Tech Data

PETRO-CANADA LUBRICANTS

PRODURO™ TO-4+ XL Synthetic Blend and PRODURO TO-4+ Transmission/Drive Train Oils (TDTO)

Introduction

Petro-Canada PRODURO TO-4+ Oils are premium heavy duty transmission/drive train oils designed to meet the Caterpillar TO-4 lubricant specification. These exceptional formulations maximize the life of the frictional materials in Caterpillar powershift transmissions, eliminate the chatter in wet brake mechanisms and protect drive train gears against wear. The PRODURO product line is specially formulated with Petro-Canada's 99.9% pure HT base oils and high performance additives.

PRODURO TO-4+ is available in the following viscosity grades: SAE 10W, SAE 30, SAE 50, and SAE 60. PRODURO TO-4+ XL Synthetic Blend is available as a Lo Temp grade.

Some of these PRODURO TO-4+ grades go beyond traditional TO-4 fluids as they can meet multi-grade specifications. Because they provide reliable performance over a wider range of temperatures, components will operate under optimal viscosity longer, resulting in better protection and less wear.

PRODURO TO-4+ SAE	ALSO MEETS CAT TO-4
10W	5W
30	15W
50	-
60	-
XL Lo Temp	0W-20

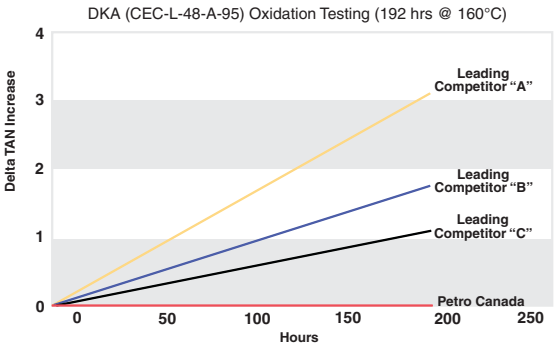
Features and Benefits

- **Better Protection**
  - Multigrade potential performance widen ambient and operating temperature ranges for optimal oil viscosity against wear
  - Outstanding resistance to oil breakdown. Extends component life by minimizing deposit build-up and keeping fresh oil properties for extended periods of time
  - Leading edge formulations significantly improves wear properties over TO-2 oils in transmissions and gears
  - Minimizes wear in high pressure hydraulic pump systems
- **Longer Oil Life**
  - Outstanding resistance to oil degradation due to the advanced formulations that contains 99.9% pure Petro-Canada base stocks
- **Smoother Operation**
  - Oil formulation carefully balances lubricity and functional properties
  - Operation of powershift clutches and wet brake mechanisms optimized
  - Minimizes clutch plate wear and brake chatter
- **Lower Operational Costs**
  - Reduces maintenance costs
  - Increases reliability
  - Increases equipment availability

What is the HT difference?

Petro-Canada Lubricants starts with the HT purity process to produce water-white, 99.9% pure base oils. The result is a range of lubricants, specialty fluids and greases that deliver maximum performance for our customers.

PRODURO TO-4+ 30
Resists oil degradation and sludging for longer life and better protection.



In the DKA oxidation test, product performance is measured by how much the acidity of the oil (TAN) increases over time (therefore the flatter the line the better.) Compared to the leading competitors, Petro-Canada's PRODURO TO-4+ 30 ad vanced formulation resists oil degradation best.

Applications

Petro-Canada PRODURO TO-4+ transmission/drive train oils (TDTO) are designed for use in Caterpillar off-highway vehicles. They are formulated to meet the Caterpillar TO-4 specification, Allison C-4 fluid requirements, API Gear Lubricant Service GL-3 for manual transmissions and spiral bevel gears, API Category CD (obsolete) for diesel engine oils, Komatsu microclutch transmission oil specification and ZF's TE-ML03 classification.

Petro-Canada PRODURO TO-4+ XL Synthetic Blend Lo Temp is a multigrade SAE 0W-20 TO-4 fluid for use at colder ambient temperatures. The exceptional low temperature flow characteristics of PRODURO TO-4+ XL Synthetic Blend Lo Temp provide effective lubrication at temperatures down to -45°C / -49°F.

PRODURO TO-4+ (TDTO) Fluids are recommended for the following Caterpillar vehicle systems:

- Powershift and Hydrostatic Transmissions[4]
- Wet Brake Mechanisms
- Differentials and Final Drives
- Hydraulics

For components requiring a Caterpillar FD-1 oil, Petro-Canada recommends the PRODURO FD-1 product line.

Grade Selection

APPLICATION	PRODURO TO-4+				
	XL LO TEMP[4]	10W[4]	30	50	60
Powershift Transmissions[4], °C (°F)	-40[1] (-40) to +10 (+50)	-21 (-6) to +10 (+50)	-9 (+16) to +35 (+95)	+5 (+41) to +50 (+122)	N/A
Hydrostatic Transmissions[4], °C (°F)	-40 (-40) to +40 (+104)	-20 (-4) to +40 (+104)	+5 (+41) to + 50 (+122)	N/A	N/A
Final Drives On-Highway[2], °C (°F)	-45 (-49) to 0 (+32)	-30 (-22) to 0 (+32)	-25 (-13) to +25 (+77)	-17 (+1) to +50 (+122)	-9 (+16) to +52 (+126)
Final Drives Off-Highway[3], °C (°F)	-45 (-49) to 0 (+32)	-30 (-22) to -10 (+14)	-25 (-13) to +15 (+59)	-17 (+1) to +34 (+93)	-9 (+16) to +52 (+126)
Hydraulics, °C (°F)	-40 (-40) to +40 (+104)	-25(-13) to +50 (+104)	-15 (+5) to +50 (+122)	N/A	N/A
Output Transfer Gears	-40 (-40) to -10 (+14)	-32 (-26) to +30 (+86)	-20 (-4) to +50 (+122)	N/A	N/A
Powershift Transmissions (797)	N/A	N/A	-9 (16) to +50 (+122)	+5 (+41) to +55 (+131)	N/A
Hydraulic Systems (M Series Motor Graders)	-40 (-40) to +40 (+104)	-5 (23) to +40 (+104)	N/A	N/A	N/A
Track Roller Fram Recoil Spring/ Pivot Shaft Bearing	-40 (-40) to +0 (+32)	-32 (-26) to +0 (+32)	-22 (-8) to +25 (+77)	-5 (+23) to +50 (+122)	+5 (+41) to +52 (+126)
Drive Axles (Small /Med)	-45 (-49) to +0 (+32)	-27 (-17) to +15 (+59)	-22 (-8) to +43 (+110)	+5 (+41) to +50 (+122)	N/A
Drive Axles (Large)	-45 (-49) to -10 (+14)	-27 (-17) to +0 (+32)	-22 (-8) to +20 (+68)	-12 (+10) to +43 (+110)	-5 (+23) to +52 (+126)
Starting Engine Transmissions	-45 (-49) to +40 (+104)	-32 (-26) to +20 (+68)	-12 (+10) to +25 (+77)	N/A	N/A
Variable pitch fans	N/A	N/A	-17 (+1) to +25 (+77)	-12 (+10) to + 52 (+126)	N/A
Backhoe Loaders (Rear Axles)	N/A	N/A	-27 (-17) to +40 (+104)	0 (+32) to +52 (+126)	+10 (+50) to +55 (+131)

Note: Ambient temperature range in °C (°F)

[1]Caterpillar models 768C, 769C, -10°C to 22°C (-40°F to 72°F)

[2]Wheeled vehicles e.g. tractors, loaders, skidders, compactors and off-highway trucks

[3]Tracked vehicles e.g. tractors, pipelayers, skidders and loader

[4]Refer to "Caterpillar Machine Fluids Recommendations" service publication SEBU 6250 (Most Recent Version) for more specific information.

Typical Performance Data

PROPERTY	TEST METHOD	PRODURO TO-4+				
		XL LO TEMP	10W	30	50	60
Density @ 15°C, kg/l	D4052	0.852	0.856	0.873	0.889	0.900
Flash Point, °C (°F)	D92	209 (408)	239 (462)	259 (498)	253 (487)	253 (487)
Viscosity cSt @ 40°C (SUS @ 100°F) cSt @ 100°C (SUS @ 210°F)	D445	35.1 (177.8) 7.4 (50.9)	35.4 (181.3) 6.3 (47.3)	88.5 (458.8) 11.0 (63.9)	209 (1104) 18.4 (94.18)	371 (1980) 26.9 (132.7)
Viscosity Index	D2270	184	128	110	97	97
Brookfield Viscosity, cP @ °C (°F)	D2983	10,140 @ -40 (-40)	48,100 @ -35 (-31)	80,200 @ -26 (-15)	630,400 @ -15 (5)	106,000 @ -10 (14)
Cold Cranking Viscosity, cP @ °C (°F)	D5293	4,403 @ -35 (-31)	5,219 @ -25 (-13)	10,433 @ -20 (-4)	11,167 @ -10 (14)	15,854 @ -5 (23)
Borderline Pumping Viscosity cP @ °C (°F)	D4684	12,875 @ -40 (-40)	13,967 @ -25 (-13)	9,892 @ -20 (-4)	25,543 @ -15 (5)	-
Pour Point,°C (°F)	D5950	-51 (-60)	-33 (-27)	-27 (-17)	-27 (-17)	-21 (-6)
Channel Point, °C (°F)	FDSTD 971D3456.2	<-55 (<-67)	-38 (-36)	-35 (-31)	-27 (-17)	-26 (-15)
Sulphur, % wt	D4294	0.4	0.3	0.4	0.7	1.0
Zinc, % wt	D4951	0.1	0.1	0.1	0.1	0.1
Calcium, % wt	D4951	0.3	0.3	0.3	0.3	0.3
Phosphorus, % wt	D4951	0.1	0.1	0.1	0.1	0.1

The values quoted above are typical of normal production. They do not constitute a specification.

To order product or to learn more about how Petro-Canada Lubricants can help your business visit: **lubricants.petro-canada.com**
or contact us at: **lubecsr@petrocanadalsp.com**

CERTIFIED
ISO 9001
ISO 14001
ISO/TS 16949

IM-7857E (2013.08)

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