



Information Kit

Part One

Red Line Synthetic Overview

<i>Available online:</i>	<u><i>Part Two's</i></u>	<i>Last</i>
● <i>Trucks</i>		<i>18/8/03</i>

Disclaimer: This information is to be used as a guide only. Always refer to manufacturer's specifications.

Although all reasonable care has been taken to ensure that the information contained in this publication is accurate, such information is nevertheless liable to variation in the event of changes occurring in: the blend formulation; methods of storage; changes resultant from research and development; or due to the improper handling or application of any of the products referred to; or in the requirements of any specification or approval relating to any of the products.



Why use Red Line Oil?

- Lasts longer
- Works out cheaper
- Gives the highest protection

It's synthetic but the
benefits are REAL!



Contents:

• Red Line Synthetic Oils – Starting A Revolution...	4
• Red Line Exceeds World Standards	5
• Operation Temperatures	5
• Why are some For and Some Against Synthetics...?	5
• Quality Standards –Classifications Petrol , Diesel, Gear	6
• Interesting Results	7
• Terminology of Oils in the Industry	10
• Are All Synthetics The Same Quality?	11
• Red Line Compatibility	12
• Viscosity –Guide to SAE System	12
• Red Line – Natural Multi-grade	12
• Red Line – Environmental Impact	12
• FAQ’s Frequently Asked Questions	13
• Quality and Loyalty – The best lasting Service	14

More Information Available from www.redlineoil.com.au

Product Information	WaterWetter -	Full Technical Data Sheet, MSDS Sheet
	Diesel Fuel Catalyst –	Full Technical Data Sheet, MSDS Sheet, EPA Registration
	RL2 Diesel Enhancer-	Full Technical Data Sheet, MSDS Sheet, EPA Registration
	Engine Oils ALL	Full Technical Data Sheet, MSDS Sheet
	Diesel Engine Oil-	Full Technical Data Sheet, MSDS Sheet
	Gear Oils -	Full Technical Data Sheet, MSDS Sheet
	CV2 Extreme Grease	Product Data Sheet, MSDS Sheet
	Plus more...	

Articles of Interest	Report by Canobolas Diesel – Diesel Fuels
	Overall Summary - Red Line Products - Environmentally Friendly
	Plus more...



Red Line Synthetic Oils - Starting A Revolution...

Red Line Oils is a modern oil company. Our product technology is among the most advanced in the world. Red Line makes use of poly-ol-ester synthetic basestock which is recognised as the best quality in the world. You hear of poly-ol-ester in relation to jet turbine engines because of its high temperature stability. Take that technology and bring it back to automotive and the results are fantastic.

Red Line 100% synthetics have outperformed other brand synthetic and mineral oils with startling results.

- **If it isn't magic, what makes Red Line Oils number One?**
It is because Red Line oils have the highest film strengths available. Red Line gear oils and transmission lubricants are proving to provide excellent shiftability and gear protection *carrying higher loads at extreme temperatures and for longer times*. In particular the state of the art Shockproof range is impressive with its EP package kicking butt with gear protection!
- **FACT:** Red Line oils can give more power and improve fuel economy by as much as 10% compared to other brand mineral & synthetic oils.
- **FACT:** Red Line synthetics reduce wear so as to extend component life by up to four times.
- **FACT:** Red Line synthetics can extend normal oil drain times:
“...the oil in my Statesman V8 gets safely changed every 30,000 kms...”
- **FACT:** Red Line's Super Coolant & Heat Transfer Agent '*WaterWetter*' for radiators can double the cooling system capacity to transfer heat, reducing temps up to 30°C. It also contains a top inhibitor package to prevent corrosion.



RED LINE EXCEEDS WORLD STANDARDS

All Red Line Synthetic Gear Oils exceed the following respective requirements.

API GL-1 GL-3 GL-4 GL-5 GL-6
MIL-L-2105D

All Red Line Synthetic Engine Oils meet or exceed the following respective requirements.

API SL/SJ/SH/SG/SF/CF-4/CE/CD/CC/CE/CF/CG-4/CH-4/CI-4
CCMC G-4/PO-2/D-3/TG-2/TPD-2/TD-3/E2-96

Limited space precludes a complete list of all specifications met by individual products.
USERS OF RED LINE PRODUCTS ARE RECOMMENDED, AT ALL TIMES, TO REFER TO THE ORIGINAL MANUFACTURER'S REQUIREMENT AND OR SPECIFICATIONS.

OPERATION TEMPERATURES

The RED LINE product grades shown in the following text are recommendations, which cover ambient temperature operation, e.g. 0 degrees to 35 degrees Celsius. If operating in temperatures that are consistently outside this range, you may need to change to another Red Line product rated for higher or lower temperatures.

Why are Some For and Some Against Synthetics...?

This seems to vary greatly on a person's individual experience with synthetics. Thirty years ago, synthetics in their infancy went through usual teething pains. Some have bad experiences to tell, but in fairness the word 'synthetic' is an often over exploited and misrepresented word in the lubrication industry – in other words, you don't always get what you think you are getting. A good mineral oil could actually outperform a bad synthetic!

Red Line claim to make the world's largest range of number #1 synthetic oils, and yes the proof is in the performance. For testimonials go to www.redlineoil.com.au, click on products and select one then click on testimonials.



QUALITY STANDARDS

To indicate the performance level or quality of a lubricant, the American Petroleum Institute (API) has established the following classifications:

PETROL CRANKCASE CLASSIFICATIONS:

- SA - Straight Mineral light duty only.
- SB - Minimum duty, anti-scuff fortified.
- SC - Requirements for vehicles up to 1968.
- SD - Requirements for vehicles up to 1972.
- SE - Minimum requirement for most vehicles after 1972.
- SF - Minimum requirements for most vehicles after 1980.
- SG - Minimum requirements for most vehicles after 1988.
- SH - Supersedes all previous 'S' classifications. These oils have stringent test requirements offering significantly improved engine sludge control and wear protection.
- SJ 1997 Gas Engine Warranty Maint Service Standard.
- SL 2003 Gas Engine Warranty Maint Service Standard

DIESEL CRANKCASE CLASSIFICATIONS

- CA Light duty only.
- CB Early models moderate duty.
- CC Late models moderate only.
- CD Severe duty and supercharged.
- CE Very severe turbocharged duty.
- CF-4 Very severe low emission turbocharged 4-cycle duty.
- CG-4 Very severe duty turbocharged engines meeting '1994 U.S. Exhaust Emission Standards'
- CH-4 Very severe duty – '1999 US Emission Standard'
- CI-4 2002 Superior to API CH-4, CG-4 and CF-4 –“meet 2004 Exhaust Emission Standards”

GEAR OILS CLASSIFICATIONS

- GL1 Unfortified straight mineral oils.
- GL2 Worm drive anti-wear mineral oils.
- GL3 Spiral bevel axles and some manual transmissions.
- GL4 Hypoid moderate high speed EP oil.
- GL5 Hypoid shock load, high speed and torque EP oil.
- GL5 Plus Please contact Red Line Technical Dept. for classification description.



INTERESTING RESULTS

Simply, just remember that Red Line can outperform any other oil in the market place including reducing engine, diff or gearbox temperatures 10-30°C.

Please take time to read this information as we have seen amazing results using all of Red Line's 100% Synthetic oil and additive products, both off workshop floors & field tests, such as:

4WDs and Motor Vehicles & Racing Industry

- Quieter engines. Idle speeds increasing up to 200 rpm after changing engine oil on carburettor vehicles.
- Increased horsepower (especially in racing industry).
- Substantial increase in fuel economy – average **10%** on most 4WD's.
- Dramatic improvement in shift-ability in transmissions or clutch operation and on vehicles with overactive synchros causing crunching into gear – 100% improvement.
- Dramatic improvements in doubling cooling system capacity to transfer heat out
- Grease that won't 'throw out' of tail shaft C.V.s or turn to 'clay' and create vibration harmonics.

Trucking

- Fuel economy improvements of over 8%-10%, because of the lower friction characteristics of Red Line oil and or power gains of ~5%.
- Reduction of temperatures in gearboxes and differentials 10-30°C – especially effective on overheating units.
- Improvement in gear shift-ability and reduction of noisy gearbox. Cleaner engines and reduced noise.
- Big reduction in wear metal - doubling of component life eg diffs lasting double/ triple expected or standard rebuild times.



- Doubling of cooling system capacity to transfer heat, reduce cylinder head temperatures and stop ‘hot spots’ and reduce cooling fan on/off times.
- Treatment of fuel including low sulphur for substantial reduction of pump wear,
- Extended oil change intervals in all areas up to 4 times, **including engine.**

Compressors & Pumps

- Significant reduction of cold start-up problems
- Extended drain intervals up to 5 times – particularly suits remote equipment.
- Reduction of component wear and heat related fatigue and breakage.

Heavy and Industrial Machinery

Same improvements as trucks but also includes:

- Hydraulic power fades substantially reduced & hot temperatures reduced
- Increased oil changeout time up to 4 & 5 times (especially small motors).
- CV2 grease is identified as the only grease to cling to bearings under heavy load and high operating temperatures – extending life of bearings.

LRP replaced with Red Line Lead Substitute

- Reduction of fuel wear damage
- Stays on the valve longer at wide open throttle, to prevent valve seat recession
- Has high temperature stability (sodium base)
- Improves fuel economy & reduces vehicle / equipment poor idle and hesitation.
- Often when the transport in question has deteriorated since using LRP, and consequently sounds in need of a ‘tune’, the problems have been eased considerably if not completely fixed with Red Line Oils Lead Substitute.



Additives - Diesel Fuel - including Low or No Sulphur

- Effective cleaning of blocked fuel injectors in equipment.
- Major reduction in fuel friction causing the wearing of fuel pumps, etc. Greatly assists in decreasing rapid wear damage (resulting in parts failure).
- Significant 5%+ overall & economy improvements are usually experienced.
- Water Remover and antifreeze – removes equal amount water to product applied.
- Wax reducer significantly reduces filter blockages.
- Diesel Biostat eliminates else significantly reduces microbial problems.

Two Cycle Products

- Equipment produces more power, less noise and significantly longer bearing life.
- All two cycle product reduce smoke, but additionally Red Line 2 cycle Smokeless means smoke is virtually non-existent, which is important in the climate demanding environmentally friendly products.
- Keeps spark plugs, pistons and valves clean, to prevent ring sticking and scuffing which gives easier starts. Rust protection is superior.
- Immediate benefits can include equipment operating more economically (fuel lasts longer), and reduction in noise pollution & smoke pollution.

BENEFITS

- Because Red Line synthetic oils don't break down like other mineral and synthetic oils, **drain times are extended** considerably. For a standard petrol motor vehicle, a recommended oil change of 5,000kms can increase to 30,000kms.
- Using Red Line Synthetics **reduces wear** by a factor off up to four (4) times over other brand mineral and 'synthetic' oils, hence the 'proven to outperform' label.



TERMINOLOGY OF OILS IN THE INDUSTRY!

This section is a simple guide to give you a better understanding of basic terminology and the different types of oils used in the oil industry.

Mineral oil is mined or extracted from the earth's natural resources and contains many impurities. Processing and refining of this oil may reduce some levels of the impurities. Synthetic oil is manufactured or man made. There are two types –

Type 1 – *True Synthetics* –

Satisfy both of the following:

- 1) It is completely man-made AND
 - 2) It does not contain mineral oil and therefore contains NO impurities
- Red Line is a 100% man made synthetic which contains no impurities and can assist in the removing of impurities from an already contaminated system. 100% Synthetic provides ultimate benefits and performance over other synthetic and mineral oils.

Type 2 – *So Called Common Market Synthetics* –

Most other market brands are in this category and are made from a blend of processed mineral oil and some synthetic base OR made from a mineral oil put through an unnatural process such as hydro-cracking (this is legally allowed to be called synthetic also). These oils may therefore still contain impurities and characteristics of mineral oil.

This can include labels such as “Fully Synthetic”, “Semi Synthetic” and “Synthetically Fortified”:

- 1) “Fully Synthetic” & “100% Synthetic”– terms used very broadly. A mineral oil put through an unnatural process (such as ‘hydro-cracking’) to remove / refine molecules can legally be labelled synthetic even though this oil will still contain impurities and some of the characteristics of mineral oil.
- 2) “Synthetically Fortified” – usually refers to a plain mineral oil to which a synthetic basestock has been added.. It stands to logic that a poor quality synthetic added to a poor quality mineral oil could possibly perform worse



than a plain good quality mineral oil. Also, there is no indication of the % synthetic used. Possibly, a mineral oil with only 2% synthetic basestock added can still be called “synthetically fortified”.

- 3) “Semi Synthetic” – a variation of meaning - could include either of the above two definitions.

ARE ALL SYNTHETICS THE SAME QUALITY?

Red Line Synthetic Oil Corp. is one of the unique, rare manufacturers using significant amounts of **state-of-the-art, Poly-ol-ester base-stocks**. “Base stock” is an oil industry term for the chemical core of any lubricant. *Poly-ol-esters* are the ultimate base-stocks because they are the only types that withstand the tremendous heat and stress, like those present in the hot sections of modern jet engines.

In the battle for profits, other companies cut corners in their synthetic product by making their product almost entirely *poly-alpha-ole-fin* based. This type of synthetic base stock is cheaper and cannot withstand the temperature like that of *Poly-ol-ester* base stock, nor equal *Poly-ol-ester* base stock quality. This is why Red Line outperforms other minerals *and synthetics*.

Base stock used by manufacturers include:

<u>Source</u>	<u>Name</u>	<u>Description</u>
a. (Synthetic)	Poly ol ester (POE)	Recognised as the #1 basestock in the world. Red Line is the only company in the world that sells such a high quality based oil to the automotive market.
b. (Synthetic)	Di ester	
c. (Synthetic)	Poly alpha olefin (PAO)	
d. (Synthetic)	Poly ester	
e. (Synthetic)	Poly alkaline Glycol (PAG)	
f. (Petroleum)	Mineral Oil - Hydrocracked	
g. (Petroleum)	Mineral Oil – Plain	

Most brands that use significant amounts of synthetic basestocks will openly name which synthetic they use as the more expensive the basestock used to make the oil, the more expensive the end product, however the better the end user results are.



RED LINE'S COMPATIBILITY

Red Line oil are compatible with all petroleum and most other synthetics, so flushing is not required. Red Line oils are designed to be compatible with seals which were designed for use with petroleum products. Reduced temperatures and improved deposit control should allow longer seal life.

GUIDE TO VISCOSITY - SAE SYSTEM

Red Line has some of the best viscosity ratings around. The viscosity numbering system was devised by the Society of Automotive Engineers. It is used to correlate the "thickness" of an oil (the measure of oil's resistance to flow) and the ability to lubricate moving parts at different temperatures. The system has been in use for many years and during 1980 was updated to more accurately describe lubricating oils. Synthetic oils have the best low temperature flow characteristics.

Oil viscosity is measured at both high and low temperatures-

High Temperature: At high temperature (i.e. 100°C) the viscosity measurement is useful in selecting the correct oil to lubricate a working engine.

Low Temperature: At low temperature, the measurement predicts engine cranking or startup characteristics and oil pump-ability. The viscosity measured at low temperature has "W" after the SAE number, eg SAE 15W40.

RED LINE – A NATURAL MULTI-GRADE

The synthetic base stock of Red Line synthetic oils have a natural multi grade property which means that large amounts of unstable polymeric thickeners, like those use in petroleum oils, are not required to manufacture our multi grades.

Multigrade oils such as 20W50 are formulated to meet the control limits at low temperatures (ie the SAE **20W**-50 rating) and at high temperatures (SAE 20**W50**). Multigrade oils provide better lubrication in a wide range of climatic conditions than monograde oils.

RED LINE - ENVIRONMENTAL IMPACT

The synthetic Poly-ol-ester base stocks Red Line use, completely thermally decompose in the combustion process, helping to reduce petroleum pollution. Additionally, Red Line has a number of fuel additives that reduce smoke pollution and diesel emissions by up to 17%. Red Line's Two Stroke Watercraft oil is bio-degradable, helping our marine environment.



FAQ's

Why does Red Line cost so much?

Ans: With extended drain times, the cost is about the same as cheap oil, but when it comes to looking after your equipment, the benefits are much BIGGER. Don't be fooled. You only get what you pay for. Cheaper synthetics are made from cheaper ingredients which give lesser results! In the battle for profits, other companies cut corners in their synthetic product by making their product almost entirely poly-alpha-olefin based. This type of synthetic base stock is cheaper and cannot withstand the temperature like that of Poly-ol-ester base stock, nor equal Poly-ol-ester base stock quality.

What's so good about Red Line Oils?

Ans: While polyolester gives Red Line the highest temperature and thermal stability to help prevent the wear and tear common from other oils, Red Line also uses advanced "contaminant lock-up" technology. Using this technology you get: quieter & cleaner operation, less wear, lower maintenance bills and improved economy.

Are there different grades of synthetic?

Yes, the same way there are all sorts of coffee grades, there are all types of synthetic grades. Red Line is recognised as using the number #1 best synthetic grade in the world (polyolester). Lesser quality synthetics give lesser results and performance.

Is Red Line compatible with other oils?

Ans: Yes, but like any product, if you dilute it, you lessen the benefits. Red Line is compatible with all mineral oil seals. **Red Line oil does not require any extra additives.**

Is Red Line as good as Mobil 1?

Ans: Better! Mobil 1, Amsoil and most other synthetics oils are made from diester or poly-alpha-olefin (PAO esters). They may be better than mineral oil but Red Line's polyolester is the best stock known to man in oil technology, hence the results are with it.

Is my warranty affected by using Red Line?

Ans: Not at all. Red Line meets & exceeds all manufacturers' requirements, but within warranty you should follow manufacturer oil change intervals.



Quality and Loyalty

You have the right to ask your workshop to put in the best products available for both you and your car. Don't assume that this will automatically get done.

What workshop wants to recommend products that extend oil change intervals? The industry is seeing conflict in customer service between workshops that want to give their clients the best service and product advice and hence have a customer for life, and workshops that resist recommending a good product in case it means less breakdowns and repairs - and hence less work for them.

In one case example, Red Line once had a diff rebuild centre, return Red Line oil product because they recognized that it would extend the life of the diff and that wasn't in their interests. (No one there, thought to ask the interests of the client!) There is argument with this thinking, because in another case a customer had an automatic transmission rebuilt and when it failed again within two years – they DID NOT take it back to the original repairer. The Point: There is very little in the way of customer loyalty these days, and like anyone, the customer will go back to the person that gives me the BEST LASTING service.

The workshops mentioned first have ironically discovered that changing their customers to Red Line has not only resulted in their customers coming back, but also their customer's friends and family. Word of mouth goes a long way, and everyone wants to get THE BEST.

The Point: There is very little in the way of customer loyalty these days, and like anyone, the customer will go back to the person that gives me the BEST LASTING service.