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TECHNICAL AND INDUSTRIAL ASPECTS OF REGIONAL INTEGRATION  
AND SPECIALIZATION IN THE LATIN AMERICAN AUTOMOTIVE INDUSTRY 2/

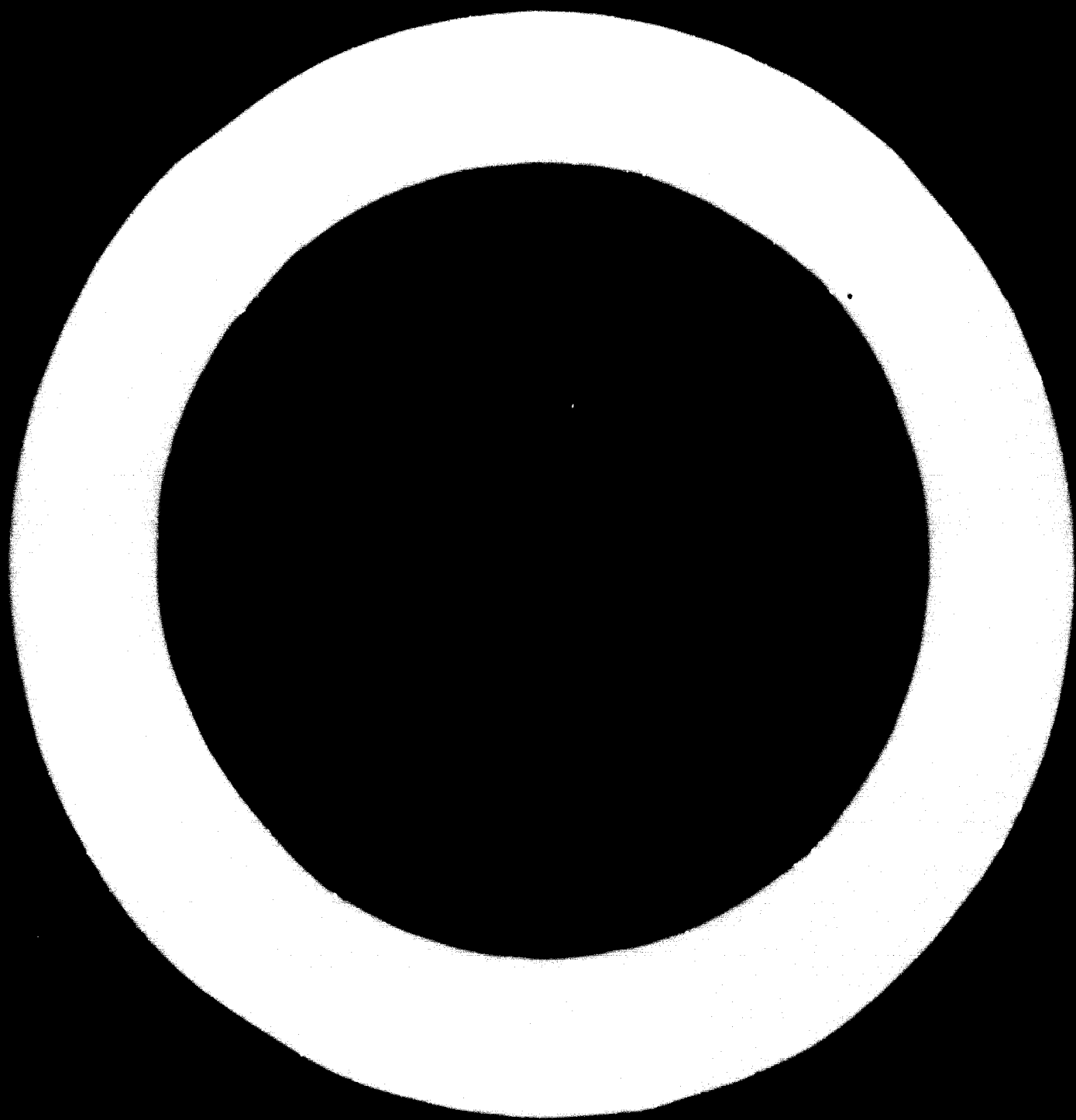
prepared by

The Secretariat of the Economic Commission for Latin America

(This report is intended to serve as an introduction to some  
of the sessions of the Working Group)

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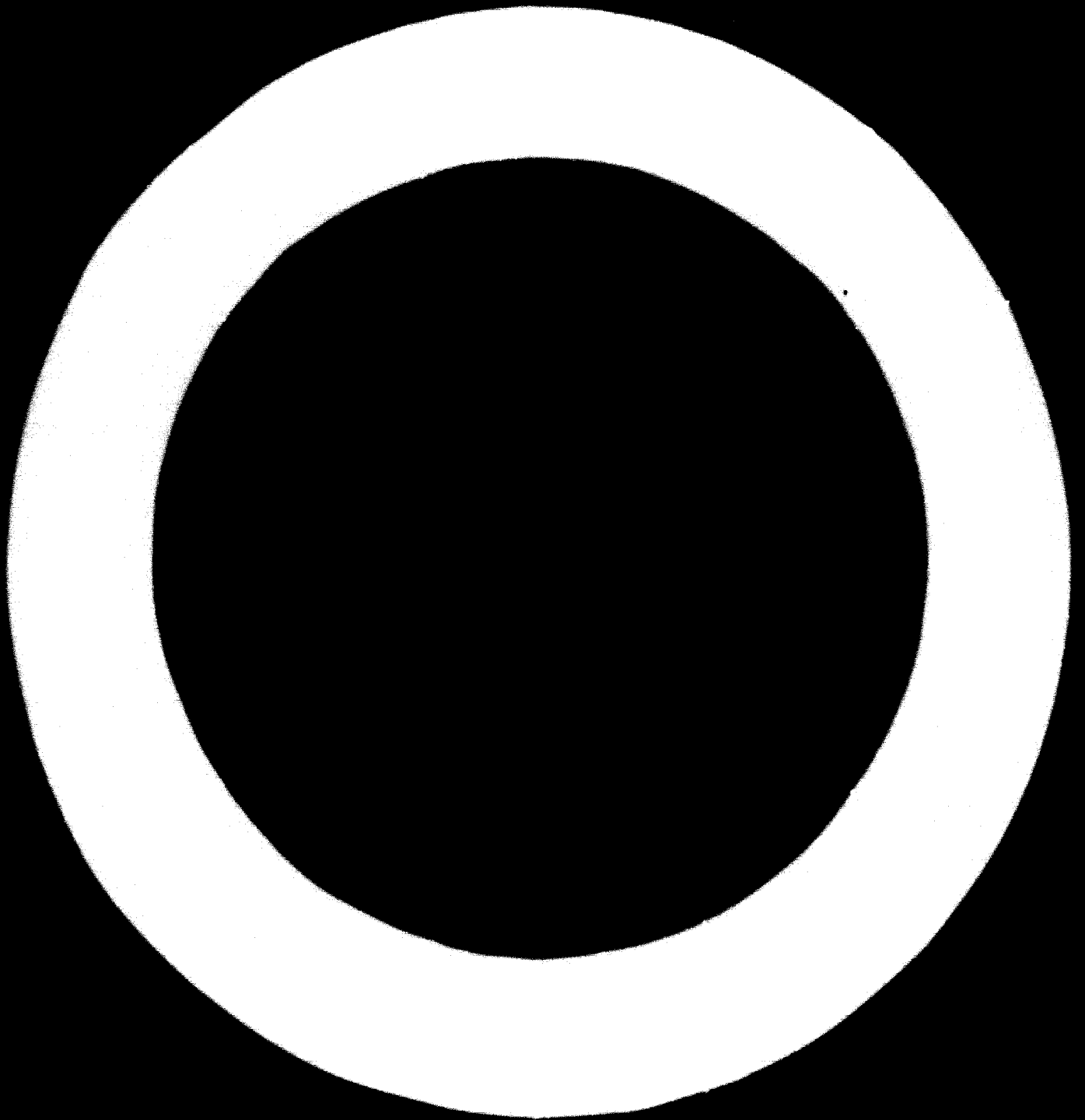


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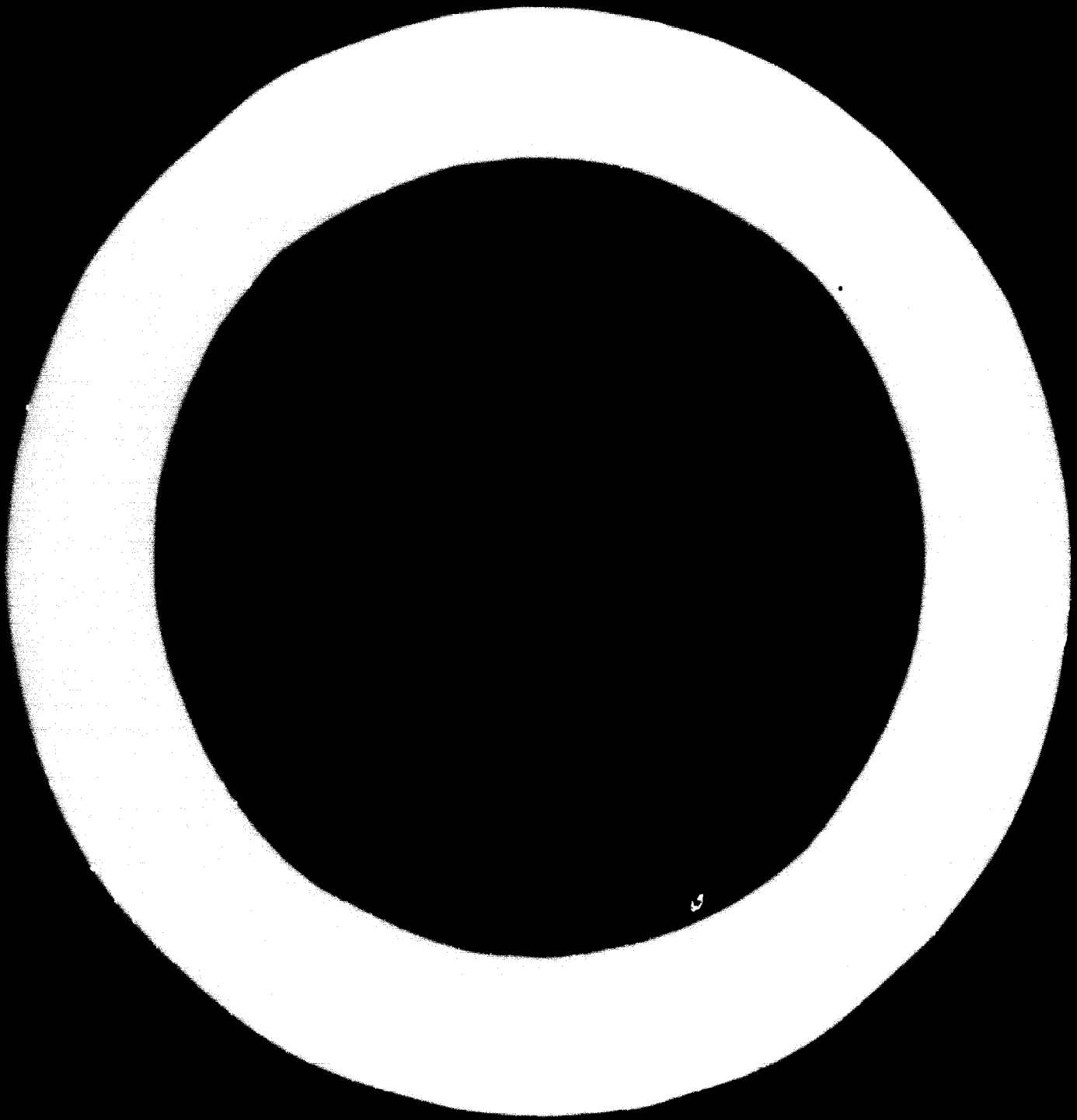
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/TECHNICAL AND



TECHNICAL AND INDUSTRIAL ASPECTS OF REGIONAL INTEGRATION AND  
SPECIALIZATION IN THE LATIN AMERICAN AUTOMOTIVE INDUSTRY

Some questions will be raised during the sessions of the Working Group in connexion with the technical and industrial aspects involved in the regional and subregional integration of the Latin American automotive industry.

It will be generally agreed that the automotive industry is a rather complex one comprising a great variety of specialized manufacturing and servicing branches and an intricate network of supplier-buyer relationships. Therefore, a profound knowledge of the nature of this industry is undoubtedly required to devise any plan or programme that can be put into practice. The organization of the present Working Group has been arranged in order to clarify some of the major questions provided by the study of this industry. First, questions which arise in connexion with the study of the automotive products should be examined, that is to say, the motor-vehicle and its parts and components. How can the many parts and components of the different types, makes and models of vehicles be identified and classified? Would it be practical to classify these elements according to one single scheme valid for all kinds of vehicles or should a more flexible approach be adopted? Apart from such definitions being a starting point for a systematic economic analysis, they are required for a whole complete series of practical issues, such as the co-ordination of national economic and fiscal policies in the field of automotive industries among countries that desire to implement an integration treaty or trade agreement.

It is also convenient to study the structure of the automotive industry, motor-vehicle as well as parts and components manufacture. Moreover, an insight has to be gained not only into the manufacturing sector, but also into the problems of vehicle and spare parts distribution, as well as into the relationship existing between the automotive industry and the other branches of economic activities, especially those that supply materials and services. If it is admitted that integration of Latin American automotive markets and industries means the tying together of specialized manufacturing operations which are spread over a large geographical area, then it becomes important to distinguish operations which can be decentralized

/from those

from those which should be centralized. Obviously, attention should be given not only to the structure of the automotive industry, such as it exists today in general throughout the world, but also to a more ideal point of view taking into account the present economic and social situation of the Latin American countries and their future requirements.

It is generally admitted that production costs of vehicles and their parts and components are high in Latin America compared with established standards in the industrialized countries. However, little research work has been carried out with a view to identifying and evaluating the factors which contribute to the abnormal production costs in Latin American countries. A study recently published by ADEFA in Argentina proposes a basic division between internal and external industrial factors influencing the formation of costs in the automotive industry. More specifically it has been recognized that the manufacturing cost of vehicles in Latin America, is essentially a function of the size of the home market, content of locally produced components, variety of types, makes and models of vehicles, variety of the main locally produced components, frequency of model or design changes affecting vehicles and local components and, last but not least, the cost of inputs of national as well as foreign origin for the established vehicle and parts and components manufacturers. Since all of these variables are influenced in one way or another by government policies and company strategies, it would be interesting to analyse their true relationship in order to take it into account when formulating any proposal concerning regional integration of the automotive industry or the expansion of intra-regional trade. The aspects which would have to be taken into account to elaborate models for industrial complementation and expansion of trade should be discussed at length by the Working Group. Among them for example, is the identification of those branches and operations of the automotive industry which require certain scales of production in order to achieve low manufacturing costs. To what extent does uniformity exist in the models manufactured and marketed within Latin America by the different companies, including model years and individual component specifications? To what extent is such uniformity required when procurement of components is envisaged on a regional or even world-wide scale? What

/are the



are the transport and inventory requirements which have to be taken into account when considering alternative models or forms of regional integration? Obviously rational plans of regional integration can only be formulated if meaningful answers can be given to the afore-mentioned questions.

A. Classification of vehicle components and appraisal of their economic importance

Motor-vehicles are essentially assembly products comprising a large number of parts and components. Moreover each of these elements follows several stages of elaboration from raw materials to semi-elaborated products, finished components and vehicle sub-assemblies. People who work in the automotive industry are of course very familiar with these different products and the relationship existing between them. Many other people, among them car owners, and technicians, have also been interested in the motor vehicle as an object of study and hobby and some car owners feel like "self-made men" and attend to the maintenance and repair of their cars themselves. However, more than a layman's knowledge of the motor-vehicle as a technical product does not always exist in many public agencies and government institutions who have advisory or executive authority in connexion with the definition or implementation of economic and fiscal policies aimed at the development of the local motor-vehicle industry and its markets.

On the other hand, the existing legal framework in several Latin American countries shows that more and more definitions are being adopted on the various stages of vehicle assembly and on their parts and components. This is illustrated by the procedures applying to import control, the list of components whose domestic procurement is obligatory and to some extent by the rules governing the national content percentage. However useful for the law-maker and public administrator a knowledge of the motor-vehicle as a technical and assembly product may be, he also requires a fair knowledge of the economic value of the different parts and components of the motor-vehicle. Some of the national content rules are based on value rather than on weight integration of locally produced parts and components. The exchange of automotive parts between Argentina and Chile is in operation on a compensatory basis of exports for imports and requires the assessment

/of the

of the value of the parts which are exchanged. Finally it should be recalled that the aim of the present ECLA/IDB project is to evaluate the foreseeable magnitude of benefits which would accrue to alternative forms of regional and subregional integration of the automotive industry in Latin America. Evidently this task also requires gaining a fair knowledge of values corresponding to the different automotive products.

1. Functional breakdown of typical vehicles into their parts and components

Some reasons have been given above for which definitions relative to parts and components are required. There are of course many ways in which vehicle parts and components can be classified. One of them is to break a vehicle prototype into functional units and to identify all major elements belonging to the same unit. Assembly parts and finished components can then be analysed and grouped according to their corresponding semi-elaborated products, raw materials and the technological processes intervening in their manufacture.

It is not intended here to present an elaborate list of components or to incite the participants of the Working Group to express their views on the correctness or completeness of such a list. It is proposed rather to work on the definition of some basic criteria which should guide the elaboration of any classification scheme of parts and components in connexion with the purpose for which it is used, since it is recognized that the form and the detail of a specific classification may vary considerably in each individual case. In the first instance it will be found that in some cases a uniform terminology applicable to all types of vehicles might be convenient for the sake of simplicity whereas in other cases it might be preferable to adopt a different classification terminology for each separate type of vehicle. Consequently, the elaboration of a classification terminology of parts and components should begin with a definition of the various types of vehicles to which it would apply.

Which is the variety of vehicles that could be considered in this respect? The correct answer to this question depends, as already mentioned, on the purpose for which ultimately the classification tools are to be used, but some basic considerations can be stated here. A principle which should

/always govern

always govern the elaboration of any decision. One factor which is often forgotten, is that such an instrument must be as simple in order that it can be applied in general and on the other hand, it must be sufficiently elaborate in order to be flexible when applied to individual cases.

The following features could be considered to define different vehicle types:

**I. Varieties according to purpose or use:**

- (a) Passenger cars
- (b) Jeeps
- (c) Pick-ups
- (d) Trucks
- (e) Buses
- (f) Special purpose vehicles

**II. Varieties according to the layout of the main mechanical parts:**

- (a) Engine:
  - (i) Front mounted
  - (ii) Rear mounted
  - (iii) Under-floor mounted
- (b) Drive:
  - (i) Front axle
  - (ii) Rear axle
  - (iii) Two axles

**III. Varieties according to chassis design:**

- (a) Frame type chassis
- (b) Platform type chassis
- (c) Body incorporated chassis (self-supporting body)

**IV. Varieties according to the types of suspension:**

- (a) Front wheel suspension
  - (i) Rigid axle
  - (ii) Independent suspension
- (b) Rear wheel suspension
  - (i) Rigid axle
  - (ii) Independent suspension

**V. Varieties according to the number of axles (in the case of trucks, buses and special purpose vehicles).** /The combination

The combination of the different features and varieties would theoretically give rise to a large number of individual vehicle types, but as it will be recognized the number of types which actually exist is fortunately very much smaller.

Similar distinguishing features could be found when each subassembly or major part of a vehicle is considered and a list of optional equipment could also be drawn. In this way, a set of parts and components nomenclatures could be generated which would apply to each of the models of vehicles assembled in the different Latin American countries. At present, parts and components terminology applied by the fiscal agencies varies considerably from one country to another and sometimes within the same country. Undoubtedly the implementation of any regional or subregional integration scheme of the Latin American automotive industry will require some standardization of the legal framework and fiscal procedures relative to this industry and consequently also of the terminology and classification of parts and components.

But it will be found that assembled parts and finished components are not the only products in the automotive industry. According to the stages of the manufacturing process, raw materials and semi-elaborated products can be distinguished and it is interesting to note that many of the finished components can be traced to a common origin in form of semi-elaborated products or raw materials. It must also be borne in mind that many of the finished components and semi-elaborated products are typically procured from outside of the automotive industry thus simplifying to some extent the elaboration of a product terminology and classification scheme.

At this stage of the report some criteria should be defined to which a useful product terminology should conform:

(a) Any of the parties involved in the development of the automotive industry - manufacturers as well as government agencies - should be in a condition to identify easily and clearly any product which they handle;

(b) A classification scheme should show clearly which components belong to a certain assembly unit or system and vice-versa, or in other words, which elements belong to a certain set;

(c) The form and degree of elaboration of any product terminology should be geared to the purpose for which they are intended to be used; however, it should be standardised, as far as possible, according to the terminology used among the countries which envisage an integration of their automotive markets.

2. Composition of vehicles by weight and value of their parts and components

National integration content has been mainly measured in Latin American countries by comparing either the weight or the value of the locally produced parts and components with the total ones of the vehicle. Each of the two measures have been applied more or less successfully and it is not intended here to plead in favour of one or another system. It should only be recalled that the weight system has the obvious advantage that the weight of a part can be easily checked by anyone, whereas the value of a part is a controversial point. On the other hand, the weight of a part has no clear economic meaning, since the value/weight ratio varies widely between products according to materials and technologies used in their manufactures and other factors. However, the weight of a part may suggest some economic meaning to a qualified expert, but generally full specifications besides weight are required in these cases. As anyone might be aware, the value of parts and components cannot be assessed by their price alone, since many parts and components are not marketed in the form of original equipment and for those parts which are, the market mechanism works in a defective way due to the structure peculiar to the automotive industry. It should therefore be recognized that the value of parts and components can primarily be assessed by the automotive industry only, and moreover on a comprehensive basis by the vehicle manufacturer alone.

On the basis of which criteria should the value of a part or component be therefore established? Which price or cost is to be considered for a complete vehicle which is the basis of comparison for measuring the "national content value" of a locally assembled vehicles? The second question is easier to answer than the first one since the price of vehicles can be more easily obtained than that of their parts and components. In order that the price given for a certain vehicle be meaningful it must be stated whether it is the wholesale or list price, whether it is ex-factory, fob or cif port of importing country, and whether the vehicle is a built-up, semi-knocked down or completely knocked-down unit. Regarding the parts and components, their value could be established on the basis of the omission cost or otherwise the cost of the kits which are imported for local assembly. The difficulty lies in the fact that concerning individual parts and components these costs /are generally

are generally not recorded on bills or other documents which are readily available. Furthermore, these costs may vary from one country to another for the same part according to the expenses involved in assembling the kits, and because in some cases these costs include charges which are not directly related to the cost of manufacturing and supplying the part. Possibly the most objective way of establishing the value of parts and components would be to refer to the manufacturer's standard or target cost. However, it will be generally sustained that this cost would also vary to a certain extent according to geographic location, since input costs for commodity prices differ considerably even between the major vehicle manufacturing countries or regions such as the United States, Western Europe and Japan.

In spite of these obstacles, consideration should be given to the importance of having available comparative cost data for a rationalization of the future development of the automotive industry in Latin America. A general target of this development is to reduce the present level of production and distribution costs, and in some countries to avoid a general and permanent extraordinary increase of these costs in connexion with the creation of new manufacturing facilities. Consequently, some means must be created to evaluate the relative efficiency or inefficiency of different manufacturing activities. In addition, the promotion of trade between Latin American countries requires the recognition and development of procurement opportunities outside of different countries and an objective means to achieve this is obviously by comparison of input costs and commodity prices. Due to great structural differences between Latin American countries and given the objectives of their national development policies, a balance of the trade currents corresponding to automotive products might be required under some circumstances as a pre-requisite to an integration of their markets. However, the balance should not be established by considering the actual commodity prices in each of the trade partners but rather the cost of alternate procurement on the world market.

It will be admitted by everyone that this matter is a complex one and that any solution to the problem which has been set forth might have far-reaching consequences. The discussions of the participants in the Working Group might therefore be highly beneficial for clarifying the alternate issues and for finding a balanced solution.

/B. Range

B. Range of manufacturing and other economic activities performed by the automotive industry and its patterns of specialization

The automotive industry manufactures a great variety of products, uses many different materials and services and performs an extensive range of manufacturing and other economic activities. Since the aim of the present ECLA/IDB research project is to evaluate the prospects and to set forth possible forms of regional integration in the Latin American automotive industry, it has been felt that this industry should be clearly defined according to the range of products primarily manufactured, and the other economic activities which it normally performs should also be recalled. Furthermore, keeping in mind that in the context of this working paper the automotive industry has been considered as being formed of two more elementary industries, motor-vehicle manufacturers and parts and components manufacturers, the same criteria of identification applied to the major industry should also be applied to both branch industries.

Definitions in this field would also be of considerable practical value in connexion with the administration of fiscal incentives to the automotive industry in Latin America. The public official should be given the appropriate procedures which would allow him to decide objectively which manufacturing activities should be encouraged and which should not. In addition, it would be desirable for all parties concerned with the automotive industry to be able to consult published records giving details on the administrative and technical requirements that have to be fulfilled by a firm in order to qualify for incentives granted for instance in connexion with the establishment of a new plant, the manufacture of a new product range or exports of automotive products, and so on.

It will be remembered that in classification manuals of industrial activities, such as those published by the statistical offices of the countries or of the international organizations, an industry or group of industries is defined by a set of products called primary products of that industry. Accordingly an industry is formed by all industrial establishments

/manufacturing these

manufacturing these products and conforming to a standard of specialization. The specialization ratio of an industrial establishment is then defined as the ratio of the value of its annual production of all primary products relative to the same industry or industry group to the value of its total annual production.

As it can be seen in figure 1, the primary products corresponding to the automotive industry as a group, as well as to the motor-vehicle industry taken individually are complete motor vehicles, spare parts and accessories, and kits of original equipment for the assembly of motor vehicles in other countries. The commodity motor-vehicle includes passenger cars, jeeps, pick-ups, trucks, buses, special-purpose vehicles, and chassis for the three last types of vehicles.

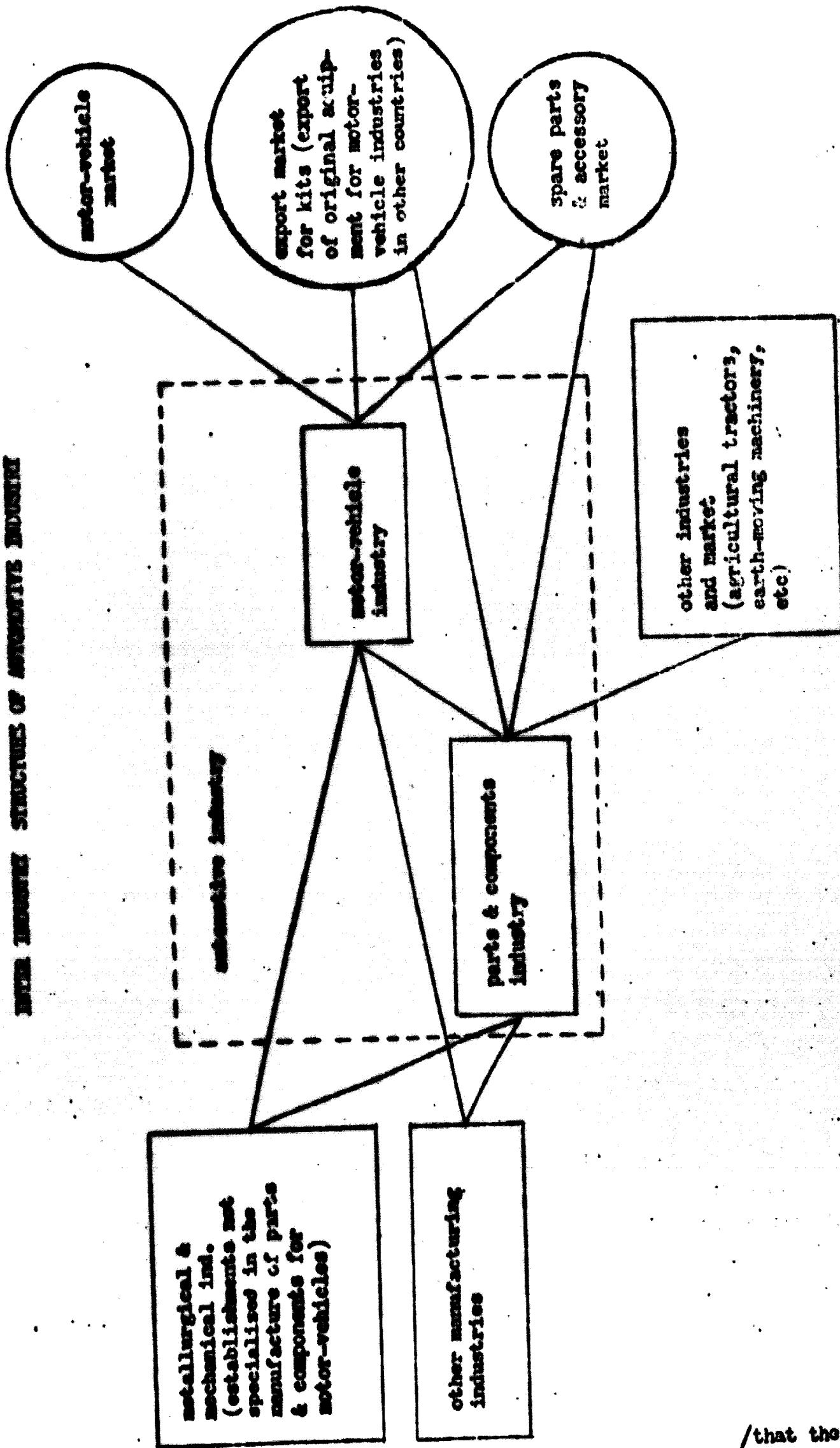
Primary products of the parts and components industry include those commodities which are manufactured by specialized establishments, apart from the motor-vehicle industry, with the additional condition that these establishments account for a major part of a country's total volume of production corresponding to the same products. The ratio of the specialized establishments' output of primary products to a country's total production volume relative to the same products is usually referred to as the coverage ratio of the particular industry. Thus it could be specified for instance that a certain commodity has to be considered a primary product of the parts and components industry, if it can be shown that all specialized establishments, independent of the motor-vehicle industry, account for more than half of a country's output relative to the same commodity. It should be noted, however, that the International Standard Industrial Classification published by the United Nations classifies under separate industry groups some automotive parts and components such as tyres and tubes which obviously are manufactured by specialized establishments.

However useful these definitions might be in the industrialized regions of the world, it will be found that they are of little practical value when they should be applied to the actual situation in the Latin American countries, where the automotive industries are, and only in some of the larger countries, just emerging from its infant stage. It is a well-known fact

/Figure I



**Figure 1**  
**THE INTERNAL STRUCTURE OF AUTOMOTIVE INDUSTRY**



/that there

that there are relatively few establishments specialized in the manufacture of automotive parts and components in most Latin American countries that manufacture or assemble vehicles. Furthermore, detailed product statistics are lacking in Latin America and if they do exist they would be of relatively little value since they would only show the past or present picture of an industrial pattern which in some countries is still evolving while in others it is changing quickly and sometimes quite unexpectedly.

For the same reasons it would not be appropriate to use the existing patterns of the industrialized countries as an absolute model for the Latin American countries. Not only do current economic and industrial conditions in these countries differ widely from one to another, but it must also be kept in mind that some economic policy-makers in Latin America believe that the automotive industry should make an effort to adopt a structure which might suit to some extent the particular situation of their countries. It cannot be overlooked that such reasoning might not predominate during the formulation of future trade or sectoral complementation agreements on a regional or subregional scale.

On the other hand, it should not be forgotten that due to the investment and licensing strategy of many international firms a specialized part and component industry could not be created in Latin America without the aid of foreign capital investment. This fact obviously generates a trend toward the reproduction of the patterns of specialization existing in the industrialized countries. Nevertheless, it should also be recognized that in many Latin American countries the manufacture of automotive parts and components has been initiated by local firms as part of a diversification programme into the automotive field.

The latter fact should be taken into consideration when a definition is coined to identify the parts and components industry in Latin America in connexion with sectoral complementation agreements. Formerly, industry has been defined as a group of specialized industrial establishments, where establishment means a geographically or physically separate unit. It is

/believed however,

believed however, that the concept of industry could be widened in the Latin American case in order to include as their elementary units the specialized manufacturing units or departments of non-specialized establishments or companies providing that these departments keep separate records of inventory and of accounting. This last condition is obviously a requisite for a clear measurement of the specialization ratio applying to the elementary manufacturing units which have been defined. It is also a requisite for establishing the coverage ratio of the industry specialized in the manufacture of parts and components.

Table 1 shows a tentative example of a pattern of specialization in the parts and components industry. Over twenty specialized parts and components industries have been identified. The designation of each industry identifies the primary products of that industry. In this way also an example is being given of what could be defined as the parts and components industry as a whole.

It will be noted that all primary products listed in the above-mentioned table are finished products, that is to say products not requiring any machining operation before being assembled. The motor-vehicle industry, as well as the parts and components industry itself, procures from the market many other finished products as well as semi-finished products and raw materials. The suppliers of these products figure in the metallurgical and mechanical industries as well as in a number of other manufacturing industries. Annex I lists these industries together with the main products supplied to the automotive industry. These industries are often referred to as the supporting industries or industrial infrastructure when the feasibility of creating an automotive industry in a new country is discussed. They also include most industries which are in a subcontracting position in relation to the motor-vehicle industry, which means that they manufacture according to the specifications of the motor-vehicle industry without owing patents, trade marks or license rights.

/Table 1

Table 1

EXAMPLE OF A PATTERN OF SPECIALIZATION IN THE PARTS AND COMPONENTS INDUSTRY

| Functional unit of the motor-vehicle | Industry designation   | Other markets supplied by the specialized industry besides the automotive industry and its markets |
|--------------------------------------|--|--|
| Engine                               | Manufacture of diesel engines (for motor-vehicles)           | Manufacture of agricultural tractors, materials handling equipment, earth moving machinery, etc.   |
| Engine components                    | Manufacture of pistons and piston pins                       | Manufacture of diesel and gasoline engines in general and compressors.                             |
|                                      | Manufacture of piston rings                                  | Idem   |
|                                      | Manufacture of valves  | Idem   |
| Engine fuel and air intake system    | Manufacture of carburetors and fuel pumps                    | Manufacture of diesel and gasoline engines   |
|                                      | Manufacture of injection pumps and nozzels                   | Idem   |
|                                      | Manufacture of air filters                                   | Manufacture of diesel and gasoline engines in general and compressors                              |
| Engine lubrication system            | Manufacture of lubricants<br>Pumps and oil and fuel filters  | Idem   |
| Engine cooling system                | Manufacture of radiators                                     | Idem   |
| Transmission and power train         | Manufacture of transmissions (manual and automatic transm.)  | Manufacture of agricultural tractors, materials handling equipment, earth moving machinery, etc.   |
|                                      | Manufacture of clutches                                      | Idem   |
|                                      | Manufacture of differential gears, propulsion shafts & axles | Idem   |

Table 1 (cont.)

| Functional units of the motor-vehicles   | Industry designation   | Other markets supplied by the specialized industry besides the automotive industry and its markets   |
|--|--|--|
| <b>Steering system</b>   | Manufacture of steering mechanisms   | Manufacture of agricultural tractors materials handling equipment, earth moving machinery, etc.  |
|  | Manufacture of steering columns  | Idem   |
|  | Manufacture of steering bars   | Idem   |
| <b>Suspension system</b>   | Manufacture of springs   | Idem   |
|  | Manufacture of shock absorbers   | Idem   |
| <b>Braking system</b>  | Manufacture of brakes  | Idem   |
|  | Manufacture of linings for brakes and clutches   | Idem   |
| <b>Wheels</b>  | Manufacture of wheels  | Idem   |
| <b>Body</b>  | Manufacture of bodies, driver cabins and containers for trucks, buses and special purpose vehicles | Idem   |
|  | Manufacture of dashboard instruments, indicators and switches                                      | Idem   |
|  | <b>Electrical equipment</b>  | Manufacture of spark plugs   |
| Manufacture of lamps (head lights, indicator lamps, etc.)  |  | Manufacture of agricultural tractors, materials handling equipment, earth moving machinery, other transportation equipment, etc.   |
| Manufacture of automotive electrical equipment (starter motors, dynamos and generators, voltage regulators, circuit breakers and ignition distributors, ignition coils, acoustical horns and wiper motors) |  | Manufacture of diesel and gasoline engines in general, agricultural tractors, materials handling equipment, earth moving machinery, other transportation equipment, etc. |

/Coming now

Coming now to the non-manufacturing activities performed by the automotive industry, it should just briefly be recognized that the motor-vehicle industry keeps quite a tight control over the distribution of vehicles. The motor-vehicle industry also assures the availability of spare parts, which is an important factor in order to avoid a too fast product obsolescence, and it controls the spare part market to some extent since it competes in this market with the independent manufacturers of parts and components. There appears to be some evidence that in the industrialized countries the motor-vehicle manufacturers have diversified their operations in the manufacture of certain parts and components in order to gain a greater control in the spare parts markets. It would be beneficial for the working group to discuss additional aspects related to the distribution of vehicles, such as the after-sales service and the financing of installment plants, where the motor-vehicle manufacturers play a major role.

C. Identification and appraisal of the technical and economic factors influencing the production costs in the Latin American automotive industry

It is a well-known fact that the production costs of motor-vehicles in Latin American countries are much higher than the corresponding costs in the industrialized countries. Furthermore, it is evident that with few exceptions the production costs of parts and components are also relatively high. Although the factors influencing the elevation of production costs are more or less known in a qualitative manner, there reigns quite a bit of confusion as to their quantitative contribution in the distortion of the cost picture. In very general terms it could be said that the high costs can be traced down to three basic factors: (a) The peculiar economic and industrial structure of the Latin American countries; (b) Government economic and fiscal policies; (c) Company strategy of the international firms operating in Latin America; (d) Company strategy of the locally-owned firms of the automotive industry. It should be noted that the first factor is in reality a situation which is only subject to gradual change, whereas the other three factors influence each other mutually. Consequently, an understanding of the reasoning and behaviour characteristic to the position

/supported by

supported by each of the three parties involved is necessary in order to put forward any viable proposal aiming at intraregional trade expansion or market integration.

In connexion with this subject the participants of the Working Group should be referred to two very interesting documents:

(a) ADEFA, Asociación de Fábricas de Automotores en la Argentina, published a report "La Industria Automotriz Argentina - Informe Económico 1969" which is based on an inedited study on the factors distorting the formation of prices in the Argentine automotive industry. In this study, which was conducted under the co-ordination of Dr. Gino Miniati, Director of Fiat Concord, the principal parts and components manufacturing associations of the country also participated. This research work constitutes a most serious attempt to identify in detail and appraise in quantitative terms the various conditions and factors influencing the production cost and consumer price of motor-vehicles manufactured in Argentina.

(b) A doctoral thesis submitted by Dr. Russell Martin Moore to the Fletcher School of Law and Diplomacy with the title "The Role of Extrazonally Controlled Multinational Corporations in the Process of Establishing a Regional Latin American Automotive Industry: A Case Study of Brazil. An extract of this thesis has been published as Information Document N° 2 as a background paper for the meeting of the Working Group.

(c) A doctoral thesis submitted by Mr. C. Sicard to the "Faculté de Droit et des Sciences Economiques de Paris" in October 1966, with the title "Study of Problems Related with the Establishment of Motor-Vehicle Industries in Developing Countries". An extract of this thesis has been published as Information Document N° 12 as a background paper for the meeting of the Working Group.

(d) "Factors that distort prices in the Argentine Motor Vehicle Industry", presented by "Fiat Concord" and which is based on a study about "Factors that distort costs structure in the Argentine Motor-Vehicle Industry". This study has been published as Information Document N° 17 as a background paper for the meeting of the Working Group.

/The economic

The economic and industrial structure of the Latin American countries should now be briefly exposed to discussion. As a general feature of these countries it is apparent that although some of them are quite populous countries, their per capita income is low and therefore their motor-vehicle markets are very small compared to the average industrialized country. Moreover, most countries have established high protective barriers around their frontiers in order to foster industrialization. This policy has resulted in a generally high price-level for semi-elaborated and basic raw materials, such as iron and steel products, which account for a large proportion of the raw materials consumed by the automotive industry. Furthermore, the protective policy has resulted in many cases in the creation of production plants whose scales of operation are too small as compared to the scales normally required for economic operations. These negative factors could not be totally offset by lower cost rates for labour in Latin America and since the products of some industries are raw materials and supplies to other industries, high production costs have been spread throughout the Latin American economies. Hereby even industries which are operating relatively efficiently when compared to international standards have lost their potential possibility of selling to export markets. On the other hand, since import duties and other related fiscal charges are generally high also for raw materials, both national and foreign-sourced raw materials and supplies have high prices. Many industries in Latin America are not yet fully integrated, as is the case of the iron and steel industry already mentioned, or still in an infant stage of growth, and this fact also contributes to the formation of a high cost level. This group of industries has to invest heavily in infrastructures, manpower training and must in many instances auto-finance their own plant expansion and integration programmes. In order to finance these charges, the gross profit rates are in some cases relatively high, hereby also contributing to an inflation of costs and prices.

After having taken a quick insight into the general economic and industrial conditions affecting the production costs of vehicles in Latin America, a closer view should be taken of the more particular conditions which, as formerly stated, are influenced by specific government policies and company strategies in the field of the automotive industry. These

/conditions can



conditions can be defined in connexion with the market size of each country, as follows:

- (a) Annual volume of local production of motor vehicles for the domestic market;
- (b) National integration content of parts and components;
- (c) Magnitude of exports of vehicles and parts and components as compared to the production for national consumption, as well as the conditions under which these exports are made;
- (d) Number of manufacturing companies or variety of makes and brands manufactured considering separately motor vehicles and their main parts and components;
- (e) Model diversification and standardization of parts and components;
- (f) Frequency and depth of model change and of specifications relative to main parts and components.

It should be noted that the first three of the listed conditions are mainly under government control, whereas the last ones are influenced substantially both by governments and automotive companies.

When the government of a Latin American country has adopted a programme for developing a national automotive industry, the import of complete vehicles has been severely restricted to the extent that the local motor-vehicle manufacturers could dispose of almost the entire domestic market. A few countries, however, have been less restrictive in the import of trucks and buses at least at the beginning of their automotive development programme. Furthermore, new companies who would start manufacturing in a country in many cases were allowed to import during an initial period complete CKD sets for local assembly in order to dispose of a lead time to develop local supply sources of parts and components. A general feature of the government policies, was however to compel the companies to incorporate progressively a higher percentage of locally produced components into their markets.

The national integration content of parts and components is another of the conditions which determine basically the cost level of motor vehicles. All Latin American countries manufacturing motor vehicles compel their manufacturers to fulfill a certain content-level. Unfortunately, the way in which the national content is measured varies from country to country, making therefore, a direct and precise comparison between the countries impossible. Moreover, the compliance with a national integration content /applies in

applies in some countries to the whole of the automotive industry, including the parts and components industry, whereas in other countries only to the motor-vehicle manufacturers. Nevertheless, it could be said in general terms that in Argentina and Brazil the automotive industry is almost entirely integrated from a national point of view and the other countries' content-level is considerably lower.

Some countries consider also parts and components imported from other LAFTA countries as "national" in connexion with the local content requirements. In Chile, a large proportion of parts counted as "national" are in reality made in other LAFTA countries. A few countries have also established lists of components whose incorporation to locally assembled vehicles is obligatory. It is felt that a comparison of the national integration content achieved by the different countries would be required in accordance with the objectives of the joint ECLA/IDB study. It is hoped that the studies which have been commissioned on the situation of the automotive industries in different countries and which, as it is expected, will be presented to the Working Group, should provide the necessary information.

The magnitude of exports of vehicles and their parts and components as compared to the production for national consumption has apparently only been of significance in the case of Chile. As it is known, this country imports parts and components from other LAFTA countries and, as has just been mentioned, considers them in connexion with the establishment of the content value as "national", if these imports are compensated by exports of parts and components manufactured in Chile. Although the export ratio is actually of little significance in the Latin American automotive industry, it will increase its importance in the future as a response to regional and subregional integration efforts as well as export promotion policies. The new legislation adopted by Mexico in the field of automotive industry development may illustrate this case.

Finally, the last three conditions listed at the beginning of this chapter should be considered in connexion with the identification of factors influencing the cost of vehicles. As it will be recalled, these conditions refer to the number of manufacturers operating in a country, model diversification, frequency of model change, and so on, which are

/basically established

basically established by both government policies and company strategies. In all the Latin American countries who manufacture motor vehicles, or are starting to manufacture them, the establishment of a manufacturing plant is subject to government authorization. The individual aspects of the policies applied by different governments may vary, but it can be said that with a few exceptions these policies have been quite liberal, allowing the establishment of a number of manufacturing plants which is relatively large when compared to the size of the individual markets, especially with regard to the markets of the smaller Latin American countries. Before the manufacture of motor-vehicles started in the different countries, an extensive variety of marks and brands were marketed, and consequently, in most cases governments have felt inclined to accept any manufacturer or the manufacture of any make that would conform to a set of minimum conditions or agree to certain conditions of plant localization. The only exceptions in this situation constitute Colombia and recently also Peru, for these countries clearly aim to restrict the number of motor-vehicle manufacturers from the very beginning. But, as previously stated, most countries have been considerably flexible regarding the admission of manufacturers in their territory, possibly in the hope that competition between them would force some companies out of the market. To some extent these hopes have been fulfilled in the case of Argentina and Brazil, and also in Chile; in the latter case, however, at the expense of the locally-owned firms. In Mexico, the government has favoured plants of concentration affecting several motor-vehicle firms. However, it seems that these plans have not yet reached the stage of implementation. On the other hand, Mexico, as well as some other countries, has restricted the number of specialized parts and components manufacturers in its territories.

The policies directed towards a restriction of the number of companies manufacturing motor-vehicles or certain parts and components appeal from a technical point of view taking into account the size of the local markets on one hand, and on the other, the plant scales required for economic operation. However, the difficulties lie in their form of implementation. The economic policies in Latin America have traditionally been inspired in liberal doctrines, that is to say the establishment of general legal

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conditions for industrialization and the approval of any investment proposal complying with these norms. If, however, the number of firms which would be allowed to operate in a field is fixed from the beginning, they would then be admitted to the market and to a system which would grant equal rights and establish equal conditions to everybody. The recent issues in Colombia and Peru regarding this question might appeal to some parties and be firmly rejected by others. In any case, the interdependence between motor-vehicle development policy and foreign investment policy must not be forgotten and no hasty conclusions should be drawn from experiments, the results of which are yet to be seen.

The variety of different types and models of vehicles which should be manufactured in a country in order not to surpass a certain level of production costs and, at the same time, to satisfy consumer needs reasonably, is another problem frequently discussed in Latin America. Even the company strategies differ in this respect between individual international firms. Whereas some firms prefer to concentrate on one market sector only and to manufacture only one, or in any case a limited number of vehicle types and models, others follow a strategy of diversification. In the market sector of passenger cars, the offer of the international firms is also adapted to the operating conditions and consumer habits in their home country. Up to now, American cars have been big cars, and European and Japanese cars, smaller. In the countries just mentioned, the decision of model diversification can be taken by each firm because this is in accordance with the competitive character of these markets. A wrong decision made by a firm in this sense is paid for dearly and might signify its disappearance from the market. In the highly protected markets of the Latin American countries where, moreover, the manufacture of motor-vehicles depends strongly on the international firms, the rules of the game are somewhat different and, consequently, the question arises whether some sort of government intervention is not beneficial to the final consumer. However, some fundamental questions are the following: To what extent does a multi-model programme of a brand influence the production costs as compared to the possibility of manufacturing only one basic model of the same brand? Which are the basic models manufactured and marketed by each of the international firms operating in

/Latin America

Latin American and which are the models derived from each basic model? To what extent would the vehicle market react against a reduction in the model variety which is actually available in the majority of Latin American countries?

Similar questions arise in connexion with the manufacturers of parts and components. How many manufacturers of each part and component are required to serve adequately the motor-vehicle manufacturers' need of product differentiation and supply reliability? Which is the minimum plant size of each specialized parts and components industry? Which is the real scope of nation-wide and international standardization? These and other related questions must be given an adequate answer if a nationalization of the automotive industry in Latin America is to be envisaged.

The frequency of model change and of launching the manufacture of new parts and components, particularly of the major mechanical units of the motor vehicle, appears to be another important cost factor in the Latin American scene. The home market of the world's big vehicle manufacturers requires, with the exception of a few economy cars, a frequent model change. The changing transport and environment situation in these markets requires the incorporation of technical progress into motor-vehicles, thereby originating design changes of existing parts and components and the development of new ones. Last, but not least, the high standard of living in the developed countries demands more and more comforts. In any respect the situation is quite different in Latin America. However, since the engineering and product development is just in its infant stage in this region, there is no choice but to adopt the existing solutions. Moreover, the majority of Latin American countries must follow the model changes that occur in the developed countries because they rely partially on the import of parts and components from these sources. The problem of assuring parts and components interchangeability and of co-ordinating production and procurement of these items on a world-wide scale will become even more important in the future than it is at present. Which solutions could be envisaged that would be satisfactory to all parties involved? How would alternative forms of regional and subregional integration influence the search for such solutions? What is the present state regarding frequency of model change in the different motor-vehicle companies? Here again the findings of the Working Group will certainly be of great value.

/D. Consideration

D. Consideration of basic industrial conditions for proposals of regional integration of the automotive industry in Latin America

As it can be seen from the foregoing parts of this document, regional integration of the automotive industry in Latin America means abandoning the present scheme of Latin American markets, each one becoming self-sufficient or striving towards that goal. It means the creation of over the frontier buyer-supplier or inter-industrial links and specialization of manufacturing plants among the existing plants and the plants which will be built in the future. Eventually some scheme of national specialization could be contemplated in some group of countries or subregion. From an ideal point of view an integration movement embracing the whole of Latin America would be preferable to an implementation of subregional agreements. However, the ideal solution might not be feasible immediately under the present economic and political constraints. It is now generally accepted that Latin American economic integration will follow two phases - a faster one between some communities of countries and a slower one in the region as a whole. It is also accepted that subregional integration will lay the groundwork for regional integration. At the same time, it should be said that regional integration does not mean that the goal of national self-sufficiency should be changed into the same objective on a regional or subregional scale. On the contrary, one of the objectives of regional integration is unquestionably to improve the position of the Latin American countries in connexion with the opportunities that trade offers on a world-wide basis.

In the case of the automotive industry a set of particular conditions will have to be kept in mind when any form of regional or subregional integration will be devised. Some of these conditions will be briefly outlined for discussion during the meeting of the Working Group. The first question which will be raised here is how can the proliferation of manufacturing plants of a size too small for economic operation be prevented? The obvious answer, "through the adjustment of the import duty rates", appears not to be entirely satisfactory considering the distortion of input costs in the internal markets. The question of whether some other means could not be devised for the purpose, such as the definition of minimum plant sizes

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for a range of typical manufacturing activities and industries. It is a well-known fact that for a certain industry or product the manufacturing cost decreases with growing plant size. Economic plant size corresponds then to the range where manufacturing costs no longer fall substantially with increasing plant size. Moreover, it would be necessary to take into account that manpower cost rates differ greatly between Latin American countries and industrialized countries. The corresponding ratio might be as high as five or ten depending on the particular countries on which the comparison is based. Consequently, if the situation relative to manufacturing costs and commodity prices of the industrialized countries is adopted as a standard or as a target, it could be said that in general the economic plant size would be smaller for a Latin American country than for an industrialized country. Of course the economic size of a plant must also be studied in connexion with its location because of the transport costs intervening in the procurement of raw materials and in the delivery of finished goods. The main question remains, however, whether a range of economic plant sizes can be defined with sufficient accuracy for the different manufacturing industries of the automotive sector.

Another main issue of the integration case concerning the automotive firms in particular, is how the problem of co-ordinating the manufacturing and marketing operations on a regional scale can be adequately solved. A major constraint which has to be considered is that some regional integration schemes may perhaps require the balance of trade currents at least in the initial stages of implementation. It is recognized that motor-vehicle demand in individual countries and for individual makes of vehicles presents noticeable fluctuations in the short term, which cannot always be predicted accurately. Consequently, the question arises as to how the requirements of balanced trade, national integration content, and similar ones can be fulfilled when procurement, manufacturing and marketing is envisaged on a multi-national basis. A review of the experience gained by the firms who participate in the programme of exchanging Argentine parts and components for Chilean ones would certainly be very instructive.

To what extent should complete vehicles be exchanged between countries and to what extent parts and components? The positions supported

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by the individual automotive industries and individual companies differ in accordance with their market situation and strategy. The requisites and possibilities for streamlining the production programmes relative to basic models and model varieties, manufactured in the different countries, may also differ from case to case. In several countries motor-vehicle manufacturers have adjusted to some degree the specifications of parts and components used as original equipment. These measures have in turn affected the product interchangeability within Latin American countries and will require special consideration during the formulation of regional complementation programmes. Perhaps it could be within the reach of the Working Group to assess the state of the present situation in connexion with the products manufactured by each of the participating companies. This assessment could also include the scope for a regional standardization of technical specifications corresponding to automotive products and its usefulness in connexion with regional integration.

Finally, consideration has also to be given to the aspect of world-wide co-ordination of automotive product manufacture and marketing. It cannot be forgotten that the product development is concentrated in the home office of the international motor-vehicle and parts and components manufacturers and presumably it will remain concentrated there to a large extent and for some time. Consequently, these international firms will play a most important role in co-ordinating their product programmes, not only on a regional scale in Latin America, but on a world-wide scale. Such aspects as the need to guarantee product interchangeability within certain geographical areas, the servicing of vehicle fleets with spare parts, and the use of alternative sources of supply, will govern future company decisions in this field. Within the framework of such a pattern, could then the "freezing" of models on a regional scale be considered as a feasible solution in view of the cost reductions achieved? Or would the development of special economy models, not subject to frequent design changes, which would be marketed universally, be a more acceptable solution? Here again the opinions expressed during the meeting of the Working Group will be of great value in clarifying these questions.

/ANNEX I



ANNEX I

Main supplier industries for the automotive industry

(see page 13 of text)

Supplier industry

Main materials and products  
supplied to the automotive  
industry

Iron and steel industry

Cold rolled sheets and coils,  
hot rolled plates, sheets and coils  
Special and alloy steels  
Foundry pig iron  
Ferro alloys

Iron and steel foundries

Raw foundry castings (grey iron,  
malleable iron, special iron,  
steel castings)

Forges

Semi-elaborated products  
manufactured by die-forging,  
up-setting, etc.

Non-ferrous metal industry

Aluminium, copper and zinc  
materials and alloys; rolled,  
drawn, extended and moulded semi-  
elaborated products

Die casting

Die casted products in Zamac and  
aluminium and copper alloys

Mechanical industries  
(including metal-working  
industries)

Metal stampings  
Locks and fixtures  
Bolts, screws and fasteners  
Tools and fixtures  
Electro-plated parts  
Machined parts  
Seat springs and frames  
Transmission chains  
Roller bearings  
Seals and gaskets  
Vehicle tools

/Annex I (Concl.)

Annex I (Conclusion)

Supplier industry

Main materials and products  
supplied to the automotive  
industry

Electrical equipment industry

Batteries

Wires and cables

Lamp bulbs and fixtures for small  
lamps

Electronic Industry

Auto radios and electronic devices

Rubes and tyre industry

Tubes and tyres

Rubber products industry

Extruded and moulded rubber  
products, transmission belts

Plastic products industry

Extruded and moulded plastic  
products

Textile industry

Materials and products for interior  
trim

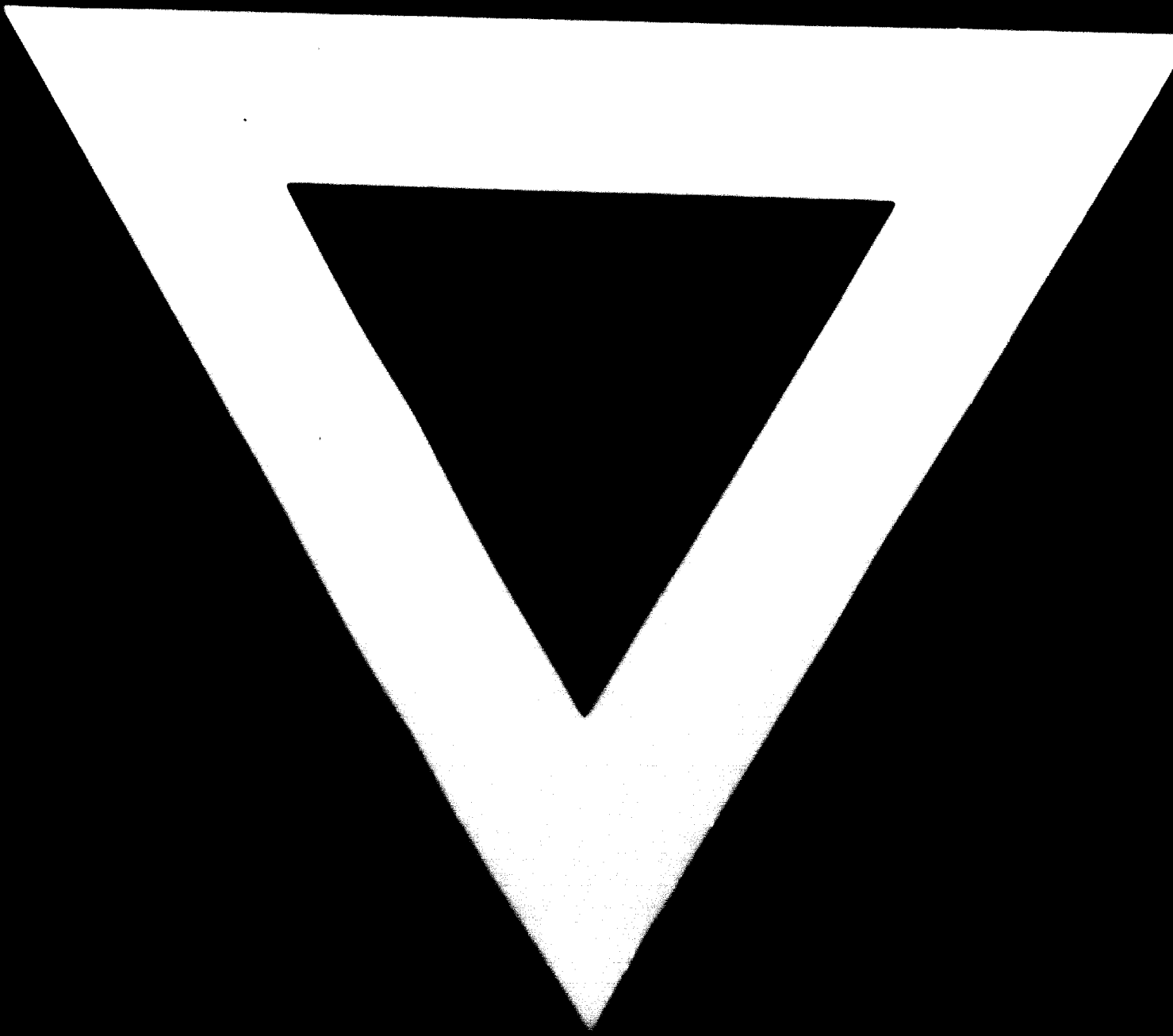
Chemical industry

Paints, varnishes and adhesives

Glass industry

Windscreens and windows





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