



SynMax Performance Lubricants

13750 Metric Drive, Roscoe, IL. 61073 (815) 389-9999 www.synmaxperformancelubricants.com

TECHNICAL BULLETIN – API Question: Modern Street vs. Classic Hot Rod Oils

API Question: Modern Street Oils vs. Classic, Vintage & Hot Rod Motor Oils:

The purpose of this technical bulletin is to lay out the general facts about Older OEM Classic Hot Rod and street (standard automotive) engine oil formulations that are API rated / licensed or are NOT API rated / licensed, zinc diorgano dithiophosphate (ZDDP) and the chemical limits associated with some of the different API ratings. Answering much that has been written and discussed about today's engine oils not being the same as they use to be and used within Classic, Vintage, Sports Car & Hot Rod engine applications especially when these engine applications employ the use of flat tappet camshafts.

Articles have been written by oil marketing companies, stating that if the engine oil has an API rating of either SJ, SL, or SM or has an API license as indicated by the presence of the API "Donut" on the container that it either does not contain any zinc diorgano dithiophosphate or enough zinc diorgano dithiophosphate (also known as ZDDP) in order to prevent premature flat tappet failure. Just because an engine meets or exceeds a particular API Service Classification or is licensed by the API this does not mean that the particular engine oil can or cannot be used in Classic Hot-Rod applications and will or will not protect against flat tappet / cam & cylinder wear.

The ability for flat tappet wear (also bearings and other components) to be reduced (increased durability) is subject to the total amount of anti-wear additives and surface technology used within the formulation. This requires study for the customer to get the current facts (2008 and beyond). Information contained within this document will answer many of the questions that need to be answered. Remember to always ask questions and find out for yourself.

The Importance of Zinc Diorgano Dithiophosphate (ZDDP)

One of the primary functions of engine oil is to reduce wear. This is particularly important older or heavily loaded applications, such as those found racing engine that employ the use of flat tappet and rolling cam followers. **Normally metal-to-metal contact is prevented by the engine oil's lubricant film being thick enough to keep the contact metal surfaces of the engine separated. However, during periods of shock or heavy loading, pressures, or at cold start-up, the lubricant (or hydrodynamic) film between the two metal surfaces is either squeezed out or rupture.**

This "lubrication film squeezing" out not only causes the two metal surfaces to come into contact with each other, but also causes the **entire load to be carried by the contacting metal surfaces** of the two mating parts. Once this "**lubrication film squeezing**" occurs, severe wear, galling and eventual failure of the metal surfaces can take place, **unless some means is found to prevent metal-to-metal contact.**

Thoughts as stated in the book Lubrication Fundamentals; "In heavy loaded applications, flat tappet cam followers operate on partial oil films at least part of the time. **Lubrications with advanced anti-wear additives are necessary if rapid wear and surface distress are to be avoided.** The oil additive zinc diorgano dithiophosphate (ZDDP) is to provide anti-wear activity for the camshaft and lifter."

The older valve spring pressures in pushrod engines require higher levels of formulated anti-wear, especially flat tappet engines. **Loading on the rubbing surfaces within the valve train may be high, particularly in Older Vintage, European Sports Car, Classic & Hot Rod engines,** where valve springs must be used to ensure that the valve closes rapidly and positively. **This loading can result in lubrication failure unless special care is taken in the formulation of the lubricant".**

Bottom Line: Older OEM Classic & Vintage Type Hot-Rod Engines require oils specifically created for the application.



SynMax Performance Lubricants

13750 Metric Drive, Roscoe, IL. 61073 (815) 389-9999 www.synmaxperformancelubricants.com

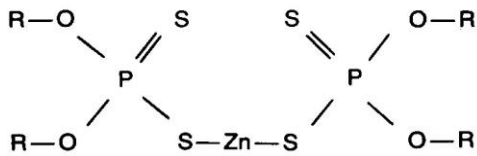
TECHNICAL BULLETIN – API Question: Modern Street vs. Classic Hot Rod Oils

Anti-wear additives are used within the formulation of the engine oil to combat metal-to-metal contact. Anti-wear additives prevent metal-to-metal contact by adding film forming compounds which protect the metal surfaces either by a physical absorption or a chemical reaction with the metal surface, just when temperatures rise due to initial metal-to-metal contact in order to form a low shear film at the point of contact. **These films are weaker than the underlying metal and can easily slide over each other without welding or causing other damage also reducing wear.** The films formed by anti-wear additives also prevent excessive friction energy losses.

There are many types of anti-wear additives, yet the most widely used and predominant type of anti-wear additive used in the formulation of engine oils for the past 50 years is zinc diorgano dithiophosphate (ZDDP). ZDDP is a universal type of additive since it not only functions as an anti-wear additive but also as an oxidation, rust and corrosion inhibiting additive.

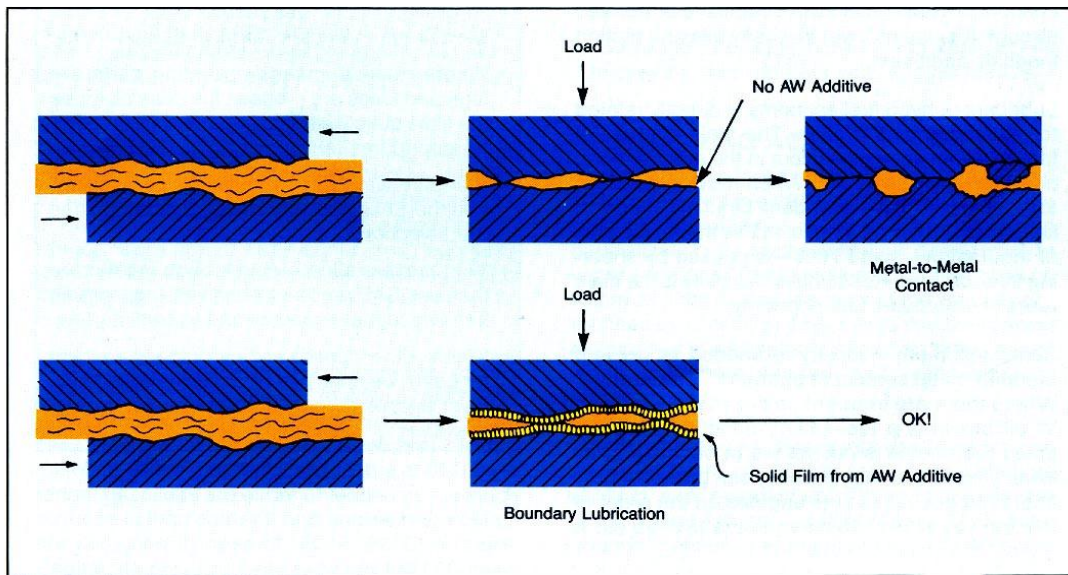
ZDDP comes apart at high temperatures in the engines to form protective films of zinc sulfides and zinc phosphates. These films bond to the metal surfaces and prevent the metal surfaces from contacting with each other. As fresh metal is exposed by rubbing, the ZDDP forms new films and so on until the anti-wear additive is used up.

ZDDP chemical structure looks like this:



The R's can be either alkyl (straight or branched hydrocarbon chains) or aryl (aromatic hydrocarbon rings) or a combination of both. The main purpose is to make oil-soluble all of the inorganic compounds in the molecule (such as the zinc, ZN) so they can be carried by the engine oil where it is needed.

Anti-Wear Additives Mode of Action





SynMax Performance Lubricants

13750 Metric Drive, Roscoe, IL. 61073 (815) 389-9999 www.synmaxperformancelubricants.com

TECHNICAL BULLETIN – API Question: Modern Street vs. Classic Hot Rod Oils

Problem with high levels of anti-wear or Zinc (ZDDP):

When the (ZDDP) levels exceed 1500 ppm and the Classic, Vintage, Sports Car & Hot-Rod engine has combustion or piston ring blow-by; problems can happen. **Once the oil enters the combustion chamber** (from blow-by) **Zinc phosphate particles will separate from the oil under extreme combustion temperatures** (explained above).

These Zinc phosphate particles will attach unto the crown of the piston. Valve face and imbedded into the spark plug. This further created “hot spots” upon these components causing detonation commonly called “combustion detonation” or “pre-detonation” or “spark detonation”.

Problem which happens with high levels of Zinc phosphate particles attaching or coating upon a catalytic converter causing damage, is the same principal applying to the piston combustion area.

SynMax™ solves many of the problems regarding high levels of anti-wear or Zinc (ZDDP):

SynMax Performance Lubricants has provided a proven solution for the required higher levels of anti-wear 2000 ppm for the Classic-Hot Rod application. SynMax uses a proprietary anti-wear additive (originally developed by a confidential program for the military) which works in team work with the Zinc (ZDDP) named SynMax™. This SynMax™ special formulation increases the ppm level – (often in Classic Hot Rod and Older OEM applications – doubling the anti-wear levels of most current modern street oils) without increasing adverse effects of high levels of regular Zinc (ZDDP) above 1500 ppm.

This greatly reduces the effects of pre-detonation from hot spots upon parts within the combustion chamber. Since most racing or older engines have combustion blow-by, SynMax™ advantage helps solve the problem.

API Engine Oil Ratings and Symbols:

The API administers the licensing and certification of engine oil performance standards through the Engine Oil licensing and Certification system. This system's purpose is to define, certify and monitor engine oil performance.

To qualify for a license or certification engine oil marketers must submit an application in which they identify each product's brand name, viscosity grade and API category being licensed. They must attach data sheets reporting the chemical and physical properties of each viscosity grade for each brand name being submitted. The candidate engine oil must be supported by engine testing using the American Chemical Council's Code of practice and must comply with the API's base oil interchange/viscosity read-across guidelines. The marketer must sign an affidavit that test data is available to support the performance claims.

If the candidate engine oil qualifies, the oil marketer must enter into a formal licensing agreement to display the API Certification Mark (Starburst) and/or API Service (Donut) on their oil containers. They must also pay licensing and annual royalty fees associated with engine oil licensing and certification. Licensed and certified engine oils are subject to review by the API's Aftermarket Audit Program.

Once the engine oil is licensed the marketer can then display the API's engine oil symbols on its containers. The API labeling system consists of two symbols: the API Service Symbol and the API Certification Mark.



SynMax Performance Lubricants

13750 Metric Drive, Roscoe, IL. 61073 (815) 389-9999 www.synmaxperformancelubricants.com

TECHNICAL BULLETIN – API Question: Modern Street vs. Classic Hot Rod Oils

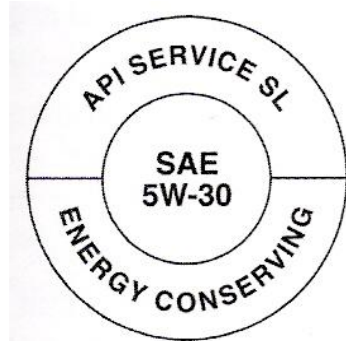
API (American Petroleum Institute) Service Symbol

The API Service symbol, which is commonly called the Donut, is used for both diesel and gasoline engine oils. The Donut is designed to provide specific information to the consumer regarding the engine oil's viscosity grade, the service classification and specific information such as if the engine oil meet energy conserving capabilities or supplemental specifications such as API CI-4 Plus. The Donut can be placed anywhere on the container.

The API symbols compare as follows:

The Donut Symbol

- Is displayed on only some API licensed products.
- Applies to gasoline engine oils only.
- Engine oils displaying this symbol:
 - Meet the most up-to-date performance standards set by ILSAC.
 - Must be energy efficient, so only certain viscosity grades are eligible.
 - Must be suitable for all previous performance standards.



The Starburst Symbol

- Is displayed on only some API licensed products.
- Applies to gasoline engine oils only.
- Engine oils displaying this symbol:
 - Meet the most up-to-date performance standards set by ILSAC.
 - Must be energy efficient, so only certain viscosity grades are eligible.
 - Must be suitable for all previous performance standards



SynMax Performance Lubricants

13750 Metric Drive, Roscoe, IL. 61073 (815) 389-9999 www.synmaxperformancelubricants.com

TECHNICAL BULLETIN – API Question: Modern Street vs. Classic Hot Rod Oils

API Certification Mark



The API's star shaped Certification Mark is commonly called the Starburst. This symbol tells consumers that the engine oil meets the most up-to-date requirements for gasoline powered vehicles as outlined by the latest ILSAC Specification. (Currently GF-4). Engine oils carrying the Certification Mark are energy conserving and are suitable for all previous model years. The mark is always displayed on the front of the container.

The API Certification Mark remains the same for a given application even if a new minimum engine oil performance standard is developed by ILSAC. Many automobile manufacturers recommend and specify the use of engine oils that carry the API Certification Mark.

All engine oils that are licensed through the API must display the API Service Symbol (Donut). Those engine oils that display the API Certification Mark (Starburst) must meet additional requirements above those service classifications used for the API Donut. Gasoline engine oils that meet both the API and ILSAC Standards are engine oils that are preferred for and specified for use by gasoline vehicle OEMs. API licensed engine oils that meet Starburst requirements must display both API symbols.

API Service Classifications

The API Service Categories are named with an alphanumeric system that consists of two letters that sometimes are followed by a number. The first letter is always either "S" for gasoline engine service or "C" for commercial diesel engine service. Second letter increases sequentially with each new category as engine oil evolve to match new performance requirements. Number 2 or 4 may also follow the two letters in the "C" classification to identify if a motor oil is formulated for two-stroke or four-stroke diesel engines.

There are currently three active API "S" service classifications for passenger car engine oils. They are:

API SM is the newest category. It was introduced on November 30, 2004 and provides full protection for all gasoline engines. API SL, designated for 2001 model year & older, is scheduled to become obsolete.

SM (Current) 2004 for all automotive engines currently in use introduced November 30, 2004 SM oils are designed to provide improved oxidization, resistance, improved deposit protection, better wear protection, and better low temperature performance over the life of the oil. Some SM oils may also meet the latest ILSAC specification and/or qualify as energy conserving.

SL (Current) 2001 and older Gasoline Engine Service

SJ (Obsolete) 1997 and older Gasoline Engine Service.

SG (Obsolete) 1989 and older Gasoline Engine Service.

SF (Obsolete) 1980 and older Gasoline Engine Service.

SE (Obsolete) 1972 and older Gasoline Engine Service.

ILSAC (International Lubricant Standardization and Approval Committee) Specifications:



SynMax Performance Lubricants

13750 Metric Drive, Roscoe, IL. 61073 (815) 389-9999 www.synmaxperformancelubricants.com

TECHNICAL BULLETIN – API Question: Modern Street vs. Classic Hot Rod Oils

The standards developed by ILSAC are the basis for API and automotive industry standards for passenger car engine oil quality.

The ILSAC specifications not only incorporates the various ASTM (American Society for Testing and Materials) engine sequence and laboratory bench tests used to qualify an engine oil as meeting a certain “S” category, but it also can include more stringent pass/fail limits for these engine sequence tests and laboratory and additional test methods, such as for fuel economy tests and chemical limits.

Only engine oils meeting the SAE (Society of Automotive Engineers) Viscosity Grades 0W-XX (such as 0W-30), 5W-XX (such as 5W-20, 5W-30, etc) and 10W-XX (such as 10W-30) can qualify as meeting the ILSAC specification.

The most current specification is ILSAC GF-4, which became active on July 31, 2004. Previous specifications, (which are now obsolete) include GF-1, GF-2, and GF-3. ILSAC GF-4 is backward compatible with all previous GF standards

Although the ILSAC GF standards apply only to a limited set of viscosity grades-namely SAE 0W-XX, 5W-XX and 10W-XX multi-grades, where “XX” can only be 20,30,40,50 and 60, practically speaking only the –20 and –30 grades stand any chance of passing the fuel economy requirements that have been set by the ILSAC GF specifications; because of the requirements in the area of fuel economy for ILSAC GF-4.

Only SAE 0W-20, 0W-30, 5W-20, 5W-30 and 10W-30 viscosity grades can meet both the requirements of ILSAC GF-4 and API SM Service Classification.

The API SM service classification parallels the ILSAC GF-4 standard in all respects except for the fuel economy requirements. In fact as applied to these ILSAC specified SAE viscosity grades. there are virtually no differences between the two standards.

This results in for the first time, all SM qualified engine oils that are marketed under the SAE viscosity grades that are defined in the ILSAC GF-4 standard being required by the ILSAC/Oil Committee to also meet the stricter chemical limits for phosphorus and sulfur and fuel economy limits of the ILSAC GF-4 standard.

Where ILSAC defined SAE viscosity grades are not used or specified the definition of the API SM Service Classification excludes any form of chemical limits for sulfur and phosphorus.



SynMax Performance Lubricants

13750 Metric Drive, Roscoe, IL. 61073 (815) 389.9999 www.synmaxperformancelubricants.com

TECHNICAL BULLETIN – Modern Street vs. Older Classic Hot-Rod Motor Oils.

Zinc and Phosphorus Levels in Engine Oils:

For the past decade phosphorus levels in engine oils that are designed to be used in passenger car, truck and SUV gasoline powered engines have been **lowered in order to protect the emission control systems of these vehicles.**

Phosphorus in engine oils can deactivate the noble metal catalysts found in the vehicles emission system by coating and building up on the active catalyst sites, causing irreversible damage that accumulates over time.

As a result, increased levels of harmful emissions such as NO_x, carbon monoxide and hydrocarbons pass through the catalytic converter unchanged and into the atmosphere.

Because of this potential it has resulted in reductions in phosphorus levels beginning with the introduction of ILSAC GF-2 specification (the starburst symbol you see on the quart and gallon containers).

This reduction in phosphorus also resulted in a reduction in the amount of zinc present in the engine oil since the primary source of phosphorus comes from the Zinc Diorgano Dithiophosphate (ZDDP) aka Zinc Dithiophosphate (ZDP) in the shorter version.

The ILSAC GF-2 set phosphorus limits of (1000 ppm) 1.0% by weight maximum for engine oils used in passenger car, truck and SUV gasoline engines.

By the 2004 model year with the introduction of the ILSAC GF-4 specification (the latest API Starburst Classification) phosphorus levels were reduced to 0.06% (600 ppm) by weight min. to 0.08% (800 ppm) by weight max. with an additional requirement that engine oils that meets both the ILSAC GF-4.

API Service Classification SM for SAE 0W-20, 0W-30, 5W-20, 5W-30 and 10W-30. For all other viscosity grades such as SAE 0W-40, 5W-40, 5W-50, 15W-40, 15W-50, and 20W-50 or those engine oil that meet only the API Service Classifications Gasoline Engine Oil Service Classifications SL and SM or API Service Classifications SL/CF, SM/CF, CF-4/SL, do not have any restrictions on the amount of phosphorus that can be present in the engine oil.

These restrictions and limits on phosphorus can be further confirmed in the API's "[1509 Engine Oil Licensing and Certification System 15th Edition, April 2002 Technical Bulletin 3 August 19,2004](#)" and in the following statement on page 2 of the American Petroleum Institute's "[Form BGF4SM Engine Oil Licensing and Certification \(EOLCS\) Application For Licensure Part B-Product Data Sheet](#)".

Phosphorus limits of (600 ppm) min. and (800 ppm) max. apply to API SM SAE 0W-20, 0W-30, 5W-20, 5W-30 and 10W-30 oils. Phosphorus limit of (1000 ppm) max. applies to API SJ SAE 0W-20, 5W-20, 5W-30 and 10W-30 oils and API SL SAE 0W-20, 0W-30, 5W-20, 5W-30, and 10W-30 oils.

Limit of (1200 ppm) Applies to API SH SAE 5W-30 and 10W-30 oils (SH must be preceded by a "C" category). If CF-4, CG-4, CH-4 and/or CI-4 categories precede SM or SL and there is no API Certification Mark, the limit for phosphorus does not apply.

Many experts in the automotive industry (including cam shaft and engine builders) **have previously agreed** the use of heavy duty diesel truck oil for Classic Hot Rod applications, because of the higher levels of Zinc (ZDDP) – up to 1500 ppm (0.15% by weight).



SynMax Performance Lubricants

13750 Metric Drive, Roscoe, IL. 61073 (815) 389.9999 www.synmaxperformancelubricants.com

TECHNICAL BULLETIN – Modern Street vs. Older Classic Hot-Rod Motor Oils.

That previous thought; worked up to 2007 (before the updated diesel oils where forced **to reduce the anti-wear content within the oils (CI-4 Plus) to 1200 ppm 1.2% by weight**). Reason is that the newer engine truck designs (2007 or newer) have catalytic converters with modern emission systems – just like their automotive little brothers.

FACT: 1000 - 1200 ppm is not enough anti-wear protection for the Older OEM Classis Hot Rod component applications (especially cam & solid lifters).

Customer users need to be educated – oils which were selected previous to 2007 for heavy duty or other performance applications, needs to be seriously re-evaluated. That is why SynMax Performance Lubricants has provided a special product for Classic Hot-Rod only applications.

Today's true specialty motor oils have a full load of anti-wear and additives. Specialty oils normally aren't embossed with the consumer-friendly API donut or starburst insignia. Such specialty oils won't meet manufacturer's warranty requirements for new vehicles, may degrade catalytic converter performance in long-term use. Most cases have not been formally submitted to the oil industry's current benchmark performance test and validation procedure.

Even better than current diesel oils, are specially formulated Classic Hot-Rod motor oils. Although an increased cost, **these oils usually contain more anti-wear additives than current diesel truck oils**, as well as other performance-enhancing ingredients specifically designed for older OEM original Classic Hot-Rod gasoline engine needs.

Current diesel oils do not have enough friction modifiers claimed as helpful in preventing piston scuff on Classic Hot-Rod gasoline engines, especially if running modern low multi-viscosity oils (5W20 or 5W30).

SynMax Performance Lubricants provides field tested proven performance driven engine oils (and other specialty products) to the Classic Hot Rod and automotive industry developed at the highest levels of aerospace and chemical engineering. SynMax engines oils contain a sufficient amount of ZDDP / SynMax™ anti-wear additives to protect against premature wear for the specific application(s).

NOTE: High levels of Zinc/ ZDDP anti-wear application racing oils, because of the aggressive use of anti-wear additives (1500 ppm) is designed for short term older OEM Classic Hot Rod or heavy duty use and is not recommended for long term use or long drain interval applications (standard automotive like 5,000 – 7,000 miles+). Such long term applications require a synthetic street or heavy duty performance designed oil.



SynMax Performance Lubricants

13750 Metric Drive, Roscoe, IL. 61073 (815) 389.9999 www.synmaxperformancelubricants.com

TECHNICAL BULLETIN – Modern Street vs. Older Classic Hot-Rod Motor Oils.

SYNMAX DIAMOND LIKE ADDITIVE SOLID FILM LUBRICANT ACTION WILL HELP PROTECT THE ENGINE DURING SHORT TERM OIL STARVATION BEFORE COMPLETE OIL PRESSURE IS ACHIEVED AT INITIAL START UP AFTER SITTING DURING LONG TERM STORAGE.

In addition to a sufficient amount of ZDDP each of these engines oils contain Diamond Like additives and SynMax's own proprietary anti-wear additive TM.

Once the Diamond Like Additive (DLA) frictional modifier is applied upon the metal surfaces of the engine(with friction and heat) this forms a long lasting slippery tenacious lubricant film, which prevents the metal surfaces from coming into contact with each other. By preventing metal-to-metal contact, damaging frictional wear is prevented from occurring, especially in heavily loaded valve-trains that employ flat tappet camshafts.

SynMax Diamond Like Additive are particularly well suited for use in Older OEM and Classic Hot-Rod engine applications where adverse conditions such as older parts need to be freed and released high pressures, and long duration use cause the engine oil's lubricant film to break down and prevent metal-to-metal contact.

Temperature and pressure between the mating metal surfaces causes the (DLA) to form a thin **solid lubricant film that is physically attracted to the metal's surface**. This film consists of a plate-like structure containing layers of Diamond Like Carbon composite atoms and SynMaxTM

Between each adjacent layer of sulfur atoms are weak bonds that **allow each plate to slide easily over one another resulting in a low coefficient of friction (0.0275)**. Within each layer between the DLA are strong bonds that help prevent the metal surfaces from contacting each other.

Historic Engineering and Chemical Research conducted found that the type of that Diamond Like Compounds come into contact with the rubbing metal surfaces that are nano-dimensions in diameter and thickness. The DLA withstands extreme pressure and fills in and evens out the microscopic pits and valleys present in the metal surfaces of the engine.

In addition to these aspects it has been found that Diamond Like compounds not only enhance ZDDP's anti-wear and friction reducing capabilities but also function as an antioxidant that will enhance the engine oil's resistance to high temperature oxidation and oxidative viscosity thickening.

By having this additional anti-wear, frictional modification and anti-oxidation protection; SynMax Classic Hot-Rod engine oil is used in older OEM applications will provide an extra margin of protection against valve train wear, which in turn can help with increased engine durability and longer engine life.



SynMax Performance Lubricants

13750 Metric Drive, Roscoe, IL. 61073 (815) 389.9999 www.synmaxperformancelubricants.com

TECHNICAL BULLETIN – Modern Street vs. Older Classic Hot-Rod Motor Oils.

Base Oil Selection for Older OEM Classic Hot Rod Applications:

You might think “newer synthetics are better”, well not really for this type of application.

1) Older OEM design motors have larger clearances and oil journals than need to be filled to flow properly and provide hydrodynamic film thickness & stickiness and heavier (not necessarily viscosity). Original base oil was heavier in weight/density – they were Group 1 & Group 2. One of the problems with synthetics is that they are lighter in weight/density and normally will not function as well in older applications. The heavier density base oil will “fill the cracks and areas” where modern synthetic will not.

Problem with the older design motor oils with earlier detergent additive packages is that they did leave dirt and varnish upon motor parts as compared to today.

2) Synthetics (Group IV / PAO Polyalphaolefin) naturally have “esters”. Ester molecules provide a solvent action within the PAO oil (even synthetic blend/plus products). **This solvent action will absorb into the older OEM design rubber parts** (such as main crank seals and valve seals etc. within the Classic, Vintage, Sports Car – Hot Rod older design type engine). **These ester molecule / solvent action will initially swell, break down then dry up the original designed seals.** Final results; is seals not working properly, leaking and ultimately needing to be replaced.

Note: Current motors use updated seal materials (like Buena) designed for synthetic motor oil use.

Detergent & other additives packages today and yesterday.

1) Yesterday, older motor additive packages (as compared to today) was not that effective, they were aggressive upon yellow metals (Copper, Brass etc.) and had other issues. Because of this, most of yesterday’s racing motor applications (50’s 60’s 70’s) used non-detergent motor oil. Some of these aggressive anti-wear and detergency additive packages were made of “fluorinated hydrocarbons”, commonly called (Bleach & Carbon) currently not allowed.

2) Today, because of modern chemical technology base oil refinement procedures; detergency and anti-wear packages are much more efficient and friendly to the metal surfaces. Currently, calcium and magnesium is used for detergency with improved anti-wear (ZDDP) formulations. Recently the use of Diamond Like Additives provides a premium protective and performance coating upon the components.

SynMax Classic Hot Rod Motor Oil is the best of both worlds:

Older “heavier weight density” base oils, designed to work within the older OEM requirements to fill the larger clearances and metal spaces, also safe for older rubber seals. Older OEM required higher levels of Zinc (ZDDP) for much needed anti-wear protection (1500+ ppm / 1.5%+ by weight)

Modern additives including; detergent to properly cleanse internal motor parts etc., with long term anti-oxidation / storage packages and moly solid lubricant protection.

The amount of ZDDP / SynMax™ anti-wear present in different designed engine oils used in SynMax Classic Hot-Rod applications can be found in Table I



SynMax Performance Lubricants

13750 Metric Drive, Roscoe, IL. 61073 (815) 389.9999 www.synmaxperformancelubricants.com

TECHNICAL BULLETIN – Modern Street vs. Older Classic Hot-Rod Motor Oils.

TABLE 1

PRODUCT NAME SAE WEIGHT	DESIGN APPLICATION	BASE OIL TYPE(ADDITIVES)	ZINC(ZDDP) & SYNMAX™ ANTI-WEAR (PPM)
SYNMAX™ Racing #640520 (SAE5W-20) #640530 (SAE5W-30) #640540 (SAE5W-40) #640550 (SAE5W-50)	Professional Competition Racing ONLY	PAO & Synthetic (DLA* Technology)	1500 – Zinc 1500 – Phosphorus 2000 - SynMax™
SYNMAX Racing™ #682050 (SAE20W-50)	Professional Competition Racing ONLY	100% Petroleum (DLA* Technology)	1500 – Zinc 1500 – Phosphorus 2000 SynMax™
Classic Hot-Rod™ #771030 (SAE10W-30) #771040 (SAE 10W-40)	Older OEM Design Classic & Hot-Rod Engines	100% Petroleum (DLA Technology)	1500 – Zinc 1500 – Phosphorus 500 SynMax™
SYNMAX™ Street and Heavy Duty Performance #880520 (SAE5W-20) #880530 (SAE 5W-30) #881030 (SAE 10W-30)	Standard Automotive Applications for Street and Heavy Duty	PAO & Synthetic (DLA* Technology)	800 – Zinc 800 – Phosphorus 400 SynMax™
SYNMAX Break-In™ #181045 (SAE10-45)	Break-In Motor Oil Special Formulation	100% Petroleum	2000 – Zinc 2000 – Phosphorus
		*Diamond Like Additives™ (DLA)	(Typical Average) (PPM- parts per million)