

Pentosin
lubricants & specialties

潘东兴双离合变速箱油
PENTOSIN Double Clutch Transmission Fluids

潘东兴的发展战略
Pentosin's Development Strategy

May 22 – 24, 2012

内容概要

Table of Contents



1. 客户的需求与潘东兴的发展策略
Customer's interest in Pentosin's development strategy
2. 宝马公司对潘东兴产品发展的一览
BMW's view on Pentosin's product history
3. 潘东兴DCTF发展史
Pentosin's DCTF history
4. 潘东兴DCTF发展策略
Pentosin's DCTF development strategy
5. 潘东兴DCTFs的由来
Pedigree of Pentosin's DCTFs



1. 客户的需求与潘东兴的发展策略

Customer's interest in Pentosin's development strategy

- 2008年，德国宝马公司向潘东兴就其不同的DCTF产品的关联性进行提问。
In 2008 Pentosin was asked by BMW about the relationship of the Pentosin DCTFs.
- 产生这一提问的背景是宝马希望了解其正在使用的BMW DCTF FFL-4与其他潘东兴变速箱油的兼容性。
Background of this question was to understand to what extent their BMW DCTF FFL-4 was backwards compatible with other Pentosin ATFs / DCTFs.
- 同时，宝马公司也希望进一步了解通过调整配方这款油在性能上有怎样的改进。
BMW also wanted to understand which improvements had been introduced by which formulation change.
- 这一提问的另外一方面则是为了理解油品的性能达到了怎样的一个层面。如果想继续提高其性能，是否仅需要对配方进行微调还是需要大量投入？
Another aspect of their question was to find out which performance level had been achieved so far and whether it could be further improved with little effort or did it need big investments?
- 宝马公司同样想要减少其用油的种类，因此想要找到一种通过引入少量在性能上能够覆盖所有必要领域的润滑油，并且这些润滑油能够与其他已投入使用的油品兼容。
BMW also had in mind to reduce the high number of their service oils and therefore wanted to find out the potential to harmonize them by introducing a small number of high performing backwards compatible oils



2a. 宝马公司对潘东兴产品发展的一览 BMW's view on Pentosin's product history

<u>起始时间</u> <u>Starting Time</u>	<u>油品名称</u> <u>Name of Gear Oil</u>	<u>与其前身相比做出的改进</u> <u>Improvement to predecessor</u>	<u>配方调整</u> <u>Formulation Change</u>	<u>应用</u> <u>Application</u>	<u>目前状态</u> <u>Current Status</u>
1995	Esso MTF EGL 72304	不是ATF LT 71141或FFL-2的前身 No predecessor of ATF LT 71141 or FFL-2	埃索公司专有技术，全合成油 Esso proprietary technology, fully synthetic.	宝马公司全部手动变速箱 BMW, all manual transmissions	1997-2007
1993	Esso ATF LT71141	首款ATF寿命油，与GK兼容 First Life Time ATF, GK compatible	雅富顿添加剂包；2/3的PAO和裂解油； 润滑油粘度指数改进剂具有良好的剪切稳定性 Afton additive package; 2/3 PAO und HC; shear stable VI-Improver	宝马，采埃孚 BMW, ZF	正在进行 ongoing
2003	Pentosin FFL-1	第一款DCTF；耐久性有限，仅为30000公里；仅生产了20吨 First DCTF; limited durability of ca. 30.000 km only; only 20t produced	雅富顿添加剂包；全合成油；创新摩擦改进剂系统；对于DCTF的性能要求来说还不够好 Afton additive package; Fully Synthetic; New FM – System; Not robust enough for DCTF	大众DQ250 VW DQ250	仅2003年 only



2b. 宝马公司对潘东兴产品发展的一览 BMW's view on Pentosin's product history

<u>起始时间</u> Starting Time	<u>油品名称</u> Name of Gear Oil	<u>与其前身相比做出的改进</u> Improvement to predecessor	<u>配方调整</u> Formulation Change	<u>应用</u> Application	<u>目前状态</u> Current Status
2003	Pentosin FFL-2	<p>耐久性改良后分别在台架测试和路试中达到150000公里。自2003年起至今一直用于大众汽车首次灌装。</p> <p>Improved durability of 150.000 km on rig and on the street. VW first fill since 2003</p>	<p>雅富顿添加剂包；100%PAO和裂解油；改良后的摩擦改进剂；添加抗磨损和抗氧化添加剂</p> <p>Afton additive package; 100% PAO and HC; Improved robust FM System; Plus EP und AO</p>	VW DQ250	正在进行 ongoing
2005	Pentosin FFL-3	<p>寿命油的性能得到改良</p> <p>Improved Life Time performance</p>	<p>提高PAO油含量；创新抗剪切粘度指数改进剂；添加摩擦改进剂、抗磨损和抗氧化添加剂</p> <p>Higher PAO Content; New shear stable VI-Improver; Plus FM, AO und EP</p>	采埃孚/ 保时捷 ZF / Porsche	正在进行 ongoing
2005	Pentosin FFL-4	<p>与密封材料兼容性得到改良？</p> <p>Improved seal compatibility?</p>	<p>抗泡性得到改良，其他改进？</p> <p>Improved anti foam, other improvements?</p>	宝马/格特拉克 DKG436 BMW GETRAG DKG436	正在进行 ongoing
2012	Pentosin FFL-3	<p>宝马新行手动变速箱MTF 戴姆勒新行手动变速箱MTF MTF for new BMW gear box MTF for new Daimler gear box</p>	<p>采埃孚研发的一款新型6速变速箱使用FFL-3作为MTF ZF develops a new 6- speed gear box and uses FFL-3 as MTF</p>	埃孚/ 宝马/ 戴姆勒 ZF / BMW / Daimler	正在进行 ongoing

3. 潘东兴DCTF发展史 Pentosin's DCTF history



- 1992: ATF LT 71141
采埃孚5速自动变速箱加装电控离合器
ZF 5-speed step automatic with ECCC
↓
- 2001: Low Vis. ATF EL 21033
采埃孚6速自动变速箱加装电控离合器
ZF 6-speed step Automatic with ECCC
(已通过检验认可但未通入使用)
(was approved but not introduced)
↓
- 2003: FFL-2
第一款商用DCTF
1. commercial DCTF
↓
- 2004: FFL-3 /-4
第一款商用DCTF寿命油
1. commercial Life Time DCTF
↓
- 2008: FFL-4 改良产品
FFL-4 Modifications
低粘度DCTF，燃油经济性DCTF等等
Low Vis. DCTF, Fuel Economy DCTF, etc.
- 展望/ Outlook: 目前的FFL-4技术有更多进行改良的潜力，其性能的诸多方面均进一步进行升级。
The current FFL4 – technology has further potential of improvement and can be upgraded in many aspects.



4a. 潘东兴DCTF发展策略 Pentosin's DCTF development strategy

- 与添加剂公司向反，潘东兴的新型油品例如MTFs, ATFs,和DCTFs等很少全部使用新技术，而是使用通过实地检验认可的完全可靠的油品的改良版本。
Contrary to what Additiv Companies do and want us to do Pentosin's new oils - MTFs, ATFs and DCTFs - are seldom entirely new technologies but improved versions of absolutely reliable field proven oils.
- 当潘东兴面临来自主机厂极高的挑战时，潘东兴首先尝试改善、调整和适应现有的、已通过认可的成熟技术。
When Pentosin is confronted by their OEMs with new highly demanding challenges Pentosin always tries first to improve, tweak and adapt existing well proven technologies.
- 潘东兴密切关注添加剂公司的动向，对其最新技术进行进行检验，并将其与潘东兴独有的内部研发技术进行比对。
Pentosin closely watches the activities of the additive companies, checks their latest developments and compares it with Pentosin's own inhouse developments.
- 大多情况下，潘东兴将其独有的技术与添加剂公司的核心技术相结合，其结果比添加剂公司的最新技术更为优越。
In most cases Pentosin's technologies that are a combination of a core technology of an Additive Comp. combined with its own inhouse technology is superior to the latest technology of the Additive Company



4b. 潘东兴DCTF发展策略 Pentosin's DCTF development strategy

- 潘东兴避免引进完全新的技术，主要是为了避免多年来通过实践检验的技术经验的流失。
Pentosin avoids the introduction of completely new technologies as the experience of many years of field performance would get lost.
- 我们的客户也同样更喜欢使用现有的通过检验的成熟技术，这让他们感到更加舒服和放心。
Our customers too prefer improved existing technologies as they feel much more comfortable with it.
- **优势/ Advantage:**
具备强大的技术基础，确保以稳固的技术根基为出发点，完全新的技术始终要承担一定的位置风险。
Banking on existing robust technologies, assures to stand on a stable fundament.
Entirely new technologies always carry the risk of unknown dangers.



5a. 潘东兴DCTFs的由来 Pedigree of Pentosin's DCTFs

- 雅富顿的添加剂Hitec 403是调配 **ESSO ATF LT 71141**的基础技术，这埃索的这款**ATF**是世界范围内第一款用于配备电控离合器的自动变速箱的**ATF**。这款**ATF**当时是为奥迪、宝马、大众、采埃孚等主机厂设计研发的。
Afton's additive technology Hitec 403 was the basic technology to formulate ESSO ATF LT 71141, which was the first world wide Life Time ATF for automatic transmission with a „Electronically Controlled Converter Clutch (ECCC)“. It was developed for the German OEMs: Audi / BMW / VW / ZF.
- 潘东兴的**FFL-2**是世界上首款作为商用的双离合变速箱油(**DCTF**)。这款油当时是为大众公司研发的，并且自2003年起就一直用于大众生产车间的首次灌装。这款润滑油以**ATF LT 71141**为基础，同时可以被看作是源于**ATF LT 71141**技术的第一代**DCTF**产品。
Pentosin FFL-2 is the first commercially available double clutch gear oil (DCTF) worldwide. It was developed for VW and is being used as their Factory Fill DCTF since 2003. It is based on the ATF LT 71141 and could be seen as a daughter of The ATF LT 71141.



5b. 潘东兴DCTFs的由来 Pedigree of Pentosin's DCTFs

- 潘东兴的**FFL-3**是世界范围内第一款官方的寿命油，是专门为宝马和采埃孚设计研发的。这款DCTF以**FFL-2**为基础并可以被认为是源于**ATF LT 71141**技术的第二代DCTF产品。
Pentosin FFL-3 is the first official Life Time DCTF world wide. It was developed for BMW / ZF. It is based on the FFL-2 and a grandchild of the ATF LT 71141.
- 到目前为止，潘东兴的**FFL-3**并非这条研发主线的终端产品。2012年我们的研发进程已经进入了更新的阶段，改进后配方能够满足主机厂对DCTF的绝大部分要求。因此，潘东兴的**FFL-5**可以被看作是源于**71141**技术的杰出的第四代DCTF产品。
Pentosin FFL-3 is by far not the end of this development root. Further development steps have been formulated in 2012 that fulfil the most demanding requirements of our OEMs. Pentosin FFL-5 could therefore be seen as a great-grandchild of 71141



谢谢！

**Thank You
For
Your Kind
Attention**

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