Independent Tests Confirm the Superior Performance of Royal Purple®

Independent tests clearly document the power, protection and performance of Royal Purple® Motor Oil. Visit www.royalpurple.com for complete tests results.

400%	Greater Film Strength — Reduces Wear[1]
300 - 500%	Greater Oxidation Stability — Increases Oil Life[2]
1.5 - 3.0%	Increase in Engine Horsepower and Torque
3 - 5%	Saves Fuel over Other "Energy Conserving" Oils
> 20%	Reduces Harmful Exhaust Emissions
Up to 12%	Reduces Engine Heat

[1] Film strength based on comparison of leading 5W30 vs. Royal Purple® 5W30 Motor Oil in Falex No. 1 "high pressure" test. (Scar widths mm. Leading 5W30 motor oil: 5.9 mm — scored; Royal Purple 5W30 Motor Oil: 1.4 mm — polished.)

[2] Oxidation life based on U.S. Bureau of Standards TFOUT oxidation test (leading synthetic 5W30 motor oil — 409 minutes; leading 5W30 mineral oil — 246 minutes; Royal Purple® 5W30 — >1300 minutes.)

Summary of Tests[3] — Some data fields are blank because the data field was not a part of the original test criteria.

Data Source	Description of Test	Engine Type	Fuel Savings	Emissions Reductions[4]			Performance Improvement
Oklahoma State University / 2001	Brand Name 15W40 engine oil vs. Royal Purple® 15W40 on full chassis HD truck dynamometer[5]	Diesel	4.4%	Smoke Opacity (SNAP Test) 22%			Horsepower 2.8%
North Carolina State University July 2002	Brand Name "energy conserving" 10W30 motor oil vs. Royal Purple® 5W30 in 25 vehicle fleet test (North Carolina Highway Patrol)	Gasoline	2.5%				
North Carolina State University July 2002	CLR Research Engine Test (15W40 motor oils)	Diesel		Soot	NO_2	CO	
	Royal Purple® vs. Brand Name mineral oil						
	@1200 RPM		3.68%	11.75%	8.5%	17.7%	
	@1600 RPM		2.48%	17.58%	6%	21.0%	
	Royal Purple vs. Premium synthetic oil						
	@1200 RPM		3.37%	4.3%	7.2%	28.15%	
	@1600 RPM		1.48%	3.0%	same	33.87%	
North Carolina State University July 2002	CLR Research Engine Test (5W30 "energy conserving" motor oils) Royal Purple® vs. Brand Name mineral oil	Gasoline		NO_2 was over 50% lower @ 1200 RPM where complete combustion occurred. CO levels with Royal Purple® were low at all loads. Royal Purple® tended to prevent incomplete combustion.			
	@1200 RPM		4.5%				
	@1600 RPM		5.0%				
	Royal Purple vs. Premium synthetic oil						
	@1200 RPM		2.5%				
	@1600 RPM		3.0%				

Summary of Tests, Continued

Data Source	Description of Test	Engine Type	Fuel Savings		Emissions Reductions[4]			Performance Improvement	
			City	Hwy	CO	HC	NO_2	Horsepower	Torque
North Carolina State University July 2002	EPA 75 (city) and HWFET (Highway Fuel Economy Test) tests comparing a Brand Name 10W30 "energy conserving" motor oil to Royal Purple 5W30 motor oil	Gasoline			EPA 75 29% HWFET 62%	EPA 75 16% HWFET 19%	EPA 75 1% HWFET -23%		
Hot Rod Magazine March 2002	Replaced existing mineral oil in a new GM 383 V-8 Motor	Gasoline						1.7%	2.0%
"Hot Rod TV" May 2002 *Hot Rod* Magazine August 2002	Replaced existing 20W50 engine oil, GM Dexron III® ATF fluid and 75W90 differential fluids with Royal Purple's 20W50 Motor Oil, Max ATF® and Max-Gear® 75W90 in a 400 HP '65 Mercury Comet and tested on full chassis dynamometer.	Gasoline						2.5%	1.5%
"Hot Rod TV" December 2002	Replaced existing mineral oil to Royal Purple's Racing 21 motor oil (viscosity similar to 5W30) and Max-Gear 75W90 in a 1962 Ford Galaxy.	Gasoline	23.4%	28.8%					
"Horsepower TV" May 2002	Replaced existing 5W30 synthetic engine oil, GM Dexron III® ATF mineral oil and 75W90 synthetic differential fluid with Royal Purple's 5W30 Motor Oil, Synchromax® manual transmission fluid and Max-Gear® 75W90 in a 2000 Camaro SS and tested on full chassis dynamometer.	Gasoline						2.9%	—
Drag Sport Magazine April 2003	Replaced existing 20W50 engine oil with Royal Purple's 10W30 Motor Oil in a 1994 SR20DET Turbo 2.0L engine from Japan fitted in a 1989 240 SX and tested on full chassis dynamometer	Gasoline						3.2%	1.5%

[3] Complete test reports and magazine articles can be viewed at www.royalpurple.com.

[4] Terminology: CO = Carbon Monoxide (a poisonous gas); HC = Hydrocarbons (unburned fuel — normally occurs when fuel to oxygen mixture is too rich); NO_2 - Nitrous Oxide (cited as a contributor to smog, ozone, acid rain and regional haze and is exacerbated by the elevated combustion temperatures of "lean burn" engines where more oxygen exists than is needed to completely burn the fuel). CO and NO_2 are typically on polar opposites. When one increases, the other decreases.

[5] Fuel and horsepower tests performed on 1996 Peterbilt truck with Caterpillar C-12 engine. Emission testing performed on Detroit Series 60 and Caterpillar 3176B engines.

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Summary of Tests, Continued

Data Source	Description of Test	Engine Type	Fuel Savings		Emissions Reductions[4]	Performance Improvement	
			City	Hwy		Horsepower	Torque
Tuner Performance Reports Magazine Issue 003, Fall 2003	Replaced existing stock motor oil with Royal Purple's high performance motor oil in a 2002 Honda Accord and tested on full chassis dynamometer.	Gasoline				1.8%	
D&D Performance Enterprises December 2003	Replaced existing synthetic motorcycle oil with Royal Purple's Max-Cycle™ 20W50 in a 2004 Harley Davidson 1200XL (Sportster Roadster) on a Super Flow Cycle Dyne Eddy Current Load Dyno.	Gasoline				1.2%	1.3%
Performance Auto & Sound Magazine January 2004	Replaced existing engine oil and transmission fluid with Royal Purple's 5W30 Motor Oil and Royal Purple's Max-Gear® 75W90 transmission lubricant in a 1999 Nissan Maxima.	Gasoline				3.0%	
Longview Inspection January 2004	Replaced existing OEM motorcycle oil with Royal Purple's Max-Cycle® 20W50 in a 2003 Harley Davidson Soft-Tail Standard with a Twin Cam 88 engine to determine if switching to Royal Purple® would reduce operating temperatures. Temperatures continuously monitored with a FLIR Model 550 Radiometer during testing.	Gasoline				Temperature Reduction	
						24˚F - 44˚F	
*V8TV	Replaced existing mineral engine oil in a stock 1990 Mustang to Royal Purple Racing 21 motor oil. Additionally, replaced existing transmission fluid with Royal Purple Max ATF® and existing differential fluid to Royal Purple's Max Gear®.	Gasoline				2.0%	

* Ignition, plus and wires were also replaced at the time fluids were replaced

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