

**Brandeis Machinery and Supply Co**  
**Falk Steudtner**  
**1801 Watterson Trail -**  
**Louisville, KY, 40299**

 P.O./Ref No.: **BRANDEIS EVANSVILLE IN**

 Unit ID: **2263 / C0987**

 Unit Worksite: **Madisonville, KY**

 Comp. Ref NO.: **6406878**

 Component Type: **DIESEL ENGINE**

 Component: **DIESEL ENGINE**

 Unit Manufacturer and Model: **Komatsu D65PX-17**

 Oil Type: **KOMATSU LOW ASH 15W40**

 Component Manufacturer and Model: **Komatsu D65PX-17**

 Component Serial Number: **2263**
**Maintenance Recommendations for Lab No. 201602020290**

 Reported On: **Feb 04 2016**

 From: **Armstrong Coal, Madisonville, KY**

ANALYSIS REFLECTS CONDITIONS / VALUES NOTED FOR MONITORING PURPOSES ONLY. Other tests results are satisfactory and data reflects the system was serviced with the appropriate oil and/or filter change at the time of sampling. No additional action is required at this time. RESAMPLE at the next scheduled interval. For an accurate and absolute (%wt.) measurement of the soot content, this sample was processed by LEM.

**SPECTROCHEMICAL ANALYSIS IN PARTS PER MILLION**

LAB NO.	Iron	Chromium	Nickel	Aluminum	Lead	Copper	Tin	Silver	Titanium	Silicon	Boron	Sodium	Potassium	Molybdenum	Phosphorus	Zinc	Calcium	Barium	Magnesium	Antimony	Vanadium	Sample Drawn
0290	40	2	1	3	1	2	<1	0.1	1	5	49	1	10	110	1007	1185	2700	<1	64	1	<1	01/28/16
0679	53	3	1	4	1	2	<1	0.1	3	6	45	<1	9	115	1084	1313	2910	<1	108	<1	<1	01/05/16
0380	36	2	<1	3	1	2	<1	<0.1	17	5	46	4	9	95	1046	1219	2525	<1	126	1	<1	12/08/15
0779	56	2	1	5	1	2	<1	0.1	103	7	22	4	1	9	1171	1434	2148	<1	401	<1	<1	11/10/15
1948	29	1	1	3	<1	1	<1	0.1	111	8	36	<1	<1	5	1172	1407	2157	<1	404	<1	<1	10/28/15
0586	24	1	<1	4	<1	1	<1	<0.1	79	5	22	<1	<1	5	901	1093	1636	<1	314	1	<1	10/07/15

**SAMPLE INFORMATION**
**PHYSICAL TEST RESULTS**

LAB NO.	MI/HR Unit	MI/HR Oil	Oil Add	FLTR CHG	Oil CHG	Viscosity 100 °C	Visc Grade	Soot	OX	NTR	GLY Test	Water	Fuel	LEM Soot
0290	6030	381	0	Yes	C	13.8	40	0.7	23*	17*	NEG	<0.1	<0.50	0.16
0679	5649	474	0	Yes	C	14.4	40	0.9	25*	18*	NEG	<0.1	<0.50	2.79
0380	5175	580	0	Yes	C	14.5	40	0.8	23*	17*	NEG	<0.1	<0.50	1.16
0779	4595	530	0	Yes	C	16.8*	50*	1.3	27*	17*	NEG	<0.1	<0.50	2.81
1948	4338	468	0	No	S	15.2	40	0.7	21*	15*	NEG	<0.1	<0.50	
0586	3870	298	0	Yes	C	15.9	40	0.7	21	13	NEG	<0.1	<0.50	

**Brandeis Machinery and Supply Co**  
**Falk Steudtner**  
**1801 Watterson Trail -**  
**Louisville, KY, 40299**

 P.O./Ref No.: **BRANDEIS EVANSVILLE IN**

 Unit ID: **2263 / C0987**

 Unit Worksite: **Madisonville, KY**

 Comp. Ref NO.: **6406881**

 Component Type: **FINAL DRIVE**

 Component: **LEFT REAR FINAL DRIVE**

 Unit Manufacturer and Model: **Komatsu D65PX-17**

 Oil Type: **PHILLIPS UNKNOWN SAE 30**

 Component Manufacturer and Model: **Komatsu D65PX-17**

 Component Serial Number: **2263**
**Maintenance Recommendations for Lab No. 201602020293**

 Reported On: **Feb 02 2016**

 From: **Armstrong Coal, Madisonville, KY**

ANALYSIS INDICATES AN ABNORMAL LEVEL OF CONTAMINATION IS PRESENT! ABRASIVES (dirt) present. CHECK seals, vents, and case for location of contaminant entry. Data provided indicates oil was changed when sampled. RESAMPLE at the next scheduled interval.

**SPECTROCHEMICAL ANALYSIS IN PARTS PER MILLION**

LAB NO.	Iron	Chromium	Nickel	Aluminum	Lead	Copper	Tin	Silver	Titanium	Silicon	Boron	Sodium	Potassium	Molybdenum	Phosphorus	Zinc	Calcium	Barium	Magnesium	Antimony	Vanadium	Sample Drawn
0293	226	2	<1	42 *	<1	1	<1	<0.1	3	131 *	4	6	14	<1	754	925	2160	12	12	<1	<1	01/28/16
0720	715 *	11	2	98 *	<1	5	<1	<0.1	7	290 *	12	7	25	5	808	1075	2335	73	17	1	2	01/20/16
0682	460 *	8	1	62 *	<1	5	<1	<0.1	4	197 *	6	4	18	4	812	1052	2398	38	13	<1	1	01/05/16
0383	339	5	<1	47	1	3	<1	<0.1	4	145 *	3	14	16	3	834	1025	2353	1	12	<1	1	12/08/15
0783	92	2	<1	15	<1	<1	<1	<0.1	1	55	2	6	6	1	782	997	2276	<1	9	<1	<1	11/10/15
0644	96	2	1	7	<1	<1	<1	<0.1	1	46	4	3	2	2	834	1069	2421	<1	9	<1	<1	10/15/15

**SAMPLE INFORMATION**
**PHYSICAL TEST RESULTS**

LAB NO.	MI/HR Unit	MI/HR Oil	Oil Add	FLTR CHG	Oil CHG	Water	Viscosity 100 °C
0293	6030	81	0	No	C	<0.1	10.9
0720	5949	774	0	No	C	<0.1	10.8
0682	5649	474	0	No	S	<0.1	11.0
0383	5175	1110	0	No	C	<0.1	11.0
0783	4595	530	0	No	S	<0.1	11.1
0644	4065	2155	0	No	C	<0.1	11.0

**Brandeis Machinery and Supply Co**  
**Falk Steudtner**  
**1801 Watterson Trail -**  
**Louisville, KY, 40299**

 P.O./Ref No.: **BRANDEIS EVANSVILLE IN**

 Unit ID: **2263 / C0987**

 Unit Worksite: **Madisonville, KY**

 Comp. Ref NO.: **6406880**

 Component Type: **HYDRAULIC SYSTEM**

 Component: **HYDRAULIC**

 Unit Manufacturer and Model: **Komatsu D65PX-17**

 Oil Type: **PHILLIPS UNKNOWN ISO 46**

 Component Manufacturer and Model: **Komatsu D65PX-17**

 Component Serial Number: **2263**
**Maintenance Recommendations for Lab No. 201602020294**

 Reported On: **Feb 02 2016**

 From: **Armstrong Coal, Madisonville, KY**

ANALYSIS INDICATES COMPONENT &amp; LUBRICANT CONDITIONS ARE ACCEPTABLE. RESAMPLE at the next scheduled interval.

**SPECTROCHEMICAL ANALYSIS IN PARTS PER MILLION**

LAB NO.	Iron	Chromium	Nickel	Aluminum	Lead	Copper	Tin	Silver	Titanium	Silicon	Boron	Sodium	Potassium	Molybdenum	Phosphorus	Zinc	Calcium	Barium	Magnesium	Antimony	Vanadium	Sample Drawn
0294	17	1	<1	14	6	10	<1	<0.1	1	27	<1	4	3	<1	417	546	679	<1	11	<1	<1	01/28/16
0683	15	1	<1	13	7	10	<1	<0.1	1	25	1	5	4	<1	423	574	701	<1	10	<1	<1	01/05/16
0384	13	1	<1	12	7	10	<1	<0.1	1	24	<1	10	5	1	432	562	680	<1	9	<1	<1	12/08/15
0784	9	<1	<1	7	6	9	<1	<0.1	<1	12	<1	6	2	<1	432	592	720	<1	9	<1	<1	11/10/15
0642	14	1	1	10	14	18	<1	<0.1	1	22	1	8	3	<1	514	703	1616	<1	20	<1	<1	10/15/15
1029	14	<1	<1	11	15	17	<1	<0.1	2	19	1	4	4	2	527	703	1680	<1	26	<1	<1	09/28/15

**SAMPLE INFORMATION**
**PHYSICAL TEST RESULTS**

LAB NO.	MI/HR Unit	MI/HR Oil	Oil Add	FLTR CHG	Oil CHG	Water	Viscosity 100 °C
0294	6030	1965	0	Yes	C	<0.1	7.2
0683	5649	1584	0	No	S	<0.1	7.1
0384	5175	1110	0	Yes	S	<0.1	6.8
0784	4595	530	0	No	S	<0.1	6.8
0642	4065	2155	0	Yes	C	<0.1	6.7
1029	3572	1662	0	Yes	S	<0.1	6.7

**Brandeis Machinery and Supply Co**  
**Falk Steudtner**  
**1801 Watterson Trail -**  
**Louisville, KY, 40299**

 P.O./Ref No.: **BRANDEIS EVANSVILLE IN**

 Unit ID: **2263 / C0987**

 Unit Worksite: **Madisonville, KY**

 Comp. Ref NO.: **6406879**

 Component Type: **TRANSMISSION**

 Component: **TRANSMISSION**

 Unit Manufacturer and Model: **Komatsu D65PX-17**

 Oil Type: **PHILLIPS UNKNOWN SAE 30**

 Component Manufacturer and Model: **Komatsu D65PX-17**

 Component Serial Number: **2263**
**Maintenance Recommendations for Lab No. 201602020291**

 Reported On: **Feb 02 2016**

 From: **Armstrong Coal, Madisonville, KY**

ANALYSIS INDICATES COMPONENT & LUBRICANT CONDITIONS WERE ACCEPTABLE. Data reflects the system was serviced and the oil & filter(s) were changed at the time of sampling. RESAMPLE at next scheduled interval.

**SPECTROCHEMICAL ANALYSIS IN PARTS PER MILLION**

LAB NO.	Iron	Chromium	Nickel	Aluminum	Lead	Copper	Tin	Silver	Titanium	Silicon	Boron	Sodium	Potassium	Molybdenum	Phosphorus	Zinc	Calcium	Barium	Magnesium	Antimony	Vanadium	Sample Drawn
0291	10	<1	<1	2	2	138	1	0.1	1	9	4	4	2	2	824	996	2313	4	8	1	<1	01/28/16
0680	7	<1	<1	1	1	137	<1	<0.1	1	6	4	2	<1	<1	829	1032	2394	3	8	1	<1	01/05/16
0381	11	<1	<1	<1	5	344	<1	<0.1	1	8	5	9	2	<1	815	989	2256	7	7	<1	<1	12/08/15
0780	9	<1	1	2	5	294	<1	<0.1	1	6	6	3	1	<1	850	1042	2349	9	9	1	<1	11/10/15
0781	16	<1	2	3	8	604*	<1	0.1	1	10	9	2	2	<1	822	971	2203	20	7	<1	<1	11/05/15
0641	12	<1	<1	<1	1	86	<1	<0.1	3	12	4	<1	<1	<1	814	1023	2395	1	14	<1	<1	10/15/15

**SAMPLE INFORMATION**
**PHYSICAL TEST RESULTS**

LAB NO.	MI/HR Unit	MI/HR Oil	Oil Add	FLTR CHG	Oil CHG	Water	Viscosity 100 °C
0291	6030	855	0	Yes	C	<0.1	10.8
0680	5649	474	0	Yes	S	<0.1	10.8
0381	5175	695	0	Yes	C	<0.1	11.3
0780	4595	530	0	Yes	S	<0.1	11.1
0781	4480	415	0	Yes	C	<0.1	11.4
0641	4065	1158	0	Yes	C	<0.1	10.8

**Brandeis Machinery and Supply Co**  
**Falk Steudtner**  
**1801 Watterson Trail -**  
**Louisville, KY, 40299**

 P.O./Ref No.: **BRANDEIS EVANSVILLE IN**

 Unit ID: **2263 / C0987**

 Unit Worksite: **Madisonville, KY**

 Comp. Ref NO.: **6406882**

 Component Type: **FINAL DRIVE**

 Component: **RIGHT REAR FINAL DRIVE**

 Unit Manufacturer and Model: **Komatsu D65PX-17**

 Oil Type: **PHILLIPS UNKNOWN SAE 30**

 Component Manufacturer and Model: **Komatsu D65PX-17**

 Component Serial Number: **2263**
**Maintenance Recommendations for Lab No. 201602020292**

 Reported On: **Feb 02 2016**

 From: **Armstrong Coal, Madisonville, KY**

ANALYSIS INDICATES ABNORMAL CONDITIONS! ABRASIVES (dirt) present. CHECK seals, vents, and case for location of contaminant entry. Data provided indicates oil was changed when sampled. RESAMPLE at the next scheduled interval.

**SPECTROCHEMICAL ANALYSIS IN PARTS PER MILLION**

LAB NO.	Iron	Chromium	Nickel	Aluminum	Lead	Copper	Tin	Silver	Titanium	Silicon	Boron	Sodium	Potassium	Molybdenum	Phosphorus	Zinc	Calcium	Barium	Magnesium	Antimony	Vanadium	Sample Drawn
0292	272	3	<1	52 *	<1	2	<1	<0.1	4	163 *	5	6	18	1	846	1023	2394	12	13	1	<1	01/28/16
0719	1155 *	16	3	184 *	<1	7	<1	<0.1	12	512 *	13	12	53	7	822	1069	2367	87	24	<1	2	01/20/16
0681	755 *	12	3	154 *	<1	6	<1	<0.1	9	432 *	11	8	43	4	806	1054	2395	76	22	<1	2	01/05/16
0382	339	6	<1	54	<1	5	<1	<0.1	4	169 *	5	12	17	4	827	1033	2341	25	12	1	1	12/08/15
0782	68	2	<1	16	<1	3	<1	<0.1	1	60	3	7	7	1	846	1076	2463	<1	9	1	<1	11/10/15
0643	58	2	<1	6	<1	1	<1	<0.1	1	41	4	2	2	2	844	1068	2416	<1	8	<1	<1	10/15/15

**SAMPLE INFORMATION**
**PHYSICAL TEST RESULTS**

LAB NO.	MI/HR Unit	MI/HR Oil	Oil Add	FLTR CHG	Oil CHG	Water	Viscosity 100 °C
0292	6030	81	0	No	C	<0.1	10.8
0719	5949	774	0	No	C	<0.1	11.1
0681	5649	474	0	No	S	<0.1	11.0
0382	5175	1110	0	No	C	<0.1	10.8
0782	4595	530	0	No	S	<0.1	10.9
0643	4065	2155	0	No	C	<0.1	10.9