



JOHN DEERE

NOTHING RUNS LIKE A DEERE

# JOHN DEERE FORESTRY LUBRICANTS GUIDE



# HIGH QUALITY LUBRICANTS

What you need to know about our products and what to do with them. Enjoy learning about it in this guide.



## CONTENTS

### INTRODUCTION TO OILS

Know the Basics.....	4
Fluid Properties Explained.....	6
Filters: Heart of Efficient Performance.....	8
Engine oils: true multi-taskers.....	10
Contaminants.....	12

### ENGINE OILS

Break-In Plus.....	14
Plus-50 II.....	14
Torq-Gard.....	15
Performance Testing: Plus-50 II.....	16

### HYDRAULIC OILS

Hydrau-Gard 46 Plus.....	18
Hydrau-Gard 22 Arctic.....	19
Bio Hydrau-Gard.....	19

### TRANSMISSION OILS

Extreme-Gard.....	20
Extreme-Gard LS 90.....	20

### COOLANTS

Cool-Gard II.....	21
Cool-Gard II PG.....	21

### GREASES

Grease-Gard Premium Plus.....	22
Grease-Gard Arctic.....	23
Grease-Gard Premium.....	23
Typical Grease Applications.....	24

### SAW CHAIN LUBRICANTS

Bio Chain-Gard Saw Chain Oil.....	26
Chain-Gard Saw Chain Oil.....	26
Bio Chain-Gard Grease.....	27
Chain-Gard Grease.....	27

### FAQ

Engine Oils.....	28
Appendix A: Package Sizes.....	30
Appendix B: Engine Oil Service Categories.....	32
Appendix C: Referenced Standards.....	34

## KNOW THE BASICS

Let's start with a brief primer – here are some essentials to keep in mind while you read through this guide.

### MINERAL BASE OILS

Crude petroleum oil is a mixture of different hydrocarbon compounds. The oil-refining process separates the crude oil into various components, which are cooled and condensed back into liquids including lube oils. These oils, or mineral stocks, are then processed to make finished engine oils, hydraulic oils, transmission fluids and gear oils.

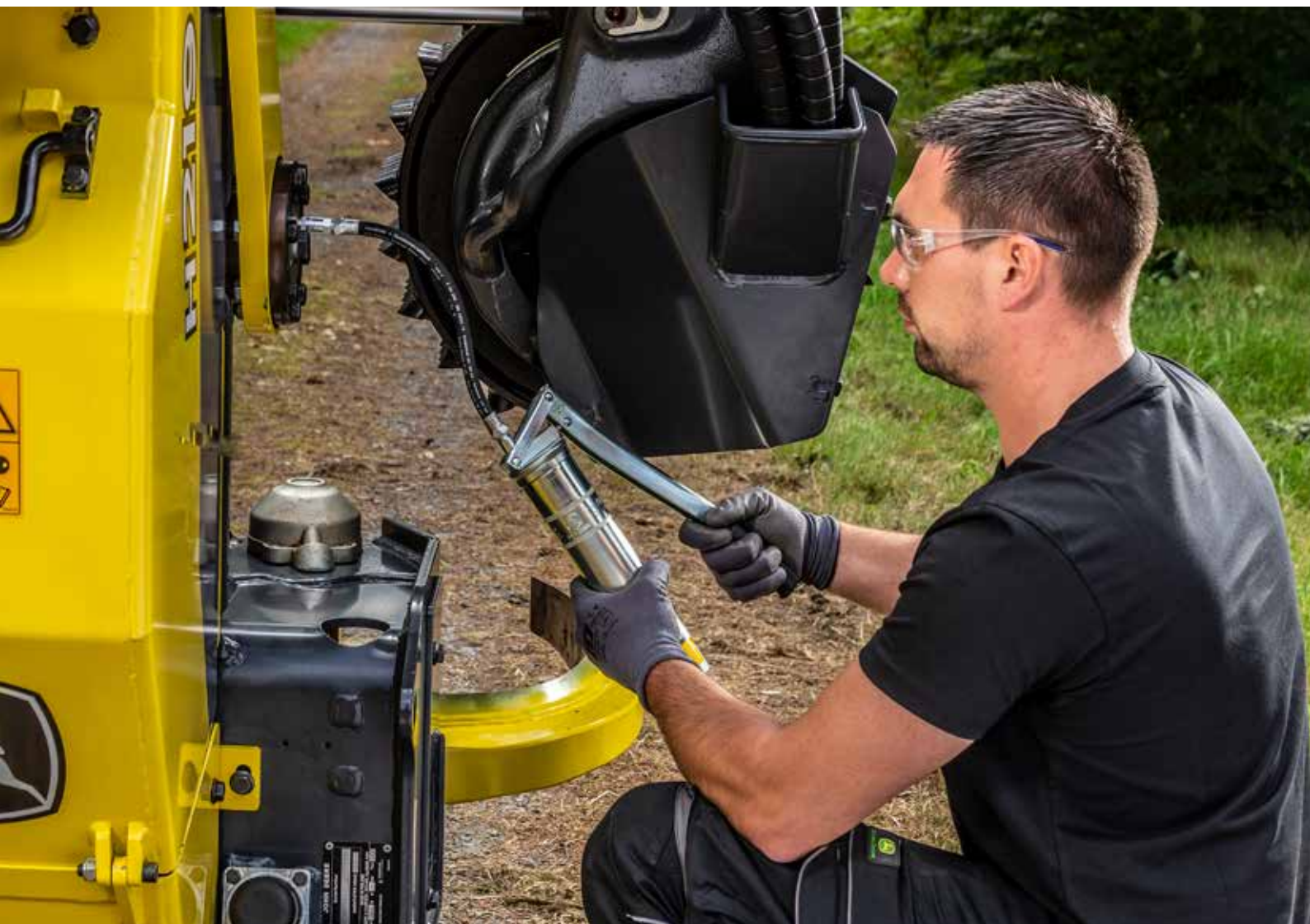
### SYNTHETIC BASE OILS

Synthetic oils are base-stock products whose structure has been changed from sources like crude petroleum oil or other carbon sources. For optimum performance, they require the right additives and the same servicing as mineral oil. The advantage of their use is best seen in extreme operating conditions: very cold or very hot temperatures.



### DARK IS GOOD

Good oil turns dark in diesel engines. Additives suspend waste products in the oil until the oil is drained.



## MULTI-GRADE OILS

Multi-grade or multi-viscosity oils provide balanced flow characteristics in a wide range of temperatures. Viscosity describes the natural behavior of an oil to change, among others, its flow characteristics in dependence of the temperature. Oil becomes more fluid as the temperature increases and less fluid as the temperature decreases. And with engine oils, fluid oil is crucial for cold morning starts! By the way, the “W” after the viscosity grade number means the oil has met a low-temperature (winter) requirement. Example: SAE 15W-40 provides reliable engine performance and protection for all climates above -15°C.

## OPERATOR’S MANUAL IS THE LAW

Use and observe the guidelines in the Operator’s Manual at all times, and make sure to use the most recent edition available. Remember that John Deere lubricants take older-model units into consideration and the manual has recommendations for which lubricant to use – if they’re followed, you can expect longer oil life with sustained performance and increased drain intervals in your John Deere equipment.



## FLUID PROPERTIES EXPLAINED

### PURPOSE DRIVEN FORMULATION

We formulate our lubricants for high intensity off-road applications and the challenging environments the lubricants must perform in order to reduce wear, boost performance and protect machines. Read about what is required of our fluids.

**POUR POINT**

The low pour point and dynamic viscosity values of all our drive train, gear and hydraulic oils guarantee low drag losses even in cold start conditions – making sure that machines crank and run smoothly with minimal losses right from the start.

**ANTI-FOAM**

Essential for smooth and precise hydraulic operation, ensuring access to the complete oil volume available.

**MATERIAL COMPATIBILITY**

It's important that the oil doesn't harm the seals, paint, yellow metals and other materials in the hydraulic and drive train systems.

**VISCOSITY**

In general viscosity describes the flow characteristics of an oil under certain conditions. There are several different "viscosities" needed to fully describe the viscometrics of an oil. The most well-known viscosities are dynamic and kinematic viscosity. Proper viscosity is key. The right viscosity over a broad temperature range guarantees the most efficient and precise operation with maximum durability.

**WEAR PROTECTION**

Hydraulic and drive train components are exposed to wear. Wear protection describes the ability of an oil formulation to work against the negative effects of surfaces contacting each other at high load and/or relative speeds.

**FRICTION PERFORMANCE**

Frictional characteristics that exactly match the requirements of an application are essential for proper machine operation. However, the lowest friction is not necessarily the goal. The right balance is key to prevent stick-slip in hydraulic cylinders or to achieve maximum brake capacity.

**CORROSION RESISTANCE**

Lubricants must contain potent corrosion inhibitors. Not only to protect the steel components from rust, but also to protect yellow metal components in the system from corrosion.

**OXIDATION (AGEING)**

It's the natural degradation of the oil formulation during service. Heat and contaminants in the presence of metals can act as catalysts to the acceleration of this natural process.



**WE'VE GOT IT COVERED**

There are lubricants and lubricants. It does make a difference what lubricant is used and where. Operator's Manual have the specifications of the lubricants to be used in your machine. John Deere lubricants meet the highest requirements and there is solution for each point of use. With original John Deere lubricants your machine will run as designed.

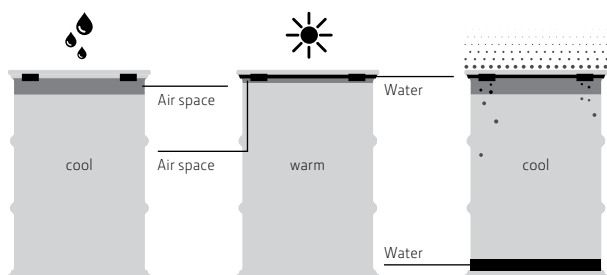


## OIL STORAGE, HANDLING AND DISPOSAL

Here are some easy tips to reduce dirt and moisture contamination risks. Remember: if it's in the oil, it gets into the equipment. So always store oil in a clean area, if possible indoors. Protect oil from the elements if stored outdoors and keep temperatures stable. Definitely avoid any contact with water and minimize exposure to direct sunlight.

Improper disposal of oil is bad for the environment! Never pour oil on the ground, down a drain or into a water body, and always observe environmental regulations. We recommend that all used oil be returned to responsible recyclers.

### CAUSE



Drum as delivered. When it rains, oil stays clean.

When it gets warm, the drum content expands and air escapes.

When it cools down, the content contracts again, creating suction that draws water in.

### PREVENTION



Keep bungs drawn tight. As in airtight!



Store drums inside whenever possible. If stored outside, lay drums on their sides.



Or at least tilt drums as shown to keep water away from the bungs, so it can't get in!





# FILTERS: THE HEART OF EFFICIENT PERFORMANCE

Filters are designed to protect your machine. They need to be changed regularly. Only replace with genuine John Deere filters – anything else will end up costing more.

Not worth risking it: Using cheap all-purpose filters ends up costing more – in equipment damage. The right filter is critical to the life of the machine.



## FUEL FILTERS

Designed to both trap and repel water. Tight pleats and the special coated media keep water out and prevent rust and microbial growth which can lead to increased fuel consumption.



## ENGINE OIL FILTERS

Our filters have even media spacing with no gaps. They are designed to trap the tiniest of particles. Even pleats and media spacing, a spiral and crimped center tube, and tight rubber gaskets ensure John Deere superior filter quality.



## HYDRAULIC FILTERS

With even spacing and higher capacity, these filters protect hydraulic systems from particulate contamination and withstand pressure pulsation and peaks – keeping contaminants out and preventing machine damage by maintaining integrity during service.



## ENGINE OILS: TRUE MULTI-TASKERS

The team, the oils and the service – they all do their part for the ultimate goal: healthy machines that serve their owners well.

We are dedicated to building machines of the highest quality, which is why we also produce major components like engines ourselves. To ensure that our engines are always protected and perform at their peak, John Deere experts have identified a range of special engine oils.



### IT'S A TEAM EFFORT

Expert advice, the right products and dedicated service – it's how owners get the most from their machines.

Sludge and dirt can cause engine failure. Our oils fight these threats, reducing wear, cooling moving parts and sealing cylinders and valve stems for one-of-a-kind, long-term engine protection.



### 1 | REDUCING FRICTION AND WEAR

Engine friction and wear are caused by the interference contact of moving parts. Combustion by-products and other contaminants present in the oil also add to engine wear. The engine oil must maintain enough viscosity to provide a cushion between moving parts under all operating temperatures.

### 2 | COOLING MOVING PARTS

Engine oil contributes significantly to piston cooling. It transports heat to the cylinder walls and into the cooling system. The engine oil must have enough heat stability to resist decomposition when exposed to hot surfaces.

### 3 | SEALING CYLINDERS

Pressures in the cylinder can reach 180 bar or higher during combustion. Engine oil helps keep the pressure inside the combustion chamber by forming a film on the piston rings and cylinder walls.

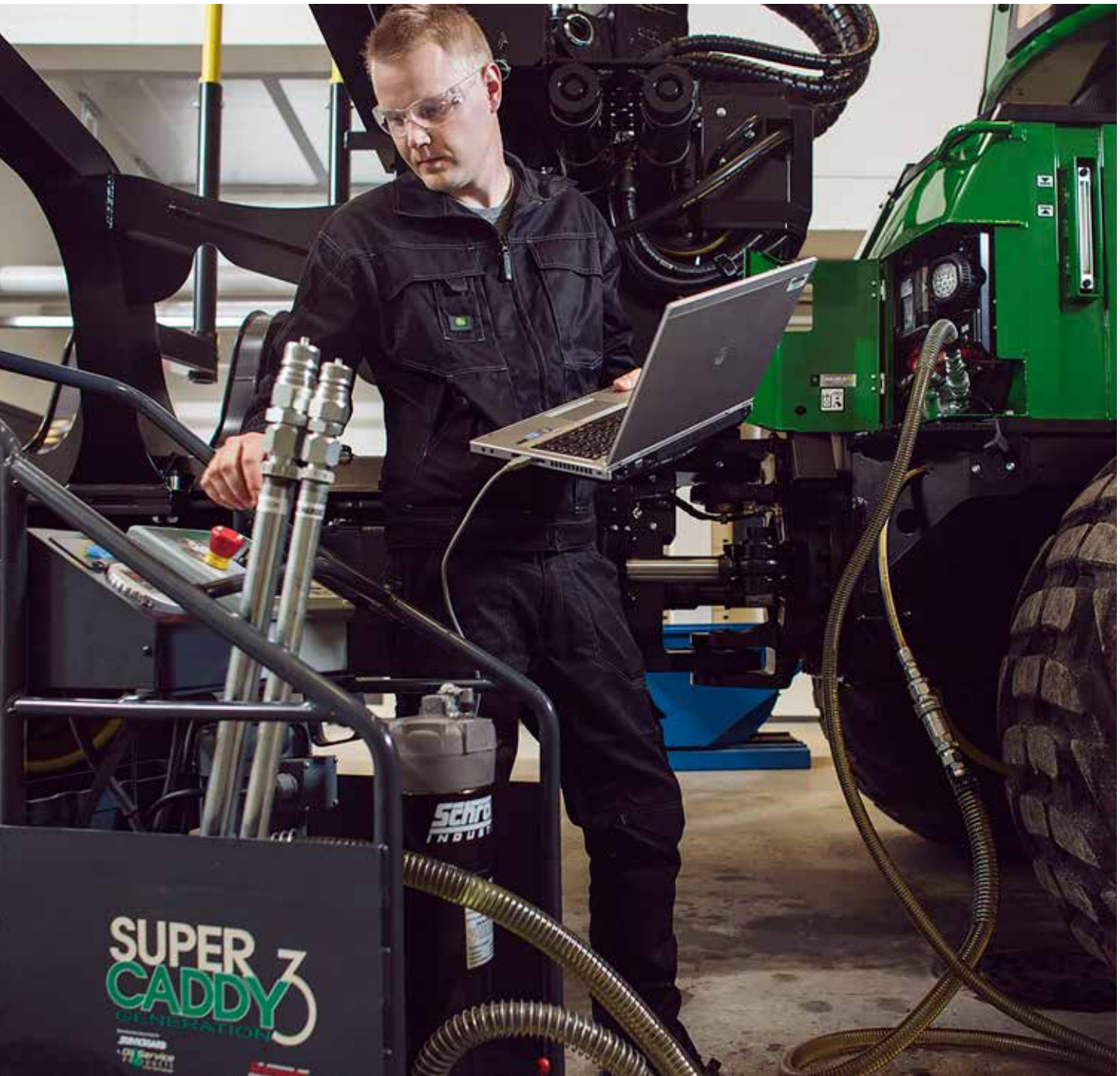
### 4 | KEEPING PARTS CLEAN

Wear and tear on base oils can cause the formation of harmful compounds. The right engine oil prevents this, suspending the compounds so they can't settle on the engine's internal surfaces.

# CONTAMINANTS

Engine oils are high-performance products that must do their job continuously and without fail. Their biggest enemy: contaminants. Here's what you need to know about contamination and how to prevent it.

Superior oil pays off – keeping the engine clean supports the extended drain intervals of our John Deere quality formula engine oils and lowers costs.



## DUST, DIRT, SOOT AND METALLIC PARTICLES

The process of combustion draws dust into the engine. Even topping up the engine oil may accidentally introduce dirt into the engine. Excessive build-up of contaminants will damage the engine, causing downtime and costs for repair or replacement.

Prevention: Service air cleaner, breather cap and crankcase ventilator at regular intervals. Change oils and filters frequently. Refer to Operator's Manual for details.

## WATER

Operating a cold engine can result in build-up of water in the crankcase oil, which can lead to plugged filters, eventually allowing unfiltered oil to circulate through the engine, damaging components.

Prevention: Run the engine to reach operating temperature before load is applied. Check temperature frequently and drain crankcase oil only when engine is warm.

## ANTIFREEZE AND COOLANTS

Antifreeze and coolants can contaminate engine oil, entering the system through leaking gaskets and damaged parts. Just as with water, contamination from antifreeze and coolants can damage the engine and usually indicates the need for major engine repairs.

Prevention: Always closely follow service manual procedures when torquing head bolts and be sure to use only the recommended coolant.

## FUEL

Contamination of engine oil with fuel can lead to piston seizure, decreased bearing life, higher oil consumption and accelerated engine wear in general.

Prevention: Allow engine to reach normal operating temperature before load is applied. Avoid over-choking in petrol engines and excessive idling in diesel engines.

## HEAT

High temperatures caused by heavy loads, faulty cooling systems, bad timing and pre-detonation speed up the oxidation of engine oils. Ultimately, this can result in ring or valve sticking and sludge formation.

Prevention: Service the cooling system regularly and check engine temperature frequently. Use John Deere Plus-50 II to delay oxidation in high heat, heavy duty operations.

## STOP WORRYING

With TimberCare™ Service Agreement you can leave the servicing in the hands of our experienced teams. Under a TimberCare service agreement your machine is serviced according to the factory planned service program. Original John Deere lubricants and filters are always used to ensure the optimal performance in every condition.



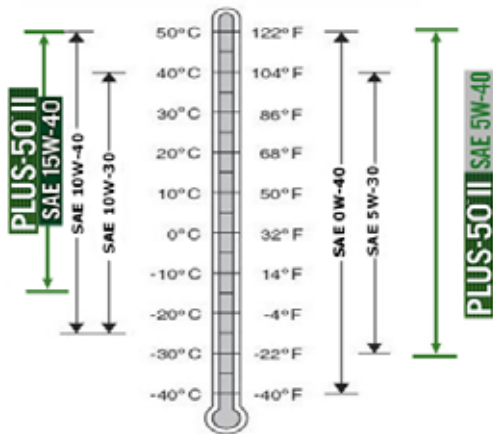
**BREAK-IN PLUS**

Specifically formulated for maximum performance and protection during initial break-in period.

Applications: New, rebuilt or remanufactured engines requiring 10W-30 engine oil.

**Features and Benefits**

- Initial service interval of 250 hours, refer to Operator's Manual
- Piston ring/liner seating control without scuffing
- Valve train and gear wear protection for extended engine life



SPECIFICATION	
ACEA	E9 / E7
API	CK-4 / CJ-4 / CI-4 / CH-4 / SN / SM / SL / SJ
JOHN DEERE VERIFICATION	
RGS	50039



**PLUS-50 II**

Exceptional full-fleet solution for severe demands and extreme operating temperatures.

Applications: Current and older 4-stroke turbocharged and supercharged diesel engines, including those with diesel particulate filter (DPF), diesel oxidation catalyst (DOC), exhaust gas recirculation (EGR) and selective catalytic reduction (SCR). Compatible with biodiesel fuel. Also suitable for petrol engines. Backwards compatible with older-generation engines.

SAE 5W-40 version: Premium semi-synthetic engine oil, specifically developed for use in extremely cold conditions, with excellent performance in temperatures of -45°C to 50°C.

**Features and Benefits**

- Drain intervals of up to 750 hours\*\* on selected equipment
- Low-ash technology for longer DPF service life
- Exceeds API CK-4 and API SN performance levels
- Remarkable protection from wear, corrosion, sludge, soot and oxidation

SPECIFICATION	
ACEA	E9 / E7
API	CK-4 / CJ-4 / CI-4 / CH-4 / SN / SM / SL / SJ
SAE	15W-40 / 5W-40*
JOHN DEERE VERIFICATION	
Severe heavy-duty off-road dyno engine test	
RGS	50027



### PLUS-50\*

Excellent for optimizing maintenance costs in older equipment.

Applications: On and off-road heavy-duty Tier 3/Stage IIIA and older-generation diesel engines in all temperatures, except arctic climate zones. (Not suitable for low emission Stage IIIB and next generation engines.)

#### Features and Benefits

- Extended drain intervals
- Wear protection for longer engine life
- Corrosion and oxidization resistance
- Extraordinary thermal stability

SPECIFICATION	
ACEA	E7
API	CI-4 / SL
SAE	15W-40



### TORQ-GARD\*

High quality, standard-interval engine oil for mixed commercial fleets.

Applications: Tier 3/Stage IIIA and older-generation diesel and petrol engines for all types of service in moderate to very cold operating temperatures. (Not suitable for low emission Stage IIIB and next generation engines.)

#### Features and Benefits

- Standard drain intervals
- Sludge control for cleaner engines
- Reduced wear and corrosion

SPECIFICATION	
ACEA	E5
API	CH-4 / SJ
SAE	15W-40 / 10W-30*

\*Available in certain countries only

\*\*For selected equipment with TimberCare Service agreement.

## PERFORMANCE TESTING: PLUS-50 II

John Deere oils exceed industry standards – because our tests do too. We put our engine oils through extreme conditions in severe diesel engine tests because we know you will put your John Deere through extreme conditions every day.



### SEVERE HEAVY-DUTY OFF-ROAD DYNO ENGINE TEST

Our severe internal heavy-duty off-road dyno engine test is what we use to evaluate engine and engine oil performance under extreme conditions. It tests for oil oxidation under high temperatures and maximum load to ensure it exceeds our John Deere requirements.

Soot is a by-product of combustion and can cause excessive wear on engines. If not properly dispersed in the oil, it collects and thickens the oil, which then plugs filters – the soot then behaves as an abrasive and can really do damage. Plus-50 II prevents the soot from collecting as compared to a standard CJ-4 conforming oil. See the difference?



John Deere Plus-50 II

CJ-4 conform Premium Oil



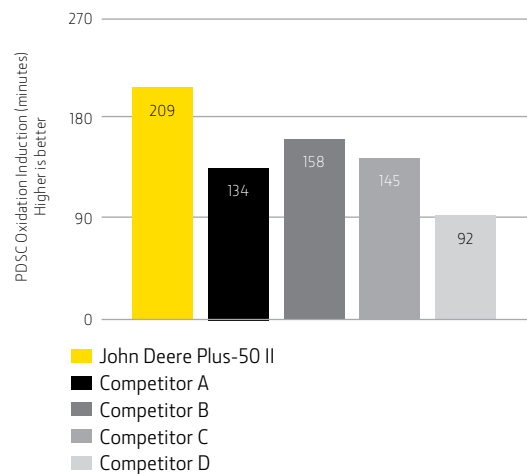


## PLUS-50 II TESTED AGAINST ITS COMPETITION

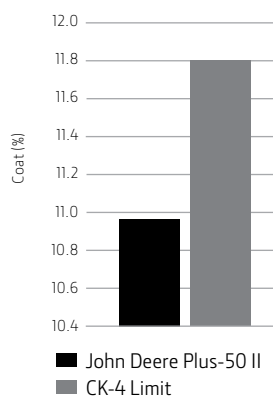
At the independent South West Research Institute in San Antonio, Texas, Plus-50 II was tested against four competitive oils. The results clearly show who leads the pack in terms of oxidation stability.

[www.swri.com](http://www.swri.com)

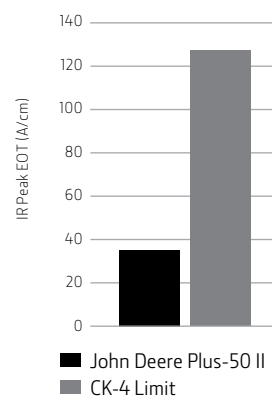
**DO MORE AND  
DO IT BETTER  
WITH PLUS-50 II**



### CAT C13 OIL AERATION TEST (COAT) – LOWER IS BETTER



### MACK T-13 TEST – LOWER IS BETTER



### API CK-4 SPECIFICATION

This is a relatively new diesel engine oil standard that we test our oils against, in addition to our own tests. The results unambiguously indicate that Plus-50 II oil far meets the API requirement.



# HYDRAULIC OILS

Our family of premium hydraulic fluids developed for John Deere forestry machines in collaboration with hydraulic component manufacturers.



## HYDRAU-GARD 46 PLUS

Advanced hydraulic fluid for demanding operations.

Applications: Demanding hydraulic operations such as forestry harvesting.

### Features and Benefits

- Superior protection from wear, corrosion and oxidation
- Exceptional shear stability
- Low viscosity variation with temperatures
- High thermal stability
- Excellent dry/wet filterability
- Rapid air release and anti-foam properties
- Reduced breakdown risk

### SPECIFICATION

ISO	11158 Typ HV
ASTM	D6258 HV
DIN	51524, part 3 HVLP type
GB	111181.1 - HV
DENISON (HF-0, HF-1, HF-2), Eaton (Vickers) Brochure 03-401-2010, MAG IAS P-70 (ISO 46)	



### HYDRAU-GARD 22 ARCTIC\*

Low-viscosity hydraulic fluid for operation in very cold environments.

Applications: Forestry equipment in cold climates.

**Features and Benefits**

- Excellent low temperature fluidity down to < -40°C
- Fresh viscosity of 8.5 cSt@+75°C
- High shear stability for stay-in-grade viscosity
- Superior filterability

SPECIFICATION	
ASTM	D6158 HV
DIN	51524-3 HVLP
GB	GB 111181.1 HV
ISO	111158 HV



### BIO HYDRAU-GARD\*

Premium biodegradable hydraulic fluid.

Applications: Hydrostatic and hydraulic systems in environmentally sensitive areas.

**Features and Benefits**

- Outstanding protection from wear and corrosion
- Reduced breakdown risk

SPECIFICATION	
ISO	12922 HFDU 15380 HEES
VDMA	24568
SP	SS 15 54 34
EU Ecolabel, USDA BioPreferred Programme, U.S. EPA VGP	

\* Available in certain countries only



# TRANSMISSION OILS

Formulated for a wide range of applications in many different operating conditions, John Deere transmission oils delivers stellar performance under immense pressure.



## EXTREME-GARD

Very high pressure transmission oil for mechanical transmissions and gearboxes.

Applications: John Deere heavy-duty off-road machines – final reduction drives, differential units, manual gearboxes and hypoid axles with a broad range of operating conditions.

### Features and Benefits

- Excellent wear and oxidation protection
- Enhanced component cleanliness
- High thermal stability

### SPECIFICATION

API	GL-5
SAE	85W-140 / 80W-90



## EXTREME-GARD LS 90

Extreme pressure transmission oil primarily for limited-slip differentials found in some agricultural machinery.

Applications: Final reduction drives, differential units, manual gearboxes and hypoid axles containing wet brakes and/or differential lock clutches with a broad range of operating conditions.

### Features and Benefits

- Gear protection in long term storage
- Enhanced component cleanliness
- Wear protection at all temperatures

### SPECIFICATION

API	GL-5
MIL-L	2105 B
SAE	90

# COOLANTS

John Deere premium coolants feature high thermal and oxidative stability and corrosion protection, with freeze points down to  $-36^{\circ}\text{C}$ . They also work very well in non-John Deere equipment.

The heavy-duty antifreeze/coolant with a special organic formulation that's kind to the environment.



## COOL-GARD II

The ready-to-use 50/50 formula protects for so long, some machines get traded in before the coolant needs to be changed.

Applications: Liquid-cooled engines, including those with cooled exhaust gas recirculation (EGR).

### Features and Benefits

- Up to 6-year/6,000-hour service life
- Extra corrosion and deposit protection
- Remarkable cavitation control for longer liner life and more efficient water pump performance
- Freeze protection down to  $-36^{\circ}\text{C}$

### SPECIFICATION

ASTM	D3306 D6210
------	----------------

## COOL-GARD II PG

Ecofriendly, ready-to-use 60/40 formula based on propylene glycol.

Applications: Liquid-cooled heavy-duty engines, including those with cooled exhaust gas recirculation (EGR).

### Features and Benefits

- Environmentally friendly formula
- Readily biodegradable: OECD 301 B
- Low eco-toxicity: OECD 201, 202, 203, 209 and USA EPA 850.1035: "Not harmful"

### SPECIFICATION

ASTM	D6210 D3306
------	----------------

# GREASES

In some situations, the use of oil is not feasible. That's when the superior lubrication properties of our greases help combat friction and metal wear. They don't drip or spatter and are designed for harsh conditions.



The use of John Deere high quality greases can help save money because equipment lasts longer, and downtime is reduced.

## GREASE-GARD PREMIUM PLUS

Premium multi-purpose HD lithium complex grease for heavy duty applications.

Applications: Protection of bearings, drive shafts and all the other moving parts where grease is required. Compatible with most other types of grease. Ideal for long-term greasing such as ball bearings and sealed applications. Covers full temperature range.

### Features and Benefits

- Excellent vibration protection
- Corrosion and wet conditions protection
- Extended re-greasing intervals

Grease-Gard Premium Plus is the preferred grease for central lubrication systems since it copes with high temperatures that can be found in bearings and low temperatures for slow moving components exposed to cold.

Cartridges available in both standard version and Lube-Shuttle® version.

### SPECIFICATION

ASTM D217	NLGI Grade 2
ISO 6743-9	L-X-CDHB 2

### JOHN DEERE VERIFICATION

RES	156226
-----	--------



## GREASE-GARD ARCTIC

General-purpose lithium grease for excellent performance in extreme cold conditions

Applications: Protection of bearings, drive shafts and all the other moving parts where a grease is required in extreme cold conditions.

Features and Benefits

- Provides good mechanical stability
- Effective corrosion protection
- Water insoluble
- Good anti-wear and extreme-pressure properties

Grease-Gard Arctic is suitable for central lubrication systems in very cold conditions.

SPECIFICATION	
ASTM D217	NLGI Grade 0
ISO 6743-9	L-X-CCHB 0



## GREASE-GARD PREMIUM

Excellent year-round, general-purpose lithium grease for light to medium duty applications.

Applications: Protection for bearings, drive shafts and all the other moving parts where grease is required, especially wheel bearings and U-joints. Ideal for daily greasing such as journal bearings. Suitable for mild temperatures, limited applicability in extreme temperature conditions.

Features and Benefits

- Extreme pressure resistance
- Excellent corrosion protection

Grease-Gard Premium is suitable for central lubrication systems so long as the temperature range is not extreme (very high and very cold temperatures).

SPECIFICATION	
ASTM D217	NLGI Grade 2
ISO 6743-9	L-X-CCHB 2
JOHN DEERE VERIFICATION	
RES	156226

# GREASE ACCESSORIES

Greasing is an essential part of daily maintenance routines. With proper equipment greasing tasks can be done efficiently and easily also in the field conditions.



**MANUAL GREASE-TRANSFER PUMP**  
[F701023]

Pump to fill grease lubrication systems and harvester head grease lubrication. Robust structure makes pumping possible also in lower temperatures. Improved structure makes pump more efficient – less pumping needed for wanted result. Suitable for 18 kg grease pails.



**AIR-PRESSURE GREASE-TRANSFER PUMP\***  
[F701024]

Semiautomatic option for filling the central lubrication or harvester head grease lubrication. Plug in and pump will fill the grease and automatically stop when container is full. Suitable for 18 kg grease pails.



**GREASE GUN, ACCU LUBER, STANDARD**

For 400 g standard and Lube-Shuttle cartridges, Li-Ion battery. For easy daily greasing with long lasting battery.





### GREASE GUN, ACCU LUBER, PREMIUM

For 400 g standard and Lube-Shuttle cartridges, Li-Ion battery. For easy daily greasing with long lasting battery and fast battery charger.



### GREASE GUN ONE-HAND MODEL

Own models for 400 g standard and Lube-Shuttle cartridges. Easy to use with one hand.



### GREASE GUN

Traditional two-hand version. Own models for 400 g standard and Lube-Shuttle cartridges.

# SAW CHAIN LUBRICANTS

Harvester saw chain needs its own special lubricants. Either it's chain oil or chain grease you prefer to use we have those covered, in trusted John Deere quality.



## BIO CHAIN-GARD SAW CHAIN OIL

Bio Chain-Gard is high-performance biodegradable saw chain oil – good for your machine and for the environment!

Application: Saw chain lubrication in general use working under severe conditions in environmentally sensitive areas like water protection areas, in the forest and agriculture.

### Features & Benefits

- Good cold flow properties with regards to winter condition
- Compatible and Miscible with standard chain saw oil, which makes the application for the user even easier
- No special change-over procedure required when switching from mineral-based oils to John Deere Bio Chain-Gard
- Supports low oil consumption to help in savings on operational costs
- Compatible with elastomer and other components
- Shows good aging and temperature stability



## CHAIN-GARD SAW CHAIN OIL

Chain-Gard is high-performance mineral saw chain oil for year-round usage.

Application: Saw chain lubricant for year-round use for felling and cutting saws in forest machine as well as in regular chainsaws.

### Features & Benefits

- All-year usability independent of temperatures due to low viscosity
- Mixable with other mineral oil-based chain saw oils
- Provides very good adhesion onto the chain and components to develop a long-lasting protection film
- Its creeping abilities ensure an excellent penetration also into the links of the chain to reduce wear and friction
- Helps to maintain chain as well as saw bar life

### SPECIFICATION

PEFCSWE003:3    SS155470



## BIO CHAIN-GARD GREASE

Rapidly biodegradable grease for harvester heads with grease lubrication. NLGI 2 version for normal conditions and little more liquid NLGI 1 for colder weather conditions.

Applications: Bio Chain-Gard grease is used for the saw chain greasing in applications, where an oil might not provide enough adhesion and a tackier behavior onto the cutting system parts is preferred. As biodegradable it is ideal for working under severe conditions in environmentally sensitive areas like water protection areas, in the forest and agriculture.

### Features & Benefits

- Good EP (extreme-pressure) properties
- Provides good wear protection
- Good low temperature properties (the NLGI 1 version)
- Shows good resistance against water



## CHAIN-GARD GREASE

High-performance grease for long-term lubrication of saw chains.

Applications: Chain-Gard grease is high-performance grease used for the saw chain greasing in applications, where an oil might not provide enough adhesion and a tackier behavior onto the cutting system parts is preferred. Formulation is based on lithium complex soap, which is suitable especially for high demands on service life, temperature capability and corrosion protection.

### Features & Benefits

- Resistant against water to avoid corrosion
- Very good resistance against aging effects
- Withstands high thermal and mechanical loads, which are typical for harvesting applications
- Helps to extend service interval to avoid downtimes, especially on more complex aggregates and hard to reach service points on the harvester head



# FAQ

The questions below seem to come up time and again, so we thought we'd put some answers together for you right here. For any questions that remain open, you can also check [deere.com](http://deere.com)



## ENGINE OILS

*IS PLUS-50II A SUITABLE "BREAK-IN" OIL AFTER ENGINE REBUILDING?*

No, because of its lubrication properties it is not recommended during the "break-in" period. A rebuilt engine must first properly wear-in the piston rings and cylinder liner walls during the first 100 hours of operation. You should use John Deere Break-In Plus instead.

*WHICH OIL IS IN NEW JOHN DEERE ENGINES?*

New John Deere engine-powered equipment is shipped with our special-purpose Break-In Plus. Do not add oil unless the oil level drops to the "add" mark on the dipstick.

*CAN I PUT CURRENT OILS INTO 1960 MACHINES?*

You should first consult the Operator's Manual for any guidelines it may offer – realizing that older manuals don't include any advances of technology since their printing. Only John Deere lubricants take older-model units into consideration, so you want to stick with those.

*I'VE USED CO-OP OIL FOR 12 YEARS AND NEVER HAD A PROBLEM. WHY SHOULD I CHANGE TO PLUS-50 II?*

The right oil is not just for avoiding catastrophic failure – most oils can do that. But when you use Plus-50 II you'll most likely see a cleaner engine, feel more power and experience less wear.



*WHEN UPGRADING TO PLUS-50 II OILS FOLLOWING THE USE OF OTHER OILS, SHOULD SMALL DIFFERENCES IN OIL CONSUMPTION RATE BE EXPECTED?*

Not normally. If you notice decreased oil consumption, no further attention is required. If you observe an increase in consumption, it may take from one to three normal drain intervals for the engine to regain previously observed oil consumption rates. That is normal and not unique to John Deere oil.

*CAN I ALSO GO 500 HOURS WITH PLUS-50 II (CK-4/E9) IN A TIER 3 OR OLDER ENGINE?*

Yes, you can. But only if you use John Deere filters, ULSD (Ultra Low Sulfur Diesel) fuel, if the original volume oil pan is in use, and if the engine is operating within the original factory specifications affecting power output, including engine control units (ECUs) and fuel delivery systems.



# APPENDIX A: PACKAGE SIZES

Our optimized packaging system has just the right size for everyone. You get what you need – no more, no less.

## ENGINE OILS

CAPACITY	PART NUMBER
<b>BREAK-IN PLUS</b>	
<b>10W-30</b>	
20 L	YU22939-020
5 L	VC22939-005
<b>PLUS-50 II</b>	
<b>15W-40</b>	
1,000 L	VC50002X1000
209 L	VC50002X200
55 L	VC50002X050
20 L	VC50002X020
5 L	VC50002X005
1 L	VC50002X001
Bulk	VC50002X000
<b>5W-40</b>	
1000 L	VC50005X1000
209 L	VC50005X200
20 L	VC50005X020
5L	VC50005X005
Bulk	VC50005X000
<b>PLUS-50</b>	
<b>15W-40</b>	
209 L	VC50000X200
20 L	VC50000X020
5 L	VC50000X005
<b>TORQ-GARD</b>	
<b>15W-40</b>	
1,000 L	VC83070-1000
209 L	VC83070-200
55 L	VC83070-050
20 L	VC83070-020
5 L	VC83070-005
Bulk	VC83070-000
<b>10W-30</b>	
209 L	VC83060-200
20 L	VC83060-020

## HYDRAULIC OILS

CAPACITY	PART NUMBER
<b>HYDRAU-GARD 22 ARCTIC</b>	
209 L	VC81922-200
20 L	VC81922-020
<b>HYDRAU-GARD 46 PLUS</b>	
1000 L	VC81946-1000
209 L	VC81946-200
20 L	VC81946-020
Bulk	VC81946-000
<b>BIO HYDRAU-GARD</b>	
209 L	VC70743-200
20 L	VC70743-020

## EXCLUSIVE QUALITY

Plus-50 II is no average engine oil. Its unique formula was developed by John Deere engineers and it is only available from John Deere dealers.

## TRANSMISSION OILS

CAPACITY	PART NUMBER
<b>EXTREME-GARD</b>	
<b>85W-140</b>	
200 L	YU82609-200
20 L	YU82609-020
<b>80W-90</b>	
1000 L	VC82610X1000
209 L	VC82610X200
20 L	VC82610X020
1 L	VC82610X001
<b>LS 90</b>	
20 L	VC87939-200
209 L	VC87939-020

## COOLANTS

CAPACITY	PART NUMBER
<b>COOL-GARD II</b>	
1,000 L	YU76215-1000
200 L	VC76215-200
20 L	VC76215-020
5 L	VC76215-005
<b>COOL-GARD II PG</b>	
200 L	YU76315-200
20 L	YU76315-020

## GREASES

CAPACITY	PART NUMBER
<b>GREASE-GARD PREMIUM PLUS</b>	
50 kg	VC67009X050
18 kg	VC67009X020
400 g	VC67009X004
400 g Lube-Shuttle®	YU82713-004
<b>GREASE-GARD PREMIUM</b>	
50 kg	VC65723-050
18 kg	VC65723-020
400 g	VC65723-004
400 g Lube-Shuttle®	YU82712-004
<b>GREASE-GARD ARCTIC</b>	
18 kg	VC69001-018
400 g	VC69001-004

## SAW CHAIN LUBRICANTS

CAPACITY	PART NUMBER
<b>BIO CHAIN-GARD SAW CHAIN OIL</b>	
1000 L	YU81790X1000
200 L	YU81790X200
20 L	YU81790X020
<b>CHAIN-GARD SAW CHAIN OIL</b>	
200 L	YU81780X200
20 L	YU81780X020
<b>BIO CHAIN-GARD GREASE</b>	
NLGI 2 18 kg	YU82911X018
NLGI 1 18 kg	YU82910X018
<b>CHAIN-GARD GREASE</b>	
NLGI 2 18 kg	YU82912X018

# APPENDIX B: ENGINE OIL SERVICE CATEGORIES

## ACEA

The European Automobile Manufacturers Association (ACEA) 2016 European Oil Sequences defines 3 sets of different Service-fill Oils performance requirements – Petrol and Light Duty Diesel Engines A/B (not listed here), Petrol and Light Duty Diesel Engines with exhaust aftertreatment system C (not listed here) and Heavy Duty Diesel Engines E (e.g. tractors, turf machinery and trucks).

### HEAVY DUTY DIESEL ENGINES

<b>E9</b>	Super High Performance Diesel (SHPD) engine oils with SAPS limit. Recommended for standard oil change intervals in diesel engines in utility vehicles with exhaust aftertreatment systems such as DPF, AGR and SCR which are operated under harsh conditions in combination with low-sulfur diesel fuel.
<b>E7</b>	Super High Performance Diesel (SHPD) engine oils for diesel engines in utility vehicles which are operated under harsh conditions.
<b>E6</b>	Ultra High Performance Diesel (UHPD) engine oils with SAPS limit. Recommended for extended oil change intervals in diesel engines in utility vehicles with exhaust aftertreatment systems such as DPF, AGR and SCR which are operated under very harsh conditions in combination with low-sulfur diesel fuel.
<b>E4</b>	Ultra High Performance Diesel (UHPD) engine oils. Recommended for extended oil change intervals in diesel engines for utility vehicles which are operated under very harsh conditions.
<b>E5 / E3 / E1</b>	No longer supported. Please refer to engine manufacturer recommendations.

## API

The American Petroleum Institute (API) service ratings define minimum oil quality. Ratings beginning with the letter "C" are oils intended for diesel engines, ratings beginning with the letter "S" are oils intended for petrol engines.

The second letter indicates a rating update; the "CK-4" rating is more current than "CJ-4", and "SN" is more current than "SM", etc.

Lubricants meeting more than one service rating may be identified "for service CJ-4/SN," etc. When dual ratings are indicated, the first rating is the primary use rating. In above example, the oil "CJ-4/SN" is primarily a diesel oil which also meets a gasoline rating.

### DIESEL ENGINES

<b>CK-4</b>	Designed to provide enhanced protection against oil oxidation, viscosity loss due to shear, and oil aeration as well as protection against catalyst poisoning, particulate filter blocking, engine wear, piston deposits, degradation of low- and high-temperature properties, and soot-related viscosity increase.  API CK-4 oils exceed the performance criteria of CJ-4, CI-4 with CI-4 PLUS 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.
<b>CJ-4</b>	Valid since 2006 for high-speed four-stroke engines according to US 2007 exhaust standards when using diesel fuel with a maximum sulfur content of 500 ppm. However, CJ-4 engine oils may strongly impact on the durability of exhaust aftertreatment systems and oil change intervals if the sulfur content in the fuel is above 15 ppm (weight). CJ-4 engine oils are very effective if particulate filters or modern exhaust gas after-treatment systems (SCR catalytic converters) are used. Backward compatibility to CI-4 Plus / CI-4.
<b>CI-4</b>	Valid since 2002 for high-speed four-stroke engines in accordance with US 2004 exhaust standards. Suitable for sulfur content in fuel up to 0.5 % weight. CI-4 engine oils offer good engine durability especially if exhaust gas recirculation is used.  Some API CI-4 engine oils may also be classified as CI-4 PLUS if more stringent limits are met with respect to soot treatment. Backward compatibility to CH-4 / CG-4 / CF-4.
<b>CH-4</b>	Introduced in 1998 for high-speed four-stroke engines in accordance with US 1998 exhaust standards. Suitable for sulphur content in fuel up to 0.5 % weight. Backward compatibility to CG-4 / CF-4.
<b>CG-4 / CF-4</b>	Obsolete. Proceed with caution and refer to engine manufacturer recommendations.



## GASOLINE ENGINES

<b>SN</b>	Latest API engine oil category introduced in October 2010, designed to provide improved high temperature deposit protection for pistons, more stringent sludge control, and seal compatibility. API SN with Resource Conserving (RC) matches ILSAC GF-5 by combining API SN performance with improved fuel economy, turbocharger protection, emission control system compatibility, and protection of engines operating on ethanol-containing fuels up to E85.
<b>SM</b>	API specifications valid since 10/2004. More stringent requirements: ILSAC GF-4, reduced SAPS amount (Sulphated Ash, Phosphorous and Sulfur amount), EC (Energy-Conserving) and ESP (Emissions System Protection). For 2010 and older engines - please refer to engine manufacturer recommendations.
<b>SL</b>	For 2004 and older engines – please refer to engine manufacturer recommendations.
<b>SJ</b>	For 2001 and older engines – please refer to engine manufacturer recommendations.
<b>SH / SG</b>	Obsolete. Proceed with caution and refer to engine manufacturer recommendations.

## ILSAC

International Lubricant Standardization and Approval Committee (ILSAC) service ratings are related to the API classifications and bring additional performance requirements, for example fuel economy improvement and restrictions in the viscosity grades that may claim to meet an ILSAC standard. Formed in 1992 by the American Automobile Manufacturers Association (AAMA) and Japan Automobile Manufacturers Association (JAMA).

<b>GF-5</b>	Valid for 2011 and older engines for improved high-temperature deposit protection, more stringent sludge control, improved fuel economy, enhanced emission control system compatibility and protection of engines operating on ethanol-containing fuels up to E85. Similar to APFI SN.
<b>GF-4</b>	Similar to API SM service category, but additional sequence of VIB Fuel Economy Test (ASTM D6837) required.
<b>GF-3</b>	Oil must meet both API SL and EC-II requirements. Has more stringent parameters with regards to long-term effects of the oil on the vehicle emission system, improved fuel economy and improved volatility, viscosity performance and deposit control. Over the service life of the oil the standard also requires reduced oil consumption rates and less additive degradation.
<b>GF-2</b>	Replaced GF-1 in 1996 and must meet API SJ requirements to meet stringent phosphorus content, low temperature operation, high temperature deposits and foam control.

## ENGINE OIL SERVICE CLASSIFICATION: PLUS-50 II

SERVICE CATEGORIES		15W-40	5W-40
API	CK-4	■	■
	CI-4 PLUS	■	
	CI-4	■	
	CH-4	■	
API (petrol)	CF	■	
	SN	■	■
	SM	■	
ACEA	SL	■	
	E9	■	
	E7	■	
JASO DH-2		■	
Ford WSS-M2C171-F1		■	
Mack	EOS-4.5	■	
	EO-O Premium Plus 07	■	
	EO-N Premium Plus 03	■	
	EO-M Plus	■	
Cummins	CES 20086	■	
	CES 20081	■	■
	CES 20077	■	
	CES 20076	■	
	CES 20075	■	
MB	228.31	■	
Volvo	VDS-4.5	■	
	VDS-4	■	
	VDS-3	■	
	VDS-2	■	
MAN M3275		■	
MTU Type 2.1		■	
DDC	93K222	■	
	93K218	■	
	93K214	■	
Renault	RLD	■	
	RXD	■	
	RD	■	
Caterpillar	ECF-3	■	
	ECF-2	■	
	ECF-1-a	■	
	TO-2	■	

# APPENDIX C: REFERENCED STANDARDS

Several international organizations have established standards and classification systems. Some regions and equipment manufacturers have their own performance specifications. This overview, though incomplete, lists the most common ones in this guide.

## ANSI/AGMA

American National Standards Institute / American Gear Manufacturers Association. ANSI is a non-profit national US standards organization. AGMA is a US trade group of companies involved in gear manufacturing. AGMA is accredited by ANSI to write U.S. standards on gearing and related field including lubrication.

**ANSI/AGMA 9005 EP** Minimum performance characteristics for Extreme pressure (EP) lubricants suitable for use with enclosed and open gearing in general power transmission applications.

## API

American Petroleum Institute. U.S. trade association for the oil and natural gas industry, active in establishment and certification of industry standards.

### GEAR LUBRICANTS

**API GL-5** Denotes lubricants intended for gears, particular hypoid gears, in axles operating under various combinations of high-speed/shock load and low-speed/high-torque conditions in hypoid axles (high offset), manual gearboxes. Basic performance specification for API GL-5 are defined in ASTM D7450.

## ASTM

ASTM International. Formerly known as American Society for Testing and Materials. Non-profit International standards organization.

**ASTM D217** Test Method for Cone Penetration of Lubricating Grease. International standardized method to measure and classify grease consistency. Classification is using NLGI consistency categories (or NLGI Grades) that reach from category "000" (fluid), to "6" (very Hard).

**ASTM D3306** Specification for Glycol Base Engine Coolant (Automobile and Light –Duty service). Covers the requirements for ethylene glycol or propylene glycol base engine coolants.

**ASTM D4950** Classification and Specification for Automotive Service Greases. Defines requirements used to describe the properties and performance characteristics of chassis greases and wheel bearing greases.

**ASTM D6158 HV** Specification for Hydraulic Oils. Class HV defines the properties of Multigrade Anti-wear Hydraulic oils.

**ASTM D6210** Specification for Glycol Base Engine Coolant (Heavy –Duty service). Covers the requirements for ethylene glycol or propylene glycol base engine coolants.

## DIN

German: Deutsches Institut für Normung e.V. (engl. German Institute for Standardization). German national organisation for standardization. DIN is a German Registered Association (e.V.). Beyond the field of lubricants DIN standards cover a wide field of technologies and sciences.

**DIN 51517-3 CLP** Defines minimum requirements for lubricating oils used in circular- and splash lubrication systems, demanding additional resistance to aging (CLP). Be aware of differences to the similar standards DIN 51517-2 CL (Oil for circular lubrication systems, demanding additional resistance to aging) and 51517-1 C (Oil for circular lubrication systems).

**DIN 51524-3 HVLP** Defines minimum requirements for oils used in hydraulic and hydrostatic systems demanding additional multi-grade viscosity characteristics. Be aware of differences to the similar standards DIN 51524-2 HLP (hydraulic and hydrostatic oil, demanding additional wear resistance) and DIN 51524-1 HL (hydraulic and hydrostatic oil, demanding additional resistance to aging).

## EPA

Environmental Protection Agency. United States federal government agency.

**VGP** Vessel General Permit. Regulation to use environmentally acceptable lubricants in all oil-to-water interfaces for vessel of a certain size in US coastal and inland waters.

## GB

Chinese: Guobiao (engl. National Standard). Chinese national standards issued by the Standardization Administration of China (SAC).

**GB 111181-1-94 HV** 1994 version of hydraulic oil standard defining minimum requirements for a multi-grade viscosity fluid comparable to ISO 11158 HV and DIN 51524-HVLP.

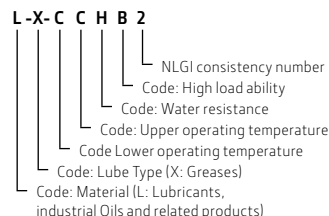
**GB 111181-1-2011 HV** 2001 Version of GB 111184-1.

## ISO

International Organization for Standardization. International standards body composed of representatives from national standards organizations from more than 150 countries.

**ISO 6743-9** Lubricants classification system. Part 9 classifies greases according to their operating conditions.

### EXAMPLE:



**ISO 15380 HEES** Specification for environmentally acceptable hydraulic fluids. HEES defines Synthetic Esters.

**ISO 15380 HETG** Specification for environmentally acceptable hydraulic fluids. HETG defines Triglycerides (sort of natural Esters).

**ISO VG 32** Defines the Viscosity Grade (VG) of an oil per ISO3448. 32 stands for the nominal kinematic viscosity in centi Stoke (cSt) [ISO SI unit: mm<sup>2</sup>/sec] of the lubricant at 40°C.

**ISO VG 46** Defines the Viscosity Grade (VG) of an oil per ISO3448. 46 stands for the nominal kinematic viscosity in centi Stoke (cSt) [ISO SI unit: mm<sup>2</sup>/sec] of the lubricant at 40°C.

## JDM

John Deere Materials standards. John Deere standards category defining materials for corporate use and third party reference..

**JDM J20** John Deere minimum requirement specification for THF (Transmission Hydraulic Fluid). Defines two different viscosity grades. (grade C & D). THF's, sometimes also called UTTO's (Universal Tractor Transmission Oil), are multipurpose oils covering the demands for drivetrain and hydraulic systems that may or may not contain wet brakes and clutches. Not to be mixed up with JDM J27 (STOU).

**JDM J27** Withdrawn in 2005. Former John Deere minimum requirement specification for multi-functional Engine/Transmission/Hydraulic Oils (STOU). Replaced by JDM J20C and engine oils specifications that meet the exhaust gas regulations of the equipment.

## JDN

John Deere unit standards (Des Moines).

**JDN 360** John Deere minimum requirement specification for greases to be used in cotton picker heads (spindle grease).

**JDN 354** John Deere minimum requirement specification for cotton picker spindle cleaners.

## JDQ

John Deere testing standards.

**JDQ 78X** High temperature, full load diesel engine test to determine oil oxidation stability. Updated version of JDQ 78A

**JDQ 78A** High temperature, full load diesel engine test to determine oil oxidation stability.

## RES

John Deere unit standard (Waterloo).

**RES 10060** John Deere proprietary specification that defines THF requirements beyond JDM J20. Basis for JD factory fill and the service fill lubricant product family under the Hy-Gard Trademark.

## MIL-L

US military standard (MIL) for lubricants (L).

**MIL 2105 D** Defines minimum requirements for multipurpose gear-lubricating oils (API GL-5).

## NLGI

National Lubricating Grease Institute.  
US non-profit trade association consisting primarily of companies that manufacture and market lubricating grease.

**NLGI 0** Grease consistency category "0" (very soft) as defined per ASTM D217.

**NLGI 2** Grease consistency category "2" (normal) as defined per ASTM D217.

**NLGI GC** Highest service classification for greases used in wheel bearings. Suitable for severe duty, high temperatures, frequent stop and go service, defined per ASTM D4550.

**NLGI LB** Highest service classification for greases used in chassis applications. Suitable for infrequent re-lubrication, high load and water exposure conditions, defined per ASTM D4550.

## NSF

NSF International.  
Formerly known as National Sanitation Foundation. US based product testing, inspection and certification organisation in the fields of quality assurance, environmental protection, food and health care.

**NSF H1** Accreditation that indicates a lubricant is acceptable for incidental food contact and can be used in food processing areas.

## USDA

United States Department of Agriculture.

**BIOPREFERRED-PROGRAMM** Public program to support purchase and use of biobased products.

## US STEEL

United States Steel Corporation. US steel producer with operations in the US and Europe.

**US STEEL 224** End user specification for industry gear oils.

## SAE

SAE International. Formerly known as Society of Automotive Engineers. US standards organization with a focus on the automotive industry.

**SAE VISCOSITY - GRADES** SAE Viscosity grades need to be differentiated into:

– Engine Oil Viscosity Classification (SAE J300) and,  
– Automotive Gear Lubricant Viscosity Classification (SAE J306)

Even both classification systems use the same nomenclature and syntax, the rheological properties (flow behavior) of an engine oil having the same SAE rating than a gear oil is not the same! While multi-grade oils can be identified by a "W" in the syntax (e.g.: SAE 15W-40). Monograde oils don't (e.g. SAE 90).

## SIS

Swedish Standards Institute. Independent Swedish standards organization active in a variety of fields.

**SS 15 54 34** Requirements and test methods for hydraulic fluids.

## VDMA

German: Verband Deutscher Maschinen- und Anlagenbau (engl. German association for machine and plant construction). Mechanical Engineering Industry Association, among other things active in the field of standardization.

**VDMA 24568** Technical minimum requirements for biodegradable pressure media. Substituted by ISO 15380.

## OTHER

**STOU** See JDM J27.

**UTTO** See JDM J20.

## BOSCH REXROTH

**RE 90220-01** OEM specification for Hydraulic pumps and motors. Additional requirements for hydraulic oils per DIN 51524.

## DAVID BROWN

**S1.53.106** OEM specification for industry gear oils.

## DENISON

Parker-Denison, Parker Hannifin.

**HF-0** OEM specification for hydraulic oils containing anti wear additives.

**HF-1** OEM specification for hydraulic oils containing no anti-wear additives.

**HF-2** OEM specification for hydraulic oils containing anti wear additives compatible with Vane pumps.

## DEXOS1 GEN 2

OEM specification (General Motors) for engine oils.

## EATON VICKERS

**BROCHURE 03-401-2010** OEM hydraulic fluid recommendations.

**BROCHURE 694** OEM specification for hydraulic oils.

## FIVES CINCINNATI

CINCINNATI Machine, CINCINNATI Milacron.

**P-70** OEM specification for hydraulic oils.

# DON'T RISK IT

YOU WILL FEEL THE DIFFERENCE

No matter how old your John Deere, you demand top performance and reliability. We can help you with the correct specification oil to look after your John Deere engine.



This literature has been compiled for worldwide circulation. While general information, pictures and descriptions are provided, some illustrations and text may include finance, credit, insurance, product options and accessories not available in all regions. Please contact your local dealer for details. John Deere reserves the right to change specification and design of products described in this literature without notice. The green and yellow color scheme, the leaping deer logo and the JOHN DEERE word mark are trademarks of Deere & Company.