JAPAN INTERNATIONAL COOPERATION AGENCY (JICA)

MINISTRY OF INDUSTRY AND TRADE
OF THE REPUBLIC OF HUNGARY

THE STUDY ON RESTRUCTURING OF THE STATE-OWNED AUTOMOTIVE PARTS COMPANY IN THE REPUBLIC OF HUNGARY

SEPTEMBER 1996

TECHNO CONSULTANTS, INC.

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Preface

In response to a request from the Government of the Republic of Hungary, the Government of Japan decided to conduct the Study on restructuring of the automotive parts company in the Republic of Hungary and the study was implemented by the Japan International Cooperation Agency (JICA).

JICA sent a study team, led by Mr. Nobuo Ishii of Techno Consultants, Inc. and organized by Techno Consultants, Inc. and HOWA Kougyou Company Ltd. to the Republic of Hungary 3 times from December 1995 to July 1996.

The team held discussion with the officials concerned of the Government of Hungary, and conducted related field surveys. After returning to Japan, the team conducted further studies and compiled the final results in this report.

I hope this report will contribute to the promotion of the plan and to the enhancement of friendly relations between our two countries.

I wish to express my sincere appreciation to the officials concerned of the Government of Hungary for their close cooperation throughout the study.

September 1996

Kimio Fujita
President
Japan International Cooperation Agency

Mr. Kimio Fujita
President
Japan International Cooperation Agency
Tokyo, Japan

September, 1996

Dear Mr. Fujita,

Letter of Transmittal

We respectfully submit our Study Report on Restructuring of the State-owned Automotive Parts Company in the Republic of Hungary. This report describes the work done in connection with the project kindly entrusted to us by your agency. It also covers technical issues discussed during the presentation of the final draft report at IMAG in July, 1996.

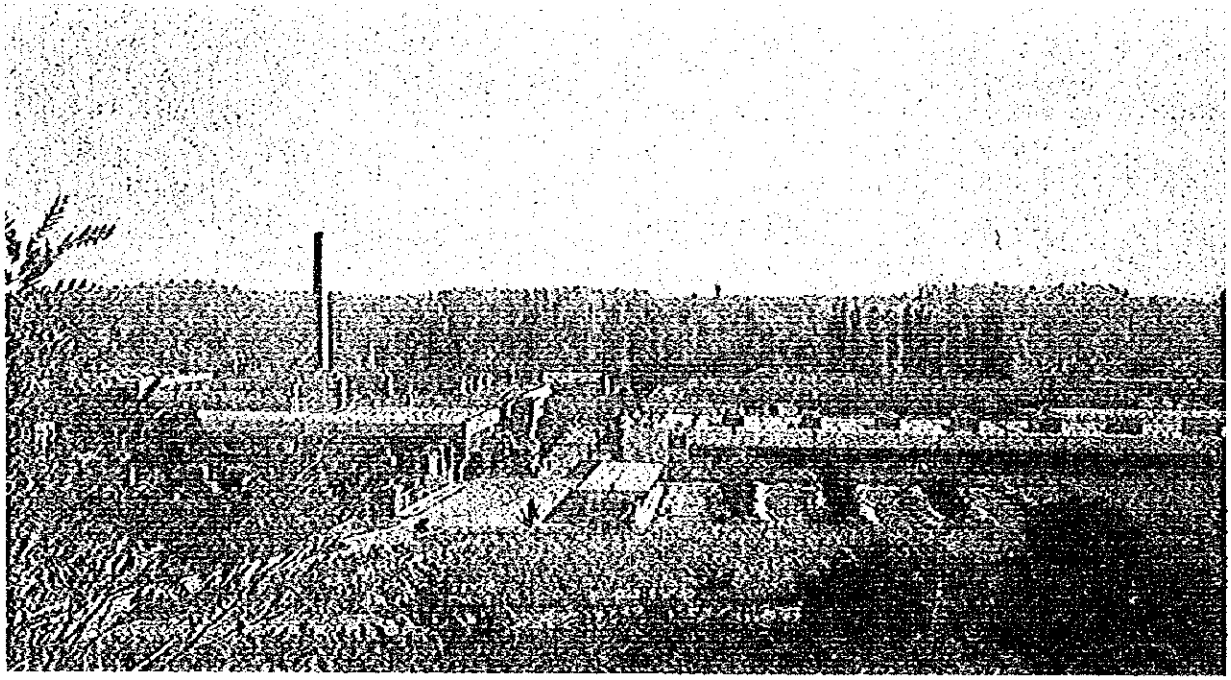
The study was carried out in two steps. In the first step, the present overall conditions of the IMAG factory were studied and analyzed. In the second step, the systems used for production processes and production control were adjusted to cope with the increased production and to improve the quality of products. Thus a modernization plan for the factory was formulated.

The above mentioned modernization plan recommends a plan to renovate the production facilities, to modernize the production control system and the corporate management system. During the field surveys, the study team paid special attention to technical transfers. By implementing the plan, we believe that the factory will definitely become prosperous due to the increase in productivity, the improvement of product quality and the increase in the production volume. Furthermore, it is expected that the study will contribute not only to the development of IMAG but also to the development of other automotive parts companies in Hungary.

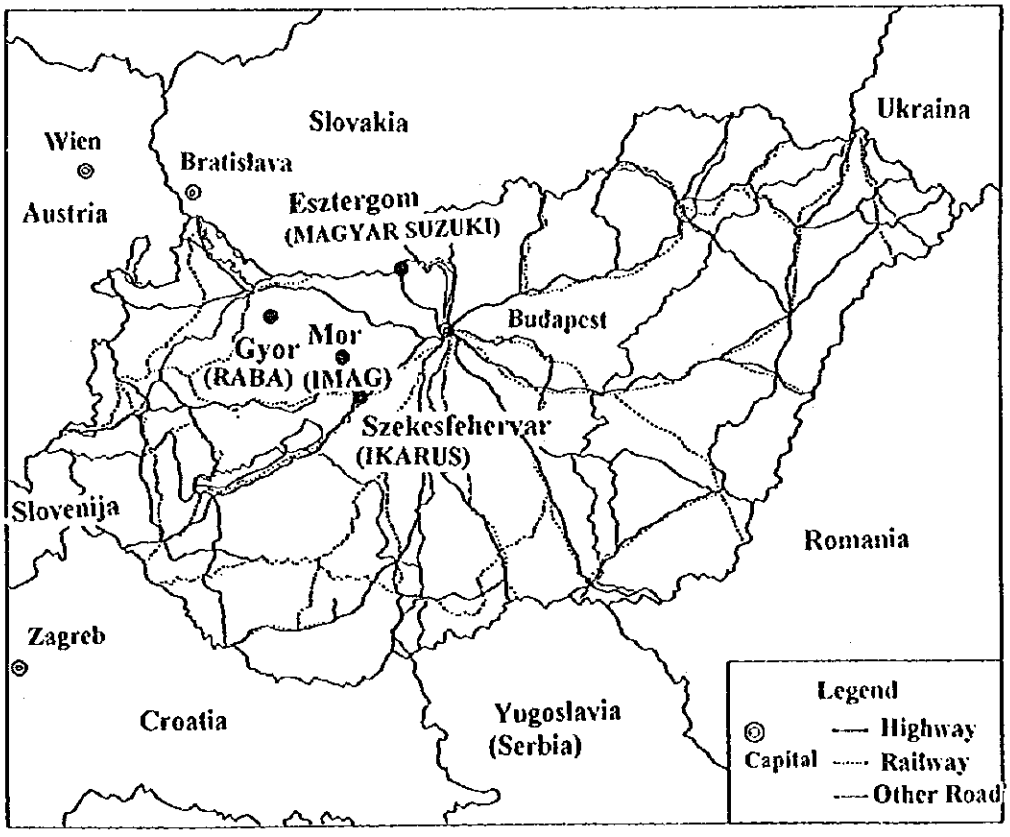
We wish to take this opportunity to express our sincere gratitude to your Agency, the Ministry of Foreign Affairs, the Ministry of International Trade and Industry, the Embassy of the Japan in Hungary. Also, we wish to express our deep gratitude to the Ministry of Industry and Trade and other authorities concerned of the Republic of Hungary and the staff of the IMAG factory who cooperated extensively in all the activities of the study team during the field surveys.

Yours respectfully

Nobuo Ishii
Team Leader for the Study of Restructuring of the State-owned
Automotive Parts Company in the Republic of Hungary



Perspective View of IMAG



Layout Plan of Hungary

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Chapter 1 Introduction

1-1 The Background of the Study

1-1-1 Social and Economical Outline

Hungary has been reforming its economy including implementing an open economic policy well in advance of other eastern European countries. In the 1980's, a series of economic reform programs were initiated such as the introduction of management and administration systems for new enterprises (1984), the overall policy for economic reform (1984) and the renovation of the banking system (1987). In 1982, Hungary was admitted as a member of the IMF and the World Bank and is aiming at internationalization of its economy. However, due to the small domestic market and as it is not blessed with many natural resources, the Hungarian economy has to rely on foreign trade. The Hungarian economy has been suffering from economic stagnation since the 1980's, due to increase in the cost of imported crude oil, the reduction in the exports of agricultural products caused by the agricultural protection policies of the western European countries and the increased debts due to foreign loans. Because Hungarian industry developed under the system in which the production of selected commodities was concentrated in various COMECON economic block countries, the loss of the markets caused by the collapse of the block has given a strong blow to the Hungarian economy.

Even under such difficult economic circumstances, the transition of the Hungarian economy to a market oriented economy has been promoted. However, the country's economy faces the difficult issues such as the reduction of the subsidies for enterprises, the reorganization of the non-profitable companies and the privatization of the state-owned enterprises.

1-1-2 Industrial Structure and Industry

The level of industrialization in Hungary is an intermediate one among the east European countries and its economic structure shows the characteristics of such countries. Although the share of the agricultural production in the national income has shown a gradual decline as the industry of the country has grown, the agricultural population is still over 20% of the national working population and agricultural and diary foodstuffs are very important export commodities.

Due to the development of industry, the industrial production amounted to 32.3% of the gross domestic products in 1990. However, in comparison with Czechoslovakia's 61% or Poland's 51%, both based on the World Bank data of 1992, the figure of 32.3% is still low. Therefore, it is forecast that the share of the industrial production in the GDP will definitely increase in future in Hungary.

Hungary does not have abundant natural resources. The only exportable natural resources are bauxite and manganese ores of which there are sufficient deposits. In Hungary where the energy and mineral resource bases are weak, efforts have been made to concentrate industrial power into industries requiring low energy consumption and further to make a special effort to produce high value added commodities. Thus, the major fields of the industrial production are the machinery industry, the food processing industry, light industry and chemical industry.

The industrial production in the 1970's achieved a very high rate of increase of 6.4% averaged over the period from 1971 to 1975, which was higher than the target rate of increase in the planned production for that period. During 1976 to 1980, the national economy suffered from stagnation due to the adverse effects of the oil price upheaval and industrial production also declined. In the 1980's, a tight money policy was adopted and the reduction in energy consumption in industrial activities was strongly implemented. The machinery industry, the food processing industry and the chemical industry were promoted accordingly. On the other hand, the energy intensive industries, the iron and steel industry, the non-ferrous metal industry and the construction material industry reduced their shares in the total national economy. Hungary has been consistently adopting the policy of encouraging the production of consumer goods. The ratio of the production of consumer goods to the total national industrial production is the highest of the East European countries. In 1990, the ratio of the production of light industry and the food processing industry was 32% of the production of the domestic industry. In 1990 when industry was restructured and the organizational establishment was reformed, industrial production was reduced. The metallurgical and the machinery industries reduced their production drastically, namely, by 19% and 13.7% compared with the previous year, respectively. In the case of the machinery industry, the reduction of the automotive industry was large, namely, 32.4% compared with the previous year. This was because Hungary was producing buses and the engines for commercial vehicles for the COMECON economic block and due to the collapse of the block, Hungary lost this market. Thus, the production of buses and automotive parts, mainly the engines for commercial vehicles, was reduced to an extreme extent.

1-1-3 Privatization and Restructuring of the State-owned Enterprises

In 1989, the law concerning the transformation of companies was enforced in order to promote the privatization of the state-owned enterprises. The State Property Agency was established in 1990 as the supervising authority to prevent possible confusion during the privatization of the state-owned enterprises and to accelerate the privatization at full speed. However, due to the lack of strong domestic capital and the non-existence of public funds to privatize the enterprises in a very short period, the dependency on foreign capital is high. In the second East-West Industry and Trade Ministers' Meeting held in April, 1993, Japan expressed her intention to carry out a study for the restructuring of a model state-owned enterprise for the purpose of supporting the privatization of the state-owned enterprises in Hungary.

1-1-4 The Subject Enterprise for The Study

It is anticipated that the Hungarian automotive industry will increase in importance for the domestic economy. However, most of the automotive parts industry which supports the automotive industry consists of Hungarian domestic enterprises. As in other socialist countries with planned economies, these Hungarian state-owned enterprises are facing many difficult problems to adjust themselves to a market oriented economy such as the privatization of the companies or factories and changing the attitudes of employees and employers.

The subject enterprise for this study, IKARUS Mori Autoparts Manufacturing Company (hereafter called IMAG), is one of the largest automotive part manufacturing companies in Hungary. They have 1,300 employees and its sales revenue in 1995 was 5,338 million forints. IMAG is one of 5 counsel companies of Hungarian Association of Automotive Parts Manufacturers. During COMECON economic regime, IMAG manufactured 500,000 to 600,000 seats for 15,000 buses per year, however since 1991 the production of buses in Hungary reduced to one tenth of the most prosperous age and the company faced with the extremely difficult conditions. On the other hand, IMAG succeeded in supplying passenger car seats and cable harnesses to the automobile assembly company of foreign capital who came to build their own factory in Hungary and IMAG could extricate themselves from the crisis conditions. IMAG still holds various financial and technical problems as a state-owned enterprise.

The state-owned enterprises including IMAG are urged to convert themselves to a company structure which can cope with a coming privatization. The study aims to implement the modernization of the corporate management of the state-owned company of Hungary. Furthermore, by the formulation of the factory modernization plan of IMAG who is the largest state-owned enterprise of automotive parts manufacturing companies in Hungary and the counsel company of the Association of Automotive Parts Manufacturing Companies, the secondary effect as supplementary influences to Hungary automotive parts industry can be expected.

1-2 The Purpose of the Study

The purpose of the study is to contribute to the development of the automobile industry of Hungary, through the formulation of the modernization plan for IMAG, a model enterprise of the state-owned automotive parts manufacturing companies in Hungary.

1-2-1 Formulation of the modernization plan

The purpose of the study is to conduct a factory diagnosis of the bus seat division and the passenger car seat division of IMAG in accordance with the request of the Hungarian government and to formulate a modernization plan for the production process, the production control and the corporate management of IMAG.

1-2-2 Implementation of Technical Transfer

At the same time, it is to aim to transfer technology to the staff and workers of IMAG in the areas of the production process, production control and corporate management.

During the first field survey, the study team prepared the short term modification plan covering 16 items as a series of the technical transfer progarmme. IMAG implemented the plan and carried out the factory modernization. The contents of the technical transfer and their implementation situation are shown in the appendix of the main report.

1-3 The Scope of the Study

The scopes of the study are as follows.

(1) Review of existing institutional and promotional policies relevant to automotive industry development

1-1 Institutional set up (administrative system, policy making body)

1-2 Financial policies (taxation system, subsidies and customs duties)

1-3 Privatization policy

1-4 Industrial standards applied to the automotive parts manufactured in Hungary

(2) Study on the present status of the automotive parts industry

2-1 Number of enterprises by scale

2-2 Products of the automotive parts industry

2-3 Production volume (quantity and value)

2-4 Export and import volume (quantity and value)

2-5 Profiles of the leading enterprises

2-6 Progress of the privatization

2-7 Trends of automotive parts companies in other European countries

2-8 Difference between the industrial standards applied to the automotive parts manufactured in Hungary and in EU

(3) Study on the present situation and problems of the divisions concerned of IMAG

3-1 Outline of the divisions to be studied

- Factory layout
- Products and manufacturing facilities
- Organization and manpower
- Procurement of raw materials
- Sales
- Production planning and business achievements

3-2 Manufacturing lines and processes

- Technical skills including technology gap
- Assembling
- Inspection
- Delivery

3-3 Production management and quality control

- Product development and design
- Inventory management
- Quality control

3-4 Management
- Decision making processes
- Human resources development
- Labor management
- Financial management

3-5 Information processing systems

3-6 Evaluation of the original modernization plan of the seat manufacturing divisions made by IMAG

3-7 Cost analysis

(4) Formulation of a plan for modernization of the divisions concerned

4-1 Targets and direction of modernization

4-2 Modernization of manufacturing lines and processes

4-3 Modernization of production control
- Product development and design
- Inventory management
- Quality control

4-4 Modernization of corporate management
- Human resources development
- Labor management
- Financial management

4-5 Modernization of information processing systems

4-6 Marketing promotion including strategy for exports

4-7 Implementation schedule

4-8 Cost estimation

(5) Financial evaluation of the project

(6) Conclusions and recommendations

1-4 Member of the Study

The members of the study teams are as follows.

NAME	ASSIGNMENT	COMPANY
Nobuo ISHII	Team Leader Auto-parts Industry Modernization Plan	Techno Consultants, Inc.
Yoshiyuki KATO	Production Process for Seat	Houwa Kogyo Co., LTD.
Yuhachiro OHNISHI	Production Process for Metal Works	Houwa Kogyo Co., LTD.
Yoshio HORIMOTO	Production Control	Techno Consultants, Inc.
Wakio HURUHASHI	Corporate Management (Marketing)	Techno Consultants, Inc.
Shizuo KAMIKURA	Corporate Management (Financial and Economic Appraisal)	Techno Consultants, Inc.

1-5 Study Schedule

The study will be carried out according to the following schedule.

(1) Field survey in Hungary

The first field survey	: December 5 to December 22,1995
The second field survey	: February 8 to March 13, 1996

(2) Study work in Japan

The first phase of the study work in Japan	: December 23, 1995 to February 21, 1996
The second phase of the study work in Japan	: March 14 to June 21, 1996

(3) Presentation of the draft final report in Hungary: July 28 to August 7, 1996

(4) Submission of the final report : The end of September, 1996

Chapter 2

Economic Situation and Auto Manufacturing Industry in Hungary

Chapter 2 Economic Situation and Auto Manufacturing Industry in Hungary

2-1 Outline of Economic Situation

2-1-1 Economic Trends

Hungary has actively carried out economic reforms, geared towards a market economy since the latter half of the 1980s. The Hungarian economy in the 1980s continued to grow in terms of real GNP although the average annual growth rate was as low as 1.7%. However, after the growth rate turned to a negative figure of -3.5% in 1990 in comparison with the previous year, negative growth continued. Industrial production in particular continued to reduce after 1987, and there was a large reduction of 12% in 1991. This is attributed to the economic confusion in the former Soviet Union and East Europe; dissolution of COMECON that was the largest market for Hungary; and reduction in exports to West Europe due to, for example, the stagnation in the economy of Germany which is one of Hungary's largest export markets. The real GNP that had decreased since 1990 increased 2.9% in 1994 compared to the previous year. Also, the gross industrial product hit bottom in 1992 and turned upwards in 1993.

Table 2-1-1 Main Economic Indicators

(Real base, Previous year = 100%)

		1990	1991	1992	1993	1994
Gross Domestic Product		96.5	88.1	97.0	99.2	102.9
(at current prices, HFT billion)		2,089.3	2,308.4	2,935.1	3,537.8	4,350.9
Manufacturing Product		92.4	82.2	93.3	106.3	103.7
Investment		90.2	87.7	98.5	102.5	112.3
External Trade						
(Export)		95.9	95.1	99.0	86.9	116.6
(Import)		94.8	94.5	92.4	120.9	114.5
Per Capita GDP						
(HFT Thousands)		195	223	284	343	424
(US$)				3,599	3,734	4,019
Consumer Price Index	(1986-1990)	14.8	35.0	23.0	22.5	18.8
Total Population (Thousands)		10,375	10,355	10,337	10,310	10,277
Economic (Thousands)		5,472	5,304	4,796	4,352	4,136
Registered Unemployment (Thousands)		24.2	100.5	406.1	663.0	632.1

Source: Statistical Yearbook of Hungary 1994

This is attributable to the fact that exports grew as much as 120.6% compared to the previous year. After peaking at 35% in 1991, the average annual increase in the Consumer Price

Index fell gradually until it reached 18.8%. Producer prices increased 11.3% relative to the previous year. Per capita GNP reached US $4,000 in 1994.

Thus, the Hungarian economy shows signs of improvement after 1993. However, the trade deficit that has continued since 1991 has not been improved. It reached 408 billion forints, or 9.4% of the GNP, in 1995.

2-1-2 Economic Policy

In Hungary, structural reform of politics and the economy occurred earlier than in the other East European countries and before Perestroika in Soviet Russia in 1989. Following the free election in 1990, the coalition cabinet led by the Liberal Forum party which acquired a landslide victory maintained a relatively stable political power and promoted economic reform. However, in the course of transition to a market economy which required liberalization and rationalization, it was clear that the national deficits had become large and getting larger and the elimination of subsidies and the restructuring of non-profitable divisions in the companies generated a large amount of unemployment. In the election of 1994, the achievements of the 4 year administration after structural reform were evaluated and the Socialist Party, the ruling party of the old regime, by appealing for the protection of socially weak people and the recovery from the prolonged economic recession, became the governing party. The government established stable political power by forming a coalition cabinet with the Liberal Democratic League and declared it would implement the following major economic policies.

(a) the structural reform of public financing and the effective usage of public funds
(b) the restructuring and integration of the state owned enterprises which are currently in financially difficult conditions, in a manner suitable to their present status.
(c) the reformation of the banking system and the privatization of the commercial banks
(d) the promotion of the privatization and administration of the remaining state property in accordance with market principles and the reform of the privatization method and the organization
(e) the promotion of investments and savings
(f) the preparation for entry to the EU
(g) the halting of the trend to reduce the amount of agricultural land and the development of the agricultural regions
(h) the development of infrastructures such as transportation, telecommunications, information technology, roads, housing, and tourist facilities

By carrying out these economic policies, the government aims to accomplish the following;

(a) the recovery from the present economic crisis

(b) the acceleration of the transition to a market oriented economy
(c) the adjustment of the various conditions required for sustainable economic growth
(d) the reduction of inflation and unemployment
(e) the control of the financial deficits and the deterioration of the foreign trade unbalance
(f) the promotion of investments and savings

Externally, Hungary aims to become a member of EU and fully rejoin Europe. In December, 1991, Hungary concluded the Union Agreement with EU and in March, 1992, the trade article in the agreement became effective. From February, 1994, the freedom of trade and the movement of business people was authorized. The Parliament of Hungary ratified the Rome Agreement with EU on February 8, 1994 and modified the regulations concerning patent rights and copyrights. Further, based upon the Agreement, the first Union Agreement meeting between EU and Poland•Hungary was held in March, 1994. At the same time, the foreign ministers meeting of EU confirmed the purpose of promoting political dialogue concerning a common diplomacy and a mutual security policy towards the central and eastern Europe counties who had signed the Union Agreement. After approval of the Parliament ratification, the formal application for membership of EU was made and Hungary will become a full member of EU in the year 2000.

Despite the above mentioned economic policies and membership of EU, the Hungarian economy is not necessarily developing smoothly as planned. In 1993 and 1994, both the international revenue and expenditures and the financial revenue and expenditures showed large deficits. The domestic economic conditions deteriorated. This is because the international competitive power of Hungary is not strong enough. Without reforming the existing economic structure, it will be impossible to expect economic growth. The government recognizes fully that the various economic problems can only be solved by the sustained growth of the economy. In 1995, the government published its medium term economic policy. This policy aims to mitigate the temporary problems caused by the unbalance of the financial revenue and expenditures and to promote the sustained growth of the economy. One of the most important points of this medium term economic policy was that, by controlling the rate of inflation, it was planned to increase the reliability of the economic forecast indexes published by the government and to promote the capital investment by the private sector and from foreign countries.

Under the medium term economic policy, the government devalued the Hungarian forint in March, 1995 and adopted the policy of introducing an import surcharge system and formulating a draft budget modification. As a result, the trade unbalance has slightly improved and the rate of increase of the deficits of the financial revenue has also improved since April. During the last one year, the deficits of the general account revenue and expenses as a fraction of the GDP were reduced from 8% to 6.5% and the deficits of the international revenue and expenses were also

reduced from 9.5% to 7%. The most important issue of the medium term economic policy was to achieve a balance in the trade and financial revenue and expenditures. It is planned to reduce the deficit in the international revenue and expenditures by 800 to 1,000 million HUF in 1996, and to bring it down to 4.5% of the GDP. In 1997 and 1998, it is planned to maintain the deficit in the international revenue and expenditures at 1.5 billion US dollars which is equivalent to the amount of investment by foreign companies and to keep it within 3% of the GDP. It is also planned that the deficit of the general income and expenditures shall be kept at 4% of the GDP in 1996 and less than 3% of the GDP after 1997. The rate of the inflation will be reduced to 15% in 1998 from the present annual rate of 28 to 30 %.

In addition to the above medium term economic policy, the government is currently formulating a long term economic modernization policy to cover the period of 10 to 15 years and is going to make its long term social and economic vision clear to the public.

2-1-3 Direct Investment of Foreign Capital

1) Overview of the introduction of foreign capital into Hungary and *neighboring countries.*

Foreign capital played an important role in the transition to a market economy and privatization of state enterprises that Hungary has proceeded with since 1989. As shown in Figure 2-1-1, the direct investment of foreign capital in Hungary is increasing. The factors behind this include the existence of favorable conditions (listed below) for introduction of foreign capital, as well as the economic reforms and the changes in social systems that the Hungarian Government has been actively carrying out.

(a) Hungary started economic reforms early, and its transition to a market economy has been rapid as shown, for example, by the introduction of new tax and financial systems.
(b) Hungary is located at the center of Europe and is easily accessible by land, air, and water.
(c) Hungary abounds in cheap highly-skilled manpower.
(d) The infrastructure is more developed and the country is more peaceful than neighboring countries.

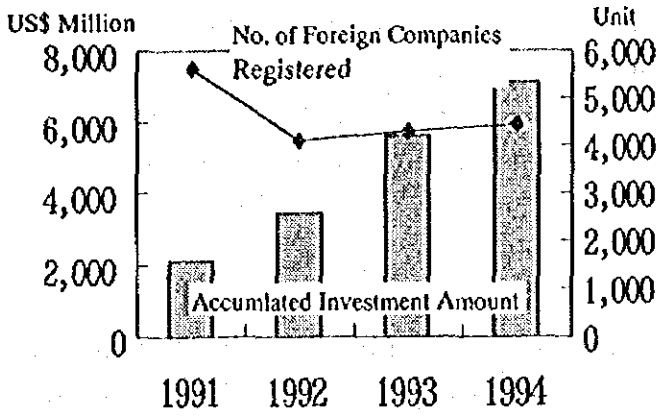


Figure 2-1-1 Changes in Direct Investment of Foreign Capital, 1991-1994

Hungary has received the largest amount of direct investment of the six former East European countries, accounting for 40% of the investment in the entire block. Recently, however, Hungary is losing its advantage because of the widening gaps in wages between Hungary and neighboring countries as well as the economic development and political reforms taking place in neighboring countries. Poland, which has a large market, and Czech which is showing a good economic performance, are attracting attention. Rumania is actively pursuing a policy of attracting foreign capital. Table 2-1-2 compares the economies of four East European countries.

Table 2-1-2 Comparison of the Economies of Four East European Countries (1994)

	Hungary	Poland	Czece Rep.	Slovakia
Gross Domestic Product (US$ billion)	39.3	86.3	37.0	13.9
GNP per Capita (US$)	3,840	2,470	3,210	2,230
Direct Investment Accumulated (US$ billion)	7.1	4.3	3.7	0.6
Average Wages & Salaries (Nominal, US$/Month)	300.7	224.5	245.8	201.2
Population (Thousands)	10,246	38,581	10,333	5,356

Source : Statistical Bulletin 1995/3

Direct Investment 1993-1996, Japan

2) Direct Investment in the automobile and automotive parts industries

As described above, direct investment in East European countries began to increase rapidly at the beginning of the 1990s when the market-opening policy swung into full gear. Each country actively introduced technology and capital from West European countries into the automobile

and automotive parts industries because of the important role the automobile industry would play in the reconstruction of the industrial sector. On the other hand, for the developed enterprises of the West, advance into East European countries means the creation of new markets and the establishment of overseas footholds for production based on cheap and highly-skilled labor. Thus, the investment in the automobile and automotive parts manufacturers constitutes a very large proportion of the total.

The main impetus for the direct investment in Hungary is to make it a platform for exporting into the EU market because of the country's small domestic market and its high technological level. The track record of investment in the automobile and automotive parts industries of East European countries is given below. As can be seen from this track record, direct investment in automobile-related industries is spreading to all the East European countries and the competition for attracting foreign capital will get increasingly fierce.

(1) Hungary

(a) In 1990, the U.S. company, General Motors (GM), set up a joint-venture assembly plant for engines and passenger cars with RABA.
Isuzu of Japan assembles pickup trucks within RABA.

(b) Magyar Suzuki, established in 1991, was the first Japanese automaker to advance into Eastern or Central Europe in earnest. It is the largest direct investment by a Japanese company.

(c) Audi, of the German Volkswagen Group, established Audi Hungary Motor (AHM) and produced 750 engines a day in 1994. It will eventually produce 2,000 engines a day.

Note: Direct investments in the automotive parts industry are discussed in Chapter 3.

(2) Poland

(a) In 1992, Fiat of Italy established Fiat Poland, a joint venture with the Polish company FSM, and started production of compact passenger cars. It is the largest joint venture in East Europe.

(b) In 1992, Ford built a car accessory plant.

(c) Peugeot began to assemble 10,000 passenger cars a year in 1993.

(d) In 1993, Volkswagen set up a joint venture for assembling VW vans. It produced 5,000 in the first year. It will produce 25,000 cars per year in future.

(e) Mercedes-Benz built an assembly plant in 1993 to expand local production.

(f) In 1994, General Motors and FSO of Warsaw established a joint venture and began assembly of the Opel Astra with an annual output of 10,000 cars.

(g) In 1995, the South Korean company Daewo purchased a plant, and reached an agreement with the FSO group concerning a joint-venture plant for automobiles and related parts.

(h) In addition, Volvo of Sweden, Renault of France, and Saab-Scania of Sweden are negotiating with local companies to produce or increase the production of large commercial vehicles such as trucks or buses.

(3) Czech

(a) In 1991, Volkswagen and Skoda started production of passenger cars in accordance with a joint-venture agreement.

(b) Daewo-Steir (Austria) Consortium acquired shares of Avia. They will produce 5,000 trucks in 1995 and 20,000 trucks in 2000.

(4) Slovakia

Volkswagen produces automobiles, TP of Czech produces automotive parts, and Yazaki Sogyo produces wire harnesses.

(5) Bulgaria

Lodacar that was set up in 1992 as the joint venture between Rover and the Dule Group plans to produce 10,000 cars in 1997.

(6) Rumania

Daewo and Oltcit Kleiover plan to produce 75,000 cars annually starting from 1996.

Figure 2-1-2 shows statistics for the production of passenger cars and commercial vehicles and the main foreign affiliates in East European countries.

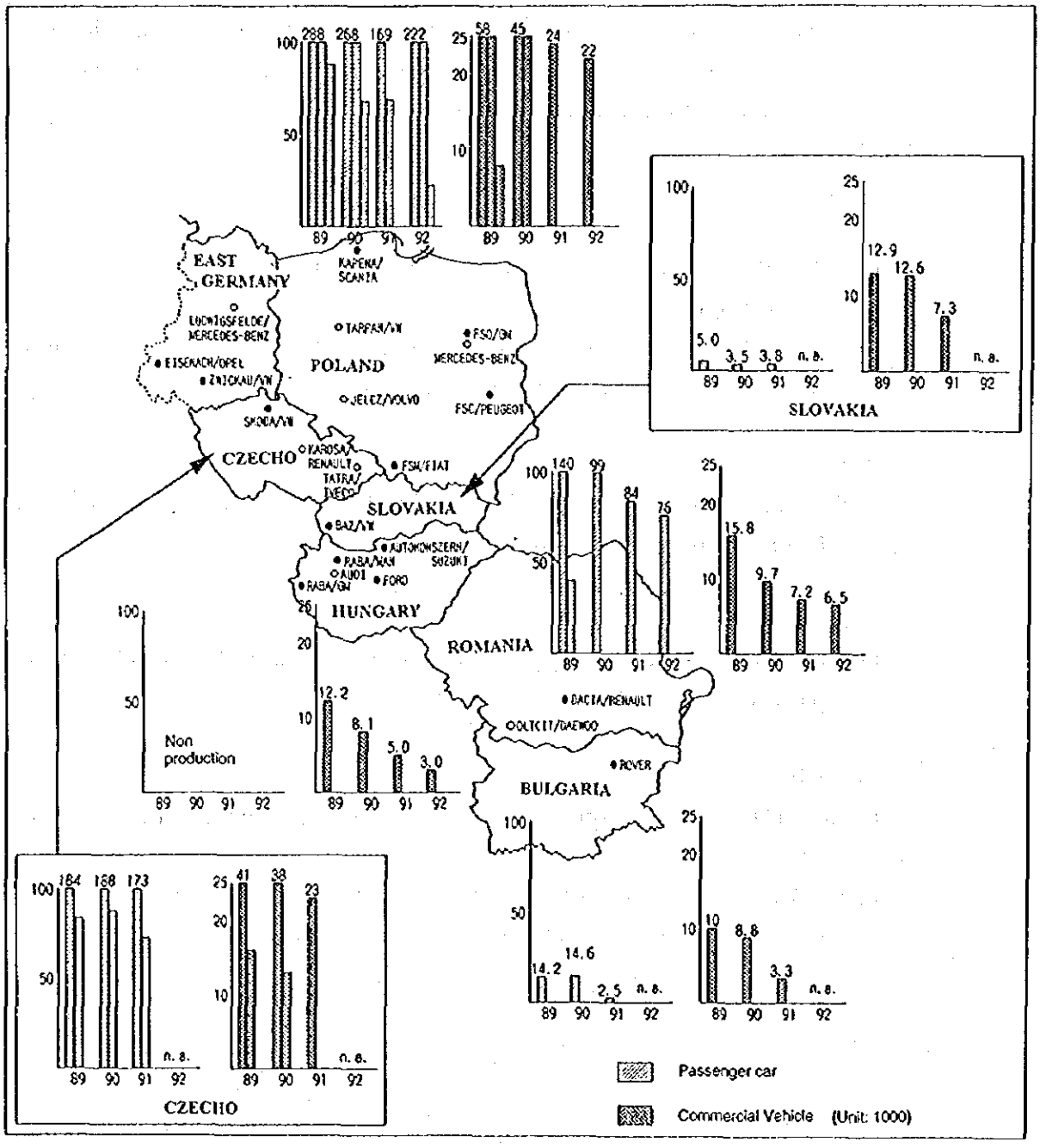


Figure 2-1-2 Statistics for Production of Passenger Cars and Commercial Vehicles and the Main Foreign Affiliates in East European Countries

2-2 Present Status of the Auto Manufacturing Industry in Hungary

2-2-1 Auto Manufacturing Industry

The automobile industry in Hungary started with the production of buses in 1895. The company which made the first bus was Uhri Imres Body Building Shop, the origin of the present IKARUS. The Hungarian automobile industry grew up gradually and before World War I, Marhab and Csepel also commenced the production of automobiles in addition to Uhri and Raba. The production of automobiles reached its peak during the second world war and recorded an annual production of 2,400 trucks, 1,000 trailers and 130 buses.

1) Truck and Buses

The trucks were manufactured by Raba and the buses were manufactured by IKARUS, exclusively in Hungary.

The production facilities were completely destroyed during the second world war. In the course of its reconstruction, the Hungarian auto manufacturing industry concentrated on the production of buses and trucks and the supply of auto parts in accordance with the divided production system within the COMECON economic structure. Table 2-2-1 shows the historic production record of trucks and buses.

Table 2-2-1 Production of Trucks and Buses

(Units: number)

Year	Trucks	Buses	Total
1949	100	500	600
1954	1,100	500	1,600
1960	2,900	1,900	4,800
1965	2,600	2,700	5,300
1970	2,860	8,843	11,703
1975	2,225	12,940	15,165
1980	1,608	15,163	16,771
1985	1,890	13,226	15,116
1986	1,833	13,586	15,419
1987	1,580	12,923	14,503
1988	2,063	12,350	14,413
1989	1,087	11,930	13,017
1990	953	8,057	9,010
1991	1,256	5,001	6,757
1992	758	3,546	4,304
1993	183	3,150	3,333
1994	60	1,500	1,560
1995	68	1,305	1,373

Souce: National statistics, interveiw data are combined and adjusted.

The production of passenger cars in Hungary was started in 1902. By the 1920's, Hungary had exported some passenger cars, however the real passenger car production per se was started quite recently when GM and Suzuki began production. Table 2-2-2 shows the production of passenger cars since 1992, started by foreign capital.

Table 2-2-2 Production Trend of Passenger Cars

(Unit: number)

Year	Magyar-Suzuki	GM (Opel)	Total
1992	916	9,936	10,932
1993	12,555	13,000	26,151
1994	19,371	12,300	40,300
1995	36,051	12,500	49,033
1996 (plan)	50,000	12,500	62,500

Source: MSC, GM interview data.

Detailed production activities are given in the Appendices.

2-2-2 Policy and Administration Concerning the Auto Manufacturing Industry

The real popularization of cars in Hungary started from the later half of the 1960's. In 1967, the number of cars owned by private drivers was only 126,000 cars, which increased to 550,000 cars in 1975 and increased by about 100,000 cars on average every year after that.

All kinds and models of cars are imported to Hungary from car manufacturers all over the world. The number of cars registered in 1991 in Hungary was 110,394 in total. The number of new and used cars and the number of cars registered for each make are shown in table 2-2-3 Passenger Car Registration in Hungary. Cars manufactured by 43 companies were imported, namely, 18 companies from Western Europe, 12 companies from Russia and East Europe, 3 big American companies, 8 companies from Japan, 1 company each from Korea and India. After 1992, in addition to the above companies, the locally manufactured new cars from GM/OPEL and Magyar-Suzuki were introduced to the market.
The number of registered passenger cars, trucks and buses in 1995 are approximately as follows:

Passenger cars	2,179,000
Trucks	258,000
Buses	21,500
total	2,458,500

Under the planned economy , the import of cars from the USSR and East Europe was a monopoly of the state-owned company called Mogut and car sales were also monopolized by a government company called Merkur.

Hungary used to pay for the cars imported from other socialist countries by trading technical products such as IKARUS buses and other automotive components. In the 1970's and 1980's, passenger cars were always in short supply in Hungary. In the late 1980's, the government reduced the import duty of new and used passenger cars from 40% to 10% in order to cope with the demands of the market. Further to this, the government introduced the free foreign currency deposit system for individual persons in Hungary in September, 1989, thus the barrier preventing imports by individual Hungarians was removed. The amount of foreign currency used by individuals for cars bought abroad and brought into Hungary was the astonishing figure of 300 million US dollars in 1989. From January 1, 1990, the government imposed a VAT of 25% in order to prevent the out-going flow of foreign currency and stop the import of environmentally unacceptable used cars which were not equipped with pollution control devices and yet the importation of used cars from Western Europe did not decrease.

Table 2-2-3 Passenger Car Registration in Hungary

Type	New	2-4 yrs	Above 4 yrs	Total
GM/Opel	2,016	1,062	7,365	10,443
Vauxhall	4	3	4	11
Saab	7	14	98	119
GM/USA made	63	183	283	529
Ford	1,420	1,558	6,322	9,300
Volkswagen	2,080	898	9,849	12,827
Audi	322	397	3,321	4,040
Seat	48	124	251	423
BMW	481	323	2,761	3,565
Mercedes	421	748	3,837	5,006
Porsche	5	15	191	211
Wartburg*	1,955	412	44	2,411
Trabant*	367	16	83	615
Renault	1,235	934	4,018	6,187
Citroen	305	469	2,611	3,385
Peugeot	1,279	1,023	2,089	4,391
Talbot	3	0	562	565
Fiat	1,079	1,401	7,148	9,628
Alfa Romeo	52	253	1,383	1,688
Lancia	79	145	743	965
Rover	17	14	98	129
Volvo	170	110	970	1,250
Skoda*	1,425	169	83	1,677
Moskvich*	768	48	6	822
Volga*	11	3	4	18
Zaporozhetz*	5	8	2	15
Dacia*	744	340	257	1,341
Aro*	41	18	8	67
Zastava*	226	10	9	245
Yugo*	394	7	1	402
Lada*	7,135	1,246	1,034	9,415
Polski*	468	76	19	563
Crysler	24	41	58	123
Honda	723	232	885	1,838
Toyota	728	339	1,560	2,627
Nissan	442	299	1,787	2,528
Mazda	514	349	1,937	2,800
Daihatsu	740	92	223	1,055
Mitsubishi	782	279	1,580	2,641
Subaru	61	29	407	497
Isuzu	5	32	29	66
Hyundai	734	45	21	800
Maruti	3,144	18	4	3,166

* Eastern Europe models.

In April, 1990, the government finally introduced the free market principle and the sales of imported automobiles were liberalized in Hungary. Now that there was complete freedom for car sales, a number of domestic and foreign car dealers were established and started the car import sales business. Mogurt and Merkur terminated their monopolies of car imports and sales at this time and companies like Mobil, Autoker and Autotechnika began to enter the auto trade and sales business. The international institutional agencies and financial agencies highly evaluated this government policy of complete freedom for car imports, coupled with the countermeasures to remedy the car shortages in the domestic market in Hungary, as a success.

In 1992, the import duty on privately owned cars was increased and the importation of used cars was controlled. The increase in the import duty on cars helped to protect the domestic car manufacturers who had just started the production of passenger cars in Hungary. The import duty imposed was 18% for gasoline cars up to 1,600 cc and diesel cars up to 2,000 cc, 28% for gasoline cars up to 2,000 cc and diesel cars up to 2,500 cc and 48% for other cars. The import duty was reduced by 5% for cars equipped with catalytic converter pollution control devices. A special duty of 30% was imposed on used cars of 4 years old or more. In 1992, an overall consumption quota system for individual persons was introduced for the import of passenger cars. Import permits were issued without any limitation for new cars, but the import permits for used cars were only issued for cars 6 years old or less because the demand for imported used cars was strong. Since January, 1993, cars more than 6 years old were only permitted for registration after passing various tests to check the functioning of the anti-pollution devices . In spite of these stringent import control measures, the import of used cars more than 6 years old increased.

On the other hand, the price of new cars has doubled since 1992 due to the price rise of new cars and the introduction of the value added tax. The passenger cars made in East Europe are no longer sold in Hungary because the untaxed COMECON trade has ended and hard currency in US dollars is used for the settlement of payment . Instead, the importation of used cars from West Europe and Japan has increased.

The Hungarian government is concerned about how to bring down the increased new car prices to a level the ordinary citizen can afford. The government considers the problem will be solved as the national economy grows and the income of the people increases.

In Hungary, there were two different opinions about how to secure the supply of automobiles. One was to manufacture a large amount of the automotive components and sell these goods to the leading automobile manufacturers in West Europe and East Europe and use the foreign currency so gained for the purchase of new cars from abroad. The other opinion was that Hungary should itself become as automobile manufacturing country. The former option had

been experienced in the past in Hungary. A number of Hungarian companies manufactured auto components under a cooperation plan for the Volga Automobile Factory(VAZ) of the Soviet Russia and had supplied components for the Lada and had received new cars as payment for the components. The latter opinion was further divided into 2 groups. One opinion was to promote the automobile production by cooperation with the old COMECON countries and the other opinion was to promote the new automobile industry with the cooperation of the enterprises who posses the most modern up-to-date technology. The method of pursuing this aim was by establishing joint venture companies with the USA, Germany and Japan, and not through technical collaboration agreements. This method was materialized eventually. The partner companies, GM and Suzuki, regarded Hungary as the strategic location for production in central Europe to meet their own company strategies. The Hungarian government and local municipalities offered various incentives to the new companies and supported them favorably in many ways. The actual production records for the past 4 to 5 years were presented in the previous section and this proved that the last correct choice was made.

The government, for the national industrial promotion policy, has selected four special industrial sectors on which to place the maximum importance. The four sectors selected by the Ministry of Industry and Trade are as follows;

(1) automotive parts industry, (2) electronics industry (3) food processing industry (4) hotel construction. The automotive industry and automotive parts industry are worth promoting intensively since a wide range of sub-sectors is affected. Because the effects are so great and widespread, the government has a keen interest in the development of the automotive industry and automotive parts industry and provides special incentive measures. The government provides tax incentives to foreign enterprises to come and invest in Hungary.

1) Tax Incentives

The corporate tax rate in Hungary is 33 %, whereas in Poland and Slovakia the corporate tax is 40% , 42% in Czech and 45% in Rumania. Further, the tax imposed on joint venture companies with foreign capital is 18% of the corporate profits plus a maximum of 5% tax on the corporate reserves remaining after paying the dividends to the share holders, for foreign companies from countries with which Hungary has concluded tax agreements already. Therefore, for most of the foreign companies investing in Hungary, the maximum corporate tax is 23%.

2) Incentives for investment promotion

From 1996, the government has introduced the new incentive policy for investment promotion. The government started the discussion of the draft in the Parliament from November, 1995 and the draft was approved by the Parliament in January, 1996. The outline of the government

policy, mainly relating to a modification of the tax system is as follows;

(a) The ratio of the tax revenue to the GDP is not to be lowered.
(b) Regarding the corporate tax, there will be no need to change the fundamental structure.
(c) Regarding the system of income tax for individual persons, the income tax will not be reduced, but the policy of achieving more fairness in the tax burden on individuals should be maintained and pursued.
(d) The tax rate of the general revenue tax will not be reduced, but the tax rate of the consumption tax is to remain unchanged.
(e) The role of the local government tax is to be increased.

The above is the policy of the government for the tax system for 1996 and the incentive measures and the tax regarding the automotive industry are summarized below.

(a) Corporate Tax

The modifications to the corporate tax in 1996 will not give any fundamental impact on the tax system nor on the total amount of the tax. However, it is intended that the tax system adopted in Hungary or to be adopted in the future shall be coordinated and adjusted to tax systems in foreign countries. The major modifications to the tax systems are the incentive measures designed to stimulate investments and to encourage exports as outlined below.

(i) For all companies in Hungary, an accelerated depreciation rate with a maximum of 30 % per year will be applied to all machinery and equipment purchased and put into operation after January 1, 1996. However, the depreciation rate for buildings shall be 10 % per year.
(ii) For projects commencing in 1996, concerned with a manufacturing business with an investment of more than 1 billion HUF, and the amount exported exceeds the amount of the previous year or if the amount exported exceeds 600 million HUF, then 50 % of the corporate tax will be exempted for a period of 5 years.
(iii) For the companies who are going to establish factories or offices in the economically depressed areas which the government classifies as areas where the unemployment rate is more than 15% , 100% of the corporate tax imposed on the sales profits will be exempted for a period of 5 years after the completion of the project. The projects which can benefit from this incentive include not only manufacturing projects but also projects in which sales profits are generated by the production of goods and in which profits are generated by merchandising activities in the above designated areas.
(iv) For the companies who are going to establish factories in areas which invite enterprises such as the industrial zones, 6 % of the total investment amount of the machinery and

equipment as well as the building cost of projects which start operating after January, 1996 will be exempted from the tax for a period of 5 years. However this is subject to the condition that an amount equal to the amount of the tax exemption shall be invested in the same designated zones within 3 years.

(v) The interest on the loans approved by the economic development program and borrowed from Hungarian financial organizations can be included as expenses in the accounts. Until now, 12 % of the calculated interest was exempted from the tax to be paid and this will be modified to 18 % of the tax payable.

(b) General Sales Tax

There will be no fundamental modifications to the general sales tax in this financial year.

(c) Consumption Tax

The regulations provide for an average 15% tax. This tax rate is imposed on consumption, however this rate is lower than the inflation rate.

(d) Automobile Tax

The total amount of the automobile tax will go to local governments from this year. Until now, the automobile tax revenues were divided between the central government and the local governments to be included in their budgets.

3) Establishment of an Economic Development Fund

The government established an economic development fund in order to grant subsidies to the enterprises who contributed to the promotion and development of industries in 1995. The funds are raised from government financial sources. The government grants subsidies for investments in the infrastructure required to build new factories, and to reduce the interest on loans. This is a very good incentive in a country with high interest rates like Hungary where the annual interest rate is 30 % per year. It is planned to apply this system to the large investments made by foreign companies. When the foreign enterprises come to the industrial zones for investment, the government considers offering a subsidy from the funds.

4) Support by Local Municipal Governments

The local municipalities welcome foreign companies which come to their areas and generate employment opportunities. Therefore, the municipal governments support the foreign companies by means of various incentives and supporting policies, such as the granting of a direct subsidy, providing the required land free of charge, or a combination of the two. For example in case of Magyar-Suzuki, the local government granted an employment subsidy because the company generated a large amount of employment in the region. It is reported that similar support measures were taken by the city of Szentgotthard when GM/OPEL established their factory there.

2-3 Privatization Policy and Current Situation

2-3-1 Privatization Policy

The government of Hungary is promoting the privatization of state owned companies as a part of its economic reform policy. For this purpose, the government has developed the legal procedures and established a coordinating agency to administrate the privatization and is arranged an organization to promote privatization. In October 1988, the law concerning private companies was established as the first step towards a market oriented economy and in 1989, the company conversion law became effective and it became possible to convert state owned companies into private companies. In 1990, the private enterprise law became effective and any private persons who wished to start the private business could operate their own business by submitting applications. For the purpose of privatizing state owned enterprises, it is possible to privatize an enterprise if three quarters or more of the votes are obtained in a general assembly meeting. A part of an enterprise can be privatized if more than two thirds of the employees of the said portion agree to privatize that portion of the enterprise.

The government established the state property administration agency in 1990. The role of the agency was to support and supervise the privatization of the state owned enterprises. The number of state owned enterprises in 1990 was 2,200 and the book value assets was 26.7 billion US dollars. The number of the enterprises under the control of the agency was 1,840. The government adopted the policy of participating aggressively in the privatization program. The outline of the privatization is as follows:

(1) Active Privatization

The state property administration agency selected and made public in September, 1990, twenty enterprises to be privatized chosen from the manufacturing industry, the tourist industry, the commercial business and the trade business which were in an excellent financial condition and would be attractive to foreign capital. The agency called for consultants who would guide these enterprises regarding practical methods of privatization, the preparation of the drafts for organization changes, and the establishment of management policies. The agency selected 20 consultant companies from abroad and 2 companies domestically. Since the privatization procedures were complicated and time consuming, only 6 state owned enterprises were privatized and the results were far from expected.

(2) Pre-Privatization

In parallel to the active privatization, the government launched a program for privatizing small scale enterprises. In accordance with the privatization law for small scale state owned enterprises formulated in September, 1990, the small scale enterprises such as restaurants with

15 employees or less, and stores with 10 employees or less were sold to Hungarian nationals. Approximately 10,000 enterprises were privatized by the end of 1994. The government made it a rule to privatize the small scale enterprises based on the privatization law of small scale state owned enterprises and the other 1,840 large scale enterprises under the management of the state property administration agency.

(3) Privatization initiated by investors

This is the method of privatization introduced by the state property administration agency in February, 1991. Foreign and Hungarian investors purchase a part or all of state owned enterprises which have been transformed into the form of a company after obtaining the approval of the agency. Most of the state owned enterprises are currently privatized by this method.

(4) Self Privatization

This method was introduced from March, 1991. 403 enterprises were selected from enterprises which had less than 300 employees and had sales revenue of more than 800 million HUF and these were entrusted to about 100 consultant firms selected by the agency for privatization. The criterion of the selection of the enterprises were later changed to the companies with less than 1,000 employees and an additional 270 enterprises were selected.

This method, together with the method of privatization mentioned in (3) above, are the main procedures for privatization of the state owned enterprises.

By the end of 1995, about half of the state owned property had been privatized. Half of the state properties sold for privatization to date have been purchased by foreign capital from Germany, America, Austria and other countries. One of the outstanding points of the privatization in Hungary is that an extremely high proportion has been purchased by foreign capital.

2-3-2 Current Status of Privatization

Privatization in Hungary has mainly taken place in the privatization of small scale enterprises and privatization conversion of small and medium scale state owned enterprises. Although some inconvenient and unsuccessful cases have been reported, it is recognized that the privatization was generally successful. However, the privatization of the large scale state owned enterprises has been delayed to a large extent. The complicated company structures, the scale of their enterprises, and the varieties of their business operations has made privatization of the large enterprises difficult and time consuming in comparison to the privatization of the small scale enterprises. To the investors, the privatization of the large companies is not attractive enough to overcome these complications, and the time and trouble involved . In order to attract the interest of the investors, it is necessary to stabilize the financial conditions of the enterprises and to

provide tax incentives to enable them to restructure the enterprises.

In May, 1995, the government launched a program to promote privatization more intensively and issued a new law and regulations. Under the new law, the government integrated the State Property Administration Agency and State Holding Company Limited and formed the new State Privatization and Holding Company Limited by Shares (APV Rt). In June, 1995, a total of 819 state-owned enterprises and assets of 110 billions HUF (US$ 8,700 million) were under the control of APV Rt for privatization.

The government stated that in the privatizing the gas and electricity utilities, 40% of the stock would be allocated to municipal governments, 9 % to the employees and the balance of 51% to foreign capital. The government also made it clear that the European Bank for Reconstruction and Development (EBRD) would make loans of US$ 90 million to the state-owned gas company, and US$ 300 million to the state-owned electricity company and would also cooperate in the privatization of banks.

2-3-3 Privatization of IKARUS

The privatization of IKARUS, the parent company of IMAG, has been discussed among the ministries concerned. The State Privatization and Holding Company Limited has set a firm schedule for privatization and started to take the necessary actions.

1) Company profile and share holders

IKARUS manufactured 12,000 to 14,000 buses in the 1970's and 1980's and supplied them to the market of COMECON. For a period of more than 20 years, IKARUS was ranked as the 4th or 5th bus manufacturer in the world. Due to the collapse of the planned economy of the Soviet Union and East Europe in 1990, the production and sales of IKARUS buses dropped to one tenth suddenly. From this time, IKARUS accumulated a vast financial losses. In August, 1990, IKARUS was placed under the control of the finance minister and started their struggle for revival. Table 2-3-1 shows the Profit and Loss situation of IKARUS for the last 4 years.

Table 2-3-1 Profit and Loss Data for IKARUS

(Unit 1,000 HFT)

Year	1992	1993	1994	1995
Sales revenue	21,306,963	22,941,749	17,055915	20,625,649
After-tax profit	−3,477,923	1,253,714	−925,120	−2,292,755
Workforce, persons	8,416	6,316	4,796	3,924
Subscribed capital	11,500,000	11,500,000	11,500,000	11,500,000
Equity	7,751,659	9,002,399	8,068,437	5,772,681

During the course of reviving the company, a new company was established on August 30, 1991 and all business has been transferred to the new company. The capital was 11,500 million HUF in total, of which 7,000 million HUF was owned by IKARUS and 3,500 million HUF was owned by Atex Rt. of Russia. Table 2-3-2 shows the Share Holders of IKARUS as of December, 1995.

Table 2-3-2 Share Holders of IKARUS

Shareholders	Share,HFTx1,000	Shareholding,%
APV Rt(Hungarian State)	7,348,500	63.90
Atex Rt(Russian Capital)	3,500,000	30.43
CEIC Holding Ltd	149,000	1.30
MHB(Hungarian Credit Bank)	500,000	4.35
Predecessor(IKARUS)	2,500	0.02
Total	11,500,000	100.00

2) *Restructuring Plan*

Although the APV Rt is the major share holder, having a 64% share, their rights are restricted by the company by-laws. According to the agreement between the revival committee and the foreign share holder, it is necessary to have a majority of more than 75% of the vote for any important subject and the majority of the Hungarian government alone is insufficient. According to the original revival plan, it was forecast that 8,000 buses would be manufactured annually and 6,000 buses would be sold to ex-Soviet and East Europe markets. This sales volume was used as the basis of the revival plan for employment and investment in production facilities. In 1991, it was planned that the accumulated loss of 10,760 million HUF would be taken care of by cash revenues and the sale of assets. In 1991, however, the loss was 365 million HUF. In 1992 and 1993, the situation became worse and it was clear that the company could no longer continue as it was. IKARUS accepted the restructuring plan prepared by the crisis management committee. The plan was to manufacture 3,000 buses per year and based on this production volume the number of employees would be reduced, the cost reduction would be made and the company would revive within the very short period of one year. By the end of 1993, a profit of 1,245 million HUF was achieved, but in 1994, there was again a loss of 925 million HUF. This was because the sales plan made by the crisis management committee was based upon the production of 2,500 to 3,000 buses per year, but the actual number sold was only 1,574 buses in 1994. The government exempted 747 million HUF out of IKARUS's 1,690 million HUF total debt, through APV Rt. And in 1995, a further 943 million debt was exempted by the government.

3) Privatization Bid of IKARUS

The privatization program was promoted with the support of APV Rt and the recent developments were as follows:

- On November 1, 1995, the bid invitation note was published in the London Times stating that-

(a) IKARUS will sell 80 % of its 9,200 million HUF stock.
(b) In addition, applicants should make a cash contribution.
(c) Bid documents can be purchased at the cost of US 800 dollars from November 6, 1995.
(d) Bid closing date will be January 8, 1996.
(e) Bids should be valid for a period of 120 days after submission.
(f) Bids will be evaluated by the Hungarian Privatization and State Holding Company-APV Rt and a consultant company, Ernst & Young Ltd.

-On February 9, 1996, Hungary ECONEWS reported the following:

(a) Five foreign companies and one domestic company participated in the bid.
  - Volvo (Sweden)
  - Scania (Sweden)
  - Daimler-Benz (Germany)
  - DAF (France)
  - Raba Kft (Hungary)
  - One other
(b) One company submitted a letter of intent but it was rejected. It is reported that the company that submitted the letter of intent was Raba Kft of Hungary.
(c) Volvo showed interest only in the Szekesfehervar Factory and an other company showed interest only in the Budapest Factory. It is also reported that another company showed interest in a venture which IKARUS had invested in. However IKARUS required this to be a privatization bid for the company as an integral unit and indicated that piece meal deal would not be accepted.
(d) Finally the privatization bid for IKARUS failed this time.

Chapter 3

Automotive Parts Industry

Chapter 3 Automotive Parts Industry

3-1 Outline of Automotive Parts Industry

In accordance with the special agreement concluded with the old COMECON member countries during the planned economic regime, Hungary had manufactured and exported its products to the USSR and COMECON market as the main supplier of buses and trucks. In addition to exporting completed buses and trucks, the Hungarian automotive parts industry played a large role as the major supplier of the automotive parts in COMECON countries. As the collateral exchange goods of the supply of automotive parts to COMECON countries, Hungary had received complete passenger cars from these countries.

In the late 1980's, the total automotive parts revenue reached 45 % of the total revenue of the auto industry in Hungary. This ratio of the automotive parts revenue to the national auto industry revenue in Hungary is an extremely high number compared with the automotive parts industries of other COMECON countries. In COMECON countries, automotive parts supply factories were clustered in the vicinity of the parent automobile assembly factory and the fact that the manufactured auto parts products were mainly supplied to the automobile assembly factory was completely different from the situation in Hungary.

After the collapse of the COMECON market, trade among the east European countries was paid for in dollars and, due to the shortage of convertible foreign currencies, the trade of automobiles decreased drastically. During the COMECON market time, Hungary had supplied automotive parts for LADA cars manufactured in the Volga Automobile Factory (VAZ) of the Soviet Union, such as ignition switches, ignition timers, wiper sets for front wind shields, horns, dashboards, door keys, engine keys, cylinder locks for trunks, batteries and so on. In addition to the LADA cars, Hungary had supplied similar automotive parts for the Fiat car produced by the FSO factory and other Fiat cars produced by the FMS factory, both in Poland, the Dacia car in Rumania, and the Zastava car in Yugoslavia. Even during those days, Hungary had a strong desire to enter into technical collaboration agreements with west European automotive parts suppliers and there were some cases in which technical license agreements were concluded, however no long term relationship such as the formation of a joint venture company was established with any west European automotive parts suppliers until the early 1980's.

In the mean time, the market share of the LADA car greatly decreased, the automobile assembly factories of Poland were privatised, and Yugoslavia entered into a civil war between ethnic groups and these events terminated the good old days of the mass supply of automotive parts from Hungary and lead to a time of supplying small quantities of wide variety of automotive parts which were sold to small markets.

3-2 Automotive Parts Industry of Hungary in the 1990's

The Hungarian automotive parts industry became active in the 1990's. There was very active foreign capital investment from the west European countries and these foreign investments were concentrated in the fields of the automobile and automotive parts industries.

(a) Suzuki of Japan constructed a full scale automobile assembly factory in Esztergom City.
(b) GM/OPEL constructed a complete automobile assembly factory and an engine manufacturing factory in Szentgotthard City.
(c) Ford constructed an electric and electronic components manufacturing factory for automobiles in Szeksfehervar City.
(d) Audi constructed an engine manufacturing factory in Gyor City.

Along with the capital investment by these giant multi-national automobile companies, a number of smaller entrepreneurs invested capital in the Hungarian automotive parts manufacturers or established joint venture companies. By 1994, the large automotive parts suppliers had come to Hungary one after the other. Some examples are as follows:

(a) ITT Automotive Europe GmbH constructed a factory in Veszprem City, which manufactures switches, cable harnesses, ABC sensors, door lock devices and so on.
(b) AUDI constructed a factory in Gyor City, which manufactures cylinder heads, in addition to engine assembly.
(c) Southtech Company of the U.S.A. constructed a factory in Tatabanya City, which produces aluminium wheels for passenger cars.
(d) VAW of Germany constructed a factory in Gyor City, which manufactures cylinder heads for GM OPEL.
(e) Linamar Machine Ltd. of Ontario, Canada, purchased a Hungarian agricultural machine factory in Oroshaza City and converted it to a factory which manufactures electronic components for the fuel pumps for Ford Motor Company and European and Canadian markets.
(f) ZF Company of Germany purchased the old Csepel factory and established a factory in Eger City which manufactures heavy duty transmissions for buses and trucks.

As a matter of fact, the Hungarian automobile assembly companies are seeking good automotive parts suppliers to reduce the total cost of complete cars to make their cars competitive in the international markets. This means that the Hungarian automotive parts suppliers are able to supply their products not only to the Hungarian automobile assembly companies, but also to automobile assembly companies in west Europe and world wide. The government of Hungary is

very eager to promote the sales of automotive parts to develop the economy of the country. The Hungarian government considers that the automobile and the automotive parts industries in Hungary were successful as a whole in the 1990's. The main reason for this success was that the Hungarian automotive parts industry could attract a large inflow of foreign capital from west Europe.

It was considered that the Hungarian automotive parts industry possessed the high technical capability needed to satisfy the severe regulations and high standards specified by the west European automobile makers, thus attracting investments from western enterprises.

Actually, the Hungarian automotive parts manufacturers could cope with issues concerning the structural aspects of auto components and possessed the necessary technical capability, marketing capability, quality control of products and so on. There are many examples of Hungarian automotive parts companies that have grown up by themselves by solving the technical, commercial and financial problems raised by customers and partners. The Hungarian automotive parts industry is considered, in fact, to be located in a very competitive and strategic position. The government of Hungary estimates that there are approximately 300 to 350 companies who are manufacturing and producing automotive parts in some way, or another. The total revenue of these automotive parts enterprises was estimated to be 500 million US dollars in 1994 and 600 million US dollars in 1995. Taking the manufacture of the automobile engines alone as an example, it is estimated that 1,000,000 units will be produced in 1998.

As explained above, it is considered that the automotive parts industry is the industry with the highest growth in Hungary. The automotive parts industry announced that they had established clearly the fundamental policy of producing high quality products and that each company guaranteed their products would maintain a level of technical standard equal to that of the west European automotive parts manufacturers and would satisfy the customers' standards and specifications. With this background, Japanese and west European automobile makers came to Hungary and purchased component products from these automotive parts companies for assembly into their complete cars. Furthermore, in addition to maintaining the quality of the products at a high level, Hungarian automotive parts manufacturers have struggled to restructure themselves and to adopt revised organizations and revised methods of cost control, in order to achieve internationally competitive prices for their products. Today, automotive parts are internationally traded goods and , if the prices, as well as the product quality, are not competitive, the suppliers will not survive and the Hungarian automotive industry is very aware of this.

3-3 Outline for the Automotive Parts Industry

The intention to invest in the automobile assembly industry and the automotive parts industry in Hungary is very high and it is rather difficult to forecast the future outlook of the automotive parts industry as well as future trends, export trends, and future employment situations in the automotive parts industry. However, the government of Hungary forecasts as follows:

(a) The growth rate of the automotive parts industry was 12 % in 1995 and it will increase to 14 to 15 % for the next 3 years .

(b) The growth rate of the exports of the automotive parts industry is estimated to be at the annual rate of 7 to 10 % for the time being.

(1) The Case of Magyar-Suzuki

In October, 1992, the Magyar-Suzuki Swift car had a locally procured contents of 22 % for press work, welding, painting and assembly works done within Magyar-Suzuki's own factory and 7 % of the materials were domestically procured giving a total of 29 % of the cost of the car. The local content became 50 % in October, 1993 and reached 53 % at the end of 1995. The automotive parts being supplied by Hungarian companies to Magyar-Suzuki are batteries, seats, press work, horns, front windshield wipers, wire harnesses, glass, painting, interiors and so on.

(2) The Case of OPEL Hungary

The OPEL Astras car manufactured in the Szentgotthard Factory were made initially of almost entirely imported automotive components. In 1992 when the car assembly work started, the domestic Hungarian automotive parts used in its production amount to only 4 % of the cost. In 1994, the local content of automotive parts had increased to 14 % of the price of the complete Astra car, and consisted of batteries, speakers, press work, painting and so on. OPEL Hungary intends to increase the local content and endeavors to adopt domestically manufactured components.

The automotive parts suppliers who furnish their products to OPEL Hungary are approved by OPEL to supply the products, not only to the Szentgotthard Factory, but also to all GM factories in Europe. This means that the sales channels are wide open to qualified Hungarian automotive parts suppliers. In fact, the amount of Hungarian automotive parts sold to European GM factories in 1994 was 100 million Deutch Marks. In 1995, this figure had increased to 300 million Deutch Marks, which was several times more than the amount sold to the Szentgotthard Factory.

3-4 Promotion Policy of Automotive Parts Industry

The policy of promoting the automotive parts industry is considered to be the most important industrial policy for central European countries. Most of the central European countries have a fairly strong automobile and automotive parts industries.

The government of Hungary recognizes very well the importance of the policy of promoting automobile and the automotive parts industries from the following two viewpoints.

(a) The automobile and automotive parts industries have a powerful influence on a wide range of supporting industries. The auto industry uses various kinds of goods such as steel products, mechanical components, rubber products, glasses, plastic materials, electric and electronic components and non-ferrous metals. Many kinds of technology developments and innovations are thereby introduced into these industries.

(b) The automobile and the automotive parts industries are on a global scale. Huge investments will be necessary for installing the massive equipment and facilities. The trade and logistics are decided by a small number of giant enterprises.
The government considers that they can exercise some kind of influence over the selection of plant sites and the amount of trade.

The Hungarian industrial world expects that the automotive parts industry will achieve dynamic growth and development. In order to accomplish this goal, the quality of basic materials, such as steel products, copper and aluminium materials, plastic materials, glass and rubber materials and paint must inevitably be improved. For this purpose, the technical ability of the whole country is indispensable.

Up until now, the development of the automotive parts industry has depended upon technological innovation. The manufacturers who have been successful as automotive parts suppliers have recognized the importance of maintaining the quality of products at a high level and aggressively incorporating technology innovations. They also recognize the importance of improving their products by uninterrupted technical development and making continuous efforts to reduce the cost of the products.

Among the automotive parts suppliers, there are a number of small and medium size companies. In order to promote the technical capability of these small and medium scale companies and prevent them from dropping out of research and development activities, the government of Hungary intends to guide these companies by its industrial policy so that they will carry out research and development work on a co-operative basis. As practical aspects of this policy, the government set up the policies of supporting the greater use of international

technical data banks, establishing an information and data gathering centre and establishing a special technology development centre and so on.

The government is promoting a so called horizontal industrial policy, namely, promoting exports, promoting investments, supporting research and development activities and is also promoting a so called vertical industrial policy, namely, strongly supporting technology innovation activities, in the true sense of the word, for the development of the automotive parts supplying industry. More specifically, the government will endeavor to improve and upgrade design capabilities and technical strengths by preserving and cultivating existing research and development institutes. And the government intends to promote an increase in the amount and variety of information relating to the automotive parts industry, efforts in marketing and enlarging markets, and the improvement and development of standards and regulations for auto parts products.

As an example of successful research and development in the automotive parts industry, the government quotes the product development of the Raba Company. Raba, as the leading company of the automotive industry, has guided the research and development activities of the small and medium scale companies who supplied small components for installation in Raba's products such as engines, chassis, and axles. They have accomplished a number of improvements by this kind of co-operative development work in the field of design and manufacturing technology.

The government of Hungary understands the necessity of restructuring the entire industrial organization to make it suitable for high value added production, high technology and high wages in the long term. Especially in the case of the automotive parts industry, the government recognizes the merits of Japanese simplified organisations and methods and intends to adopt them gradually.

The development itself needs a government policy of support for human resources development, the strengthening of institutes for research and development and financial support for the necessary investments for prototype and demonstration manufacture. If the government implements these policies for supporting the industries in a co-ordinated fashion, the Hungarian automotive parts supply industry will be well placed to be a growing industry in future.

3-5 Outline of Automotive Parts Enterprises

It is estimated that at present, approximately 300 companies are engaged in the production and manufacture of automotive parts in Hungary. About 120 of these 300 companies belong to the National Alliance of Hungarian Automotive Parts Manufacturers. The companies belonging to this association manufacture not only automotive parts, but also other engineering parts such as machine parts, electric and electronic parts, for transportation machinery and equipment, parts for construction machinery, parts for industrial machinery, structural steel fabrication and so on. Since the automotive parts manufacturers manufacture many kinds of industrial components in addition to the automotive parts, the various statistical documents published by the government do not contain a classification for the automotive part industry.

The Hungarian Association for automotive parts manufacturers was founded in 1993 and at present the number of member companies is about 120. The total number of employees of all the member companies is 27,200 at the moment. The total sales revenue of the member companies is approximately 65 billion forints, which corresponds to 40 % of the domestic total sales revenue of all industrial products in Hungary. Approximately 44 % of the sales revenue of all the member companies, namely, 28.6 billion forints are generated by the sales of automotive parts. The Association estimates that approximately half of the 23.3 billion forints comes from the export of automotive parts.

The major activities of the Association are the following 4 items.

(a) Acquisition of authorization of quality control
The association will conduct for the member companies the seminars and lectures at cost to guide how to acquire the certificates for quality control. The technical committee of the association distributes the information concerning quality control at free of charge. As the subsidy for promotion of small and medium enterprises, the association received the equipment for quality control and computers as the grand from Japanese government for the worth equivalent of 20 million Japanese yen.

(b) Consultation of legal matters
In case that any company regardless be a member or not violates the market by price dumping or other illegal methods, the association will consult the legal matters as the representative of the member companies.

(c) Research and development of products
In Hungary, the labour cost is lower than in west European countries and the member companies manufacture the products by obtaining licenses from foreign companies. However, in case that the member companies carry out the research and development by themselves, the association will guide them.

(d) Development of market

The association will collect the information concerning market and supply to the member companies. The association also introduce the member companies to exhibitions as well as supplying the information concerning the exhibitions and teach them how to obtain the related information.

The budget of the association is taken care of by the member fee of the companies. The member fee will be proportionate to the sales revenue of the companies and decided every year. The budget of the association is 4.5 million HUF in 1996.

As a result of these efforts conducted by a wide spectrum of the automotive parts industry, the technical strength and the reliability of quality of the products of the automotive parts manufacturing companies have increased and the formation of groups of affiliated automotive parts companies has been initiated by the automobile assembly companies. Especially, Magyar-Suzuki asked Japanese major automotive parts companies to conclude technical collaboration agreements with their counterparts in Hungary to facilitate technical guidance and technical transfer and to go further and to form tight and close relationships such as the establishment of joint ventures. This business approach accelerated the formation of groups of affiliated parts supplying companies. This movement will introduce and accelerate the development of new automotive parts products, the methodology of quality control and schedule control in the daily operation of the factories and methods of corporate management into the Hungarian automotive parts enterprises.

This movement is extremely significant for the Hungarian automotive parts industry as the country is about to enter the European Union as a full member in the near future. This entire movement will enhance the base of the Hungarian automotive parts manufacturing industry which is going to launch itself into the international automobile market on a global basis.

3-5-1 Codes and Standards for Automotive Parts in Hungary

The codes and standards applied to automotive parts produced in Hungary are fundamentally based upon international standards such as the ISA or ISO 9000 series, mainly as a result of the guidance and leadership of the automobile assembly companies and the large automobile related companies such as Raba. The major automobile companies and the large automotive parts companies purchase automotive components only from workshops which have passed the qualification of ISO 9000 as a rule. From the viewpoint of the quality control of the products, west European automobile assembly companies require automotive parts which have been manufactured strictly in accordance with ISO 9000 series and the Hungarian automobile companies have adopted the ISO 9000 series as the basis of their purchasing standards.

Hungarian automotive parts companies manufacture their products based on the manufacturing standards of ECE (United Nations Economic Commission for Europe). More specifically, the automotive parts such as exhaust pipes, brake mechanisms and their parts, and noise related components and diesel engine components are manufactured in accordance with Euro 1 and Euro 2 of ECE.

The Hungarian automotive parts manufacturers adopt EU standards as the basis for the safety and environmental requirements of their manufacturing equipment and production facilities. The municipal governments guide and supervise the production activities to check that the automotive parts manufacturers are, in fact, respecting and obeying the legally prescribed rules and regulations. These rules and regulations form the basis for anti-air pollution rules, waste water pollution controls and noise controls.

The large enterprises, such as Raba, give guidance to the small and medium scale automotive parts manufacturers, who supply their products to Raba, so that they can actively engage in research and development activities. Raba also guides these small and medium scale suppliers to acquire the ISO 9002 manufacturing standard. Practically speaking, the products manufactured in accordance with the internationally approved standards and regulations are expensive, therefore these high grade components are supplied to or assembled into the products of American and European automobile companies. The customers in the CIS countries of the old Soviet Russia and the east European countries prefer the Hungarian automotive parts products manufactured by the old methods at a relatively cheap price and for these customers, the Hungarian automotive parts suppliers are currently supplying completed parts and completed products which carry the H mark in place of the ISO standard.

H marks are granted and marked on the actual automotive parts products which have passed the tests and inspections specified by the Ministry of Transportation and carried out by AUTOKUT, the Research and Development Company for the Automotive Industry Limited, which is 100 % owned by the government of Hungary. After the collapse of the COMECON markets, there is a time of chaos and confusion when some of the automotive parts manufacturers manufactured their products in their own ways without adhering to any codes and regulations. To avoid this confusion, the Ministry of Transportation set forth the codes and standards represented by the H mark in 1989. The counties like Russia, Slovakia, Slovenia and a number of the central Asian countries highly respect the H marks and any automotive parts stamped with the H mark are used without further re-tests and re-inspection in these countries.

3-5-2 Privatization of Automotive Parts Enterprises

The company IMAG, which is the subject of this study, is one of 5 companies on the council of the Association of Automotive parts Manufactures of Hungary. The council is chaired by Bacony which is the largest automotive parts manufacturer in Hungary and which was privatised in 1994. IKARUS, the sole owner of IMAG, was proposed for privatization in November 1995, but this failed in February, 1996. However 52 % of IMAG stocks owned by IKARUS were transferred to Raba, a 100 % state-owned company, on February 7, 1996, as the guarantee of payment by IKARUS of their debt to Raba for the engines, chassis and axles furnished to IKARUS which had accumulated over many years. If the stocks of state-owned companies are not transacted at appropriate values similar to the prices determined by the stock exchanges of capitalist economies, such transactions will cause confusion in the Hungarian economy. The study team made a query on this point to the senior management staff of Raba by asking how much of IKARUS' debt corresponded to the 52 % of IMAG' stock, but since this sort of information confidential to the company, it was not possible to obtain any indication. Many of the Hungarian automotive parts manufacturers are rather small and medium size companies and they are being privatised faster than the huge state-owned parent companies. The privatization of the state-owned member companies of the Association of Automotive Parts Manufacturers or their affiliate companies will definitely proceeded faster than the privatization of the parent companies.

3-5-3 General Issues of Automotive Parts Enterprises

The average age of the engineers and technicians in Hungary is comparatively high. It is reported that 48% of the engineers and the technicians are over 40 years of age. In order to attract a younger generation of people who will look after the future of the automobile industry and the automotive parts industry, it is necessary to make these industries attractive enough to youngsters and maintain their attractiveness. The general environmental conditions of the automotive manufacturing shops are not so clean and the work done there is also generally dirty. To improve the working environment and to work in a clean and neatly arranged environments are the bases for producing better quality products. This will be a big issue for the entire automotive parts manufacturing industry to struggle with.

3-6 Classification of Automotive Parts Enterprises

The Hungarian automotive parts manufacturers consist of two groups of companies. The first group are who previously manufactured automotive parts for the domestic automobile companies making buses and trucks and the second are the companies who recently started producing automotive parts and supplying their products to the domestic passenger car manufacturers like GM/OPEL and Magyar-Suzuki and to the domestic commercial vehicle manufacturers making buses and trucks. These two groups of companies are now competing with each other and coexists harmoniously.

An attempt to classify the automotive parts manufacturers has been made for the 97 companies belonging to the Association of Automotive Parts Manufacturers and the 57 companies who, while not belonging to the Association, are manufacturing automotive parts and furnishing their products to the passenger car manufacturers and the commercial vehicle manufacturers. The total of 154 companies is divided into 8 categories based upon their main products as follows.

Category of Automotive products	Kinds of manufactured products
I	Metal work, press and welded products
II	Mechanical products
III	Electrical products
IV	Electronic Instrument products
V	Cast and Forged products
VI	Plastic products
VII	Rubber products
VIII	Other products (glass, batteries, computers)

The 154 automotive parts manufacturers are classified into the above 8 categories based on their main products as follows:

	Kinds of manufactured products	Number of companies (companies)	Ratio (%)
I	Metal work, press and welded products	17	11.0
II	Mechanical products	58	37.7
III	Electrical products	12	7.8
IV	Electronic Instrument products	11	7.1
	V Cast and Forged products	18	11.7
VI	Plastic products	16	7.2
VII	Rubber products	5	3.3
VIII	Other products (glass, batteries, computers, etc.)	17	11.0
	Total	154	100

75 companies, corresponding to approximately 49 % of the total are manufacturing mechanical products in categories I and II. The automotive parts products in the categories III to VIII are manufactured by approximately 10 % each of the total number of the companies. As a whole, it can be said that the number of companies manufacturing the various automotive parts in Hungary is well balanced.

Chapter 4
Outline of IMAG

Chapter 4 Outline of IMAG

4-1 History of IMAG

IMAG was established in 1969 in Mor village as a separate factory of the Bus parts manufacturing division of IKARUS. IKARUS was at that time the largest bus manufacturing company in the east European countries and IKARUS built a bus seat manufacturing factory in the hilly area of Mor village, which is located about 40 km away from its main Szekesfehervar factory. At the time when the Mor factory was built, IKARUS manufactured about 8,000 buses annually and gradually increased its bus production to about 15,000 a year at the time of peak production in the 1980's. The seats needed for these 15,000 buses amounted to 500,000 to 600,000 per year and all the seats were manufactured and supplied by the Mor factory of IKARUS. In 1977, the separate factory in Mor became Mor factory of IKARUS and in 1992, the Mor factory of IKARUS became IMAG Kft with 100% capitalization by IKARUS. Its formal company name is IKARUS Mor Alkatreszgyarto Kft, the trade name is IMAG Kft and the English name is IMAG Component Parts Manufacturing Limited.

The company outline of IMAG is shown in Table 4-1-1.

Table 4-1-1 Company Outline of IMAG

Company Name	Ikarus Mori Alkatreszgyarto Kft
Location of Head Office	H-8061 Mor, Ipartelep, Hungary
Land Area	99,738 sq.meters
Building Area	32,150 sq.meters
Established	1969
Capital	785,000,000 HFT. RABA 51.72% IKARUS 48.28%
Number of Employees	1,179
Main Products	Bus seat, car seat, cable harness, door trim, roof trim,rail car seat,etc
Domestic customers	Magyar-Suzuki,IKARUS, Hungarian Railway
Foreign customers	Audi, Ford, BPW
Annual turn-over	5,600 million HFT. in 1995

Since its foundation, IMAG had been a 100 % subsidiary of IKARUS. However, on February 7, 1996, Raba became IMAG's majority owner, having 51.72 % of the stock with the

balance of 48.12 % owned by IKARUS. This took place when IKARUS transferred stocks to Raba to guarantee payment of its debts.

During the early days of its operation, IMAG manufactured seats and spare parts for IKARUS buses, but IMAG suffered very much due to the drastic reduction of IKARUS bus production after 1990. IMAG diversified their operations and began production of seats for passenger cars, cable harnesses and door trims as the products developed as an extension of their own technology and succeeded in selling these products to Magyar-Suzuki who came to Hungary to produce passenger cars in Esztergom. The sales to Magyar-Suzuki have been increasing year by year and in 1995, sales revenue from Magyar-Suzuki amounted to 3,792 million forints, which is 62.4 % of the total revenue, and Magyar-Suzuki became IMAG's largest single customer after the collapse of COMECON economic regime.

4-2 Organization and Man-Power

IMAG is constituted of 11 staff departments and 7 line divisions as shown in Figure 4-1-1. The tasks, functions and man-power of the departments and divisions related to the subject products of this study are explained below.

1) Staff Departments

One vice president in charge of technical matters and one vice president in charge of financial matters are supervising the daily operations of their respective fields and report to the president.

- Technical Departments

The Vice president in charge of technical matters administers the Development Department (9 persons), the Technical Department (5 persons), the Factory Department (12 persons) and the Transportation Department (11 persons). He also supports the president regarding technical matters of the line divisions.

(1) Development Department

This department is in charge of the development of products which meet the requirements of markets and customers and consists of 9 persons including a manager. The development department of IMAG is divided into two groups, one is the product development group and the other is the technical development trial production group. The product development group consists of 4 persons and engages in design modifications, specification modifications, drawing work for the modifications for long distance bus seats, medium distance bus seats, city bus seats, seats for railway cars and seats for bus conductors. The technical development trial production group consists of a foreman and two workers and produces the trial products based on the drawings and specifications prepared by the product development group. The development department is not engaged in development work of seats for the Magyar-Suzuki passenger cars. This is because the seats for the passenger cars are manufactured strictly in accordance with the drawings supplied by Magyar-Suzuki.

(2) Technical Department

The technical department consists of 5 persons. The department is responsible for energy control in the factory, namely, the control of energy usage (electricity, coal, oil) planned by each department in the factory, planning of annual consumption, accumulation of records of energy used, reporting to the municipal government and control of abnormal usage. The department is also in charge of the control and coordination of investments requested by various departments as well as work related to the production techniques and manufacturing techniques of urethane foaming, painting and surface treatment which require chemical engineering knowledge.

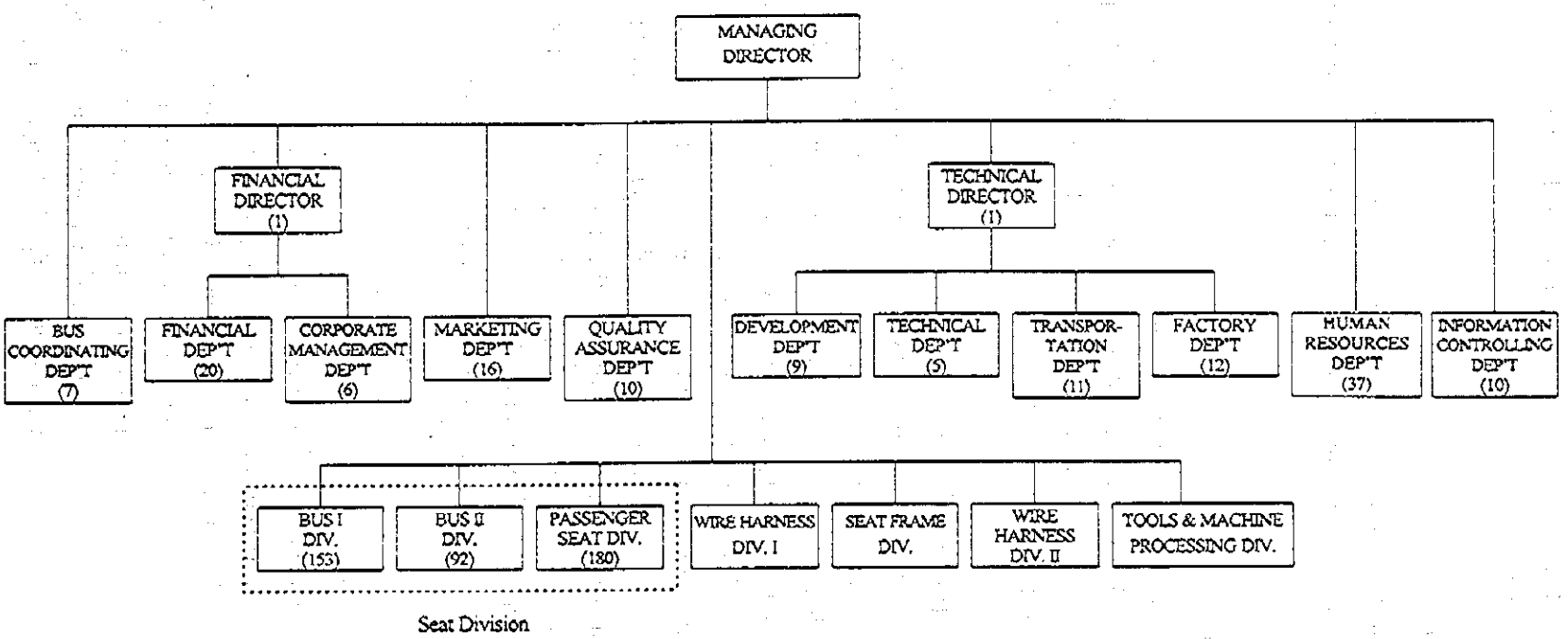


Figure 4-1-1 Organization Chart of IMAG

(3) Factory Department

This department consists of 12 persons and is in charge of the control of the electricity supply system, control of boiler operations and maintenance of equipment and machinery.

(4) Transportation Department

This department consists of 11 persons and their main work is transportation of seats for passenger cars to the Esztergom factory of Magyar-Suzuki and seats for buses to the Szekesfehervar factory of IKARUS.

- Financial Departments

The Vice president in charge of financial matters supervises two departments, namely, the Corporate Management Department and the Financial Department.

(5) Corporate Management Department

This department consists of 6 persons and is in charge of the corporate management planning, control of new investment planning from the viewpoint of finance, cost control and collection and analysis of financial statistics.

(6) Financial Department

This department consists of 20 persons and is in charge of the calculation of wages and salaries, and accounting work for payments and invoicing related to all activities of the factory.

Except for the above 6 departments which are administrated by the two vice presidents, 5 staff departments and 7 line divisions are supervised by the president directly.

The following is an explanation of these departments and divisions.

(7) Marketing Department

The marketing department is operated by 16 persons under the leadership of the manager. The marketing department consists of two groups: the sales group and the purchasing group. The sales group consists of 5 persons. Two persons are engaged in sales promotion work, and coordinating factory capabilities and customer requirements at the time of each contract. Two persons are in charge of pricing the products and carry out cost calculations, incorporation of foreign currency exchange rates and selection of profit margins. One more man is in charge of checking information concerning sales, namely, collection of data for prices of IMAG products and products of competitors, collection of information about product cycles and so on. At the moment, the manager is concurrently carrying out this function. The purchasing group consists of 8 persons and is in charge of purchasing and control of raw materials and parts, chemicals,

fuel, office supplies and so on. 6 persons are in charge of making domestic Hungarian purchases and keeping an inventory of them and 2 persons are in charge of purchasing foreign materials and the exporting of the finished products. The chief of the domestic purchase group is concurrently serving as the chief of the purchasing group. In addition to these staff, there are one secretary and two clerks in charge of foreign correspondence and document preparation.

(8) Quality Assurance Department

This department consists of 3 groups and the total number of staff is 10 persons. These 3 groups are the Quality Inspection group, the Quality Planning and Control group and the Analysis and Statistics Control group. The quality inspection group consists of 5 persons and is in charge of quality assurance and inspections in the chemical analysis room, in the mechanical inspection room, the use of 3 dimensional measurement instruments and devices for checking profiles and dimensions and so on. The quality planning and control group is staffed by a deputy manager of the quality assurance department and one staff member exclusively in charge of the group. These two staff are in charge of planning quality assurance work from an overall company viewpoint and administration of the quality control system. The analysis and statistics control group consists of two persons and is in charge of sampling tests of products in the production line, inspection of quality levels and statistical control of inspection data.

(9) Human Resources Department

The department is divided into 5 groups and the total number of staff is 37 persons. These 5 groups are

- Employee administration group
- Health control group
- Security group
- Welfare group
- Maintenance group

The Employee administration group consists of 4 persons and is in charge of the education and training of employees, employment of new employees and control of all employees. The Health control group consists of one doctor and two nurses and is in charge of first aid treatment of employees injured in accidents in the factory and periodical physical examinations of the employees. The Security group consists of 11 persons and is in charge of security matters in the factory with 3 members working 3 shifts and 2 supervisors working at day time. The Welfare group consists of 4 persons and is in charge of transportation of employees to and from work, operation of the canteen in the factory, supply and control of working clothes and work related congratulations and condolences of employees and employers. The Maintenance group consists

of 15 persons and is in charge of the maintenance and cleaning of the factory buildings and the administration buildings, and the maintenance of the gardens in the company grounds.

(10) Information Control Department

This department consists of 10 persons and in charge of work related to ensuring that all information processing in IMAG is done systematically. The group in charge of this work has 5 staff, namely, 1 programmer, 2 operators and 2 staff, and is concerned with planning the introduction of new computer systems, control of maintenance and modifications of the current programs and so on. The Legal group is taken care of by one staff member and is in charge of the administration and maintenance of company regulations and related official laws and regulations. The Information control group consists of 2 persons and is in charge of the timely supply of the information which is required by the top management for decision making. In addition to these staff, one telephone operator belongs to the information control department.

(11) Bus Coordinating Department

The bus coordinating department consists of 7 persons and is in charge of the preparation of the production planning of seats for buses. There are two groups in the department, one is the production preparation group and the other is the engineering preparation group. The production preparation group is staffed with 2 persons and is in charge of setting up the necessary working hours, load factors, and the required number of workers for each production process of bus seat production. The engineering preparation group is staffed with 4 persons and in charge of the preparation of the machines and tools and jigs required for the production of seats for buses.

The 11 staff departments described above are supervised by the president and 2 vice presidents. The following are explanations concerning the functions, and man-power of the 7 line divisions supervised by the president directly.

2) Production Divisions

(1) Bus I Division

The bus I division consists of 153 persons and is in charge of metal working for seats for buses and seats for Magyar-Suzuki passenger car. This includes all metal work required for bus seats and seats for Magyar-Suzuki such as cutting and bending of frames, press work for seat backs, press work for metal parts and welding work. This division also manufactures large sized box doors for buses, 1 meter by 2 meters made of aluminum.

(2) Bus II Division

The bus II division consists of 92 persons and is in charge of cutting and sewing surface covering materials for seats of buses, urethane foaming work and assembly work for bus seats. The urethane foaming required for the seats of Magyar-Suzuki passenger cars is done by this division. This division is also manufacturing the cable harnesses for buses.

(3) Passenger Seat Division

The passenger seat division consists of 180 persons. This division is supplied with frames and support plates manufactured by the bus I division and the urethane foam cushions manufactured by the bus II division and take care of the cutting work and sewing work, receiving of slide rails and reclining mechanisms imported from Japan and the inventory control of these parts. All these components are assembled and completed by this division to form the seats for passenger cars.

(4) Wire Harness Division

The wire harness division manufactures the cable harnesses for Magyar-Suzuki passenger cars and the total number of people is about 180 persons. Sumitomo Electric Industries of Japan has granted a technical license to IMAG. Sumitomo and IMAG have a plan to establish a joint venture company for manufacturing cable harnesses in the very near future.

(5) Seat Frame Division

The seat frame division manufactures seat frames for Audi cars and the total number of people in the division is about 150 persons.

(6) Wire Harness Division II

The wire harness division II is in charge of manufacturing the wire harnesses for Audi cars and the total number of people in the division is about 150 persons.

(7) Tool and Machine Processing Division

The tool and machine processing division is in charge of manufacturing all tools and jigs required in the factory and work requiring the use of lathes, milling machines and grinders. The total number in the division is about 100 persons.

4-3 Factory Layout and Production Facilities

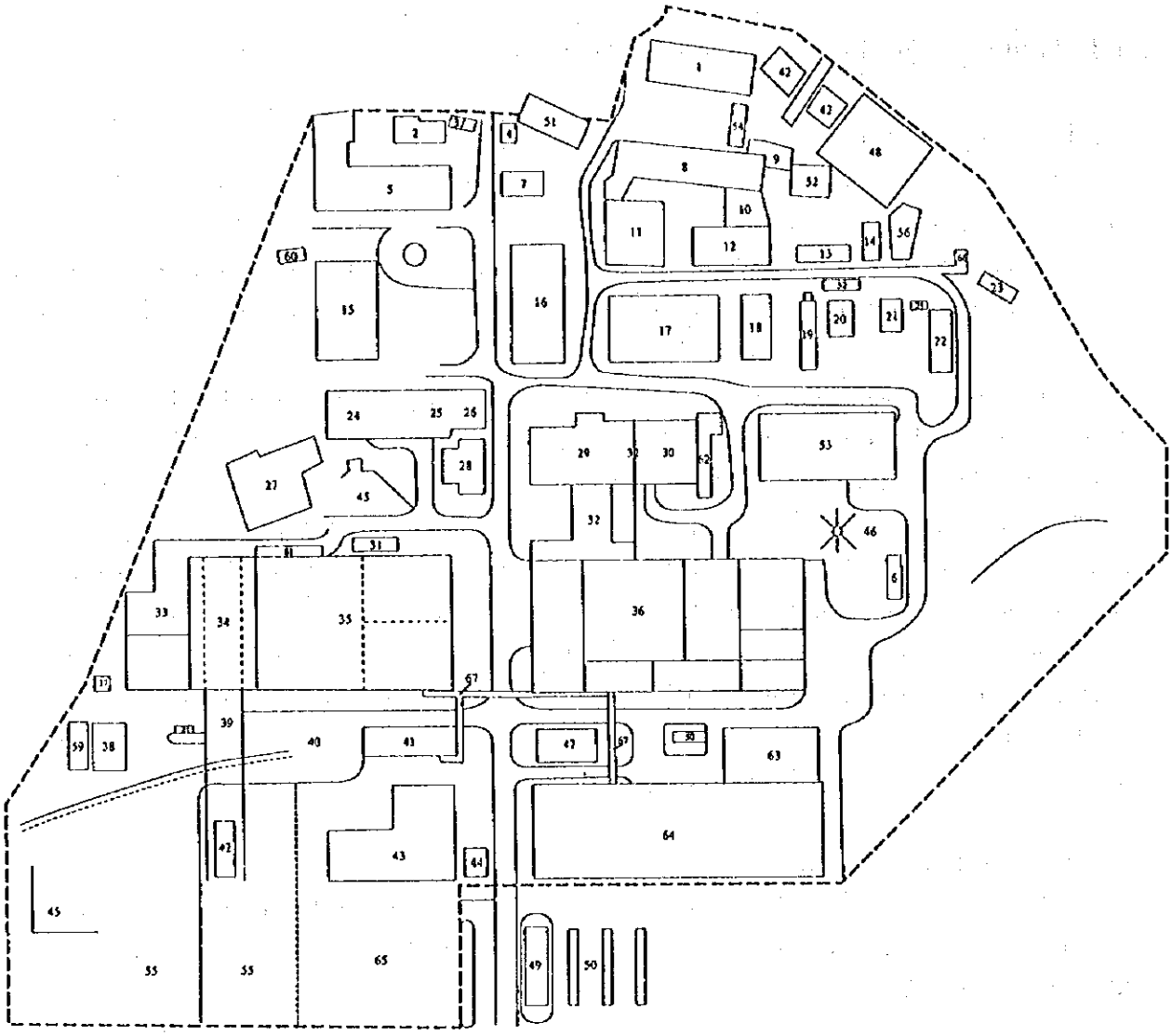
4-3-1 Factory Layout

The IMAG factory is constructed on a flat area in the hilly part of the suburbs of Mor village. The land has a trapezoidal shape of 320 meters by 315 meters and the area is about 100,000 square meters. The rail spur for transporting heavy raw materials such as steel rods and steel beams extends into the material yard, located at the south eastern corner of the factory.

The two large shop buildings are the work shops for Bus I Division and Bus II Division. The medium size buildings are for the Passenger Seat Division, Wire Harness Division for Magyar-Suzuki, Seat Frame Division for Audi and Wire Harness Division for Audi. Other small buildings are used for the administration building which functions as the head office of the company, various office buildings for the work shop and indirect departments, the maintenance shop for the production facilities, the maintenance shop for cars and trucks, the warehouse for steel materials, the storage house for chemicals and chemical agents, the boiler house, the fire fighting building, guard house and a small shop for employees. There are a total of 67 buildings and the total floor area is 32,150 square meters, which is approximately one third of the land area. Figure 4-3-1 shows the IMAG factory layout.

4-3-2 Production Facilities

The major production facilities installed in the Bus I Division, the Bus II Division and the Passenger Seat Division, which are the subject shops for this study, are shown in Table 4-3-1 Major Production Facilities.



1. Automotive Repairing Shop	632.80m²	24. Cover		47. Accounting	350.00m²
2. Ambulatory;Prot. Against fire	199.00m²	25. Cromating Shop	880.50m²	48. Water cleaning plant	55.10m²
3. Fire-Fighters	48.10m²	26. Labor		49. Bus station	210.00m²
4. Porters	47.13m²	27. Transformator and boiler house	838.80m²	50. Parking place	2497.50m²
5. Office building	720.00m²	28. Personel and labor management	331.50m²	51. Car wash	313.00m²
6. Glass house	51.00m²	29. Vestiary		52. Heat shop	259.30m²
7. Maintenance Shop	158.40m²	30. Recaro cutting	2269.40m²	53. Frimag Joint Venture	1415.60m²
8. Tod & Machine Shop	799.30m²	31. Uddeholm	130.10m²+32/1	54. Accumulator filler	80.00m²
9. Fibre materials Store	153.80m²	32. Cable, sewing	1085.50m²	55. Warehousing area	5228.00m²
10. TMK Locksmiths Shop	190.00m²	33. Stvage	1062.90m²	56. Drum store	136.00m²
11. Cable Harnes	511.20m²	34. Covered store	1225.00m²	57. Vessel store	56.00m²
12. TMK Locksmiths' Shop	395.40m²	35. 1st workshop	3563.40m²	58. Oil tank	50.00m²
13. Compressor House	128.40m²	36. 2nd workshop	4986.00m²	59. Trichloroethilene Store	128.00m²
14. Warehouse	69.70m²	37. Acid store	36.00m²	60. Fire-Fighters store	45.00m²
15. Passenger Car Seat Divi.	916.60m²	38. Chemical's Store	184.00m²	61. Tool Store	120.00m²
16. Passenger Car Cable	905.50m²	39. Crane way		62. Heating Repairing shop	
17. Initial leather store	965.10m²	40. Ramp	820.00m²	63. Foam Conditioning	766.50m²
18. Cutters' Shop	329.40m²	41. Painting shop	568.00m²	64. Michels cable	3780.00m²
19. Manu. Tool Store	132.00m²	42. Water Storage	90.00m²	65. Container store	3219.00m²
20. Manu. Tool Store	123.30m²	43. Teves Shop	1364.00m²	66. Concrete mixer	
21. Warehouse	77.70m²	44. Porters 2nd	74.75m²	67. Delivering conveyor	
22. Warehouse	136.00m²	45. Coal Storage	1800+300.00m²		
23. Warehouse	76.50m²	46. High level reservoire	100.00m²		

Figure 4-3-1 Layout Plan of IMAG

Table 4-3-1 Major Production Facilities (1/2)

Division	Name of Facility	Specification	Qty	Year of purchase
Bus I Div.	Hydraulic press	250 ton	3	1969-74
	Hydraulic press	50 ton	1	1989
	Hydraulic press bender	250 ton	1	-
	Mechanical press	100,63,40 ton	13	1971-85
	Shearing machine	3, 5 ton	2	1968,72
	Coil feeder	1,000 dia.	2	1983
	Press brake	2,500 dia.	1	1978
	CNC pipe bender	30diax2,000	1	1986
	PEYA Pipe bender	10diax2,000	2	1973,76
	Butt welding machine	50 KVA	1	1990
	Feeder for pipe cutter	25,30,200 dia	3	1986,72
	CNC pipe cutter	200 dia	1	1972
	Bus seat process machine	13 dia	4	1981
	Bench drilling machine	13 dia	5	-
	Spot welding machine	-	3	1974
	CO_2 arc welding machine	350-400A	21	1987-95
	Bench drilling machine	13-15 dia.	11	1972-85
	Special drilling machine	4-axis, 8-axis	2	1983
	Special frame bender	-	1	1974
	Spot welding machine	-	5	1995
	Portable weld machine	18KVA	1	1995
	CO_2 arc welding machine	400A	8	1995

Table 4-3-1 Major Production Facilities (2/2)

Division	Name of Facility	Specification	Qty	Year of purchase
Bus II Div	Cutting press	160t, 100t	2	1985
	Hand cutter	motor driven cutter	2	1989
	Spreading table	6mx2.5m,4mx2.5m	4	1985
	Sewing machine	heavy duty industial type	50	1985
	Injection machine	movable type head for urethane foam	8	1991
	Mold for urethane	stationary type	59	1991
	De-gas unit	vacuum type	3	1996
	De-gas unit	crushing roller type	1	1991
	De-gas work table	flat type table	2	1985
Passenger car seat Div	Hand cutter	motor driven hand cutter	3	1991
	Sewing machine	industrial type	22	1991
	Kilting machine	industrial type	1	1991

4-3-3 Products and Production Flow

Seats for buses and passenger cars are manufactured by the production process shown in Figure 4-3-2 Seat Production Process Flow Sheet. Seats are finally assembled in the assembly process and supplied to the customers after a functional test and the pre-delivery inspection. The production process lines are divided into the following four lines.

(1) Frame line
(2) Cushion line
(3) Sewing line
(4) Assembly line

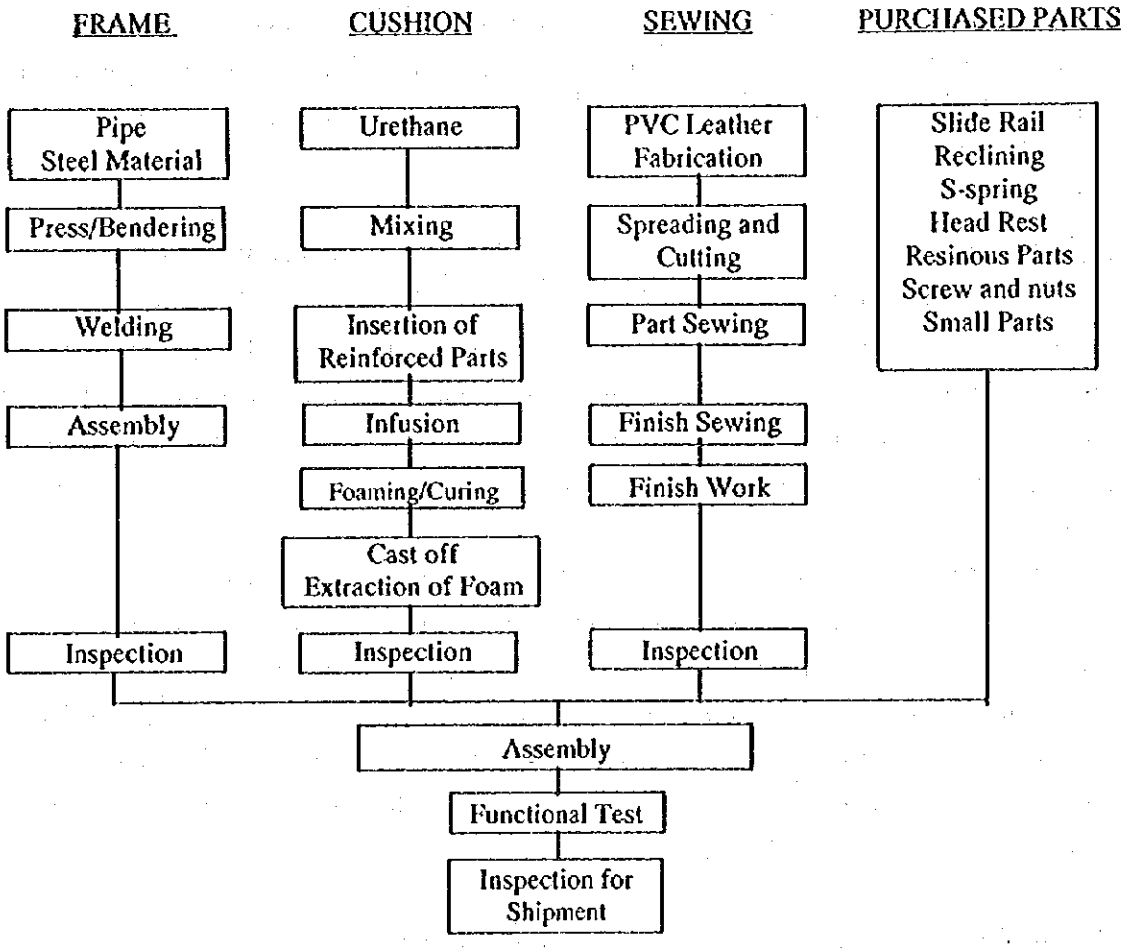


Figure 4-3-2 Seat Production Process Flow

1) Frame Work Process

In the process of making frames, the metal work for the seat frames is carried out in the Bus I Division. The frame making operations are taken care of by the following groups.

Cutting, pressing and pipe bending	:	metal working group
Welding of frames for seats of buses and rail carriages	:	welding group
Welding of frames for passenger car seats	:	welding group

(1) Cutting, Pressing and Pipe Bending Processes

The operations of cutting, pressing and pipe bending are carried out in the same process both for seats of buses and railway carriages and for seats of passenger cars. The machines and facilities being used in this process are mostly old and have been used for more than 20 years. The skill accumulated by the experience of the operators is relied on, in order to secure the accuracy required for the products. Nominated operators are assigned to predetermined machines and the work to be done is assigned to an operator who is familiar with the particular work. The

alignment of the machines is arranged according to the type of machine. The alignment by type has the merit, that it is easily adjusted to suit a change of work items, however this alignment makes it difficult to cope with mass production work or to increase the productivity of the working operations.

(2) Welding Process of Frames of Seats for Buses and Railway Carriages

The specially dedicated welding lines for each product consists of 4 separate lines, namely, the general purpose seat back line, the high grade cushion line, the leg frame line and the semi-completed parts line. The machines being used to manufacture seat frames for railway carriages are all old type. Due to the reduction in the production of seats for buses, there are a number of machines which have not been used for a long time.

(3) Welding Process of Frames of Seats for Passenger Cars

The welding process of the frames of the seats for passenger cars is a specially dedicated line for this purpose and the work is carried out by the welding group.

The welding process is divided into 4 lines, namely, the front seat back welding line, the front seat cushion welding line, the rear seat back welding line and the welding line of the semi-completed parts. These welding lines are located in the Bus I Division, but are operated and managed by the Passenger Seat Division.

2) Cushion Process (Poly-urethane Foaming Process)

The work of the cushion process (polyurethane foaming process) of the seats for buses and railway carriages and for passenger cars is all taken care of by the Bus II Division. The urethane foaming equipment is an integral system beginning with the blending device of the raw chemicals up to injection into the mold. Since this integral foaming machine required a high investment by the factory, 2 shift working is adopted to get a high utilization of the equipment.

The management pays special attention to keeping the cushion process area clean in view of the environment and uses non-toxic chemicals as raw materials. The cushion foaming technique of IMAG is high and although the productivity of the cushion foaming is not so high, many kinds of cushions are manufactured. The quality of the integrally made cushions is very good and their foaming technology is highly evaluated.

3) Cutting and Sewing Processes

The cutting and sewing work of the seats for buses is carried out by the Bus II Division. In the cutting process, the surface materials supplied in the form of rolls are spread on the spreading table and the required number of sheets are then stacked on top of each other. The stacked sheets are cut according to the shape required for the seat. The cut sheets are sent to the sewing process.

In the sewing process for bus seats, an operator uses one sewing machine which is assigned to the operator and the operator completes all the sewing work required for a particular seat. Since the surface materials for the bus seats are thick, a skillful sewing technique is needed to achieve the required accuracy and the operators are carrying out their assigned work without any difficulty. The technical level of the operators is evaluated very highly and they are producing products of a satisfactory standard.

The cutting work of the seats for the passenger cars is carried out efficiently on one cutting table on which both spreading and cutting of the surface materials is done. The shape of the seats of the passenger cars is rather simple, using mostly textiles, and the cutting work is efficiently carried out by 3 sets of hand type cutting machines. The sewing process of the seats for the passenger cars is not a mass production system, encompassing all elements of the work, but a lot production system in which 24 sets are produced at a time. For production, German-made multi-purpose sewing machines with an automatic thread cutting device have been introduced. All the operators are women and their technical skill is very high and both the production speed and the product quality do not present any problems.

4) Assembly Process

The assembly work of the seats for the buses is carried out by the Bus II Division. This is the final process for sequentially assembling the metal frames, urethane foam cushions, the sewn materials and the externally purchased parts and components to complete the seats.

In the assembly process for the seats of long distance buses, about 40 sets of the bus seats are assembled as one lot by connecting the seat cushions and the seat backs. The operators in charge of the assembly work take the required materials and components from the constantly traveling chain conveyor and place the completed seats on a vacant space on the same chain conveyor. The completed seats are stored in the storage building for completed products and when the seats for one bus have been completed, these seats will be shipped out to the customer. The assembly work of the seats for city buses is carried out by manual operations using air-tacker and air-drivers. Each operator is assembling seats by taking the materials from the chain conveyor and installing them to produce a complete seat. Mass production methods in which portions of the work are shared is not adopted in this line. The finished products do not have any wrinkles or stains and are satisfactory.

The production method for assembling the seats for passenger cars is a mass production method in which portions of the assembly work are shared between the operators. In some of the important process lines, fall safe devices have been installed to prevent any careless mistakes in the unit operations and the work is carried out in accordance with the operation procedures. The

entire processes are designed, taking quality of the products into consideration and the finished products are free from the wrinkles and stains. Stable quality products are manufactured in the factory.

4-4 Production Plans and Sales

4-4-1 Production Plans

The production plan of the seats for buses is now prepared to suit the annual production plan of IKARUS. The management is concerned about the approach attempted by KIEL and VOGEL to sell their bus seats to IKARUS and recognizes the importance of strengthening the total capability of the company.

The production plan of the seats for passenger cars is prepared in accordance with the annual production plan, the monthly production plan and the weekly production plan of Magyar-Suzuki. The cost of the passenger car seats produced by competitors such as LEAR or Johnson-Control is reported to be more expensive than that of IMAG and the management feels rather optimistic about competition in the domestic market for the passenger car seats. The customer has several alternatives in the choice of their suppliers. They can not only select foreign suppliers but also could introduce a joint venture company in Hungary or manufacture the necessary components inside their own factory, in order that they themselves can survive in the international automobile markets. Therefore the entire company should endeavor, in its day to day operations to achieve cost reductions without reducing the quality of the products. Also frequent contact should be made with the persons in charge of procurement, designing and production in Magyar-Suzuki to collect any advance information and desires of the customer so that these can be reflected in the production schedule, in order to satisfy the customer and avoid him taking any undesirable actions.

4-4-2 Sales Record

The record of sales revenues, the ratios of the direct cost and the indirect cost in the sales amounts for the 4 years from 1992 to 1995 are shown in the Table 4-4-1.

The production of passenger can seats increased almost two times each year and this contributed to the increase of the sales revenue greatly. The indirect cost in propotion to the sales revenue reduced remarkably as shown in the table and this indicates that the financial soundness of the company has increased as time goes by.

Table 4-4-1 Sales Revenue Ratio of Direct Cost and Indirect Cost

ITEM	1992	1993	1994	1995
Sales revenue (1,000 HFT)	998,392	2,003,673	2,698,349	5,337,705
Direct cost in proportion to sales revenue(%)	62.3	61.8	70.0	69.5
Indirect cost in proportion to sales revenue(%)	37.4	30.0	27.9	20.0
Revenue from domestic market (%)	61.6	76.9	80.3	90.1
Revenue from export market (%)	36.4	19.1	16.9	7.4
Return rate in proportion to sales revenue (%)	-5.2	0.9	-6.5	5.5

For 7 years from 1985 to 1991, the sales revenues of IMAG were in the range of 1 billion forints to 1.4 billion forints. In 1992, the first year in which IMAG succeeded in supplying their products to Magyar-Suzuki, the sales revenue was about 1 billion forints and the sales revenue started to increase sharply from 1993 and it almost doubled each year. In 1995, the sales revenue exceeded 5 billion forints. From 1992 to 1995, Magyar-Suzuki's share of the total sales increased from 4.2% to 39.4%, to 53.7% and to 62.4%, for each year respectively. Today, the company depends on Magyar-Suzuki in terms of the sales revenue for almost two thirds of the total sales and the importance of Magyar-Suzuki to IMAG is becoming more and more significant.

Chapter 5

Present State and Problems of Production Process

Chapter 5 Present State and Problems of Production Process

5-1 Receiving of Raw Materials

5-1-1 Organization and Duties

The receiving and issuing of raw materials and parts in IMAG are handled in three separate ways. Each of the three divisions carries out all operations from ordering to receiving separately, and each has its own receiving warehouses near the workshops that use the materials.

(a) Bus I Division: Metal materials (tubing, steel sheets, pressed parts, etc.)
(b) Bus II Division: Materials for bus seats (PV leather, cloth, harness parts, etc.)
Raw materials for cushions (urethane)
(c) Passenger Car Seat Division: Materials for passenger car seats (cloth, seat subassemblies, CKD parts, etc.)

In addition, there are warehouses for materials not used directly in production and dangerous objects, shared by all the divisions.

In the Bus I Division, which produces seat frames for buses, railway vehicles, and passenger cars, all the materials for metal working are managed collectively. Orders are consolidated into one or two batches per month, and the tasks are carried out by seven persons: three storekeepers, two crane operators, and two receiving inspectors.

The Bus II Division uses two warehouses: the warehouse for bus seat surface materials (PV leather, cloth, and harness parts) and the warehouse for urethane cushion materials. Each warehouse has its own location for storing received goods. The receipt and issue of goods are carried out by six persons: two receiving storekeepers, two persons in charge of issuing goods, and two receiving inspectors.

The Passenger Car Seat Division handles everything from ordering to receiving and issuing of all the materials for passenger car seats. Ordering has been computerized and is carried out in two shifts by two storekeepers and four persons in charge of issuing goods to the workshops (three persons per shift).

While the functional parts of seats, screws, and bolts are imported from Japan, rolled cloth and other materials are procured locally from 38 companies. 300 different kinds of items are purchased; the quantities are also large and the monthly cost exceeds 200 million forints.

Table 5-1-1 shows the main raw materials and parts procured for each division.

Table 5-1-1 Main Raw Materials and Parts Procured for Each Division

Parts Name	Main Supplier	Monthly Quantity	Procurement Cost (HFT/Month)	Remarks
Bus I Division				
Steel Tubes	Hungary	20,000m	1,561,000	79HFT/m
Square Tubes	Hungary	10,300kg	803,000	
Round Bars	Hungary	2,920kg	258,000	
Steel Sheets (Coiled)	Hungary	3,340kg	242,000	
Steel Tubes (For Passenger Car Seats)	Hungary	22,160kg	2,720,000	122HFT/kg
Aluminium	Austria	10,175kg	5,194,000	
Total Procurement Cost			10,778,000	
Bus II Division				
Urethane Raw Materials	Hungary	50,000kg	22,100,000	442HFT/kg
Integral Urethane Raw Materials	Hungary	6,000	2,800,000	
Wire Harness Materials	Hungary	17,000m	4,433,000	
PVC Leather	Hungary	18,000m^2	9,600,000	533HFT/m^2
Release Agent	Hungary	1,300kg	1,300,000	
Total Procurement Cost			40,233,000	
Passenger Car Seat Division				
CKD Parts (Reclining, Slide Rail)	Japan	4,400sets	58,629,000	
CKD Parts (SWIFT)	Japan	3,800sets	113,544,000	
CKD Parts (SEDAN)	Japan	600sets	9,319,000	
Cloth	Austria	37,400m^2	69,649,000	1,860HFT/m^2
Adhesives	Austria	250kg	146,000	
Total Procurement Cost			251,287,000	
Monthly Total Procurement Cost of All Divisions			302,298,000	

In money terms, the Passenger Car Seat Division handles 80% of the total, of which CKD parts from Japan account for 72%.

Among the goods procured locally, urethane raw materials and seat surface materials (PVC leather and cloth) are expensive. Thus, the number of receiving materials needs to be checked and the receiving inspections are to be improved focusing attention on these expensive materials.

The CKD parts from Japan and the cloth from Austria require three months for delivery, causing long inventory times. Besides, changes in the production plans for passenger cars and in the specifications of seats cause an excess or shortage of materials, resulting in late delivery or dead stock. Therefore, to alleviate the financial burden on IMAG, ordering and unit control are handled by IMAG and payments are taken care of by Magyar Suzuki: IMAG needs to buy only the quantities it consumes, and Magyar Suzuki bears the cost of the goods in stock. It is necessary to consider how to improve the process from procurement to inventory management.

5-1-2 Quality and Protection

1) Bus I Division

The steel materials are managed by the Bus I Division. The warehouse for steel materials occupies a large space next to the frame shop. It is a well-equipped warehouse: it has a high ceiling, is equipped with a large crane, and is complete with railway tracks for freight trains. However, these facilities date back to the times when buses were mass-produced, and are used infrequently now.

Most of the steel materials are pipes 5 to 10 m long. They are packed in groups of 240, and stored on pallets. The steel sheets are wrapped and placed on pallets. Although the place where each item should be stored is not clearly indicated, materials are arranged item by item, there is no fear of mixing, and one can tell what is where by looking at them.

Although quality is controlled and there is no fear of problems due to lack of preservation, some old pipes with a long inventory time have gathered rust. Both appearance and functioning are checked during the receiving inspections. The functional tests are carried out in a laboratory and test records are kept.

2) Bus II Division

(1) Seat surface materials

The dedicated warehouses for seat surface and wire harness materials are located near the seat cutting shop. The rolled sheets are laid on special-purpose pallets and the pallets are stacked in three layers. The warehouses are orderly and well kept. For example, aisles, though narrow, are provided. From this aspect, there is no major problem with the storage method, but materials

stored for a long period may become old and degraded.

At the time of actual receipt, two receiving inspectors and receiving clerks conduct a 100% inspection. They inspect the articles for deformation and check their width. The rolled sheets are tested for flame resistance and tensile strength once every three months. Although there are no statistical data, the test results are retained. The test results must satisfy reference criteria and there is no particular problem.

(2) Urethane raw materials

The urethane raw materials are poured into large storage tanks in a dedicated warehouse next to the cushion foaming shop.

IMAG's foaming system is a two-component system consisting of liquids A and B. There are seven tanks in all: three tanks (22,000 liters) for liquid A, two tanks for liquid B (22,000 kiloliters), and two tanks for raw materials for skinless foam. Since the tanks are located indoors and the materials are supplied automatically to the foaming shop, there is no problem with quality and supply.

3) Passenger Car Seat Division

The Passenger Car Seat Division manages all the materials for passenger car seats, door trims, and roof silencers collectively in a warehouse located approximately 130 m away from the seat assembly shop. Most of the functional parts for the seats are CKD parts imported from Japan. They are left packed in wooden boxes, which are piled up for storage. Boxes are carried into a temporary store in the assembly shop as required, and the parts are taken out of the boxes. As far as the storage method is concerned, there is nothing that would cause quality defects.

The rolled sheets of cloth for seat surfaces were laid on pallets, and the pallets were stacked to the ceiling. There was a large inventory of CKD parts and rolled sheets which took up 70% of the total space. There were not even aisles. This made it impossible to see how much was in stock and to use first-in first-out procedures. As a result, the goods in the lower layers remained in stock for a long time and there was the possibility of quality problems. Therefore, at the time of the first on-the-spot inspection of this Investigation, we recommended rapid improvement in this area as part of a short-term improvement plan. As a result, some improvements have been made: for example, the storage space has been doubled, and cloth and CKD parts are stored separately in two places. The receiving and issuing of goods have also been improved. Although the place to put each item is still not clearly indicated, necessary measures are being taken.

During the receiving inspection of rolled sheets, 100% of the goods are checked visually

for deformation and contamination. Such inspection is not done for the CKD parts. However, sampling inspection is carried out in the temporary storage area of the assembly shop. Although all the inspection results satisfy the specification, adequate statistical data are not produced. Although a storage place is provided for rejected parts, the personnel have not been made sufficiently aware that they should use it.

5-1-3 Present State of Receiving Materials

1) Bus I Division

Although the Bus I Division produces seats for both buses and passenger cars in one place, it purchases their materials separately through two routes.

It purchases the materials for buses from the suppliers specified by its parent company IKARUS. They are delivered in bulk by freight train once a month. The materials for passenger cars are delivered by truck twice a month. Unloading is carried out without any problems in the large warehouse, equipped with a large crane, using the crane and a forklift. Delivery is made 2 to 3 times a month, and two storekeepers and two crane operators are assigned to the job.

Most of the materials delivered are pipes. There are four lanes of automated delivery systems going directly to the cutting process through the wall between the warehouse and pipe-working shop. Each system consists of a dedicated self-propelled vehicle moving on rails that serves as a platform to carry the pipes placed on it by the crane to the cutting process. The warehouse is provided with other machinery, so there is no particular operating problem. However, the personnel do not wear helmets during work, which means that safety is not properly considered.

2) Bus II Division (warehouse for seat materials)

(1) Parts for seats

Bus II Division's warehouse for materials handles many items, but in small quantities. Job shop (order) production makes the quantities handled fluctuate. The main items handled are PVC leather, cloth, and parts related to wire harnesses. Basically, each item is delivered separately once a month, but because there are a large number of items, goods are delivered two times a day.

Receiving is handled by one receiving clerk and one worker (concurrently) in charge of issuing goods and transport. Also, inspectors are present when goods are received and conduct 100% inspection.

(2) Urethane raw materials

The urethane raw materials for cushions are placed in seven tanks for storage item by item. The urethane is delivered by a 20 kiloliter tank lorry, and piped automatically into the tanks through dedicated inlets. Delivery is made three times (three truck loads) a month on average.

For managing the quantities received, a large weighing platform has been installed at the entrance of the warehouse, and the delivered quantities are checked using the weight difference between a full and empty tank. In practice, it is difficult to carry out receiving inspections (physical testing) and quantity inspections of urethane raw materials; and contracts are based on mutual trust. However the quantities should be double-checked by using the volume of the tanks.

3) Passenger Car Seat Division

Both the quantities and number of items are large. Also, the CKD parts from Japan and the cloth from Austria have long delivery times. As a result, inventory times are long and the quantity in stock is large. This makes proper inventory management difficult. Orders are placed according to the following standards and delivery is made regularly twice a month.

	Required delivery lead time	Standard inventory time
CKD parts	3 months	0.6 month
Cloth (surface materials)	2.5 months	0.5 month
Others	1 month	0.5 month

The CKD parts and cloth, which have long delivery lead times, are ordered three months in advance, based on preliminary data given by Magyar Suzuki four months in advance. Regarding other materials, preliminary notice is given two months in advance and final quantities are ordered one month in advance. Everything has been computerized and ordering is handled by three persons. Naturally, there are differences between the preliminary quantities given by Suzuki and the actual quantities ordered four months later, but the quantities ordered by IMAG are not adjusted according to the quantities of stock on hand. This can result in shortage of necessary parts or an overstock of unnecessary parts.

Materials are delivered by truck twice a month, as a rule. Regarding CKD parts, deliveries are sometimes concentrated in certain periods due to the arrival of ships and customs clearance. Receiving is handled by two persons. Deliveries of the required materials and parts from the warehouse are carried out by the forklift to the material stock places in the manufacturing shop, in accordance with the production plan.

As described in previous section, the study team observed during the first field survey that the warehouse were stacked up to the ceiling with the rolls of the textile raw materials and the boxes of the CKD parts and the receiving and dispatching work are carried out in the conditions that appropriate passages were hardly secured for the movements of the forklifts. Since there were not enough space to deliver the materials in the storage warehouse, these materials were once placed outside of the warehouse and delivered into the warehouse after secured the vacant space by the forklift. When the stored materials placed in the lower shelf of the rear end of the warehouse were dispatched, the pallets placed in the front part of the warehouse should be removed firstly and then the forklift could make an approach to the object materials and resulted in spending several hours for this one operation. These preparatory work took several times of the actual working hours for the delivery of the storage materials. The work place was necessary to improve from the viewpoints of the-first-in-and-the-first-out practice and of the inventory control.

In accordance with the short term modification plan, the storage place for the rolls of the textile materials was moved to the newly built warehouse and the throw-away campaign were actually exercised for the dead stock materials. As the result, the active storage space in the warehouse were greatly expanded and the receiving operation and the dispatching operation were carried out very smoothly nowadays. However, it is from now on to establish the system which the store keepers can grasp "what are where and how many" all the time and to tackle the modification programme for this storage control method is the future issue to the factory.

5-1-4 Problems with Receiving of Raw Materials

1) Common problems

The receiving of raw materials varies greatly from one division to annotate. In addition, the systems of administration also vary. However, common problems are listed below:

(1) There is inadequate liaison between the function of ordering materials and control of the stock in the warehouses.

(a) The ordering function has been computerized: the quantity to be ordered is calculated by subtracting the quantity in stock from the order information. But it is doubtful if the quantity in stock is really known correctly.
(b) It is not clear whether the quantity in stock, calculated by computer, and the actual inventory are compared. It is also doubtful if differences are corrected.
(c) The Receiving and issuing of goods at the warehouses are not handled properly.
(d) Delivery is not adjusted to compensate for an overstock.

(e) Information received about changes in orders are not reflected accurately in planning purchase orders.

(f) Since cloth is bought by firm orders, based on preliminary information from the automaker, there are large gaps between ordered quantities and actual material requirements. The timing of placing orders should be reviewed.

(g) As matters stand now, manual calculation is necessary for verification in addition to computer calculation.

(2) Quantities ordered at one time are too large creating these problems.

(a) Odd articles and surplus materials form unnecessary stocks, which may result in articles never being used.

(b) Steel material with long inventory times will become rusty.

(c) Pallets, dollies, and packages are large and heavy, which makes them hard to handle, resulting in wastage.

(3) It is difficult to tell how much of each type of material is in stock and where it is stored.

(a) The place where each item should be stored is not clearly defined.

(b) The names and locations of items are not shown.

(c) The type of packages and quantities contained in them are inconsistent, making it difficult to determine the quantities in stock.

(4) Rules for acceptance inspections are not clearly defined. Although a storage place is provided for rejected parts, they are not handled properly.

(5) First-in, first-out is not used fully.

2) Problems of each division

(1) Bus I Division

(a) Since there is no wall on the receiving side of the building, some articles get dirty and/or rusty due to ingress of dust and other contaminants.

(b) The workers do not wear helmets during crane operations: safety is not managed properly.

(2) Bus II Division

(a) Articles stored in iron boxes tend to result in dead stock since it is impossible to check the amount and condition of the goods inside the boxes.

(b) Since the measurement of incoming urethane raw materials is inaccurate, proper quantity control is difficult.

(3) Passenger Car Seat Division

Some people pointed out that IMAG does not respond properly to changes in production plans of passenger cars. It turned out that the cause lay in the ordering of materials and control of the warehouse. There were problems with the management of the warehouse regarding the receiving of raw materials. However, as described earlier, extensive improvements have been made.