

Series of Promotive Report on Promotion of Investment  
in Regional Advantaged Industries in China

Report on Promotion of Investment in Automobile and  
Motorcycle Spare Parts Industries in Chongqing

Investment Promotion Agency of Ministry of Commerce, P.R.C  
Chongqing Foreign Trade & Economic Relations Commission  
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## Brief introduction

Being the most important pillar industry in Chongqing, automobile and motorcycle industry is well recognized nationwide as a strong competitor, which allows Chongqing to have taken initial shape of *China Automobile Famous City* and *Capital of Motorcycle*. Automobile accessory industry is not only an important element of automobile industry, but the basis supporting its long-term steady development, which can even guide the healthy development of the whole sector. On WTO accession, automobile consumption in China enters a period of fast growth. On one hand, international auto makers accelerate the pace of building factory by investment in China. On the other hand, they make more procurement of accessory in China, which create an unprecedented opportunity for development of automobile accessory enterprises. Chongqing motorcycle, taking a leading position in the country, has entered a stage of healthy development, indicated by a steady increase of accessory market.

The report herein referred focuses on investment in automobile and motorcycle accessory sector in Chongqing. Of course, accessory sector is developed closely based on automobile and motorcycle industry so that the basis and planning of development of entire automobile are surely involved during presentation.

Regional advantageous industry mentioned in the report refers to 2 aspects. One is automobile and motorcycle and its accessory industry account for quite a big proportion in the economy in Chongqing, which are prioritized industry for further development as well. The other aspect is automobile and motorcycle accessories are well identified as strong competitor across the country.

There are quite a great number of indicators used to analyze the competitive power for different industries and also there are numerous different explanations to it among scholars at home and abroad. In this report, competitive power for industry is only restricted to analyze foundation available for automobile and motorcycle and its accessories sector (main indicators include no.s of enterprises, employment staff, output value of industrial sales, industrial added value, total amount of assets, all-personnel labor productivity, profit and tax, average salary of employment staff and pillar enterprises, etc), position of the industry in the country(detailed indicators refer to output of automobiles over past 4 years in Chongqing, in particular sedans and motorcycles and the ranking nationwide), ability to provide associated products, relevant natural resources, workforce, ability in research and development, etc.

The report, first of all, reviews the advantage, potential for development and area of concerns of automobile motorcycle accessory industry in Chongqing from the perspective of interests of investors, of which advantage of competition covers description of automobile motorcycle and accessory industry in Chongqing, robust in existing industrial foundation, taking a leading position across the country, complete in associated products of automobile and motorcycle accessories, high in overall quality of workforce, low in cost of production, abundant in reserve of relevant scientific

and research personnel, professional in ability of innovation, much improved in building of infrastructures in Chongqing, etc; potential for further development is attributed to China's automobile industry entry into a period of fast growth, resulting in huge market demand and increasingly expanded accessory market and international corporations make more procurement of accessory in China. All these facts give rise to rare opportunity for automobile and motorcycle accessory in Chongqing, where obvious advantages are made available in terms of investment opportunity and investment environment in this biggest city in southwestern regions. Yet, there are areas of concerns with automobile accessory industry in Chongqing, featured by small size of enterprises, similar system of associated products, low input of research and development by enterprises, low ability in research and development, improvement required in brand awareness of accessory enterprises, high cost of transportation from southwestern regions, etc. All these concerns are exactly expected to be addressed by expanding investment in Chongqing. Secondly, the report goes through in details development policy, related investment policy and preferential policy promulgated by the state and Chongqing with respect to automobile motorcycle accessory industry. Finally, based on industrial competitive power in Chongqing and industrial policies in place, the report raises the area of investment in priority for automobile and motorcycle accessory in Chongqing and proposal on mode of investment, saying that the focus of investment in automobile and motorcycle accessory in Chongqing is that related to passenger van, commercial vehicle (including sedan and minibus, medium size and heavy duty motor truck, refitted vehicle while regarding motorcycle, priority is given to development of not well-developed accessory and engine of big displacement so as to fully promote Chongqing automobile and motorcycle industrial structure to advance to a higher level.

Included in the attachment are List of investment projects in priority for automobile and motorcycle accessory sectors in Chongqing and Guide to automobile accessories supported in priority in Chongqing and key technologies, which we hope can offer investors an insight into background of automobile and motorcycle accessory industry in Chongqing and to help investors make decision in investment.

## 1 Analysis of competitive power in Chongqing automobile and motorcycle accessory industry

### 1.1 Advantage of competition in Chongqing automobile and motorcycle accessory industry

#### 1.1.1 Basis of Chongqing automobile and motorcycle industry

Automobile and motorcycle are a pillar industry in Chongqing. Communication transportation equipment manufacturing industry centering on automobile and motorcycle manufacturing in 2003 witnessed a total output value of 63.586 billion yuan, up 30.9% over the preceding year, accounting for 40.0% of total output value from industrial enterprises of a certain scale<sup>1</sup> across the municipality. Now in Chongqing, there are 6 automobile enterprises with pillar ones being Qinling Motors, Chang'an Group, Chang'an Suzuki, Chang'an Ford, Chongqing Heavy Vehicle Group, producing

heavy-duty truck, light-duty truck, micro vehicle, sedan, etc; 11 refitted enterprises, producing bus, tipper, autocrane, overhead working truck, bullet-proof cash-carrying vehicle and other refitted vehicles; 4 farm transport truck enterprises and 24 motorcycles enterprises with pillar ones being Jialin, Jianshe, Zongshen, Lifan, Loncin, producing motorcycles and motor tricycles of displacement 35-250cc, dominated by motorcycle; 14 engine production enterprises with 4 ones in auto engine and 10 ones in motorcycle engine.

Along with the process of the country's reform and opening to the outside world, Chongqing automobile and motorcycle industry experienced 3 different stages during its 40 years' development: first stage, in initially starting period before 1980, Sichuan Automobile Co. and a few of heavy-duty automobile accessory enterprises were built by the state investment while a couple of refitted vehicle enterprises were founded by local government such as Chongqing Bus, Yuzhou, Beiquan, Shanhua. Second stage, in development period 10 years before reform and opening to the outside world, a great number of state-owned enterprises were developed by using stock assets, such as Jialin, Jianshe, Wangjiang, Pinshan, Qinling, Chang'an, West Auto. Third stage, in restructuring period 10 years after reform and opening to the outside world, individually-run enterprises, in particular motorcycle individually-run enterprises were founded by a great amount, such as Zongshen, Lifan, Loncin, Jintong, Dima, Chuanjiang, etc.

Chongqing Statistics Bureau shows that up to end of 2003, there are totally 516 state-owned equipment manufacturing enterprises in communication and transportation and non state-owned enterprises above certain scale, with total assets in the sector valuing 65.8 billion yuan, net value of fixed assets 17.2 billion yuan, employment staff of 204,400, technical staff of 15,000, output value of industrial sales 62.4 billion yuan, industrial added value 15.3 billion yuan, total amount of profit 3.7 billion yuan (see Table 1 for figures in detail).

Table 1: Main economic indicators of communication and transportation equipment manufacturing industry in Chongqing

Indicator	Unit	Amount
no.s of enterprises	/	516
employment staff	10,000	20.44
output value of industrial sales	10,000 yuan	6243279
industrial added value	10,000 yuan	1526937
total amount of assets	10,000 yuan	6577240
total amount of profit	10,000 yuan	368899
total amount of profit and tax	10,000 yuan	683903
sales profit rate	%	6.00
per capita profit and tax realized	yuan	33460

all-personnel labor productivity	yuan/man year	58786
average salary of employment staff	yuan	11452

source of information: *Chongqing Statistics Yearbook*

Note: figures included in statistics are from state-owned and non state-owned enterprises of a certain scale.

Production of automobiles in Chongqing from 2000 to 2003 was maintained at 2<sup>nd</sup> to 4<sup>th</sup> position across the country, of which that of sedan was maintained at 4<sup>th</sup>-5<sup>th</sup> position. Production of automobiles in Chongqing reached 404,500 in 2003, up 22.4% over the preceding year and accounting for 9.1% of the total and the 3<sup>rd</sup> position nationwide(see Table 2), of which that of sedan were 120,600, up 77.8% over the preceding year and accounting for 5.83% of the total and 6<sup>th</sup> position nationwide (see Table 3); that of cargo truck were 86,400, accounting for 7.47% of the total and 5<sup>th</sup> position (see Table 4); that of motorcycle were 4,413,200, up 19% and accounting for 30.9% of the total and 1<sup>st</sup> position nationwide (see Table 5), 1.37 million for export with amount of export US\$ 440 million, with customers scattering in about 100 countries and regions, which is an important export product in Chongqing.

Now, Chongqing has had a comprehensive capability to make 300,000 micro vehicles, 200,000 sedans, 100,000 light-duty vehicles, 20,000 heavy-duty vehicles, 12,000 refitted vehicles, 7.5 million motorcycles, 9 million motorcycle engines. In 2003, Chongqing made automobile engine of 370,000, including micro vehicle engine of 330,000 with 1<sup>st</sup> position in the country, and sold motorcycle engine of 7 million (including those used for own purpose), accounting for about 57% of total nationwide.

Table 2: Production of automobiles nationwide in 2000-2003 and Chongqing's ranking

Unit: 10,000、%

	Auto	ranking	percentage	sedan	ranking	percentage
2000 nationwide	207.00		100.00	60.70		100.00
Jilin	32.26	1	15.58	12.54	2	20.66
Shanghai	25.27	3	12.21	25.15	1	41.43
Chongqing	25.28	2	12.21	4.82	4	7.94
Hubei	18.62	4	9.00	5.45	3	8.98
2001 nationwide	234.17		100.00	70.36		100.00
Jilin	39.08	1	16.69	15.54	2	22.09
Shanghai	29.00	2	12.38	28.88	1	41.05
Chongqing	23.90	4	10.21	4.31	5	6.13
Hubei	24.19	3	10.33	7.22	3	10.26
2002 nationwide	325.10		100.00	109.20		100.00

Jilin	52.02	1	16.00	22.69	2	20.78
Shanghai	39.19	3	12.05	39.05	1	35.76
Chongqing	33.13	4	10.19	6.78	5	6.21
Hubei	39.41	2	12.12	12.34	3	11.30
2003 nationwide	444.4		100.00	206.89		100.00
Jilin	64.1	1	14.42	35.07	2	16.95
Shanghai	58.8	2	13.21	58.84	1	28.44
Chongqing	40.4	3	9.10	12.06	6	5.83
Hubei	36.9	4	8.30	12.23	5	6.39

source of information: collated based on *China Statistics Yearbook* and *Chongqing Statistics Yearbook*

Table 3: Regions with respect to production of sedan more than 100,000 nationwide in 2003

2003					Jan. – August, 2004	
ranking	regions	Production (10,000)	rate of increase %	proportion %	production (10,000)	rate of increase %
1	Shanghai	58.84	49.87	28.44	42.12	18.8
2	Jilin	35.07	54.56	16.95	25.63	13.1
3	Guangdong	18.33	106.88	8.86	16.48	50.1
4	Tianjing	17.25	82.73	8.34	13.85	16.9
5	Hubei	13.23	35.83	6.39	7.1	-6.9
6	Chongqing	12.06	77.88	5.83	10.86	41.2
7	Anhui	10.39	106.15	5.02	5.93	47.3
	nationwide	206.89	80.67	100.00	158.75	25.4

source of information: collated based on figures released by the National Statistics Bureau

Table 4: Top 6 regions with respect to production of motor truck nationwide in 2003

ranking	regions	production (10,000)	rate of increase %	proportion %
1	Beijing	23.85	64.26	20.62
2	Jilin	18.28	-11.05	15.80
3	Jiangxi	16.63	-15.11	14.38
4	Hubei	10.20	-24.28	8.82
5	Chongqing	8.64	0	7.47
6	Anhui	7.21	9.24	6.23
	nationwide	115.67	4.32	100.00

source of information: collated based on figures released by the National Statistics Bureau

Table 5: Regions with respect to production of motorcycle more than 1 million nationwide in 2003

2003					Jan. – August, 2004	
ranking	regions	production (10,000)	rate of increase %	proportion %	production (10,000)	rate of increase %
1	Chongqing	441.32	19.03	30.87	325.1	22.1
2	Guangdong	276.60	20.07	19.35	237.76	44.6
3	Zhejiang	161.68	15.02	11.31	111.62	11
4	Jiangshu	141.27	14.79	9.88	94.65	-4.8
5	Tianjin	114.79	37.65	8.03	64.96	21.6
	nationwide	1429.43	19.26	100.00	1048.94	22.2

source of information: collated based on figures released by the National Statistics Bureau

Of the biggest 6 motorcycle manufacturers in the country, there are 5 from Chongqing. In the first half of 2004, Jialin, Lifan, Jianshe, Zongshen, Loncin in Chongqing finished 2<sup>nd</sup>- 6<sup>th</sup> position with sales volume of 616,000, 502,000, 5101,000, 500,000, 495,000 respectively, merely following 738,000 with Guangdong Dachangjiang. In the first half of last year, sales volume for 5 motorcycle enterprises in Chongqing was 464,000, 344,000, 284,000, 349,000, 349,000 respectively, up 30%-plus over same period in the preceding year and even up to 76.41% on highest rate of construction (see Table 6).

Table 6: Top 6 enterprises with respect to sales volume of motorcycles nationwide in the first half of 2004

ranking	enterprise	production in the first half of 2003	production in the first half of 2004	up % over same period last year
1	Guangdong Dachangjiang		73.8	
2	Chongqing Jialin	46.6	61.6	32.19
3	Chongqing Lifan	34.4	50.2	45.93
4	Chongqing Jianshe	28.4	50.1	76.41
5	Chongqing Zongshen	34.9	50	43.27
6	Chongqing Loncin	34.9	49.5	41.83

source of information: collated based on figures released by China Auto Industrial Association

#### 1.1.2 Industrial basis of automobile and motorcycle accessory sector

In 2003, there were 356 state-owned automobile motorcycle and accessory enterprises and that above certain scale in Chongqing, with total staff of 115,000, total assets of 14.583 billion yuan, original value of fixed assets of 6.19 billion yuan, net value of fixed assets of 4.186 billion yuan, incomes

from sales of 14.747 billion yuan, industrial added value of 3.712 billion yuan, of which:

- There are 100 automobile accessory enterprises with total staff of 38,000, total amount of assets of 5.806 billion yuan, original value of fixed assets of 2.7 billion yuan, net value of fixed assets of 1.777 billion yuan, incomes from sales of 4.357 billion yuan, industrial added value of 1.416 billion yuan.
- There are 256 motorcycle accessory enterprises with total staff of 77,000, total amount of assets of 8.777 billion yuan, original value of fixed assets of 3.49 billion yuan, net value of fixed assets of 2.409 billion yuan, incomes from sales of 10.369 billion yuan, industrial added value of 2.296 billion yuan.

Plus enterprises below a certain scale, there are nearly 1000 motorcycle enterprises making auxiliary parts in Chongqing at present, most of which are individually-run enterprises operating in a flexible system and high marketization. Compared with other domestic enterprises in the sector, their advantages are highlighted as follows:

Firstly, engine and its accessory are sufficiently supplied by a couple of pillar enterprises with low cost of production. Especially, production of motorcycle engine accounts for over 50% of total in the whole country. Engine production and marketing from Lifan, Loncin, Zongshen rank top 3 nationwide.

Secondly, industrial environment where associated enterprises are concentrated has been properly formed, featured by complete in category of accessories and structure of system, which is shown in : (1) regarding engine in medium and small size displacement, well-developed technology, complete system of associated components, big scale of production, proper means of cost management, low price. (2) Components for engine, such as Yujiang crankcase, Yuyang crankshaft, Zhicheng cylinder end, Qiutian gear, Changjiang Izumi piston, Yingang cam shaft, Changxing clutch, take a leading position across the country in terms of scale of production. (3) We also have advantage on frame, oil tank, hub, electric appliance, which have taken majority of share of motorcycle electric appliance market. (4) We have possessed advanced equipments which reach the internationally advanced level of the end of 20<sup>th</sup> century, such as Jialin engine flexibility processing line, frame flexibility weld line, Zongshen engine flexibility machining line for cylinder shell and cylinder cover, Huaifu power metallurgy precision die-casting line, Changjiang bearing deep groove bearing production line.

Thirdly, strong in industrial foundation, abundant in technical staff and workforce resource, low in labor cost.

China has been internationally recognized as a country with most production of motorcycle in the world while Chongqing is granted the leading city in terms of making motorcycle in China. Currently, there are 30-plus engine components made in Chongqing which have been incorporated into relevant global systems from some Japanese firms, such as Honda, Yamaha. Thanks to advantageous ability to provide associated components, quite a few of entire auto makers as included in the catalogue such

as Ji'nan Qinqi Motorcycle Co., Ltd, Hubei Zhixi Motorcycle Co., Ltd, Neimeng Xinyuan Motorcycle Co., Ltd, Sichuan Richu Motorcycle Co., Ltd, Shanxi Yuanye Motorcycle Co., Ltd are attracted to relocate in Chongqing.

Enterprises and products in Chongqing automobile and motorcycle accessory manufacturing field with high market creditability are cummins engine made by Chongqing Heavy-Duty Vehicle Group Co., Ltd, ISUZU mould, forging, casting, seat made by Qinlin, Changjiang Izumi piston, ZF transmission and steering gear from Qijiang Gear Plant, Tokyo heat sink, Yazaki instrument, USA Lear, Chongqing Sanling Dakin clutch, Zhicheng cylinder end, Jieli hub, Qiutian gear, Yujiang die-casting, etc, which have been developed to well competed and subsequently enabled Chongqing to establish some advantages in micro vehicle, micro sedan, commercial vehicle, motorcycle, etc.

### 1.1.3 Ability to provide accessories for automobile and motorcycle

Chongqing automobile and motorcycle industry, complete in structure, has experienced development for many years and subsequently has taken initial shape for its accessory sector of co-existence of several associated system and strong competitive power in foundation.

- Associated system for heavy-duty vehicle: is created with import of steyr project and critical and heavy-duty components for heavy-duty vehicle are fabricated and provided in original Chongqing Heavy Vehicle Group. Currently, Chongqing Heavy Vehicle Group can produce 50,000 and ranks 4<sup>th</sup> position in domestic heavy-duty vehicle makers, with sales of 16106 in 2003, of which Hongyan Brand accounted for 81.41% and Steyr for 18.59%.
- Associated system for light-duty commercial vehicle: is formed with development of Qinlin and automobile manufacturer controls the holdings of associated enterprises producing critical and heavy-duty components and parts with highly added value. Qinlin has established 8 jointly-founded accessory enterprises in the country, 6 of which are holdings enterprises. In 2003, sales volume of light-duty motor truck made by Qinlin reached 29,000, ranking 7<sup>th</sup> position in the country and Qinlin is also one of 3 major makers in domestic luxury light-duty vehicle.
- Associated system for micro vehicle: is created with development of Chang'an. Every year, Chang'an Co. chooses at least 2 enterprises providing auxiliary components through tendering except for some critical and heavy-duty components. In 2003, sales volume of Chang'an micro vehicle exceeded 400,000, ranking 4<sup>th</sup> position in the country.
- Associated system for sedan: is developed with growth of Chang'an and is extended with further development of Chang'an Suzuki and Chang'an Ford. Chang'an started to produce micro sedan since 1992 for Auto only during initial stage and then imported Lingyang in 2000 in addition to founding of joint-venture with Ford, which demonstrated that Chang'an Co. accelerated the pace of producing new type of product and there are 4 platforms working simultaneously for sedan production. In 2003, sales volume with Chang'an Suzuki ranked 7<sup>th</sup> position among domestic sedan makers. In 2003, Fiesta made by Chang'an Ford was officially unveiled, followed by

Mondeo and subsequently attracted a great number of automobile accessory manufacturers to invest in Automobile Industrial Park located in Chongqing New North Zone, including some internationally renowned accessory manufacturers. In August 2003, motorcycle enterprise—Lifan, started operation of automobile business by merging Chongqing Special Automobile Manufacturing Plant and Lifan sedan is expected to be unveiled at the end of 2004, which will be the 1<sup>st</sup> sedan brand in Chongqing owning its own intellectual property right.

- Associated system for vehicles of special purpose: Chongqing Special Automobile Manufacturing Plant, together with Chongqing Dima and Chongqing Hongyan, are main special vehicle makers in Chongqing, producing insulated truck, refrigerated truck, cash-carrying van, police van, road curing truck, engineering heavy-duty truck and other types of special vehicles. After completion of technical innovation at the end of 2004, Dima Co. will be able to make all types of special vehicles for 3900, including overhead working vehicle, garbage disposal truck, etc.
- Associated system for motorcycle: is formed with development of Jialin and Jianshe motorcycles, 1<sup>st</sup> of the kind in the country. There are nearly 1000 accessory enterprises, complete in system, varied in category, low in price, taking initial shape with proportion of accessory provided being around 90% in urban regions.

Industrial concentration and industrial environment of Chongqing automobile and motorcycle accessory supported by above-mentioned associated systems are core competitive power difficult to be duplicated by other regions.

#### 1.1.4 Good quality and low cost of workforce

With advancement of economic development and popularity of 9-year compulsory education in Chongqing, much improvement has taken place on cultural education of local citizens. Census information shows that there are 19,437,000 people of labor age in Chongqing, of which there are 2,415,500 people finishing study in senior school or technical secondary school, 805,700 people with the background of college or higher, accounting for 12.4% and 4.1% respectively of labor age.

In 2003, there were employment staff of 17,263,600 in Chongqing, 2,984,200 people working in secondary industry, including 1,648,100 people in manufacturing sector. With light and heavy industries being developed simultaneously, complete in category, well-developed in manufacturing sector, Chongqing, a comprehensive old industrial city with robust foundation, has won attention of many enterprises in eastern coastal regions for recruitment of workforce with good quality here, in particular skilled industrial technical people.

Chongqing is situated at a juncture linking east and west where development relatively falls behind, resulting in vulnerable foundation of economy and cheap price of workforce. In 2003, workers and staff members in Chongqing earned a salary of 12,440 yuan at an average, ranking 16<sup>th</sup> position across the country, of which workers and staff members working in communication and

transportation equipment manufacturing sector earned a salary of 11,452 yuan at an average with all-personnel labor productivity being 58,786 yuan/man year. However, workforce price in eastern coastal regions is generally 1.5-2.5 times higher than that in Chongqing and average salary in developed countries is much higher than that in Chongqing by dozens of times. According to released salary instructive price for all positions in Chongqing for 2004, salary for high management staff varies from 1200-10,000 yuan; that for depart. manager and management staff from 750-3000 yuan; that for engineering staff from 900-3500 yuan; that for communication engineering technical staff from 800-1500 yuan; auto repair technician from 400-4500 yuan; that for auto driver from 800-2000 yuan; that for packing technician from 400-1000 yuan (more details are listed in an attachment: salary instructive price for some positions in Chongqing for 2004).

#### 1.1.5 Proper foundation in scientific research with ability in innovation

With strong strength of scientific and research education and concentrated talents, Chongqing possesses 1000-plus scientific research institutes, 33 institutions of higher learning, 620,000 scientific research staff. Particularly, Chongqing University, Chongqing Jiaotong University, Chongqing Institute of Technology, Chongqing Automobile Research Institute, Chongqing Highway Research Institute, the Third Design and Research Institute, Machinery Industry, No. 59 Institute of the Ministry of Arms, No. 22/No. 24/No.44 Institute of Ministry of Information and other scientific and research institutes and colleges of higher learning getting involved in research and development of automobile and electronics not only have developed to considerable strength and cultivated and reserved a great number of talents, but have the capability for innovation, benefiting research and development of new high-tech products.

#### 1.1.6 Infrastructures in good condition

A comprehensive transportation system has been properly established in Chongqing, supported by a combination of railway, road, waterway, aviation and pipeline and therefore, Chongqing becomes the biggest communication hub of water, land and air in the upper reaches of Yangtze River and in the southwestern regions. In the aspect of railway, there are Chenyu, Xiangyu, Chuanqian electrified railway arteries linking to railway network nationwide; in the aspect of road, there are 21 artery roads, 17 of which link Yu'nan, Guizhou, Sichuan, Hu'nan, Hubei, Shanxi to form a comprehensive road communication network accessible from all directions; in the aspect of air, Chongqing Jiangbei International Airport, the state key project, is being expanded and improved to internationally recognized airport standard; in the aspect of water, with reliance on golden Yangtze River waterway, build dozens of ports and jetties and start operation of river-sea combined business from Chongqing to overseas countries via Shanghai so that vessels of 3000te can constantly travel downstream towards overseas countries. After completion of Three Gorges project, a fleet of 10,000te can arrive at Chongqing upstream.

Chongqing, one of the loading centers in China's western grid, is abundant in output of coal and

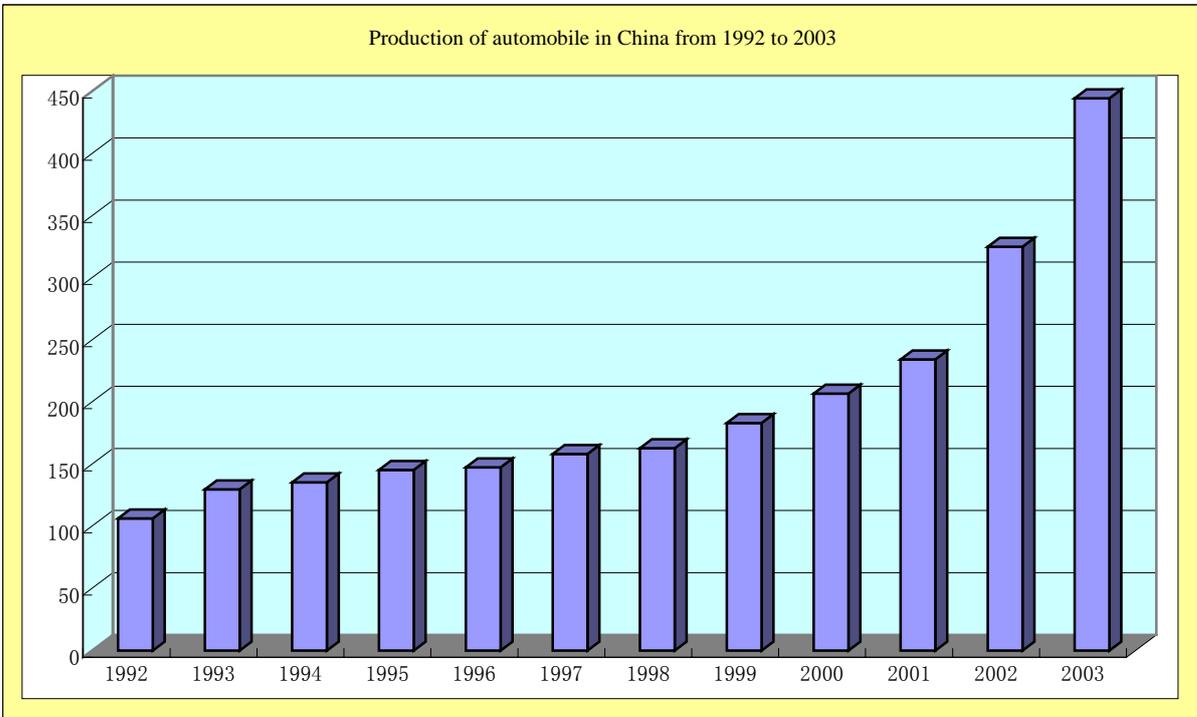
natural gas and subsequently well assured in energy supply. Located at junction of Yangtze River and Jialing River, Chongqing is proud of sufficient supply of water resources.

1.2 Potential for development of automobile and motorcycle accessory industry in Chongqing

1.2.1 China’s automobile and motorcycle industry entry into period of rapid increase

Over the past development in dozens of years, in particular rapid development in recent 10-plus years, China’s automobile industry has grown up from a small industry within mechanical industry in the past to one of the major sectors supporting the national economy and output of automobiles increased from 1.062 million in 1992 to 4.444 million in 2003 (see Chart 1). The proportion of automobile industry in the national economy as a whole are kept increasing. The proportion of automobile industrial added value in GDP was 0.83% in 1999, up to 1.55% in 2002 and even further to 1.71% in 2003.

Chart 1: Trend of development of automobile production in China from 1992 to 2003



source of information: made based on statistics from China Automobile Industrial Association

After new century, the automobile industry in China has entered a new stage of rapid growth and automobile production and marketing in 2002 witnessed a “blowout” with production of 3,251,000, up 38.8% over the preceding year; maintained rapid growth in 2003 with production of 4,443,700, up 36.7% over the preceding year.

In the first half of 2004, fueled by rapid increase of the national economy, automobile industrial economy was maintained at an increase rate of double-digit. Even though growing rate was not as high as that in the same period last year, automobile industry as a whole presented a momentum of healthy development with tuning in a rational manner. From Jan. to June, output of automobile

across the country totaled 2,677,100, up 27.1% over same period last year, of which 1,246,100 were sedan, up 36.37% over same period last year. Sales of automobile totaled 2,551,000, up 24.15%, of which 1,131,900 were sedan, up 31.59%. Production of motorcycle totaled 8,429,000 and sales of that arrived at 8,434,000, up 26.61% and 25.18% respectively over same period last year.

#### 1.2.2 Huge potential for demand for automobile and motorcycle accessories in Chinese markets

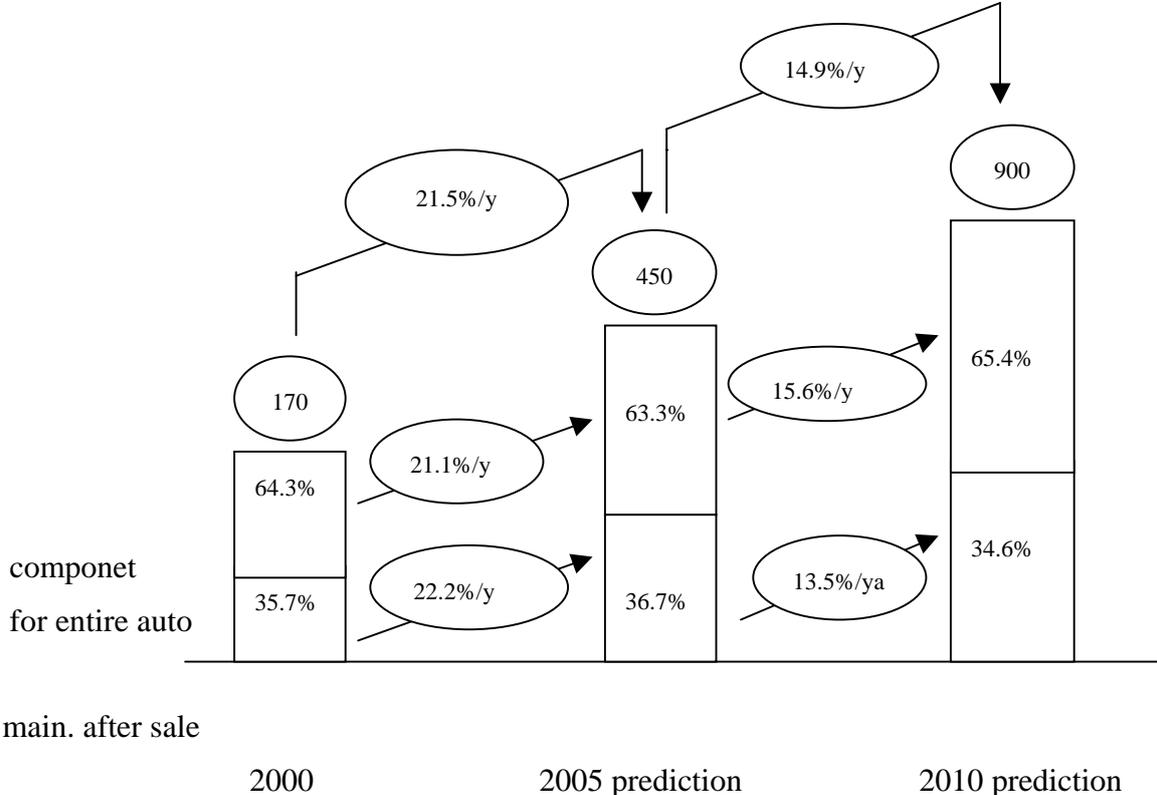
According to *Automobile Industry Development Policy* released by the National Development and Reform Commission, automobile industry will become a pillar industry in the national economy before 2010 and will make greater contribution to achieve the target of building a well-off society in an all-round way. Per capita in China has reached US\$ 1000 and that in coastal regions, total population of 3 billion, has exceeded US\$ 2000. According to evaluation standard for purchasing power issued by the World Bank, per capita GDP in China has far more than existing level, subsequently propelling China's automobile to advance to a growth stage of mass consumption. In a long period to come, automobile industry will be maintained at a momentum of rapid development, and in particular, household sedan, heavy-duty vehicle (mainly 10-15te), wagon truck, bus(especially microbus) will witness a rapid increase of market demand. Meanwhile, new type of vehicle and refitted type of vehicle will be in short supply while prices are coming down, getting close to international practice. Experts predict that based on development process of automobile industry in other countries in the world, the golden period for China's automobile development still has at least 20 years to go from a long-term perspective. In view of the fact that China's automobile is less concentrated, strategic restructuring is the only road for development of China's automobile industry. Through competition, some auto enterprises in inferior position in terms of scale, technology and cost will be eliminated from the market and China's automobile industry will be operating based on a couple of large-scale complexes with professional ability in technical research and development, seriation of products, rational division of labor, which eventually control the stake of majority of auto markets in the country. Motorcycle market will continue shrinking in southeast Asia and in the country as well, but will see a certain rising in domestic rural regions. The overall demand will present a slow rising move and market competition will be more fierce.

Experts predict that in 2005, demand for automobile in the country will reach 5.5-6 million, possession volume of 24-25.5 million, and annual demand for motorcycle will be 12-13 million, possession volume of 90-100 million; in 2010, demand for automobile in the country will reach 9-11 million, possession volume of 37.5-39 million, and annual demand for motorcycle will be 14-15 million, possession volume of 110-120 million.

With rising of no.s of entire automobiles, accessory market also will see a continuous increase. In 2000, sales volume in accessory markets across the country reached 170 billion yuan and it is expected that the volume of demand for accessory will move up to 450 billion yuan in 2005 with annual rate of increase of 21.5%, of which automobile accessory account for 63.3% with annual rate

of increase of 21.1%, service maintenance for 36.7% with annual rate of increase of 22.2%; by 2010 the volume of demand for accessory will surge to 900 billion yuan, of which automobile accessory account for 65.4% with annual rate of increase of 15.6%, service maintenance for 34.6% with annual rate of increase of 13.5% (see Chart 2)

Chart 2: Prediction of accessories in the markets across the country (unit: 1 billion yuan)



1.2.3 More procurement effected in Chinese markets by foreign automobile makers

Even though the volume of China’s automobile account for less than 5.5% worldwide, only following USA, Japan, Germany, the potential for the 4<sup>th</sup> biggest auto market looks to further increase by foreign international auto makers thanks to its total amount of population, sustained and rapid increase of the national economy. Therefore, with the pressure from nearly saturated market and increasingly fierce competition, foreign international firms come to establish manufacturing base and global procurement center in China or place focus of procurement in China while trying to secure the market shares in developed countries. According to experts, the cooperation of Sino-foreign automobile industry will experience 3 phases: in 1<sup>st</sup> phase, foreign corporations are attracted by China’s huge potential market and manage to incorporate China into their global sales systems; in the 2<sup>nd</sup> phase, after advantage about cost of workforce in China’s manufacturing sector is identified, they will build their production bases and components supply bases in China; in the 3<sup>rd</sup> phase, China will be incorporated into their global product development system so as to fully utilize technical human resources in China. Statistics show that international auto makers have effected more procurement in China. In 2002, GM procured components worth of US\$ 1.1 billion in China and will reach US\$ 10 in a next few years. Ford procured parts worth of US\$ 1 billion in China and

is expected to buy more valued US\$ 10 billion by 2010.

#### 1.2.4 Chongqing automobile and motorcycle industry accelerate pace of reform and opening to the outside world, establishing more diversified technical system

With economic development and advancement of Western Development Program, Chongqing will accelerate the pace of reform and opening to the outside world. Up to end of June, 2004, there were 3652 foreign-funded enterprises in Chongqing, with contractual amount of foreign capital of US\$ 6.456 billion and actual used amount of foreign capital of US\$ 3.534 billion. For Chongqing automobile and motorcycle industry, there are 117 foreign-funded enterprises with total amount of investment of US\$1.05531 billion, US\$278.42 million of which are from foreign capital, accounting for 26.4%. Quite a number of joint-ventures for production of entire automobile and components are founded, such as Jialing Honda, Jianshe Yamaha, Chang'an Suzuki, Chang'an Ford, Changjiang Izumi, Pinshan Taikai, Sanling Daking, Chang'an Lear, Exedy, Visteon, Minth, and seat, forging, casting, mould, technical center, axle, engine control system and driving system made in joint-venture by Qinling and Japanese ISUZU. Previously, the main technical system in Chongqing was imported from Japan, but recently Ford production line was imported, which makes diversified and improved technical system of Chongqing automobile and motorcycle.

#### 1.2.5 Chongqing is the biggest city in the western regions and offers more opportunities for development.

Chongqing is the 4<sup>th</sup> municipality directly under central government and the biggest city in western regions with a large amount of population, where people's living is going through a transition from food and clothing to well-off. A considerably great demand of consumption and investment will take place with implementation of Western Development Program, relocation of Three Gorges immigrants and urban factories and mines, construction of infrastructures in large scale, protection of ecological environment and treatment of pollution, technical innovation of the old industrial base, offering more opportunities of investment. Over recent years, Chongqing has spared no efforts in attracting investment. In 2000, the whole society completed a fixed assets investment of 65.58 billion yuan in Chongqing and this figure surged to 126.9 billion yuan in 2003, 66.5 billion yuan of which attributed to investment in capital construction. Based on division of 3 industries for investment in capital construction in 2003, there were 225, 884 and 2293 construction projects respectively and investment completed was 1.9 billion yuan, 17.8 billion yuan and 46.8 billion yuan respectively, of which there were 87 communication equipment manufacturing projects with investment of 1.29 billion yuan. In 2003 in Chongqing, total amount of social retail consumption goods reached 83.553 billion yuan and urban per capita disposable incomes were 8094 yuan, ranking 10<sup>th</sup> position in the country and 1<sup>st</sup> position in the western regions. Furthermore, radiation of Chongqing's effect on the southwestern regions as a whole can further expand the market space.

#### 1.2.6 Investment environment in Chongqing is being gradually improved.

After the municipality is formed, more efforts are input in Chongqing to improve investment environment and to speed up construction of hardware and soft environment and subsequently great changes have taken place. On one hand, a large amount of investment was utilized to speed up construction of urban infrastructures, such as railway, motorway, airport, waste water treatment plant, water works, garbage disposal plant, urban road, etc. At present, Chongqing is carrying out construction of motorway in 2 rings and with radiation in 8 directions and of railway in 1 ring and with radiation in 8 directions, which means that the proposed network is radiated towards the whole country, supported by 8 railways and 8 motorways with Chongqing in the center, generally there is a railway and motorway every 45°. In the whole country, it is only Chongqing that has 8 railways radiating towards the whole country and it is also only Chongqing that has 8 motorways radiating towards the whole country. On the other hand, construction of soft environment is strengthened in Chongqing where relevant regulations and policies are developed and improved. Focus One consultation service is applied to foreign investment in Chongqing and associated services with respect to medical advice of foreign investors, enrollment of their children, etc are properly made available. The latest research report issued by the World Bank, *Improvement of Investment Environment for Enhanced Competitive Power of the City: ranking of China's 23 cities in terms of Investment Environment*, shows, based on overall evaluation of combination of enterprise business performance, sales, labor productivity and rate of investment amount, etc, that Chongqing finish the 5<sup>th</sup> position in the country and 1<sup>st</sup> position in the western regions on urban investment environment and is scored A level on investment environment, of which 3 indicators—infrastructure, skill and technology, length of legal hearing by court are among the leading position.

### 1.3 Area of concerns with industry of accessories for automobile and motorcycle of Chongqing

#### 1.3.1 Small in size of enterprises, similar in system of providing accessories and fierce in market competition

The country's automobile accessory markets are artificially split into local regional market and group internal market, resulting in incomplete market competition, low level of concentration, poor scale merit of enterprise, unable to meet the requirement of producing entire automobile in commercial scale and with low cost. Furthermore, domestic accessory markets are constantly segregated from international markets and only experience low-level competition in the country, so enterprises' technical level and competitive power are difficult to be enhanced. Except a couple of large enterprises, majority of motorcycle accessory enterprises in Chongqing are commonly featured by small in size and similar in system of providing accessory, short of demand and fierce competition.

#### 1.3.2 Improvement required in technical level in enterprises and ability in research and development

In general, low technical input, vulnerability in professional level and research and development of product for China's accessory enterprises are hard to meet the requirement of making entire

automobile in systematic, synchronized and modularized manner. Small and all-inclusive and big and all-inclusive are commonly seen, hindering improvement of product with advanced technology and further expansion of product series.

Even though Chongqing motorcycle is the biggest in scale in the country, there are still areas of concerns with Chongqing accessory enterprises against other domestic sectors and developed regions overseas.

- Compared with Guangdong in terms of engine air gate, sealing element, appearance parts(panel and chrome treatment parts), Chongqing falls behind greatly in technical start point of accessory, manufacturing equipment level, product quality level. Taking appearance parts for example, process technique used in individually-run enterprises is not up to standard, resulting in poor quality of product while process and equipments in state-owned enterprises (such as No. 816 Plant) are advanced, able to produce good quality of product, but the cost is high and market is limited. Accessory manufacturers in Guangdong are dominated by Taiwan owners, mainly serving Dachangjiang, Wuyang Honda, common and luxury vehicles made by Sundiro Honda with accessories of good quality and high price, which has potential for further development.
- Compared with Zhejiang, Chongqing is slowdown in terms of development of auto body, manufacturing of die, replacement and remodeling of panel and is also in a disadvantageous position for quality and cost. Production of mould and panel has been taken shape in Zhejiang Taizhou Huangyan, where division of labor based on specialization takes place. Currently, 70% of panel for scooter are made there and delivered in modularized manner.
- Compared with foreign countries, motorcycle of large displacement made in Chongqing has a long way to go, in particularly design, research, development and manufacturing of engine of large displacement are nearly none in Chongqing.

### 1.3.3 Improvement required in awareness of enterprise brand

Due to historical reason, accessory enterprise directly under control of automobile maker and independent accessory enterprises in Chongqing are commonly lack of awareness of brand business and it is quite common that a same trademark is shared by accessory enterprises and automobile makers, which not only hinder the accessory enterprises' ability to fully expand product towards domestic and foreign markets, but result in market competition being carried out in a disorder manner. Recently, more and more enterprises have been aware of it and enhanced the awareness of enterprise brand business and protection of intellectual property rights.

### 1.3.4 High cost of transportation from inland

Automobile motorcycle and accessories are delivered at a higher cost from Chongqing, southwestern regions to eastern regions and foreign countries than from Guangdong, Zhejiang, Shanghai and other coastal regions.

In addition, on accession of WTO, Chinese government has deleted the measures of localization of

parts and components for automobile and motorcycle and also is committed not to impose restriction on import of parts for automobile assembly in the name of balancing foreign exchange and to reduce tariff and increase quota, etc, as well, which enable joint-venture of auto makers to use utilize more imported components, in particularly during initial stage of emergency of new product made by auto maker, causing quite a big proportion of imported components in automobile and impact to domestic accessory enterprises.

With no doubt, with increasingly expanded scale of automobile and motorcycle accessory and gradual improvement in market in Chongqing, above-mentioned concerns will be addressed in the course of development while impact from component import will not continue too long. From medium- and long-term perspective, scale of components locally made will be expanded, product quality and level be improved, advantages in price and short delivery, etc be exposed and identified.

## 2 Analysis of policy for automobile and motorcycle accessory industry

### 2.1 The state industrial policy and foreign investment policy

#### 2.1.1 the state industrial policy

In order to adapt to new situation from development of automobile industry and WTO accession, China's auto industrial policy experienced a number of adjustments over past few years with a couple of policies and regulations being promulgated and implemented, including:

- New edition of Auto Industrial Development Policy was put into effect as of June 1<sup>st</sup>, 2004. Compared with Auto Industrial Policy issued in 1004, some items against China's commitment on WTO are deleted in new policy, such as elimination of balance of foreign exchange, proportion of import substitution and export performance; reduction of administrative approval by a big margin, invigorating large enterprises while relaxing control over small ones; guiding enterprises to proceed in a healthy way based on regulations and technical specifications; encouraging development of product with our own intellectual property right by raising brand strategy, defining policy direction for development of enterprises on its own; guiding annexation and reorganization of existing auto enterprises to promote domestic enterprises/groups to become bigger and stronger. It is of great significance to strengthen law-based building of auto sector, to propel industrial restructuring and reorganization, to promote healthy development of the industry, to break up, expand consumption market to meet increasingly rising demand in the market. In practice, according to new auto industrial policy, China's auto accessory enterprise are required to follow the trend of development of international industry by actively taking parting in research and development of product in main auto makers and subsequently developing ability in systematic research and development in the field of key auto components. Foreign investors are encouraged to invest in the field of production of auto components so as to allow component enterprises with comparative advantage to be able to deliver components in

professional, commercial and modularized manner. “Procurement beforehand” or “synchronized development” has been already adopted in foreign auto industry, which means that during initial stage of development of automobile, component vendors have participated in development of components, ie. product being developed is tested, improved, assessed and put into production with entire automobile simultaneously, which make the intervals of research much shorter and also avoid competition in disorder.

- Upon approval from the State Council, *Administrative Rules Governing the Auto Financing Company* was promulgated by China Banking Regulatory Commission and put into effect as of October 3<sup>rd</sup>, 2003, which was an important move adopted by China to fulfill our commitment on WTO entry to regulate the business activities of the auto consumer credit services and to open the gate for foreign auto makers engaging in auto financing in China. Foreign capital’s entry into auto distribution channel predict that competition of China’s auto industry has been gradually expanded from production field to service trading field.
- Administrative Regulation on Recalling of Defective Auto was put into effect as of October 1<sup>st</sup>, 2004, which indicates that the state place a focus on auto quality and protection of legitimate rights and interests of consumers, and that China’s auto industry is fully becoming integrated into the global market.

#### 2.1.2 Commitment on WTO accession

On WTO accession, China’s commitments to auto tariff and opening of market were made as follows:

- Gradual reduction of auto tariff. According to Chinese government’s commitments, auto tariff was to be reduced since Jan. 1<sup>st</sup>, 2002 on a year-on-year basis and before July 1<sup>st</sup>, 2006, tariff rate of entire sedan will be declined to 25%, that of sedan components to 10.12%; that of entire bus to 22%, that of components to 10.49%; that of entire motor truck to 21.25%, that of components to 9.76%; that of entire special truck and its components to 10.95% and 9.76% respectively; that of entire motorcycle and its components to 42.14% and 11.5% respectively; that of semi-trailer and its components to 10%; that of 122 auto components to 10.4%.
- Gradual reduction of non-tariff. Since 2000, import quota for auto and key components, auto crane and chassis, motorcycle and key components will be increased by 15% respectively on a year-on-year basis and will be completely deleted before Jan. 1<sup>st</sup>, 2005. Import quota for auto tire will be increased by 15% on a year-on-year basis and will be deleted before Jan. 1<sup>st</sup>, 2005. Furthermore, list of auto and key products restricted by import quota would decline every year since 2001 and will be fully deleted before 2005.
- Gradual opening of auto service market. During 3 years’ transition period, gradually relax trade weight; gradually relax brokerage on commission, wholesale, retail, franchised business. Within 5 years, delete share ratio restriction applied to more than 30 branches, gradually relax control

over auto auxiliary distribution services, etc; allow non-financial institutes from foreign capital to engage in auto consumer service industry; gradually relax control over communication service, maintenance service, freight service on agency, etc.

### 2.1.3 Industrial policy for foreign investment

Now, China, one of the countries able to attract foreign direct investment to the ultimate extent, will make available more opportunities for investors at home and abroad, with sustainable and stable growth of China's national economy, strategic restructuring of the economy, deepening of opening to the outside world for service industry, encouragement of development of hi-tech sector, advancement of Western Development Program, implementation of strategy of revitalizing the old industrial bases in northeastern regions and speeding up of restructuring and reorganization of state-owned enterprises.

In recent years, the strategy that centers on auto export to Chinese market is shifted by every international auto maker in the world to the strategy that decide to make and sell auto in China directly. Thanks to the advantage of easily following trend of local market, low cost, convenient service due to indigenous supply of raw material and component, while establishing improved supporting system for local product and making full use of local resources, it is an inevitable demand by foreign investors investing in enterprise to ensure long-term stable development of enterprise by extending industrial chain for improvement of production, delivery efficiency and reduction of cost and also an inevitable choice for foreign investors investing in enterprise to adapt to fierce competition and swift change in international markets. With development of entire auto manufacturing industry, auto component industry will become a key field attracting foreign investment. Statistics from Ministry of Commerce show that up to end of 2002, there were totally 1256 foreign-funded enterprises engaging in auto industry in China with attracting contractual foreign capital of US\$ 4.668 billion and actual use of foreign capital of US\$ 4.474 billion; in 2003, rapid increase took place by approving founding of 865 new foreign-funded enterprises in the year, up 49.65% over the same period last year, nearly equal to 2/3 of accumulative total no.s from 1983-2002; contractual foreign capital of US\$ 4.14 billion, up 142.48% over the same period last year, equal to 90% of accumulative total no.s; actual use of foreign capital of US\$ 2.003 billion, up 62.92% over the same period last year, equal to half of accumulative total no.s.

In the near future, Chinese government will continue to encourage and support foreign investors to invest in auto and motorcycle supporting industry and to build supporting base aimed at the whole world; continue to encourage international accessory enterprises to put more efforts in research and development of product in China by establishing product research and development center; continue to encourage foreign-funded enterprises to utilize import substitution of raw materials in an attempt to propel expansion of cooperation with domestic enterprises of medium and small size, to introduce advanced practical technology, to supply components for large-scaled foreign-funded enterprises and

to get access to international corporations' global production, sales network.

In order to follow economic development and new conditions on WTO accession, Chinese government actively encouraged foreign investors for investment in the field of auto and motorcycle and their components in China by revising *Instruction Catalogue of Foreign Investment Industry* in 2002. According to new issue of *Instruction Catalogue of Foreign Investment Industry*, included in auto and motorcycle industry for encouragement are:

- design and manufacturing of auto, motorcycle mould (die, injection mould, die stamping mould, etc), clamp(clamp for welding, clamp for inspection, etc);
- manufacturing of founding castings for auto and motorcycle;
- manufacturing of entire auto and motorcycle with foreign capital not more than 50%;
- manufacturing of auto and motorcycle engine: as a commitment made on entry into WTO, China has eliminated the restriction that proportion of foreign capital in engine-made joint-venture should not be more than 50%, instead foreign investors are allowed to take bigger share or exclusively foreign-owned enterprises;
- manufacturing of critical auto components: brake assembly, axle assembly, transmission, fuel pump for diesel engine, turbocharger for diesel engine, external emission controls for diesel-fueled truck, strainer(3-filter), constant velocity universal joint, shock absorber, combination instrument, special fastener of high strength;
- Manufacturing of electronic fuel injection system, electronic anti-lock braking system, SRS and other auto electronic equipment systems; manufacturing of critical components for motorcycle: carburetor, magneto, starting dynamo, disc brake.

#### 2.1.4 Other preferential policies

According to *Catalogue of Advantageous Industry for Foreign Investment in the Middle and Western Regions* updated in 2004, auto components manufacture are among the catalogue by Chongqing. The following preferential policies are applied to foreign-funded enterprises which are founded in the middle and western regions and among the category of encouragement by the state: foreign invested productive enterprises, under a business license of ten years or upwards, will be exempt from corporate income tax for two successive years starting from the first year in profit, and liable for 50% of the normal rate for the following three years (“two-year’s exemption and three-year’s half”); After the expiration of the stipulated corporate income tax exemption and reduction period, if enterprises of advanced technology type funded by foreign investment is still categorized that of advanced technology type, then they are still entitled to 50% cut for another 3 years. During this 3 years, if the enterprises are confirmed to be export-oriented enterprises with its export value taking up more than 70% of the total output value of the year, they are liable for 50% cut of corporate tax income based on tax rate stipulated by the Tax Law, but not lower than 10% after 50% cut.

## 2.2 Regional industrial policy and preferentials

### 2.2.1 Regional industrial policy

As a pillar industry in Chongqing, Auto and motorcycle industry are among the top agenda of 4 key industries to be developed in priority in Chongqing. According to *Decision on Promoting Advancement of New Type of industrialization Made by Chongqing CPC Municipal Committee* issued on June 30<sup>th</sup>, 2004, development of auto and motorcycle industry will be accelerated in Chongqing.

- Making auto and motorcycle industry bigger and stronger. Follow the pace of modern auto industry by consolidating foundation of auto component, enhancing ability of self-research, developing diversified composition of capital, founding (group) enterprise, running business in commercial operation manner, internationalization of product market. Continue to combine technology import with self-innovation, to establish research and service platform for auto technology, to build auto and motorcycle inspection center and comprehensive test field with leading level in the country. Based on pillar enterprises or groups, by enhancing international cooperation and adjusting and optimizing resources in the sector, build and create “China Auto Town” combining manufacture, research, trade and service with integration of colleges of higher learning and scientific research institutes in an attempt to reach a production capacity of entire auto for 1 million before 2007 and 1.5 million before 2010, taking market share of 15% in the country. Propelled by entire auto, system, assembly, develop a great number of component enterprises and build a production base of auto components aimed at the global market.
- Help conversion of motorcycle from “type of expansion in quantity” to “type of quality benefits” to form a complete ability in research and development of entire auto, engine and component. Main model of auto is expected to reach internationally advanced level at end of the 20<sup>th</sup> century and some products to reach international level of that time. Create 3-5 internationally renowned brands and build a “Motorcycle Capital” with the largest in size, the best capability in component supply, the most advanced in technology. 2007 will witness 7 million of motorcycles in production and marketing, 2010 saw 9 million and entire unit will take a market share of 50% in the country and export of entire unit will account for 60% of total in the country.

Furthermore, *Auto and Motorcycle Industrial Development Plan* issued by Chongqing government pointed out, based on production of components from 3 major pillar enterprises—Chang’an, Qinling, and Chongqing Heavy Vehicle Group, to strengthen the advantage in high-duty and micro truck, to expand 2 categories of products—sedan and heavy-duty truck, to foster in industrial base aimed at special and particular purpose truck; that equipment level of auto production enterprises be in line with that of auto industry in the world; to create an internationally recognized “Motorcycle Capital” in Chongqing with large in scale, excellent in quality, advanced in technology.

To the end, Chongqing government pointed out, in order to follow the development strategy applied by international corporations to China, to establish, perfect and expand technological research

institutes for cooperation with international corporations in more fields so as to help upgrade Chongqing auto industry to an all-inclusive industry combining manufacture, technological research, trading service and to enhance support to development of economy in Chongqing.

### 2.2.2 Other regional policies

In addition to the same preferential policy as applied to local enterprises, foreign-funded enterprises also are liable to other preferential policies promulgated by central government and Chongqing government to encourage foreign investment. Also Chongqing Economic and Technological Development Zone and Chongqing High-tech Industrial Development Zone at the state level offer more preferential terms. Supported by Economic and Technological Development Zone at the state level, Chongqing government build another new development zone in the north, including export processing park, environmental protection park, auto industrial park. Chang'an Ford and other quite a number of auto component enterprises are just accommodated in the auto industrial park.

Regarding auto industry under development in priority in Chongqing, municipal government pays high attention by establishing robust assurance mechanism in place. Chongqing auto industry steering team was formed in March, 2004, led by the mayor, including 3 vice-mayors as vice team leaders and main chiefs of municipal departments concerned, which holds a meeting every half year to address areas of concerns with auto industry development. Furthermore, Chongqing municipal government provide "Focus One Type" consultation service to foreign-funded enterprises in an attempt to improve department management level, work efficiency and service awareness, all of which provide an essential assurance and confidence for healthy development of auto industry in Chongqing.

## 3 Area of investment in priority for automobile and motorcycle sectors in Chongqing and proposal for investment

### 3.1 Area of investment in priority

#### 3.1.1 Area of investment in priority for automobile accessory in Chongqing

##### 3.1.1.1 Viewed from industrial competitive power of key automobile accessory

According to quantitative analysis on competitive power of 60 key auto components made by Chongqing department concerned, there are 3 categories from the results as follows:

- components with strong competition, mainly material-intensive, labor-intensive or not suitable for long-distance transportation, those are used for imported auto or exported auto in commercial manner, totaling 33 and accounting for 20% of manufacturing cost of entire auto;
- components with competitive power close to international equivalent, those are mainly used for imported auto in commercial manner, affecting key assembly of entire auto performance and system components, which could be advantageous products through efforts, totaling 19 and accounting for 20% of manufacturing cost of entire auto;

- Components with weak competitive power, those are mainly completely new products or there is still a gap in the country, but potential market-demanding high-tech components, totaling 5 and accounting for 15% of manufacturing cost of entire auto.
- There are other products against direction of development, needing elimination, totaling 3. See following table for details and for reference.

Table 7: List of development of automobile accessories in priority in Chongqing

competitive power	List of products in priority
strong competition	Izumi piston , Changjiang bearing, lighting fitting, Yuqiang injection, Qinling axle, die, forging, casting, tire, casting blank, etc
medium competition	Sanling clutch, Jianshe auto A/C compressor, Qijiang gear case, micro truck engine, motorcycle engine, Hongyu brake, Qingling panel, seat, carriage, etc.
potential for development	lean-burn device, CNG combustion device, ABS, Qinshan electronic automatic transmission

Analysis above shows the direction of development and investment trend for accessory industry in Chongqing:

- For products with strong competition, continue to give full play to their comparative advantages by expanding investment and operating in commercial manner. Fully support labor-intensive components with a large demand in international maintenance markets, such as non-asbestos friction material, brake disc and drum, etc, and take an active part in the international division of labor by expanding export.
- For auto assembly components for use with imported auto, which competitive power is getting close to international level, we should strengthen international cooperation by digesting introduced technology for an improved ability in research and development and meanwhile create a number of component enterprises or groups with self-ability in development and systematic delivery to suit the requirement of synchronized development for component and entire auto to enter into international associated system as quickly as possible while meeting domestic demand.
- For high-tech mechanical and electronic integration products with weak competition now but potential for development, such as EFI, ABS, we should gear up for more investment by establishing JV and introducing technology to catch up with internationally advanced level so as to propel development of high-tech auto electronic technology in Chongqing.
- For typical and technically complex components with small usage but big size of economic

batch, such as rubber gasket, etc, those could be procured directly from other countries in short term and we also could attract foreign investment from medium- and long-term point of view.

#### 3.1.1.2 Viewed from focus of development of automobile industry in Chongqing

Development of Chongqing auto and motorcycle industry is designed to build Chongqing auto industry to an all-inclusive industry combining manufacture, technological research, trading service and to enhance support to development of economy in Chongqing. Priority should be given to 2 focuses, ie. forge ahead with building of 2 industrial clusters, promote upgrading of industrial structure of Chongqing in a massive way centering on development of minibus(below 9 seats), commercial auto(sedan, micro bus, medium-duty and heavy-duty truck); spare no efforts to propel building of component and refitted auto industrial clusters.

To the end, enterprises of different ownership, including individually-run and foreign-funded enterprises in Chongqing are encouraged to get involved in auto industry to help a great number of motorcycle component enterprises to enter into auto component production field, playing a robust foundation for development of auto industry of Chongqing. In general, with sedan, motorcycle and heavy-duty being placed at focus and component as base, investment in following fields are greatly welcomed:

- commercial auto is shifted to heavy-duty truck in an attempt to take a leading position in high-tech heavy-duty truck;
- enrich sedan category for more market shares in an attempt to reach 10%-plus in the country;
- increase motorcycle to a higher level in an attempt to keep existing 30% market share in the country;
- Cultivate a number of component “giants” aimed at the country as a whole in an attempt to be incorporated in system of component procurement set by international corporations.

#### 3.1.2 Area of investment in priority for motorcycle accessories in Chongqing

The investment promotion work for Chongqing motorcycle component will be progressed with clearly defined objective, focus and aim, only centering in Chongqing motorcycle industrial policy and existing competitive power. According to competition advantage and disadvantage of Chongqing motorcycle component industry, the key field for investment in the future will concentrate on die, panel, axle, electric plating, airtight packing, digital instrument and other process and components in gap and engine of large displacement.

Motorcycle industry plays a decisive role in Chongqing, which has developed to a full marketization stage. But due to the same supporting system and vulnerability in scientific and research ability, redundant construction for same type of products are commonly seen. In order to address the existing concerns with Chongqing motorcycle industry for long-term healthy development, we should attract

more foreign investment to resolve urgent technical problems in the sector based on current condition so as to bring technical level in the sector to a higher level.

See table below for details on direction of development of key technology for motorcycle in Chongqing

Table 8: Direction of development of key technology for motorcycle in Chongqing

No.	technical direction	technical terms	description	target for development
1	research and development technology for entire auto	analysis technology for design of frame of entire auto	frame CAE analysis technology, including 3-dimensional model building method, synchronized design technology, collision simulation technology, analysis technology of frame dynamics, etc	Use CAE analysis technology to carry out overall analysis of strength, rigidity of frame and dynamic property of entire auto.
2		matching technology of entire auto	matching technology of engine and frame, dynamic matching technology, etc	form corresponding theoretical model able to guide design and test, to improve efficiency and dynamics for economy and reduction of vibration noise.
3		analysis technology of test of entire auto	test technology of dynamic test for frame	
			test technology of road simulation for entire auto and frame	able to test durability of entire auto and frame and prediction of life, able to partially substitute road durability test for entire auto in order to shorten development interval.

No.	technical direction	technical terms	description	target for development
			frame virtual test technology	Develop a frame virtual test system and test criteria used for development of frame for entire auto makers and component makers.
4	research and development technology for engine	multiple-cylinder , multiple-gate and large displacement technology	arrangement of structure for multiple-cylinder, multiple-gate engine, airway design and flow field inside cylinder and dynamic analysis, design of engine of large displacement	form multiple-cylinder, multiple-gate technology of Chongqing's characteristics, able to develop large displacement engine bigger than 400ml on our own.
5		cooling technology	research of water cooling technology and oil cooling technology	improve engine dynamics, reduce thermal load, extend use life, reduce oil consumption and noise, enhance proportion of water/oil cooling engine
6		combustion technology	1、lean-burn technology 2、layer combustion technology 3、activated group(AR) combustion technology 4、Optimization technology for airway, combustion chamber, porting system, fuel oil system	Keep updated of the technology and commercialize scientific and technological results, enabling Chongqing motorcycle to be in better performance than domestic product of same displacement and lower emission than regulation at the time.

No.	technical direction	technical terms	description	target for development
7		engine dynamic test technology	AC dynamometer system, road resistance simulation, automatic drive system, test software	Simulate drive condition on engine test platform to test dynamics, economy for expected separation of engine development and entire auto.
8	safety, environmental protection technology	vibration and noise control technology	structure analysis, modal analysis, dynamic test and shock absorb technology	Greatly improve ability to control vibration and analyze test. Extend life of component by reducing vibration and enhance comfortability.
			noise reduction technology for engine combustion noise, porting noise, mechanical noise, tire noise and other source of noise	Develop analysis method for motorcycle noise, establish corresponding test detection device, to be utilized in development of new products
9		emission control technology	secondary air inflow re-combustion technology, oxidization catalyzed technology, electric injection technology, two-stroke separation lubrication	Commercialize production on the condition that emission has met latest national standard and emission regulations from main export countries.
10		( ABS ) Anti-lock braking system(ABS)	Develop motorcycle electronic ABS control system, including development of control system, road data collection of all kinds of adhesion factors, etc.	Have key core technology in our hands and apply to main models of motorcycle.

No.	technical direction	technical terms	description	target for development
11	new energy new material new process	battery-operated motorcycle	design technology of entire auto, development of drive system, electrical motor, battery charging device, high energy battery, energy management system, etc.	Develop practical battery-operated motorcycle to take quite a big market share of motorcycle.
12		alternative fuel motorcycle	study of combustion theory of alternative fuel, corrosion study of combustion product for alternative fuel, safety technology study of fuel storage	Develop alternative fuel motorcycle with emission meeting latest national standard, and with good dynamics and economy.
13		new material	1、high-strength material with light mass 2、environmental protection material 3、new sealing material	Expand application of new materials, improve reliability and environmental protection for access of low cost, high quality and excellent performance.
14		surface treatment technology	1、electric plating technology 2、painting technology	Enhance appearance quality grade and corrosive-resistance for lower cost to enable surface treatment technology to be leading position in the country.

3.2 Proposal on mode of investment of automobile and motorcycle accessory sectors in Chongqing

Currently, the way foreign businessmen invest in China vary from Sino-foreign joint ventures, cooperative businesses, exclusively foreign-owned enterprises, cooperative development,

compensatory trade, processing and fitting, international lease, technical transfer, loan, emerging, to BOT, etc. Foreign-funded auto and motorcycle component enterprises in Chongqing are allowed to establish in a diversified way based on feature of the sector, market demand and corporate intention, in principle that allowed by the state policy and benefiting development of auto and motorcycle component enterprise in Chongqing, including exclusively foreign-owned enterprises, Sino-foreign joint ventures, cooperative businesses, technical transfer, emerging, etc.

## Conclusion

Viewed from industrial basis of auto and motorcycle, industrial basis of component, ability to supply component, auto industry in Chongqing possesses a certain competition advantage in the country while motorcycle industry here takes a leading position across the country. Even though there are some concerns present, small in scale of enterprise, low in technology utilized, fierce in market competition, potential for further development is made available, in the light of development trend of auto and motorcycle in Chongqing and nationwide, in combination with professional quality of workforce, low price of workforce, well-developed scientific and research foundation and adequately established investment environment.

Auto component industry is a key sector under development in priority in Chongqing and in the country as a whole and also an important field to attract foreign investment. Therefore, there are quite a number of preferential policies available promulgated by the state and local government. Investing in Chongqing auto and motorcycle component sector will not only expand the sales locally, but expand the sales of component across the country through Chongqing, even enter into international market and eventually into component industrial system set by international corporations by making use of professional and appropriately priced local workforce.

China's sustainable and fast growth of economy becomes a magnet attracting more and more foreign investment. Chinese government and Chongqing municipal government are sparing no efforts in improving investment environment so as to create more comfortable condition for foreign investors. From here we see that it will be a prosperous future for investing in auto and motorcycle component industry in Chongqing.

Appendix 1: List of investment projects in priority for automobile and motorcycle accessory sectors in Chongqing

Appendix 2: Guide to automobile accessories supported in priority in Chongqing and key technologies

## Appendix 1: List of investment projects in priority for automobile and motorcycle accessory sectors in Chongqing

item	Name of project	owner of inviting investment	total amount of investment (10,000 yuan)	project profile	mode of cooperation	project contact	telephone
1	Engine rocker and EGK and EGR	Yibin Tiangong Co., Ltd	8000	Engine rocker with production capacity of 6 million sets every year and EGK and EGR	joint-venture or cooperative	Zhang Yongda	68256354
2	Built-in electric gasoline engine production line for automobile engine	Chongqing Haitong Automobile Gasoline Pump Plant	6500	Build a built-in electric gasoline production line for automobile engine with an annual capacity of 500,000 sets	joint-venture or cooperative	Zhang Xinhua	49831831
3	joint-venture or cooperative project on motorcycle engine	Loncin Group	4150	joint-venture or cooperative for motorcycle engine	joint-venture or cooperative	Chen Jiakun	68671819
4	Development of new product-automobile sealing strip	Chongqing Yifeng Co.	3154	Development of new product-automobile sealing strip	joint-venture or cooperative	Hou Kaili	63852493

5	Project on development of automobile gearbox	Chongqing Yunyang Crankshaft Plant	12000	develop an electric heating melting/forging furnace casting production line	joint-venture or cooperative	Liu Buyun	55159008
6	Mini bus G series engine camshaft project	Chang'an Automobile (Group) Co., Ltd	1080	develop a mini bus G series engine camshaft production line	joint-venture or cooperative	Shi Jin'gang	67591067
7	project on making magnesium alloy wheel hub	Chongqing Jieli wheel manufacturing Co., Ltd	16600	a capacity of 5 million auto wheel hubs every year	joint-venture or cooperative	Wu Qiang	68780315
8	project on production of auto precision forging	Chongqing Huajiang Machinery Plant	10056	develop an annual capacity of 9300te of precision forging for species of auto gear blank and 2000te of precision forging for species of auto gear shaft.	joint-venture or cooperative	Zhao Zhuguo	46323168
9	lead acid storage battery for motorcycle	Chongqing Wanguang Power Co., Ltd	4300	annual capacity of 2 million lead acid storage batteries for motorcycle	joint-venture or cooperative	Wen Ji'an	58965248

10	Industrialization of diaphragm spring clutch for light-duty automobile	Chongqing Huajun Electromechanical Manufacturing Co., Ltd	6000	an annual capacity of 600,000 sets of diaphragm spring clutch for light-duty automobile	joint-venture or cooperative	Ren Mengqing	61605050 68621616
11	paper-based friction material (for use with auto, motorcycle and engineering machinery)	Chongqing Huajun Electromechanical Manufacturing Co., Ltd	6000	12 million pieces of paper-based friction discs for use with motorcycle, auto and engineering machinery	joint-venture or cooperative	Ren Mengqing	61605050 68621616
12	diaphragm-type auto clutch	Qiaobei Machinery Industrial Co. in Shuangqiao District	5818	With an area of 36mu, build workshop building and purchase equipments	joint-venture or cooperative	Liu Zhujiang	43332142
13	technical innovation for annual capacity of 600,000 pieces of exhaust pipes and 2.4 million pieces of cylinders	Chongqing Kaishi Machinery Manufacturing Co., Ltd	6300	With an area of 40mu, build workshop building of 6000 m2.	joint-venture or cooperative	Qu Jinlian	43333877
14	production of auto	Chongqing	12300	annual capacity of 1 million mini	joint-venture	Wu	46323168

	wheels	Huajiang Machinery Plant		sedan wheels and 500,000 steel-aluminum texture wheels		Wenda	46738867
15	non-asbestos auto brake disc	Dian Jiang County Industrial Economic Technological Development Zone Management Committee	4600	annual capacity of 1 million sets of new type of non-asbestos brake discs	joint-venture or cooperative	Zhen Huaibin	74681551
16	asbestos auto brake disc	Chongqing Huayu Friction Material Co.	1100	annual capacity of 5 million sets of brake discs	joint-venture or cooperative	Chen Yutian	67994164 67990555
17	production system on automobile and motorcycle copper cable	Chongqing Pigeon Electric Wire and Cable Co., Ltd	15600	annual capacity of 10,000te of auto and motorcycle copper products and 400,000km of auto and motorcycle cables	joint-venture or cooperative	Li Chunlin	67607306 67110502
18	project on auto steering gear, safety guards, drive shaft assembly	Chongqing Changfeng Electric Equipment Plant	10000	build a production line with annual capacity of 100,000 sets of power-driven steering gears,	joint-venture or cooperative	Lin Zhuoyi, Fen Wei	47521373 47522485

				200,000 sets of steering gear of intermediate absorber type, 200,000 sets of drive shaft			
19	Automobile accessory project	Chongqing Chang'an Automobile Accessory Plant	3200	annual capacity of 250,000 sets of window regulators, 200,000 sets of steering intermediate and straight rails, 150,000 sets of seat ironware assemblies	joint-venture or cooperative	Bo Chaoyun	67592297 67592892
20	production line of auto ductile iron casting	Wangjiang Machinery General Plant	5000	with a capacity of 12,000te on spheroidal graphite casting	joint-venture or cooperative	Zhou Jifu, Yang Bo	67110500 67110502
21	Project on PLC integrated controller for garbage truck	Wuqiao Investment Promotion Office	3500	build workshop building of 3000 m2 and a production line of annual capacity of 10,000 PLC controllers	joint-venture or cooperative	He Bolin	58547115
22	motorcycle catalytic converter	Economic Commission under Fengdu County	8500	build a production line with annual capacity of 1.5 million motorcycle catalytic converters	joint-venture or cooperative	Wan Shuyuan, Liu Jian	70605292 70605372

23	vehicle air purifier system (VAPs)	Chongqing Jianshe Automobile A/C Co., Ltd	1017	build a production line with a capacity of 100-500,00	joint-venture or cooperative	Wang Jian	68810556-2859
24	project on 1.5 million pieces of chill alloyed iron camshaft	Chongqing Xiyuan Camshaft Co., Ltd	10000	build workshop building and purchase equipments	joint-venture or cooperative	Yu Shuzhou	49894093
25	expansion project on motorcycle cylinder block with an expected annual capacity of 1.5 million	Fulin Jinyin Motorcycle Co., Ltd	2575	a casting capacity of 1.5million cylinder blocks for all types of motorcycles	joint-venture or cooperative	Chen Zhenju	72108108

## Appendix 2: Guide to automobile accessories supported in priority in Chongqing and key technologies

### Auto body and key technologies

#### I 、 Auto body molding technology

- 1 Auto body modeling planning expert system;
- 2 Auto body virtual reality technology and development system;
- 3 Auto body model rapid manufacturing and molding reversal engineering development system;
- 4 Optimization of auto body pneumatic molding analysis and wind tunnel test technology;
- 5 Auto body man-machine engineering design technology;
- 6 Analysis of simulation of auto thermal comfort and test technology.

#### II 、 Auto body structure design technology

7. Auto body light weight technology;
8. Auto body structure safety design technology;
9. Auto body anti-corrosion design technology;
10. Auto body sealing structure design and sealing strip technology;
11. Auto body thermal insulation structure design and analytic technology;
12. Compartment vibration noise control technology;
13. Auto body structure test system.

#### III 、 Auto body manufacturing technology

14. Digital die mould face design expert system—auto body computer-aided molding, face design of knowledge-based layout expert, die face reversal engineering;
15. Digital die mould process expert system—auto body panel partitioning technology, auto body computer main model technology, auto body stamping process analysis;
16. Digital die forming analytic expert system—auto body stamping simulation analysis, stamping product quality certification, optimization of trial die and stamping process;
17. Digital die structure design expert system—mould structure design and analysis, mould computer 3-dimensional entity design, optimization of mould structure;
18. Digital die manufacturing expert system—supervision of digital die trial mould, acceptance of trial mould, auto body panel assembly simulation analysis technology, sub-assembly of complete auto and general assembly analysis;
19. Digital die stamping expert system—commissioning and certification of stamping production line, acceptance process for die stamp, acceptance process for stamping parts;
20. Design of auto body made of aluminum alloy, magnesium alloy, composite material and manufacturing technology;
21. Rapid manufacturing system for sample auto body: simple manufacturing of die stamp and clamping fixture and rapid detection system.

#### IV 、 Auto body accessories and key technologies

22. Auto seat and key technology;
23. Air bag and key technology;
24. Auto intelligent air condition(IAC) technology;
25. Auto intelligent electronic instruments and panel modeling technology;
26. Auto interior decoration and key technology;
27. Research of technology on matching of auto passengers protection and associated constraint system.

#### Auto engine and key technologies

##### I 、 Gasoline engine and key technologies

28. Development of cylinder internal direct injection engine
29. Injection system of direct injected fuel oil and key technology (lean combustion technology, design of oil injector, analysis of property of direct injection combustion emission, technology of injection in sequence for multiple points at closed loop control inlet.
30. Controlled turbine pressurized plant and development technology;
31. Variable intake, variable valve, variable valve timing system and key technology (including VTEC(variable timing electronic control) technology, VTC (variable timing control) technology);
32. Electronic controlled ignition system development;
33. Research of property of engine with direct injection combustion emission

##### II 、 Diesel engine and key technologies

34. Development of diesel engine in direction injection;
35. Development of intercooled diesel engine;
36. Spiral intake and CFD analysis;
37. HP common rail technology;
38. Design of injection pump and injector;
39. Design and analysis of combustion chamber;
40. Diesel engine particle filter DPF;
41. Heavy-duty diesel engine air/fuel ratio and control of injection amount and optimization design.

##### III 、 Engine generality technology

42. Engine digital prototype technology (CFD analysis technology, finite element analysis technology, mechanism dynamics analysis technology, reliability analysis technology, rapid molding technology, engine thermal energy management technology);
43. Exhaust gas recirculation(EGR) technology;
44. Development of LPG auto electronic injection program;
45. Cylinder body, Cylinder cover (including cylinder body and cylinder cover made of aluminum alloy and aluminum-magnesium
46. Casting/forging technology for engine accessories;
47. Admission gear and system elasticity design technology;

- 48. Short piston, piston ring and manufacturing technology;
- 49. Multiple air-gate technology;
- 50. Development of integrated startup engine;
- 51. Exhaust purification program;
- 52. Technology on engine vibration noise control (NVH);
- 53. Development of engine composite material accessories (oil tank, oil bottom case);
- 54. Copper heat sink and processing technology.

#### Auto chassis accessories and key technology

##### I 、 Transmission and key technology

- 55. Automated mechanical transmission (AMT) and key technology;
- 56. Automated transmission (AT) and key technology;
- 57. Continuously variable transmission (ICT, CVT) and key technology;
- 58. Technology of reduction of noise from mechanical transmission;
- 59. Development of MT and AMT clutches.

##### II 、 Auto braking and key technology

- 60. Development of hydraulic ABS program;
- 61. Development of pneumatic ABS program;
- 62. EBD electronic braking distribution system;
- 63. Technology of development on key accessories with braking system: braking pipe, vacuum booster, friction disc, braking caliper, booster pedal.

##### III 、 Auto suspension and key technologies

- 64. Variable damping (current variables, magnetic-current variables) shock absorber and development technology;
- 65. Development of active body control (ABC) system;
- 66. Air suspension and key technology.

##### IV 、 Steering gear and key technologies

- 67. Matching technology of steering system: mechanism, steering knuckle gear rod arm;
- 68. Development of electronic power steering (EPS) system;
- 69. Development of electronic hydraulic steering (EPHS) system;
- 70. Development of combination steering wheel

##### V 、 Axle and key technologies

- 71. Technology on reduction of noise of gear;
- 72. Gear manufacturing technology;
- 73. Axle housing and half rear axle manufacturing technology;
- 74. Development of combination bearings and manufacturing technology.

##### VI 、 Miscellaneous

- 75. Technology on constant-speed driving shaft;

76. Auto electric vortex retarder and key parts;

77. Auto hydraulic retarder and key parts.

Auto electronic control technology

78. Electronic chassis control system key technology: ABS control system, electronic power (hydraulic) steering system (EPHS、EPS), active body control system;

79. Electronic control system key accessory development: sensor, micro-processor (engine ECU), hydraulic control valve development;

80. Auto active collision-avoidance system and key accessories: truck-mounted radar, TPM(tire pressure monitor system), safety belt pretightening control ,etc;

81. Automated transmission (AMT、AT、CVT) control technology;

82. Auto intelligent air conditioner (IAC) control technology;

83. Auto lighting equipment and control technology;

84. Development of auto sensor in micromotion, multi-function and intelligence: crankshaft position sensor, camshaft position sensor, air throttle position sensor, and other variety of auto sensors for level, temperature, pressure, position, rpm, speed, accelerated speed, displacement;

85. Auto CAN bus development technology;

86. Auto starter, generator and integration technology;

87. Development of weakly mixing power auto electric motor;

88. Auto GPS navigation system;

89. Auto electronic anti-theft system;

90. Auto information system: auto traveling self-indication system, auto communication system, audio information system, auto entertainment equipment, internet system;

91. Development of electric controlled auto body accessories: remote-controlled lock, electric seat, electric back view mirror, defrost/demister devices, etc;

92. Development of auto electromagnetic compatibility- and radio interference-related elements;

Key technology of generality for auto accessories;

93. Auto vibration noise control technology;

94. Auto accessory dynamic monitor technology;

95. Development of auto accessory test equipment;

96. Auto CAD/CAE/CFD/CAM/RP technology;

97. Auto matching technology: chassis accessory matching technology, auto body and chassis matching technology;

98. Technology of reuse of auto material recovery;

99. Technology of light weight of auto accessory;

100. Auto new materials and application technology (high-strength steel plate, composite material, engineering plastic, aluminum alloy material, aluminum-magnesium alloy material).

Contact:

Investment Promotion Agency of Ministry  
of Commerce of PRC

Address: Fifth Floor, No.82 Dong  
Changan Avenue, Dongchen District,  
Beijing, China

Zip: 100747  
Tel: 0086-10-85226532  
0086-10-85226590  
Fax: 0086-10-85226529  
website: [www.fdi.gov.cn](http://www.fdi.gov.cn)

Chongqing Foreign Trade & Economic  
Relations Commission

Address: No. 65 Jianxin North Road,  
Chongqing, China

Zip: 400020  
Tel: 0086-23-89019455  
0086-23-89018014  
Fax: 0086-23-89019397  
Website: [www.ft.cq.cn](http://www.ft.cq.cn)

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