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The Seminar on the Establishment and Development of the Automotive Industry in Developing Countries

Karlovy Vary, CSSR, ~~14 October - 1 November 1968~~ 24 Feb - 14 March 1969

THE ESTABLISHMENT AND DEVELOPMENT OF THE AUTOMOTIVE EQUIPMENT INDUSTRY IN THE UAR 1/

by

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Factories Manager
El Nasr Automotive
Manufacturing Co.
United Arab Republic

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THE ESTABLISHMENT AND DEVELOPMENT OF THE AUTOMOTIVE EQUIPMENT INDUSTRY IN THE U.A.R.[1/]

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SUMMARY

1. Since 1950 a small automotive assembly plant established by Ford Motor Company existed in the United Arab Republic. With the exception of tires and batteries, all parts were imported. Because of import regulations, this plant has been restricted to repair activities since 1964.

2. Market prospects, strategic factors, the need to provide employment and the existence of some unused military industrial facilities were the main reasons which led to the decision to establish a national automotive industry in the United Arab Republic.

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* This is a summary of a paper issued under the same title as ID/WG.13/13.

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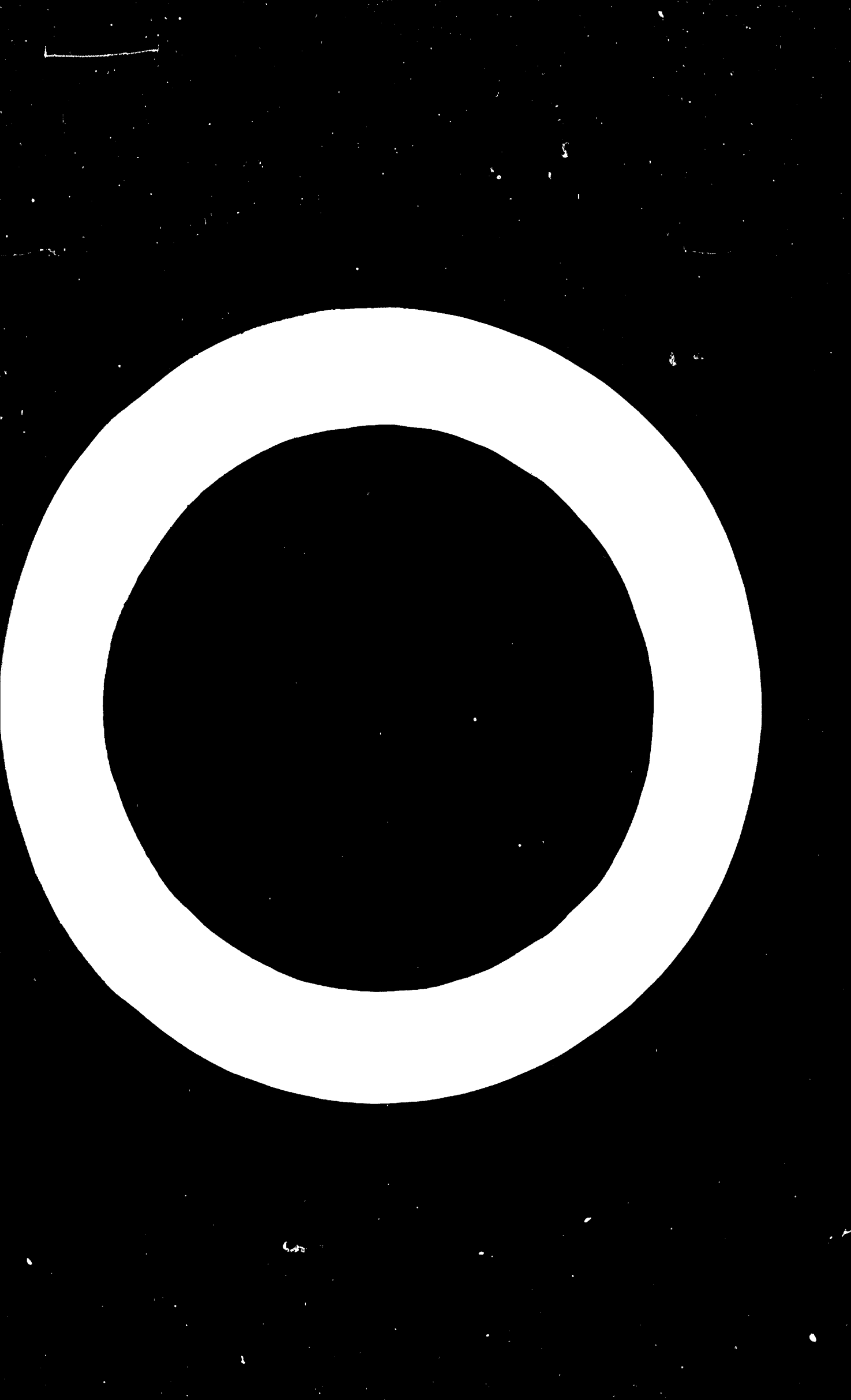
3. The state firm, El Nasr Automotive Manufacturing Company, founded in 1960, began with the production of trucks and buses according to the contract signed in 1958-1959 between the local authorities and the Federal Republic of Germany firm, Klöckner-Humboldt-Deutz. Starting with assembly and production of simple parts, the local content had to be increased gradually. Difficulties in reaching the planned content of locally supplied components occurred because of the inadequacy of the ancillary industries. Nevertheless, in the next few years it is expected to achieve a local content of about 75 per cent.

4. In 1962 El Nasr Automotive Manufacturing Company began the production of a trailer licensed by the Federal Republic of Germany firm, Blumhardt. At the moment almost all parts of this trailer are locally produced.

5. According to the contract signed with the Yugoslav firm, Industrija Motora Rakovica, El Nasr Automotive Manufacturing Company started to assemble tractors in 1962. Objections from major consumers with respect to the suitability of the tractor for local conditions led to a delay in the project and various modifications in the tractor itself.

6. In 1962 El Nasr Automotive Manufacturing Company also began to assemble Fiat cars. Up to 1967 about 14,000 cars had been assembled. In order to reach higher local content in passenger cars, production will be concentrated on the Fiat 1500 engine and the assembling of vehicles in which this engine can be installed.

7. The paper indicates and discusses the main difficulties which the company El Nasr, which now employs about 4,800 workers, had to face. The most important of these problems resulted from: diversity of projects, continuous modifications of models and parts, lack of foreign currency and skilled personnel, and insufficient and inadequate ancillary industries.



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Introduction

1. 1952 marks the year of revolution in Egypt. It also marks the evolution of modern industry in the country, which has been so far considered a purely agricultural nation, except for a group of modern textile factories and the traditional sugar production plants. The main national income was from the export of different agricultural products, mainly cotton and rice. The Egyptian market was wide open for the importation of all kinds of industrial goods.

2. On top of these goods were motor cars of all makes and types. All the internationally known car manufacturers shared in these imports and were competing to augment their share. Thus the Egyptian market had the widest possible variety of cars and the dealers were quite busy importing the required spare parts to keep these cars going.

3. During the Second World War when importation to Egypt became very restricted it was difficult to keep the cars running. Spare parts became more and more scarce and their prices rose quickly. Several small workshops started making a good business producing certain spare parts that were easy to imitate, despite the very low quality of the production.

4. Soon after the war the flow of imported cars and spare parts started again and the crisis was nearly forgotten. However this crisis became the main initiative which drove a number of business people to establish the first factories for the production of automobile accessories in Egypt. Thus the production of tires was started in a modern tire factory in Alexandria, and the manufacture of batteries was introduced in another factory. Production of brake linings and leaf springs was also planned.

5. In 1950 The Ford Motor Company constructed a new assembly plant at Smouha in Alexandria. The plant was especially equipped for the assembly of all types of cars ranging from small passenger cars (Consul, Taunus and Anglia) up to heavy-duty trucks and tractors for agriculture. The productive capacity of the plant was twelve vehicles per day or 3,000 units per year to be assembled from completely knocked down (CKD) components. The activities of the plant also included engine reconditioning and a fully equipped service school.

6. The plan which had an area of 7.22 acres and a covered floor space of 270,825 m was built in a free zone area. It employed about 340 workers and served in the beginning to cover the needs of Sudan and Turkey in addition to Egypt. The total number of units assembled in the years 1962, 1963 and 1964 were 1,440, 1,534 and 1,345 having a value of LE 2,812,815 and LE 1,422,725, respectively. The activities of the Ford Motor Company continued until it was recently stopped by the restrictions put on the importation of cars and the difficulties in obtaining the foreign exchange required for an importation. Plant activities are at present restricted to repair work of Ford cars already on the market.

7. After the revolution, industrializing the country became one of the main targets of the Government. In 1956 the Ministry of Industry was created and the first five-year industrial plan was announced shortly thereafter.

8. The production of automotive equipment was one of the subjects that received attention from the beginning. The spare parts crisis during the Second World War revealed the importance of standardization and the urgent need of having local production of certain important spare parts. The idea was gradually developed to include the production of trucks, and the first studies for the execution of this project were started in 1953. As will be explained in detail in the following chapters, tedious studies and tests were made, which led to the conclusion of the first contract for the production of trucks and buses in 1959. That year can be considered as the real date of birth of the automotive industry in the United Arab Republic.

I. RAIL AND ROAD TRANSPORT CONDITIONS IN THE UNITED ARAB REPUBLIC

Area and population

9. The UAR covers a total area of 1,002,000 km^2. Out of this total area 965,000 km^2 are desert, leaving only 37,000 km^2 of cultivated land in the Nile valley and the Delta, representing only about 3.7 per cent of the total area of the country.

10. The total population is at the present 30.05 million, thus giving a population density of 21 inhabitants per km^2. Excluding the desert area, the actual population density related to cultivated land is 835 inhabitants per km^2, which is considered among the highest population densities in the world.

11. The rate of population increase (2.53 per cent per year) is also very high. In the period between 1927 and 1966 the population has been more than doubled. This extremely high rate of population growth represents one of the major problems facing the development of the Egyptian economy.

12. The two main cities in the UAR are Cairo, the capital, with 4.196 million inhabitants, and Alexandria, the main harbour on the Mediterranean, with 1.8 million inhabitants. The rest of the population is distributed among the other 23 states of the UAR in the following way:

(a) 13.398 million people in the northern states including the Nile Delta, the Suez Canal and the norhtern coast;

(b) 10.657 million people in the southern states including the upper Nile valley south of Cairo, the Red Sea coast, and the new valley.

Transport via roads and railways

13. Until recently the transport of passengers and goods in the UAR depended mainly on railway service. A network of railways covers all the main cities and states of the UAR. The length of the railway lines amounts at present to 4,263 km. The longest line connecting Alexandria on the northern coast to Aswan on the southern border is about 1,250 km long. The total passenger and goods transport load by railway in 1965 is noteworthy. The total passenger transport was 5,788 km, and the total freight transport, 3,458 km.

14. However, in the last ten years great efforts were exerted to establish new roads and highways and to improve the condition of the existing roads. A modern two-lane highway was constructed connecting Alexandria to Cairo via the Nile Delta. New desert roads were also built joining Cairo to the Suez Canal at Ismailia and the Nile valley to the newly cultivated area in the new valley. Thus the road transport of goods arriving from harbours to Cairo (representing the main centre of consumption) and to upper Egypt was greatly encouraged. A new era for road transport has thus been opened, and represents a vital factor in the establishment and growth of the automotive industry in the UAR.

15. The following figures give the length of the roads in the UAR in 1966 as compared to 1952.

Table 1

Length of roads, 1952 and 1966
(in kilometres)

	1952	1966
Agricultural roads	14,395	17,305
Desert roads	2,619	5,253
Total	17,014	22,558

The total length of the new roads built in the period 1952 to 1966 amounts to 5,544 km.

16. Table 2 gives a break-down of the gross tonnage of goods unloaded and shipped from the different Egyptian harbours.

Table 2

Goods unloaded and shipped, 1966
(in millions of tons)

Harbours	1966
Goods unloaded	
Alexandria	7.3
Suez	2.3
Port Said	0.8
Total	10,4
Goods shipped	
Alexandria	2,3
Suez	1.7
Port Said	0.3
Total	4.3

II. THE AUTOMOTIVE MARKET

Trucks

Trucks with payload over three tons

17. The total number of trucks with a payload over three tons running in the UAR during 1966 was 22,640. This figure includes all types of trucks used for civil purposes whether equipped with normal platforms, tippers, tanks or refrigerating units. It excludes all military vehicles (for which no details are available).

18. These trucks represent a variety of internationally known makes which - with the exception of 5,400 trucks which had been produced locally since 1961 - have been all imported. It is to be noted that about 9,000 trucks out of the total number (i.e. about 40 per cent) are over ten years old and thus require frequent replacement of worn parts.

Trucks with less than three tons payload

19. The total number of trucks having a payload of less than three tons that were running in the UAR during 1966 was 5,284. These trucks included all types of light trucks, pick-ups and delivery vans. Since 1960, 1,847 of these have been imported. They are a variety of makes with the greatest number representing Ford, International, Studebaker and Chevrolet. Most of the Ford trucks have been assembled locally in the Ford plant at Alexandria.

Trailers

20. The total number of truck trailers running in the UAR in 1966 was 2,194. This figure includes all types of transport trailers whether with normal platforms, tanks or refrigerator units. It is to be noted that 1,729 of these trailers were licensed since 1960, representing about 80 per cent of the total. This can be traced back to the fact that until recently the use of truck trailers was very limited, due to inadequate road conditions and the crowded traffic in city centres. However, with the improvement of road conditions and the construction of highways, the use of trailers became more and more common.

21. This was further boosted by the establishment of trailer production locally. The demand for trailers has increased rapidly during the last five years and now almost equals that for trucks.

Buses

22. The total number of buses running during 1966 was 6,434. This figure includes 3,834 public transport buses, 1,815 private buses, 528 school buses and 257 tourist buses. About one fifth of these buses are over ten years old and represent immediate replacement needs. They include 2,470 buses locally made during 1961 to 66 representing about 35 per cent of the total bus fleet. The rest of the buses are imported of different makes, the greatest number being represented by Bedford and Mercedes. Among the public transport buses the biggest percentage are city transport buses used in the big cities. About 1,200 of these buses are running in Cairo and about 500 in Alexandria.

Passenger Cars

23. According to statistics (as of July 1967) the total number of passenger cars licensed are: 90,913 private cars, 15,268 taxis and 5,819 microbuses.

24. The total number of passenger cars is thus about 112,000. This figure includes practically all well-known intern tional makes. It includes also 14,120 locally assembled NASR cars produced according to the licence of Fiat of models 1100, 1300 and 2300.

25. The majority of the cars running are continental medium-size cars with engine capacities of one to two litres. This size is the most popular and most adequate to the social conditions in the UAR.

26. The number of cars imported in the years 1952 to 1959 is as follows:

Table 3

Number of imported cars, 1952 - 1959

	No. of cars imported	Value in LE
1952	4,575	2,491,586
1953	2,044	1,008,560
1954	3,131	1,577,326
1955	5,722	3,267,563
1956	1,913	1,860,973
1957	1,049	631,957
1958	3,174	1,477,962
1959	5,085	2,319,375

27. The number of imported cars decreased greatly in the years 1956 to 1958 due to the lack of foreign currency in those years. In the years 1960 and 1961 about 7,000 cars were imported before restrictions were placed on the importation of motor cars in 1962. Practically no import licence was granted for importation of complete cars after 1962. Cars registered in the years following 1962 were either of local production or cars brought to the UAR by Egyptians returning from their work abroad or foreigners working in the UAR.

28. Referring the number of registered cars to the total number of inhabitants, the ratio is 283 inhabitants per registered motor car (1967). This figure has decreased considerably in the last ten years and is continuously decreasing despite the improvement in the standard of living. There is no doubt that this figure is very high if compared with figures in industrialized countries as for example 5.0 cars per inhabitant in the Federal Republic of Germany, 6.2 in the United Kingdom, 10.9 in Italy, 50 in Spain, 55 in Japan and 45 in Brazil.

29. However if we consider the per capita income in the UAR, which is still low as compared to these countries, this figure appears to be fairly high. No doubt the present efforts exerted in industrializing the country are resulting in a gradual increase of the per capita income and will lead to a gradual increase in the use of motor cars. The average national annual income per person increased from LE 37.1 in 1952/53 to LE 50.2 in 1959/60 and LE 59.8 in 1964/65.

30. It is expected that by 1975 the figure of inhabitants per car will decrease to about 280. Taking into consideration the number of inhabitants by 1975, which is expected to be 35 million, the number of cars running in 1975 should be 125,000.

31. From the above suvey of the automobile market in the UAR, it can be seen that the market potential is rather limited. This represented a considerable handicap against the establishment of an automobile industry which is basically a mass production industry requiring a minimum of production capacity to be economical.

32. However, positive steps were made towards the establishment of this industry due to the following factors:

(a) There are now increasing prospects of exportation to Arab and African countries, stimulated by the prospect of forming the

common Arab market. The first step towards that end was the treaty signed between a number of Arab countries, members of the Arab League, granting Arab products certain custom exemptions or reductions when exchanged from one country to the other. Also the African markets with their continuously increasing potential represented good prospects of no less importance, although more challenging.

(b) There was an urgent need for more trucks and buses, which appeared as a natural result of the industrialization of the country, and the numerous construction, economic and industrial projects that were started after 1952. The projects for land reclamation from the desert and for the land reform represented also big future consumers for automotive products.

(c) There were factors which favour the availability of a local automobile factory. The presence of such a factory would lead towards standardization of the automobile market in the country and correspondingly the standardization of its requirements in spare parts. The great variety of car makes that were imported into the country has caused difficulty in their upkeep. Large amounts of foreign currency are yearly consumed by the importation of spare parts which are still not enough to keep the cars running. The need for standardization was greatly felt, especially during war times when importation restrictions had to be faced, resulting in the complete stoppage of large numbers of cars at a time when they were most needed.

(d) The Government eagerly wished to create industries that could offer opportunities for work to the maximum number of people. The well-known characteristic of the automotive industry, with the ancillary industries that it helps create, of requiring large numbers of labourers either directly or indirectly, was an appealing factor in favour of introducing this industry.

(e) There existed a number of military factories that had in time of peace a big production capacity that could be utilized for producing certain automotive components with little extra investment. In fact, making use of these available production capacities was the basis on which the project of automobile production started.

All these factors together have helped in the creation of the automotive industry in the UAR.

III. THE ESTABLISHMENT OF THE TRUCK AND BUS INDUSTRY

33. During the years 1956 and 1957 the first studies and contacts for the establishment of the truck and bus industry in the UAR were started. Sample trucks of different makes were brought into Egypt and tested under the severest local conditions. The exact performance of each truck was registered and analysed. A complete offer for the establishment of an automotive industry was submitted by Eastern Germany and Czechoslovakia combined, and was carefully studied by different committees. The offer included the production of

trucks and tractors and the establishment of a number of ancillary industries needed for that production. The offer was however finally discarded due to the very high investment it required.

34. As a result of these studies and tests it was finally decided in October 1957 to issue an international tender for the establishment of truck production. The truck to be produced was specified to have a payload of about five tons which was adequate at that time for use in Egypt. Furthermore it was requested that the truck factory should be able to produce trucks for civil use in a 4 x 2 execution and for military use with a 4 x 4 form for use under cross-country conditions.

35. The tender issued requested the submission of offers for the production of such a truck at a capacity of 3,500 trucks per year in two working shifts of fifteen working hours per day. The offer was to include the granting of the production licence as well as all the technical assistance needed for the establishment of the production locally. Additional optional offers for the assembly and part production of tractors, diesel engines and passenger cars were to be included if desired.

36. In November 1957 a technical committee was formed by the Ministry of Industry to visit all the automobile companies which expressed a wish to participate in the tender, so as to clarify and explain to them all aspects of the requested project.

37. The companies included Daimler Benz and Kloeckner-Humboldt-Deutz of the Federal Republic of Germany, Saurer of Austria, Fiat of Italy and Praga of Czechoslovakia. The closing date for the submission of the offers was the end of March 1958. Sample trucks were requested to be sent to Egypt and were thoroughly tested under all local conditions. Studies of the offers submitted and testing of the sample trucks continued for about ten months.

38. Finally, in November 1958, the result was announced, and it was Kloeckner-Humboldt-Deutz of the Federal Republic of Germany that was selected. The preliminary contract for the establishment of truck production was thus signed between that firm and the Organization for the Execution of the Five-Year Industrial Plan on 29 November 1958.

39. Further negotiations followed to work out the different articles of the final contract which was signed in Cairo in February 1959. Production of bus bodies

was added to the contract to be built on rear engine chassis having the same engine as the truck and with several other identical components.

40. The production capacity contracted for was:

2900 trucks 4 x 2 and 4 x 4 with a payload of six tons and 112 hp diesel engines,
600 buses of 65 passenger capacity and
500 extra diesel engines.

The contract foresaw an increase in that capacity to 6,000 trucks and buses per year.

41. It should be noted here that the truck selected had an air cooled diesel engine. It was debated at length whether this type of engine was suitable for the hot climate. Doubts were expressed in that respect, especially concerning the bus with the engine located in the rear as city buses are subjected to heavy traffic conditions and overloads. Thorough tests were therfore performed before signing the contract, the results of which left no reason for doubt; the engine proved quite successful and no trouble was encountered with cooling. This fact has been proven again and again through the millions of kilometres that the buses and trucks have run in the UAR since production was started.

42. This contract signed for the production of trucks and buses can be considered as the real birth certificate of the automotive industry in Egypt. Immediately afterwards the El Nasr Automotive Manufacturing Company was founded as a state company with a capital of eight million LE, and was entrusted with the execution of the project. In April 1960 the company started its activities.

43. The contract included the granting of the production licence and sales rights in the UAR and certain other Arab and African countries. It included further the extension of all know-how and technical assistance needed to build up the new automobile factory and for organizing the production, sales and after-sales service of the products. The contract included also the delivery of all production equipment and raw materials needed for the new factory, as well as all parts finished or semi-finished.

44. In July 1962, a supplementary contract was signed with the same firm for the production of an eight ton payload truck. The selected truck had the same air cooled engine as the original one but with a higher output (125 Din hp) The production capacity contracted for was 1,200 trucks per year in two shifts and included the production of both the 4 x 2 and 4 x 4 versions.

45. The total production capacity of trucks thus became 4,100 gear year. Production of both types - the six ton and eight ton payload - was to run simultaneously. The original equipment contracted for was to be modified and amended so as to allow the production of both types simultaneously.

IV. RESUME OF THE PLAN OF PRODUCTION FOR TRUCKS AND BUSES AS FORSEEN IN THE SIGNED CONTRACT

46. According to the plans stipulated in the contract for the production of truck and bus chassis, the production should start and proceed gradually in eight different stages of one year each until the maximum local production percentage was achieved. The contract was based on attaining local production of 47 per cent of the total value of the complete truck (as referred to the ex-factory price of the supplier) inside the automotive factories, produced with the equipment provided for in the contract. This percentage included the value of all parts to be produced inside the factory plus the added value of labour in the assembly painting and final testing.

47. About 46 per cent of the total value of the complete truck was to be produced by different local suppliers representing the ancillary industries. This percentage included tires, batteries, window panes, rubber parts, plastic parts, electrical accessories and other different parts foreseen to be produced by specialized local suppliers. It further inoluded the value of the semi-finished castings and forgings planned to be produced in a special independent forging plant and foundry which was to be built (and has now been completed).

48. It should be noted that according to the contract, the obligations of the supplier were limited to the guarantee of obtaining the 47 per cent production content within the new automobile factory with the equipment to be delivered within the scope of the contract. Though it remained further the obligation of the supplier to help develop the ancillary industries in order to achieve the 46 per cent local production entrusted to them, yet the supplier bore no guarantee for attaining this percentage. The main effort in exploiting the local ancillary industries remained as the major job of the automotive company together with the concerned industrial organizations.

The eight production stages

49. The three first stages (of one year each) included all assembly operations of the chassis, cab and main mechanical groups such as engine, axles and brakes. They included furthermore the production inside the factory of all small and relatively simple parts of the chassis either machined or pressed. These parts included fuel tanks, air tanks, mudguards, pipes, different standard parts, several links and tie rods. They also included several cab parts such as the wooden frame of doors, and other small parts, the cab itself being completely welded and painted locally. The production percentage to be achieved by the factory at the end of these three stages was about 18 per cent of the value of local production of the whole truck. If the percentage of the value of the parts which were to be purchased from different local suppliers were added to the total local production percentage it would be about 38 per cent.

50. The fourth and fifth stages (each of one year) were mainly restricted to the production of the engine. The fourth stage included the production of certain major parts of the engine such as cylinder, cylinder head and flywheel, while the fifth stage included the production of the rest of the engine parts. The two stages included the production of the front and rear axles and other heavier parts of the chassis and cab. The production percentage at the end of these stages was foreseen to be 30 per cent inside the factory and about 69 per cent together with the value of the locally purchased parts.

51. The sixth, seventh and eighth stages, which were later amalgamated into two stages of one year each, included the production of gear box, steering, propeller shaft and all heavy pressings of chassis and cab. By the production of these parts a total local production percentage of 47 per cent inside the factory and 93 per cent with the addition of local suppliers would be attained.

52. The plan foresaw the continuation of purchasing certain parts from foreign suppliers. These parts, estimated in value of about seven per cent of the truck value at the end of the project, included all highly specialized parts, the local production of which would either require special skill difficult to attain, or would be uneconomic. The parts included certain roller and ball bearings, valve seats, injection nozzles and measuring instruments.

53. Therefore, the project included the production of 47 per cent of the total truck value in seven years time, to which the time of starting the production

should be added. Parts for about 46 per cent in value were anticipated to be purchased from local suppliers.

54. The equipment needed for the automobile factory was to be supplied in six stages corresponding to the seven production stages. The equipment included the complete assembly equipment, the engine production shop, the gear shop, the heat treatment shop, the press shop, the general machine tool shop, the tool room and the general maintenance shop.

55. Furthermore the equipment included a complete bus body production shop with all its welding and painting facilities. The production of the bus body was planned to proceed in two stages of one year each. The production inside the factory was to achieve a percentage in value of 57 per cent of the total bus body value plus parts bearing a value of approximately 39 per cent were anticipated for local supply. The factory would have no forge or foundries of its own but would depend on existing local suppliers in that field.

56. Thus at the beginning of 1960, the El Nasr Automotive Manufacturing Company was founded and started the building of their new factories in a vast area allocated to the company in Wadi-Hof, 30 km south of Cairo. All plans for the production stages had been worked out and agreed upon with the contractor. A team of engineers and technicians were sent to the Federal Republic of Germany for training and the real work for establishing the automobile industry in the UAR was well on its way.

The execution of the truck and bus project

57. On 23 July 1960 the first assembly line for trucks was inaugurated in the new factory site in Wadi-Hof. The factory had already a built-up area of 8,000 m^2. The trucks were assembled out of CKD sets imported from the Federal Republic of Germany with a local content of about fifteen per cent which included tires, batteries, glass panes, paints and certain wooden and plastic parts.

58. Local production has continued to progress gradually attaining the production percentages shown in the following table:

Table 4

Local production rate of trucks and buses, 1960-1966

	Percentage of total value
Trucks:	
January 1960	15
January 1961	20
January 1962	25
January 1963	30
January 1964	32
January 1965	35
January 1966	38
Buses:	
January 1962	18
January 1963	25
January 1964	32
January 1965	40
January 1966	47

59. During January 1960 to July 1966 the three first planned production stages were achieved, as well as a good part of the fourth stage. Equipment having a value of about LE 1.9 million (equivalent to about 5 million US dollars) was received, erected and put into operation. Further equipment for the production of the bus body was received, having a value of about LE 180,000 (equivalent to about 0.48 million US dollars). The total local production percentage attained in the bus production is shown in table 4 above.

60. Comparing the actually attained figure with the planned one, it can be clearly seen that the execution of the project was delayed. The main reason for this delay, apart from the difficulties encountered with the local suppliers (which will be referred to later in the paper) was the lack of foreign currency needed for the purchase of the necessary equipment. Great difficulties and delays were faced in obtaining the required credit; this remained the main handicap preventing fulfilment of the plans.

61. A big step toward solving this problem was made in May 1965, when means were found to finance the puchase of a good portion of the remaining equipment by by long term credit. An agreement was reached with the contractor to buy certain standard machine tools from eastern European countries whose currencies were easier to obtain. Thus,means were made available to purchase most of the remaining necessary equipment, and for a sum of about LE 3.85 million (equivalent to about 10 million US dollars). Immediately thereafter the selection of the required equipment and its order followed. The delivery of this equipment started at the end of 1966 and upon receipt was immediately erected and put into operation. It was hoped that by the end of 1967 the fourth, fifth and part of the sixth stage would be finished, thus obtaining a local production percentage of about 34 per cent inside the factory.

62. Further efforts are being made to finalize the remaining stages. It was hoped that all the rest of the equipment would be ordered by the end of 1967 or during the first months of 1968. The project would thus be completely finished (from the point of view of planned production inside the factory) by the end of 1969. The actual period of execution would therefore be ten years from the date of the signed contract.

63. During these years (from 1960) production continued and the following number of trucks and buses were produced:

Table 5

Number of trucks and buses produced, 1959 - 1966

	Trucks		Buses	
	number	value LE	number	value LE
July 1959 - June 1960	273	918,450	114	592,800
July 1960 - June 1961	682	1,896,050	292	1,394,080
July 1961 - June 1962	694	1,897,189	521	2,681,420
July 1962 - June 1963	1,067	4,083,450	396	2,777,508
July 1963 - June 1964	1,328	5,139,346	536	3,707,686
July 1964 - June 1965	932	3,915,046	421	2,914,714
July 1965 - June 1966	986	3,786,921	281	1,970,250
July 1966 - Dec. 1966	412	1,666,745	80	542,300

64. Production attained its maximum during 1963/64 and then decreased in the following years. This was directly the result of the difficulties encountered in obtaining the foreign currency needed for the importation of parts. This difficulty was amplified by the delay in attaining the local production

percentages planned, thus failing to diminish the value of the required imported parts.

65. To overcome this difficulty the Company exerted every possible effort to accelerate the local production as previously explained. On the other side, efforts were also made to export the completed buses in order to use the revenue to cover the Company's needs. The Company actually succeeded in exporting the following buses:

Table 6

Buses exported, 1964-1967

	Buses		Country
	number	value LE	
1964/65	62	390,049	I r a k
1965/66	37	233,615	I r a k
1966/67	300	1,700,000	Kuweit a/

a/ This last order for 300 buses to Kuweit was concluded recently and is under execution at present.

66. It is hoped that through the increasing possibilities of exportation to Arab countries and the expected quick increase in local production, it will become possible to cover all the production needs of foreign currency and thus to increase the factory's production capacity.

V. PRODUCTION OF TRAILERS

67. Following the signing of the contract for the production of trucks and buses the need arose for a trailer that was fit for use with the trucks, the production of which had just started. The big economic advantage of trailers for transport made the production of such trailers the logical step to be taken following the production of trucks. This step was further encouraged by the similarity in the parts and production methods between the trailer and the truck.

68. Thus in March 1961 after having contacted a few trailer manufacturers, a contract was signed with a firm of the Federal Republic of Germany

(Blumhardt - Wupperthal) for the production of trailers in Egypt. The contract which was signed with the Five-Year Industrial Plan Organization concerned the licensed production of 1,000 trailers yearly of different types, having a payload of six, eight and twelve tons, in one shift. The execution of the contract was entrusted to the El Nasr Automotive Manufacturing Company, and was planned to run parallel with the production of trucks, making use of the available production capacity of the equipment included in the truck project. The investment required was thus minimized, improving greatly the economy of the project and affecting favourably the economy of the original truck project. A technical study was made directly after the contract to try to standardize some components and parts between the produced trucks and the selected trailers. The study did effectively lead to the adaptation of certain truck parts in the trailer such as the air reservoir and certain brake parts and rims, which simplified the production of the trailers.

69. In April 1962 the assembly of eight and twelve ton trailers was started locally. The progressive manufacture of trailer parts then followed, so that today practically all trailer parts are produced locally except for axles and turntables. The production of axles was scheduled to start at the end of 1967. The production of turntables, entrusted to a local supplier, is progressing successfully. Thus 100 per cent local production of these trailers is anticipated before July 1968. The company has recently started manufacturing agricultural trailers of four ton payloads to cover the needs in that important field.

70. The tutal number of trailers produced from the start in 1962 until the end of June 1967 was 626 with a value of LE 1,484,077.

VI. PRODUCTION OF PASSENGER CARS

The Ramses car

71. The first real attempt to produce a passenger car was made in 1958, when two young Egyptian engineers were granted permission by the Government to manufacture a small car. The first two prototypes were ready for test in July 1958. They were very similar to the small British car, Frisky, with an engine of 400 cm^3 capacity. They were assembled out of components imported from different makes and the body was made locally in fibre glass. The cars

were named Ramses, and the Ramses Car Manufacturing Company was established as a small private firm in July 1959. The cars were very simple in design, having no differential and no reverse gear. They were driven backwards by reversing the engine's rotating direction.

72. The various tests performed on the cars showed many defects, and basic modifications on the design had to be introduced. A differential gear and a reverse gear were introduced and the body was made of sheet metal. Most of the chassis parts were imported from NSU Motorenwerke A.G. of the Federal Republic of Germany; the rear engine, clutch, gearbox differential and rear axle being imported as one integrated unit. To encourage this project, the Five-Year Plan Organization made a contract with the firm to buy the first 100 cars to be produced in 1960, with modified specifications, at a price of LE 620 per car.

73. The cars were assembled locally with certain additions of locally manufactured parts. The sheet-metal body was produced manually in the workshops that the firm had built in Cairo (not far from the Guiza pyramids) and according to a local design that fitted well with the imported chassis.

74. Other versions of the car, such as a light pick-up and a convertible model, were also made. The local production percentage in the cars ranged about 40 per cent of the total car value. Among the parts included in local production were springs, cables, bumpers, seats, tires and batteries.

75. In December 1963 the company was nationalized and amalgamated with a factory producing bicycles and motor-cycles. The production of the small cars continued and new models were brought to the market. However the activities in that field remained on the small scale in which they were started and most of the work done was manual. These activities were partly affected by difficulties encountered in obtaining the foreign currency needed for importation of the required parts, and production thus dropped in the last two years.

76. The following table shows the production figures since the start in 1959:

Table 7

Number of Ramses cars produced,

1959 - 1967

	No. of cars
1959	12
1960	138
1961	158
1962	214
1963	415
1964	429
1965	448
1966	305
1967	92

77. The selling price of the Ramses car is at present LE 1,070 including LE 200 production tax.

Contract with Fiat

78. When the second five-year industrial plan was worked out in 1959, the question of producing a passenger car arose and was debated at length. The market requirements were estimated at about 7,000 cars per year, a number believed to be much too small to allow for economic production. However, due to several factors a decision was made in favour of the project. Thus it was included in the second five-year industrial plan which was officially announced at the end of 1959. The project assumed, as a basis, the production of a medium size car for four or five persons and with an engine capacity of 1 to 1,5 litres. The production capacity was determined to be 10,000 cars per year in two working shifts. Expansion possibilities to a production of 20,000 cars per year was foreseen in the project planning, as well as the assembly of a bigger car in limited quantities.

79. Based on this plan, studies and contacts were started in 1960 with a number of international car manufacturers. Several offers were received, but were found to be for assembly only and were therefore disqualified. Only three offers conformed with the project requirements; namely the offers submitted by Fiat of Italy, Renault of France and Borgward of The Federal Republic of Germany.

80. The three offers were thoroughly studied and at last a decision was made in favour of Fiat. A contract was signed on 30 March 1961 between the Five-Year Industrial Plan Organization and Fiat based on local production of 10,000 cars of the Model 1100 in two working shifts; local assembly of 2,000 cars of the Model 2300 and local assembly of 1,000 jeep Compagnola.

81. Again the execution of the contract was entrusted to the El Nasr Automotive Manufacturing Company which had just started production of trucks and buses. It was believed that executing all the automotive projects in one company would help reduce the overhead charges and improve the economy of the projects by making use of the equipment of one project in the other, thus reducing the total investment needed.

VII. RESUME OF THE PLAN OF PRODUCTION OF PASSENGER CARS

Stages of production

82. The contract with Fiat foresaw the establishment of local automobile production of the Model 1100 progressively in four independent stages. The first stage was the car assembly. This stage is in itself divided into several steps according to the form in which the car parts are delivered from abroad for assembly. In the first step which is called "Standard 2 assembly" the car body is completely welded and painted, while the mechanical groups are delivered in CKD condition. In the second step called "Standard 4 assembly" the body is knocked down into a number of main parts while in the third and last step, "Standard 6", the body is completely knocked down, and is completely welded and painted locally.

83. The second stage was engine production; the third, production of the different mechanical groups including gearbox, transmission and suspension; and the fourth stage, the production of the body. This last stage, which requires very high investment in presses and dies, was considered as an optional stage, the execution of which should be decided later according to the way the project progressed and according to the economic study to be made in that respect.

84. It was estimated that at the end of the four stages, the total value of the locally produced parts together with the added value in assembly

would amount in 88.5 per cent of the total car value. This included the value of the parts to be purchased from the local ancillary industry.

85. No fixed time for the execution of every stage was defined, but was left for the mutual decision of both partners according to progress of the work.

86. According to the contract, Fiat was to grant to the Egyptian partner the production licence and the complete documented details needed for starting local production. Fiat had also the obligation to assist the Egyptian partner in purchasing all the necessary equipment as defined by Fiat who bore the guarantee for their suitability and sufficience to achieve the agreed upon production capacity.

87. Fiat had also the obligation to relate to the Egyptian partner all modifications introduced in the selected model all through the period of the contract, as well as to supply all components and parts finished or semi-finished according to the needs of production. Fiat was also to assist in organizing the production, inspection, sales and after-sale service of the products of the contract.

The execution of the passenger car project

(i) Sales and prices

88. A few months after signing the contract, the Fiat Model 1300 appeared on the international market. It was decided to select this model as the basis of the contract in place of the 1100 Model originally selected. However, as sale of the Model 1100 was already announced, and about 7,000 cars had been sold in the few weeks following this announcement, it was decided to start with the assembly of this model to cover these sales, and simultaneously start the assembly of the new 1300 Model.

89. It might be interesting at this point to refer to the big rush encountered in the sale of the 1100 car, as soon as its availability was announced. This can be easily explained by the very favourable selling price of LE 736 at the time when any other car on the market had a price of at least LE 900. In less than two weeks, more than 7,000 cars were sold, with one-third of the price paid for each car as an advance payment. This fact, which under normal conditions would have been very pleasing, threw a big obligation on the company which had only limited amounts of foreign currency for the importation of

parts necessary to cope with this demand. Delivery times of two to four years resulted.

90. The same happened again when the 1300 Model was launched and its sales began. The selling price was LE 934, a price relatively low and very appealing.

91. It might be argued here that the prices should have been fixed at a higher rate to conform more with the prevailing market prices and to limit the consumption. It should however be understood that it was one of the aims of the Government to make available a car at a reasonably fair price. The prices therefore, as fixed by the Ministry of Industry, aimed to fulfill this target more than to ensure high profits to the producing company. The persistence of high demand and the difficulty of increasing production at a time when most of the parts required for production were still imported, formed a heavy load on the foreign currency requirement. This was the reason for increasing prices in 1963 to LE 837 for the 1100 Model and to LE 1,035 for the 1300 Model. In 1965 the prices were increased again to LE 1,000 for the 1100 and to LE 1,300 for the 1300. Later in 1965 the Government placed a production tax on the cars locally produced, and so the selling prices were increased to LE 1,200 for the 1100 and to LE 1,700 for the 1300. This represents the price at present.

92. To overcome the difficulty of obtaining the required foreign currency and to ensure the continuation of production which suffered permanently from the limited amounts of currency allocated to the project (and even stopped production completely for a time), the company had to find its own means for obtaining foreign currency. The solution was found when the possbility of selling cars to be paid in foreign currency was examined and proved quite successful. The cars thus sold were delivered in Egypt at a price which included all customs and taxes. Due to the high custom tariff on imported cars, which amounts to about 280 per cent of the car value, this way offers a very appealing solution and a better alternative to Egyptians abroad than bringing back a car for which they will have to pay such a high custom tariff. It should be noted that parts imported in CKD condition are subject to customs of only about 30 per cent of the imported parts value. This solution succeeded in bringing the company an income of foreign currency which attained a value of about 800,000 pounds sterling in about one year's time.

(ii) Production development

"Standard 2 assembly"

93. The equipment necessary for starting the assembly according to "Standard 2 assembly" were delivered and erected in the beginning of 1962. The assembly of the two Models, 1100 and 1300, started in June 1962. Later in October 1962 the assembly of the 2300 Model was started and in July 1963, the jeep.

94. The assembly in that form proved to be uneconomic and impractical. The packing and shipping charges were very high, so that the saving in the assembly costs were overbalanced by these extra costs, and the result was a higher car price. The bodies were delivered and welded and painted and as they were subjected to shocks and bumps during transport, it was found that they often required a lot of repair work and paint on arrival. This expense added to the car cost and made this form of assembly impractical. This stage was therefore considered a transition period for training workers before the assembly started.

"Standard 4 assembly"

95. This stage was started in January 1964 after all the equipment necessary was received and erected. Certain difficulties were met in obtaining paints and chemicals needed which caused a delay in starting this stage, planned originally to start in July 1963.

96. Both Models, 1100 and 1300, were assembled on the same mechanical line, whereas the 2300 Model and the jeeps had independent assembly lines. After a certain time of training an assembly rate of 22 cars per day in one shift was easily achieved.

97. During this stage all parts were imported except tires, batteries, glass, exhaust mufflers, signs and emblems, seats and trimming materials, paints and oils. Together with the assembly work the local production percentage can be estimated at about 25 per cent of the total car value.

"Standard 6 assembly"

98. The execution of this stage was postponed to a later time, giving priority to the engine production.

Engine production

99. Due to the fact that the 1300 Model was replaced by Fiat by the 1500 Model, it was decided to produce the engine of this last model. This was more favoured due to the many uses of the 1500 engine, as it is a suitable engine for micro-buses, delivery vans and light trucks. In August 1964 a technical delegation was sent to Fiat to complete studies of that stage, and order the required equipment. The equipment was ordered from various western and eastern European countries and attained a value of about LE 960,000. A big part of the special tooling was ordered from Fiat

100. The delivery of the equipment started at the beginning of 1967 and construction work started immediately thereafter. Production trials were to start at the end of 1967. The production inside the factory was to include the machining of most of the engine parts. The semi-finished castings and forgings would be purchased from local suppliers who were already well on their way with their production. The accessories, such as the electrical components, fuel system components etc. would be imported until locally supplied.

(iii) Future prospects

101. The two remaining stages of this project are being postponed at this time. This has been decided, so as to give time for all stages just started, either in the production of the 1500 engine or in the truck and bus project, to be completed and all difficulties successfully conquered.

102. The 1500 engine that will be produced locally will be used in the assembly of the 1500 cars, as well as for other applications that are under study.

(iv) Number of cars produced

103. The following table gives the number and value of cars produced locally from the beginning of production until the end of 1966:

Table 8

Number of Fiat cars produced, 1962 - 1966

	Number	Value in LE
1962/63	3,796	3,446,548
1963/64	4,527	4,468,984
1964/65	4.004	3,680,590
1965/66	1,615	2,272,380
July-Dec. 1966	46	87,715
Total	13,988	13,956,217

VIII. PRODUCTION OF TRACTORS

Development of contract with Yugoslavia

104. To cover the increasing demands for tractors on projects of agriculture, land reform and soil reclamation, the project of production of tractors was included in the second five-year industrial plan. Thorough investigations made by competent experts in the Ministries of Agriculture and Agrarian Reform showed that the tractor which is most needed should have a power of about 50 hp and should be of the wheel type. The yearly requirements were estimated to be about 1,500 tractors, with the prospect of being doubled within the coming ten years, particularly after the termination of the Aswan High Dam project.

105. In the beginning of 1960, contacts and studies started with several tractor manufacturers. Sample tractors were imported and tests were made to determine their suitability under the specific local conditions of agriculture. Different offers were also received and studied, among which an offer for the production of the Yugoslav tractor, Zadrugar 50, was included. This offer was found quite favourable and the tractor itself proved satisfactory when tested. Thus in January 1961, and as an annex to the agreement for technical and economic aid signed between the Five-Year Industrial Plan Organization and the Republic of Yugoslavia, the preliminary contract for the production of tractors in the UAR was signed. The agreement was based on the yearly production of 3,000 tractors and 3,000 additional diesel engines for industrial and automotive use, in two working shifts.

106. The tractor selected was originally produced in Yugoslavia under the license of the Italian firm, Landini, and is basically the Massey Fergusson tractor with the Perkins engine as produced in Italy. The engine is a four cylinder water cooled diesel engine of 50 hp and one of a series produced in three four and six cylinders covering a range between 35 and 85 hp. The license obtained covers the tractor and the complete engine series.

107. The final contract was signed in July 1961 and its execution was entrusted to the El Nasr Automotive Manufacturing Company, so as to have all the automotive projects executed in one place. This was believed best to improve the economy and reduce costs and overhead in the execution of the projects. It did, however, throw a tremendous load on the management of this company and

necessitated the complete reorganization of the company and the replanning of its layout. The capital of the company was increased to LE 14.5 million, paid entirely by the Government.

108. The contract is basically very similar to the two previous contracts signed with Kloeckner-Humboldt-Deutz and Fiat. It foresaw the production of the tractor in five successive production stages starting with the assembly of the tractor and engines and the production of certain small parts. In the following stages the engine would then be produced, while the fifth and last stage was reserved for the production of the gearbox, steering and transmission parts.

109. At the end of the stages the local production percentage was estimated to achieve a value of 46.5 per cent of the total tractor value. It was further anticipated to obtain from local suppliers parts with a value of about 43 per cent, so that the total local production percentage would achieve 89.5 per cent of the total tractor value.

110. The time required for execution was to be harmonized with the other projects and was expected to run more or less parallel to the stages of the truck and bus projects.

Development of production

111. The assembly of the tractors started in April 1962 and that of engines in July 1963. The second production stage, including the production of several small parts and light pressings, was started in February 1967, while the equipment for the third stage was ordered and was expected to start production at the end of 1967.

112. The execution of the project was subjected to big delays. The main reasons for these delays were certain objections that the competent authorities in the Ministry of Agrarian Reform (being the main consumer) presented with regard to the performance of the tractor in the actual local applications. Time consuming investigations and new tests on the tractor were performed and have finally led to the introduction of a number of modifications to make it more suitable for local use. Due to the hard soil in Egypt, the tractor weight had to be increased and extra weight was added to the rear and front axles in order to improve its cultivating abilities. Production was changed over to the new modified tractor and it is hoped progress, so far delayed, will be resumed in completing the rest of the stages.

113. The local production percentage already achieved in the tractor is about 25 per cent of the total tractor value inside the factory. To this percentage about nine per cent should be added representing the value of parts purchased from local suppliers, including the front tires, exhaust mufflers, extra weights and batteries. The number and value of tractors and engines produced locally were as follows:

Table 9

Locally produced tractors and engines, 1962-1966

	Tractors		Engines	
	number	value	number	value
1962/63	605	822,800	773	466,334
1963/64	866	1,177,760	871	540,161
1964/65	286	388,960	-	-
1965/66	1,016	1,381,760	791	540,121
Jan.-July66	571	771,331	935	808,341
Total	3.344	4,542,591	3,370	2,354,957

IX. EL NASR AUTOMOTIVE MANUFACTURING COMPANY

114. The contract for the production of tractors represents the last contract signed in the line of automotive products. As mentioned, the execution of all these contracts was entrusted to the El Nasr Automotive Manufacturing Company. Some relevant data of the Company are:

Invested capital	LE 14.5 million;
Fixed assets	LE 10 million (including equipment LE 4.6 million, constructions and service networks LE 3 million);
Built-up factory area in 1967	239,350 m^2;
Total built up factory area (final stage)	260,000 m^2;
Total area of factory premises	1,260,000 m^2;
Personnel in 1967	4,825;
Total personnel (final stage)	10,000;
Salaries and allowances in 1967	LE 1.3 million;
Company dealers in Egypt in 1967	21.

115. During its development stages, the Company faced many difficulties that caused repeated delays in the execution of the projects. A brief summary of these difficulties and their reasons is given in the following chapter.

X. DIFFICULTIES ENCOUNTERED IN THE DEVELOPMENT OF THE AUTOMOTIVE INDUSTRY

Diversity of the projects

116. When the Company was founded in 1960, the only project at hand was the production of trucks and buses. All the Company's plans were based on that project alone and factory buildings were started according to this project's needs. However, in 1961 and within a period of three months the Company signed contracts to execute three more projects, i.e. trailers, passenger cars and tractors, the volume of which was in no way smaller than the original one.

117. Thus the Company had to be completely reorganized, and all its plans and layouts had to be revised and readjusted. The fact that the same management had to face four different partners of three different nationalities and co-ordinate them, added to the magnitude of difficulties encountered. Different systems had to be standardized, such as, the product numbering system, which presented difficult problems to solve.

118. Moreover, the production lines were already started in 1960. This added to the tremendous load the Company faced, as the efforts had to be distributed between planning, building the factories, negotiating new contracts and orders for equipment, training the required personnel, producing and organizing sales and service - all simultaneously.

Lack of foreign exchange

119. The most important single factor retarding production and progress of the projects has been and is still the lack of adequate foreign exchange for capital equipment and such raw materials and parts as are needed for production. Difficulties in obtaining import licences for raw materials and parts caused delays and made it difficult to plan in advance. Production continuously suffered from interruptions and stoppages. The Company had always to decide between using foreign exchange quotas allocated to it for the continuation

of the production lines to cover the urgent needs of the market, or buying the necessary capital investment to ensure the planned progress in the project stages. Decisions in favour of production continuation had often to be taken to avoid stoppages and meet urgent needs, thus causing further delays in obtaining the equipment necessary for the execution of the projects. This, in itself, increased the foreign exchange requirements for parts and raw materials due to the delayed local production of parts, and caused indirectly a continuing drain on foreign exchange.

120. This situation has been solved recently and a decision to give full priority to completing the truck and bus project, as well as certain stages of the other projects, has been taken. Ways to obtain foreign currency to cover production needs were also found by the company itself as has been previously discussed.

Lack of skilled personnel

121. The problem of finding the required skilled personnel represented also one of the difficulties that handicapped the Company's progress. The rapid expansion of the Company and the different projects that were started at the same time, required large numbers of skilled personnel to cope with all the functions entailed in such a big venture. Such high skills as were requested were practically unavailable, expecially considering that the automotive industry was still in its pioneering stages in the UAR. Training was the only solution, and the Company put great effort in organizing training courses in different fields. Several engineers and technicians were sent for training abroad in the contractors' factories. A number of experts were also delegated from the contractors for short periods to assist in starting production in the different stages.

122. The lack of skill was mostly felt in the production planning, tool design and processing and in the stores. The large number of parts that were produced locally or imported, and which had to be moved properly so as to reach the assembly lines at the proper time, required high skill in planning. This represented one of the major difficluties and caused frequent production stoppages. The number of different items in the stores are at present about 120,000, a figure that indicates the magnitude of the problem.

123. To face this problem and solve it properly the Company has recently introduced electronic data processing machines and is now contracting for a

computer. Some of the major operations, such as stock control and supply orders, are already conducted on these machines.

Lack of ancillary industries

124. All the contracts have foreseen the supply of a large variety of parts from local ancillary industries, the value of these parts being anticipated to be about 43 to 46 per cent of the total product value at the end of the various production stages. These parts included the castings and forgings needed for machining in the automotive factory where no forge or foundry was planned. Thus the share of the ancillary industries was by no means less than that of the automotive factory; in fact it was even bigger. The importance of this share became even more drastic, as most of the fast moving parts needed as spare parts, were in this share. Examples of such parts are pistons and rings, electrical accessories, bearing shells and rubber and plastic parts.

125. In 1961, when the automotive industry actually started, there were hardly any automotive ancillary industries, with the exception of a tire factory in Alexandria and several battery factories. Certain other items such as plastic parts, straight glass and exhaust mufflers were produced irregularly and without adhering to any specifications.

126. The task that the company had to face therefore was a very heavy one. New suppliers had to be created and the existing ones had to be trained to stick to exact specifications and delivery schedules. Existing capacities had to be exploited and new production skills developed.

127. A special permanent committee was formed with representaives from the company, the Five-Year Industrial Plan Organization and the military factories to deal with these tasks. The company itself formed a special technical department which was only responsible for the purchase of locally produced parts.

128. Due to enormous and persistent efforts the company succeeded in obtaining a large number of parts from local suppliers. The total number of parts obtained was 1,907 different items, representing 10 to 25 per cent of the total value of each product. These items were supplied by 144 different suppliers, either government companies or private enterprises.

129. Among the items successfully produced locally today are:

(a) From metal and engineering industries - casting (ferrous and non-ferrous), forgings, leaf springs, cables, exhaust mufflers, bolts and nuts, special standard parts, various pressings, emblems, wooden parts, spark plugs, horns, air and oil filters, gaskets and brake linings;

(b) From chemical industries - different paints and chemicals needed for for painting, rubber parts, plastic parts, tires and glass;

(c) From textile industries - all material required for the upholstery and trim;

(d) From petroleum industries - oils and lubricants and thinners.

130. Several new projects for producing certain automotive parts have also been established, mostly in the military factories, and are expected to be in production soon. Among these projects are the production of pistons, gudgeon pins and rings (expected to start in December 1967); production of clutches under license of Fichtel and Sachs of the Federal Republic of Germany; ball and roller bearings under licence of FAG of the Federal Republic of Germany; radiators, helical springs, pressure die casted aluminium parts, valves and bearing wheels.

131. However, it must be noted that the relatively small volume of production represents a serious handicap towards the establishment of new ancillary industries. The majority of such industries are based strictly on large-scale production and would be completely uneconomic if produced on the limited scale on which the automotive industry in the UAR is based. This difficulty is also confronted with some of the existing ancillary industries and causes the price of the products to be very high. It throws an extra burden on the automotive factory and greatly increases the price of the completed local product.

Continuous modifications in parts and models

132. One of the main characteristics of the automotive industry is the continuous improvement and modification introduced in the design and specifications of the different car parts. This is much more the case in passenger car production, where the car model itself is completely changed once every one or two years.

133. These continuous changes proved to be a serious difficulty which hampered the progress of work in the different stages, especially in those stages where

parts of a certain group were produced locally, whereas others were imported from the original supplier. There was then no alternative but to follow the original manufacturer's modifications, so that the different parts would fit together. This would often require major modifications in the tooling which would result in great extra expense, especially in relatively small production volume. This difficulty will be partly overcome when it becomes possible to produce the whole group locally, thus making it possible to freeze a group of parts (except for slight modifications which do not require major changes in the equipment) until the tooling is economically depreciated.

XI. CONCLUSION

134. From this survey it can be concluded that the automotive industry has been firmly founded in the UAR. Though this young industry is still facing some difficulties it can be said that most of the early problems have been overcome.

135. It might be true that the targets set were too ambitious. Yet the practical and actual experience received so far should make it possible to attain the majority of the aims set.

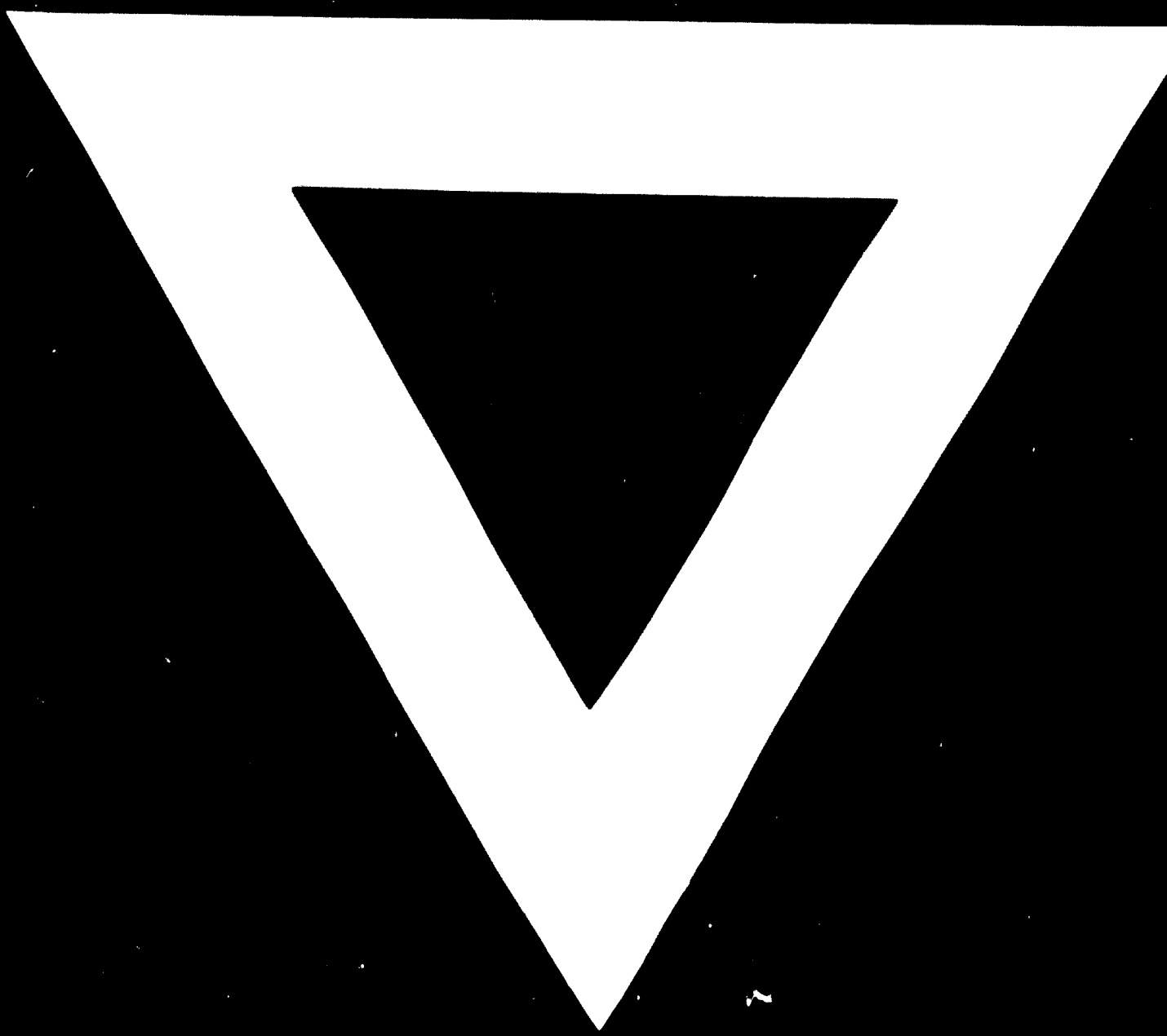
136. In light of the present situation, it can be expected that local production of trucks and buses will achieve its final stages within the next two years. A local production percentage of at least 75 per cent of the total value of the vehicles should be then attained. Within the same period, trailers are also expected to be locally produced in their entirety. The production of these trucks, buses and trailers shall be enough to cover all local needs, as well as a good percentage of the needs of the neighbouring Arab countries.

137. Production of tractors for agriculture as well as industrial diesel engines shall closely follow the production of trucks and buses. Making use of the available capacity in the truck and bus factory, as well as of available capacities in existing military factories, it is believed that it will be possible to achieve a minimum percentage of about 70 per cent of the total value of the tractor, in local production within the next two years with a minimum new investment. The production of the rear tires, which has recently started in the tire factory at Alexandria, will also help to increase this percentage.

138. As for passenger cars, it is expected that production in the next few years will be concentrated on the Fiat 1500 engine and the assembly of a car model where this engine can be fitted. Any further production of the mechanical groups or body is, for the time being, quite improbable.

139. On the other hand there is a strong tendency to assemble microbuses and delivery vans locally. The types to be selected will allow the use of the 1500 engine, production of which is about to start. It should be also possible, without difficulties or extra investment, to produce their bodies locally.

140. Thus the Egyptian automotive industry will continue to flourish and will represent soon, one of the main industries in the UAR.



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