LUBRICANTS SPECIFICATIONS AND CLASIFICATIONS

ACEA EUROPEAN OIL SEQUENCES-GUIDELINE

Three main factors specifically affecting the European market: • Extended oil drain intervals • Fuel savings • Exhaust gas composition
ACEA specifications are guidelines for European cars. The different uses of the oils are labelled by the European ACEA 2012 classification by letter:

A / B	for passenger car gasoline and light duty diesel engines
C	for passenger cars gasoline and light duty diesel engines with after treatment devices
E	for commercial vehicles with heavy duty diesel engines

ACEA A / B FOR GASOLINE AND DIESEL ENGINE OILS

A1 / B1	Stable, stay-in-grade oil intended for use at extended drain intervals in gasoline engines and car & light van diesel engines specifically designed to be capable of using low friction low viscosity oils with a high temperature / high shear rate viscosit+y of 2.6 mPa*s for xW / 20 and 2.9 to 3.5 mPa*s for all other viscosity grades. These oils are unsuitable for use in some engines. Consult owner manual or handbook if in doubt.
A3 / B3	Stable, stay-in-grade oil intended for use in high performance gasoline engines and car & light van diesel engines and / or for extended drain intervals where specified by the engine manufacturer, and / or for year-round use of low viscosity oils, and / or for severe operating conditions as defined by the engine manufacturer.
A3 / B4	Stable, stay-in-grade oil intended for use in high performance gasoline and direct injection diesel engines, but also suitable for applications described under A3 / B3.
A5 / B5	Stable, stay-in-grade oil intended for use at extended drain intervals in high performance gasoline engines and car & light van diesel engines designed to be capable of using low friction low viscosity oils with a High temperature / High shear rate (HTHS) viscosity of 2.9 to 3.5 mPa*s. These oils are unsuitable for use in some engines. Consult owner manual or handbook if in doubt.

ACEA C FOR CATALYST COMPATIBILITY OILS

C1	Stable, stay-in-grade oil intended for use as catalyst compatible oil in vehicles with DPF and TWC in high performance car and light van diesel and gasoline engines requiring low friction, low viscosity, low SAPS oils with a minimum HTHS viscosity of 2.9 mPa*s. These oils will increase the DPF and TWC life and maintain the vehicles fuel economy. Warning: these oils have the lowest SAPS limits and are unsuitable for use in some engines. Consult owner manual or handbook if in doubt.
C2	Stable, stay-in-grade oil intended for use as catalyst compatible oil in vehicles with DPF and TWC in high performance car and light van diesel and gasoline engines designed to be capable of using low friction, low viscosity oils with a minimum HTHS viscosity of 2.9 mPa*s. These oils will increase the DPF and TWC life and maintain the vehicles fuel economy. Warning: these oils are unsuitable for use in some engines. Consult owner manual or handbook if in doubt.

C3	Stable, stay-in-grade oil intended for use as catalyst compatible oil in vehicles with DPF and TWC in high performance car and light van diesel and gasoline engines, with a minimum HTHS viscosity of 3.5 mPa*s. These oils will increase the DPF and TWC life. Warning: these oils are unsuitable for use in some engines. Consult owner manual or handbook if in doubt.
C4	Stable, stay-in-grade oil intended for use as catalyst compatible oil in vehicles with DPF and TWC in high performance car and light van diesel and gasoline engines requiring low SAPS oil with a minimum HTHS viscosity of 3.5 mPa*s. These oils will increase the DPF and TWC life. Warning: these oils are unsuitable for use in some engines. Consult owner manual or handbook if in doubt.

SAPS : Sulphated Ash, Phosphorus, Sulphur DPF : Diesel Particulate Filter TWC : Three way catalyst HTHS : High temperature / High shear rate viscosity

ACEA E FOR HEAVY DUTY DIESEL ENGINE OILS

E4	Stable, stay-in-grade oil providing excellent control of piston cleanliness, wear, soot handling and lubricant stability. It is recommended for highly rated diesel engines meeting Euro I, Euro II, Euro III, Euro IV and Euro V emission requirements and running under very severe conditions, e.g. significantly extended oil drain intervals according to the manufacturer's recommendations. It is suitable for engines without particulate filters, and for some EGR engines and some engines fitted with SCR NOx reduction systems. However, recommendations may differ between engine manufacturers so Driver Manuals and / or Dealers shall be consulted if in doubt.
E6	Stable, stay-in-grade oil providing effective control with respect to piston cleanliness and bore polishing. It further provides excellent wear control, soot handling and lubricant stability. It is recommended for highly rated diesel engines meeting Euro I, Euro II, Euro III, Euro IV and Euro V emission requirements and running under severe conditions, e.g. extended oil drain intervals according to the manufacturer's recommendations. It is suitable for engines without particulate filters, and for most EGR engines and most engines fitted with SCR NOx reduction systems. However, recommendations may differ between engine manufacturers so Driver Manuals and / or Dealers shall be consulted if in doubt.
E7	Stable, stay-in-grade oil providing effective control with respect to piston cleanliness and bore polishing. It further provides excellent wear control, soot handling and lubricant stability. It is recommended for highly rated diesel engines meeting Euro I, Euro II, Euro III, Euro IV and Euro V emission requirements and running under severe conditions, e.g. extended oil drain intervals according to the manufacturer's recommendations. It is suitable for engines with or without particulate filters, and for most EGR engines and for most engines fitted with SCR NOx reduction systems. E9 is strongly recommended for engines fitted with particulate filters and is designed for use in combination with low sulphur diesel fuel. However, recommendations may differ between engine manufacturers so Drivers Manuals and / or Dealers should be consulted if in doubt.
E9	Stable, stay-in-grade oil providing effective control with respect to piston cleanliness and bore polishing. It further provides excellent wear control, soot handling and lubricant stability. It is recommended for highly rated diesel engines meeting Euro I, Euro II, Euro III, Euro IV and Euro V emission requirements and running under severe conditions, e.g. extended oil drain intervals according to the manufacturer's recommendations. It is suitable for engines with or without particulate filters, and for most EGR engines and for most engines fitted with SCR NOx reduction systems. E9 is strongly recommended for engines fitted with particulate filters and is designed for use in combination with low sulphur diesel fuel. However, recommendations may differ between engine manufacturers so Drivers Manuals and / or Dealers should be consulted if in doubt.

ILSAC STANDARD FOR PASSENGER CAR ENGINE OILS

GF-5	Introduced in October 2010, designed to provide improved high temperature deposit protection for pistons and turbochargers, more stringent sludge control, improved fuel economy, enhanced emission control system compatibility, seal compatibility, and protection of engines operating on ethanol-containing fuels up to E85.
GF-4	Use GF-5 where GF-4 is recommended.
GF-3	Use GF-5 where GF-3 is recommended.
GF-2	Use GF-5 where GF-2 is recommended.
GF-1	Use GF-5 where GF-1 is recommende

GASOLINE ENGINES **(Follow your vehicle manufacturer's recommendations on oil performance levels)**

SN	Introduced in October 2010, designed to provide improved high temperature deposit protection for pistons and turbochargers, more stringent sludge control, improved fuel economy, enhanced emission control system compatibility, seal compatibility, and protection of engines operating on ethanol-containing fuels up to E85.
SM	For 2010 and older automotive engines.
SL	For 2004 and older automotive engines.
SJ	For 2001 and older automotive engines.
SH	**OBSOLETE:** For 1996 and older automotive engines.
SG	**CAUTION:** Not suitable for use in most gasoline-powered automotive engines built after 1993. May not provide adequate protection against build-up of engine sludge, oxidation, or wear.
SF	**CAUTION:** Not suitable for use in most gasoline-powered automotive engines built after 1988. May not provide adequate protection against build-up of engine sludge.
SE	**CAUTION:** Not suitable for use in most gasoline-powered automotive engines built after 1979.
SD	**CAUTION:** Not suitable for use in most gasoline-powered automotive engines built after 1971. Use in more modern engines may cause unsatisfactory performance or equipment harm.
SC	**CAUTION:** Not suitable for use in most gasoline-powered automotive engines built after 1967. Use in more modern engines may cause unsatisfactory performance or equipment harm.
SB	**CAUTION:** Not suitable for use in most gasoline-powered automotive engines built after 1951. Use in more modern engines may cause unsatisfactory performance or equipment harm.
SA	**CAUTION:** Contains no additives. Not suitable for use in most gasoline-powered automotive engines built after 1930. Use in modern engines may cause unsatisfactory performance or equipment harm.

DIESEL ENGINES (Follow your vehicle manufacturer's recommendations on oil performance levels)

CJ-4	For high-speed four-stroke cycle diesel engines designed to meet 2010 model year on-highway and Tier 4 nonroad 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). However, the use of these oils with greater than 15 ppm (0.0015% by weight) sulfur fuel may impact exhaust aftertreatment system durability and/or drain interval. CJ-4 oils are especially effective at sustaining emission control system durability where particulate filters and other advanced aftertreatment systems are used. 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. When using CJ-4 oil with higher than 15 ppm sulfur fuel, consult the engine manufacturer for service interval.
CI-4	Introduced in 2002. For high-speed, four-stroke engines designed to meet 2004 exhaust emission standards implemented in 2002. 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. Some CI-4 oils may also qualify for the CI-4 PLUS designation.
CH-4	Introduced in 1998. For high-speed, four-stroke engines designed to meet 1998 exhaust emission standards. CH-4 oils are specifically compounded for use with diesel fuels ranging in sulfur content up to 0.5% weight. Can be used in place of CD, CE, CF-4, and CG-4 oils.
CG-4	**OBSOLETE:** Introduced in 1995. For severe duty, high-speed, four-stroke engines using fuel with less than 0.5% weight sulfur. CG-4 oils are required for engines meeting 1994 emission standards. Can be used in
CF-4	**OBSOLETE:** Introduced in 1990. For high-speed, four-stroke, naturally aspirated and turbocharged engines. Can be used in place of CD and CE oils.
CF-2	**OBSOLETE:** Introduced in 1994. For severe duty, two-stroke-cycle engines. Can be used in place of CD-II oils.
CF	**OBSOLETE:** Introduced in 1994. For off-road, indirect-injected and other diesel engines including those using fuel with over 0.5% weight sulfur. Can be used in place of CD oils.
CE	**CAUTION:** Not suitable for use in most diesel-powered automotive engines built after 1994.
CD-II	**CAUTION:** Not suitable for use in most diesel-powered automotive engines built after 1994.
CD	**CAUTION:** Not suitable for use in most diesel-powered automotive engines built after 1994.
CC	**CAUTION:** Not suitable for use in most diesel-powered engines built after 1990.
CB	**CAUTION:** Not suitable for use in most diesel-powered engines built after 1961.
CA	**CAUTION:** Not suitable for use in most diesel-powered engines built after 1959.

SAE VISCOSITY GRADES: PASSENGER CAR MOTOR OIL

Multigrade oils such as SAE 5W-30 and 10W-30 are widely used because, under all but extremely hot or cold conditions, they are thin enough to flow at low temperatures and thick enough to perform satisfactorily at high temperatures. Note that vehicle requirements may vary. **Follow your vehicle manufacturer's recommendations on SAE oil viscosity grade.**

If lowest expected outdoor temperature is	Typical SAE viscosity grades for passenger cars
0°C (32°F)	0W-20, 0W-30, 5W-20, 5W-30, 10W-30, 10W-40, 20W-50
–18°C (0°F)	0W-20, 0W-30, 5W-20, 5W-30, 10W-30, 10W-40
Below –18°C (0°F)	0W-20, 0W-30, 5W-20, 5W-30