

PETRONAS Urania – supporting your fleet and your bottom line today, tomorrow, and in the future.

PETRONAS
Urania

Stronger for longer



Discover core strength.

PETRONAS is ready for the world of tomorrow, today

PETRONAS Lubricants International (PLI) is part of the PETRONAS Group. With 10 blending plants, over 30 sales offices and products distributed in more than 90 countries worldwide, PLI's global network of over 240 scientists, technical professionals and engineers anticipate future mobility challenges and opportunities, then research and develop advanced fluid technology solutions to meet tomorrow's challenges, today.

We strive to deliver maximum value to our consumers, customers and the markets in which they operate – while minimising our environmental impact and pioneering high-performance fluids that are manufactured in increasingly low CO₂ environments and are dedicated to reducing emissions.

We're an ambitious business, driven by a relentless, restless energy.

**What's next? What if?
How can we? Why don't we?**

**We're unstoppable.
We are PETRONAS.**

The world is changing and growing – fast

It's tough out there – and it's getting tougher. The world is changing at breakneck speed, throwing an ever-growing, intense set of external challenges and pressures your way...

As people are living longer, the **global population is growing** – significantly in the East, and with particular expansion among the middle classes. This **increase in middle class consumption** will place increased pressure on the supply chain, with **more food and goods** to be transported by **more trucks**, covering **more kilometres** – delivering to more people that don't want to wait.

And as the population rises, so too will **urbanisation** and the **growth of megacities**, creating even more challenges for **last mile deliveries** – and as more and more trucks enter densely populated areas, it's likely that they'll be required to meet the same emissions standards as light trucks and vans.

Finally, globalisation – the big trend of the last 20 years – is slowing down as trade is starting to become more regionalised, increasing the demand for trucks, light trucks and vans.

Right now...

There are more than **90 million** new trucks and vans on the road each year*

By 2030...

The global population will increase by **1.2 billion†**

97% of this growth will occur in developing countries†

60% of the global population will live in cities†

94% of increased urbanisation will occur in developing countries†

* Source - Automotive World, 1996.

† Source - Roland Berger Trend Compendium 2030. Megatrend 1: Demographic Dynamics, Oct 2017.

The business environment is getting tougher – fast

The relentless pace of global change means the operating environment is getting tougher, too. Demand is heavier, journeys are longer, timescales are shorter, competition is greater, customer expectations are higher, environmental regulations are tougher and vehicle technology is moving faster than it ever has before.

Increasing CO₂ emissions and labour regulations means businesses need to seek **more sustainable solutions** – at a time when **rising operating costs** paired with **lower cost entrants** from developing economies place more **pressure on profit and margins**.

The pressure's on: The drive to net zero CO₂ emissions

The move to net zero CO₂ emissions by 2050 means limits for CO₂, NO_x and PM are up to 98% lower. This, coupled with tighter labour regulations, means OEMs are forced to introduce major hardware design interventions – everywhere from the engines and pistons to the after-treatment systems – with greater investment placed in hybrid engine technologies, biofuels and gas fuels, and new, more demanding fluid specifications.

2013 – Euro VI

2020 – China VI

2020 – Bharat VI



Technological developments designed to improve efficiency and productivity – such as connected vehicles allowing truck-to-HQ, truck-to-truck and driver-to-HQ communication – also bring with them **complexity** and the need for **hands-on, intelligent interpretation** of new data sets.

All at a time when we can expect more congestion and city traffic than ever. This means more **stop-start driving**, more engines running at **higher temperatures**, and **more stress for transmission systems and fluids** – all of which can lead to **rising maintenance costs** and **unscheduled downtime**.

A perfect storm of tighter deadlines, harsher conditions, keener competition and tougher regulations means that now, more than ever, it takes **core strength for fleets to minimise risk, maximise profit and uptime, go the distance and succeed.**

We're here to help.

Right now...

Demand for last mile deliveries is growing **8% per annum.***

By 2030...

Road freight transport is expected to **increase by 40%****

41 million electric commercial vehicles by 2040.†

* Source - McKinsey, 'Parcel delivery: the future of the last mile', September 2016.

** Source - European Commission Logistics and Multimodal Transport Forum 2015.

† Source - Automotive World May 2020.

It takes core strength to succeed

Truck engines and transmission systems are under constant attack. Every trip, the battle to stay strong in the face of ever-increasing demands is a test of resilience – and it's a similar kind of resilient core strength that everyone working in the industry, from drivers to CEOs, needs to draw upon, to go the distance and deliver on time, every time.

PETRONAS Lubricants International is here to support you. Our newly formulated engine oils and transmission fluids are engineered to stay stronger for longer, delivering stronger profits through:

- Increased vehicle availability
- Reduced operating costs
- Improved driver experience.

Increased vehicle availability could generate **\$2-4,000 a day***†

More KMs covered and goods delivered = **more happy customers**

Could cut annual fuel bills by **\$500 - \$1,500 per truck†**

Operating costs:
a small change
can make a big
difference...

* Depending on type of freight and local freight rates.
Source: ACEA and US www.truckinginfo.com

† Indicative figures based on assumptions depending on the specific business variants such as annual km covered, fuel prices, driving style and fuel consumption.



Stronger fluids. Stronger profits.

Maximum vehicle availability:
reclaim between 1 and 12 maintenance days per truck, per year

Your trucks only contribute to your bottom line when they're out on the road. Our premium PETRONAS Urania engine oils and PETRONAS Tutela transmission fluids stay stronger for longer – as long as 180,000 km or more – reducing scheduled maintenance for oils and filters to as little as 1 day a year.

Reduced fuel costs:
reduce fuel consumption by 1-2%†

Our top-of-the-line PETRONAS Urania engine oils and PETRONAS Tutela transmission fluids can help reduce fuel consumption by 1% to 2% – offsetting the higher purchase price in under a year and reducing your annual fuel bill.

Reduced repair & maintenance costs:
extend engine and transmission life and protect resale value

Our most advanced engine oils and transmission fluids form a stronger fluid film that protects the moving parts of your engine and transmission from premature wear, significantly extending their useful life. This means that any major overhaul work can be delayed for some years, leading to significant cost savings – while well-maintained trucks also hold their value for longer.

Enhanced driver experience:
healthier, more productive workforce

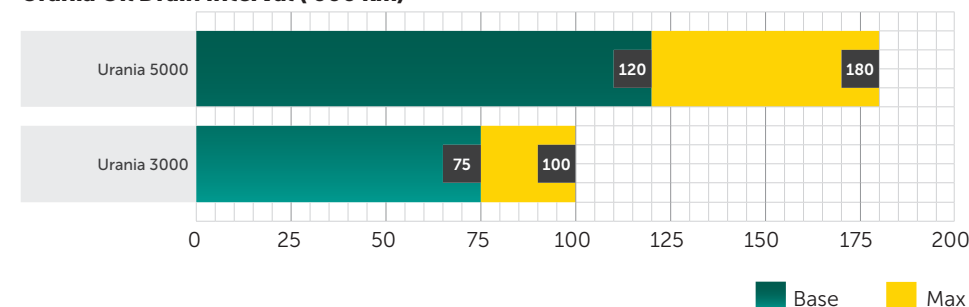
Our most advanced PETRONAS Urania engine oils and PETRONAS Tutela transmission fluids improve driving experience significantly, by making cold starts easier, improving the engine and transmission's response to acceleration, especially uphill, delivering easier gear shifts (again, especially on hilly roads) and reducing noise from engine, transmission and axle systems.

An improved experience reduces driver fatigue and stress, meaning they will have fewer accidents and be happier and more productive, delivering better customer experience as they deliver goods.

***Always consult your vehicle handbook.**

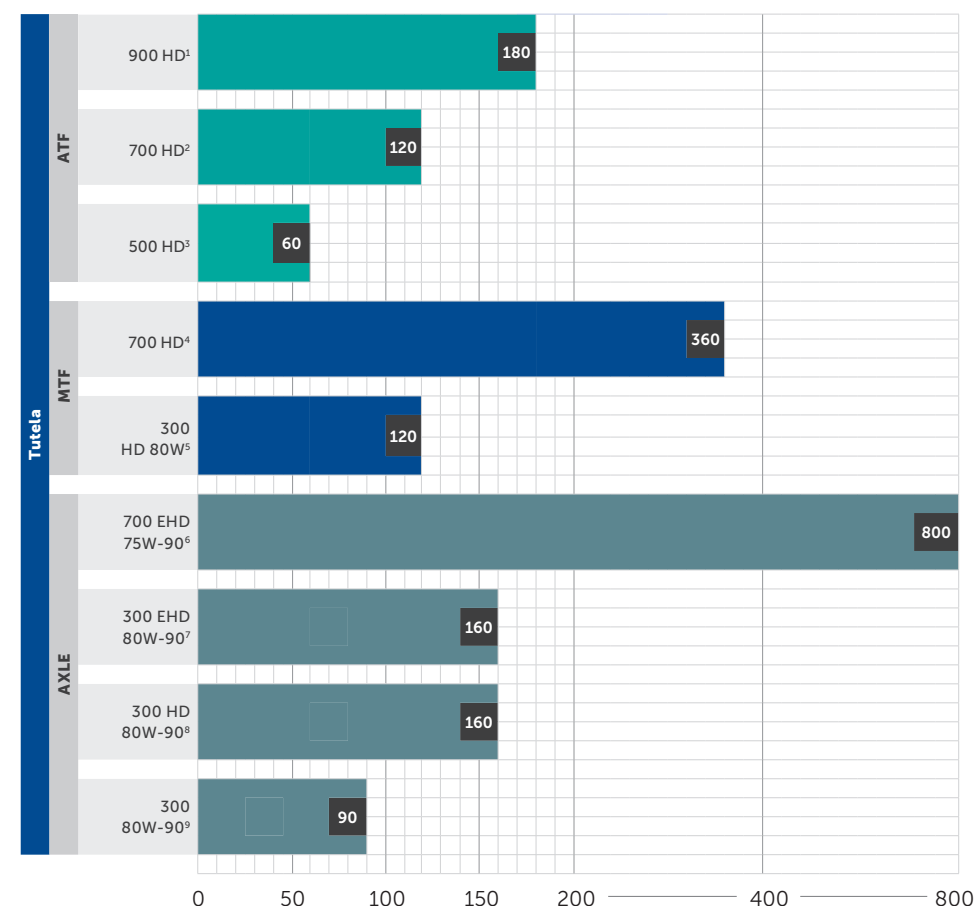
† Indicative figures based on assumptions depending on the specific business variants such as annual km covered, fuel prices, driving style, fuel consumption, tyre condition and engine & transmission system condition.

Urania Oil Drain Interval ('000 km)



Tutela Extended Oil Drain Intervals ('000 km)

Based on OEM approvals and specifications



¹Based on MAN 339 Type Z12 and ZF TE-ML 20C and Extended Drain Intervals based on MAN 339 Type V2 and Voith H55.6336.xx specifications.*

²Based on MAN 339 Type V2 and Voith H55.6336.xx specifications.*

³Based on MAN 339 Type V1, VOITH H55.6335.xx.

⁴Based on ZF TE-ML 01L, 02L specifications.*

⁵Based on MAN 341 Type E2 and Eaton specifications.*

⁶Up to 800,000km based on Arvin Meritor O76N specifications.*

⁷Based on MAN 342 Type M2 and SAE J2360 specifications.*

⁸Based on MAN 342 Type M2 and SAE J2360 specifications.*

⁹Based on MAN 342 Type M1 specification.*

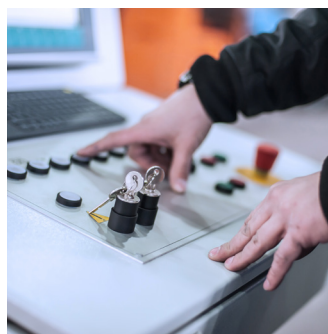
New PETRONAS Urania with StrongTech™ technology

Engineered to stay stronger for longer

To withstand the hostile environment deep inside the engine over long distances and in stop/start operating conditions, an oil needs to be incredibly resilient.

It needs the durability to maintain its optimal viscosity in the face of high temperatures and harmful deposits. It needs core strength.

PETRONAS Urania with StrongTech™ technology is engineered to stay stronger for longer, forming a uniquely strong fluid film to extend drain intervals and engine life, maximise performance and profitability, and give you the core strength to keep moving.



Stronger fluid

- Reduces metal-to-metal contact even at extreme temperatures.
- Controls harmful soot and deposits thanks to stronger cleaning properties.
- Resists oxidation and viscosity loss caused by high temperatures or high shear.

Stronger vehicle

- Runs for longer even in harsh external conditions and under the stresses of different driving styles.
- Delivers reduced emissions thanks to improved fuel efficiency.
- Enables lower operating costs.

Stronger engine

- Delivers more power and torque.
- Offers longer engine life.
- Reacts faster to prevent issues.
- Extends DPF life.

PETRONAS Tutela:

Protect your truck's Hidden Heroes

A truck's engine is only part of its overall performance story. There are a number of other extremely hardworking systems that are just as critical to a vehicle's efficient, continued performance – systems that demand a technically advanced fluid system, but which are often undervalued and overlooked.

We call them the Hidden Heroes

Liken a vehicle to a team, and these critical ancillary systems are its unsung workhorses, performing in extremely demanding conditions. The pressures within a truck's Transmission System far exceed those experienced anywhere else in the vehicle. The Cooling System has to rise to the challenge of engines running hotter than ever, while still delivering in icy climates.

True heroes - yet we only notice them when they fail...

PETRONAS Tutela: enhanced protection for ancilliary systems

The PETRONAS Tutela range of fluids represents our commitment to researching and developing fluids that are specifically engineered to protect all of a vehicle's systems, and are designed to work in conjunction with PETRONAS Urania to keep your business moving.



PETRONAS – supporting your every business need

Our support to your business extends beyond providing the fluids you need to maximise vehicle performance and increase your efficiency. We're here to help you meet the challenges of your systems and your business.



Engine Diagnostic Services

As part of our Engine Diagnostic Services, we carry out a detailed used oil analysis. This comprises a set of laboratory tests to assess the condition of the lubricant and engine – and to identify early indications of engine failure before it occurs. Ideal for fleet maintenance managers, our services enables you to apply preventive maintenance processes, and schedule mechanical work in advance.



Lubrication Consultancy

Our Lubrication Consultancy Services include an on-site lubrication study enabling you to optimise your maintenance costs; a lubrication chart displaying the fluids and drain intervals for each of your trucks; a benefit calculator allowing you to compare the total operating costs of different oils; and a lubrication finder so you can quickly find the right lubricating fluids for your vehicle.



Skills Development

Benefit from a comprehensive set of training tools that are designed to increase awareness and competency in key areas related to lubricating fluids. If you're an owner operator, small fleet manager or workshop mechanic, it'll enable you to quickly develop your knowledge and understanding of lubricating fluids and their applications, boosting your skills in the critical area of preventative maintenance.

Supporting you today, tomorrow, and in the future.

For help and advice on any of our fluids or to take advantage of our business support services, talk to your Key Account Manager.

Appendix

PETRONAS Urania Range

All product groups

| Products | Approvals & Specifications Profile | Low Emission* | Fuel Efficiency | Long Drain | Protection | Instant Response** | Cold Start | Noise reduction |
|------------------|---|---------------|-----------------|-------------------|------------|--------------------|------------|-----------------|
| | | | | | | | | |
| 5000 | | | | | | | | |
| 5000 ECO 5W-20 | MAN M3977 | ● | ● | Not yet available | ● | ● | ● | |
| 5000 LS-FE 5W-30 | API FA-4, JASO DH-2, MB-Approval 228.61, Cummins CES 20087, Detroit Diesel DFS93K223 | ● | ● | ● | ● | ● | ● | ○ |
| 5000 LSF 5W-30 | API CK-4, ACEA E6/E7/E9, JASO DH-2; CAT ECF-3; Cummins CES 20086; DAF Extended Drain, Deutz DQC IV-10 LA; Mack EOS-4.5; MB-Approval 228.51; MTU CAT. 3.1; Renault RLD-3; Volvo VDS-4.5; Detroit Diesel DFS93K222 | ● | ● | ● | ● | ● | ● | ○ |
| 5000 F 5W-30 | ACEA E4/E7, Cummins CES 20077/20076, DAF Extended Drain, Deutz DQC IV-10, Mack EO-N, MAN M3277, MB-Approval 228.5, MTU Type 3, Renault VI RLD-2, Scania LDF-3, Volvo VDS-3 IVECO 18-1804 Class TFE | | ● | ● | ● | ● | ● | ○ |
| 5000 LS 10W-40 | API CK-4, ACEA E6 E9/E7, JASO DH-2, CAT ECF-3, Cummins CES 20086/20081, DAF Extended Drain, Detroit Diesel DFS93K218/DFS93K222, Deutz DQC IV-10 LA, Mack EOS-4.5, MB-Approval 228.51, MAN M3477, Renault VI RLD-3, Volvo VDS-4.5, MTU CAT. 3.1; Scania Low SAPS, IVECO 18-1804 Class TLS E9 | ● | ● | ● | ● | ● | ● | ● |
| 5000 10W-40 | API CI-4, ACEA E4/E7, Cummins CES 20078, MAN M3377 / M3277, Mack EO-N, MB-Approval 228.5, Renault RLD-2, MTU Type 3, Volvo VDS-3 IVECO 18-1804 Class T3 E4 | | ● | ● | ● | ● | ● | ● |
| 3000 | | | | | | | | |
| 3000 LS 10W-30 | API CK-4, ACEA E9/E7, CAT ECF-3, Cummins CES 20086; DAF, Deutz DQC III-10 LA; Mack EOS-4.5; MB-Approval 228.31; MTU CAT. 2.1; Renault VI RLD-3; Volvo VDS-4.5; Detroit Diesel DFS93K222; Ford WSS M2C171-F1; MAN M3775 | ● | ● | ● | ● | ● | ● | ○ |
| 3000 LS 15W-40 | API CK-4, ACEA E9/E7, CAT ECF-3, Cummins CES 20086; DAF, Deutz DQC III-10 LA; Mack EOS-4.5; MB-Approval 228.31; MTU CAT. 2.1; Renault VI RLD-3; Volvo VDS-4.5; Detroit Diesel DFS93K222; Ford WSS M2C171-F1; MAN M3775 | ● | | ● | ● | ● | ● | ● |
| 3000 10W-40 | API CI-4, ACEA E7, Global DHD-1, JASO DH-1, CAT ECF-2 / ECF-1a; Cummins CES 20078/77, Deutz DQC III, MAN M 3275, Mack EO-N, MB 228.3, MB 229.1, MTU Type 2, Renault RLD-2, Volvo VDS-3 | | ● | ● | ● | ● | ● | ● |
| 3000 E 15W-40 | API CI-4 Plus, CAT ECF-2, ECF-1A, MB-Approval 228.3 (approvable), Volvo VDS-3, Mack EO-N, Renault RLD-2, JASO DH-1, Global DHD-1; Cummins CES 20078/77/76/72/71, Detroit Diesel DSF 93K215, Deutz DQC III, MAN M3275, MTU Type 2 | | | ● | ● | ● | ● | ● |
| 3000 15W-40 | API CI-4, ACEA E7, Global DHD-1, JASO DH-1, CAT ECF-1-a/ECF-2, MB-Approval 228.3, Cummins CES 20078, Detroit Diesel DSF 93K215, Deutz DQC III, Mack EO-N, MTU Type 2, Renault VI RLD-2, Volvo VDS-3, Cummins CES 20077, MAN M3275, IVECO 18-1804 Class T2 E7 | | | ● | ● | ● | ● | ● |
| 1000 | | | | | | | | |
| 1000 15W-40 | API CH-4, CAT ECF-1-a, Cummins CES 20076/CES 20077, Deutz DQC II, IVECO 18-1804 Class T3, Mack EO-M Plus, MAN M 3275, MB 228.3, MTU Type 2, Volvo VDS | | | ● | ● | ● | ● | ● |
| 1000 E 15W-40 | API CI-4 | | | | ● | ● | ● | ● |

Notes

*Low Emission benefits refer to compatibility with DPF (Diesel Particulate Filter) systems

**Responsiveness benefits refer to engine or transmission system ability to instantly provide power and torque.

The benefits highlighted in the table above are given as direction based on technology and performance features rather than a direct guarantee for every individual need. It is recommended to compare the potential benefits between different products from the Urania range to assess the most appropriate product.

The benefits depend highly on various factors including operating conditions, driving style, engine & transmission conditions and fuel quality. You should always consult your vehicle handbook.

○ Basic level – most fluids can offer this benefit level.

● Max level – only few premium fluids can offer this benefit level.

PETRONAS Tutela Range

All product groups

| Products | Approvals & Specifications Profile | Low Emission* Fuel Efficiency Long Drain Protection Instant Response** Cold Start Noise reduction | | | | | | |
|--|--|---|-------------|-------------|-------------|-------------|-------------|-------------|
| | | | | | | | | |
| Automatic Transmission & Powersteering | | | | | | | | |
| TUTELA ATF 900 HD | MAN 339 Type V2, Z12; ZF TE-ML 16S, 20C, 25C; VOITH H55.6336.xx | | | <div></div> | <div></div> | <div></div> | <div></div> | <div></div> |
| TUTELA ATF 700 HD | MB-Approval 236.9; MAN 339 Type L1, Z2, Z11, V2; Volvo 97341, VOITH H55.6336.xx; ZF TE-ML 04D, 09, 16L, 14B, 20B, 25B Suitable For Use: Dexron IIIH, Allison C-4, Allison TES-389, Allison TES-295, Volvo 97340 | | | <div></div> | <div></div> | <div></div> | <div></div> | <div></div> |
| TUTELA ATF 500 HD | MAN 339 Type Z1, V1; MB-Approval 236.1 / 236.9; Volvo 97341; VOITH H55.6335.xx; ZF TE-ML 03D, 04D, 05L, 09, 14A, 17C, 21L Suitable For Use: Dexron IIIH, Allison TES-389, Allison C-4 (TES-228); Volvo 97340 | | | <div></div> | <div></div> | <div></div> | <div></div> | <div></div> |
| TUTELA ATF D3 | JASO M315-2013 1A, JASO M315-2013 2A, GM DEXRON®-IIIG/IIIH, Allison C-4, Ford Mercon®, Bosch TE-ML 09, ZF TE-ML 09 | | | | <div></div> | <div></div> | <div></div> | |
| Manual Transmissions | | | | | | | | |
| TUTELA MTF 700 DM 75W-90 | API GL-4, MB-Approval 235.11 Suitable For Use: MAN 341 Type MB | <div></div> | <div></div> | <div></div> | <div></div> | <div></div> | <div></div> | <div></div> |
| TUTELA MTF 700 HD 75W-80 | API GL-4, MAN 341 Type Z4; Volvo 97307; ZF TE-ML 01L, 02L, 08, 16K Suitable For Use: DAF; Eaton Europe (300.000km 3 years); Renault Note technique B0032/2 Annex 3 | <div></div> | <div></div> | <div></div> | <div></div> | <div></div> | <div></div> | <div></div> |
| TUTELA MTF 500 75W-90 | API GL-4 | <div></div> | <div></div> | <div></div> | <div></div> | <div></div> | <div></div> | |
| TUTELA MTF 300 HD 80W | API GL-4; MB-Approval 235.1, ZF TE-ML 08, 17A Suitable For Use: MAN 341 Type E2 | <div></div> | <div></div> | <div></div> | <div></div> | <div></div> | <div></div> | <div></div> |
| TUTELA MTF 300 80W-90 | API GL-4 | | | | <div></div> | <div></div> | <div></div> | <div></div> |
| Axles, Differentials and Final Drives | | | | | | | | |
| TUTELA AXLE 700 EHD 75W-90 | SAE J2360, API GL-4/GL-5/MT-1 Meritor O-76N; MAN 341 Type Z2, 342 Type S1; MB-Approval 235.8; SCANIA STO 2:0A FS; Volvo 97312; ZF TE-ML 02B, 05A, 07A, 12L, 12N, 16B, 16F, 17B, 19C, 21A; MIL PRF-2105E. Suitable For Use: DAF; DETROIT DIESEL DFS93K219.01; MACK GO-J; Renault Note technique B0032/2 Annex 3 | <div></div> | <div></div> | <div></div> | <div></div> | <div></div> | <div></div> | <div></div> |
| TUTELA AXLE 500 75W-90 | API GL-5, MIL PRF-2105D; ZF TE-ML 07A, 08 | <div></div> | <div></div> | <div></div> | <div></div> | <div></div> | <div></div> | |
| TUTELA AXLE 300 80W-90 | API GL-5; Suitable For Use: MIL PRF-2105D; MAN 342 Type M1, Type M2; ZF TE-ML 05A, 07A, 08, 12E, 16B, 17B, 19B, 21A, NATO O-226 | | | <div></div> | <div></div> | <div></div> | <div></div> | <div></div> |
| TUTELA AXLE 300 85W-140 | SAPI GL-5; Suitable For Use: MIL PRF-2105D; ZF TE-ML 05A, 07A, 08, 12E, 16C, 16D | | | | <div></div> | | | <div></div> |
| TUTELA AXLE 300 LS 80W-90 | API GL-5 ZF TE-ML 05C, 12C, 21C | | | <div></div> | <div></div> | <div></div> | <div></div> | <div></div> |

Notes

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