

Frequently Asked Questions:

Motor Oil-

Why is Royal Purple® superior to other motor oils?

Royal Purple® outperforms mineral and synthetic oils due to its superior synthetic base oils and its proprietary Synerlec® additive technology. Synerlec® significantly increases oil film strength to dramatically reduce friction and improve combustion. This translates into more horsepower and torque, improved fuel economy, and dramatically reduced wear and heat. Royal Purple® Motor oils with Synerlec® have been proven to reduce exhaust emissions as well.

Are Royal Purple® lubricants compatible with other motor oils?

Yes. Royal Purple® lubricants are fully compatible with mineral or synthetic oils. No special procedures are necessary when switching to Royal Purple®.

Can I put Royal Purple® into my brand new car?

Yes. Royal Purple® currently offers many viscosity grades of API Licensed Motor Oils. (See the Royal Purple® Motor Oil Product Page or visit the [API Engine Oil Licensing and Certification Website](#) for more information). To allow for proper break in of the engine, Royal Purple® recommends waiting until the manufacturer's first scheduled oil change or a minimum of 2,000 miles in new gasoline engines. Allow 8,000 to 10,000 miles before using Royal Purple® in diesel engines.

How often should I change Royal Purple® in my passenger car?

Royal Purple® recommends following the manufacturer's maintenance intervals while the vehicle is under factory warranty. In clean engines that are no longer under warranty, oil change intervals up to 12,000 miles with continued filter changes every 3,000 to 4,000 miles (top-off oil as needed) are recommended. In dirty engines, Royal Purple® recommends standard 3,000 to 5,000 mile oil and filter change intervals until the engine oiling system is clean and free of deposits, which are left by lower quality oils and / or poor maintenance or mechanical problems. This will allow time to gradually remove existing deposits / contaminants without overloading the oiling system (pump, pick-up, filter, etc.). (Mechanical problems such as fuel dilution, coolant leaks into the crankcase, poor air filtration and / or failure to maintain proper oil level are all detrimental factors to the service life of any engine oil. Any one of these factors can significantly shorten the useful service life of any oil).

Will synthetic oil cause my engine to leak?

Properly formulated synthetic oils will generally not cause an engine oil leak. Synthetic oils possess a higher degree of natural solvency, which can clean and remove deposits left by other oils. The removal of extensive oil deposits can expose marginal or damaged oil seals that may then leak. If an engine currently has excessive oil consumption (i.e. greater than 1 quart / 1,000 miles) the recommended course of action is to solve the oil consumption problem before switching to a synthetic.

Should I use an oil additive with Royal Purple®?

No. We strongly recommend against using any oil additives, as do most automotive manufacturers. Engine oils are formulated with a fine balance of additives (anti-foam, corrosion inhibitors, anti-wear, detergent / dispersants, oxidation inhibitors) and more is not necessarily better. The use of an oil additive could upset the balance resulting in reduced performance.

Is Royal Purple® synthetic motor oil?

Yes. Royal Purple® Motor oils are composed of a proprietary formulation of synthetic base oils and synthetic additives containing iso-paraffinic diluents.

Motorcycle-

Does Royal Purple® offer specific motor oils for motorcycles?

Yes. While the Royal Purple SAE and Racing engine oils may be used in motorcycle applications the Max-Cycle® line of engine oils has been formulated specifically for motorcycle engines and transmissions.

Will Royal Purple® cause my clutch to slip?

No. Royal Purple® provides exceptional film strength for excellent metal-to-metal protection, yet it is also safe for use in wet-clutch applications.

How often do I change Royal Purple® in my motorcycle?

While under factory warranty Royal Purple® recommends following the manufacturer's recommended maintenance intervals. In bikes with clean engines in sound operating condition, Royal Purple® may be used up to 8,000 miles with a filter change every 3,000 to 4,000 miles (top-off oil as needed). In motorcycles with high mileage engines, dirty engines or engines otherwise suspect in cleanliness, Royal Purple® recommends allowing two to three standard 3,000 mile oil and filter change intervals. This will allow ample time for Royal Purple® to gradually remove existing deposits / contaminants without overloading the system (pump, pick-up, filter, etc.). Once these precautionary intervals have been performed, drain intervals may be extended as recommended for clean engines.

What viscosity do you recommend for motorcycles?

Follow the manufacturer's recommendations regarding viscosity. Most manufacturers recommend a 10W40 for 4-cycle, liquid-cooled motorcycles. Air / oil cooled motorcycles typically specify a 20W50. Check your owner's manual for verification or contact Royal Purple's Automotive Technical Department at 888-382-6300.

What oil do you recommend for Harley Davidson motorcycles?

For Evolution and Twin Cam motors, Royal Purple's Max-Cycle® 20W50 is recommended. For Sportsters and Buell motorcycles, Royal Purple's Max-Cycle® 10W40 may be used. Check your owner's manual for verification or contact Royal Purple's Automotive Technical Department at 888-382-6300.

What do you recommend for the primary tank and transmission?

We recommend Royal Purple® Max-Cycle® 10W30 motor oil in the primary tank. For Sportster transmission applications, Royal Purple® recommends Max-Cycle® 10W30 motor oil.

What product do you recommend for 2-cycle gearboxes?

For motorcycle 2-cycle gearboxes and 4-cycle gearboxes with a separate reservoir, Synchronax® manual transmission fluid is recommended.

2-Cycle Engines-

What product do you recommend for pre-mix in my 2-cycle engine?

Either Royal Purple's 2-Cycle TCW III® or 2-Cycle TCW III® Racing may be used in pre-mix applications.

What product do you recommend for oil-injected engines?

Royal Purple® 2-Cycle TCW III® is recommended for stock oil-injection applications. Royal Purple® 2-Cycle TCW III® Racing is recommended for use with modified oil-injection metering.

What product should I use in my oil-injected snow machine?

For low temperature oil-injected applications, Royal Purple's Snow 2-C™ is recommended.

Can I use Royal Purple® to pre-mix with alcohol, methanol or nitro-methane?

No. Royal Purple's 2-cycle oils are formulated for use in gasoline applications only.

Rotary Engines-

Can Royal Purple Motor Oil be used in a rotary engine?

Yes. A rotary engine is a modified four-cycle engine that recommends the use of an API licensed motor oil for street applications.

More information and FAQs on lubrication of Rotary Engines:

In a rotary engine, the oil lubricates the eccentric shaft bearings, thrust needle bearings and rotor bearings similar to a crank and rod bearing of a piston engine as well as being injected into the combustion chambers to lubricate the apex seals, corner seals, and side seals helping to create the sealing mechanism doing the equivalent job of the piston rings.

Royal Purple provides outstanding protection for the e-shaft, rotor bearings, thrust bearings and is suitable for the oil injection system as it has proven to run cleaner than other oils and is an excellent choice for rotary apex seals, corner seals, and side seals.

Mazda makes a statement in the Owner's Manual not to use synthetic oils in a rotary engine, why do you say that it is OK?

Royal Purple has performed seal compatibility testing on the components used in a rotary with excellent results, including older rotary engine seals dating back to the Cosmo. Royal Purple's Technical Services Manager David Canitz has been an owner and racer of rotary engine cars and has used synthetic motor oils in rotaries since 1985 with excellent results. He has been trying to find an answer to this Mazda statement for the last 18 years.

In the early development of synthetic oils decades ago, there were purportedly some seal compatibility issues. Today's synthetic oils do not have the compatibility issues of the old oils.

There is no substantiated evidence of seal compatibility issues with Royal Purple.

Here are some facts:

- The Mazda Factory racing departments recommend and use 'synthetic' oils including the winning 1991 Leman's 20-G 4 rotor Mazda 787B.
- MazdaComp USA printed manual (now Mazdaspeed) recommends the use of synthetic oils for racing conditions.
- Royal Purple Motor Oils have been used in rotary engines (both race and street) for ten plus years with excellent results.
- Royal Purple Motor Oil is compatible with the bearing material, sealing elastomers, and combustion seals used in a rotary engine.

I heard that synthetic oil doesn't burn like mineral based oils and will coat the inside of the engine with deposits.

If this were a problem with synthetic motor oils in general, then all internal combustion engines using a 'synthetic' would experience increased deposits on internal surfaces. The opposite is actually the norm.

Conventional four-cycle motor oils will typically leave deposits of carbon and ash when injected into the rotary apex seal, corner seal, and side seal areas. Royal Purple's motor oil actually burns cleaner due to the synthetic base stock being free of contamination and many of the additives being 'ashless'. This may not be true for all synthetics but Royal Purple has been proven to work extremely well in rotary engines.

Royal Purple's formulation of synthetic hydrocarbon motor oil does burn at the nominal combustion temperatures experienced in both street and racing applications, whether normally aspirated, turbocharged, or supercharged. (500 – 1700° F idle to race rpms typical combustion temps)

Will the synthetic oil affect the oil seals?

No. Royal Purple's Motor Oil is fully compatible with the elastomers found in rotary engines as well as more conventional piston engines. The oil seals, housing seals and other elastomers used in rotary engines typically consist of Buna N, Nitriles, Neoprene, or Viton materials, which are also commonly found in piston engine cars.

I hear that synthetic is 'thinner or lighter' oil, is there a greater possibility that the oil will leak between the seals?

No. If an engine's sealing surfaces are in good condition, synthetic oil should not cause any leakage. However, if an engine has marginal seals, there is a 50/50 chance the seals will leak less or more. Synthetic motor oil is going to have similar viscosity to that of conventional motor oil – except at extreme temperatures. Due to a flatter viscosity curve, at low temperatures it will not thicken as much (easier winter cranking) and it does not thin out as quickly at higher operating temperatures (better oil film at higher rpm).

Should I go longer or shorter between oil changes?

Royal Purple recommends that the maximum oil drain / filter change interval listed in the Owner's Manual be followed while under warranty (new RX8). For FA, FB, FC, FC Turbos, and FD rotaries, extending drain intervals from two to five-fold is possible if desired. Since the rotary engine injects oil through the use of a metered oil pump, either adding oil into the carb base plate air / fuel mixture or directly injecting oil into the rotor housing, rotary engines will consume oil of one quart per 1000 – 3000 miles. It is important to maintain the proper crankcase oil level in your rotary engine if you decide to extend oil drain intervals.

If I pre-mix my fuel for the rotary engine, do I use the same ratio as with mineral based oils? Does it burn at the same rate?

In an ideal world, the rotary engine metered oil pump should inject an ashless oil designed to burn in the combustion chamber and use a four-cycle oil in the crankcase for the eccentric shaft, rotor bearings, and thrust bearings. For the street, Mazda simplified the OE system to use just one oil, that being a typical four-cycle oil for both the e-shaft as well as the combustion chamber. Royal Purple recommends using our standard TCW III 2 Cycle Oil if the metered oil pump is still enabled. The two-cycle oil being added to the fuel tank is in addition to what Mazda designed to inject and acts as a supplement or insurance. Depending on which

engine, the level of modifications (street port, Bridgeport, peripheral port, nitrous, turbocharged) and application, the typical mix ratio could vary from 200:1 to 800:1.

For a pure racing application where the metered oil pump has been disabled or removed, again based on the actual engine and modification level, the ratio could vary from 150:1 to 600:1. For this application, we recommend our Racing 2 Cycle TCW III product or the standard 2 Cycle TCW III can also be used.

A stock FD twin turbo 13B with the MOP oil injection system can typically use about one quart per 1500 miles under hard street driving. If this vehicle is getting 15 mpg, the gasoline to oil ratio is 400:1. If the oil consumption on this vehicle reduces to 1 quart per 2500 miles and fuel efficiency increases to 20 mpg, the gasoline to oil ratio increases to 600:1. The stock metering oil pump is a great system as it varies with throttle position (load on the engine). Pre-mixing has to be calculated for the 'worst case' that will be seen by the engine for that fuel load. Under racing conditions, that's wide-open throttle at racing rpms. This means that at idle, the ratio may be slightly fat (rich).

Racing Oil-

Can I use racing oils in my street car?

Yes. Royal Purple's racing oils are formulated with detergents / dispersants necessary for daily use. The heavier grades (i.e. 21, 41 and 51) may be used in street driven applications. However, Royal Purple's racing oils do not conform to API and / or ILSAC licensing requirements and should not be used when vehicle warranty is an issue.

What is the difference between your SAE motor oils and your racing oils?

Royal Purple's motor oils are formulated to provide unparalleled performance and protection and comply with API / ILSAC specifications. Its racing oils vary in viscosity and formulation as compared to the SAE motor oils to provide the greatest performance gains possible without regard to API, SAE and / or ILSAC specifications.

What product should I use in my race car?

Royal Purple® has several options for racers. Its standard motor oils are formulated to outperform many of the "racing" oils on the market. But Royal Purple's racing oils redefine the category. Royal Purple's racing oils offer an even greater performance increase than its motor oils. With that said, the following are some guidelines to determine which products to use. As a point of reference, Royal Purple® recommends using a racing oil that is closest in viscosity to the oil the race car is currently using (e.g. a racer using a conventional or synthetic 20W50 racing oil would be safe using either Royal Purple's SAE 20W50 motor oil or upgrading to Royal Purple's Racing 51). The tolerances to which the motor was built can play a role in an oil recommendation. Looser specs (e.g. greater than .003") might require heavier weight oil than a motor built to tighter specs (e.g. .002") to maintain idle oil pressure. Keep in mind that it is much easier to be conservative and use heavier weight viscosity oils and then go lighter when experience and comfort level dictate.

Can I run your oils with exotic fuels (alcohol, methanol, nitrous-oxide, etc.)?

Yes. Royal Purple's lubricants can be used with exotic fuels. For the best protection, Royal Purple® has formulated its Racing 11 and Racing 41 specifically with this in mind. These two oils are formulated to combat fuel emulsification to hold up even better than Royal Purple's other racing oils in alcohol and methanol applications.

Does this mean that I should not run your other oils with these fuels?

Not necessarily. Royal Purple's other oils will still perform better than conventional racing oils; however, Royal Purple® specifically formulated Racing 11 and Racing 41 with these requirements in mind.

How should I break in my racing motor with your oil?

We recommend using a quality mineral-based oil for break-in purposes. As a general rule, follow your engine builder's guidelines. On street setups, the rings should seat within the first three or four times the engine is brought to temperature. After the rings have seated, change to Royal Purple®. It is not recommended to break in an engine using Royal Purple®, as the film strength of the oil may not allow proper seating of the rings.

Can I use Royal Purple® with coated bearings?

Yes. You can use Royal Purple® on newly coated bearings with no mineral oil break-in required.

How often should I change the oil in a race car?

This can vary depending upon application and the level (amount) of contamination (i.e. dirt, fuel, water, etc.). A good rule of thumb is to find out the racer's current type of oil and oil change interval. If the racer is using petroleum oil, you should feel comfortable doubling or tripling their change interval. If the racer is running another synthetic, you can feel comfortable doubling their change interval.

How will running your product affect my oil temperature?

In most instances, vehicles with properly functioning cooling systems can reduce oil temperatures by 5-20° F by using Royal Purple®.

What product do you recommend for use with nitro-methane?

Royal Purple's full line of "Nitro" oils have been specially formulated for use in high power nitro and blown alcohol applications.

What do you recommend for a Lenco transmission?

For the 5-speed transmission, Royal Purple's Max ATF® or Racing 9 motor oil is recommended. For a 3 speed, Max ATF® is the best bet.

I notice a heavy odor from the gear oil after a race. Is this normal? Why?

The noncorrosive, extreme pressure additives in gear oils do give off a distinctive odor, and this can be magnified under extreme racing conditions. This is normal for API-GL5 hypoid gear oils containing sulfur / phosphorous extreme pressure additives.

Is it true that your oils lose their performance edge after six or eight passes? (Drag Racing)

No. Royal Purple® has not found any evidence that it shows deterioration in performance after being subjected to race conditions. It is possible that fuel dilution contamination may start to hinder the performance of the engine oil; however, dyno results do not support this claim.

Transmissions-

Can I use your Max ATF® in my transmission?

Check your owner's manual for verification. Royal Purple's Max ATF® is formulated exclusively for transmissions specifying a Ford Mercon® / GM Dexron® III type fluid.

What product do you recommend for manual transmissions / transfer cases that specify a Ford Mercon® and / or GM Dexron® fluid?

For manual transmissions and / or transfer cases specifying a Ford Mercon® or GM Dexron® type ATF, Royal Purple® recommends either its Max ATF® or for greater performance, its Synchronax®.

My vehicle has a locking differential. Do I need to add additional friction modifiers when using your Max-Gear®?

No. All viscosities of Max-Gear® are formulated with hypoid friction modifiers necessary for use in clutch or cone type differentials. No additional additives are necessary.

My vehicle's transmission specifies an API GL-4 gear oil. Can I use Max-Gear®?

Yes. Max-Gear® possesses both API GL-5 and GL-4 certification. Max-Gear® is formulated with Royal Purple's proprietary, Synslide® additive technology to provide the exceptional film strength necessary for GL-5 applications, yet it is noncorrosive to soft metals found in manual transmissions that specify a GL-4 rated lubricant.

Purple Ice®-

Purple Ice should not be used in new radiators until anti-freeze has been cycled through the system. Contact Royal Purple's technical department for more information at 888-382-6300

Can Purple Ice® be used with Dex-Cool® anti-freeze?

Yes. Purple Ice® is fully compatible with both Dex-Cool® type coolants (pinkish - orange) and the more common ethylene glycol (green dye).

What water / anti-freeze concentration is recommended when using Purple Ice®?

Purple Ice® may be added to any anti-freeze / water concentration; however, testing has shown higher water concentrations yield greater cooling benefits. While Purple Ice® does contain corrosion inhibitors as well as lubricants to compensate for a lower anti-freeze / water concentration, Royal Purple® recommends a minimum of 20 percent anti-freeze concentration be used in street driven vehicles because Purple Ice® has no effect on the boiling and / or freezing point of water.

How much Purple Ice® do I need to add to my cooling system?

When using Purple Ice® with an anti-freeze / water concentration, Royal Purple recommends adding 1 ounce of Purple Ice® per quart of cooling system capacity. For straight water (racing) applications, Royal Purple® recommends adding 1.5 ounces of Purple Ice® per quart of cooling system capacity.

Will adding too much Purple Ice® harm my cooling system?

No. A higher concentration of Purple Ice® than recommended won't offer any additional cooling benefit nor will it have any adverse effects on the engine or cooling system.

Can Purple Ice® be used in diesel engines?

Yes. Purple Ice® may be used in diesel engines for improved heat transfer as well as reduced cavitation.