



*The First in Synthetics*®

# **Product Recommendation and Drain Interval Chart**

# AMSOIL Synthetic Motor Oil Maxim

	<b>A</b>	<b>B</b>	<b>C</b>	<b>D</b>
<b>Recommendations are for whichever comes first, mileage or time.</b>	Personal vehicles with gasoline fueled engines	Personal light truck vehicles with diesel fueled engines	European automobiles with gasoline or diesel engines	High performance and racing engines
<b>Normal:</b> Up to 35,000 miles or 1 year. <b>Severe:</b> Up to 17,500 miles or 1 year.	TSO <sup>1</sup>			
<b>Normal:</b> Up to 25,000 miles or 1 year. <b>Severe:</b> Up to 15,000 miles or 1 year.	ASL, ATM	HDD <sup>1</sup> , AME, ACD		
<b>Normal &amp; Severe:</b> Up to 2 X OEM* recommendations for conventional petroleum oil or 1 year.				
<b>Normal &amp; Severe:</b> Extend intervals based on oil analysis or use the longest drain recommendation of the OEM*.		DEO, PCO	AFL	
<b>Normal &amp; Severe:</b> 7,500 miles or 6 months or longer based on vehicle OEM* recommendations.	XLM, XLF, XLT, XLO			
<b>Normal &amp; Severe:</b> Extend intervals based on oil analysis or use the longest drain recommendation of the OEM*. Vehicle owner's discretion where engines are modified.				TRO <sup>2</sup> , AHR <sup>2</sup> , TSO <sup>2</sup> , AMO <sup>2</sup>

\*OEM - original equipment manufacturer

**Note:** AMSOIL recommends checking the oil frequently to maintain proper fill levels and maximum engine protection.

## Application Guidelines

- 1 - Highest performing product and formulated to maximize fuel efficiency.
- 2 - Consider application and viscosity needs. Where engines are modified, the vehicle owner assumes responsibility for oil change intervals.
- 3 - Product has excellent performance and is a secondary recommendation for motorcycles.
- 4 - Product may not be specifically marketed for the application. However, it has excellent performance and should be considered when simplifying purchases or consolidating inventory, such as with mixed diesel and gasoline engine fleets.

**All intervals are for "mechanically sound" equipment** defined as - Engines that are in good working condition and do not, for example, leak oil or consume excessive amounts, are not worn out, do not overheat, do not leak anti-freeze, and have properly working emission control systems. AMSOIL recommends repairing malfunctioning engines prior to the installation of AMSOIL Synthetic Motor Oils.

## Vehicles Prone to Sludge

The engines identified in the following chart have been reported to be prone to sludge. The use of AMSOIL Synthetic Motor Oils at regular drain intervals established by the vehicle manufacturer will reduce the likelihood of sludge formation, provide the best protection and insure that the vehicle manufacturer honors any extended warranty.

<b>Engines In Question</b>				
Makes	Engine	Models and Years	U.S. Engine Population	New-engine warranty
<b>Audi/Volkswagen</b>	1.8L 4 turbo	1997-2004 Audi A4, Volkswagen Passat	447,000	8 years/unlimited mileage
<b>Chrysler/Dodge</b>	2.7L V-6	1998-2002 Chrysler Concorde, Chrysler Sebring, Dodge Intrepid, Dodge Stratus	797,000	None. Chrysler will handle on a case-by-case basis.
<b>Lexus/Toyota</b>	3.0L V-6	1997-2001 Lexus ES300, Toyota Camry, Toyota Avalon, Toyota Sienna;	1,577,000	8 years/unlimited mileage
	2.2L 4	1999-2001 Lexus RX300, Toyota Camry Solara; 2001 Toyota Highlander		
<b>Saab</b>	2.0L 4 turbo	2000-02 9-3 hatchback, 2000-03 9-3 convertible	82,000	8 years/unlimited mileage
	2.3L 4 turbo	1999-2003 Saab 9-5, 1999 9-3 Viggen	68,000	8 years/unlimited mileage

\*Source: Analysis from Ward's Auto Info Bank (approximate).

# Minimum Recommended Drain Intervals

E	F	G	H	I	J	K
Four-stroke motorcycle engines	Four-stroke ATV & snowmobile engines	Four-stroke marine craft with gasoline fueled engines	Four-stroke gasoline or diesel fueled small/compact engines	Commercial or fleet vehicles and motorhomes with gasoline engines	Heavy duty on/off-road applications, fleet, marine and motorhomes with diesel engines	Industrial natural gas engines
				TSO		
				ASL, ATM, AMO, ARO, HDD <sup>4</sup>		
MCF, MCV, On-road use		WCT, WCF, AME <sup>4</sup> Inboards & I/O		AME <sup>4</sup> , ACD <sup>4</sup>	HDD <sup>1</sup> , AME, ACD, AMO, ARO (engines w/o <b>EGR</b> )	
MCF, MCV, Off-road use	AFF	WCT, WCF Outboards & Personal Watercraft	ASE, ACD <sup>4</sup> , AMO <sup>4</sup>		HDD <sup>1</sup> , AME, ACD, PCO, AMO, ARO (Engines with <b>EGR</b> )	ANG
				XLM, XLF, XLT, XLO		
AMO <sup>3</sup> , ARO <sup>3</sup> , ASE <sup>3</sup>				DEO	DEO	

**Normal Service** defined as - Personal transportation vehicles frequently traveling greater than 10 miles at a time and not operating under severe service.

**Gasoline Engine Severe Service** defined as - Turbo/supercharged engines, commercial or fleet vehicles, excessive engine idling, first and subsequent use of AMSOIL engine oil in vehicles with more than 100,000 miles, daily short trip driving less than 10 miles (16km), frequent towing, plowing, hauling or dusty-condition driving.

**Diesel Engine Severe Service** defined as - Extensive engine idling, daily short trip driving less than 10 miles (16km), frequent towing, plowing, hauling or dusty-condition driving.

**Modifications and Alterations** - Engines operating under modified conditions are excluded from extended drain recommendations. Examples include the use of performance computer chips, non-OEM approved exhaust, fuel or air induction systems and the use of fuels other than those recommended for normal operation by the manufacturer.

**Oil filtration** - Extended oil drain intervals are based on the user following AMSOIL recommended filter service intervals. See oil filter recommendation on next panel.

- Application Description and Examples**
- (A) **Personal vehicles with gasoline fueled engines:** Personal passenger cars, pick-up trucks, SUVs and vans both turbo and non-turbo charged with gasoline engines
  - (B) **Personal light truck vehicles with diesel fueled engines:** Personal pick-up trucks, SUVs and vans both turbo and non-turbo charged with diesel engines
  - (C) **European Automobiles:** Audi, BMW, Mercedes Benz, Volkswagen, Volvo, Mini-Cooper, Land Rover, Opel, Peugeot, Porsche and Saab both gasoline and diesel
  - (D) **High Performance and Racing Engines:** Street rods, muscle cars, race cars, 4x4 off-roads, and modified street/track vehicles
  - (E) **Four-Stroke Motorcycle Engines:** All American, Japanese and European motorcycles including street, sport, touring and off-road bikes
  - (F) **Four-Stroke ATV and Snowmobile Engines:** Arctic Cat, Bombardier/Can-Am, Honda, Kawasaki, Polaris, Suzuki, Yamaha, etc.
  - (G) **Four-Stroke Marine Craft w/ Gasoline Fueled Engines:** Honda, Mercury, Yamaha, Johnson/Evinrude, Bombardier/BRP, Suzuki, Nissan, Tohatsu, OMC, Volvo Penta, Mercruiser, Chevrolet, Ford, Chrysler Marine, Crusader and Marine Power
  - (H) **Four-Stroke Gasoline Fueled Small & Compact Engines:** Garden, lawn and utility tractors, lawn mowers, generators, light towers, pumps, welders and other compact 4-cycle gasoline fueled engines
  - (I) **Commercial, fleet and motorhomes with gasoline engines:** All fleet, delivery, municipal and emergency vehicles, school and charter buses, (any vehicle or equipment used for non-personal use) as well as RVs/motorhomes
  - (J) **Heavy duty on/off-road applications, marine and motorhomes with diesel engines:** Over-the-road tractors; all fleet, delivery, municipal and emergency vehicles, school & charter buses; off-road equipment, compact diesel engines and diesel powered marine craft (any vehicle equipment used for non-personal use) as well as RVs/motorhomes
  - (K) **Industrial Natural Gas Engines:** Compressor engines, pumps, generators etc. (Not intended for automotive applications)

## Brief Product Descriptions

### TSO - 0W-30 Series 2000 Premium Synthetic Motor Oil

- Highest performing product for automotive gasoline engines • Replaces 0W-20, 5W-20, 5W-30 and 10W-30 viscosities
- Longest Life • Best high temperature deposit control • Best cold flow properties • Best wear protection in a 30 weight
- Maximizes fuel efficiency • Some racers have found benefit with this oil

### HDD - 5W-30 Synthetic Premium Heavy-Duty Diesel and Gasoline Motor Oil

- Highest performing product for diesel engines • Low viscosity maximizes fuel efficiency • Better anti-wear performance in 4-ball wear test compared to conventional and other synthetic diesel oils • Excellent for use with gasoline engines, making it an all-fleet product
- API CI-4 Plus-quality oil for EGR equipped and non-EGR diesel engines • Superior soot thickening and viscosity control

### ASL - 5W-30 Synthetic Motor Oil

- Best selling AMSOIL motor oil • Long Life • Excellent high temperature stability, wear protection, fuel efficiency and outstanding cold flow properties

### ATM - 10W-30 Synthetic Motor Oil

- Very popular AMSOIL 10W-30 motor oil • Long Life • Excellent high temperature stability, wear protection, fuel efficiency and cold flow properties

### AFL - 5W-40 Synthetic Motor Oil European Car Formula

- Best performing product for European diesel and gasoline fueled engines • Fulfills the viscosity and high performance requirements of VW (including 505.01), Porsche, BMW, Mercedes Benz and others

### AMO - 10W-40 Synthetic Motor Oil

- Primary recommendation for automotive 10W-40 applications • Long Life • Excellent high temperature stability and wear protection

### XL Series Synthetic Motor Oils (XLM 5W-20) (XLF 5W-30) (XLT 10W-30) (XLO 10W-40)

- High quality products that exceed the performance requirements of modern and older vehicles • Fuel Efficient • Long Life • Excellent low cost option to other AMSOIL synthetic motor oils • Purchasing bid appropriate • XLO 10W-40 is ideal for high mileage vehicles

### ACD - 10W-30/SAE 30 Synthetic Heavy-Duty Diesel Oil

- Meets both multi-grade and straight grade requirements • Primary recommendation for SAE 30 diesel applications • API CI-4 Plus-quality oil for EGR equipped and non-EGR diesel engines • Superior soot thickening and deposit control • Also good for gasoline engines

### DEO - 5W-40 Synthetic API CJ-4 Diesel Oil

- Primary recommendation for 2007 and newer diesel engines, although backwards compatible and may be used in older diesel engines • Protects exhaust particulate filters • Wide viscosity range, replaces 5W-40, 10W-40 and 15W-40 oils

### AME - 15W-40 Synthetic Heavy-Duty Diesel and Marine Motor Oil

- Best selling AMSOIL diesel engine oil • API CI-4 Plus-quality oil for EGR equipped and non-EGR diesel engines • Superior soot thickening and deposit control • Also good for gasoline engines

### PCO - 15W-40 Semi Synthetic Heavy-Duty Motor Oil

- High quality, lower cost option to other AMSOIL synthetic motor oils for diesel or gasoline engines • Purchasing bid appropriate

### TRO - 20W-50 Series 2000 Synthetic Racing Oil

- Best performing product for high performance or racing engines that use 20W-50 • Extraordinary film strength and wear protection
- Excellent high temperature deposit control • Long life

### ARO - 20W-50 Synthetic Motor Oil

- Primary recommendation for automotive 20W-50 applications • Long Life • Excellent high temperature stability and wear protection

### MCF - (10W-40), MCV (20W-50) Synthetic Motorcycle Oils

- Best performing products for motorcycle engines, transmissions and, where appropriate, primary chaincases • Long life • Reduces friction, heat, and wear • Best high temperature deposit control • Excellent off-season rust protection

### AFF - 0W-40 Formula 4-Stroke Power Sports Synthetic Motor Oil

- Best performing product for ATVs and snowmobiles • Excellent hot and cold temperature performance • Reduces friction, heat, and wear • Anti-rust for off-season storage

### WCT (10W-30), WCF (10W-40), Formula 4-Stroke Marine Synthetic Motor Oils

- Best performing products for gasoline fueled 4-stroke outboards, inboards, I/O and personal watercraft • FC-W registered and warranty certified for 4-stroke outboard motors • Engineered for maximum anti-wear, anti-rust protection • Excellent for high horsepower, high RPM engines as well as all-day trolling conditions

### AHR - SAE 60 Synthetic Heavy Weight Racing Oil

- High viscosity oil slows down thinning effects of fuel dilution in super charged, nitro methane or alcohol burning race engines
- Excellent wear and deposit control • Good for motorcycles that use SAE 60

### ANG - SAE 40, Low Ash, Synthetic Natural Gas Engine Oil

- Premium product that extends oil life and reduces maintenance costs • Controls nitration and acid build-up • Anti-wear formulation minimizes valve recession • Low volatility reduces oil consumption

### ASE - 10W-30/SAE 30 Synthetic Small Engine Oil

- Commercial grade synthetic oil for compact gasoline and diesel engines operating under adverse conditions • Examples include

# AMSOIL Filter Change Recommendations

## **Lube Filters**

### Vehicles with Gasoline or Diesel Fueled Engines

- **EaO:** Change filter at time of oil change up to 25,000 miles or one-year service life, whichever comes first, when used in conjunction with AMSOIL Synthetic Motor Oil.
- **Donaldson Endurance:** Heavy-duty commercial vehicles and off-road equipment, when used in conjunction with AMSOIL Synthetic Motor Oil, change filter up to two times longer than OEM\* recommendations, not to exceed 60,000 miles for on-highway diesel applications. Always change oil filter at the time of oil change.
- **WIX:** OEM recommendations extended to match drain intervals of AMSOIL XL Motor Oils.

### Stationary Engines

- **EaO and Donaldson Endurance:** Up to two times longer than OEM\* recommendations. Always change oil filter at time of oil change.
- **WIX and Donaldson P Series:** OEM\* recommendations.

### Motorcycles

- **EaOM:** For maximum engine protection, AMSOIL recommends changing the EaOM every time you change oil.
- **WIX:** OEM\* recommendations.

## **Air Filters**

### Vehicles with Gasoline or Diesel Fueled Engines

- **EaA:** Change every four years or 100,000 miles whichever comes first, provided the filter is cleaned according to AMSOIL recommended procedures every year or 25,000 miles, whichever comes first. Not applicable for off-road, frequently dusty or other severe-duty applications. Clean and change more often as determined by operating conditions or as indicated by restriction gauge.
- **WIX and Donaldson P Series:** OEM\* recommendations or restriction gauge.
- **EaAU:** AMSOIL recommends cleaning per restriction gauge if the vehicle is so equipped. Otherwise, clean the filter according to operating conditions. Extremely dusty environments will require more frequent cleaning.

### Heavy-Duty Commercial Vehicles and Off-Road Equipment

- **Donaldson Endurance:** Change per restriction gauge. Donaldson guarantees Endurance Air Filters will last twice as long as standard filters; otherwise Donaldson will provide a new filter at no charge. See Donaldson Endurance air filter program rules below.
- **WIX and Donaldson P Series:** OEM\* recommendations or restriction gauge.

### Stationary Engines

- **EaA:** Change every four years, provided the filter is cleaned according to AMSOIL recommended procedures every year. Not applicable for off-road, frequently dusty or other severe-duty applications. Clean and change more often as determined by operating conditions or as indicated by restriction gauge.
- **Donaldson Endurance:** Change per restriction gauge. Donaldson guarantees Endurance Air Filters will last twice as long as standard filters; otherwise Donaldson will provide a new filter at no charge. See Donaldson Endurance air filter program rules below.
- **WIX and Donaldson P Series:** OEM\* recommendations or restriction gauge.

### Motorcycles

- **EaAM:** Clean the EaAM Filter every year or according to operating conditions. Extremely dusty environments will require more frequent cleaning. The EaAM Filter should be changed every four years.
- **PSFA:** Clean and oil the Power Sports air filter every time you wash your motorcycle/ATV or as riding conditions dictate.

### Donaldson PowerCore Applications

- Per OEM\* recommendations or restriction gauge.

\* original equipment manufacturer

### Donaldson Endurance Air Filter Program Rules

- Use only Donaldson Endurance Air Filters.
- Have accurate records of current cellulose media change intervals.
- Keep accurate track of miles driven with Donaldson Endurance Air Filters.
- Maintain accurate maintenance records.
- Provide filter for inspection.
- Standard Donaldson warranty terms and conditions apply.

### EaA Cleaning Instructions: Every year or 25,000 miles or as required

- Carefully remove filter from the housing. Clean the housing with a shop towel being careful not to knock contaminants into the air inlet.
- Cleaning can be done by two methods:
  1. Vacuum Cleaning: Place the filter on a flat surface and carefully vacuum the filter media on the dirty side where the incoming airflow enters the filter. Be careful not to rub the filter pleats with the vacuum cleaner attachment too aggressively as this may damage the filter. Using a vacuum with too much suction may damage the filter.
  2. Shop Air Cleaning: Hold the filter with one hand and carefully blow the filter media at a 45-degree angle on the clean side of the filter using low-pressure (15 to 20 psi) shop air. Be careful not to rub the filter pleats with the air nozzle as this may damage the filter. Using too high of air pressure will damage the filter media.
- Reinstall the filter into the air filter housing and secure.

# Drivetrain Applications and Service Intervals

## Automatic Transmission Fluid Recommendations

### Synthetic Universal Automatic Transmission Fluid (ATF)

Recommended for use in most domestic and foreign automotive and light truck transmissions up to 50,000 miles under severe service\* and up to 100,000 miles under normal service\*, or according to OEM intervals, whichever is longer. Also recommended for heavy-duty transmissions such as Allison, Voith and ZF according to the transmission OEM extended oil drain interval for synthetic oil.

### Torque-Drive Synthetic Automatic Transmission Fluid (ATD)

Recommended for use in heavy-duty transmissions according to the OEM extended drain recommendation for synthetic oil including Allison TES-295, ZF TE-ML 14C and Voith G1363. Also recommended where DEXRON® III or MERCON® is specified. In DEXRON® III or MERCON® applications, use up to 50,000 miles under severe service\* and up to 100,000 miles under normal service\*, or according to OEM intervals, whichever is longer. See the G-1966 for further details.

### Synthetic SuperShift® Racing Transmission Fluid (ART)

Recommended for use in racing and high performance applications where no slip clutch performance is desired. No set drain interval recommendation is made.

\* As defined by the OEM. Where absent, Severe Service should be defined as excessive engine idling, continuous stop and go city driving, and frequent towing, plowing or hauling.

## Manual Transmission Oil Recommendations

### Synthetic Manual Transmission & Transaxle Gear Lube (MTG)

Recommended for synchronized manual transmissions and transaxles that require 75W-85, 75W-90 or 80W-90 API GL-4 extreme pressure gear lube, muscle car transmissions, Gear Vendors gear splitters, as well as a replacement for GM part #12346190 and Chrysler part #4874459. Under normal operating conditions AMSOIL MTG will last two times longer than conventional petroleum GL-4 gear oils. Where the OEM recommends synthetic oils, follow that drain interval (such as NV 4500). See AMSOIL G-2077 for further details.

### Synthetic Manual Synchronesh Transmission Fluid (MTF)

Recommended for automotive and light truck applications that use a non-extreme pressure, highly friction modified synchronesh transmission fluid. Transmissions & transaxles include some models of New Venture, Tremec, Land Rover, MG, Mini Cooper and Honda. AMSOIL MTF is a direct replacement for GM and Chrysler synchronesh fluids. Recommended for 50,000-mile service intervals or longer (up to 150,000 miles) as indicated in the owner's manual.

## Differential Gear Lube Recommendations

- **Severe Gear Synthetic Extreme Pressure (EP) Lubricants 75W-90 (SVG) & 75W-140 (SVO)**
- **Long Life Synthetic Gear Lubes 75W-90 (FGR) & 80W-140 (FGO)**
- **Synthetic Gear Lube 80W-90 (AGL)**

Consult the owner's manual or the Original Equipment Manufacturer (OEM) to establish Normal or Severe service.

Product/Classification	Normal Service	Severe Service
SVG, SVO, FGR, FGO, AGL, Cars, SUVs, Light Trucks	Drain at 100,000 miles of service or according to the owner's manual, whichever is longer.	Drain at 50,000 miles of service or according to the owner's manual, whichever is longer.
FGR, FGO Heavy Duty Class 8 Line Haul	Follow the OEM drain interval (miles or hours) for synthetic oil up to <b>500,000</b> miles or three years, whichever comes first. Otherwise, drain at twice the OEM interval for petroleum oil.	
SVG, SVO, AGL Heavy Duty Class 8 Line Haul	Follow the OEM drain interval (miles or hours) for synthetic oil up to <b>250,000</b> miles or three years, whichever comes first. Otherwise, drain at twice the OEM interval for petroleum oil.	
SVG, SVO, FGR, FGO, AGL Heavy Duty Off-Road Vocational	Follow the OEM drain interval (miles or hours) for synthetic oil up to <b>120,000</b> miles or one year, whichever comes first. Otherwise, drain at twice the OEM interval for petroleum oil.	

- For non-differential service such as MT-1 manual transmission applications, consult owner's manual or the OEM for a synthetic oil service interval. Where no synthetic oil service interval exists, drain at twice the interval for petroleum oil.
- Gear oils should be changed more frequently when operating in dusty or dirty conditions unless the gear system is sealed or equipped with membrane type breathers.
- AMSOIL does not support extended drain intervals where water contamination occurs. Check and service the gear oil frequently when water contamination is possible.

AMSOIL products and Dealership information are available from your local AMSOIL Dealer.

