

# GPS LINK

A GUIDE TO PRODUCTS AND SERVICES



# GPS LINK

## A GUIDE TO PRODUCTS AND SERVICES

GPS Link offers a quick look at the various **Castrol Heavy Duty** products and services. For complete information on product background, features, test results and specifications, visit **Castrol GPS: Guide to Products and Services** at [www.castrol.com/GPS](http://www.castrol.com/GPS).

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# 1. Engine Oils

## Synthetic Engine Oils

### Castrol® Elixion® CJ-4

SAE 5W-30

Castrol Elixion is a full synthetic diesel engine oil engineered to reduce operating costs while providing outstanding engine protection and up to 4% fuel economy.\* Castrol Elixion offers certified API CJ-4 performance, and its highly advanced chemistry provides extra protection against cold starts, wear, soot, oxidation and deposits. *Industry Specifications and OEM Approvals:* API CJ-4, CI-4 Plus, CI-4, CH-4; CAT ECF-3; Cummins CES 20081; Volvo VDS-4; MACK EO-O Premium Plus; and MB Sheet 228.31.

\*compared to conventional 15W-40

## Semi-Synthetic Engine Oils

All Castrol VECTON products are certified CO<sub>2</sub>-neutral according to the internationally applicable PAS 2060 standard.



### Castrol® VECTON® FA-4

SAE 10W-30

Castrol VECTON 10W-30 FA-4 with unique SYSTEM PRO TECHNOLOGY™ is a part-synthetic diesel engine oil that represents the latest technology heavy-duty engine oil engineered specifically for fuel economy in select 2017 and beyond model year diesel engines. It is targeted exclusively at today's low emission, low fuel consumption trucks and buses where API FA-4 is required. *Industry Specifications and OEM Approvals:* API FA-4; Cummins CES 20087; DDC DFS 93K223.

### Castrol® VECTON® Long Drain CK-4

SAE 10W-30

Castrol VECTON Long Drain 10W-30 CK-4 with unique SYSTEM PRO TECHNOLOGY™ is an advanced part-synthetic heavy-duty diesel engine oil that conforms to the requirements of PC-11 engine oil technology. Specifically engineered to deliver longer oil life and enable longer service intervals (up to 80,000 or 1,000 hours\*) even under severe operating conditions, Castrol VECTON Long Drain 10W-30 CK-4 can be used in diesel engines where API CK-4 or CJ-4 and previous diesel engine oil categories are required. *Industry Specifications and OEM Approvals:* API CK-4, JASO DH-2, CAT ECF-3, Cummins CES 20086, DDC DFS 93K222, Deutz DQC III-10 LA, Ford WSS-M2C171-F1, Mack EOS-4.5, RVI RLD-4, Volvo VDS-4.5

### Castrol® VECTON® CK-4

SAE 15W-40

Castrol VECTON 15W-40 CK-4 with unique SYSTEM PRO TECHNOLOGY™ is an advanced part-synthetic heavy-duty diesel engine oil that conforms to the requirements of PC-11 engine oil technology. Castrol VECTON 15W-40 CK-4 can be used in diesel engines where API CK-4 or CJ-4 and below is required. Castrol VECTON 15W-40 CK-4 is engineered specifically to deliver longer oil life, thus enabling longer service intervals even under severe operating conditions. In fact, it delivers extended drain intervals of up to 60,000 miles\*. *Industry Specifications and OEM Approvals:* API CK-4, JASO DH-2, CAT ECF-3, Cummins CES 20086, DDC DFS 93K222, Deutz DQC III-10 LA, Ford WSS-M2C171-F1, Mack EOS-4.5, RVI RLD-4, Volvo VDS-4.5.

\*in combination with a proper oil analysis program like Castrol Labcheck

## Conventional Engine Oils

### Castrol® CRB® Multi CK-4

SAE 10W-30 15W-40

Castrol CRB Multi is a multi-purpose, heavy-duty engine oil designed to provide superior protection to diesel engines. It is engineered to promote long, healthy engine life and offers protection to diesel engines in a variety of applications and duty cycles. Castrol CRB Multi conforms to the strict requirements of PC-11 engine oil technology and can be used in diesel engines where API CK-4, CJ-4 and below is required. *Industry Specifications and OEM Approvals:* API CK-4; CAT ECF-3; Cummins CES 20086; DEUTZ DQC III-10 LA; DDC DFS 93K222; Ford WSS-M2C171-F1, Mack EOS-4.5; RVI RLD-4; Volvo VDS-4.5.



# Engine Oils (cont'd)

## Castrol® Tection® HD

SAE 10W-30

Castrol Tection HD is a diesel engine oil designed to provide excellent performance and protection for pre-2004 US trucks, buses and equipment, including both EGR and non-EGR engines. Formulated with low ash chemistry, Castrol Tection HD offers advanced soot handling and dispersancy, outstanding TBN retention, and good shear stability to protect against wear throughout the oil drain interval. *Industry Specifications and OEM Approvals:* API CI-4, CH-4, CG-4, SL; Cummins CES 20076; and Mack EO-M Plus.

## Castrol® Assuron™ (Straight Grades)

SAE 10W 30 40 50

Castrol Assuron Straight Grades are high performance, heavy duty engine oils that couple selected base stocks with a carefully balanced additive package. Castrol Assuron's proven performance in various on- and off-highway heavy-duty diesel engines features enhanced engine performance, protection of engine parts for extended life, and reduced maintenance costs. *Industry Specifications and OEM Approvals:* SAE 10W (CF); 30 (CF-2, CF); 40 (CF-2, CF); 50 (CF-2, CF).

## Castrol® Railroad Engine Oil

SAE 40

Castrol Railroad Engine Oil is a premium quality, high ash zinc free additive railroad diesel engine oil. It is formulated with highly refined HVI base stocks to meet the severe service demands of today's locomotive engines, where modified piston rings and cylinder liners have significantly reduced oil consumption and placed extra demands on the oil. Castrol Railroad Engine Oil has excellent alkalinity retention. *Industry Specifications and OEM Approvals:* LMOA Generation V; General Electric Generation IV, Long Life; Internal Listing of the Electro-Motive Diesel (EMD) of General Motors.

## On-Road Natural Gas Engine Oils

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### Castrol® Duratec™ ES

SAE 15W-40

Castrol Duratec ES is a low ash synthetic lubricant for use in natural gas fueled engines where minimal thermal degradation and good deposit control is expected, and enables "extreme" extended drain intervals up to 1200 hours.\* Castrol Duratec ES delivers exceptional nitration and oxidation control along with antiwear and extreme pressure protection, and reduces deposits and maintains engine cleanliness while offering a wide range of operating temperatures. It is designed for use in a wide range of natural gas equipment, including Cummins, CES 20074, Mack, Volvo, and other on road engines requiring a low ash natural gas engine oil.

### Castrol® Duratec™ NG

SAE 15W-40

Castrol Duratec NG is a low ash natural gas engine oil that has been proven to safely extend drain intervals up to 600 hours.\* It is formulated to provide outstanding resistance to nitration and oxidation, thus meeting the performance requirements of many of today's mobile natural gas fueled engines. Castrol Duratec NG prevents the sludge, varnish, plugged filters, and deposits that occur in natural gas engines as a result of oxidation and nitration, and is designed for use in a wide range of natural gas equipment, including Cummins, CES 20074, Mack, Volvo, and other on road engines requiring a low ash natural gas engine oil.

*\*in combination with a proper oil analysis program like Castrol Labcheck*



# Engine Oils (cont'd)

## Stationary Natural Gas Engine Oils

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### Castrol® Duratec™ LFG

SAE 40

Castrol Duratec LFG low ash formula was designed to eliminate landfill gas engine operators' traditional trade-off between high ash oils for longer drain intervals and low ash oils with lower deposits. By increasing drain intervals up to two times versus standard landfill gas engine oils while extending head life up to 70%,\* Castrol Duratec LFG combines an exclusive low ash additive package with hydrocracked base stocks that safely extend drain intervals and offer protection against acid formation, oxidation, and nitration. This proprietary low ash technology provides extended oil drains and decreased oil consumption while protecting valves from harmful silicon deposits in stationary natural gas engines.

*\*in combination with a proper oil analysis program*

### Castrol® Duratec™ LFG 40 [REPLACES Castrol Duratec HPL 40]

SAE 40

Castrol Duratec LFG 40 for stationery engines is a low ash formulation designed for modern high-speed, 4-stroke natural gas engines. When compared to standard group I natural gas engine oils, Castrol Duratec LFG 40 reduces daily oil consumption up to 50%, leading to cleaner engines and less carbon build-up. Its excellent TBN efficiency neutralizes harmful acids while the outstanding antioxidants and "antioxidants" suppress oxidation and nitration to prevent sludging, varnishing, plugged filters, deposits, and prematurely thickened oil. LFG 40 is designed for use in a wide range of stationery equipment including Caterpillar, Waukesha, Ulstein, Jenbacher, Deutz, Wartsila, Superior, MAN, and Cooper-Bessemer.

### Castrol® Duratec™ A

SAE 40 15W-40

Castrol Duratec A ashless formulation is designed to reduce deposit formation and improve oxidation characteristics while offering excellent corrosion control. Outstanding TBN retention technology neutralizes acids throughout the drain interval cycle, protecting engines from acid formation, and stable formulations deliver low oil consumption that leads to less carbon build up and keeps engines running clean with excellent thermal control. Castrol Duratec is catalyst compatible and delivers excellent demulsability to release entrained air and water. It is designed for use in 2-stroke and select 4-stroke equipment including Cooper-Bessemer, Clark, Worthington (2T) and AJAX.

### Castrol® Duratec™ L

SAE 40 15W-40

Castrol Duratec L has been designed to reduce deposit formation and improve oxidation characteristics while offering excellent corrosion control and TBN retention. Duratec L provides outstanding resistance to acid corrosion and is specially formulated to reduce valve seat recession. With a wide range of operating temperatures, Duratec L offers exceptional anti-wear and extreme pressure protection, reduces deposits and maintains engine cleanliness. Castrol Duratec L is designed for use in a wide range of equipment including modern 4-stroke engines, Caterpillar, Waukesha, Ulstein, Jenbacher, Deutz, Wartsila, Perkins, and Ruston.



## 2. Hydraulic Fluids

### Castrol® Dual Range HV™

ISO 32 46 68 100

Castrol Dual Range HV Hydraulic Fluids are exceptional multi-viscosity hydraulic fluids designed for the most severe environments and applications in construction and mining machinery under varying ambient conditions. Shear stable polymers keep the fluid's viscosity consistent over a wide range of temperatures. Castrol Dual Range HV Hydraulic Fluids offer energy efficiency along with high viscosity indexes and low pour points to ensure extra pump protection and efficiency in cold weather starts, as well as needed viscosity protection at higher operating temperatures. Castrol Dual Range HV delivers excellent demulsibility and hydrolytic stability, preventing components from damaging rust and corrosion. They are dyed purple to facilitate leak detection. *Industry Specifications and OEM Approvals:* Denison HF-O, HF-1, HF-2; Vickers 35VQ25A, M-2950-S Mobile Hydraulic Systems and I-286-S Industrial Hydraulic Systems; Cincinnati Machine P-68 (ISO 32), P-70 (ISO 46) and P-69 (ISO 68); Racine S106; Joy Mining Machinery HO-T (AW 46), HO-S (AW 68); DIN 51524.

### Castrol® Blue Hydraulic Plus™

ISO 32 46 68 100

Castrol Blue Hydraulic Plus meets the most severe industry requirements. It's formulated with up to 50% more performance additive than some competitors, giving a larger margin of safety in key areas of corrosion, oxidation and wear protection. Castrol Blue Hydraulic Plus offers excellent hydrolytic stability in the presence of water, and is formulated to meet or exceed the industry standards for vane, gear and piston pumps. It is well suited for use in mobile hydraulic equipment like excavators, bulldozers and drilling equipment that have various types of pumps and a common sump in the same hydraulic circuit. *Industry Specifications and OEM Approvals:* Denison HF-O, HF-1, HF-2; Vickers 35VQ25A, M-2950-S Mobile Hydraulic Systems and I-286-S Industrial Hydraulic Systems; Cincinnati Machine P-68 (ISO 32), P-70 (ISO 46) and P-69 (ISO 68); Racine S106; Joy Mining Machinery HO-T (AW 46), HO-S (AW 68); DIN 51524.

### Castrol® Paradene™ AW

ISO 22 32 46 68 100 150 220 320 460

Castrol Paradene AW is a premium industrial antiwear hydraulic oil line for hydraulically activated equipment that utilizes high-performance pumps. Castrol Paradene AW will remain stable and clean in today's machine tool equipment where increasingly sophisticated control systems are used. Its careful selection of base stock combined with an outstanding additive package including an anti-foam ingredient leads to long fluid life and equipment life savings. Paradene AW provides outstanding long-term performance and protection. *Industry Specifications and OEM Approvals:* Denison HF-O, HF-1, HF-2; Vickers 35VQ25A, M-2950-S Mobile Hydraulic Systems and I-286-S Industrial Hydraulic Systems; Cincinnati Machine P-68 (ISO 32), P-70 (ISO 46) and P-69 (ISO 68); Racine S106; Joy Mining Machinery HO-T (AW 46), HO-S (AW 68); DIN 51524.

### Castrol® Anvol® SWX 46 [PREVIOUSLY Castrol Anvol SWX FM]

ISO 46

Castrol Anvol SWX 46 is an HFDU polyolester-type hydraulic fluid as defined by ISO 6743/4 and ISO 12922<sup>1</sup>. It meets the requirements for Factory Mutual Category 1 Classification and provides a safe working environment and improved system reliability, and is readily biodegradable. Formulated to work in high-pressure hydraulic systems up to 7500 psi, Castrol Anvol SWX 46 provides gear, vane and piston pumps with protection against wear equivalent to that of mineral oils. Castrol Anvol SWX 46 is used in areas of the manufacturing industry where there is high risk of fire, such as hot strip mills, coil handling facilities, pipe mills and continuous casters.

<sup>1</sup> per ISO 6743 / 4 and ISO 12922:1999 / Corrigendum 1:2001 (E), these are classified as synthetic fluids free of water, but of other composition than HFDR (Phosphate Ester).

# Hydraulic Fluids (cont'd)

## Castrol® Performance™ Bio HE [PREVIOUSLY Castrol Carelube HTG™]

ISO 32

Castrol Performance Bio HE is formulated from natural vegetable oils to be more environmentally acceptable than traditional hydraulic oils. It is readily biodegradable and is invaluable where leakage could cause soil or water contamination. Castrol Performance Bio HE features a naturally high viscosity index base oil (200 VI); this extra-high VI means that Castrol Performance Bio HE experiences little change in viscosity during its recommended operating range of 0°F to 175°F. Castrol Performance Bio HE has demonstrated low toxicity, naturally high lubricity and anti-wear properties and delivers exceptional stay-in-grade performance over its operating range.

## Castrol® Aerial Lift Fluid

Castrol Aerial Lift Fluid is a specially formulated multi-viscosity hydraulic fluid. It displays noted performance in mobile lift applications where extremes of temperature are encountered and system operation, reliability, dielectric strength and protection are mandatory. Castrol Aerial Lift fluid has outstanding thermal, hydrolytic and oxidation stability.

## Castrol® Paradene™ R&O

ISO 46 68 100 150 220 320 460

Castrol Paradene R&O is a premium quality rust and oxidation inhibited lubricant with excellent water separation ability for longer equipment life and reduced maintenance costs. Castrol Paradene R&O oils are particularly suited to meet today's stringent industrial requirements through a combination of a high viscosity index base oil, foam, rust and corrosion inhibitors and a special oxidation inhibitor. Castrol Paradene R&O is tailored to meet the needs of non anti-wear hydraulic and circulating systems, as well as non-EP gear oil applications.



# 3. Transmission Fluids

## Off-Road Transmission Fluids

### Castrol® Trans-C™ HT

SAE 10W-30

Castrol Trans-C HT is a full synthetic, all-weather hydraulic and transmission fluid that balances high-temperature wear protection for gears and bearings with low temperature flow properties for positive shifting in transmissions. Its full synthetic formulation can extend drain capability with regular used oil intervals, reduce wear, and guard against foaming. This multi-functioning fluid allows for product consolidation. Castrol Trans-C HT is recommended for use as a TO-4, TO-4M or C4 type fluid and offers excellent Vickers 35VQ25 performance.

### Castrol® Trans-C™

SAE 10W 30 50 60\*

Castrol Trans-C is formulated to meet the strict frictional requirements of a Caterpillar TO-4 fluid, and is tested for friction control using seven different frictional materials, both metallic and nonmetallic. Castrol Trans-C's proven friction control results in powershift transmission performance with less clutch slippage and clutch setting adjustments and elimination of brake noise. Anti-foam protection and excellent sludge and deposit control ensures clear lubrication channels resulting in a longer, trouble-free transmission life. *Approvals and Recommendations:* Castrol Trans-C provides Allison C-4 and Vickers 35VQ25 performance and exceeds TO-4 specifications.

\*Available in drums only.

### Castrol® UTF – Universal Tractor Fluid

Castrol UTF is a premium hydraulic/transmission fluid that exceeds the refill and service top-off needs of farm and industrial tractor transmissions, differentials and wet disc brakes. Castrol UTF is compounded with anti-wear, extreme pressure, anti-oxidant and friction control additives and foam and corrosion inhibitors, and couples this superb additive package with highly refined base oils and a shear stable viscosity index improver for a balanced package. Castrol UTF provides just the right balance of smooth engagement and minimum slippage, which is ideal for power transmission performance. Due to its smooth performance characteristics, Castrol UTF reduces heat-associated wear in power transmissions.

*OEM Specifications:* Allis Chalmers Power Fluid 821; Case/New Holland MS-1207/Hy-Tran Plus, MS-1210/TCH, MS-1204/TFD Fluid, MS-1205/TFD-II Fluid, MS-1206/PTF Fluid, JIC-145, JIC-185, B-6/Hy-Tran, CNH MAT 3505 (MS-1209 Hy-Tran Ultra Fluid), Ambra Mastertrans Fluid CNH MAT 3525 (M2C-134D), Multi G & Multi G 134, Nexplore Fluid; Caterpillar TO-2; John Deere J20A, J20C, JD303, J14B, J14C; Deutz-Allis AC Power Fluid 821 XL; Ford Tractor M2C53A, M2C53C, M2C21A/B, M286B/C, M2C134A/B/C/D, M2C77A; Kubota Universal Transdraulic Fluid, UDT Fluid; Massey Ferguson M-1110, M-1127 A/B, M-1129-A, M-1135, M-1141 (Permatran III); Oliver/White Q-1766B, UHTF Type 55, Q-1722, 102082, Q-1826; Sperry Vickers Pass on Pump Tests ASTM-D2882 and 35VQ25; Volvo WB-101; ZF - 03E, 05F.

### Castrol® TranSynd® RD

Castrol TranSynd RD is a premium, synthetic, universal powershift and automatic transmission fluid that is engineered to remain stable under the most severe conditions. With excellent thermal and oxidation stability that resists deposit formation, TranSynd RD is a year-round fluid that offers outstanding corrosion and foaming resistance and high viscosity index synthetic base fluids that provide superior high/low temperature performance. Castrol TranSynd RD is recommended by Allison Transmission for "Rigorous Duty" applications where extended drain intervals and reduced life cycle costs are desired in Allison 5000, 6000, 8000 and 9,000 Off-Highway Series transmissions. *Industry Specifications and OEM Approvals:* Allison TES 353 (AN-032001), Allison C4 (31554001)





# Transmission Fluids (cont'd)

## On-Road Transmission Fluids

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### Castrol® Syntrans™ Z Long Life

SAE 75W-80

Castrol Syntrans Z Long Life is a full synthetic fluid developed specifically to meet ZF extended drain intervals requirements (500.000 km) and is particularly suitable for severe applications where loads and temperatures are higher. It is approved for use in all ZF commercial manual and automated manual transmissions, and can be recommended in other manual transmissions requiring API GL-4. With excellent wear and EP performance, Syntrans Z Long Life's outstanding frictional characteristics provide improved shift quality and extend component life, thus reducing maintenance costs. *Industry Specifications and OEM Approvals:* API GL-4 MAN 341 Z5, MB-Approval 235.41, ZF TE-ML 01E, 02E, 16P.

### Castrol® Transmax® Manual E Long Life 40

Castrol Transmax Manual E Long Life 40 is a specially formulated synthetic lubricant designed for fuel efficiency, extended drain intervals and severe service in heavy duty commercial vehicle transmissions requiring a non-EP transmission lubricant. It is formulated to protect higher torque transmissions coupled with increased horsepower engines and is approved for use in Eaton transmissions such as Ultrashift Plus, Fuller Advantage, FR and RT Series. *Approvals and Recommendations:* API Category MT-1, Eaton PS-386, Mack TO-A Plus, Meritor O-81, Navistar MPAPS B-6816 Type II.

### Castrol® Syngear™ CD 50

SAE 50

Castrol Syngear CD 50 is a specially formulated synthetic transmission fluid designed for extended drain and severe service in heavy-duty manual transmissions that require a non EP gear or transmission fluid. Castrol Syngear CD 50 contains an anti-wear additive as well as rust, oxidation and corrosion inhibitors, and its 100% synthetic base stocks provide greater load carrying ability and excellent thermal stability for greater fuel economy and longer equipment life. Castrol Syngear CD 50's high viscosity index and low pour point provide outstanding all-weather, year round performance. *Industry Specifications and OEM Approvals:* Eaton Roadranger PS164REV7, Meritor extended drain, Dana synchronized and non-synchronized transmissions.

### Castrol® Syntrans™

SAE 75W-85

Castrol Syntrans is a full synthetic transmission fluid recommended for most commercial vehicle manual transmissions (truck, bus, light-duty commercial vehicle) where API GL-4 lubricants are required. Excellent thermal and oxidative stability maintains transmission cleanliness and lubricant performance, allowing extended drain capability. Superb cold flow characteristics give smoother gear shifts at low temperatures, and high shear stability maintains lubricant performance throughout the drain interval. Castrol Syntrans' good wear and EP performance also ensures component protection under high load conditions, reducing downtime and service costs. *Industry Specifications and OEM Approvals:* API GL4, MAN 341 E4, MB approval 235.4, Volvo 97307, Eaton 500,000 km drain Europe (service bulletin 2273).

### Castrol® Heavy Duty Multi-Purpose ATF

Castrol Heavy Duty Multi-Purpose Automatic Transmission Fluid (ATF) is suitable for most power transmission and hydraulic systems, including passenger car and truck automatic transmissions, powershift transmissions in off-highway construction equipment, hydrostatic drives and industrial, agricultural, mining and marine hydraulics. Castrol Heavy Duty Multi-Purpose ATF has excellent anti-wear, corrosion resistance, friction retention, and oxidation and thermal stability. *Industry Specifications and OEM Approvals:* Allison TES-389 and Allison C-4 (older equipment that recommends a non-synthetic "Dexron type"),



# 4. Gear Lubricants

## Mobile Equipment Gear Oils

### Castrol® AP Gear Lubricant

SAE 80W-90 85W-140

Castrol AP (All Purpose) Gear Lubricant is a multi-purpose, thermally stable, extreme pressure gear oil formulated to extend oil service life and reduce critical component wear. Its high-quality base oils and additives provide excellent load-carrying ability, EP properties, wear resistance, oxidation stability and anti-rust, anti-corrosion and anti-foam properties. Castrol AP Gear Lubricant meets the requirements of API (American Petroleum Institute) gear oil classification GL-5, SAE J2360, and MIL-PRF-2105E. *Recommendations:* Castrol AP Gear Lubricant is recommended for a variety of applications, including but not limited to BMW, Dodge, Eaton, Euclid, Ford Motor Company, General Motors, Navistar, Nissan, Renault, Rockwell International, and Volkswagen. Castrol AP Gear Lubricant is J2360 (Formerly MIL-PRF-2105E) approved.

### Castrol® Axle FD-1

Castrol Axle FD-1 is semi synthetic, multi grade final drive fluid designed to extend drain intervals up to 6000 hours\* in off road final drives where FD-1 specified fluids are suitable for use. Castrol Axle FD-1 improves wear protection when compared to mineral TO-4 50 fluids; additionally, Castrol Axle FD-1's synthetic base stock withstands a wide range of operating temperatures.

*\*in combination with a proper oil analysis program like Castrol Labcheck*

### Castrol® Syngear™

SAE 75W-90 80W-140

Castrol Syngear is a premium, synthetic, heavy duty, multi-grade gear lubricant that meets API GL-5 service. It provides excellent cold weather performance, outstanding stability under higher than normal operating temperatures, and substantial load carrying ability for cooler operation and longer equipment life. Castrol Syngear is ideal for severe service environments and customers who want to extend service intervals. *Industry Specifications and OEM Approvals:* API GS-5, API MT-1 (75W-90); SAE J2360 (Formerly MIL-PRF-2105E); Dana SHAES 429 Rev. A, Dana SHAES 256 Rev. C (75W-90); Mack Truck GO-J Plus (75W-90); and International TMS 6816. Accepted by Eaton Corporation as alternatives to their Eaton Roadranger Lubricants.

## Stationary Gear Oils

### Castrol® Alpha® HC [PREVIOUSLY Castrol Isolube]

ISO 32 46 68 150 220 320 460

[For ISO 100, CONTACT Castrol tech support at 630-961-6562]

Castrol Alpha HC is a synthetic lubricant with technically advanced chemistry that excels in applications requiring optimum oxidation control and thermal stability, consistent anti-wear performance and low carbon-forming tendencies. Castrol Alpha HC extends drain intervals and provides excellent performance in circulating oil and gear set applications and in compressors. Castrol Alpha HC can reduce power consumption versus some competitive conventional and synthetic gear oils, delivering a 6.2% improvement vs. a non-EP conventional gear oil.\* Its improved molecular structure and a minimal decrease in operating viscosity leads to lower internal friction, which results in a decrease in power consumption.

*\*Energy consumption was measured in kilowatts used per ton of rock conveyed. Ambient and operating temperatures were evaluated in order to quantify additional benefits derived from all products.*

### Castrol® Alpha® HC EP [PREVIOUSLY Castrol Isolube EP]

AGMA 2 EP 4 EP 5 EP 6 EP 7 EP 8 EP

ISO 68 150 220 320 460 680

[For ISO 100, CONTACT Castrol tech support at 630-961-6562]

Castrol Alpha HC EP lubricants are a series of ISO graded chemistries with carefully chosen synthetic components to deliver optimum performance in applications requiring AGMA EP gear oils. Castrol Alpha HC EP provides maximum protection in industrial gear sets, off-highway construction and mining applications. It has exceptional oxidative and thermal stability.



## Gear Lubricants (cont'd)

### Castrol® Alphasyn T™ [REPLACES Castrol SHL Lubricant 150, 200, 460]

ISO 150 220 320 460

The Castrol Alphasyn T gear oil range of synthetic lubricants are based on polyalpha-olefin (PAO) fluids and sulphur/phosphorus anti-wear additive technology, providing outstanding thermal stability and good load carrying capacity. Alphasyn T grades meet the requirements of DIN 51517 Parts 2 and David Brown Type A.

### Castrol® EP Gear Lubricant

AGMA 2 EP 3 EP 4 EP 5 EP 6 EP 7 EP 8 EP

ISO 68 100 150 220 320 460 680

Castrol EP Gear Lubricants are exceptional quality gear oils designed for severe duty applications. They feature selected base oils with an extremely stable additive package, delivering outstanding performance where an AGMA EP gear oil or U.S. Steel 224 performance is recommended.

## 5. Greases

### Castrol® Pyroplex® Gold

NLGI 1 2

Castrol Pyroplex Gold is a high performance, semi synthetic, aluminum complex grease that excels in heavily-loaded equipment where extreme operating conditions prevail. It contains a high level of synthetic solids, including 6% molybdenum disulfide, and enhanced Hydro-Activated™ technology coupled with an aluminum complex thickener and carefully selected semi-synthetic base fluids to give equipment a protective lubricant barrier against wear, even during conditions of high load. Castrol Pyroplex Gold combines the mobility of a typical NLGI 1 grade grease with the staying power and extreme pressure performance of an NLGI grade 3 grease.

### Castrol® Pyroplex® Protection ES

NLGI 1 2

Castrol Pyroplex Protection ES is a specially formulated synthetic, lithium complex grease designed for extended service performance in challenging on-highway applications. It provides corrosion resistance, extreme pressure performance, enhanced hydroactivation technology for performance in wet conditions and "stay-in-place" ability with outstanding mobility through all seasons.

### Castrol® Pyroplex® Blue

NLGI 1 2

Castrol Pyroplex Blue's unique multifunctional solid lubricant additive actually builds tack and adhesion when exposed to moisture via Hydro-Activated™ technology that resists softening and washout. Castrol Pyroplex Blue protects plain and anti-friction bearings under severe conditions where water, dust and pressure are present. It is designed to operate in wet environments over a wide temperature range. Ideal for hinge and bucket pins, Castrol Pyroplex Blue's affinity for metal surfaces is enhanced, and lubricating film strength increases where high temperature performance, rust protection and extreme pressure properties are required.

### Castrol® Pyroplex® Red

NLGI 1 2

Castrol Pyroplex Red is a multi-purpose grease designed to operate over a wide temperature range. Its lithium complex base plus extreme pressure additives exhibit good water resistance and mechanical stability in high temperature applications. Castrol Pyroplex Red is a high temperature, EP, lithium complex grease that meets the highest performance standards of automotive, fleet, industrial and off-highway applications. Its ability to withstand extreme high temperatures makes it a particularly good grease for use with disc brake wheel bearings. Castrol Pyroplex Red exceeds NLGI specification GC-LB.



## Greases (cont'd)

### Castrol® Sphero<sup>l</sup>® SHL 00 [PREVIOUSLY Castrol SHL 00]

NLGI 00

Castrol Sphero<sup>l</sup> SHL 00 is a synthetic, semi-fluid lubricant offering excellent wheel end system lubrication, minimal leakage and exceptionally long service. It delivers low-/high-end temperature performance with extreme pressure and anti-wear additives.

### Castrol® Contractor Special

NLGI 1 2

Castrol Contractor Special is a lithium complex extreme pressure lubricant containing 3% molybdenum disulfide. It is formulated to offer high temperature and heavy-duty performance with good pumpability and shear stability. Castrol Contractor Special excels in heavy-duty applications such as bucket pins and articulating joints where a tough, durable lubricating film is mandatory.

### Castrol® HD Lithium

NLGI 00 0 2

Castrol HD Lithium is a lithium 12-hydroxy stearate, multi-purpose, extreme pressure grease that exhibits excellent low and high temperature performance, good water resistance and high shock load capacity. It excels in ball joint suspensions, universal joints, steering gears, anti-friction bearings, plain bearings, slides, ways and jibs. Castrol HD Lithium is intended for use on a ball and roller anti-friction bearings as well as conventional sleeve bearings; Castrol HD Lithium 00 Grease is intended for service where an NLGI 00 grade lithium grease is required, including some automatic grease systems.

### Castrol® HD Lithium 00

Castrol HD Lithium 00 grease is a smooth, dark amber colored, lithium 12-hydroxy stearate grease. Castrol HD Lithium 00 Grease is intended for service where an NLGI 00 grade lithium grease is required, including some automatic grease systems.

### Castrol® Fifth Wheel Grease

NLGI 2

Castrol Fifth Wheel Grease has been designed specifically for fifth wheel applications (on-highway vehicles) where stay-in-place performance is critical under all weather and application conditions. Castrol Fifth Wheel Grease's graphite/moly formulation and high percentage of "tackifiers" give it a true affinity for metal surfaces.

### Castrol® Open Gear 800

NLGI 1

Castrol Open Gear 800 is a synthetic lubricant that quiets noisy gears, increases gear life, and contains 10% solids to provide outstanding adhesion to metal surfaces under the toughest operating conditions. Castrol Open Gear 800 lowers lubrication costs and extends service intervals. It can be used in industrial open gears, dipper sticks and cables and drill bit couplings.



## 6. Coolants

### Castrol® Radicool™ SF-O Premix

Castrol Radicool SF-O Premix, a heavy-duty, nitrite-free, extended-life antifreeze/coolant, is a premium quality, Organic Acid Technology (OAT), ethylene glycol-based fluid. Specially formulated with advanced additive technology, this product provides extended service maintenance protection in heavy duty applications without the addition of SCAs, and meets nitrite-free coolant requirements of many industry-leading OEMs. It offers extended service life of 1,000,000 miles or 20,000 hours.

*OEM Specifications:* ASTM D3306, ASTM D6210, ASTM DA7583, Behr Radiator, Caterpillar EC-1, Cummins (Diesel/NG) CES 14603, Daimler DBL 7700.00, Daimler MS-7170, Detroit Diesel 93K217, Ford WSS-M97B44-D, GM GMW3420 International, John Deere JDS-G135, Komatsu KES 07 892, Mack GS17004, MAN 324 Type SNF, Mercedes Benz 325.3, MTU 5048, Navistar CEMS B-1 Type IIIA, Paccar CSO185, TMC RP 338A, Volvo/Mack 20774185.+

\*HD Extender may be needed based on water quality.

+ Meets or exceeds the listed performance specifications.

### Castrol® Radicool™ Heavy Duty Premix

Castrol Radicool Heavy Duty Premix is a premium quality, conventional technology ethylene glycol-based fluid. The product is specially formulated with industry-leading additives to provide optimum performance in heavy duty vehicles requiring supplemental coolant additives (SCAs). Castrol Radicool Heavy Duty Premix contains nitrites for superior wet sleeve liner cavitation protection. *Industry Specifications and OEM Approvals:* ASTM D3306, ASTM D6210, CAT DEAC/NGEC, Chrysler MS-7170, Cummins CES 14603, Detroit Diesel 7SE298, Ford ESE-M97B44-A, Freightliner 48-22680, GM 1825M, GM 1899M, John Deere JDM H24A, John Deere JDM H24B & C, Mack GS17004, MTU 5048, Navistar CEMS B-1 Type II, Perkins (CAT), TMC RP 329, Volvo-GM Heavy Truck.+

+ Meets or exceeds the listed performance specifications.

### Castrol® Automotive Antifreeze

Castrol Automotive Antifreeze is a conventional (green), ethylene glycol based antifreeze with silicate additives to provide maximum year-round protection for the aluminum components of today's car and light duty diesel engines. Castrol Automotive Antifreeze contains inhibitors that provide excellent protection from freezing to -84°F and boil-over to +276°F, and its patented formula protects all metals, including aluminum, against damaging rust and corrosion when used as recommended. It meets the requirements of car and light truck manufacturers. *Industry Specifications and OEM Approvals:* GM 1825M, Chrysler MS7170 sec. A & B 1-4, Ford ESE-M9B44-a Sec. 3.1.1 & 3.12, ASTM D-4985, ASTM D-3306, ASTM D4340, John Deere H24C2, Navistar B1, TMC RP302B, SAE J1034, Volvo-GM Heavy Truck, SAE J1941, John Deere H24B1/H24C1.+

+ Meets or exceeds the listed performance specifications.



## 7. Other Products

### Castrol® Aircol® SR [REPLACES Castrol SHL Lubricant 32, 46, 68]

ISO 32 46 68 100

Castrol Aircol™ SR compressor oil range of premium lubricants are designed for use in rotary screw compressors. Based on polyalphaolefin (PAO) fluids, Aircol SR grades meet the requirements of Atlas Copco 8000 hour oil drain interval and Kaeser.

### Castrol® Magna® RD [PREVIOUSLY Castrol Rock Drill Oil]

ISO 46 100 150 220 320 460

Castrol Magna RD Range Oils consist of selected mineral oils specially compounded with lubricity fortifiers, corrosion inhibitors and tackiness additives. It contains a tackiness agent that provides excellent adhesive characteristics to drill surfaces. Castrol Magna RD is recommended for companies including Gardner-Denver, Atlas Copco and SIG.

### Castrol® Magna® SW D [REPLACES Castrol Way Lubricant]

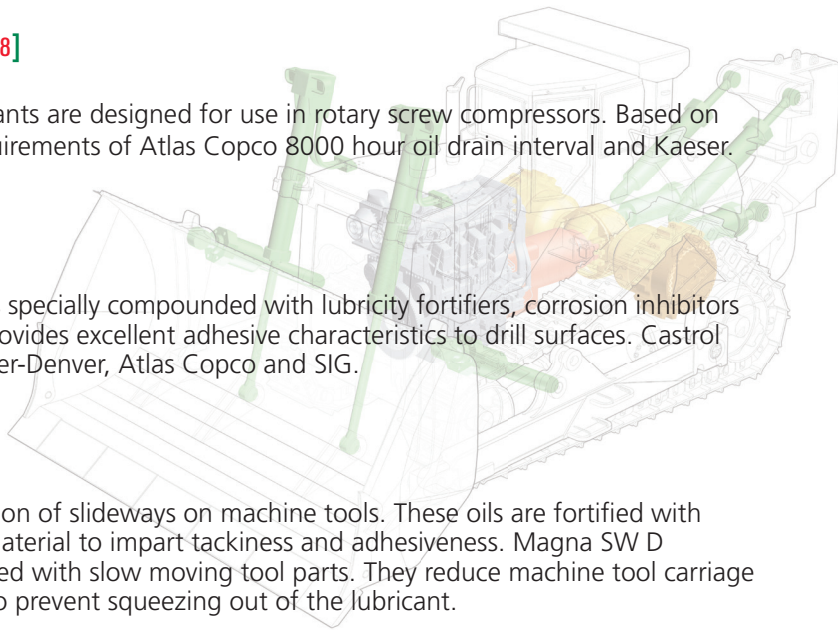
ISO 32 68 100 150 220

Castrol Magna SW D is specially formulated for the lubrication of slideways on machine tools. These oils are fortified with selected oiliness, extreme pressure additives and a special material to impart tackiness and adhesiveness. Magna SW D lubricants overcome the stick-slip motion ordinarily associated with slow moving tool parts. They reduce machine tool carriage chatter and possess the necessary adhesive characteristics to prevent squeezing out of the lubricant.

### Castrol® Perfecto® HT 4 and HT 5 Plus [PREVIOUSLY Castrol Heat Transfer Oils 100 Light and 1590]

ISO 22 46

Castrol Perfecto Heat Transfer Oils have low pour points and offer excellent circulation during cold weather start-ups, eliminating over-heated pump motors and protecting against hot spots (high fluid temperature in the heat exchanger).  
*Application Recommendations:* Castrol Perfecto HT 4 – in closed circulation systems with temperatures up to 287°C (550°F); Castrol Perfecto HT 5 Plus – in closed circulation systems with temperatures up to 315°C (600°F).



## 8. Programs and Services

### Castrol® Labcheck® Next Generation

Redesigned with easy-to-use features and helpful shortcuts, Labcheck Next Generation is the most advanced, intuitive used oil analysis program in the industry. Labcheck Next Generation performs a variety of measurements, helping to save real dollars in maintenance, repairs and unscheduled downtime. Sample analysis is completed within 24-48 hours of receipt at the laboratory, and fleet information is available 24 hours a day at [www.castrol.com/labcheck](http://www.castrol.com/labcheck) (login credentials required).

### Castrol® HD Focus Newsletter

*HD Focus* is a quarterly newsletter that offers customers insights on Castrol products, programs, services and HD industry news. To access the most current version of the *HD Focus* newsletter, as well as all archived online issues, visit [www.castrolhdfocus.com](http://www.castrolhdfocus.com).

### Castrol® Training Video: Truck Lubrication “Best Practices”

The “Best Practices” video trains your employees on the proper way to safely and accurately service a Class 8 truck, because your profitability — and customer satisfaction — depend on it. This informative and comprehensive video shows step-by-step industry best practices for fluid changes, oil sampling, chassis lubrication, and more.

### Castrol®/Des-Case Partnership

Des-Case specializes in contamination-control products for lubricants, with a complete line of desiccant breathers, fluid handling systems and equipment reliability services for improved fluid cleanliness, reduced equipment downtime, and increased equipment efficiency. Des-Case offers competitive pricing for Castrol customers along with technical, customer, and in-field support.

### Castrol® Oil Dispensing Containers

Castrol Oil Dispensing Containers by Oil Safe® improve handling practices, reduce contamination, and make jobs easier, faster, safer and cleaner. Durable, HDPE-plastic graduated drums measure up to 5 quarts/liters and feature a stretch spout lid and extra-wide necks for non-spill filling.

### Castrol® Equipment Program

The Castrol Equipment Program offers professionally installed, high-quality lubrication equipment for storing and dispensing Castrol products in a safe and efficient manner. With competitive pricing and trade loan options, the program features equipment from Alemite, Graco and Raasm.

# Current API Engine Oil Service Classifications

## Gasoline Engines

- SN** In 2010, the American Petroleum Institute introduced a new engine oil category under the name API SN and a new supplemental category called Resource Conserving. The API SN category is an improvement over the API SM category in the following areas: high temperature deposit protection for pistons, better sludge control, better seal compatibility, and after-treatment compatibility. Resource Conserving performance is commonly found in 0W-20, 0W-30, 5W-20, 5W-30, and 10W-30.
- SM** Introduced in 2004, SM oils are designed to provide improved oxidation resistance, improved deposit protection, better wear protection and better low-temperature performance over the life of the oil, compared to previous API S categories. Some SM oils may also meet the latest ILSAC specification and/or qualify as Energy Conserving. They may be used where API Service Category SJ and SL earlier categories are recommended.
- SL** Introduced July 1, 2001. SL oils are designed to provide better high-temperature deposit control and lower oil consumption, compared to previous API S categories. Some of these oils may also meet the latest ILSAC specification and/or qualify as Energy Conserving.
- SJ** Meets 1997 Engine Warranty Service Requirements. Provides reduced phosphorus content to protect catalytic converters. Replaces all previous API "S" specifications.

## Diesel Engines

- FA-4** API Service Category FA-4 describes certain XW-30 oils specifically formulated for use in select high-speed four-stroke cycle diesel engines designed to meet 2017 model year on-highway greenhouse gas (GHG) emission standards. These oils are formulated for use in on-highway applications with diesel fuel sulfur content up to 15 ppm (0.0015% by weight). API FA-4 oils are not interchangeable or backward compatible with API CK-4, CJ-4, CI-4 with CI-4 PLUS, CI-4, and CH-4 oils. Refer to engine manufacturer recommendations to determine if API FA-4 oils are suitable for use.
- CK-4** API Service Category CK-4 describes oils for use in high-speed four-stroke cycle diesel engines designed to meet 2017 model year on-highway and Tier 4 non-road exhaust emission standards as well as for previous model year diesel engines. These oils are formulated for use in all applications with diesel fuels ranging in sulfur content up to 500 ppm (0.05% by weight). API CK-4 oils exceed the performance criteria of API CJ-4, CI-4 with CI-4 PLUS, CI-4, and CH-4 and can effectively lubricate engines calling for those API Service Categories. When using CK-4 oil with higher than 15 ppm sulfur fuel, consult the engine manufacturer for service interval recommendations.
- CJ-4** Introduced in October 2006 for high speed, 4-stroke diesel engines, designed to be compliant with all engine technology including pre-model year 2007. This legislation, known as US EPA 07, requires that all 2007 model year vehicles emit lower levels of nitrogen gases (NOx) and particulate matter (PM). The category was needed to match the availability of ultra low sulfur diesel (ULSD) fuel on the market late 2006 and to meet the needs of new engines equipped with exhaust aftertreatment devices. Optimum protection is provided for control of catalyst poisoning, particulate filter blocking, engine wear, piston deposits, low- and high-temperature stability, soot handling properties, oxidative thickening, foaming and viscosity loss due to shear. API CJ-4 oils exceed the performance criteria of API CI-4 with CI-4 Plus, CI-4, CH-4, CG-4 and CF-4 and can effectively lubricate engines calling for those API Service Categories.
- CI-4 Plus** Introduced on September 1, 2004, API CI-4 Plus is an extension of the API CI-4 category, which did not meet a few key requirements in Exhaust Gas Recirculation (EGR) engines. After API CI-4 had been in the field, with the final engine designs, concerns were raised by the original equipment manufacturers (OEMs) regarding the way API CI-4 oils manage soot and the higher shear stresses seen in the new engines. To overcome these concerns, the industry developed and introduced the Mack T-11 engine test that measures the ability of the lubricant to control viscosity with the "new" soot that the EGR engines were producing. The industry also increased the severity of the Kurt Orbahn shear stability bench test from 30 to 90 cycles, which was found to more accurately represent the shear stresses that the new engines were placing on the oil.

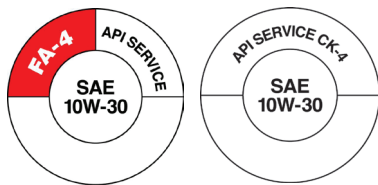




- CI-4** Introduced September 5, 2002, API CI-4 oils are for high-speed 4-stroke diesel engines designed to meet 2004 exhaust emission standards implemented in 2002. API CI-4 oils are formulated to sustain engine durability where exhaust gas recirculation (EGR) is used and are intended for use with diesel fuels ranging in sulfur content up to 0.5% weight. Can be used in place of CD, CE, CF-4, CG-4 and CH-4 oils.
- CH-4** API CH-4 provides engine protection in heavily sooted environments of new engines that must meet today's more stringent emission requirements.
- CG-4** (Obsolete) For high-speed diesels in on- and off-road use, API CG-4 oils provide protection against deposits, corrosion, foaming and soot accumulation.
- CF-4** (Obsolete) For 4-stroke cycle diesel engines, API CF-4 includes the replacement of Caterpillar 1G2 test with Caterpillar 1K and more severe pass/fail limits in the Cummins NTC-400 than for API CE.
- CF-2** (Obsolete) For severe duty 2-stroke engine service, API CF-2 replaces CD-11. Oils that meet this standard must pass the 6V92TA test and the Caterpillar 1M-PC test.
- CF** (Obsolete) For indirect-injected engines using a wide range of fuels, especially those with high sulfur content, API CF oils control deposits and inhibit bearing corrosion.

### Resource Conserving

This is a category of oils that provide less fuel consumption than the API's standard reference test oil and are licensed as "Energy Conserving" with the API.



### API ILSAC GF-5

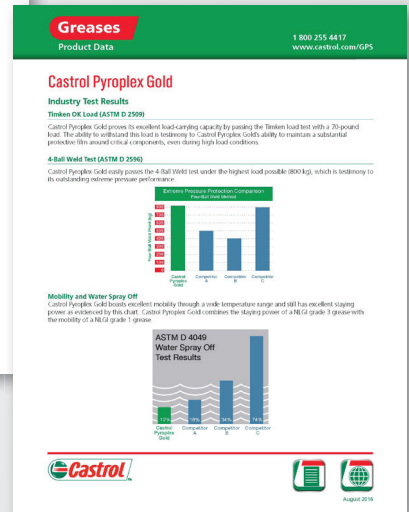
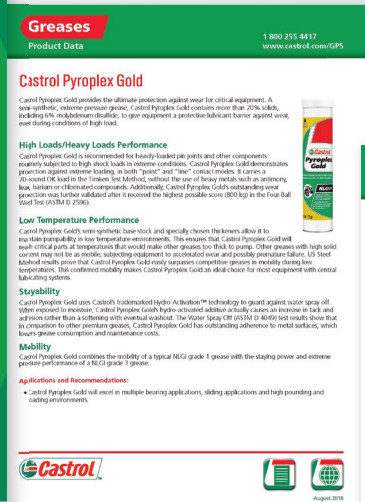
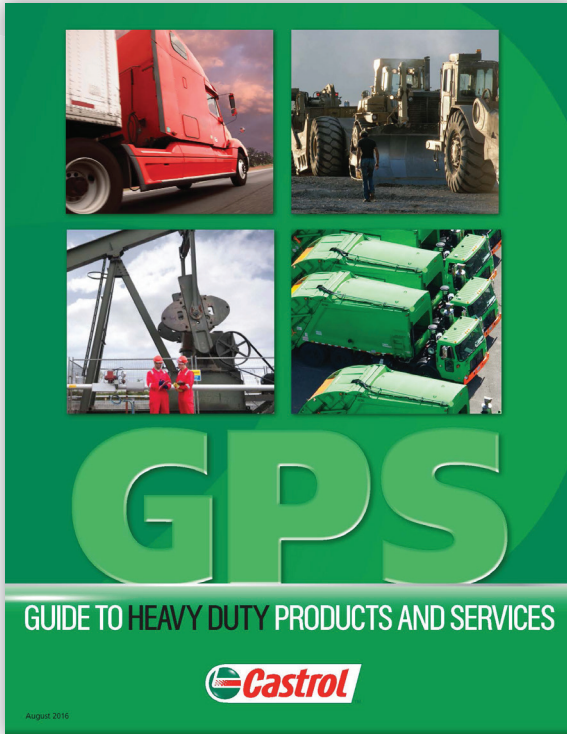
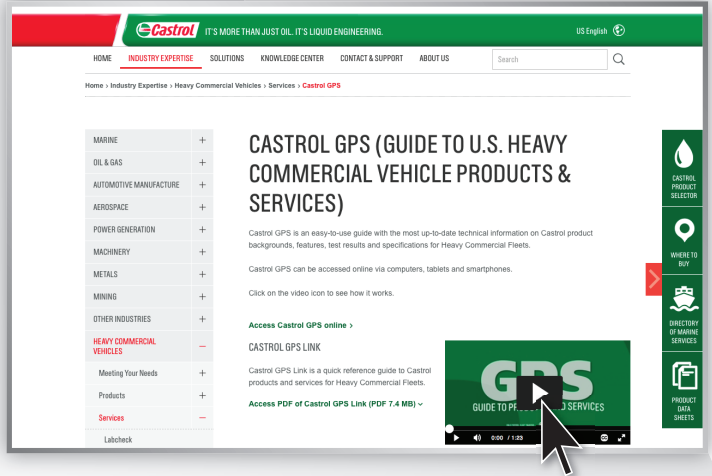
In order to display the API certified symbol or starburst, a motor oil must comply with all the requirements of API SN plus specific phosphorus requirements and also fuel economy performance as measured by the ASTM Sequence VID test.



For more information about Castrol products and services, please call **1 800 255 4417**.

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