFICATION	RESULT	UNITS
1) Api Gravity	D-287	30 minimum	38.5	°
2) Distillation	D-86			
Initial Boiling Point		345 (typical)	356	Degrees Fahrenheit
10 % Recovered Volume		420 (typical)	388	Degrees Fahrenheit
50 % Recovered Volume		500 (typical)	486	Degrees Fahrenheit
90 % Recovered Volume		540 minimum / 640 maximum	582	Degrees Fahrenheit
Final Boiling Point		670 (typical)	614	Degrees Fahrenheit
Total Recovered Vol.	D-86	98.0 minimum	98.0	volume %
3) Cetane Index	D-976	40 minimum	49.3	
4) Water and Sediment	D-1796	0.0500 maximum	<0.0010	volume %
5) Sulfur content	D-5453	15 maximum	8	parts per million
6) Viscosity @ 40 degrees C	D-445	1.9 minimum / 4.1 maximum	2.32	cSt
7) Cloud Point	D-2500	Report	2	Degrees Fahrenheit
8) Flash Point	D-93	126 minimum	145	Degrees Fahrenheit
9) Lubricity by HFRR	D-6079	520 maximum	296	microns

Comment: All test results are within specifications.



130-B, HARDING AVE. BELLMAWR, NJ 08031
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 EMAIL: lab@analaboratories.com

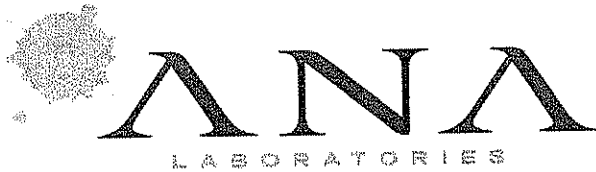
Lab Number: S10E4431
 Customer ID: AMTRAKFTX
 Source: TRUCK
 Sample Date: 4/30/2010
 Product Type: Fuel
 Report Date: 5/17/2010

AMTRAK
 ATTENTION:
 TIM COOPER
 400 SOUTH HOUSTON ST. STE. 100
 DALLAS, TX 75202

TEST DESCRIPTION	ASTM	SPECIFICATION	RESULT	UNITS
1) Api Gravity	D-287	30 minimum	32.7	°
2) Distillation	D-86			
Initial Boiling Point		345 (typical)	392	Degrees Fahrenheit
10 % Recovered Volume		420 (typical)	440	Degrees Fahrenheit
50 % Recovered Volume		500 (typical)	540	Degrees Fahrenheit
90 % Recovered Volume		540 minimum / 640 maximum	638	Degrees Fahrenheit
Final Boiling Point		670 (typical)	662	Degrees Fahrenheit
Total Recovered Vol.	D-86	98.0 minimum	98.0	volume %
3) Cetane Index	D-976	40 minimum	45.7	
4) Water and Sediment	D-1796	0.0500 maximum	<0.0010	volume %
5) Sulfur content	D-5453	15 maximum	7	parts per million
6) Viscosity @ 40 degrees C	D-445	1.9 minimum / 4.1 maximum	3.32	cSt
7) Cloud Point	D-2500	Report	24	Degrees Fahrenheit
8) Flash Point	D-93	126 minimum	161	Degrees Fahrenheit
9) Lubricity by HFRR	D-6079	520 maximum	214	microns

Comment: All test results are within specifications.

For ANA LABORATORIES, INC.



130-B, HARDING AVE. BELLMAWR, NJ 08031
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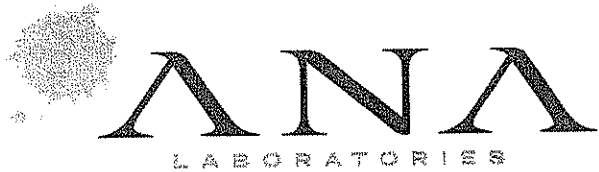
Lab Number: S10E11991
 Customer I.D: AMTRAKFTX
 Source: TRUCK
 Sample Date: 5/14/2010
 Product Type: Fuel
 Report Date: 5/27/2010

AMTRAK
 ATTENTION:
 TIM COOPER
 400 SOUTH HOUSTON ST. STE. 100
 DALLAS, TX 75202

TEST DESCRIPTION	ASTM	SPECIFICATION	RESULT	UNITS
1) Api Gravity	D-287	30 minimum	38.2	°
2) Distillation	D-86			
Initial Boiling Point		345 (typical)	348	Degrees Fahrenheit
10 % Recovered Volume		420 (typical)	388	Degrees Fahrenheit
50 % Recovered Volume		500 (typical)	499	Degrees Fahrenheit
90 % Recovered Volume		540 minimum / 640 maximum	590	Degrees Fahrenheit
Final Boiling Point		670 (typical)	630	Degrees Fahrenheit
Total Recovered Vol.	D-86	98.0 minimum	98.8	volume %
3) Cetane Index	D-976	40 minimum	50.2	
4) Water and Sediment	D-1796	0.0500 maximum	<0.0010	volume %
5) Sulfur content	D-5453	15 maximum	8	parts per million
6) Viscosity @ 40 degrees C	D-445	1.9 minimum / 4.1 maximum	2.46	cSt
7) Cloud Point	D-2500	Report	8	Degrees Fahrenheit
8) Flash Point	D-93	126 minimum	149	Degrees Fahrenheit
9) Lubricity by HFRR	D-6079	520 maximum	296	microns

Comment: All test results are within specifications.

For ANA LABORATORIES, INC.



130-B, HARDING AVE. BELLMAWR, NJ 08031
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 EMAIL: lab@analaboratories.com

Lab Number: S10F15805
 Customer I.D: AMTRAKFTX
 Source: TRUCK
 Sample Date: N/A
 Product Type: Fuel
 Report Date: 7/6/2010

AMTRAK
 ATTENTION:
 TIM COOPER
 400 SOUTH HOUSTON ST. STE. 100
 DALLAS, TX 75202

TEST DESCRIPTION	ASTM	SPECIFICATION	RESULT	UNITS
1) Api Gravity	D-287	30 minimum	32.7	°
2) Distillation	D-86			
Initial Boiling Point		345 (typical)	344	Degrees Fahrenheit
10 % Recovered Volume		420 (typical)	401	Degrees Fahrenheit
50 % Recovered Volume		500 (typical)	498	Degrees Fahrenheit
90 % Recovered Volume		540 minimum / 640 maximum	614	Degrees Fahrenheit
Final Boiling Point		670 (typical)	658	Degrees Fahrenheit
Total Recovered Vol.	D-86	98.0 minimum	98.0	volume %
3) Cetane Index	D-976	40 minimum	40.8	
4) Water and Sediment	D-1796	0.0500 maximum	<0.0010	volume %
5) Sulfur content	D-5453	15 maximum	9	parts per million
6) Viscosity @ 40 degrees C	D-445	1.9 minimum / 4.1 maximum	2.56	cSt
7) Cloud Point	D-2500	Report	4	Degrees Fahrenheit
8) Flash Point	D-93	126 minimum	150	Degrees Fahrenheit
9) Lubricity by HFRR	D-6079	520 maximum	281	microns

Comment: All test results are within specifications.

For ANA LABORATORIES, INC.



130-B, HARDING AVE. BELLMAWR, NJ 08031
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 EMAIL: lab@analaboratories.com

Lab Number: S10G743
 Customer I.D: AMTRAKFTX
 Source: N/A
 Sample Date: N/A
 Product Type: Fuel
 Report Date: 7/6/2010

AMTRAK
 ATTENTION:
 TIM COOPER
 400 SOUTH HOUSTON ST. STE. 100
 DALLAS, TX 75202

TEST DESCRIPTION	ASTM	SPECIFICATION	RESULT	UNITS
1) Api Gravity	D-287	30 minimum	37.8	°
2) Distillation	D-86			
Initial Boiling Point		345 (typical)	356	Degrees Fahrenheit
10 % Recovered Volume		420 (typical)	390	Degrees Fahrenheit
50 % Recovered Volume		500 (typical)	490	Degrees Fahrenheit
90 % Recovered Volume		540 minimum / 640 maximum	590	Degrees Fahrenheit
Final Boiling Point		670 (typical)	642	Degrees Fahrenheit
Total Recovered Vol.	D-86	98.0 minimum	98.0	volume %
3) Cetane Index	D-976	40 minimum	48.3	
4) Water and Sediment	D-1796	0.0500 maximum	<0.0010	volume %
5) Sulfur content	D-5453	15 maximum	11	parts per million
6) Viscosity @ 40 degrees C	D-445	1.9 minimum / 4.1 maximum	2.43	cSt
7) Cloud Point	D-2500	Report	5	Degrees Fahrenheit
8) Flash Point	D-93	126 minimum	145	Degrees Fahrenheit
9) Lubricity by HFRR	D-6079	520 maximum	258	microns

Comment: All test results are within specifications.



130-B, HARDING AVE. BELLMAWR, NJ 08031
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 EMAIL: lab@analaboratories.com

Lab Number: S10G13561
 Customer I.D: AMTRAKFTX
 Source: 7
 Sample Date: 7/20/2010
 Product Type: ULSD
 Report Date: 8/9/2010

AMTRAK
 ATTENTION:
 TIM COOPER
 400 SOUTH HOUSTON ST. STE. 100
 DALLAS, TX 75202

TEST DESCRIPTION	ASTM	SPECIFICATION	RESULT	UNITS
1) Api Gravity	D-287	30 minimum	39.2	°
2) Distillation	D-86			
Initial Boiling Point		345 (typical)	354	Degrees Fahrenheit
10 % Recovered Volume		420 (typical)	380	Degrees Fahrenheit
50 % Recovered Volume		500 (typical)	486	Degrees Fahrenheit
90 % Recovered Volume		540 minimum / 640 maximum	590	Degrees Fahrenheit
Final Boiling Point		670 (typical)	628	Degrees Fahrenheit
Total Recovered Vol.	D-86	98.0 minimum	98.0	volume %
3) Cetane Index	D-976	40 minimum	50.6	
4) Water and Sediment	D-1796	0.0500 maximum	<0.0010	volume %
5) Sulfur content	D-5453	15 maximum	18	parts per million
6) Viscosity @ 40 degrees C	D-445	1.9 minimum / 4.1 maximum	2.11	cSt
7) Cloud Point	D-2500	Report	4	Degrees Fahrenheit
8) Flash Point	D-93	126 minimum	152	Degrees Fahrenheit
9) Lubricity by HFRR	D-6079	520 maximum	269	microns

Comment: All test results are within specifications.

For ANA LABORATORIES, INC.



130-B, HARDING AVE. BELLMAWR, NJ 08031
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 FAX: 856-931-5205
 EMAIL: lab@analaboratories.com

Lab Number: S10H2976
 Customer I.D: AMTRAKFTX
 Source: N/A
 Sample Date: 8/2/2010
 Product Type: ULSD
 Report Date: 8/18/2010

AMTRAK
 ATTENTION:
 TIM COOPER
 400 SOUTH HOUSTON ST. STE. 100
 DALLAS, TX 75202

TEST DESCRIPTION	ASTM	SPECIFICATION	RESULT	UNITS
1) Api Gravity	D-287	30 minimum	37.1	°
2) Distillation	D-86			
Initial Boiling Point		345 (typical)	340	Degrees Fahrenheit
10 % Recovered Volume		420 (typical)	380	Degrees Fahrenheit
50 % Recovered Volume		500 (typical)	490	Degrees Fahrenheit
90 % Recovered Volume		540 minimum / 640 maximum	596	Degrees Fahrenheit
Final Boiling Point		670 (typical)	642	Degrees Fahrenheit
Total Recovered Vol.	D-86	98.0 minimum	98.5	volume %
3) Cetane Index	D-976	40 minimum	46.8	
4) Water and Sediment	D-1796	0.0500 maximum	<0.0010	volume %
5) Sulfur content	D-5453	15 maximum	8	parts per million
6) Viscosity @ 40 degrees C	D-445	1.9 minimum / 4.1 maximum	2.38	cSt
7) Cloud Point	D-2500	Report	2	Degrees Fahrenheit
8) Flash Point	D-93	126 minimum	149	Degrees Fahrenheit
9) Lubricity by HFRR	D-6079	520 maximum	404	microns

Comment: All test results are within specifications.

For ANA LABORATORIES, INC.



ANA

LABORATORIES

130-B, HARDING AVE. BELLMAWR, NJ 08031
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EMAIL: lab@analaboratories.com

Lab Number: S10H12023
Customer I.D: AMTRAKFTX
Source: N/A
Sample Date: 8/17/2010
Product Type: ULSD
Report Date: 9/7/2010

AMTRAK
ATTENTION:
TIM COOPER
400 SOUTH HOUSTON ST. STE. 100
DALLAS, TX 75202

TEST DESCRIPTION	ASTM	SPECIFICATION	RESULT	UNITS
1) Api Gravity	D-287	30 minimum	37.1	°
2) Distillation	D-86			
Initial Boiling Point		345 (typical)	336	Degrees Fahrenheit
10 % Recovered Volume		420 (typical)	370	Degrees Fahrenheit
50 % Recovered Volume		500 (typical)	484	Degrees Fahrenheit
90 % Recovered Volume		540 minimum / 640 maximum	600	Degrees Fahrenheit
Final Boiling Point		670 (typical)	640	Degrees Fahrenheit
Total Recovered Vol.	D-86	98.0 minimum	98.0	volume %
3) Cetane Index	D-976	40 minimum	46.0	
4) Water and Sediment	D-1796	0.0500 maximum	<0.0010	volume %
5) Sulfur content	D-5453	15 maximum	8	parts per million
6) Viscosity @ 40 degrees C	D-445	1.9 minimum / 4.1 maximum	2.38	cSt
7) Cloud Point	D-2500	Report	5	Degrees Fahrenheit
8) Flash Point	D-93	126 minimum	150	Degrees Fahrenheit
9) Lubricity by HFRR	D-6079	520 maximum	389	microns

Comment: All test results are within specifications.

For ANA LABORATORIES, INC.



130-B, HARDING AVE. BELLMAWR, NJ 08031
 P.O. BOX 727 BELLMAWR, NJ 08099-0029
 PHONE: 1-800-648-2625 or 856-931-0011
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 EMAIL: lab@analaboratories.com

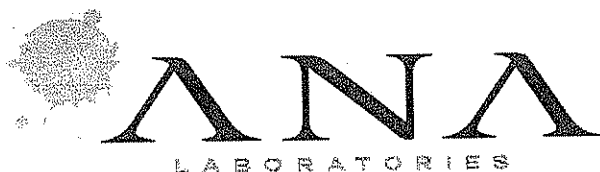
Lab Number: S10J15342
 Customer I.D: AMTRAKFTX
 Source: N/A
 Sample Date: N/A
 Product Type: ULSD
 Report Date: 10/19/2010

AMTRAK
 ATTENTION:
 TIM COOPER
 400 SOUTH HOUSTON ST. STE. 100
 DALLAS, TX 75202

TEST DESCRIPTION	ASTM	SPECIFICATION	RESULT	UNITS
1) Api Gravity	D-287	30 minimum	38.2	°
2) Distillation	D-86			
Initial Boiling Point		345 (typical)	356	Degrees Fahrenheit
10 % Recovered Volume		420 (typical)	390	Degrees Fahrenheit
50 % Recovered Volume		500 (typical)	498	Degrees Fahrenheit
90 % Recovered Volume		540 minimum / 640 maximum	590	Degrees Fahrenheit
Final Boiling Point		670 (typical)	644	Degrees Fahrenheit
Total Recovered Vol.	D-86	98.0 minimum	98.0	volume %
3) Cetane Index	D-976	40 minimum	50.1	
4) Water and Sediment	D-1796	0.0500 maximum	<0.0010	volume %
5) Sulfur content	D-5453	15 maximum	6	parts per million
6) Viscosity @ 40 degrees C	D-445	1.9 minimum / 4.1 maximum	2.43	cSt
7) Cloud Point	D-2500	Report	5	Degrees Fahrenheit
8) Flash Point	D-93	126 minimum	149	Degrees Fahrenheit
9) Lubricity by HFRR	D-6079	520 maximum	367	microns

Comment: All test results are within specifications.

For ANA LABORATORIES, INC.



130-B, HARDING AVE. BELLMAWR, NJ 08031
 P.O. BOX 727 BELLMAWR, NJ 08099-0029
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 EMAIL: lab@analaboratories.com

Lab Number: S10K16187
 Customer I.D: AMTRAKFTX
 Source: 500
 Sample Date: 10/20/2010
 Product Type: ULSD
 Report Date: 11/6/2010

AMTRAK
 ATTENTION:
 TIM COOPER
 400 SOUTH HOUSTON ST. STE. 100
 DALLAS, TX 75202

TEST DESCRIPTION	ASTM	SPECIFICATION	RESULT	UNITS
1) Api Gravity	D-287	30 minimum	38.3	°
2) Distillation	D-86			
Initial Boiling Point		345 (typical)	340	Degrees Fahrenheit
10 % Recovered Volume		420 (typical)	382	Degrees Fahrenheit
50 % Recovered Volume		500 (typical)	500	Degrees Fahrenheit
90 % Recovered Volume		540 minimum / 640 maximum	590	Degrees Fahrenheit
Final Boiling Point		670 (typical)	630	Degrees Fahrenheit
Total Recovered Vol.	D-86	98.0 minimum	98.3	volume %
3) Cetane Index	D-976	40 minimum	50.1	
4) Water and Sediment	D-1796	0.0500 maximum	<0.0010	volume %
5) Sulfur content	D-5453	15 maximum	8	parts per million
6) Viscosity @ 40 degrees C	D-445	1.9 minimum / 4.1 maximum	2.44	cSt
7) Cloud Point	D-2500	Report	7	Degrees Fahrenheit
8) Flash Point	D-93	126 minimum	162	Degrees Fahrenheit
9) Lubricity by HFRR	D-6079	520 maximum	243	microns

Comment: All test results are within specifications.

For ANA LABORATORIES, INC.



ANA

LABORATORIES

130-B, HARDING AVE. BELLMAWR, NJ 08031
 P.O. BOX 727 BELLMAWR, NJ 08099-0029
 PHONE: 1-800-648-2625 or 856-931-0011
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 EMAIL: lab@analaboratories.com

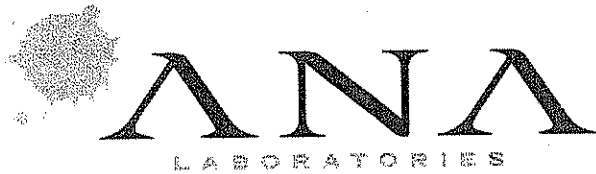
Lab Number: S10K18233
 Customer I.D: AMTRAKFTX
 Source: 500
 Sample Date: 10/28/2010
 Product Type: ULSD
 Report Date: 11/6/2010

AMTRAK
 ATTENTION:
 TIM COOPER
 400 SOUTH HOUSTON ST. STE. 100
 DALLAS, TX 75202

TEST DESCRIPTION	ASTM	SPECIFICATION	RESULT	UNITS
1) Api Gravity	D-287	30 minimum	37.5	°
2) Distillation	D-86			
Initial Boiling Point		345 (typical)	342	Degrees Fahrenheit
10 % Recovered Volume		420 (typical)	390	Degrees Fahrenheit
50 % Recovered Volume		500 (typical)	508	Degrees Fahrenheit
90 % Recovered Volume		540 minimum / 640 maximum	596	Degrees Fahrenheit
Final Boiling Point		670 (typical)	630	Degrees Fahrenheit
Total Recovered Vol.	D-86	98.0 minimum	98.5	volume %
3) Cetane Index	D-976	40 minimum	49.7	
4) Water and Sediment	D-1796	0.0500 maximum	<0.0010	volume %
5) Sulfur content	D-5453	15 maximum	9	parts per million
6) Viscosity @ 40 degrees C	D-445	1.9 minimum / 4.1 maximum	2.48	cSt
7) Cloud Point	D-2500	Report	7	Degrees Fahrenheit
8) Flash Point	D-93	126 minimum	156	Degrees Fahrenheit
9) Lubricity by HFRR	D-6079	520 maximum	262	microns

Comment: All test results are within specifications.

For ANA LABORATORIES, INC.



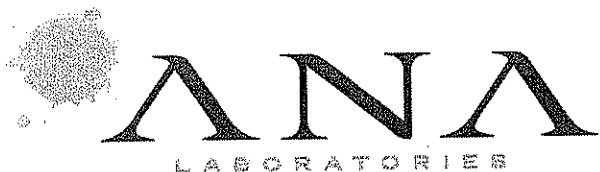
130-B, HARDING AVE. BELLMAWR, NJ 08031
 P.O. BOX 727 BELLMAWR, NJ 08099-0029
 PHONE: 1-800-648-2625 or 856-931-0011
 FAX: 856-931-5205
 EMAIL: lab@analaboratories.com

Lab Number: S10M2581
 Customer I.D: AMTRAKFTX
 Source: 500
 Sample Date: 11/29/2010
 Product Type: ULSD
 Report Date: 12/14/2010

AMTRAK
 ATTENTION:
 TIM COOPER
 400 SOUTH HOUSTON ST. STE. 100
 DALLAS, TX 75202

TEST DESCRIPTION	ASTM	SPECIFICATION	RESULT	UNITS
1) Api Gravity	D-287	30 minimum	36.6	°
2) Distillation	D-86			
Initial Boiling Point		345 (typical)	340	Degrees Fahrenheit
10 % Recovered Volume		420 (typical)	384	Degrees Fahrenheit
50 % Recovered Volume		500 (typical)	500	Degrees Fahrenheit
90 % Recovered Volume		540 minimum / 640 maximum	618	Degrees Fahrenheit
Final Boiling Point		670 (typical)	656	Degrees Fahrenheit
Total Recovered Vol.	D-86	98.0 minimum	98.0	volume %
3) Cetane Index	D-976	40 minimum	47.3	
4) Water and Sediment	D-1796	0.0500 maximum	<0.0010	volume %
5) Sulfur content	D-5453	15 maximum	9	parts per million
6) Viscosity @ 40 degrees C	D-445	1.9 minimum / 4.1 maximum	2.52	cSt
7) Cloud Point	D-2500	Report	7	Degrees Fahrenheit
8) Flash Point	D-93	126 minimum	149	Degrees Fahrenheit
9) Ash Content	D-482	0.01 maximum	0.005	weight %
10) Carbon Residue 10% bot.	D-524	0.35 maximum	0.098	weight %
11) Lubricity by HFRR	D-6079	520 maximum	419	microns

Comment: All test results are within specifications.



130-B, HARDING AVE. BELLMAWR, NJ 08031
 P.O. BOX 727 BELLMAWR, NJ 08099-0029
 PHONE: 1-800-648-2625 or 856-931-0011
 FAX: 856-931-5205
 EMAIL: lab@analaboratories.com

Lab Number: S10M16495
 Customer I.D: AMTRAKFTX
 Source: 500
 Sample Date: 12/20/2010
 Product Type: ULSD
 Report Date: 1/6/2011

AMTRAK
 ATTENTION:
 TIM COOPER
 400 SOUTH HOUSTON ST. STE. 100
 DALLAS, TX 75202

TEST DESCRIPTION	ASTM	SPECIFICATION	RESULT	UNITS
1) Api Gravity	D-287	30 minimum	37.2	°
2) Distillation	D-86			
Initial Boiling Point		345 (typical)	356	Degrees Fahrenheit
10 % Recovered Volume		420 (typical)	396	Degrees Fahrenheit
50 % Recovered Volume		500 (typical)	498	Degrees Fahrenheit
90 % Recovered Volume		540 minimum / 640 maximum	598	Degrees Fahrenheit
Final Boiling Point		670 (typical)	628	Degrees Fahrenheit
Total Recovered Vol.	D-86	98.0 minimum	98.0	volume %
3) Cetane Index	D-976	40 minimum	46.0	
4) Water and Sediment	D-1796	0.0500 maximum	<0.0010	volume %
5) Sulfur content	D-5453	15 maximum	8	parts per million
6) Viscosity @ 40 degrees C	D-445	1.9 minimum / 4.1 maximum	2.31	cSt
7) Cloud Point	D-2500	Report	5	Degrees Fahrenheit
8) Flash Point	D-93	126 minimum	145	Degrees Fahrenheit
9) Ash Content	D-482	0.01 maximum	0.005	weight %
10) Carbon Residue 10% bot.	D-524	0.35 maximum	0.076	weight %
11) Lubricity by HFRR	D-6079	520 maximum	410	microns

Comment: All test results are within specifications.



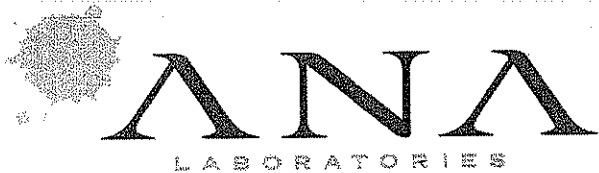
130-B, HARDING AVE. BELLMAWR, NJ 08031
 P.O. BOX 727 BELLMAWR, NJ 08099-0029
 PHONE: 1-800-648-2625 or 856-931-0011
 FAX: 856-931-5205
 EMAIL: lab@analaboratories.com

Lab Number: S11B879
 Customer I.D: AMTRAKFTX
 Source: 500
 Sample Date: 1/27/2011
 Product Type: ULSD
 Report Date: 2/25/2011

AMTRAK
 ATTENTION:
 TIM COOPER
 400 SOUTH HOUSTON ST. STE. 100
 DALLAS, TX 75202

TEST DESCRIPTION	ASTM	SPECIFICATION	RESULT	UNITS
1) Api Gravity	D-287	30 minimum	36.8	°
2) Distillation	D-86			
Initial Boiling Point		345 (typical)	368	Degrees Fahrenheit
10 % Recovered Volume		420 (typical)	408	Degrees Fahrenheit
50 % Recovered Volume		500 (typical)	508	Degrees Fahrenheit
90 % Recovered Volume		540 minimum / 640 maximum	600	Degrees Fahrenheit
Final Boiling Point		670 (typical)	638	Degrees Fahrenheit
Total Recovered Vol.	D-86	98.0 minimum	98.0	volume %
3) Cetane Index	D-976	40 minimum	49.2	
4) Water and Sediment	D-1796	0.0500 maximum	<0.0010	volume %
5) Sulfur content	D-5453	15 maximum	10	parts per million
6) Viscosity @ 40 degrees C	D-445	1.9 minimum / 4.1 maximum	2.54	cSt
7) Cloud Point	D-2500	Report	7	Degrees Fahrenheit
8) Flash Point	D-93	126 minimum	149	Degrees Fahrenheit
9) Ash Content	D-482	0.01 maximum	0.005	weight %
10) Carbon Residue 10% bot.	D-524	0.35 maximum	0.078	weight %
11) Lubricity by HFRR	D-6079	520 maximum	316	microns

Comment: All test results are within specifications.



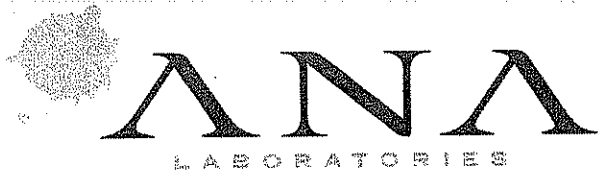
130-B, HARDING AVE. BELLMAWR, NJ 08031
P.O. BOX 727 BELLMAWR, NJ 08099-0029
PHONE: 1-800-648-2625 or 856-931-0011
FAX: 856-931-5205
EMAIL: lab@analaboratories.com

Lab Number: S11C4846
Customer I.D: AMTRAKFTX
Source: 500
Sample Date: 3/2/2011
Product Type: ULSD
Report Date: 3/22/2011

AMTRAK
ATTENTION:
TIM COOPER
400 SOUTH HOUSTON ST. STE. 100
DALLAS, TX 75202

TEST DESCRIPTION	ASTM	SPECIFICATION	RESULT	UNITS
1) Api Gravity	D-287	30 minimum	35.8	°
2) Distillation	D-86			
Initial Boiling Point		345 (typical)	370	Degrees Fahrenheit
10 % Recovered Volume		420 (typical)	410	Degrees Fahrenheit
50 % Recovered Volume		500 (typical)	504	Degrees Fahrenheit
90 % Recovered Volume		540 minimum / 640 maximum	600	Degrees Fahrenheit
Final Boiling Point		670 (typical)	618	Degrees Fahrenheit
Total Recovered Vol.	D-86	98.0 minimum	99.0	volume %
3) Cetane Index	D-976	40 minimum	46.9	
4) Water and Sediment	D-1796	0.0500 maximum	<0.0010	volume %
5) Sulfur content	D-5453	15 maximum	10	parts per million
6) Viscosity @ 40 degrees C	D-445	1.9 minimum / 4.1 maximum	2.45	cSt
7) Cloud Point	D-2500	Report	9	Degrees Fahrenheit
8) Flash Point	D-93	126 minimum	154	Degrees Fahrenheit
9) Ash Content	D-482	0.01 maximum	0.005	weight %
10) Carbon Residue 10% bot.	D-524	0.35 maximum	0.065	weight %
11) Lubricity by HFRR	D-6079	520 maximum	294	microns

Comment: All test results are within specifications.



130-B, HARDING AVE. BELLMAWR, NJ 08031
 P.O. BOX 727 BELLMAWR, NJ 08099-0029
 PHONE: 1-800-648-2625 or 856-931-0011
 FAX: 856-931-5205
 EMAIL: lab@analaboratories.com

Lab Number: S11D6749
 Customer I.D: AMTRAKFTX
 Source: 500
 Sample Date: 3/22/2011
 Product Type: ULSD
 Report Date: 4/19/2011

AMTRAK
 ATTENTION:
 TIM COOPER
 400 SOUTH HOUSTON ST. STE. 100
 DALLAS, TX 75202

TEST DESCRIPTION	ASTM	SPECIFICATION	RESULT	UNITS
1) Api Gravity	D-287	30 minimum	37.6	°
2) Distillation	D-86			
Initial Boiling Point		345 (typical)	356	Degrees Fahrenheit
10 % Recovered Volume		420 (typical)	392	Degrees Fahrenheit
50 % Recovered Volume		500 (typical)	508	Degrees Fahrenheit
90 % Recovered Volume		540 minimum / 640 maximum	598	Degrees Fahrenheit
Final Boiling Point		670 (typical)	634	Degrees Fahrenheit
Total Recovered Vol.	D-86	98.0 minimum	99.0	volume %
3) Cetane Index	D-976	40 minimum	50.1	
4) Water and Sediment	D-1796	0.0500 maximum	<0.0010	volume %
5) Sulfur content	D-5453	15 maximum	9	parts per million
6) Viscosity @ 40 degrees C	D-445	1.9 minimum / 4.1 maximum	2.66	cSt
7) Cloud Point	D-2500	Report	10	Degrees Fahrenheit
8) Flash Point	D-93	126 minimum	149	Degrees Fahrenheit
9) Ash Content	D-482	0.01 maximum	0.005	weight %
10) Carbon Residue 10% bot.	D-524	0.35 maximum	0.059	weight %
11) Lubricity by HFRR	D-6079	520 maximum	266	microns

Comment: All test results are within specifications.



ANA

LABORATORIES

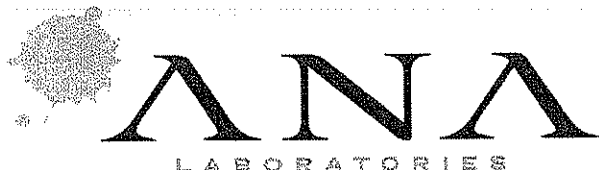
130-B, HARDING AVE. BELLMAWR, NJ 08031
P.O. BOX 727 BELLMAWR, NJ 08099-0029
PHONE: 1-800-648-2625 or 856-931-0011
FAX: 856-931-5205
EMAIL: lab@analaboratories.com

Lab Number: S11E1512
Customer I.D: AMTRAKFTX
Source: 500
Sample Date: 4/26/2011
Product Type: ULSD
Report Date: 5/18/2011

AMTRAK
ATTENTION:
TIM COOPER
400 SOUTH HOUSTON ST. STE. 100
DALLAS, TX 75202

TEST DESCRIPTION	ASTM	SPECIFICATION	RESULT	UNITS
1) Api Gravity	D-287	30 minimum	37.0	°
2) Distillation	D-86			
Initial Boiling Point		345 (typical)	350	Degrees Fahrenheit
10 % Recovered Volume		420 (typical)	396	Degrees Fahrenheit
50 % Recovered Volume		500 (typical)	508	Degrees Fahrenheit
90 % Recovered Volume		540 minimum / 640 maximum	600	Degrees Fahrenheit
Final Boiling Point		670 (typical)	638	Degrees Fahrenheit
Total Recovered Vol.	D-86	98.0 minimum	99.0	volume %
3) Cetane Index	D-976	40 minimum	49.0	
4) Water and Sediment	D-1796	0.0500 maximum	<0.0010	volume %
5) Sulfur content	D-5453	15 maximum	5	parts per million
6) Viscosity @ 40 degrees C	D-445	1.9 minimum / 4.1 maximum	2.70	cSt
7) Cloud Point	D-2500	Report	9	Degrees Fahrenheit
8) Flash Point	D-93	126 minimum	156	Degrees Fahrenheit
9) Ash Content	D-482	0.01 maximum	0.005	weight %
10) Carbon Residue 10% bot.	D-524	0.35 maximum	0.067	weight %
11) Lubricity by HFRR	D-6079	520 maximum	555	microns

Comment: Result in yellow it out of specification.



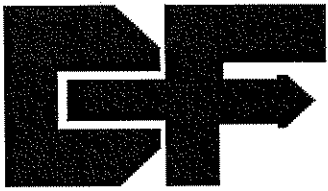
130-B, HARDING AVE. BELLMAWR, NJ 08031
 P.O. BOX 727 BELLMAWR, NJ 08099-0029
 PHONE: 1-800-648-2625 or 856-931-0011
 FAX: 856-931-5205
 EMAIL: lab@analaboratories.com

Lab Number: S11F6558
 Customer I.D: AMTRAKFTX
 Source: 500
 Sample Date: N/A
 Product Type: ULSD
 Report Date: 6/27/2011

AMTRAK
 ATTENTION:
 TIM COOPER
 400 SOUTH HOUSTON ST. STE. 100
 DALLAS, TX 75202

TEST DESCRIPTION	ASTM	SPECIFICATION	RESULT	UNITS
1) Api Gravity	D-287	30 minimum	35.6	°
2) Distillation	D-86			
Initial Boiling Point		345 (typical)	350	Degrees Fahrenheit
10 % Recovered Volume		420 (typical)	388	Degrees Fahrenheit
50 % Recovered Volume		500 (typical)	500	Degrees Fahrenheit
90 % Recovered Volume		540 minimum / 640 maximum	598	Degrees Fahrenheit
Final Boiling Point		670 (typical)	612	Degrees Fahrenheit
Total Recovered Vol.	D-86	98.0 minimum	98.5	volume %
3) Cetane Index	D-976	40 minimum	45.2	
4) Water and Sediment	D-1796	0.0500 maximum	<0.0010	volume %
5) Sulfur content	D-5453	15 maximum	7	parts per million
6) Viscosity @ 40 degrees C	D-445	1.9 minimum / 4.1 maximum	2.55	cSt
7) Cloud Point	D-2500	Report	9	Degrees Fahrenheit
8) Flash Point	D-93	126 minimum	153	Degrees Fahrenheit
9) Ash Content	D-482	0.01 maximum	0.005	weight %
10) Carbon Residue 10% bot.	D-524	0.35 maximum	0.083	weight %
11) Lubricity by HFRR	D-6079	520 maximum	423	microns

Comment: Test results are within specification.



DIRECT FUELS BIODIESEL

12485 Calloway Cemetery Road
Euless, TX 76040
(817)-354-2780

CERTIFICATE OF ANALYSIS

LOT NUMBER: 06030110

SAMPLE DATE: 3/1/2010

SAMPLE TYPE: Biodiesel

Test	Test Method	Min.	Max	Results	Units
Acid Number	ASTM D-664		0.50	0.36	mg KOH/g
Appearance	Visual	Report		Clear and Free	
Carbon Residue	ASTM D-4530		0.050%	< 0.001	mass %
Cetane	ASTM D-613	47		52*	
Cloud Point	ASTM D-2500	Report °C		14	°C
Cold Soak Filtration	ASTM D-6751 Annex		200	99	seconds
Copper Corrosion	ASTM D-130		3	1A	
Distillation	ASTM D-1160		360 °C	324*	°C
Flash Point	ASTM D-93A	130 °C		142.5	°C
Haze Rating	ASTM D-4176		2	1	
Glycerine, Free	ASTM D-6584		0.020%	0.014	mass %
Glycerine, Total	ASTM D-6584		0.240%	0.109	mass %
-Glycerine, monoglycerides	ASTM D-6584		0.400%**	0.287	mass %
-Glycerine, diglycerides	ASTM D-6584		0.200%**	0.131	mass %
-Glycerine, triglycerides	ASTM D-6584		0.200%**	0.013	mass %
Metals: Calcium & Magnesium	EN-14538		5 ppm	< 1***	ppm
Metals: Phosphorus	ASTM D-4951		0.001%	< 0.0001***	mass %
Metals: Potassium & Sodium	EN-14538		5 ppm	< 1***	ppm
Moisture Content by K.F.	ASTM D-6304	Report		0.006	volume %
Oxidation Stability	EN 14112	3 Hours		> 6	Hours
Sulfated Ash	ASTM D-874		0.020%	0.004***	mass %
Sulfur	ASTM D-5453		15 ppm	6.2	ppm
Viscosity	ASTM D-445	1.9 mm ² /s	6.0 mm ² /s	4.7	mm ² /s
Water & Sediment	ASTM D-2709		0.050	< 0.005	%

*Denotes typical test results from outside lab analysis performed by LCS LLP on Feb. 1, 2010 on lot 09020110.

** Not an official ASTM specification. Direct Fuels corporate specification.

***Denotes typical test result from last lot with that analysis performed on Feb. 23rd, 2010: lot # 08022310.

Approved by Quality Assurance Specialist Jacob McClernon:



DIRECT FUELS BIODIESEL

12485 Calloway Cemetery Road
Euless, TX 76040
(817)-354-2780

CERTIFICATE OF ANALYSIS

LOT NUMBER: 08030910

SAMPLE DATE: 3/9/2010

SAMPLE TYPE: Biodiesel

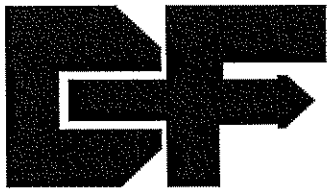
Test	Test Method	Min.	Max	Results	Units
Acid Number	ASTM D-664		0.50	0.39	mg KOH/g
Appearance	Visual	Report		Clear and Free	
Carbon Residue	ASTM D-4530		0.050%	0.003	mass %
Cetane	ASTM D-613	47		52 ¹	
Cloud Point	ASTM D-2500	Report °C		14	°C
Cold Soak Filtration	ASTM D-6751 Annex		200	80	seconds
Copper Corrosion	ASTM D-130		3	1A ³	
Distillation	ASTM D-1160		360 °C	324 ¹	°C
Flash Point	ASTM D-93A	130 °C		155.0	°C
Haze Rating	ASTM D-4176		2	1	
Glycerine, Free	ASTM D-6584		0.020%	0.006	mass %
Glycerine, Total	ASTM D-6584		0.240%	0.128	mass %
-Glycerine, monoglycerides	ASTM D-6584		0.400% ²	0.352	mass %
-Glycerine, diglycerides	ASTM D-6584		0.200% ²	0.199	mass %
-Glycerine, triglycerides	ASTM D-6584		0.200% ²	0.007	mass %
Metals: Calcium & Magnesium	EN-14538		5 ppm	< 1 ³	ppm
Metals: Phosphorus	ASTM D-4951		0.001%	< 0.0001 ³	mass %
Metals: Potassium & Sodium	EN-14538		5 ppm	< 1 ³	ppm
Moisture Content by K.F.	ASTM D-6304	Report		0.005	volume %
Oxidation Stability	EN 14112	3 Hours		> 12	Hours
Sulfated Ash	ASTM D-874		0.020%	0.004 ³	mass %
Sulfur	ASTM D-5453		15 ppm	5.7	ppm
Viscosity	ASTM D-445	1.9 mm ² /s	6.0 mm ² /s	4.6	mm ² /s
Water & Sediment	ASTM D-2709		0.050	< 0.005	%

¹ Denotes typical test results from outside lab analysis performed by LCS LLP on Feb. 1, 2010 on lot 09020110.

² Not an official ASTM specification. Direct Fuels corporate specification.

³ Denotes typical test result from last lot with that analysis performed on Feb. 23rd, 2010: lot # 08022310.

Approved by Quality Assurance Specialist Jacob McClernon:



DIRECT FUELS BIODIESEL

12485 Calloway Cemetery Road
 Euless, TX 76040
 (817)-354-2780

CERTIFICATE OF ANALYSIS

LOT NUMBER: 07031510

SAMPLE DATE: 3/15/2010

SAMPLE TYPE: Biodiesel

Test	Test Method	Min.	Max	Results	Units
Acid Number	ASTM D-664		0.50	0.39	mg KOH/g
Appearance	Visual	Report		Clear and Free	
Carbon Residue	ASTM D-4530		0.050%	0.020	mass %
Cetane	ASTM D-613	47		52 ¹	
Cloud Point	ASTM D-2500	Report °C		12	°C
Cold Soak Filtration	ASTM D-6751 Annex		200	90	seconds
Copper Corrosion	ASTM D-130		3	1A	
Distillation	ASTM D-1160		360 °C	324 ¹	°C
Flash Point	ASTM D-93A	130 °C		160.5	°C
Haze Rating	ASTM D-4176		2	1	
Glycerine, Free	ASTM D-6584		0.020%	0.016	mass %
Glycerine, Total	ASTM D-6584		0.240%	0.126	mass %
-Glycerine, monoglycerides	ASTM D-6584		0.400% ²	0.346	mass %
-Glycerine, diglycerides	ASTM D-6584		0.200% ²	0.120	mass %
-Glycerine, triglycerides	ASTM D-6584		0.200% ²	0.023	mass %
Metals: Calcium & Magnesium	EN-14538		5 ppm	< 1 ³	ppm
Metals: Phosphorus	ASTM D-4951		0.001%	< 0.0001 ³	mass %
Metals: Potassium & Sodium	EN-14538		5 ppm	< 1 ³	ppm
Moisture Content by K.F.	ASTM D-6304	Report		0.023	volume %
Oxidation Stability	EN 14112	3 Hours		11.9	Hours
Sulfated Ash	ASTM D-874		0.020%	0.004 ³	mass %
Sulfur	ASTM D-5453		15 ppm	6.0	ppm
Viscosity	ASTM D-445	1.9 mm ² /s	6.0 mm ² /s	4.4	mm ² /s
Water & Sediment	ASTM D-2709		0.050	< 0.005	%

¹ Denotes typical test results from outside lab analysis performed by LCS LLP on Feb. 1, 2010 on lot 09020110.

² Not an official ASTM specification. Direct Fuels corporate specification.

³ Denotes typical test result from last lot with that analysis performed on Feb. 23rd, 2010: lot # 08022310.

Approved by Quality Assurance Specialist Jacob McClernon:



DIRECT FUELS BIODIESEL

12485 Calloway Cemetery Road
 Euless, TX 76040
 (817)-354-2780

CERTIFICATE OF ANALYSIS

LOT NUMBER: 08032210

SAMPLE DATE: 3/22/2010

SAMPLE TYPE: Biodiesel

Test	Test Method	Min.	Max	Results	Units
Acid Number	ASTM D-664		0.50	0.44	mg KOH/g
Appearance	Visual	Report		Clear and Free	
Carbon Residue	ASTM D-4530		0.050%	0.008	mass %
Cetane	ASTM D-613	47		52 ¹	
Cloud Point	ASTM D-2500	Report °C		17	°C
Cold Soak Filtration	ASTM D-6751 Annex		200	95	seconds
Copper Corrosion	ASTM D-130		3	1A	
Distillation	ASTM D-1160		360 °C	324 ¹	°C
Flash Point	ASTM D-93A	130 °C		156.5	°C
Haze Rating	ASTM D-4176		2	1	
Glycerine, Free	ASTM D-6584		0.020%	0.015	mass %
Glycerine, Total	ASTM D-6584		0.240%	0.159	mass %
-Glycerine, monoglycerides	ASTM D-6584	Report %		0.452	mass %
-Glycerine, diglycerides	ASTM D-6584	Report %		0.168	mass %
-Glycerine, triglycerides	ASTM D-6584	Report %		0.020	mass %
Metals: Calcium & Magnesium	EN-14538		5 ppm	< 1 ²	ppm
Metals: Phosphorus	ASTM D-4951		0.001%	< 0.0001 ²	mass %
Metals: Potassium & Sodium	EN-14538		5 ppm	< 1 ²	ppm
Moisture Content by K.F.	ASTM D-6304	Report		0.006	volume %
Oxidation Stability	EN 14112	3 Hours		> 6	Hours
Sulfated Ash	ASTM D-874		0.020%	.004 ²	mass %
Sulfur	ASTM D-5453		15 ppm	4.4	ppm
Viscosity	ASTM D-445	1.9 mm ² /s	6.0 mm ² /s	4.7	mm ² /s
Water & Sediment	ASTM D-2709		0.050	< 0.005	%

¹ Denotes typical test results from outside lab analysis performed by LCS LLP on Feb. 1, 2010 on lot 09020110.

² Denotes typical test result from last lot with that analysis performed on March 17th, 2010; lot # 09031710.

Approved by Quality Assurance Specialist Jacob McClernon:



DIRECT FUELS BIODIESEL

12485 Calloway Cemetery Road
 Euless, TX 76040
 (817)-354-2780

CERTIFICATE OF ANALYSIS

LOT NUMBER: 09032910

SAMPLE DATE: 3/29/2010

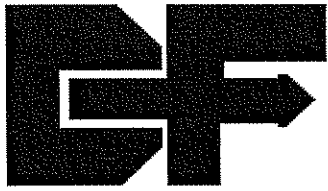
SAMPLE TYPE: Biodiesel

Test	Test Method	Min.	Max	Results	Units
Acid Number	ASTM D-664		0.50	0.48	mg KOH/g
Appearance	Visual	Report		Clear and Free	
Carbon Residue	ASTM D-4530		0.050%	< 0.001	mass %
Cetane	ASTM D-613	47		52 ¹	
Cloud Point	ASTM D-2500	Report °C		18	°C
Cold Soak Filtration	ASTM D-6751 Annex		200	83	seconds
Copper Corrosion	ASTM D-130		3	1A	
Distillation	ASTM D-1160		360 °C	324 ¹	°C
Flash Point	ASTM D-93A	130 °C		142.5	°C
Haze Rating	ASTM D-4176		2	1	
Glycerine, Free	ASTM D-6584		0.020%	0.008	mass %
Glycerine, Total	ASTM D-6584		0.240%	0.145	mass %
-Glycerine, monoglycerides	ASTM D-6584	Report %		0.436	mass %
-Glycerine, diglycerides	ASTM D-6584	Report %		0.147	mass %
-Glycerine, triglycerides	ASTM D-6584	Report %		0.022	mass %
Metals: Calcium & Magnesium	EN-14538		5 ppm	< 1 ²	ppm
Metals: Phosphorus	ASTM D-4951		0.001%	< 0.0001 ²	mass %
Metals: Potassium & Sodium	EN-14538		5 ppm	< 1 ²	ppm
Moisture Content by K.F.	ASTM D-6304	Report		0.010	volume %
Oxidation Stability	EN 14112	3 Hours		> 12	Hours
Sulfated Ash	ASTM D-874		0.020%	.004 ²	mass %
Sulfur	ASTM D-5453		15 ppm	5.2	ppm
Viscosity	ASTM D-445	1.9 mm ² /s	6.0 mm ² /s	4.8	mm ² /s
Water & Sediment	ASTM D-2709		0.050	< 0.005	%

¹ Denotes typical test results from outside lab analysis performed by LCS LLP on Feb. 1, 2010 on lot 09020110.

² Denotes typical test result from last lot with that analysis performed on March 17th, 2010; lot # 09031710.

Approved by Quality Assurance Specialist Jacob McClernon:



DIRECT FUELS BIODIESEL

12485 Calloway Cemetery Road
Eules, TX 76040
(817)-354-2780

CERTIFICATE OF ANALYSIS

LOT NUMBER: 07040510

SAMPLE DATE: 4/6/2010

SAMPLE TYPE: Biodiesel

Test	Test Method	Min.	Max	Results	Units
Acid Number	ASTM D-664		0.50	0.48	mg KOH/g
Appearance	Visual	Report		Clear and Free	
Carbon Residue	ASTM D-4530		0.050%	< 0.001	mass %
Cetane	ASTM D-613	47		52 ¹	
Cloud Point	ASTM D-2500	Report °C		16	°C
Cold Soak Filtration	ASTM D-6751 Annex		200	81	seconds
Copper Corrosion	ASTM D-130		3	1A	
Distillation	ASTM D-1160		360 °C	324 ¹	°C
Flash Point	ASTM D-93A	130 °C		140.5	°C
Haze Rating	ASTM D-4176		2	1	
Glycerine, Free	ASTM D-6584		0.020%	0.013	mass %
Glycerine, Total	ASTM D-6584		0.240%	0.134	mass %
-Glycerine, monoglycerides	ASTM D-6584	Report %		0.385	mass %
-Glycerine, diglycerides	ASTM D-6584	Report %		0.139	mass %
-Glycerine, triglycerides	ASTM D-6584	Report %		0.006	mass %
Metals: Calcium & Magnesium	EN-14538		5 ppm	< 1 ²	ppm
Metals: Phosphorus	ASTM D-4951		0.001%	< 0.0001 ²	mass %
Metals: Potassium & Sodium	EN-14538		5 ppm	< 1 ²	ppm
Moisture Content by K.F.	ASTM D-6304	Report		0.012	volume %
Oxidation Stability	EN 14112	3 Hours		> 12	Hours
Sulfated Ash	ASTM D-874		0.020%	.004 ²	mass %
Sulfur	ASTM D-5453		15 ppm	5.2	ppm
Viscosity	ASTM D-445	1.9 mm ² /s	6.0 mm ² /s	4.7	mm ² /s
Water & Sediment	ASTM D-2709		0.050	< 0.005	%

¹ Denotes typical test results from outside lab analysis performed by LCS LLP on Feb. 1, 2010 on lot 09020110.

² Denotes typical test result from last lot with that analysis performed on March 17th, 2010; lot # 09031710.

Approved by Quality Assurance Specialist Jacob McClernon:



DIRECT FUELS BIODIESEL

12485 Calloway Cemetery Road
Euless, TX 76040
(817)-354-2780

CERTIFICATE OF ANALYSIS

LOT NUMBER: 06041210

SAMPLE DATE: 4/12/2010

SAMPLE TYPE: Biodiesel

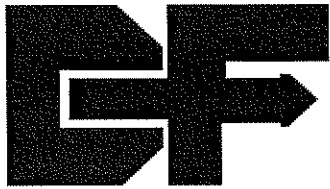
Test	Test Method	Min.	Max	Results	Units
Acid Number	ASTM D-664		0.50	0.42	mg KOH/g
Appearance	Visual	Report		Clear and Free	
Carbon Residue	ASTM D-4530		0.050%	0.047	mass %
Cetane	ASTM D-613	47		52 ¹	
Cloud Point	ASTM D-2500	Report °C		16	°C
Cold Soak Filtration	ASTM D-6751 Annex		200	87	seconds
Copper Corrosion	ASTM D-130		3	1A	
Distillation	ASTM D-1160		360 °C	324 ¹	°C
Flash Point	ASTM D-93A	130 °C		152.5	°C
Haze Rating	ASTM D-4176		2	1	
Glycerine, Free	ASTM D-6584		0.020%	0.016	mass %
Glycerine, Total	ASTM D-6584		0.240%	0.137	mass %
-Glycerine, monoglycerides	ASTM D-6584	Report %		0.373	mass %
-Glycerine, diglycerides	ASTM D-6584	Report %		0.150	mass %
-Glycerine, triglycerides	ASTM D-6584	Report %		0.021	mass %
Metals: Calcium & Magnesium	EN-14538		5 ppm	< 1 ²	ppm
Metals: Phosphorus	ASTM D-4951		0.001%	< 0.0001 ²	mass %
Metals: Potassium & Sodium	EN-14538		5 ppm	< 1 ²	ppm
Moisture Content by K.F.	ASTM D-6304	Report		0.009	volume %
Oxidation Stability	EN 14112	3 Hours		10.2	Hours
Sulfated Ash	ASTM D-874		0.020%	.004 ²	mass %
Sulfur	ASTM D-5453		15 ppm	4.7	ppm
Viscosity	ASTM D-445	1.9 mm ² /s	6.0 mm ² /s	4.7	mm ² /s
Water & Sediment	ASTM D-2709		0.050	< 0.005	%

¹ Denotes typical test results from outside lab analysis performed by LCS LLP on Feb. 1, 2010 on lot 09020110.

² Denotes typical test result from last lot with that analysis performed on March 17th, 2010; lot # 09031710.

Approved by Quality Assurance Specialist Jacob McClernon:

REC 8.4, Approved by QMR: Effective 10/3/08



DIRECT FUELS BIODIESEL

12485 Calloway Cemetery Road
 Euless, TX 76040
 (817)-354-2780

CERTIFICATE OF ANALYSIS

LOT NUMBER: 08042110

SAMPLE DATE: 4/21/2010

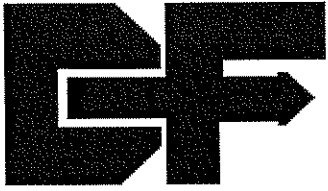
SAMPLE TYPE: Biodiesel

Test	Test Method	Min.	Max	Results	Units
Acid Number	ASTM D-664		0.50	0.40	mg KOH/g
Appearance	Visual	Report		Clear and Free	
Carbon Residue	ASTM D-4530		0.050%	< 0.001	mass %
Cetane	ASTM D-613	47		52 ¹	
Cloud Point	ASTM D-2500	Report °C		17	°C
Cold Soak Filtration	ASTM D-6751 Annex		200	83	seconds
Copper Corrosion	ASTM D-130		3	1A	
Distillation	ASTM D-1160		360 °C	324 ¹	°C
Flash Point	ASTM D-93A	130 °C		144.5	°C
Haze Rating	ASTM D-4176		2	1	
Glycerine, Free	ASTM D-6584		0.020%	0.005	mass %
Glycerine, Total	ASTM D-6584		0.240%	0.106	mass %
-Glycerine, monoglycerides	ASTM D-6584	Report %		0.310	mass %
-Glycerine, diglycerides	ASTM D-6584	Report %		0.142	mass %
-Glycerine, triglycerides	ASTM D-6584	Report %		0.000	mass %
Metals: Calcium & Magnesium	EN-14538		5 ppm	< 1 ²	ppm
Metals: Phosphorus	ASTM D-4951		0.001%	< 0.0001 ²	mass %
Metals: Potassium & Sodium	EN-14538		5 ppm	< 1 ²	ppm
Moisture Content by K.F.	ASTM D-6304	Report		0.008	volume %
Oxidation Stability	EN 14112	3 Hours		12.3	Hours
Sulfated Ash	ASTM D-874		0.020%	.001 ²	mass %
Sulfur	ASTM D-5453		15 ppm	5.3	ppm
Viscosity	ASTM D-445	1.9 mm ² /s	6.0 mm ² /s	4.7	mm ² /s
Water & Sediment	ASTM D-2709		0.050	< 0.005	%

¹ Denotes typical test results from outside lab analysis performed by LCS LLP on Feb. 1, 2010 on lot 09020110.

² Denotes typical test result from last lot with that analysis performed on April 16th, 2010: lot # 06041510.

Approved by Quality Assurance Specialist Jacob McClernon:



DIRECT FUELS BIODIESEL

12485 Calloway Cemetery Road
 Euless, TX 76040
 (817)-354-2780

CERTIFICATE OF ANALYSIS

LOT NUMBER: 06042610

SAMPLE DATE: 4/26/2010

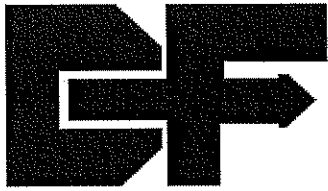
SAMPLE TYPE: Biodiesel

Test	Test Method	Min.	Max	Results	Units
Acid Number	ASTM D-664		0.50	0.38	mg KOH/g
Appearance	Visual	Report		Clear and Free	
Carbon Residue	ASTM D-4530		0.050%	0.011	mass %
Cetane	ASTM D-613	47		52 ¹	
Cloud Point	ASTM D-2500	Report °C		18	°C
Cold Soak Filtration	ASTM D-6751 Annex		200	86	seconds
Copper Corrosion	ASTM D-130		3	1A	
Distillation	ASTM D-1160		360 °C	324 ¹	°C
Flash Point	ASTM D-93A	130 °C		136.5	°C
Haze Rating	ASTM D-4176		2	1	
Glycerine, Free	ASTM D-6584		0.020%	0.014	mass %
Glycerine, Total	ASTM D-6584		0.240%	0.128	mass %
-Glycerine, monoglycerides	ASTM D-6584	Report %		0.359	mass %
-Glycerine, diglycerides	ASTM D-6584	Report %		0.143	mass %
-Glycerine, triglycerides	ASTM D-6584	Report %		0.000	mass %
Metals: Calcium & Magnesium	EN-14538		5 ppm	< 1	ppm
Metals: Phosphorus	ASTM D-4951		0.001%	< 0.0001	mass %
Metals: Potassium & Sodium	EN-14538		5 ppm	< 1	ppm
Moisture Content by K.F.	ASTM D-6304	Report		0.010	volume %
Oxidation Stability	EN 14112	3 Hours		> 12	Hours
Sulfated Ash	ASTM D-874		0.020%	.001 ²	mass %
Sulfur	ASTM D-5453		15 ppm	4.7	ppm
Viscosity	ASTM D-445	1.9 mm ² /s	6.0 mm ² /s	4.7	mm ² /s
Water & Sediment	ASTM D-2709		0.050	< 0.005	%

¹ Denotes typical test results from outside lab analysis performed by LCS LLP on Feb. 1, 2010 on lot 09020110.

² Denotes typical test result from last lot with that analysis performed on April 16th, 2010: lot # 06041510.

Approved by Quality Assurance Specialist Jacob McClernon:



DIRECT FUELS BIODIESEL

12485 Calloway Cemetery Road
 Euless, TX 76040
 (817)-354-2780

CERTIFICATE OF ANALYSIS

LOT NUMBER: 09050410

SAMPLE DATE: 5/4/2010

SAMPLE TYPE: Biodiesel

Test	Test Method	Min.	Max	Results	Units
Acid Number	ASTM D-664		0.50	0.46	mg KOH/g
Appearance	Visual	Report		Clear and Free	
Carbon Residue	ASTM D-4530		0.050%	0.006	mass %
Cetane	ASTM D-613	47		52 ¹	
Cloud Point	ASTM D-2500	Report °C		17	°C
Cold Soak Filtration	ASTM D-6751 Annex		200	85	seconds
Copper Corrosion	ASTM D-130		3	1A	
Distillation	ASTM D-1160		360 °C	324 ¹	°C
Flash Point	ASTM D-93A	130 °C		140.5	°C
Haze Rating	ASTM D-4176		2	1	
Glycerine, Free	ASTM D-6584		0.020%	0.020	mass %
Glycerine, Total	ASTM D-6584		0.240%	0.149	mass %
-Glycerine, monoglycerides	ASTM D-6584	Report %		0.401	mass %
-Glycerine, diglycerides	ASTM D-6584	Report %		0.153	mass %
-Glycerine, triglycerides	ASTM D-6584	Report %		0.023	mass %
Metals: Calcium & Magnesium	EN-14538		5 ppm	< 1 ²	ppm
Metals: Phosphorus	ASTM D-4951		0.001%	< 0.0001 ²	mass %
Metals: Potassium & Sodium	EN-14538		5 ppm	< 1 ²	ppm
Moisture Content by K.F.	ASTM D-6304	Report		0.014	volume %
Oxidation Stability	EN 14112	3 Hours		> 12	Hours
Sulfated Ash	ASTM D-874		0.020%	.004 ³	mass %
Sulfur	ASTM D-5453		15 ppm	5.0	ppm
Viscosity	ASTM D-445	1.9 mm ² /s	6.0 mm ² /s	4.7	mm ² /s
Water & Sediment	ASTM D-2709		0.050	< 0.005	%

¹ Denotes typical test results from outside lab analysis performed by LCS LLP on Feb. 1, 2010 on lot 09020110.

² Denotes typical test result from last lot with that analysis performed: lot # 06042610.

³ Denotes typical test result from last lot with that analysis performed: lot # 06041510.

Approved by Quality Assurance Specialist Jacob McClernon:



DIRECT FUELS BIODIESEL

12485 Calloway Cemetery Road
 Euless, TX 76040
 (817)-354-2780

CERTIFICATE OF ANALYSIS

LOT NUMBER: 07051010

SAMPLE DATE: 5/10/2010

SAMPLE TYPE: Biodiesel

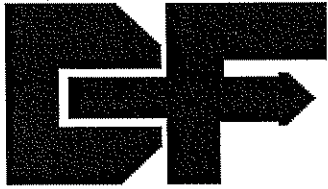
Test	Test Method	Min.	Max	Results	Units
Acid Number	ASTM D-664		0.50	0.39	mg KOH/g
Appearance	Visual	Report		Clear and Free	
Carbon Residue	ASTM D-4530		0.050%	0.011	mass %
Cetane	ASTM D-613	47		52 ¹	
Cloud Point	ASTM D-2500	Report °C		14	°C
Cold Soak Filtration	ASTM D-6751 Annex		200	84	seconds
Copper Corrosion	ASTM D-130		3	1A	
Distillation	ASTM D-1160		360 °C	324 ¹	°C
Flash Point	ASTM D-93A	130 °C		156.5	°C
Haze Rating	ASTM D-4176		2	1	
Glycerine, Free	ASTM D-6584		0.020%	0.010	mass %
Glycerine, Total	ASTM D-6584		0.240%	0.113	mass %
-Glycerine, monoglycerides	ASTM D-6584	Report %		0.330	mass %
-Glycerine, diglycerides	ASTM D-6584	Report %		0.101	mass %
-Glycerine, triglycerides	ASTM D-6584	Report %		0.017	mass %
Metals: Calcium & Magnesium	EN-14538		5 ppm	< 1 ²	ppm
Metals: Phosphorus	ASTM D-4951		0.001%	< 0.0001 ²	mass %
Metals: Potassium & Sodium	EN-14538		5 ppm	< 1 ²	ppm
Moisture Content by K.F.	ASTM D-6304	Report		0.013	volume %
Oxidation Stability	EN 14112	3 Hours		8.7	Hours
Sulfated Ash	ASTM D-874		0.020%	.004 ³	mass %
Sulfur	ASTM D-5453		15 ppm	3.5	ppm
Viscosity	ASTM D-445	1.9 mm ² /s	6.0 mm ² /s	4.7	mm ² /s
Water & Sediment	ASTM D-2709		0.050	< 0.005	%

¹ Denotes typical test results from outside lab analysis performed by LCS LLP on Feb. 1, 2010 on lot 09020110.

² Denotes typical test result from last lot with that analysis performed: lot # 06042610.

³ Denotes typical test result from last lot with that analysis performed: lot # 06041510.

Approved by Quality Assurance Specialist Jacob McClernon:



DIRECT FUELS BIODIESEL

12485 Calloway Cemetery Road
Euless, TX 76040
(817)-354-2780

CERTIFICATE OF ANALYSIS

LOT NUMBER: 09051810

SAMPLE DATE: 5/18/2010

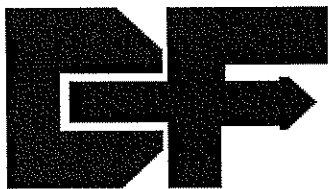
SAMPLE TYPE: Biodiesel

Test	Test Method	Min.	Max	Results	Units
Acid Number	ASTM D-664		0.50	0.32	mg KOH/g
Appearance	Visual	Report		Clear and Free	
Carbon Residue	ASTM D-4530		0.050%	0.013	mass %
Cetane	ASTM D-613	47		52 ¹	
Cloud Point	ASTM D-2500	Report °C		17	°C
Cold Soak Filtration	ASTM D-6751 Annex		200	87	seconds
Copper Corrosion	ASTM D-130		3	1A	
Distillation	ASTM D-1160		360 °C	324 ¹	°C
Flash Point	ASTM D-93A	130 °C		150.5	°C
Haze Rating	ASTM D-4176		2	1	
Glycerine, Free	ASTM D-6584		0.020%	0.002	mass %
Glycerine, Total	ASTM D-6584		0.240%	0.100	mass %
-Glycerine, monoglycerides	ASTM D-6584	Report %		0.318	mass %
-Glycerine, diglycerides	ASTM D-6584	Report %		0.099	mass %
-Glycerine, triglycerides	ASTM D-6584	Report %		0.009	mass %
Metals: Calcium & Magnesium	EN-14538		5 ppm	< 1	ppm
Metals: Phosphorus	ASTM D-4951		0.001%	< 0.0001	mass %
Metals: Potassium & Sodium	EN-14538		5 ppm	< 1	ppm
Moisture Content by K.F.	ASTM D-6304	Report		0.016	volume %
Oxidation Stability	EN 14112	3 Hours		10.3	Hours
Sulfated Ash	ASTM D-874		0.020%	0.001	mass %
Sulfur	ASTM D-5453		15 ppm	4.8	ppm
Viscosity	ASTM D-445	1.9 mm ² /s	6.0 mm ² /s	4.7	mm ² /s
Water & Sediment	ASTM D-2709		0.050	< 0.005	%

¹ Denotes typical test results from outside lab analysis performed by LCS LLP on Feb. 1, 2010 on lot 09020110.

Approved by Quality Assurance Specialist Jacob McClernon:

REC 8.4, Approved by QMR: Effective 10/3/08



DIRECT FUELS BIODIESEL

12485 Calloway Cemetery Road
Eules, TX 76040
(817)-354-2780

CERTIFICATE OF ANALYSIS

LOT NUMBER: 08052410

SAMPLE DATE: 5/24/2010

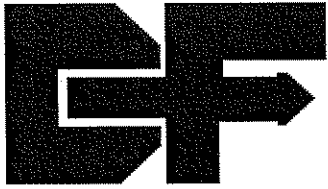
SAMPLE TYPE: Biodiesel

Test	Test Method	Min.	Max	Results	Units
Acid Number	ASTM D-664		0.50	0.48	mg KOH/g
Appearance	Visual	Report		Clear and Free	
Carbon Residue	ASTM D-4530		0.050%	0.005	mass %
Cetane	ASTM D-613	47		52 ¹	
Cloud Point	ASTM D-2500	Report °C		18	°C
Cold Soak Filtration	ASTM D-6751 Annex		200	86	seconds
Copper Corrosion	ASTM D-130		3	1A	
Distillation	ASTM D-1160		360 °C	324 ¹	°C
Flash Point	ASTM D-93A	130 °C		148.5	°C
Haze Rating	ASTM D-4176		2	1	
Glycerine, Free	ASTM D-6584		0.020%	0.007	mass %
Glycerine, Total	ASTM D-6584		0.240%	0.116	mass %
-Glycerine, monoglycerides	ASTM D-6584	Report %		0.336	mass %
-Glycerine, diglycerides	ASTM D-6584	Report %		0.131	mass %
-Glycerine, triglycerides	ASTM D-6584	Report %		0.025	mass %
Metals: Calcium & Magnesium	EN-14538		5 ppm	< 1 ²	ppm
Metals: Phosphorus	ASTM D-4951		0.001%	< 0.0001 ²	mass %
Metals: Potassium & Sodium	EN-14538		5 ppm	< 1 ²	ppm
Moisture Content by K.F.	ASTM D-6304	Report		0.014	volume %
Oxidation Stability	EN 14112	3 Hours		9.0	Hours
Sulfated Ash	ASTM D-874		0.020%	.001 ²	mass %
Sulfur	ASTM D-5453		15 ppm	4.1	ppm
Viscosity	ASTM D-445	1.9 mm ² /s	6.0 mm ² /s	4.7	mm ² /s
Water & Sediment	ASTM D-2709		0.050	< 0.005	%

¹ Denotes typical test results from outside lab analysis performed by LCS LLP on Feb. 1, 2010 on lot 09020110.

² Denotes typical test result from last lot with that analysis performed: lot # 09051810.

Approved by Quality Assurance Specialist Jacob McClernon:



DIRECT FUELS BIODIESEL

12485 Calloway Cemetery Road
Euless, TX 76040
(817)-354-2780

CERTIFICATE OF ANALYSIS

LOT NUMBER: 08060110

SAMPLE DATE: 6/1/2010

SAMPLE TYPE: Biodiesel

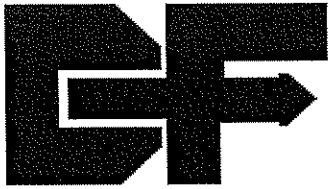
Test	Test Method	Min.	Max	Results	Units
Acid Number	ASTM D-664		0.50	0.48	mg KOH/g
Appearance	Visual	Report		Clear and Free	
Carbon Residue	ASTM D-4530		0.050%	0.008	mass %
Cetane	ASTM D-613	47		52 ¹	
Cloud Point	ASTM D-2500	Report °C		17	°C
Cold Soak Filtration	ASTM D-6751 Annex		200	85	seconds
Copper Corrosion	ASTM D-130		3	1A	
Distillation	ASTM D-1160		360 °C	324 ¹	°C
Flash Point	ASTM D-93A	130 °C		154.5	°C
Haze Rating	ASTM D-4176		2	1	
Glycerine, Free	ASTM D-6584		0.020%	0.008	mass %
Glycerine, Total	ASTM D-6584		0.240%	0.114	mass %
-Glycerine, monoglycerides	ASTM D-6584	Report %		0.346	mass %
-Glycerine, diglycerides	ASTM D-6584	Report %		0.106	mass %
-Glycerine, triglycerides	ASTM D-6584	Report %		0.008	mass %
Metals: Calcium & Magnesium	EN-14538		5 ppm	< 1 ²	ppm
Metals: Phosphorus	ASTM D-4951		0.001%	< 0.0001 ²	mass %
Metals: Potassium & Sodium	EN-14538		5 ppm	< 1 ²	ppm
Moisture Content by K.F.	ASTM D-6304	Report		0.022	volume %
Oxidation Stability	EN 14112	3 Hours		> 12	Hours
Sulfated Ash	ASTM D-874		0.020%	.001 ³	mass %
Sulfur	ASTM D-5453		15 ppm	4.0	ppm
Viscosity	ASTM D-445	1.9 mm ² /s	6.0 mm ² /s	4.7	mm ² /s
Water & Sediment	ASTM D-2709		0.050	< 0.005	%

¹ Denotes typical test results from outside lab analysis performed by LCS LLP on Feb. 1, 2010 on lot 09020110.

² Denotes typical test result from last lot with that analysis performed: lot # 09052610.

³ Denotes typical test result from last lot with that analysis performed: lot # 09051810.

Approved by Quality Assurance Specialist Jacob McClernon:



DIRECT FUELS BIODIESEL

12485 Calloway Cemetery Road
Euless, TX 76040
(817)-354-2780

CERTIFICATE OF ANALYSIS

LOT NUMBER: 07060710

SAMPLE DATE: 6/7/2010

SAMPLE TYPE: Biodiesel

Test	Test Method	Min.	Max	Results	Units
Acid Number	ASTM D-664		0.50	0.45	mg KOH/g
Appearance	Visual	Report		Clear and Free	
Carbon Residue	ASTM D-4530		0.050%	0.025	mass %
Cetane	ASTM D-613	47		52 ¹	
Cloud Point	ASTM D-2500	Report °C		18	°C
Cold Soak Filtration	ASTM D-6751 Annex		200	82	seconds
Copper Corrosion	ASTM D-130		3	1A	
Distillation	ASTM D-1160		360 °C	324 ¹	°C
Flash Point	ASTM D-93A	130 °C		148.5	°C
Haze Rating	ASTM D-4176		2	1	
Glycerine, Free	ASTM D-6584		0.020%	0.007	mass %
Glycerine, Total	ASTM D-6584		0.240%	0.110	mass %
-Glycerine, monoglycerides	ASTM D-6584	Report %		0.334	mass %
-Glycerine, diglycerides	ASTM D-6584	Report %		0.112	mass %
-Glycerine, triglycerides	ASTM D-6584	Report %		0.000	mass %
Metals: Calcium & Magnesium	EN-14538		5 ppm	< 1 ²	ppm
Metals: Phosphorus	ASTM D-4951		0.001%	< 0.0001 ²	mass %
Metals: Potassium & Sodium	EN-14538		5 ppm	< 1 ²	ppm
Moisture Content by K.F.	ASTM D-6304	Report		0.015	volume %
Oxidation Stability	EN 14112	3 Hours		> 12	Hours
Sulfated Ash	ASTM D-874		0.020%	0.001 ³	mass %
Sulfur	ASTM D-5453		15 ppm	4.5	ppm
Viscosity	ASTM D-445	1.9 mm ² /s	6.0 mm ² /s	4.6	mm ² /s
Water & Sediment	ASTM D-2709		0.050	< 0.005	%

¹ Denotes typical test results from outside lab analysis performed by LCS LLP on Feb. 1, 2010 on lot 09020110.

² Denotes typical test result from last lot with that analysis performed: lot # 09052610.

³ Denotes typical test result from last lot with that analysis performed: lot # 09051810.

Approved by Quality Assurance Specialist Jacob McClernon:



DIRECT FUELS BIODIESEL

12485 Calloway Cemetery Road
Euless, TX 76040
(817)-354-2780

CERTIFICATE OF ANALYSIS

LOT NUMBER: 09061410

SAMPLE DATE: 6/14/2010

SAMPLE TYPE: Biodiesel

Test	Test Method	Min.	Max	Results	Units
Acid Number	ASTM D-664		0.50	0.39	mg KOH/g
Appearance	Visual	Report		Clear and Free	
Carbon Residue	ASTM D-4530		0.050%	< 0.001 ⁴	mass %
Cetane	ASTM D-613	47		52 ¹	
Cloud Point	ASTM D-2500	Report °C		16	°C
Cold Soak Filtration	ASTM D-6751 Annex		200	90	seconds
Copper Corrosion	ASTM D-130		3	1A	
Distillation	ASTM D-1160		360 °C	324 ¹	°C
Flash Point	ASTM D-93A	130 °C		163.5	°C
Haze Rating	ASTM D-4176		2	1	
Glycerine, Free	ASTM D-6584		0.020%	0.008	mass %
Glycerine, Total	ASTM D-6584		0.240%	0.117	mass %
-Glycerine, monoglycerides	ASTM D-6584	Report %		0.388	mass %
-Glycerine, diglycerides	ASTM D-6584	Report %		0.059	mass %
-Glycerine, triglycerides	ASTM D-6584	Report %		0.000	mass %
Metals: Calcium & Magnesium	EN-14538		5 ppm	< 1 ²	ppm
Metals: Phosphorus	ASTM D-4951		0.001%	< 0.0001 ²	mass %
Metals: Potassium & Sodium	EN-14538		5 ppm	< 1 ²	ppm
Moisture Content by K.F.	ASTM D-6304	Report		0.020	volume %
Oxidation Stability	EN 14112	3 Hours		> 12	Hours
Sulfated Ash	ASTM D-874		0.020%	0.001 ³	mass %
Sulfur	ASTM D-5453		15 ppm	4.8	ppm
Viscosity	ASTM D-445	1.9 mm ² /s	6.0 mm ² /s	4.7	mm ² /s
Water & Sediment	ASTM D-2709		0.050	< 0.005	%

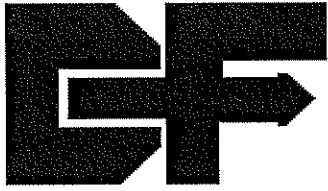
¹ Denotes typical test results from outside lab analysis performed by LCS LLP on Feb. 1, 2010 on lot 09020110.

² Denotes typical test result from last lot with that analysis performed: lot # 09052610.

³ Denotes typical test result from last lot with that analysis performed: lot # 09051810.

⁴ Denotes typical test result from last lot with that analysis performed: lot # 08061010.

Approved by Director of Biodiesel Operations Mark Farrer:



DIRECT FUELS BIODIESEL

12485 Calloway Cemetery Road
Euless, TX 76040
(817)-354-2780

CERTIFICATE OF ANALYSIS

LOT NUMBER: 08062110

SAMPLE DATE: 6/21/2010

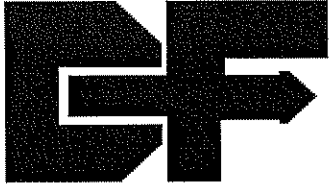
SAMPLE TYPE: Biodiesel

Test	Test Method	Min.	Max	Results	Units
Acid Number	ASTM D-664		0.50	0.47	mg KOH/g
Appearance	Visual	Report		Clear and Free	
Carbon Residue	ASTM D-4530		0.050%	< 0.001	mass %
Cetane	ASTM D-613	47		52 ¹	
Cloud Point	ASTM D-2500	Report °C		18	°C
Cold Soak Filtration	ASTM D-6751 Annex		200	81	seconds
Copper Corrosion	ASTM D-130		3	1A	
Distillation	ASTM D-1160		360 °C	323 ¹	°C
Flash Point	ASTM D-93A	130 °C		162.5	°C
Haze Rating	ASTM D-4176		2	1	
Glycerine, Free	ASTM D-6584		0.020%	0.010	mass %
Glycerine, Total	ASTM D-6584		0.240%	0.117	mass %
-Glycerine, monoglycerides	ASTM D-6584	Report %		0.350	mass %
-Glycerine, diglycerides	ASTM D-6584	Report %		0.103	mass %
-Glycerine, triglycerides	ASTM D-6584	Report %		0.005	mass %
Metals: Calcium & Magnesium	EN-14538		5 ppm	< 1	ppm
Metals: Phosphorus	ASTM D-4951		0.001%	< 0.0001	mass %
Metals: Potassium & Sodium	EN-14538		5 ppm	< 1	ppm
Moisture Content by K.F.	ASTM D-6304	Report		0.018	volume %
Oxidation Stability	EN 14112	3 Hours		> 12	Hours
Sulfated Ash	ASTM D-874		0.020%	< 0.001	mass %
Sulfur	ASTM D-5453		15 ppm	3.8	ppm
Viscosity	ASTM D-445	1.9 mm ² /s	6.0 mm ² /s	4.7	mm ² /s
Water & Sediment	ASTM D-2709		0.050	< 0.005	%

¹ Denotes typical test results from outside lab analysis performed by LCS LLP.

Approved by Quality Assurance Specialist Jacob McClernon:

REC 8.4, Approved by QMR: Effective 10/3/08



DIRECT FUELS BIODIESEL

12485 Calloway Cemetery Road
 Euless, TX 76040
 (817)-354-2780

CERTIFICATE OF ANALYSIS

LOT NUMBER: 07062810

SAMPLE DATE: 6/28/2010

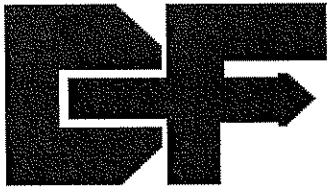
SAMPLE TYPE: Biodiesel

Test	Test Method	Min.	Max	Results	Units
Acid Number	ASTM D-664		0.50	0.40	mg KOH/g
Appearance	Visual	Report		Clear and Free	
Carbon Residue	ASTM D-4530		0.050%	< 0.001	mass %
Cetane	ASTM D-613	47		52 ¹	
Cloud Point	ASTM D-2500	Report °C		15	°C
Cold Soak Filtration	ASTM D-6751 Annex		200	82	seconds
Copper Corrosion	ASTM D-130		3	1A	
Distillation	ASTM D-1160		360 °C	323 ¹	°C
Flash Point	ASTM D-93A	130 °C		158.5	°C
Haze Rating	ASTM D-4176		2	1	
Glycerine, Free	ASTM D-6584		0.020%	0.002	mass %
Glycerine, Total	ASTM D-6584		0.240%	0.134	mass %
-Glycerine, monoglycerides	ASTM D-6584	Report %		0.419	mass %
-Glycerine, diglycerides	ASTM D-6584	Report %		0.147	mass %
-Glycerine, triglycerides	ASTM D-6584	Report %		0.010	mass %
Metals: Calcium & Magnesium	EN-14538		5 ppm	< 1 ²	ppm
Metals: Phosphorus	ASTM D-4951		0.001%	< 0.0001 ²	mass %
Metals: Potassium & Sodium	EN-14538		5 ppm	< 1 ²	ppm
Moisture Content by K.F.	ASTM D-6304	Report		0.026	volume %
Oxidation Stability	EN 14112	3 Hours		> 12	Hours
Sulfated Ash	ASTM D-874		0.020%	< 0.001 ²	mass %
Sulfur	ASTM D-5453		15 ppm	4.8	ppm
Viscosity	ASTM D-445	1.9 mm ² /s	6.0 mm ² /s	4.7	mm ² /s
Water & Sediment	ASTM D-2709		0.050	< 0.005	%

¹ Denotes typical test results from outside lab analysis performed by LCS LLP on lot 08062110.

² Denotes typical test result from last lot with that analysis performed: lot # 08062110.

Approved by Quality Assurance Specialist Jacob McClernon:



DIRECT FUELS BIODIESEL

12485 Calloway Cemetery Road
Euleless, TX 76040
(817)-354-2780

CERTIFICATE OF ANALYSIS

LOT NUMBER: 09070510

SAMPLE DATE: 7/5/2010

SAMPLE TYPE: Biodiesel

Test	Test Method	Min.	Max	Results	Units
Acid Number	ASTM D-664		0.50	0.38	mg KOH/g
Appearance	Visual	Report		Clear and Free	
Carbon Residue	ASTM D-4530		0.050%	0.006	mass %
Cetane	ASTM D-613	47		52 ¹	
Cloud Point	ASTM D-2500	Report °C		15	°C
Cold Soak Filtration	ASTM D-6751 Annex		200	83	seconds
Copper Corrosion	ASTM D-130		3	1A	
Distillation	ASTM D-1160		360 °C	323 ¹	°C
Flash Point	ASTM D-93A	130 °C		156.5	°C
Haze Rating	ASTM D-4176		2	1	
Glycerine, Free	ASTM D-6584		0.020%	0.008	mass %
Glycerine, Total	ASTM D-6584		0.240%	0.131	mass %
-Glycerine, monoglycerides	ASTM D-6584	Report %		0.384	mass %
-Glycerine, diglycerides	ASTM D-6584	Report %		0.141	mass %
-Glycerine, triglycerides	ASTM D-6584	Report %		0.021	mass %
Metals: Calcium & Magnesium	EN-14538		5 ppm	< 1 ²	ppm
Metals: Phosphorus	ASTM D-4951		0.001%	< 0.0001 ²	mass %
Metals: Potassium & Sodium	EN-14538		5 ppm	< 1 ²	ppm
Moisture Content by K.F.	ASTM D-6304	Report		0.008	volume %
Oxidation Stability	EN 14112	3 Hours		> 12	Hours
Sulfated Ash	ASTM D-874		0.020%	< 0.001 ²	mass %
Sulfur	ASTM D-5453		15 ppm	2.8	ppm
Viscosity	ASTM D-445	1.9 mm ² /s	6.0 mm ² /s	4.7	mm ² /s
Water & Sediment	ASTM D-2709		0.050	< 0.005	%

¹ Denotes typical test results from outside lab analysis performed by LCS LLP on lot 08062110.

² Denotes typical test result from last lot with that analysis performed: lot # 08062110.

Approved by Quality Assurance Specialist Jacob McClernon:



DIRECT FUELS BIODIESEL

12485 Calloway Cemetery Road
Euless, TX 76040
(817)-354-2780

CERTIFICATE OF ANALYSIS

LOT NUMBER: 06071310

SAMPLE DATE: 7/13/2010

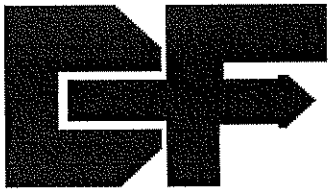
SAMPLE TYPE: Biodiesel

Test	Test Method	Min.	Max	Results	Units
Acid Number	ASTM D-664		0.50	0.47	mg KOH/g
Appearance	Visual	Report		Clear and Free	
Carbon Residue	ASTM D-4530		0.050%	< 0.001	mass %
Cetane	ASTM D-613	47		52 ¹	
Cloud Point	ASTM D-2500	Report °C		14	°C
Cold Soak Filtration	ASTM D-6751 Annex		200	78	seconds
Copper Corrosion	ASTM D-130		3	1A	
Distillation	ASTM D-1160		360 °C	323 ¹	°C
Flash Point	ASTM D-93A	130 °C		158.5	°C
Haze Rating	ASTM D-4176		2	1	
Glycerine, Free	ASTM D-6584		0.020%	0.013	mass %
Glycerine, Total	ASTM D-6584		0.240%	0.128	mass %
-Glycerine, monoglycerides	ASTM D-6584	Report %		0.380	mass %
-Glycerine, diglycerides	ASTM D-6584	Report %		0.116	mass %
-Glycerine, triglycerides	ASTM D-6584	Report %		0.000	mass %
Metals: Calcium & Magnesium	EN-14538		5 ppm	< 1 ²	ppm
Metals: Phosphorus	ASTM D-4951		0.001%	< 0.0001 ²	mass %
Metals: Potassium & Sodium	EN-14538		5 ppm	< 1 ²	ppm
Moisture Content by K.F.	ASTM D-6304	Report		0.012	volume %
Oxidation Stability	EN 14112	3 Hours		> 12	Hours
Sulfated Ash	ASTM D-874		0.020%	< 0.001 ²	mass %
Sulfur	ASTM D-5453		15 ppm	3.6	ppm
Viscosity	ASTM D-445	1.9 mm ² /s	6.0 mm ² /s	4.7	mm ² /s
Water & Sediment	ASTM D-2709		0.050	< 0.005	%

¹ Denotes typical test results from outside lab analysis performed by LCS LLP on lot 08062110.

² Denotes typical test result from last lot with that analysis performed: lot # 08062110.

Approved by Quality Assurance Specialist Jacob McClernon:



DIRECT FUELS BIODIESEL

12485 Calloway Cemetery Road
 Euless, TX 76040
 (817)-354-2780

CERTIFICATE OF ANALYSIS

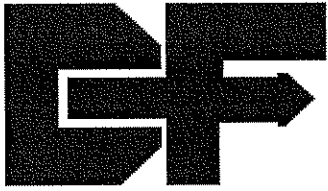
LOT NUMBER: 08071910
 SAMPLE DATE: 7/19/2010
 SAMPLE TYPE: Biodiesel

Test	Test Method	Min.	Max	Results	Units
Acid Number	ASTM D-664		0.50	0.49	mg KOH/g
Appearance	Visual	Report		Clear and Free	
Carbon Residue	ASTM D-4530		0.050%	< 0.001%	mass %
Cetane	ASTM D-613	47		52 ¹	
Cloud Point	ASTM D-2500	Report °C		14	°C
Cold Soak Filtration	ASTM D-6751 Annex		360	226	seconds
Copper Corrosion	ASTM D-130		3	1A	
Distillation	ASTM D-1160		360 °C	323 ¹	°C
Flash Point	ASTM D-93A	130 °C		158.5	°C
Haze Rating	ASTM D-4176		2	1	
Glycerine, Free	ASTM D-6584		0.020%	0.008	mass %
Glycerine, Total	ASTM D-6584		0.240%	0.131	mass %
-Glycerine, monoglycerides	ASTM D-6584	Report %		0.418	mass %
-Glycerine, diglycerides	ASTM D-6584	Report %		0.101	mass %
-Glycerine, triglycerides	ASTM D-6584	Report %		0.000	mass %
Metals: Calcium & Magnesium	EN-14538		5 ppm	< 1 ²	ppm
Metals: Phosphorus	ASTM D-4951		0.001%	< 0.0002 ²	mass %
Metals: Potassium & Sodium	EN-14538		5 ppm	< 1 ²	ppm
Moisture Content by K.F.	ASTM D-6304	Report		0.025	volume %
Oxidation Stability	EN 14112	3 Hours		> 12	Hours
Sulfated Ash	ASTM D-874		0.020%	< 0.001 ²	mass %
Sulfur	ASTM D-5453		15 ppm	2.4	ppm
Viscosity	ASTM D-445	1.9 mm ² /s	6.0 mm ² /s	4.7	mm ² /s
Water & Sediment	ASTM D-2709		0.050	< 0.005	%

¹ Denotes typical test results from outside lab analysis performed by LCS LLP on lot 08062110.

² Denotes typical test result from last lot with that analysis performed: lot # 09071510.

Approved by Quality Assurance Specialist Jacob McClernon:



DIRECT FUELS BIODIESEL

12485 Calloway Cemetery Road
 Euless, TX 76040
 (817)-354-2780

CERTIFICATE OF ANALYSIS

LOT NUMBER: 06072710

SAMPLE DATE: 7/27/2010

SAMPLE TYPE: Biodiesel

Test	Test Method	Min.	Max	Results	Units
Acid Number	ASTM D-664		0.50	0.43	mg KOH/g
Appearance	Visual	Report		Clear and Free	
Carbon Residue	ASTM D-4530		0.050%	0.003	mass %
Cetane	ASTM D-613	47		52 ¹	
Cloud Point	ASTM D-2500	Report °C		15	°C
Cold Soak Filtration	ASTM D-6751 Annex		360	82	seconds
Copper Corrosion	ASTM D-130		3	1A	
Distillation	ASTM D-1160		360 °C	323 ¹	°C
Flash Point	ASTM D-93A	130 °C		156.5	°C
Haze Rating	ASTM D-4176		2	1	
Glycerine, Free	ASTM D-6584		0.020%	0.019	mass %
Glycerine, Total	ASTM D-6584		0.240%	0.160	mass %
-Glycerine, monoglycerides	ASTM D-6584	Report %		0.445	mass %
-Glycerine, diglycerides	ASTM D-6584	Report %		0.169	mass %
-Glycerine, triglycerides	ASTM D-6584	Report %		0.000	mass %
Metals: Calcium & Magnesium	EN-14538		5 ppm	< 1 ²	ppm
Metals: Phosphorus	ASTM D-4951		0.001%	< 0.0002 ²	mass %
Metals: Potassium & Sodium	EN-14538		5 ppm	< 1 ²	ppm
Moisture Content by K.F.	ASTM D-6304	Report		0.012	volume %
Oxidation Stability	EN 14112	3 Hours		> 5	Hours
Sulfated Ash	ASTM D-874		0.020%	< 0.001 ²	mass %
Sulfur	ASTM D-5453		15 ppm	4.4	ppm
Viscosity	ASTM D-445	1.9 mm ² /s	6.0 mm ² /s	4.7	mm ² /s
Water & Sediment	ASTM D-2709		0.050	< 0.005	%

¹ Denotes typical test results from outside lab analysis performed by LCS LLP on lot 08062110.

² Denotes typical test result from last lot with that analysis performed: lot # 09071510.

Approved by Quality Assurance Specialist Jacob McClernon:



DIRECT FUELS BIODIESEL

12485 Calloway Cemetery Road
Euleless, TX 76040
(817)-354-2780

CERTIFICATE OF ANALYSIS

LOT NUMBER: 09080410

SAMPLE DATE: 8/4/2010

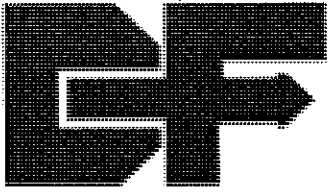
SAMPLE TYPE: Biodiesel

Test	Test Method	Min.	Max	Results	Units
Acid Number	ASTM D-664		0.50	0.47	mg KOH/g
Appearance	Visual	Report		Clear and Free	
Carbon Residue	ASTM D-4530		0.050%	< 0.001	mass %
Cetane	ASTM D-613	47		52 ¹	
Cloud Point	ASTM D-2500	Report °C		15	°C
Cold Soak Filtration	ASTM D-6751 Annex		360	87	seconds
Copper Corrosion	ASTM D-130		3	1A	
Distillation	ASTM D-1160		360 °C	323 ¹	°C
Flash Point	ASTM D-93A	130 °C		152.5	°C
Haze Rating	ASTM D-4176		2	1	
Glycerine, Free	ASTM D-6584		0.020%	0.015	mass %
Glycerine, Total	ASTM D-6584		0.240%	0.152	mass %
-Glycerine, monoglycerides	ASTM D-6584	Report %		0.462	mass %
-Glycerine, diglycerides	ASTM D-6584	Report %		0.121	mass %
-Glycerine, triglycerides	ASTM D-6584	Report %		0.000	mass %
Metals: Calcium & Magnesium	EN-14538		5 ppm	< 1 ²	ppm
Metals: Phosphorus	ASTM D-4951		0.001%	< 0.0002 ²	mass %
Metals: Potassium & Sodium	EN-14538		5 ppm	< 1 ²	ppm
Moisture Content by K.F.	ASTM D-6304	Report		0.010	volume %
Oxidation Stability	EN 14112	3 Hours		> 12	Hours
Sulfated Ash	ASTM D-874		0.020%	< 0.001 ²	mass %
Sulfur	ASTM D-5453		15 ppm	5.4	ppm
Viscosity	ASTM D-445	1.9 mm ² /s	6.0 mm ² /s	4.7	mm ² /s
Water & Sediment	ASTM D-2709		0.050	< 0.005	%

¹ Denotes typical test results from outside lab analysis performed by LCS LLP on lot 08062110.

² Denotes typical test result from last lot with that analysis performed: lot # 09071510.

Approved by Quality Assurance Specialist Jacob McClernon:



DIRECT FUELS BIODIESEL

12485 Calloway Cemetery Road
Euless, TX 76040
(817)-354-2780

CERTIFICATE OF ANALYSIS

LOT NUMBER: 09081110
SAMPLE DATE: 8/11/2010
SAMPLE TYPE: Biodiesel

Test	Test Method	Min.	Max	Results	Units
Acid Number	ASTM D-664		0.50	0.34	mg KOH/g
Appearance	Visual	Report		Clear and Free	
Carbon Residue	ASTM D-4530		0.050%	0.003	mass %
Cetane	ASTM D-613	47		52 ¹	
Cloud Point	ASTM D-2500	Report °C		14	°C
Cold Soak Filtration	ASTM D-6751 Annex		360	79	seconds
Copper Corrosion	ASTM D-130		3	1A	
Distillation	ASTM D-1160		360 °C	323 ¹	°C
Flash Point	ASTM D-93A	130 °C		152.5	°C
Haze Rating	ASTM D-4176		2	1	
Glycerine, Free	ASTM D-6584		0.020%	0.014	mass %
Glycerine, Total	ASTM D-6584		0.240%	0.144	mass %
-Glycerine, monoglycerides	ASTM D-6584	Report %		0.432	mass %
-Glycerine, diglycerides	ASTM D-6584	Report %		0.125	mass %
-Glycerine, triglycerides	ASTM D-6584	Report %		0.000	mass %
Metals: Calcium & Magnesium	EN-14538		5 ppm	< 1 ²	ppm
Metals: Phosphorus	ASTM D-4951		0.001%	< 0.0002 ²	mass %
Metals: Potassium & Sodium	EN-14538		5 ppm	< 1 ²	ppm
Moisture Content by K.F.	ASTM D-6304	Report		0.009	volume %
Oxidation Stability	EN 14112	3 Hours		> 12	Hours
Sulfated Ash	ASTM D-874		0.020%	< 0.001 ²	mass %
Sulfur	ASTM D-5453		15 ppm	5.0	ppm
Viscosity	ASTM D-445	1.9 mm ² /s	6.0 mm ² /s	4.7	mm ² /s
Water & Sediment	ASTM D-2709		0.050	< 0.005	%

¹ Denotes typical test results from outside lab analysis performed by LCS LLP on lot 08062110.

² Denotes typical test result from last lot with that analysis performed: lot # 09071510.

Approved by Quality Assurance Specialist Jacob McClernon:



DIRECT FUELS BIODIESEL

12485 Calloway Cemetery Road
Eules, TX 76040
(817)-354-2780

CERTIFICATE OF ANALYSIS

LOT NUMBER: 06081910

SAMPLE DATE: 8/19/2010

SAMPLE TYPE: Biodiesel

Test	Test Method	Min.	Max	Results	Units
Acid Number	ASTM D-664		0.50	0.41	mg KOH/g
Appearance	Visual	Report		Clear and Free	
Carbon Residue	ASTM D-4530		0.050%	< 0.001	mass %
Cetane	ASTM D-613	47		52 ¹	
Cloud Point	ASTM D-2500	Report °C		14	°C
Cold Soak Filtration	ASTM D-6751 Annex		360	79	seconds
Copper Corrosion	ASTM D-130		3	1A	
Distillation	ASTM D-1160		360 °C	323 ¹	°C
Flash Point	ASTM D-93A	130 °C		146.5	°C
Haze Rating	ASTM D-4176		2	1	
Glycerine, Free	ASTM D-6584		0.020%	0.011	mass %
Glycerine, Total	ASTM D-6584		0.240%	0.125	mass %
-Glycerine, monoglycerides	ASTM D-6584	Report %		0.370	mass %
-Glycerine, diglycerides	ASTM D-6584	Report %		0.120	mass %
-Glycerine, triglycerides	ASTM D-6584	Report %		0.000	mass %
Metals: Calcium & Magnesium	EN-14538		5 ppm	< 1 ²	ppm
Metals: Phosphorus	ASTM D-4951		0.001%	< 0.0003 ²	mass %
Metals: Potassium & Sodium	EN-14538		5 ppm	< 2 ²	ppm
Moisture Content by K.F.	ASTM D-6304	Report		0.012	volume %
Oxidation Stability	EN 14112	3 Hours		> 12	Hours
Sulfated Ash	ASTM D-874		0.020%	0.009 ²	mass %
Sulfur	ASTM D-5453		15 ppm	4.5	ppm
Viscosity	ASTM D-445	1.9 mm ² /s	6.0 mm ² /s	4.7	mm ² /s
Water & Sediment	ASTM D-2709		0.050	< 0.005	%

¹ Denotes typical test results from outside lab analysis performed by LCS LLP on lot 08062110.

² Denotes typical test result from last lot with that analysis performed: lot 07081510.

Approved by Quality Assurance Specialist Jacob McClernon:



DIRECT FUELS BIODIESEL

12485 Calloway Cemetery Road
 Euless, TX 76040
 (817)-354-2780

CERTIFICATE OF ANALYSIS

LOT NUMBER: 06090110

SAMPLE DATE: 9/1/2010

SAMPLE TYPE: Biodiesel

Test	Test Method	Min.	Max	Results	Units
Acid Number	ASTM D-664		0.50	0.31	mg KOH/g
Appearance	Visual	Report		Clear and Free	
Carbon Residue	ASTM D-4530		0.050%	< 0.001	mass %
Cetane	ASTM D-613	47		52 ¹	
Cloud Point	ASTM D-2500	Report °C		15	°C
Cold Soak Filtration	ASTM D-6751 Annex		360	79	seconds
Copper Corrosion	ASTM D-130		3	1A	
Distillation	ASTM D-1160		360 °C	323 ¹	°C
Flash Point	ASTM D-93A	130 °C		154.5	°C
Haze Rating	ASTM D-4176		2	1	
Glycerine, Free	ASTM D-6584		0.020%	0.004	mass %
Glycerine, Total	ASTM D-6584		0.240%	0.121	mass %
-Glycerine, monoglycerides	ASTM D-6584	Report %		0.378	mass %
-Glycerine, diglycerides	ASTM D-6584	Report %		0.128	mass %
-Glycerine, triglycerides	ASTM D-6584	Report %		0.000	mass %
Metals: Calcium & Magnesium	EN-14538		5 ppm	< 1 ²	ppm
Metals: Phosphorus	ASTM D-4951		0.001%	< 0.0003 ²	mass %
Metals: Potassium & Sodium	EN-14538		5 ppm	< 2 ²	ppm
Moisture Content by K.F.	ASTM D-6304	Report		0.066	volume %
Oxidation Stability	EN 14112	3 Hours		> 12	Hours
Sulfated Ash	ASTM D-874		0.020%	0.009 ²	mass %
Sulfur	ASTM D-5453		15 ppm	6.2	ppm
Viscosity	ASTM D-445	1.9 mm ² /s	6.0 mm ² /s	4.7	mm ² /s
Water & Sediment	ASTM D-2709		0.050	< 0.005	%

¹ Denotes typical test results from outside lab analysis performed by LCS LLP on lot 08062110.

² Denotes typical test result from last lot with that analysis performed: lot 07081510.

Approved by Quality Assurance Specialist Jacob McClernon:



DIRECT FUELS BIODIESEL

12485 Calloway Cemetery Road
 Euless, TX 76040
 (817)-354-2780

CERTIFICATE OF ANALYSIS

LOT NUMBER: 09110210
 SAMPLE DATE: 11/2/2010
 SAMPLE TYPE: Biodiesel

Test	Test Method	Min.	Max	Results	Units
Acid Number	ASTM D-664		0.50	0.48	mg KOH/g
Appearance	Visual	Report		Clear and Free	
Carbon Residue	ASTM D-4530		0.050%	< 0.001	mass %
Cetane	ASTM D-613	47		52 ¹	
Cloud Point	ASTM D-2500	Report °C		15	°C
Cold Soak Filtration	ASTM D-6751 Annex		360	86	seconds
Copper Corrosion	ASTM D-130		3	1A	
Distillation	ASTM D-1160		360 °C	323 ¹	°C
Flash Point	ASTM D-93A	130 °C		142.5	°C
Haze Rating	ASTM D-4176		2	1	
Glycerine, Free	ASTM D-6584		0.020%	0.015	mass %
Glycerine, Total	ASTM D-6584		0.240%	0.121	mass %
-Glycerine, monoglycerides	ASTM D-6584	Report %		0.343	mass %
-Glycerine, diglycerides	ASTM D-6584	Report %		0.115	mass %
-Glycerine, triglycerides	ASTM D-6584	Report %		0.000	mass %
Metals: Calcium & Magnesium	EN-14538		5 ppm	< 1 ²	ppm
Metals: Phosphorus	ASTM D-4951		0.001%	< 0.0001 ²	mass %
Metals: Potassium & Sodium	EN-14538		5 ppm	< 1 ²	ppm
Moisture Content by K.F.	ASTM D-6304	Report		0.006	volume %
Oxidation Stability	EN 14112	3 Hours		> 12	Hours
Sulfated Ash	ASTM D-874		0.020%	< 0.001 ²	mass %
Sulfur	ASTM D-5453		15 ppm	6.3	ppm
Viscosity	ASTM D-445	1.9 mm ² /s	6.0 mm ² /s	4.8	mm ² /s
Water & Sediment	ASTM D-2709		0.050	< 0.005	%

¹ Denotes typical test results from outside lab analysis performed by LCS LLP on lot 08062110.

² Denotes typical test result from last lot with that analysis performed: lot 08101410.

Approved by Quality Assurance Specialist Jacob McClernon:



DIRECT FUELS BIODIESEL

12485 Calloway Cemetery Road
Eules, TX 76040
(817)-354-2780

CERTIFICATE OF ANALYSIS

LOT NUMBER: 07120110
SAMPLE DATE: 12/1/2010
SAMPLE TYPE: Biodiesel

Test	Test Method	Min.	Max	Results	Units
Acid Number	ASTM D-664		0.50	0.41	mg KOH/g
Appearance	Visual	Report		Clear and Free	
Carbon Residue	ASTM D-4530		0.050%	< 0.001	mass %
Cetane	ASTM D-613	47		52 ¹	
Cloud Point	ASTM D-2500	Report °C		14	°C
Cold Soak Filtration	ASTM D-6751 Annex		360	77	seconds
Copper Corrosion	ASTM D-130		3	1A	
Distillation	ASTM D-1160		360 °C	323 ¹	°C
Flash Point	ASTM D-93A	130 °C		146.5	°C
Haze Rating	ASTM D-4176		2	1	
Glycerine, Free	ASTM D-6584		0.020%	0.002	mass %
Glycerine, Total	ASTM D-6584		0.240%	0.139	mass %
-Glycerine, monoglycerides	ASTM D-6584	Report %		0.455	mass %
-Glycerine, diglycerides	ASTM D-6584	Report %		0.126	mass %
-Glycerine, triglycerides	ASTM D-6584	Report %		0.000	mass %
Metals: Calcium & Magnesium	EN-14538		5 ppm	< 1 ²	ppm
Metals: Phosphorus	ASTM D-4951		0.001%	< 0.0001 ²	mass %
Metals: Potassium & Sodium	EN-14538		5 ppm	< 1 ²	ppm
Moisture Content by K.F.	ASTM D-6304	Report		0.008	volume %
Oxidation Stability	EN 14112	3 Hours		> 12	Hours
Sulfated Ash	ASTM D-874		0.020%	< 0.001 ²	mass %
Sulfur	ASTM D-5453		15 ppm	7.2	ppm
Viscosity	ASTM D-445	1.9 mm ² /s	6.0 mm ² /s	4.7	mm ² /s
Water & Sediment	ASTM D-2709		0.050	< 0.005	%

¹ Denotes typical test results from outside lab analysis performed by LCS LLP on lot 08062110.

² Denotes typical test result from last lot with that analysis performed: lot 06111510.

Approved by Quality Assurance Specialist Jacob McClernon:



DIRECT FUELS BIODIESEL

12485 Calloway Cemetery Road
 Euless, TX 76040
 (817)-354-2780

CERTIFICATE OF ANALYSIS

LOT NUMBER: 07010811

SAMPLE DATE: 1/8/2011

SAMPLE TYPE: Biodiesel

Test	Test Method	Min.	Max	Results	Units
Acid Number	ASTM D-664		0.50	0.43	mg KOH/g
Appearance	Visual	Report		Clear and Free	
Carbon Residue	ASTM D-4530		0.050%	< 0.001 ³	mass %
Cetane	ASTM D-613	47		53 ¹	
Cloud Point	ASTM D-2500	Report °C		15	°C
Cold Soak Filtration	ASTM D-6751 Annex		200	82	seconds
Copper Corrosion	ASTM D-130		3	1A ³	
Distillation	ASTM D-1160		360 °C	324 ¹	°C
Flash Point	ASTM D-93A	130 °C		148.5	°C
Haze Rating	ASTM D-4176		2	1	
Glycerine, Free	ASTM D-6584		0.020%	0.010	mass %
Glycerine, Total	ASTM D-6584		0.240%	0.124	mass %
-Glycerine, monoglycerides	ASTM D-6584	Report %		0.396	mass %
-Glycerine, diglycerides	ASTM D-6584	Report %		0.073	mass %
-Glycerine, triglycerides	ASTM D-6584	Report %		0.007	mass %
Metals: Calcium & Magnesium	EN-14538		5 ppm	< 1 ²	ppm
Metals: Phosphorus	ASTM D-4951		0.001%	< 0.0001 ²	mass %
Metals: Potassium & Sodium	EN-14538		5 ppm	< 1 ²	ppm
Moisture Content by K.F.	ASTM D-6304	Report		0.003	volume %
Oxidation Stability	EN 14112	3 Hours		>9	Hours
Sulfated Ash	ASTM D-874		0.020%	0.001 ²	mass %
Sulfur	ASTM D-5453		15 ppm	9.5	ppm
Viscosity	ASTM D-445	1.9 mm ² /s	6.0 mm ² /s	4.8 ³	mm ² /s
Water & Sediment	ASTM D-2709		0.050	< 0.005	%

¹ Denotes typical test results from outside lab analysis performed by LCS LLP on lot 08120310.

² Denotes typical test result from last lot with that analysis performed: lot # 08121510.

³ Denotes typical test result from last lot with that analysis performed: lot # 08010611.

Approved by Director of Biodiesel Operations Mark Farrer:



DIRECT FUELS BIODIESEL

12485 Calloway Cemetery Road
Eules, TX 76040
(817)-354-2780

CERTIFICATE OF ANALYSIS

LOT NUMBER: 09020311

SAMPLE DATE: 2/3/2011

SAMPLE TYPE: Biodiesel

Test	Test Method	Min.	Max	Results	Units
Acid Number	ASTM D-664		0.50	0.43	mg KOH/g
Appearance	Visual	Report		Clear and Free	
Carbon Residue	ASTM D-4530		0.050%	< 0.001	mass %
Cetane	ASTM D-613	47		53 ¹	
Cloud Point	ASTM D-2500	Report °C		15	°C
Cold Soak Filtration	ASTM D-6751 Annex		200	84	seconds
Copper Corrosion	ASTM D-130		3	1A	
Distillation	ASTM D-1160		360 °C	324 ¹	°C
Flash Point	ASTM D-93A	130 °C		140.0	°C
Haze Rating	ASTM D-4176		2	1	
Glycerine, Free	ASTM D-6584		0.020%	0.008	mass %
Glycerine, Total	ASTM D-6584		0.240%	0.127	mass %
Glycerine, monoglycerides	ASTM D-6584	Report %		0.389	mass %
Glycerine, diglycerides	ASTM D-6584	Report %		0.121	mass %
Glycerine, triglycerides	ASTM D-6584	Report %		0.000	mass %
Metals: Calcium & Magnesium	EN-14538		5 ppm	< 1 ²	ppm
Metals: Phosphorus	ASTM D-4951		0.001%	< 0.0001 ²	mass %
Metals: Potassium & Sodium	EN-14538		5 ppm	< 1 ²	ppm
Moisture Content by K.F.	ASTM D-6304	Report		0.005	volume %
Oxidation Stability	EN 14112	3 Hours		>12	Hours
Sulfated Ash	ASTM D-874		0.020%	< 0.001 ²	mass %
Sulfur	ASTM D-5453		15 ppm	7.9	ppm
Viscosity	ASTM D-445	1.9 mm ² /s	6.0 mm ² /s	4.8	mm ² /s
Water & Sediment	ASTM D-2709		0.050	< 0.005	%

¹Denotes typical test results from outside lab analysis performed by LCS LLP on lot 08120310.

²Denotes typical test result from last lot with that analysis performed: lot # 06011711.

COA approved by Jacob McClernon, QMR.

REC 8.4, Approved by QMR: Effective 10/3/08



DIRECT FUELS BIODIESEL

12485 Calloway Cemetery Road
 Euless, TX 76040
 (817)-354-2780

CERTIFICATE OF ANALYSIS

LOT NUMBER: 07030311

SAMPLE DATE: 3/3/2011

SAMPLE TYPE: Biodiesel

Test	Test Method	Min.	Max	Results	Units
Acid Number	ASTM D-664		0.50	0.47	mg KOH/g
Appearance	Visual	Report		Clear and Free	
Carbon Residue	ASTM D-4530		0.050%	< 0.001	mass %
Cetane	ASTM D-613	47		53 ¹	
Cloud Point	ASTM D-2500	Report °C		15	°C
Cold Soak Filtration	ASTM D-6751 Annex		200	89	seconds
Copper Corrosion	ASTM D-130		3	1A	
Distillation	ASTM D-1160		360 °C	324 ¹	°C
Flash Point	ASTM D-93A	130 °C		162.5	°C
Haze Rating	ASTM D-4176		2	1	
Glycerine, Free	ASTM D-6584		0.020%	0.002	mass %
Glycerine, Total	ASTM D-6584		0.240%	0.101	mass %
-Glycerine, monoglycerides	ASTM D-6584	Report %		0.326	mass %
-Glycerine, diglycerides	ASTM D-6584	Report %		0.097	mass %
-Glycerine, triglycerides	ASTM D-6584	Report %		0.000	mass %
Metals: Calcium & Magnesium	EN-14538		5 ppm	< 1 ²	ppm
Metals: Phosphorus	ASTM D-4951		0.001%	< 0.0001 ²	mass %
Metals: Potassium & Sodium	EN-14538		5 ppm	< 1 ²	ppm
Moisture Content by K.F.	ASTM D-6304	Report		0.006	volume %
Oxidation Stability	EN 14112	3 Hours		9.7	Hours
Sulfated Ash	ASTM D-874		0.020%	< 0.001 ²	mass %
Sulfur	ASTM D-5453		15 ppm	6.2	ppm
Viscosity	ASTM D-445	1.9 mm ² /s	6.0 mm ² /s	4.8	mm ² /s
Water & Sediment	ASTM D-2709		0.050	< 0.005	%

¹ Denotes typical test results from outside lab analysis performed by LCS LLP on lot 08120310.

² Denotes typical test result from last lot with that analysis performed: lot # 09021711.

COA approved by Jacob McClernon, QMR.

REC 8.4, Approved by QMR: Effective 10/3/08



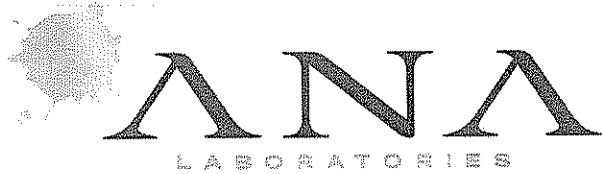
130-B, HARDING AVE. BELLMAWR, NJ 08031
 P.O. BOX 727 BELLMAWR, NJ 08099-0029
 PHONE: 1-800-648-2625 or 856-931-0011
 FAX: 856-931-5205
 EMAIL: lab@analaboratories.com

Lab Number: S09M18457
 Customer I.D: AMTRAKTX
 Source: 500 BASELINE
 Sample Date: 12/22/2009
 Product Type: B-100
 Report Date: 12/31/2009

AMTRAK
 ATTENTION:
 TIM COOPER
 400 SOUTH HOUSTON ST. STE. 100
 DALLAS, TX 75202

TEST DESCRIPTION	ASTM	SPECIFICATION	RESULT	UNITS
1) Flash Point	D-93	130 minimum	165	degrees Celsius
2) Water and Sediment	D-2709	0.0500 maximum	0.0150	volume %
3) Kinematic Viscosity @ 40 C	D-445	1.9 - 6.0	4.62	cSt
4) Sulfated Ash	D-874	0.020 maximum	0.001	weight %
5) Sulfur	D-5453	15 maximum	0.0005	parts per million
6) Copper Strip Corrosion	D-130	No. 3 maximum	1a	rating
7) Cetane Index	D-976	47 minimum	60.3	
8) Cloud Point	D-2500	Report	17	degrees Celsius
9) Carbon Residue	D-4530	0.0050 maximum	0.0031	weight %
11) Acid Number	D-664	0.50 maximum	0.30	mg KOH/g
12) Free Glycerin	D-6584	0.020 maximum	0.230 **	volume %
13) Total Glycerin	D-6584	0.240 maximum	0.250 **	volume %
14) Phosphorus	D-4951	0.0010 maximum	<0.0001	weight %
14) Distillation Temperature 90%	D-1160	360 maximum	341	degrees Celsius
15) Calcium and Magnesium	EN14538	5 maximum	<1	parts per million
16) Sodium and Potassium	EN14538	5 maximum	<1	parts per million
17) Oxidation Stability	EN14112	3 minimum	>10	hours

Comment: Results for Free and Total Glycerin are not with ASTM specifications.



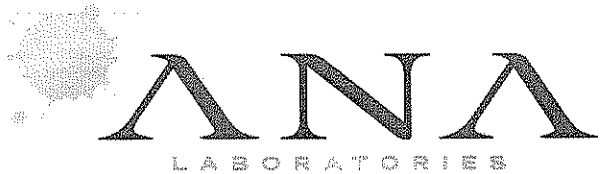
130-B, HARDING AVE. BELLMAWR, NJ 08031
 P.O. BOX 727 BELLMAWR, NJ 08099-0029
 PHONE: 1-800-648-2625 or 856-931-0011
 FAX: 856-931-5205
 EMAIL: lab@analaboratories.com

Lab Number: S10B2442
 Customer I.D: AMTRAKTX
 Source: 500 B100
 Sample Date: 1/21/2010
 Product Type: B-100
 Report Date: 2/12/2010

AMTRAK
 ATTENTION:
 TIM COOPER
 400 SOUTH HOUSTON ST. STE. 100
 DALLAS, TX 75202

TEST DESCRIPTION	ASTM	SPECIFICATION	RESULT	UNITS
1) Flash Point	D-93	130 minimum	146	degrees Celsius
2) Water and Sediment	D-2709	0.0500 maximum	0.0100	volume %
3) Kinematic Viscosity @ 40 C	D-445	1.9 - 6.0	4.67	cSt
4) Sulfated Ash	D-874	0.020 maximum	0.001	weight %
5) Sulfur	D-5453	15 maximum	0.0007	parts per million
6) Copper Strip Corrosion	D-130	No. 3 maximum	1a	rating
7) Cetane Index	D-976	47 minimum	59.1	
8) Cloud Point	D-2500	Report	17	degrees Celsius
9) Carbon Residue	D-4530	0.0050 maximum	0.049	weight %
11) Acid Number	D-664	0.50 maximum	0.28	mg KOH/g
12) Free Glycerin	D-6584	0.020 maximum	0.00	volume %
13) Total Glycerin	D-6584	0.240 maximum	0.00	volume %
14) Phosphorus	D-4951	0.0010 maximum	<0.0001	weight %
14) Distillation Temperature 90%	D-1160	360 maximum	331	degrees Celsius
15) Calcium and Magnesium	EN14538	5 maximum	<1	parts per million
16) Sodium and Potassium	EN14538	5 maximum	<1	parts per million
17) Oxidation Stability	EN14112	3 minimum	>10	hours

Comment: Results are within specifications.



130-B, HARDING AVE. BELLMAWR, NJ 08031
 P.O. BOX 727 BELLMAWR, NJ 08099-0029
 PHONE: 1-800-648-2625 or 856-931-0011
 FAX: 856-931-5205
 EMAIL: lab@analaboratories.com

Lab Number: S10B9637
 Customer I.D: AMTRAKTX
 Source: Fort Worth
 B-100
 Sample Date: 2/9/2010
 Product Type: B-100
 Report Date: 2/22/2010

AMTRAK
 ATTENTION:
 TIM COOPER
 400 SOUTH HOUSTON ST. STE. 100
 DALLAS, TX 75202

TEST DESCRIPTION	ASTM	SPECIFICATION	RESULT	UNITS
1) Flash Point	D-93	130 minimum	163	degrees Celsius
2) Water and Sediment	D-2709	0.0500 maximum	0.0100	volume %
3) Kinematic Viscosity @ 40 C	D-445	1.9 - 6.0	4.69	cSt
4) Sulfated Ash	D-874	0.020 maximum	0.001	weight %
5) Sulfur	D-5453	15 maximum	0.0007	parts per million
6) Copper Strip Corrosion	D-130	No. 3 maximum	1a	rating
7) Cetane Index	D-976	47 minimum	58.9	
8) Cloud Point	D-2500	Report	17	degrees Celsius
9) Carbon Residue	D-4530	0.0050 maximum	0.022	weight %
11) Acid Number	D-664	0.50 maximum	0.28	mg KOH/g
12) Free Glycerin	D-6584	0.020 maximum	0.095**	volume %
13) Total Glycerin	D-6584	0.240 maximum	0.101	volume %
14) Phosphorus	D-4951	0.0010 maximum	<0.0001	weight %
14) Distillation Temperature 90%	D-1160	360 maximum	338	degrees Celsius
15) Calcium and Magnesium	EN14538	5 maximum	<1	parts per million
16) Sodium and Potassium	EN14538	5 maximum	<1	parts per million
17) Oxidation Stability	EN14112	3 minimum	>10	hours

Comment: **Test result is not within specifications.



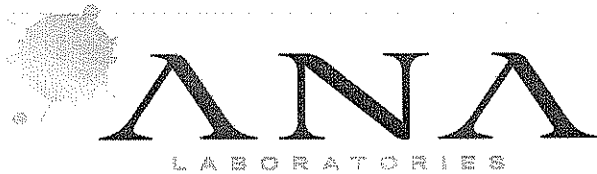
130-B, HARDING AVE. BELLMAWR, NJ 08031
 P.O. BOX 727 BELLMAWR, NJ 08099-0029
 PHONE: 1-800-648-2625 or 856-931-0011
 FAX: 856-931-5205
 EMAIL: lab@analaboratories.com

Lab Number: S10L4238
 Customer I.D: AMTRAKTX
 Source: Fort Worth
 B-100
 Sample Date: 10/27/2010
 Product Type: B-100
 Report Date: 11/11/2010

AMTRAK
 ATTENTION:
 TIM COOPER
 400 SOUTH HOUSTON ST. STE. 100
 DALLAS, TX 75202

TEST DESCRIPTION	ASTM	SPECIFICATION	RESULT	UNITS
1) Flash Point	D-93	130 minimum	179	degrees Celsius
2) Water and Sediment	D-2709	0.0500 maximum	0.0100	volume %
3) Kinematic Viscosity @ 40 C	D-445	1.9 - 6.0	4.76	cSt
4) Sulfated Ash	D-874	0.020 maximum	0.001	weight %
5) Sulfur	D-5453	15 maximum	0.0014	parts per million
6) Copper Strip Corrosion	D-130	No. 3 maximum	1a	rating
7) Cetane Index	D-976	47 minimum	59.6	
8) Cloud Point	D-2500	Report	16	degrees Celsius
9) Carbon Residue	D-4530	0.0050 maximum	0.029	weight %
11) Acid Number	D-664	0.50 maximum	0.3	mg KOH/g
12) Free Glycerin	D-6584	0.020 maximum	0.0	volume %
13) Total Glycerin	D-6584	0.240 maximum	0.0	volume %
14) Phosphorus	D-4951	0.0010 maximum	<0.0001	weight %
14) Distillation Temperature 90%	D-1160	360 maximum	336	degrees Celsius
15) Calcium and Magnesium	EN14538	5 maximum	<1	parts per million
16) Sodium and Potassium	EN14538	5 maximum	<1	parts per million
17) Oxidation Stability	EN14112	3 minimum	>10	hours

Comment: Test data as per your request.



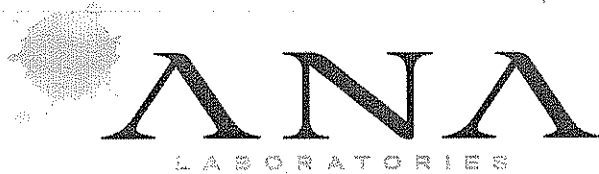
130-B, HARDING AVE. BELLMAWR, NJ 08031
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 PHONE: 1-800-648-2625 or 856-931-0011
 FAX: 856-931-5205
 EMAIL: lab@analaboratories.com

Lab Number: S09M18456
 Customer I.D: AMTRAKTX
 Source: 500 BASELINE
 Sample Date: 12/22/2009
 Product Type: B-20
 Report Date: 12/31/2009

AMTRAK
 ATTENTION:
 TIM COOPER
 400 SOUTH HOUSTON ST. STE. 100
 DALLAS, TX 75202

TEST DESCRIPTION	ASTM	SPECIFICATION	RESULT	UNITS
1) Flash Point	D-93	52 minimum	72	degrees Celsius
2) Water and Sediment	D-2709	0.0500 maximum	<0.0010	volume %
3) Kinematic Viscosity @ 40 C	D-445	1.9 - 4.1	3.19	cSt
4) Ash content	D-482	0.01 maximum	0.003	weight %
5) Sulfur	D-5453	15 maximum	9	parts per million
6) Copper Strip Corrosion	D-130	No. 3 maximum	1a	rating
7) Cetane Index	D-976	40 minimum	45.6	
8) Cloud Point	D-2500	Report	-6	degrees Celsius
9) Carbon Residue 10 %	D-524	0.3500 maximum	0.1010	weight %
10) Aromaticity	D-1319	35 maximum	46.6 **	volume %
11) Acid Number	D-664	0.3 maximum	0.12	mg KOH/g
12) Free Glycerin	D-6584	Report	0.07	volume %
13) Total Glycerin	D-6584	Report	0.07	volume %
14) Distillation Temperature 90%	D-86	343 maximum	336	degrees Celsius
15) Biodiesel Content	D-7371	6-20	17.4	volume %
16) Oxidation Stability	EN14112	6 minimum	>10	hours
17) Lubricity	D-6079	520 maximum	207	microns

Comment: Result for Aromaticity is not with ASTM specifications.



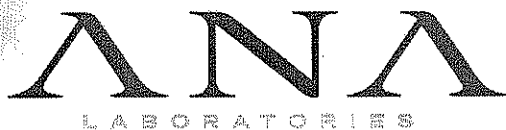
130-B, HARDING AVE. BELLMAWR, NJ 08031
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 PHONE: 1-800-648-2625 or 856-931-0011
 FAX: 856-931-5205
 EMAIL: lab@analaboratories.com

Lab Number: S10B2441
Customer I.D.: AMTRAKTX
Source: 500 B20
Sample Date: 1/21/2010
Product Type: B-20
Report Date: 2/12/2010

AMTRAK
ATTENTION:
TIM COOPER
 400 SOUTH HOUSTON ST. STE. 100
 DALLAS, TX 75202

TEST DESCRIPTION	ASTM	SPECIFICATION	RESULT	UNITS
1) Flash Point	D-93	52 minimum	74	degrees Celsius
2) Water and Sediment	D-2709	0.0500 maximum	<0.0010	volume %
3) Kinematic Viscosity @ 40 C	D-445	1.9 - 4.1	3.14	cSt
4) Ash content	D-482	0.01 maximum	0.003	weight %
5) Sulfur	D-5453	15 maximum	9	parts per million
6) Copper Strip Corrosion	D-130	No. 3 maximum	1a	rating
7) Cetane Index	D-976	40 minimum	53.3	
8) Cloud Point	D-2500	Report	7	degrees Celsius
9) Carbon Residue 10 %	D-524	0.3500 maximum	0.040	weight %
10) Aromaticity	D-1319	35 maximum	31	volume %
11) Acid Number	D-664	0.3 maximum	0.19	mg KOH/g
12) Free Glycerin	D-6584	Report	0.00	volume %
13) Total Glycerin	D-6584	Report	0.00	volume %
14) Distillation Temperature 90%	D-86	343 maximum	331	degrees Celsius
15) Biodiesel Content	D-7371	6-20	20	volume %
16) Oxidation Stability	EN14112	6 minimum	>10	hours
17) Lubricity	D-6079	520 maximum	195	microns

Comment: Results are within specification. Please note, Cloud Point is only 7 C (44 F).



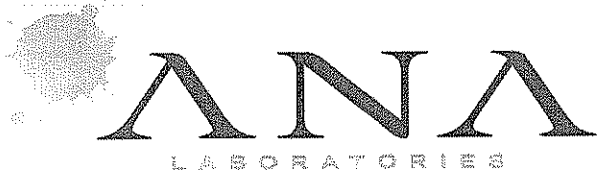
130-B, HARDING AVE. BELLMAWR, NJ 08031
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 FAX: 856-931-5205
 EMAIL: lab@analaboratories.com

Lab Number: S10B9636
 Customer I.D: AMTRAKFTX
 Source: Fort Worth
 B-20
 Sample Date: 2/9/2010
 Product Type: B-20
 Report Date: 2/22/2010

AMTRAK
 ATTENTION:
 TIM COOPER
 400 SOUTH HOUSTON ST. STE. 100
 DALLAS, TX 75202

TEST DESCRIPTION	ASTM	SPECIFICATION	RESULT	UNITS
1) Flash Point	D-93	52 minimum	67	degrees Celsius
2) Water and Sediment	D-2709	0.0500 maximum	<0.0010	volume %
3) Kinematic Viscosity @ 40 C	D-445	1.9 - 4.1	3.14	cSt
4) Ash content	D-482	0.01 maximum	0.003	weight %
5) Sulfur	D-5453	15 maximum	9	parts per million
6) Copper Strip Corrosion	D-130	No. 3 maximum	1a	rating
7) Cetane Index	D-976	40 minimum	47.2	
8) Cloud Point	D-2500	Report	-6	degrees Celsius
9) Carbon Residue 10 %	D-524	0.3500 maximum	0.051	weight %
10) Aromaticity	D-1319	35 maximum	24	volume %
11) Acid Number	D-664	0.3 maximum	0.19	mg KOH/g
12) Free Glycerin	D-6584	Report	0.00	volume %
13) Total Glycerin	D-6584	Report	0.00	volume %
14) Distillation Temperature 90%	D-86	343 maximum	333	degrees Celsius
15) Biodiesel Content	D-7371	6-20	20	volume %
16) Oxidation Stability	EN14112	6 minimum	>10	hours
17) Lubricity	D-6079	520 maximum	212	microns

Comment: Test results are within specification.



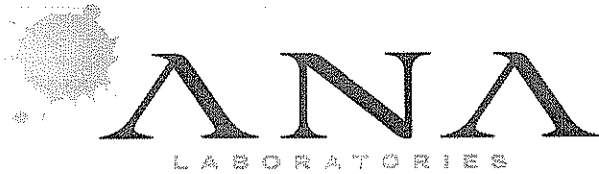
130-B, HARDING AVE. BELLMAWR, NJ 08031
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 PHONE: 1-800-648-2625 or 856-931-0011
 FAX: 856-931-5205
 EMAIL: lab@analaboratories.com

Lab Number: S10G17927
 Customer I.D: AMTRAKFTX
 Source: Fort Worth
 B-20
 Sample Date: 7/27/2010
 Product Type: B-20
 Report Date: 8/9/2010

AMTRAK
 ATTENTION:
 TIM COOPER
 400 SOUTH HOUSTON ST. STE. 100
 DALLAS, TX 75202

TEST DESCRIPTION	ASTM	SPECIFICATION	RESULT	UNITS
1) Flash Point	D-93	52 minimum	73	degrees Celsius
2) Water and Sediment	D-2709	0.0500 maximum	<0.0010	volume %
3) Kinematic Viscosity @ 40 C	D-445	1.9 - 4.1	2.62	cSt
4) Ash content	D-482	0.01 maximum	0.003	weight %
5) Sulfur	D-5453	15 maximum	8	parts per million
6) Copper Strip Corrosion	D-130	No. 3 maximum	1a	rating
7) Cetane Index	D-976	40 minimum	46.4	
8) Cloud Point	D-2500	Report	-6	degrees Celsius
9) Carbon Residue 10 %	D-524	0.3500 maximum	0.052	weight %
10) Aromaticity	D-1319	35 maximum	22	volume %
11) Acid Number	D-664	0.3 maximum	0.17	mg KOH/g
12) Free Glycerin	D-6584	Report	0.00	volume %
13) Total Glycerin	D-6584	Report	0.00	volume %
14) Distillation Temperature 90%	D-86	343 maximum	328	degrees Celsius
15) Biodiesel Content	D-7371	6-20	19.9	volume %
16) Oxidation Stability	EN14112	6 minimum	>10	hours
17) Lubricity	D-6079	520 maximum	209	microns

Comment: Test results are within specification.



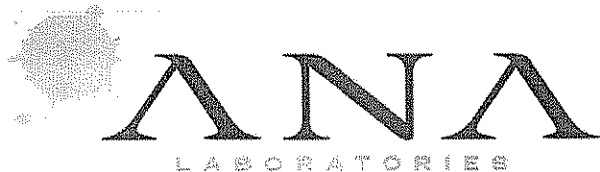
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 PHONE: 1-800-648-2625 or 856-931-0011
 FAX: 856-931-5205
 EMAIL: lab@analaboratories.com

Lab Number: S10H8698
 Customer I.D: AMTRAKFTX
 Source: Fort Worth
 B-20
 Sample Date: 8/2/2010
 Product Type: B-20
 Report Date: 9/7/2010

AMTRAK
 ATTENTION:
 TIM COOPER
 400 SOUTH HOUSTON ST. STE. 100
 DALLAS, TX 75202

TEST DESCRIPTION	ASTM	SPECIFICATION	RESULT	UNITS
1) Flash Point	D-93	52 minimum	67	degrees Celsius
2) Water and Sediment	D-2709	0.0500 maximum	<0.0010	volume %
3) Kinematic Viscosity @ 40 C	D-445	1.9 - 4.1	2.70	cSt
4) Ash content	D-482	0.01 maximum	0.003	weight %
5) Sulfur	D-5453	15 maximum	7	parts per million
6) Copper Strip Corrosion	D-130	No. 3 maximum	1a	rating
7) Cetane Index	D-976	40 minimum	47.0	
8) Cloud Point	D-2500	Report	-5	degrees Celsius
9) Carbon Residue 10 %	D-524	0.3500 maximum	0.072	weight %
10) Aromaticity	D-1319	35 maximum	20	volume %
11) Acid Number	D-664	0.3 maximum	0.20	mg KOH/g
12) Free Glycerin	D-6584	Report	0.00	volume %
13) Total Glycerin	D-6584	Report	0.00	volume %
14) Distillation Temperature 90%	D-86	343 maximum	330	degrees Celsius
15) Biodiesel Content	D-7371	6-20	20.0	volume %
16) Oxidation Stability	EN14112	6 minimum	>10	hours
17) Lubricity	D-6079	520 maximum	187	microns

Comment: Test results are within specification.



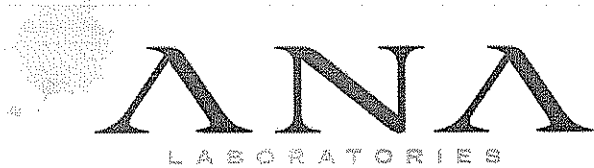
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 FAX: 856-931-5205
 EMAIL: lab@analaboratories.com

Lab Number: S10J10382
 Customer I.D: AMTRAKFTX
 Source: 500
 FUEL
 Sample Date: 9/13/2010
 Product Type: FUEL
 Report Date: 10/7/2010

AMTRAK
 ATTENTION:
 TIM COOPER
 400 SOUTH HOUSTON ST. STE. 100
 DALLAS, TX 75202

TEST DESCRIPTION	ASTM	SPECIFICATION	RESULT	UNITS
1) Flash Point	D-93	52 minimum	69	degrees Celsius
2) Water and Sediment	D-2709	0.0500 maximum	<0.0010	volume %
3) Kinematic Viscosity @ 40 C	D-445	1.9 - 4.1	2.44	cSt
4) Ash content	D-482	0.01 maximum	0.003	weight %
5) Sulfur	D-5453	15 maximum	6	parts per million
6) Copper Strip Corrosion	D-130	No. 3 maximum	1a	rating
7) Cetane Index	D-976	40 minimum	49.2	
8) Cloud Point	D-2500	Report	-5	degrees Celsius
9) Carbon Residue 10 %	D-524	0.3500 maximum	0.044	weight %
10) Aromaticity	D-1319	35 maximum	20	volume %
11) Acid Number	D-664	0.3 maximum	0.18	mg KOH/g
12) Free Glycerin	D-6584	Report	0.00	volume %
13) Total Glycerin	D-6584	Report	0.00	volume %
14) Distillation Temperature 90%	D-86	343 maximum	327	degrees Celsius
15) Biodiesel Content	D-7371	6-20	19.9	volume %
16) Oxidation Stability	EN14112	6 minimum	>10	hours
17) Lubricity	D-6079	520 maximum	182	microns

Comment: Test results are within specification.



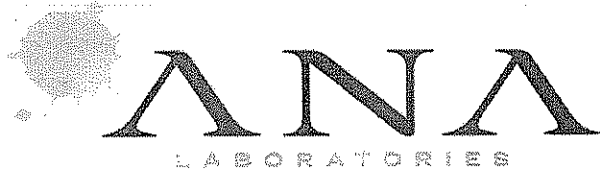
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 FAX: 856-931-5205
 EMAIL: lab@analaboratories.com

Lab Number: S10K18234
 Customer I.D: AMTRAKFTX
 Source: 500
 FUEL
 Sample Date: 10/28/2010
 Product Type: FUEL
 Report Date: 11/6/2010

AMTRAK
 ATTENTION:
 TIM COOPER
 400 SOUTH HOUSTON ST. STE. 100
 DALLAS, TX 75202

TEST DESCRIPTION	ASTM	SPECIFICATION	RESULT	UNITS
1) Flash Point	D-93	52 minimum	72	degrees Celsius
2) Water and Sediment	D-2709	0.0500 maximum	<0.0010	volume %
3) Kinematic Viscosity @ 40 C	D-445	1.9 - 4.1	2.78	cSt
4) Ash content	D-482	0.01 maximum	0.003	weight %
5) Sulfur	D-5453	15 maximum	6	parts per million
6) Copper Strip Corrosion	D-130	No. 3 maximum	1a	rating
7) Cetane Index	D-976	40 minimum	51	
8) Cloud Point	D-2500	Report	27	degrees Celsius
9) Carbon Residue 10 %	D-524	0.3500 maximum	0.104	weight %
10) Aromaticity	D-1319	35 maximum	23	volume %
11) Acid Number	D-664	0.3 maximum	0.22	mg KOH/g
12) Free Glycerin	D-6584	Report	0.00	volume %
13) Total Glycerin	D-6584	Report	0.00	volume %
14) Distillation Temperature 90%	D-86	343 maximum	328	degrees Celsius
15) Biodiesel Content	D-7371	6-20	20.6	volume %
16) Oxidation Stability	EN14112	6 minimum	>10	hours
17) Lubricity	D-6079	520 maximum	201	microns

Comment: Test results are within specification.



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EMAIL: lab@analaboratories.com

Lab Number: S10M8815
Customer I.D: AMTRAKFTX
Source: 500
FUEL
Sample Date: 12/8/2010
Product Type: FUEL
Report Date: 12/23/2010

AMTRAK
ATTENTION:
TIM COOPER
400 SOUTH HOUSTON ST. STE. 100
DALLAS, TX 75202

TEST DESCRIPTION	ASTM	SPECIFICATION	RESULT	UNITS
1) Flash Point	D-93	52 minimum	67	degrees Celsius
2) Water and Sediment	D-2709	0.0500 maximum	<0.0010	volume %
3) Kinematic Viscosity @ 40 C	D-445	1.9 - 4.1	2.81	cSt
4) Ash content	D-482	0.01 maximum	0.003	weight %
5) Sulfur	D-5453	15 maximum	13	parts per million
6) Copper Strip Corrosion	D-130	No. 3 maximum	1a	rating
7) Cetane Index	D-976	40 minimum	49.5	
8) Cloud Point	D-2500	Report	-5	degrees Celsius
9) Carbon Residue 10 %	D-524	0.3500 maximum	0.040	weight %
10) Aromaticity	D-1319	35 maximum	15	volume %
11) Acid Number	D-664	0.3 maximum	0.18	mg KOH/g
12) Free Glycerin	D-6584	Report	0.00	volume %
13) Total Glycerin	D-6584	Report	0.00	volume %
14) Distillation Temperature 90%	D-86	343 maximum	330	degrees Celsius
15) Biodiesel Content	D-7371	6-20	19.5	volume %
16) Oxidation Stability	EN14112	6 minimum	>10	hours
17) Lubricity	D-6079	520 maximum	160	microns

Comment: Test results are within specification.



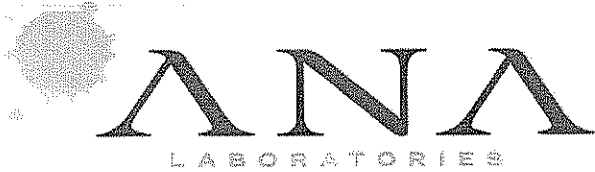
130-B, HARDING AVE. BELLMAWR, NJ 08031
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 EMAIL: lab@analaboratories.com

Lab Number: S11B880
 Customer I.D: AMTRAKFTX
 Source: 500
 FUEL
 Sample Date: 1/27/2011
 Product Type: Bio-Diesel 20 %
 Report Date: 2/25/2011

AMTRAK
 ATTENTION:
 TIM COOPER
 400 SOUTH HOUSTON ST. STE. 100
 DALLAS, TX 75202

TEST DESCRIPTION	ASTM	SPECIFICATION	RESULT	UNITS
1) Flash Point	D-93	52 minimum	68	degrees Celsius
2) Water and Sediment	D-2709	0.0500 maximum	<0.0010	volume %
3) Kinematic Viscosity @ 40 C	D-445	1.9 - 4.1	2.81	cSt
4) Ash content	D-482	0.01 maximum	0.004	weight %
5) Sulfur	D-5453	15 maximum	9	parts per million
6) Copper Strip Corrosion	D-130	No. 3 maximum	1a	rating
7) Cetane Index	D-976	40 minimum	49.1	
8) Cloud Point	D-2500	Report	-4	degrees Celsius
9) Carbon Residue 10 %	D-524	0.3500 maximum	0.074	weight %
10) Aromaticity	D-1319	35 maximum	16	volume %
11) Acid Number	D-664	0.3 maximum	0.21	mg KOH/g
12) Free Glycerin	D-6584	Report	0.00	volume %
13) Total Glycerin	D-6584	Report	0.00	volume %
14) Distillation Temperature 90%	D-86	343 maximum	329	degrees Celsius
15) Biodiesel Content	D-7371	6-20	20.8	volume %
16) Oxidation Stability	EN14112	6 minimum	>10	hours
17) Lubricity	D-6079	520 maximum	208	microns

Comment: Test results are within specification.



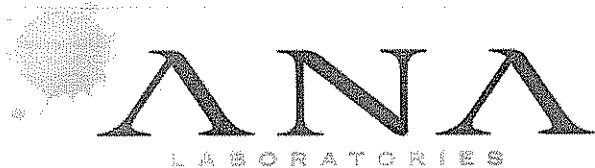
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 EMAIL: lab@analaboratories.com

Lab Number: S11B19763
 Customer I.D: AMTRAKFTX
 Source: 500
 FUEL
 Sample Date: 2/22/2011
 Product Type: Bio-Diesel 20 %
 Report Date: 3/8/2011

AMTRAK
 ATTENTION:
 TIM COOPER
 400 SOUTH HOUSTON ST. STE. 100
 DALLAS, TX 75202

TEST DESCRIPTION	ASTM	SPECIFICATION	RESULT	UNITS
1) Flash Point	D-93	52 minimum	71	degrees Celsius
2) Water and Sediment	D-2709	0.0500 maximum	<0.0010	volume %
3) Kinematic Viscosity @ 40 C	D-445	1.9 - 4.1	2.84	cSt
4) Ash content	D-482	0.01 maximum	0.004	weight %
5) Sulfur	D-5453	15 maximum	10	parts per million
6) Copper Strip Corrosion	D-130	No. 3 maximum	1a	rating
7) Cetane Index	D-976	40 minimum	48.3	
8) Cloud Point	D-2500	Report	-4	degrees Celsius
9) Carbon Residue 10 %	D-524	0.3500 maximum	0.048	weight %
10) Aromaticity	D-1319	35 maximum	13	volume %
11) Acid Number	D-664	0.3 maximum	0.20	mg KOH/g
12) Free Glycerin	D-6584	Report	0.00	volume %
13) Total Glycerin	D-6584	Report	0.00	volume %
14) Distillation Temperature 90%	D-86	343 maximum	327	degrees Celsius
15) Biodiesel Content	D-7371	6-20	19.0	volume %
16) Oxidation Stability	EN14112	6 minimum	>10	hours
17) Lubricity	D-6079	520 maximum	233	microns

Comment: Test results are within specification.



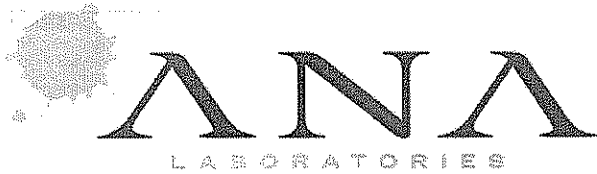
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 FAX: 856-931-5205
 EMAIL: lab@analaboratories.com

Lab Number: S11D6748
 Customer I.D: AMTRAKFTX
 Source: 500
 FUEL
 Sample Date: 3/22/2011
 Product Type: Bio-Diesel 20 %
 Report Date: 4/19/2011

AMTRAK
 ATTENTION:
 TIM COOPER
 400 SOUTH HOUSTON ST. STE. 100
 DALLAS, TX 75202

TEST DESCRIPTION	ASTM	SPECIFICATION	RESULT	UNITS
1) Flash Point	D-93	52 minimum	66	degrees Celsius
2) Water and Sediment	D-2709	0.0500 maximum	<0.0010	volume %
3) Kinematic Viscosity @ 40 C	D-445	1.9 - 4.1	2.94	cSt
4) Ash content	D-482	0.01 maximum	0.004	weight %
5) Sulfur	D-5453	15 maximum	9	parts per million
6) Copper Strip Corrosion	D-130	No. 3 maximum	1a	rating
7) Cetane Index	D-976	40 minimum	50.9	
8) Cloud Point	D-2500	Report	-3	degrees Celsius
9) Carbon Residue 10 %	D-524	0.3500 maximum	0.029	weight %
10) Aromaticity	D-1319	35 maximum	13	volume %
11) Acid Number	D-664	0.3 maximum	0.20	mg KOH/g
12) Free Glycerin	D-6584	Report	0.00	volume %
13) Total Glycerin	D-6584	Report	0.00	volume %
14) Distillation Temperature 90%	D-86	343 maximum	326	degrees Celsius
15) Biodiesel Content	D-7371	6-20	22.1	volume %
16) Oxidation Stability	EN14112	6 minimum	>10	hours
17) Lubricity	D-6079	520 maximum	208	microns

Comment: Bio content is above the 20% maximum.



130-B, HARDING AVE. BELLMAWR, NJ 08031
 P.O. BOX 727 BELLMAWR, NJ 08099-0029
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 FAX: 856-931-5205
 EMAIL: lab@analaboratories.com

Lab Number: S11D7238
 Customer I.D: AMTRAKFTX
 Source: 500
 FUEL
 Sample Date: 4/6/2011
 Product Type: Bio-Diesel 20 %
 Report Date: 4/19/2011

AMTRAK
 ATTENTION:
 TIM COOPER
 400 SOUTH HOUSTON ST. STE. 100
 DALLAS, TX 75202

TEST DESCRIPTION	ASTM	SPECIFICATION	RESULT	UNITS
1) Flash Point	D-93	52 minimum	71	degrees Celsius
2) Water and Sediment	D-2709	0.0500 maximum	<0.0010	volume %
3) Kinematic Viscosity @ 40 C	D-445	1.9 - 4.1	2.85	cSt
4) Ash content	D-482	0.01 maximum	.005	weight %
5) Sulfur	D-5453	15 maximum	11	parts per million
6) Copper Strip Corrosion	D-130	No. 3 maximum	1a	rating
7) Cetane Index	D-976	40 minimum	46.1	
8) Cloud Point	D-2500	Report	-11	degrees Celsius
9) Carbon Residue 10 %	D-524	0.3500 maximum	.062	weight %
10) Aromaticity	D-1319	35 maximum	13	volume %
11) Acid Number	D-664	0.3 maximum	0.20	mg KOH/g
12) Free Glycerin	D-6584	Report	0.00	volume %
13) Total Glycerin	D-6584	Report	0.00	volume %
14) Distillation Temperature 90%	D-86	343 maximum	326	degrees Celsius
15) Biodiesel Content	D-7371	6-20	9.3	volume %
16) Oxidation Stability	EN14112	6 minimum	>10	hours
17) Lubricity	D-6079	520 maximum	179	microns

Comment: Bio content is above the 20% maximum.



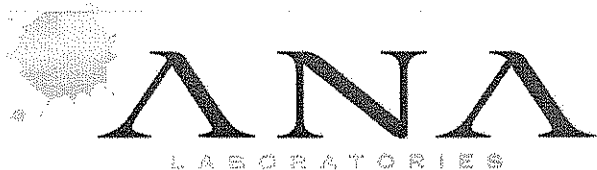
130-B, HARDING AVE. BELLMAWR, NJ 08031
 P.O. BOX 727 BELLMAWR, NJ 08099-0029
 PHONE: 1-800-648-2625 or 856-931-0011
 FAX: 856-931-5205
 EMAIL: lab@analaboratories.com

Lab Number: S11E1513
 Customer I.D: AMTRAKFTX
 Source: 500
 FUEL
 Sample Date: 4/26/2011
 Product Type: Bio-Diesel 20 %
 Report Date: 5/18/2011

AMTRAK
 ATTENTION:
 TIM COOPER
 400 SOUTH HOUSTON ST. STE. 100
 DALLAS, TX 75202

TEST DESCRIPTION	ASTM	SPECIFICATION	RESULT	UNITS
1) Flash Point	D-93	52 minimum	73	degrees Celsius
2) Water and Sediment	D-2709	0.0500 maximum	<0.0010	volume %
3) Kinematic Viscosity @ 40 C	D-445	1.9 - 4.1	2.89	cSt
4) Ash content	D-482	0.01 maximum	0.005	weight %
5) Sulfur	D-5453	15 maximum	4	parts per million
6) Copper Strip Corrosion	D-130	No. 3 maximum	1a	rating
7) Cetane Index	D-976	40 minimum	50.5	
8) Cloud Point	D-2500	Report	-12	degrees Celsius
9) Carbon Residue 10 %	D-524	0.3500 maximum	0.033	weight %
10) Aromaticity	D-1319	35 maximum	14	volume %
11) Acid Number	D-664	0.3 maximum	0.16	mg KOH/g
12) Free Glycerin	D-6584	Report	0.00	volume %
13) Total Glycerin	D-6584	Report	0.00	volume %
14) Distillation Temperature 90%	D-86	343 maximum	327	degrees Celsius
15) Biodiesel Content	D-7371	6-20	17.8	volume %
16) Oxidation Stability	EN14112	6 minimum	>10	hours
17) Lubricity	D-6079	520 maximum	171	microns

Comment: All test results are within specifications.



130-B, HARDING AVE. BELLMAWR, NJ 08031
 P.O. BOX 727 BELLMAWR, NJ 08099-0029
 PHONE: 1-800-648-2625 or 856-931-0011
 FAX: 856-931-5205
 EMAIL: lab@analaboratories.com

Lab Number: S11E12257
 Customer I.D: AMTRAKFTX
 Source: 500
 FUEL
 Sample Date: 5/9/2011
 Product Type: Bio-Diesel 20 %
 Report Date: 6/8/2011

AMTRAK
ATTENTION:
TIM COOPER
 400 SOUTH HOUSTON ST. STE. 100
 DALLAS, TX 75202

TEST DESCRIPTION	ASTM	SPECIFICATION	RESULT	UNITS
1) Flash Point	D-93	52 minimum	73	degrees Celsius
2) Water and Sediment	D-2709	0.0500 maximum	<0.0010	volume %
3) Kinematic Viscosity @ 40 C	D-445	1.9 - 4.1	2.76	cSt
4) Ash content	D-482	0.01 maximum	0.005	weight %
5) Sulfur	D-5453	15 maximum	6	parts per million
6) Copper Strip Corrosion	D-130	No. 3 maximum	1a	rating
7) Cetane Index	D-976	40 minimum	46.6	
8) Cloud Point	D-2500	Report	-12	degrees Celsius
9) Carbon Residue 10 %	D-524	0.3500 maximum	0.048	weight %
10) Aromaticity	D-1319	35 maximum	15	volume %
11) Acid Number	D-664	0.3 maximum	0.24	mg KOH/g
12) Free Glycerin	D-6584	Report	0.00	volume %
13) Total Glycerin	D-6584	Report	0.00	volume %
14) Distillation Temperature 90%	D-86	343 maximum	324	degrees Celsius
15) Biodiesel Content	D-7371	6-20	18.7	volume %
16) Oxidation Stability	EN14112	6 minimum	>10	hours
17) Lubricity	D-6079	520 maximum	199	microns

Comment: All test results are within specifications.

Emissions Testing of Amtrak Unit #500

May 25, 2011
GE Transportation
Prepared by: Doug Glenn

On May 23, 2011 Amtrak Unit #500 was delivered to GE Transportation's locomotive emissions test facility in Erie, Pennsylvania. The unit had completed a one year test on B20 biodiesel fuel sponsored by Amtrak, Oklahoma Department of Transportation and the Federal Railroad Administration. GE was asked to conduct an emissions test on the unit at completion of the 1 year program to help understand emissions output with B20 fuel. The unit was delivered with a fuel tank full of B20 biodiesel for emissions testing. Inbound inspection of the unit revealed no visible leaks and no active alarms or faults. Unit #500 was built in 1991 and has an FDL 12 cylinder engine with a Tier 0 emissions upgrade.

The unit was pulled into the test facility and connected for emissions testing. This consisted of locating the unit under a stack containing sample probes for gaseous and particulate matter sampling as well as instrumentation for smoke opacity readings. Connections to the low pressure fuel system were made so that fuel consumption of the locomotive could be measured during testing. Electrical power from both the main and auxiliary alternators was measured. The unit was then tested according to procedures of 40 CFR Part92.

Two test cycles were completed on the unit. One cycle was completed using on-board B20 in the fuel tank. The other cycle was completed using petroleum diesel fuel. Fuel samples of both the on-board B20 and the petroleum diesel fuels were collected for analysis. The fuel analysis is included in Appendix A.

Plots of individual modal emissions are shown in figures 1-5. Data for low idle shows an unusually high difference in emissions and fuel consumption between B20 and diesel fuel. This anomaly in the data appears in gaseous, PM and fuel consumption data. Therefore the anomaly is unlikely a measurement issue as multiple measurement systems detected the same event. As it is not known what caused the anomaly and because the other two unloaded modes (idle and dynamic brake) show no such discrepancy, it would seem reasonable to conclude the event is just as likely an engine operating issue as it would be a result of fuel differences. Therefore, in Table 1 duty cycle composite emission test results are shown utilizing only 10 modes for B20 and diesel. This is accomplished by redistributing the low idle weighting factor to the idle mode for both B20 and diesel fuel. For completeness, Appendix B has a table similar to Table 1 and presents the duty cycle emissions data utilizing all eleven modes.

**NOTE: This document does not grant approval for use of biodiesel blends in GE locomotives.
Review applicable Maintenance Instructions for approved fuels.**

	Unit# Amtrak #500			
	Test Dates May 23 and 24, 2011			
	10 MODES			
	Line Haul Duty Cycle Results			
	BSHC	BSCO	BSNO_x	BSPM
	(gm/hp-hr)	(gm/hp-hr)	(gm/hp-hr)	(gm/hp-hr)
B20 Fuel	0.38	0.9	8.3	0.13
Diesel Fuel	0.40	0.8	7.9	0.14
Tier 0 Limits	1.00	5.0	9.5	0.60
	Switch Duty Cycle Results			
	BSHC	BSCO	BSNO_x	BSPM
	(gm/hp-hr)	(gm/hp-hr)	(gm/hp-hr)	(gm/hp-hr)
B20 Fuel	0.69	1.2	10.6	0.24
Diesel Fuel	0.72	1.2	10.2	0.24
Tier 0 Limits	2.10	8.0	14.0	0.72
	Smoke Opacity Results			
	Steady State	30 sec	3 sec	
B20 Fuel	12	16	35	
Diesel Fuel	11	15	34	
Tier 0 Limits	30	40	50	

Table 1 – Amtrak #500 Emissions Results (10 modes)

The tested emissions results and Tier 0 limits are shown above. Figures 1-5 below show how low idle gaseous emission, PM and fuel rate differ between the two fuels during their respective test runs.

NOTE: This document does not grant approval for use of biodiesel blends in GE locomotives. Review applicable Maintenance Instructions for approved fuels.

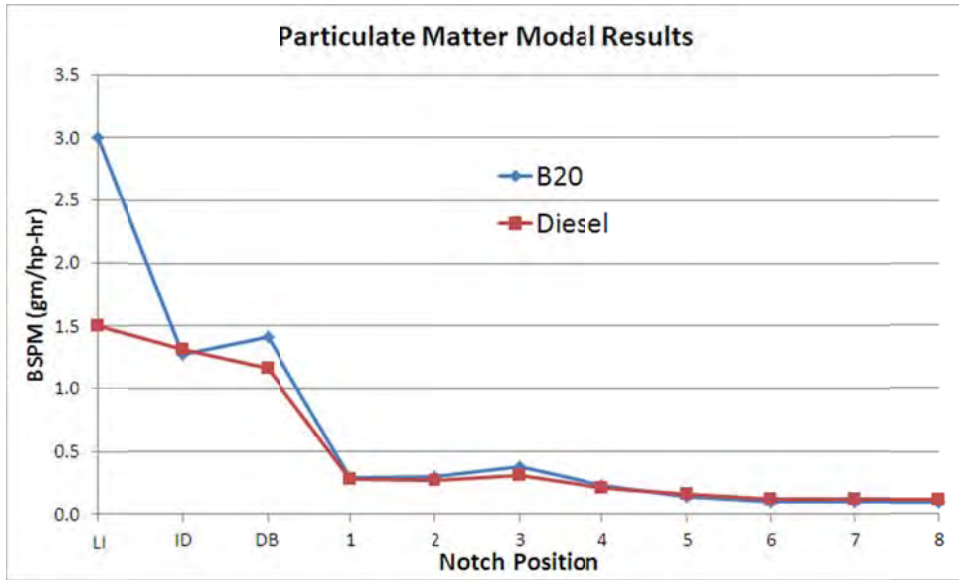


Figure 1 – Modal Particulate Results

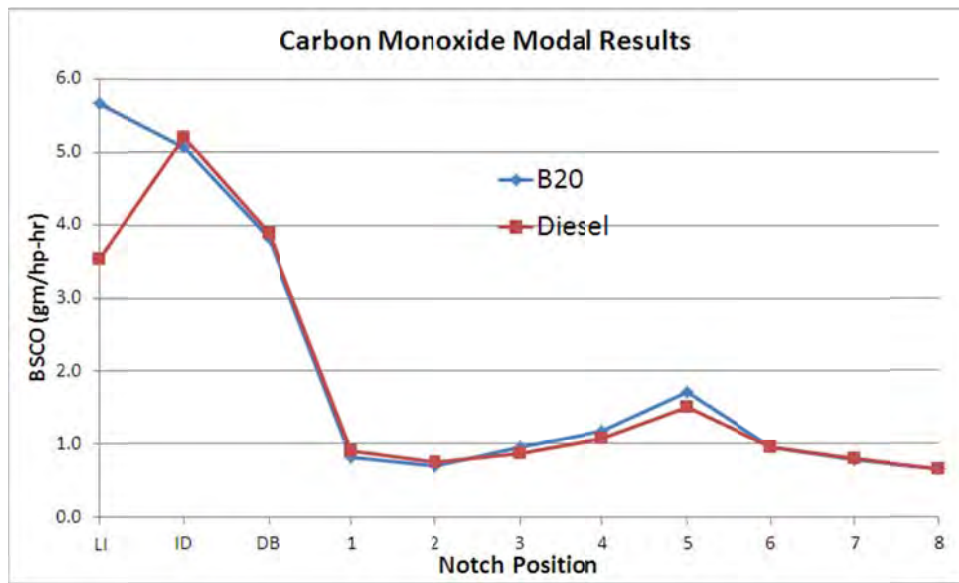


Figure 2 – Modal Carbon Monoxide Results

NOTE: This document does not grant approval for use of biodiesel blends in GE locomotives. Review applicable Maintenance Instructions for approved fuels.

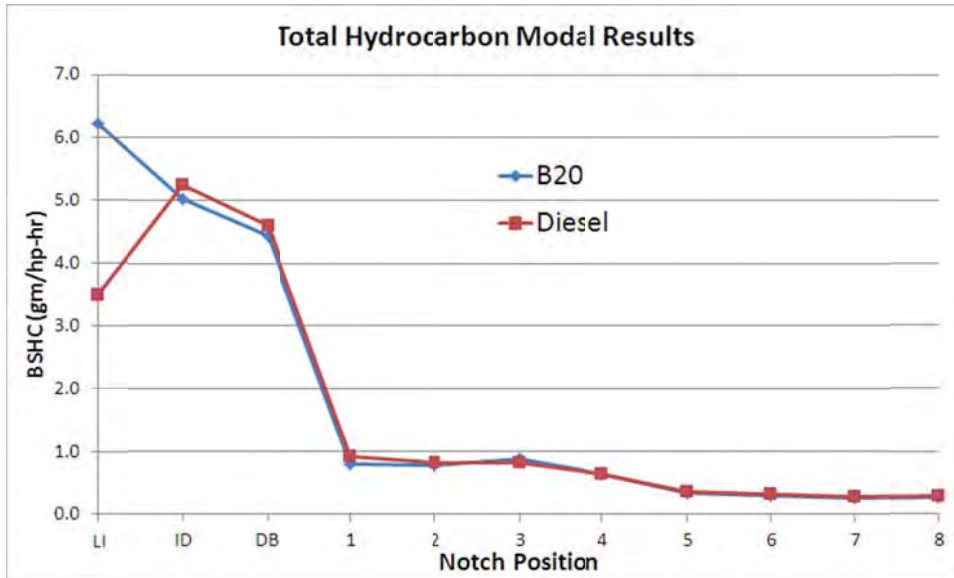


Figure 3 – Modal Total Hydrocarbon Results

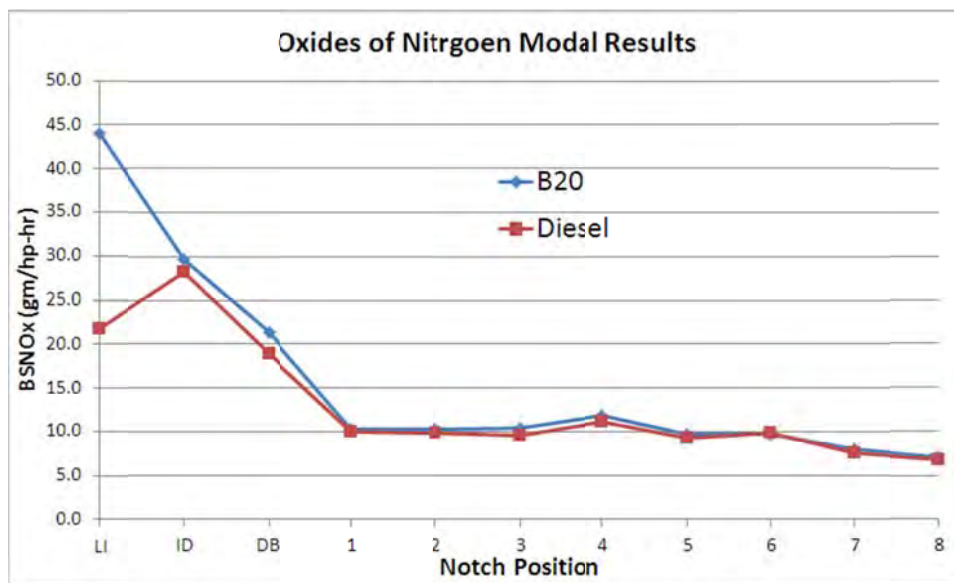


Figure 4 – Modal Oxides of Nitrogen Results

Fuel consumption results for this testing showed that notch 8 B20 consumption increased 1.3% by mass or 0.5% by volume. Individual modal results for brake specific fuel consumption are shown in figure 5 below.

NOTE: This document does not grant approval for use of biodiesel blends in GE locomotives. Review applicable Maintenance Instructions for approved fuels.

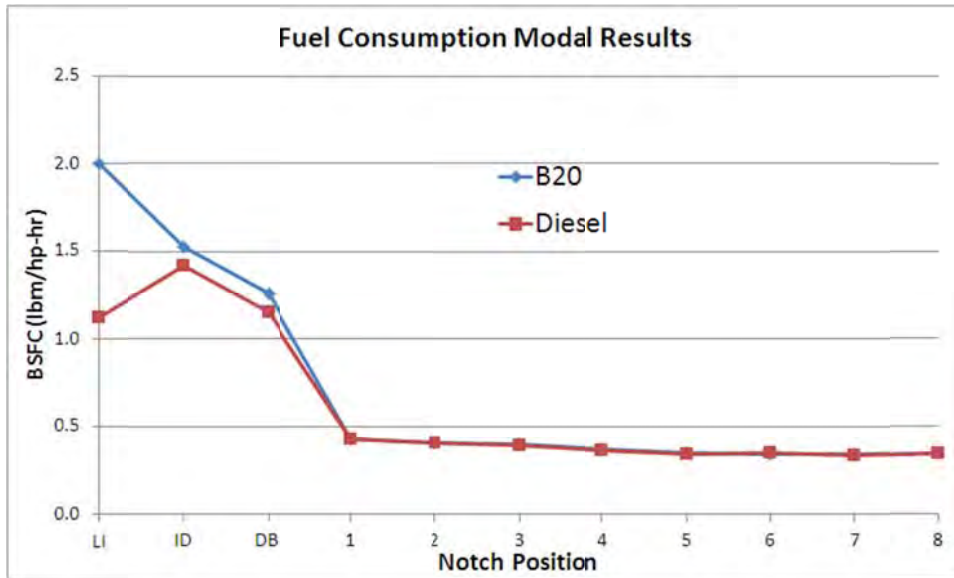


Figure 5 – Fuel Consumption Modal Results

The modal power results for each test are shown in figure 6. This illustrates the locomotive was able to make full power on B20.

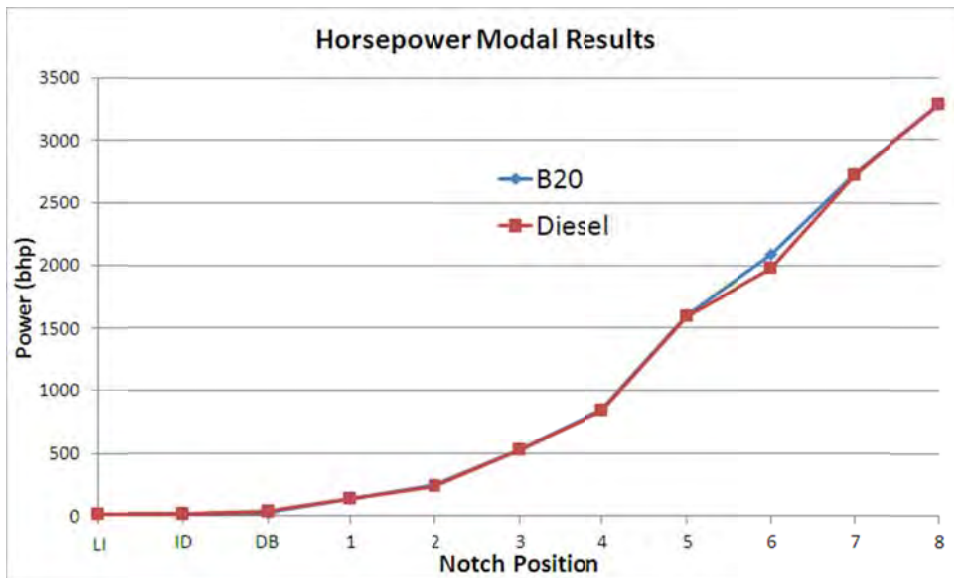


Figure 6 – Modal Power Results

NOTE: This document does not grant approval for use of biodiesel blends in GE locomotives. Review applicable Maintenance Instructions for approved fuels.

CONCLUSION

Amtrak unit #500 was delivered to GE Transportation for emissions testing on B20 and diesel fuel. These results show that both fuels continue to meet Tier 0 emissions standards. There is an increase in BSNO_x of about 5% which is expected with biodiesel. Additionally, a 1.3% (by mass) fuel consumption increase with B20 was observed at notch 8. Full power at all modes was achieved with B20 fuel. The fuel consumption hit when considering volumetric consumption was 0.5%.

Results for particulate, total hydrocarbons and carbon monoxide show an unusually high difference at low idle between B20 and diesel fuel. This trend is not understood and is different than the idle and dynamic brake points. The fact that multiple independent measurement systems detect a difference at low idle suggests the observation was real. What is not understood is what caused the deviation.

In reviewing fuel analysis results, the aromatic content was slightly high (37.7% vs. 35% max) for ASTM D7467. The B20 acid number was very good at 0.06 mg KOH/g verses 0.3. Oxidation stability was good and the measured biodiesel content was 16.3% by volume.

**NOTE: This document does not grant approval for use of biodiesel blends in GE locomotives.
Review applicable Maintenance Instructions for approved fuels.**

APPENDIX A

Test Method	Description	Units	AM 500 CERT
			Cert 1
D2622_07	Sulfur Content	ppm	2886
D4052	API Gravity	--	36.1
	Specific Gravity	--	0.8444
	Density at 15°C	grams/L	844
D445	Viscosity at 40°C	cSt	2.523
D4809	GROSS Heat of Combustion	BTU/lb	19622
		MJ/kg	45.64
		cal/g	10900.9
D4809	NET Heat of Combustion	BTU/lb	18426
		MJ/kg	42.858
		cal/g	10236.4
D5186	Total Aromatics	mass %	27.6
	Mono-aromatics	mass %	20.4
	Polynuclear Aromatics	mass %	7.3
D5291	Carbon Content	wt%	86.22
	Hydrogen Content	wt%	13.11
D86	IBP	deg. F	349
	10%	deg. F	409
	50%	deg. F	495
	90%	deg. F	599
	FBP	deg. F	655
	Recovered	mL	97.9
	Residue	mL	1.5
	Loss	mL	0.6
D976	Cetane Index		46.9
D93	Flash Point	Deg. F	155
		Deg. C	67

Figure A1 – Petroleum Diesel Fuel Analysis

NOTE: This document does not grant approval for use of biodiesel blends in GE locomotives. Review applicable Maintenance Instructions for approved fuels.

Test Method	Description	Units	AM 500 LOCO
			Loco 1
D1319	Aromatics	vol%	37.7
	Olefins	vol%	0.8
	Saturates	vol%	61.5
D2709	Particulate	vol%	0.01
D4052	API Gravity	--	34.8
	Specific Gravity	--	0.8508
	Density at 15°C	grams/L	850.3
D445	Viscosity at 40°C	cSt	2.836
D4809	GROSS Heat of Combustion	BTU/lb	19199
		MJ/kg	44.656
		cal/g	10665.9
D4809	NET Heat of Combustion	BTU/lb	18011
		MJ/kg	41.893
		cal/g	10006.1
D5291	Carbon Content	wt%	85.02
	Hydrogen Content	wt%	13.02
D5453	Sulfur Content	ppm	65.8
D664	Acid Number - Inflection Point	mg KOH/g	0.06
	Buffer End Point	mg KOH/g	<0.05
D86	IBP	deg. F	341
	10%	deg. F	418
	50%	deg. F	534
	90%	deg. F	617
	FBP	deg. F	641
	Recovered	mL	97.9
	Residue	mL	1.4
	Loss	mL	0.7
D976	Cetane Index		49.5
D93	Flash Point	Deg. F	149
		Deg. C	64
EN14078	FAME Content - IR	vol%	16.3
EN140112m	Oxidation Stability - Rancimat	hour	> 24

Figure A2 – B20 Fuel Analysis

NOTE: This document does not grant approval for use of biodiesel blends in GE locomotives. Review applicable Maintenance Instructions for approved fuels.

APPENDIX B

This Appendix B presents the composite duty cycle emissions data for all 11 modes for both B20 and diesel fuel. Table 1 in the main body presented the composite duty cycle emissions excluding low idle, therefore only 10 modes. As can be seen in figure 1 – 5 in the main body, there is an anomaly with the low idle emissions and fuel consumption.

Unit# Amtrak #500				
Test Dates May 23 and 24, 2011				
Line Haul Duty Cycle Results				
	BSHC	BSCO	BSNOx	BSPM
	(gm/hp-hr)	(gm/hp-hr)	(gm/hp-hr)	(gm/hp-hr)
B20 Fuel	0.38	0.9	8.3	0.13
Diesel Fuel	0.39	0.8	7.9	0.14
Tier 0 Limits	1.00	5.0	9.5	0.60
Switch Duty Cycle Results				
	BSHC	BSCO	BSNOx	BSPM
	(gm/hp-hr)	(gm/hp-hr)	(gm/hp-hr)	(gm/hp-hr)
B20 Fuel	0.68	1.2	10.7	0.26
Diesel Fuel	0.68	1.2	10.0	0.24
Tier 0 Limits	2.10	8.0	14.0	0.72
Smoke Opacity Results				
	Steady State	30 sec	3 sec	
B20 Fuel	12	16	35	
Diesel Fuel	11	15	34	
Tier 0 Limits	30	40	50	

Table B1 – Amtrak #500 Emissions Results (11 modes)

The tested emissions results with all 11 modes and Tier 0 limits are shown above.

NOTE: This document does not grant approval for use of biodiesel blends in GE locomotives. Review applicable Maintenance Instructions for approved fuels.



Oronite

FR-861
Amtrak General Electric
Transportation
Evaluation of a B-20 Biodiesel in a
General Electric P-32 Locomotive

March 2010 – June 2011

Chevron Oronite Company LLC
Industrial Engine Oils
Richmond, California

Prepared by
P. Van Slyke
D. Anderson

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ENGINE INSPECTION OF AMTRAK UNIT #500

Summary

After completing one year of operational testing on B20 biodiesel testing, Unit #500 was brought to Amtrak's facility in Chicago for a detailed inspection of two power assemblies. The power assemblies located in positions 2R and 2L had been premeasured prior to testing and installed in Unit #500. On June 7, 2011, the premeasured power assemblies were removed from the engine for inspection to determine wear and engine deposits. The levels of piston deposits, surface sludge, ring and liner wear, and connecting rod bearing condition were inspected and evaluated. Also performed were a video image scope inspection of cylinders 5R and 5L *in situ* and a visual inspection of injector tip deposits of these cylinders. The injectors showed carbonaceous deposits on the tips. It is unknown if the deposits were affecting fuel flow. A video image scope of 5R and 5L liners showed evidence of rusting as a result of past water leaks. In addition to the engine inspection, used oil condition was monitored and analyzed at Oronite's facility in Richmond, California, during the course of the test. Prior to the start of testing a sample of the biofuel (B100) and biodiesel (B20) was analyzed. The B100 was analyzed for glycerin, water, and oxidative stability. Also, biodiesel samples (B20) were analyzed for biodiesel content during the course of the test.

The results of the testing show no abnormal conditions as related to engine deposits or engine wear. The condition of the parts was deemed comparable to normal conditions as experienced on passenger and freight locomotive operations. The engine parts inspected showed normal piston deposits. The liner wear was minimal, with most of the original crosshatch still evident. Piston rings also showed low wear and were in serviceable condition. The engine bearings showed normal wear (overlay not worn through) and even loading with no evidence of corrosion. Used oil and fuel analysis showed the oil to be in good condition over the course of the one year test and biodiesel content was at the B20 level over the one-year test. Though the locomotive experienced some operational issues during the sixteen month test period (Feb 2010 – May 2011), no operational difficulties were experienced due to oil or fuel condition.

This test protocol focused on the operational performance of only one locomotive. Locomotive Maintenance Officers Association (LMOA) established field test guidelines specify the use of a minimum of four test and two reference locomotives to generate multiple data points while effectively addressing operational issues that sometimes occur with individual locomotives during the test period. Definitive conclusions or commentary regarding the consumption of B20 biodiesel in locomotive engines in diverse service applications is not in the scope of this report.

Fuel and Oil

The fuel used during the test was a low sulfur diesel fuel splash blended to B20 with a transesterified tallow based biofuel. A sample of the B100 was sent to the Oronite test lab for analysis. Oronite conducted test methods for glycerin, water, and oxidative stability on the B100 and B20 sample for quality and the results showed the B100 and B20 to be within specifications. Samples of the test fuel (B20) were periodically sent to the Oronite test lab. The data set shows

that the fuel remained at the B20 level over the course of testing. Test results can be found in Appendix 1.

The oil used for the test was a commercially available 20W-40 multigrade Generation 5 locomotive oil. Samples of the used oil were taken monthly and sent to the Oronite lab for analysis. See discussion of the used oil analysis findings below.

Piston Deposit Ratings

Two premeasured power assemblies at cylinder positions of 2L and 2R were removed from the test unit. Parts removed and inspected for deposits were the liner cylinder head assembly and the pistons.

The two pistons were rated using the Coordinating Research Council (CRC) diesel piston rating method. Table 1 summarizes the piston deposits from Amtrak Unit #500. The table below shows that Unit #500 had moderate piston deposits that are consistent with other passenger and freight service. Though the ratings appear to be in alignment with inspection results for locomotives in moderate to severe service (MWH/month), the operational conditions, duty cycle, and MWH usage of Unit #500 was not available at the time of inspection. The detailed rating sheets can be found in Appendix 2-1 and 2-2. Photos can be found in Appendix 5-1 and 5-2.

Table 1

Piston Deposit Ratings CRC Unweighted Demerits

Piston Zone	2R	2L
Groove #1	45.3	47.2
Groove #2	49.1	49.1
Groove Oil	0.0	0.0
Crownland	35.7	29.1
Land #2	14.9	16.3
Land #3	0.0	0.0
Total Demerits	145	142

Engine Sludge

The following areas were rated for sludge:

- Rocker box cover
- Rocker box and valve gear
- Crankcase Cover
- Crankcase “A” frame

The rocker boxes were rated using the CRC Sludge Merit Rating scale. Sludge ratings are made on a merit basis wherein a rating of 10 designates a part completely free of sludge and where parts with increased accumulations of sludge are represented by lower rating numbers. The sludge rating is based on the sludge depth and area covered not the color or character of the deposits.

As Table 3 illustrates, the rocker boxes were free of any significant sludge with very little, if any, depth. The table shows the average ratings of both test cylinders. Detailed ratings can be found in Appendix 2-3. Photos can be found in Appendix 5-3, 5-4, and 5-5.

Table 3
CRC Sludge Deposit Ratings

Piston Zone	2R	2L
Crankcase Cover	9.75	9.75
Rocker Cover	9.56	9.56
Crankcase A Frame	9.50	9.50
Rocker Box	9.63	9.63

Liner Wear

Liner 2R and 2L were visually inspected. They were evaluated at the top and bottom of the piston stroke and on the thrust and anti-thrust sides. The liners were observed for any wear anomalies including scuffing, polishing, and scratching. The liners showed very little wear. No liner showed evidence of scuffing. There was some incipient bore polishing occurring at the top ring reversal area, however, the area of polishing was mild. Overall, the liners were in good, serviceable condition. Detailed ratings can be found in Appendix 3-1. Photos can be found in Appendix 5-6.

A surface finish study was conducted on the liner using a Mahr Surf surface finish measuring device. Surface measurements were taken at the bottom of the liner in the “no wear” area below piston travel, in the middle of the liner and at the top of the liner. At the top of the liner the surface finish measurements were taken with the lacquer/varnish material, and with the lacquer/varnish material removed with vinegar (acetic acid). The table below shows the results of the measurements of the average peak to valley (Rz) in microinches at a 0.07-inch traversing length.

Amtrak Unit 500
Average Peak to Valley (Rz), Microinches

Piston Zone	2L	2R
Top With Lacquer	118	84.5
Top Without Lacquer	103	138
Middle	135	97.5
No Wear Bottom	160	117

Additional Inspections – Cylinders 5R and 5L

The fuel injectors were removed from cylinders 5R and 5L and a boroscope inspection was performed on the liners through the injector hole. There was evidence of staining, either from rust or corrosion on the liner surfaces. Discussions with the shop foreman determined that the locomotive had experienced a storage-related failure in the past and was most likely the cause of the abnormal appearance of the liners. Engine operation and used oil analysis indicated that there are no operational difficulties as a result. Inspection of the injectors showed that there was a moderate level of carbonaceous deposits on the injector tips. With 5X magnification it appeared that the injector tip spray nozzles were not occluded, however it was indeterminate if there was any loss in injector performance or interruption of the spray pattern as a result of the deposits. Photos of the injector tips are in Appendix 5-7.

Piston Rings

The piston rings were removed from the pistons of both power assemblies removed from Unit #500 and brought back to Oronite’s Richmond facility for inspection. The piston rings were inspected visually for evidence of abnormal wear and deposits and measured in comparison to the pre-test measurements. The ring faces were examined under magnification and showed only signs of normal wear. There was no evidence of scoring or scuffing. Visual evaluation of the carbon deposits were also made on the piston rings. The carbon buildup corresponded to that of the pistons and was in the medium to light range based on the CRC rating system. The measurement data, visual inspection, and deposit ratings showed the rings to be in normal, serviceable condition. Detailed measurements of the piston rings are in Appendix 3-2 and 3-3. Photos can be found in Appendix 5-8

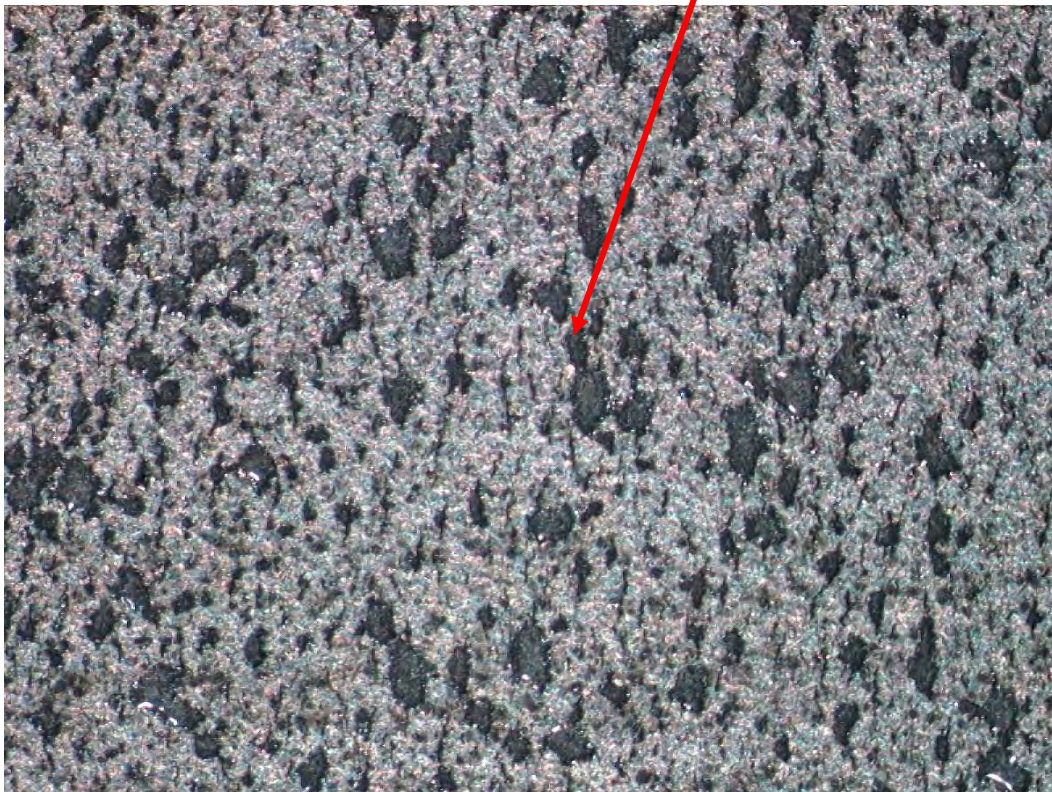
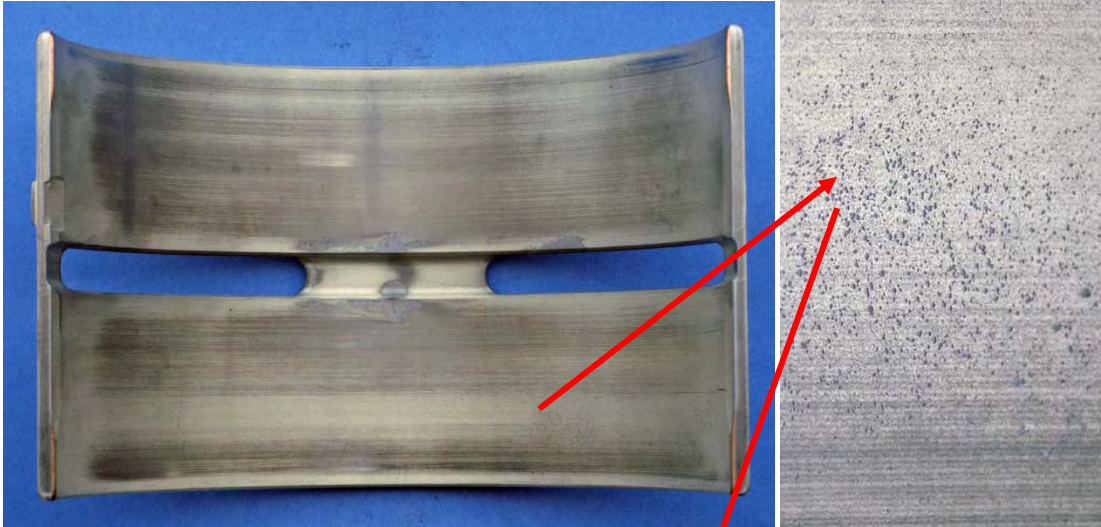
Connecting Rod Bearings

The connecting rod bearings from Unit #500 were visually inspected for wear. The bearings showed normal wear patterns and even loading and were in serviceable condition. Closer inspection under magnification showed signs of pitting and metal migration on only the bottom shells of the bearings. Biodiesel has been documented to cause bearing corrosion when there is dilution in the oil sump. There is concern that the pitting may be caused by this corrosive mechanism. The bearings were brought back to Oronite and were analyzed at Oronite’s Tribology lab. After visual inspection bearings were sent to GE for more detailed examination

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of the pitting to determine cause. Ratings of the bearing can be found in Appendix 3-4. Photos can be found in Appendix 5-9.

The area of pitting was covered with small cracks and pits and the pits appear to be aligned with the cracks. The cracks appear to be enlarging into pits via fracture of the edge. The examined pits appear to be caused by mechanical rather than chemical action or corrosion. Further investigation is needed as to the cause of the initial cracking. The photographs below show a magnified image of the cracking and pitting of the bearing flashing and overlay surface. See figures below.



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Oil Performance

Appendices 4-1 through 4-8 are plots of the used oil analysis showing the oils performance during the test. The used oil samples were collected by Amtrak personnel and were received by Oronite. Analyses were performed by Chevron's Analytical labs. The oil was analyzed for:

- Viscosity increase by ASTM D445
- Base Number (BN) by ASTM D4739 and Acid Number (AN) by ASTM D664
- Pentane insolubles by the LMOA method by ASTM D7317
- Oxidation by IR
- Wear metals by ASTM D5185
- Fuel dilution by ASTM D3524 and biodiesel dilution by Oronite proprietary methods

These data show all parameters to be within condemning limits. A complete summary of the oil analysis data can be found in Appendix 4-1.

Note: The trend data implies that the oil was changed at approximately 60 days, 270 days, and 400 days, however Oronite does not have maintenance records to verify.

The plots of the 100°C viscosity (Appendix 4-2) showed no significant increase in viscosity up to when the oil was changed.

Appendix 4-3 plots the AN and BN. The BN retention was good, dropping to a low of 7.37 mm KOH/g. The AN rose slightly over this same time period to 4.18 mm KOH/g before dropping.

Coagulated pentane insolubles by the LMOA method are plotted in Appendix 4-4. They remained low with a maximum of 2.6 wt %.

Oxidation of the engine oil was measured by DIR method. The graph in Appendix 4-5 show that oxidation was under control and remained low for the entire duration of the test.

Wear metals (iron, copper, and lead) were measured using the ICP method. For all three, the levels were very low and well within the condemning limits. Appendices 4-6 through 4-8 show the wear metal trends.

Fuel dilution (total) and biodiesel dilution were also monitored. As an acidic material, biodiesel dilution in the oil may be problematic being corrosive to metallic surfaces. For the duration of the test both total fuel dilution and biodiesel dilution were very low and in many observations were below measurement limit. The table below shows the results of the dilutions.

Total and Biodiesel Dilution in Locomotive #500

Date	Fuel Dilution, %	Bio Content, %
03/01/10	0.0	0.0
03/08/10	<1	<0.5
03/18/10	<1	<0.5
04/03/10	<1	<0.5
04/06/10	<1	<0.5
04/16/10	<1	<0.5
04/26/10	<1	<0.5
05/06/10	<1	<0.5
06/10/10	<1	<0.5
06/20/10	<1	<0.5
06/30/10	<1	<0.5
07/12/10	<1	<0.5
07/20/10	<1	<0.5
08/09/10	<1	<0.5
08/20/10	<1	<0.5
09/13/10	1.2	<0.5
09/23/10	<1.0	<0.5
10/05/10	<1.0	0.7
10/13/10	<1.0	0.6
10/23/10	<1.0	0.6
11/01/10	1.2	0.6
12/08/10	2.5	<0.5
12/10/10	2.5	<0.5
01/27/11	3.0	<0.5
02/22/11	1.2	<0.5
03/02/11	1.1	<0.5
03/09/11	<1.0	0.5
03/22/11	<1.0	0.5
04/15/11	1.3	<0.5
04/26/11	1.9	<0.5
05/05/11	2.0	<0.5
06/06/11	1.7	<0.5

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Conclusion

Amtrak Unit #500 completed a one-year operational field trial using B20 biodiesel. A field inspection consisting of evaluating the engine for deposits and wear resulted in the following observations. In addition, used oil condition and fuel quality was monitored and analyzed to determine oil performance.

- Inspection of the 2R and 2L power assemblies showed moderate piston deposits and very clean engine surfaces lacking any sludge or deposit depth.
- Inspection of the 2R and 2L power assemblies showed minimal wear to the cylinder liners and piston rings.
- Inspection of the 2R and 2L connecting rod bearings showed normal wear. Evidence of small pitting is not caused by corrosion and needs to be investigated further.
- Used oil analysis exhibited good viscosity control.
- Used oil analysis exhibited good base retention and acid control.
- Used oil analysis exhibited good insoluble control.
- Used oil analysis exhibited good oxidation control.
- Used oil analysis exhibited very low wear metals (Pb, Cu, Fe) indicating low wear.

Appendix 1
Fuel Inspection

B100 Analysis

Test	Specification	Result
Free Glycerin	0.020% Max.	0.011%
Total Glycerin	0.240% Max.	0.118%
Oxidation Stability	3 Hrs Min.	41.8 Hrs
Karl Fisher Water ¹	400 ppm Max.	106 ppm

¹ In lieu of ASTM D2709 Water and Sediment

Biodiesel Concentration in Amtrak Samples

Date of Sample Sent to Oronite	Biodiesel Content, %
12/23/2009	22.4
2/9/2010	22.2
2/11/2010	20.1
4/3/2010	22.4
7/7/2010	23.4
7/27/2010	22.2
8/9/2010	21.8
9/13/2010	20.6
10/23/2010	23.0
1/27/2011	22.0
2/22/2010	20.0
3/27/2011	20.9
4/26/2011	19.5
5/9/2011	22.0

Appendix 2

Piston and Sludge Deposits Worksheet

- Appendix 2-1: GE Piston Deposit Measurements, Cylinder # 2L
- Appendix 2-2: GE Piston Deposit Measurements, Cylinder # 2R
- Appendix 2-3: GE Sludge Ratings

Appendix 2-1
AMTRAK B-20 TEST - FR861
ORONITE TECHNOLOGY
UNIT 500 GE P32-8 7FDL-12 LOCOMOTIVE
GE Piston Deposit Measurements

Cylinder # 2L
 Top Groove Fill 47.2
 Total Deposits 142

Description of Deposits and Location

Piston Zone	1st. Quadrant										2nd. Quadrant									
	HC	MC	LC	VLC	BL	DBr	AL	LAL	VLA	Clean	HC	MC	LC	VLC	BL	DBr	AL	LAL	VLA	Clean
Grooves #1		95	5								5	50	45							
Grooves #2		95	5									100								
Oil #1										100										100
Crownland		10	20	70								40	15	45						
Land #2			10	85	5								10	80	10					
Land #3										100										100
Land #4										100										100
Zone	3rd. Quadrant										4th. Quadrant									
Grooves #1	HC	MC	LC	VLC	BL	DBr	AL	LAL	VLA	Clean	HC	MC	LC	VLC	BL	DBr	AL	LAL	VLA	Clean
Grooves #1		100										95	5							
Grooves #2		95	5									95	5							
Oil #1										100										100
Crownland		50	45	5								30	30	40						
Land #2			30	70									10	90						
Land #3										100										100
Land #4										100										100

CRC Demerit Rating Summary

Piston Zone	1st Q	2nd Q	3rd Q	4th Q	Avg.
Grooves #1	48.8	41.3	50.0	48.8	47.2
Grooves #2	48.8	50.0	48.8	48.8	49.1
Oil #1	0.0	0.0	0.0	0.0	0.0
Crownland	20.5	30.5	37.0	28.5	29.1
Land #2	15.8	15.5	18.0	16.0	16.3
Land #3	0.0	0.0	0.0	0.0	0.0
Land #4	0.0	0.0	0.0	0.0	0.0

RATING SCALE

- HC - Heavy Carbon
- MC - Medium Carbon
- LC - Light Carbon
- VLC - Very Light Carbon
- BL - Black Lacquer
- DBr - Dark Brown Lacquer
- AL - Amber Lacquer
- LAL - Light Amber Lacquer
- VLA - Very Light Amber Lacquer

Appendix 2-2
AMTRAK B-20 TEST - FR861
ORONITE TECHNOLOGY
UNIT 500 GE P32-8 7FDL-12 LOCOMOTIVE
GE Piston Deposit Measurements

Cylinder # 2R
Top Groove Fill 45.3
Total Deposits 145

Description of Deposits and Location

Piston Zone	1st. Quadrant										2nd. Quadrant									
	HC	MC	LC	VLC	BL	DBr	AL	LAL	VLA	Clean	HC	MC	LC	VLC	BL	DBr	AL	LAL	VLA	Clean
Grooves #1		25	75								5	90	5							
Grooves #2		100										90		10						
Oil #1									100											100
Crownland		55	30	15							5	30	30	35						
Land #2			10	80	10									90	10					
Land #3									100											100
Land #4									100											100
Zone	3rd. Quadrant										4th. Quadrant									
Grooves #1	HC	MC	LC	VLC	BL	DBr	AL	LAL	VLA	Clean	HC	MC	LC	VLC	BL	DBr	AL	LAL	VLA	Clean
Grooves #1		100										95	5							
Grooves #2		100										100								
Oil #1									100											100
Crownland		20	35	40	5						5	75	20							
Land #2				100										90	10					
Land #3									100											100
Land #4									100											100

CRC Demerit Rating Summary

Piston Zone	1st Q	2nd Q	3rd Q	4th Q	Avg.
Grooves #1	31.3	51.3	50.0	48.8	45.3
Grooves #2	50.0	46.5	50.0	50.0	49.1
Oil #1	0.0	0.0	0.0	0.0	0.0
Crownland	37.3	32.8	25.3	47.5	35.7
Land #2	15.5	14.5	15.0	14.5	14.9
Land #3	0.0	0.0	0.0	0.0	0.0
Land #4	0.0	0.0	0.0	0.0	0.0

RATING SCALE

HC - Heavy Carbon
MC - Medium Carbon
LC - Light Carbon
VLC - Very Light Carbon
BL - Black Lacquer
DBr - Dark Brown Lacquer
AL - Amber Lacquer
LAL - Light Amber Lacquer
VLA - Very Light Amber Lacquer

Appendix 2-3
AMTRAK B-20 TEST - FR861
ORONITE TECHNOLOGY
UNIT 500 GE P32-8 7FDL-12 LOCOMOTIVE
GE Sludge Ratings

Cylinder # 2R

Location Percent Area and Depth

Crankcase Cover				Rocker Cover				Crankcase "A" Frame				Rocker Arms			
1/4A	100	D	0	1/4A	50	D	0	1/4A	0	D	0	1/4A	50	D	0
1/2A	0	E	0	1/2A	25	E	0	1/2A	100	E	0	1/2A	50	E	0
3/4A	0	F	0	3/4A	25	F	0	3/4A	0	F	0	3/4A	0	F	0
A	0	G	0	A	0	G	0	A	0	G	0	A	0	G	0
AB	0	H	0	AB	0	H	0	AB	0	H	0	AB	0	H	0
B	0	I	0	B	0	I	0	B	0	I	0	B	0	I	0
C	0	J	0	C	0	J	0	C	0	J	0	C	0	J	0
Merit 9.75				Merit 9.56				Merit 9.50				Merit 9.63			

Cylinder # 2L

Location Percent Area and Depth

Crankcase Cover				Rocker Cover				Crankcase "A" Frame				Rocker Arms			
1/4A	100	D	0	1/4A	50	D	0	1/4A	0	D	0	1/4A	50	D	0
1/2A	0	E	0	1/2A	25	E	0	1/2A	100	E	0	1/2A	50	E	0
3/4A	0	F	0	3/4A	25	F	0	3/4A	0	F	0	3/4A	0	F	0
A	0	G	0	A	0	G	0	A	0	G	0	A	0	G	0
AB	0	H	0	AB	0	H	0	AB	0	H	0	AB	0	H	0
B	0	I	0	B	0	I	0	B	0	I	0	B	0	I	0
C	0	J	0	C	0	J	0	C	0	J	0	C	0	J	0
Merit 9.75				Merit 9.56				Merit 9.50				Merit 9.63			

Appendix 3

Liner, Piston Ring, and Bearing Wear Worksheet

- Appendix 3-1: Cylinder Liner Measurements, Cylinder # 2R
- Appendix 3-2: GE Ring Measurements, Cylinder # 2R
- Appendix 3-3: GE Ring Measurements, Cylinder # 2L
- Appendix 3-4: GE Connecting Rod Bearing Inspection

Appendix 3-1
AMTRAK B-20 TEST - FR861
ORONITE TECHNOLOGY
UNIT 500 GE P32-8 7FDL-12 LOCOMOTIVE
Cylinder Liner Measurements

Cylinder # 2R Liner Serial # LG09100823

Direction Relative to Crankshaft

Inches From Fire Face	Perpendicular					Inches From Fire Face	Parallel				
	Before Test	Taper	After Test	Taper	Wear		Before Test	Taper	After Test	Taper	Wear
1 1/2 ¹	9.0041	0.0021	9.0039	0.0027	-0.0002	1 1/2 ¹	9.0049	-0.0003	9.0039	0.0000	-0.0010
2 3/64	9.0049	0.0013	9.0045	0.0021	-0.0004	2 3/64	9.0041	0.0005	9.0039	0.0000	-0.0002
5	9.0066	-0.0004	9.0064	0.0002	-0.0002	5	9.0045	0.0001	9.0035	0.0004	-0.0010
8	9.0065	-0.0003	9.0064	0.0002	-0.0001	8	9.0043	0.0003	9.0026	0.0013	-0.0017
13 15/16 ²	9.0066	-0.0004	9.0071	-0.0005	0.0005	13 15/16 ²	9.0049	-0.0003	9.0044	-0.0005	-0.0005
15 3/8 ³	9.0062	0.0000	9.0066	0.0000	0.0004	15 3/8 ³	9.0046	0.0000	9.0039	0.0000	-0.0007

Cylinder # 2L Liner Serial # LG09100826

Direction Relative to Crankshaft

Inches From Fire Face	Perpendicular					Inches From Fire Face	Parallel				
	Before Test	Taper	After Test	Taper	Wear		Before Test	Taper	After Test	Taper	Wear
1 1/2 ¹	9.0037	0.0017	9.0048	0.0028	0.0011	1 1/2 ¹	9.0035	0.0012	9.0060	0.0001	0.0025
2 3/64	9.0045	0.0009	9.0058	0.0018	0.0013	2 3/64	9.0042	0.0005	9.0059	0.0002	0.0017
5	9.0060	-0.0006	9.0074	0.0002	0.0014	5	9.0047	0.0000	9.0056	0.0005	0.0009
8	9.0054	0.0000	9.0077	-0.0001	0.0023	8	9.0045	0.0002	9.0050	0.0011	0.0005
13 15/16 ²	9.0060	-0.0006	9.0080	-0.0004	0.0020	13 15/16 ²	9.0042	0.0005	9.0062	-0.0001	0.0020
15 3/8 ³	9.0054	0.0000	9.0076	0.0000	0.0022	15 3/8 ³	9.0047	0.0000	9.0061	0.0000	0.0014

New liner bore Min. 8.9980" Max wear limit 9.120"

¹ Top ring reversal

² Bottom ring travel

³ No wear reference point below ring travel

Bore standard used for measurements 9.000"

Comments: 2R - Light polish on Thrust side @ 6". Light polish at ring reversal, 360°. Amber deposits 2" down from fire face. Good cross hatching on rest of liner. Intake port dry/light carbon. Fire face - clean.
2L - Light polish at ring reversal, 360°. Amber deposits 2" down from fire face. Good cross hatching on rest of liner. Intake port wet/clean.
Fire face - light deposit around intake valve

Appendix 3-2
AMTRAK B-20 FIELD TEST - FR861
ORONITE TECHNOLOGY
UNIT 500 GE P32-8 7FDL-12 LOCOMOTIVE
GE Ring Measurements

Cylinder FR861 R2

RING THICKNESS, in						
Ring #	Position	Tip	90°	180°	270°	Tip
1	Before	0.1863	0.1864	0.1863	0.1863	0.1862
	After	0.1849	0.1852	0.1853	0.1853	0.1852
	Decrease	0.0014	0.0012	0.0010	0.0010	0.0010
2	Before	0.1176	0.1177	0.1170	0.1177	0.1180
	After	0.1173	0.1173	0.1171	0.1171	0.1171
	Decrease	0.0003	0.0004	-0.0001	0.0006	0.0009

RADIAL WIDTH, in						
Ring #	Position	Tip	90°	180°	270°	Tip
1	Before	0.3019	0.3020	0.3024	0.3019	0.3007
	After	0.3010	0.3023	0.3024	0.3014	0.3000
	Decrease	0.0009	-0.0003	0.0000	0.0005	0.0007
2	Before	0.3039	0.3039	0.3043	0.3045	0.3042
	After	0.3032	0.3032	0.3033	0.3034	0.3032
	Decrease	0.0007	0.0007	0.0010	0.0011	0.0010

RING END GAP, in			
Ring #	1	2	Oil
Before	0.057	0.086	0.000
After	0.056	0.086	0.000
Increase	-0.001	0.000	0.000

RING WEIGHT, grams			
Ring #	1	2	Oil
Before	165.40	102.50	0.00
After	164.87	102.20	0.00
Decrease	0.53	0.30	0.00

SIDE CLEARNCE, in (missed)			
Ring #	1	2	Oil
Before	0.0000	0.0000	0.0000
After	0.0000	0.0000	0.0000
Increase	0.0000	0.0000	0.0000

Appendix 3-3
AMTRAK B-20 FIELD TEST - FR861
ORONITE TECHNOLOGY
UNIT 500 GE P32-8 7FDL-12 LOCOMOTIVE
GE Ring Measurements

Cylinder FR861 L2

RING THICKNESS, in						
Ring #	Position	Tip	90°	180°	270°	Tip
1	Before	0.1859	0.1859	0.1859	0.1858	0.1859
	After	0.1852	0.1849	0.1850	0.1851	0.1852
	Decrease	0.0007	0.0010	0.0009	0.0007	0.0007
2	Before	0.1173	0.1174	0.1174	0.1174	0.1174
	After	0.1171	0.1170	0.1170	0.1170	0.1170
	Decrease	0.0002	0.0004	0.0004	0.0004	0.0004

RADIAL WIDTH, in						
Ring #	Position	Tip	90°	180°	270°	Tip
1	Before	0.3016	0.3023	0.3031	0.3031	0.3020
	After	0.3012	0.3022	0.3025	0.3024	0.3014
	Decrease	0.0004	0.0001	0.0006	0.0007	0.0006
2	Before	0.3038	0.3035	0.3036	0.3035	0.3037
	After	0.3033	0.3038	0.3037	0.3031	0.3031
	Decrease	0.0005	-0.0003	-0.0001	0.0004	0.0006

RING END GAP, in			
Ring #	1	2	Oil
Before	0.053	0.086	0.000
After	0.052	0.086	0.000
Increase	-0.001	0.000	0.000

RING WEIGHT, grams			
Ring #	1	2	Oil
Before	165.30	102.10	0.00
After	164.73	101.92	0.00
Decrease	0.57	0.18	0.00

SIDE CLEARNCE, in (missed)			
Ring #	1	2	Oil
Before	0.0000	0.0000	0.0000
After	0.0000	0.0000	0.0000
Increase	0.0000	0.0000	0.0000

Appendix 3-4
AMTRAK B-20 TEST - FR861
ORONITE TECHNOLOGY
UNIT 500 GE P32-8 7FDL-12 LOCOMOTIVE
GE Connecting Rod Bearing Inspection

Description of Bearing Condition

Bearing	Rod Journal # 2
Top	Appearance of even/normal loading. Good/serviceable condition 50% Flashing remover, no copper showing Light dirt scratching, and small pitting in flashing overlay
Bottom	Appearance of even/normal loading. Good/serviceable condition 70% Flashing removed, no overlay removed and no copper showing 2% Cavitation wear @ oil gallery, and small pitting in flashing overlay

Appendix 4

Used Oil Data and Charts

- Appendix 4-1: Used Oil Analysis
- Appendix 4-2: Viscosity Increase
- Appendix 4-3: Base and Acid Number
- Appendix 4-4: LMOA Pentane Insolubles
- Appendix 4-5: Oxidation
- Appendix 4-6: Copper
- Appendix 4-7: Iron
- Appendix 4-8: Lead

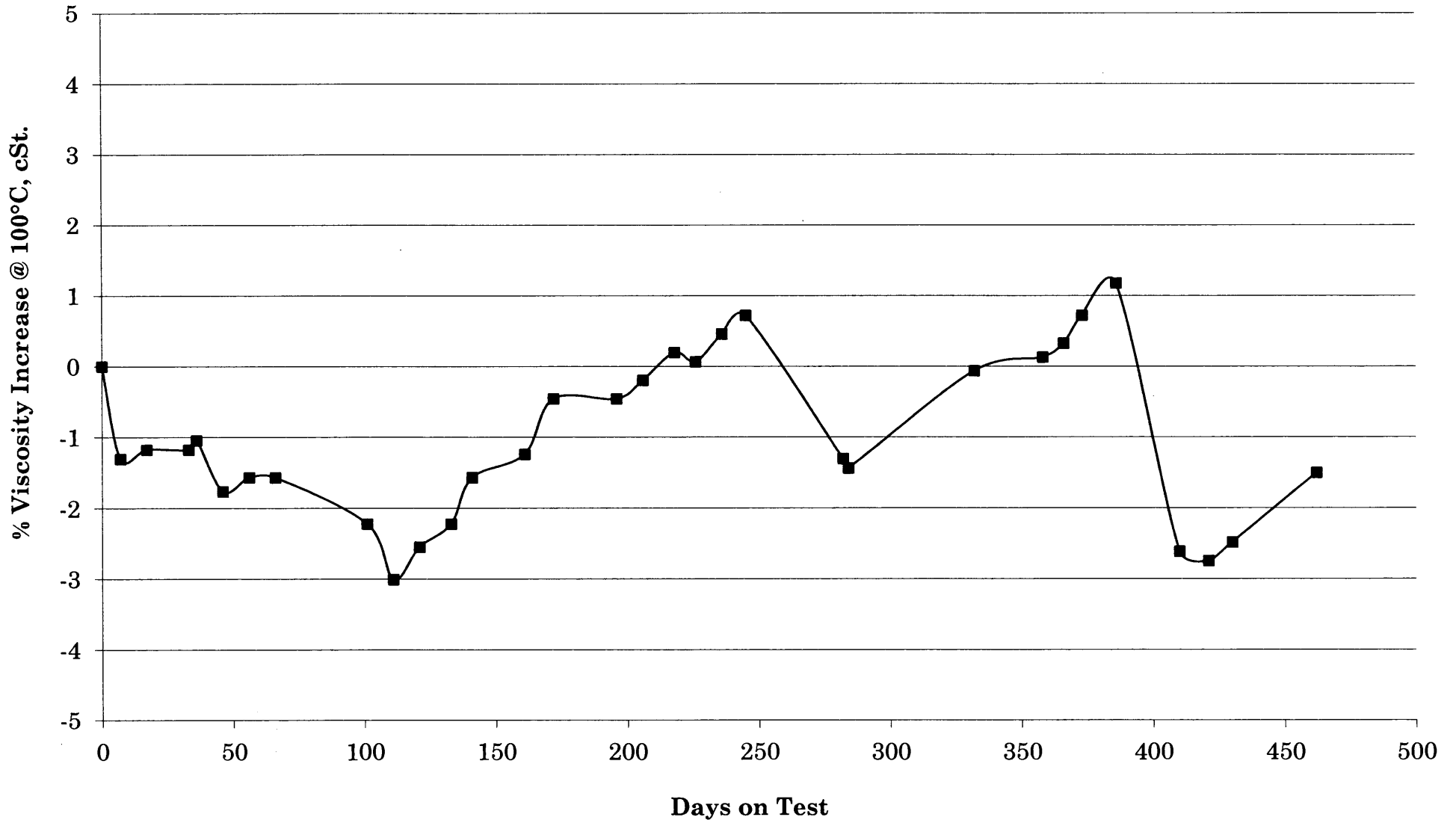
Appendix 4-1
USED OIL ANALYSIS
Unit 500

Amtrak Bio Diesel Test

Date	Engine	Vis	% Vis. Inc.	TBN	TAN	CPI	DIR				ICP SPECTRO ppm										Fuel Dilution	Bio Content		
Sampled	Days	100°C	100°C	D4739	D664	LMOA	Oxi	Nit	Sulf	Soot	B	Ca	Cr	Cu	Fe	Mo	Na	P	Pb	Si	Sn	Zn	%	%
03/01/10	0	15.3	0.00		0	0	0	0	0	0	0			0	0				0	5	<2.0	<2.0	0.0	0.0
03/08/10	7	15.10	-1.31	10.73	1.9	0.92	5	1	15	0.08	1	4964	<1.0	1	5	99	<10.0	20	1	5	<2.0	<2.0	<1	<5
03/18/10	17	15.12	-1.18	9.94	2.0	0.99	5	1	14	0.10	1	4744	<1.0	1	6	95	<10.0	29	1	5	<2.0	<2.0	<1	<5
04/03/10	33	15.12	-1.18	9.43	2.8	1.25	7	1	18	0.15	1	4822	<0.5	1	7	96	<5.0	27	1	4	<1.0	1	<1	<5
04/06/10	36	15.14	-1.05	9.32	3.0	1.49	8	1	19	0.16	1	4886	<0.5	1	8	96	<5.0	30	1	4	<1.0	<1.0	<1	<5
04/16/10	46	15.03	-1.76	8.53	2.7	1.55	7	1	19	0.18	1	4654	<0.4	1	8	92	<4.0	37	0	5	<0.8	<0.4	<1	<5
04/26/10	56	15.06	-1.57	8.29	2.6	1.53	9	1	22	0.22	1	4824	<0.5	1	10	93	<5.0	35	1	5	<1.0	<1.0	<1	<5
05/06/10	66	15.06	-1.57	8.01	3.3	1.59	8	1	19	0.21	1	4412	<0.5	1	9	90	<5.0	39	1	5	<1.0	<1.0	<1	<5
06/10/10	101	14.96	-2.22	12.30	1.8	0.67	3	0	9	0.06	12	5730	<0.46	0	4	107	<4.62	9	<0.46	13	<0.92	1	<1	<5
06/20/10	111	14.84	-3.01	10.10	2.0	0.86	4	1	11	0.10	11	5310	<0.45	0	4	100	<4.50	19	<0.45	3	<0.90	1	<1	<5
06/30/10	121	14.91	-2.55	9.62	2.7	1.29	6	1	17	0.14	10	5169	<0.48	0	5	99	<4.76	18	<0.48	3	<0.95	2	<1	<5
07/12/10	133	14.96	-2.22	10.40	2.7	1.03	6	1	16	0.11	8	5067	<0.46	0	6	97	<4.57	28	<0.46	3	<0.91	<0.46	<1	<5
07/20/10	141	15.06	-1.57	10.00	3.0	1.46	8	1	21	0.22	6	5040	<0.48	0	7	94	<4.81	24	<0.48	3	<0.96	<0.48	<1	<5
08/09/10	161	15.11	-1.24	9.19	2.9	1.86	8	1	21	0.20	7	4857	<0.47	1	7	95	<4.73	36	<0.47	4	<0.95	<0.67	<1	<5
08/20/10	172	15.23	-0.46	8.67	2.8	1.46	8	1	20	0.22	6	4652	<0.43	0	8	92	<4.30	44	<0.43	3	<0.86	<0.46	<1	<5
09/13/10	196	15.23	-0.46	9.04	3.3	1.95	9	1	23	0.22	6	4890	<0.51	0	8	98	<5.09	39	<0.51	3	<1.02	<1.24	1.2	<5
09/23/10	206	15.27	-0.20	8.68	2.0	1.55	11	1	26	0.27	6	4995	<0.52	0	9	98	<5.19	38	1	3	<1.04	1	<1.0	<0.5
10/05/10	218	15.33	0.20	8.36	2.5	1.97	13	1	31	0.32	6	5076	<0.48	1	11	99	<4.82	39	<1.27	3	<0.96	1	<1.0	0.7
10/13/10	226	15.31	0.07	8.08	3.5	2.6	11	2	28	0.30	5	4705	<0.46	1	10	94	<4.60	43	<0.46	4	<0.92	1	<1.0	0.6
10/23/10	236	15.37	0.46	7.62	2.7	2.37	10	1	25	0.27	4	4570	<0.48	1	10	91	<4.80	47	<0.48	3	<0.96	1	<1.0	0.6
11/01/10	245	15.41	0.72	7.37	3.0	2.5	11	1	28	0.33	4	4538	<0.51	1	12	90	<5.12	46	<1.39	3	<1.02	<0.51	1.2	0.6
12/08/10	282	15.10	-1.31	14.10	2.2	0.7	4	0	9	0.06	1	6029	<0.42	0	4	111	<4.18	13	<0.42	2	<0.84	<0.42	2.5	<5
12/10/10	284	15.08	-1.44	13.60	2.4	0.7	5	1	12	0.08	1	6185	<0.47	0	2	109	<4.71	14	<0.63	3	<0.94	<0.47	2.5	<5
01/27/11	332	15.29	-0.07	11.90	3.4	0.92	9	1	21	0.18	1	5893	<0.50	0	7	110	<4.97	16	<1.659	3	<0.99	<0.86	3.0	<5
02/22/11	358	15.32	0.13	10.14	4.2	1.61	9	1	19	0.19	1	5260	<0.46	0	7	100	<4.61	36	<0.61	3	<0.92	<0.68	1.2	<5
03/02/11	366	15.35	0.33	10.64	4.0	2.18	10	1	22	0.24	1	5221	<0.48	0	7	100	<4.85	34	<0.48	3	<0.97	1	1.1	<0.5
03/09/11	373	15.41	0.72	9.57	3.6	1.92	11	1	25	0.26	1	5306	<0.45	0	9	100	<4.46	37	<0.91	3	<0.89	<0.45	<1.0	0.5
03/22/11	386	15.48	1.18	9.12	3.6	2.06	11	1	27	0.29	1	5181	<0.48	0	10	99	<4.82	39	<0.48	3	<0.96	<0.48	<1.0	0.5
04/15/11	410	14.90	-2.61	14.20	1.5	0.51	3	0	6	0.01	1	5900	<0.44	0	3	115	<4.39	19	<0.44	5	<0.88	1	1.3	<0.5
04/26/11	421	14.88	-2.75	13.70	1.8	0.53	3	0	9	0.07	1	5909	<0.46	0	1	114	<4.60	20	<0.46	4	<0.92	<0.46	1.9	<0.5
05/05/11	430	14.92	-2.48	13.10	2.1	0.83	5	0	13	0.11	1	5879	<0.49	0	4	115	<4.87	20	<0.49	4	<0.97	<0.49	2.0	<0.5
06/06/11	462	15.07	-1.50	12.90	1.61	1	6	1	16	0	0.5	5991	<0.50	0	5	114	<4.98	18	<0.50	4	<1.00	<0.50	1.7	<0.5

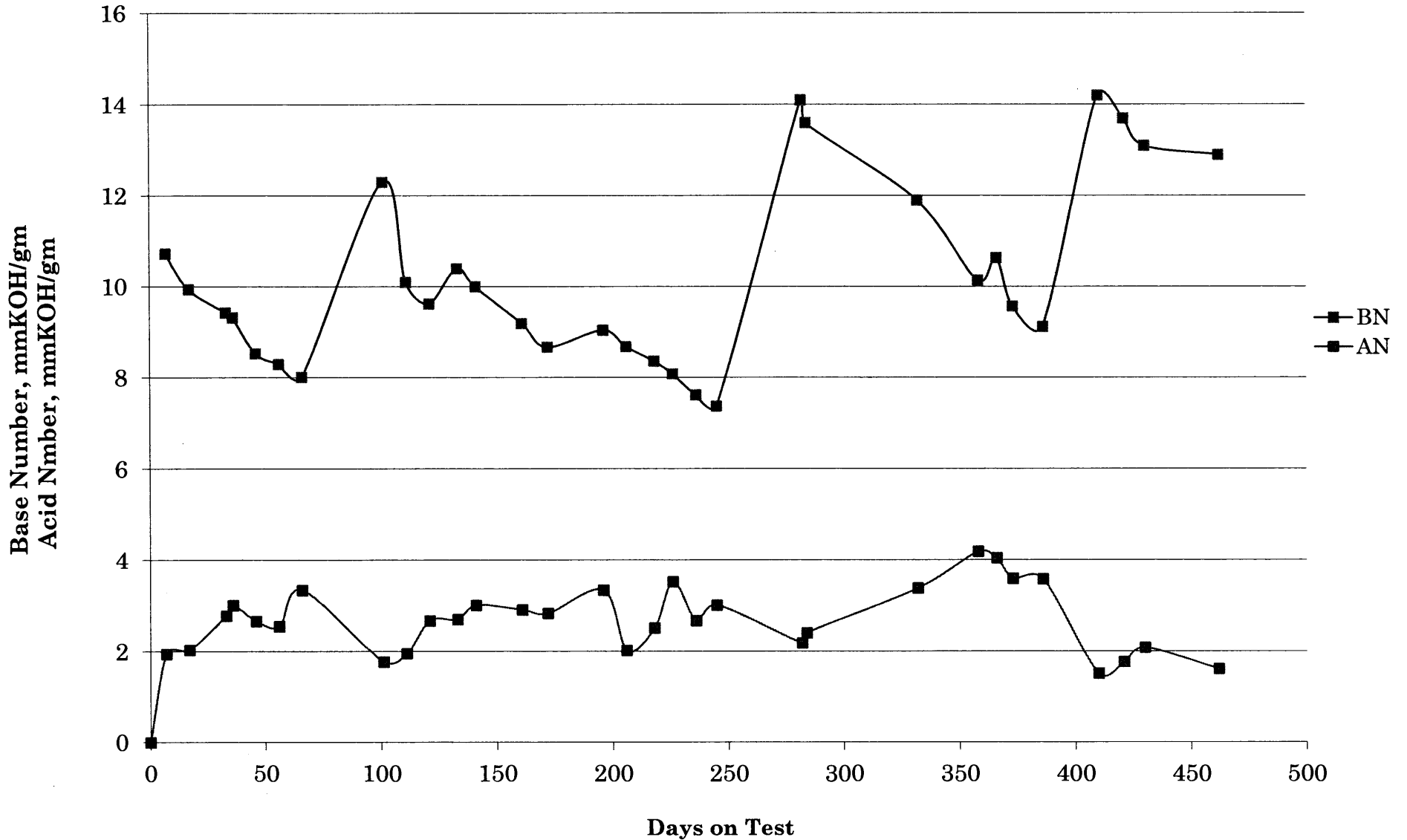
Possible oil change based on rise in BN, drop in AN and PI

Appendix 4-2
FR-861 Amtrak B-20 Test
Unit 500
Viscosity Increase

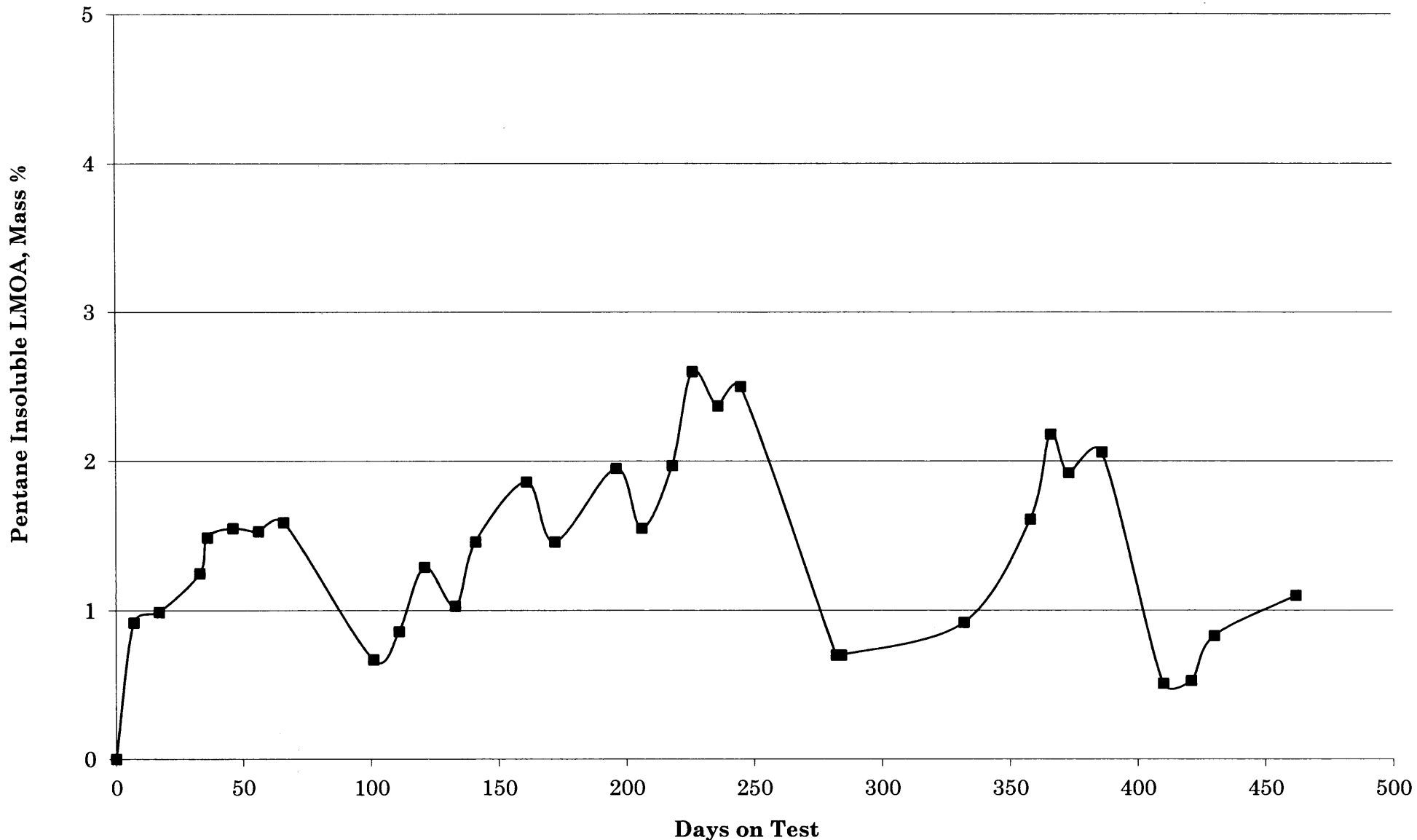


This document does not grant approval for use of biodiesel blends in GE locomotives. Review applicable Maintenance Instructions for approved fuels.

Appendix 4-3
FR-861 Amtrak B-20 Test
Unit 500
Base and Acid Number

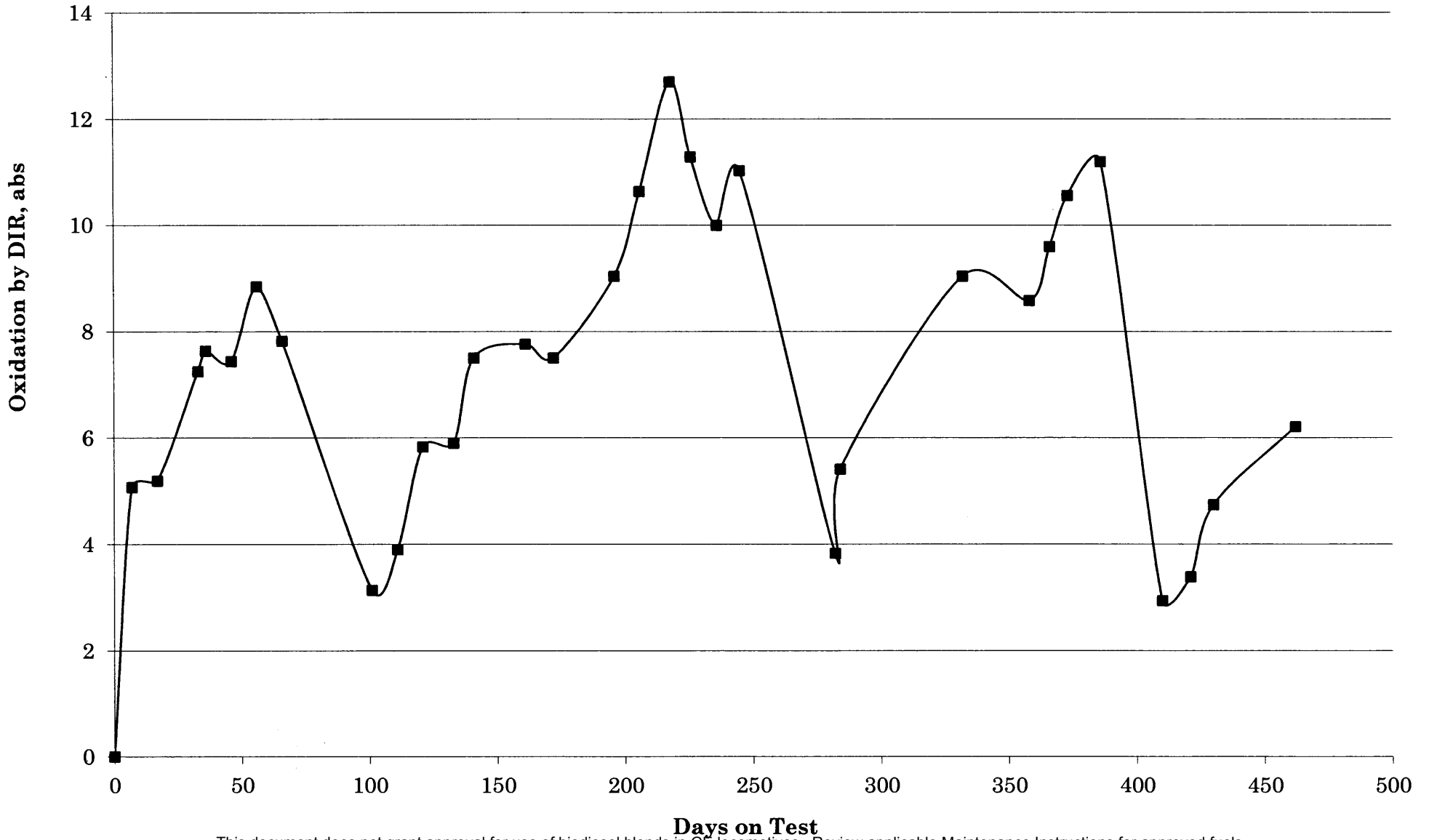


Appendix 4-4
FR-861 Amtrak B-20 Test
Unit 500
LMOA Pentane Insolubles

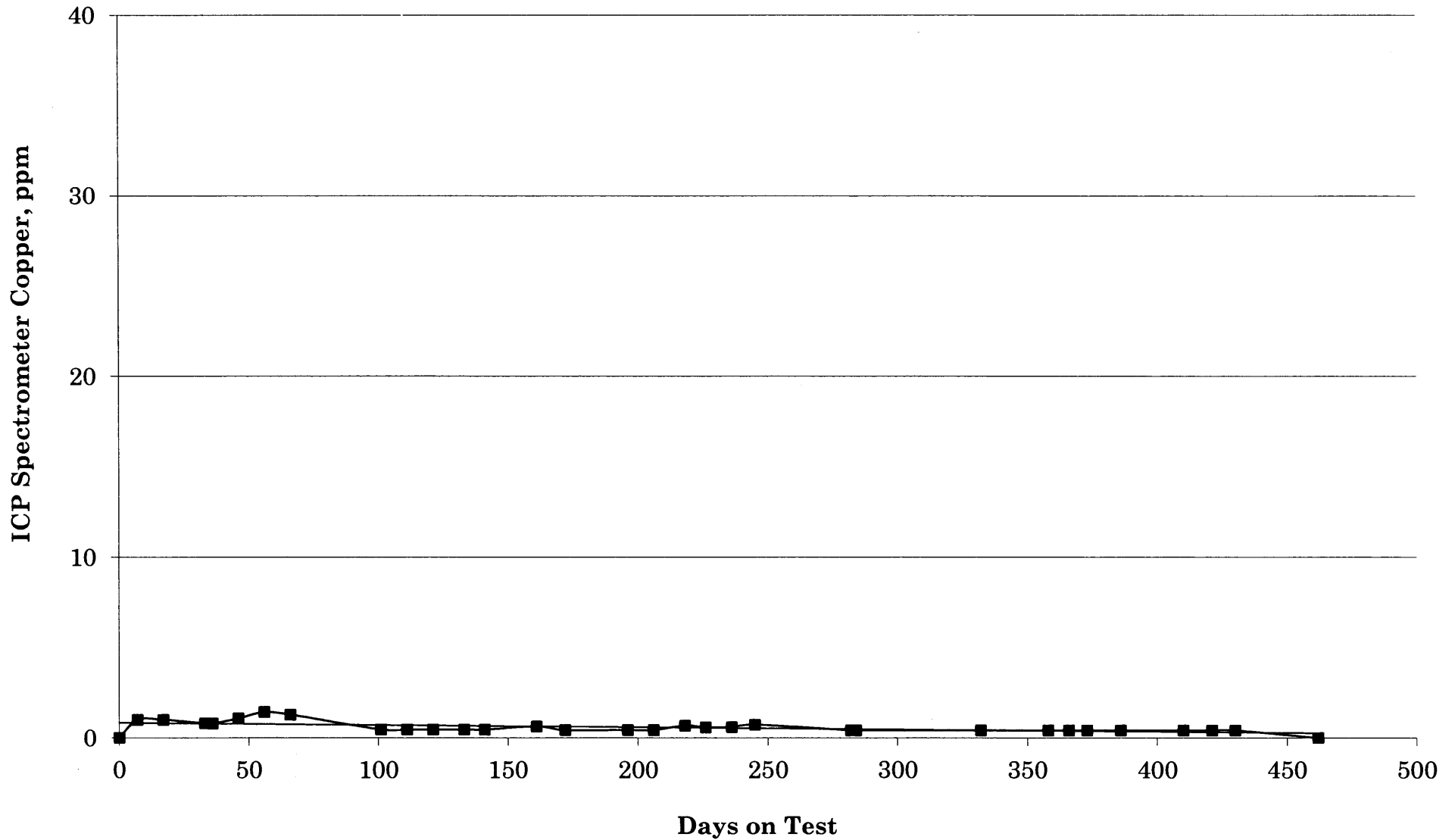


This document does not grant approval for use of biodiesel blends in GE locomotives. Review applicable Maintenance Instructions for approved fuels.

Appendix 4-5
FR-861 Amtrak B-20 Test
Unit 500
Oxidation

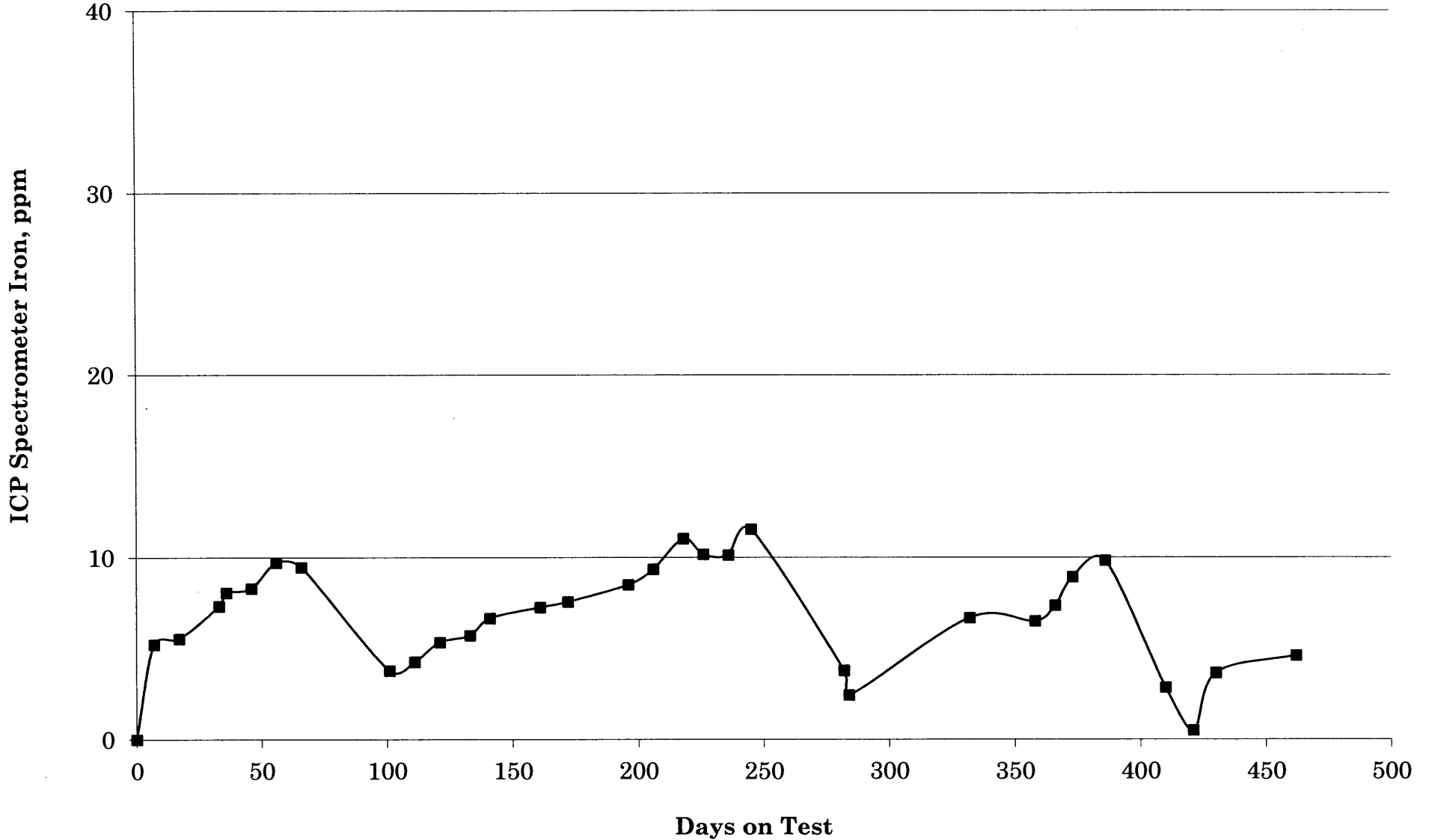


Appendix 4-6
FR-861 Amtrak B-20 Test
Unit 500
Copper

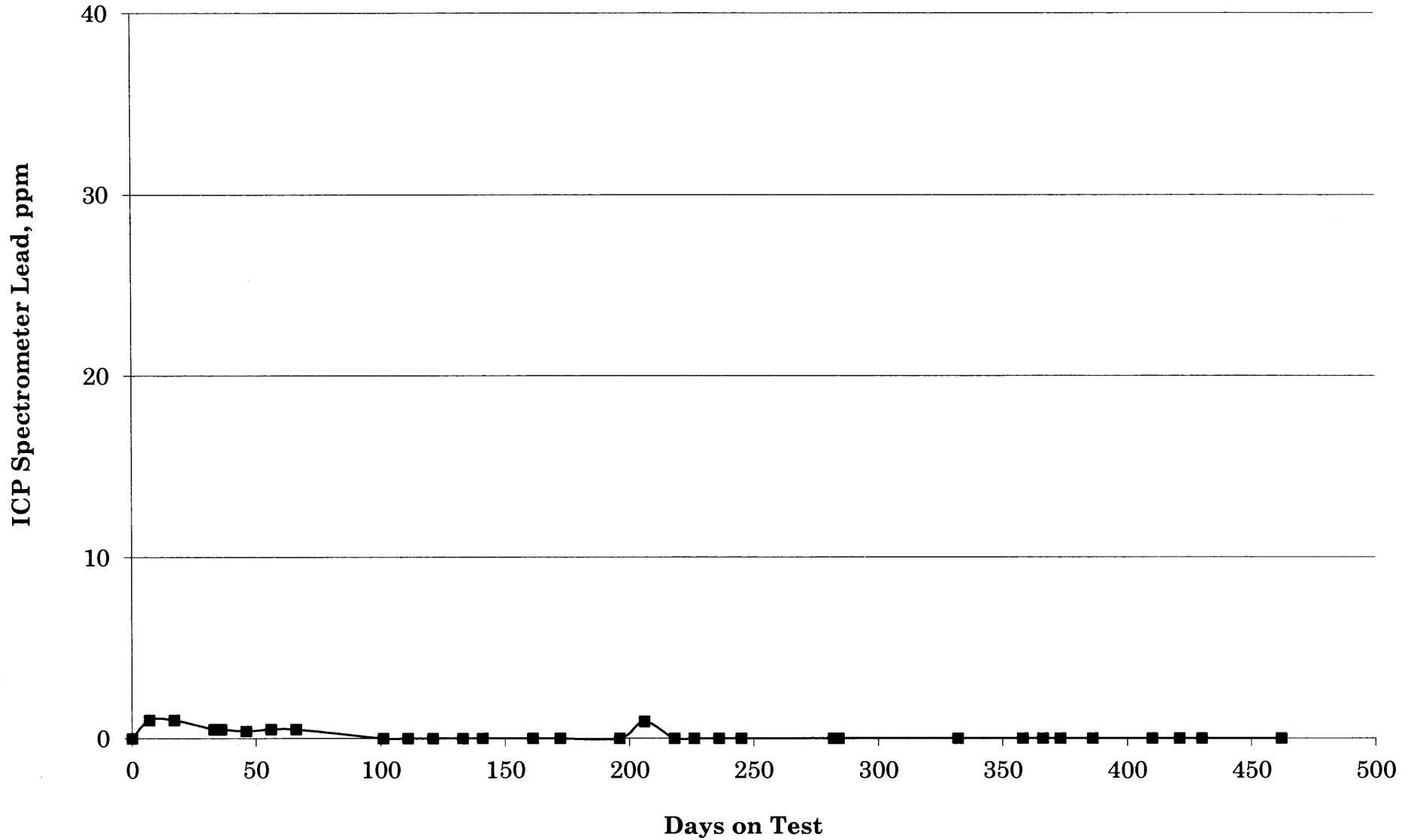


This document does not grant approval for use of biodiesel blends in GE locomotives. Review applicable Maintenance Instructions for approved fuels.

Appendix 4-7
FR-861 Amtrak B-20 Test
Unit 500
Iron



Appendix 4-8
FR-861 Amtrak B-20 Test
Unit 500
Lead



This document does not grant approval for use of biodiesel blends in GE locomotives. Review applicable Maintenance Instructions for approved fuels.

Appendix 5

Photographs

- Appendix 5-1: Pistons (Thrust)
- Appendix 5-2: Pistons
- Appendix 5-3: Rockers
- Appendix 5-4: Rocker Covers
- Appendix 5-5: Crankcase Covers
- Appendix 5-6: Liners
- Appendix 5-7: Injectors
- Appendix 5-8: Rings
- Appendix 5-9: Bearing (Top and Bottom)

Appendix 5-1
AMTRAK B-20 FIELD TEST - FR861
ORONITE TECHNOLOGY
UNIT 500 GE P32-8 7FDL-12 LOCOMOTIVE



Piston 2R (thrust)

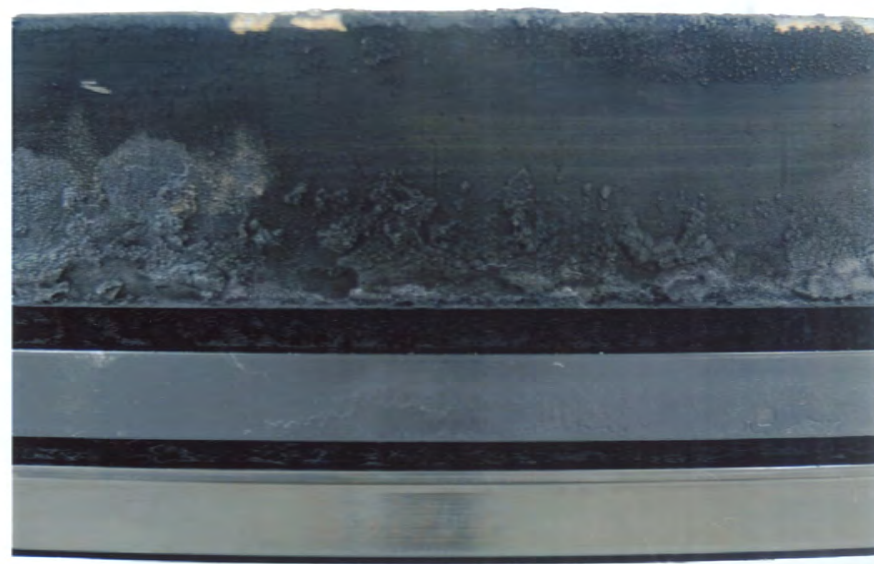


Piston 2L (thrust)

Appendix 5-2
AMTRAK B-20 FIELD TEST - FR861
ORONITE TECHNOLOGY
UNIT 500 GE P32-8 7FDL-12 LOCOMOTIVE

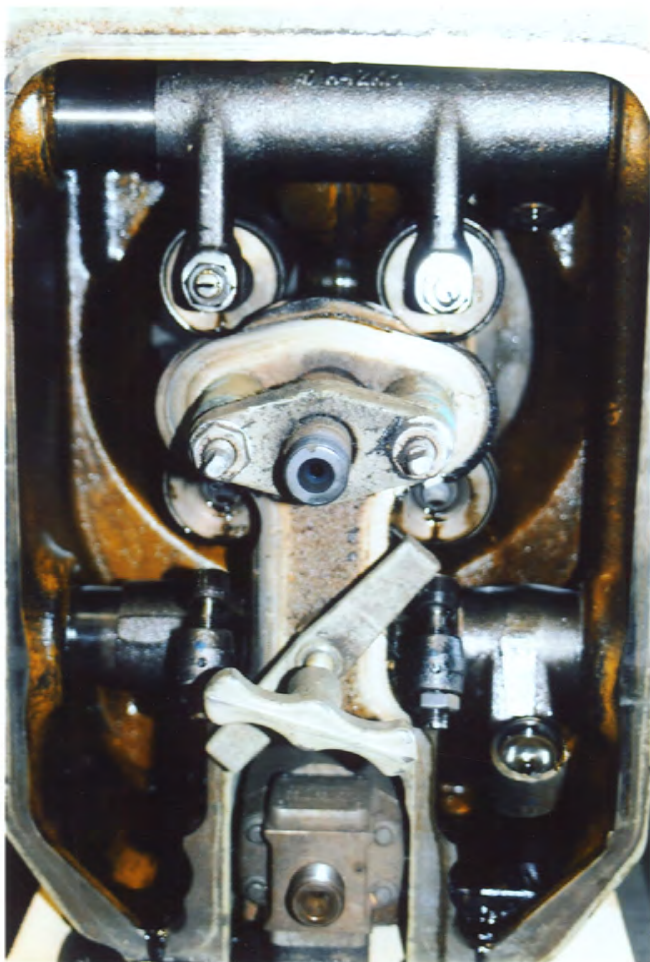


Piston 2R (RBZ#4)

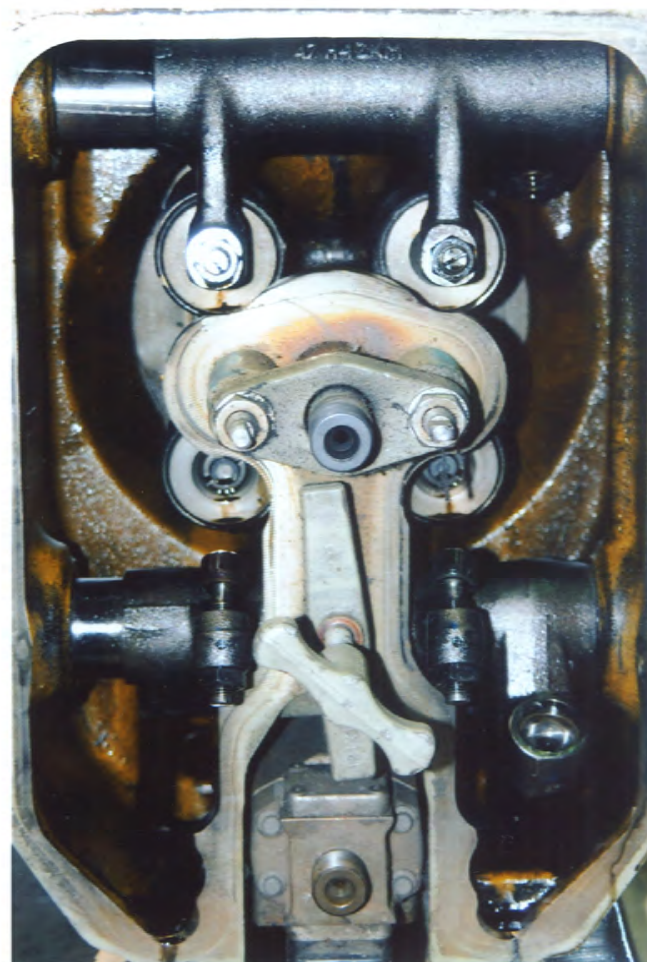


Piston 2L (RBZ#4)

Appendix 5-3
AMTRAK B-20 FIELD TEST - FR861
ORONITE TECHNOLOGY
UNIT 500 GE P32-8 7FDL-12 LOCOMOTIVE

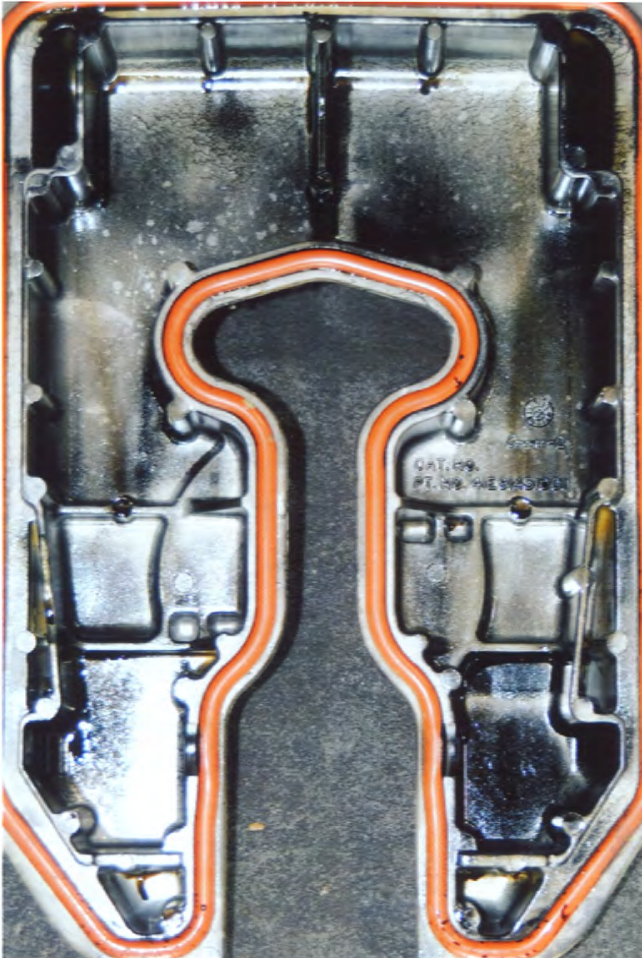


Rockers 2R



Rockers 2L

Appendix 5-4
AMTRAK B-20 FIELD TEST - FR861
ORONITE TECHNOLOGY
UNIT 500 GE P32-8 7FDL-12 LOCOMOTIVE



Rocker Cover 2R



Rocker Cover 2L

Appendix 5-5
AMTRAK B-20 FIELD TEST - FR861
ORONITE TECHNOLOGY
UNIT 500 GE P32-8 7FDL-12 LOCOMOTIVE

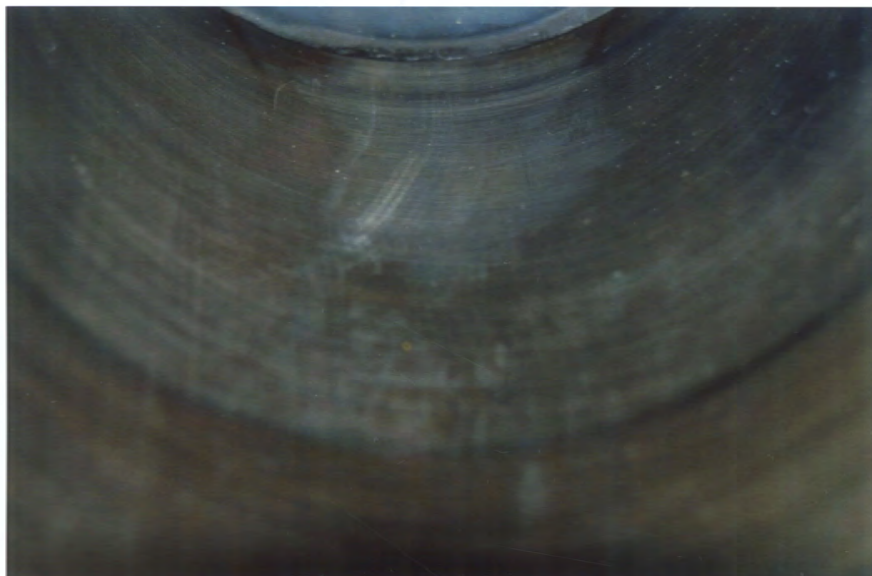


Crankcase Cover 2R

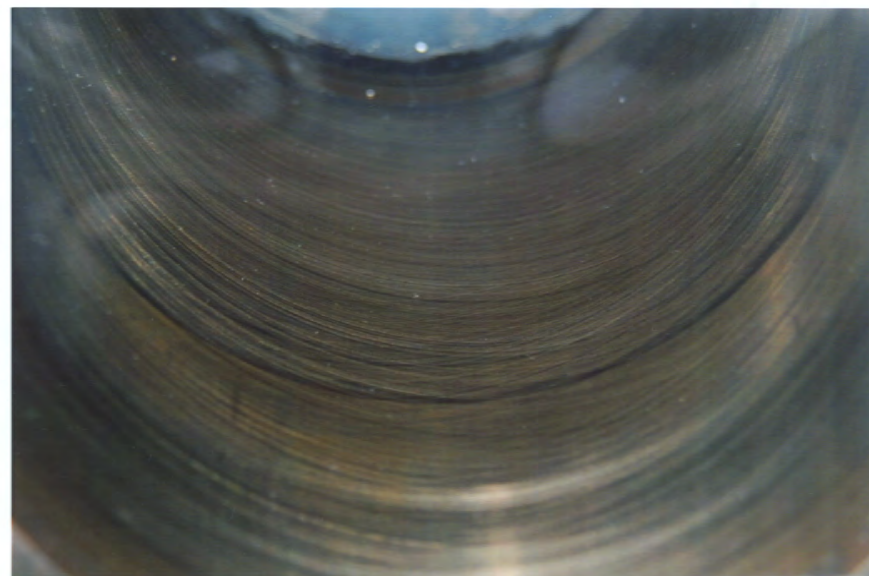


Crankcase Cover 2L

Appendix 5-6
AMTRAK B-20 FIELD TEST - FR861
ORONITE TECHNOLOGY
UNIT 500 GE P32-8 7FDL-12 LOCOMOTIVE



Liner 2R



Liner 2L

Appendix 5-7
AMTRAK B-20 FIELD TEST - FR861
ORONITE TECHNOLOGY
UNIT 500 GE P32-8 7FDL-12 LOCOMOTIVE

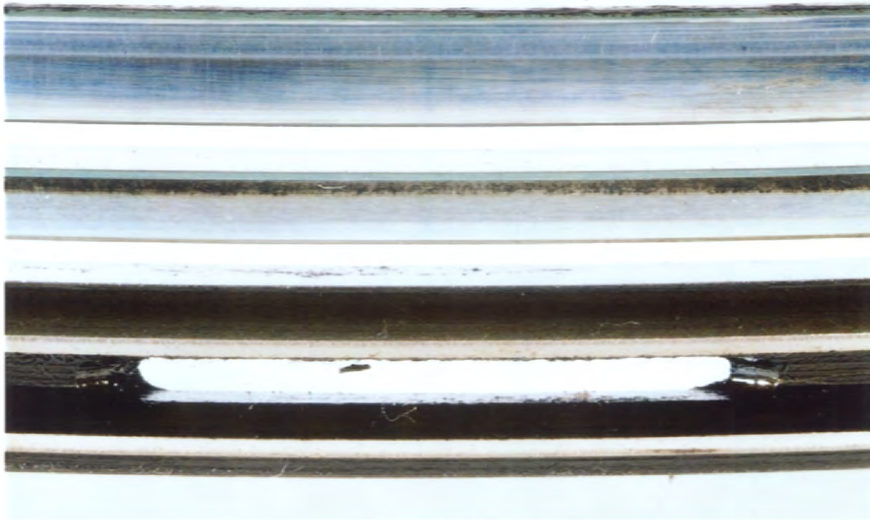


Injector 5R



Injector 5L

Appendix 5-8
AMTRAK B-20 FIELD TEST - FR861
ORONITE TECHNOLOGY
UNIT 500 GE P32-8 7FDL-12 LOCOMOTIVE

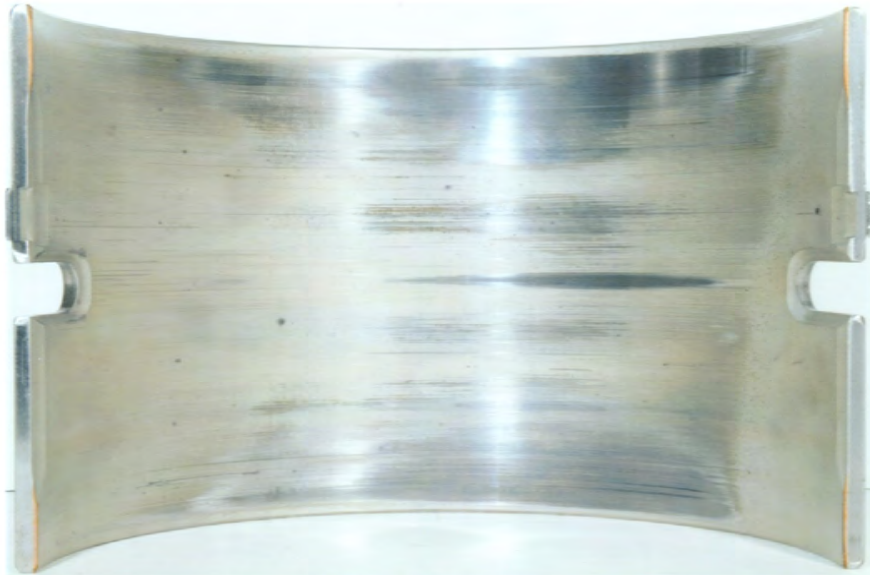


**Rings 2R
Face**

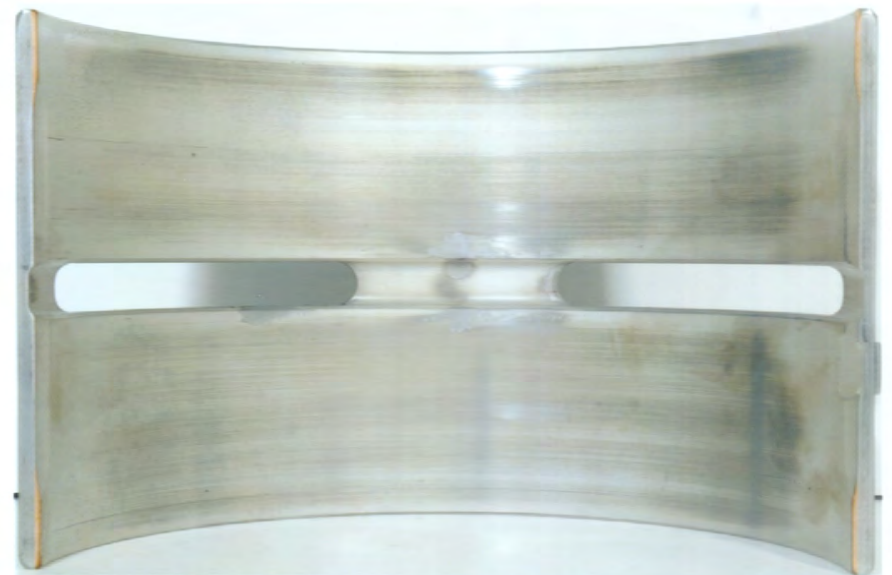


**Rings 2R
Backside**

Appendix 5-9
AMTRAK B-20 FIELD TEST - FR861
ORONITE TECHNOLOGY
UNIT 500 GE P32-8 7FDL-12 LOCOMOTIVE



Bearing Top



Bearing Bottom