

A NOTE ON THE INDIAN
MOTOR VEHICLE INDUSTRY

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1. Introduction

The Indian motor vehicle industry has developed capabilities to produce a wide variety of motor vehicles, ranging from single seater mopeds to 24 tonne heavy duty trucks - in factories located across the length and breadth of the country. There were manufacturers in the public, joint and private sectors, with varying scales of operations. Several new manufacturers also intended to enter the industry, with either their own or foreign technologies.

The motor vehicle manufacturers and prospective entrants were looking forward to the release of the document outlining the Government of India's strategy for the motor vehicle industry for the next five to ten years. Aspects like the objectives which the industry should serve, the desired vehicle mix, the priorities for these objectives, the policy initiatives and the support programmes for facilitating the achievement of these objectives had to be decided by the Government of India.

The motor vehicle population had gone up nearly three fold over the last 10 years, the per capita ownership having gone up 2.3 fold. Exhibit 1 gives category wise details of vehicle population between 1979 and 1988.

2. History of the Industry

The birth of the motor vehicle industry as we know it can be traced back to 1862 when a Frenchman M. Renoir built the first contraption that would be recognised today as a car, propelled by a gas spark-ignition engine. Towards the end of the 19th century, there were a series of independent inventions in countries ranging from Italy to the United States. The best known of these inventors are probably the German, Gottlieb Daimler, founder of the Daimler-Benz group, who produced a petrol-driven car and the American, Henry Ford, who is widely credited with the principle of mass production which laid the foundations of today's motor vehicle industry.

The first car to be driven on Indian roads arrived in 1898 on a ship from England at Bombay's Victoria Docks. It was not until 30 years later, in 1928 that Indian produced cars and trucks were rolled out, assembled from completely knocked down (CKD) parts by General Motors India (GMI) in Bombay. Ford Motor Company of India set up assembly plants shortly afterwards in Madras (1930), Bombay (1931) and Calcutta (1931). Another CKD car and truck assembly plant was set up in 1936 in Madras by Addison and Company. By 1938, combined installed capacity of the Indian motor vehicle industry was 96,000 units per annum. The first Indian-owned motor vehicle plant started operations in 1947 when Premier Automobiles Limited (PAL) under the management of Aero-Auto brought out Dodge, De-Soto and Fargo trucks and buses. Hindustan Motors Limited (HML) managed by Birla Brothers started assembly from CKD packs of Studebaker trucks and buses soon after.

In 1952, The Indian Ministry of Commerce and Industry assigned the Tariff Commission the role of studying the grant of protection or assistance to encourage the motor vehicle industry. The Tariff Commission produced its report a year later. Its principal recommendation was that firms without a phased manufacturing programme (PMF) should be asked to cease operations. The immediate effect of the Tariff Commission report was that the foreign owned companies wound up their operations in India, saying that the small size of the Indian market would make it unprofitable to manufacture vehicles locally. The number of automobile manufacturers was reduced to five from the previous figure of twelve. The tariff commission report also suggested that Government give priority to commercial vehicles such as trucks and buses over personalised modes of transport.

3. Profile of Manufacturers

3.1 Manufacturers of Cars

Premier Automobiles Ltd. (PAL): This company which belongs to the Walchand Group of industries started producing an Indian version of the Fiat 1100 at their Kurla factory near Bombay in 1947. PAL has continued with the same basic model, albeit with slight changes in styling and engineering over the years, which is now marketed as the Premier Fadmini. PAL also started production of a 1966 model Fiat, but powered by a Nissan engine in 1986, calling it the Premier NE 118. PAL has a 23 % share of the car market now. Though Premier had intended to offer a full range of four wheelers in the beginning, it concentrated on cars in the later years.

Hindustan Motors Ltd. (HML): HML which is part of the business house of Birlas started producing a version of the British Motor Corporations' Morris Oxford in 1949 and called it the Hindustan 10. HML initially set up the plant at Port Okha, Gujarat but moved to Uttarpara in West Bengal. The Hindustan 10 was succeeded

by the Hindustan 14, Landmaster, Ambassador, Ambassador Mark II, Ambassador Mark III, and Ambassador Mark IV in that order. HML's Uttarpara plant still produces the Ambassador Mark IV which is not substantially different from the earliest Hindustan 10. In 1984, HML started making a luxury car called the Contessa in collaboration with a British company, Vauxhall but using an Ambassador engine. In 1986 this was replaced by an engine produced in collaboration with Isuzu company of Japan. It now has 17% of the car market. The company brought out an improved version of the 50 year old Ambassador in October 1990 which is called Nova. There are also plans to produce cars with fuel efficient 1500cc engines from 1991/92 onwards. In addition to cars, the company is producing earth moving equipment.

Standard Motor Products of India Ltd. (SMPIL): This company started car production with the assembly of the Standard Vanguard Car at their Madras factory in 1952 in collaboration with Standard Motor Company Ltd of U.K. The first manufactured product was the Standard 8 in 1954 and then the Standard 10 in 1955. The Standard Herald was then produced, followed by the Gazel. SMPIL's car assembly came to a virtual halt in 1985. The Standard range of cars were priced lower than the competing Premier and Hindustan products. In 1986, it started again with production of the Standard 2000, billed as India's first luxury car, which was built in collaboration with Rover of UK. This was a very high priced car. This car was not a success. At present, talks are going on between the management, unions and the Board of Industrial and Financial Reconstruction (BIFR) regarding the future of the company. Bajaj Tempo Ltd. is reported to have shown interest in taking over the company.

Maruti Udyog Ltd. (MUL): MUL started its production in 1983, at its factory located at Gurgaon, near New Delhi. Originally set up by Mr. Sanjay Gandhi as a private venture in the mid-70's under the name Maruti Ltd., it had not produced a single car for sale till the time of his death in 1980. The company was nationalised in 1981, and a joint venture was established with Suzuki Motor Company, Japan in 1982. Suzuki motor company held 26% of the market share. Indian versions of the Suzuki Alto are produced as the Maruti Standard and the Maruti Deluxe. Suzuki's High-Roof Van which is used as a commercial run-around in Japan is positioned here as a 'roomy' car and called the Omni. It had 60% of the Indian car market in 1988, up from 0% just 6 years before. The Maruti is a 800cc car which was priced lower than the available brands. An Indian version of the 1000cc Suzuki Esteem is expected to be produced from 1990.

Sunrise Automobiles of India Ltd. (SAIL): This company, based in Bangalore, started with a three wheeler car called the Badal in association with a British company, Reliant, in 1976. The Badal was rejected by the market and the company's efforts to position it as an alternative to the three-wheeler autorickshaw did not succeed. Their latest product is the diesel engined Montana, for which the company claims extremely low operating costs, similar to that of motorcycles.

3.2 Manufacturers of Jeeps

Mahindra & Mahindra (M&M): This company started production of the jeep in collaboration with the U.S. company, Kaiser Jeep Corporation (formerly called Willys Motor Inc.). M&M's best known product is its 4-wheel drive jeep truck. It also produces the Jeep Station Wagons. It has about 85 % share of the jeep market. M&M's products are made in plants located in Maharashtra.

M&M receives some minor competition from HML's jeep called Trekker. There are two new entrants into the jeep market. One is Bajaj Tempo Ltd. (BTL) which makes the Trax and the other is Maruti which makes an Indian version of Suzuki's Samurai Jeep called the Maruti Gypsy which now has about 13% market share.

3.3 Manufacturers of Commercial Vehicles

This catch all category covers both bus and truck manufacturers as they produce vehicles that are primarily designed for commercial purposes. Commercial Vehicles (CV's) are themselves classified into Light Commercial Vehicles (LCV's - payload less than 3 tonnes), Medium Commercial Vehicles (MCV's - Payload between 3-7.5 tonnes) and Heavy Commercial Vehicles (HCV's - payload greater than 7.5 tonnes). PAL started production of Dodge and Fargo trucks, and buses in collaboration with Chrysler Corporation of the U.S.A. in the medium duty vehicles range. PAL's share of the commercial vehicle market showed a declining trend and it finally stopped its production in 1985.

Tata Engineering and Locomotive Company (TELCO): This company belonging to the Tata group started production of India's first diesel engine trucks and buses in collaboration with Daimler Benz of West Germany (the world's largest truck producer) in 1954 at Jamshedpur in Bihar. TELCO later set up another vehicle plant at Pune. TELCO now dominates the MHCV market and entered the LCV market in 1984. Telco has a 76 % market share in the truck market while it has a 55 % share in the bus market. It has also got 22.5 % of the LCV market. The LCV was developed by TELCO on its own without a foreign collaborator. In addition, it has diversified into off the road applications and developed capabilities to build its own machine tools.

Ashok Leyland (AL): This was a joint venture promoted by a British Company, Leyland Motors in collaboration with Madras based Ashok Motors in 1954. Ashok Leyland started a phased manufacturing programme in 1956, which primarily produced diesel engined, heavy commercial vehicles. Ashok Leyland is the number two company in the Indian commercial vehicle industry. In 1987, Rover Group (formerly British Leyland) sold its interests in Ashok Leyland to the Hinduja group and IVECO, the second largest commercial vehicle manufacturer in Europe. AL has now got 44 % of the bus market and 22 % of the truck market. It has its units in Ennore, Bhandara, Hosur and Alwar. The company has entered into a collaboration with a Japanese company, Izuzu, for

producing fuel efficient engines.

The other company to start CV production in 1954-55 was HML in collaboration with Bedford Motor Company of Britain. HML is now producing HCV's in collaboration with Izuzu of Japan. But it has a very small share of the commercial vehicle market (less than 2%) at present. SMPIL in collaboration with Standard Motors of Coventry, UK also produces an LCV, the Standard 20 and has about 4% of the market.

Bajaj Tempo Ltd. (BTL): This company, belonging to the Pune based Firodia group, has been producing LCV's under license from a German company, Vidal and Sohn Tempo Work since 1959. This is a three wheeled vehicle called the Hanseat. The company also produces an LCV for passenger transport called the Matador Bajaj Tempo entered into a collaboration with Daimler Benz in 1984 for LCV production and now manufactures mini-buses under this agreement.

New Entrants: In the early eighties four new companies entered the LCV market in collaboration with leading Japanese companies. These were Eicher Mitsubishi, Allwyn Nissan, DCM Toyota and Swaraj Mazda. None of these companies has been able to capture a significant share of the market, with market shares ranging from 5% for Allwyn Nissan, (now Mahindra Nissan) to 10% for Eicher Mitsubishi. While technically, they are good products the relatively large level of Japanese content in them has caused their prices to keep being hiked regularly as the Indian rupee has been in free fall against the Japanese Yen. Allwyn Nissan was later taken over by M & M and is now called Mahindra Nissan. It was originally in the public sector, but the Andhra Pradesh government decided to divest itself of its holdings in 1988. Its plant is at Zahirabad in A.P and started production in 1985. Swaraj Mazda's plant, located at Asron in Hoshiarpur district in Punjab, started production in 1985. DCM Toyota, owned by the Shri Ram group started producing LCV's in 1985 at Surajpur, near Ghaziabad in U.P. Eicher Mitsubishi which is in the joint sector started production of their LCV line in 1986 at Pithampur in Madhya Pradesh.

Ministry of Defence: Apart from these commercial vehicles, the Ministry of Defence produces two types of vehicles in defence factories. One is the Shaktiman truck built in collaboration with M.A.N of West Germany since 1958 and the other is called Jonga (one-tonne trucks and jeeps) and has been built in collaboration with Nissan of Japan since 1961. The production of these vehicles was started at ordnance factories principally on the initiative of a former Raksha Mantri, Mr. Krishna Menon who said private manufacturers were overcharging the defence services. The decision to set up such production lines went against the recommendations of the Tariff Commission report.

3.4 Manufacturers of Scooters

Automobile Products of India Ltd. (APIL): The first Indian scooters were made by APIL in Bombay in 1955, in collaboration with an Italian company, Innocenti after APIL's plan to make cars in association with the British company, Hillman did not materialise. It was the leading brand for many years and at one time, Lambretta, the model it produced, was almost synonymous with the word scooter. But the rise of other scooter companies saw a decline in demand for its products and now this privately owned company has totally stopped scooter production and makes only three wheelers at present.

Bajaj Auto Ltd. (BAL): This is the largest scooter manufacturer in India, with plants at Pune and Waluj in Maharashtra. Bajaj was set up in 1960 with collaboration from the Italian company, Piaggio and now has 55% of the market. BAL is also the largest of the three wheeler producers in India with 81% share in the market. BAL is involved in a joint venture operation with the Government of Maharashtra called Maharashtra Scooters Limited (MSL) for producing scooters at Satara in Maharashtra. BAL is also responsible for the distribution of MSL's products which have 14% share of the market.

LML Ltd.: This is a Kanpur based company belonging to the Lohia group that has captured a sizable market share (21%) within the past few years. LML also collaborated with Piaggio and started production in 1983.

Scooters India Ltd. (SIL): This company was set up at Lucknow in Uttar Pradesh in the public sector in 1972 and production started in 1975. The objective was to attempt to fulfill the large demand for scooters in the last decade. This was the first attempt by the Government of India to enter the automobile sector. (In fact, a strategy for every major state to have its own scooter production plant was also mooted.) Innocenti Lambretta was the foreign collaborator. This was not a commercial success. This company makes negligible number of scooters. Their three wheelers - branded as Vikram - have been successful as public transportation in many of the cities in North India. Since SIL was making huge losses, it was being considered as a candidate for de-nationalization and BAL was reported to have shown interest in taking over the company. The Government of India has since decided to continue to run it in the nationalized sector.

Gujarat Narmada Automobiles Ltd. (GNAL): This is the only state government owned scooter manufacturer at present. It was started as Girnar Scooters Ltd. in 1971 which was promoted by the Gujarat Small Scale Industries Corporation and made scooters for a number of years without achieving much success. It was taken over by Gujarat Narmada Fertiliser Corporation and relaunched as GNAL in 1987. GNAL now has about 5% of the scooter market.

Kinetic Honda Motor Ltd. (KHML): This company, belonging to the

Enfield India Ltd. (EIL): This company has been producing motorcycles built in collaboration with a British motorcycle manufacturer, Enfield since the 1950's at Madras under the brand name Bullet. After the entry of the Japanese bikes, it has lost considerable market share (current figure: 6%) and is now making plans to improve its sales performance. They propose to introduce India's most powerful motorcycle soon with an engine capacity of 500 c.c. They had signed an agreement with Zundapp Werke of West Germany to make a range of two wheelers. Enfield is also producing an innovative 22 c.c. vehicle called the Mofa which costs less than half the price of a moped. Going by the present motor vehicle legislation, it will not require to be registered, insured or a license to drive.

Ideal Jawa Private Ltd. (IJPL): This company has been producing Indian versions of a Czechoslovakian motorcycle, the Jawa in Mysore since 1960. It has recently restarted production after the plant was closed for a couple of months in 1988/89.

New entrants:

The biggest changes to the Indian motorcycle market came in the early 1980's when four companies started production of Japanese motorcycles in India. Apart from the tie-up between Escorts and Yamaha mentioned above, three other collaborations with Japanese companies were entered into. A number of joint ventures came into production in collaboration with leading Japanese motorcycle manufacturers.

TVS Suzuki (TSL): This company which belongs to the TVS-Iyengar group started production at Hosur, Tamil Nadu in 1984. It is reported to be the most highly indigenised of the motorcycle companies with Japanese collaboration. Besides being a company trading in Ashok Leyland commercial vehicles and Premier Cars, the Group consists of Companies engaged in manufacturing brakes, steering and other automobile parts. It also has a tyre manufacturing company.

Hero Honda Motor Ltd. In 1985, Hero Honda which belongs to the Hero group set up their plant at Daruhara in Haryana. This company's motorcycle's unique selling proposition is its claim to being the most fuel-efficient machine in the country. It should be noted that in spite of the broad banding policy, this company has agreed to keep out of the scooter market to avoid competing with the other Honda collaborator, Kinetic Honda, in return for a reciprocal agreement from KHL.

Bajaj Auto Ltd. In 1986 the Kawasaki Bajaj was launched by Bajaj Auto Ltd. at Pune. As it did not achieve immediate success in the marketplace, it was relaunched in 1988 with some technical changes and steep undercutting of competing products.

Exhibit 2 provides details about companies engaged in automobile manufacture

Firodia group introduced an automatic geared scooter in collaboration with Honda of Japan in 1986 that was substantially different technically from the other scooters on the market. It now has 5% share of the market after some initial difficulties in selling their vehicle.

Four scooter manufacturers went out of business in the last six years. Two of these (Andhra Pradesh Scooters Ltd. and Karnataka Scooters Ltd.) were State Government undertakings. Kelvinator and Automobile Products of India were the other two.

3.5 Manufacturers of Mopeds

Kinetic Engineering Ltd. (KEL) :KEL, which is a Firodia group company produces mopeds exclusively at its Ahmednagar plant in Maharashtra and has 43 % of the market. It started production in 1970 with its own technology.

TVS-Suzuki Ltd. (TSL) : TSL has 40% of the market and manufactures mopeds at its Hosur plant on the Tamil Nadu-Karnataka border near Bangalore. The Hosur moped plant was initially set up by the TVS - Iyengar group under the name Sundaram Clayton, but was merged with TVS's motorcycle operations in 1987. TSL's range of mopeds was also developed indigenously.

Kinetic Honda Motor Ltd. (KHML): This company started making Luna mopeds in 1987. Most Luna's produced in the country are produced by Kinetic Engineering Ltd. KHML went in for Luna production since its scooter line was operating at only a fraction of installed capacity.

Others:Kelvinator of India, Majestic Auto Ltd., and Enfield India Ltd. are the only other companies which make mopeds now. Kelvinator has a plant at Alwar in Rajasthan . It has a 6 % market share while Majestic Auto which belongs to the Hero group, based at Ludhiana in Punjab has a 4% share of the market. Madras based Enfield India which is best known for its motorcycles has a 3% share of the market.

Nine moped manufacturers have closed down in the last nine years, including Mysore based Sree Chamundi Mopeds which was in collaboration with one of the worlds largest automobile groups, Peugeot of France.

3.6 Manufacturers of Motorcycles

Escorts Ltd. (EL): The largest motorcycle manufacturer in India, EL is based in Faridabad, Haryana. It makes motorcycles under the brand name Rajdoot based on a Polish motorcycle, Cekopa, and more recently started another motorcycle line in collaboration with Yamaha of Japan. It was the first company to sign a collaboration agreement with a Japanese company for motorcycle manufacture. It has 34% of the motorcycle market.

Exhibit 3 gives production figures manufacturer-wise over the period 1979 - 1988.

Exhibit 4 compares the market shares of various companies in 1988 with 1979 and also compares the concentration indices for the various automobile categories for these two years.

4. Policy Environment of the Industry:

4.1 Regulatory Policies of the Government

The Industries (Development and Regulation) Act (IDRA) was passed in 1951 for the purpose of implementing the government's industrial policy. The motor vehicle industry was included in the first schedule of IDRA. Manufacturers in this schedule were required to obtain a license to carry out their manufacturing activity. A license was also required for manufacturing a new article, substantial expansion, change of location and for conducting business if a change was introduced in government policy. The reasons given by the government for introducing the licensing requirements were: optimal utilisation of investible resources; allocation of investible resources with a view to matching need-based requirements, preventing concentration of economic power, locating economic activity in a dispersed manner to widen the industrial base etc.

According to the Monopolies and Restrictive Trade Practices (MRTP) Act of 1969 any company with net fixed assets and gross current assets in excess of a certain defined limit was required to obtain clearance under the MRTP act for capacity expansion. In 1985 this limit was fixed at Rs. 100 crores. The equity participation of foreign companies was limited to 40% under the the Foreign Exchange Regulation (FERA) Act, enacted in 1973. This limited the foreign equity participation to a maximum of 40 per cent. Only Ashok Leyland was affected at that time, as British Leyland owned 52% of the company then. Daimler-Benz had an 11.5% share in TELCO. The Government's policy at that time was to discourage foreign financial collaborations while permitting foreign technical collaborations to some extent.

In 1980, the government made a statement promising to act as a catalyst in the modernisation of the automobile industry. Government policy appeared to favour an introduction of competition and an infusion of recent motor vehicle technology, through foreign technical and financial collaboration. Up to 1981 18 foreign collaborations were approved. In the years from 1981-1983, 21 collaborations for the manufacture of motor vehicles were approved. Similarly a number of collaborations between Indian auto component manufacturers and foreign firms were approved. Companies entering into collaborations were also expected to draw up a timetable for progressive indigenisation by drawing up a Phased Manufacturing Programme (PMP). This was to be a 5 year programme which would be monitored by the Directorate of

Technical Development (DGTD). The present methodology for determining local content is not known, but that used by the Tariff Commission is given below.

$$\text{Import Content} = \frac{\text{Total Ex-factory price of imports}}{\text{Total Ex-factory price of complete vehicle in country of origin}} \times 100\%$$

$$\text{Indigenous content} = 100 - \text{Import content}$$

The Government also announced a re-endorsement scheme by which the licensed capacity would be increased up to 133 per cent of the best production over the previous five years, provided there had been a minimum of 94 per cent capacity utilisation. Two years later in August 1984 it was announced that this re-endorsement scheme would not apply to the motor vehicle industry. Exhibit 5 provides data on the licences and letters of intent issued so far.

4.2 Broad Banding

In January 1985, the broad-banding policy was announced. Under this scheme, the motor industry was classified into just two groups:

- a) Motorized two wheelers and three wheelers up to 350 cc engine capacity
- b) Motorised 4- wheeled vehicles

This was in contrast to the former policy where capacities for each model could only be determined after being sanctioned by the Government.

TELCO responded to the broad banding policy by introducing a range of LCVs in the Indian market. It also had a plan to produce cars in collaboration with Honda, a Japanese Company. This plan had to be shelved because the government decided to review its policies regarding foreign collaboration. Ashok Leyland has also started producing its own LCV's now. Bajaj Auto Ltd. took advantage of the policy by utilising a part of its two wheeler license to produce three wheelers.

In May 1985, motor vehicle manufacturers were exempted from sections 21 and 22 of the MRTP act, enabling them to seek approval for substantial expansion (i.e. more than 25 per cent) or for new units under IDRA. Then in May 1986, the government announced a minimum economic scale of 25,000 vehicles per annum for commercial vehicle manufacturers and said that units producing below this will be actively encouraged to achieve this figure.

4.3 Tariff Policies

The Government has levied tariffs on motor vehicles since 1921, when an 11 per cent ad valorem import duty was imposed on buses, lorries and their accessories which were classified as luxury goods. The exact rates keep fluctuating with almost every budget but some of the reasons for the tariff policies adopted have been said to be: (a) protection to the domestic industry via quantitative restrictions and a graduated differential in customs duties on components. (b) priority for commercial vehicles over private transport and (c) incentives for ancillary producers

The import of fully built-up vehicles was almost completely banned. Certain categories of users are still allowed to import, through the numbers of cars imported thus is of negligible proportions. This includes Indians returning on Transfer of Residence (Indians who have spent at least two years abroad and are planning to stay here for at least one year), embassies and handicapped people. The prohibitive rates of duty that have been imposed will ensure that this remains a negligible sector of the market.

Motor vehicles are also subject to Central excise duties, central sales tax, motor vehicles tax, local sales tax and octroi. Apart from these, the tariffs levied on the manufacturer's inputs are passed on to the consumer.

5. India's Automobile Ancillary Industry

Since more than a thousand components go into the making of an automobile, development of an auto ancillary sector was essential for developing a motor vehicles industry.

India's automobile ancillary industry is made up of 250 units in the organised sector and about 2000 in the small scale sector. It was estimated to be a Rs.1340 crores industry in 1988. Till the advent of the large scale foreign collaboration in the early part of this decade, the indigenous auto ancillary industry catered to virtually the entire range of components needed by Original Equipment Manufacturers in the manufacture of motor vehicles and for use as spare parts. In the spare parts market, the Automobile Components Manufacturers Association estimates that up to 80 % of the market is made of spurious parts.

Tyres and tubes are also required by all on-road vehicles but this industry is usually regarded as part of the rubber products sector. There are 11 tyre manufacturers with combined installed capacity of 14.2 million tyres (1985 figures) and combined sales of 11.4 million tyres in 1985. The tyre industry was delicensed in 1988 and the Government is considering delicensing of the tyre cord industry. Traditionally, tyres have been in short supply and the manufacturers have been blamed for this. In 1988, the

Ministry of Surface Transport allowed import of tyres under DGL for the State Road Transport Undertakings. Almost immediately, the tyre supply to the SRTU's went up.

The auto components industry has a large number of manufacturers in comparison to the number of automobile manufacturers. It was reported that components manufacturers are plagued by diseconomies due to low production scale. In 1985 there were reported to be 14 units making clutch plates for 225000 vehicles whereas in Japan there were only 4 such units for their production of more than 10 million vehicles. A similar situation exists for all components manufacturers.

The Indian components industry's performance did not satisfy the Japanese companies which collaborated in the joint ventures for manufacturing automobiles. According to the Japanese, the Indian industry was incapable of supplying components which matched their specifications. They said components manufacturers had outdated production technology and unreliable product quality. A World Bank unpublished report on the Indian auto products industry is said to have come to similar conclusions as the Japanese on the state of the components industry.

Since that time a number of joint ventures have come into existence between local companies and foreign companies which is expected to update the state of the Indian industry to somewhere nearer the state in Western countries.

From the start of the 6th Five Year Plan, the Government took a decision to delicense the automotive ancillary industry for non-MRTP and non-FERA companies for factories located outside city municipal limits producing items that were not restricted for the small scale sector (defined as having plant and machinery below Rs.35 lakhs). Even MRTP companies only have to register with the Directorate General of Technical Development (DGTD) when setting up in a backward area. The Govt. also announced a system of broad-banding for the auto-ancillary industry. Under this, the industry was classified into the following groups:

1. Auto electrical components
2. Suspension components
3. Transmission components
4. Clutch and break systems
5. Fuel injection equipment
6. Cooling system
7. Engine ancillaries and connected components
8. Dashboard instruments, taxi meter etc.

It is reported that the Automobile Manufacturers Association and the Automotive Component Manufacturers Association have launched a programme to standardise design of some components so that they can be used in vehicles from different manufacturers. This would reduce diseconomies of scale to an extent. It is, however, felt by industry watchers that this sort of arrangement is nowhere

near the kind of cooperative ventures that companies abroad are getting into. For example, three European carmakers, Peugeot, Renault and Volvo have entered into a joint venture to produce six-cylinder engines for their large cars.

Most of the plants in the organised sector are located in the following places:

Western India: Bombay-Thane, Pune, Aurangabad and Nasik.

Southern India: Madras and Coimbatore.

North India: New Delhi and Faridabad.

Small scale units are also concentrated in the towns mentioned above as well as in Bangalore, Hyderabad and Calcutta.

6. Interaction with the international environment

6.1 Exports

India is reported in the press to be striving hard on the export front. Indian motor manufacturers highlight their export performance in their advertisements as a measure of their quality. Exhibit 6 tabulates India's export performance country-wise. Exhibit 7 gives India's export performance in monetary terms over the six most recent years for which data was available. Exhibit 8 indicates export quantities tabulated manufacturer wise.

According to industry watchers, the technology used abroad and quality standards there is far too advanced for Indian companies to make a real impact in the highly competitive international market currently dominated by leading Japanese and European manufacturers. The new entrants in the international arena like South Korea have used the benefits arising from economies of scale and low labour cost to make a dent in the small car market. It is believed that collaboration with Japanese companies imposes constraints on export drives in the Western world. Hence efforts need to be made to make inroads into eastern bloc countries. Companies with their own efforts in developing and commercialising technologies of vehicle manufacture like Telco, TVS, Kinetic Engineering and Bajaj Auto stand a better chance. The question then is; what kind of government support programmes would help them develop the potential to build a competitive advantage in the international market.

6.2 Indian joint ventures abroad

Two Indian companies have been involved in setting up motor vehicle plants abroad. One is TELCO which set up a plant for assembly and manufacture of commercial vehicles in Malaysia, Tatab Industries. The other is Ashok Leyland with a commercial

6. Imports and collaboration

Since independence, the avowed policy of the Government has been to establish indigenous capability in production through the phased manufacturing programme. The 1952 Tariff Commission recommendation was the first step. In 1980, the Government of India allowed both technical and financial collaboration in the automobile sector.

There have been reports of a slowdown in the pace of indigenisation, which was attributed by the manufacturers to the inability of indigenous component makers to meet their requirements. However, the steep rise in value of the Japanese Yen against the Rupee is now forcing them to indigenise faster to avoid being priced out of the market.

A number of proposals for setting up motor vehicle production lines in collaboration with foreign companies were rejected in September 1989. These included proposals for collaborations with such well established companies as BMW and Citroen. A license was granted to a Madras based company for an Export Oriented Unit to produce cars in collaboration with a Soviet manufacturer, Lada. It was reported that this was done because of the absence of hard currency requirements in this deal.

Exhibit 9 provides data on collaborations by Indian manufacturers.

7. Impact of Motor Vehicle Operation

7.1 Pollution

It is well known that motor vehicles are one of the greatest producers of pollution. The most significant automotive emissions are hydrocarbons, carbon monoxide and nitrogen oxides. Other pollutants produced are airborne lead, sulphur dioxide and particulates (soot.). Diesel engines emit high amounts of sulphur dioxide and, soot and a higher proportion of poly aromatic hydrocarbons which are carcinogenic. In India, most commercial vehicles and an increasing number of cars and jeeps have diesel engines. The price differential between petrol and diesel is certain to attract more car owners to diesel vehicles.

The technology to drastically reduce emissions exist. The problem is the expense involved. Devices to control pollution raises both the complexity and price of new cars. They may also decrease power and economy. The Central Motor Vehicles rules does lay down some emission standards, but the earliest they are expected to come into effect is 1990.

It has been felt by industry watchers that the most effective way to reduce emissions would be to restrict the use of automobiles. Mass transportation, bicycles or vehicle pools would probably produce net emission reductions better than that achievable with expensive pollution control devices.

7.2 Fuel Consumption:

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It was noted by industry watchers that while manufacturers all over the world were working on new fuel efficient models after the first oil shock of 1973, Indian manufacturers kept producing and selling the same products as they were confident of their products selling well in the protected Indian market in spite of the rises in fuel prices.

The Government of India does make statements about the need to conserve energy resources. However, the transportation sectors' requirements for petroleum products is rising at an increasing rate. To some extent, this cannot be helped as increase in demand for transportation is a natural sign of an expanding economy. What can be controlled is the type and quantities of vehicles on the roads. The recent trend towards private transport will accelerate the demand for petroleum products, as these modes are much more energy intensive than public transport. (Energy expended, Kilocalories per passenger-km for various modes are : Bus- 61.2; 2-wheeler-134; 3-wheeler- 159; Car-306;). It is felt that the Government could promote fuel-efficient vehicles. At 1987 rates of production, India has reserves left till A.D 2017, just 27 years away. In 1989/90, petroleum consumption was estimated at 53.5 million tonnes, but the Centre for Monitoring the Indian Economy estimates that in 1999/2000 the requirements will go up to 94 million tonnes. At least one-third of consumption (1985/86 figures) is accounted for by the transport sector. In this context, India spent about Rs.6000 crores in 1988/89 in foreign exchange for importing about 26 million tonnes of crude oil and 9 million tonnes of Petroleum, Oil and Lubricants (POL). Over the past five years, the slump in oil prices has saved the country several thousand crores in hard currencies. If the oil market picks up in the next five years as predicted by oil industry analysts, it will come at a time of rapidly rising demand for POL in the country and a simultaneous plateauing of domestic oil production (assuming no major new find).

Government could encourage and reward companies that come out with fuel efficiency improvements. Incentives could be given to spend on R&D or to incorporate any additional efficiencies. There is however a scheme whereby a 1/2 % cess is levied on automobile sales, ostensibly to support R&D work at the Automotive Research Association of India, Pune. Reducing vehicle weight, reducing engine displacement, improvement in engine efficiency, improvement in lubrication, improvement in transmission

efficiency, reduction in drag resistance, reduction in tyre rolling resistance, shift to front-wheel drive, and an increase in the number of gears have been suggested as some of the ways of improving fuel efficiency.

What is clear is that the energy situation is such that the Government of India is required to play an activist role in deciding the impact the motor vehicle industry could make on fuel consumption.

The Indian government has imposed some of the highest taxes in the world on petrol. While in Ahmedabad, a litre of petrol cost Rs. 9.90 in 1989, the prices in other countries ranged from Rs. 1.18 in Lagos to Rs. 4.36 in Sydney to Rs. 6.54 in New York.

Exhibit 10 shows the outlook for the transport energy situation in 1990 in India.

7.3 Congestion

The increasing trend towards private transport poses problems of congestion. Even in cities like Los Angeles (two-thirds of its urban space go to accommodate motor vehicles) which have been designed around the automobile, rush hour traffic frequently moves at a crawl. Apart from time costs, it wastes fuel. It is estimated that 4% of annual petrol consumption in the U.S is wasted due to congestion. Bearing in mind the design of most Indian cities, the increasing traffic trends being seen now can be expected to produce severe congestion costs. Private transport modes use road space inefficiently compared to public transport. In some places, road utilisation is now priced. Singapore and Hong Kong are two examples where road users are charged for driving in certain areas with problems of congestion.

Exhibit 11 gives compares efficiency of road space utilisation for various vehicle categories.

7.4 Impact on Safety

About 48,000 people were killed and 200,000 injured in road accidents in 1988. This figure is reported to be much higher than the corresponding figures in other countries. Any attempt to improve the Indian safety record will need to address several issues, including the inbuilt safety of automobile products. Under the Motor Vehicles Act 1988, Govt. has the power to regulate vehicle construction standards by imposing norms on aspects of car design and assembly. However no standards as such have been laid down. A Safety and Pollution standards committee was constituted under the aegis of the Automotive Research Association of India in 1983 by the Department of Heavy Industry which comes under the Ministry of Industry and Company Affairs. This committee was asked to suggest standards to "reduce malfunction and premature failure" of basic automotive systems like brakes, steering, etc". Car construction standards was

outside its scope. The report was submitted in July 1985 along with the ARAI's drafts for about 24 or so standards which dealt with items like hand controls, wipers, horns, brakes, etc. A standard was mooted for testing car doors against side impact. Seatbelts were mentioned as a low priority item while head restraints which guard against whiplash in case of a collision from the rear was not even mentioned. Two serious recommendations were made :

- a) The centre should assume powers to force automakers to conform to laid down norms. This has been done now as mentioned earlier.
- b) A Safety laboratory should be set up, probably with a view to advance Indian automotive safety engineering capabilities. The ARAI has been entrusted with this, it is understood. Knowledgeable observers however have doubts as to whether the trained manpower exists in India to carry out any meaningful work, considering that even automobile manufacturers have rather limited expertise even in basic matters like engine development, tooling and body styling.

The Bureau of Indian Standards has set up a committee on Automotive Safety and Pollution. Apparently its task is to "rationalise the draft standards submitted by the ARAI to make them practical for implementation." However, these standards are not expected to be incorporated till 1992 at the earliest.

7.5 Impact on Technology Skills:

While no study has been carried out, it has been felt by industry watchers that the development of the motor vehicle industry has had high technological backward and forward linkages. In addition to skills development in the components industry, it has contributed to the development of skills in building a variety of general and special purpose machine tools. The gap between available skills and expected skills surfaced when the existing manufacturers could not meet the exacting quality demands from Japanese Companies.

7.6 Impact on Employment

About 150,000 persons are reported to be directly employed by the members of the Association of Automobile Manufacturers of India. Apart from this, the industry is a good employment generator. It was estimated by the National Council of Applied Economic Research that each truck generated 12 jobs. With increasing automation and the use of robots for assembly work, the direct employment potential of this industry has come down. In fact, the vehicle manufacturers appear to be concerned with increasing the number of vehicles produced per person already on the job. The industry continues to provide employment opportunities downstream in terms of repair network, actual operations of vehicles and support services such as petrol stations and wayside hotels.

B. Investments in Roads

The Government of India is responsible for the construction and maintenance of certain trunk routes which have been declared National Highways and all roads in Union Territories. At present, National Highways make up just 2% of total road length but carry 33% of total traffic. So far, the necessary civil engineering works have been carried out mostly by state P.W.D's but now the Government of India has taken a decision to set up a body called the National Highways Authority of India that would eventually be entirely responsible for the National Highway network. India's road network carried about 210 billion tonne kilometres (BTK's) of freight in 1987 but is expected to carry between 600 - 800 BTK's in 2000. For comparison, in 1951 only 12 BTK's of freight traffic were carried by road.

If freight is to be transported in the magnitudes envisaged, massive investments will have to be made in the highway network. At present, there is reported to be a large gap between the resources required and that actually allocated. The Government has recently taken loans from both the World Bank and the Asian Development Bank for certain road projects. The Road User Cost study prepared by the Central Road Research Institute, Delhi, estimated that poor quality roads cause annual fuel wastage of Rs. 500 crores, additional vehicle operating costs of Rs. 2000 crores and costs due to accidents of Rs. 400 crores. A recent study estimated that an investment of Rs. 14128 crores on the National Highway network could produce savings of would produce savings of Rs. 44500 crores between 1988 and 2003, giving an internal rate of return of 56%.

9. Demand Management

To a certain extent, the Government is in a position to influence automobile demand. The rate of growth of the economy has a strong effect on the rate of growth of demand for transportation and hence motor vehicles. The macro-economic policies of the Government which affect the growth of the economy are thus of great concern to the automobile industry. Tariff policies adopted is one of the principal instruments of the Government. The relaxation in import duty rates for imported components were what made it feasible for the joint-venture plants to take off in the early to mid 1980's. Again, the excise duties charged on different categories of motor vehicles can cause significant changes in demand. For example, initially the 1989/90 budget announced an increase of 5% in excise rates for motorcycles while retaining the previous excise rate on scooters. This increased the prices of motorcycles by about Rs. 2500 - 4000, and soon there were reports of a sharp drop in demand for motorcycles. After considerable lobbying in Delhi by the concerned manufacturers the increased rates were withdrawn. The recently passed Motor Vehicles Act has also created demand problems for

LCV manufacturers and two wheeler manufacturers. LCV operators who had previously been operating their fleets by grossly overloading them find they can no longer do so as the authorities are enforcing restrictions laid down in the Act. As such operators run on very thin margins, they find it unprofitable to run operations without overloading. Hence, there is now a demand slump in this sector. LCV manufacturers are reported to be going in for design modifications that would enable them to combat the drop in orders. Motorcycle and scooter manufacturers are required to install turn indicators and have now been given a two year grace period to do so. Immediate enforcement of this provision would have created serious problems for the manufacturers as even giants like BAL had not felt the need to fit turn indicators until compelled to do so by the new legislation. Sixteen year-olds can now be issued licenses for gearless 2-wheelers. This could possibly enlarge the size of the market for such vehicles, although this decision was probably taken to legalise underage riding which was difficult to control.

The Government's credit policies also affect demand particularly in the commercial vehicle segment where it is reported that up to 34 % of the finance for purchasing truck, come from banks and financing agencies. The corresponding figures for LCV and bus purchase are 50 % and 75 % respectively. In the early eighties the Government of India extended the credit squeeze to the transport sector. This affected the demand for commercial vehicles and TELCO and Ashok Leyland decided to go slow on their expansion plan. In a bid to boost demand, some automobile manufacturers have set up their own motor credit corporations, such as Bajaj Auto Finance and Lakshmi Finance (TVS group) and Ashok Financial Services (AL Groups). Even a multinational bank like CitiBank has set up a motor vehicle finance division. Some of the commercial banks have also announced schemes to support vehicle buying. Again some manufacturers have been taking the initiative to promote institutional buying, where they offer special discounts when a bulk order comes from an organisation's employees.

Demand projections in this industry have been largely overstated in some sectors particularly, and some manufacturers who relied on such estimates to invest in motor vehicle plants have found themselves in financial difficulties as a result. Exhibit 12 compares recent production figures with demand forecasts.

10. The Motor Vehicle Act 1988

This Act came into force in July 1989. It is meant to be a comprehensive piece of legislation that would take into account the latest developments on the transport scene. The Motor Vehicle Rules, framed under this act, have laid down certain standards that if implemented would make substantial changes in the standards of construction and maintenance of vehicles. All vehicles with 4 or more wheels are expected to have seat belts, collapsible steering column and a padded dashboard. The

manufacturers are also supposed to use only auto components which have the ISI mark, if the Bureau of Indian Standards has laid down any for them. Speed governors may be required to be fitted on transport vehicles if the Government desires it at a later date. Prototypes of new vehicles are expected to be sent to established automotive institutions such as the Automotive Research Association of India or the Vehicles Research and Development Establishment of the Ministry of Defence to be tested for compliance with the provisions of the Act and Rules. The Motor Vehicle Act makes no mention of an organisation that would be responsible for establishing and enforcing safety standards.

It should be noted that the provisions of the Act which affect the manufacturers have been delayed. There were reports that maximum age limits were to be imposed on various categories of vehicles and that this proposal was actively being encouraged by the Ministry of Industry and automobile manufacturers. After a lot of controversy, including a three day total public transport bandh in Bombay, the Minister of Surface Transport at the time, Mr. Rajesh Pilot announced that no age limits would be imposed. However, vehicles that are more than 14 years old will have to renew their registration certificate which would then be renewable every 5 years.

11 New Product Possibilities

The existing or prospective vehicle manufacturers could think of involving new types of vehicles for existing or new applications. For example, they could introduce two wheelers with lower engine capacities or four wheelers in higher tonnage range. In addition if the mix of vehicles on these roads is adjusted so that about 25% of freight is borne by vehicles with 3 or more axles, it has been estimated that total transport costs will go down from Rs. 8340 crores to Rs. 5950 crores. At present 99% of vehicles have only two axles. They could think of vehicles for rural use, to meet the need for carrying both freight and passengers together. Should such efforts be encouraged by the Government?

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Exhibit - 1

Total Number of vehicles on the Roads (Excluding 3 - wheelers)

	Cars/Jeeps	Buses	Trucks	2-wheelers	Total
1979	995835	133163	443632	1887618	3468248
1980	1054404	140346	472093	2115254	3782097
1981	1116701	153756	526608	2528364	4325429
1982	1207338	163964	586692	2962698	4920684
1983	1351204	180000	647633	3511868	5690705
1984	1424000	196000	719000	4234000	6573000
1985	1546000	211000	782000	5121000	7660000
1986	1414300	230400	848100	5797800	8290600
1987	1738614	246264	901534	6749414	9627826
1988	2054750	259660	1014980	8493400	11822790

*****Motor Vehicle Industry*****

Particulars of motor vehicle manufacturers

Manufacturer	Works	Type of Product	Sales(1988) Rs. crore (1987)	Net Profit(1988) Rs. crore
Mahindra Nissan (All India Nissan)	Zahirabad (A.P)	LCV's	14.81 (1987)	(3.71)
Ashok Leyland	Ennore/Hosur (Tamil Nadu) Bhandara (Mah'tra) Alwar (Raj'tan)	MHCV's/Diesel Engines	455.47	12.6
Automobile Products of India Ltd.	Bombay/Aurangabad (Mah'tra)	Scoters/3- wheelers Ancillaries	27.51 (1987)	(8.49)
Bajaj Auto Ltd.	Pune/Aurangabad (Mah'tra)	Scoters/3-wheelers Motorcycles	514.1	14.82
Bajaj Tempo Ltd.	Pune/Pithampur (Mh./M.P)	3/4 wheeler LCV's Diesel engines	139.94	8.29
DCM Toyota	Ghaziabad (U.P)	LCV's	82.82	(5.71)
Eicher Motors Ltd.	Pithampur (M.P)	LCV's	59	(1.63)
Enfield India Ltd.	Tiruvottiyur Annakanaipatti Ranipet Thoraipakkam (Tamil Nadu)	Motorcycles Agro Indl. engines	57.45	(7.99)
Escorts Ltd.	Faridabad (Haryana) Patiala Bangalore Ballabgarh	Tractors/Motorcycles Auto/Railway Ancillaries Indl./Constrn. Equipment	422.31	9.69
Gujarat Narada Auto Ltd.	Roopnagar (Gujarat)	Scoters	22.43	(3.81)
Hero Honda Motors Ltd.	Dharuhera	Motorcycles	187.53	8.32
Hindustan Motors Ltd.	Uttarpara (West Bengal) Halol (Guj.) Hosur Trivellore (Tamil Nadu)	Cars/Trekkers LMHCV's Construction equipment (excavators/dumpers) Steel structural castings	332.71	(5.71)

Exhibit - 2 (contd..)

Manufacturer	Works	Type of Product	Sales (1988) Rs. crore	Net Profit (1988) Rs. crore
Ideal Jawa Pvt. Ltd.	Mysore (Kar'taka)	Motorcycles	21 (1987)	n.a
Kinetic Engineering Ltd.	Ahmednagar (Mah'tra)	Mopeds	100.71	3.22
Kinetic Honda Motors Ltd.	Pithampur (M.P)	Scooters	38.4	(5.88)
Kelvinator of India Ltd.	Alwar (Raj'tan)	Mopeds/Scooters	148.6	4.53
LML Ltd.	Kanpur (2 plants) (U.P)	Scooters	289.96	(6.95)
Maharashtra Scooters Ltd.	Satara (Mah'tra)	Scooters	63.65	12.42
Mahindra & Mahindra Ltd.	Bombay Nasik Igatpuri (Mah'tra)	Jeeps/LCV's Tractors	589.98	6.13
Majestic Auto Ltd.	Ludhiana (Punjab)	Mopeds	29.96	8.19
Maruti Udyog Ltd.	Gurgaon (Delhi)	Cars/Jeep Mini-van	622.43	18.71
Premier Automobiles Ltd.	Kurla/Wadala Dombivili/Thane (Mah'tra)	Cars/LCV's	184.33	(8.28)
Scooters India Ltd.	Lucknow (U.P)	Scooters/3-wheelers	9.77	(26.57)
Standard Motor Products of India Ltd.	Perungalathur (Tamil Nadu)	LCV's/Cars	27.26	(20.39)
TVS Suzuki Ltd.	Hosur (Tamil Nadu)	Mopeds/Motorcycles	124.06	(9.01)
Swaraj Mazda	Hoshiarpur (Punjab)	LCV's	24.2	(5.76)
Tata Engineering & Locomotive Co. Ltd.	Jaashedpur (Bihar) Pune (Mah'tra)	LMHCV's Excavators	1222.9	15.62

Exhibit - 3

*****AUTOMOTIVE INDUSTRY -- PRODUCTION TRENDS*****

CARS***	1979	1980	1981	1982	1983	1984	1985	1986	1987	1988
HML	17523	21752	23197	21836	23683	24376	24864	22387	25561	27557
PAL	11556	8726	18674	20711	20929	26620	29223	26581	31191	36565
WJL					175	12857	48635	63504	90985	95396
SMPIL	56	6	4	1	1	0	11	1557	484	215
SAL	106	51	31	126	302	938	523	55	39	210
Total Car Prod'n	29235	30538	42106	42674	45898	64813	102456	114884	148184	159937
JEEP***										
M&M	12340	15068	17029	19660	21660	22246	26876	21580	28995	29839
HML	1210	2305	2433	1764	1577	1857	1457	1387	1851	870
WJL							67	6203	3371	5063
PAL	224	202	600	478	330	157	0	0	0	0
Total Jeep Prod'n	13774	17579	20062	21902	23567	24270	28400	29170	33417	35772
LCV***										
BTL	6509	9881	8589	11708	9626	12900	13987	13344	16845	15828
M&M	3084	3617	7234	9834	9658	11515	11577	10926	6776	5569
SMPIL	2425	3491	4459	4751	5395	5810	4583	2807	1530	1687
Telco							18	3384	8237	10382
A-Nissan							1099	1654	1139	2338
DCM-Toyota							1323	2385	3073	3452
E-Mitsubishi								754	2375	4631
S-Mazda							600	1530	1909	3111
PAL	153	239	585	698	446	416	142	46	1	0
Total LCV Prod'n	12171	17148	20867	26191	25125	30647	33329	36832	41085	46198

TRUCKS***

	1979	1980	1981	1982	1983	1984	1985	1986	1987	1988
TELCO	23855	23832	31873	34454	34287	32606	36586	29671	35310	39891
AL	6025	6553	8145	9225	6829	7194	6789	5650	6899	9320
HML	697	1703	2126	293	117	218	597	776	984	832
SEL	0		591	820	0	0	0	0	0	0
PAL	634	739	1998	1557	496	283	269	0	0	0
Total Truck prod'n	31271	32827	44733	46349	41729	40301	44241	36057	43193	50243

BUSES***

TELCO	7830	7936	13161	8643	11787	14134	12631	11067	12119	10641
AL	6230	6375	6866	7138	6582	7236	9154	9615	9446	9332
HML	115	112	126	19	1	0	21	12	2	59
PAL	68	55	99	64	21	96	64	0	0	0
Total bus prod'n	14243	14478	20272	15864	18391	21466	21870	20694	21569	20032

SCOOTERS***

	1979	1980	1981	1982	1983	1984	1985	1986	1987	1988
BAL	61540	109962	107050	140920	169479	186773	256967	366007	415960	348515
MSL	19491	25006	24546	32597	53482	56337	58650	90739	92474	92211
SIL	32485	36195	32373	37874	26923	24025	30189	6414	2011	810
LML					250	10222	41359	101558	72292	139609
GSL/GNAL	763	3417	5953	4131	3857	4906	1659	0	20370	29738
KMK								12769	21856	34540
Kelvinator							1026	16	0	0
API	26338	23405	21284	24082	14582	9695	7184	5275	209	0
APSL	9453	10564	10580	10394	5312	5345	23353	11572	931	0
KSL	2873	1374	1098	729	45	0	0	0	0	0
Total scooter prod'n	152951	209943	202884	250727	273850	297303	422307	595150	626091	645823

Exhibit - 3 (contd.)

WOPEDS***	1979	1980	1981	1982	1983	1984	1985	1986	1987	1988
KEL	30279	45935	73128	57442	132815	157661	182075	211789	195597	191042
SUCL/TVS	0	2518	22875	53032	70547	100071	126858	148030	181155	193349
MAL	7251	24398	52672	77605	110035	94597	97548	61398	58416	24450
EIL						8681	24668	11434	14309	12252
Kelvinator							7341	14343	24058	27661
KHM										25343
SCM							9585	1554	0	0
MIL	16185	18691	23388	18992	9006	8571	2121	0	0	0
KGPL	2831	7401	7311	2343	6367	7413	3499	656	0	0
IAL	1364	474	0	0	0	1774	1022	0	0	0
SZUL	3006	2706	3823	2576	309	0	0	0	0	0
SPEF	2241	2811	2227	572	0	0	0	0	0	0
REL	2225	0	0	0	0	0	0	0	0	0
TMM	1537	1147	0	0	0	0	0	0	0	0
Others	6853	3958	2227	572	0	0	601	580	2072	n.a
Total moped prod'n	72922	110031	187651	213134	329079	378768	455298	449792	475607	478297
MOTORCYCLES***										
EL	40701	47064	51571	60350	68215	81815	90271	101742	110784	142094
EIL	20433	22716	26884	29989	28195	30726	37408	26126	23517	25972
IJPL	25660	31786	31572	29194	33481	30395	27662	17907	15885	8408
BAL	2	13	756	9443	25666	27338	36144	43446	48173	82661
TSL						4794	40254	61913	47359	56747
HH							13662	63588	62934	96373
KSL	0	0	0	1063	697	215	0	0	0	0
Saund Zweirand	17	7	12	0	0	0	0	0	0	0
Total motorcycle prod'n	87013	101586	110795	130039	156254	175283	246001	314716	308652	411668

Exhibit - 3 (contd.)

THREE_WHEELERS***	1979	1980	1981	1982	1983	1984	1985	1986	1987	1988
Bajaj	13332	21538	18384	23558	27229	30792	34329	41855	47560	56869
API	3376	4465	5771	6681	9763	10124	13756	10202	11551	11910
Sie	235	518	698	428	664	986	1182	1021	1213	1064
Total three wheeler prod'n.	16947	26519	24863	30585	37656	41816	49267	53078	60324	68983

Sources: ACMA, ATAM reports

*****AUTOMOTIVE INDUSTRY -- SALES TRENDS*****
 (Concentration indices 1979 vs. 1988)

CAFE***

	1979			1988		
	Units	Market share (M.S)	(M.S) ²	Units	Market share (M.S)	(M.S) ²
HML	17117	0.591	0.350	27088	0.170	0.029
PAL	11675	0.403	0.163	36864	0.232	0.054
MCL		0.000	0.000	94573	0.595	0.354
SNPIL	54	0.000	0.000	210	0.001	0.000
SAL	104	0.004	0.000	210	0.001	0.000
Total Car sales	28950			158945		
		C.I	0.512		C.I	0.437

JEEP***

M&M	11192	0.889	0.790	30634	0.840	0.711
HML	1231	0.098	0.010	900	0.005	0.000
MCL				4794	0.132	0.017
PAL	169	0.013	0.000	0	0.000	0.000
Total jeep sales	12592			36328		
		C.I	0.880		C.I	0.729

LCV***

BTL	6555	0.544	0.295	14846	0.349	0.122
M&M	2931	0.243	0.059	5102	0.120	0.014
SNPIL	2441	0.202	0.041	1684	0.040	0.002
Telco				10903	0.258	0.067
A-Nissan				2135	0.050	0.003
DCM-Toyota				3497	0.082	0.007
Eicher				4322	0.102	0.010
PAL	131	0.011	0.000	0	0.000	0.000
Total LCV sales	12056			42569		
		C.I	0.396		C.I	0.224

TRUCKS***

TELCO	25050	0.764	0.583	41408	0.805	0.648
Ashok Leyland	5063	0.179	0.032	9113	0.177	0.031
HML	1237	0.038	0.001	936	0.018	0.000
PAL	658	0.020	0.000	0	0.000	0.000
Total truck sales	32808			51457		
		C.I	0.617		C.I	0.509

Exhibit - 4 (cont'd.)

RUSES***

	1979			1988		
	Units	Market share (M.S)	(M.S) ²	Units	Market share (M.S)	(M.S) ²
TELCO	7679	0.555	0.308	11461	0.563	0.317
Ashok Leyland	6015	0.435	0.189	8854	0.435	0.189
HML	90	0.007	0.007	50	0.007	0.007
PAL	58	0.004	0.000	0	0.000	0.000
Total Bus sales	13942			20367		
		C.I	0.497		C.I	0.506

SCOOTERS***

BAL	30508	0.257	0.066	362105	0.555	0.308
MSL	19559	0.165	0.027	92200	0.141	0.020
SIL	30352	0.260	0.068	665	0.001	0.000
LML				137932	0.212	0.045
BSL/BNAL	740	0.006	0.000	25370	0.039	0.002
Kinetic Honda				10459	0.015	0.000
API	26336	0.222	0.049	0	0.000	0.000
APSL	9160	0.077	0.006	0	0.000	0.000
KSL	1394	0.012	0.000	0	0.000	0.000
Total Scooter sale	118557			652031		
		C.I	0.217		C.I	0.377

MOPEDS***

KEL	30840	0.410	0.174	191546	0.412	0.170
SUCL/TYS	0	0.000	0.000	186999	0.402	0.162
MAL	7272	0.101	0.010	24050	0.052	0.003
EIL				12467	0.027	0.001
Kelvinator				23244	0.050	0.003
Kinetic Honda				26350	0.057	0.003
MIL	15959	0.222	0.049	0	0.000	0.000
KBPL	2491	0.035	0.001	0	0.000	0.000
IAL	1229	0.017	0.000	0	0.000	0.000
SZUL	2943	0.041	0.002	0	0.000	0.000
SPEF	2201	0.031	0.001	0	0.000	0.000
REL	2225	0.031	0.001	0	0.000	0.000
TNML	1500	0.022	0.000	0	0.000	0.000
Others	6003	0.083	0.007	n.a		
Total Moped sales	71943			464664		
		C.I	0.246		C.I	0.341

Exhibit - 4 (contd.)

THREE_WHEELERS***	1979	Market share (M.S)	(M.S) ²	1988	Market share (M.S)	(M.S) ²
Rajaj	13146	0.785	0.616	55728	0.817	0.667
AFI	3377	0.202	0.041	11478	0.168	0.028
SIL	228	0.013	0.000	1032	0.015	0.000
Total 3-wheeler sales	16743	C.I	0.657	68236	C.I	0.695

Source: AIAP

Manufacturer	Capacity	Manufacturer	Cap
PASSENGER CARS		COMMERCIAL VEHICLES (Contd.)	
Licensed		Licensed	
Hindustan Motors Ltd. Calcutta	80,000	Standard Motor Products of India Ltd. Madras	
Maruti Udyog Ltd. New Delhi	140,000	Swaraj Mazda Ltd. Rooper	
Premier Automobiles Ltd. Bombay	50,000	Tata Engg. & Loco. Co. Ltd. Bombay	
Standard Motor Products of India Ltd. Madras	12,500	Trishul Auto Crafts (P) Ltd. Patna	
Siyani Automobiles Ltd. Bangalore	3,000		35
	285,500		
Letter of Intent		Letter of Intent	
Munir K. Sarkar, Burdwan	2,400	Bharat Earth Movers Ltd. Bangalore	50
JEEPS		TRACTORS	
Licensed		Licensed	
Mahindra & Mahindra Ltd. Bombay	40,000	Auto Tractors Ltd. Lucknow	12
		Bihar State Agro Ind. Dev. Corp. Patna	10
		Eicher Goodearth Ltd. Faridabad	17
		Eicher Farm Machinery Ltd. Chandigarh	11
		Eicher Diesel Ltd. Alwar	7
		Escons Ltd. Faridabad	20
		Escons Tractors Ltd. Faridabad	10
		Gujarat Tractors Corp. Ltd. Baroda	7
		Harsha Tractors Ltd. New Delhi	10
		Hindustan Machine Tools Ltd. Pinjore	15
		Karloskar Tractors Ltd. Nasik	10
		Malundra & Malundra Ltd. Bombay	18
		Pittie Tractors Pvt. Ltd. Pune	12
		Pratab Steel Rolling Mills. Balabgarh	5
		Punjab Tractors Ltd. Chandigarh	20
		Sooraj Tractors Pvt. Ltd. Amritsar	7
		Tractors & Farm Equipments Ltd. Madras	12
		United Auto Tractors Ltd. Hyderabad	5
			203
Letters of Intent		Letter of Intent	
		Repute Tractor Engg. Pvt. Ltd. Bangalore	18
MOTOR CYCLES		SCOOTERS	
Licensed		Licensed	
Indeco India Ltd. Madras	418,000	Andhra Pradesh Scooters Ltd. Pattancheru	160,000
Indeco Ltd. New Delhi	230,000	Automobile Products of India Ltd. Bombay	200,000
Indeco (India) Pvt. Ltd. Mysore	92,000	Bajaj Auto Ltd. Poona	600,000
Indo Scooters Ltd. Madras	100,000	Bharat Heavy Electricals Ltd. New Delhi	15,000
Indo Automotives Ltd. Jamshedpur	6,000	Bihar Scooters Ltd. Patna	30,000
Indo Auto Ltd. Ludhiana	110,000	Gujarat Namada Auto Ltd. Bharuch	200,000
Indo Engg. Ltd. Bombay	6,000	Karnataka Scooters Ltd. Bangalore	60,000
Indo Scooters India Pvt. Ltd. Aligarh	600	Kelvinator of India Ltd. New Delhi	100,000
Indo Automotives Ltd. Saharanpur, U.P.	3,000	Kerala Automobiles Ltd. Trivandrum	24,000
Indo Engg. Tractors Ltd. New Delhi	7,000	Kinetic Honda Motors Ltd. Indore	200,000
Indo Auto Ltd. Bangalore	600	Lohia Machines Ltd. Kanpur	200,000
Indo Scooters Pvt. Ltd. Kanpur	500	Maharashtra Scooters Ltd. Solara	87,000
Indo Auto Ltd. New Delhi	250,000	Punjab Scooters Ltd. Chandigarh	24,000
	1,223,700	Scooters India Ltd. Lucknow	100,000
		Tawi Scooters Ltd. Srinagar	12,000
		U.P. Scooters Ltd. Kanpur	24,000
		West Bengal Scooters Ltd. Calcutta	30,000
		Rajasthan State Indl. & Mineral Dev. Ltd. Jaipur	24,000
			2,093,000
COMMERCIAL VEHICLES			
Licensed			
Atsya Nissan Ltd. Hyderabad	50,000		
Atsya Leyland Ltd. Madras	54,500		
Bajaj Tempo Ltd. Poona	30,000		
B.M. Toyota Ltd. New Delhi	15,000		
Indo Motors Ltd. New Delhi	12,000		
Hindustan Motors Ltd. Calcutta	30,000		
Indo Motors Rajkot (DEI Vehicles)	300		
Mahindra & Mahindra Ltd. Bombay	13,000		
Maruti Udyog Ltd. New Delhi	40,000		
Premier Automobiles Ltd. Bombay	15,000		
Standard Motor Products of India Ltd. Madras	12,000		
Siyani Automobiles Ltd. Bangalore	3,000		

Exhibit-5 (contd.)

CAPACITY

Manufacturer	Capacity
(SCOOTERS Contd.)	
Letters of Intent	
Aravind Benette Ltd. Calcutta	100,000
Gujarat Small Inds. Corp. Ahmedabad	70,000
Kerala Scooters Ltd. Trivandrum	50,000
West Bengal Scooters Ltd. Calcutta	70,000
	<u>196,000</u>
THREE WHEELERS	
Licensed	
Atul Auto Industries, Jamnagar	300
Automobile Products of India Ltd. Bombay	15,000
Bajaj Auto Ltd. Poona	33,000
Deva Automotive Pvt. Ltd. Kanpur	1,000
Electromobiles Ltd. Bangalore (Electric Vehicles)	25,000
Kerala Automobiles Ltd. Trivandrum	10,000
Lohia Machines Ltd. Kanpur	50,000
Scooters India Ltd. Lucknow	50,000
Karnataka Scooters Ltd. Bangalore	10,000
Sunku Enterprises (Kegd.) Hyderabad	1,000
	<u>199,300</u>
Letters of Intent	
Bajaj Auto Ltd. Poona	50,000
MOPEDS	
Licensed	
Atlas Auto Ltd. Sonapat	50,000
Elgi Equipments Ltd. Coimbatore	10,000
Hero Honda Motors Ltd. New Delhi	100,000
India Automotives Ltd. Jamshedpur	24,000
TVS-Suzuki Ltd. Madras	100,000
Karnavati Auto Ltd. Ahmedabad	15,000
Kelvinator of India Ltd. New Delhi	100,000
Kinetic Engg. Ltd. Poona	200,000
Kirloskar Chitoge Patil Auto Ltd. Kolhapur	24,000
Majestic Auto Ltd. Ludhiana	100,000
Mopeds India Ltd. Tirupathi	30,000
Ramon Engg. Ltd. Bombay	24,000
Saund Zweired Union (India) Pvt. Ltd. Gwalior	15,000
Scooters India Ltd. Lucknow	50,000
Scooters Kerala Ltd. Alleppey	50,000
Shree Chamundi Mopeds Pvt. Ltd. Bangalore	100,000
S & P Engg. Products Ltd. Calcutta	50,000
Tamil Nadu Mopeds Ltd. Madras	20,000
	<u>1,062,000</u>
Letters of Intent	
Balraj Aggarwal, Kamal (Haryana)	100,000
Sundram Clayton Ltd. Madras	294,000
Sundram Clayton Ltd. Madras (AP Unit - Assembly)	100,000
	<u>494,000</u>
D.G.T.D. Registered	
Karnavati Automobiles Ltd. Ahmedabad	15,000
Aravind Auto Ltd. New Delhi (I.C. Engines)	500,000

Source : ACFE

Exhibit - 6

Indian motor vehicle exports (1985/86): Value Rs. Crore

Country	4 wheeled vehicles	2 & 3 wheeled vehicles
USSR	11.9	0
Iran	9.3	0
Nepal	6.2	0.3
Bangladesh	5.6	0.14
UAE	4.6	1.1
Sri Lanka	3.5	0.3
Ghana	3.3	0
Uganda	1.7	0
Kenya	1.3	0.04
Mauritius	1.3	0
Kuwait	1.2	0
Malaysia	1	0
Bahrain	0.8	0
Yemen	0.6	0
Oman	0.4	0
Others	0	0.62
Total	52.7	2.5

Source: ACMA reports

Exhibit - 7

Indian Motor vehicle industry: Export trends (Rs. Crore)

	4 - wheeler vehicles	2 and 3 wheeler vehicles
1980/81	58.4	11
1981/82	75.1	8
1982/83	62.5	3
1983/84	43.4	4.2
1984/85	62.5	2.9
1985/86	52.7	2.5

Source: AIAM

Exhibit - 8

*****Automobile Industry- Exports*****

	1983/84	1984/85	1985/86
ASHOK LEYLAND			
Trucks and buses	252	255	281
BAJAJ AUTO			
Scooters	6957	3198	3438
3-wheelers	661	808	865

	7618	3998	4295
BAJAJ TENPO			
Hanseat	4	8	18
Matador	8	1	7

	4	1	17
HINDUSTAN MOTORS			
Trucks & buses	2		644
TELCO			
Trucks & buses	832	2887	1498

Source: AIAC

Exhibit 59
FOREIGN COLLABORATIONS - TECHNICAL

NAME OF COMPANY	NAME OF COLLABORATOR	PRODUCTS	YEAR
1. Andhra Pradesh Scooters	Piaggio Spa	Scooters	(1982-1992)
2. Automobile Products of India	Automotive Products	Brake Systems & Clutch Assembly	(1955-1985)
	Berat Brema Bejag KG	Clutch Facings	(1967-1972)
	Alfred Sell Autoteile Fabric	Brakes	
		Tie Rod Ends, Drag link ends, King pins, side rod assembly, Spring Bolts	(1961-1981)
	Firestone Tyre & Rubber	Brake Lining	(1954-1971)
	Fichtel & Sachs AG	Clutches	(1959-1978)
	Fiat SPA	Brakes	(1959-1968)
	Innocenti SG	Scooters & 3-Wheelers	(1955-1970)
3. Ashok Leyland	Leyland Vehicles	Cabs	(1984-1992)
	Zahnrad Fabrik Friedrichshafen	Synchromesh Gearbox	(1981-1991)
	Hino Motors Ltd.	Diesel Engines	(1986-1994)
4. Allways Nissan	Nissan Motor Co.	Light Commercial Vehicle	(1983.....)
5. Bejai Auto	Piaggio & Company	Scooters & 3 Wheelers	(1960-1971)
	Industria Prototipi & Serie	Restyling of Scooters	(1982.....)
	Kawasaki Heavy Industries Ltd.	Motor Cycles	(1982.....)
	Vögel, Spa	Special Purpose Machine Tools for Auto Components	(1985.....)
6. Bejai Tempo	Vidal & Sohn Tempo Werk	Tempo 3 Wheeled Commercial Vehicles	(1957-1987)
	Vidal & Sohn Tempo Werk merged with Rheinstahtl Hanomag AG	Tempo Viking 4 Wheeler Commercial Vehicles Petrol	(1964-1972)
	Rheinstahtl Hanomag AG merged with Hanomag Henschel Fahrzeug werke GmbH	Hanomag D 301 E 2 Type Diesel Engine	(1968-1972)
	Zahnradfabrik Friedrichshafen AG	ZF Automotive Gear Box 4 DS 10	(1962-1972)
	Daimler Benz AG	OM - 616 Diesel Engine	(1979-1989)
		T-1 Type Light Commercial Vehicles	(1986-1996)

NOTE: The two terminal years in the last column show the beginning and the end of the collaboration. Where sign is given the collaboration is still continuing but the terminal date of its end is not known.

Exhibit - 9 (contd.)

NAME OF COMPANY	NAME OF COLLABORATOR	PRODUCTS	YEAR
7. DCM Toyota	Toyota Motor Corporation	Light Commercial Vehicle	(1984-1984)
8. Escorts	Yamaha Motor Co.	Motor Cycles/Scooters	(1983-)
9. Enfield India	Maschinen Fabric	IC Engines/Diesel Engines & Engine blocks	(1981-)
	Enfield Cycle Co.	Motor Cycle & Components	(1954-1989)
	Villiers Engg. Co.	Two Stroke Engine Gear Box Units	(1960-1970)
	Zundapp Werke GmbH	Motor Cycle, Motor Cycle Engine, Mopeds	(1982-)
10. Eicher Motors	Mitsubishi	Light Commercial Vehicles	()
11. Hindustan Motors	Vaushell Motors	Commercial Vehicles	(1980-1983)
	Isuzu Motors	Commercial Vehicles	(1983-)
12. HMT	Motokov Foreign Trade Corporation	Engines Axles & Transmissions for Passenger Cars	(1983-)
		Trooper	(1984-)
		Tractors	(1971-1983)
		Motor Cycle & Mopeds upto 100 cc	(1984-1994)
13. Hero Honda	Honda Motor Co.	350 cc Twin Cylinder Engine	(1983-1991)
14. Ideal Jawa India	Polytechnic	(")	(1970-1973)
	Polytechnic	(")	(1980-1970)
15. Kinetic Engineering	Motokov	Jawa 250 cc Motorcycle	(1980-1970)
	Morino Franco	(20% Component)	(1980-1970)
	Motori Minarelli	Jawa 250 cc Motorcycle	(1980-1981)
	Honda Motor Co.	(80% Component)	(1983-)
16. Kinetic Honda	Moped Engine	Moped Engine	(1984-1989)
	Moped Engine	Moped Engine	(1982-)
17. Kelvinator of India	Agrati Garelli SPA	Scooters	()
18. Kirloskar Cummins	Pieraggio & CSPA	Mopeds	()
		Diesel Engines	()
19. Lohia Machines	Pieraggio & CSPA	Light Scooter 97cc	(1987-)
		Moped 49.77 cc	(1983-)
		3 Wheelers	()

Exhibit - 9 (contd.)

NAME OF COMPANY	NAME OF COLLABORATOR	PRODUCTS	YEAR
20. Majestic Auto	Herz Motor	Two Wheelers Engine	(1985-.....)
21. Mahindra & Mahindra	St. Daimler PUCH AG	Fuel Efficient Two Wheeler	(1986-.....)
	American Motor Corporation	Jeep Vehicles	(1954-1974)
	Automobile Peugeot	XDP-4,80 Diesel Engines	(1975-1989)
	KIA Machine Tools	Light Commercial Vehicles	(1979-1995)
	International Harvester	4 speed Transmission and transfer cases	(1982-1985)
	Dana Corporation	Agricultural Tractors	(1961-1971)
		Propeller Shafts, Axle Shafts and Universal joint kits	(1978-1986)
22. Maruti Udyog	Suzuki Motor Company	Cars & Commercial Vehicles	(1982-.....)
23. Premier Automobiles	Henry Meadows	Meadows Diesel Engines	(1967-1971)
	North American Rockwell Corp.	Timken Axles, Assemblies and related components for commercial vehicles	(1963-1970)
	FIAT SPA	Fiat 124 Car Body	(1981-1986)
	Chrysler Corporation	Fiat 1100 D 4 Door sedan Car	(1965-1971)
	Nissan Motor Co. Ltd.	Dodge/Fargo Commercial Vehicle	(1968-1972)
	Lambretta	Nissan A12 Engine Transmission	(1984-1989)
24. Scooters India	F. Perkins Limited	Scoters, 3 Wheelers	n.a.
25. Simpson	Np. Collaborator - Purchased Design from Austin Rover Group Limited	Diesel Engines	n.a.
26. Standard Motor Products		Passenger Car	(1983-.....)
27. Sundaram Clayton		Mopeds	
28. Swraj Mazda	Mazda Motor Corporation	Light Commercial Vehicles	(1984-.....)
29. TAFE	Massey Ferguson	Agricultural Tractors	n.a.
30. Telco	Daimler Benz AG	Diesel Engines, Trucks & Buses	(1954-1969)
	Kuhnie Kopp & Keusch AG	Direct Injection Engines	(1969-1974)
	George Fischer Limited	Turbocharges for IC Engines	(1977-1985)
31. TVS-SUZUKI	Suzuki Motor Company	Ductile/SG Iron castings	(1978-1988)
32. Gujarat Narmada Auto		Motorcycles/Mopeds with 100 cc Range	(1983-1993)
33. V.S.T. Tillers & Tractors	Mitsubishi Heavy Industries	Scoters	
		Mini 4 wheel Tractor	n.a.

Energy Consumption Characteristics

Type	Fuel/veh. (Tonne/yr)	Ton.KM Eqvlt.	Dist. util.	Type Nos.	Type Output (tonne-ks)	Output Propn.	Type Fuel (tonne/yr)	Propn. Fuel use
Scoters	0.296	960	7500	5000000	4.0E+09	0.010	1400000	0.05
M/Cycles	0.296	1120	8500	2300000	2.6E+09	0.003	690000	0.02
Mopeds	0.296	800	6200	2500000	2.0E+09	0.004	740000	0.03
Cars	1.412	1600	9100	2000000	3.2E+09	0.007	2024000	0.10
Taxis	2.815	4000	22000	150000	7.2E+08	0.002	422250	0.01
Rickshaw	1.342	3360	21500	384000	1.3E+09	0.003	515320	0.02
Buses	17.8125	300000	100000	270000	0.1E+10	0.176	4009375	0.17
LDV's	4.213	20000	20000	330000	9.2E+09	0.020	1390290	0.05
Trucks	17.3166	399000	44360	894000	3.6E+11	0.773	15401040	0.55
				13020000	4.6E+11		20343003	

Exhibit - 11

Congestion : Efficiency of road space utilisation

	Area(sq. m.)	Avg. Occupancy	Occupancy/Sq. m
Scoters	5	1.62	0.32
Motorcycles	5	1.62	0.32
Mopeds	5	1.62	0.32
Cars	12	2.2	0.18
Taxis	12	2.63	0.22
Autrickshaws	7.5	1.95	0.26
Buses	27.5	37.5	1.36

Source: Ministry of Industry

*****AUTOMOTIVE INDUSTRY -- PRODUCTION TRENDS*****

CARS***	1988	1988/89 DCAA Estimate	1996 Dept. of Industry estimate
Total Car Prod'n	159937	135000	121000
JEEP***			
Total Jeep Prod'n	35772	41000	24400
LCV***			
Total LCV Prod'n	46198	75000	81000
TRUCKS***			
Total MHCV prod'n	70075	110000	107000
SCOOTERS***			
Total scooter prod'n	645823	600000	606000
MOPEDS***			
Total moped prod'n	478297	641000	n.a
MOTORCYCLES***			
Total motorcycle prod'n	411660	302000	n.a
THREE_WHEELERS***			
Total three wheeler prod'n	68983	125000	54000

Source: DCAA, AIAD reports

APPROVAL

GRANTS, EXCHANGE

FEB 88

FEB 88

FEB 88