



# PERRY JOHNSON LABORATORY ACCREDITATION, INC.

## Certificate of Accreditation

*Perry Johnson Laboratory Accreditation, Inc. has assessed the Laboratory of:*

***Petro Lubricant Testing Laboratory, Inc.***  
*116 Sunset Inn Road, Lafayette, NJ 07848*

*(Hereinafter called the Organization) and hereby declares that Organization is accredited in accordance with the recognized International Standard:*

**ISO/IEC 17025:2005**

This accreditation demonstrates technical competence for a defined scope and the operation of a laboratory quality management system (as outlined by the joint ISO-ILAC-IAF Communiqué dated April 2017):

***Testing of Oils and Greases for the Lubricant Industry***  
*(As detailed in the supplement)*

Accreditation claims for such testing and/or calibration services shall only be made from addresses referenced within this certificate. This Accreditation is granted subject to the system rules governing the Accreditation referred to above, and the Organization hereby covenants with the Accreditation body's duty to observe and comply with the said rules.

For PJLA:

Tracy Szerszen  
President/Operations Manager

*Initial Accreditation Date:*

March 11, 2005

*Issue Date:*

May 2, 2017

*Expiration Date:*

May 31, 2019

*Revision Date:*

February 27, 2018

*Accreditation No.:*

59321

*Certificate No.:*

L17-183-R1

Perry Johnson Laboratory  
Accreditation, Inc. (PJLA)  
755 W. Big Beaver, Suite 1325  
Troy, Michigan 48084

*The validity of this certificate is maintained through ongoing assessments based on a continuous accreditation cycle. The validity of this certificate should be confirmed through the PJLA website: [www.pjllabs.com](http://www.pjllabs.com)*



# Certificate of Accreditation: Supplement

## Petro Lubricant Testing Laboratory, Inc.

116 Sunset Inn Road, Lafayette, NJ 07848

Contact Name: Josiah Wintermute Phone: 973-579-3448

Accreditation is granted to the facility to perform the following testing:

FIELD OF TEST	ITEMS, MATERIALS OR PRODUCTS TESTED	SPECIFIC TESTS OR PROPERTIES MEASURED	SPECIFICATION, STANDARD METHOD OR TECHNIQUE USED	METHOD APPLICATION RANGE
Mechanical <sup>F</sup>	Tribological Tests: Oils and Greases	Wear Preventative Characteristics (4-Ball Method)	ASTM D2266	1 kg to 40 kg
			ASTM D4172	1 kg to 40 kg
		Friction Analysis	PLTL-95	1 kg to 40 kg
		Timken OK Load Carrying	ASTM D2509	3 lb to 100 lb
			ASTM 2782	3 lb to 100 lb
		US Steel Retention Test (Four Gram Method)	USS-IRT	33 lb or 43 lb
		Load Wear Index (4-Ball EP)	ASTM D2596 ASTM D2783	13 kg load to 800 kg load
		Mean Hertz Load	FTM-6503	6 kg load to 794 kg load
		Falex Pin & V Block Test	ASTM D2625	250 lb load to 4 000 lb load
			ASTM D3233	300 lb load to 4 500 lb load
		Falex Pin & V Block Tooth Wear Test	ASTM D2670 ASTM D5620	690 lb load or 920 lb load
		Falex Ring on Block	ASTM D2714	30 lb load to 630 lb load
		Load Carrying Capacity Test-Falex Test	Molycote 3400A, CTM 0225	13 kg load to 800 kg load
		Endurance Life Test-Falex Pin & V Block Test	Molycote 3400A, CTM 0409	250 lb load to 4000 lb load
		Fretting Wear Test	ASTM D4170	550 lb - ft load
	Gear Wear, Navy	FTM-335	5 lb load and 10 lb load	
	Rheological Tests: Oils and Greases	Penetration Cone (Worked or Unworked)	ASTM D217	8.5 mm to 47.5 mm
		Penetration (Used for Softer Unrefined Waxes)	ASTM D937	8.5 mm to 47.5 mm
		Penetration Cone (½ scale or ¼ scale)	ASTM D1403	8.5 mm to 47.5 mm
		Penetration of Waxes	ASTM D1321	8.5 mm to 47.5 mm
Penetration Cone (Worked Stability)		FTM-313	8.5 mm to 47.5 mm	



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Mechanical <sup>F</sup>	Rheological Tests: Oils and Greases	Viscosity, Kinematic	ASTM D445	1 cSt to 200 000 cSt
		Viscosity of Greases at High Temperature	ASTM D3232	3000 cP to 32 000 cP
		Borderline Pumping Temperature	ASTM D3829	10 000 mPa·s to 100 000 mPa·s
		Viscosity, Kinematic (0 °F to -65 °F) Storage 72 hours	ASTM D2532	1 000 cSt to 200 000 cSt
		Viscosity, Brookfield	ASTM D2983 and ASTM D1824	100 cP to 1 000 000 cP
		Viscosity, Scanning Brookfield (+100°C To -40°C)	ASTM D5133	100 cP to 1 000 000 cP
		Viscosity Index (calculation)	ASTM D2270 and ASTM D567	20 cSt @ 100 °C to 5 569 cSt @ 40 °C
		Apparent Viscosity	ASTM D1092	10 sec <sup>-1</sup> to 20 000 sec <sup>-1</sup>
		Mobility of Grease, US Steel Method	LT-37	10 sec <sup>-1</sup> to 20 000 sec <sup>-1</sup>
		Molecular Weight from Viscosity	ASTM D2502	100 cSt @ 100 °F to 750 cSt @ 100 °F
		Conversion to SUS	ASTM D2161	See ASTM D445
		Yield Stress/Apparent Viscosity (MRV)	ASTM D4684	10 000 cP to 100 000 cP
		Apparent Viscosity Cold Cranking Simulator	ASTM D5293	-5 °C to -40 °C
		Low Temperature Torque	ASTM D1478	0 °C to -73 °C
		Low Temperature Torque of Wheel Bearing	ASTM D4693	0 °C to -73 °C
		Low Temperature Torque @ -65 °F	per SAE AS8660	1 000 g cm to 5 000 g cm
		Corrosion Tests: Oils and Greases	Copper Strip Corrosion	ASTM D130
	Copper Strip Corrosion		ASTM D130	#1-A to # 4-C (Chart)
	Corrosion, Bomb Copper, 210°F @ 20 hours		ASTM D1261	ASTM D130 Chart #1-A to # 4-C



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Mechanical <sup>F</sup>	Corrosion Tests: Oils and Greases	Glassware Corrosion	ASTM D1384	88 °C @ 336 hr
		Lead Corrosion	FTM-5321	325 °F @ 1 hr
		Corrosiveness (Bimetallic Couple)	FTM-5322 ASTM D6547	27 °C @ 50 % R.H. after 10 days
		Corrosion, Copper	ASTM D4048 and FTM-5309	ASTM D130 Chart #1-A to # 4-C
		Humidity Cabinet Test	ASTM D1748 and FTM-5329	100 % R.H.
		Corrosion, Solid Film of Lubricants	ASTM D2649	500 hr @ 100 % R.H.
		Salt Spray Corrosion	FTM-4001.2	5 % Salt Fog
		Salt Spray Corrosion Test	ASTM B117	5 % Salt Fog
		Water Displacement and Stability	FTM-3007	1 hr at room temperature
		Emcor Rust Test	ASTM D6138 and IP-220 and DIN 51802	Rating #0 to Rating #5
		Iron Chip Corrosion Test	ASTM D4627	Visual break-point of Rust Formation after 24 hr
		Sea Water Rust Preventative Properties	ASTM D5969	24 hr @ 52 °C Visual rating per paragraph 11
		Rust Preventative Properties	ASTM D1743	48 hr @ 52 °C
		Rust Prevention	ASTM D665	Visual rating per paragraph 12
		Film Stability and Corrosion on Steel	Per Mil-Prf-27617 PLTL-37	Visual Pass/ Fail rating per paragraph 3.6
		Corrosive Effects-Metals Section Corrosive Effects-Non-Metals	Per SAE AS8660 PLTL-41 PLTL-42	Visual Pass/ Fail rating per Table 1 of AS8660
		Carbon Residue, Conradson	ASTM D189	5 % Carbon Residue or Less
		Oxidation Tests: Oils and Greases	Ash Content	ASTM D482
	Carbon Residue. Ramsbottom		ASTM D524	5 % Carbon Residue or Less



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Mechanical <sup>F</sup>	Oxidation Tests: Oils and Greases	Sulfated Ash	ASTM D874	1 mg ash to 20 mg ash
		Oxidation, Pressure Vessel	ASTM D942	210 °F @ 100 hr
		Rotating Pressure Vessel Oxidation	ASTM 2272 and D2112	25.4 psi drop @ 150 °C
		Thin Film Oxygen Uptake Test (TFOUT)	ASTM D4742	160 °C to Induction Time
		Oxygen Stability of EP Gear Oils	ASTM D2893	95 °C (method A) or 121 °C (method B) For 312 hr
		High Temperature Stability	Mil-Prf-83282, Mil-Prf-87272, and Mil-Prf-87257 (PLTL-30)	205 °C @ 100 hr 200 °C @ 100 hr 200 °C @ 100 hr
		Corrosion and Oxidation	FTM-5307, FTM-5308; and ASTM D4636	125 °C @ 168 hr to 235 °C @ 24 hr
		Thermal Stability and Corrosivity	FTM-3411	525 °F @ 96 hr
		Cincinnati Milacron Thermal Stability Procedure A or B	ASTM D2070 PLTL-86	135 °C @ 168 hr 101 °C @ 24 hr or 72 hr
		Corrosion and Oxidation Stability	PLTL-48 for Mil-DTL-17111	per specification
		Oxidation Stability	ASTM D943	Time to reach TAN 2 mg KOH/g
		Hydrolytic Stability	ASTM D2619	93 °C @ 48 hr
		Sludging Tendencies of Inhibited Mineral Oil	ASTM D4310	95 °C @ 1 000 hr per Procedure A or Procedure B
		Oxidation Stability of Mineral Insulating Oil	ASTM D2440	110 °C for 72 hr and 164 hr
	Sonic Shear Stability	ASTM D2603, ASTM D5621, PLTL-131, and PLTL-141	per specification	
Performance Tests: Oils and Greases	Elastomer Compatibility	ASTM D471	Time, Temperature and Elastomer type by request	



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Mechanical <sup>F</sup>	Performance Tests: Oils and Greases	Elastomer Compatibility NBR-L and CR Type	ASTM D4289 AMS-3217/2C AMS-3217/3C	100 °C for 70 hr 150 °C for 70 hr
		Compression	ATM D395	Time, Temperature and Elastomer type by request
		O-Rings	ASTM D1414	Time, Temperature and Elastomer type by request
		Hardness	ASTM D2240	Time, Temperature and Elastomer type by request
		Swelling of Rubber-FS, FA, QVI	Mil-Prf-7808 FTM-3604 FTM-3432	Time, Temperature and Elastomer type per Specification
		Swelling of Rubber-FA	Mil-Prf-23699, FTM 3432, FTM 3433	Time, Temperature and Elastomer type per Specification
		Swelling of Rubber-L	FTM-3603	AMS 3217/2C
		Swelling of Rubber-H	FTM-3604	AMS 3217/1B
		Foaming Characteristics, Sequence I Only	ASTM D892	24 °C Temperature
		Foaming Characteristics, Sequence I, II, III	ASTM D892	24 °C and 93 °C Temperatures
		Foaming Characteristics, Sequence I, II, III, IV	ASTM D892	24 °C and 93 °C Temperatures
		Emulsion Characteristics	ASTM D1401	54 °C Test (up to 90 cSt) and 82 °C Test (above 90 cSt)
		Foaming Tendencies of Engine Coolants in Glassware	ASTM D1881	88 °C Temperature
		Demulsibility Characteristics	ASTM D2711	Procedure A for Non-EP Oils or Procedure B for EP Oils
		Water Sludging	Mil-DTL-17111 PLTL-15	-2 % to 10 % viscosity change





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Mechanical <sup>F</sup>	Performance Tests: Oils and Greases	Congealing Point	ASTM D938	20 °C to 100 °C
		Cloud Point	ASTM D2500	50 °C to -80 °C
		Pour Point	ASTM D97	50 °C to -80 °C
		Stability, Low Temperature	FTM-3459	0 °F to -65 °F vs. BaCl turbidity standard
		Water Sensitivity	Mil-PRF-46170 PLTL-75	90 % minimum light transmittance
		Biological Activity	PLTL-80	Color Comparison Chart
		Waterproof Sealing	SAE AS8660	per specification
		Aniline Point	ASTM D611 Method A	-38 °C to 170 °C
		Evaporation Loss	ASTM D972	100 °C to 150 °C
			ASTM D2595	93 °C to 316 °C
		High Temperature Bearing Performance	ASTM D3336 121 °C to 260 °C	per material specification
		Life Performance of Wheel Bearing Grease	ASTM D3527	160 °C in 20 hr increments
		Leakage of Wheel Bearing Grease	ASTM D4290	160 °C @ 20 hr
		Water Washout Characteristics	ASTM D1264	38 °C Test Temp or 79 °C Test Temp
		Water Spray Off	ASTM D 4049	100 °F and 40 psi water spray @ 5 min
		Boiling Water Emersion	FTM-3463	after 5 min in boiling water
		Resistance of Grease to Fuel	FTM-5414	Percent solubility in Fuel
		Resistance of Grease to H <sub>2</sub> O and Ethanol	FTM-5415	Visual
		Roll Stability	ASTM D1831	25 °C to 100 °C and 2 hr to 100 hr duration
		Bethlehem Steel Combo Test, Parts A & B	LT-46	per specification
Dirt Count	FTM-3005	15 μ to 125 μ opaque particles per cc		



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Mechanical <sup>F</sup>	Performance Tests: Oils and Greases	Contamination, Trace Sediment	ASTM D2273	0.001 mL per 100 mL and above
		Contamination, Particulate and filter time	FTM-3009 and ARP598B	particles per 100 mL and filter time per 100 mL
		Particulate Contamination by HIAC Counter	FTM-3012	particle counting in the range of 5 μ to 100 μ per 100 mL
		Insoluble Contamination of Hydraulic Fluids	ASTM D4898 and FTM-3010	sediment weight 0.1 mg and up per 100 mL
		Oil Separation, Koppers Method	ASTM D4425	percent oil separation @ 36 000 G
		Oil Separation	FTM-321 and ASTM D6184	100 °C @ 30 hr
		Oil Separation (Storage)	IP-121	42 hr @ 40 °C or 168 hr @ 40 °C
			ASTM D1742	24 hr at 25 °C and 0.25 psi pressure
		Oil Separation (Black & Decker Method)	PLTL-81	100 x 10 mm Nickel Cone 50 hr
		Evaporation and Bleed	PLTL-31 per SAE AS8660	per specification
		Pressure Oil Separation and Penetration	PLTL-84 (US Steel Method)	23 °C @ 22 hr at 100 psi pressure
		Melting Point of Waxes	ASTM D87	per specification
		Physical Properties: Oils and Greases	Drop Point (Microcrystalline Waxes)	ASTM D127
	Dropping Point		ASTM D566	25 °C to 288 °C
			ASTM D2265	25 °C to 316 °C
	Boiling Point		ASTM D1120	20 °C to 400 °C
	Freezing Point		ASTM D1177	20 °C to -40 °C
	Precipitation Number		ASTM D91	0.001 mL per 100 mL
	Gravity, API		ASTM D287	-1 API to 51 API units
	Gravity, Lipkin Bicapillary	ASTM D1481	0 °C to 100 °C range	





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Mechanical <sup>F</sup>	Physical Properties: Oils and Greases	Gravity, Specific	ASTM D1298	-1 API to 51 API units and 0.75 to 1.25 specific gravity units
		Color (ASTM)	ASTM D1500 and ASTM D156	0.5 to 8.0 ASTM Color Numbers or -16 to 30 Saybolt Color Numbers
		Color Platinum-Cobalt Scale	ASTM D1209	#1 Platinum-Cobalt Number to #500 Platinum-Cobalt Number
		Specific Gravity (Grease Pycnometer)	PLTL-90	at 15 °C, 20 °C, 25 °C or 60 °F per specification
		Specific Gravity of Engine Coolant	ASTM D1122	1.00 to 1.35 Specific Gravity Units
		Flash and Fire Points (Cleveland Open Cup)	ASTM D92	79 °C to 400 °C
		Flash and Fire Points (Pensky Martin Closed Cup)	ASTM D93	60 °C to 190 °C
		Autoignition Temperature	ASTM D2155, and ASTM E659	Hot Flame Ignition Temperature
		High Pressure Spray Ignition	FTM-6052	1 000 psi at room temperature
		Wick Ignition	FTM-352	Number of Cycles to Ignition
		Flammability	SAE AS8660 specification PLTL-39	Pass/Fail per specification requirements
		Tag Open Cup	ASTM D1310	-18 °C to 165 °C
		Tag Closed Cup	ASTM D56	for Flash Points less than 93 °C
		Flame Propagation	ASTM D5306	millimeters per second
		Water by Distillation	ASTM D95	0 % to 25 % Water Content by Volume
		Distillation	ASTM D86	Initial Boiling Point through Dry Point
Titer Point of Fatty Acids	ASTM D1982	Temperature of Liquid Flow		



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Mechanical <sup>F</sup>	Physical Properties: Oils and Greases	Molecular Weight and Apparent Vapor Pressure by Evaporation	ASTM D2878	Calculation of Molecular Weight and Apparent Vapor Pressure from Evaporation Rate by ASTM D972
		Vapor Pressure by Isoteniscope	ASTM D2879: from 0°C to 270°C	Closed Vessel Vapor Equilibrium at Test Temperature
		Air Release Properties	ASTM D3427 and DIN51381	Time to Release Entrained Air at 25 °C, 50 °C or 75 °C
		Quenching Time of Heat Treating Fluids	ASTM D3520 and ASTM D6200	Time to Curie Point for ASTM D3520 and Time/Temperature Graph from 850 °C to 200 °C for ASTM D6200
		Soxhlet Extraction of Base Oil	PLTL-82	Percent Solids and Percent Oils of Lubricating Greases
		Low Temperature Turbidity	per Mil-Prf-17111 specification PLTL-13	Pass/Fail per specification
		Solidification	Per Mil-G-46886 (PLTL-38)	at -55 °C for 24 hr
		Specific Heat by DSC	ASTM E1269	-100 °C to 600 °C
		Refractive Index	ASTM D1747 and ASTM D1218	1.30 to 1.63 RI at selected temperature
		Surface Tension	ASTM D1331	Method A is Surface Tension and Method B is Interfacial Surface Tension
		Calculation of Carbon Distribution and Structural Group Analysis by the n-d-M Method	ASTM D3238 %Ca Aromatic Carbon %Cr Carbon in Rings %Cn Napthenic Carbon %Cp Paraffinic Carbon	Required Data: ASTM D1218 Refractive Index ASTM D1298 Specific Gravity ASTM D2502 Average Molecular Weight ASTM D2622 Sulfur Content
Density, API Gravity	ASTM D4052	4 °C to 70 °C		



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Chemical <sup>F</sup>	Chemical Properties: Oils and Greases	Neutralization Number, Potentiometric	ASTM D664	mg KOH/g sample
		Saponification Number	ASTM D94	mg KOH/g sample
		Neutralization Number, Color	ASTM D974	mg KOH/g sample
		Acidity of H <sub>2</sub> O Layer	ASTM D1093	Color Indication Test
		Reserve Alkalinity	ASTM D1121	Antifreeze and Antirust Solutions
		Bromine Number	ASTM D1159	Olefin Purity
		Chlorine Content by WDXRF	ASTM D6443 and ASTM D7536	4 ppm as Cl and above
		Sulfur Content by WDXRF	ASTM D2622	3 ppm as S and above
		Water Content, Karl Fischer	ASTM D1744	50 ppm water to 1 000 ppm water
			ASTM D4377	200 ppm water to 2 000 ppm water
		Hydroxyl Number	ASTM D1957	mg KOH/g sample after acetylation
		Base Number (Perchloric Acid Method)	ASTM D2896	mg KOH/g sample
		Total Base Number	ASTM D4739	mg KOH/g sample
		Iodine Number	ASTM D5768	Unsaturation Number as cg Iodine/g sample
		pH of Engine Coolants and Anti-Rusts	ASTM D1287	pH 1 to pH 14 units direct meter reading
		Analysis of Grease	ASTM D128	per specification
		Pentane and Toluene Insolubles	ASTM D893	Volumetric Measurement : 0.001 mL to 1.00 mL
		Ford Method Molybdenum Disulfide	AJ 106-2	Percent MoS <sub>2</sub> (0.01 % to 100 %) per gram of sample
Metals Analysis by ICP/OES (Aqueous preparation by Closed Vessel Microwave Digestion)	ASTM D7303, ASTM D1976, ASTM D4951 and ASTM D5185	Parts per million or mg/kg of 28 elements including Sulfur and Phosphorus.		
Molybdenum Disulfide Content	FTM-3722, FTM-3710, and FTM-3720	Percent MoS <sub>2</sub> (0.01 % to 100 %) per gram of sample		
Infrared Spectrograph	ASTM E1252 and PLTL-78	Perkin-Elmer Paragon 1000 PC FTIR Scan: 4 400 cm <sup>-1</sup> to 450 cm <sup>-1</sup>		



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Electrical <sup>F</sup>	Oils	Volume Resistivity	ASTM D1169	4 x 10 <sup>7</sup> Ω-cm 4 x 10 <sup>16</sup> Ω-cm D.L. = 2 %
		Dielectric Constant & (Dissipation Factor)	ASTM D924	1.5 x 10 <sup>-7</sup> to 1.5 x 10 <sup>4</sup> D.L. = 0.001
		Dielectric Strength (Breakdown)	ASTM D877	80 V to 75 kV
			ASTM D1816	D.L. = 100 V
	Electrical Conductivity	ASTM D4308	0 ps/m to 20 000 ps/m D.L. = 1 ps/m	
	Filling Compounds, Greases, and Pastes	Dielectric Constant & (Dissipation Factor)	ASTM D150	1.5 x 10 <sup>-7</sup> to 1.5 x 10 <sup>4</sup> D.L. = 0.001
		Volume Resistivity	ASTM D257	4 x 10 <sup>7</sup> Ω-cm 4 x 10 <sup>16</sup> Ω-cm D.L. = 2 %
		Dielectric Strength (Breakdown)	ASTM 149	80 V to 75 kV D.L. = 200 V
	Fuels and Oils	Electrical Conductivity	ASTM 2624	0 ps/m to 200 000 ps/m D.L. = 1 ps/m

1. The presence of a superscript F means that the laboratory performs testing of the indicated parameter at its fixed location. Example: Outside Micrometer<sup>F</sup> would mean that the laboratory performs this testing at its fixed location.