THE AUTOPARTS INDUSTRY
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Chapter I

Introduction
1. Introduction

1.1 Objective

The purpose of this document is to provide an overview of the domestic and international autoparts industry, as a tool to facilitate the identification of business opportunities for the industry in Mexico.

It includes a reference framework of the autoparts industry on a global level with information on production, sales, major trends, consumption, trade, investment and regulations, among other topics.

The document provides an overview of the domestic industry, focusing on market, trade, existing clusters, chambers and associations, programs, and the current legal framework. It also includes information aimed at identifying the opportunities to help project Mexico as a great destination for foreign investment and define its exporting potential.

1.2 Key Global Indicators 2011

Global production
1.208 trillion dollars

Autoparts share of the total manufacturing production worldwide
3%¹

Global consumption
1.175 trillion dollars

Production share by region 2011

14% North America¹
5% Latin America¹
16% European Union¹
6% Rest of the World¹
58% Asia Pacific¹

Global exports
818.181 billion dollars²

Global Imports
785.767 billion dollars²

1. Source: Global Insight
2. Source: Global Trade Atlas
1.3 Key for Indicators Mexico 2011

- **Production**: 67.989 billion dollars
- **Consumption**: 54.734 billion dollars
- **Foreign Direct Investment from the autoparts sector, 2006 - 2011**: 7.648 billion dollars
- **Number of jobs created**: 602,816 individuals
- **Mexican Exports**: $45.587 billion dollars
- **Mexican Imports**: 32.332 billion dollars

More than 1,100 autoparts manufacturing companies located in Chihuahua, Nuevo León, Coahuila, Tamaulipas, Baja California Norte, Sinaloa, Durango, Tlaxcala, State of Mexico, Morelos, Hidalgo, Federal District, Jalisco, Guanajuato, Querétaro, Aguascalientes and San Luis Potosí.

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3. Source: National Autoparts Industry (INA) and INEGI.
4. Source: Global Trade Atlas and Global Insight
5. Source: Deputy Director’s Office of the National Register of Foreign Direct Investment, Ministry of Economy.
6. Source: Monthly survey of the manufacturing industry, INEGI.
7. Source: Global Trade Atlas and INA
8. Source: INA.
Chapter II
Description of the Autoparts Industry
2. Description of the Autoparts Industry

The autoparts industry accounts for 3% of total production of the global manufacturing sector. The industry is very diverse, covering final consumer goods used to supply Original Equipment Manufacturers (OEMs) known also as automakers, and supplying the aftermarket or used car replacement.

It is organized into three levels of production:

**Tier 1**
Direct suppliers of OEMs. They develop components such as engine parts, steering and suspension systems, air conditioning systems, electronic components, etc.

**Tier 2**
Suppliers of Tier 1. They manufacture equipment and products used in the most advanced and specialized components of the automotive industry: forged and stamped parts, die casting, plastic parts, machined parts, etc.

**Tier 3**
They provide inputs and raw materials to Tier 2 manufacturers complying with the highest quality requirements of the automotive industry.

An essential element in the autoparts industry is the support processes to develop and manufacture components or parts that are included in the industry.

The following tables show the application of several processes used to manufacture various systems or components of the industry.

### Table 1. Autoparts manufacturing processes

<table>
<thead>
<tr>
<th>Suspension system</th>
<th>Body</th>
<th>Braking systems</th>
</tr>
</thead>
<tbody>
<tr>
<td>Machining</td>
<td>Die-cutting</td>
<td>Machining</td>
</tr>
<tr>
<td>Forging</td>
<td>Sheet Metal</td>
<td>Die-cutting</td>
</tr>
<tr>
<td>Welding</td>
<td>Electrostatic paint</td>
<td>Forging</td>
</tr>
<tr>
<td>Pressure injection</td>
<td>Surface treatment</td>
<td>Welding</td>
</tr>
<tr>
<td>Thermal treatment</td>
<td>Plastics</td>
<td>Sintering</td>
</tr>
<tr>
<td>Surface treatment</td>
<td>Welding</td>
<td>Thermal treatment</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Surface treatment</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Transmission system</th>
<th>Traction system</th>
<th>Cooling system</th>
</tr>
</thead>
<tbody>
<tr>
<td>Machining</td>
<td>Machining</td>
<td>Machining</td>
</tr>
<tr>
<td>Forging</td>
<td>Forging</td>
<td>Die-cutting</td>
</tr>
<tr>
<td>Die-cutting</td>
<td>Die-cutting</td>
<td>Sheet Metal</td>
</tr>
<tr>
<td>Pressure injection</td>
<td>Welding</td>
<td>Welding</td>
</tr>
<tr>
<td>Sintering</td>
<td>Pressure injection</td>
<td>Mechanic assembly</td>
</tr>
<tr>
<td>Mechanic assembly</td>
<td>Thermal treatment</td>
<td>Thermal treatment</td>
</tr>
<tr>
<td>Thermal treatment</td>
<td>Surface treatment</td>
<td>Surface treatment</td>
</tr>
<tr>
<td>Surface treatment</td>
<td></td>
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</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Steering system</th>
<th>Safety system</th>
<th>Electric and electronic components</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pressure injection</td>
<td>Machining</td>
<td>Machining</td>
</tr>
<tr>
<td>Mechanic assembly</td>
<td>Die-cutting</td>
<td>Die-cutting</td>
</tr>
<tr>
<td>Surface treatment</td>
<td>Mechanic assembly</td>
<td>Sheet Metal</td>
</tr>
<tr>
<td></td>
<td>Thermal treatment</td>
<td>Welding</td>
</tr>
<tr>
<td></td>
<td>Surface treatment</td>
<td>Mechanic assembly</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Thermal treatment</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Surface treatment</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Plastics</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Exhaust system</th>
<th>Rims and tires</th>
<th>Fuel consumption</th>
</tr>
</thead>
<tbody>
<tr>
<td>Machining</td>
<td>Machining</td>
<td>Machining</td>
</tr>
<tr>
<td>Die-cutting</td>
<td>Die-cutting</td>
<td>Extrusion</td>
</tr>
<tr>
<td>Welding</td>
<td>Sheet Metal</td>
<td>Sheet Metal</td>
</tr>
<tr>
<td>Pressure injection</td>
<td>Thermal treatment</td>
<td>Welding</td>
</tr>
<tr>
<td>Mechanic assembly</td>
<td>Surface treatment</td>
<td>Surface treatment</td>
</tr>
<tr>
<td>Thermal treatment</td>
<td>Die-cutting</td>
<td>Die-cutting</td>
</tr>
<tr>
<td>Surface treatment</td>
<td>Stamping</td>
<td>Stamping</td>
</tr>
<tr>
<td></td>
<td>Plastics</td>
<td>Plastics</td>
</tr>
</tbody>
</table>

Source: ProMexico.

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9. INEGI & Global Insight.
2.1 Supply Chain of the Automotive Industry

The supply chain of the automotive industry is based on companies which use/generate processes such as forging, machining, welding, etc., that supply material for all the production levels of the industry, to produce major and minor components that are in turn supplied to OEMs.

In addition, companies in charge of the different processes also supply components to the distributors of the aftermarket or spare parts segment, including spare parts or garage chains.

The following figure shows the structure of the automotive industry supply chain:

![Supply Chain of the Automotive Industry](Image)

Source: ProMexico.

2.2 Major Autoparts for Light Vehicles

Major components require a high degree of sophistication. The companies that produce them, base their production on advanced manufacturing, developed technology innovation and the lowest cost production. Some of these components are:

- Pumps
- Main harness
- Crowns and pinions
- Safety systems
- Bodies
- Suspensions
- Air bags
- Crankshafts
- AC systems
- Radiators
- Compressors
- Injection systems
- Catalyzers
- Alternators
- Indicators
- Sensors
- Gears
- Dashboards
- Power windows/Windshield wipers
- Audio
- Video/Multimedia
- Tires
- Rims
- Transmissions
- Braking systems

2.3 Minor Autoparts for Light Vehicles

The production of small components does not require a high degree of sophistication; the manufacturing process is basic and requires a minimum of technology integration. The same as major parts, these components comply with high quality standards warranting the quality of the product. Some of these components are:

- Oil sump
- Engine valves
- Tank caps
- Hubs
- Pins
- Rises
- Clamps
- Spark plugs
- Tracks
- Joints
- Air filters
- Washers
- Pistons
- Gas tanks
- Torque rod
- Accessories
- Hoses
- Forks
- Disc/drum brakes

Tiers

- T2: Minor Components
- T1: Major Components

Processes

- After Market
- Major Components
- Minor Components

Garage chains

Spare parts chain stores

OEMs
Chapter III

Global Overview
3. Global Overview

3.1 Segmentation by Line of Business

Production of the autoparts industry is mainly destined to the OEMs, but also to the aftermarket.

The OEMs design, develop and manufacture light and heavy vehicles (light commercial vehicles, buses and trucks).

The aftermarket industry has the following structure:

1. Parts used to repair crashed cars.
2. Wear parts.
3. Mechanical parts.
4. Equipment and accessories.
5. Spare parts.

Graph 1. Aftermarket structure, 2010

3.2 Global Autoparts Production

In 2011, global autoparts production reached 1.208 trillion dollars, Asia Pacific represents the largest share with 58%, followed by the European Union and North America. Global production is expected to increase at an annual average rate of 7% between 2012 and 2020. Latin America is expected to record the highest growth rate of all regions, with 9%.10

China and Japan are among the leading autoparts manufacturers.11 It is important to note that China will continue to consolidate as the leading producer in the industry in the next ten years, however, Japanese autoparts production will fall considerably, opening opportunities for countries as Mexico, Brazil and South Korea.10

Table 2. Global production

<table>
<thead>
<tr>
<th>Region</th>
<th>Production 2011 (million of dollars)</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Asia Pacific</td>
<td>697,507</td>
<td>58%</td>
</tr>
<tr>
<td>European Union</td>
<td>199,280</td>
<td>16%</td>
</tr>
<tr>
<td>North America</td>
<td>173,174</td>
<td>14%</td>
</tr>
<tr>
<td>Other</td>
<td>60,125</td>
<td>5%</td>
</tr>
<tr>
<td>Latin America</td>
<td>78,181</td>
<td>6%</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>1,208,267</strong></td>
<td>100%</td>
</tr>
</tbody>
</table>

Source: Global Insight & INEGI

Graph 2. Production share by country, 2011

10. INEGI and Global Insight
11. The analysis includes the following countries: Mexico, Canada, United States, Germany, France, China, Japan, South Korea and Brazil.
3.2.1 Global Consumption

In 2011, global autoparts consumption reached a total value of 1.175 trillion dollars\(^{12}\). China was the country with the highest consumption with 288.552 billion dollars.

**Graph 3. Consumption by country, 2011 (millions of dollars)**

![Graph showing consumption by country, 2011]

Source: Global Trade Atlas & Global Insight

3.2.2 Global Trade

Global exports for the sector reached a total of 818.181 billion dollars in 2011\(^{13}\). Germany was the leading autoparts exporter globally, with a 15% share. It is worth noting that during the same year, the United States was the largest importer with 16% share.

**Table 3. Global trade 2011**

<table>
<thead>
<tr>
<th>Country</th>
<th>Exports 2011 (millions of dollars)</th>
<th>Imports 2011 (millions of dollars)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Germany</td>
<td>123,311</td>
<td>125,591</td>
</tr>
<tr>
<td>Japan</td>
<td>81,267</td>
<td>95,020</td>
</tr>
<tr>
<td>United States</td>
<td>81,005</td>
<td>45,511</td>
</tr>
<tr>
<td>China</td>
<td>66,828</td>
<td>41,104</td>
</tr>
<tr>
<td>Mexico</td>
<td>45,587</td>
<td>36,707</td>
</tr>
<tr>
<td>France</td>
<td>42,070</td>
<td>32,332</td>
</tr>
<tr>
<td>South Korea</td>
<td>37,181</td>
<td>20,621</td>
</tr>
<tr>
<td>Canada</td>
<td>20,132</td>
<td>15,161</td>
</tr>
<tr>
<td>Brazil</td>
<td>11,915</td>
<td>13,240</td>
</tr>
<tr>
<td>Rest of the world</td>
<td>308,885</td>
<td>360,480</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>818,181</td>
<td>785,767</td>
</tr>
</tbody>
</table>

Source: Global Trade Atlas, Global Insight & INA

3.3 Major Trends

Car manufacturing has become more and more competitive; the innovation of the automotive industry and the higher level of sophistication of the products that are manufactured, compel companies to improve processes and generate technology that fulfills the requirements of the OEMs. As a result, autoparts manufacturing has followed the same trend, and concerned about the development of the industry, companies focus on investing capital to ensure they have skilled staff and state-of-the-art machinery and equipment to supply automakers.

3.3.1 Supply Development and Local adaptation

In terms of supply, it is worth mentioning that global corporate offices of leading automakers are slowly beginning to delegate some autonomy to regional offices, in a search of more immediate inputs sources; companies' supply strategy involves not only inputs purchase orders or supply in the countries where they have their corporate offices, but it is also important to track local companies that can satisfy their requirements and which are located through contacts between regional offices and local supply chains.

The local adaptation is based on the quality of the industry's development in countries where the leading automakers operate, due to demands related to improvements in design and product innovation to integrate into their vehicles. The existence of design centers that develop technology innovation in manufacturing components and new components manufactured with specific quality standards demanded by the OEMs is, therefore, extremely important for autoparts manufacturing countries, and also enables them to maintain competitive advantages in automakers' supply chain.
3.3.2 Life Cycle Reduction of Automotive Models

Vehicles tend to innovate in terms of design, technology, prices, etc. Vehicle models show constant changes when faced with consumers’ new requirements. Generally the model of a vehicle changes completely every 3 or 4 years, directly affecting the autoparts industry because to a great extent the parts of the vehicle are replaced, forcing companies to change production lines.

The purpose of the changes made is to improve the design of the parts and materials used for their production, and companies must therefore constantly improve and offer the best product available.

3.3.3 Hybrid and Electric Cars

Concerns for the environment and fuel savings are the main reason for automakers to focus on supporting the development of hybrid and electric cars. Among the features of these vehicles are their low speed drive by means of gasoline or electric engines, silent engines, greater fuel performance, reduced pollutant emissions and gases.

Hybrid vehicles use electric engines that are compatible with fuel, diesel, hydrogen, natural gas or biofuels such as ethanol and its mixtures.

More and more automakers sell these cars. The production and sales of these cars are expected to increase over time, reducing the share of internal combustion fuel engine vehicles. That is why autoparts innovation must evolve to supply this new market.

3.3.4 Car Safety

According to the WHO (World Health Organization), every year more than 800 thousand people die in road accidents, making car safety systems essential. Technology development in these systems is increasing, and the integration of sensors, circuits and new designs can prevent traffic accidents. Automakers are constantly looking for new technologies to apply to the various systems involved in safety (steering, braking, electrical, etc.).

Car safety also refers to products and technologies to prevent car thefts (tracking and location systems and electronic immobilizers). This segment is very dynamic because innovation and the creation of new mechanisms can easily be introduced to the market with great acceptance from consumers.

3.3.5 Design of Cars with New Materials (lighter Cars)

Manufacturing lighter cars creates significant advantages in terms of safety and fuel savings. Replacing metallic materials with other more resistant ones, such as plastics or fibers derived from natural compounds, is a topic that interests engineers and scientists. The creation of new components increases, as autoparts manufacturers strive to build more sophisticated, flexible, resistant and rigid components for use in the automotive industry.

3.4 Leading Companies in the World

The leading companies in the autoparts industry (based on sales) come from the main car producing countries and have their corporate offices in countries such as the United States, Germany, Japan and France.

14. It is very important to mention that drugs and alcohol abuse by drivers is one of the main causes and represents a high percentage of the number of reported accidents.
Table 4. The top 100 autoparts companies in the world

<table>
<thead>
<tr>
<th>Rank</th>
<th>Company Name</th>
<th>Country</th>
<th>Region</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Denso Corp.</td>
<td>Japan</td>
<td>Japan</td>
</tr>
<tr>
<td>2</td>
<td>JTEKT Corp.</td>
<td>Japan</td>
<td>Japan</td>
</tr>
<tr>
<td>3</td>
<td>CIE Automotive S.A.</td>
<td>Spain</td>
<td>Spain</td>
</tr>
<tr>
<td>4</td>
<td>Robert Bosch</td>
<td>Germany</td>
<td>Germany</td>
</tr>
<tr>
<td>5</td>
<td>Magneti Marelli S.p.A.</td>
<td>Italy</td>
<td>Italy</td>
</tr>
<tr>
<td>6</td>
<td>Asahi Glass Co.</td>
<td>Japan</td>
<td>Japan</td>
</tr>
<tr>
<td>7</td>
<td>Continental AG</td>
<td>Germany</td>
<td>Germany</td>
</tr>
<tr>
<td>8</td>
<td>PPG Industries Inc.</td>
<td>USA</td>
<td>USA</td>
</tr>
<tr>
<td>9</td>
<td>Continental AG</td>
<td>Germany</td>
<td>Germany</td>
</tr>
<tr>
<td>10</td>
<td>Webasto AG</td>
<td>Germany</td>
<td>Germany</td>
</tr>
</tbody>
</table>

The origin of these companies is distributed as follows:

Graph 4. Main Companies by Origin

- **Germany**: 31%
- **Japan**: 19%
- **United States**: 28%
- **France**: 6%
- **Others**: 16%

Source: Global Trade Atlas

3.5 Certifications

**ISO 9000**

This is a set of quality and continuous quality management standards that were established by the International Standardization Organization (ISO). ISO 9000 specifies the way in which an organization operates, their quality standards, times of delivery and service levels. Its implementation offers businesses numerous advantages, including the following:

- **ISO/TS 16949**

Commonly known as “TS2”, ISO/TS 16949 is a catalog of the requirements of the automotive quality system that is based on various international industry standards and requirements, such as AVSQ (Italy), EAQF (France), QS-9000 (US) and VDA 6.1 (Germany). ISO/TS 16949 enables suppliers and subcontractors of the automotive industry to use a single document to comply with these international quality management standards.

The goal of TS2 is to develop fundamental quality systems that provide continuous improvements with an emphasis on fault prevention, variation and waste reduction in the supply chain. It aligns international requirements of the automotive quality system to provide the following benefits:
• Instead of using the Checklist Method from the CS-9000 norm, it is based on the process approach.
• Suppresses multiple certification audits, and reduces documentation requirements
• A process model more effective and flexible customer-oriented
• A framework to manage and improve the entire business.

ISO 14000

ISO 14000 is a set of environmental management documents that once implemented, will affect every area of an organization's management of its environmental responsibilities and will help organizations to systematically deal with environmental issues, with the goal of improving environmental behavior and opportunities for economic benefit.

The following are quality systems used in the industry:
• Six sigma
• Lean Manufacturing
• Production part Approval Process
• Advanced product quality planning
• Balanced Scorecard
• 5’s
Chapter IV

The Autoparts Industry in Mexico
4. The Autoparts Industry in Mexico

In Mexico, the autoparts industry follows the same trend as the automotive industry as a whole. This has a positive impact, because in 2011, light vehicle production reached a new historic record of 2.5 million units, 13.1% more than what was recorded in 2010 and 21.6% higher than 2009, when the last record in national production was recorded.\(^{15}\)

The automotive industry is expected to continue growing in the future and Mexico will produce more than 3.7 million light vehicles by the end of 2015, almost double the units produced in 2009.\(^{16}\)

The growth of OEMs benefits the autoparts industry because the market will demand a wide range of products for assembly companies’ production lines, while the number of vehicles sold will increase the demand from the aftermarket or spare parts market segments.

4.1 Autoparts Production and Consumption

In 2011, autoparts production in Mexico reached a total of 67.989 billion dollars,\(^{17}\) while consumption reached 54.734 billion dollars.\(^{18}\) Production is expected to increase by 0.1% in 2012, compared to 2011, with an expected 68.044 billion dollars.

The following table shows production value by system or component:

<table>
<thead>
<tr>
<th>Systems or components</th>
<th>Amount (millions of dollars)</th>
<th>% Share</th>
</tr>
</thead>
<tbody>
<tr>
<td>Electrical parts</td>
<td>14,933</td>
<td>22%</td>
</tr>
<tr>
<td>Automotive fabrics, carpets and seats</td>
<td>7,015</td>
<td>10%</td>
</tr>
<tr>
<td>Engine parts</td>
<td>6,565</td>
<td>10%</td>
</tr>
<tr>
<td>Transmissions, clutches and their parts</td>
<td>5,556</td>
<td>8%</td>
</tr>
<tr>
<td>Accessories and automotive use parts</td>
<td>4,347</td>
<td>6%</td>
</tr>
<tr>
<td>Gasoline engines</td>
<td>3,723</td>
<td>5%</td>
</tr>
<tr>
<td>Suspension, steering and their parts</td>
<td>2,689</td>
<td>4%</td>
</tr>
<tr>
<td>Diesel engines</td>
<td>2,567</td>
<td>4%</td>
</tr>
<tr>
<td>Stampings and their parts</td>
<td>2,489</td>
<td>4%</td>
</tr>
<tr>
<td>Brakes and their parts</td>
<td>2,212</td>
<td>3%</td>
</tr>
<tr>
<td>Automotive rims and tires</td>
<td>1,397</td>
<td>2%</td>
</tr>
<tr>
<td>Bodies</td>
<td>1,170</td>
<td>2%</td>
</tr>
<tr>
<td>Automotive oils, lubricants and liquids</td>
<td>1,153</td>
<td>2%</td>
</tr>
<tr>
<td>Automotive rubber products</td>
<td>786</td>
<td>1%</td>
</tr>
<tr>
<td>Automotive windows, glasses and windshields</td>
<td>432</td>
<td>1%</td>
</tr>
<tr>
<td>Cooling</td>
<td>311</td>
<td>0%</td>
</tr>
<tr>
<td>Other</td>
<td>10,644</td>
<td>16%</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>67,989</strong></td>
<td><strong>100%</strong></td>
</tr>
</tbody>
</table>

Source: INA

---

15. Source: International Organization of Motor Vehicle Manufacturers (OICA for its french acronym)
16. Source: Business Monitor
17. Source: INA and INEGI
18. Source: Global Trade Atlas and Global Insight
4.2 Mexican Trade of Autoparts

In 2011, Mexican autoparts exports reached 45.587 billion dollars, recording an average annual growth rate of 10% in the last decade.

Imports reached 32.332 billion dollars, recording an average annual growth of 10% in the last decade.¹⁹

Mexican exports are mainly destined for the US autoparts Industry, with 89%. It is worth mentioning that one third of the value of autoparts imported by the US comes from Mexico, placing the country as the leading supplier to the US market.

### Table 6. Leading Trade Partners

<table>
<thead>
<tr>
<th>Commercial Partner</th>
<th>Exports 2011 (millions of dollars)</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>United States</td>
<td>40,728</td>
<td>89%</td>
</tr>
<tr>
<td>Canada</td>
<td>1,823</td>
<td>4%</td>
</tr>
<tr>
<td>Brazil</td>
<td>406</td>
<td>1%</td>
</tr>
<tr>
<td>Germany</td>
<td>349</td>
<td>1%</td>
</tr>
<tr>
<td>United Kingdom</td>
<td>281</td>
<td>1%</td>
</tr>
<tr>
<td>Japan</td>
<td>235</td>
<td>1%</td>
</tr>
<tr>
<td>China</td>
<td>162</td>
<td>0%</td>
</tr>
<tr>
<td>Australia</td>
<td>141</td>
<td>0%</td>
</tr>
<tr>
<td>Colombia</td>
<td>128</td>
<td>0%</td>
</tr>
<tr>
<td>Argentina</td>
<td>113</td>
<td>0%</td>
</tr>
<tr>
<td>Rest of the world</td>
<td>1,221</td>
<td>3%</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>45,587</td>
<td>100%</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Commercial Partner</th>
<th>Imports 2011 (millions of dollars)</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>United States</td>
<td>18,399</td>
<td>57%</td>
</tr>
<tr>
<td>China</td>
<td>3,153</td>
<td>10%</td>
</tr>
<tr>
<td>Japan</td>
<td>2,423</td>
<td>7%</td>
</tr>
<tr>
<td>Germany</td>
<td>1,533</td>
<td>5%</td>
</tr>
<tr>
<td>Canada</td>
<td>1,433</td>
<td>4%</td>
</tr>
<tr>
<td>South Korea</td>
<td>1,131</td>
<td>3%</td>
</tr>
<tr>
<td>Brazil</td>
<td>736</td>
<td>2%</td>
</tr>
<tr>
<td>Taiwan</td>
<td>467</td>
<td>1%</td>
</tr>
<tr>
<td>Italy</td>
<td>305</td>
<td>1%</td>
</tr>
<tr>
<td>India</td>
<td>283</td>
<td>1%</td>
</tr>
<tr>
<td>Rest of the world</td>
<td>2,469</td>
<td>8%</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>32,332</td>
<td>100%</td>
</tr>
</tbody>
</table>

Source: INA & Global Trade Atlas.

4.3 Transnationals Companies in Mexico

The Mexican industry is the main supplier to the North American market; nationally, there are more than 1,100 companies of the three tiers of production, strengthening the industry and providing it with a product diversification that benefits assemblers. This is why the sector’s production chain is competitive and reacts efficiently to market demand.

Some of the leading autoparts companies established in Mexico are:

Table 7. Businesses operating in Mexico

<table>
<thead>
<tr>
<th>Brand</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bosch</td>
</tr>
<tr>
<td>Magna</td>
</tr>
<tr>
<td>Delphi</td>
</tr>
<tr>
<td>Continental</td>
</tr>
<tr>
<td>Autoliv</td>
</tr>
<tr>
<td>Valeo</td>
</tr>
<tr>
<td>Hyundai</td>
</tr>
<tr>
<td>Dymos</td>
</tr>
<tr>
<td>Lear</td>
</tr>
</tbody>
</table>

Source: ProMexico
It is worth noting that 84 of the top 100 autoparts companies mentioned in chapter 3.4 of this study are established in Mexico. The origin of the companies included in this list and their operations in Mexico are as follows:

Graph 6. Origin of companies established in Mexico

Source: Automotive News

As of December 2011, the autoparts industry created a total of 602,816 jobs.

Table 8. Employment

<table>
<thead>
<tr>
<th>Areas</th>
<th>Staff Used</th>
</tr>
</thead>
<tbody>
<tr>
<td>Electrical and electronic equipment for automotive vehicles</td>
<td>216,153</td>
</tr>
<tr>
<td>Seats for automotive vehicles</td>
<td>74,629</td>
</tr>
<tr>
<td>Gasoline engines and their parts for automotive vehicles</td>
<td>41,589</td>
</tr>
<tr>
<td>Plastic autoparts</td>
<td>35,076</td>
</tr>
<tr>
<td>Transmission systems parts</td>
<td>25,352</td>
</tr>
<tr>
<td>Die-cut metallic parts for automotive vehicles</td>
<td>22,762</td>
</tr>
<tr>
<td>Steering systems and suspension parts for automotive vehicles</td>
<td>17,736</td>
</tr>
<tr>
<td>Brake system parts for automotive vehicles</td>
<td>16,888</td>
</tr>
<tr>
<td>Bodies and trailers</td>
<td>16,220</td>
</tr>
<tr>
<td>Glass</td>
<td>8,629</td>
</tr>
<tr>
<td>Rims and tires</td>
<td>6,323</td>
</tr>
<tr>
<td>Storage cells and batteries</td>
<td>6,026</td>
</tr>
<tr>
<td>Lubricant oils and greases</td>
<td>4,793</td>
</tr>
<tr>
<td>Other parts for automotive vehicles</td>
<td>110,640</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>602,816</strong></td>
</tr>
</tbody>
</table>

Source: INA & INEGI

In 2010, average salaries in the manufacturing industry for transportation equipment production were 2.7 dollars per hour.

According to INEGI, average salaries in Mexico’s OEMs record double the value compared to the rest of the manufacturing industry.

4.4 Localization and Specialization of Autoparts Production in Mexico

Autoparts manufacturers in Mexico are located mainly in four regions:

1. **Northeastern region**: includes 198 plants distributed across Chihuahua, Nuevo León, Coahuila and Tamaulipas. Production in this region focuses on air conditioning systems, automotive systems, plastic parts, electric system parts and engine and machined parts.

2. **Northwestern region**: includes 70 plants in the states of Baja California Norte, Baja California Sur, Sinaloa and Durango. This region produces mainly air conditioning and heating systems, interior components, accessories and electric systems for cars.

3. **Southeastern region**: includes 101 plants distributed across Tlaxcala, Puebla, Tlaxcala, the State of Mexico, Morelos, Hidalgo and Mexico City. Production in the area focuses on seats, air conditioning, hydraulic bottle jacks, interior components, engine parts, electric systems, stampings and suspensions.

4. **Center region**: includes 142 plants in the states of Jalisco, Guanajuato, Querétaro, Aguascalientes and San Luis Potosí. Production in this region focuses on stampings, electric components, brakes and their parts, rubber products, engine parts and transmissions for cars.
Figure 2. Localization and specialization of autoparts production in Mexico

Northeast Region:
- 198 Plants
- Products/Systems:
  - Air conditioners, automotive systems, plastic parts, parts for the electrical system, engine parts and machine parts.

Northwest:
- 70 Plants
- Products/Systems:
  - Air conditioning systems and heating, interior components, accessories and electrical systems for automobiles.

*Fiat will produce its vehicles in the Saltillo Chrysler's plant
Figure 3. Localization and specialization of autoparts production in Mexico

Central Region:
- 101 Plants
- Products/Systems:
  Seats, air conditioning, bottle type jack, interior components, engine parts, electrical systems stamping and suspension.

Bajío Region:
- 142 Plants
- Products/Systems:
  Stamping, electrical components, brakes and parts, rubber products, engine and transmission parts for automobiles.
4.5 Manufacturing Costs

In 2011, according to KPMG, Mexico offers 13% savings in autoparts manufacturing costs, 19.4% in plastic and 19.5% in metal inputs used in the industry, compared to costs in the United States and nine other manufacturing countries.

Graph 7. Manufacturing costs

Autoparts

-5.4% -5.0% -3.8% -3.4% -3.1% -3.0%
-13.0%

Mexico, Brazil, United Netherlands, France, Canada, Italy, United States, Germany, Australia, Japan

Precision manufacturing

-6.0% -5.6%
-4.0% -3.5% -3.1% -2.9%
-11.9%

Mexico, Brazil, United Netherlands, France, Canada, Italy, Germany, United States, Australia, Japan, States

Plastic components manufacturing

-8.9% -7.8%
-6.2% -6.0% -5.8%
-19.4%

Mexico, Brazil, United Kingdom, France, Italy, Netherlands, Canada, Germany, United States, Australia, Japan, States

Metal components

-9.8%
-5.6% -5.5% -5.0% -3.8%

Mexico, Brazil, United Kingdom, Italy, France, Netherlands, Canada, Germany, United States, Australia, Japan, States

4.6 Metal-Mechanic Suppliers

Mexico has a vast expertise in the supply chain for companies in the automotive and autoparts industries, which is why there is development in metal-mechanic industry processes, an industry that is directly linked to car and autoparts manufacturing.

Local companies are able to provide processes required by multinationals, because they are diversified processes that comply with international quality standards.

The processes include the following:

- Smelting
- CNC (computer numeric control) machining
- Pressure injection/Die casting
- Stamping
- Welding
- Assemblies
- Surface treatments/Metal treatments
- Moulding by plastic injection

Source: KPMG, Competitive Alternatives (KPMG's Guide to International Business Location), 2012
The Autoparts Industry

**Casting**
- Total companies: 212
- States with the highest production:
  - Estado de México
  - Nuevo León
  - Jalisco
  - Coahuila
  - San Luis Potosí
  - Distrito Federal
  - Puebla

**Printing**
- Total companies: 65
- States with the highest production:
  - Estado de México
  - Nuevo León
  - Chihuahua
  - Querétaro

**Welding**
- Total companies: 274
- States with the highest production:
  - Nuevo León
  - Estado de México
  - Durango
  - Tamaulipas
  - Coahuila

**Surface Treatments**
- Total companies: 192
- States with the highest production:
  - Nuevo León
  - Estado de México
  - Coahuila
  - Durango
  - Tamaulipas

**Plastics Injection Molding**
- Total companies: 47
- States with the highest production:
  - Distrito Federal
  - Estado de México
  - Chihuahua
  - Querétaro
  - Nuevo León
  - Tamaulipas

**Assemblies**
- Total companies: 192
- States with the highest production:
  - Nuevo León
  - Estado de México
  - Chihuahua
  - Coahuila
  - Tamaulipas
4.7 Foreign Direct Investment (FDI)

Foreign Direct Investment in the autoparts industry has been very volatile in recent years, due mainly to the 2009 economic crisis.

Between 2006 and 2011, accumulated investments in this industry reached 7,648 billion dollars. This means that the autoparts industry accounts for 4% of the total amount generated by investments recorded in every industry during the referenced period on a national level.\(^{21}\)

\textbf{Graph 8. Autoparts FDI (millions of dollars)}

The following table shows the diversification of products made by the companies that invested in Mexico with their investment amounts during the period of reference.

\begin{table}[h]
\centering
\caption{Foreign Direct Investment by system or component}
\begin{tabular}{|l|c|c|}
\hline
Type of product & Value (millions of dollars) & \% \\
\hline
Oils and greases & 163 & 2\% \\
Plastic autoparts & 17 & 0\% \\
Rims and tires & 385 & 5\% \\
Glass & 104 & 1\% \\
Iron and steel part molding & 205 & 3\% \\
Internal combustion engines, turbines and transmissions & 392 & 5\% \\
Storage cells and batteries & 7 & 0\% \\
Bodies and trailers & 5 & 0\% \\
Gasoline engines and their parts for automotive vehicles & 0 & 0\% \\
Electrical and electronic equipment for automotive vehicles & 783 & 10\% \\
Steering systems and suspension parts for automotive vehicles & 66 & 1\% \\
Brake system parts for automotive vehicles & 463 & 6\% \\
Transmission systems parts & 190 & 2\% \\
Seats for automotive vehicles & 3 & 0\% \\
Die-cut metallic parts for automotive vehicles & 1 & 0\% \\
Other parts for automotive vehicles & 4,865 & 64\% \\
\hline
\textbf{Total} & \textbf{7,648} & \textbf{100\%} \\
\hline
\end{tabular}
\end{table}

\textit{Source: Ministry of Economy. Assistant Director General of the National Registry of Foreign Investments.}

In the referenced period, 75 companies from the autoparts industry announced 106 investment projects creating an estimated 35,821 new jobs.\(^{22}\)

\begin{table}[h]
\centering
\caption{Investment projects.}
\begin{tabular}{|l|c|}
\hline
Year & Number of Projects \\
\hline
2006 & 14 \\
2007 & 18 \\
2008 & 20 \\
2009 & 25 \\
2010 & 16 \\
2011 & 13 \\
\hline
\textbf{Total} & \textbf{106} \\
\hline
\end{tabular}
\end{table}

\textit{Source: FDI Intelligence, Financial Times Ltd.}

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\(^{21}\) Source: Ministry of Economy. Assistant Director General of the National Registry of Foreign Investments.

\(^{22}\) FDI Intelligence, Financial Times Ltd.
In this period, 75 companies announced investments. The German company Robert Bosch was leading one, with a total of seven investments announced between January 2006 and June 2011. It is worth mentioning that the top ten companies to announce investments in Mexico account for 30% of investment announcements in the autoparts industry, with 32 projects.\(^2^3\)

Below are the ten leading companies that announced the largest number of projects in the referenced period:

- Robert Bosch
- Magna International
- Meritor (ArvinMeritor)
- Jatco Ltd
- Mahle
- Hella KGaA Hueck & Co
- Nippon Kayaku
- ZF Friedrichshafen
- Haldex
- Donaldson

Other relevant investments in the autoparts industry were made by the following companies: \(^2^4\)

Magna: It will build a plant in San Luis Potosi, where it will make stamping parts.
- 100 million dollar investment
- 700 direct jobs

Denso: It will build its new plant in Guanajuato, where it will manufacture air conditioning devices.
- 57 million dollar investment
- 400 direct jobs

Novem: It will build a plant in Querétaro, where it will produce finishes for interiors in real wood and authentic aluminum, initially for BMW, GM and Mercedes-Benz.
- 25 million dollar investment
- 500 direct jobs

Maruichi Steel Tube Ltd.: It will establish a subsidiary in Aguascalientes to produce automotive steel pipes.
- 10 million dollar investment
- Initial annual production of 12 thousand tons of steel pipes for Nissan Motor Co. and other Japanese assemblers.

Donaldson: It opens a new plant in Aguascalientes.
- 25 million dollar investment
- 260 new jobs.

Faurecia: It will build a new plant in Puebla where it will make interior systems.
- 33 million dollar investment
- 150 direct jobs

Hella: In June 2013 it will begin construction of a new plant in Guanajuato to manufacture head and tail lights.
- 100 million dollar investment

### 4.8 Chambers and Associations

There are several important players in Mexico that support the development of the autoparts industry, mainly:

**National Autoparts Industry (INA)\(^2^5\)**

The INA is the leading association of the autoparts industry in Mexico. Its main strategic lines include:

- The integration of all levels of the automotive sector’s production chain.
- The insertion of the automotive industry into the global economy.
- The economic strengthening of the autoparts sector through the establishment of national and international synergies.

**National association of Tires Distributors and Renovating Plants (ANDELLAC)\(^2^6\)**

ANDELLAC caters to the needs of its associates by consolidating the union of the tire sector and renovation, providing consulting, training and certifications using its resources.

Some of its associates include:

- Bridgestone
- Continental
- Good Year
- Michelin
- Pirelli
- Tornel
- Cooper tires

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\(^{23}\) FDI Intelligence, Financial Times Ltd.
\(^{24}\) Source: INA and automotive site
\(^{26}\) National Association of Rim Distributors and Renovating Plants, www.andellac.com.mx
Mexican Association of the Automotive Industry, A.C. (AMIA)\textsuperscript{27}

AMIA represents the interests of car manufacturing companies. The group works to reconcile the interests of these companies jointly with regard to similar institutions, in practically every area, before chamber confederations and municipal, state and federal governments.

In addition, it supports the growth of Mexico’s automotive industry, surveys the standard framework that influences the industry and analyzes the evolution and relevant data of affiliates.

AMIA is constituted by the following companies:

- Founding partners: Chrysler de México, S.A. de C.V., Ford Motor Co., S.A. de C.V., General Motors de México, S.de R.L. de C.V., Nissan Mexicana,
- S.A. de C.V., Volkswagen de México, S.A. de C.V.
- Participating brands: Fiat, Subaru, Mercedes Benz.

National Association of Bus, Truck and Tractor-trailer Producers (ANPACT)\textsuperscript{28}

ANPACT represents heavy vehicle (more than 6.3 tons) and diesel engine manufacturers, and fosters the development of the transportation industry in Mexico.

Its main strategic lines are:

- To be the institution that represents and promotes the defense of the interests of transportation vehicle and engine producers and dealers in Mexico.
- To represent the interests of diesel engine dealers and, if applicable, other companies related to transportation.

Some of its associates are:

- DINA
- ISUZU
- Kenworth
- Mercedes Benz
- SCANIA
- Volvo
- Freightliner
- International

4.9 Automotive Engineering and Design Centers

The establishment of design centers in Mexico has helped to strengthen the sector’s existing capacities and the quality of products manufactured in Mexico. The following are a few examples of this type of center operating in Mexico:

General Motors Regional Engineering Center\textsuperscript{29}

Based in Toluca, in the State of Mexico, the General Motors Regional Engineering Center employs 700 engineers that design and conduct engineering research testing on various vehicles for General Motors. The center focuses on designing and developing new technology for cars.

Nissan Technology Development Center (CDT Nistec)\textsuperscript{30}

Based in Toluca, in the State of Mexico, it is one of Nissan’s nine centers of this kind. It employs 366 people, most of whom are Mexican engineers.

The center focuses on reducing pollutant emissions from engines by 70%; it has special noise chambers to simulate roads and detect part and body wear due to vibration; and it simulates extreme hot and cold weather conditions to certify the correct operation of systems and plastics. It is part of Nissan’s global research and development (R&D) network, which works closely with similar centers in the US and Brazil. Mexico contributes with parts design, vehicle evaluation and bench testing.

\textsuperscript{27} Mexican Association of the Automotive Industry, www.amia.com.mx
\textsuperscript{28} National Association of Bus, Truck and Tractor-trailer Producers, www.anpact.com.mx
\textsuperscript{30} Information from various media (press).
Chrysler Automotive Research, Development and Engineering Testing Center

Based in Mexico City, the center was built to develop and evaluate new Dodge, Chrysler, Jeep, Mitsubishi and Hyundai vehicles. Some of the center’s areas are: Vehicle testing, labs to measure pollutant emissions, materials and metrology engineering labs, engine and transmission dynamometers. It provides direct jobs to 30 engineers who specialize in process development and certification, in addition to the indirect jobs required by each project.

At the center, employees perform world-class engineering tests, study environmentally friendly raw materials and alternate fuel technologies, emission reduction and petroleum derived fuels.

The vehicle testing, research and development area occupies the largest space in the facilities and performs activities such as development, review and testing processes, including any type of operation from changing or modifying a part, to partially or totally changing the body, chassis, engine, transmission, etc. To do so, current models are used as well as the concepts of the vehicles that will be launched for sale in the future.

Research and Technical Assistance Center of the State of Querétaro (CIATEQ)

Based in Querétaro, the center is built with the participation of the federal government, represented by CONACYT and LANFI, the state government of Querétaro and state industrials, headed by executives from Grupo ICA and Grupo SPICER.

CIATEQ performs technology development projects for the automotive and autoparts industry, from basic engineering to the manufacture of purpose-built machinery and equipment, tools, test benches, control and measurement systems, creation of prototypes and development of specialized vehicles for airports. The center’s projects include the following:

- Wind tunnel for car radiator testing
- Design and production of thermocycling test bench to evaluate charged air coolers
- Mechanical design of the new ranges of seven agricultural tractor models
- Design and production of an aluminum tractor mold
- Angle cutting machine for rubber profile
- Inspection and laser labeling machine for engine rings
- Thermocycling testing machine for car coolers
- Device to inspect the position of head lights
- Car tire testing machine
- Crane to assemble car powertrains
- Machines for secondary operations in the production of doors seals
- Drill for rubber extrusion line
- Zero-gravity arm for suspension assembly line
- Analysis and simulation of car structures
- Machines to test truck dashboards
- Welding template for the car seat structure
- Assembly table for seat frames
- Measurement and verification devices for car window elevators
- Redesign of cooling systems, molds and auxiliary elements to manufacture aluminum autoparts
- Design and production of cabin to apply water-based paint
- Design and construction of a set of machines for secondary operations in the production of car door seals.

Strategic Alliances and Innovation Networks for Competitiveness (AERIS)\textsuperscript{33}

AERIS is a mechanism promoted by CONACYT that supports companies in the planning and constitution of alliances and innovation networks with other companies and academic institutions.

Its goal is to position Mexico as a viable global option for automotive research and development and to promote the development and application of new technologies in the industry which increase the technical capacity of Mexicans for the development of new automotive products and technologies.

The following are the network’s strategic lines:

- New materials: ultralight plastics
- Nanotechnology applied to automotive systems
- Development of mathematical simulation models (CAD, CAE, CAM)
- Innovation in fuel performance and alternative fuels (electric hybrid)
- Vehicle adaptation to Mexico’s specific characteristics
- R&D in electric systems and components
- Technology development for HVAC
- New technologies applied to manufacturing

Vehicle Electronic Technology Center\textsuperscript{34}

This is an initiative that results from the agreement between the Technological and Higher Education Institute of Occident (ITESO) and the company Soluciones Tecnológicas, in Guadalajara. The center develops and integrates electronic systems for automotive applications, in the following areas:

- Testing and systems integration services for testing modules and systems for assembly companies and their suppliers.
- Engineering, design and electronic systems integration services.
- Technology research and development in electronic systems.

Users are assembly companies that export vehicles to North America and Europe and their suppliers; electronic component and automotive systems software manufacturers and designers; as well as university and other research institutes related to system design for cars, airplanes, boats, electronics and software, particularly firmware.

Delphi Technical Center\textsuperscript{35}

Headquartered in Ciudad Juárez, Chihuahua, this component engineering center designs and develops products and employs close to three thousand people of whom almost half are engineers and technicians. It has been operating for 8 years, during which it has obtained 50 patents, 35 defensive publications and 8 industrial secrets based on components, systems and applications for the automotive sector.

Center for the Development of the Automotive Industry in Mexico (CEDIAM)\textsuperscript{36}

The Center for the Development of the Automotive Industry in Mexico gives nationwide coverage of advice, training, technology research and development services to the automotive sector. It was created with the support of various players, such as companies, institutions, chambers and government, with the purpose of expanding information and reducing the gap between them to achieve greater support for the national industry.

The center has more than 300 researchers, labs, equipment and a network of national coverage. It has presence in Coahuila, Monterrey, the State of Mexico, Querétaro, Guanajuato, Jalisco, Puebla, Aguascalientes, Morelos, San Luis Potosí and Sonora.

Nuevo León Automotive Cluster (CLAUT)\textsuperscript{37}

The Nuevo León Automotive Cluster is a civil association comprising tier 1 automotive industry manufacturers and related academic and government institutions.

\textsuperscript{33} CONACYT, http://www.conacyt.mx/fondos/institucionales/Tecnologia/Avance/Paginas/Avance_AERIS.aspx
\textsuperscript{34} ITESO, http://portal.iteso.mx/portal/page/portal/ITESO/Informacion_Institucional/ITESO_Empresa/Centro_de_tecnologia_electronica_vehicular
\textsuperscript{35} Infomaquila, http://www.youtube.com/watch?v=y3kHhfbOM
\textsuperscript{36} ITESM, http://www.itesm.mx/rzc/CeDIAM/cediam1/index.htm
\textsuperscript{37} CLAUT, http://claut.com.mx/
CLAUT seeks to develop the integrated chain from vehicle assembly companies to tier 1, 2 and 3 suppliers, as well as companies that support the automotive industry, such as logistics and consulting service companies, among others.

**Industrial Engineering and Development Center (CIDESI)**

The CIDESI was founded on March 9, 1984 and is part of the System of Centers of the National Science and Technology Council.

CIDESI is ISO 9001:2008 certified and is the first Center of the CONACYT System that is AS9100 B certified as a supplier for the aviation industry.

It was granted the National Technology Award in 2003 and the State Exportation Award of the State of Querétaro in 2004. Is is a reliable supplier to PEMEX, authorized supplier to BOMBARDIER, Member of the Alliance with National Instruments and the Texas Instruments Design House. It contributes to the development of the country's production sector with two main offices located in the states of Querétaro and Nuevo León, inside the Monterrey Technology Research and Innovation Park. In addition, it has labs in San Luis Potosí and in important companies in Mexico.

**Advanced Materials Research Center (CIMAV)**

The Advanced Materials Research Center (CIMAV) is an institution that is part of the National System of Public Centers CONACYT. It was founded in the city of Chihuahua in October 1994, and its creation is the result of an agreement between the Federal Government, the State Government of Chihuahua and Canacintra Chihuahua Chapter, which has given it special features that have positively affected its development.

It has highly specialized staff that do basic oriented and applied research as well as technology development with the goal of meeting the country's scientific, technological and academic demand, based on eleven research lines and two institutional academic programs.

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Chapter V

Investment Opportunities
5. Investment Opportunities

Mexico has a solid autoparts industry that makes it a highly attractive market. In addition, it has direct access to the NAFTA region, expanding companies’ potential market. Opening a plant in Mexico grants an excellent opportunity for internationally renowned companies since they can expand their production and export capacity to the NAFTA zone and Latin America.

Another advantage of establishing operations in Mexico is the solid presence of the automotive industry, which has 19 light and heavy vehicle assembly companies that manufacture approximately 50 models and produce 2.5 million units, strengthening the autoparts industry to supply this market.

Mexico must promote investments in major components because they are in high demand by assemblers and are mostly imported. Components identified as a lack of the supply chain are:

- Transmissions
- Fuel engines
- Bodies
- Safety systems
- Injectors
- Sensors
- Dashboards
- Pumps

In terms of support processes, foreign companies that work on these activities can invest in processes that are missing, lacking or have are under-developed in Mexico, such as:

- Cold and hot forged parts
- Polymer extrusion with metal inserts
- Flocking finishing
- Die casting aluminum over 450 tons
- High Strength Steel
- Stainless Steel
- Steel Casting
- Stainless Steel Casting
- Precision stamping
- Deep stamping
- External Plastic Chroming
- High volume sintering
- Dies and mold-holders (Body parts)
- Sequential dies
- Manufacturing of plastic molds
- Manufacturing of die casting molds
- Fiberglass parts
- Blow molding (with or without paint)
- Assembly or manufacturing of electronic sensors and components
Chapter VI

Export Opportunities
6. Export Opportunities

In the global market OEM’s and Tier 1 companies seek to develop strategic alliances with suppliers abroad that guarantee performance, quality, durability, price and innovation. There are companies in Mexico that offer quality and a capacity to export products and processes that are fundamental for the automotive industry.

Exports of minor components can be promoted within the autoparts industry because Mexican companies have the experience and quality required to supply this type of components, which include:

- Oil sump
- Gear boxes
- Tank caps
- Hubs
- Accessories
- Rises
- Clamps
- Spark plugs
- Tracks
- Joints
- Air filters
- Washers
- Pistons
- Gas tanks
- Torque rod
- Pins
- Hoses
- Forks
- Disc/drum brakes

Latin-America is a great area of opportunity for autoparts’ exports, due to the growth of the automotive industry in countries like Argentina and Brazil, with demand for this type of product having the same positive trend. In addition, these products can be exported to the aftermarket in the United States, because spare parts chains look for quality products at low costs, which can position Mexican companies in this market segment.

The exportation of basic processes such as stamping, forming, die casting, plastic injection and machining is another window of opportunity for Mexican companies which comply with quality standards of international markets. This way, Tier 2 companies can position themselves abroad.
Chapter VII
Legal Framework
7. Legal Framework

7.1 Automotive PROSEC and Regla Octava (Eighth Rule)

Sectorial Promotion Programs (PROSEC) are aimed at manufacturers to help them import inputs with a preferential tariff, in order to maintain their competitiveness, particularly in globalized sectors like the automotive.

This way, most of Automotive PROSEC inputs can be imported with tariff exemptions.

<table>
<thead>
<tr>
<th>Table 11. Tariff structure of Automotive Prosec</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number of tariff fractions (2007)</td>
</tr>
<tr>
<td>1,837</td>
</tr>
<tr>
<td>420</td>
</tr>
<tr>
<td>53</td>
</tr>
<tr>
<td>2</td>
</tr>
<tr>
<td>2,312</td>
</tr>
</tbody>
</table>

Source: Ministry of Economy.

However, when PROSEC does not meet companies’ needs, they use Regla Octava of the General Import and Export Tariff Law with a 0% tariff rate. Companies with Automotive PROSEC registration can access the automotive Regla Octava (tariff fraction 9802.00.19) when they meet the following criteria:

- To diversify supply sources and maintain competitiveness
- To meet the needs of new investment projects
- For no national production or shortage of supply

7.2 Automotive Decree

On December 31, 2003, the Federal Official Gazette published the “Decree to support the competitiveness of the terminal automotive industry and support the development of the domestic car market”41 aimed at supporting investment in the manufacture of light vehicles in the country by granting various benefits.

The following are benefits granted to registered manufacturing companies:42

- To be considered “manufacturing companies” for the purposes of provisions on “automotive tax deposit” and other provisions of the Customs Law.
- To be able to import with zero ad-valorem tariff any vehicles of the segments which produce in Mexico, under the tariff/quota, for an annual volume equal to 10% of production of the immediately previous year.
- To be automatically considered “manufacturing companies” under the Sectorial Promotion Program of the Automotive and Autoparts Industry.

The decree establishes three registration modes to access its benefits; however, only one of them is worth mentioning for the autoparts industry: article 4 of this decree, which description supports that companies that perform or will perform manufacturing, assembly and even bulletproofing processes that increase the value of the vehicle by 50% can obtain the benefits, only if BMW is registered as a participating company under this article.

7.3 Drawback

It provides beneficiary exporters the possibility of obtaining a return on general import tax paid for goods that are returned in the same state or which have been altered or repaired.

7.4 IMMEX

This instrument simplifies processes and requirements for the maquila regime. It allows the temporary import of goods required in an industrial or service process aimed to create, transform or repair foreign goods that are imported temporarily for later exportation. The beneficiaries of the program are selected by the Ministry of Economy (SE) which can authorize resident legal entities to be taxed on a single IMMEX Program under Title II of the Income Tax Law which considers a reduction of up to 50% in tax rates.

40. Goods for the Sectoral Promotion Program for the Automotive and Autoparts Industry, when companies receive the approval referred to in the Eighth Complementary Rule, for the interpretation and application of the Fee of the General Importation and Exportation Tax Law based on criteria established by the Ministry of Economy. SIAVI.
41. Modified on April 15, 2010.
42. Ministry of Economy, Monography of the automotive industry.
7.5 Shelters

The shelter service streamlines the process of setting up a business.

With this program a Mexican operation establishes a Mexican maquila company, provides industrial space, operators, technicians and engineers for production and administrative staff to manage the maquila's particular operations.

The advantage of this scheme is that companies begin operations without having to worry about customs, legal and/or administrative procedures that delay the opening process.

Services offered include:
• Staff management
• Licenses and permits
• Accounting and fiscal services
• Customs procedures
• Operation and maintenance services
• Transportation and logistics services, among others.

7.6 Rules of Origin (automotive)

A free trade agreement benefits countries that are part of a trade zone. Rules of origin are used to determine which goods from countries outside the trade zone can benefit from preferential tariff treatment.

The following table shows rules of origin related to the automotive industry that result from the various free trade or economic cooperation agreements.

<table>
<thead>
<tr>
<th>FTA/Economic Cooperation Agreement</th>
<th>Automotive rules of origin</th>
</tr>
</thead>
<tbody>
<tr>
<td>NAFTA</td>
<td>The required regional content value (VCR) must be 62.5% (for transportation vehicles of less than 15 passengers) or 60% (for transportation vehicles of 16 passengers or more) under the net cost method.</td>
</tr>
<tr>
<td>European Union</td>
<td>“To confer the status of original, the value of all the materials used to manufacture the product must not exceed 40% of its manufacturing price.”</td>
</tr>
<tr>
<td>EFTA</td>
<td>“To confer the status of original, the value of all the materials used to manufacture the product must not exceed 40% of its manufacturing price.”</td>
</tr>
<tr>
<td>Mercosur</td>
<td>“Brazil and Argentina: Index of regional content (IRC) not lower than 60%; Uruguay: IRC not lower than 50%; Mexico: IRC not lower than 30%.”</td>
</tr>
<tr>
<td>Colombia*</td>
<td>VCN between 35% and 50%.</td>
</tr>
<tr>
<td>Chile</td>
<td>“VRC of at least 32% using the transaction value method, or VRC of at least 26% using the net cost method.”</td>
</tr>
<tr>
<td>Bolivia</td>
<td>VRC of at least 32% using the net cost method.</td>
</tr>
<tr>
<td>Costa Rica and Nicaragua</td>
<td>VRC of at least 32% using the net cost method.</td>
</tr>
<tr>
<td>Guatemala, Honduras and El Salvador</td>
<td>VRC of at least 50%.</td>
</tr>
<tr>
<td>Israel</td>
<td>“40% of the transaction value or 30% using the net cost method.”</td>
</tr>
<tr>
<td>Perú**</td>
<td>VRC of at least 35%.</td>
</tr>
<tr>
<td>Japan</td>
<td>VRC of at least 65%.</td>
</tr>
</tbody>
</table>

*/In April 2011, Mexico and Colombia reached an agreement to modify the rules of origin that are applied to certain vehicles.

**/In April 2011, Mexico and Peru signed a Free Trade Agreement that is in the process of being approved.

Source: Ministry of Economy.
7.7 Standards and Certifications

For the automotive sector there are two types of international guidelines to establish standards and certifications focused on vehicle manufacturing: the World Forum for the harmonization of vehicle regulations (WP.29) and rules established by the WTO. The first was established by the European Union, while the second was established together with the Department of Transportation, and both regulate vehicle imports to the United States.

The Case of the European Union:

WP.29 was established on June 6, 1952 as part of the Committee of Interior Transportation, through resolution number 45 of the Subcommittee of Road Transportation (SC.1) of the United Nations’ Economic Commission for Europe.

Its first report specified the types of issues at the time, for example, if it was best to install one or two red lights in the rear of a vehicle, etc. Slowly, the working program was shaped and concerns regarding accident prevention began to manifest.

WP.29’s meetings are public; any government or interested party may attend the meetings and observe their work.

The official procedure to participate is very simple: a letter is sent, signed by the officer authorized in the relevant country or in the relevant regional organization of economic integration, notifying the secretary of the WP.29 of the country or organization’s desire to send representatives to the meetings and participate in the WP.29’s activities.

Normally, the WP.29 meets three times a year. The subsidiary expert working groups each meet twice a year.

The Forum issues standards in the following areas:

- Active safety in vehicles and their components (accident prevention)
- Passive safety of vehicles and their components (collision resistance)
- Environmental considerations
- General safety considerations
- Special technical considerations

The Case of the United States

The World Trade Organization’s Agreement on Technical Obstacles is a document that establishes the characteristics of a product or the production processes or methods related to them, including applicable administrative provisions, and whose observance is mandatory. It can also include prescriptions for terminology, symbols, packaging, marking or labeling that are applicable to a product, process or production method, or deal exclusively with them.

The principles followed and defended by the WTO are:

- Most Favored Nation Treatment, which establishes that the Members will ensure that, with respect to technical regulations, any products imported from the territory of a Member are treated no less favorably than similar products from any other country.
- National Treatment, which establishes that the Members will ensure that, with respect to technical regulations, any products imported from the territory of a Member are treated no less favorably than similar products of national origin.

Complementing the above, the standards and guidelines that a vehicle imported from the United States must follow are established by the country’s Department of Transportation, which has a list of safety regulations and standards for vehicles in general.

Effects in Changes to Standards and Certifications by the United States.

An example of measures that affect the car manufacturing/exportation platform in Mexico was President Barack Obama’s announcement in July 2011 when he revealed the agreement between the Presidency and 13 light vehicle manufacturers (Ford, GM, Chrysler, BMW, Honda, Hyundai, Jaguar/Land Rover, Kia, Mazda, Mitsubishi, Nissan, Toyota and Volvo), regarding fuel efficiency. The brands that signed the agreement currently account for 90% of vehicles sold in the United States.
The agreement establishes that, for the 2012-2016 period, vehicles are expected to have a fuel efficiency of 15 km/l (35 m/gal), while by 2025 it is expected to increase to 23 km/l (54.5 m/gal). The increased efficiency would involve a reduction of 1.7 trillion dollars on gasoline expenditure, an average of eight thousand dollars per vehicle for 2025.

This is part of a consensus established by assemblers to invest in R&D of new vehicles and clean technologies; however, the impact on Mexico’s automotive platform did not create big concerns because the industry’s design and technology in our country have the infrastructure and talent required for the new production of vehicles, and even offer Mexico the opportunity to become a relevant producer of environmentally friendly vehicles.
Chapter VIII

Conclusion
8. Conclusion

The autoparts industry in Mexico has evolved positively during the last years. Production is expected to go from 57.599 billion dollars in 2010 to 68.044 billion in 2012. In order to keep on with this performance, the federal and state governments, and the industry’s relevant players mentioned in this document, will need to work together and focus efforts, among others, on new product innovation, the creation of new design centers that can lead the way to a more capable national industry and the development of state-of-the-art technology. Fundamentally, the attraction of investments to the automotive sector must continue, as it strengthens and furthers the autoparts industry in response to the higher market demand for the basic products and processes needed for the sector to function properly.

Requirements imposed by both car assemblers and the spare parts market compel autoparts manufacturers to comply with high levels of quality, efficiency, delivery times, customer service and cost reduction strategies. Companies established in Mexico meet all of these requirements, providing a solid basis from where to consolidate its role as an industry leader and become a cluster that serves as an international platform, with Mexican manufactured goods increasingly being recognized as high quality high added value products.

Mexican companies must be innovative and evolve in light of the great changes that the industry requires, especially the penetration of hybrid and electric vehicles that require the supply chain to create high added value products with very specific certifications.
9. Annex

**Molding.** The action executed by a mold or die, when pressure is applied to a material to make a cut and deform the material used.

**Sheeting.** A volumetric deformation process through which the thickness of a material is reduced or products are created using metallic sheets as the main components.

Soldering. A process to join two or more components through metal fusion. Soldering can be arc, plasma, mig, tig, etc.

**Forging.** Metal deformation process that can be done hot or cold and where material is distorted by applying compression forces.

**Extrusion.** Process used to create objects with a defined and fixed cross section. The malleable material is pushed or extracted through a mold of the desired cross section.

Traditional and CNC machining. Traditional machining is done using a cutting tool to provide the desired configuration, while CNC machining is done using a computer which produces more precise cuts.

**Welding.** A process based on material design, cutting, assembly and soldering.

**Injection molding.** A semicontinuous process where a molten polymer is injected into a pressure-closed mold through a small orifice called a flap. The material solidifies inside the mold and the final part is obtained by cooling the mold and removing the molded part from the cavity.

**Thermal treatment.** This process covers heating solid metals or alloys to specific temperatures, holding these high temperatures for enough time and subsequently cooling them at an appropriate rate to improve their physical and mechanical properties, especially hardness, resistance and elasticity.

**Surface treatment.** A manufacturing process that is performed to provide specific characteristics to the surface of an object, such as to increase its hardness, control its dimensions, increase its mechanical resistance, etc.

**Casting.** A set of operations to shape metallic materials through fusion, casting on the appropriate mold and solidification inside it.

**Assembly.** The process to join two or more pieces using screws, bolts, pins or fasteners.

**Sintering.** Thermal treatment of a metallic or ceramic compact or powder at temperatures below the mixture’s fusion point, to increase its strength and resistance creating strong bonds between particles.
### Key Indicators

<table>
<thead>
<tr>
<th>Indicator</th>
<th>Unit</th>
<th>Source</th>
</tr>
</thead>
<tbody>
<tr>
<td>Share of the autoparts from the total production of the manufacturing worldwide industry, 2011.</td>
<td>3%</td>
<td>For Mexico, the monthly survey of the manufacturing industry, INEGI, is considered, for the rest of the countries, Global Insight.</td>
</tr>
<tr>
<td>Global autoparts production, 2011.</td>
<td>1.208 trillion dollars</td>
<td>For Mexico, the monthly survey of the manufacturing industry, INEGI, is considered, for the rest of the countries, Global Insight.</td>
</tr>
<tr>
<td>Participation of the North America production in the global autoparts industry, 2011.</td>
<td>14%</td>
<td>For Mexico, the monthly survey of the manufacturing industry, INEGI, is considered, for the rest of the countries, Global Insight.</td>
</tr>
<tr>
<td>Participation of the European Union production in the global autoparts industry, 2011.</td>
<td>16%</td>
<td>Global Insight.</td>
</tr>
<tr>
<td>Participation of the Asia Pacific production in the global autoparts industry, 2011.</td>
<td>58%</td>
<td>Global Insight.</td>
</tr>
<tr>
<td>Participation of the Latin America production in the global autoparts industry, 2011.</td>
<td>5%</td>
<td>Global Insight.</td>
</tr>
<tr>
<td>Participation of other areas production in the global autoparts industry, 2011.</td>
<td>6%</td>
<td>Global Insight.</td>
</tr>
<tr>
<td>Global autoparts consumption, 2011.</td>
<td>1.175 trillion dollars</td>
<td>For Mexico, the monthly survey of the manufacturing industry, INEGI, is considered, for the rest of the countries, Global Insight.</td>
</tr>
<tr>
<td>Global exports from the autoparts industry, 2011.</td>
<td>818.181 billion dollars</td>
<td>Global Trade Atlas.</td>
</tr>
<tr>
<td>Global imports from the autoparts industry, 2011.</td>
<td>785.767 billion dollars</td>
<td>Global Trade Atlas.</td>
</tr>
<tr>
<td>Number of autoparts companies in Mexico, 2011.</td>
<td>More than 1100</td>
<td>National Autoparts Industry.</td>
</tr>
<tr>
<td>Autoparts production in Mexico, 2011.</td>
<td>67.989 billion dollars</td>
<td>Prepared by ProMéxico with data from INEGI, National accounts.</td>
</tr>
<tr>
<td>Autoparts consumption in Mexico, 2011.</td>
<td>54.734 billion dollars</td>
<td>Prepared by ProMéxico with data from Global Trade Atlas and Global Insight.</td>
</tr>
<tr>
<td>Mexico’s exports from the autoparts industry, 2011.</td>
<td>45.587 billion dollars</td>
<td>Global Trade Atlas.</td>
</tr>
<tr>
<td>Mexico’s imports from the autoparts industry, 2011.</td>
<td>32.332 billion dollars</td>
<td>Global Trade Atlas.</td>
</tr>
<tr>
<td>Foreign direct investments in the autoparts industry, 2006-2011.</td>
<td>7.648 billion dollars</td>
<td>Estimated by ProMéxico with data from the Assistant General Director of the National Direct Foreign Investment Registry, Ministry of Economy.</td>
</tr>
<tr>
<td>Localization and Specialization of Autoparts Production in Mexico</td>
<td>Northeast, northwest, southeast and center regions.</td>
<td>ProMéxico.</td>
</tr>
<tr>
<td>Autoparts employment in Mexico, as of December, 2011.</td>
<td>602.816</td>
<td>Monthly survey of the manufacturing industry, INEGI.</td>
</tr>
</tbody>
</table>