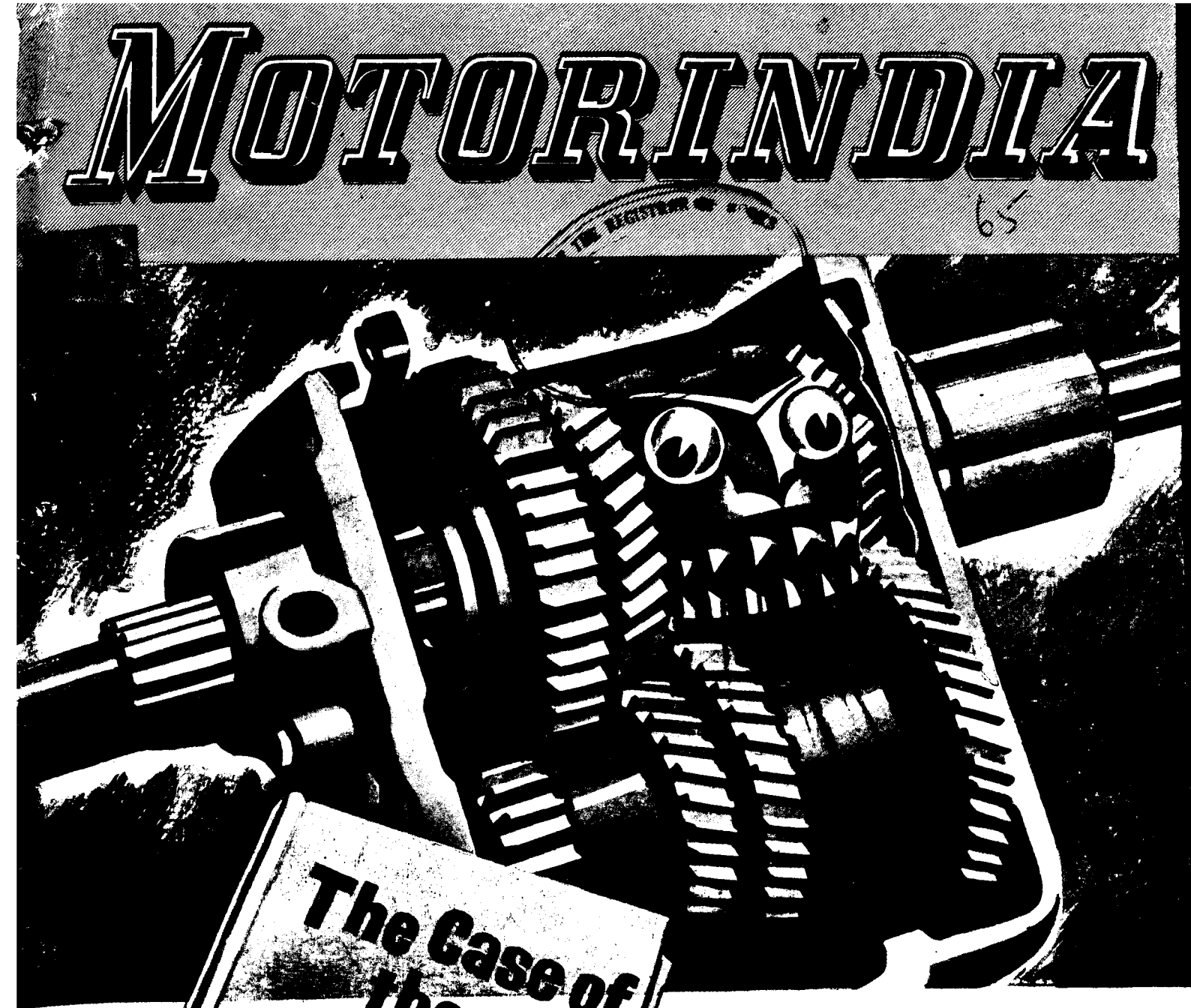




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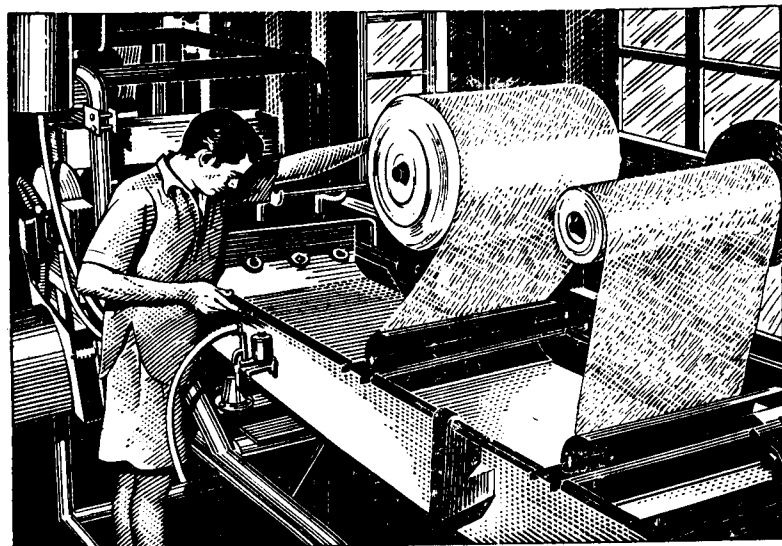
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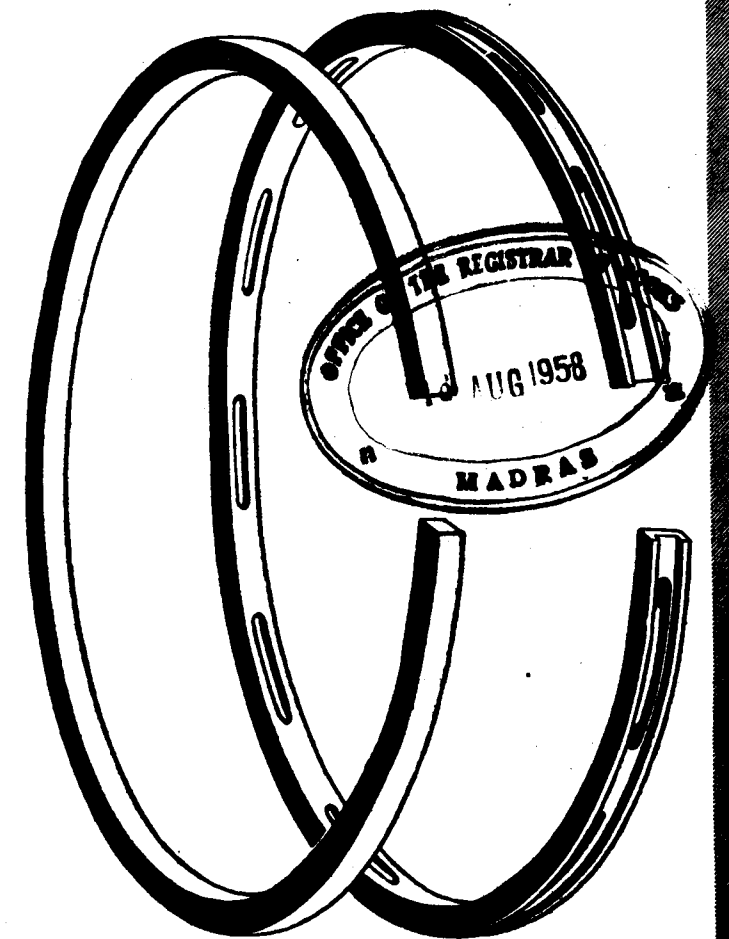
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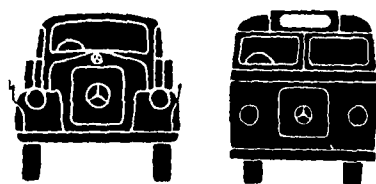
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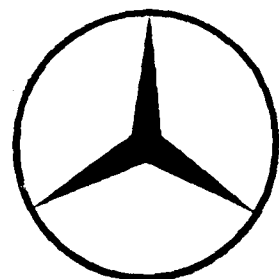
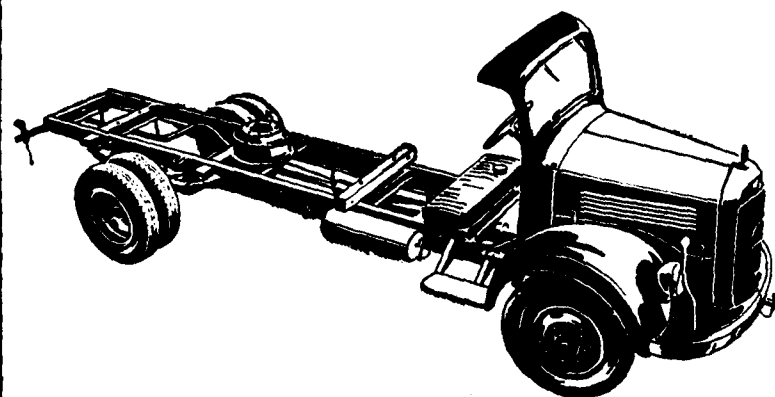
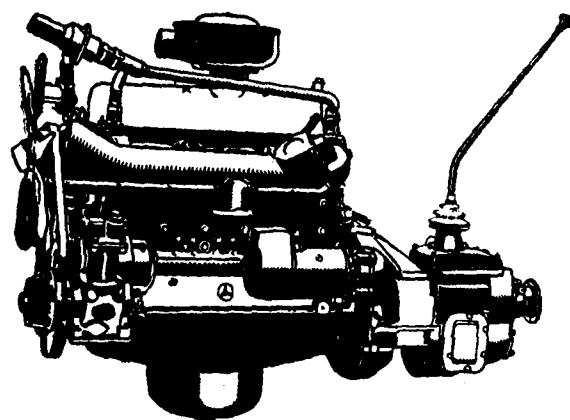
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MOTORINDIA

ANNUAL 1958

Editor : M. RAJAGOPALAN

CONTENTS

Editorial	...	7
World scenes from East to West	...	9 & 57
The goose and the Golden Eggs by K. Santhanam	...	11
The Indian Automobile Industry :—		
Jeep	...	15
Perkins	...	21
Leylands	...	25
Dunlops	...	29
Tata Benz	...	31
Hyderabad Allwyn	...	35
Enfield	...	41
Hindustan Motors	...	41
Kirloskar	...	43
Production Progress Pictorial	...	45
Technical Education in India by B. Sen Gupta	...	51
Inland Transport in the United Kingdom	...	59
Foreign Cars — illustrated	...	77
Aluminium in Road Transport by R. K. Chari	...	87
Friction Shock Absorbers	...	88
The ABC of the Automobile by V. M. Meswani	...	91
Motor Industry in Great Britain by Gordon Wilkins	...	98
I am a Motor Addict by Dr. C. P. Ramaswami Iyer	...	99
Driving Dilemmas by our Australian Correspondent	...	101
Humours of Motoring by S. K. Chettur I.C.S.	...	102
Rhymes While you Ride by A. Holden	...	103
London to Sydney by a Scooter by Robert Kingsbury	...	105
Famous Last Words by A. Holden	...	107
Passenger Transport Bus Service and Taxis in Madras State	...	109
Nationalised Transport in Madras State	...	110
Hill Stations in South India by S. Natarajan	...	113
Air News	...	115

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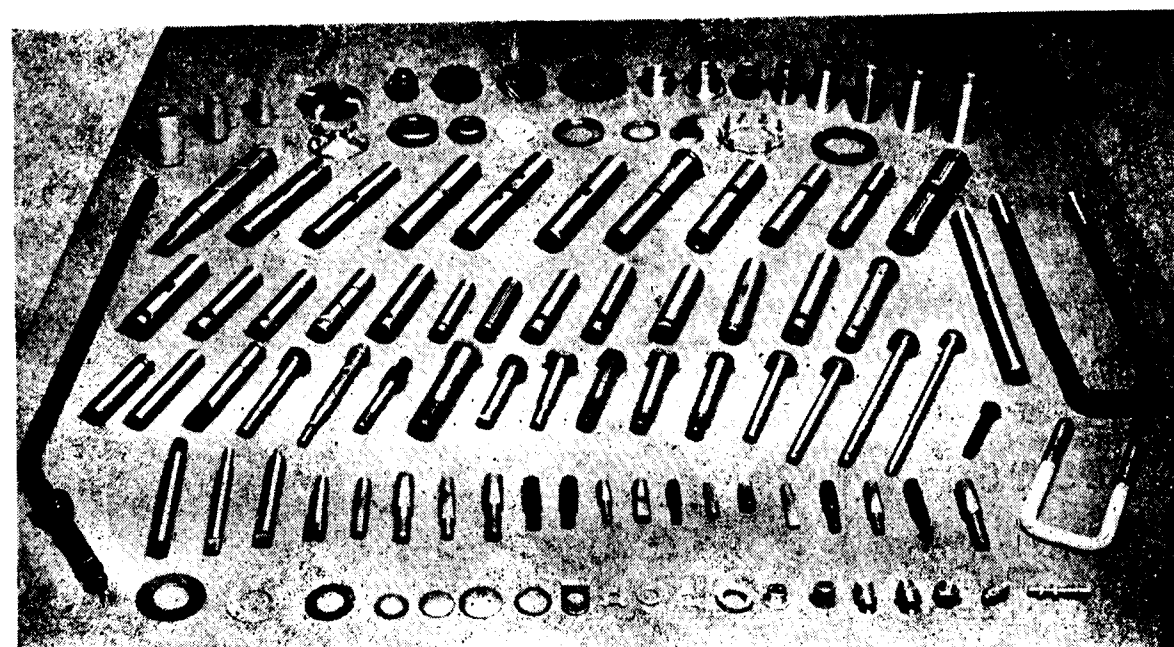
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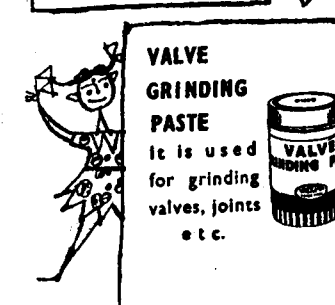
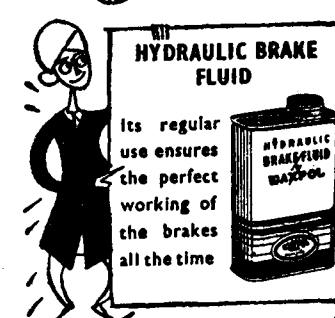
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MOTORINDIA

65

Index to Advertisers

	PAGE		PAGE
Armstrong Smith Private Ltd.	... 30	Imperial Chemical Industries (India) Ltd.	... 18
Ashok Leyland Ltd.	... 60	Independent India Motor Co.	... 50
Associated Auto Parts Private Ltd. The	... 70	Indian Aluminium Co. Ltd.	... 86
Associated Engineering Works Ltd.	... 104	India Pistons Private Ltd. (Third cover)	...
Associated Trades	... 64	Jay Motors	... 60
Auto Instruments Co.	... 93	Kamal & Co. (Jaipur) Private Ltd.	... 108
Auto Lamps	... 104	Kannappan Motor Stores	... 100
Auto Diesels	... 91	Kirloskar Oil Engines Ltd.	... 42
Automobile & Agricultural Industries Corporation	... 28	Lucas Indian Service Private Ltd.	... 56
Automobile Components	... 60	Madras Bangalore Transport Co. Private Ltd.	... 66
Automotive & Allied Agencies. The	... 91	Madras Mercantile Agencies	... 74
Automotive & Allied Industries (Private) Ltd.	... 76	Madras Sales Corporation	... 21
Auto Sales Co.	... 35	Mahindra & Mahindra Ltd.	... 14
Balu Automobiles. The	... 37	Miniature Bulb Industries of India	... 94
Bangalore Automobiles	... 70	Modern Automobiles	... 6
Basha, A.	... 54	Modern Distributing Co.	... 78
Bawa Motors	... 39	Motokov	... 24
Bharat Agencies. The	... 22	Motorcycles (India)	... 29
Bharat Motors	... 81	Motor & General Trading Co.	... 56
Bombay State Road Transport Corporation	... 38	Motor Industries Co. Ltd.	... 16
Bower Battery Manufacturing Co. (Private) Ltd.	... 76	Maxwell Trading Co.	... 72
Carborandum Universal Ltd.	... 62	Nethaji Lorry & Bus Service	... 108
Central Automobiles Private Ltd.	... 36	Newton & Co.	... 39
Central Trading Co.	... 44	Overseas Manufacturers Sales Co.	... 34
Chandulal Mehta & Co. Private Ltd.	... 72	Pavana Electric Co.	... 103
Chimanlal Desai & Co.	54 & 75	Popular Transports	... 62
Chloride & Exide Batteries (Eastern) Private Ltd.	... 90	Premier Automobiles Ltd.	... 8
Competition (Sales) Corporation (Facing Index)	...	Purushotham Murarjee	... 95
Continental Motors	... 40	Raman & Raman Private Ltd.	... 100
Deens Garage	... 27	Ramalingam & Sons, V.C.	... 64
Dunlop Rubber Co. (India) Ltd.	... 74	Ruby Rubber Works Ltd.	... 68
Eastern Agencies. The	... 92	Scott & Pickstock Private Ltd.	... 89
Eastern Automobile & Engineering Co. (Private) Ltd.	... 52	Simpson & Co. Ltd.	... 20
Enfield India Ltd.	... 38	Singson & Co. (India)	... 50
George Oakes Private Ltd.	... 80	South India Automotive Corporation (Private) Ltd.	... 100
Glass & Miniature Bulb Industries	... 32	Standard Batteries Ltd. (Second cover)	...
G.M. Automobiles	... 68	Standard Garage	... 26
Goetze (India) Private Ltd.	... 1	Standard Motor Products of (India) Ltd.	... 52
Grover, D.V.	... 23	Standard Vacuum Oil Co. (Front cover)	...
Gurmukh Singh & Sons (Regd.)	... 50	Tata Locomotive & Engineering Co. Ltd. (Facing contents)	...
Himco (India) Private Ltd. (Fourth cover)	...	United India Fire & General Insurance Co. Ltd.	... 25
Hindustan Ideal Insurance Co. Ltd.	... 68	Upper India Trading Co.(P)Ltd.	19,23&33
Hindustan Motor Ltd.	... 12	Vijay Diesels	... 96
		Vijay Trading Co.	... 66
		Vikrama Engineering Co.	... 17
		Waxpol Industries Ltd.	3 & 5

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editorial

ANOTHER MILESTONE

Another milestone passes with the publication of this Annual and *MOTORINDIA* enters the third year in its service of the automotive industry, the motorist and the operator. We may, therefore, be excused for some introspection and for viewing in public our own future.

The year that is past has been a critical one for this publication, thanks to the ever-increasing prices of already held stocks of superior quality paper following an inevitable restriction of imports by Government. This increase has, in a way, practically eclipsed the progress of our economy during the year. Otherwise, our second year of publication is remarkable in many ways because of our achievements. We deliberately use the word achievement, because it is no small tribute to the excellence of production and contents of this journal that we should have been called upon to shoulder the unique responsibility of being voted the official or approved organ of the Redex Car Club—an international organisation—whose membership, no doubt, is centred in the City of Bombay where there is no dearth of automobile publications. This recognition has given *MOTORINDIA* an exceptional opportunity of, if we may say so, selling coal to New Castle.

No less important an event during the same year is the recognition of *MOTORINDIA* by the Mysore Automobile Parts & Allied Merchants Association as their approved organ. Members of these two organisations are all readers of *MOTORINDIA* now and we have no doubt about the manner in which they enjoy the columns of *MOTORINDIA* and its contents.

Thus, the year that is past has been one of mixed feelings for this publication.

For the Automotive Industry, however, it is a year of great significance in that feeder factories producing endless number of ancillary or allied products for the industry have sprung up in some numbers in various parts of the country. Practically every week a new manufacturing unit is being established. It is well that such units of production should spring up, because unless feeder industries for the manufacture of most of the 5,000 auto parts that comprise a motor vehicle are developed by new manufacturers throughout the length and breadth of this country there is no immediate future for the economic production of automobiles in this country. True, the way in which automobile production started some years ago did not realise this basic fact, but we are glad to note that the main manufacturers are realising the very essential part that the feeder industries are bound to play in the economy of automobile production.

It is, therefore, with a sense of duty to the industry and a sense of responsibility to the consumer that we rededicate ourselves for the future orderly growth of this industry in this country.

Onward to 1,00,000

November 22, 1957 marked a red-letter day in the life of our young company. On that day we celebrated the production of our 55,000th vehicle.

Behind its production lie a few brief but hectic years, years of careful, far-sighted planning and intense effort, ultimately translated into prideful achievement. Ahead of it lies an undreamt of future, a vast field of endeavour for us. To follow it, there will be a long long line of more and more vehicles to be produced under our plan of progressive manufacture.

These vehicles* are destined to play an important role in the country's transport and economy. Imagine the crores of rupees that are likely to be saved by way of foreign exchange! The Second Five Year Plan, which has been rightly called the "Transport Plan," is geared to the needs of rapid industrial development. The target is an annual manufacture of 57,000 vehicles by 1961. We have the will, the confidence and the ability to make a substantial contribution to it.

* Dodge and Fargo diesel buses — Diesel and petrol trucks — Dodge, Plymouth and Fiat cars

THE PREMIER AUTOMOBILES LIMITED BOMBAY 37

SISTA'S-PAL-293



A scenic spot along the Kiso River
(JAPAN RHINE)

World scenes from

EAST
&
WEST



The Rock of Gibraltar

THE GOOSE AND THE GOLDEN EGGS

BY

SRI K. SANTHANAM

Motor transport is, today, the national goose that lays the golden eggs. It has to do so not for one but for many persons. However, all of them are becoming greedy and impatient to get ever bigger eggs.

The Central Government derives an income of 13 crores from imports of motor vehicles and parts and 30 crores from the excise and import duties on motor spirit. The State Governments get 20 crores per annum from motor transport, through sales-tax on motor spirit, registration and licence fees and taxation of stage carriages, public carriers and private vehicles. Though, fortunately, tolls have been generally abolished, they are still to be found in some places. Municipalities also levy *octroi* duties and terminal taxes in many towns. Like the Central tax on railway fares, the State Governments are levying taxes on fares and freights of passengers and freight carried by motor transport.

The poor goose has also to lay a substantial egg to subsidize the production of motor vehicles in the country. The national importance of this industry may be freely admitted. But the burden it imposes on the users of motor transport is not as well recognised. Assuming that 30,000 units are produced annually through part manufacture and part assembly, the cost of each unit above that of the imported vehicle of the same variety may be estimated to be about Rs. 5,000. In other words, the country is giving a subsidy of about 15 crores annually for this purpose. As was explained the other day by a Representative of the Standard Motors, U.K., the foreign exchange components of the Indian product is likely to be considerable for many years to come. It is natural that these parts should cost much more to the Indian manufacturer than to the foreign producer who makes them. There is also the royalty to be paid. The factories producing motor cars in India are not large enough to hope for economic production in the future. Hence the subsidy will grow with increase in Indian production.

At the other end, the motor transport has to ply on roads which are not surfaced and which are frequently not even properly metalled. Generally, road maintenance throughout India is unsatisfactory though in some States like Madras, it is not so bad. This causes heavy depreciation both to motor transport and roads. If to all this is added the price of petrol and the operating charges, the cost of motor transport is necessarily high. It is bound to become higher, as a considerable part of the existing motor vehicles was imported at a time when the burden was not so heavy. Further, the substitution of diesel buses and trucks has, for the present, enabled operators to bear higher taxation without increase of fares and freights. I doubt if this can continue much longer. The shortage of transport may make it possible to increase fares and freights. But it is bound to have a deterrent effect on economic progress.

Thus, we are moving in a vicious circle. On the one hand, we are planning for the highest possible rate of economic development. On the other hand, such development is hampered, if not altogether prevented, by the anxiety of the various parties concerned to make the largest immediate profit possible. In this fierce context between the present and future, the latter is bound to suffer. I feel that a rational and comprehensive policy is needed if motor transport is to play its rightful part in the economic development of the country.

It must start with the roads. All roads available for public service vehicles should be surfaced as quickly as possible with bitumen. No extension should be allowed on un-surfaced roads. This will conserve the life of the motor vehicle and also prevent the deterioration of the roads.

Next comes maintenance of roads available for motor traffic. I think, the simplest and the best way to maintain them is to make the motor operators responsible for it. If

there are more operators than one on a particular route, the road may be divided between the operators for maintenance. If the operators are paid maintenance charges at the existing rates, I am sure the maintenance will be much superior to that at present.

Next, the possibilities of reducing the cost of production have to be explored on a national basis. It may be found that if all the existing manufacturers of automobiles can combine and set up factories for producing common parts, substantial economies may result. If necessary, there should be no hesitation in changing the designs so that as many parts as possible may be produced in common.

Another step is to simplify motor taxation and stabilize it at the existing level for a specific period, say 15 years. I am aware of the demand for reduction of the present high rates, but neither the States nor the Central Governments can afford to lose any part of the existing revenues. If they can refrain from increasing taxation, it is as much as can be expected from them.

Heavy taxation, bad roads and other difficulties which motor transport has had to face had some beneficial aspects also. It made it unprofitable for the inefficient operators and has enabled efficient operators to annex the routes of the former. Motor traffic is to-day unsuitable for the small operator and I am convinced that only those who have a fleet of at least 100 vehicles can provide well-equipped repair shops, training facilities for operating and maintenance staff and amenities for workers and passengers. It is not blind nationalisation but prudent rationalisation that is needed. It will be wise for the Government and operators to bring about this rationalisation through conscious co-operation rather than allow it to be imposed by the pressure of necessity.

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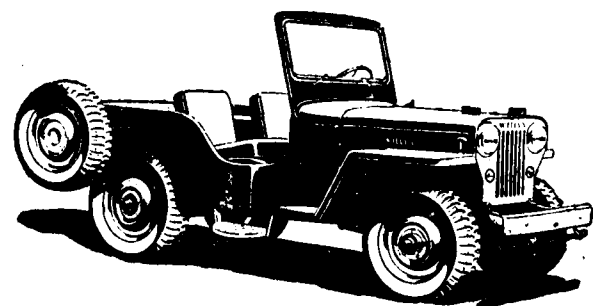
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The
Indian
Automobile
Industry

From The Horse's Mouth

Is a familiar saying when you talk of a certainty but when it comes to a question of dependable background in our infant auto industry, there can be no better and authentic version of progress than that of the chairmen of various firms as they tell the shareholders of progress achieved and planned.

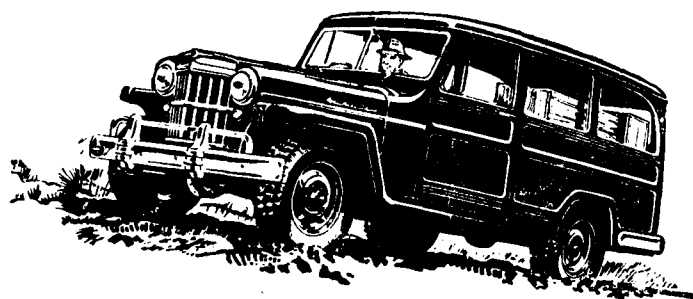
The following pages give such an authentic version of progress in the industry.



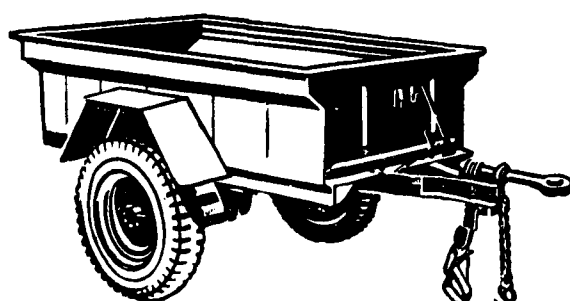
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JEEP TURNOVER REGISTERS 33% INCREASE

By Mr. K. C. MAHINDRA

The turnover in Jeeps and allied vehicles was about 33 per cent higher than in the previous year. The Company's dealers and distributors have added additional facilities in order to meet the growing demand for after-sales service. Their co-operation has been forthcoming very rapidly in spite of reduction in their gross remuneration made last year by the Tariff Commission.

Tractor sales show a heavy decline due principally to the severe restrictions imposed by Government on import quotas. Unfortunately for our Company, Government chose to base the licence quota on the imports for the year 1954-55 which was the first full year of our handling the David Brown franchise and when our sales were comparatively small. Repeated representations to Government for additional *ad hoc* licences have not borne any fruit. To me it is surprising indeed that with the continuous threat of foodgrains deficiency and the urgent need for substantial increase year by year in the quantum of our agricultural products, the very highest priority is not being given to such instruments of higher productivity as tractors and implements. Even our programme for the progressive manufacture of Tractors in India prepared in collaboration with David Brown, and submitted in November 1956 to Government, is still awaiting decision.

The Trailer Division shows a turnover of about 35 per cent over last year's figures. In order to meet the expanding need for Trailers in the country, our Directors have decided to separate this activity in a new subsidiary company. Import licences have not been readily forthcoming for essential components which are not available locally. Arrangements have therefore been concluded with the well-known British firm of Rubery Owen & Co., Ltd., to provide the Plant, Tooling and Designs required to commence the manufacture of these components. In return for the supply of these equipments Rubery Owen will be allotted equivalent shares in the new company up to

49 per cent of the total capital. The balance 51 per cent will be held by your Company. This arrangement will not only ensure the production of complete Trailers in the country, but will enable the new company to enlarge the range, size and scope of Trailers. The excellent research facilities and design improvements available with Rubery Owen in Britain will be at the disposal of the Indian company.

In accordance with the findings of the Tariff Commission that the demand in the country for Jeeps would progressively increase to 5,000 units by 1961, a phased programme for increasing the production capacity of your Company was submitted to the Government. The progressive schedule to double the rate of production in order to cater for this growth in demand has now received approval. The details of the foreign exchange required for additional plant, machinery and tooling are with the Government and receiving their consideration. Indications are that sanction for this purpose will be forthcoming soon, particularly as plans relate to the manufacture of special utility vehicles.

In planning manufacturing facilities to produce automotive vehicles in volumes of 5,000 units or more, the basic requirements for an economic operation change. On a small volume production even scattered facilities might suffice, but for larger volumes the economics of the scheme dictate the need for consolidated and integrated facilities. Systematic store-keeping and straight line flow of production, efficient handling of component manufactures and good housekeeping both in the factory and the warehouses become an economic essential. Need for flexibility for further expansions calls for meticulous planning in great detail. With this in view, the engineers of our Company have been making elaborate studies and although a year or two ago it was not possible to contemplate a large building programme, the eas-

ing of construction materials in the market makes it now a practical proposition. Our Company already owns over 100 acres of land at Pimpri near Poona, and provided further facilities like water, power and railheads can be arranged, plans to build in that area may materialise. For the purpose of doubling our present targets for production of Jeeps and for integrated development, substantial finance will be required. The Company's application for issue of additional capital is under discussion with the Controller of Capital Issues and as soon as the details are finalised the shareholders will receive prompt intimation.

In concluding this survey of Company's operations and hopes for the future, may I say that despite stringent conditions of operations in an economy presaging a world wide recession amidst inflationary potential, the results of the current half year indicate that our Company's executives have been adapting themselves to meet these new and diverse circumstances and have maintained a high level of management efficiency. These are relative terms. In the ultimate analysis, volume of sales, quality production, development outlook and profits are the criteria of judgment. Of the quality of the product made in India, Willys engineers have spoken highly. The design and development section of our Company is today in an embryonic stage, but a sound beginning has been made and the basic thinking behind these developments is under proper guidance. I place considerable emphasis on this aspect, as in my opinion with our present knowledge of automobile designs and with the scanty manufacturing facilities in the country, lot of useful effort is being wasted in attempting to do too much.

Government deserves praise for initiating an aggressive programme

MICO

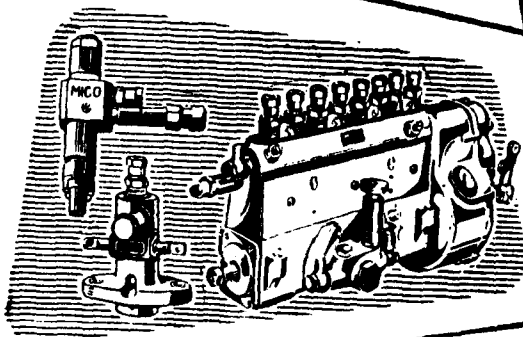
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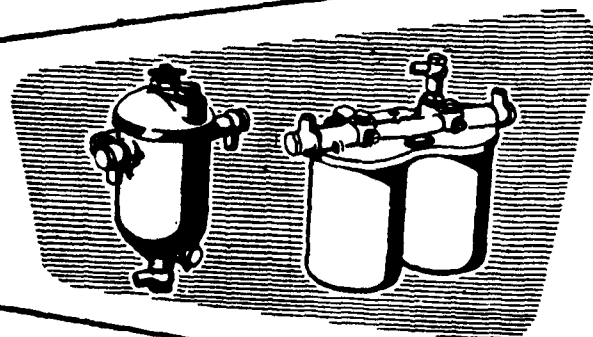
SPARK PLUGS



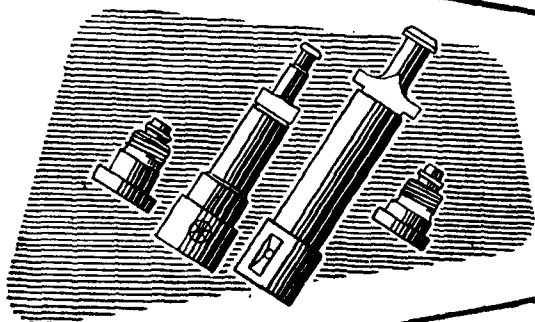
**FUEL INJECTION PUMPS
 & NOZZLE HOLDERS**



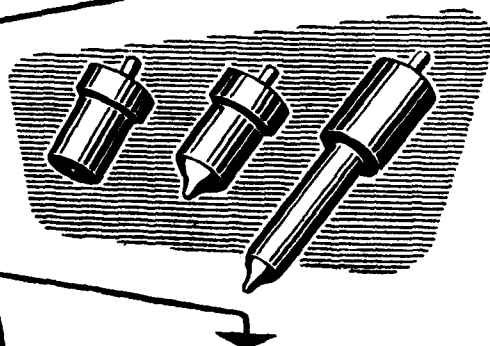
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for increasing industrial production and a considerable measure of success has attended these efforts, but to sustain the increase and keep on a progressive rate of growth two essential conditions must be satisfied, namely, demand to keep pace with supply and raw materials to be made available in abundance and in time.

Transportation has been sometimes defined as the conveyor belt of industry. India has widespread and complicated railway system originally established to cater for activities in port towns in so far as industrial economy was concerned. The overhaul and rehabilitation of the system has consumed vast sums of money. With the increased demands placed on this system by the contemplated growth in the economy it was correctly recognized that a major effort would be required in expanding the system and almost 25% of the Second Plan outlay was devoted for this purpose. With the expenditure of over Rs. 1,000 crores on the system the railways are expected to be able to haul 162 million tons by 1960-61, an increase of about 47 million tons over 1955-56. When we consider that the steel industry expansion alone will require a movement of 36 million tons a year, the added increase in the carrying capacity of the railway system appears much too inadequate for the rest of the economy in India. When we consider that the eruption of high food-grain prices in various corners of the country is principally due in maldistribution and to the failure to reach the foodgrains to the hot-spots within time the matter becomes extremely urgent for an exhaustive re-examination of the transport position. It would appear that despite the best efforts to rehabilitate track and extend the rolling stock it will still not be possible for the railways to service the distribution needs. A medium with greater

flexibility and accessibility must be found. In considering the various alternatives there is but little choice. It is the use of trucks, truck-trailers and tractor-trailers alone which would ease the burden on the overloaded railways and on our meagre coastal services.

There are a number of factors which act today as deterrent to the development of an extensive Truck Haulage Service. The recent announcement of an Inter-State Transport Commission with comprehensive powers over development, co-ordination and regulation and of Transport Development Council at the ministerial level and of Road and Inland Water Transport Advisory Committee composed of official and non-official members is a welcome recognition of the importance of the distribution problem. It is acknowledged that the level of taxation in India so far as transport is concerned is perhaps the highest in the world; that Inter-State controls on movement from one State to another are irrational and obstructive without yielding a single tangible benefit to any party; that threat of nationalisation of Goods Haulage Services in various States is a positive dis-incentive to development. There are not sufficient trucks coming off the manufacturer's lines, nor are operators coming forward in sufficient numbers to take up the service. The Minister of Transport and Communication stated the other day that the Plan provides for the production of 136,000 vehicles between the years 1957 and 1961. This volume, even if achieved, plus the existing fleet computed to be about 130,000 vehicles less obsolescence is hardly adequate for what is estimated as the minimum requirement, for moving the products of the Second Plan economy. Some special effort would be necessary as much for

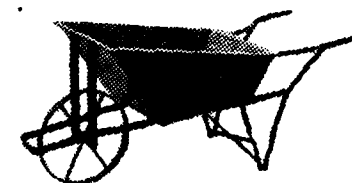
supply of more vehicles as for improving the road system, including the bridging of important rivers and provision of feeder roads from and to centres of production and consumption. We have the triple problem in road transport which must find a solution if the planned economy is to achieve even a modicum of success in operation. There is first the problem of building the balance of 114 bridges as planned; of extending the mileage of national highways to a minimum of 15,000 miles; of a concerted and intelligent development of feeder roads and bye-ways. This problem, we are assured, is being energetically tackled by the Transport Ministry. The second problem is the quick supply within the next few years of an adequate number of trucks with payloads ranging from one-ton to ten-tons and of truck-trailer and

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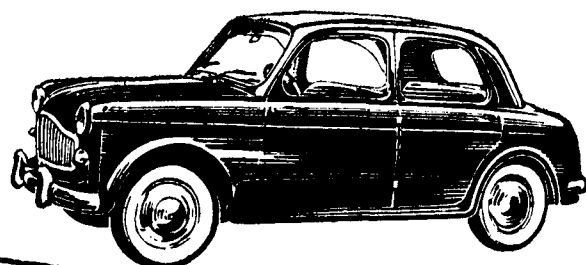
Mechanical & Structural Engineers
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Annual 1958
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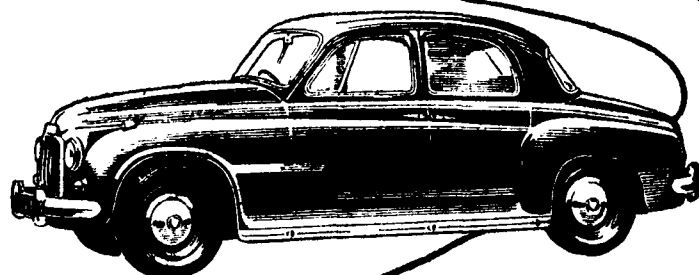
MOTORINDIA

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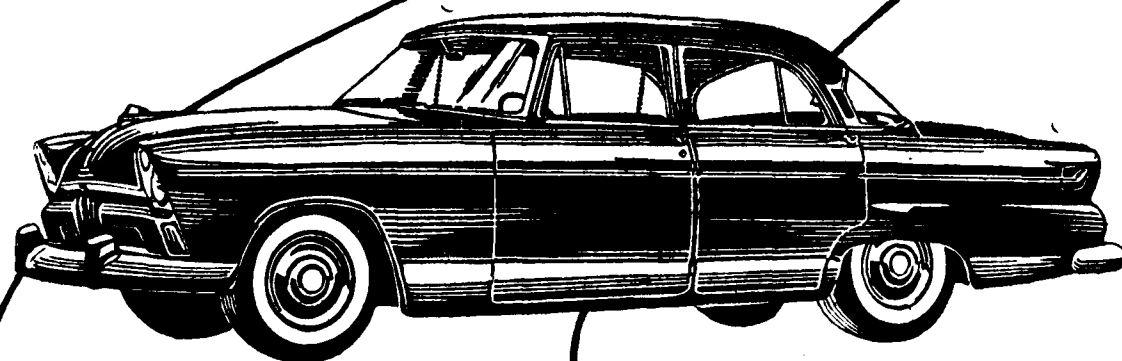
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tractor-trailer combinations for service on the main routes. I reckon that from now provision of a minimum of 50,000 trucks a year and say 5,000 tractor-trailer combinations should be made. The producers of trucks, tractors, trailers in India are not equipped today to furnish this quantity of vehicles. A concerted and co-ordinated programme as between the various manufacturers, a factures and a direction to get the results at any cost is the desideratum of planning in this context. Finance is the mobilizer and I suggest that while the Ministry and the Planning Commission engage themselves in devising methods of co-ordination and direction, the proposed Refinance Corporation for Industry Private Limited should take up, as a matter of priority, the requirements for capital finance of the various manufacturers for the speed-up. I reckon that a matter of Rs. 10 crores will be needed and this is not a large amount for insuring the production of 50,000 trucks and 5,000 tractor-trailer combinations a year in the country.

Alongside such production there will be the question of off-take—who will buy these vehicles and who will operate? This is problem number three. The decision on the moratorium on the nationalisation of goods transport has been extended till the end of the Third Five-Year Plan period is good as far as it goes, but it is not enough. Apart from long-term inducements for people to engage themselves in this service with its high obsolescence mark, there is the vital question of finance. Money for financing the purchase every year of 50,000 truck services and for finding operating costs thereof is simply not there in the country. I suggest a Truck Finance

& Development Corporation which would guarantee the manufacturers the purchase of all the vehicles they can produce and which would simultaneously offer the operators easy payment terms on an instalment basis. The Hire Purchase System has become a normal and essential part of the automotive trade in America and in Europe. Private agencies, no doubt, have flourished in India too, but their scale of operations is too small and their finances insufficient. The Truck Finance & Development Corporation which I am asking the State to sponsor should be able to meet the demand of the problem as posed by me with capital fund of say Rs. 50 crores—a small sum as compared to the huge outlay on the railways system. If the charter of the Refinance Corporation cannot be specially amended to render assistance in full scale to the present manufacturers, for they may not come in the category of "medium industries," their capital finance will need to be provided by the Truck Finance & Development Corporation which I have proposed.

Railway transport in India quite correctly received priority, but there are physical limitations to its quick growth. For a Road Haulage Service the limitations are minor and of not such colossal magnitude in capital expenditure as in the railway. Rupee for Rupee, investment in a properly co-ordinated Road Transport organisation will yield much richer dividends than in the railways, I am convinced that what I have suggested in the matter of transport organisation, will not only provide prominent additional employment, but also lay securely, the foundations of modern transport system as has been the experience in other countries.

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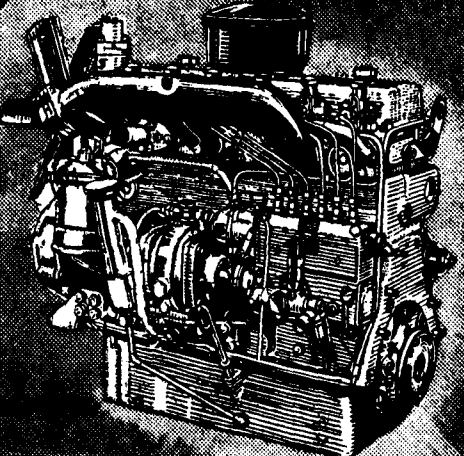
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Production to be increased to 12,000 units per year

By SRI S. ANANTHARAMAKRISHNAN

In the Last Annual Report of this Company, the shareholders were advised that the entire engine, according to programme, was completed as at 31st December 1956, with the exception of Crankshaft and Camshaft. Since submission of that report, indigenously machined Crankshafts and indigenously manufactured Camshafts have been approved and fitted to the engines. Since January 1957, we have been producing completely indigenous engines and as a result of the high standard of workmanship and rigid inspection policy adopted, there has been no complaint whatsoever and the Madras manufactured engines are equal in every respect to the imported Perkins engines.

Cylinder Block and Cylinder Head and Crankshaft are now being machined out of castings and stampings received from U.K.

In regard to the indigenous production of Cylinder Block and Cylinder Head castings, one of our subsidiaries has carried out certain experiments after receipt of pattern and core box equipment from overseas. Since the cupola originally installed in the foundry could not give the required metal temperatures, it was found necessary to install an entirely new cupola. Design for this cupola was obtained from the U.K. and the cupola itself was manufactured in our Works and subsequently erected in Addison & Co. Private Ltd's foundry. A few experiments on this new cupola have been made and others are continuing. Proper grade of coke is also not readily available for this class of castings although every effort is being made to persuade the Government for allotment of coke. It will take some time to develop and perfect such highly complicated castings, and our company is taking all suitable steps to be self-sufficient in this direction as early as possible. As regards Crankshaft stampings, our company is here again making every effort to establish local source of supply; but, equipment available in the country does not appear to be

large enough for handling Crankshafts of the P6 engine size. It is hoped that indigenous source will eventually be found.

Expansion

Since submitting our last report, certain developments have taken place as a result of which we have submitted to the Government of India, a revised expansion programme from the present capacity of 3,000 to 12,000 units per year the expansion of 9,000 units to cover the following:

- 5,000 P6 Vehicular type engines in addition to the present 3,000.
- 3,000 P3 TA engines, i.e., Tractor type engines.
- 500 P4 Industrial engines.
- 250 P6 Industrial engines.
- 250 P6 Tractor engines.

In regard to P3 TA Tractor engines, our company is hoping to arrive at an agreement with Messrs. Standard Motor Products of India, Ltd., Madras, in conjunction with Messrs. Massey-Harris-Ferguson (India) Ltd., Bangalore, for fitment of the P3TA engine as original equipment to the 'Ferguson' tractors to be progressively manufactured by Messrs. Standard Motor Products of (India) Ltd., Madras. Our company also hopes to arrange with Messrs. Voltas, Ltd., Bombay for

supply of these engines to the 'International Harvester' tractors. The demand from these original Manufacturers alone is expected to be in the order of 3,000 P3 TA engines per annum.

P4 INDUSTRIAL ENGINES: Negotiations are under way for fitment of these engines as original equipment to Road Rollers being manufactured by Messrs. Jessop & Co., Ltd., Calcutta and Messrs. Marshall Sons & Co., Calcutta.

The P6 Industrial engines are for the Climax-Holman Air Compressors.

With regard to P6 TA, this is in good demand from users of tractors fitted with petrol engines for conversion purposes, but we are also exploring the possibilities of getting this fitted as original equipment to Fordson Major tractors under a tie up to be made with the United Provinces Commercial Corporation Ltd., Calcutta.

The Expansion Scheme is of course subject to Government approving the deferred terms of payment for Capital Goods. The Director and General Manager of the Company was deputed during the middle of 1957 to negotiate with machinery manufacturers in the U.K. and on the Continent and he had obtained certain deferred terms—one from a Supplier in the U.K. and another from a supplier in West Germany.

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and we have submitted those terms to the Government for Approval. The estimated cost of the capital goods including charges for deferred payment terms and additional jigs and fixtures, etc., works out to approximately Rs. 1 crore and the additional working capital required subject to Messrs. F. Perkins Ltd., continuing to extend certain financial facilities recently concluded with them for import of CKD engines, will range from Rs. 31.25 lakhs at the beginning to Rs. 92.96 lakhs at the end of the programme.

Engine Production

The total number of engines produced during the year under report was 3,548 out of which 3,533 were sold and the balance 15 were carried forward to the next financial year.

During the latter half of the year under report, the Original Equipment Manufacturers—Messrs. Premier Automobiles Ltd., and Messrs. Hindustan Motors Ltd., have not been off taking any engines from our Company for various reasons with the result our company had to depend only on the conversion market for the sale of the engines produced during that period. Messrs. Premier Automobiles have however resumed offtaking from our company from October 1957 and it is hoped that they will continue to patronise our company's product as before.

Negotiations are under way with Messrs. Hindustan Motors Ltd., regarding their requirements of engines.

Conversion Kits

The demand for Conversion Kits both from Original Equipment manufacturers and from the trade continues steadily. The total number of Conversion kits sold during the year was 4,164 as compared to 3,758 during the previous year.

Coach Building Department

Our Company's order book for bodies has maintained itself satisfactorily during the year under report. Owing to large running contracts received from Nationalised Transport Organisations, our Company had to regretfully decline acceptance of individual orders from certain customers who wanted delivery simultaneously.

Light Engineering Specialities

The demand for the various engineering specialities continues. Owing, however, to the want of space, our company has not been able to meet all the demand and our Directors are exploring the possibilities of shifting the body building and Light Engineering sections to the Sembiam Industrial Estate.

Labour Relations

Our Directors are pleased to report that the relations between the management and the Labour are continuing to be cordial.

Pursuant to the decision taken at the last session of the Indian Labour Conference held at New Delhi, the experiment of participation of labour in management is carried out in the private sector in our Group in the South. Our Company has agreed to this move and the Joint Council of Management is now functioning. It is hoped that this experiment will be successful and will result in increased productivity and consequential prosperity not only to all the companies concerned but also to our workers.

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ENNORE PREPARES FOR 3,000 VEHICLES PER YEAR

BY SIR A. RAMASWAMI MUDALIAR

During the year 1957 very considerable progress was made in the expansion of the Company's buildings and in the installation in them of plant and equipment required for the further implementation of our Phased Manufacturing Programme. The total expenditure during the year on buildings amounted to Rs. 16.75 lakhs; and the total expenditure on plant and equipment Rs. 34.5 lakhs. This by no means represents the end of our expansion.

Early in 1957 it became obvious that in order to meet the heavy expenditure on buildings and equipment additional capital would be required. In the month of August this issue was taken up and the financial difficulty of managing with too little capital in relation to the magnitude of our manufacturing project was removed.

The company's objective is the establishment of the production at its Ennore Factory of the complete range of Leyland heavy duty commercial vehicles, as the development of roads and consequently of road transport in India progressively increases the demand for such vehicles. In accordance with this policy a proposal for the expansion of our project to include the manufacture of Leyland 'Tiger' and 'Titan' chassis in our Programme was submitted to the Government of India at the end of 1956. This new Phased Manufacturing Programme has now been accepted. Planning is already in progress and physical implementation will commence towards the end of this year.

This first step in the extension of our activities to include the manufacture of commercial vehicles with heavier load capacities than the 'Comet' is of very great importance to us for two reasons. The trend towards heavier vehicles as India's roads continuously improve and bridges and culverts are strengthened or rebuilt is inevitable. While, therefore, it may appear uneconomic from the point of view of the existing sales potential to engage in the production of vehicles with gross loading capacities exceeding 12 tons, there is no doubt that by the time manufacture is fully established the demand will justify the new project. The second reason, and initially the more important, is that the new programme provides in the first phase for the manufacture of the Leyland '600' and '680' diesel engines which are alternative fittings in the heavier chassis. These engines are suitable for most heavy transport requirements and they are the standard power units in Leyland trucks up to the 'Octopus' which is designed for 54,000 lbs. gross loads.

To enable the production of 'Comet' chassis to be increased without delay to 3,000 chassis per annum and to provide for the addition of the Tiger/Titan Programme, the company's authorised capital was increased to Rs. 3.25 Crores.

Anomalies in gross vehicle weight restrictions: This question has continued to engage the attention of the Central and State Governments and of manufacturers and operators. Happily, it now appears not only that a serious attempt will be made

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to increase permissible gross laden weights on all roads which will bear them but also that steps will be taken to limit registered laden weights in all cases to a figure not exceeding, in any circumstances, the manufacturers' specified gross vehicle weights. This is a most important step and in the right direction and all those responsible for it are to be congratulated. There is, however, still scope for a great deal of progress in the development of a road system which will enable heavier, and therefore more economic, load units to be carried over our highways. Gross vehicle weights have been restricted to such a low level in the past that the present tendency to consider 12 tons the ultimate limit is understandable. 12 tons may very well be an immediately desirable target, but it is quite inadequate as an ultimate one. If India's roads are to play their part in solving the tremendous problem of transporting goods and persons as industrial and agricultural production continue to develop, then 25 tons and not 12 must be the ultimate target for commercial vehicles. It is only by such a re-orientation of thinking on this question that full use will be made of the ability of heavy road transport vehicles to solve the country's transport problem.

The sales of 'Comet' chassis increased steadily since the Manufacturing Programme was inaugurated and there is every indication that this trend will continue. The firm enjoyed the confidence of State and Municipal Transport organisations and repeat orders from these important operators continued. More recently, private operators have been purchasing our vehicles in a continuously increasing volume and sales to the latter now exceed those to the former. We can without

doubt look forward to 1958 being an outstanding year in your company's history both with regard to sales and to progress with the Manufacturing Programme. At some point towards the end of this year we shall pass the half-way mark in manufacture. That is, more than half the value of a 'Comet' chassis will become made in India. At the end of 1957, 36% of the value of the chassis was produced at the Factory; and at the end of 1958 the percentage will become 55. These percentages indicate nett savings in foreign exchange.

Unfortunately, just when we have surmounted all our initial difficulties, are well ahead with our production programme and are beginning to enjoy a sales demand which will ensure our efforts shall be financially sound, a shortage of foreign exchange has intervened. We are, therefore, continuously in the position of not knowing whether our own efforts to increase our local production to meet the sales demand will be matched by our ability to import from Leyland Motors those portions of the chassis still manufactured by them. This is a most unsatisfactory state of affairs because it obviates planning sufficiently far ahead to ensure complete co-ordination of our own and of Leyland Motors' effort to keep strictly to our programme. It is suggested that Government might relieve manufacturers of this anxiety by issuing licences for import at least six months in advance of the beginning of the period in which import will take place. Such an arrangement would enable manufacturers in India, still dependent on the import of some parts of their products, to order imported material in time to ensure its delivery at the right time.



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DUNLOPS Register All Round Increase But Still Unable To Meet Demand

BY THE MANAGING DIRECTOR

During the last year production increased in nearly all lines, but even so we were not able to meet the demand for all our products. The Government permitted limited imports to help relieve some of these shortages, but particularly in respect of cycle tyres and rims sufficient quantities have not been available to meet requirements.

During the past year the road transport industry underwent tremendous changes and expansion, particularly long distance goods transport. The modern truck now engaged in this work requires tyres capable of carrying heavy loads at high speeds over long distances. Such tyres must be built with the best available materials and using the latest manufacturing techniques. It is in this respect that the company is particularly fortunate in having available to it the full resources of the Dunlop world-wide research, technical and engineering organisations.

We have continued to retain our premier position in the car tyre market. The progress which the motor car industry has been making in recent years is in danger of slowing up owing to the difficult licensing situation of the imported components. The reasons for this are too well known to everyone and unfortunately these are likely to persist for some time.

The bicycle industry has continued to grow very rapidly and the demand for our products has been well in excess of supply.

During 1957 the installation of plant for the manufacture of large earthmover tyres was completed

and production commenced early this year. The demand for this type of tyre is increasing.

Good progress was made in our Industrial Rubber products range and in particular the demand for conveyor belting has exceeded all expectations.

The popularity of Dunlopillo for all its various uses continues to grow and the additional capacity which was installed during the year was utilised to the full.

Expansion plans

I am happy to be able to tell you that satisfactory progress is being made at our new factory at Ambattur near Madras, and we are hopeful that everything will be ready for the production of bus, truck and cycle tyres to commence at the beginning of 1959. The construction of the main buildings is well underway and plant and machinery are beginning to arrive in the country.

Expansion is also continuing at Sahaganj and in particular increased production of giant tyres, cycle tyres and cycle rims is well in hand.

Raw materials

The raw materials supply position was generally satisfactory although on several occasions during the year our stock position became dangerously low in some of our main

requirements. There was a period when the congestion in Calcutta port seriously delayed clearance of vital cargoes but the position improved very considerably towards the end of the year. Our production planning problems would be considerably lessened if Government could grant import licences for essential raw materials on a longer basis than six months at a time.

There was virtually no improvement in the production of raw rubber in India during 1957 as compared with the previous year. On the other hand, consumption of rubber reached a new record, with the result that we had to rely on considerable imports.

Prices of raw materials were stable throughout the year but there were increases in import duty on a number of raw materials and machinery parts.

As I have already said, our production is due to expand very considerably in the near future to meet the essential needs of the road transport industry which is so vital in this country. This expansion has, of course, the full support and approval of the Government and we are, therefore, confident that licences to import increased quantities of raw materials will be granted.

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BY MR. J. R. D. TATA

Today, there are virtually only two large railway systems in the world which still purchase new steam locomotives, India's being one of them. Here, as elsewhere, a gradual but inevitable movement towards the "dieselisation" of rail transport is taking shape, retarded only by financial and foreign exchange considerations. As and when oil in adequate quantities is discovered within the country, the process is bound to be accelerated. Our works are exceptionally well equipped to undertake the manufacture of diesel locomotives. The Railway Board have recently issued enquiries for a fairly substantial number of such locomotives and we propose to respond to this enquiry in collaboration with our technical associates, Messrs. Krauss-Maffei A. G. and Messrs. Daimler-Benz A. G. We are in this regard fortunate in our association with both these firms, for Krauss-Maffei are leaders in the field of main line diesel hydraulic locomotives, while the Daimler-Benz range of high efficiency diesel engines are ideally suited to rail traction. If our expectations fructify, we can look forward to a long period of continued collaboration with, and service to, the Indian Railways, even after the cessation of steam locomotive manufacture.

The Automobile Division has kept to schedule in its programme of indigenous manufacture despite several adverse factors including shortages of steel, transport difficulties, congestion at docks and delays in the receipt of machinery and materials.

The automobile industry was the subject of a price enquiry by the Tariff Commission who submitted their recommendations at the end of 1956. Since then we have made considerable progress. We are today nearing the end of the second stage of development strictly according to schedule and, despite the many complicated problems affecting supplies and operations, we are confi-

dent that our manufacturing programme will be maintained.

The Tata-Mercedes-Benz commercial vehicles continue to enjoy the popularity and dominant position in the market which their quality and performance has deservedly earned for them, and we have no doubt of their ability to withstand any competition they may have to face.

The unexpected situation created by the heavy drain on the country's foreign exchange resources has been a source of anxiety. I am glad to say, however, that the Government of India have recently informed the company that its reasonable requirements of foreign exchange for plant and equipment to implement its approved manufacturing programme will be sanctioned. We are grateful to Government for this decision. It will enable us to proceed rapidly with our plans and complete them according to schedule by the end of 1959 when we expect to be in a position to produce almost entirely Indian-made diesel truck and bus chassis in the Automobile Division.

When our present development programme is completed, we shall be saving through indigenous production of truck and bus chassis a larger amount of foreign exchange each year than the aggregate amount of foreign exchange spent for the purchase of plant, machinery and equipment for the Automobile Division.

On the recommendation of the Tariff Commission, the Government of India have decided to leave the automobile manufacturers in the country a reasonably free hand to fix their prices within the overall limits of a return of 10% on cost, subject to general supervision and check by the Government of India. We welcome this decision which will go a long way towards provid-

ing an effective incentive for the rapid development of the industry.

The Tariff Commission have observed that in the automobile industry the first priority should be accorded to commercial vehicles. The annual requirements of commercial vehicles are expected to be as high as 40,000 by the year 1960-61. Further, from the strategic point of view, the speedy attainment of self-sufficiency is of far greater importance in the case of commercial vehicles than in the case of passenger cars. The Tariff Commission have further advocated the manufacture of diesel vehicles in preference to petrol driven vehicles. In conformity with this view, we have submitted to Government a scheme framed in consultation with our technical associates for doubling once again the capacity of our Automobile Division and bringing it up to 12,000 vehicles per year. The Government of India have informed the company that the scheme will find acceptance provided suitable credit arrangements can be made to stretch out the foreign exchange expenditure over a period of years.

While we are anxious to collaborate with Government to expand output of trucks and buses, we trust that the Government of India will in due course enable us also to diversify the output of our Automobile Division by the manufacture of other types of vehicles within the range of output of our technical associates, Messrs. Daimler-Benz A. G., such as light commercial vehicles, cars and diesel engines for various uses. Such diversification will promote more intensive use of our available capacity and experience. It will promote efficiency and reduce costs. The best warranty that we can offer to Government for the fulfilment of these objectives in due time is our actual performance in the fulfilment of the initial programme of manufacture



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of trucks and buses on which we are now engaged.

On the recommendation of the Tariff Commission, the Government of India have decided to grant protection to the automobile industry for a period of ten years. Our present manufacturing programme will have been completed long before the end of this period. We hope also, before that time, to be well on the way to completing the proposed plans for expansion as well as diversification. In effect, it is our intention to build up in this country, as rapidly as circumstances and the authorities concerned will permit a self-contained and highly efficient automobile industry.

We have also taken steps to implement other recommendations of the Tariff Commission, so far as they relate to us, amongst which is the extension of hire-purchase facilities, with the collaboration of our bankers and insurers, to the buyers of Tata-Mercedes-Benz vehicles.

The construction of the steel foundry is almost complete. Since the close of the year some of the sections have commenced work and this department will be in full operation by the end of this year. This foundry is unquestionably the most up-to-date in the country and with the growing importance of the part played by steel castings in the engineering industry, it will be the source of a substantial accretion of strength to our company.

In view of the increase in the output of the Automobile Division and the further expansion now proposed, the plans for the alloy iron foundry were revised early in the year to take care of the additional requirements of castings and include provision for further expansion in future. This revision involved some initial delay, but subsequent progress has been rapid. The construction of all buildings is virtually completed. Orders for all the necessary equipment have been placed and plant and equipment has started to arrive at the Works. Production of castings for the Automobile

Division is expected to commence according to schedule to meet the requirements of the approved manufacturing programme.

The coming into operation of the Foundries Division will result in significant economies not only through the reduction in the cost of the castings, but also through the elimination of the costly hold-ups and loss of productive time, through delays in delivery and defects in the quality of castings, which constituted one of the most serious problems encountered by the company in the past.

It is disappointing to note that, whereas in the preceding two or three years there were hopeful signs of a growing sense of responsibility and discipline on the part of our workers, there has been in the year under review a tendency on the part of certain sections of workmen to take matters in their own hands in preference to following proper constitutional methods for representing their views and grievances. Our men are amongst the highest paid in the engineering industry. They enjoy excellent conditions of work in a fine integrated factory equipped with the best machinery and equipment to which we are continuously adding. The company has done and will continue to do all it can to provide, in addition to more than fair wages, a high standard of such amenities as housing, medical benefits, training and the like. The capital investment per employee in our company is probably the largest in the industry. Our employees have a fine and safe future before them, but it is time they realised that the company's continued ability to pay high wages and provide the maximum of amenities and job security depends on high productivity which, in turn, requires that the workers put in a reasonable day's work.

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Self Sufficiency in Bus Body Building

The Hyderabad Allwyn Metal Works Ltd

BY SRI G. B. GADRE

I recall, with immense pleasure and pride, that unforgettable day in the month of October, 1946 when the first bus built by us—a Double Decker one—went out of our Shops to be delivered to the Road Transport Department of the then Nizam's State Railway. It was, no doubt, an event of great significance in the history of ALLWYN as we had stepped into a new field—building all-metal bus bodies—which had great potentialities. We celebrated that occasion full of hopes for a bright future. And, now, important landmark in the progress of ALLWYN—that of completing the First One Thousand All Metal Bus Bodies, has just been celebrated.

The end of World War II saw us in a state of happy prosperity. Within a short space of four years since our opening up in Hyderabad, we had established ourselves nicely, with excellent buildings, good staff and equipment, and prospering business. Naturally, we went in for post-war expansion schemes to widen the scope of our activities. The Road Transport Department of the then Nizam's State Railway, which was by far the only State-run Transport Undertaking in the country at that time, were until then buying all their bus bodies from Park Royal Vehicles of London. They encouraged us to build bodies for them at Hyderabad in association with Park Royal. And, so, in 1946 we started our association with the world-renowned bodybuilding Firm of Park Royal Coach Works of London.

In the early stages, we were importing bus bodies in semi-knocked down condition from Park Royal and assembling them for the R.T.D.

After delivering the initial 30 double deckers and some 200 single deckers assembled from complete S.K.D. kits received from Park Royal, we naturally decided to go ahead along the path of self-sufficiency. We made a beginning in 1949 by fabricating structural parts

and sub-assemblies in our Shops from designs and patterns received from Park Royal, but continued to import all the fittings such as windows, seats, etc. In fact, in those days we had to import even aluminium plates and panels, from rubber cushions, leather, cloth, and several other essential items. Our progress in this direction was initially very slow, mainly because, in the meanwhile, we were adversely hit by the political upheaval in Hyderabad State, culminating in Police action. In 1950 we took on an enormous order for Ballot Boxes, and had almost to forget everything about bus body building for nearly a year. We lagged behind in deliveries, and even R.T.D. had to place some of their orders on outside Firms. The real recovery started from 1953 onwards when Khan Bahadur C. B. Taraporvala took over the management on behalf of H.E.H. The Nizam and also arranged for extra funds to enable us to buy more raw materials and increase our turnover.

At this stage, we got another big boost by securing orders for bodies from the B.E.S. & T. Undertaking of the Bombay Municipality. B.E.S.T. like R.T.D. are known for their very exacting standards. These two organisations always insist on the best, and quite rightly so, for a good chassis deserves a good body so as to make it the best earning proposition. Although it is always difficult to work with quality-conscious customers, it is an equally great pleasure to do so because they always appreciate a good point and are prepared to pay for it, while on the other hand, they are always willing to guide us in improving our own standards and designs and performance. For instance, B.E.S.T. asked for a light weight body first on a Leyland Tiger Cub chassis, and then a double-decker on a Leyland Titan chassis. This made us learn a lot about handling aluminium alloy extruded sections for

designing bus structures—a knowledge which has since stood us in good stead many a time. I can say without any hesitation that much of the credit for our development goes to these two premier operators in the country, the R.T.D. and the B.E.S.T. Our acknowledgments are also due to the various other operators, notably the Delhi Road Transport Authority, West Bengal State Transport, Madras State Transport etc., for the support they have given us by entrusting large body contracts to us.

During this period, in order to cope up with the increased work, we re-organised the Shops to provide nearly double the working space for the Bus Body Department than what it had before. Naturally, we also added to the tools and equipment required for fabrication and assembly operations. We obtained the services of experts from our associates, who trained our technicians in the design and manufacture of bus bodies.

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Experimental Section Now Builds Prototypes

A skeleton Design department was also set up, and we started making our own drawings and layouts and patterns. Side by side, we devoted considerable energies in developing bus fittings such as windows, seat frames, destination indicators etc. I think we were the first successful manufacturers in India to design and manufacture complete half-lift type windows within the country, and well over a thousand buses are fitted with windows of this design, not only in Hyderabad but in other parts of the country, chiefly with the Bombay State Transport who purchased some 800 bus sets of windows from us. Our windows have been copied to a large extent by other body-builders, but we are not worried about it because we are now developing an entirely new window framed in aluminium extruded sections.

But the biggest boost came in 1956 when Birla Brothers took over the management of the company, and immediately set out in right earnest on a programme of overall expansion. Since then, we have been setting ourselves ever rising targets, in the bus body line as in other lines and I am glad to say, we are fulfilling most of them. But now we have a well-staffed and well-equipped drawing and design office with an attached experimental section where prototypes are built, and we take particular pride in the fact that we can design complete bodies purely on the basis of coach-builder's chassis drawing, without even looking at the chassis. This type of working ensures fullest interchangeability of parts and even complete bodies.

The general pattern of the Road Transport Industry in the country has been undergoing quick changes during the past decade. For a long time passenger road transport was almost a monopoly of private operators through out the country except for the R.T.D. in Hyderabad and a few other small State-owned undertakings. A single purchase would rarely go above ten vehicles at a time, and the operator was not inclined to have his own assembly shop, and so he had to depend upon private bodybuilders. Then came

nationalisation, in State after State, of passenger road transport industry. Some states like Bombay and U.P. have gone at a tremendous pace, and have nationalised practically all the mofussil services throughout the State. Others, with limited resources, have been expanding, rather slowly but very surely towards complete rationalisation. As these large nationalised undertakings are set up, they build their own huge Workshops for servicing and maintenance, and also for building their own bodies. However, few of them can put up a full range of equipment required for bodybuilding, and have mainly to depend upon purchasing bodies in the kit form and assembling themselves. So, from the point of view of coachbuilders like ourselves, the emphasis is now shifting from building complete bodies to designing and supplying mecano type kits for quick and accurate assembly by the operators themselves. To cope up with these changed conditions, we have designed a standard body structure of all-steel construction and another standard structure of all-aluminium-construction. In either case, the kit consists of certain standardised parts, fully pre-fabricated in well designed jigs and fixtures which can be combined in various ways to give bodies of different lengths and widths to suit different chassis. In order to improve deliveries, we have also decided to take up production of these standard parts in substantial lots, say, 150 or 200 sets at a time, and stock them in a ready-to-deliver state. In fact, we have already taken up the production of the first such batch of 150 sets. Kits on these lines are being supplied right now to various operators, for instance 50 Tiscor Steel and 50 Aluminium kits are being supplied to U.P. Roadways, and 20 Tiscor Steel and 2 All-Aluminium kits are going to the Mysore Government Road Transport Department, and eight all-Aluminium kits are going to the Ceylon Transport Board. We are also supplying 25 specially designed double decker body kits of chiefly aluminium construction to West Bengal State Transport who already have 44

bodies built by us in regular service for over five years past.

As for the future, apart from improving and increasing the business of conventional bus bodybuilding, we have ambitions to build special types of bus and coach bodies, particularly integral bodies, i.e., vehicles of chassisless construction, in association with some chassis manufacturers. We believe that this type of vehicle has a great future, particularly in the major cities like Bombay, Delhi, Calcutta and Madras, because of their intrinsic light weight. We would also like to build Trolley bus bodies, since cities like Bombay and perhaps Calcutta may be thinking in terms of introducing trolley buses. We also believe that sooner or later, Indian Railways would require a large number of diesel rail coaches for feeder services as well as for fast services between cities situated near to each other. The bodies for such coaches are usually designed and built on similar lines to bus bodies, and we think we can play an important part in constructing such vehicles if given an opportunity. This apart, there are various other types of public service vehicles such as ambulances, fire engines, aircraft re-fuellers, propaganda vans, etc., where there is enough scope for original designing, and we propose by and by to study these types of vehicles for inclusion in one range. In fact, we have made a small beginning by undertaking to build plant protection vans for the Agriculture Department of Andhra Pradesh, a Blood Bank Van for the Medical Department of Andhra Pradesh and Epidemic Vans for the Public Health Department of Andhra Pradesh. The Defence Services also

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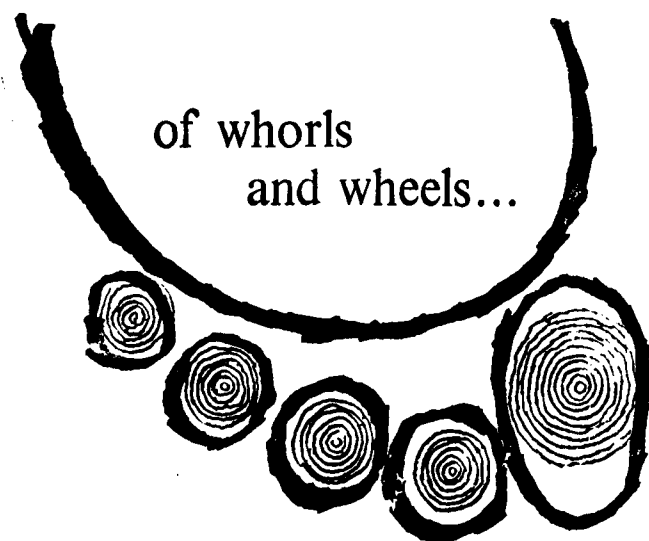
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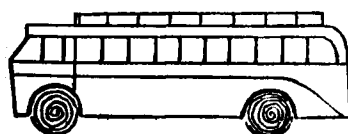
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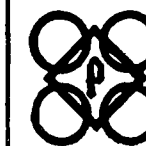
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require a very large variety of road transport vehicles, and their requirements are usually fairly extensive. We have made a beginning in trying to understand their requirements by taking up two educational orders for Wireless Trucks, a specimen of which is exhibited outside, and general service bodies. We hope to play a significant roll even in the production of these and similar defence vehicles.

To design a good product, one must have facilities to test its performance. To design a good bus, one should be able to test it to make sure that it is good in all respects, structurally as well as in respect of fittings, etc. To carry out such tests, the Society of Motor Manufacturers and Traders in England have prepared a proving ground near Nuneaton. The ground consists of a round track on which

can be found specimen of types of roads that one comes across in all parts of the world such as paved roads, badly corrugated roads, roads with deep pot-holes, duty and sandy tracks, ditches, etc. If a vehicle is made to go round this track for 500 miles, it gets a test similar to an actual run of say 50,000 miles. All parts of chassis and body get severe battering, and all defects are shown up prominently. This, indeed, is a great help to a designer because he can eliminate such defects before taking up bulk production. Will it be too much for me to hope that Hyderabad which pioneered nationalised road transport in India will also pioneer in this respect and provide a good proving ground for vehicles produced anywhere in the country? After all it only amounts to building some 10 or 15 miles of bad road and that should not be very difficult.

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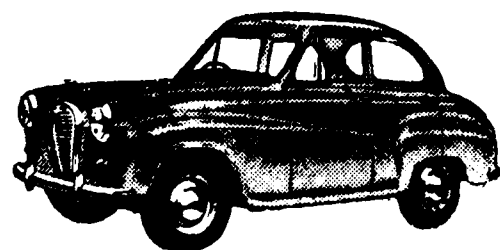
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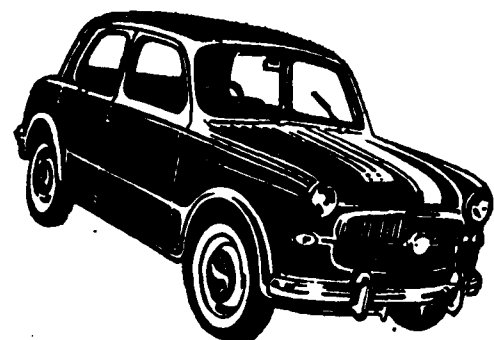


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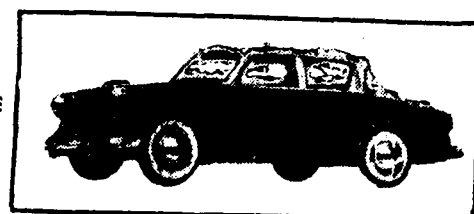


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THE ENFIELD FACTORY IS GROWING RAPIDLY

By MR. K. R. SUNDARAM IYER

Very valuable spade work was done by Madras Motors Private Ltd., who originally obtained the licence from the Government of India for the manufacture of motorcycles and did yeoman service in enabling this Company to come into being. In the initial stages, the assembling was being done in a small area of 10,000 sq.ft. in Mount Road, but the Company now has its own factory premises of over 29,000 sq.ft., thanks to the efforts of Madras Motors and its then Managing Director, Mr. S. Sankaran. The selling organisation of Madras Motors throughout India and their experience in organising sales and service are now entirely at the disposal of Enfield India.

The Enfield Factory is now growing rapidly. The present built-in area of the Factory is a vast improvement, but still inadequate for the purpose. The administrative offices also form part of this new premises. The Enfield Cycle Co Ltd., through one of their associates in England made available to Enfields plant and machine tools at reasonable prices. Most of these have already arrived. In addition to the three existing bays, a fourth one is being added up giving an additional 9,000 sq.ft. of premises. A further addition of 14,645 feet is being got ready for the Press and Sheet Metal Shop. These are now nearing completion. A fair part of the plant and machinery is already in commission.

Phased over a period of years, the venture of manufacturing motorcycles forms a substantially major part of the industrial progress of the country. The requirements for Enfields in terms of plant and machinery are quite large. With a view to enabling the Factory install further batches of Plant and Machinery, a loan of Rs. 11 lakhs was received from the Industrial Finance Corporation of India recently. This, it is expected, will assist the Factory a great deal in completing their immediate programme.

The Company has been given the licence to manufacture three-wheelers both for passenger and load carrying purposes. Arrangements have been made to use a large number of common equipment in manufacturing these so that we could evolve a scheme of economy in the manufacture of motorcycles themselves. These three-wheelers which have been on actual test over the past year—thanks to the untiring efforts of the Technical Expert, Mr. H.B. Stanford,—are now ready for sale.

Far from being a luxury vehicle for the chosen few, with the introduction of advanced technique and the marketing of lighter weight vehicles at an economical cost, motor cycles have now become an economical form of transport for the middle class man and indeed should soon become a popular transport vehicle for a large section of the Indian population.

Excellent roads are coming up all over the country and tremendous strides have been made in the field of road laying for which thanks are due to the Government. This should encourage the Company to expect the kind of transport which they are now manufacturing to be in great demand. Since entering into the present new premises, the Factory production has more than doubled. With increasing facilities expected in the immediate future and with the easing of the Shipping facilities, there was every confidence that progress will be at a rapid pace.

The modern motorcycle, for speed, economy, safety and comfort, is bound to prove an appropriate form of utility transport for the middle class, for the vast number of technicians engaged in the Five Year Plans and a necessity for the many engaged in the economic and productive activities of the country.

The Hindustan Motors Ltd

(From Directors' Report)

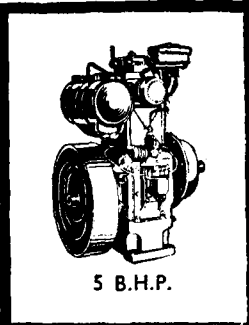
During the year under review the Press shop has started working and manufacture of body panels for Hindustan Cars has been taken in hand and the work is progressing satisfactorily. This is the first time the body pressing is done in India. With this manufacture the import contents in our cars have been reduced to only minor parts, while most of the major components are made in India. Thus the Hindustan Car is almost wholly manufactured in India. This saving of a considerable amount of Foreign Exchange will be helpful to the country in conserving Foreign Currency reserves.

The Tariff Commission, after investigation into the price structure of automobiles, recommended to the Government to allow adjustment of prices by individual manufacturers according to their costs. They also found that Hindustan Cars were marketed at a loss and so recommended to the Government to allow adjustment of their prices. The Government accepted their recommendation and has allowed manufacturers to fix their prices after prior notice to the Government. With the approval of the Government therefore the price of Hindustan Cars has partially been increased. The cost of production has further gone up. Consequently, the price has to be adjusted with the consent of the Government in due course.

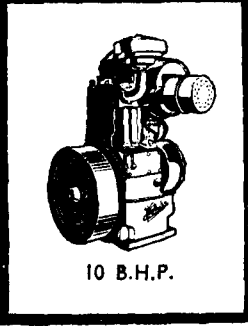
The sale of Hindustan Cars was slightly better but the recent increase in all-round taxes makes the position uncertain. The effect of the increase in prices has also to be watched. The future prospects therefore cannot be forecast with any degree of certainty.

To help increase sale of vehicles, arrangements for providing facility for hire purchase are being made through Hindustan Motor Corporation Ltd., one of the Company's subsidiaries which is taking necessary steps for the same.

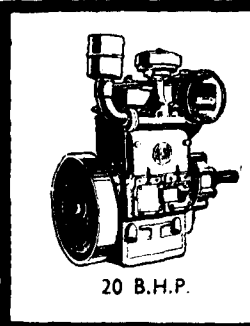
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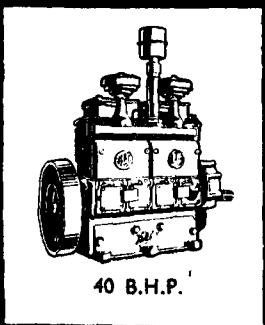
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BY S. KIRLOSKAR

1953 was a year of depression and slump for the Indian Industries. But the Kirloskar Oil Engines Ltd. put their faith in the proverb that 'The darkest hour is nearest the dawn.' Undaunted by the gathering shadows of the nation-wide slump, the Kirloskar Oil Engines Ltd., drew up an ambitious plan of development, and carried it out successfully by dint of labour, research and perseverance. In the short span of five years, they have gone a long way towards increased output and international reputation.

The Kirloskar Oil Engines Ltd., were the pioneers in the manufacture of High Speed Vertical Engines, and the Diesel Engines manufactured by them are today universally recognised as unequalled in strength, durability and the low cost of running. While their monthly output in 1953 was 200 to 300-5 H.P. Engines, it has today gone upto 800 to 850 Engines. The Kirloskar Oil Engines Limited have maintained their place of honour and supremacy as the ushers of a new era in Indian enterprise.

The Kirloskar Oil Engines are today in increasing demand in Cyprus, Persian Gulf, Iran, Iraq and other countries in the Middle East, and the South East Asian countries like Burma, Malaya, Thailand and Indonesia. The latest conquest of Kirloskar High Speed Engines is Australia!

The scouts and representatives of the Kirloskar Oil Engines Limited visit all these marketing centres, and report on the local conditions, and gather important data which may be useful in advancing the sales, popularity, and service of the Kirloskar Oil Engines. This helps the

Kirloskar Oil Engines Limited to establish and promote relations of mutual co-operation and trust with consumers of Diesel Engines all over the world.

Nearly 60 P.C. of Indian consumers' demand is today met by the Kirloskars. They are aware that their output falls short of the total indigenous demand. But it would be wrong to suppose that this is only due to our increasing exports, and that the remedy lies in stopping or cutting these exports so that we shall be in a better position to meet the demand for our Engines in India. It has to be remembered that export of Indian goods to foreign countries brings in return the much needed foreign exchange, and makes possible the purchase of heavy machinery, without which expansion of Indian manufacturing plants would not be possible. It is the export of our Engines that is laying the foundation of the expansion and development of our factory, and it is this expansion which will in the near future, enable us to remove the dissatisfaction of the Indian customers.

It cannot be overlooked that the accumulation of credit in sterling means indirectly the increase of the national potentiality to make purchase in the sterling area of the world, on which the success of the Second Five-Year Plan evidently depends in a large measure. We have, therefore, readily accepted a moral binding under the policy of the Engineering Export Promotion Council to continue with our exports. We do believe that the integrity of our organisation and high quality

of our Engines, going out abroad, will create an atmosphere of trust in all Indian goods in the minds of the foreign customers, and will thus open out a wider field for exports from India. We, therefore, look upon our exports as not only a valuable business proposition, but also a kind of national service.

At the same time we cannot ignore our duty towards the Indian customers. It is a painful thought that our supply cannot cover the Indian demand to its fullest extent. But the day is not far away when there will be no room for any complaint in this connection. We have prepared an ambitious Blue Print of expansion and development. We are aiming at a target of 1,000 High Speed Engines per month. We are confident that we shall not only reach, but exceed this target, as our factory has already started running non-stop in three shifts.

It will be thus seen that we are planning to increase our present exports, and at the same time to expand and develop our manufacturing activities, so that we shall meet fully the demand of our valued Indian patrons. As pioneers in the field of Vertical High Speed Engines, we consider it as our humble duty to expand our foreign business, thus building up a reserve of foreign credit and exchange, and also to satisfy to the fullest extent our indigenous customers. We naturally look forward to the continuation of the Government Policy not to allow the import of Diesel Engines and thus to protect and speed up this national industry, which is so vital in the growth of an efficient and prosperous industrial India!

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MOTORINDIA

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The following pages give pictures of automobile and allied production in India's infant industries engaged in manufacturing Vehicles and Components, for the first time in automobile history.

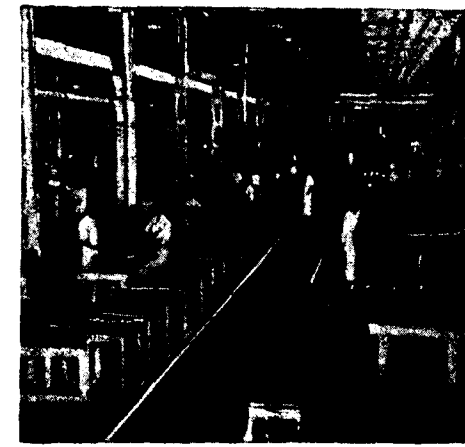
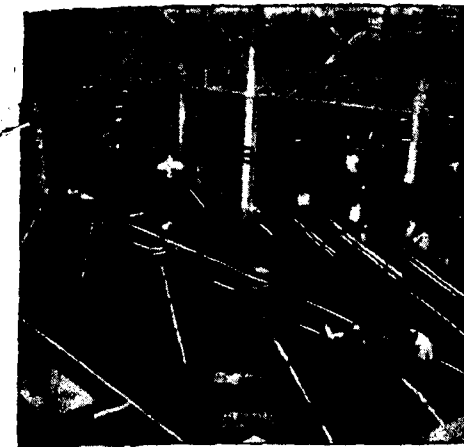
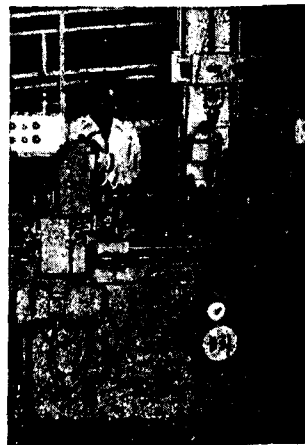
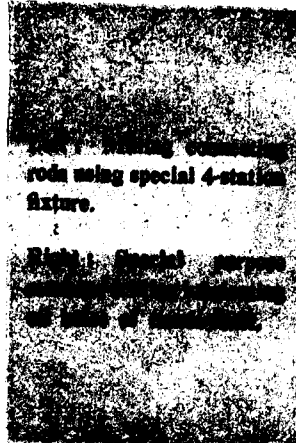
Engines

More important than new vehicle production is the fact that vehicles, old and new, are kept moving by a steady Stream of Perkins Diesel engines that roll off the Mount Road factory.

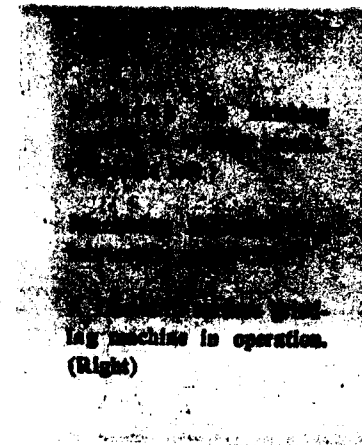
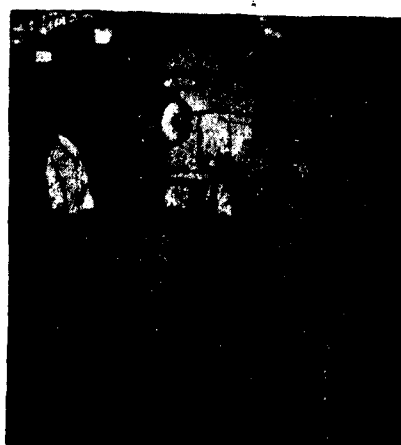
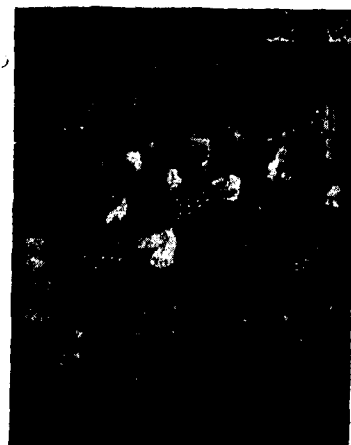
Photos on right and next page show various sections of the Simpsons' factory at work.



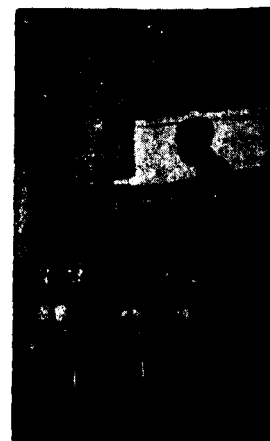
Milling process of side faces in the connecting rod bay. On the right is a general view of the bay.



A general view of the Company's spacious tool room.



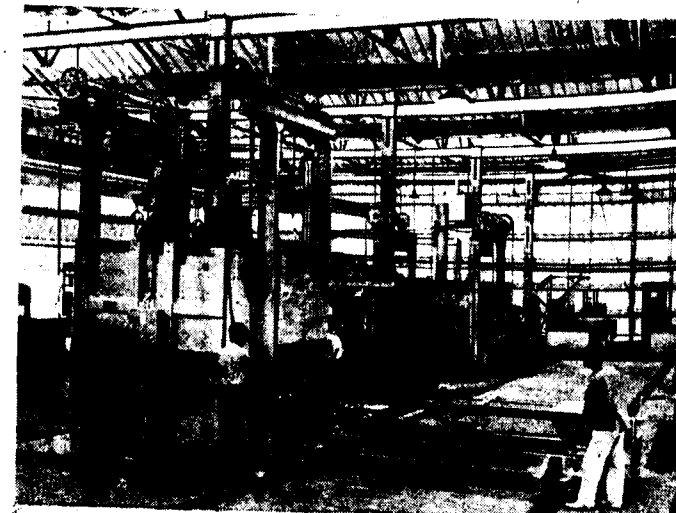
Big machine in operation. (Right)



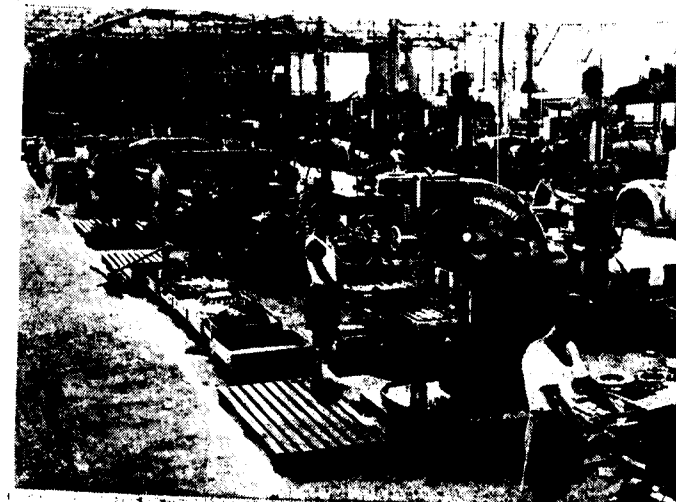
LEYLAND VEHICLES



Lathes turning Phosphur Bronze Bushes



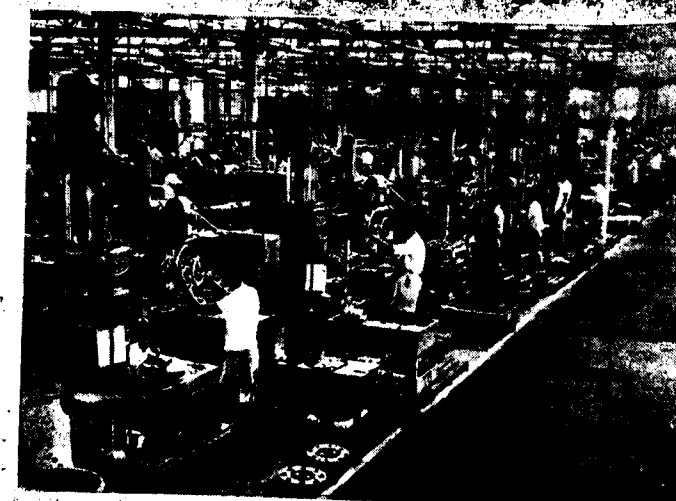
Heat treatment of axle arm forging



Milling of ends of spring bushes



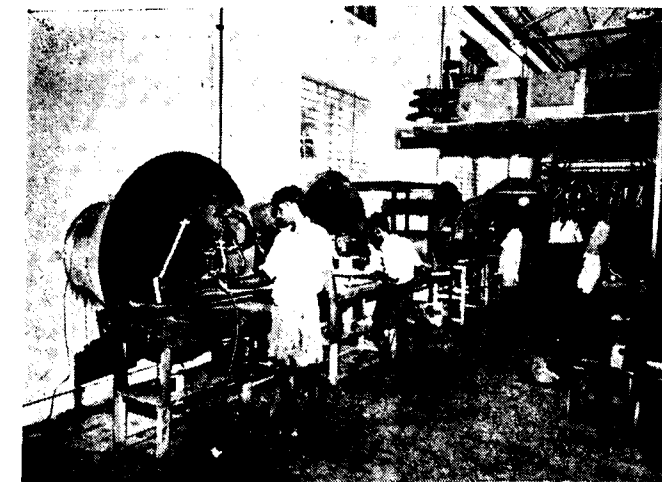
Front end structure assembly line



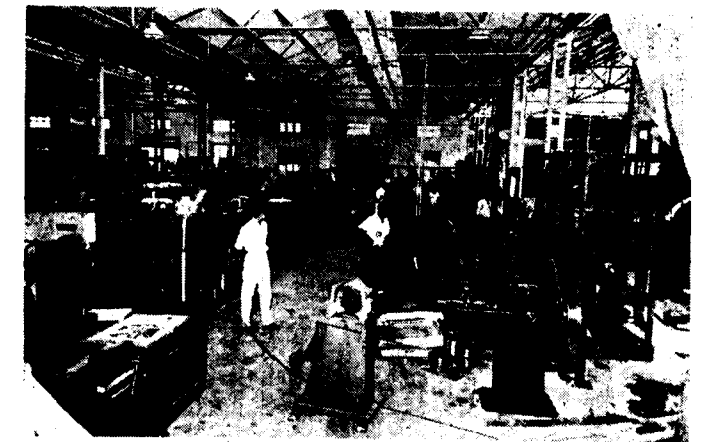
Radial Drilling Machine in operation

SLOWLY, BUT SURELY, PROGRESS IS BEING MAINTAINED by the Ashok Leyland factory at ENNORE, despite a critical Foreign exchange situation affecting incoming Capital equipment.

ENFIELD MOTOR CYCLES

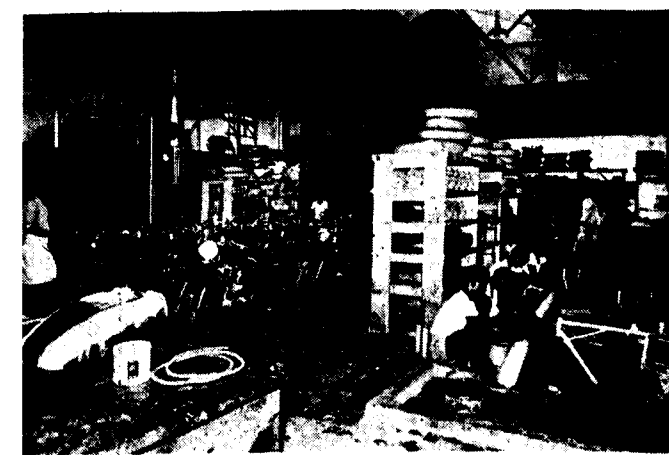


A view of the Paint Section



The Machine Shop

Roll out of the Tiruvottiyur Factory according to schedule, as pictures on this page show, but to meet the country's demand, the factory has to more than double its output.



Another view of the Paint Section



The assembled Enfields may be seen in the foreground

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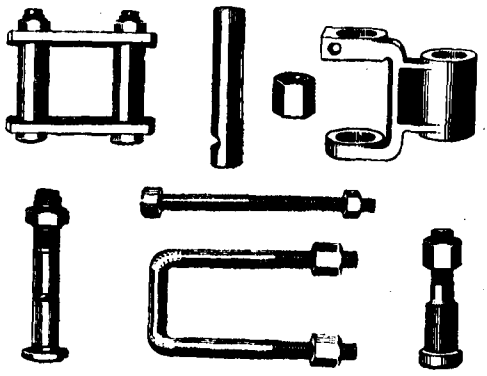
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TECHNICAL EDUCATION IN INDIA

With Special reference to training in Automobile Engineering

BY
PROF. B. SEN GUPTA

For decades the bulk of engineering activities in our country were confined to irrigation and power development and road and rail transport. Since most of the designing, manufacture of machinery, and fabrication of structures, etc., was done by engineers abroad and since the supervision of heavy work executed in the country itself was also entrusted to foreign engineering firms, the demand for Indian engineering personnel was restricted to Civil and Electrical branches of engineering and that too was mostly for maintenance purposes. The early institutions—the Engineering School at Guindy, the Thompson Engineering College, Roorkee, and the Engineering Colleges at Poona and Calcutta, admitted each year only a limited number of students just sufficient to meet the somewhat restricted demand. There was no diversification in the engineering courses offered by these institutions. The courses in Mechanical, Telecommunications and other branches of engineering training have been only recent additions to the curriculum of these institutions. Engineering Colleges which were subsequently established in our country followed the same pattern. Establishment of specialised and advanced Post-graduate courses in various fields is still more recent development in technical education in India.

The Second World War, as in many other fields, forced the pace of technical education in India. The blitzkrieg air attacks on Great Britain and menace of sub-marines to shipping in Mediterranean and other waters considerably reduced the volume of seaborne trade of the world. India, in the circumstances, became one of the member sources of supplies for the Eastern traders of the world. This led to a sudden increase in the demand for manufactured articles within the country and necessitated the training of a number of skilled personnel of all grades. Existing institutions were expanded and new ones opened. Many young men who would not normally embark on a technical

career seized the opportunity and obtained training in engineering. The developments of the war period had one more beneficial effect. Old prejudices and obstacles against industrial employment were gradually overcome.

With the advent of Independence, our leaders realized that if India were to make good for the time lost in her economic advance a stupendous programme of organised scientific research was necessary at the national level. The Government of India, therefore, formulated a scheme for the establishment of a chain of National Laboratories for advanced Scientific Research. In 1951, our country, for the first time in its history embarked on a planned programme for economic development. Since the tempo of Industrial Development depends mainly on a strong agricultural base, the First Five-Year Plan mainly emphasized on the development of agriculture, irrigation, power and transport. During the period 1951-56, as the developmental activities, except for the large size of many projects, remained of the same pattern as in the past, the experience of the engineering talent available in the country was by and large sufficient for execution of the projects under the plan. The help of foreign firms and experts was no doubt necessary but it was in a very small measure compared to the size of the plan.

The Government, however, recognized that every plan, if we are to catch up with other industrialized countries in a much shorter time, should lead to bigger effort in the succeeding plan. The Second Five-Year Plan, ambitious as it may seem, but modest in view of the needs of the country, therefore demands of the people much greater emphasis and effort. The inclusion of a number of projects in the Second Plan was rather inevitable. The country must become self-sufficient soon in steel, machine tools, rail-

way coaches heavy chemicals, fertilizers, heavy electrical equipment, inland transportation and the like in order that other industries dependent on these goods and services could be developed with economy and speed. However, it was realized that the establishment of these heavy and basic industries depended on an adequate supply of trained engineering personnel in large numbers who could, with confidence handle the various industrial projects visualized in the Second and subsequent Plans in all stages such as planning, designing, manufacture and marketing. The plan also visualized the necessity of research and development work required for the basic needs of various industries and made adequate provision for them.

In view of the immense nature of the problem and the limited time at my disposal. I will confine myself to the problem of supply and training of engineering graduates and diploma holders with particular reference to those specializing in the field of Automobile Engineering.

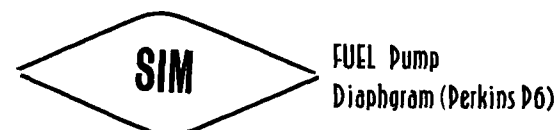
As I have mentioned earlier, the acute shortage of engineering personnel was realized by the Government only at the time when the Second Plan was under preparation. The Planning Commission appointed an Engineering Personnel Committee in September, 1955 under the Chairmanship of Shri Y. N. Sukhtankar, the then Secretary of the Planning Commission. The Committee in its report submitted in May 1956 observed that at the end of the Second Plan period and on the basis of the then existing facilities for technical education and schemes for expansion included in the Second Plan, there would be a serious shortage of technical personnel for the execution of the various programmes of national development. The Committee estimated that there would be a shortage of 1,800 engineering graduates and 8,000 diploma holders by 1960-61. In addition to the four Higher Technological Institutions, 5 new Engineering colleges and 21 Polytechnics included in the Second Plan, the Committee therefore sug-

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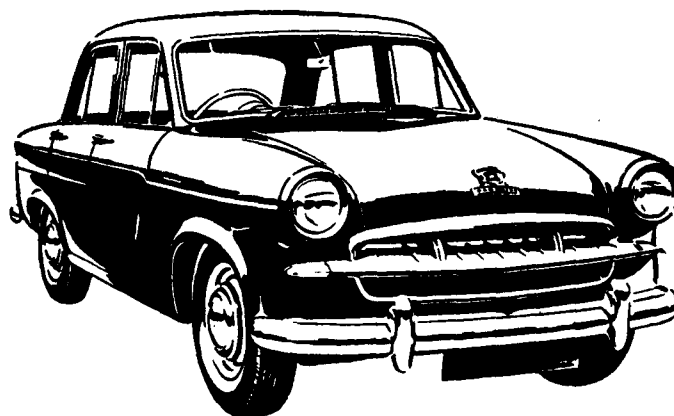
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gested that 18 more new Engineering colleges and 62 more new Polytechnics should be established and at the same time, the training capacity of the existing institutions in the country should be increased by 20% in the case of degree courses and 35% in the case of diploma courses.

The recommendations of the Engineering Personnel Committee were considered both by the Central Government and the Planning Commission. They were of the view that having regard to the available resources and particularly, the personnel the establishment of a large number of new institutions viz., 18 colleges and 62 Polytechnics would not be feasible. Accordingly to the Government, the most fruitful and practicable way of expanding technical education was to enlarge the 'Unit Size' of the existing and well established technical institutions.

They agreed that it would be quite practicable to have an Engineering college with an enrolment of 1,000 to 1,600 students and Polytechnics with a strength of 600 to 1,000 students provided that the instructional facilities are increased correspondingly and the administrative structure is suitably shaped. New Engineering Colleges and Polytechnics should be established only when warranted.

On examining the matter in all its various aspects and after discussions with the Chairman of the Regional Committees, State Governments and Heads of Technical Institutions, detailed proposals were formulated by Ghosh-Chandrakant Committee for converting 19 existing Engineering colleges and 46 existing Polytechnics into bigger units so as to yield 2,538 additional seats for the degree courses and 4,225 additional seats for the diploma courses. For the balance of the requirements, the establishment of three new Engineering colleges and 27 new Polytechnics capable of yielding 520 seats for degree courses and 4,680 seats for diploma courses were proposed.

These recommendations were given effect to at the beginning of the academic year 1957-58. All over India the established institutions like the Poona Engineering College, the Ahmedabad Engineering College, the Victoria Jubilee Technical Institute, Engineering College of

Baroda University, increased their admission to degree courses and the Governments are taking every steps to put up new polytechnics for the training of diploma holders. It is hoped that unless the progress is hampered by want of equipment, building material, and above all, suitably trained teachers, the target figure for training of engineering personnel will be achieved by the end of the Second Five-Year Plan.

The Government of India also recognized the need for specialised training and research facilities and instituted post-graduate training facilities in specialized subjects in the institutions where nucleus of such training and personnel were already available.

Some of the subjects in which such training facilities have been made available are :

- Internal combustion engines.
- Power engineering.
- Metallurgy.
- Automobile engineering.
- Gas turbine.
- Textile technology.
- Communication engineering.
- High Voltage technique.
- Management studies.

The Victoria Jubilee Technical Institute which had already had well established departments of textile technology and Automobile Engineering were therefore selected by the Government for post-graduate courses in these subjects.

Courses in management studies were started in centres like Calcutta, Bangalore and Bombay where there was concentration of industries. This institute was also selected as one of the centres for management studies.

With the rapid nationalization of the Road Transport Organizations in different states, the necessity of the trained personnel to maintain the fleet of buses on the road was very keenly felt. In Bombay State a post-diploma course in Automobile Engineering was started at this Institute in the year 1951 at the instance of the Bombay State Road Transport Corporation.

Like all other categories of Engineers, Automobile Engineers may be classified into two broad divisions.

The first category includes those who will be capable of planning, preparing designs, carry out investigation into the technical problems involving material, design, manufacturing process, etc., faced by the industry and utilizing the results of such investigations. These are the engineers who will go in for post-graduate training.

The second category will include those engineers who will be required by the automobile industry, the transport undertakings and the various maintenance and servicing centres for manufacture, supervision and maintenance work at different levels. For the training of this category of trained personnel the post-diploma course seemed to be adequate. It was therefore decided to start a post-diploma course rather than a post-graduate course for the purpose of training Engineers for the State Transport undertaking.

It was realized at the very start that the automobile engineers were basically mechanical engineers and since requirement of trained personnel was very urgent, a short course of training to Diploma holders in Mechanical Engineering spread over a period of one-and-a-half years was contemplated. It was also realized that in order to be immediately useful to the transport undertaking, there should be close liaison between the Institute and the S.T. Undertaking. An integrated course was therefore drawn up where the students during their 18 months' training period could receive an organized training in the State Transport Organisation in repairs and maintenance of the vehicles for at least six months. Thanks to the support of State Transport Organization the course has proved to be very popular and the students completing the course, have been found quite useful and have been readily absorbed.

During the last few years a number of concerns manufacturing automobiles were started with the help of foreign car manufacturers such as Chrysler Corporation, Morris Motors and Standard Motors. The Government of India while granting licences stipulated the condition that the programme of manufacture should be so phased that in about 5 to 10 years time most if not all

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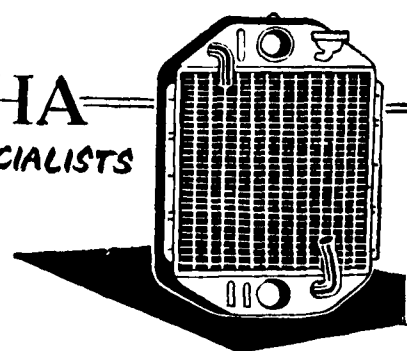
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parts must be manufactured in India, if possible from indigenous material. The Government at the same time realized that in order that the above condition could be observed in practice facilities for post-graduate training in automobile engineering spread over a duration of about 2 years should be started at some selected institutions where facilities were already existing.

In this State the nucleus of imparting training in Automobile Engineering already existing at the Victoria Jubilee Technical Institute for post-diploma course was accepted by the Government of India as quite suitable for development of post-graduate studies in the same subject. Further, since there was a large concentration of automobile industrial concerns in and around the City of Bombay, the decision to my mind was very appropriate. The Government of India therefore sanctioned a non-recurring grant of about 1½ lacs for expanding the facilities of the auto engineering workshop and laboratories, by supplementing these laboratories with equipment and instruments for training and investigation work. In addition, the Government sanctioned another grant of Rs. 2,56,000 for Metrology—or fine measurements laboratory which was absolutely necessary for standardisation of parts.

I am proud to say that the first post-graduate course in Automobile Engineering was started at the V.J.T. Institute this year with a maximum admission capacity of 20 boys. As with the diploma course, so also here, the necessity of participation of Industry in training the students was realized and I am happy to say that the Industry in Bombay has readily come forward to help the Institute in working out a two-year 'Sandwich course' in which theoretical instruction and practical work could be given side by side. I am also thankful to the Management of the Premier Automobiles, Mahindra & Mahindra and others, who have even gone so far as to assure me of their support and co-operation in respect of availability of technical personnel and of training facilities at the works to help the Institute's staff in the specialized subjects such

as Design, Metrology, Heat treatment, Time and Motion study etc.

Whereas the technical institutions are being provided with funds by Government of India for equipment which are necessary for the day-to-day conduct of the course of studies, the aspect which is essential for these post-graduates studies, I am afraid, has not been fully realized. I mean the part of the course of studies which would arouse interest in the minds of budding engineers, would make them probe into the mysteries of science, viz., facilities for investigation and research. I personally think that the post-graduate students should be encouraged to take up at least a few problems of investigation in order to initiate them to research and to make them familiar with the research technique. Judging from this standpoint, our courses are still lacking in essential details.

As I have said before, I congratulate the Automobile Industry in this state for the co-operation given so far. There is however one point which requires careful consideration. In my opinion, the technical institutions and the industry should work hand in hand. The Technical Institution should provide the industry with trained personnel whereas the industry should help the institution to train the personnel for them. The technical institution should undertake to carry out routine developmental tests and to solve the problems for the industry by undertaking research or investigation into those problems, whereas the industry should hand over such work and such problems to the technical institutions and should help the technical institutions with equipment and even financial assistance to set up the Laboratory facilities required for the purpose. The institutions are more likely to be able to provide the requisite technical talent to tackle a problem—Mechanical engineers, Electrical engineers, Electronic engineers, Chemists, Metallurgists, Physicists who may be able to undertake a co-operative research programme.

One further point—The present automobile industry depends, more or less, on their parent organization for design and know-how. I have been told that the Tariff Board and the Government of India have

been insisting on use of indigenous material for the manufacture of various parts but this cannot be done under the present conditions, unless the foreign manufacturers alter their designs to suit our requirements and our material. This is too much for us to expect of a foreign concern. This has to be done by our own men. Our technicians and research workers must be encouraged to develop our own material and to produce our own designs. They must be helped to carry out research on their own and to apply the data obtained by them to their own designs. The process may seem to be rather odd, but odd as it may seem, this is, to my mind, the only way open to train our men who would be aware of their shortcomings and would be confident of their work. We are importing know-hows, but the process cannot go on for ever. We must train our own men and give them opportunities even to make mistakes in order to learn from them.

The industry must realize the importance of the co-operative work and assist the technical institutes to build up and to work the research laboratories. The technical institutes, in their turn, will have to assist the industry, to carry out any test or investigations for the benefit of the industry. I am certain that Technical Institutions will shed off their inertia and will take part in any such co-operative effort.

It will be in the interest of the Nation in general and the Automobile Industry in particular, if a close liaison is established between technical institutes and the industry with an agreed programme of training and research planned in a manner commensurate with the needs of the industry and its development on a co-operative basis, and if the Industry agrees to do its best to provide adequate facilities, equipment and resources to the technical institutions. It may not be out of the place for me to put before the manufacturers of automobiles and automobile products of India that in all technically advanced countries in the world the success of technical education and training has been due to active participation and generous help, from the industry. This country cannot be an exception.

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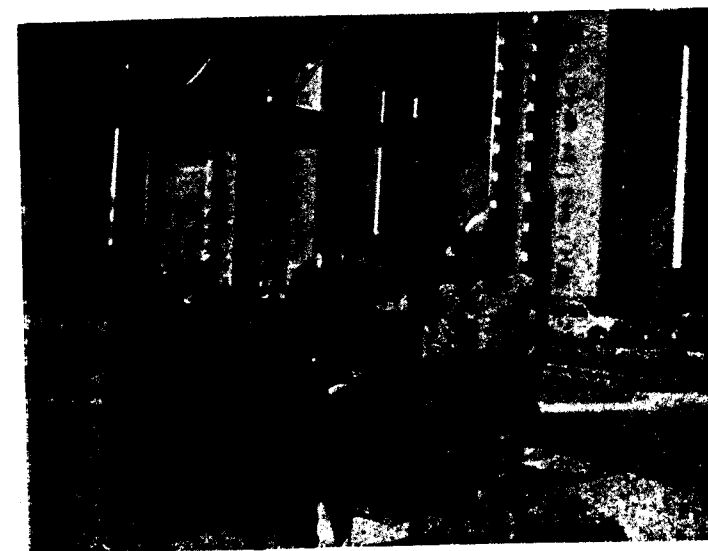
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MORE WORLD VIEWS

VALLINGBY—a satellite town of Stockholm showing a mobile information booth in the foreground, intended for tourists.



A tower view
in Madrid



The impact of ancient moghul civilisation in Europe can be seen from the palace view to the left.

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INLAND TRANSPORT

IN THE UNITED KINGDOM

The dense passenger and freight traffic of Great Britain* is carried mainly by road and rail, although coastal shipping and, to a lesser extent, inland waterways play an important part in carrying freight, particularly bulky cargoes. Passenger and freight traffic on the domestic services of British airlines is steadily increasing (see R. 3583, Civil Aviation in the United Kingdom). There are in Great Britain some 19,000 route-miles of railways (51,300 track miles) and nearly 200,000 miles of road, of which only about one-quarter may be classed as main roads. The railway network was developed mainly in the nineteenth century from 1840 onwards (and there are now more railways per square mile in Britain than in any other country, except Belgium), while the building of new roads and the widening and strengthening of old ones to accommodate the increasing motor-vehicle traffic has been, and still is, a feature of the twentieth century.

In 1956, the number of passenger journeys made by public transport (road and rail) in Great Britain was about 17,000 million. In addition, in the summer of 1956, 3,887,906 motor cars and 1,326,210 motor cycles were licensed for use on the roads. The annual mileage of most of the cars is believed to be between five and ten thousand. Journeys by public transport are mainly short and a great many of them are to and from places of work. The resultant concentration of travel in the morning and evening 'rush hours' constitutes a formidable problem in London and other centres of industry and commerce.

A general picture of Great Britain's domestic freight transport system is provided by the figures in the table below, produced as the result of a special inquiry into goods trans-

port by road made in 1952; they are only rough estimates, but no more accurate or up-to-date figures exist for the system as a whole.

TABLE					
<i>British Domestic Freight Transport, 1952</i>					
		Tons Car-ried (Mil- lions)	Ton-Mile- age (Thou- sand mil- lions)	Tons Car-ried Per- cen- tage	Ton-Mile- age Per- cen- tage
Rail	...	300(a)	22	24	43
Road	...	900	19	72	37
Coastal shipping.		40	10(b)	3	20
Inland Water-ways	...	10(a)	0.2	1	...
Total	...	1,250	51	100	100

Source: *Paper by K. F. Glover and D. N. Miller, read before the Royal Statistical Society, 28th April 1954.*

(a) Tons originating, including free hauled traffic.

(b) The 'inland equivalent,' that is the ton-mileage by inland transport that would result if the coastwise traffic passed by inland means of carriage.

In 1956, British Railways carried 21,473 million net ton-miles¹ of freight (918 million net ton-miles less than in 1952) and there were 1,173,311 goods vehicles on the roads (about 200,000 more than in 1952) so the share of freight traffic carried by road has increased.

The State has for a long time exercised considerable control over public transport operators, and the scope and degree of regulation in the interest both of public safety and of efficiency has increased steadily throughout the twentieth century.

*For an account of inland transport in Northern Ireland see page 75.

I. THE BRITISH TRANSPORT COMMISSION

Today the British Transport Commission has an annual turnover of £700 million and is the largest single employer of labour in the country, employing some 800,000 men and women. Its present role and structure are the result of a series of Transport Acts passed since 1947.

The Transport Acts of 1947, 1953 and 1956

On 1st January, 1948, in accordance with the provisions of the Transport Act of 1947, most of Great Britain's² inland transport system passed into public ownership. On that date, the railways, all railway-owned steamships, docks, hotel and road transport interests, most of the country's canals (including all those owned by the railways) and the whole of London's passenger transport system came under the control of the British Transport Commission, a newly created public authority, which was given the duty of providing an efficient, adequate, economical and properly integrated system of public inland transport and port facilities for passengers and goods. In addition, the Commission was to arrange for the gradual acquisition of privately owned long-distance road haulage firms. Road passenger transport outside London was not taken over, but the Commission was given power to prepare area schemes for co-ordinating passenger services by road and rail, including power to acquire road passenger undertakings for this purpose. A considerable amount of road haulage, several

¹Net ton-miles are calculated by multiplying the tonnage carried by the actual distance it was carried.

²In Northern Ireland public ownership was brought into effect by the Transport Act (Northern Ireland), 1948 (see page 75).

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waterways and many docks were left outside the Commission's scope.

The Conservative Government, which took office in 1951 announced a new policy for the operation of public transport, including decentralization of the railway administration, greater freedom to adopt normal commercial practice particularly in charging, the partial return of long-distance road haulage to private enterprise, and the revocation of the Commission's power to make schemes for the co-ordination of road and rail passenger services. The policy was put into effect by the Transport Act of 1953, and the actual reorganisation of the British Transport Commission was completed by 1st January, 1955. A further Act, the Transport (Disposal of Road Haulage Property) Act, 1956, was necessary to complete the reorganisation of the road services.

Today the British Transport Commission resembles in organisation, purpose and status a large-scale commercial corporation. It is in keen competition with public and private transport by road, sea and air.

Present Organisation

Under the provisions of the 1947 Act, the British Transport Commission is responsible to the Minister of Transport and Civil Aviation who, in turn, is responsible to Parliament. The Minister appoints the members of the Commission (with the maximum membership of 14 members and a chairman) and is empowered to give general directions to the Commission in the national interest and to approve the general outline of programmes of major development and of training, education and research. The Commission was originally given borrowing powers of £ 275 million, which were increased to £ 600 million in 1955. The Transport (Railway Finances) Act, 1957, provides for a temporary extension of the purposes for which the Commission may borrow or secure advances (see below). An annual report and statement of accounts is submitted to the Minister who lays it before Parliament.

The Commission itself is a policy-making and not a managing body.

It works through six policy-making Committees each dealing with one particular subject in relation to all the Commission's activities, and through Sub-Commissions which are not policy-making but each of which takes a special interest on behalf of the Commission in the activities of one of the 'Divisions' (see below) and serves as a clear and easy channel of approach to the Commission. These Committees, and Sub-Commissions are composed of members of the Commission.

There are seven divisions to carry on various activities of the Commission's undertaking: British Railways, British Road Services, Tilling (bus) Group, Scottish Omnibus Group, British Transport Docks, British Transport Waterways, British Transport Hotels and Catering Services. The management of British Railways is in the hands of six Area Boards (the areas corresponding with the former regions, which leave day-to-day management to the General Managers of the areas. Important matters affecting general policy are reserved to the Commission and are dealt with by the British Railways Division and the Railways Sub-Commission.

Road passenger transport and the underground railways in the London area are operated by the London Transport Executive which was established as an agent of the British Transport Commission by the Transport Act, 1947.

Since September 1956, the business of British Road Services has been conducted through five limited companies with some 15,000 vehicles altogether. The shares of all these companies are owned by the Commission although two companies may still be disposed of as going concerns. British Road Services' Board of Management controls the operating companies through their Boards of Directors. For purposes of executive management there are six geographical divisions and one division (Pickfords) for special traffics.

Consultation with coastal shipping operators is provided by the Coastal Shipping Advisory Committee, which was set up under the

1947 Act to consider, and from time to time to report to the Minister on all matters jointly affecting the interests of the British Transport Commission and those of coastal shipping. The 1953 Act extended the scope of the Committee's work to include road haulage. The members of this committee are appointed by the Minister from the Commission and from among representatives of coastal shipping after consultation with interests concerned; it is intended to arrange for road haulage interests to be represented on the committee. The Commission also consults with the operators of coastal liners on questions of rates and charges at the Coasting Liner Conference.

Financial results

The Commission reported in 1956 that it had earned a working surplus in every year since it came into being in 1948, but in several of those years the surplus earned was insufficient to meet the central charges of the Commission, which include central administrative expenses and interest on stock. The Commission is permitted to balance its accounts 'taking one year with another,' but at the end of 1954 it had an accumulated deficit of £39 million. By the end of 1955, following a railway strike and a period of increased costs, the deficit had increased to £70 million, and by the end of 1956 it was nearly £120 million. The Commission is confident that the various corrective measures that it has in hand, particularly projects that will be completed early in the railway modernization programme will bring its financial position into balance by 1961 or 1962. Meanwhile, in order to place the organisation on a sound financial basis during the critical years of reconstruction, the Government will, under the Transport (Railway Finances) Act, 1957, make special advances to the Commission up to £250 million to meet the annual revenue deficits for this limited period. The advances made will be liable to interest and will be repaid in instalments.

Transport Tribunal

The Transport Tribunal, set up under the 1947 Act, has jurisdiction

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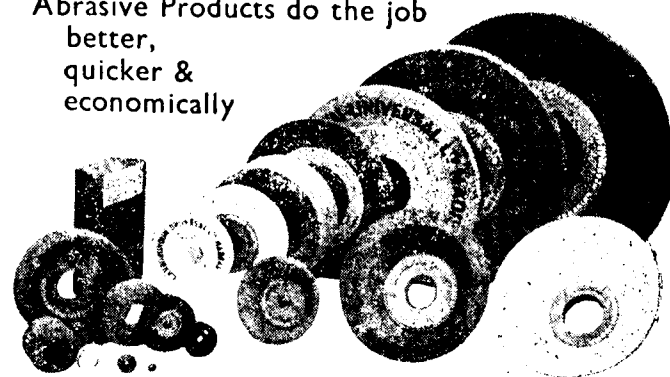
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over the charges scheme which govern the maximum charges which the British Transport Commission may make on British Railways, on the road and rail services provided by the London Transport Executive, at its docks, and by tolls for the use of inland waterways. The Tribunal replaced the Railway Rates Tribunal and has also taken over responsibilities from certain other statutory bodies. Appeals arising from applications for road haulage (goods vehicles) licences are heard by the Tribunal and it has other duties relating to harbours and canals.

Transport Users' Consultative Committees

There are eleven Area Transport Users' Consultative Committees and a Central Transport Consultative Committee for Great Britain, which were set up under the 1947 Act, to give transport users an opportunity of putting forward criticisms and constructive suggestions for improving transport services provided by the Commission. The members of these committees are appointed by the Minister, after consultation with interests concerned, to represent commerce, industry, agriculture, labour, local authorities and the British Transport Commission itself. The area committees in England report to the Central Committee, which reports to the Commission and the Minister, who may give directions to the Commission upon any matter dealt with by a recommendation of the Central Committee. Since 1953, the Scottish and Welsh Committees also report direct to the Minister. Matters dealt with include the British Transport Commission's proposals for closing branch railway lines, withdrawing passenger train services, closing stations, and complaints by the public of inadequacy of services or facilities.

Railways

For a hundred years Great Britain has had a widespread railway network and, despite the vast and rapid growth of road and air transport in recent times, the railways remain a vital part of the country's transport system. The passenger services alone show how important

a role the railways have to play in this system, particularly in comparison with the role of railways in some other countries. For instance, the services of British Railways' Southern Region carry annually almost the same number of passengers as all the Class I railways of the United States of America, although, of course, the average length of journey is much less. The urban and suburban passenger services for London, Glasgow, South Lancashire and Birmingham carry about 1½ million passengers a day, mainly to and from their work in brief rush hour periods. These services account for about half the annual total of 1,000 million passengers on British Railways. The railways are also indispensable to a great part of the basic freight traffic. Every day British Railways haul a total of some 60 million ton-miles of freight and the flexibility of their operations enables them to deal with sudden heavy movements of bulk freight such as coal, or crops at harvest time. In 1956 British Railways carried a total of 277 million tons of freight.

Britain was the pioneer of railway development which was so essential to industrial and commercial expansion. Railroads were in use around pits and ironworks by the end of the sixteenth century, but the trucks were mainly drawn by horses. In the early nineteenth century various British engineers showed how locomotives could be used and George Stephenson was responsible for improved locomotive design. In 1825 the Stock ton to Darlington railway was opened as the first public railroad on which locomotives were used. This was followed by the Liverpool and Manchester railway of 1830 on which George Stephenson's famous 'Rocket' locomotive was employed. The great period of railway building was from 1840 to 1875, with a short lull following the collapse of the speculative railway boom in 1846. Government intervention began in 1846 with an Act of Parliament prescribing a standard gauge of 4 feet 8½ inches for all new lines except extensions of the Great Western Railway, which then had a gauge of 7 feet; it was not completely converted to the standard gauge until 1892. During the 1840s and 1850s

some railway companies were amalgamated and arrangements were made between the others to facilitate through traffic from one company's system to that of another. The Railway and Canal Traffic Act of 1854 obliged the companies to provide reasonable facilities and to avoid undue preference between users. The Railway and Canal, Traffic Act of 1888 drew up a standard freight classification and schedules of maximum freight charges which came into operation in 1893; alterations in rates had to be approved by a Railway and Canal Commission.

During the first world war the railways all came under centralised Government direction through a Railway Executive Committee. This experience served to emphasise the need for concentration and a comprehensive reorganisation of the system. Accordingly, the Railways Act of 1921 amalgamated 123 companies into four large groups: the London, Midland and Scottish, London and North Eastern, Great Western, and Southern. The Railway Rates Tribunal, which was established to take over the functions of the Railway and Canal Commission, was entrusted with the duty of carrying out an annual review of standard rates and fares which were to be adjusted with reference to the principle of maintaining to the companies a standard net revenue equivalent to that of 1913. In the inter-war years, the railways suffered both from the general industrial depression and from the growing competition of road transport and the standard net revenue was never earned. The railways experienced sharp competition, partly because road transport often offered cheaper and better facilities and partly because the statutory regulation of the railways' charging system led to the loss of some profitable traffics and the retention of unprofitable ones. Proposals made by the railways in 1938 for relief from statutory regulation of charges were overtaken by the outbreak of war in 1939 when the railways again passed under the control of a Government Railway Executive Committee. After the war came the Transport Act of 1947, bringing the railways under public ownership and causing them to be operated as a single enterprise

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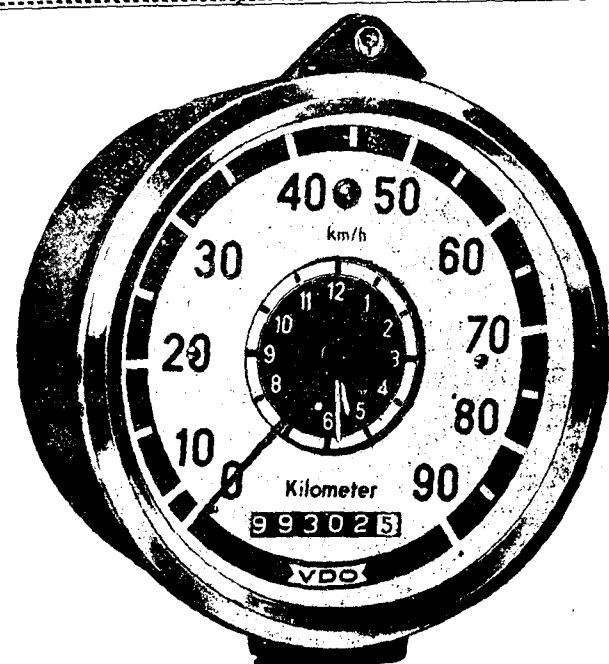
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known as British Railways with six regional sub-divisions—London-Midland, Western, Eastern, Southern, North Eastern, and Scottish. At first they were operated by a Railway Executive, on behalf of the British Transport Commission, but by the Transport Act of 1953 the Executive was abolished and a new organisation was set up.

Staff and assets of British Railways

The following figures summarise the numbers of staff employed and vehicles, ships and track owned by British Railways at the end of December, 1956:

Staff, total number ...	570,547
of which:	
Administrative Technical and clerical.	74,028
Operative ...	287,821
Maintenance and Construction.	195,585
Permanent way (standard gauge)—	
Railroad mileage (incl. electrified).	19,025
Track mileage (incl. electrified).	51,188
Locomotives—	
Steam ...	17,522
Electric ...	71
Diesel ...	94
Diesel-electric ...	513
Gas-turbine electric.	2
Others ...	5
Passenger carriages (a)—	
Locomotive hauled.	36,150
Diesel multiple unit stock.	453
Electric multiple-unit.	4,939
Freight vehicles ...	1,117,464
Ships (b) ...	129
Net tonnage of ships.	81,521
Road vehicles—	
Motors and tractors.	5,207
Articulated motive units.	10,639
Trailers for above...	29,416
Horse-drawn vehicles.	1,224

(a) Including rail motor vehicles.

Annual 1958

(b) Including 8 jointly owned and 7 operated but not owned. British railways operate services on twelve routes to the Continent including two train-ferry services, Harwich-Zeebrugge and Dover-Dunkirk. Services are also operated across the Irish Sea, and on coastal waters and lakes.

At the end of 1956, there were 363 railway refreshment rooms, of which 70 were operated by tenants and 293 by British Transport Hotels and Catering Services, which also operated 36 hotels. Two hotels were operated by tenants. Hotels and catering services staff numbered 15,305.

Development of British Railways

During the first eight years of the British Transport Commission's life to the end of 1956, capital expenditure on British Railways amounted to about £360 million. Some of this was accounted for by maintenance, including arrears of maintenance inherited from the war period, and renewal of rolling stock. Several new lines of development have been completed in recent years, including the electrification of the lines between Wath, Sheffield and Manchester, from London to Chelmsford and from London to Southend, a diesel service between Edinburgh and Glasgow and the introduction of diesel rail cars in various parts of the country. Existing development projects have now been incorporated in a £1,200 million modernisation and re-equipment programme announced by the Commission in January 1955, which is based on the premise that work on its main components will be capable of being started during the first five years and completed within fifteen. The Commission expects that the result will ultimately be to improve the financial position of the railways by at least £85 million a year. The programme is to be financed partly from internal sources and partly by the issue of Transport Stock for which a Treasury guarantee will be available.

Major features of the programme are the remodelling of freight services and the progressive displacement of steam by diesel and electric traction. As regards freight services, operations are to be completely reorientated so as to speed up movement, reduce costs, provide direct transit for main streams of

traffic and to attract to the railways a due proportion of the full-load merchandise traffic which would otherwise pass by road. Larger wagons are to be introduced, continuous brakes are to be fitted to all wagons, and marshalling yards, goods stations and handling facilities are to be improved. As regards traction, electricity is regarded as the ideal alternative to steam, especially where traffic is dense, but the substantial engineering work involved in converting a length of line to electric traction imposes a limit on the amount of main-line electrification that can be completed during the 15-year period. Thus, it has been decided to electrify, during this period, two major trunk-routes from London (King's Cross) to Leeds, and from London (Euston) to Birmingham, Liverpool and Manchester; to extend the existing electrification from London (Liverpool Street) to Chelmsford as far as Ipswich, including some branch lines; and to complete the electrification of the main routes of the Southern Region east of a line from Portsmouth to Reading. On the rest of the main-line services it is proposed to introduce diesel traction as quickly as possible. The programme also provides for track improvements, signalling improvements including an extension of automatic train control, and the introduction of multiple-unit diesel trains in many areas.

Development projects that were in progress in 1956 or were due to be undertaken during 1957 included: the electrification of the line from London to Bishop's Stortford and of the line from Manchester to Crewe (due to be completed in 1959, this is a 'pilot scheme' for the electrification from London to Birmingham, Liverpool and Manchester, the extension of various Southern Region electrified services; the introduction of diesel services from Birmingham to Swansea and from London to Hastings; the improvement of passenger stations at Manchester, Glasgow, Plymouth and Cannon Street (London); and the construction of five new marshalling yards at Stratford and Barking (both in the London suburbs), Edinburgh and Margam (in connection with the South Wales steel traffic) which together will cost nearly £10 million.

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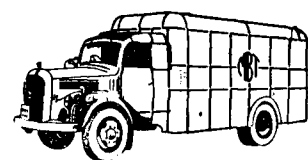
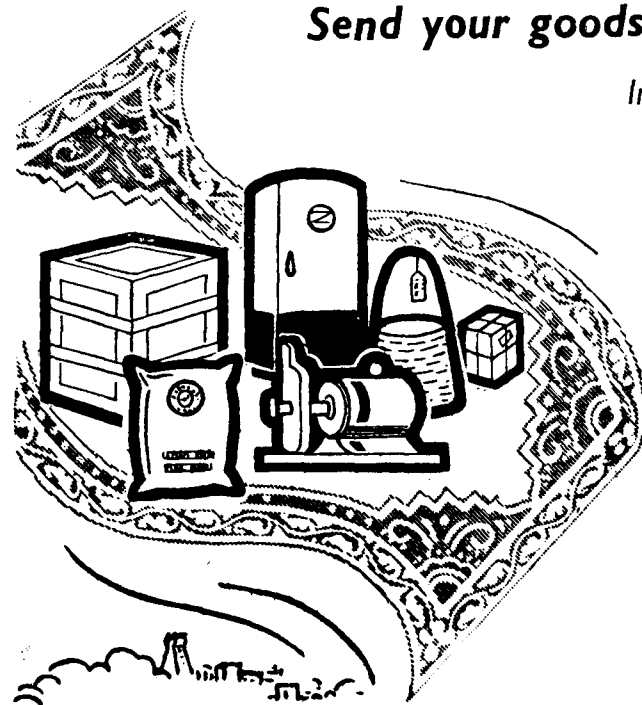
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By 1957, over one-third of the total sum of £1,200 million, to be spent under the fifteen-year programme, was committed to developments, either in progress or authorised. Large individual programmes of expenditure that had been authorised included £92 million for electrification, £33.5 million for diesel main line and shunting locomotives, £32.5 million for diesel multiple-unit trains and £46 million for major works such as track widening, new junctions, and station and depot reconstruction schemes. The following items are some of the main features of the railway modernisation programme for 1957 and 1958. Over 200,000 freight vehicles will be provided with continuous braking, thus enabling freight train speeds to be greatly increased. More than 100,000 new freight and service vehicles and over 13,000 road-rail containers will be delivered. Deliveries of locomotives in 1957-58 are expected to include 20 electric main line locomotives, over 160 diesel main line locomotives and more than 500 diesel shunters. In addition, about 1,700 powered coaches for multiple-unit electric and diesel trains are expected to be delivered. Five diesel-electric *de luxe* trains will come into operation in 1958 on routes from London to Manchester, to Birmingham and Wolverhampton and to Bristol. New lines, primarily for freight traffic, will be built at Stratford-upon-Avon, at Edinburgh, in Yorkshire and in South Wales.

Roads

The road system in Britain is complex and to a large extent haphazard. For centuries after the Romans left Britain, road building and maintenance were left mainly to the parish, which was naturally concerned only with local needs. The most effective intervention by the Central Government was in the seventeenth century with the institution of turnpike trusts. The maintenance of a length of road was placed in the hands of a trust, made up of private individuals, empowered to levy tolls at the gates it erected at the limits of its jurisdiction. Early in the nineteenth century there were 1,000 of these trusts administering some 22,000 miles of road. The same period was also notable

for improvements in construction associated with the names of Telford, who emphasised the importance of solid foundations, and McAdam, who demonstrated the value of an arched surface of broken stone or flint. Turnpike roads made it possible for coaches to reach an average speed of 12 miles an hour. But transport by river and canal retained the advantage in handling bulky traffic and, as the nineteenth century progressed, the railways almost drove long-distance road transport out of existence. Roads held their own in towns where horse-drawn omnibus services were developed and then horse tramways, the first of which were introduced into London and Birkenhead in the early 1860s. Towards the end of the nineteenth century the tramways were electrified and largely taken over by local authorities. London's trams have now disappeared, as have those of most other cities and towns.

While tramways were still being developed, there came the internal combustion engine and the rapid increase in the number of motor cars. In 1909, the Government set up a Road Board to assist in providing new and better roads to meet the needs of the new traffic. In 1919 the Board's responsibilities were taken over by the newly created Ministry of Transport.

In 1956, Great Britain had 189,037 miles of public highway, over two miles for every square mile of territory. There were 8,270 miles of trunk roads, 19,670 of Class I roads, 17,646 miles of Class II roads, 48,818 miles of Class III roads, and 94,633 miles of unclassified roads. Roads are classified according to their traffic value, those of purely local traffic importance remaining unclassified. On maps and sign posts the trunk and Class I roads can mostly be identified by the letter 'A' in front of a route number, and Class II roads by the letter 'B.' Trunk roads are the main arteries of national traffic and the whole cost of their upkeep is met from Exchequer funds derived from annual grants voted by Parliament. The Minister of Transport and Civil Aviation is the highway authority for trunk roads in England and Wales and administers approved expenditure on these roads. For Class I, II and III roads the

Minister makes grants towards approved expenditure at the rates of 75, 60 and 50 per cent respectively. The highway authorities for these and for classified roads are the local authorities—in most cases the councils of counties and county boroughs. In Scotland, the Secretary of State has the same responsibilities for roads as the Minister has in England and Wales.

Development

Economic difficulties since the war have restricted expenditure on major improvements and new construction, and the bulk of expenditure on roads—£110 million in the year ended 31st March, 1956—has been devoted to maintenance and repair, although since 1953 there has been increasing emphasis on new works. In February 1955, the Government announced the first instalment of an expanded programme of road construction and improvement. It is intended that in the four financial years 1955-59 road development works in Great Britain should be authorised, involving an ultimate expenditure of £147 million by the Government and of £20-£30 million complementary expenditure by local highway authorities. In July 1957, the Government announced a new expanded programme of road works that will ultimately cost £240 million for the four years 1958-62 (this overlapping one year of the existing programme). The programme includes certain major projects of great national importance. The cost of these will be formidable and the Government has it in mind to charge tolls in suitable cases, with provision for sharing the proceeds with local authorities where they contribute to the expenditure. The Minister of Transport and Civil Aviation has explained the plan of campaign for the road programme. First, to construct as quickly as possible the first stage of a national network of modern trunk routes; these will be through routes, in many cases confined to motor traffic only. Secondly, to clear away the worst bottle-necks in urban areas and thus to give free outlets from the big cities and from other main sources of traffic to the trunk routes. Thirdly, to press forward with the maximum amount of smaller road works

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all over the country. The Minister has also announced his intention to give priority to the programme develops to five new major road projects ; a trunk road from London to Newcastle, based on the Great North Road ; a new motor road from London to Birmingham and Lancashire ; two new trunk roads from London to the south-east by-passing the Medway towns, and Maidstone and Ashford ; a new road from the industrial Midlands to the South Wales ports ; and a road from London westwards to London airport, the West of England and South Wales. In March 1957, work began on a tunnel under the River Thames from Dartford to Purfleet to provide a new road link between Kent and Essex ; it is expected that it will be completed by 1962. In Scotland, it is intended that construction of a new road bridge across the Firth of Forth should begin in the summer of 1958.

Road Transport

Between 1830 and the 1914-18 war, the railways were unchallenged as the chief means of transport in the country ; the war, however, greatly stimulated the development and use of motor transport. In the period immediately following the first world war, the growth of public road transport began to make itself felt as a serious competitor of the railways and there was keen competition within the road transport industry itself. In 1928 a Royal Commission on Transport was appointed to consider the issues involved, and following its recommendations legislation was introduced. The Road Traffic Act, 1930, provided either directly or by regulations for (i) a reclassification of motor vehicles and the re-enactment of the licensing system for drivers ; (ii) the prescription of speed limits and a variety of ' safety ' measures, including a restriction on the hours during which drivers of public service and goods vehicles could remain continuously on duty ; (iii) safety requirements governing the construction and use of motor vehicles ; (iv) compulsory insurance against third party risks ; and (v) the introduction of a comprehensive licensing and inspection system for public service (passenger) vehicles, under which bodies

of Traffic Commissioners were created with the duty, within defined traffic areas, of licensing vehicles, drivers and conductors, and services operated. The Traffic Commissioners consist of a full-time chairman appointed by the Minister and two part-time members chosen by the Minister from a panel of persons nominated by local authorities. Applications for licences for road services are considered at public sittings at which competing operators or local authorities can exercise a right of objection ; the Traffic Commissioners have power to suspend or revoke a licence in certain circumstances. Although the Minister can issue general directions to Traffic Commissioners, he has no power to intervene in their decisions, unless an applicant or an objector, being aggrieved at a decision, appeals to him. The effect of this system has been to ensure for road passenger transport the regularity and reliability which has been a feature of railway services.

In 1933, the Road and Rail Traffic Act was passed ; it was based on the recommendations of the Royal Commission and on those contained in a report of a conference of experts, known as the Salter Report. A system of licensing for road haulage vehicles was introduced and three types of carriers' licences were instituted ; the ' A ' licence for general public haulage ; the ' B ' licence for public haulage limited to certain goods or certain areas and covering also the carriage of the licensee's own goods ; and the ' C ' licence for the carriage by traders of their own goods alone. The licensing authorities for goods vehicles are the chairmen of the licensing authorities for public service vehicles in each traffic area, and applications for ' A ' and ' B ' licences are considered at public inquiries as in the case of road service licences under the Road Traffic Act, 1930 ; ' C ' licences are granted on application without public inquiry. A licence can be suspended or revoked by a licensing authority for breaches of licence conditions committed frequently, wilfully or to the public danger. There is a right of appeal against a decision of a licensing authority to an independent tribunal, the Transport Tribunal

The effect of this system has been to relate the operations of vehicles under ' A ' and ' B ' licences to approved needs and to eliminate wasteful competition between the different forms of transport.

The Transport Act, 1947, as already noted, established the British Transport Commission, which took over ' A ' and ' B ' hauliers predominantly engaged on long-distance haulage. Vehicles operating under ' C ' licences and those used for carrying certain specialised traffics were not affected by the Act ; ' A ' and ' B ' licensed vehicles which were not acquired by the Commission could only be used on journeys of over 25 miles from base under permits granted by the Commission. By the end of 1951, when the acquisition of vehicles by the Commission was completed 3,266 undertakings with 41,265 vehicles and 3,018 trailers had been acquired. Carriers' licences were not required for vehicles operated by the various undertakings of the Commission.

The Transport Act, 1953, required the British Transport Commission to dispose of the bulk of its road haulage undertaking, and all vehicles operated by the Commission were made subject to the carriers' licence system.

The Commission was to be allowed to retain a proportion of its road haulage fleet corresponding broadly to the interest the railways had in road haulage when they were taken over on 1st January, 1948.

A Road Haulage Disposal Board was set up to supervise the disposal of the Commission's vehicles. Purchasers of the vehicles were entitled to operate them at once without restriction as to distance and the 25 mile radius limit was removed from all operators on 1st January, 1955. The Act also established an annual transport levy on all goods vehicles of more than 1½ tons unladen weight and on all goods tractors, out of which the Commission was to be compensated for the capital loss suffered ; this levy was terminated at the end of 1956 after having produced about £12½ million. The Road Haulage Disposal Board's sales of the smaller lots of vehicles proceeded well, but there was little response to the offers of the larger

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units of the trunk services. The Government therefore decided that if the vital trunk services were to be preserved there was no alternative to leaving them in the hands of British Road Services. The Transport (Disposal of Road Haulage Property) Act, 1956, was accordingly passed to enable the Commission to make over to companies under their control more vehicles than permitted under the 1953 Act. In all, 19,000 vehicles were sold during the course of disposals. As from 9th September, 1956, British Road Services have been conducting their business through the medium of five companies : British Road Services Ltd. (general haulage 7,750 vehicles) ; BRS (Pickfords) Ltd. (special traffic and some contracts, 1,350 vehicles) ; BRS (Contracts) Ltd., (1,000 vehicles) ; BRS (Parcels) Ltd. (4,400 vehicles) ; and BRS (Meat Haulage) Ltd. (500 vehicles). The shares of all these companies are owned by the British Transport Commission ; those of BRS (Parcels) Ltd. and BRS (Meat Haulage) Ltd. are still subject to disposal at some later date.

At the end of 1956, 1,180,396 goods vehicles were authorised under carriers' licences, including 87,995 under 'A' (public carriers') or contract 'A' licences ; 68,906 under 'B' (limited carriers') licences ; 998,219 under 'C' (private carriers') licences ; and 25,276 under special 'A' licences issued to purchasers of vehicles formerly operated by the British Transport Commission as part of the nationalised road haulage undertaking.

Road safety measures

In 1956, there were six and three-quarter million motor vehicles licensed to use Great Britain's roads, of which over three and three-quarter million were motor cars and over a million and a quarter were motor cycles. Traffic density, is therefore, high, presenting serious problems of control and safety. In 1956, 5,367 people were killed on the roads and 262,593 injured. Under the Road Traffic Acts of 1930 and 1934 the Government introduced a variety of measures designed to improve road safety, such as imposing a speed-limit in built-up areas, requiring all new

drivers to pass a driving test, and laying down penalties for dangerous driving. A number of new traffic laws were introduced under the Road Traffic Act, 1956, but they were not all put into force immediately. This Act includes provisions making compulsory the annual testing of all vehicles which are ten years old, or more ; enabling local authorities to designate parking places on the roads at which charges can be made by means of parking meters ; extending to cyclists penalties for dangerous driving ; and placing pedestrians under a legal obligation to obey the directions of police on traffic duty. Vigorous road safety campaigns are conducted by local authorities with the aid of Government grants. The Royal Society for the Prevention of Accidents, the police and education authorities are all actively at work to the same end. There is a system of pedestrian crossings including some marked with conspicuous white stripes—hence the name 'zebra crossings'—and illuminated by flashing beacons. The standard of conduct for all road users—pedestrians and drivers—is set out in *The Highway Code*, the third edition of which was published in May 1957. A failure to observe any provision of this code does not of itself render a person liable to criminal proceedings of any kind but it may be taken into account in any such proceedings. Drivers of motor vehicles—including motor cycles, motor scooters and powered pedal cycles—all have to pass a driving test before being granted a substantive licence to drive ; until they pass the test they may obtain a 'provisional' licence which necessitates their displaying 'L' (Learner) plates and, in all cases of vehicles constructed to carry passengers, they must be accompanied by a qualified driver. Under a new law that came into operation on 1st October, 1956, as part of the Road Traffic Act, 1956, drivers who have not renewed their licences for ten years or more must pass the driving test before they can obtain a new substantive licence.

Inland Waterways

In 1761, James Brindley completed the Bridgewater Canal to take coal from the collieries owned by the Duke of Bridgewater at Worsley

to Manchester. This marked the beginning of canal building in modern Britain which played an important part in promoting the industrial and commercial expansion of the late eighteenth and early nineteenth centuries. Most of the present network—except, notably, the Manchester Ship Canal which was built between 1888 and 1894—was completed by 1840 when the development of railways brought to an end the golden age of canals. As railway competition developed, many canal companies were reduced to a precarious position, and, often at the instance of the companies, about one-third of the canal mileage passed to the control of the railways. During the first world war, Government control of railways included railway-owned canals. In 1917, the main canals not owned by the railway companies were placed under the control of a Canal Control Committee of the Board of Trade, being returned to their owners at the end of the war. Government control was again the rule in the second world war and, in 1948, the canals passed direct from Government control to the British Transport Commission.

The system

There are some 2,400 miles of navigable inland waterways in Great Britain of which some 600 miles are now used only a little or not at all by commercial traffic. Some 1,000 miles are narrow waterways which can generally be used only by boats not exceeding 7 feet in width with a load varying from 25 to 30 tons ; the remainder are broad waterways which can be used by craft with from 50 to 400 tons capacity. Broad waterways are mainly the canalised rivers, e.g., the Severn, Lee and Stort Navigation, Trent Navigation, Weaver Navigation and Aire and Calder Navigation ; while narrow waterways, are mainly the canals in the interior, e.g., the Grand Union, the Shropshire Union, and the Birmingham network. The canals in Scotland are broad.

The British Transport Commission is responsible for 2,164 miles, of which, 1,430 miles are in commercial use. The canals in England and Wales under the control of the Commission are grouped into four

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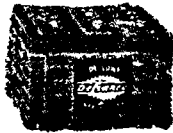
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3. The South-Western Division is based on the Severn estuary and its waterways are related to the ports of Avonmouth, Gloucester, Sharpness, Barry Lydney, Cardiff, Newport and Swansea.
4. The South-Eastern Division is based on the Thames estuary and its waterways give access to the Port of London and to the Midlands.

Canals in Scotland, which are separately administered by the British Transport Commission, are the Caledonian Canal, the Crinan Canal, the Forth and Clyde Canal, the Monkland Canal and the Union Canal.

Most of the traffic on the waterways is carried by independent carriers or by traders in their own craft. The British Transport Commission, however, at the end of 1956 owned 23 tugs and 1,141 carrying craft with a carrying capacity of 41,140 tons, including 219 power-driven craft with a carrying capacity of 8,391 tons.

Survey of waterways

Since assuming control, the British Transport Commission has taken steps to strengthen the commercial organisation so as to secure increased traffic, improved dredging methods and equipment; it has brought better types of craft into service, established a research organisation and undertaken various development works, including the elimination of dangerous bends and the opening up of bottle-necks. It has spent over £2 million on arrears of maintenance and on new plant and equipment. In 1956, total traffic amounted to 10.4 million tons,

of which 5 million tons were coal, 2.1 million tons liquid in bulk, and 3.3 million tons general cargo. Nearly all this traffic is carried on 1,200 miles of waterway, and 85 per cent of it on only 325 miles, indicating a serious problem of moribund canals.

In April 1954, the Commission appointed a Board of Survey to examine its inland waterways, to report on whether they were being used to the best possible advantage and to suggest what should be done with those which could no longer be put to economic commercial use. The Board of Survey reported in 1955. It recommended, *inter alia*, that a separate organisation, *British Transport Waterways* should be set up for the waterways (this has been done, that certain waterways of a total mileage of 771, which had insufficient commercial prospects to justify their retention for navigation, should be transferred to other authorities such as River Boards; and that responsibility for the canals in Scotland, which were running at a loss, should be transferred to the Secretary of State for Scotland.

In 1955, the Commission authorised the expenditure of £500,000 as a first instalment of schemes to develop to the full those waterways which are of real value to the national transport system. In January 1956, a programme of further development works costing £5½ million was announced and, in February 1956, the Ministry of Transport and Civil Aviation instituted a further and wider inquiry into the economics of the whole system.

London Transport

London's transport system, in its modern sense, may be said to have begun when in 1829, four years after the opening of the Stockton and Darlington Railway, the first omnibus—horse-drawn—appeared on the London streets. Trams, also horse-drawn, appeared in 1861. In 1863 the first underground steam railway, the Metropolitan, was built by digging a great trench for the line and roofing it over. In 1870 a better method for building a railway inside a city was found when the Tower Subway was constructed. The line was laid in an

entirely underground tunnel and this became the world's first tube railway. In 1890 the City and South London, the first electric tube railway in the world, was opened, and it was followed in 1900 by the Cental London Railway, called the 'twopenny tube' because for a time all journeys on it cost twopenny. Soon after this, buses and trams ceased to be horse-drawn and used petrol and electricity respectively for their motive power, and trams, buses and underground railways rapidly developed into the vast network of London's transport system.

Until 1933 there was no unified operation. The large number of transport interests included: the main line railways with their suburban services; an Underground Group controlling most of the underground railways which was associated with the London General Omnibus Company's buses, Green Line Coaches and three tramway companies; the independent Metropolitan Railway Company; London County Council tramways; 13 municipal tramway undertakings; and some 60 small independent bus undertakings. But in 1933, the whole system, except the main line railways' suburban services, was vested in a public corporation, the London Passenger Transport Board. During the second world war, London Transport was taken over by the Government and operated, like the main line railways, through the Railway Executive Committee. In 1948, on the establishment of the British Transport Commission the London Transport Executive took over control.

The London Transport Executive is responsible for the operation of passenger road and rail services in the London area, with the exception of the main line railways, suburban services of British Railways, and taxicabs, which are all privately operated by companies or owner-drivers.¹

The Executive consists of a chairman and from four to eight members; in 1957 there were four full-

¹During 1956 in the Metropolitan Police District, which covers the counties of London and Middlesex and parts of Essex, Kent, Surrey and Hertfordshire, annual licences were issued for 5,898 taxicabs; licensed taxicab drivers at the end of 1956 numbered 9,051.

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More goods from farms, mines and factories have set motor transport a big task under the Second Plan. Rs. 269 crores have been allocated for road development in the next five years; at the end of the Plan, no well-developed village will be more than 5 miles from a main road; the present goods fleet of about 116,000 trucks will rise at the rate of 10,000 a year.

The Dunlop factory at Sahaganj, the largest rubber manufacturing plant in Asia, has taken in hand active measures to expand output to meet the growing requirements of road transport. A new Dunlop factory is being set up at Ambattur, near Madras, and will commence production in the near future.



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time and three part-time members. The chairman and full-time members each have special functional responsibilities apart from their general responsibility for running the London Transport System.

The operation of London's transport is a vast undertaking. It serves an area of 2,000 square miles, extending for an average distance of 25 miles from Charing Cross in the centre of London. It covers, in whole or in part, 10 counties, and includes the cities of London and Westminster, 27 other metropolitan boroughs, 2 county boroughs, 48 municipal boroughs, 59 urban and 29 rural districts. The total population of the area approaches 10 million.

From north to south the railway network stretches 18 miles, from east to west 32 miles and from north-west to east 49 miles. The total length of the railway over which London Transport trains operate is 253 miles, of which a third is underground, including the longest tube tunnel in the world, 17½ miles. London Transport trains serve 277 stations.

Diesel buses and coaches travel over roads which have a total length of 2,977 miles, and trolley buses (which use electricity) over 253 miles of road.

To carry traffic over all this area, the London Transport Executive in December 1956, owned 4,026 railway cars, 7,793 buses and coaches, and 1,614 trolley buses. The total staff employed at the end of 1956 was 87,237 of whom 12,017 were women. The total number of passenger journeys in 1956 was 3,913 million, or about 75 million every week.

The challenge to the efficiency of London Transport presented by this vast traffic is being met by a continuous process of development. Thus, since the end of the war, all remaining trams have been replaced by buses, extensions to the underground railway have been built and more efficient light alloy trains have been introduced. Current development plans include a new tube railway from the north-east to the west-end of London, and replacement of the remaining trolley-buses by diesel buses.

Public Transport in Northern Ireland

With the exception of passenger transport in the City of Belfast, which is provided by the Corporation, public road transport, road and rail services within Northern Ireland are mainly provided by the Ulster Transport Authority, a public body which was established under the Transport Act (Northern Ireland), 1948.

This body provides a country-wide omnibus service and also offers a comprehensive road freight service, both for the carriage of sundries and for the use of firms not wishing to use their own vehicles.

Railways

There are 433 miles of railroad open for traffic. Of these, 266 miles are operated by the Great Northern Railway Board, which is a joint undertaking of the Government of Northern Ireland and the Government of the Republic of Ireland. The Northern Ireland members of the Board are drawn from the Ulster Transport Authority which is responsible for the remaining 167 miles of railway.

The Great Northern Railway is operated as a single unit and statistics for the Northern Ireland half are not separately available. The scope of the Ulster Transport Authority's operations is indicated by the

following figures for the year ended 30th September 1956 :

Railroad mileage (open for operations) ...	167 miles
Road route mileage (omnibus) ...	2,670 miles
Locomotives ...	48
Diesel rail cars and trailers ...	58
Railway coaching vehicles ...	267
Railway freight vehicles ...	2,352
Omnibuses and coaches ...	914
Goods motor vehicles and trailers ...	1,120
Passengers carried during the year ...	100,084,650
Merchandise carried during the year ...	1,617,549 tons
Livestock carried during the year ...	873,930 head

Roads

There are 13,657 miles of public roads in Northern Ireland, comprising 348 miles of trunk roads, 960 miles of Class I roads, 1,747 miles of Class II roads, 2,760 miles of Class III roads, and 7,842 miles of unclassified roads. The Ministry of Commerce is responsible for the maintenance and improvement of the trunk roads and makes grants from the Road Fund (which is derived from such sources as the proceeds of taxation of mechanically propelled vehicles registered in Northern Ireland and from driving licence fees) to help the local authorities who are responsible for the other roads. During the four years ended 31st March 1956, a total of £17.1 million was spent on work on all types of roads in Northern Ireland.

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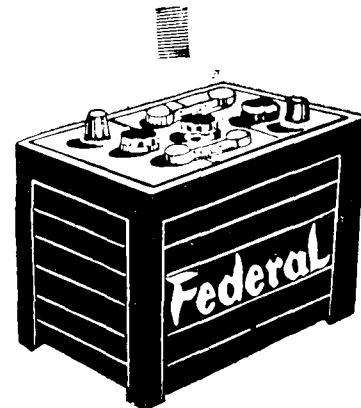
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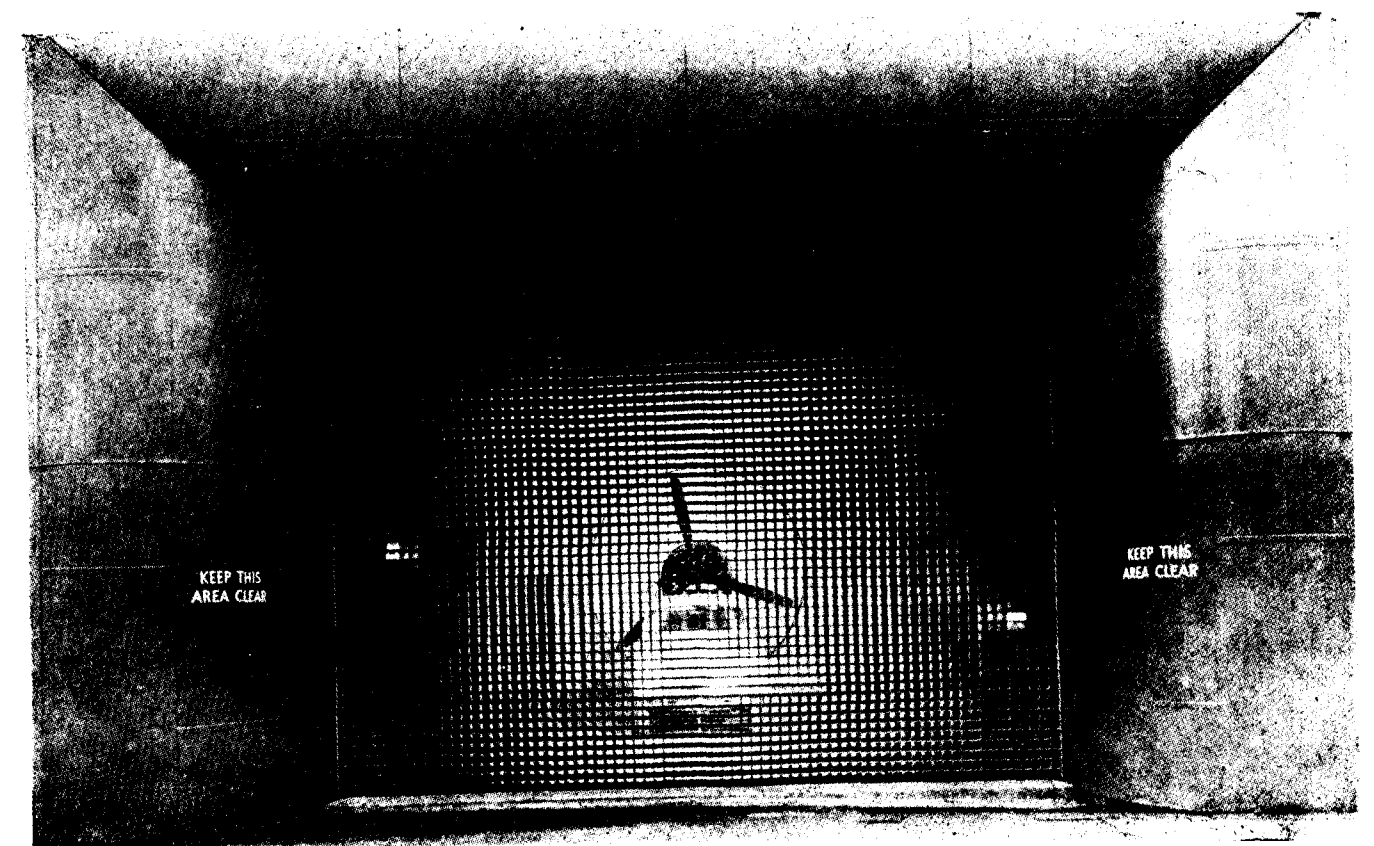
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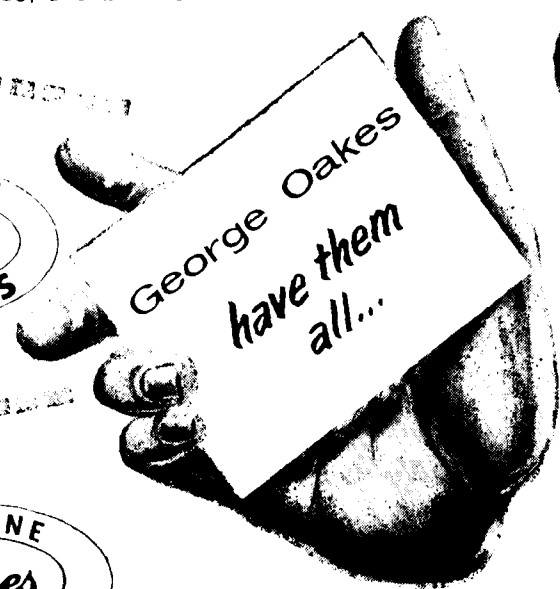
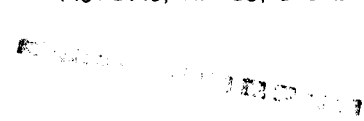
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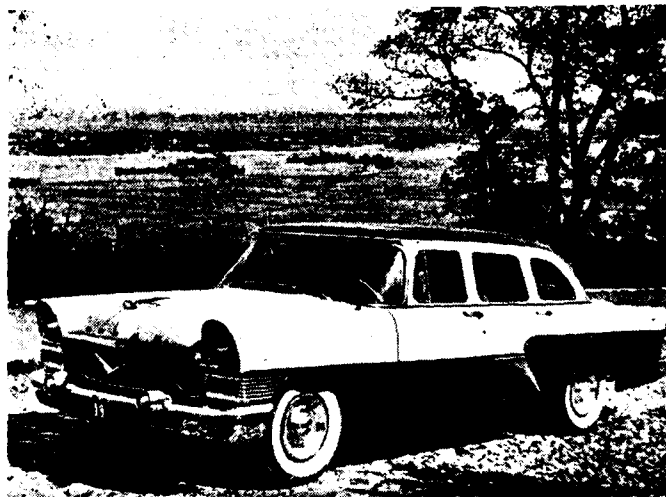


A passenger bus made on the basis of the GAZ-51 by the Riga Auto Repair Works.

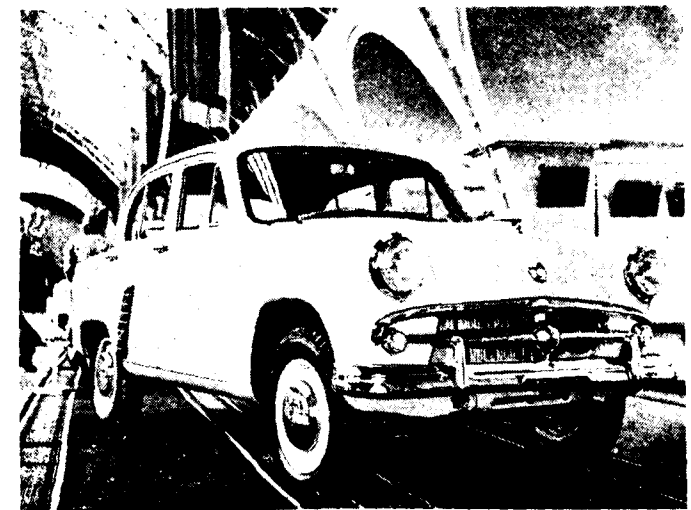


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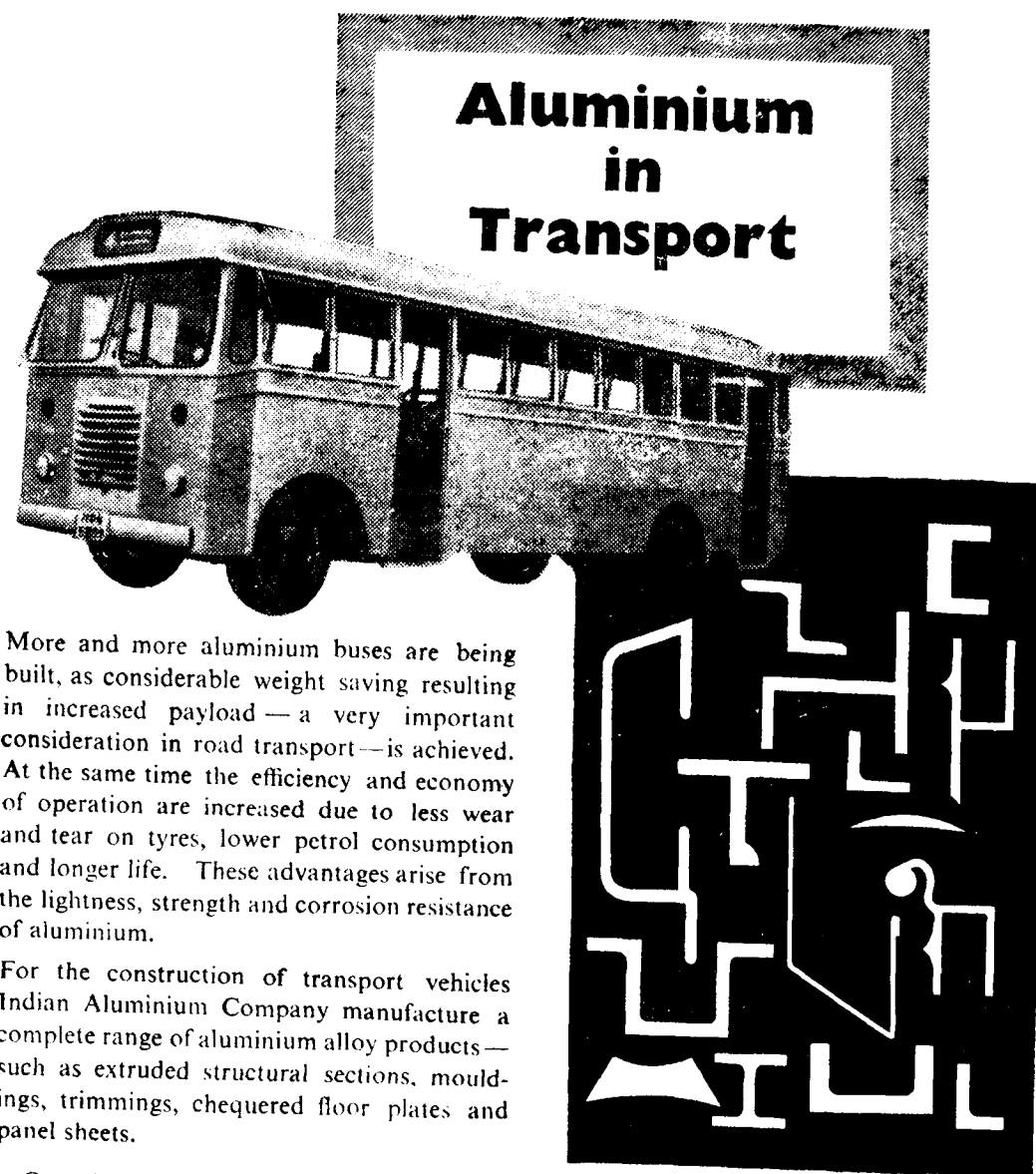


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More and more aluminium buses are being built, as considerable weight saving resulting in increased payload—a very important consideration in road transport—is achieved. At the same time the efficiency and economy of operation are increased due to less wear and tear on tyres, lower petrol consumption and longer life. These advantages arise from the lightness, strength and corrosion resistance of aluminium.

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ALUMINIUM IN ROAD TRANSPORT

BY R. K. CHARI

The use of aluminium in Road transport vehicles has developed extensively during the last half century. Combining lightness and superior corrosion resistance with strength comparable to that of steel, aluminium alloys held out manifold advantages over traditional materials like timber and steel. Aluminium construction enables saving in dead-weight, which can be utilised to increase revenue-earning payload or to reduce fuel cost. The corrosion resistance of aluminium gives it durability and eliminates the frequent repair work necessary with other materials, which results in high maintenance charges and a considerable part of the available fleet being rendered idle during repairs. As a result of these advantages, aluminium construction leads to economics, which amply justify the extra initial cost involved.

Passenger buses

All aluminium construction of a single deck bus results in a weight saving of over one ton, compared to composite timber and steel construction. Such a bus will feature the entire body structure above the chassis level built in extruded aluminium sections, the flooring being in aluminium chequered plates and the panelling in aluminium sheets. Sheets and sections, in the appropriate alloys and tempers, demanded by the service conditions of road transport vehicles, are indigenously manufactured and readily available.

All-aluminium construction of a single deck bus involves a slightly increased initial cost, which is in the range of Rs. 1,500 per bus. But, the reduction of dead weight by over one ton and the durability of aluminium under the aggressive climatic conditions in India lead to substantial savings in the recurring cost of fuel, maintenance and spare parts replacement. This is amply

illustrated by the following data derived from the experience of prominent fleet operators in India with all aluminium buses :

Extra mileage per gallon of diesel oil about 2 miles. (This corresponds to a saving of nearly 15% in fuel cost).

Reduction of tyre wear—15%.

Reduction of brake wear—10%.

Experience has shown that the extra initial cost of aluminium buses is amortised over a short period and substantial long term economy is effected.

In line with developments abroad, Government and Private transport operators in India have been quick to realise the manifold advantages of aluminium as a construction material. State Transport Organisations like B.E.S.T., B.S.R.T.C., U.P. Roadways and W.B.S.T. and private operators like T.V.S. Ltd., Madurai are increasingly adopting all-aluminium buses for their fleets. Many all aluminium buses have been running on Indian roads for years now, rendering satisfactory service.

Lorries and trucks

The benefits yielded by aluminium in passenger bus construction apply as well to the construction of load carriers like trucks and trailers. The increased payload capacity, rendered possible by reduced tare-weight, is of greater importance in the case of trucks and lorries. The reduction of idle hours, achieved by decreased maintenance needs, also serves to increase the revenue-earning capacity of the vehicle. The economies of aluminium construction are, therefore, all the more significant in relation to load carrying vehicles. In the transport of minerals the superior corrosion resistance

of aluminium makes it an ideal construction material.

The saving in dead weight will vary from vehicle to vehicle, depending on the type and dimension of the truck body. For a 5 ton drop side truck, of common size 7'-6" × 13' the weight saving effected is in the range of half a ton—the revenue earning capacity being increased correspondingly by 10%.

A number of all-aluminium trucks have rendered excellent service in Bombay. These form part of the Bombay State Road Transport Corporation's fleet of trucks. Other operators are also evincing active interest in aluminium.

Miscellaneous vans

Vans for various purposes—ambulance vans, delivery vans etc., are also being built in aluminium. While increased payload is of importance for delivery vans, the elimination of idle hours during maintenance and repairs assumes importance for service vans, such as are used by the ambulance, conservancy and Fire Fighting services.

A very interesting development in this field is the recent adoption in the country of all-aluminium construction for delivery vans built on "Lambretta" scooters, which has been found ideal for the service conditions involved.

With the rising tempo of industrial production in the country as a main feature of our National development plans and against the background of the inadequacy of the existing transport facilities in the country, the road transport industry looks forward to a period of useful and accelerated expansion. Aluminium and its alloys produced in the country, it is hoped, will render valuable assistance in this progress.

Annual 1958
M—11

MOTORINDIA

87

(Contributed)

Spring breakages in every transport organisation in India are fairly heavy and one of the remedies advanced to prevent such breakages is to use the most effective type of Shock Absorbers to protect the springs and chassis against bumps on bad roads.

Hydraulic type Shock Absorbers are commonly used and these types of Shock Absorbers though effective in the initial stages are difficult to maintain and repair and a stage comes when the springs are left without the assistance of Shock Absorbers, however perfect the maintenance be.

The provision of any Shock Absorber on a chassis will help to reduce spring breakages, especially when the vehicles are operating on bad roads and will also have the desired effect on other components of the chassis provided the Shock Absorbers continue to work in a satisfactory condition and do not easily go out of commission.

The common Hydraulic type Shock Absorbers are of piston or telescopic type which need constant attention to keep them in first class condition. The disadvantage with these types of Shock Absorbers is the linkage between the axles and the Shock Absorbers which, being a weak point, either break too often or get disconnected owing to the rubber bushes wearing out and losing their hold on the pins. The Hydraulic type Shock Absorbers are also prone to give trouble due to leakage of fluid.

The answer for the above disadvantages is Andre Hartford Shock Absorbers, which are of the friction type and require very little attention as against other type of Shock Absorbers and have robust linkages. Further, Andre Hartford Shock Absorbers are adjustable and can be adjusted according to the carrying capacity of the vehicle and road conditions. They can be adjusted to take overloads on the vehicle as and when necessary. This is a great advantage.

The constructional details of the Andre Hartford Shock Absorbers are extremely simple and consist of two arms fitted with the famous silent block flexible bearings held in position by dual control springs on either side of the unit.

The Silent Block Articulating Bearing is used in all Andre Hartford Shock Absorbers and consists of an inner and outer steel sleeve, the space being filled with a special rubber material which is stretched in position and is therefore always under sufficient tension to prevent any movement taking place between rubber and the outer arm and inner arm sleeves.

The movement necessary to allow the Shock Absorbers to function takes place in the material itself without friction or slipping, therefore, there is no wear, no lubrication nor other attention required, and further the elastic nature of the material also allows for the absorption of lateral strain and the two parts to flex in relation to each other.

Andre Hartford Shock Absorbers incorporate a number of important

improvements which results in greater efficiency, reliability and smoothness of action under all conditions. These improvements include :

- (1) New type non-corrosive friction plates entirely unaffected by weather conditions.
- (2) Dual Control Springs of new design on either side of the Shock Absorber giving an accurate pressure adjustment.
- (3) A self locking indicator clearly registering the degree of adjustment, which cannot work loose under any conditions.
- (4) A dirt and moisture excluding ring as a safety measure.
- (5) "Andruo" friction discs of new improved type, specially treated and impregnated to resist weather conditions and give the maximum smooth damping action under the most extreme working conditions.
- (6) All are fitted with 'Silent-bloc' Rubber Bearings, which require no lubrication or attention, always remain silent in action and last indefinitely.

By fitting Andre Hartford Shock Absorbers, apart from the improvements in riding qualities, a considerable saving in the consumption of springs, fewer number of vehicles meeting with breakdowns which in itself will result in operational economy.

Recently one of the biggest State Transport Corporations in India has switched over to Andre Hartford Shock Absorbers as a result of their test.

From the reports received from the above Transport Corporation, there have been only 52 spring leaves breakages in six months for ten vehicles by fitting Andre Hartford Shock Absorbers against 895 breakages on identical vehicles plying under the similar conditions but with or without their original hydraulic type Shock Absorbers.

Andre Hartford Shock Absorbers are also most suitable for Locos and Railway coaches.

For a direct replacement for the majority of Hydraulic Telescopic Shock Absorbers, Andre Hartford Telescopic friction type Dampers are also available.

The damper, being of friction design, has outstanding advantages—primarily, reliability and adjustability. There is no fluid to leak or to deteriorate and no servicing whatsoever is required.

The Andre Telescopic Damper is unique by virtue that it can be instantly adjusted for varying loads or road conditions whilst fitted in position on the vehicle. This is made possible by turning the outer Skirt tube, a spring locking device automatically preventing loss of adjustment by vibration.

The Andre Hartford Shock Absorbers are available for all types of cars and trucks.

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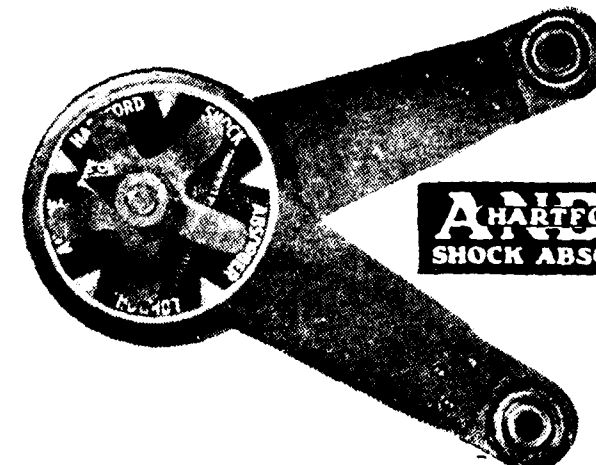
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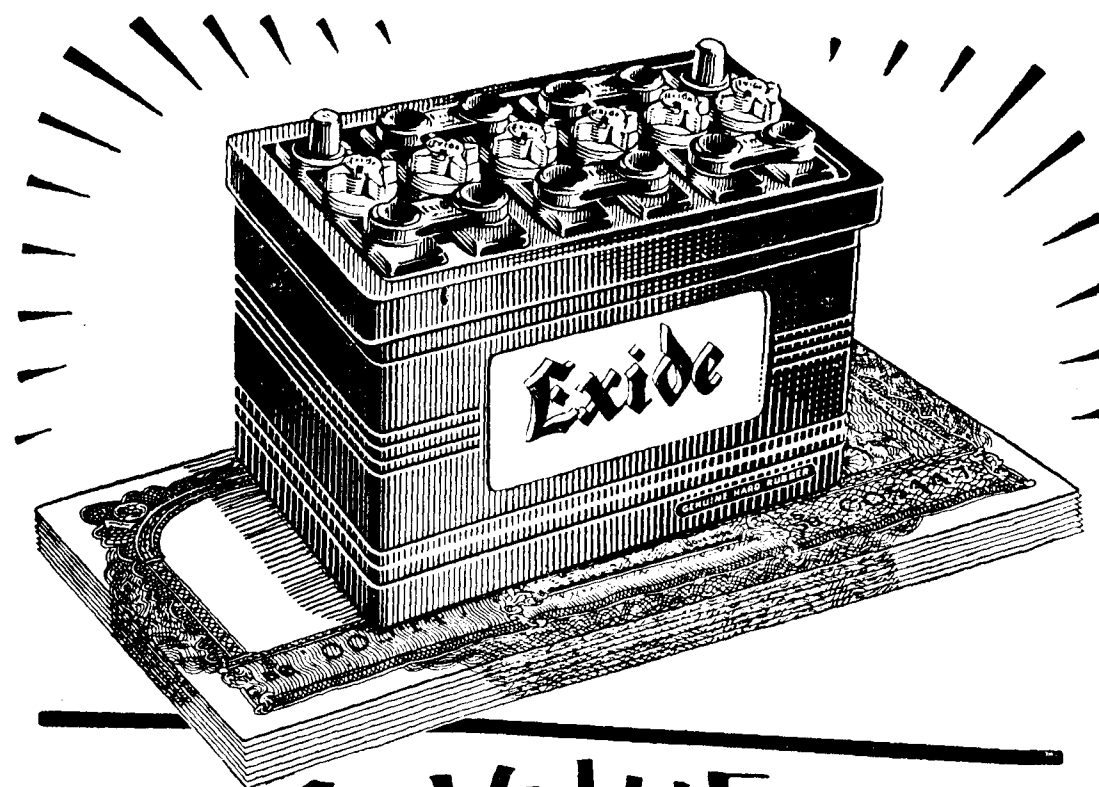
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EBSC-20

THE A. B. C. OF THE AUTOMOBILE

BY Sri V. M. MESWANI

A motor vehicle could be divided into a number of major groups, according to their function.

1. *Basic Structure* : This basic structure is essentially related to a horse drawn carriage or cart and consists of a frame, suspension system, axles and wheels and tyres.

2. *Power plant* : This provides motive power and includes fuel supply system, exhaust system and cooling system.

3. *Transmission system* : This transmits power to wheels and to any mechanical aux. system of the vehicles.

4. *Auxiliaries* : The common auxiliaries are electrical equipments, required to provide ignition, starting, lighting and signalling.

In addition, commercial vehicles are fitted, sometimes, with air-compressor for brake operation, winches etc.

5. *Controls* : Brakes, steering gear, changing speed lever, pedals, etc.

6. *Superstructure* : The body (in respect of cars) and body with cab. (in respect of trucks).

Before discussing about the groups, in detail, it is desirable to discuss the engine position and general classification, of the vehicle, taking into consideration the function they are required to fulfil.

Engine position

Engine position : In U.S.A. and in Great Britain, vehicles such as cars and load trucks are produced with conventional type of mounting of the engine, though, in U.S.A., even commercial vehicles have their engines conventionally mounted, but in Great Britain, except light delivery vans, most of the commercial vehicles have their cab brought forward over the engine to give increased payload.

However, there is an increasing tendency for the public service vehicles to locate the engines in the middle, under the floor of the vehicles. However, this is mostly restricted to the compression ignition type of engines, as in this type of engines, the fire hazard is absolutely negligible as compared to the petrol engine.

Mounting of the underfloor engines gives appreciable advantage as it gives increased payload and contributes considerably to the driver's comfort as this eliminates noise and heat. It has also a further advantage as it reduces the length of the drive from engine to rear axle which is quite an important consideration in long wheelbase vehicles.

In U.S.A., the practice of mounting of engine in the rear is also in vogue for the last 20 years ; while, a number of small cars with rear engine are in production in Europe. *The General Classification of vehicles*

The 3 main type of vehicles are :

(a) Single unit load carrier—which includes Car and Commercial Trucks ;

(b) Articulated vehicles—consisting of tractor unit, with partially super-imposed load carrying trailer, so arranged that the better part of the trailer weight is carried by the tractor.

(c) A tractor which does not carry load by itself, but is designed to draw independent trailers, carrying very heavy loads, even upto 100 tons or more.

The single unit vehicles ; the majority of these vehicles are conventional 4 wheel vehicles, with 2 axles, in which the front axle is a non-driving axle and the rear axle is a driving one. However, the single unit vehicles are manufactured with 4×2 , 4×4 and 6×4 , where the 2nd figure indicates the number of driving wheels.

In the case of 4×4 and 6×4 , it is the usual practice to provide the auxiliary 2-speed gear box,

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along with the main gear box, so arranged that the front wheels are only driven when the low range of auxiliary box is in use. However, when high auxiliary range is in use, the vehicles become 4 × 4 and 6 × 4. This auxiliary box is frequently called the transfer case. However, for Military vehicles, they are so designed that the front wheel drive can also be engaged on all the gears.

Articulated vehicles: The tractor unit of articulated vehicles are of 4 × 2 type generally, though occasionally 4 × 4 is also used.

In this class must be included "Mechanical Horse" used by Railways for local delivery. This has low power, 3 wheel single steering wheel in the front and connecting rear driving axle.

This is a very popular type of vehicle, because, of its low cost of running and maneuverability in awkward places. The coupling mechanism between the semi-trailer and tractor are so arranged that when a tractor is reversed into its position, all connections are automatically made with the trailer, while the lever within the driver's cab enables the

whole process to be reversed. This semi-trailer is fitted with a pair of retractable wheels in front which are automatically raised or lowered. Independent tractors are used for handling very heavy loads on appreciable gradients.

Group I

Basic structure: There are 2 types of distinct constructions in use. The conventional frame to which all mechanical units are attached and body or body and cab are super-imposed.

Integral frameless construction, in which the body is so designed as to combine the functions of body and frame.

The former practice is standard for all commercial vehicles as well as for larger and expensive cars but the majority of the manufacturers have for a lighter type of car with weight of about a ton—adopted frame-less construction. This is only possible in a closed car, as the roof, screen pillars, door pillars and the rear panel form essential part of the complete structure. Such

bodies are usually all steel and are only suitable for large volume production, while the open and ordinary commercial vehicles, do not lend themselves to such frame-less construction.

A conventional chassis frame is made of 2 channel sections raised together by cross members but the great improvement in welding techniques recently have enabled a lot of manufacturers to adopt a welded box section frame, constructed of relatively thin material which is very much lighter than pressed steel, has equal rigidity as open channel section and is relatively stronger in torsion as compared to its weight.

Suspension system: Two distinct type of suspension systems are in use:—(1) Conventional system in which the springs are attached to the rigid beam axle; (2) Independent system in which each wheel is free to move vertically without any reaction to its second wheel. The former is used for the front wheel axle of commercial vehicles and for rear axles of most of the private as well as commercial vehicles.

However, there are a few instances where the front independent suspension is used on commercial vehicles, while many small cars on the continent have independent rear suspension.

The leaf spring suspension:—In 4 wheel vehicles, the leaf springs are attached to the axles at the centre and attached to the frames at their ends; the front end operating on fixed pin and rear ends shackled to the frame to allow changes of lengths of springs as they are deflected. With this arrangement, it used to be known as *Hotch kiss* type. When applied to the rear axles, the springs take both the thrust or pull and torque reaction due to drive or brakes.

Axles: The weight carrying portion of the axles, both front and rear, have been secured on beams supported at both the ends, loaded at 2 integral points, and subject to the following loads:—

(a) Vertical load at the spring centres due to the weight of the vehicle.

(b) Side thrust at the radius of the tire due to centrifugal force when going round a curve.

It is empirical practice to assume this side thrust as equal to one-third of the load on the tire.

(c) The fore and aft load at the wheel centre due to braking or driving effort.

(d) Torque reaction due to the drive or brake.

In addition to these, for the cross country vehicles, especially in the case of Military vehicles, provision must be made in the front axle for stock loading due to striking or unexpected obstacles.

(The value for items (a) and (b) is assumed, while designing, twice the normal static load. A very modest factor of safety will take care of C and D as well).

Axle construction: Front axle has a conventional simple H section forging, carrying king pins at outer ends. While, the rear axle is usually banjo shape, either one piece forging or pressing or a central casting with inserted tubular extensions.

There are 3 types of rear axles:

- (1) Full floating.
- (2) $\frac{3}{4}$ floating.
- (3) Semi-floating.

The full floating type is used for medium and heavy commercial vehicles. The semi-floating type is used for private and lighter commercial vehicles. The $\frac{3}{4}$ floating type is used in some private cars and medium commercial vehicles.

In full floating action, the hub bearings are mounted on tubular extensions of axle proper, and the axles does not carry any part of the weight of the vehicle. It only transmits driving torque.

The $\frac{3}{4}$ floating action has single hub bearing, mounted on the outside of the rear axle casing. As the axle shaft is subject to bending load, which may be positive or negative according to whether a car is driving straight or round a bend.

In semi-floating action, the wheel hubs are mounted directly to the axle shaft which then becomes the part of the weight carrying system and therefore subject to all the load outlined above.

Further, shaft being rotating parts, the loads alternating from positive max. to negative positive, the fatigue stress due to same must be taken into consideration.

Wheels: Wire spoked wheels, are used, for sports and racing cars mainly for the consideration of light weight. However, for ordinary vehicles, private and commercial, the pressed steel wheels are generally used and such wheels consist of central flanges, pressed into rolled sectioned rims, and retained in its position by spot or continuous welding.

In heavier type of commercial vehicles, the thickness of the disc in the centre may be as much as 7/16", tapering the disc of the centre outward so that the thickness of the flange to which the rim is pressed is even less than half the centre thickness. In private cars and commercial vehicles, disc is relatively thin and of uniform thickness. The disc wheels are attached to the hub by a number of bolts and conically seated nuts, ranging from 4 in light

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car to 10 per wheel on heavy commercial vehicles.

Tyres

The passenger car tyres have a load capacity ranging from 5 to 15 cwt. per tyre, according to the size. Giant tyres have load carrying capacity ranging from 12½ to as much as 94 cwt. per tyre.

A lot of development has taken place in tyres recently, such as adoption of rayon in place of canvas, which serves to effect appreciable saving in weight. In the passenger cars, the tendency is to reduce the ring diameter and increase the tyre section for same load capacity. Tubeless tyre also is a recent development.

Power Plant

All engines in the motor vehicles are internal combustion engines which could be divided into two distinct classes—petrol engines and oil engines.

In the petrol engine, highly volatile fuel is used and combustible

mixture of air in the petrol vapor is produced in the carburettor and fed into the engine, either by natural aspiration or forced induction—super-charging. The mixture is ignited electrically, compression being not sufficient to fire the charge automatically. In the oil engine, non-volatile fuel is used, filtered and is fed into the engine, thereby natural aspirations or by forced induction air is then compressed to a ratio of the order of 16:1 and at the top of the compression stroke, fuel in the form of fine spray is injected into the compressed place or into the chamber communicating with the compression place.

There is an intermediate type of engine, known as vaporising oil engine, which is largely used in agricultural tractors and the like. Most of the characteristics of these engines are like that of the petrol engine. The only difference being that it uses relatively cheap paraffin type of fuel which being not volatile enough, has to be pre-heated. Each of the above type of engines could further be sub-divided into 2 or 4

strokes, according to the cycle of operation.

A few lighter type of engines, such as those of motor cycles and small vehicles, work on 2 stroke but majority of the engines both C.I. and Petrol are 4 stroke type. The fuel efficiency of the internal combustion engine is measured in terms of the pounds of fuel per BHP. It is largely the function of the expansion ratio—just as the steam engine. With high expansion ratio, waste of heat is appreciably reduced which results into fuel economy and for this reason, for all commercial vehicles, the C.I. has completely displaced the petrol engine. The use is steadily increasing even for lighter vehicles, taxi cabs etc., but the running characteristics at low speeds is limited, which in turn restricts its use for private car on a very large scale.

Arrangement of cylinders

The number of cylinders may range from 1 as in the case of motor cycle to as many as 16 as in the case of some American cars. The cylinders may be vertical, in line,

arranged in 'V' or Horizontal in line. However, a great majority of the engines—both petrol and C.I. have either 4 or 6 cylinders vertical in line or arranged in 'V'.

Valves location

Side valves, overhead valves which are operated directly by overhead camshaft or camshafts, or single overhead camshaft, through locating levers but in common they are operated by a push rod.

Racing engines are frequently with 4 valves—2 inlet and 2 exhaust which are always overhead operated valves from overhead camshafts.

Engine Lubrication: In majority of the engines, the forced lubrication system is common. Considerable amount of oil is carried in the sump and is pumped under considerable pressure to the main bearings and camshaft bearings.

The crankshaft is drilled so as to lead oil to the big end bearings—crankpins. In overhead valve engines oil is forced to rocker bearings also.

In forced lubrication system, oil filter is essential in order to intercept small particles like casting sand or abrasives etc. Such a filter may be of full floating type or bypass type.

Fuel Supply System: The fuel supply system for petrol engine consists of fuel pump, carburettor, air cleaner etc., together with necessary pipings.

CI Engines: Fuel supply system: In this system, the high pressure positively driven injection pump delivering measured quantity of fuel at pressures of the orders of 3000 to 7000 per sq. in. to spray nozzles located in the cylinder head is used.

The quantity of fuel delivered per stroke is controlled by settings and also by a governor which limits the maximum engine speed. The very small quantity of fuel requires together with high pressure at which the fuel is delivered requires extremely high degree of workmanship and accuracy in the injection pump. The amount of visible exhaust is a very close guide as to the correctness of the amount of fuel being delivered in the conditions of operations.

The speeds for larger engines are limited upto 1800 RPM; in smaller engines somewhat higher speed is permitted but in no case the speed limit could approach those attainable in petrol engine.

Exhaust System: Silencer is mainly an expansive chamber with baffle device to retard the flow. The silencer and the tail pipe must be so located that it will not affect the petrol tank and the public services from behind. In ambulances, it is usual to carry the pump pipe upto a point above the roof so as to avoid the fumes from entering into the body.

Cooling System: In all cooled engine, such as a motor cycle, suitable cooling ribs are provided in the casing. In the car or truck engines, besides the cooling ribs, a large amount of volume of air is forced by a fan or a suitable duct round the cylinders. The conventional method is to provide the water jackets round the cylinders and cylinder head and to circulate water through jackets through radiators by means of circulating pumps. For being provided to ensure a good draft to the vehicle even a low vehicle speed.

Thermostatic Valve: Experience indicates that in order to avoid the risk of boiling, under abnormal temperature conditions, thermostatic valve should be fully operated when the temperature of the water is of the order of 30°F below boiling point. However, in order to cope up with the high air temperature prevailing in certain parts of the world, pressure system has been introduced in order to raise the boiling point and so increase the temperature difference between air and water.

(Pressure on 5.3 lbs. per sq. in.—i.e., 20 lbs. sq. absolute—increases the boiling point to 228°F and at 10.3 lbs., i.e., at 25 lbs. sq. absolute—the boiling point is 240°F)

Radiators: There are two types of radiators: Honey comb and tubular.

Group III

Transmission system—In majority of the vehicles, the Transmission consists of friction clutch, gear boxes,

giving 3, 4 or 5 different ratios of torque output, the propellar shaft and a final gear reduction in the rear axle.

Clutch: The function of the clutch is to pick-up the drive of the engine smoothly and to disengage the drive whenever required. Generally, single disc faced with suitable friction material and clamped to the 2 surfaces, is the conventional type of clutch. A fluid flywheel is also considerably used in automobile industry.

Gear Box: In majority of the gear boxes, synchromesh system is used in which gears are constantly in mesh and the gear changes are made by sliding dogs. The ratio of output torque from the gear box to the input torque from the engine on the lowest gear is usually between 3 and 4 to 1 in private cars and between 5 and 7 to 1 in commercial vehicles. On the top gear drive through the box is direct, i.e., ratio is 1 to 1.

Prop. Shaft: This transmits the power from the rear end of the gear box to the final reduction gear in the axles, and also accommodates vertical movements of the rear axle relative to the frame.

If the distance between the rear axle and gear box is excessive, the shaft is usually divided in 2 parts with a central bearing.

It is necessary that the angle of operation of the joints at each end of the shaft be as near as possible equal. The angularity of the joints sets up the bending moments proportionate to the torque and tangent to the angle.

Rear Axle: Hypoid bevel is now the almost universally adopted in private cars and commercial vehicles, which has many advantages from the manufacturing point of view.

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Group IV

Auxiliaries : Electrical equipments—supply system, starter, ignition system and auxiliary services, of which lighting is the principle.

The 12 volt system is used for cars and trucks except with 24 volt when used in conjunction with the CI engines, in order to reduce the size of the starter.

Group V

Controls : There are different type of gears that are being used, the principles are :—

Worm and Sector,
Worm and Nut,

Cam and lever and sample rack and pinion.

Power assisted starter is also becoming very common in heavy type of vehicles, and also on cars in U.S.A. Almost all power assisted types are of hydraulic types.

Brakes : All are of internal expanding type operating in drums attached directly to the round wheels. Hydraulically operation of the brakes

is by far the most popular system. In vehicles of about 5 tons GVW and upwards, vacuum air compressed servo assistance is necessary and must be provided. In petrol engines, the depression in the inlet manifold when throttle is closed is sufficient to operate a vacuum servo but with CI engine, there is no such depression. It is usual to equip the CI engine vehicles with small rotary exhaustor to operate the servo brake system. Compressed air system is also in use.

Materials

Materials used for important components: It is unfortunate that varying principles and designs of different engines do not permit standardization of the various parts. With our limited models, along with the development of the industry, if standardization of the use of materials for various components could be achieved, it will considerably help and accelerate the development of the industry.

To achieve this, it will not be out of place to mention, the principle and factors which influence the

selection of steels for the various automobile components.

The main factors are :—

(a) Availability, together with the suitability of materials for modern production methods and

(b) Conditions of fatigue failures and susceptibility of various materials to stress raisers. The effect of heat and chemical attack by burnt gasses should also be considered in the combustion zone.

Crankshaft : Crankshafts are subject to combined bending and torsional stresses and significant stress raisers are present at sharp fillet radii. The design of the crankshafts mainly depends upon the bearing pressure on the crank pin and rigidity. They are forged and the steel generally used has the following specifications.

Car.	...	0.43 to 0.50%
Mang.	...	0.72 to 1.00%
Sili.	...	0.15 to .30%
Phos. max.		.040
		.050

The forgings are heat treated to give an ultimate strength of 50 to 60 tons per square inch, with maximum hardness of 160 to 190.B.

In the CI engines, more highly alloyed materials are used.

Connecting Rods

Alternating stresses combined with bending stresses in this component require a combination of toughness and strength and steel similar to that used for crankshaft is selected.

Cylinder Block and crank cases : The rigidity of the crankcase is dependant upon the design and construction of the cylinder blocks and generally, mono-block type of construction is preferable as it incorporates water jackets and cylinder together and for this, cast iron of following approx. specification is generally used with Brinel Hardness of 170 to 217.

Sili	...	1.8 to 2.10
Mang.	...	.60 to .90
Total Carbon		3.10 to 3.4
Combined Carbon		.50 to .70
Phos.	...	.12 to .18
Sul. max.	...	.125

The Bores of cylinder block must have wear resistance characteristics and where the wet liners are used, they are made out of centrifugal casting which gives sounder, smoother and uniform material.

Camshaft : Generally, these are made of special cast iron or case hardened steel. Low alloy iron camshafts have locally chilled noses. The hardening property of case iron is used to full advantage and chill of C-40 Rockwell is adequate, on a case hardening camshaft a surface hardness of C-60 Rockwell is usually obtained. Tappets are also made out of chilled iron.

Transmission Gears : The gears have to withstand wear (scuffing) shock and fatigue stress and individual design influences the type of material most suitable for the particular stress imposed.

Following are the specifications of the two main materials employed in the Transmission.

Carbon	Si.	Mn.	Ni.	Mo.
PER CENT	PER CENT	PER CENT	PER CENT	PER CENT
0.14	0.10	0.30	1.50	0.20
0.20	0.35	0.60	2.00	0.30
Carbon	Si.	Mn.	Ni.	Cr.
PER CENT	PER CENT	PER CENT	PER CENT	PER CENT
0.18	0.10	0.30	3.00	0.60
Max.	0.35	0.60	3.75	1.10

Rear axle : In considering the design of the crown wheels and pinions the main point to be considered is the distortion it undergoes. Particularly for Hypoid gear selection of steel for hypoid crown wheel and pinion is determined by the consideration of its response to hardening, the mechanical property being quite subsidiary.

The shock loads from the driving wheels usually concentrate at the differential wheels and pinions. Same consideration applies to the cross pins and differential carrier which must be capable of absorbing shock and is therefore made from malleable or nodular cast iron of the following specifications :

Nodular cast iron

Physical properties :

Tensile strength...	25 to 35 tons/sq. inch.
Elongation	...10 to 18%
Brinell Hardness	150 to 190

Axle shaft : The axle shafts are subject to torsional and bending stresses. It is therefore essential that the steel is hardened to a strength which satisfies the torque in the spline but at the same time it must remain settable and tough enough to be relatively free from the effect of stress raisers which may radically reduce the fatigue life of the axle shaft.

Stub axles : It is essential that all steering and wheel assemblies should be tough and not break during any shock during the service. It is far preferable that such components should bend rather break. Stub axles are therefore, made out of alloy steel.

Non-ferrous material in automobile industry

The total weight of the non-ferrous metal is only a fraction of the weight of the steel used. But, the peculiar advantage of the former material—i.e., non-ferrous, in certain directions make their use indispensable. They are generally more expensive and are not used indiscriminately.

Zinc base alloys

The alloys are used for multitude of parts like door handles, fuel pumps, carburettors, windshield wipers, speedometer frame, hydraulic brake parts, brackets, instrument panels, body moulding, etc.

Aluminium and its alloys : Aluminium cylinder heads are popular in high efficiency engines. High thermal conductivity of aluminium as compared with cast iron enables the compression ratio to be raised without the fear of detonation.

The aluminium castings are made to the following specifications :

Pistons : Owing to its lightness, aluminium has completely replaced the cast iron for complete pistons. On account of its low co-efficient of expansion and high strength at alleviated temperature, it enables us to select this material for use in piston assemblies.

Besides this, magnesium castings for crank case, tin base alloys for motor car engine bearings, lead base alloys for bearings, bronze of various composition for bushes, brass and copper for radiators, side lamps, windshield frames, solder for radiators, body fittings, electrical joints (terminals joints), etc.

The various other materials used in automobile are plastic, rubber, glass, timber, etc. Plastic also is used for making moulds, and dies for body parts stampings where low production is required.

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MOTOR INDUSTRY IN GREAT BRITAIN

M.I.R.A. ACTIVITIES EXPANDING

(From Gordon Wilkins)

Despite the construction of their own proving grounds and research laboratories by the big vehicle manufacturers in England, the Motor Industry Research Association is kept fully occupied on problems of common interest which it would be uneconomic for individual companies to resolve independently. In addition to the well known proving ground and laboratories at Lindley a wind tunnel may soon be provided and discussions are now in progress in the form it should take. MIRA now has about 750 member companies and maintains an important technical information service for them.

Current activities are mainly concerned with investigations into strength of materials and components, special studies on power units, development of new transmissions and performance studies on complete vehicles, including thorough testing and evaluation of foreign products. Cars from America, Europe and Australia are given a full performance test, and an endurance test of about 40,000 miles, including 1,000 miles on the destructive "pave" track after which they are stripped for inspection of all components.

Cold rolling of fillets, that is the angles between the crankpin and crankweb of a crankshaft, or between a stub axle and its flange has been developed by MIRA for the industry. It has shown increases in fatigue strength up to 80 per cent on items like crankshafts and sub axles and has now been adopted in production in some factories. Although surface rolling is not new, precise knowledge on techniques has been lacking and the work at MIRA has provided basic data on the rolling times and pressures required for different materials and fillet sizes. Investigations are also being made into bending fatigue strength of gear teeth and torsional strength of the splined portions of axle shafts. The latter has produced a large range of samples of characteristic fractures produced by various combinations of stress and frequency.

Investigations into car body noises are facilitated by a quiet chamber which has all internal surfaces treated with sound damping materials. There is a roller set into the floor, with granite chippings cemented to its periphery, which can be used to rotate one wheel of a car and help investigations into road-excited body noises. Investigations have been carried out with scale models in wind tunnels to see how far the results agree with those from tests on complete cars of the same type in the wind tunnel of the Royal Aircraft Establishment at Farnborough. One set of results which we saw showed fairly good agreement on drag co-efficient but wider variations in such data as yawing moment and pitching co-efficients.

There are of course other arguments in favour of a full sized tunnel and MIRA already has a design ready for a tunnel with four air impellers specially arranged for car testing. Scale models are expensive to make and such items as cooling systems and ventilations can only be investigated in full size. Photographs also suggest that there may be wide variations between the behaviour of wool tufts on a model and on the full-sized car.

Two experimental automatic transmissions are currently under development at MIRA. One consists of an axial piston-type hydraulic pump and motor combined in a differential arrangement. The other uses a hydrostatic drive with epicyclic gearing in a shunt arrangement to give higher overall efficiency than is obtainable from pure hydraulic drive.

MIRA is also analysing the power losses in engines. Torque measuring wheels fitted with strain gauges are being used in the timing gear of a diesel engine to measure power consumed by camshaft and injection pump, and a cylinder liner supported on piezo-electric crystals is being used in an attempt to measure the forces imparted to the liner by piston and ring friction.

The cold room, which can take one commercial vehicle or two cars at temperatures down to -60°C was

being used to record peak pressures in the engine of a diesel vehicle at -15°C. The normal idling pressure was 750 lb./sq. in. but during a cold start with glow plugs, pressures of 1,250 lb./sq. in. had been seen and the use of other aids might send peak pressures up to 180 lb./sq. in. These high pressures experienced during starts in extreme cold impose heavy stresses on the engine components.

MIRA has evolved standards for visibility for automobiles which will eventually be incorporated in a standard specification for the industry. It is also working on new equipment for testing motor vehicles. One apparatus now on trial consists of a photo-electric recorder for accelerations and decelerations which makes a record on magnetic tape. A disc with holes in it is revolved by a fifth wheel or part of the vehicle's transmission and allows a series of flashes to pass from a small lamp to a photo-electric cell. The pulses are recorded on two tapes, alternately for one second each. When the tapes are played back in the laboratory, the number of pulses in each second is counted giving a record of the average speed during each second from which a record of acceleration or deceleration can be constructed. Other items already in use include a torque-measuring steering wheel which is clamped to the existing wheel of a test car. This employs electrical strain gauges to measure the effort required. Another is a torque measuring road wheel which can be fitted in place of an existing wheel to measure the power actually reaching the wheels to drive the car. This has a series of coils on iron cores fixed to the hub and armatures in between them attached to the rim. Driving torque varies the distance between the armatures and pole pieces and so varies the inductance of the wire coils, allowing the torque to be measured electrically while the car is running.

Investigations into vibration and other phenomena in moving cars are also made easier by a new miniature cathode ray oscilloscope which uses transistors, consumes only 4.5 watts and works off a 12 volt supply.

"I am a motor addict"

BY
DR. C. P. RAMASWAMI AYYAR

Over fifty years ago, I purchased my first motor car and was thus one of the earliest in Madras to own a motor vehicle.

A senior member of Messrs. Parry & Co. had, about two years earlier, purchased a steam-driven car which had a capricious mind of its own and it very often decided to stop in the middle of the way from his house to his office on the beach. The services of a large number of fisher-folk and passers-by had to be enlisted for the purpose of hauling the car to its destination and many of us who were members of the Bar and who also travelled along the beach to the High Court and witnessed this spectacle, invented a new definition of 'horse-power.' Our joke was that a twenty horse-power motor car meant that twenty horses were necessary to drag it when it stopped.

The petrol-driven vehicle soon superseded the steam car and I became the owner of two French cars, one, a most reliable Darracq and the other, two-seater, eight horse-power, two cylinder De Dion Bouton. As early as 1907-1908, the French manufacturers had perfected the design of their engines which were more dependable than many of the later European models. In fact, I personally drove the De Dion Bouton on the Nilgiris, from Ootacamund almost to the site of Tipu's fort Hulicul Droog which overlooks the plains and which was rebuilt by Tipu Sultan after his conquest of Mysore and the Nilgiris. The road was full of ruts and large stones and pebbles and one had to be particularly careful in treading one's way through the spiraling roads.

The exploits of the Fords and the Chevrolets and of the Jeep (all creations of the world wars) are, of course, justly celebrated but it is marvellous that even before the new mechanical devices and gadgets and the new types of tyres that came later into vogue, the De Dion Bouton's performance was almost equal to the record of the Jeeps. I had joined the Royal Automobile Club of London as a member soon after

owning a car and I still continue my membership of that great organisation which is now housed in its palatial home in Pall Mall. I was also a regular subscriber and an occasional contributor to English and French Motor journals; and I remember sending a copy of a photograph taken of the De Dion Bouton after its ascent of the Hulical Droog.

The Darracq and the De Dion Bouton were, by no means, silent companions on the road and my friends used to say that a horn was really unnecessary because the noise of the engine and its Exhaust gave adequate notice of the car's arrival long before it could be seen.

Those were the days of uninhibited export and import and the days of free exchange; and, in succeeding years, my Darracq was purchased by one of the senior members of the Bar who was at the top of his practice and who wished to proceed quickly to the court.

I may mention here that my father who was a member of the Bar and afterwards became a Judge, had four horses which were used in relays of two, for driving from our house in Mowbray's Road to the High Court, the first two horses being unyoked near the Ice House on the beach—(next to the Besant statue) and the other horses being used for the rest of the drive. My cars which easily did 30 to 40 miles an hour, therefore attracted much attention and, as stated above, a senior member of the Bar purchased the Darracq from me and others followed his example. I then went in for a more modern and less noisy make, the Napier, which, at that time, had attained great celebrity in Continental motor races and was the predecessor in reputation of the Rolls Royce.

About this time, the sleeve valve was introduced and its praises were sung so vociferously that I exchanged the Napier for a Daimler. The luxuriousness of its appointment and the silence it achieved were, however, counter-balanced by the circumstance that the chassis was hung over the axle and I found great difficulty when driving it over ruts or over rough hill roads where its solidity and heaviness were a bit of

a handicap on the hills though it was most comfortable on a good road.

It was at this time that the American cars came to the front and the great firms that made American history,—Ford, Overland, Dodge, Studebaker, Chevrolet, Pierce Arrow and others—demonstrated the value of a high clearance and of light construction. The American owner was generally so rich that he could and did change his car almost every year as he changed his suit and Henry Ford made history by building a car to suit the American taste. For the middle class man, he produced what used to be called the Tin Lizzie and for the plutocrat he created the Lincoln which, with the American features, was also luxurious. The account that I read of the performance of the American cars, led me to buy in succession, a Studebaker, an Overland and a Dodge. Henry Ford also proved that a cheap article need not necessarily be nasty. Indeed, during the wars, the Ford and the Chevrolet proved that they could stand up to any strain and when I visited the battle-fields of Europe many years later, I found the remains of the model T. Ford, of the Dodge and the Chevrolet strewn the plains of North France and of Flanders.

Later, I had the pleasure and the opportunity of owning a Lincoln for some time but I found, when I practically settled down in Ootacamund, that it could not easily negotiate the hair-pin bends and sharp turnings leading up to the Ooty houses and my last choice was a Chevrolet which I have had for ten years. It has done over 75,000 miles and has really not needed any radical overhauls. It is almost as good as new but a car, like a house or a dog, has to be loved to develop its best qualities.

A similar story can be told of a historic Rolls Royce which my friend and political leader, Dr. Annie Besant, possessed and which achieved an enormous total mileage with the minimum of attention and the maximum of efficiency.

It will be realised from this narrative that I am not only a motor enthusiast but what may be called a motor addict and I trust that this short sketch will impart to the readers of "Motorindia" not only a little delectation but some amusement.

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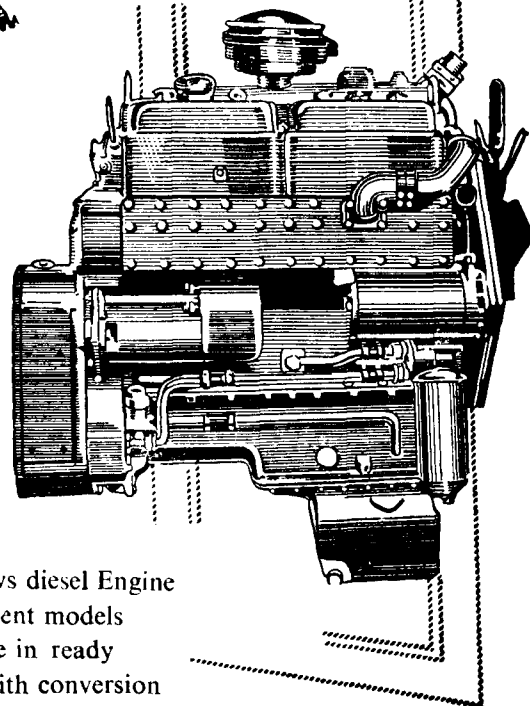
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DRIVING DILEMMAS

Our Australian Correspondent

The motorist to-day finds matters difficult enough having to contend with indifferent roads and thoughtless pedestrians, at the same time doing his best to remember and to put into practice all the rules of the road.

Motoring in any country is fraught with relevant and irrelevant uncertainties, and sometimes incidents that occur when one is "on the road" indicate that almost anything can and does happen.

Isn't it strange how one motorist involved in a minor traffic mishap will invariably blame the "other fellow," with vehemence and bravado, to boot?

The way that, always keeping an eagle eye on the motorist on the "right side," some "smart" motorist will pass at speed on the incorrect side.

Then there's the motorist, who in the dead of night, slams first one door then another, until it seems that his vehicle must surely possess at least eight doors. This is usually followed by shouted farewells, a whirring of the engine, a final burst of exhaust noise accompanied by several resounding toots on an ear-piercing horn.

And isn't it galling to find yourself hemmed in by closely-parked cars in front and behind, and with a third line on the right hand side, making your exit impossible?

Of course, it's an understood thing nowadays that the traffic lights change from green to red just as you make your approach, with your passengers excitedly urging you on.

And there's the way that the hole in the road that you swerve to avoid has an "associate" closeby through which you bump and jar your way, protestingly.

The motorist who believes he can safely pass between your car and the oncoming tram (or street car) only to find himself tightly jammed,

until transport authorities can relieve him from his predicament.

The motorists, who one after another will stop their vehicles close to an accident, alight and do nothing more than gape at the victims in curiosity and with little thought of offering assistance or advice.

The pedestrian on a darkened roadway (at night) who insists on walking on the wrong side, and dressed in black and dark brown clothing, to his own and your danger.

The glares that one has to contend with from impatient and incomprehensible motorists as you "give way" at a pedestrian crossing on which a number of aged persons have become "stranded."

The friends whom you have given a ride in your car, who apparently believe that in closing the door of the vehicle, are shutting the so-called "Iron Curtain."

The motorist who glides past you suddenly and silently, without a reassuring or informative toot on his horn.

The motorist, approaching you with lights on "high beam," who when saluted to remind him, changes immediately down to low, and thence back again to high, almost in the same instant.

The awesome look on some of the faces of speeding motorists as they see a police cyclist quietly waiting by the side of a busy highway, observing various infringements of laws.

The motorist who, without a care in the world, roars past a hospital or nursing home, at excessive speed and with the maximum amount of sound and fury.

And isn't it nearly always the case that when some glaring breach of the traffic regulations has been noticed, no traffic officer on hand to reprimand, caution or to apprehend the law-breaker?

The friend who promises to "pick you up" by car at an early morning hour in the middle of winter and promptly forgets to do so.

The garage man or service station proprietor, who after "servicing" your vehicle while you are at work, leaves it standing out on the street for half the day—unlocked and with ignition keys in the engine.

The man who in conversation with you as you meet him in the street, calmly places his somewhat weighty foot on your loose bumper bar, for support.

And, of course, there's the motorist who persists in stopping his vehicle on a corner of a busy roadway, to greet and converse with a passing acquaintance.

The motorist who thoughtlessly or otherwise, parks his car plumb across your driveway, you have clearly labelled "No parking" or "Keep clear," probably to save him from walking a few steps towards his destination.

The mechanic, who, having repaired your car, sits himself on the seat in his oily uniform, only to have the grease adhere to your own clothing, when later you get into the driving seat.

The man who makes a left hand turn after carefully giving a right hand signal.

The way your shining and spotlessly-clean vehicle is returned to you, grimy and scratched, with several dents on the mudguards, after it has been loaned to a friend.

The mechanic who inspects your car, tells you that "there's nothing wrong" with the lights, only to have a second "light test" reveal a faulty globe condition.

The motorist who takes a "short cut," only to find that almost every second car had the same idea in mind, but things just as difficult as the crowded highway he had previously quitted.

Annual 1958

MOTORINDIA

101

HUMOURS OF MOTORING

BY S. K. CHETTUR I.C.S.

I remember reading an article in an American magazine which pointed out quite seriously that American motor car production had reached such a point that it would be impossible to secure any parking space for these vehicles in the larger towns. As a result, it would be useless having a car for movements within a large town like New York or Detroit or Chicago as the trouble and time taken to find a parking place would hardly fit in with the keeping of appointments. It seems simpler and more economical in such places to take a taxi to one's destination and dismiss the taxi on arrival and take a fresh taxi for the next assignment. In other words, a large proportion of the American car output is destined to be diverted as taxis for big-town users.

Here, in Madras, the parking problem has assumed somewhat difficult proportions already, particularly in Mount Road, Broadway and other busy thoroughfares. But the humorous possibilities are shown best in the Marina on a Sunday evening in the stretch of pavement extending south-wards from the fountain opposite the I.G. of Police Office. The Commissioner wisely introduced the system of parking diagonally to the pavement. Apart from economy of space, it was easy to drive off at any time without let or hindrance. Most cars prefer to back up against the pavement diagonally. Thus, when a gap is seen, the car draws up just ahead and attempts to reverse into the gap. Meanwhile a driver with more promptness than politeness has swerved into the gap in one continuous motion (as he is driving forwards) and occupied the space. The following colloquy thereupon ensues, when the driver of the reversing car now halted in mid-stream comes up to expostulate. "I don't think that's very clever. You've no right to this place."

Opportunist Driver. "You don't? Have'nt I? You are welcome to your opinion."

Mid-Stream Driver. "You saw me backing for this opening."

O.D. Did I? How do I know you were not just practising reversing?

M.S.D. Practising? I drove a car when you were a baby in your mother's arms.

O.D. Let's keep our mothers out of this.

M.S.D. I still think you have no right there. Kindly get out and let me finish my parking.

O.D. Tell that to the Commissioner of Police.

M.S.D. I have a good mind to back in and smash up your car.

O.D. You try, and we'll see whose car smashes.

And so on and so forth. Of course there is no question that the opportunist driver is in the wrong, and the complex situation can easily be resolved by the Commissioner making a rule and enforcing it that cars shall be parked with their backs to the pavement. Then everyone has to stay poised to reverse and none can steal a march on his neighbour.

Of course there are certain snags about this arrangement. For one thing, the level of reversing skill varies considerably from driver to driver. Women drivers are proverbially bad at reversing and the bumper was specially invented by a far-seeing motor-designer for their benefit. "You've scratched my bumper," said an irate car driver to a woman who had reversed into him. "That's what bumpers are for, surely?" retorted the lady revealing an interesting point of view. Another snag is that the latest American cars are extremely long and their rear-ends stick out three or four feet across the pavement, tripping up the unwary at night-time. But the more recent the car, the more ornamental and erect and brilliant the tail-lights. A friend of mine happily described them as "illuminated lingams." I fore-see a happy religious revival in the future with bands of devotees in a *bhajana* party clapping and singing behind a brilliantly lit American

car with its tail lights blazing away to high heaven.

An undesirable development in the American car is the tendency to increase its length. In the old days, this was achieved by a false bonnet, in the modern era, by that and a capacious luggage-carrier. And of course stream-lining tends to accentuate the length of a car. In our crowded streets this places a heavy responsibility on the driver, who like the monkey in the fable has always got to remember what exactly is going to happen to his tail. It also complicates matters when entering the gates of bungalows opening on to narrow lanes. These cars are really meant only for sweeping along spacious highways and autobahns and making gracious curves along pre-determined routes. To see them in our crowded bazaars locked up in a dense stream of traffic is a painful sight and makes my heart go pit-a-pat. At such times I have always felt happy that I did not own such a car as I would suffer from severe nervous exhaustion after driving in one such any where in Madras (Yes, it is quite true. There are many types of grapes and some of them are very sour!)

At the opposite pole to this are the three-seater midget cars of England with their plastic domes. *Punch* recently had a clever cartoon showing one of these midget cars about to come into collision with a well dressed gentleman leaving a hotel and the angry one is shown as taking a flying football kick at the midget car with disastrous results for the latter!

One of the perennial subjects for humour in motoring is the mileage

one gets out of a car. You ask anybody "how many miles do you get to the gallon" and the answer is as exaggerated as that of a fisherman describing the size of his catch. "Oh I get 24 miles." "Is yours a four-cylinder?" "Oh, no a six." "And you get 24 miles?" "Yes, in town on long runs I get 26." The actual truth will be that he gets sixteen in town, and 18 on long runs, but no owner will ever admit this. A friend of mine has worked out his buying of petrol on a 20 mile per gallon basis: he would put in 4 gallons of petrol and refuse to buy for another 80 miles by his speedometer result. I have found him sitting in his car by the road side waiting patiently while his driver with a tin had gone to fetch petrol from the nearest pump. He was out of gas again.

American magazines consider the garage a stock subject for jokes. Most of these relate to the size of the garage and the difficulty of getting out of your car while in the garage. But the *Ford Times* recently had a clever cartoon on a new theme. It showed a weary husband who has just been clearing a fifty-yard path from his garage to the road through a six-foot snow drift. As he is about to open the garage door, with evident triumph and relief, his dear little wife calls out from the kitchen. "Oh, I forgot to tell you, dear. I took the car over to mother's yesterday before the storm started."

Refusal to dip one's lights in favour of an approaching car has been fruitful of many accidents and jokes. Famous last words are: "Oh so you won't dip your lights, ah! Blast you! I'll do the same!" But the blasting was not so one-sided as he expected!

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M-13

RHYMES WHILE YOU RIDE

BY

A. HOLDEN

Some women back-seat drivers
Show vigour and great zeal.
But should we install for 'em
A back-seat driving wheel?

Do take care when driving,
Don't cause worry to any,
For even one accident,
Is really one too many.

To make for safer motoring
Speeding's no excuse,
Don't accelerate and have them
Say that you are "foot-loose."

It can be too "smart" driving
To pass at speed on a hill;
And many who do so rarely,
Live to repeat their skill.

There's politics in driving
The Centre, the Left and more,
So the careful motorist
Keeps the Right side of the Law.

You can be a life-saver,
When motoring out-of-doors.
The life you are saving,
Might probably be yours.

It is not fully realised
By motorists one and all
That they themselves and vehicles
Need constant full overhauls.

If you have parking trouble
When you are City-bound
Then leave your car at home,
Where it's safe and sound.

"I never seem to get the bracks!"
He said and sped off down the hill
He got them at once alright;
They stopped him from a spill.

New cars are getting bigger,
Heavy, long and too wide,
To pass them on roads nowadays,
You've got to move aside.

Smooth tyres can be a danger
In wet and in rainy times
Retread and regroove them
The saving's life and dimes.

The humble motorist out driving
Is always really wise, and
On the Queen's Highway,
Never acts King-size!

Used cars bring in money,
Though often full of faults.
They need many repairs
To keep going without halts.

This "pressomatic" driving
Can really make you sing,
To get the best on outings
Who presses buttons on the thing?

In some lands police take photos,
Of road breaches by the mile,
But can you seem them saying:
"Now, just a nice, big smile?"

To obtain the best from motoring,
More courtesy do we need,
Make certain "UR" in the word,
And it's not CURT-esy you breed.

"Plenty of time: it's alright."
He said and made to cross the street.
It might have been far better if
He had moved his body with his feet.

Look alive when driving,
At this we all should strive.
That doesn't mean speeding,
But driving to arrive—alive.

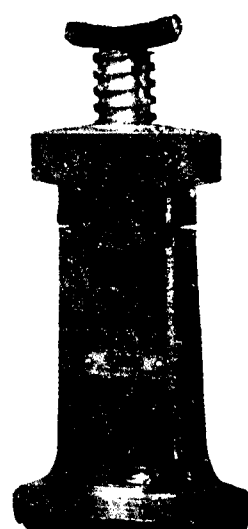
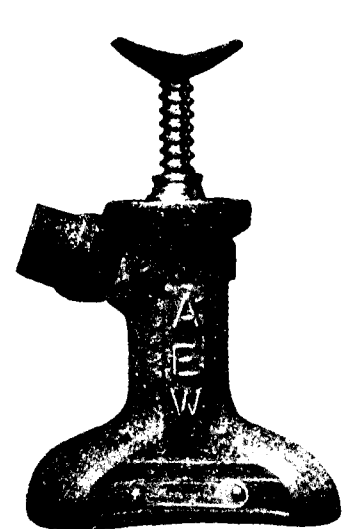
Kids can be so thoughtless,
When riding on their "grids."
(slang for bikes)
So, drivers, do take warning—
And watch out for s-kids.

Stop, look and listen,
That is sound advice,
Not, look, stop and miss 'em.
Always please think twice.

She showed him her brand new car.
"Come for a ride" said this lass.
She drove it to a full stop.
Laughingly said "I think I'm outa gas!"

Her car struck his an awful whack,
"This will cause some strife!"
He turned to face the culprit
Was speechless: 'twas his wife!

This stock car sporting
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London to Sydney on A Scooter

BY ROBERT KINGSBURY

Whenever a group of fellow country men get together the subject sooner or later gets on to the subject of home and how to get there. An increase of 20% on fares was enough to depress the New Zealanders living in London and to produce all sorts of crazy ideas on how to get home.

My suggestion was that there were several countries in Western Europe I had not visited ; and there is a land mass stretching from Norway to India with a road, of sorts, all the way.

For transport I decided on a motor-scooter as a car or a powerful motor-cycle would be too expensive to buy and to run. On a long tour there would be disadvantages but being able to do about 100 miles to the gallon and having a spare wheel more than tipped the scales in favour of a scooter.

THERE ARE MANY PROBLEMS AND MUCH RED TAPE AT THE START OF SUCH A TOUR AND THIS IS WHERE THE AUTOMOBILE CLUBS REALLY COME INTO THEIR OWN. THE CARNET INTERNATIONAL DRIVING LICENCE, INTERNATIONAL DRIVING CERTIFICATE, CAMPING CARNET, INTRODUCTION CARDS TO TOURING CLUBS AND SHIP RESERVATIONS. THESE ARE JUST A FEW OF THE FORMALITIES THAT THE CLUBS SMOOTH OUT TO ENSURE A TROUBLE FREE TOUR.

They advise as to which countries you will need visas for and then starts the long slow progress around the Consulates.

Then there is the extra equipment, pannier frames built of tubular steel to fit the sides of the machine, an extra petrol tank holding the spare wheel on top, army kit bags to fit on the panniers and all the extra spare parts and special tools suggested by the Lambretta people. It would be foolish to start off without extra tools, such as the special puller for the magnate, for from Italy to India. There are

only a few places that could cope with the repairs.

I drove from London to New Castle and shipped over to Bergen, in Norway, where I disembarked and started driving North to get as near to the Arctic Circle as possible. It was mid-summer but the worst seasonal weather for 30 years with driving rains turning the fast disappearing road into a torrent, after two days at mountainous roads and rivers swollen by heavy rains. I gave up and turned South towards Oslo.

In Britain you drive on the left side of the road, in Norway on the right and entering Sweden, the left side again.

From Sweden to Denmark is a short trip by ferry and here you drive on the right again. Here like Holland are thousands of cycles, especially in Copenhagen, and after work it tends to get fairly dangerous surrounded by Hordes of Bikes but Copenhagen is one of the most charming cities in the world and the people most hospitable.

South again leaving the islands of Denmark by ferry to northern Germany and the mainland of Europe. Here were the best roads of the tour on the famous German autobahns, two, three lane roads stretching across the country and avoiding the cities and towns which are such a problem to get through.

The Lambretta looked pretty small on these grand roads but comfortably did over 300 miles a day to Lubeck, Hamburg, Hanover, Frankfurt and down to Heidelberg and the Black Forest. There is a Medieval atmosphere that persisted from Heidelberg right through Switzerland ; and an unspoilt charm in every small town and village.

In Switzerland I stocked up with the official amounts of Italian, Yugoslavian, Greek, Turkish and Pakistani monies as the rates offered here were better than the official rates in each country.

It was a joy to travel through Switzerland after the industrial North through lovely towns like Konstantz, Zurich and Bern then trying the

scooter out by climbing the high mountain passes, over the Custon, the Grimsal and the Furka in one exciting day. Here is some of the most fantastic mountain scenery in Europe.

The next day I climbed over the Cimplon Pass and down into Italy past lakes Lugano and Comonto the Northern plains and Milan.

The roads from Sweden to Italy are very good except for the high mountain passes which are hard to maintain and in Italy they are still good with stretches of autobahn in perfect condition. These are toll roads and you tend to lose the advantage of being on a fast highway by having to stop and buy a ticket at one end then return it at the other.

From Milan to Genova, then following the coast stretching from the Riviera to Pisa and inland to Florence, Venice and Trieste. This part of Italy is certainly the most beautiful place I have ever visited; it would be unthinkable to leave Europe without spending as long as possible here.

The last night in Italy was at Trieste and here was also the last youth Hostel before Pakistan and India.

The hostels had served me well, giving cheap accommodation and cooking facilities in most places worth visiting in Europe. From Trieste to Rijeka the road is pretty good and there is an autobahn, built by the German during the occupation of Yugoslavia, to Belgrade, the capital city. Sometimes it gets a little difficult following the road-signs as the spelling in the country is different from the spelling on the maps. It does help to have a map, with the local names, pasted on linen to prevent tearing.

After Belgrade the road rapidly deteriorates until Nis where for three hundred miles it cannot be called a road any longer. Although well signposted the surface is non-existent with unbridged rivers making it particularly dangerous after rain.

The local farm animals also give cause for alarm on the roads. Not

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"We woke up to find five wheels of a car stolen"

being used to engine noises they do not follow any logical behaviour. Twice horses with carts forced me off the road after hearing the scooter noise and stampeding. Before making the last run to the Yugoslavian border it is a good idea to check at the final big town to see if your visa is in order. This will save a long ride back, over impossible roads for readjustments.

AT LEAST HALF THE TOURISTS I MET HAD OUT OF DATE VISAS AND HAD TO GO BACK, FOR IT TAKES A VERY CLEAVER MAN TO FIGURE OUT A YUGOSLAVIAN VISA.

In Greece there are good roads well signposted again until Alexandropolis where it is rough to the Turkish border.

In Turkey new roads are being put down at fantastic speed. Huge earth moving machinery is carving out main highways into Istanbul and striding out right across the country. Quite often there are detours where you must go through rivers or over miles of sand and signs have not caught up with the speed of road building.

In Istanbul I visited the automobile club to get the latest reports of new roads. They presented me with the newest maps published in late 1956, already these were obsolete and the best information on new highways could only be given by the small petrol stations en route. TURKEY IS THE END OF WESTERN STYLE HOTELS and there are long stretches of road spanning the vastness of Asia Minor that are barren and lifeless. In the mountain areas warm clothing and bedding must be carried but in most towns are found cheap hotels costing about a rupee a night.

Turkey is the start of Middle Eastern hospitality to travellers,

from here on I found that if I stayed at a tea house or camped with a family the law of desert hospitality held good.

Other people who scorned this hospitality and camped in the desert or on the outskirts of a town were fair game for thieves. One man whilst sleeping had his car jacked up and the five wheels, together with most of his possession stolen!

Ankara to Adana was very cold and high but in the 1,000 miles of lonely road I saw the first of the camel trains that become so familiar later on. Then through the Silician Gates pass and down to the warm coast and the Syrian border.

My Syrian visa was good only for 48 hours and that meant fast driving. Here the advantage of having a small amount of currency for each country paid off for it is difficult to know the local holidays when banks are closed. Damascus has a reasonable amount of spare parts for most vehicles, the first to be found since Italy, and it is just as well to stock up wherever you find them.

In Jordan I went to Mafrag the first day and made arrangements to stay at the Iraq Petroleum Company's camps along the oil-pipe line. It is a comfort to know that these camps are at regular intervals in over 500 miles of desert.

But it was after Rutba Wells that my second breakdown came. The first was in Turkey with broken front forks which were welded and strengthened in a small blacksmiths shop and are still holding. Now it was the rear wheel and the holding bolts had sheared off. I waited several hours for a truck and one finally came along at 3 a.m. and gave me a lift to Baghdad where I had new bolts cut.

Coming to the border between Iraq and Iran the customs barrier was down and unlit. Just a few feet from it I saw the barrier too late and had to skid the scooter under the barrier bar and landed up with a bounce on the customs doorstep.

The road is fairly good all the way to Tehran but I struck the tail end of bad earthquakes in Northern Iran.

Soon after the border you start climbing first over the Pikak Pass, 5,300 feet up and into the freezing coldness of Kermanshah. Over shaken up roads and through towns that would not take the responsibility of having travellers during the earthquake emergency.

One early morning I started up the Asadabad Pass, the highest one since Switzerland, to an altitude of 8,680 feet, it was bitterly cold and the narrow winding road is very dangerous at the best of times. At the top I was rewarded by a wonderful view of snow covered mountains and valleys in the early morning sun.

In Tehran I was advised to take the Northern route to Meshed and then go South East to Zahedan. It is bad to Meshed the wild countryside and lonely desert is impregnated with salt and took five days to do 600 miles.

In Meshed I waited three days for the rain to stop and started off with the track alive with water ruts and rocks. Except for occasional signs I could not have told if I was on a road or not. The scooter got stuck, time after time in thick mud and during this run the torsion bar, supporting the engine weight, broke in half. The bar was welded and broke four more times in Iran. So with very slow progress I finally limped the scooter into Zahedan. On the worst day I had driven over

nine hours and gone less than 50 miles in all that time.

The scooter was patched up again in Zahedan before I tackled the last stretch of bad road before the good highways of Pakistan and India.

This is a different type of road with deep sand banks stopping me all the time. After 60 miles I had my first puncture in over 13,000 miles and when taking off the wheel I found the rear bolts, replaced in Baghdad, had been wrongly made and had begun to shear off again so I could not replace the spare wheel.

After waiting for two days without water not even a camel had come in sight so I left everything and started walking to the next small town on the border. After a few miles a camel came lopping along and the driver gave me a lift the rest of the way.

In Mirjava a railways blacksmith had a try at cutting me new bolts, so not very enthusiastically, I drove across from Iran into Pakistan to find a place for the repairs to be done properly.

The patched up scooter lasted the first few miles into Pakistan and then the same trouble again near Non-kundi where a North West Frontier patrol gave me a lift. The army got me to Quetta, where at last the job was done properly and then on to good sealed roads again to Lahore and India.

I got to Amritsar where the torsion bar broke again. This time for good and none were to be found in the town but the automobile club arranged for the scooter and myself to be loaded on to a truck and brought to Delhi with a cargo of sugarcane.

New Delhi meant spare parts at last the agents repaired and serviced the Lambretta very quickly and efficiently and it has been plain sailing on good roads all over India.

Famous Last Words.....

BY A. HOLDEN

The motorist who is frank and outspoken when motoring, has often to "eat his own words," although he may be merely passing a comment on the performance of his vehicle, the state of the roads or generalising on the service provided by garages, service stations and/or mechanics.

Sometimes such chatter is uttered on the spur of the moment, unthinkingly, or perhaps in a boastful fashion. But for whatever cause or reason, how often do the content of these utterances bounce back on the authors?

For example:

1. "There's nothing like this Super plus petrol! I could never do 50 on this corner before on the old stuff!"
2. "There cannot be anything wrong with this car. I've only had it for a month."
3. "Now, if you could take that dent out and paint over those scratches on the fenders, my husband will NEVER know it."
4. "Damn it! I'm still having trouble b-a-c-K-l-n-g out s-om-e-t-i-m-e-s. Oops!"
5. "What did YOU say? Why don't I drive where I am looking! O.K.! Then, why don't you look where you're driving!"
6. "Ah! Traffic Lights! Bet I can get through before they change."
7. "Hey, you kids! Stop playing about in the back seat. One of you might fall out.....! Alright, the rest of you stay out...!"
8. "There must surely be a garage or service station along here soon. I hope."
9. "Pedestrians! They are all the same. He should have dodged. He could see me coming."
10. "Oh, so this is a restricted speed-limit area, Constable? I'm so sorry. I never saw the notice. Next time, I'll....."
11. "Don't be alarmed. I can stop in time. I've just had the brakes relined. They grip immediately, like this....."
12. "Just you watch me overtake that old car in front! This bend will do alright."
13. "These tyres do not need re-treading! They will be good for another thousand miles, at least!"
14. "I know! I know! Although I have only got one good headlight, I can see enough with it."

15. "If you think this car's fast, then you haven't seen anything yet! She can reach 100 along this stretch."

16. "Well, if you insist dear. You can drive for a little time. But promise me, you won't leave the footpath."

17. "Where's my driving licence, constable? I, er, haven't got one. This car belongs to a friend."

18. "O-hic-hic Kay, men! All aboard! Hic, hic! There's plenty of room for one more."

19. "Don't worry, I've never had a blow-out in my life."

20. "Certainly I checked the oil, the water, the petrol and the batt—! The battery! It's the battery!"

21. "You don't think I'd come all this way for nothing, do you? This is the right road!"

22. "Even if this is a one-way street, it's perfectly safe. No one's coming the other way."

23. "I always carry a spare tin of petrol with me for emergencies like this. I have it in the boot....."

24. "Here, give me a light before you put in that petrol. I'm dying for a smoke....."

25. "Nothing wrong with these roads. I've Dr/iv/en over f/a/r worse in MY t-i-m-e."

26. "Very powerful this horn! Save's me using the brakes on corners, if I blow it loud beforehand."

27. "You silly fool! Of course it was YOUR FAULT! I've never had an accident in my life before!"

28. "Doesn't it run beautifully! Practically fool proof. Even drives safely—whoops! with one hand."

29. "What's the good of hand signals? They never bother me. The other driver can see what I'm doing."

30. "Hold it! Left, left! Not right, left! Slow, slow! Ease it off, Look out! Oh, well. Never mind, dear! We need a new gate, anyway."

31. "I'll soon fix it. No trouble to change the wheel.....Good heavens, I've left the spare at home!"

32. "Ah, a railway crossing! Anything coming on your side? Mine looks very clear....."

33. "I will still go. It's only a busted s-p-r-i-n-g."

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Passenger Transport Bus Services and Taxis in Madras

(CONTRIBUTED)

The improvement of motor transport facilities is of particular significance in the context of the increasing tempo of activities under the Second Five Year Plan in the State. Orders have therefore been issued to all Regional Transport Authorities to increase the number of buses upto 25% particularly on coveted routes. Last year 53 buses, 474 taxis and auto-rickshaws and 802 lorries were licensed to be put on the roads in addition to the existing fleet. The Regional Transport Authorities are giving special attention to increase bus services particularly in the areas where Community Development Programmes and National Extension Service Schemes are in operation, with a view to keep pace with the increasing demands from the public for transport facilities. As a result of the action taken as stated above, 53 buses have been put on roads in various districts of this State during 1957 as given below :

Name of District	Number of new buses put on road
Coimbatore ...	12
Madurai ...	1
Nilgiris ...	4
North Arcot ...	14
Salem ...	8
South Arcot ...	2
Tanjore ...	8
Tiruchirapalli ...	1
Tirunelveli ...	3
Total ...	53

In order to provide long distance passenger services, the State Transport Authority, Madras, is granting permits for bus services on inter-district routes which are over hundred miles on trunk road and inter-district routes—vide statements below :

Inter-District		Number of buses introduced
Name of route	Distance of route	
(1) Tiruchirapalli to Tiruvannamalai via Padalur, Tholudur, Ulundur and Tirukoilur (Express).	128 miles	2 buses

Name of route	Distance of the route	Number of buses introduced
(2) Madurai to Salem via Dindigul, Pallapatti, Karur, Namakkal and Rasipuram (Express).	143	2 buses
(3) Madras to Chidambaram via Chingleput, Tindivanam, Panruti and Cuddalore (Express).	170	1 bus

Inter-State Routes

Name of route	Distance of the route	Number of buses introduced
(1) Madras (Mint) to Tirupathi via Tada and Kalahasti.	about 90 miles	1 bus
(2) Broadway to Tirupathi via Trivellore and Tiruthani.	Do.	1 bus
(3) Madras (Mint) to Tirupathi via Periapalayam.	Do.	2 buses
(4) Madras (Mint) to Tirupathi via Oothukottai.	Do.	1 bus
(5) Madras (Mint) to Venkatagiri via Tada and Naidupet.	Do.	1 bus

About 474 additional contract carriages including baby taxis and auto-rickshaws were introduced in 1957 as per particulars furnished below :

Name of district	Number of additional contract carriages introduced	Name of district	Number of public carriers permits issued.
Chingleput ...	8	Chingleput ...	13
Coimbatore ...	57	Coimbatore ...	73
Kanyakumari ...	20	Madras City ...	117
Madras City ...	315	Madurai ...	30
Madurai ...	2	The Nilgiris ...	37
Nilgiris ...	19	North Arcot ...	75
North Arcot ...	8	Ramanathapuram ...	52
Ramanathapuram ...	4	Salem ...	83
Salem ...	22	South Arcot ...	88
Tiruchirapalli ...	10	Tanjore ...	60
Tirunelveli ...	9	Tiruchirapalli ...	110
Total ...	474	Tirunelveli ...	64
		Total ...	802

Goods Transport—Lorry services

On account of the working of the various development schemes throughout the Indian Union, goods transports have increased by leaps

MOTORINDIA

Annual 1958

NATIONALISED TRANSPORT IN MADRAS STATE

(By A SPECIAL CORRESPONDENT)

With the object of operating road transport services, primarily in the interest of public and of providing maximum convenience and facilities to the travelling public, the Government of Madras decided in December 1946 that the motor transport services in the State should be nationalised. This decision was taken on the recommendation of the Central Committee on Post-War Reconstruction. In pursuance of this policy, the Government sanctioned early in March 1947, the introduction of 30 buses in Madras City to operate in addition to the existing fleet of private buses. By stages the private vehicles were withdrawn and by July 1948, the entire city bus transport was nationalised. After 1948, the only addition to the nationalised transport was with the integration of Kanyakumari district along with the nationalised transport of that district to the State in 1956. Last year, the Government have notified their intention to take over some of the suburban routes of Madras City.

The year 1958 is the 12th year in the life of the Madras State Transport. The period was one of all-round progress in the working of the Department. The fleet and operating strength, collections received, vehicle mileage, number of passengers carried and amenities as well as quality of services offered to the public, all have recorded a steady increase consistent with the increased traffic demand. With the object of pleasing the public generally and the travelling public in particular the department was able to render efficient service to tackle the peak hour problem.

By the linguistic redistribution of States effected on 1-11-56 the Government buses running in the areas transferred from the former Travancore-Cochin State have been taken over by this department with effect from the same date, and a new branch of the Madras State Transport designated as Kanya-



A Double Decker

kumari Branch has come into existence at Nagercoil on the above date. Prior to 1-11-56 this district was operating only 44 Schedules with 53 buses, while on 31-3-58 the fleet contained 75 vehicles.

During the year 1956 the Government have declared this department as permanent. This has ensured the security of services of the workers and produced an atmosphere

of contentment in the minds of the workers.

In order to meet the increasing needs of the travelling public in Madras City, the fleet strength was raised to 450.

The services were operated to a high percentage of punctuality. The average number of buses operated, mileage, passengers carried etc., from 1954 to 1957 is shown below :

	1954	1955	1956	1957
Average number of buses operated	276	289	322	330
Gross mileage	1,30,75,514	1,32,52,798	1,33,30,832	1,40,37,119
Passengers carried	10,84,41,592	11,64,21,311	12,29,01,402	13,47,11,687

From the above figures it may be seen that there is a steady increase during the past years in the number of buses operated, gross mileage performed and the passengers travelled.

Experience gained in the past has revealed that several problems concerning the traffic could be solved more expeditiously and effectively by holding periodical meetings of Traffic Officials rather than by resorting to the routine correspondence. It has accordingly been arranged that every week the Traffic

officials meet together under the Presidentship of the Honorary Director to discuss problems on traffic and improve the traffic conditions in the City. All important subjects on traffic are discussed during the meeting and the decisions taken are implemented by the traffic executives. This system is working quite satisfactorily.

Relief services have been introduced from various crowded centres in the city to relieve the congestion at this intermediate stops, during peak hours. In order to assist

the travelling public to get accommodation in buses particularly during the peak hours checking inspectors on point duty have been posted at all important traffic points. It is the duty of these checking inspectors to arrange queues and assist the public to get into the proper buses in an orderly manner, without waste of time. This arrangement has been greatly appreciated by the public.

Various amenities to passengers like issue of season tickets on selected routes, construction of shelters, queue railings, issue of tickets in important bus stops, etc., have been arranged. Special buses are continued to be operated on all festival occasions, including Guindy Races. Excursions specials are also operated on all Sundays to Mahabalipuram (via) Thirukalikundram. Buses are also hired out to the public as usual.

To encourage tourist traffic this department has built a 30 seater Tourist Coach on one of the Royal Tiger Worldmaster Chassis with constellation type seats, a toilet room, in the rear with Wash Basin and Commode, Fans, etc. This coach has been designed, constructed and finished at the State Transport Central Workshop, Chromepet. The set-up of the entire coach is majestic and graceful and it assures excellent comfort to the tourists. With effect from 10-11-57 this coach is utilised as Mahabalipuram Special and operated on all Sundays to Mahabalipuram, charging Rs. 5 as to and from fare.

The Driving School continued to give refresher course to the drivers of this department and the conductors were also recruited after giving training by the department.

To infuse the need for courtesy towards passengers by the running



Passengers queuing up

staff annual celebrations of courtesy week were also conducted every year and all employees were instructed to be polite and courteous to the travelling public. Meetings were held at various bus termini in which the leaders of the local area participated. Film shows on road-safety were also arranged.

With a view to encouraging thrift and afford credit facilities to the staff, employees Co-operative Thrift and Credit Societies were formed in Transport House Depot at Madras and State Transport Central Workshop at Chromepet.

The Government have drawn up a housing scheme under which certain categories of workers will be eligible for allotment of newly constructed houses at Erukancheri and Sembiam. Proposals are also under consideration for the formation of a separate House Construction Society on a co-operative basis for the workers.

Madras State Transport Department has got a fully equipped Engineering Department which is essential to the success of a Transport Organisation. The Engineering Department consist of two parts (a) Depots ; (b) Workshops.

(a) The Depot is responsible for the cleaning, servicing and running repairs and docking of vehicles. It also provides line staff for dealing with breakdowns on the line.

(b) The workshops are responsible for the reconditioning and repair of component parts of the body chassis and engine. The workshop consists of several sections, each section being devoted to one component part such as battery, body, clutch and gear, chassis brakes electrical radiator, paint, engine, steering transmission vulcanising, welding and so forth. Apart from major repairs the Engineering Department provide servicing facilities on a planned basis. Besides the daily inspection of buses at nights the vehicles are washed at fixed intervals. Other parts are also serviced according to schedule. The defects reported by the driver are promptly attended to so that the vehicle is entirely fit to be turned out for the following day's service.

For the purpose of efficient maintenance, servicing and repairs the main depot at Transport House has been divided into two units, each depot having approximately 185 to 190 vehicles. Each depot is placed under the immediate con-

trol of one Assistant Engineer for maintenance work. Rest of the 75 buses are stationed in Patullo Road Depot and these buses are being utilised exclusively for peak hour traffic. Each of the depots at Transport House is divided into 4 sections each section is allotted 40 vehicles and the section is in charge of a Foreman. The system of maintenance in these depots is of preventive maintenance type. This consists of checking up of vehicles daily and weekly during night time. Monthly maintenance is carried on by stopping the vehicles for 2 or 3 days. Every six months the vehicles are overhauled and painted for purposes of obtaining fitness certificate. Normally after a year of running, the vehicles are sent to State Transport Central Workshop where Annual Overhaul is carried out by thoroughly stripping down all the parts such as engine, front axle, gear box, steering, body and chassis. There is a de-greasing equipment in State Transport Central Workshop in which all parts and materials are cleaned. After this Annual Overhaul the vehicles get a new lease of life for another year to run on the road.

The Central Workshop Organisation at Chrompet which has all the facilities for major mechanical repairs and body work at one central place integrating all the workshop activities brought about improved and efficient work reflecting ultimately in lower operating cost and quicker service for the Department. The workshop is attending to the major works like annual overhaul of buses and the heavy repairs to Government buses, construction of new bus bodies, retreading and recapping of worn out tyres. The workshop is divided into two major sections, viz., Body shop and

Auto-shop. The work pertaining to the body of the chassis, such as new body construction, body repairs, upholstery and painting is attended to in the body shop and mechanical repair, viz., overhaul of engines, axles and other components is carried out in the auto-shop.

When the Kanyakumari Branch was taken over by this Department from Travancore-Cochin State there were only 64 old buses. The Government have replaced 8 old buses and provided new buses in their places. It is proposed to construct a well equipped workshop at a cost of Rs. 5.6 lakhs at Nagercoil for maintenance and overhaul of the buses there.

There are about 4,000 workers in the Traffic and Technical Branches belonging to the various categories in this department including State Transport Central Workshop at Chrompet and Kanyakumari Branch at Nagercoil.

Every year uniforms are issued free to the workers for purposes of appearance, uniformity, prestige

and identification. The Traffic Staff are given three sets of uniforms and the Technical Staff two sets. The workers are also given laundry allowance of Rs. 1.50 nP. per month. They are also supplied with shoes as a new item from 1957-58. Amenities such as Canteen, Rest Room, Recreation Club have been provided in Transport House Depot at Madras and at State Transport Central Workshop at Chrompet. The workers are also participating in outdoor games like Volley-ball, Hockey, Badminton, etc. Apart from the grant of Dearness Allowance, House Rent Allowance is also given to the workers. The staff of the department are provided with free bus passes to travel on Government buses and the workers at Chrompet are given importation allowance under certain conditions to meet the cost of monthly Railway Season tickets.

It has been the constant endeavour of this Department to provide an adequate and efficient service to the public and the results achieved so far have been very satisfactory.

At the terminus near High Court



MOTORINDIA

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HILL STATIONS IN SOUTH INDIA

BY
S. NATARAJAN, B.A.

The Hill stations of the South are all the year round resorts. Except perhaps two months of monsoon in June and July the rest of the year is cool and crisp and the sun is never hidden for long. Indeed the months of September to October are considered by knowledgeable veterans to be more pleasant than the summer months. There is a beauty in the winter of the hills.

The two major hill stations are Ootacamund and Kodaikanal. Man and Nature have collaborated to make Ooty the unchallenged Queen of the hill stations. Bracing climate, picturesque scenery and plentiful facilities for sport and recreation are but a few of the blandishments that draw Holiday Makers to this lovely mountain resort.

Mettupalayam at the foot of the hills was the old railway terminus before Nilgiri Mountain Railway was built. Before this railway the travellers used to board little carts called 'Tongas' dragged by a pair of sturdy hill ponies which were relayed every five miles or so.

In those days people who went to Ooty used to provide themselves with clothing on lines similar to those taken by a polar explorer.

The very approach to the place is inspiring and magnificent. Ooty is a beautiful valley shaped like a cup with the most lofty hills of the Western and Eastern Ghats walling it on all sides. There is plenty of level space in and around Ooty which is something unknown in any other hill station. Nature has endowed the district with superb waterfalls like Pykara, Kateri, Kolacombe, and St.

Catherine. After visiting these falls if you are so minded you could climb to the highest point in South India on the top of the old Doddapetta and enjoy the superb vista spread beneath you.

Coonoor and Kotagiri

Many visitors to the Nilgiris choose to stay on the lower heights in Coonoor and Kotagiri the former 6,000 ft. height and the latter 6,500 ft. height.

In the heart of Coonoor town is the beautiful Sims Park. Lady Cannings seat six miles from Coonoor is perhaps the loveliest point in this area.

Kotagiri is called a 'little pearl in the ear of Nilgiris.' The scene on both sides of the road to Kotagiri is most exquisite.

Apart from Ooty there are a large number of smaller stations dotted round the blue mountains and many of them are insufficiently developed and little known. Even Coonoor which offers a milder

climate than Ooty stands in need of propaganda.

Kodaikanal

The generous splendour of the summer days is nowhere so gorgeous as in Kodaikanal which bids fair to challenge the right of Ootacamund to the title of Queen of the hill stations. Kodaikanal with its hills, rocks, woods, lonely lake and bracing air, is adored by many who wants to escape from the sweltering heat of the summer. Situated on the southern crest of the upper Palani hills at an elevation of 7,000 ft. above sea level it is at a distance of about 60 miles from the Kodaikanal station road. A delightful run on the Ghat road past rugged scenery brings one from railway station to Kodai.

Kodaikanal was discovered in about 1920 and became popular as the American missionaries of Madurai founded a colony on the Hills. Sir Vere Levinge who was the Collector of Madurai in 1860 constructed several roads and bridle paths and

Sheep
Grazing
at
Ooty



MOTORINDIA

113

introduced planting of European fruit trees and flower plants. He also planned the Kodai lake. A monument to his memory is seen at the lake front opposite to Kodai Municipal Office.

The lake in the centre of the town is the chief attraction spread over an area of 60 acres and skirted by three mile tarred road, which is ideal for walks and drives. Boating in this lake is a wonderful experience.

For the true lover of nature Kodaikanal provides within a comparatively small circumference on the hill varied charms. Indeed this beautiful hill station has often been likened to Switzerland.

The Coaker's walk running along the southern brink of the towns overlooking the plains provides a panoramic view. There are three high masses of granite stone called pillar rocks. Between and below them there are several caves into which visitors descend for sight seeing. From the top of them a superb view of Agamalai can be had. From Kodai you also get a view of Dolphins Nose about three miles from the lake. The Silver Cascade, the Glen falls, Pamber and Bear Shola falls and the Fairy falls have endowed Kodaikanal with a wonderful panorama. On Nandingipuram hill (7,700 ft. high) an observatory is situated. It is considered to be one of the finest observatories of the world.

The Perumal Peak is the ultimate ambition of any one visiting Kodaikanal. The panorama seen from the top of this embraces the entire country, Madurai, Virudhunagar, Tiruchi, Palani and even the Nilgiris.

Unfortunately Kodai lacks the conveniences necessary to middle class living. Kodai is still to be developed.

Yercaund

When coming to speak of smaller hill stations mention must be made of Yercaund which is but an hour's run by car from Salem town. It is curious and rather difficult to understand that so pleasant and accessible a hill station has been utterly neglected. Smaller hill stations like this are best suited for short holidays.

Other cool peaks

Coorg with its river, its Cardamom hills, its sanctuaries and its pretty township is really a beauty spot in South India. In the hills of Coorg is the cradle of the Cauvery river which makes them as important in Geography of India as on its holiday maps.

To those who want to leave the beaten track there are pleasant spots like Munnar in the hills bordering on Coimbatore and Malabar. Andhra is planning to encourage the development of that valley whose very name inspires the feeling of peace—Rishi valley. There is an excellent Sanatorium here.

Indians first

It should be recognised that the hill stations have to be populated

amongst Indians, rather than made attractive to the foreign tourists. People of this country need the change that the hill stations provide and the tourism that demands fostering is one that caters to the middle classes of India.

Since the dawn of freedom there has developed a peculiar political allergy towards the hill stations. This is due in part to their association with the foreign regime during which the bureaucrats relaxed and recreated themselves in the heights while the masses toiled in the plains below. This feeling is still prevalent.

The fact that the revival of Government exodus to the hills will give a fillip to their development.

A view of the Ooty gardens



BRITAIN'S "AERIAL PACK-HORSE"

HANDLEY PAGE HERALD SHOWS

Versatility In Tests

The need to produce a versatile, easily operable load-carrying aircraft to fill the gap being left by the gradual withdrawal of the widely used Dakota is claimed to have been met by the Handley Page Herald, which has now come through rigorous tests with flying colours.

While the public imagination is seized by reports of coming jet airliners travelling at the speed of sound, the fact remains that a big proportion of the world's airlines still rely upon the twin-engined, 180-mph Douglas Dakota for internal and short-haul passenger and freight services. And this despite the fact that the Dakota, which gave such remarkable service in countries like India and Burma in World War II, is regarded by aircraft designers as obsolescent.

Its rugged qualities and comparative cheapness of operation have kept it in service, although for some years it has been accepted that a more modern aircraft was desirable as a replacement.

In considering such a replacement, aircraft designers took note of the fact that throughout the world hundreds of millions of people away from the highly developed centres of civilization are air-minded in the matter of travel and supply. And inquiry has shown that what they need is a medium-sized air transport able to carry a good payload of men and goods and still be able to land on small, unsurfaced airstrips.

Before turning from the drawing-board to the production model, Handley Page representatives toured the world to ascertain needs and inspect areas where an "aerial pack-horse" could profitably operate. The high-wing Herald which resulted—although not a giant—is easily the biggest aeroplane ever to have landed on, and taken off from, the cow-pasture airstrip on the tiny Channel island of Alderney.

The version of the Herald with Rolls-Royce Dart turboprop engines made its maiden flight from a small grass air-field near Reading, England, in March. It took off in 300 yds. and landed in an even shorter distance. Of the flight, which demonstrated the Herald's high cruising and low landing speed, test pilot H. G. Hazelden afterwards said: "Never have I had an easier flight."

Export contribution

Sir Frederick Handley Page, who explained that his company had developed the new turbo-prop branch-airliner entirely from the company's own resources as a private venture, said: "The Herald is likely to make a valuable contribution to Britain's export drive." Sir Frederick recalled that it was a Handley Page converted twin-engined bomber which inaugurated a Calcutta-Bombay passenger-carrying air service as far back as 1920.

The Dart Herald, it is claimed by Handley Page engineers, should bring speed, smoothness, and reliability of turbo-prop flight to local-service and medium-range air routes all over the world, both in developed regions and in areas where costly concrete-surfaced airfields do not exist.

Carrying 4½ passengers or 42 tons of freight, or a combination of both, the Dart Herald cruises at 275 mph. It can take a maximum payload of more than 10,000 lb. over a range of 700 miles. By cutting the payload to 6,200 lb. the range is made 1,430 miles.

As to reliability, the Dart turboprop engine is backed by some 4,000,000 flying hours of operating experience. The Handley Page Herald was developed particularly for service in such areas as India, Pakistan, Arabia, Australia, Africa, and Central and South America, where branch-line operation demands simplicity of handlings and ease of servicing and maintenance.

New 'Local Service' Version of Viscount Airliner

Details have been released in London by Vickers-Armstrongs (Aircraft) Ltd. of a new version of the Viscount propeller-turbine airliner—the Local Service Viscount.

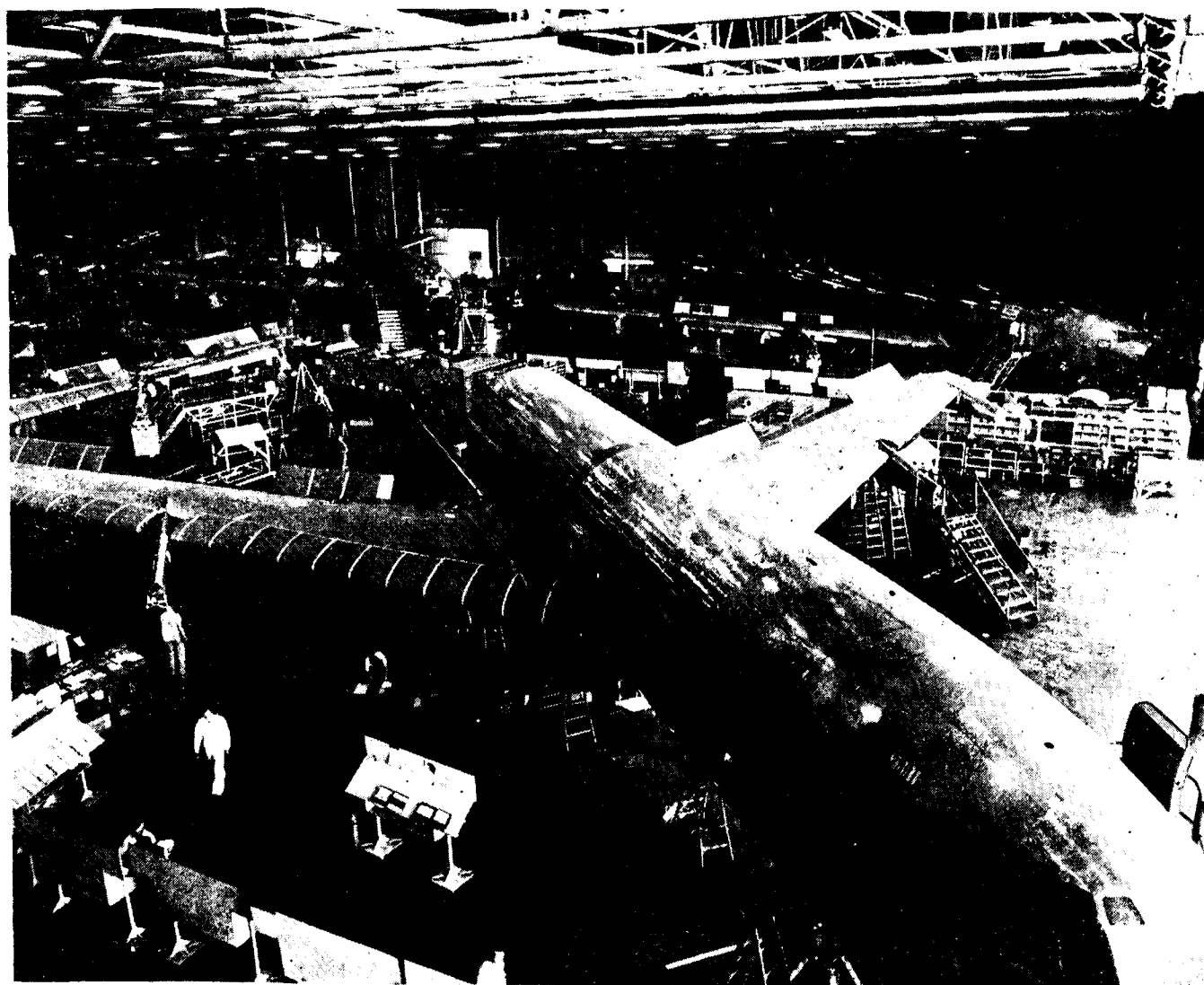
As its name implies, the Local Service Viscount has been developed to meet the need for a fast, modern airliner capable of providing competitive yet economical service over relatively short inter-city air routes. Its specifications are already being studied in the United States, and the new Viscount also has applications in other parts of the world.

The fuselage of the Local Service Viscount is similar to that of the proven Series 700 Viscount aircraft, but with a re-designed interior cabin layout permitting greater seating capacities, from 54 passengers in the standard version to 65 passengers in a high-density layout. The wing structure is strengthened to permit higher speeds at low altitude.

The Rolls-Royce Dart 506 propeller-turbine engine has been chosen in order to give the best combination of take-off and climb performance, cruise speed, and economy. "Quick-Turnround" features built into the aircraft include folding air steps, provision for additional batteries for internal engine starting, propeller brakes on the two port engines and the starboard inner engine and, in the four-abreast seating layout, an exceptionally wide gangway.

Deliveries of this aircraft can be made in mid-1959. The existing worldwide after-sales service will enable the Local Service Viscount to go straight into airline operation.

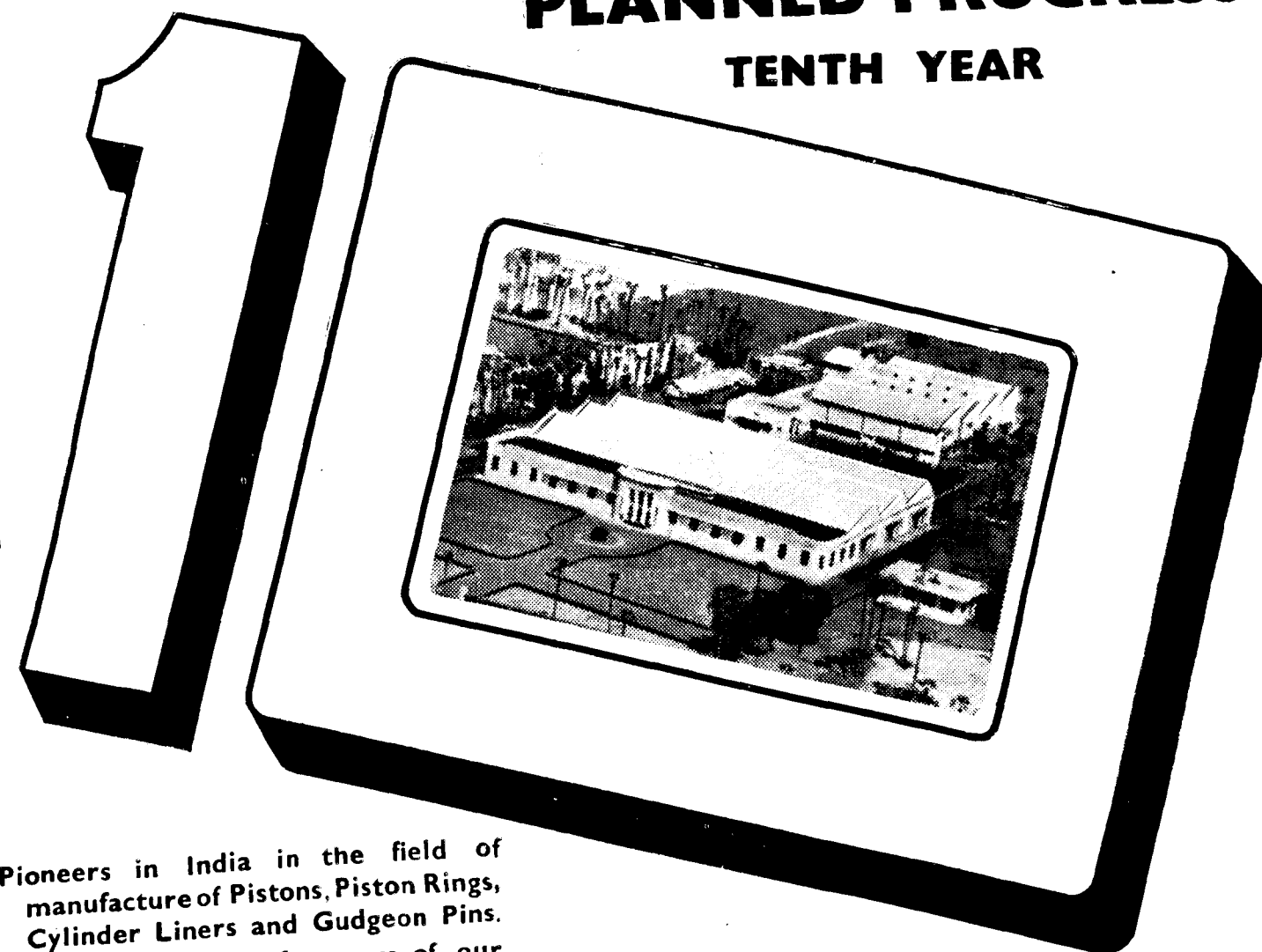
FIRST BOEING INTERCONTINENTAL JET AIRLINER IN FINAL ASSEMBLY



The first of the long-range Boeing Model 707-320 INTERCONTINENTAL jet airliners, is shown in this recent photo taken following the placing of the giant 600-miles-per-hour aircraft at the start of the final assembly line at Boeing Airplane Company's Transport Division, Renton, Wash. Rapidly nearing completion on the back leg of the horseshoe-shaped final assembly line can be seen (at right) the sixth Boeing 707 Stratoliner destined for Pan American World Airways followed closely by the first two 707's for American Airlines. Pan American also will receive the first of the 296,000-pound INTERCONTINENTALS in 1959. Both Pan American and American Airlines will begin regular jet passenger service later this year with their Boeing 707 Stratoliners. These planes are expected to go to Bombay-Calcutta in less than 100 minutes next year.

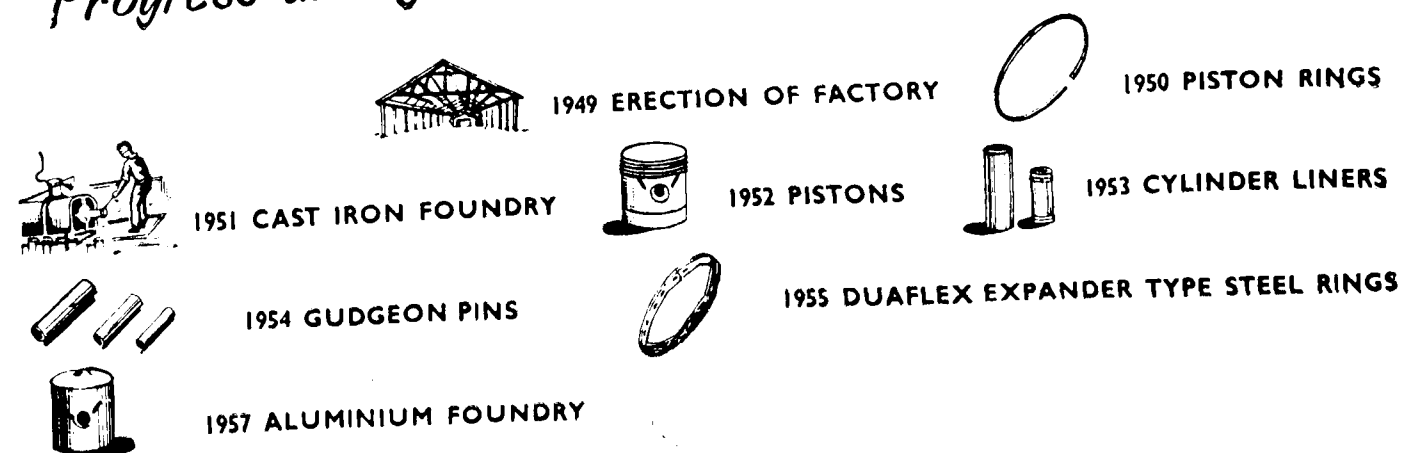
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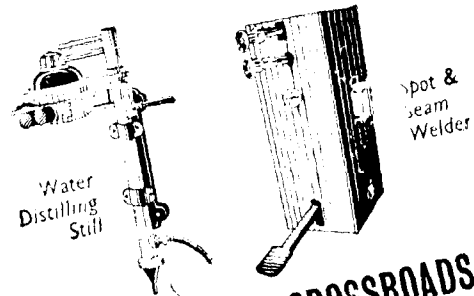
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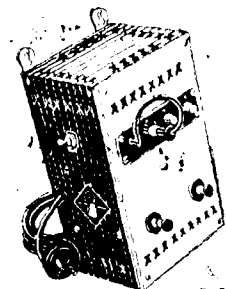
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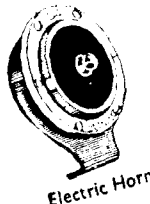


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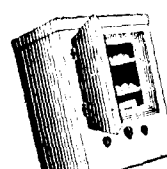
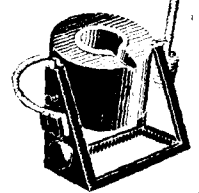


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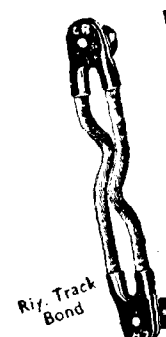


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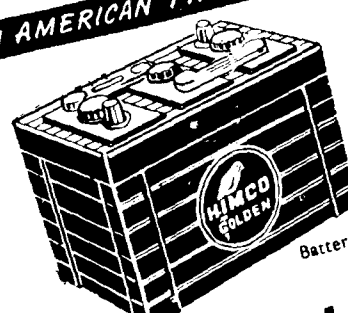
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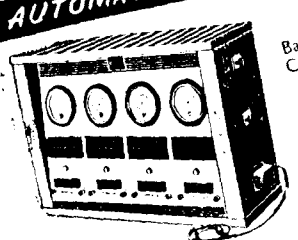
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