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CASE STUDY ON THE MANUFACTURE OF PISTONS AND OTHER MOTOR-VEHICLE PARTS IN MEXICO 2/

presented by

MO-RE-SA, Motores y Refacciones S.A., México D.F.

1/ Organized jointly by the Economic Commission for Latin America (ECLA), the Inter-American Development Bank (IDB) and UNIDO.

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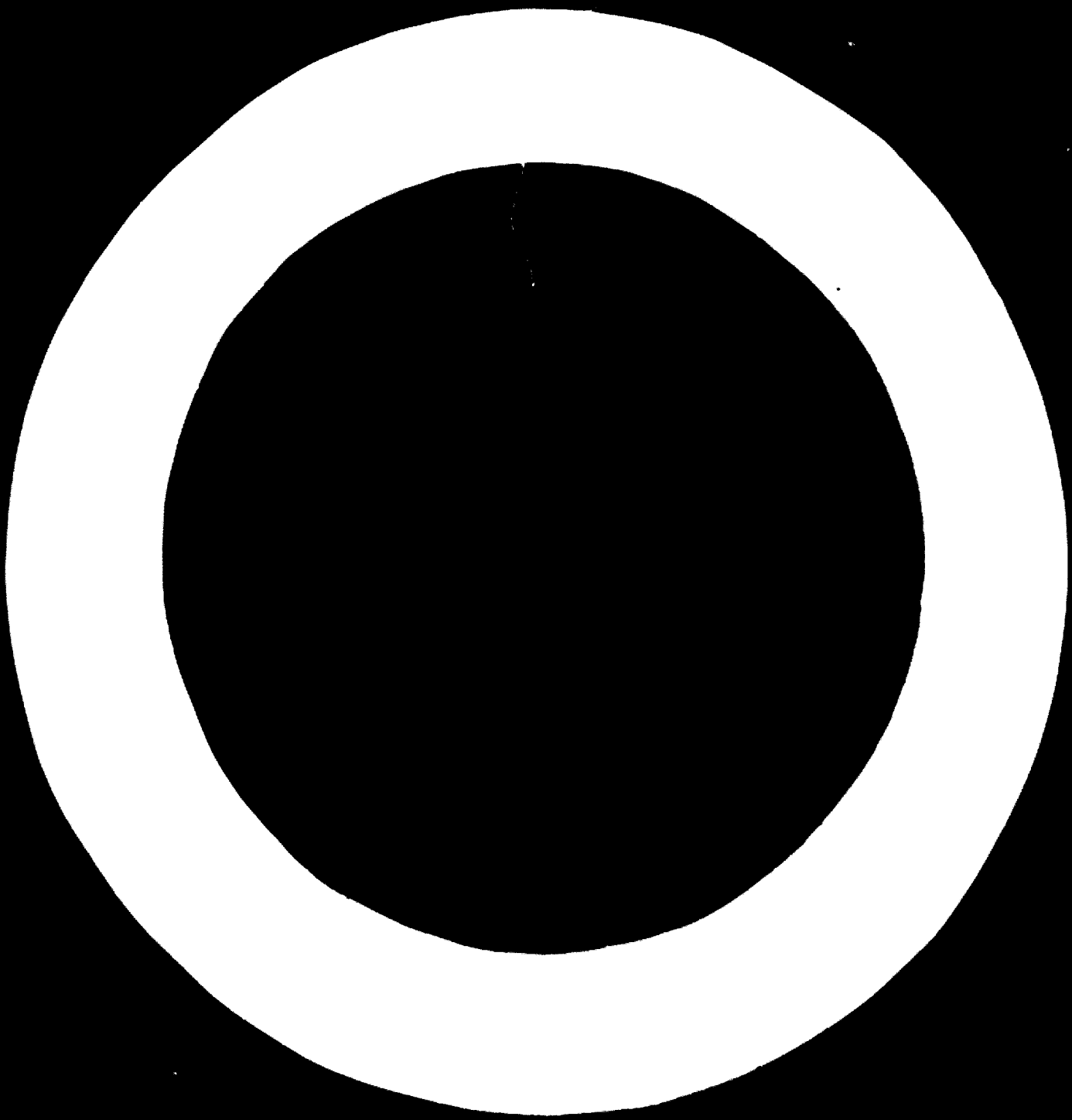

1. Introduction to the enterprise

MOTORES Y REFACCIONES, S.A. (MO-RE-SA), Mexican firm, established in Mexico City since 1949, currently operating two plants with 1,359 workers and 661 officials and employees of various categories (total: 2,020 persons), with a capital stock of 70,000,000 Mexican dollars (5,600,000 United States dollars) and assets valued at 171,000,000 Mexican dollars (13,000,000 United States dollars), comprising more than 50 per cent Mexican capital, specializing in the manufacture of the following parts for both petrol- and diesel-powered motor vehicles:

pistons
piston bolts
motor-vehicle valves
tappets or valve lifters
aluminium cast parts (not machined)

Because increasing demand both for spare parts and from truck and passenger car manufacturers has prevented the firm from operating outside the country, it has concentrated exclusively on the domestic Mexican market, which we supply with 80 to 90 per cent of its total requirements.

We are suppliers for:

Fábricas Automex, S.A. (Chrysler)
General Motors de México, S.A. de C.V.
Nissan Mexicana, S.A. de C.V. (Datsun)
Volkswagen de México, S.A. de C.V.
Diesel Nacional, S.A. (Cummins and Renault Motors)
Ford Motor Company, S.A.
Motores Perkins, S.A.
International Harvester Mexico, S.A.

Some of these firms have exported motors containing parts manufactured by us to Latin American and to other countries.

We are licensed manufacturers for the following makes:

Federal-Mogul Corp. (Sterling) - pistons
Mahle Komm - Ges. - pistons
TRW Inc. (Thompson) - valves
Stanadyne Inc. (Standard Screw Co.) - tappets
Burges-Norton Mfg. Co. - piston bolts

/2. General

2. General observations

We offer below our independent views regarding the list of objectives and sample outline prepared by the Industrial Development Division of the United Nations Economic Commission for Latin America (ECLA), Santiago, Chile. ("Objectives and criteria relative to the definition of a series of case studies on the economies of scale in manufacture of automotive vehicles and auxiliary components", Santiago, Chile, March 1970.)

For the most part, manufactures of motor vehicle parts in Latin America specialize in articles required by national markets and their spheres of influence.

A system of specialization by product for purposes of complementarity would have definite possibilities for Latin American enterprises affiliated to a single parent company or operating under the license of a single firm were it not for the circumstances obtaining in the various countries of the region, such as different levels and concepts of national content from country to country, transport costs, delivery times, fluctuations in rates of exchange, and the fact that, for reasons of logic and necessity, our Governments encourage local manufacturing and the manufacturers themselves are anxious to use local manpower which would otherwise be unemployed if the articles concerned were produced by a neighbouring country.

It is debatable whether or not this manpower could be employed in another manufacturing branch since not all Latin American countries offer the same facilities for freely selecting the articles to be produced.

As for those countries whose domestic motor-vehicle market currently depends partially or totally on outside sources, it is important to examine carefully exactly what products are involved. Strictly, for the purpose of this study - because it is no doubt one of the most important questions - it would be interesting to consider what possible solution there could be to the frequent, sometimes even annual, change of models and bodies that, year after year, have to compete not only with the previous model but with models from outside the region. We are of the opinion that no Latin American country would want to be left behind in this field for fear that this would give the impression that its market was stagnant by comparison with that of the more industrialized countries that redesign and modernize their motor-vehicles and apply more advanced techniques every year.

/It would

It would be interesting to know the outcome of a study of possible complementarity agreements among Governments, based on national specialization, with regard to motor-vehicle products not yet manufactured in Latin America. To do this, it would be necessary to find out:

(1) what natural resources a country interested in this form of specialization possessed, since without them its attempts to integrate the products could entail heavy import costs and therefore a loss of foreign currency;

(2) what manual and technical labour is available for supplying domestic raw materials, and the operational costs involved;

(3) the geographical location of the country, conditions and cost of transport to the recipient of the product and possible output in view of regional and international competition and from the economic point of view.

In some Latin American countries, considerable progress has been made in the various industries involved in manufacturing motor-vehicle parts. If an integration programme is to be really effective, however, it must operate under conditions of international competition.

Before this can happen, several obstacles have to be overcome, not only from the industrial point of view but also in terms of infrastructure - a very important factor affecting the efficiency of our operations - and every suitable means has to be used to correct the procedures and systems to which firms are committed in order to work efficiently.

Excessive protection for inefficient industries discourages any constructive initiative to make improvements.

Tax exemptions and other inducements for motor-vehicle industries do not always bring the desired results, since they entail such lengthy import and export control formalities that production, for example, is often held up for months when importing machinery and/or basic or complementary raw materials for finishing our articles.

Discussions at the technical level are undoubtedly of the utmost importance, but it is our opinion that a comprehensive study of the general conditions under which our industries operate and of the short- and long-term implications of integration programmes deserve special attention.

/3. Manufacturing

3. Manufacturing techniques

There is one aspect that, from our point of view, cannot be overlooked, namely, that many of our motor-vehicle products involve the use of extra-regional techniques developed by highly industrialized enterprises which in turn have trading arrangements with countries that have no licensed manufacturers. Naturally, this makes for a conflicting situation when regionally manufactured products are sold in countries where the same make of product is normally imported from outside the region.

4. Approximate percentage value of our products

(Point II of the outline.) Varies between 1 and 2 per cent of the total cost of the vehicle. Although this is a fairly low percentage value in terms of the total cost of the vehicle, it relates to highly specialized and vital motor parts for which demand is reasonably satisfactory.

5. Scope of standardization

(Point III of the outline.) For this, a study will have to be carried out in agreement with the various manufacturers of established makes of trucks and passenger cars to be found on the regional market so as to determine what parts could feasibly be standardized in line with exchange and complementarity agreements between the countries concerned. Preference should be given to the most technically advanced products coming from the countries that are in a position to offer the best conditions and to provide guarantees as regards both volume and continuity so that long-term studies and projections can be made.

6. Technological operations

(Point IV of the outline.) The engineering, foundry, forging, machining and quality control operations in our plants are carried out in accordance with local conditions, the specifications governing the various manufacturing norms for the product, and the requirements of the consumer actually producing the vehicle.

The raw materials of local origin are as follows:

(1) Aluminium alloy in ingot form for casting pistons, etc.;

(2) Low-carbon steel in the form of hot-rolled bars for piston bolts;

/(3) High-carbon

(3) High-carbon steel or steel alloy for forging valves, also in the form of hot- or cold-rolled bars as appropriate;

(4) Iron castings with specially controlled specifications, for tappets.

7. As regards point V of the outline, we feel that, in order to establish approximate annual production volumes and capacities, it will be necessary to know the installed capacity of the countries involved and the desire and/or ability of each manufacturer to participate in the complementarity and integration programme.

8. (Point VI of the outline.) This point has been covered in general terms under points IV and V.

9. (Point VII of the outline.) Before we could determine manufacturing costs in relation to volume, it will be necessary to consider whether we will be in a position to participate in the programme, once its general outline has been established. We can, however, state that, as regards raw materials, the national content of our products is 95 - 98 per cent, the remaining 5 to 2 per cent being composed of materials and components bought locally or, to a diminishing extent, imported.

10. (Point VIII of the outline.) In order to obtain information on this point, the volumes referred to and the extent of our participation should, for reasons already given, be defined as accurately as possible. The studies we have carried out indicate that, over the next one to five years, we shall have to take steps to double our output merely for purposes of satisfying domestic demand and providing certain products for export, in accordance with programmes adopted by the motor-vehicle manufacturers and the Mexican Government, as pointed out at the beginning of this document.

11. (Point IX of the outline.) The average cost of direct manpower involved in manufacturing our products in relation to the total manufacturing cost is around 15 per cent, that of indirect manpower 20 per cent. Naturally, these percentages vary and in Mexico the possible effects of the new federal labour law governing labour benefits are still unkown in this respect.

/12. (Point

12. (Point X of the outline.) Other costs such as electrical energy, fuel and lubricants, indirect materials, amortization of installation costs, repairs and general maintenance and other indirect manufacturing costs amount to about 30 per cent.

13. (Point XI of the outline.) In direct connexion with monthly manufacturing operations, the relevant figures are as follows:

Stocks of raw materials	150 per cent
Materials in process	167 per cent
Finished products	350 per cent

14. (Point XII of the outline.) Selling costs, including those listed in the outline, amount to approximately 11 per cent.

15. (Point XIII of the outline.) Since, as already pointed out, we operate solely on the domestic market, we have no experience in these matters.

/CONCLUSIONS

CONCLUSIONS

As a first step,

1. Reduce to a minimum, and standardize, the makes and models of motor vehicles being manufactured in Latin America by offering suitable inducements to the terminal industries operating in all the countries parties to the agreement. For this purpose, it would be advisable to choose the makes and models most widely sold in Latin America;

2. Associate domestic capital with foreign capital from the major terminal industry enterprises. This would:

(a) not only have the immediate effect of improving relations with suppliers of mixed and domestic capital,

(b) but also place the Latin American terminal industry in a similar situation to that of the suppliers, with a remote but desirable possibility of eventually bringing about a more consolidated motor-vehicle parts industry.

If this were done, it would be possible to establish the norms necessary for standardizing the parts and components of the vehicles and motors chosen and approved for the region as a whole, and to make the maximum use of investment in the motor-vehicle parts industry, its experience and established techniques so as to promote the production of motor vehicles in Latin America.

A minority association of foreign capital with domestic capital would also be advisable in the motor-vehicle parts industry since this would facilitate the acquisition and permanent availability of technical and economic assistance at the highest international level.

A further aspect that should not be overlooked is that the kind of capital arrangements and associations suggested could pave the way to extraregional exports; this would permit larger production volumes than would be required for Latin America alone, with all the attendant advantages that this could logically be expected to bring.

The past history of the motor-vehicle industry does not support the views expressed above. However, unless a new approach and new steps are adopted from now on, each country and industry will continue looking after its own interests indefinitely and thus restrict the possibilities of the complementarity and integration programme to a mere question of lower costs.

NO-RE-SA
MOTORES Y REFACCIONES, S.A.

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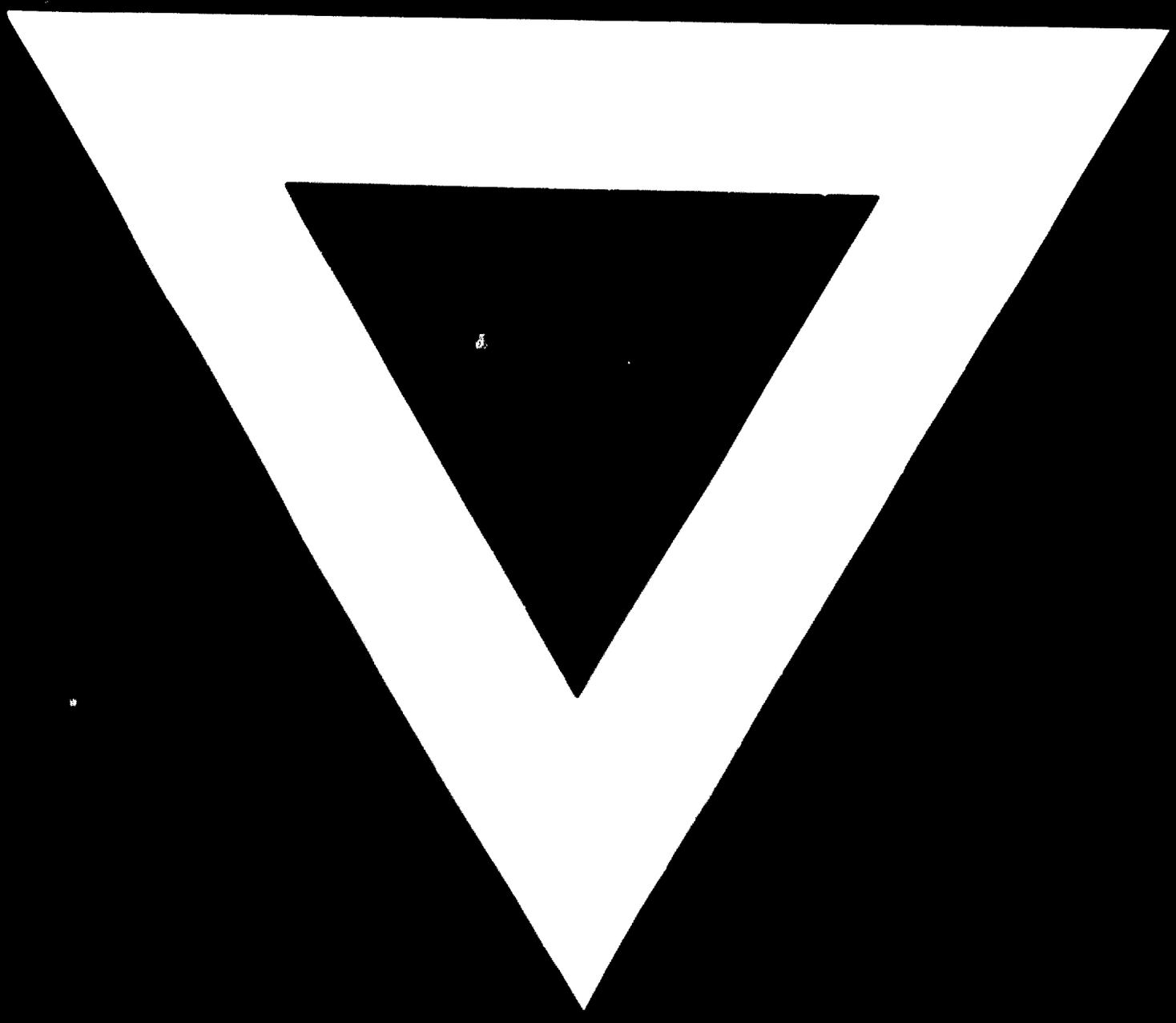

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