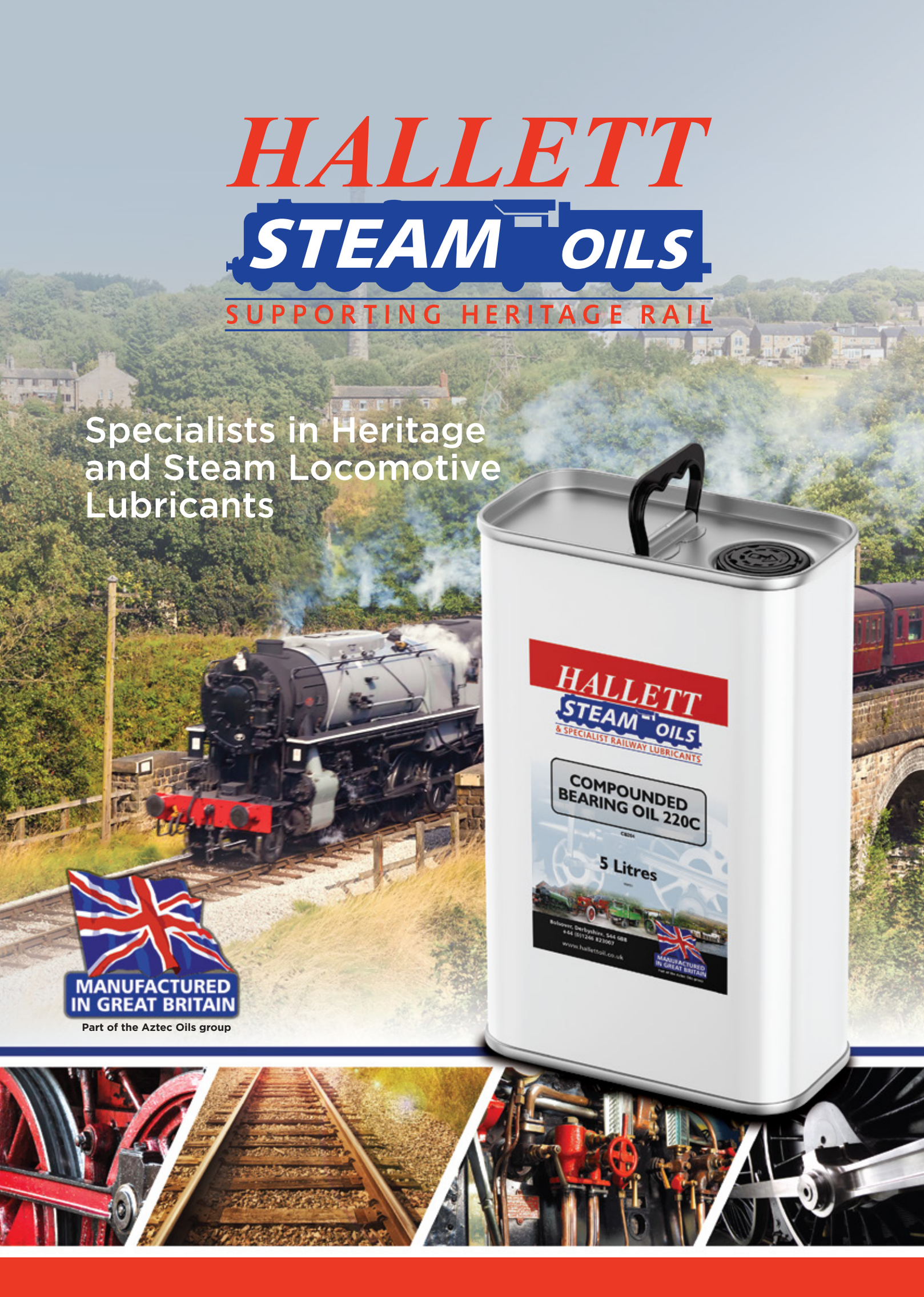
HALLETT

STEAM OILS

SUPPORTING HERITAGE RAIL

Specialists in Heritage and Steam Locomotive Lubricants



MANUFACTURED IN GREAT BRITAIN

Part of the Aztec Oils group

HALLETT STEAM OILS

SUPPORTING HERITAGE RAIL

A World-Renowned Legacy in Heritage Steam

When he founded Hallett Oils, industry-renowned entrepreneur Richard Hallett saw that something was missing in the market. Taking his notepad with him, he went among owners, operators, and enthusiast communities, asking them about their experiences with existing lubrication solutions – and enlisting their help to develop an alternative that would fly high where previous products fell short. Hallett's signature steam oil line is based on the culmination of this knowledge. Every product is perfectly suited to the exacting and specific needs of heritage steam.

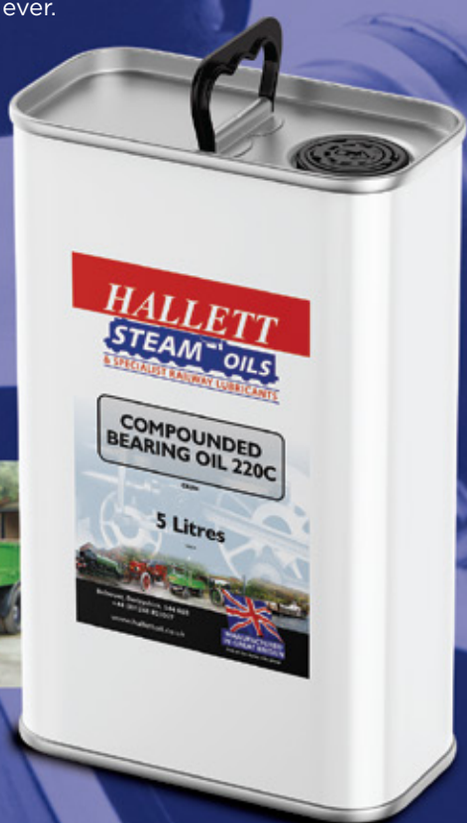
With a reputation that grew from recommendation alone, Hallett is now the biggest, best, and brightest supplier for all things steam across the UK and international markets and can be found powering locomotive engines as far afield as Australia and New Zealand.

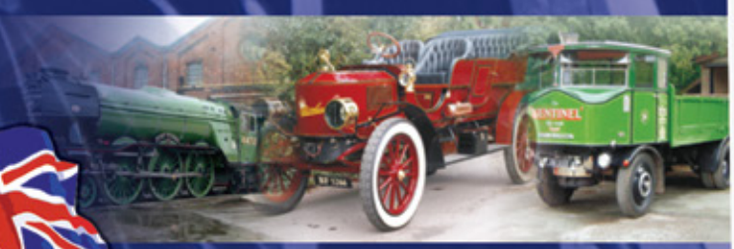
The Hallett name has become recognisable the world over with specialists, industrialists, and hobbyists alike, and is considered the authority in steam lubrication. We settle for nothing less than exceptional quality when it comes to steam oil – and we don't expect our customers to either.

That's why, in addition to prioritising the quality of our products, we guarantee extensive advice and guidance through our free lubrication trouble-shooting service. We understand that the wrong oil for the wrong machine can cause troublesome, unnecessary damage and wear. With our support, customers can be confident that they have the optimal product for their requirements that will not only prevent harm, but keep their equipment running smoother than ever.

Specialists in Steam

Hallett Steam Oils offer a complete range of Lubricants including Steam Cylinder Oils and Bearing Oils for locomotives, traction engines, steam rollers, steam cars, steamboats and stationary engines. Both steam and diesel-powered locomotion is catered for within our comprehensive range. We believe in supplying our customers with exactly what they require to achieve the best results from their equipment or hobby.





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Steam Lubrication

Compounded or Non-Compounded

In steam cylinder lubrication there are two types of oils, compounded and non-compounded. Compounded lubricants contain a fatty acid which historically has been tallow. Natural tallow has a poor pour-point, it can drop out of suspension and settle at the bottom of containers, particularly in cold weather. Developments mean there are now alternatives that can provide the benefits of tallow without its negative properties.

The compounding is used to allow the oil to form an emulsion in the presence of moisture or steam. This allows the lubricant to be displaced and carried with the steam into the cylinder. Once attracted to the metal surface, these fatty substances act on the metal surface to form lubricating layers and soaps helping to protect the component by reducing friction on sliding and rolling surfaces, even at elevated temperatures.

Non-compounded lubricants are straight mineral oil based so the oil does not form an emulsion. This is used when the steam condensate is to be recovered as it allows a clean separation of the oil and water. The oil can then be drained off and the water returned to the tank. These oils do not provide the same type of lubrication as they only rely on an oil film to keep the metal surfaces apart, higher viscosity fluids provide a thicker oil film.

The three typical viscosities of oil for steam cylinder lubrication are often referred to as “light”, “medium” and “heavy” which correspond to ISO 460, 680 and 1000 grades. The number corresponds to the viscosity of the fluid at 40°C in cSt or mm^2/s.

Over Lubrication:

The rate of oil feed should always be generous but should not be so great as to allow the accumulation of oil in the cylinders. In an ideal situation, the feed rate should vary with the power but continuous control is not always possible with certain types of lubricators. Over lubrication often occurs where the engine is subjected to fluctuations in load. Excess oil will then tend to accumulate in the cylinders and at high temperatures may form carbon deposits. In such cases, deposit formation can usually be decreased by reducing the rate of oil feed to a safe minimum or by changing to a more easily atomised oil.

Incomplete or Poor Lubrication:

Groaning, chattering and excessive wear are generally due to incomplete distribution of the cylinder oil and often occurs when engines operate for long periods at low load. Troubles of this sort can usually be overcome by changing to a compounded oil of the same viscosity or by switching to a lower viscosity oil, alternatively the location or the design of the atomiser will need to be improved.

Incorrect Lubricant:

If the oil is too viscous it will not atomise correctly, which can lead to problems (particularly on small engines) with severe drag and poor lubrication until running temperatures are achieved. In extreme cases where too high a viscosity is used, severe wear or even hydraulic damage can occur. However, if the oil is not viscous enough for the application it will not be able to form the correct oil film on the working surfaces. In this case the result will be excessive wear and steam leakage past valves, pistons and glands.

Oil of the correct type and viscosity should always be used.

Steam Cylinder Oils

Code	Name	Details
STO009	**COMPOUNDED STEAM CYLINDER OIL 460C**	A compounded oil formulated for the lubrication of steam cylinders. Treated with fatty compounds to form an emulsion in the presence of steam allows the oil to spread on internal surfaces. Designed for lower steam pressures and saturated steam conditions. This product is suitable for small gauge steam engines and models.
STO010	**COMPOUNDED STEAM CYLINDER OIL 460CT**	A compounded oil formulated with a unique additive technology to offer improved corrosion resistance and lubricity to protect components and reduce wear. Designed for lower steam pressures and saturated steam conditions.
STO022	**STRAIGHT CYLINDER OIL 460NC**	A non-compounded oil formulated for the lubrication of steam cylinders in applications where the practice is to recover steam condensate. Designed for lower steam pressures and saturated steam conditions. This product is suitable for steamboats.
STO016	**COMPOUNDED STEAM CYLINDER OIL 680CT**	A compounded oil formulated with a unique additive technology to offer improved corrosion resistance and lubricity to protect components and reduce wear. Suitable for use with saturated & light superheated steam for steam locomotives mainly on preserved lines, traction engines, steam rollers and stationary engines.
STO019	**STRAIGHT CYLINDER OIL 680NC**	A non-compounded oil formulated for the lubrication of steam cylinders, in applications where the practice is to recover steam condensate. Designed for higher steam pressures.
STO006	**COMPOUNDED STEAM CYLINDER OIL 1000+**	A compounded oil formulated with a unique additive technology to offer improved corrosion resistance and lubricity to protect components and reduce wear. Specially for super-heated steam locomotives, running on main line. Sentinel lorries and similar applications use this product.
STO007	**COMPOUNDED STANLEY STEAM OIL 1000+**	A compounded oil formulated with a unique additive technology to offer improved corrosion resistance and lubricity to protect components and reduce wear. Developed specifically for the Stanley Steam Car.
STO021	**STRAIGHT CYLINDER OIL 1000NC**	A non-compounded oil specially for super-heated steam vehicles and applications or where the practice is to recover steam condensate.

Grade	Steam Temperature (°F)	Steam Temperature (°C)	Boiler Gauge Pressure (lbs./sq)	Steam Condition	Condensate Recovery
COMPOUNDED STEAM CYLINDER OIL 460C	Up to 340	Up to 170	Up to 125	Saturated	No
STRAIGHT CYLINDER OIL 460NC	Up to 370	Up to 190	Up to 150	Saturated	Yes
COMPOUNDED STEAM CYLINDER OIL 460CT	Up to 370	Up to 190	Up to 150	Saturated	No
COMPOUNDED STEAM CYLINDER OIL 680CT	Up to 550	Up to 290	Up to 250	Saturated & Light	No
STRAIGHT CYLINDER CYLINDER OIL 680NC	Up to 550	Up to 290	Up to 250	Light Super Heat	Yes
COMPOUNDED STEAM CYLINDER OIL 1000+	Over 550	Over 290	Over 250	High Temperature Super Heat	No
STRAIGHT CYLINDER OIL 1000NC	Over 550	Over 290	Over 250	High Temperature Super Heat	Yes
COMPOUNDED STANLEY STEAM OIL 1000+	Up to 700	Up to 370	Over 250	High Temperature Super Heat	No

Should the application fit into two viscosities, always use the lower viscosity.

Straight oils can replace compounded although the feed rate must be increased in saturated steam conditions.

COMPOUNDED STANLEY STEAM OIL 1000+ is dyed blue/green for visibility in the winker sight glass.

Steam Bearing Oils

Code	Name	Details
STO001	**COMPOUNDED BEARING OIL 100C (LBO100C)**	Specialised non-staining compounded formulations delivering sustained, optimal anti-wear protection to motions and bearings whilst maintaining an emulsified oil film in wet conditions. Can also be used for general purpose lubrication or in industrial gear drives and bearings where a typical EP gear oil would cause staining to yellow metals. Hotter ambient temperatures, slower revolutions or worn bearings may require the use of a thicker bearing oil. Rapeseed oil free.
STO002	**COMPOUNDED BEARING OIL 150C (LBO150C)**	
STO003	**COMPOUNDED BEARING OIL 220C (LBO220C)**	
STO026	**COMPOUNDED BEARING OIL 320C (LBO320C)**	
STO004	**COMPOUNDED BEARING OIL 460C (LBO460C)**	
STO005	**COMPOUNDED BEARING OIL 680C (LBO680C)**	
STO020	**STRAIGHT BEARING OIL 220NC (LBO220)**	Used by engines for providing lubrication to the motions, bearings and used as a general-purpose, non-staining lubricant with total loss systems or where compounding is not preferred. Rapeseed oil free.
STO018	**STRAIGHT BEARING OIL 460NC (LBO460)**	Used by engines where the increased temperature requires the use of a thicker oil. Provides lubrication to the motions, bearings and used as a general-purpose, non-staining lubricant with total loss systems or where compounding is not preferred. Rapeseed oil free.

Miscellaneous Products

Code	Name	Details
STO023	**BATTLE OF BRITAIN SUMP OIL**	A blend of solvent refined mineral oil utilising specific additive technology for the lubrication of Bulleid chain-driven valve gear. Provides the big end and reversible gear pumps with superb anti-wear protection and vital cooling whilst being viscous enough to allow oil through perforated pipe to lubricate valve motions & pins.
STO015	**SENTINEL CRANKCASE OIL 680**	Formulated from a select blend of high-quality solvent refined mineral base oils which provide a strong lubrication film with excellent oxidation and corrosion resistance. As the "S" type Sentinel crankcases were susceptible to collecting steam, condensation & water in the crankcase. Therefore, it was important that this water separated from the lubricant to enable any free water to be drained.
GRE071	**LOCOTAK 6Z**	A highly tenacious bitumen-based lubricant primarily used for Traction Motor Gears in diesel electric locomotives. Developed to be able to withstand heavy impacts and shock loads makes it suitable for use in arduous conditions where an adhesive and tacky lubricant is required such as open gears, wire ropes, chains, flexible couplings, and sliding surfaces of drag lines and shovels.
GRE068	**WASH OUT PLUG GREASE**	A premium quality graphited compound for anti-seize applications where low chlorine and sulphur levels are required and where a nickel containing product is to be avoided. Primarily suitable for steel boiler washout plugs. Wash Out Plug Grease is also suitable for assembly and running-in purposes. The compound is designed to prevent damage during start up and protects against wear in adverse operating conditions
GRE067	**LITHIUM 2 GREASE**	Used extensively for applications throughout heritage locomotive and smaller gauge models. It is particularly useful where there might be unwanted reactions between extreme pressure additives and some of the components used, such as staining on brass or bronze materials.
GRE072	**LITHIUM 3 GREASE**	Used extensively for applications throughout heritage locomotive and smaller gauge models. It is particularly useful where there might be unwanted reactions between extreme pressure additives and some of the components used, such as staining on brass or bronze materials.

Diesel Locomotive Oils

Specialist engine oils for heritage four stroke diesel locomotives, these robust engine oils have shown superior thermal, oxidative and shear resistance to combat against viscosity thinning and pre-mature ageing whilst providing protection from corrosion and wear to optimise the service life and keep components clean. Our extensive range has products to suit naturally aspirated and turbo charged engines with and without filtration including engines with silver plated components which require an advanced zinc free lubricant.

Code	Name	Details
STO030	**NDX 30**	Non-detergent/dispersant monograde engine oils. Recommended by Aztec Oils as suitable for the following requirements: API CC
STO031	**NDX 40**	
MON047	**HDX 30**	Detergent/dispersant monograde engine oils for naturally aspirated four stroke engines. SAE 30 and 40 viscosity grades are ideal for lightly loaded engines. Recommended by Aztec Oils as suitable for the following requirements: API CC
MON048	**HDX 40**	
MON049	**HDX 50**	
MON033	**DX-3 30+**	Powerful detergent/dispersant monograde engine oils suitable for turbocharged or naturally aspirated diesel four stroke engines. Recommended by Aztec Oils as suitable for the following requirements: API CF-4.
MON036	**DX-3 40+**	
MON037	**DX-3 50+**	
MON038	**FLUSHING OIL**	An advanced mineral based detergent/dispersant flushing oil, suitable to be used in engines, transmissions and hydraulic systems proir to replenishment with new lubricant.
MON031	**RAILROAD ZF 40 CF**	A premium grade crankcase oil developed using a specially designed additive system. This provides excellent detergency and is zinc free, ideal for where engines are fitted with silver bearings. Recommended by Aztec Oils as suitable for the following requirements: API CF |EMD and GE diesel engines | LMOA Gen 5
HDD026	**RAILROAD ZF 20W-40**	A premium multigrade crankcase oil developed using a specially designed additive system. 20W-40 This provides excellent detergency and is zinc free, ideal for where engines are fitted with silver bearings. Recommended by Aztec Oils as suitable for the following requirements: API CF | EMD and GE diesel engines | LMOA Gen 5

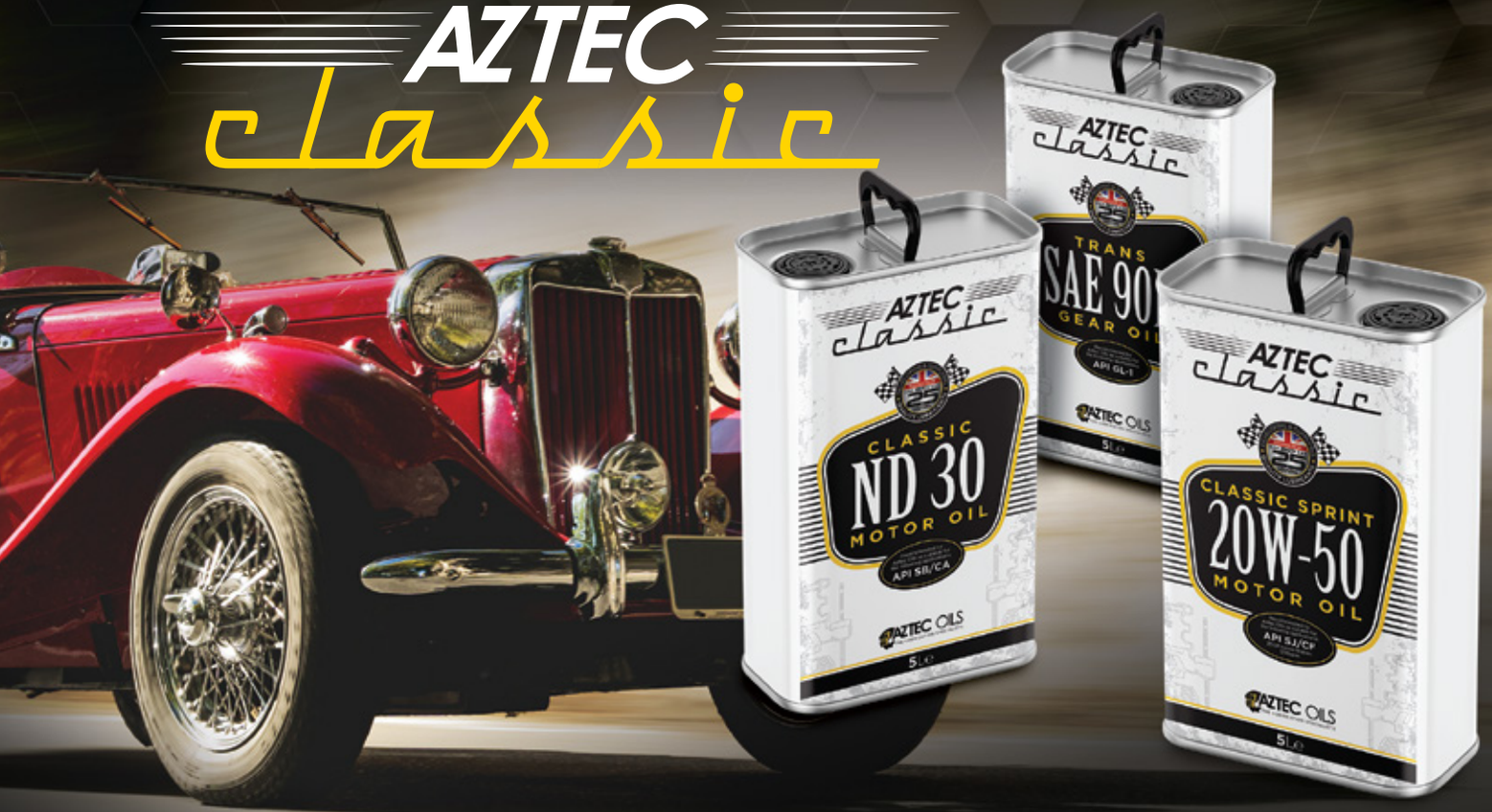
RS Clare

The most important part of a railway is the permanent way or p-way – the pair of rails, laid on the sleepers and embedded in ballast, over which trains run.

Via rail lubricant specialist's RS Clare, we can provide a full range of p-way products – from fishplate, curve rail, and switchplate lubricants, to p-way maintenance lubricants, to wear protection kits.

Code	Name	Details
RSC/ASPW	**ALL SEASONS P-WAY LUBRICANT**	Long life fishplate lubricant. NLGI 00
RSC/SL	**SWITCHPLATE LUBRICANT**	High performance slide chair lubricant with excellent corrosion protection. NLGI 000
RSC/TBD	**TRACK BIO DEGREASER**	Readily biodegradable, water-soluble degreaser. Ideal for trackside maintenance.
RSC/CS	**CLARETECH SUPREME**	A non-toxic, readily biodegradable curved rail grease for application via trackside lubricators, formulated with extreme pressure and anti-wear additives for enhanced performance capabilities.

AZTEC classic



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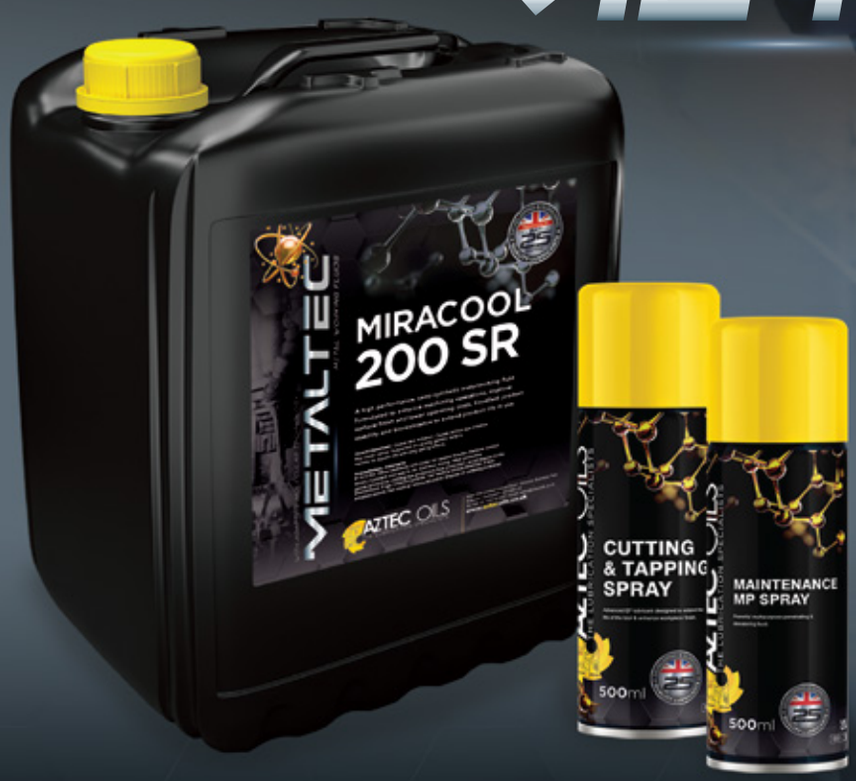
View the full range at
www.**aztec**oils.co.uk

METALTEC

METAL WORKING FLUIDS



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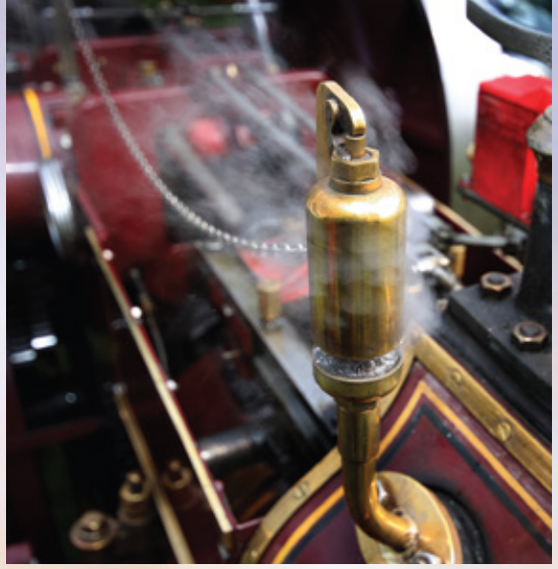

HALLETT

STEAM OILS

SUPPORTING HERITAGE RAIL

Hallett Oils are proud to be part of the Aztec Oils Group, offering premium levels of assistance to all our customers. We have a dedicated Technical Support team on hand to offer guidance on the correct use of our products.

Our expert team in our on-site laboratory continually test the quality and compliance of all our lubricants so that our customers know that Aztec Oils is a brand they can trust.

Email: **Technical@aztec**oils.co.uk

www.**hallett**oil.co.uk

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THE LUBRICATION SPECIALISTS

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