Changan Automobile’s Strategic US R&D Center for the Future Growth

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November 16, 2011

The Changan US R&D Center, Inc. is an American based company, 100% owned by its parent Changan Automobile Co., Ltd.
长安美国研发中心是由长安汽车股份有限公司100%控股的一家美国公司

Changan US R&D Center, Inc.
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长安汽车 Changan Automobile Co., Ltd.

中国汽车第一阵营企业
Among the First Camp of China’s Automotive Industry

《汽车产业调整振兴规划》（国发5号, 2009年2月9日）
Ref. Automotive Industry Adjustment and Renovation Planning (GUOFA NO.5, Feb. 9th, 2009)

Changan’s Brands 长安的汽车品牌

Besides domestic brands, Changan currently has joint ventures with Suzuki, Ford, Mazda, Volvo, and PSA Peugeot-Citroen

除了自主品牌以外，长安目前与铃木、福特、马自达和标致雪铁龙有合资合作
A Brief Review of China Automotive Industry
中国汽车工业简史

China auto industry started with establishment of FAW in 1953, 中国汽车工业史零起点是长春“一汽”的奠基

China’s open-door to the world started with Beijing-Jeep JV in 1984, 汽车工业的改革开放，则以“北京吉普”的签约合作为标志

Shanghai-VW 50-50 JV, a large volume production, in 1985
成立于1985年的上海大众是一家中德合资企业, 投资比各为50%

Currently, there are 100+ Own-Brand auto OEs, 30+ JV OEs,
Most major global auto companies have JVs in China
目前，中国的整车企业有100多家，汽车合资企业30多家，全球主要跨国汽车公司在中国均有合资企业。

A Brief History of China Automotive Production
中国汽车产量简史

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中国汽车产量简史
Since 2001, China has officially become a WTO member
中国从2001年12月11日起正式成为世贸组织成员
China Auto Annual Sales in Years of 2001 to 2010, AGR 26%

In 2010 China Auto Sales 18.3M, World No.1, vs. No.2 US 12M
2010年中国汽车产销量蝉联世界第一, 与第二名美国差距600多万辆

An Example of JV Companies, GM China with Shanghai Auto and FAW, 通用在中国之例

GM Year 2010 Sales Data

<table>
<thead>
<tr>
<th>Market</th>
<th>Volume (Mil)</th>
<th>Growth wrt 2009</th>
<th>Share</th>
</tr>
</thead>
<tbody>
<tr>
<td>China</td>
<td>2.35</td>
<td>28.8%</td>
<td>28.0%</td>
</tr>
<tr>
<td>US</td>
<td>2.22</td>
<td>6.3%</td>
<td>26.5%</td>
</tr>
<tr>
<td>Global Total</td>
<td>8.39</td>
<td>12.2%</td>
<td>100%</td>
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</tbody>
</table>

GM Profit Reports

<table>
<thead>
<tr>
<th></th>
<th>Year 2010</th>
<th>$4.67B</th>
<th>Profit</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Year 2009</td>
<td>$(23.5B)</td>
<td>Loss</td>
</tr>
</tbody>
</table>

GM China sales in 2010 were more than US sales, the first time in the GM’s 102 year history, overseas sales more. 通用汽车2010年在海外市场销量超过美国，这是该公司102年以来首次海外市场销量超过其本土市场。

Kevin Wale (GM China CEO), "In 2010 China auto sales contributed more than 50% of the profit to the GM International Operation."
甘文维强调，在整个通用汽车国际部(GMIO)中，中国区贡献的利润在50%以上。

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Results of China Automotive Industry with JVs

中国发展合资汽车工业的问题

Rapid development of JV vehicles in the China auto market
合资给中国汽车业带来的结果是合资车型快速占领市场

A transform and establishment of the China automotive industry
实现了中国汽车工业质的转变

In 2010, JV market share is 54%, while the Own Brand market is about 45%, in total vehicle sales volume 合资汽车占了市场的 54%

China automotive companies have not got the core technologies for the vehicle product development, but only the production lines
但中国汽车工业并没有拥有核心技术，获得的仅是生产线

The original thought of “to exchange the market for the technologies” is not realized in China yet
用市场换技术在中国并没有实现

The cost of the Auto JV development is very high
发展汽车合资公司是有高代价的

Challenges to the China Automotive Companies

中国汽车企业面临的挑战

There are big differences, in the vehicle performance and product quality, between the own-brands and the JVs

Lack of automotive core technologies, in terms of product specifications, design procedures, validation methods, and other essential Intellectual Properties

At each stage of the vehicle product development process, there are no complete engineering details, inputs-outputs, design guidelines, and engineering database

The old reverse engineering approach can not provide an insight into the technical know-how

How to compete with the global automotive giants, or survive, and win, in the future?
Auto Product Development Process

汽车产品的正向开发过程与能力

Full product development capability – Continued upgrade, improvement and optimization to auto product performance.

- Targets Setting
- Quantified Performances
- Detailed Designs
- Manufacture Feasibility
- Prototype & Tuning
- Design Validation

- Whole Vehicle Dynamic Performance
- Exhaust and Combustion Economics
- Crash Safety
- Vehicle Dynamics
- Strength, Fatigue and Durability
- Vibration, Noise and Ride Comfort
- Heat Transfer & Fluid Dynamics
- Electric and Electronics Performance

Intellectual Properties:

- Database (Products & Designs, Performance Index, Materials & Loads)
- Design Specs (Tech Procedures, Methods & Tools; Eng. Guides)
- Validation Methods (Verification Specs, Testing, Simulation)

Changan Automobile’s Development Strategy

长安汽车发展战略

Mission: To pioneer auto culture and benefit human life

长安使命：引领汽车文明引领汽车文明造福人类生活

Vision: To build the world’s leading automobile enterprise

长安愿景：打造世界一流汽车企业

Principles: Forward-looking strategy, market-driven, technology-led, cost-effective, enterprise-wide participation, efficient execution

长安准则：战略前瞻、市场牵引、科技驱动、成本领先、全员参与、高效执行
Changan’s Strategic Global R&D System, “Nine locations in five countries, each with its own focus”

The four overseas R&D centers are across Asia, Europe and North America 四个海外研发中心纵贯亚洲、欧洲和北美

US R&D center focused on chassis design and development

Italian R&D center focused on styling and exterior design

UK R&D center focused on powertrain development

Japanese R&D center focused on interior design and molding

First of its Kind 第一家

Changan US R&D Center, Inc. is the first R&D center ever established by a Chinese automotive OEM in Michigan, USA 长安美国研发中心是第一家在密西根设立研发中心的中国整车企业

Design and development of high quality vehicle chassis platforms, sub-systems and parts, by integrating and using world advanced automotive engineering technologies.
Mission Statement of Changan US R&D Center

长安美国研发中心的定位

- Core Functionalities:
  1. Vehicle Chassis Product Development
  2. Engineering Capability Enhancement
  3. Technology & Research
  4. People & Career Advancement

- Extended Responsibilities:
  1. Technology Trends & Directions
  2. New Product Initiatives
  3. Overseas Market Information

- Chassis Products & Tasks:
  1. Medium and Premium Passenger Cars
  2. CUVs, SUVs
  3. New Energy Vehicles
  4. Performance Enhancement & Quality Improvement of Company’s Key Platforms and Chassis Products

A Center of Excellency in the Automotive Product Development

Changan US R&D Center in Detroit

汽车城底特律

Detroit – World Auto City, Culture, Resources

- US Big 3 HQs (GM, Ford, Chrysler)
- World Tech-Centers (Toyota, Nissan, Hyundai, …)
- International Tier-1 HQs (Delphi, Visteon, TRW, …)

- Detroit Int. Auto-Show (100+ years, Prestige, Leads Trend)
- SAE International (Auto engineers, Committees, Papers)
- Technical Expos & Exhibits (Testing, Dynamics, …)

- Engineering Talents (300k+: all disciplines, skill sets)
- Auto Service Firms (300+: Design, Analysis, Testing, …)
- Special Auto Facilities (PGs, Inertias, K&C, …)
Major Technical Areas 工程技术领域

- Chassis Systems Engineering
- Suspension Systems
- Steering Systems
- Brake Systems
- Vehicle Dynamics (Ride & Handling)
- CAE (MBD, FEA, NVH, Durability)
- CAD
- Testing & Tuning
- Project Management

Chassis Focused 专攻汽车底盘

Using perfect combination between computer simulation and test validation, to enable the US R&D Center become a strong competitor in international market of chassis system development!
Critical Role 关键作用

Mr. Xu Liuping, Chairman of Changan Automobile: “The establishment of the US R&D Center will play an important role in improving our global product development system and in capturing global automotive technology trends.”

长安汽车董事长徐留平： “美国研发中心的成立，将对长安汽车采集全球汽车科技之长、全球科技纵深布局起到重要的推动作用。”