

MOTORINDIA

ANNUAL 1957

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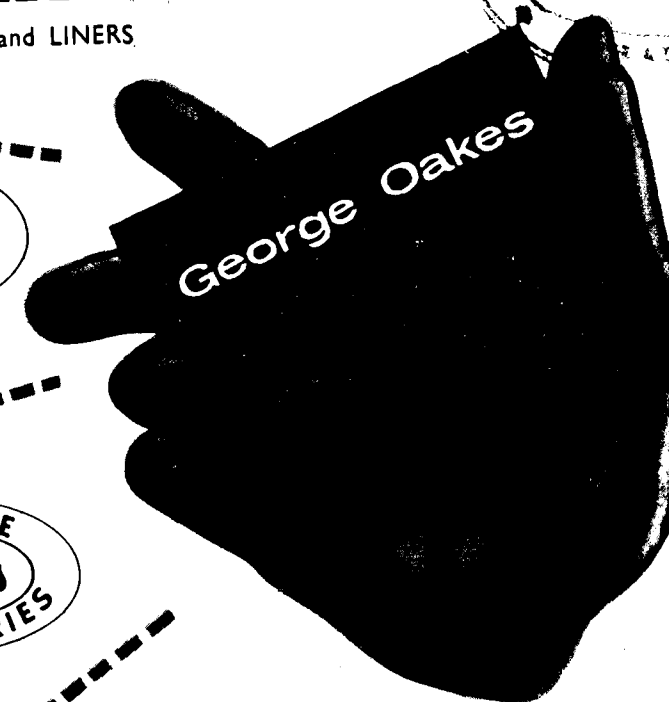


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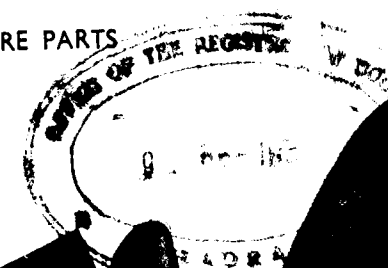
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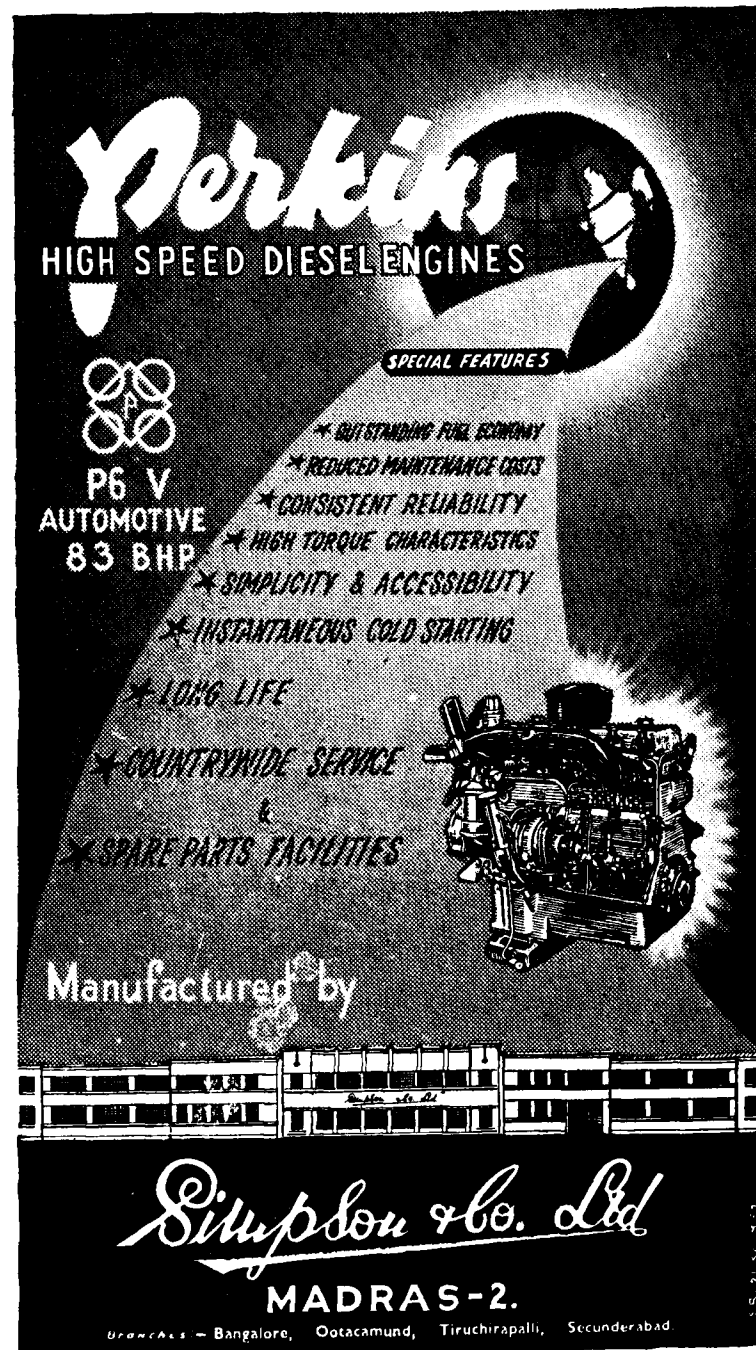
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MOTORINDIA

ANNUAL 1957

Editor : M. RAJAGOPALAN

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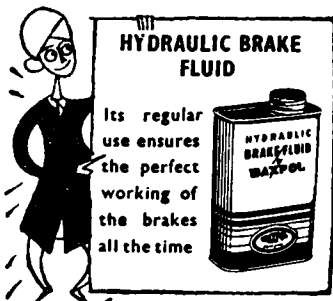
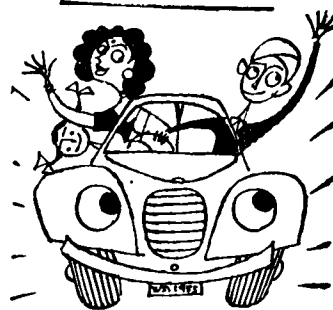
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editorial

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Our Annual

We have real pleasure in presenting this our first Annual Number to the public, particularly the motorists and the automobile world. It was just a year ago that South India possessed its only automobile publication and it is gratifying that the unstinted support and patronage of automobile interests, and motorists and fleet owners in particular, have made it possible for us to plan and bring out this Annual feature.

The automobile fraternity are no doubt familiar with Annual Numbers of various publications in this country and abroad and in adding to that list the Motorindia Annual, we take delight in the fact that we have been able to give some very good, reading matter of use and interest to the operator, to the motoring enthusiast and to the Parts Trade. We have secured on a very exclusive basis and at considerable cost, stories and photographs of interest from various parts of the world written by well-known writers. Tourism, developments in transport, modern trends in automobile designing, new gadgets that go to help the motorist, an interesting survey of latest models in various countries and an enlightened report on the automobile in Europe by our Special Correspondent Mr. Gordon Wilkins. We commend these and other interesting features of this publication to the notice of our esteemed readers and we would make a request to each reader to go through the entire publication and judge the quality of its contents for themselves.

We invite suggestions and comments from readers. We, however, hope that readers will remember that this is only our first Annual and as time goes on, it will be our constant endeavour to improve upon sources of information and illustration with a view to making available to the readers a comprehensive picture of the industry as such and the allied topics in general.

We would be failing in our duty if we do not express our sincere thanks for the very ready support that the automobile trade and industry has given us in bringing forth this Annual Number. Our thanks are equally due to the numerous contributors who have found time to write articles of interest to the industry.

Fraternal Greetings

From Mr. F. D. Ahmed, President, Mysore Automobile Parts & Allied Merchants' Association :

"It is a great pleasure for me to convey to you best wishes on behalf of the Association and myself on the occasion of the First Anniversary of MOTORINDIA. I have no doubt that that your magazine will gain further popularity in the territory of distribution, for I have been very keenly observing the many articles that are of great interest. Further more, a magazine of this nature was needed so much in South India. MOTORINDIA has certainly a place amongst the top magazines of our country which compare most favourably with the magazines of other countries. Once again let me congratulate you and the sponsors on the successful effort that was made to initiate this popular magazine which will no doubt stay as an attractive medium for information to the business community."

★

From Mr. Mahomed Usman, K.C. S.I., K.C.I.E., LL.D., President, Automobile Association of Southern India, Teynampet Gardens, Madras:



mobile Association of Southern India, Teynampet Gardens, Madras:

"I am glad to learn that the MOTORINDIA has completed one year of its publication successfully. I wish the magazine all success in future."

★

From Mr. L. L. Narayan, President, Motor Vehicles & Allied Merchants Association, Mount Road, Madras:



"My congratulations to you on the completion of a full year of your publication MOTORINDIA, which has been of very great value to the Automobile and Allied interests, particularly being the only well edited magazine of South."

★

From F. Webb, President, The Bangalore Motor Sports Club, Bangalore :

Congratulations on your First Anniversary.

A Motor Magazine such as yours which covers a wide field and concentrates on aspects of motoring in Southern India is indeed most welcome. As Motor Sport enthusiasts we should like to see more news of sports interest in your columns, which you may perhaps be able to include in forthcoming numbers.

Best Wishes for years of useful service.

★

FROM SRI LAL BAHADUR SASTRI
Minister of Transport and
Communications, India :

DEAR SHRI RAJAGOPALAN

I am glad to learn that MOTORINDIA has just completed its first year of publication. You have indeed done well during this short period. The get up of the magazine and its printing have been of a high standard and I am sure it has well catered to the needs of those interested in the transport industry.

I wish it many years of successful existence.

Yours sincerely
(Sd.) LAL BAHADUR

From Mr. V. Kunjitapadam, President, The Madras Motor Parts Dealers Association, Mount Road, Madras :

"I am happy to learn that the MOTORINDIA will shortly celebrate its second birthday. I wish it and those connected with it many happy returns of the day. The MOTORINDIA to which I subscribe, has been very informative and useful to the Trade. I can vouch for the popularity of the magazine and its Editor, Sri M. Rajagopalan, a class Journalist and a keen Motorist. The MOTORINDIA has pledged itself to serve the needs of manufactur-



ers, dealers and the motorists alike and this seemingly opposed and difficult job, it is doing well. I heartily wish it all success."

100 MILLION MOTORS

ARE NOW ON THE ROAD

In the modern world the growth of motor traffic seems to know no bounds. The expansion of industry and trade, the rise in personal incomes, and the success of the motor manufacturers in catering for man's insatiable desire to move about from place to place—all these have contributed to the remarkable increase in motor vehicle registrations since the war. Another milestone has just been passed, for the number of vehicles in use in all countries is estimated by *The American Automobile* to have exceeded 100 million units at the beginning of this year. This new record comprises 78.8 million passenger cars, 23.2 million lorries and over 700,000 buses. It compares with a total of some 44 million vehicles of all kinds at the beginning of World War II. This implies an *average* annual (compound) rate of increase since 1939 of about 5 per cent for all vehicles—rather more for commercial vehicles, and rather less for cars.

Last year's increase, like those of 1954 and 1955, was as high as 8 per cent for both cars and commercial vehicles. Whereas in the U.S.A. the number of vehicles rose by 6 per cent in 1955 and by 4 per cent during 1956, in most other countries recent increases have been far higher. If the world average rate of increase were to revert to 5 per cent annually, the total number of vehicles in all countries would reach about 200 million by 1970, with the possibility of a doubling of the demand for motor fuel. Moreover, *The American Automobile* puts the number of motor, cycles, scooters, etc., at 15.5 million, and of farm tractors at 9.2 million, and there will no doubt be rapid advances in these categories, too.

OVER 64 MILLION IN U.S. ALONE

The U.S.A., with about 170 million inhabitants, is credited with as many as 54.1 million cars and 10.5 million lorries and buses, or 63 per cent of the world total. Though the great majority of U.S. families already own at least one car, the continued expansion of the fleet is assured by the expected further growth in the population (recently at a rate of 1.7 per cent annually), and by the propensity of well-to-do families to acquire a second or even a third car. Apart from the net expansion, there was an estimated replacement

demand for nearly 4 million vehicles in the U.S.A. last year, compared with over 4 million annually in the preceding three years. But the rate of scrappage will probably be much smaller this year, as very few pre-war vehicles are left on the roads. Next to the U.S.A., Canada has the largest number of motor vehicles in relation to the population (26 as compared with 37 per 100 inhabitants) and there was last year a surprisingly rapid increase in the number of new registrations there.

TABLE I

WORLD : MOTOR VEHICLE REGISTRATIONS

(Thousand Units : Beginning of Year)

	1940	1955	1956	1957	1957 : Index (1940 = 100) (1956 = 100)		1957 : % of World Total
U.S.A. ...	30,294	58,050	62,040	64,601	214	104	62.9
Canada ...	1,421	3,554	3,831	4,323	304	113	4.2
Other Western Hemisphere ...	888	2,829	2,980	3,335	376	112	3.2
W. Europe*	8,452	14,481	16,284	19,317	229	119	18.8
U.S.S.R.*	880	2,600	2,875	3,130	392*	109	3.0
Other E. Europe*	184	513	567	587	201*	103	0.6
Oceania...	1,201	2,566	2,734	2,950	245	108	2.9
Asia ...	696	2,008	2,268	2,594	373	114	2.5
Africa ...	693	1,700	1,888	1,991	284	105	1.9
World*	44,629	88,311	95,467	102,828	230	108	100.0

Of which :

Cars ...	36,200	67,007	73,117	78,815	217	108	76.7
Lorries and buses ...	8,429	21,067	22,304	23,961	275	108	23.3
Unspecified vehicles ...	...	237	46	52	...	...	0.0

* O.E.E.C. countries (all Germany in 1940), also Spain, Finland and Yugoslavia.

* U.S.S.R. and other E. Europe are estimated ; the 1955 figures for E. Europe and World originally published by *The American Automobile* have been adjusted to include an estimated number of 210,000 vehicles in E. Germany.

* Index refers to E. Europe excluding E. Germany.

Source : *The American Automobile*, May 1957, and corresponding issues in earlier years.

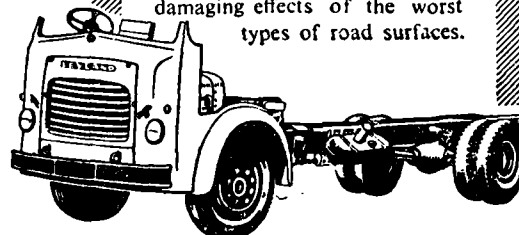
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For Delhi, Himachal Pradesh, Punjab & Rajasthan:
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 Saralgham, 1/2 Jhandewala, NEW DELHI

For West Bengal, Bihar & Assam:
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For the free world outside North America, the estimated number of motor vehicles rose by 15.4 per cent, from 26,154,000 at the beginning of 1956 to 30,187,000 early this year. The latter figure included well over 19 million units in Western Europe, and nearly 3 million in the highly motorized countries of Australia and New Zealand. In Western Europe, the number of motor vehicles rose by as much as 19 per cent, though in some European countries the process of expansion is not being matched by commensurate road building efforts. Even in the most highly industrialized countries of Western Europe, the number of motor vehicles per head of the population is still much lower than in North America and Oceania. But since they are thickly populated, their motor transport is dense in relation to their area and to their road mileage.

PROGRESS RETARDED IN ASIA

The number of motor vehicles is also increasing in all other parts of the free world, including the less developed countries of Asia, Africa, and Latin America though progress there is often retarded by lack of funds. In most countries of the free world outside North America, relatively few old vehicles have been discarded in recent years, and contrary to the situation in the U.S.A., replacement demand in these countries may therefore increase over the next few years.

In the U.S.S.R. and other Communist countries, the motor vehicle still plays a subordinate part in the economic and social life. Despite official pronouncements in some of these countries that motor transport deserves greater support than hitherto, the main emphasis in their planning continues to be on the expansion of heavy industry. Inadequate provisions for motor production and road building suggest that the progress of motor transport will be much slower than in other economic spheres, and will lag far behind that of the free world.

Production of motor vehicles, excluding assembly operations, totalled last year 11.5 million in the world as a whole, and nearly million in the free world. Though two million lower than in the preceding year, the latter figure was the second highest on record, comparing with a free world output of only 9.7 million in 1954 and of 10 million in 1953. Car production is, of course, chiefly concentrated in a few major manufacturing countries in North America and Western Europe, while the production of commercial vehicles takes place chiefly in the same countries and in the

TABLE II
WORLD : MOTOR VEHICLE PRODUCTION *
 (Thousand Units)

	Passenger Cars		Lorries and Buses			Total	
	1955	1956	1955	1956	1955	1956	% Change
U.S.A. ...	7,920	5,816	1,249	1,104	9,169	6,920	-24.6
W.Germany. ...	706	845	203	228	909	1,073	+18.0
U.K. ...	897	707	341	299	1,238	1,006	-18.7
France ...	560	663	164	164	724	827	+14.2
Canada ...	375	374	79	99	454	473	+4.2
Italy ...	231	280	36	36	267	316	+18.3
Japan ...	13	24	135*	183	148	207	+33.0
Australia ...	47	49*	17	17*	64	66*	+3.1
Sweden ...	33	38	15	19	48	57	+18.7
Total Free World ...	10,782	8,796	2,239	2,149	13,021	10,945	-15.9
U.S.S.R. ...	107	98	337	367	444	465	+4.7
E.Germany. ...	14	14*	22	27	36	41	+13.9
Czechoslovakia ...	10	11	14	14*	24	25	+4.2
Poland ...	4	6	13	13	17	19	+11.7
Total Iron Curtain countries. ...	135	129	386	421	521	550	+5.6
World Total ...	10,917	8,925	2,625	2,570	13,542	11,495	-15.1

* Excluding minor producing countries, usually producing well under 10,000 vehicles p.a., also excluding assembly operations.

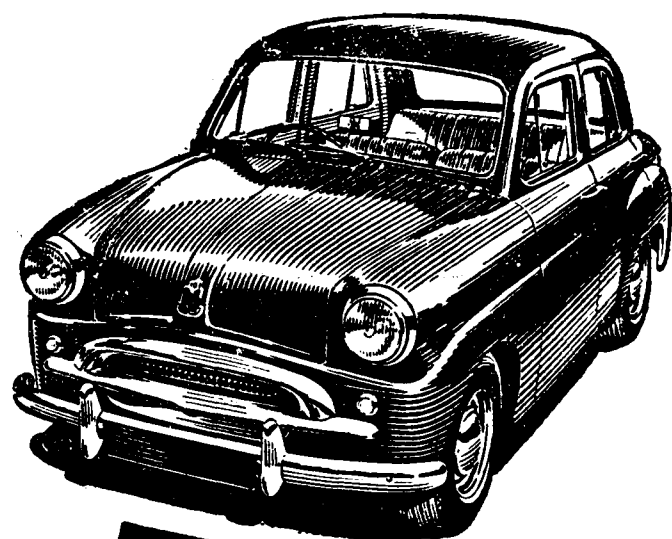
* Including three-wheeled vehicles (88,000 in 1955 and 106,000 in 1956).

* 1956 figures show new registrations of locally produced vehicles.

* In the absence of published figures for 1956, it is assumed that there was no change from 1955.

Source : S.M.M.T., London, and national statistics.

U.S.S.R. But Japan, Australia, and Sweden have growing motor industries, while projects for opening new production units are in hand, for instance, in Brazil and China. In addition, assembly operations (from imported parts) are going on in perhaps a score of countries. Thus, in Australia 150,000 vehicles were assembled last year, in addition to the local manufacture of about 66,000 units; Belgium assembled 122,000 vehicles, S. Africa 52,000, New Zealand 48,000 Mexico 42,000 and India 31,000. Altogether, the assembly plants of the world appear to have turned out about 600,000 vehicles last year. At least in some cases, parts are assembled which are not included in the vehicle production statistics of the manufacturing countries, and to this extent it would be justifiable



**IT's unbeatable-
for**

- ★ **ECONOMY**—The Standard Super Ten has petrol consumption of 35 m. p. g. average or more according to driving conditions.
- ★ **RELIABILITY**—The list of successes of the Standard Ten in major international rallies has seldom been equalled by other cars of its class. It was 1st in the R. A. C. Round-England Rally of 1955, 1st and 2nd in the 1955 Australian Golden Jubilee Small Car Trial and 1st in Class One in the 1956 Round-England Rally—plus 50 other successes. What better evidence of the toughness, safety, durability and efficiency of this fine car?
- ★ **PERFORMANCE**—The Standard Super Ten, with its easy-change, four speed, gearbox and 948 c. c. overhead valve engine giving superb acceleration, is unbeatable. Designed specifically for safety, manoeuvrability and ease of parking.

STANDARD Super Ten

THE UNION CO., (Motors) PRIVATE LTD.,
MADRAS — BANGALORE — COOTY

S M Z/25

to add figures showing assembly operations to world production figures.

Last year's over-all decline in production was more than accounted for by the sharp reduction in the U.S.A., from 9.2 million in 1955 to 6.9 million in 1956. The reduction was unavoidable because the high output of 1955 had resulted in over-large inventories. When these had been cleared, factory sales of cars totalled 2,326,000 in the first four months of this year, this being 40,000 more than in the corresponding period of 1956. The advance, compared with last year, was thus rather small, partly no doubt due to the much lower replacement demand.

SLUMP IN U.K. PRODUCTION

In the U.K., too, there was last year a slump in production (which continued into the early months of this year) due to credit restrictions at home and marketing difficulties abroad, aggravated by the Suez crisis. However, restrictions on hire-purchase have now been relaxed, and with motor fuel rationing ended, the prospect of recovery in the U.K., is now more favourable than a few months ago. Meanwhile, production has continued to expand in the main Continental countries; Western Germany, reaching an output of nearly 300,000 in January-March this year, has displaced the U.K., as the world's second largest producer of motor vehicles.

About 1.6 million motor vehicles, equivalent to 15 per cent of the free world's production, were exported last year from the countries of manufacture. The U.K. and Western Germany each sold nearly half their output abroad, but in the U.S.A., the export proportion was only 3 per cent for cars and 18 per cent for commercial vehicles. German car exports rose by 100,000 units last year and, with the exports of its main competitors falling, the country became the leading car exporter, notably of small models. However, lorries and buses from the U.S.A., accounted for well over 40 per cent of the free world's export trade in commercial vehicles, the U.K. taking second place, followed at a considerable distance by Western Germany.

TABLE III
FREE WORLD : MOTOR VEHICLE EXPORTS *

(Thousand Units)

	Passenger Cars		Lorries and Buses		Total			Total as % of Production : 1956
	1955	1956	1955	1956	1955	1956	% Change	
U.S.A.	212	175	177	198	389	373	- 4.1	5.4
W. Germany	326	421	84	79	404	500	+ 24.8	46.5
U.K. ...	373	318	158	146	531	464	- 12.6	46.2
France	133	151	30	25	163	176	+ 8.6	21.3
Canada ...	12	14	6	5	18	19	+ 5.5	4.0
Italy ...	69	78	5	9	74	87	+ 17.6	27.5
Free World	1,119	1,157	460	462	1,579	1,619	+ 2.5	14.8

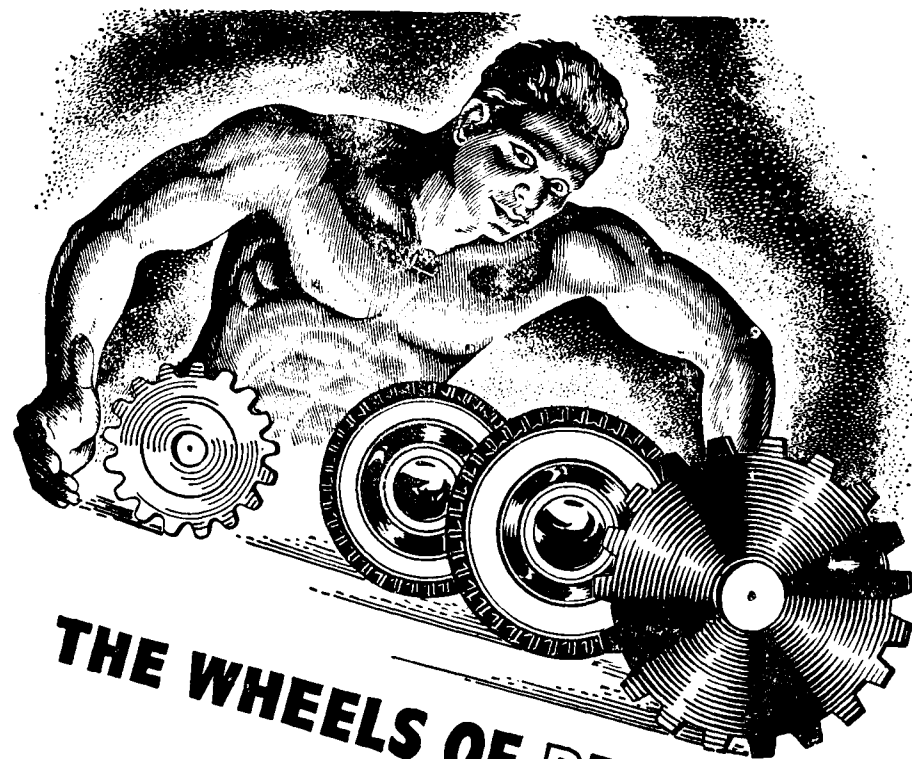
* Excluding negligible exports from other countries of the free world. There are also relatively small exports from Communist countries, mainly into neighbouring markets.

Source : S.M.M.T., London.

The motor industry in the free world, and especially that of Western Europe, will probably be more affected than most other industries by the proposed European Economic Union, comprising Western Germany, France, Italy and Benelux, and the still wider European Free Trade Area, embracing all O.E.E.C. countries. If all internal trade barriers in Western Europe are eventually abolished, some European manufacturers may suffer from the gradual reductions and eventual disappearance of the duty protection (e.g., in the U.K. 30 per cent) which they now enjoy. Others should be able to expand their sales and achieve substantial economies through larger-scale and co-ordinated production, as do their counterparts in the U.S.A. Cheaper vehicles and a more concentrated industry might well result. The new schemes have, of course, not yet been formally accepted, and the lowering of trade barriers will at any rate be a gradual process, probably taking 12 to 15 years until they are finally abolished.

MOTORINDIA IS THE ACCREDITED ORGAN OF

The Madras Motor Parts Dealers' Association



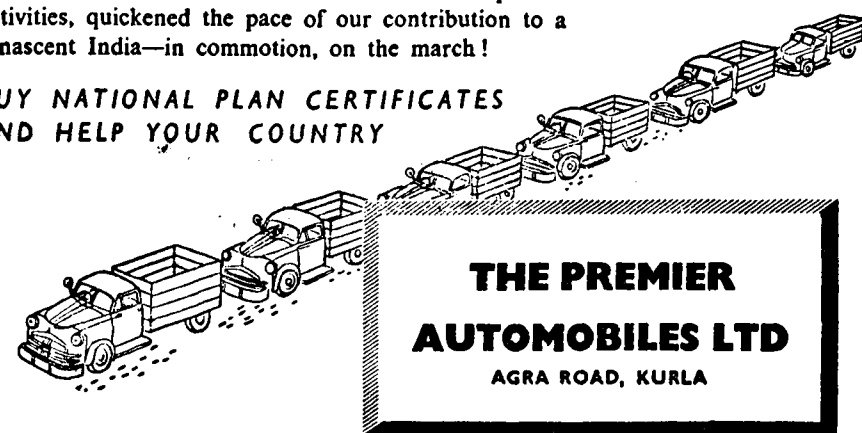
THE WHEELS OF PROGRESS

The people of India, in the words of our beloved Prime Minister, are on the move. There is a spirit of adventure abroad, awakening after decades of torpor.

The promoters of the Premier Automobiles Limited, saw far ahead when in 1946 they laid the foundations of an industry destined to play an important part in trade, transport, and the economic well-being of the country.

Thanks to the policy of the Government of India to encourage automobile companies with a *manufacturing programme*, we shall be privileged to place before the public *completely Indian-made* trucks and cars in the near future. We have expanded our activities, quickened the pace of our contribution to a *renascent India*—in commotion, on the march!

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SISTA'S PAL-179

JAPAN'S AUTO PRODUCTION ★ ★ ★ FAST INCREASING

The increase in the production of Japanese automobiles is indeed remarkable. The production of some kinds of automobiles has been doubling every year. Reduction in prices and announcement of new models have often been made.

The Toyota Motor Co., announced a reduction in the price of its small car, being followed in rapid succession by Nissan Motor, Hino Diesel and Fuji Precision Machinery Co.

The reasons given by Toyota and Nissan for the price reduction are as follows :—

(1) Cost of production has been reduced as a result of the progress of mass production.

(2) The manufacturers wish to open the way for export besides expanding their domestic market.

Production of the small cars subject to the price reduction by the two companies has increased to more than double in the past one year.

Trucks account for 70 per cent of Japan's automobile production. Of late the increase in the production of small trucks of one to two tons has been especially conspicuous. Until four or five years ago their production was about one half as compared with ordinary trucks, but they outstripped ordinary trucks, the year before last. This year their output is expected to total 100,000 or twice as many as ordinary trucks.

Fuji Precision Machinery Co. has reduced the production of its passenger motor car "Prince" to about 60 a month during the past one year and has increased the output of small trucks to 600 to 700 a month.

Ohia Motor Co., is also expected to carry out a full-fledged mass

production, while Isuzu Motor Co., is planning to launch the production of small wagon-type trucks for both passengers and cargo.

Increase in the production of small trucks is liable to lead to an encroachment upon the market for three-wheel trucks 500,000 of which are in use in Japan.

Dai Hatsu Kogyo and Toyo Kogyo, both of which are major producers of three-wheel trucks, are said to be engaged in a test production of four-wheel trucks. If they begin producing four-wheel trucks, the manufacture of small trucks, in Japan will increase further.

In Japan the production of diesel buses is 10 times as many as gasoline buses. Japan is vying with Germany for top position in the world both in the quality and the output of diesel buses.

Toyota has also entered the field of diesel car production with five-ton trucks as the starter. It plans to turn out buses in autumn this year. Diesel engine trucks are of large type capable of carrying five to eight tons of load. The passenger automobiles produced in Japan include Toyopet of Toyota, Datsun of Nissan and Prince of Fuji Precision. Besides these, Austin is assembled by Nissan, Hillman by Isuzu and Renault by Hino out of imported parts through these companies' technical co-operation with foreign auto-makers.

The production of Toyopet and Datsun numbers more than 1,000 a month each, whereas the assembling of foreign cars is limited to 300 a month due to foreign currency restriction. Seventy to eighty per

cent of the passenger automobiles produced in Japan are bought by taxicab operators. Cars for rough use such as taxicabs should be of high efficiency even if they are comparatively expensive. Therefore competition may become keener for raising the efficiency of Japanese automobiles.

Toyoto is planning to produce a four-seat car a little smaller than Toyopet, while Nissan is expected to turn out Datsun equipped with a new engine.

In view of the fact that the standard of living is comparatively low in Japan, automobiles in general use in Japan are likely to be of small type prices at about 3,250,000 each.

The export of Japanese automobiles has been increasing by leaps and bounds. The figure for 1956 was double that of 1955.

The export in 1956 by types of cars was 2,455 as follows :—

Passengers cars 46, Trucks 1,700, Buses 517, Utility vehicles 183, and Tractors and trailers 9.

Japan-made buses light, strong

The bodies of Japanese buses are light, strong and smart-looking as the technique of aircraft industry is applied to their production.

They are equipped with heating and cooling devices and their seats can be built in whatever way is asked by foreign buyers.

They can be divided into three types according to the location of their engines—front, rear and under-floor. Their horse power is 105 to 230 and their maximum carrying capacity is 80 persons.

Being on the highest level in quality in the world, Japanese buses are in great demand from abroad.

*With accent on Comfort and Capacity
—Utility and Economy*

**MULTI-PURPOSE HINDUSTHAN
TRAVELLER**



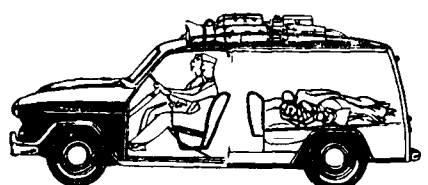
Comfortable accomodation for
six adults and their luggage.



With the rear seat folded down,
it has the capacity of a light van
and seats for three in front...



or, you get space to spread your
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Trivandrum ; Vijayawada ; Vizianagaram.

AUTO PART INDUSTRY IN JAPAN

BY
YOSHITARO MATSUMOTO
(President,
Japan Automobile Publishing Co.)

The automotive parts industry in Japan has been co-operating in the movement for the rationalisation of production advocated by the Ministry of International Trade and Industry since last year. Though no conspicuous effect has been seen, the movement has succeeded in reducing the cost to some extent.

There has been not much change in the prices of products, however, because the workers' cost of living has increased, while the prices of materials have remained unchanged.

With the value of Japanese auto parts coming to be recognized in overseas markets, foreign buyers tend to select products of higher quality. The auto parts makers are therefore doing their best to improve the quality and lower the cost.

The auto parts manufacturers desire that the foreign buyers pay full attention to the quality of products and buy them at equitable prices without making unreasonable demand for price reduction.

The export of Japanese auto parts has been increasing year after year. The export in 1956 amounted to \$8,600,249 showing a 13 per cent gain from \$6,024,413 of the preceding year.

Japan's principal markets for automotive parts in 1956 are as follows :—

Dollar areas—

R y u k y u \$616,522, Uruguay \$312,168 Mexico \$196,438, Iran \$196,438 ; Peru \$163,626.

Sterling areas—

India \$1,263,556 ; Burma \$582,831 M a l a y a \$472,176 ; Singapore 130,606.

Annual 1957

3

Open account areas—

Philippines \$1,090,579 ; Brazil \$925,812 ; Thailand \$598,690 ; Formosa \$548,903.

Increasing demands for Japanese automotive parts in foreign countries owe to the following factors :—

(1) Japanese makers manufacture not only those parts suited for Japan-made vehicles but also those for Ford, Chevrolet, Dodge, G.M.C., jeep and various other types.

(2) A sharp increase in cars is taking place throughout the world.

JAWA-CZ

The best two-strokes

Not long ago the JAWA-CZ Works celebrated their Silver Jubilee. Experiences of twenty-five years of motor-cycle design and production were embodied in JAWA-CZ motor-cycles, which, soon after the Second World War, gained popularity with the public in all parts of the world. There is practically no country where JAWA-CZ machines would not serve faithfully and reliably their owners and spread the good name of the make.

The success of JAWA-CZ motor-cycles is based foremost on the originality of their conception. The proof of this is that a number of characteristic components, imprinting on JAWA-CZ motor-cycles their individuality, is protected by patents.

First among these typical features ranks the semi-automatic clutch. An original novelty of JAWA-CZ motor-cycles is the single lever gear change and starter mechanism. Gear changing and engine starting is by a single lever. In its normal position the lever serves for gear changing. When required for starting, it has just to be pressed lightly towards

the engine and lifted into its starting position. After starting the engine, the lever returns automatically to its original position and serves again for gear changing. The advantage of this mechanism consists in the fact that there are fewer parts and fewer controls on the machine. It needn't be stressed that the elimination of a separate starter lever improved by the appearance of the engine and thereby the look of the motor-cycle.

The location of the battery in a box on the L.H. side of the machine is patented as well. The battery is perfectly protected against damage and dirt and does not endanger the clothes of the rider.

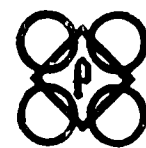
Original is the construction of the steering head ; it ensures absolute rigidity and safety.

Finally, one of the principal features of JAWA-CZ motor-cycles is the compact and smooth surface of the engine. The smooth lines of the machine necessitate that the engine should not disturb the general appearance. Therefore the engine is of unit construction with the gearbox. The carburetter is located in the block and fully enclosed and just this gives the engine its compact shape. This was made possible by a special design of the inlet port which is below the level separating the cylinder from the crankcase and so permits the location of the carburetter in the crankcase and its enclosure. The carburetter cover is at the front adapted to the shape of the cylinder and at the rear to that of the crankcase.

Added to these original elements are other characteristic features, with which the latest JAWA-CZ models are well known in the world.

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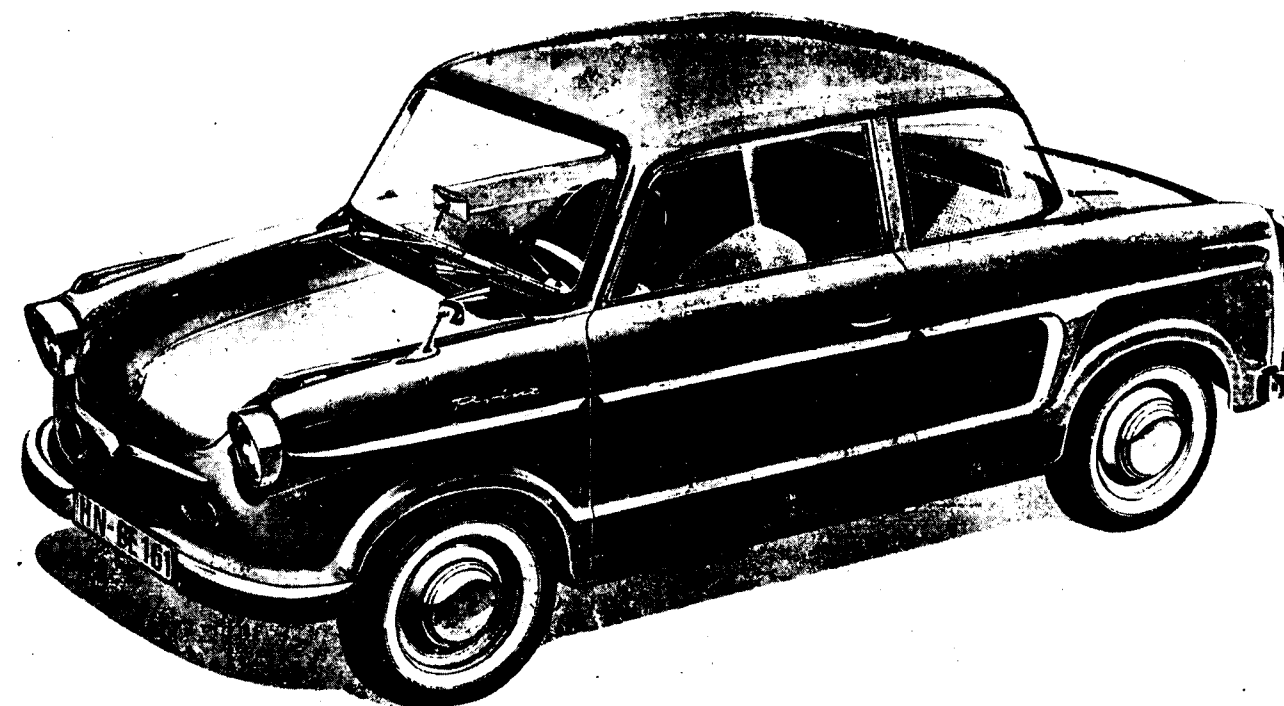
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BOMBAY 4

The "Battle of the Babies" Begins

In Europe



The NSU Prince which is now available in two models. The low price of the Prince plus its economic fuel consumption make this car a truly attractive proposition, alas not for the Indian Motorist

New Cars at Frankfurt, Paris and London Auto Shows

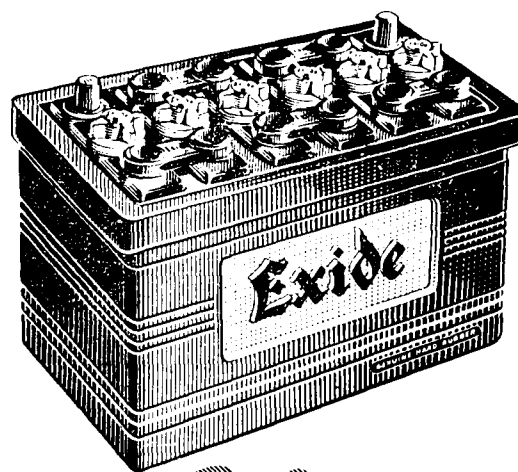
(FROM GORDON WILKINS our Special Correspondent)

"Battle of the Babies" Draws New Italian, German and French Contestants—G.M. Subsidiaries Launch New Six-Cylinder Vauxhall and New Four-Cylinder Opel—New German Ford, and Modifications to British Fords—Alfa Giulietta Sports Sedan—Bristol with Bigger Engine and Disc Brakes.

The "Battle of the Babies" has been making the big news at the first two big auto shows of the European autumn season, Frankfurt and Paris. European living standards are rising fast, but auto taxes and fuel costs are high, and something more thrifty than the conventional automobile was needed to bring the pleasures of travel on four wheels within reach of the millions who use bicycles, scooters and motor cycles. Countless

attempts have been made since the war to provide this vital link in the personal transport chain, but most failed through lack of finance, lack of popular appeal, or sheer bad design. The scooter boom is past its peak, the three-wheeled compromise, a sort of scooter with enclosed bodywork has failed to win wide acceptance, and now big industrialists with ample production resources are moving in to put over a new series of

THIS IS 3 TIMES BETTER



NOT ONLY Exide plates with CB 95 alloy grids so long-lived that they needed a longer-lasting separator.

NOT ONLY Porvic microporous plastic separators, virtually everlasting in battery service.

BUT ALSO a container built of Hard Rubber—tough and shock-resistant to outlast Exide plates living their full life insulated by Porvic separators.

Recent discoveries, fully utilised for improvement in the Silver Exide, raise performance and length of life to a new peak.

Still keeps going
when the rest have
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At no
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Silver Exide

A CHLORIDE & EXIDE PRODUCT

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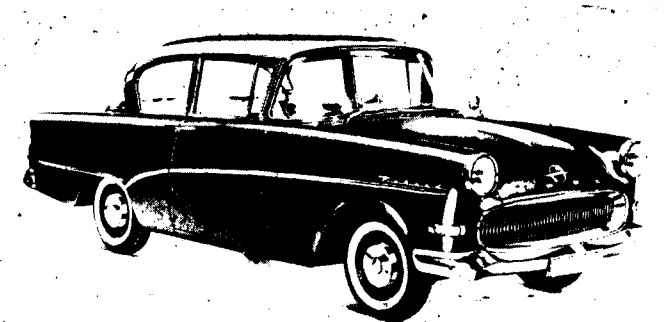
miniature cars which are well engineered, fully developed and keenly priced. Carl Borgward of Bremen, who had proved the point by providing up his little Lloyd into Germany's third—biggest selling car, pays the penalty of success by attracting powerful competition from Italy comes the Fiat 500, from France the Vespa, and from Germany the Zundapp Janus, the B.M.W. 600, the N.S.U. and an improved Goggomobil.

Designs differ widely, but on some points, designers are unanimous. Engines are air-cooled by fans for cheapness, and because the warm air from the cylinders can be blown inside the car to provide a cheap heater. Springing is indepent all round, to keep down unsprung weight, and obtain a good ride with a very light car. Coil springs are the most popular choice, with telescopic dampers. Gearboxes are manual, sometimes without even synchromesh, but easy driving aids are coming on the tiniest cars. The cute little Goggomobil coupe has the Selectomat four-speed shift; a flick of a switch on the facia and a kick on the clutch pedal gives a swift, noiseless shift. The British-built Isetta, now being exported to Canada, has an electro-magnetic powder clutch worked by a contact in the gear lever; you just push the lever through from one position to another without touching any pedals, except that it helps if you accelerate the engine during downshifts. This is a development of the Eaton clutch developed in the U.S.A. Fine iron powder is trapped in a recess between the flywheel and the driven disc, and when an electro-magnetic field is created between the two, the iron coagulates, to join them up forming a smooth-acting foolproof automatic clutch. The same principle is being adapted in France by Jaeger in automatic clutches

The 1958 Simca Aronde



Annual 1957



Opel Rekord, the latest Opel model which is introduced in the European motor show

which will be optional on Peugeot and Panhard next year.

But getting back to the babies, there is no agreement yet on where to put the engine; but the rear position get most votes. Fiat, B.M.W., N.S.U. and Vespa have rear engines, Lloyd has front-engine and front-drive, while Zundapp carries the engine amidships.

Here a quick look at them each in more detail.

FIAT 500.—Built by one of Europe's biggest manufacturers at a great new plant just outside Turin, the 500 looks like a scaled down 600, with wheelbase reduced by 2½ in. and tract about an inch narrower, and it weighs about 105 lb. less. There are only two seats, but behind is a seat-shaped space for luggage, which could carry two toddlers on cushions. Engine is a vertical twin air-cooled four-stroke of 479 cc. with compression of 6.55 to 1 to permit use of low-grade fuels, and it gives 13 bhp at 4,000 rpm. Four-speed gearbox has no synchromesh, but gear shifting is easy, although double-clutching is needed to ensure absolutely quiet downshifts at all speeds. Suspension is like that of the Fiat 600, with transverse leaf spring at front, wishbones and coil springs at rear. Brakes are hydraulic self-adjusting and powerful. Side windows are fixed, with swinging, ventilating panels, and a folding roof is standard. Air from the engine cooling system, under thermostatic control, warms the interior. Maximum speed is about 55 mph and Fiat claim it will do 52 miles/U.S. gal.

VESPA, famous Italian scooter manufacturers, have launched the Vespa car, but are building it in France instead of Italy. This avoids direct competition with Fiat, and as the two cars are so very much alike, the competition would have been very keen. At first the Vespa will be sold in France, Belgium and Switzerland,

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and you will find.....Comfort and
Elegance because this car is trimmed with Genuine

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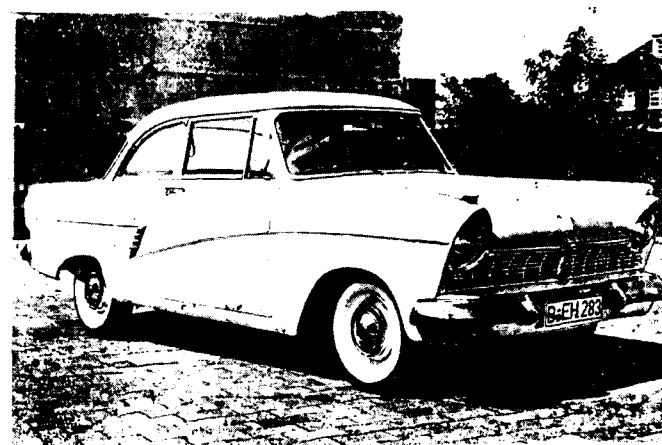
- ★ Matching Modern Design
- ★ Enriching with Colour and Comfort
- ★ Possessing qualities which only
real leather can give

THE CHOICE OF MEN OF DISTINCTION

Raj Bhavans, State Legislatures, Passenger Aircraft,
Board-Rooms, Deluxe Hotels, Public Transport,
Cinema Theatres, Houses of discriminating people
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**GORDON WOODROFFE LEATHER
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MADRAS I**

Factory and Tannery at PALLAVARAM



The De Luxe Taunus 17 m

but as Vespa have assembly plants or plants making scooters under licence in England, Germany, Spain, Belgium and Italy, it could be sold world-wide if it catches on. In size, shape, accommodation and performance it is very close to the Fiat. Main difference is the fact that the engine, of 393 c.c. is a two-stroke, lubricated by mixing 2 per cent of oil with gasoline. Gearbox has three speeds, with synchromesh on the top two. Maximum speed announced is 53-55 mph., and fuel consumption 48-50 miles/U.S. gal. Spare wheel lies under the passenger's seat and the battery is reached by taking off the dummy grille at the front. Suspension is by coil springs all round; with single wishbones at the rear, and with sliding pillars enclosing telescopic dampers at the front, resembling in some respects the suspension used on British Fords, except that the lower end of the pillar rides on a trailing arm with separate anti-roll bar, instead of a wishbone incorporating the anti-roll bar. Steering by rack and pinion, with an ingenious self-centering arrangement. Tyres 4.00-10; weight 795 lb.

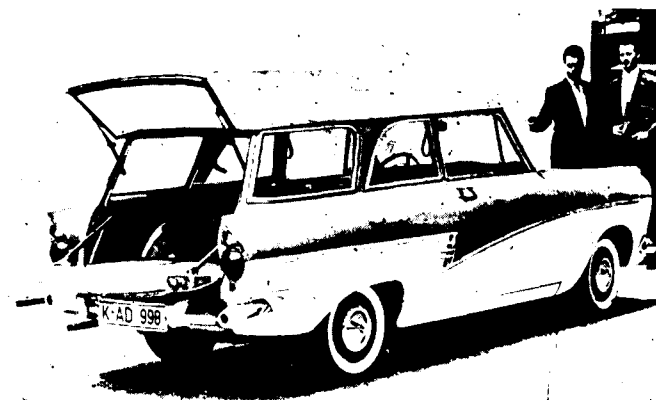
N.S.U. PRINCE—N.S.U. the motor cycle manufacturers of Neckarsulm, enter the car market with a small four-seater which is not pretty, but practical. (Not to be confused with N.S.U. of Heilbronn, who build the Fiat 600 and Fiat 1100 under licence, and who knows? may get into the act by building the Fiat 500). It has a two-door unit-construction body with twin-cylinder fan-cooled four-stroke engine mounted transversely at the rear, and a small luggage trunk at the front, where spare wheel and fuel tank are also carried. Engine has an overhead camshaft driven by eccentrics, like N.S.U. motor cycle units, and is de-rated to give 20 bhp at

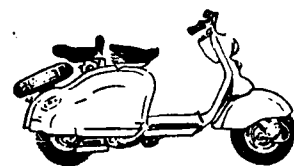
4,600 rpm from 583 cc. Car weighs 1,078 lb. and a maximum of 65 mph is claimed with quite lively acceleration. Engine could easily give more power, but German insurance premiums rise sharply for horsepower ratings over 20. Four-speed non-synchromesh gearbox is in unit with engine and differential. Front suspension is by double wishbones and coil springs and telescopic dampers with rack and pinion steering; rear springing is by very large tubular steel wishbones, pivoted near the car's centre line, with coil springs and dampers. Two separate front seats are easily removable for picnics, and there are two more seats at rear, though with limited knee and head room. Fuel consumption is said to be 51 miles/U.S. gal at steady 50 mph. Wheelbase 78½ in. Tyres 4.40-12.

B.M.W. 600—is a true four-wheeled four-seater, which will be built alongside existing two-seater Isetta. It has single Isetta-style front door, which opens bringing with it steering wheel and instrument panel for easy access to front seats, and a single door on right side allows entry to rear seats. Flat-twin fan-cooled engine of 585 cc is at rear, and like that of N.S.U. is de-rated to 20 bhp at 4,000 rpm for domestic insurance reasons, but could obviously give more for export. Compression is 6 : 5 : 1. Front suspension is Dubonnet, with trailing arms and coil springs, and rear is independent by single trailing wishbones with coil springs. Four-speed gearbox has synchromesh for all gears. Wheelbase 66.9 in. Tyres 5.20-10; maximum speed 62 mph. Fuel consumption 40-50 miles/U.S.

ZUNDAPP JANUS.—Oddest of all is the Zundapp Janus, with back-to-back seating for four, and a door at each end. It is made by a well-known scooter and

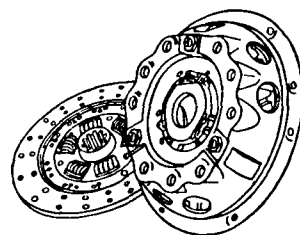
Ford Taunus, 17 m. station wagon



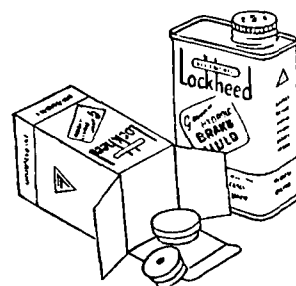
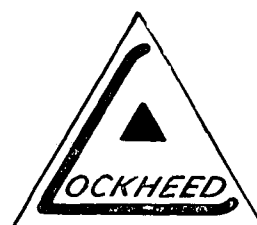


Lambretta

Motor Scooters & Light Trucks



Clutch Assemblies & Spares



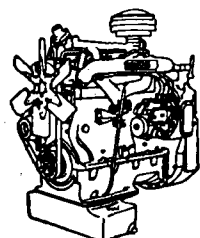
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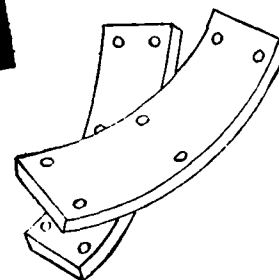
MEADOWS



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FRAP-S

motor cycle manufacturer, who like others saw the end of the boom days in his previous manufacturing lines and added a car to the range. The unusual layout is quite practical, and gives a light, rigid structure, but rear passengers may be dazzled by headlights of following cars. Engine is smaller than on the most of the others a single-cylinder fan-cooled two-stroke of 248 cc which lies on its side in the centre of the car, under the seats, sharing the space with fuel tank and spare wheel. However, it is said to produce 14 bhp at 5,000 rpm., sending this brisk little box humming along at 50 mph. Fuel consumption is quoted as 42 mpg at 35 mph. Suspension is by coil springs all round. Front wheels are carried on forward projecting swinging arms, which are joined by an anti-roll bar. Rear suspension is by swing axles, with radius arms. Transmission is through multi-plate clutch running in oil, and four-speed gearbox without synchromesh.

Among the larger cars, there's no question of seeing new models right across the board, or even extensive face lifts in all cases; European production economics are based on a five-year model cycle with intermediate changes which are minor by Detroit standards. Here's the picture as we went to press. General Motors German subsidiary Opel launched their new Olympia Rekord; roughly equivalent to Britain's Vauxhall Victor. Longer, wider and lower than before, the car has wrap-round windscreen and rear window, and comes in three versions, all with two doors; Olympia sedan, Olympia Rekord sedan de luxe and Car-a-Van station wagon. Four-cylinder ohv engine gives 52 hp S.A.E. from 1488 cc and transmission is three-speed with steering column shift. A neat idea is stowage of spare wheel inside contour of rear fender, where it causes minimum interference with luggage space.

Both style and mechanical design are in accord with American practice, but in announcing the new model Dr. Ing. E. H. Karl Stief, Engineering Director of Adam Opel A. G. said: "Mr. and Mrs. Everyman have not fallen victims to the speed craze. They want to motor economically, safely and dependably, comfortably and without exertion. Accordingly we have once more refrained from pushing up the horsepower rating." Truly the Atlantic is still a very wide ocean, even though General Motors has factories on both sides!

First shipment of 1,000 Opels was expected to reach U.S.A. late September.



Lloyd 600

TRENDS IN FRENCH CARS

Ford of Cologne, launched their biggest car to date, the Taunus 17-M, competitive with Britain's Ford Consul. There are normal and de luxe sedans with two and four doors, and a well-planned station wagon. Unit body-chassis, of course, and the famous Macpherson sliding pillar front suspension, with the high roll centre, which already confers such outstanding road holding on the British Fords. Interiors are in bright modern style, and a new touch in use of control buttons semi-recessed in a sloping surface of facia, like press buttons on a radio or tape recorder. Engine is four-cylinder 1680 cc 76.6 x 84 mm. with 7.1:1 compression, giving 60 bhp. installed (about 65 gross). For transmission, there is choice of three-speed box with steering column shift and all gears synchronised, or four-speed box with top three synchronised. Borg Warner over-drive, and an automatic clutch are optional Wheelbase 102½ in. Length, 172½ in. Weight 2,250 lb. Tyres 5.90-13 Electric system 6-volt. Maximum speed 78 mph.

Established French manufacturers were making few changes; but Renault had a new semi-automatic transmission of their own design for the Fregate. It consisted of a three-element torque converter, Ferlec electrically controlled clutch, and three-speed gearbox. Control lever on steering column has six positions; VR (Town and Country) M (Mountains), E (Emergency), plus Reverse, Neutral and Park. Moving lever automatically frees clutch and allows change of range to be



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India Motor Parts & Accessories Private Ltd.

1/155, MOUNT ROAD, MADRAS-2

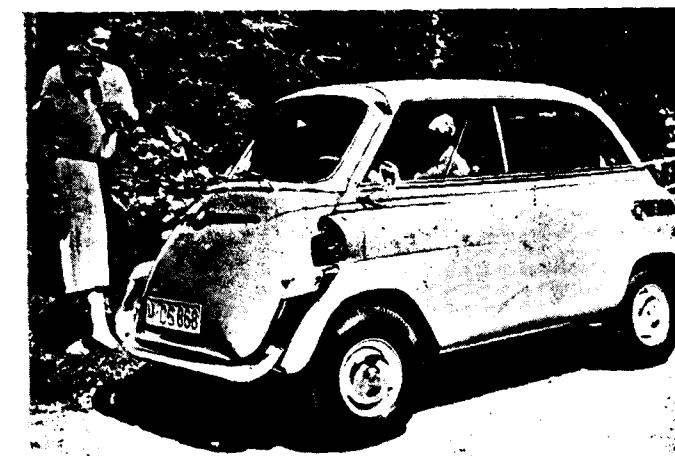
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made by shifting gears in manual gear box, eliminating the costly planetary gear sets, clutches and hydraulic controls on American systems. There is no auto-changing between one range and another, but the system gives two-pedal control, and is a simple step towards full automation. Engine compression ratio is up to 7.5:1, giving 80 bhp. SAE. Renault Dauphine has more comfortable front seats; Dauphine and 750 have more flexible suspension giving a softer ride. Plastic head lining now standard on Dauphine and full disc wheels, which permit use of tubeless tyres.

Panhard's Dyna grew a ducted cooling fan on its air-cooled flat twin engine and took warm air from the cylinders to heat the interior. Simca this year achieved a remarkable feat with an Aronde sedan which ran at Montlhery track night and day for over five weeks totalling 900 hours, during which it set up a new world record, regardless of class or vehicle type for 100,000 km. (62,000 miles) at an average of over 70 m.p.h. Experience of this marathon run has resulted in production of the Montlhery sedan, externally similar to previous Arondes, except for different wheel discs, but fitted with the Flash Special 1,290 cc motor, giving 56 bhp at 5,200 rpm on a 7.8:1 compression, an advance of 9 hp over the stock engine. Reclining front seats are standard. Flash Special engine also goes in Plein Ciel sports coupe and Oceane convertible.

And from Italy, a similar development although at a higher price. T.I. (Turismo Internazionale) version of Alfa Giulietta sedan, with souped up engine; twin choke carburetter, and secondary float chamber for high speed cornering, with compression raised to 8:1 to produce 65 bhp from 1,290 cc at 6,000 rpm.



B. M. W. 600



Zundapp Janus has seats for four back to back



A mobile workshop built by Messrs Simpson & Co. Ltd., for the Government of India, Small Industries Service Institute

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HAM.57.8A



Yes, this is an art museum, but it is always on the move. Read story below

'MOBILES

TAKE ART, KNOWLEDGE, MEDICINE

TO PEOPLE

Years ago, when the automobile was founded, it was used mainly as a form of transport for carrying men and material—men in cars or buses and material in trucks and lorries. The automobile itself has advanced from year to year and today, the role of the automobile in many parts of the world is something different from what it used to be two or three decades ago. In the early part of the century, those who required education had to go to schools, those who needed medical aid had to visit clinics or dispensaries and those who wanted some recreation had to proceed all the way from their homes to a cinema, drama or circus and those who wanted refreshments outside their

homes had to reach the nearest restaurant. In enabling all these forms of travel, the automobile gradually played an increasing part so that people can reach destinations like the above by travelling in a bus or in a private car. But, it has to be remembered that all these years there were lots and lots of people, especially in the under-developed countries, who could not for various reasons, economic, physical or otherwise, avail themselves of any of the above-mentioned facilities. With the change of the times and with the expansion of democracy as it is today, the task of people supplying these facilities has increased tremendously so that they cannot afford to neglect people who cannot

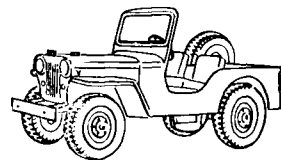
Annual 1957

MOTORINDIA

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the parched earth through the dry months...
water to drink...water to provide power.

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proceed to the nearest bookshop or a canteen or a
drama to enjoy the facilities offered in such shows.

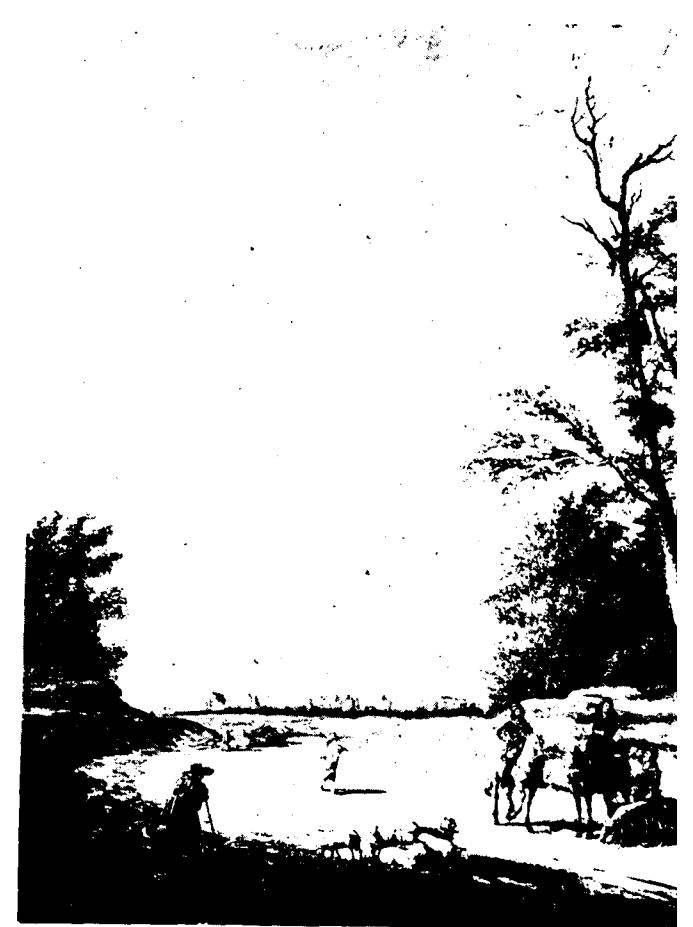
It is now realised that the duty of the State as well as
organisers of such facilities is to take education or
a cinema or other facilities to the people, however
remote their places of abode may be. In this task,
the modern automobile has got a part which no other
form of transport can play either now or at a later
date. The spirit of democracy has resulted in mobile
post-offices taking postal facilities to the people at
different areas, in mobile bookshops making available
books in the remotest corners of the country, mobile
canteens supplying refreshments at places far and near,
and so on. In fact, the multifarious uses to which
the automobile has been put to today can best be
imagined if one looks into the strides made by coach
builders of today in various countries including our
own. In Madras, as in other parts of India, thanks
to the excellent workmanship and expansion pro-
grammes of leading coach builders, we have mobile
cinema vans, taking the films to the villages or to
inaccessible places, we have canteens supplying at
the beach or at other temporary places of resort, we
have found recently that an enterprising circus firm
has thought best to build a special mobile van to carry
its elephants and other animals along the road.

The Art Mobile here stops for a show expands on all four
making a beautiful all-round covered verandah for people
to go through the exhibits. Picture shows Driver-Curator
of the Museum William Robert Gaines behind the counter
explaining to a visitor



Annual 1957

MOTORINDIA



This XVIIth century Dutch painting by Albert Cuyp depicting
horsemen halting on a road, is from the collection of Walter
P. Chrysler Junior, and forms part of the Art Mobile interior

In America, in England and in all other European
countries, the automobile has been given the maximum
utility in that it is used as mobile homes to overcome
housing accommodation.

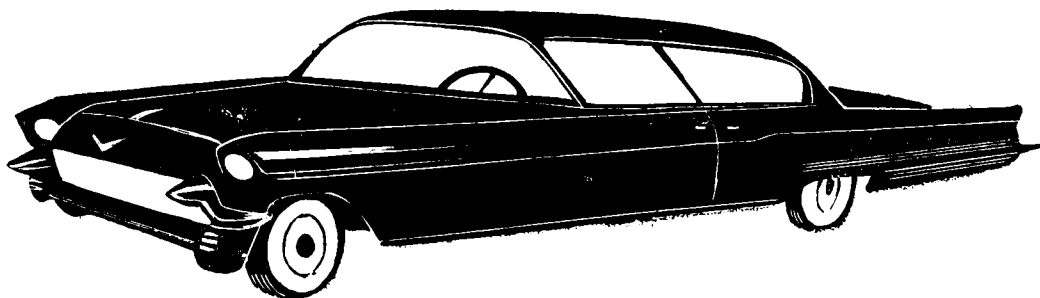
We give for the benefit of our readers some of the
interesting mobile vehicles and the interesting parts
they play in carrying knowledge, know-how or sights
and even art to remote places.

A very interesting development in recent years in
America is the artmobile. The Museum of Fine Arts in
Richmond, Virginia is taking the democratic princi-
ples seriously by literally bringing art to the people.
The Museum invented the ARTMOBILE, a trailer-
truck, pulled by a tractor. This artmobile, an ambulant
museum, can be placed on every square next to the
school, the churches and at the centre of the towns.
Its route comprises the whole state of Virginia and
includes even the smallest villages and settlements.

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1957

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Within a few minutes the museum can be opened for business. It is of great educational value for those people who cannot come to the headquarters building in Richmond. This Richmond Museum has arranged more than 70 travelling exhibitions, but could not send its finest works all over the country because of the obvious difficulties of shipping and handling by unexperienced hands.

The artmobile provides a practical solution. It is an all-aluminium trailer, measures 34 feet in length, 7 feet in width and 7 feet 10 inches in height. With its sides opened out and the information booth added to the back during display periods the vehicle measures 51 feet long by 22 feet wide. It is permanently air-conditioned with humidity control for the comfort of both, visitors and paintings. The fire protection provides an automatic extinguishing system that is harmless to the pictures. To prevent jarring while in transit, each picture is hung with four loose pin-hinges. Each painting is individually spot-lighted.

William Robert Gaines is the curator of this ambulant branch of the Richmond Museum. He is also his driver, who got special instruction for handling this voluminous trailer-truck. During visiting hours he not only polices the crowd but he gives lectures over a public address system, selects the musical records from the epoch of the exhibited works and sells catalogues, reproductions and other publications of the Museum.

The first ambulant show through the State of Virginia, was a selection of 16 Dutch masters from the Walter P. Chrysler collection. It contains works by Bosch, Breughl, Cuyp, Dow, Ostade, Terborch, etc.

Fifteen people can visit the automobile at the same time. Some morning hours are reserved for school groups, the afternoon for clubs and organizations and the rest of the time the museum is open for the general public.

The artmobile will spread art-education for deeper all over the country than the usual travelling exhibits, which until now were confined to the walls of big city museums. Thanks to the sponsorship of commerce and industry and thanks to its own initiative, the Virginia Museum of Fine Arts could realize the idea to bring the fine arts to the people of the far-off hinterland.

Another example of modern use for the automobile also comes from the United States. The Grand Union Company, a retail food chain which operates approximately 325 stores and super-markets in the United States and Canada recently put into service a "CLASSROOM ON WHEELS." The "Classroom," actually a mam-

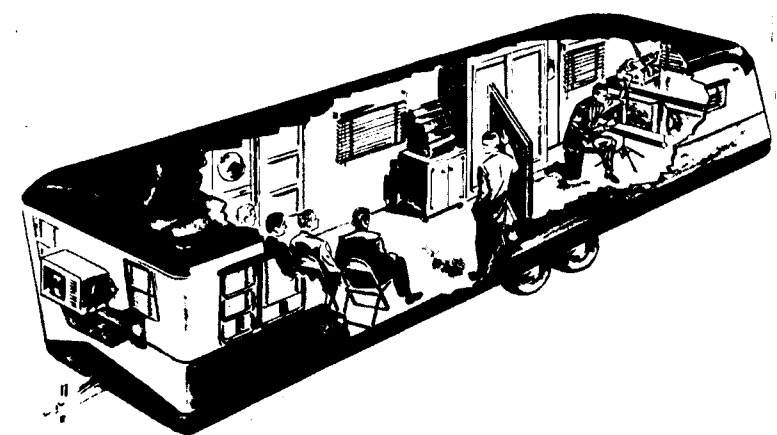


Classes in Book-keeping inside the "Class-room on wheels" shows, Instructor Robert using a chart

moth trailer completely fitted out with personnel training equipment, was designed by Grand Union for the purpose of extending its employee training programme.

The company is constantly seeking ways to improve its already extensive programme of personnel training.

Below is a cutaway drawing of "Classroom on Wheels" showing roomy, comfortable interior where training of personnel will take place in places far and near. When on the move, all equipment is stored away and secured and air conditioners at front provides comfortable temperature all round



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Grand Union's Personnel Department estimates that better than 2,000 company employees—more than one out of every four—received formal classroom training last year. Officials of the chain believe that this startling departure in personnel training—perhaps the forerunner of an industry trend—will now enable them to train many more employees than in the past.

The mission assigned to the "classroom on wheels" is that of travelling throughout the territory encompassed by the Grand Union Chain and training stores employees in the three main categories of Dairy, book-keeping, and checking. In addition, employees will receive thorough training in courtesy and good customer relations.

Lansing P. Shield, President of the Grand Union Company, predicts that the "Classroom" innovation will prove a boon both to employees and management.

The "Classroom" is believed to be the first trailer designed especially for a personnel training programme. A product of Stewart Coach Industries, it is 33 feet long and eight feet wide, with an interior height of seven feet. Birchwood panelling, fluorescent lighting, heat-

ing and air-conditioning make it a comfortable school-room for employees to learn the "Three R's" of the food business. The exterior is bright yellow, red and blue, and bears the legend : "Grand Union Classroom on Wheels—Personnel Training for Friendly Efficient Service."

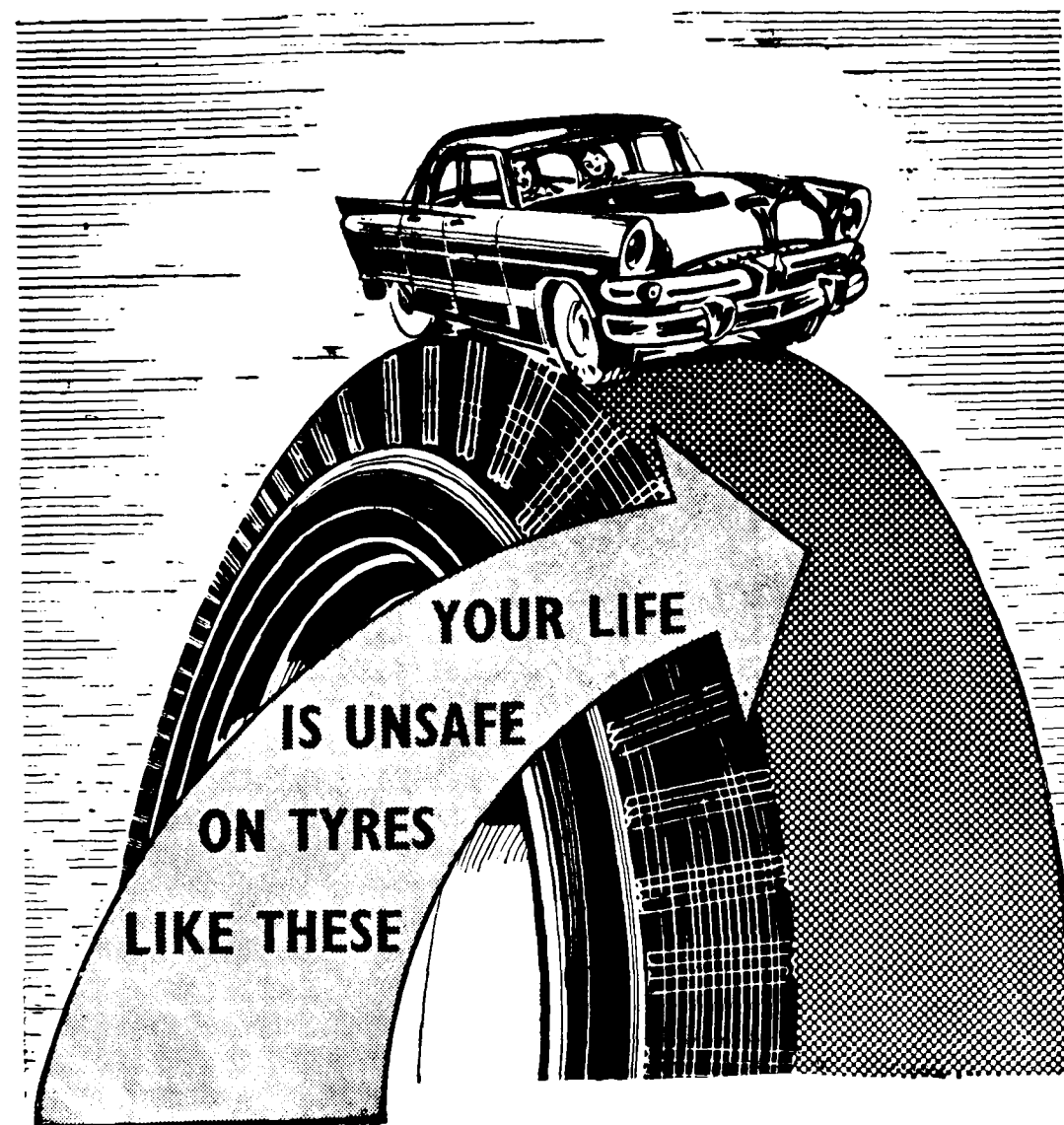
The trailer carries cash registers, blackboard, motion picture and slide film projection equipment, and all the tools necessary for training checkers, dairy personnel and book-keepers. Counters used in training checkers can be easily and quickly converted into desks for book-keeper training. Classes will range in size from four to ten persons.

A 1954 Chevrolet Sedan with special springs, heavy-duty transmission four-wheel trailer, hand brake, and attachment for the trailer's directional signals draws the "Classroom" on its route.

"Classroom" is being used (1) to train personnel for new stores and stores which have been enlarged, (2) to train new personnel for present stores, (3) to recruit new personnel, (4) for the retraining of personnel, and (5) as a mobile conference room.

The Classroom is a mammoth trailer fitted with equipment for training personnel in checking, book-keeping and dairy etc. The Chevrolet which draws the trailer has special springs, heavy-duty transmission, four-wheel trailer hand brake, and attachment for the trailer's directional signals





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The interior of a mobile library built recently by Messrs. Simpson & Co. Ltd. and now in operation in the roads of South India

HERE, IN INDIA

Though our country is far behind American standards in our economy and our all-round progress, yet it is gratifying to note that thanks to the enterprise of

Among the many Mobiles, which Messrs. Simpson & Co. Ltd. have been building for various clients without much fanfare and publicity is a mobile dispensary which take medicine, relief and succour to people in far off villages in India. Picture below shows the latest fittings in the inside of the dispensary



Annual 1957

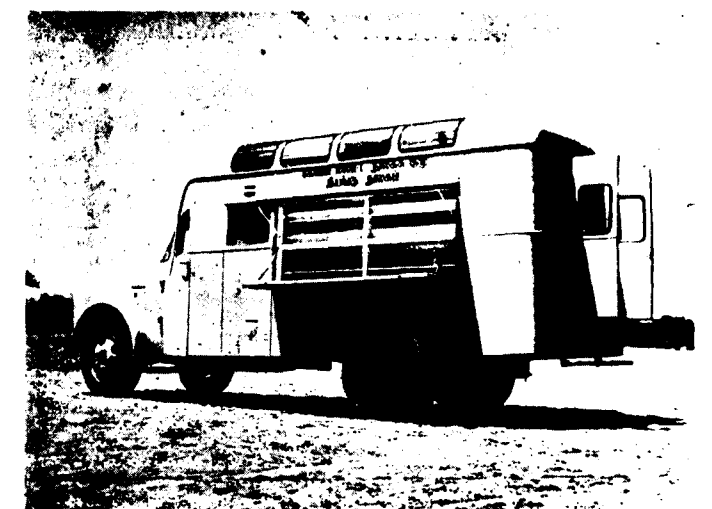


Here is how Simpson-built mobile workshop looks like with the sides up. These runners of knowledge take industrial know-how and facility to the remotest parts of South India.

leading coach builders, we too can boast of vehicles constructed with a view to carrying many things to the villages and to remote parts.

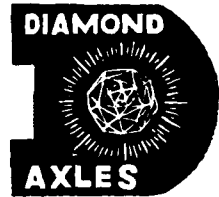
Messrs. Simpson & Co., whose Coach Building Department have been moving with the times for over a hundred years now has recently constructed a mobile library which is common sight today on the roads of Coimbatore. They have also constructed a mobile workshop which is used by the Industries Department for serving the small industries of the State. Another interesting construction of automobile body is the mobile dispensary which has all the facilities of a modern miniature hospital and which is doing the rounds in various districts in the State. We are sure many other coach builders in different parts of this country also are moving with the times building such useful vehicles which not only carry men and material, but also knowledge, recreation, and relief to the masses at large.

Another Simpson-built mobile library on the roads of Coimbatore



MOTORINDIA

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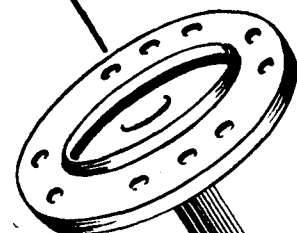


When competition is at its toughest, the driver's confidence in his machine and fittings is much more effective than trusting to luck. That is why the leading operators of today refuse to take chance and insist on DIAMOND AXLES

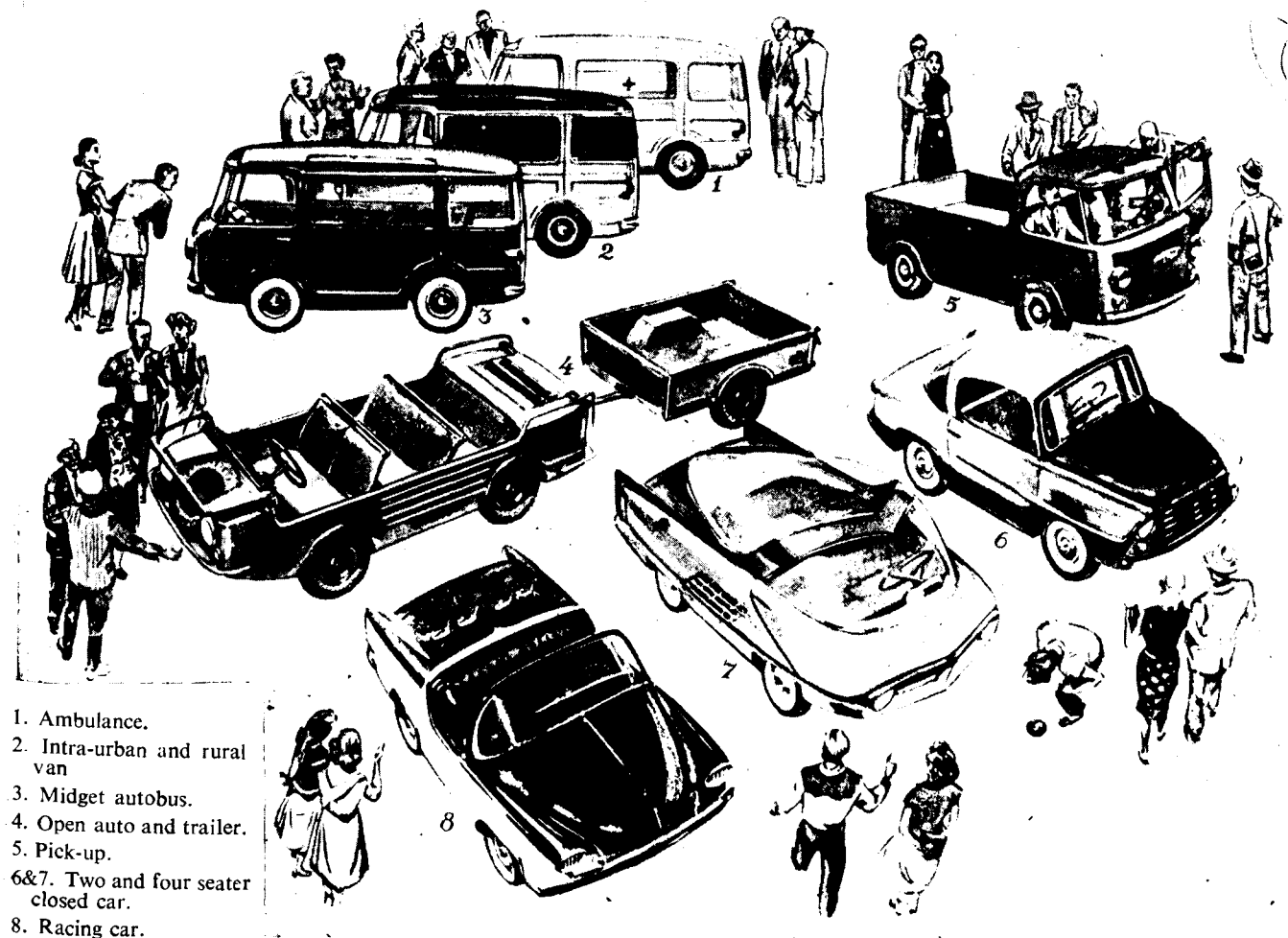
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- ★ ACCURATE WORKMANSHIP
- ★ EASY INSTALLATION.



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Micro—Piston Displacement Cars



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2. Intra-urban and rural van.
3. Midget autobus.
4. Open auto and trailer.
5. Pick-up.
- 6&7. Two and four seater closed car.
8. Racing car.

What should the Midget Car be like?

BY Engineer U. DOLMATOVSKY

Soviet designers are giving their attention to the creation of "micro-piston-displacement" cars and have even thought out a facetious formula for them. It reads $5'' \times 5''$ which, deciphered, means: 5 seater, 500 kg. in weight, 500 cm³ engine capacity, 5 liters of fuel per 100 km. of road, 500 km. of road on full fuel tank. Of course, these five's should be regarded as rough targets, but the designers are out to reach them.

At first glance such a machine would seem beyond realization. At any rate some new constructional approaches are required in order to create it.

One of the promising approaches is the unusual car type known as the "coach" which ensures relatively small overall body dimensions coupled with sufficient capacity, and good stream lining, maneuverability and visibility. Everything superfluous can and should be eliminated from the design and each assembly should be subjected to hypercritical analysis in line with the motto: "Diminish and lighten to the reasonable limit."

The coach arrangement is extensively employed in autobus design. The idea of it is this: the mechanisms,

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and, in the first place, the engine, are disposed within the confines of the body itself, *i.e.*, under the floor, under the seats, next to the driver, in the "tail" of the body, etc., whereas the driver's seat has been brought out to the very front end, and the passenger premises occupy practically the whole space of the car. As compared with the ordinary autobus, where the engine is mounted in front of the body, the autobus with a coach arrangement has smaller overall dimensions and weighs less while retaining exactly the same capacity ; besides, the driver has a good view of the road, the load can be evenly distributed between the wheels, and a shortened wheel base (the distance between the axles) ensures the machine maneuverability.

These are just the qualities that are needed in the micro-piston-displacement car.

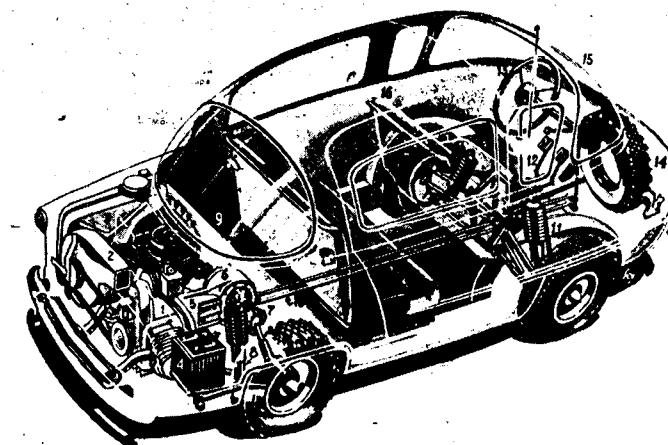
Calculations show that, with a coach arrangement, the midget car can be made a half a meter shorter than ordinarily, will weigh correspondingly less, and will require a less powerful and a lighter engine.

But, whereas the coach-arrangement problem is solved comparatively simply as far as the autobus is concerned, that can hardly be said for the passenger car, where serious difficulties are encountered.

PASSENGER CAR MUST BE LOW

The passenger car must be low. How, under these conditions, is the seat to be set up over the front axle ? How is convenient access to the seat to be insured, restricted not only from above by the roof of the body, but also from below by the wheel houses ? How is jolting on the front seat to be cut down ? The engine in a passenger car, especially one of the coach type, just cries out to be installed in the streamlined "tail" of the body, taken up today by a much too large luggage compartment. But an engine installed in the rear requires a special cooling system, special devices for controlling the mechanisms far removed from the driver. It is not an easy job either to create a body with a beautiful shape when there is such an unusual correlation of spaces.

The main obstacle to setting up a convenient front seat in an automobile of the coach type is the wheels. The wheels restrict the width of the seat cushions, make it hard to get in, cause jolting. They have to be made smaller. But here, new complications crop up : the difficulties of putting a brake in a small wheel, of getting the required load-carrying capacity out of small types,



The micro-piston-displacement car above shows :—1. Engine, 2. Cooling fan cowling, 3. Fuel tank, 4. Storage battery, 5. Gear box, 6. & 7. Universal joint, 8. Rear wheel suspension, 9. Luggage compartment, 10. Gear shift tension rod, 11. Front wheel suspension under driver's seat, 12. Brake and clutch pedals etc.

of providing sufficient clearance between the bottom of the body and the road.

Small wheels with low-pressure types are used the most frequently for micro-piston-displacement cars. The size of the wheel is cut down by curtailing the diameter of the rim and still leaving a comparatively thick tyre section. If the outside diameter of the wheel is not more than 540 mm., then, in getting into the car, it will not be necessary to step over the wheel house jutting into the car, for it will be on a level with the seat cushion or even somewhat lower. The comparatively big diameter of the tyre insures it the necessary load carrying capacity with half the inside pressure customary for the "big" cars in use. Low-pressure tyres absorb a considerable part of the vibrations caused by rough road and increase the ability of the car to negotiate sandy, boggy, snow and similar tough terrain.

Both the front and the rear wheels of the car are suspended independently from the body on springs and telescopic shock-absorbers. This contributes to smooth driving and increases the clearance between body and road notwithstanding the small wheel diameter.

At the same time the use of small wheels makes the car some 30 kg. lighter than the ordinary small piston-displacement cars now in use.

There are automobiles in which the doors are so inconveniently disposed that the factory instruction

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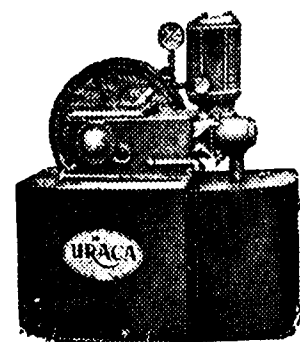
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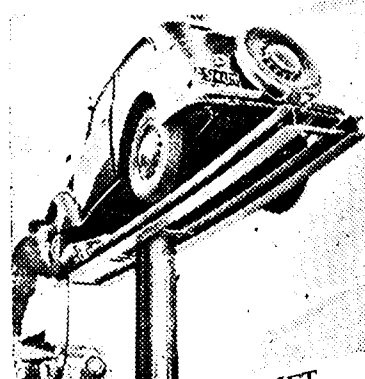
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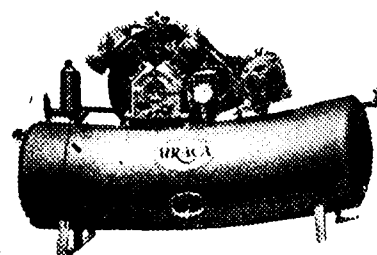
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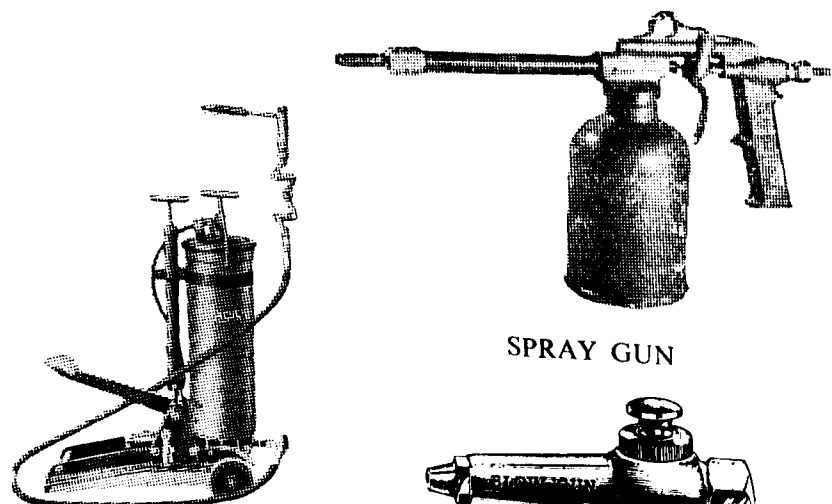
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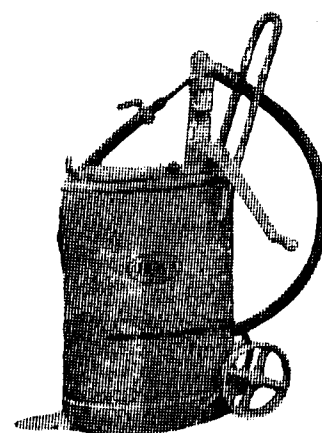
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devotes a special section to the procedure for getting in : if you were to try getting in "head first," say, you would run the risk of getting stuck in the doors ; it appears that you first have to sit down on the seat cushion without getting into the car, and only then pull in your head and feet. Until recently matters were even worse in this respect in the case of automobiles having a coach arrangement.

The problem of improving access to the front seat in "coach" cars has been tackled in several ways. On the Dubonet car, the door was placed up in front, and on the Izzetta this arrangement was supplemented with a steering column that swung out together with the door. However, a door like that is not quite convenient : it can't be opened when cars are closely parked at the curb. If the doors are placed at the sides, the doorway is not large enough even if they take in part of the roof. It is possible to solve the problem in another way. The door is done in the form of a lid that swings up forward around a horizontal axis along with the steering shaft ; the shaft is furnished with a universal joint. Upon swinging out the lid, one may sit down on the seat without stooping as though it were an armchair standing on the floor of a room. The lid door is counter-balanced by a spring.

That is how attempts are being made to solve a problem that may seem unimportant. But actually, upon the solution of two or three such problems depend the possibility of planning the automobile as a whole and the question of whether the "coach" passenger car is "to be or not to be."

The engine, clutch, gear box and final drive, fuel tank and storage battery are most often placed in back ; and the steering gear and spare wheel, in front.

As far as the engine goes, the most common construction embodies two cylinders, overhead valves and forced air cooling. The power of the engine in micro-piston-displacement cars ranges from 15 to 30 h.p.; and the engine capacity from 0.35 to 0.75 liters.

The clutch and the gear box are of the ordinary type. The power unit is in the block with the final drive of the rear axle and the power is transmitted to the wheels by rocking shafts, each having one or two universal joints.

Clutch control is by rod or hydraulic drive ; gear-box control is by hollow rods and a lever ; carburetor control

is by rod drive ; starter control is remote and by push button.

Breaks are hydraulic. Wheels are of the divided disc types.

Before this too there has been occasion more than once to pose the question : must a car, especially a small one, have four doors, four lowering windows, and many of the other innovations in body construction ?

Is there really such a great need for the left rear door, for example, with the doorway weakening the body frame and the re-enforcement of the door frame adding to the body weight ? This door, you know, is very rarely used and there is a recent ruling of the State Auto Inspection that prohibits it to be opened altogether on streets and highways so that passengers will not step out on to the traffic way. It is also rare that all four windows in the body are opened. It is asserted that the car must have a luggage compartment accessible from the outside, and a solid drop lid with heavy hinges and locks is made ; would it not be more correct to dispose the luggage compartment inside the body, but provide convenient access to it ?

In designing micro piston-displacement cars everything is eliminated from their construction that is not absolutely necessary for their normal operation, for the convenience of the driver and the passengers. However, it is necessary to reconsider even the body parts that are retained.

If the left rear door is done away with, the right one must be so placed that it will also be convenient for the passenger who occupies the left seat to get into the car. The passenger should not have to hunch up as he does when getting into the modern midget car. The doorway embraces part of the roof, and special drain gutters are placed around the upper rim to keep rain water from leaking into the body.

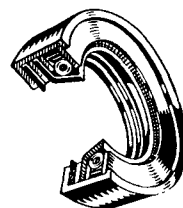
In the rear compartment, the window on the left is made to lower (the one in the door on the right being fixed), or, instead of lowering windows, ones that slide or turn open are used.

The luggage compartment is directly behind the back of the rear seat. By tilting the back of the seat forward, it is possible to load and unload it through the side door. The spare wheel and the tool kit are put out of the way in a compartment behind the front wall of the body. In this way the wheel serves as an additional bumper in case the car runs into another machine or some other obstacle.

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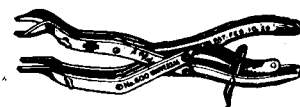


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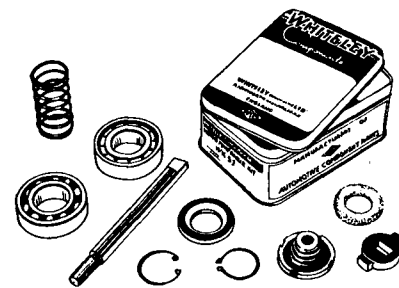
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In this way it is possible to eliminate in the small piston-displacement car the left rear doorway re-enforcements ; the hinges, locks, arresting device, and guide tenons of the left rear door, the guide grooves and the mechanism for raising the right window ; the drop lid of the luggage compartment with its lock, hinges and prop ; the metal parts of the upholstery ; the spare wheel carrier. What is more, the body does not become any the less inconvenient as a result, but acquires additional strength and "loses" a good 40 to 45 kg. in weight.

There is also another trend in designing, and that is to cut down the size, weight, capacity and cost of the car while retaining its usual scheme, namely disposing the seats within the confines of the wheel base. Here, if it is desirable to keep the weight of the car down to 500 kg., only a two-seater, or at the very best a three-seater body, can be obtained.

While inferior to the "coach" car as regards capacity, streamlining and visibility, the "reduced big car" has its strong point : it is still simpler in construction, and, accordingly, cheaper. A machine like that is of definite interest to those car users who are satisfied with a two-seater.

A variant of the two-seater automobile is the three-wheel motor buggy. But then, I'd say, this is no longer an automobile. The three-wheel buggy is relatively unstable, correspondingly slow-speed, and besides, drives with difficulty over bad roads, since it takes three ruts instead of two as in the four-wheel car. The three-wheelers do as yet have certain adherents, but they do not have broad prospects of development.

One of the most serious problems facing designers of midget car is to boost their ability to negotiate bad roads, since the vehicles are intended for service in rural localities as well. The thing is to get the car to negotiate such roads easily without adding to its weight or complicating its structure with such mechanisms as the distributor box and the front drive unit.

Tests of existing experimental models indicate that that problem is to a great extent being solved.

With a road clearance of some 200 mm. and a short wheel base, the midget car can take very steep knolls, and big overhang angles do not permit the front or rear bumpers to scrape the ground at the point of transition from horizontal to inclined stretches of road

and vice-versa. With a 20 to 25 h.p. engine, the light car can take steep hills. Some 200 kg. of the weight of the car falls to the share of each wheel, the specific pressure of the wheel on the ground not exceeding 1.5 kg. per sq. cm. If, notwithstanding this, the car should get struck, two persons can without any special effort push it out of the jam with their hands, and six persons can lift it off the road.

The midget car can, without reversing, make a complete turn within a space from seven to eight meters in diameter. Such maneuverability sometimes comes in very handy, when an obstacle can't be taken "head on," say, but may be by-passed by maneuvering between trees and bushes.

On good roads, micro-piston-displacement cars, with a load corresponding to four passengers, can develop a speed of up to 90 km. an hour, consuming no more than six liters of fuel per 100 km. on a highway. They are sufficiently stable and have a satisfactorily smooth motion.

Designers are tirelessly working to perfect the experimental midget cars : their goal is reliable and faultless operation, convenience and beauty of form of these little cars, which have a big future before them.

Six seater passenger car below possess a speed of 120 k.m. an hour



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Daimler Benz at Frankfurt Auto Show

Herewith we give you a summary of the new Daimler-Benz production program exhibited at the International Automobile Show in Frankfurt in September 1957

More value—At the same price

Is the "Leitmotiv" of this program which is marked by re-styled and more valuable interior appointments, an even higher acceleration and other new characteristics of all medium class models.

It comprises the following features:
TYPE 180—With 74 H.P. engine and overhead camshaft.

TYPE 300 AUTOMATIC—With new body, longer wheelbase—180 H.P. fuel injection engine and automatic gear-box.

HYDRAK—The hydro-automatic clutch—upon special request—for the 6-cylinder models 219 and 220 S.

Industrial vehicles :

O 317—City bus with high transport capacity, air suspension and 220 H.P. underfloor engine.

UNIMOGS—With longer wheelbase.

"More value—At the same price"

It is the motto of the passenger car program of the Daimler-Benz AG which was presented at the International Automobile Show of 1957 in Frankfurt. It comprises further improvements in the modern interior appointments, introduces new features for all medium-class models and offers the following innovations: Type 180 with an OHC 74 HP engine, a hydro-automatic Daimler-Benz clutch which can be mounted in the models 219 and 220 s upon special request, and the new hard-top model 300 with a 180 H.P. fuel injection engine and the well-proved automatic transmission.

The model 180 gets from the new engine with overhead camshaft considerably more spirited performance and a higher top speed.

With an output increase of 25% and improved interior appointments, it is offered at the same price as before. It is not difficult to predict that this car, of which more than 52,000 units have been built until now, will be even more successful in the future.

The popular models 180-D (with Diesel engines) and 190 also appear with improved interior appointments to which various innovations introduced in all Mercedes-Benz passenger car models must be added, such as the tiltable Mercedes-star on the hood, a new licence plate lighting at the rear, padded sun vizors and the different adjustment of the shock absorbers.

The novel hydro-automatic 'Hydrak' clutch developed by Daimler-Benz makes driving simpler and easier. The 'Hydrak' can be mounted upon special request in the 6-cylinder models 219 and 220 S. The driver can select at any time whichever gear he wishes, but he is relieved of the necessity to operate the clutch. The 'Hydrak' consists of a mechanical clutch which is automatically set in action and a hydraulic clutch which ensures uninterrupted smooth and jolt-free driving. It differs from other automatic clutches by its smoothness and—an essential point for safe driving on mountain roads the braking effect of the engine is retained when driving downhill. Since there is no clutch pedal, the driver has only to operate the gear-shift lever and controls his driving speed by using the gas and the brake pedal.

Thanks to further design improvements resulting in a higher torque, the models 219 and 220 s, already

well-known for their lively performance, have now got an even better acceleration. These models now also boast a larger assortment of interior appointments.

The 300 Automatic is being presented in a new version. With its new restyled body, a longer wheelbase and a window surface area increased by 30% this model is one of the most distinguished cars on the international market.

With the newly-developed, intermittent manifold-type fuel injection of the powerful 180 H.P. (S.A.E.) engine and the improved automatic transmission, the new version of the "300 Automatic" can be considered as a pioneer in the technical sphere. The design and roadholding ability of this aristocratic Mercedes-Benz car are both planned to satisfy even the most exacting requirements.

As far as the sports car production is concerned several details of the popular type 190 S.L. have been improved. Since the beginning of May also the series production of the 300 S.L. Roadster has started and is proceeding space, while delivery all over the world has begun.

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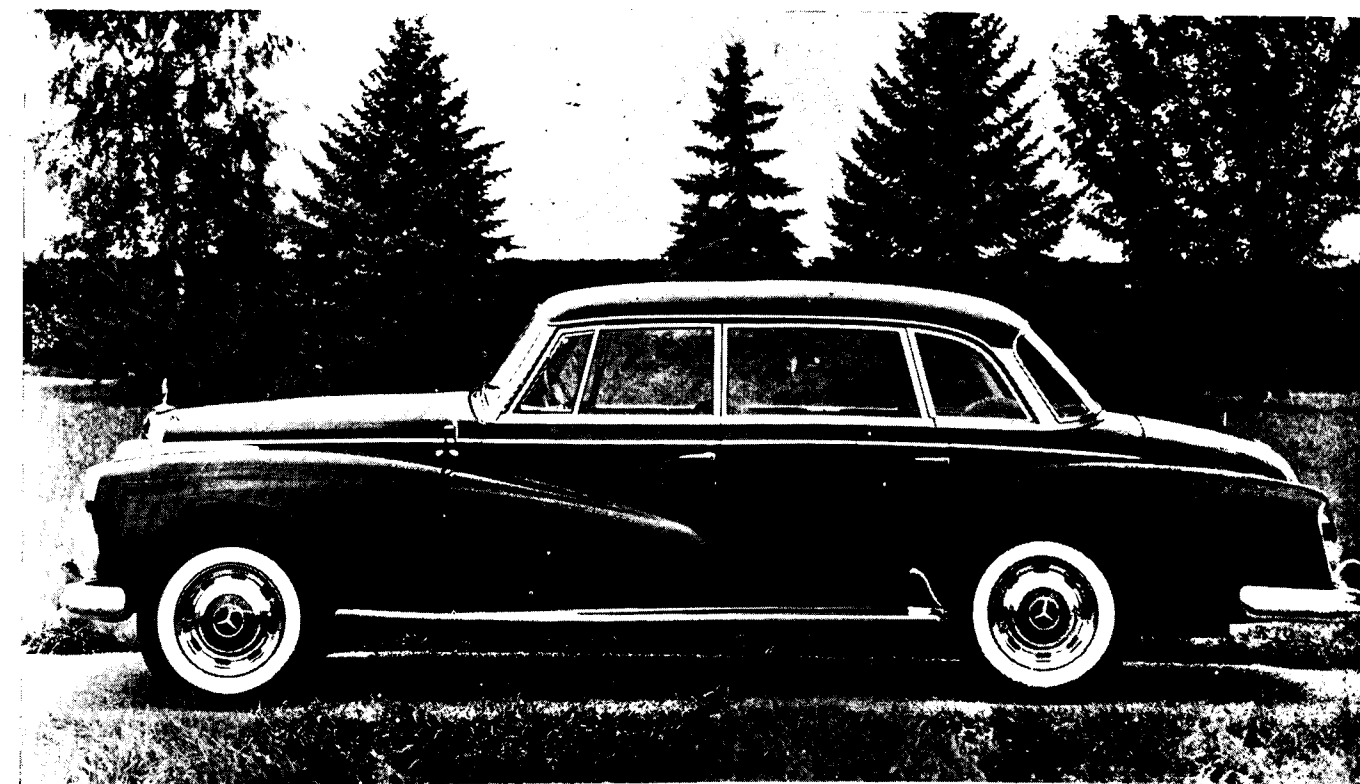
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Mercedes Benz 300 automatic with new body and 180 h.p. fuel injection engine

The New Mercedes—Benz "300 Automatic"

With 180 HP fuel injection engine and restyled body

The Type 300 Automatic, which tops the Daimler-Benz passenger car production program, appears with substantial improvements in a new version. It is characterised by a four-door body with large window surfaces and a longer wheel-base. From the mechanical point of view, it is equipped with an intermittent manifold-type fuel injection which raises the engine's output from 136 to 180 HP. This increased power together with some modifications in the automatic transmission improve the acceleration considerably. Upon special request, this model can also be supplied with a mechanical full-synchromesh four-gear transmission. With the fuel injection this largest passenger car

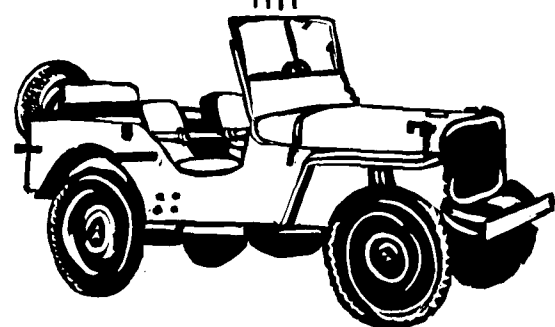
of the Mercedes-Benz program is thus once again pioneering a technical innovation. By its new exterior and interior styling it has become, also as far as the appearance is concerned, one of the most distinguished cars on the international market.

The new styling

The new body has strikingly elegant lines and a very light interior compartment, which has been enlarged by 5½". It gives the passengers an unobstructed view on all sides. The characteristic front with the familiar radiator grille, builtin fog lamps and new headlight ornamental rings enhance the traditional outlines. The central part with its

long window surfaces, four large windows which can be completely lowered and rear side panes which can be removed, gives this aristocratic Mercedes-Benz its modern appearance. The rear part with its wider window, larger trunk and conspicuous new tail lights, which combine the direction indicator, brake and clearance lights as well as the back-up lights, has also been restyled.

The softly upholstered seats with novel fabrics—or upon special request with leather—the car dome which has been trimmed with light plastic material, the front backrests which can be adjusted to form a real reclining seat, and the wide, foldable arm support at the rear, all these



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appointments give the interior compartment a note of modern comfort. The heating and ventilation designed for all conditions with two dual-speed defroster blowers, powerful two-speed windshield wipers, a combined control mechanism for the overtaking signal lights and the horn, a lockable glove compartment and padded sun visors, as well as locks at both front doors form part of the rich equipment.

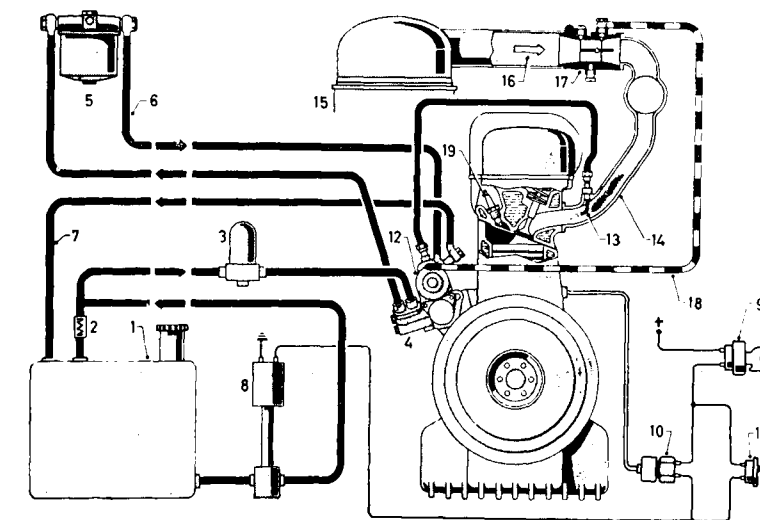
Various reinforcements have further increased the body rigidity of this sedan without central pillars.

Engine

The newly-developed, intermittent manifold-type fuel injection gives the well-proved 6-cylinder engine a 30% higher output and an increased torque which markedly affect the acceleration and hill-climbing ability of the new Type 300 Automatic. The fuel injection engine has a compression ratio of 8.55 : 1. A Bosch-pump with an ingenious governing system and a gasoline-plunger feed pump mounted to it, is used as injection pump. An additional electric fuel pump which is automatically controlled by the engine oil pressure, but which can also be operated by a switch on the instrument panel, ensures a satisfactory supply of fuel at all times and eliminates any vapor lock which may have formed. The fuel injection engine has furthermore an automatic starting aid. The numerous electric consumers of this car are fed from a 300 watt generator.

The new Type 300 Automatic has an automatic transmission as standard equipment. Modifications in the automatic mechanism have improved acceleration. When starting in the normal way, one still drives off in the 2nd speed, but when starting in "kickdown" position, the first speed is now automatically engaged; this speed can also be engaged at any time at speeds below 25 m.p.h. by bringing the pedal into "kickdown" position.

Moreover, the transmission is equipped with a new blocking device which automatically arrests the car when it comes to a standstill on a gradient and prevents it from rolling backward. To start driving again, it is merely necessary to step on the gas pedal.



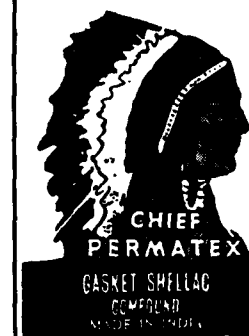
Above is the fuel injection drawing of type 300 Mercedes

The well-proved X-shaped oval type frame with auxiliary springing which can be brought into operation for heavier loads has been retained, although the wheel-base has been lengthened to 124". The chassis too with its independent front wheel suspension, trapezoid triangular wishbones and coil springs and the rear single-joint swing axle with low pivot point has remained unchanged. The rear axle ratio keeps to 4.67 : 1 except for deliveries to the U.S.A., where a 5.11 : 1 rear axle ratio will be used.

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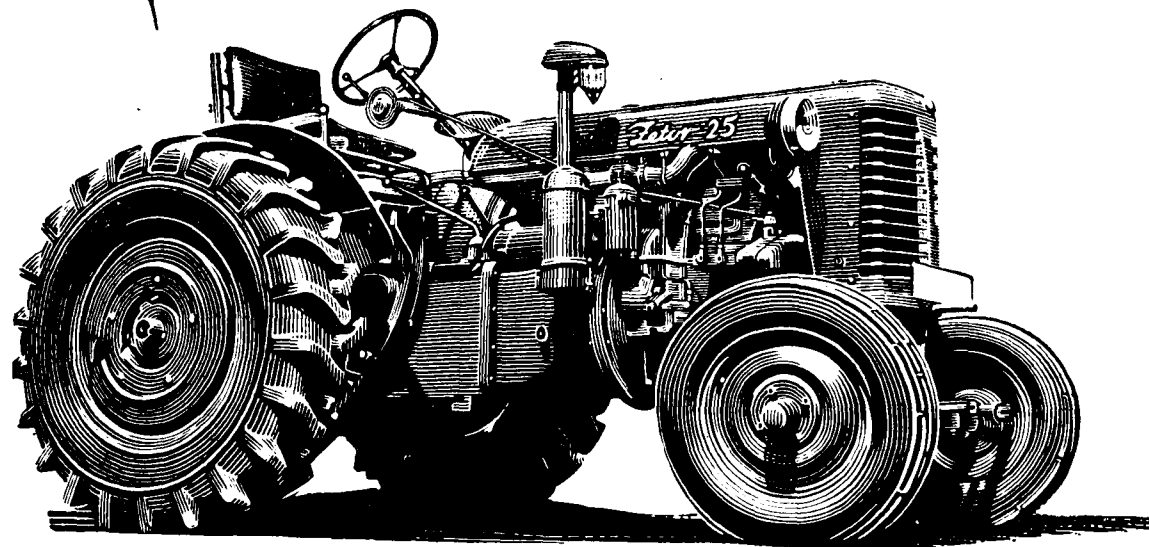


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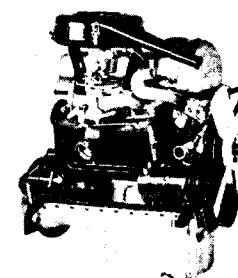


Above photo shows the latest Mercedes Benz 180 with 74 h.p. engine and overhead cam shaft

Reasonable in price, lively, spacious and elegant—all this are the advantages of the new Mercedes-Benz 180. The four-cylinder engine with overhead camshaft and 74 HP increases the car's performance by 25 per cent and gives it livelier driving properties. Improved acceleration and climbing ability provide greater safety in our ever growing traffic. The interior appointments were further refined and various items on the outside improved. With all these improvements, the price of the car has remained the same.

The four cylinder short stroke engine with overhead camshaft and Solex downdraft carburetor renders 74 HP (S.A.E.). The low compression ratio of 6, 8 : 1 permits the use of standard fuel. The slightly enlarged piston displacement, as well as the change from the side camshaft to the over-head camshaft engine with a higher r.p.m. range result—apart from increased output—

The 74 h.p. engine and cam shaft



Annual 1957

in a considerably improved acceleration and increased flexibility at the same fuel consumption as before. The top speeds in the gears could also be substantially increased. The units typical for Daimler-Benz which have been proved thousands of times will naturally be retained in the new Type 180, as for instance the controlled synchromesh Daimler-Benz four-speed transmission, the self-adjusting recirculating ball-type steering and the single joint swingaxle adopted from racing car design, just to mention a few of them.

New Equipment

The new two-tone door linings and the new, improved quality of the comfortable seats give the interior a modern and functional appearance. The 180 has also padded sun vizors. The solid connection between floor frame unit and all-steel body give the car extreme sturdiness providing maximum safety and generous space for passengers and luggage. The restyled outer features of this car include the tiltable Mercedes-Benz star, the new license plate lighting in the over-riders, the larger tail lights as well as a handy grip on the rear lid.

Due to its substantially increased liveliness, the Type 180, of which more than 52,000 units have been delivered up to now and which is the least expensive car of the whole Mercedes-Benz production range, will certainly win many new friends.

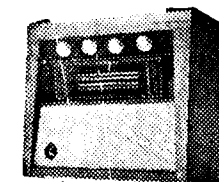
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Hydrak

The New Daimler-Benz Hydro-automatic clutch

Daimler-Benz has developed a new hydro-automatic clutch for its models 219 and 220 s—the Daimler-Benz Hydrak-clutch.

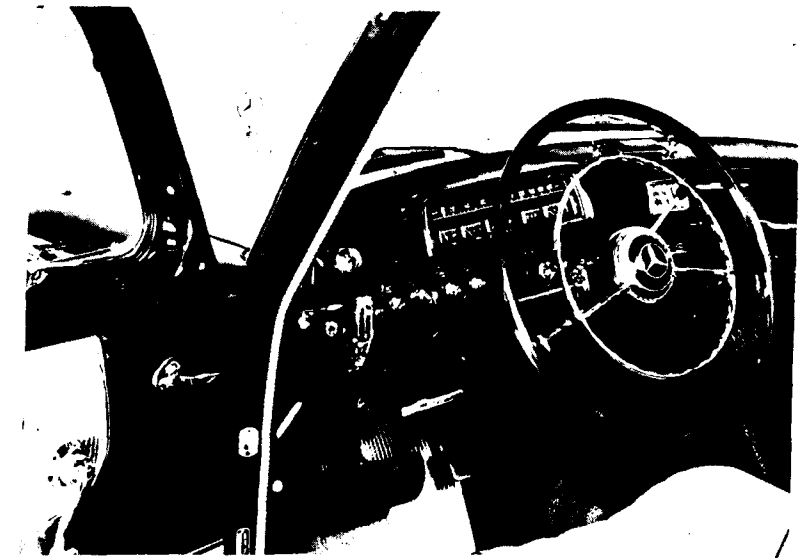
This new unit which is mounted upon special request provides much simpler operation. The driver need only operate the gear-shift lever and gas pedal, while the clutch-pedal is eliminated.

The Hydrak-clutch comprises a mechanical and a hydraulic part. The mechanical clutch is automatically disengaged by an electric contact when the gear-shift lever is touched. Thanks to its oil flow, the hydraulic system produces a smooth and spirited drive and on the other hand makes it possible to brake the car down even to a stop without having to touch the gear-shift lever. Thanks to this system the normal wear and tear of the clutch lining remains negligible.

With the Hydrak-clutch even the inexperienced driver and the technically less instructed lady can shift gears just as smartly as the sports enthusiast. On the other hand, the experienced motorist can at any time select the gear he wishes and thus retain his own personal style of driving.

The Mercedes-Benz Hydrak-clutch gives the following advantages :—

Getaways and gear-shifting even on mountain roads are always smooth and lively. More attention can be paid to the road, since it is possible to remain in second or third gear even in the densest city



NO CLUTCH PEDAL : The Mercedes Benz 220 S as well as the 219 can be equipped on request with the hydro-automatic clutch developed by Daimler Benz, seen in the photo above

traffic and only gas and brake pedal have to be operated. Thanks to the hydraulic clutch it is impossible to stall the engine when braking or stopping, e.g., in front of traffic lights. And when the light turns "green" the driver has only to accelerate without touching the gear-shift lever.

On level ground, starting in second gear presents no problems whatsoever. When the gear is engaged, it is sufficient to step on the gas pedal to get the car off without any jolts. The next gears can be selected by operating the gear-shift lever in accordance with the speed required. Starting to drive upward on a hill (a nightmare for all beginners) is simplicity itself with the Hydrak-clutch. In that case, the first gear is used.

Thanks to the freewheel device it is possible to brake with the engine when driving downhill and furthermore to block the car with a gear when it is stationed on a gradient.

Acceleration and top speed are not reduced by the hydro-automatic clutch.

Design and mode of operation

The Daimler-Benz clutch 'Hydrak' consists of—

a hydraulic clutch with freewheel unit ;

a single-plate dry clutch and

a booster unit to actuate the mechanical clutch and furthermore ;

a control mechanism for the automatic operation of the booster unit.

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MOTORINDIA

Annual 1957

55



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MADRAS 2

When the gear-shift lever, whose position and design remains unchanged, is touched, it releases an electric contact which opens a valve of the vacuum-operated booster unit. This connects the booster unit with a vacuum container or with the suction pipe, as the case may be. The differential pressure as compared with the atmospheric pressure disengages the clutch so quickly that the gear can be engaged with the usual speed.

After the gear-shift lever is released, the vacuum side of the booster unit is vented by atmospheric pressure and thus together with the help of its pressure springs the clutch is engaged again.

In order to ensure a jolt-free start at any time, the hydraulic clutch which is in constant rotation is mounted between the mechanical

clutch and the engine crankshaft. The slip which is characteristic of hydraulic clutches at low revolution speeds makes it possible for the engine to idle when a gear is engaged even when the car is at a stand-still. As the revolution speed rises, the slip is reduced and the car drives smoothly off. At high revolutions, the hydraulic clutch becomes practically a rigid connection.

The driving and the driven parts of the hydraulic clutch are bridged over by a freewheel unit which gets into action when the speed of the rear wheels is higher than the speed of the engine. Thus the freewheel unit guarantees a rigid connection of engine and power transmission when the car is pushed by the power of its own gravity. This means that when the car is travelling downhill, it is always possible, despite the hydraulic clutch, to brake with the engine through decelerating, which is not the case with some other automatic clutches. The freewheel unit also allows to block the car with a gear when it is stationed on a gradient and has the additional advantage of ensuring that an engine which is still cold in winter cannot "die off" when driving slowly.

A special control device governs the engaging of the mechanical clutch depending on whether the rear axle is in traction or pushed by the gravity of the car and makes up for any difference between the engine speed and that of the rear axle.

It is obvious that the Hydrak clutch offers definite advantages: simplified operation and increased driving comfort through smooth shifting which at the same time favours the durability of the car.

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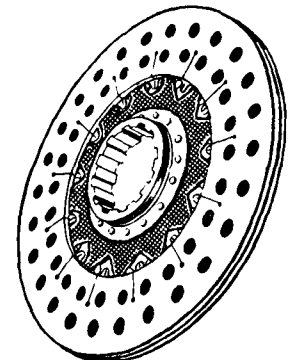
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The Mercedes-Benz Omnibus "O 317" with pneumatic suspension and underfloor engine

Daimler-Benz, the largest German bus manufacturers, have once again led the way in the building of this modern means of transportation. At the 1957 International Motor Show at Frankfurt the Mercedes-Benz "O 317," a bus with an under-floor engine and pneumatic suspension suitable for operating in city centres, will be exhibited for the first time.

The "O 317" is to be equipped with the OM 326 engine, which is, in principle, similar to the 220 HP six-cylinder Diesel engine, already well known in the long-distance truck "L 326." This powerful, underfloor engine gives the vehicle a remarkable power reserve at all times. In addition to the well known advantage that the whole of the vehicle's length is used for passenger space, it also has a most favourable structural layout which allows to carry out the most important repairs and service operations from the side and from the front.

The 13 yds. (12 m) long "O 317," apart from the advantages already mentioned, offers hydraulic steering as standard, three independently operating brakes and a fully synchronized transmission.

The Mercedes-Benz "O 317," the first German bus with air suspension, is equipped with rubber bellows with height compensation, two in front and four in the rear. Clear improvements in suspension qualities are attained by this pneumatic system and, in addition, the body, independently of the load carried, always keeps the same entering height, which is the reason why the height compensation has been built in. Differing loads are compensated by changing the air pressure in the bellows. When the bus is carrying

passengers the rubber bellows are compressed and the control valves immediately increase the pressure in the bellows compensating the load.

This new bus has a wheelbase of 19 ft. 2 $\frac{1}{8}$ ins. (front track 6 ft. 6 ins. rear track 5 ft. 11 ins.) and a length of 39 ft. 1 $\frac{1}{2}$ in. (front overhang 8 ft. 9 $\frac{1}{8}$ ins., rear overhang 14 ft. 1 $\frac{1}{2}$ in. The normal carrying capacity amount to 76 standing and 30 seated persons (permissible total weight 33,000 lbs.), while in rush hours a maximum of 120 persons, 90 standing and 30 seated, can be carried (maximum weight permissible 35,200 lbs.). In spite of its large capacity, the bus is very manoeuvrable, as may be seen from its relatively small turning circle of 23 yds. 2 ft. In order to speed up the flow of passengers and to facilitate entering, a rear platform, set one step lower, has been built on the city bus model. The light weight floor frame stiffened by transverse and longitudinal members is welded into a very stable and torsionally strong unit.

A single plate dry clutch and a Daimler-Benz four speed synchromesh or, upon request, a hydro-mechanical transmission are in block with the six-cylinder in-line engine. Mounted on the oblique shoulder rims are 11.00-20 eHD tyres. Special attention was paid to facilitate servicing when the arrangement of the engine and units was designed. In spite of the underfloor construction, this problem has been solved

in a very practical way. For example, oil dipstick, valves, injection nozzles, air and fuel filters are easily accessible for maintenance by opening laps on the right hand side of the vehicle. The engine cooling system, the heating system, the generator, the hydraulic pump and the air compressor have been arranged in the front of the vehicle. These units are driven by a propeller shaft linked to the crankshaft and leading forwards. On account of this displacement they are as easily accessible and to service and as conveniently arranged as with a forward mounted engine. The cooling blower is hydro-statically driven and its speed thermostatically controlled.

Three brakes, each working independently, guarantee maximum safety. A four wheel compressed air brake with a foot pedal valve is used as the service brake. The exhaust brake according to the Daimler-Benz system no longer needs to be separately actuated but is controlled by the first stage of the brake pedal valve. A governor ensures that the engine continues to run independently of the movement of the vehicle. For arresting the vehicle a ratchet brake operating on the rear wheels has been installed.

The speeds in each gear for the four speed synchronized transmission amount to 10 mph. in first, 17 mph. in second, 27 mph. in third and 43 mph. in top.

Climbing ability: 1 in 5.2 in first, 1 in 9 in second, 1 in 16.6 in third, and 1 in 28 in top.

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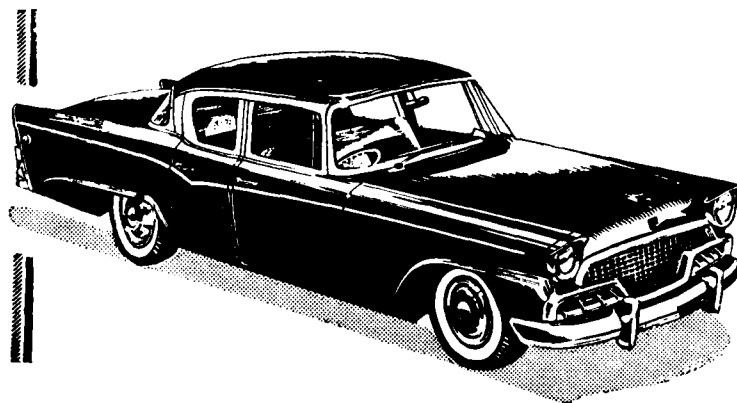
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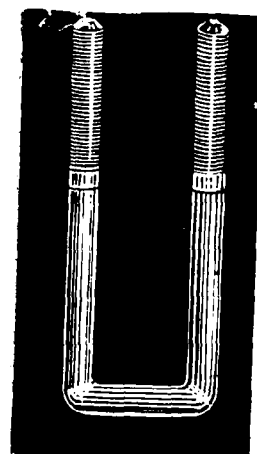
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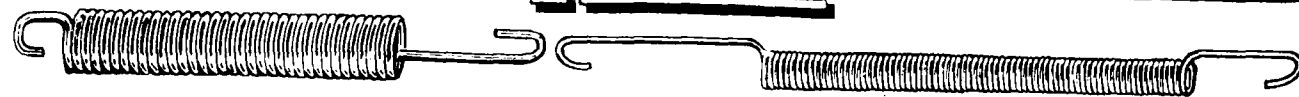
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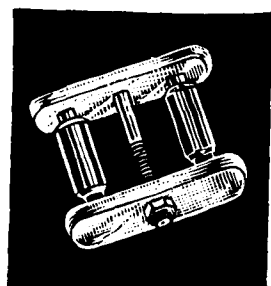
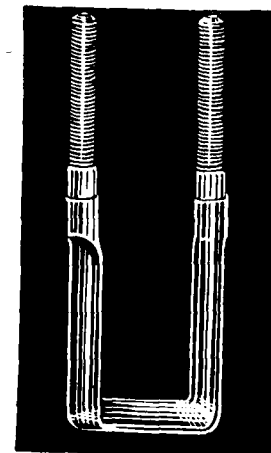
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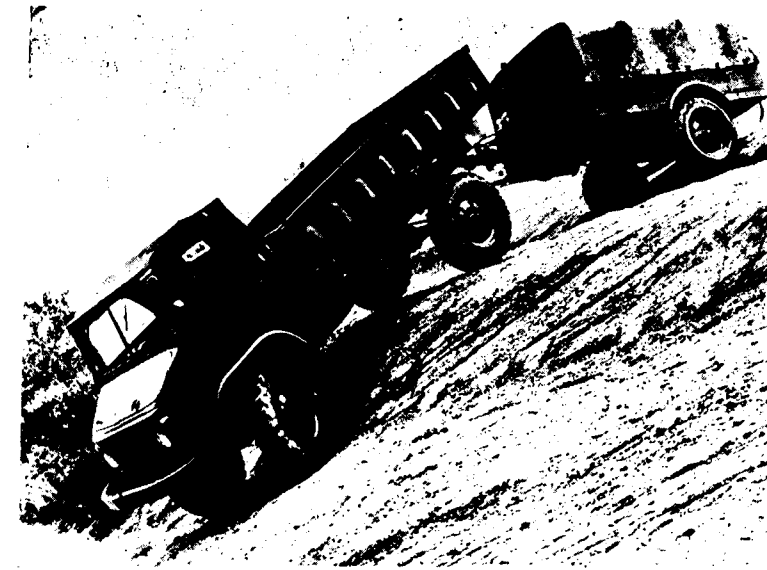
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Introducing the
UNIMOG "S"
with a longer
wheelbase

Until now, the UNIMOG "S" a vehicle which is ideally suited for cross-country operation and masters the most difficult assignments, was delivered with a short or long wheelbase. Interest has, however, increasingly been shown in the version with a long wheelbase. For this reason, the UNIMOG "S" with the 94 HP 6-cylinder gasoline engine will only be produced with a 114 3/16" wheelbase as from September 1957. The length of the loading platform amounts to 9' 9" in this design. The stability of the vehicle when driving up or down steep grades is even better than in the past. The manoeuvrability has remained practically unchanged in comparison with the previous short version with 106 5/16" wheelbase. The design of the chassis frame is even sturdier than in the past whilst its resistance to torsional strains has been effectively raised.

The chassis of this version, which has a large ground clearance, resembles as far as the most important components are concerned that of the well-proved Diesel-UNIMOG—which continues to be a great favourite for agriculture, municipal and transportation assignments of all kinds. Four-wheel drive, transmission, differential locks and portal axles are identical in both models and permit the use of many perfected UNIMOG components. Thus, apart from the rationalization of production methods, maintenance and the procurement of spare parts have been simplified.



Unimog-S with 2900 mm wheelbase

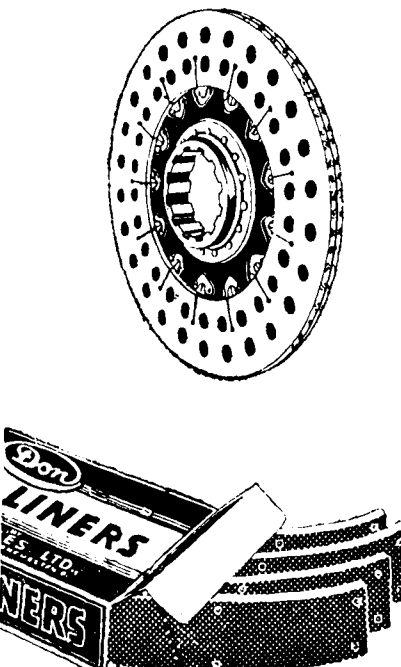
The cross-country ability of the UNIMOG "S" can be compared with that of a track-laying vehicle and even surpasses it in some respects. The traction and climbing ability of the vehicle even with a fully-loaded platform deserve special mention. The speed range extends from 60 m.p.h. right down to about 1 m.p.h.

The special design of the chassis accounts for its universally admired driving qualities on road and cross-country terrain. The vehicle is equipped with low-pressure tires which in conjunction with portal axles and differential locks make it possible to drive over what would otherwise be impassable terrain. The turning radius is small. By the cab-over-engine design the length of the vehicle is much better exploited than with the conventional arrangement.

Driving is easy thanks to the excellent view of the road ahead, comfortable seats, a modern recirculating ball-type steering system with steering shock absorbers, a fully-synchronized 6-gear transmission and reliable brakes.

The flexible Mercedes-Benz 2.200 c.c. Otto engine endows the vehicle with robust strength in addition to rendering an excellent performance. This means that it can also be used as a tractor and prime mover. Implements are driven by the engine through the front or rear power take-off shaft. Instead of the platform special bodies and units of all types can also be mounted on the sturdy frame.

Thanks to its driving qualities, its cross-country manoeuvrability, and its tractive power, the vehicle is eminently suited for the transportation of persons and material over impassable country. It can be used for an extremely wide range of operations as an emergency, rescue, and fire-fighting vehicle (on building sites, in mountains and in the desert, in the jungle, in snow-covered areas, etc.), and as a first-aid vehicle. When units such as compressors, pumps, generator sets, road-building and snow-clearing implements have to be operated, the UNIMOG "S" is as indispensable as in its capacity of tractor for road and trackless country.



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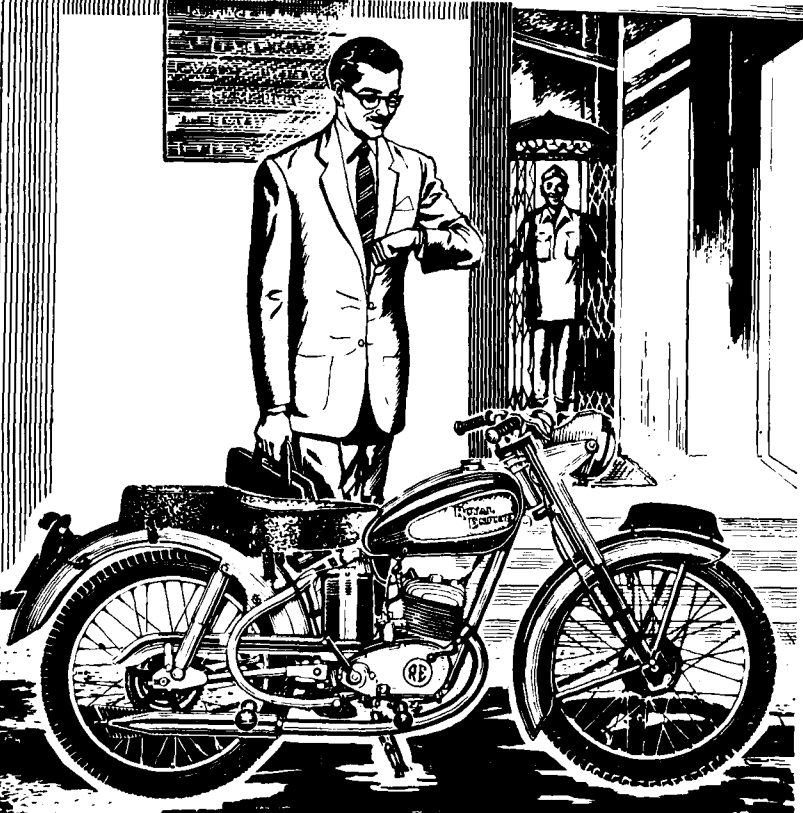


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THE 1957 HILLMANS

New Range of colours for the Husky

The stylish new Hillman Minx Saloon and Convertible are being shown at this year's Paris and London Motor Shows for the first time.

Since it was first introduced earlier this year the latest Hillman Minx has proved one of the most outstanding of Britain's light cars.

Now in full production, it is already a leading contender in overseas markets as a result of its economy, performance, finish and modern styling.

The Hillman Minx inherits the unbroken family car tradition stretching back through the years to 1932 and no other model has held the motoring spotlight in world markets for so long.

Of entirely new design, with a long low elegance of line, outstanding performance, sparkling acceleration, excellent economy and a top speed of more than 75 m.p.h. the Minx has been produced in three versions—the De Luxe Saloon, the Convertible and the Special Saloon—all of which have outstanding features in common.

They have been ingeniously designed to combine a more spacious interior and increased luggage space with a compact yet graceful appearance.

The short stroke 1390 cc. O.H.V. engine, which was first introduced two years ago has been developed to give a compression ratio of 8 : 1 and 51 b.h.p. at 4,600 r.p.m.

The improved power/weight ratio and torque weight ratio provides a satisfying reserve of power for rapid acceleration and effortless hill climbing.

Safety has been a leading factor in design. Particular attention has been paid to road holding, steering, extra braking power and better all round vision.

The superior road holding qualities are to a great extent due to the exceptionally efficient front suspension unit combined with the perfect balance of the new 'low-look' body which allows a low centre of gravity.

Greater torsional strength, another important safety factor, is provided by unitary construction of the body. Despite the particularly low centre of gravity, however, there has been no alteration in ground clearance.

Better visibility is provided by a wide curved windscreen and full width side windows and the large swept-round rear window, which allows a clear and unobstructed view in all directions. In addition, the driver has the advantage of a sloping bonnet giving clear frontal vision. Better braking is provided by the powerful hydraulic brakes of rally tested design, which have wide anti-fade linings and which allow the driver to pull up swiftly and safely from any speed.

The front suspension unit incorporates coil springs, telescopic shock

absorbers and an anti-roll bar. Both front and rear seats are cradled within the longer wheel base so that all the occupants of the car share the greater comfort of the smooth suspension.

The new steering unit, with its light and accurate control, not only helps to prevent fatigue at high cruising speeds but also allows the car to be parked quickly and manoeuvred easily in traffic.

The inside of the Minx offers a generous increase in space over previous models. The floor line has been recessed below the level of the body sills to give more head and leg room, and the full width rear seat also adds to passenger comfort.

The grouping of the instruments has been given particular consideration. The main instruments are conveniently placed on the central panel of the handsome facia where they can be seen at a glance by the driver. In addition, the warning lights—for flashing indicators, head lamp beam, oil and ignition—are immediately above the steering column, but they have been designed to prevent any glare at night.

Indeed, the complete control layout of the Minx has been carefully

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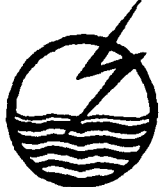
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studied. A full turn of the combined ignition-starter switch brings the engine to life, the finger-tip, synchromatic gear control on the steering column comes easily to hand.

Pendant type pedals have been fitted to eliminate floor draughts and assist in the dust proofing of the car and a new hydraulic clutch control allows smooth working by cushioning the clutch pedal against engine vibrations.

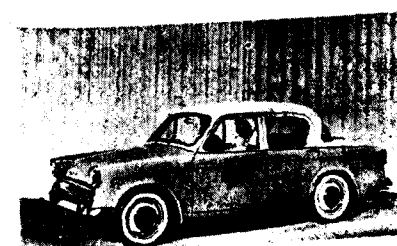
Both front doors can be locked independently inside and out to enable ease of parking. The luggage locker is exceptionally large and is both wider and deeper than on previous models. The spare wheel has been placed in an upright and easily accessible position.

A car of good looks deserves attractive colours, and a wide range of colour schemes has been created to show off the modern and graceful body styling to its full effect.

The MINX CONVERTIBLE has two wide opening doors and a three-way adjustment for the hood, which can be kept closed for saloon car comfort, fully opened to give the sports car look or folded half way in the smart and fashionable coupe-de-ville position. It is available in five single tone colours, each with a choice of different coloured hoods.

The MINX DE LUXE SALOON has a luxurious finish and is available in a range of five two-tone colour schemes and four single-tone

The Hillman Minx saloon



Annual 1957
9



The latest Hillman Minx convertible with 1390 c.c. o.h.v. engine

colours, all with harmonising interior trim.

The MINX SPECIAL SALOON follows the Rootes policy of providing an especially economically priced model which differs from the De Luxe version only in details of exterior and interior trim. All the equipment essential for passenger and driver comfort has been retained and the Special Saloon is now available in four single-tone colours.

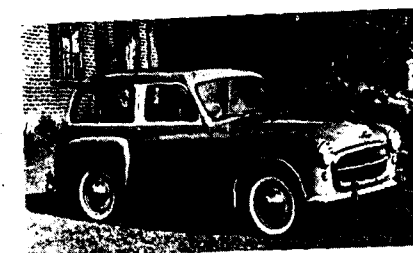
Provision is made on all the models for a wide range of equipment to be fitted as extras, including radio, heater, clock, ammeter, oil gauge, cigar lighter, whitewall tyres, over-riders and rimfinishers.

The all-purpose HILLMANMINX ESTATE CAR, which is powered by the latest engine, continues in its present form but the sturdy, dual-purpose Hillman Husky has been given a new range of colours for 1957.

The HUSKY, which is the only Hillman model to retain the well tried 1265 cc. side valve engine, famous for its reliability and excellent performance at low cost, has all the characteristics of the smart 4-seater saloon while providing extra carrying capacity which will appeal to a large variety of users.

It is an all purpose car—with the rear seat in position it carries four passengers and 250 pounds of luggage and with the rear seats folded it has an uninterrupted, covered platform for a 5 cwt. load.

The latest Hillman Husky



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The world's airspeed record of 1,132 m.p.h. was set up in March 1956 by the Fairey Delta 2 which was fitted with DUNLOP TYRES, WHEELS, BRAKES and 'MAXARET' anti-skid units.

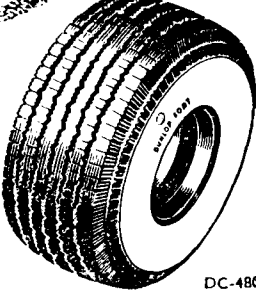


The world's landspeed record of 394 m.p.h.—still unbeaten—was set up by the late John Cobb driving his Napier-Railton Mobil Special fitted with DUNLOP TYRES and WHEELS.

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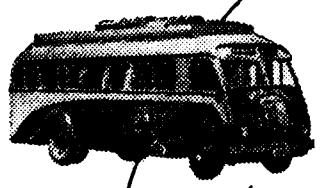




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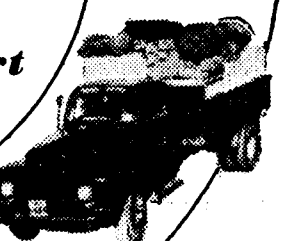


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1957 HUMBER MODELS

Lower Priced Humber Hawk Estate Car

Two of the 1957 Humber models are appearing at the Paris and Earls Court Motor Shows for the first time. They are the De Luxe Humber Hawk Saloon, and the Humber Super Snipe with full automatic transmission.

In addition, the Humber Hawk Saloon and Touring Limousine, the Humber Hawk Estate Car and the Humber Super Snipe Saloon and Touring Limousine will continue in production and will be available with or without overdrive.

Fully Automatic Humber Super Snipe

The fully automatic Humber Super Snipe, which is one of the lowest priced "no clutch, no gear lever" cars yet produced in Europe, gives the driver an entirely new conception of motoring and uses the world proven Borg-Warner type of automatic transmission which has successfully undergone rigorous testing both in Britain and abroad.

This new transmission, simplifies driving and so reduces fatigue; it gives smoother operation; a greater flexibility for the 4138 cc. 6-cylinder engine; an improved performance; increased safety, and still maintains petrol economy.

With no clutch pedal or change speed lever to operate, the driver has only to operate the brake and accelerator pedal.

Humber Hawk Estate Car

The brilliantly designed "two in one" Humber Hawk Estate Car is an elegant member of the distinguished Humber range which will carry six passengers in saloon car comfort, or, if need be, a full load of luggage and equipment of up to 7 feet in length.

It is now available at a new highly



The elegant Humber Hawk estate car

competitive price of £865 plus £433. 17s. 0d. purchase tax.

The four-door, all-steel body of the Hawk Estate Car gives very accessible entry and a cleverly, designed tail gate is notable for its easy loading features.

An up-to-date minute feature is the rear window which can be wound down into the tail gate if additional ventilation is required.

The exceptionally comfortable bench-type rear seat, which has room for three passengers, may be folded into the floor for extra loading space and this is an easy and rapid operation. Metal floor runners have been fitted to facilitate easy loading.

The outstanding 2,267c.c. Humber Hawk overhead valve engine provides ample power and enables the Estate Car to perform all its

requirements with efficiency and economy.

Humber Hawk Saloon, Touring Limousine and De Luxe Saloon

The Saloon and Touring Limousine have been steadily improved and are available in extremely attractive dual colour schemes which are both striking and distinctive.

The high performance and quality, at medium cost, of the Humber Hawk provides exceptional value in its class and appeals to a wide range of motorists as a full size family car of unusual distinction.

In "De Luxe" form, the Hawk Saloon offers motorists additional interior refinements which emphasise more than ever the marque's traditional qualities of comfort and elegance.

The additional features incorporate the fitting of Walnut veneered cappings and pleated leather rolls across the instrument facia and along the top of the door panels. The handsomely appointed interior has been further enhanced with a contrasting panel surrounded by a chrome stripe, on the lower half of each door and these blend tastefully with the upholstery and exterior paintwork.

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The Humber Super Snipe and Touring Limousine

To maintain the development of
the Super Snipe on progressive lines
and to keep it in the forefront of its
class, this distinctive model may
now be purchased with a highly
efficient overdrive unit and a most
attractive range of dual colour
schemes. Individual front seats are
also available, if required.

Combining, as it does, perfor-
mance with luxury and high cruising
speeds ideal for long distance
touring, with smoothness and com-
fort in traffic, the Super Snipe will
appeal to those who appreciate true
quality.

The Super Snipe Touring
Limousine, with its sliding partition,
has been designed for the motorist
who wishes to combine the advan-
tages of a chauffeur-driven car with
those of a luxurious owner-driven
saloon.



The latest 6-seater 90 m.p.h., Humber
Hawk

The New Humber Hawk

**Lower Lines, More Power—And
choice of Automatic Transmission**

An entirely new and more power-
ful Humber Hawk, with sleeker
lines and a top speed of 90 m.p.h.
is announced today by the Rootes
Group.

It has a single or dual-tone body
of completely new aero-dynamic
design, with wrap-round screens
at front and rear, giving the latest
six-seater luxury Hawk a contem-
porary air of graceful purpose.

It is available in standard form or
with either Laycock de Normanville
overdrive or Borg-Warner fully,
automatic transmission.

Standing only 5 ft. 1 in. high, the
new Hawk is 4 ins. lower than its
predecessor and, although slightly
narrower than the model it replaces,
it has more room inside and both
front and rear seats are 3½ ins.
wider.

The elegant bonnet conceals an
engine of greater power. The ther-
mal efficiency of the 2½ litre overhead
valve unit, which has proved so
successful since its introduction two
years ago, has been improved by
raising the compression ratio to
7.5:1. The addition of a new
Zenith carburettor has helped to
increase the output to 78 b.h.p.

maximum at 4,400 r.p.m. and,
120.25 lbs. ft. torque at 2,300 r.p.m.
This increase has made possible
the use of a higher rear axle ratio,
so raising the car's maximum speed
to 90 m.p.h. The cruising speed
has also been improved without
any sacrifice in performance through
the gears.

Greater engine smoothness has
been achieved by introducing a
vibration damper to the front end
of the crankshaft, removing any
tendency for rough running to
develop in certain critical speed
ranges.

All the seating positions are now
cradled within the wheelbase and
the new, perfectly balanced design
has helped to lower the centre of
gravity.

Excellent road holding qualities,
so essential from a safety point of
view, are a feature of the new model;
which hugs the road even on the
severest S-bends and over the
roughest terrain.

The independent front suspension
assembly employs coil springs and
swinging links, but efficiency has
been improved by fitting large
capacity telescopic shock absorbers
down the centre of the springs.

Advance design, too, is reflected
in the way in which rubber insu-
lation has been used in the body
construction. The Hawk's seven
league boots, in fact, have rubber-
cushioned soles. Transmission of
noise and vibration has been kept
to a minimum by the elimination
of metal-to-metal contact.

In designing the body, Rootes
Group engineers have drawn on
more than 15 years experience of
integrating body shells and chassis
frames into a single welded assembly

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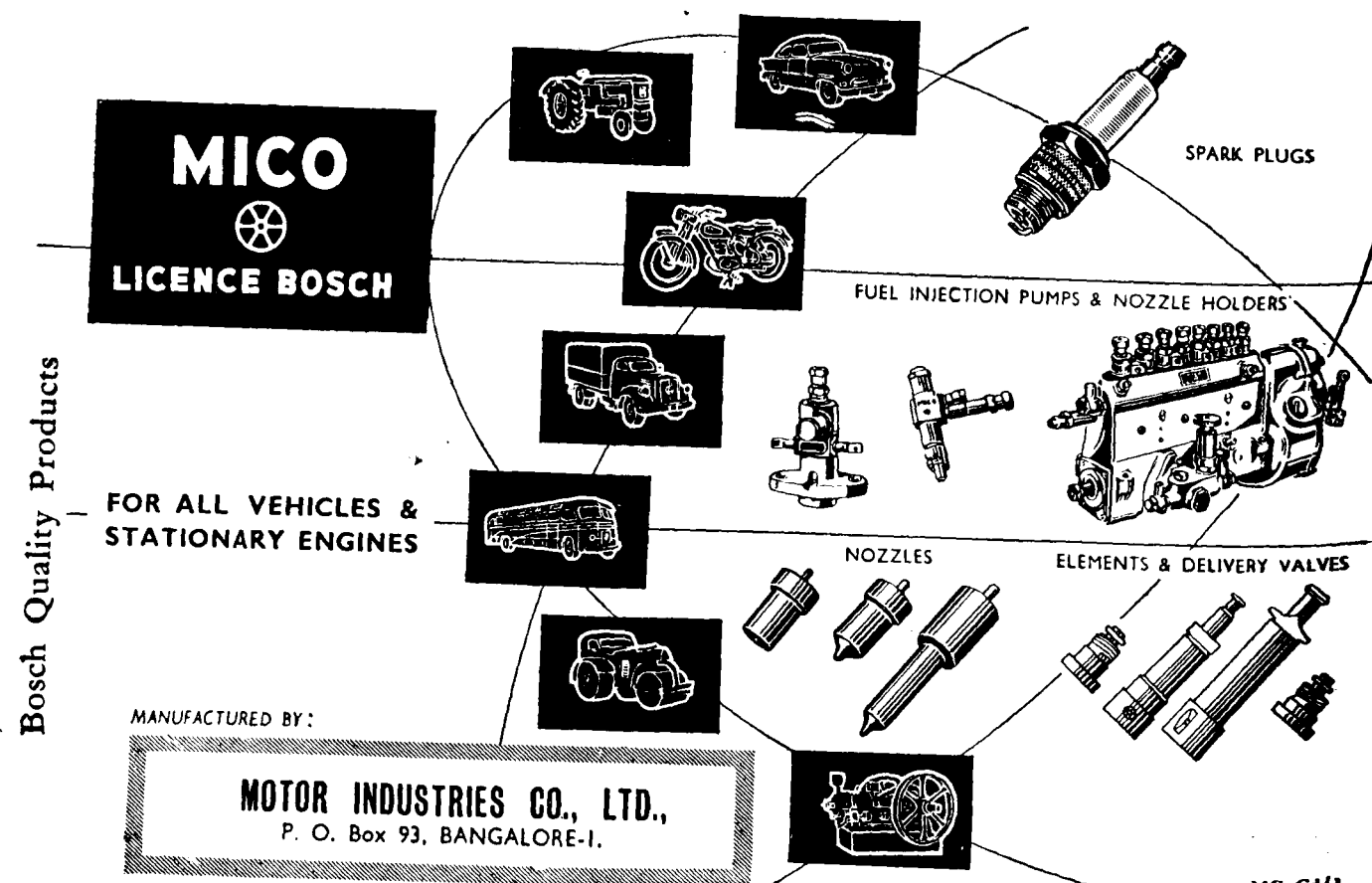
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MADRAS 2

A Trial will Convince you



of great strength. The new Hawk has a clean-cut layout which eliminates noise-producing wind traps and turbulent air-flow, gives easier mounting of the chassis units, fewer welding problems, easier servicing and—perhaps most important saves weight. Four wide, well balanced doors give driver and passenger ease of access and exit.

A powerful car needs powerful brakes and the brake lining area of this new car is 9 sq. ins. larger than that of its predecessor. To cope with load transference on to the front wheels during braking, the size of the front brake drums has been increased from 10 ins. to 11 ins. in diameter.

The interior of the car has the traditional luxurious air of a Humber product, now combined with better visibility through the fully wrap-around—front and rear screens. Window area is 720 sq. ins. greater than on the previous model.

All instruments and main hand controls are grouped on a full width facia panel. The facia assembly is framed by a soft “crash pad” and contains a deep glove box on the passenger side, a loudspeaker grille, an ash tray and has provision for fitting a radio, heater control and cigar lighter.

The instrument panel, which is positioned directly in front of the driver, comprises a speedometer, fuel gauge and thermometer, and provision is also made for fitting an oil pressure gauge and ammeter. Windscreen wipers are two speed. The built-in ventilation system, which provides for four demister nozzles to clear the wide windscreen, is operated by a simple control on the facia.

The front foam rubber cushioned seat can be adjusted for rake and offers a choice of six positions for leg room. Both seats have a double width centre arm rest for each door.

The de luxe trim includes twin sun visors with passenger vanity mirror, washable plastic roof lining, deep pockets in each front door trim pad and a deep pile carpet. There is a spacious parcel shelf behind the rear seat.

The luggage compartment provides more than 19.5 cu. ft. of effective space—4 cu. ft. larger than in the previous model. The fuel tank carries 11½ gallons and the filler is neatly concealed by the reflector in the off-side rear lighting cluster.

Like its famous predecessors, the new Humber Hawk is also available as a Touring Limousine—with a wind-up glass partition which divides the front and rear compartments.

Optional extras available include: Fully automatic transmission, over-drive unit, individual reclining front seats, white-wall tyres, radio and heater.

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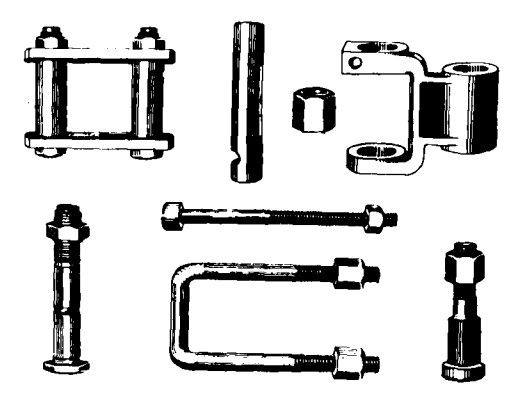
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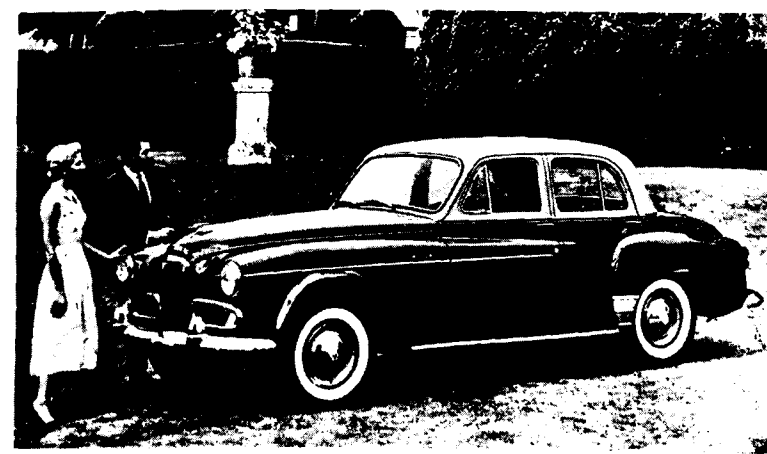
The Humber Super Snipe with full automatic transmission is the lowest priced "no-clutch, no-gear lever" car in Britain.

With the new transmission fitted as an optional extra, the aristocratic Super Snipe is priced at £1,075-0-0 plus £538-17-0 purchase tax. And to conform with this new value-for-money price, the popular, conventional-transmission Super Snipe saloon and touring limousine are priced at £950-0-0 (plus £476-7-0 purchase tax) and £1,030-0-0 (plus £516-7-0 purchase tax).

The Super Snipe automatic transmission, which gives the driver an entirely new conception of motoring, is of the world-proven Borg-Warner type and has been extensively tested on the Humber Super Snipe at home and abroad.

For more than twelve months Sir William Rootes, Chairman of the Rootes Group, has personally been driving and testing the new automatic transmission on his own Super Snipe.

The rigorous tests undertaken have proved that this transmission gives motorists six main advantages : it simplifies driving and so reduces fatigue ; gives smoother operation ; a greater engine flexibility ; an improved performance ; increased safety ; and still maintains petrol economy.



The latest Humber Super Snipe Saloon with fully automatic transmission and 4138 c.c. o.h.v. engine

With no clutch pedal or change-speed lever to operate, the driver has only to operate the brake and accelerator pedal.

Driving technique is simple : driving range is selected, the accelerator depressed and the car moves away smoothly, gears changing automatically to conform with road speed and throttle setting. To stop the car, the brake is applied in the normal way and the gears become automatically disengaged when the engine speed has fallen to a pre-determined number of revolutions.

Gear changing on hills is fully automatic but a change down at any time is easily effected by "kicking down" the accelerator pedal.

Overdrive remains available as an extra on the orthodox transmission models and an additional attractive optional fitting is offered. This is a new type of bucket seat for driver and passenger which, in addition to the normal fore and aft adjustment, contains a squab which is also moveable and can be set in the most comfortable position. It can be lowered to an almost horizontal position, allowing the passenger to recline and relax during long journeys.

MOPEDS

Vast progress has been made by the manufacturers of two-wheelers and Mopeds particularly in the European countries.

Prominent among the manufactures are M/s. Expresswerke Aktiengesellschaft, Neumarkt Opf. Near Nurnberg—Germany.

Safety, comfort and elegance are the outstanding features of the Express Mopeds, the driving qualities of which will fill in motorcyclists with enthusiasm.

The novel pressed steel fork unites the advantages of the oscillating and the telescope suspension. The rear wheel suspension is well adapted to the said suspension in its spring rythm.

Elegance is a feature which Radexi gives the motor cyclist in the sports or in the conservative models. The stream lined form of this nice vehicle has not only made its way in Germany, but also in foreign countries.

The Moped Bobby 6 which is a product of Pantherwerke Ag also of Germany being of extra solid design stands biggest loads and is claimed to be the strongest Moped of its class.

Special twist proof tubular steel frame that has supporting struts of light model is a special feature of this cycle.

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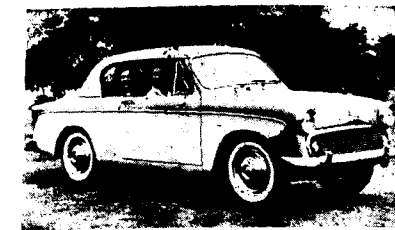
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More Powerful Sunbeam Rapier

Lower priced mark III Saloon



The latest Sunbeam Rapier
has twin carburettors

The latest Sunbeam models announced by the Rootes Group and which are now appearing at the International Motor Show at Earls Court include a higher performance Sunbeam Rapier and a lower priced Mark III Saloon.

The Sunbeam Rapier, one of Britain's most outstanding high performance sports saloons, will, in future, be powered by the R-67 twin-carburettor 67.5 b.p.h. engine and will be available in a wide range of single and dual-tone colour schemes.

The engine has been specially developed to give fast acceleration through the gears, high cruising speeds and a quicker getaway. The latest power unit has new inlet and exhaust manifolds, incorporating two Zenith carburettors, along with special heat resisting exhaust valves which give particularly long life. Despite this increase in power, there is no loss of fuel economy and the price remains unchanged.

The popular and successful Sunbeam Mark III Saloon has been reduced in price by £70—or £105

including purchase tax. In announcing this price reduction Mr. Brian Rootes said:—

“The Mark III Saloon has been in production long enough for our early overhead costs to have been absorbed and we are taking this opportunity of passing on this saving to the motorist.”

The Mark III Saloon has had a great number of successes in all the international rallies on the Continent. With its 2½ litre overhead valve engine which develops 85.5 b.h.p. and gives a top speed of 95 m.p.h. it offers real speed with safety and absolute reliability.

The latest addition to the range, 1.4 litre Sunbeam Rapier, has now been given a power unit similar to those used in the cars which were placed first and second in their class in the last Mille Miglia Road Race. The two Sunbeam Rapiers which were prepared for that event completed the gruelling 1,000 mile course at an average speed of more than 65 m.p.h. and averaged 72 m.p.h for the first 500 miles of the Race.

The Rapier was the first production saloon to be offered with overdrive on third and top gears as a standard fitting, giving greater economy and enabling engine wear to be considerably reduced.

A two-door, hard top saloon of modern styling, it is a model which lends itself to two-tone colours.

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An Entirely New Singer

The 1½-Litre Gazelle

The Singer Gazelle, an entirely new 1½-litre high performance model offering a new high standard of economical luxury travel, is announced by the Rootes Group.

Since the Singer and Rootes merger nine months ago, the designers, engineers and stylists of both organisations have collaborated to produce a fast, reliable, yet economical car with elegant modern styling and outstanding safety features, which will be ideally suitable for both home and export markets.

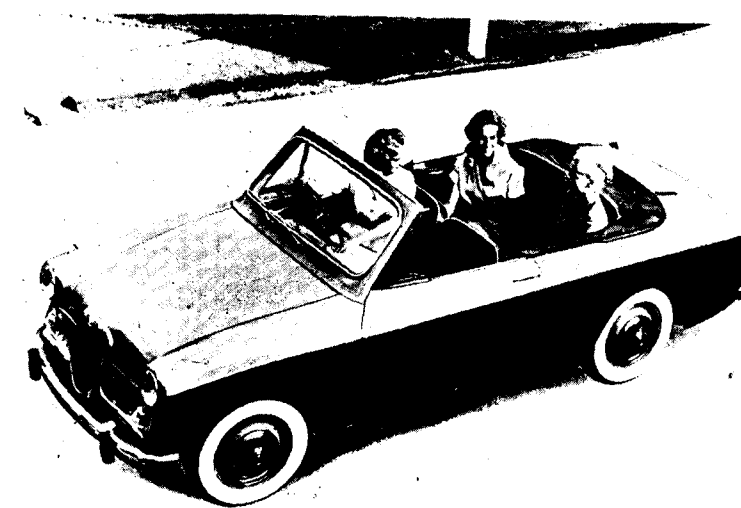
In doing so, they have retained and developed the brilliantly designed 4-cylinder, 1496 c.c. Singer engine, world renowned for its reliability, long life and low running costs. In its new form it now has a compression ratio of 7.5 to 1 and develops 52.5 b.h.p. at 4,500 r.p.m.

This, combined with the excellent power/weight ratio, enables the Gazelle, both in convertible and saloon forms, to have a top speed in excess of 80 m.p.h. and yet achieve an economical fuel consumption.

A feature of the engine the overhead camshaft, a means to high efficiency usually found only on the most highly priced cars.

It drives through a four-speed synchromesh gear-box with finger-tip control steering column gear change. The clutch is hydraulically operated by a pendant pedal, ensuring the lightest possible action and the maximum dust-proofing for the interior of the car.

In designing the Gazelle full emphasis has been given to safety features including all-round visibility. It is the first Singer to have unitary construction, which not only gives greater strength to the body, but also allows a low centre of



The new Singer Gazelle 1½ litre convertible

gravity and consequent ease to handling. By this system all the stresses can be evenly distributed and the designers have achieved a ground clearance of seven inches, despite the low lines of the car.

Powerful smooth acting brakes with 9 inches diameter brake drums and a total lining area of 121 square inches gives the Gazelle a braking power equal to that of many considerably larger and heavier cars, so providing a generous margin of safety.

The suspension has been developed in conjunction with a wide track of 4 feet 1 inch to combine maximum passenger comfort with excellent road-holding, reliability and freedom from roll.

The Gazelle is in the luxury class and many of its fittings are unique for a car of its price. Its walnut panels on the facia and doors give an elegant yet modern appearance to the interior, particularly in view of the attractive modern styling of the upholstery and trim.

There is a lockable glove box in front of the passenger and a shelf in front of the driver, a full width parcel shelf behind the rear seat, and arm rests on the rear doors, all of which will have particular appeal to the woman motorist.

The very comprehensive equipment includes, in addition to the normal lighting arrangement of side, head, stop, and tail lamps and flashing indicators, such items as courtesy lights operated by the doors, twin windtone horns, windscreens washers, twin sun visors, rim finishers and fully wrap-round bumpers with over-riders front and rear.

A full range of instruments including oil, petrol and engine temperature gauges, and an ammeter are fitted and the speedometer has a trip recorder.

Another feature making for convenience is the incorporation of the starter switch in the ignition lock, so that turning the ignition key to its full extent operates the starter.

Provision is made for the fitting of a heater, radio set and clock. Whitewall tyres and individual bucket seats are also standard extras.

A particularly spacious boot offers adequate luggage accommodation for a large family and easy access is achieved by means of a counter-balanced lid which has finger-tip control.

The Gazelle offers luxury with economy, speed with safety, and roominess with elegance and compactness, placing it in a light car class of its own and ensuring it a wide appeal in all markets.

QUALITY WITH QUANTITY AUSTINS

Unique 'Conveyorised' Inspection Line at Longbridge

In the upholding of sustained quality, inspection of the finished article plays a vital part. Individual components, either small or large, must be scrutinised at the manufacturing stage so that an established standard is maintained. The organised inspection of such individual parts offers no problem. Either 100 per cent inspection or sampling may be undertaken and inspection tools—from the simple gauge to the intricate electronic magnifier—may be brought close up to the producing machines.

When components are brought together to form the car, however, inspection takes on a particular difficulty. Obviously 100 per cent inspection would mean doubling the numbers on the Assembly Line by an equal number of inspectors. Therefore it is general practice throughout the motor industry, both here and abroad, to employ roving inspectors. But since men are fallible there are snags in this method—and one slight flaw that escapes the inspector's attention can have a quite disproportionate nuisance value to the eventual owner of the car. This is a danger that faces all car manufacturers in all producing countries. To overcome it we have evolved an entirely new method of final-assembly inspection.

INSPECTION CONVEYOR

The huge Austin Car Assembly Building at Longbridge has been extended to give 70 per cent more space; the major portion of this space is to be used for inspection. The novelty of the method lies in the fact that a conveyor line is used for final inspection operations. Cars, after leaving the main assembly lines, progress down the inspection lines, where an inspection in stages is carried out.

Inspectors each have an individual inspection programme. By this means inspection coverage is on a regularised basis and every car receives precisely the same scrutiny to a systematic and meticulous schedule. Each car has an individual work ticket and any defects are noted down on this. Adjoining the inspection line are a number of rectification bays where the work detailed on the ticket is carried out.

The sequence of operations on the final inspection line is briefly as follows:—

Dust Sealing :—An instrument, used for spot checks is a vacuum unit which is clipped to a window aperture and driven from the car's battery. Air is sucked out of the saloon interior and if the pressure differential, denoted by a gauge, falls below an acceptable level, a fault in the sealing is indicated.

Wheel Alignment :—After tyre pressures have been checked, the car is halted on a special jig incorpo-

rating two pairs of measuring arm which contact the front wheels. The setting of these arms actuates an electrical gauge which enables the wheel alignment to be checked and accurately re-set if necessary.

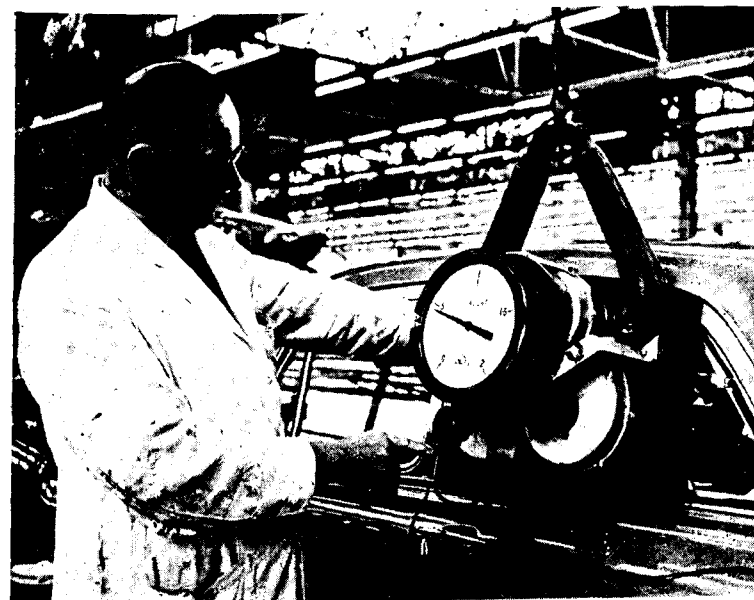
"Static" Running Test :—The car is next moved on to an ingenious installation of rollers enabling to be driven as though on the road, and the tester to verify the operation of engine, clutch, gearbox, propeller shaft, rear axle, and brakes. Housed in a pit nearly eight-feet deep, the installation employs four large-diameter rollers; the rear pair are driven by the rear wheels of the car and linked to the front pair which in turn drive the car's front wheels. Hydraulically-operated safety devices are automatically brought into use once the car is on the test rig; these include small locating rollers for the front wheels, stability forks under the axle, and an exhaust gas extractor at the rear.

The new conveyorised inspection lines in the Austin Car Assembly Building shows the end of A95 and A105 line



MOTORINDIA

Annual 1957



A vacuum unit shown above sucks air from the car's interior and by gauging the pressure differential indicates the efficiency of the sealing, part of a unique conveyorised final inspection line at Austins, Longbridge

Inspection Pit :—Following the roller test the car is conveyed over a long inspection pit, where all underneath mounting and suspension bolts are checked and any minor adjustments—such as clutch pedal travel—which may have been indicated by the roller test, are carried out. If the roller test has shown that the ignition timing is not quite perfect, a stroboscope is available here to assist in making an accurate adjustment. At the same time the coachwork is inspected inside and out, minor electrical adjustments are made if necessary, and polishers give the car a showroom finish. A final check is made by a senior inspector and if any major adjustments are noted on the car's inspection card the model is then sent to a special rectification bay.

Water Test :—Selected cars—particularly those for export—are sent through a spray booth where fine jets of water are directed under high pressure on all sides (including the underside) of the car. Any water leaks in the coach work are quickly

revealed—though a fault is very unlikely at this stage. Immediately after the water test, the car is sponged down and then passes through a low temperature oven for thorough drying.

Waxing booth :—A spraying booth where cars can be given a coating of wax is another new installation in the Austin Car Assembly Building. The tax coat has been found to give excellent protection to export shipments under corrosive conditions encountered during the voyage; the wax is easily removed by warm soapy water. A lanoline spray is used to protect the engine and this need not subsequently be removed.

INTERMEDIATE INSPECTION

This additional emphasis on final inspection will not, of course, result in any relaxation of the complex inspection system during the manufacturing stages. In this category there are basically three stages of testing. Every part is inspected visually; there are stations where a percentage of output is held back for scientific testing; and when sub-assemblies such as gearbox,

engine and axle are completed there is a further careful examination—one in every 10 engines is completely stripped for re-examination.

MILLIONTH-OF-AN-INCH ACCURACY

The delicate gauges used in inspection are maintained in a "Standards" room, a glass-walled, air-conditioned office where the temperature is

B.M.C. OUTPUT STILL CLIMBING

Record Exports to U.S.A.

Production figures in May, released by the British Motor Corporation show remarkable increases in output. The May total of car production (compared with May 1956) was up by 40.25 per cent, and that of commercial vehicles by 14.25 per cent.

Exports to U.S.A. trebled

Exports to the U.S.A. for the first quarter of this year (compared with 1956) almost trebled, to exceed 10,000 units. During the first five months of this year, B.M.C. exported 51.65 per cent of all vehicles produced to overseas markets.

With the active co-operation of the Trade Unions, many B.M.C. factories are at present operating on production schedules which necessitate night-shift working and overtime. Combined production of the Austin A35 and the Morris Minor 1000 alone, now exceeds 4,000 a week.

controlled at 62° F. all the year round. One such instrument, used for measuring cylinder bores, works in micro-inches—one-millionth of an inch. Electrical equipment is tested both during and after installation. Car bodies are inspected many scores of times, from the raw metal pressings hot from the machines, through out the complex paint processing, along the trim lines and so on to the final assembly lines.

Annual 1957

MOTORINDIA

79

ACHIEVEMENTS OF DELHI TRANSPORT

Modern Bus Depot and Housing Scheme

BY A. K. MANDAL

Starting practically from scrap in respect of the number of buses and their conditions, in respect of Depot and Workshop facilities in respect of amenities to the passengers and welfare of the workers, the Delhi Road Transport Authority can look back with satisfaction at the improvements made in all the sectors. Considered in the light of the demand on its services arising out of the post-partition influx and ever-multiplying population of Delhi, the achievements are remarkable.

Most Modern Depot at Shadipur

The D.R.T.A. was at once faced with the task of replacing the old and outworn buses and of adding more and more buses to the fleet. Proper workshop and depot facilities also claimed immediate attention. Among other things, two new depots were built up during the First Five Year Plan period at Vinay Nagar and Coronation Road at distance of 5 miles to the south and 8 miles to the north respectively from Connaught Place, the heart of the capital. In the matter of selecting the sites the availability of spacious land at spots which can eliminate the dead mileage of buses has not become possible. But as far as possible mileage has been relatively reduced.

Whereas in the construction of these two new depots lots of improvements were effected on the old ones at Karolbagh and Rajghat inherited by the nationalised transport undertaking, the new depot constructed under the Second Five-Year Plan at Shadipur, located at about 5 miles to the west of Connaught Place, has incorporated all available expert knowledge on the subject. In preparing the lay-out plan for this depot, equal emphasis has been given to (i) labour welfare, (ii) smooth working and (iii) quick outshedding of buses.

Credit for the achievement goes to Shri B. K. Lal, General Manager of the Delhi Road Transport Authority who was ably assisted by the Executive Engineer, Shri R. R. Goel and Shri B. T. S. Khadkiwala, Chartered Architect and Town Planner.

A fairly big Canteen on the first floor of the new depot which can seat 140 people quite comfortably,

to be equipped with suitable furniture, water-coolers, etc., serving good but cheap food and drinks, is a real boon to the workers. The attached recreation hall to be equipped with radio set and newspaper stands, etc., provide for welcome change from work. And there is the rest room with ten beds. The workers are no less happy with the provision of a separate room for changing clothes and this is just at the centre of their place of work. In this new depot, the Dispensary has got a medical examination room and a separate bath. Latrines and lavatories have been provided at various places in such a way that the workers have to do very little of walking for reaching them. Modern lauvres protect all the rooms from direct beating of sun and inclement weather. Each of entrance and exist gates has a cabin for the chowkidar on duty.

The Control Room of the depot stands between the entrance and exit gates. Fitted up with a microphone for directing the operational staff, the Control Room has been designed in such a way that the staff in the Control Room can conveniently watch the operational staff at work.

One wing of the depot consists of rooms for fire-fighting equipments, tyre-repair section, battery charging section, stores with spacious additional space in the basement, night shift stores, scrap stores, smith compressor and lubricating machines section, laundry, barber, cobbler, cycle shed, workshop shed, etc. The other wing contains rooms for visitors, Traffic Superintendent, Depot Supervisor's Office, lost property office, cash section, ticket section, general office, auditors records, and canteen, etc. For current records and storage of tickets, built-in almirahs have been provided in adequate numbers. To have better output and minimum possible strain on workers, different sections have been laid out in close proximity to one another.

Car-washing shed and the refuelling section are placed at suitable position in the courtyard. For washing of vehicles R.C.C. tank of 5,000 gallons capacity has been provided so that washing can go on even

if the car washer goes out of order. This tank will also feed the water mains during such hours when Municipal supplies are not available.

The ten-feet high boundary wall encloses a spacious courtyard for parking of buses. Parking places are marked properly with concrete curved stones and raised platform. Parking is as safe and easy now as the outshedding is smooth and quick. Built up for the purpose of 140 buses, this depot will easily take another forty should the subsequent expansion programme so necessitate.

Depot Workshop

Unlike the human body which can move and work, though not so comfortably, when afflicted with certain types of ailments, the buses can rarely do so. Hence the urgency of an efficient depot workshop can never be over-emphasised. The workshop of this depot can claim to have the advantage of the most progressive lay-out plan on the subject. Special mention can be made of the following in respect of the improvements effected on the workshop sheds of the previous two new depots.

1. The pits are lighted and these lights can be changed to convenient angles.
2. A longitudinal bay $7\frac{1}{2}'$ wide connects the pits at the middle making it very convenient for the workmen to attend to the engine under the bus.
3. Movable bridges have been placed across the central bay. Green lights have been fixed at the eye-level of the driver on the wall facing him to indicate that the bridges are in position and that he can safely drive on.
4. Drainage arms are there in the service pits for automatic drainage of used oils from the vehicle to the storage tank placed outside the depot.
5. The shed is provided with rolling shutters to protect the workers from stormy and inclement weather.
6. A large enough room in the shed for the office of the Engineer-in-charge who gets a full view of the people at work below.

Two More New Depots

During the Second Five-Year Plan period two more new depots will be constructed at an estimated cost of

Rs. 21.72 lakhs. One of them will be located at Indraprastha, about 2 miles to the east of Connaught Place and the other one at Tihar in Tilak Nagar area, situated at a distance of 5 miles to the west of Shadipur. After these are built up, the two old depots functioning since the time of the now-defunct Gwalior and Northern India Transport Company, Ltd., will be abolished and the Delhi Road Transport Authority will be having five new depots in the east, west, north and south of the capital, to operate the target number of 589 effective buses.

New H.O. Building and Expansion of Central Workshop

The Building Scheme also provides for the D.R.T.A.'s own Head Office Building. The site of Indraprastha has already been selected for the purpose.

For constructing the Central Workshop about three and a half acres of land had been occupied during the first plan period. Additional land has since been acquired making the total area of 10 acres for this purpose. More than 150,000 square feet of built up area will be added for the Central Workshop and the Central Stores to the existing area of about 46,000 square feet. In addition to this a modern canteen for 400 workers shall be constructed. A training school for bus drivers and conductors and offices required for the stores and engineering branches are also included in the programme.

Staff Quarters

The Delhi Road Transport Authority has already constructed 180 quarters for the staff within a furlong of the new Shadipur Depot, within an area of 9 acres of land including 1.5 acres to serve as playground and community centre. Plenty of open spaces and lawn lie around the quarters. The Staff Colony is also provided with a number of shops and one enquiry office. The residents of the Colony will get all the advantages of the adjoining fast-developing localities.

Out of these 180 quarters, 140 are meant for Class III employees and the rest for Class IV employees. Each quarter for Class III employees, encloses a space of 600 square feet with 2 rooms, 1 kitchen having smokeless oven, verandah, 1 bath room and 1 lavatory and that for a Class IV employees is built up on an area of 332 square feet with 1 room, 1 kitchen and verandah. Each set of two quarters has got a bath and lavatory

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“Fear of Nationalisation

Retards Road Transport Developement”

(Contributed)

The significant part played by road transport in Madras State will be apparent from a perusal of the figures of road density in the State. When compared to area, the density, is 0.48 miles per square mile against the All India average of 0.20 miles, and there are 796 miles of roads for every million of the population, against the All-India average of 680 miles. The economic development of any country depends to a great extent on efficient road communication. Roads facilitate not only the movement of people, but also goods. Weakness in our road system will affect the efficiency of all other forms of transport, such as railways, aeroplanes and shipping. The wealth potential of all forms of assets, whether human labour, lands, mines or industries, is closely linked to the efficiency of road communication.

The general growth of economic activity in the country in recent years and the inability of the railways to meet all the traffic demands no doubt tended to provide considerable opportunity for expansion of road transport, chiefly motor vehicles. Moreover, all goods transport and almost all of the passenger services in the State are at present in the hands of private operators and, despite the nationalised bus services in the Kanyakumari District and in the City of Madras,

the private operators will continue to have a predominant share of road traffic, in the State. Still, the development of road traffic over the past few years has not been upto expectations. The inadequate development of road transport in recent years, despite the enormous pace of growth of the economic development of the country, has been attributed to fear of nationalisation and high levels of taxation on motor spirits. The restrictions on inter-State road communication also it seems, tend to inhibit the growth of road communication. Of late, there has been a rethinking on the part of State Governments, on the necessity for allowing a free flow of road transport between States, and as a result, it is likely that a common policy among States will emerge. But essentially, the growth of road transport has not progressed commensurate with other developments mainly because it is still in the hands of small operators with minimum fleet strength. A special study group of Planning Commission after consultation with the Ministry of Transport has advised against nationalisation of road transport and it has also advised that private operators should be assisted in forming viable units. Thus, with the bogey of nationalisation removed, and active assistance assured, the private operators can go ahead and establish a sound system of road traffic for the State.

common to both. But the lay-out plan has taken good care to preserve the privacy of the dwellers.

The Colony has got its own sewerage system and also the sewage disposal tank. The colour scheme of the quarters is made up of different shades to do away with the monotony of the look of uniformity.

It would be possible to add a second room to the single room quarters without disturbing the existing arrangements as and when so desired; because it is considered that sooner or later free India shall provide at least two-roomed quarters to its Class IV employees.

Out of the remaining 380 staff quarters to be built up during the Plan period, 180 will be located near the the Vinay Nagar Depot and the rest at Gur Mandi on Grand Trunk Road, opposite the recently developed Pratap Bagh Colony. Total estimated expenditure for all the 560 staff quarters is Rs. 39.8 lakhs.

The earliest realisation of the necessity for a road plan was felt in 1943, when the Chief Engineers of States met at Nagpur and evolved the Post-war Road Development Plan, which aims at bringing every village of a population above 500 within five miles of a pucca road. Based on this objective, Madras State drew up a 25-year plan and launched it in 1947. This plan was later merged in the First Five-Year Plan and is now being continued in the Second Five-Year Plan. One decade of planned progress in roads has given Madras 23,903 miles of roads consisting of 1,087 miles of national highways, 1,086 miles of State Highways, 7,875 miles of major district roads, 4,745 miles of other district roads and 9,090 miles of village roads, comparing very favourably against the road density ratio of All-India.

There is a feeling that the expansion envisaged under the Nagpur Plan when the *per capita* income was a mere Rs. 230 is not sufficient, in the context of rise both

n the *per capita* income and the overall railway freight. It is therefore obvious that increase in road mileage ought to be more than that envisaged in the Nagpur Plan. In Madras State, during the Second Five-Year Plan period, it is proposed to achieve the following physical targets for roads other than National Highways : —Cement concreting 67.7 miles, black-topping 666.3 miles and metalling 1,106 miles. Construction of minor bridges and culverts 245 Nos. schemes and construction of major bridges 84 Nos. schemes. In consonance with the aim of the Nagpur Plan, it is proposed to form about 1,967 miles of road under the plan during the plan period in order to provide access to the villages of India. Besides the above, the Community Projects, and National Extension Service Blocks form village roads to connect villages and these roads after formation are handed over to the District Boards for maintenance.

Agriculture depends for its very existence and certainly for its efficiency, on adequate transport facilities being available. The cultivator naturally produces only such things as can be easily sold and bring in a return for his labour. If the road system is not efficient, the transportation costs would be prohibitive and would wipe out the profits of the cultivator leading to curtailed production. Good communications in an area will often bring new crops within the range of profitable cultivation. In fact the improvement in communications has been instrumental in bringing about the change from subsistence farming to growing of cash crops. Bad communications not only hamper the agriculturist in the marketing of his produce, but also raise the price of his own purchases from elsewhere. In short the true income of the cultivator is largely dependent on the efficiency of communications, particularly road communications.

The benefits accruing from roads are innumerable. It would suffice to mention only a few here. On the existence of easy communications, depends the maintenance of internal security, and also to a very appreciable degree the mental and material advancement of the rural population. Roads bring children willingly to schools and patients quickly to hospitals. The postal system in the country is likewise dependent on roads. It is clear therefore that if India is to progress towards greater prosperity, the first essential is the provision of an adequate network of roads, and with roads, an efficient and cheap road-transport system. While the Government will do all it can to furnish the roads, we need enterprising operators to take up the challenge and prove their mettle by giving us well coordinated road-transport services.

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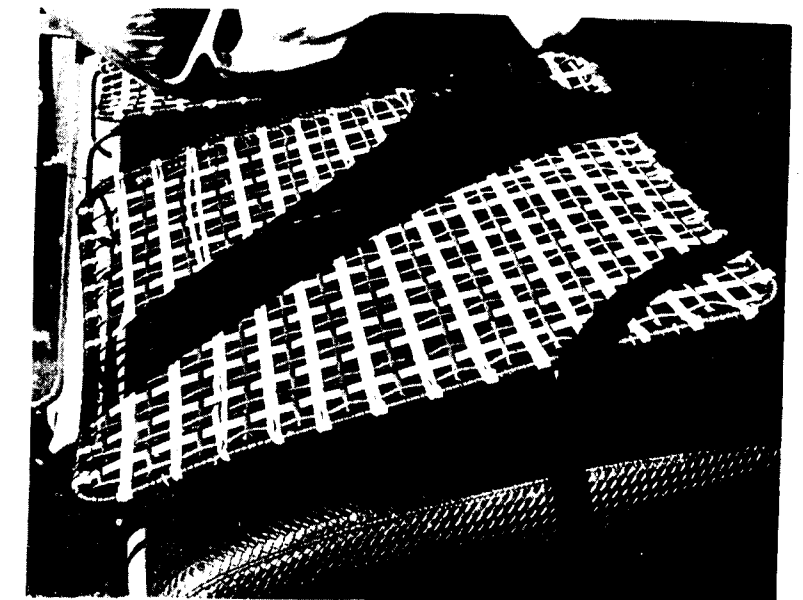
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FOR THE MOTORIST

CAR POLISHING is made easier with new Dynel Mitt, Union Carbide's new science fiber. The mitt fits on the hand like a glove thus minimizing the effort unaffected by the chemical action of detergents of strong soaps. It is capable of double duty as a dusting and polishing cloth for furniture, glass, books, floors etc.

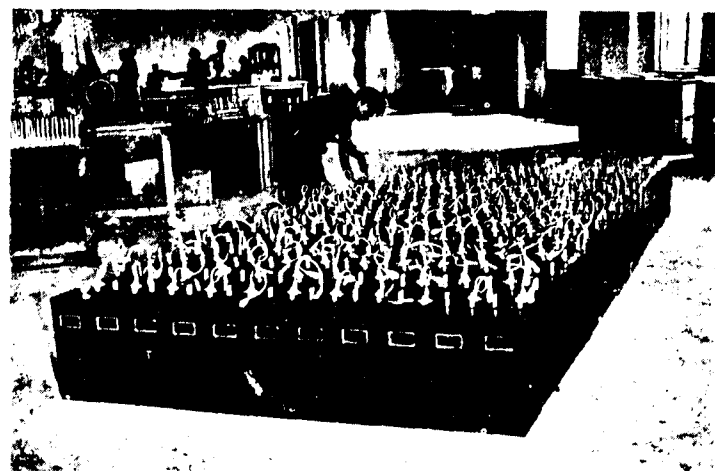
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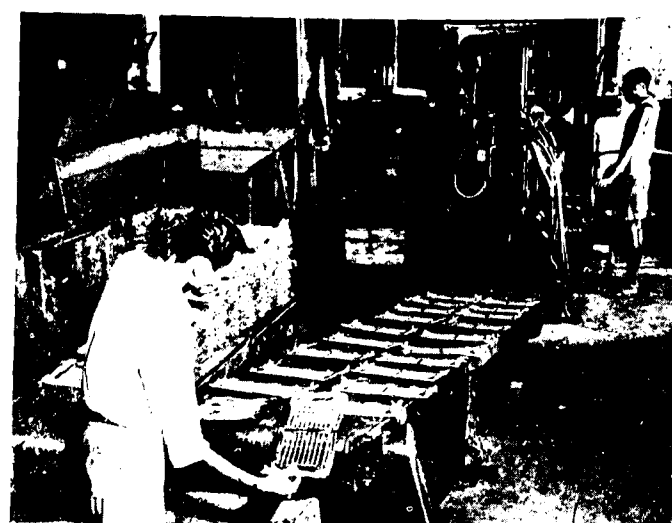
ANTI CREASE : A bamboo frame between the driver and the upholstery prevents the jacket from creasing and dries the clothes when wet.

GADGETS

CATEYES UNDER THE SHOE will make the pedestrian safe for cars approaching from the rear at night. A good idea for road safety.



A batch of train-lighting Batteries awaiting shipment to Indian Railways



Automatic casting of plate-grids

Serving India's transport, communications and defence services

A VITAL FACTOR in modern life is the lead-acid storage battery—used extensively in all forms of transport and communications, including motor vehicles, railway trains, aircraft, telephones and telegraphs, radio and other applications.

It is definite that without batteries, the life of the nation would come to a standstill. No wonder, then, that Standard Batteries Ltd., can claim to be contributing vitally to the national welfare.

Foremost national manufacturers

Standard Batteries Ltd., are the foremost national manufacturers of lead-acid storage batteries—a truly national enterprise, with 100 per cent Indian capital, Indian labour and Indian management.

The Standard Batteries factory in Bombay stands in grounds of about 20 acres. It has over 600 employees.

The factory is self-contained, comprising up-to-date plant for manufacturing every component part of a modern storage battery.

Testing and research laboratories

Attached to the factory is a well-equipped testing and research laboratory. Here strict quality control tests are made on all raw materials and components,

and electrical and mechanical tests are made on batteries at different stages of manufacturers.

At the same time, the laboratories work to develop new types of batteries for the special requirements of Government undertakings and the defence services.

Wide range of products

Standard Batteries Ltd., make a complete range of automobile, tractor and heavy-duty batteries. To this large-volume production, the Company added in 1951 the first mass production in India of train-lighting batteries for the railways. An aircraft battery for the famous HT-2 trainer produced by Hindusthan Aircraft Ltd., was specially designed and is now in production.

As the need arises, Standard Batteries Ltd., manufacture other types of special-purpose batteries vital to the nation's economy—thus helping to make India independent of foreign sources of supply.

Latest 'know-how'

As a result of a recent technical agreement with Messrs Tudors of Sweden, one of the most experienced battery manufacturers in the world, Standard Batteries Ltd., now benefit from Tudors' technical 'know-how' and from their many exclusive patents. These will be



A part of the special purpose batteries section

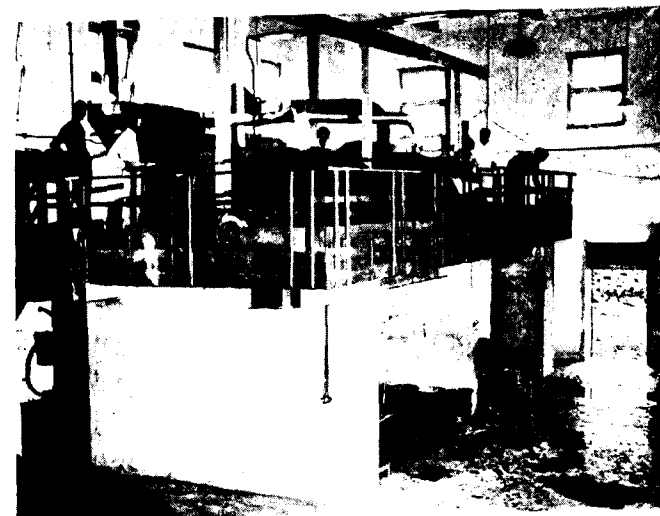
an important factor in the success of Standard's development programme.

High quality at low cost

The high quality and low cost of 'Standard' batteries owe their existence to a combination of special advantages. The factory employs skilled technicians working on modern automatic machines; all components are made within the same premises, ensuring complete quality control; batteries are rigorously inspected and tested at every stage of manufacture; and the Company has built up a fund of 'know-how' unique among Indian manufacturers.

The result is efficient large-scale production, the advantages of which are passed on to the buyer in the

Tow of the Oxide Mills producing lead—suboxides which form the active material of the battery plates



A view of the assembly line for motor vehicle batteries

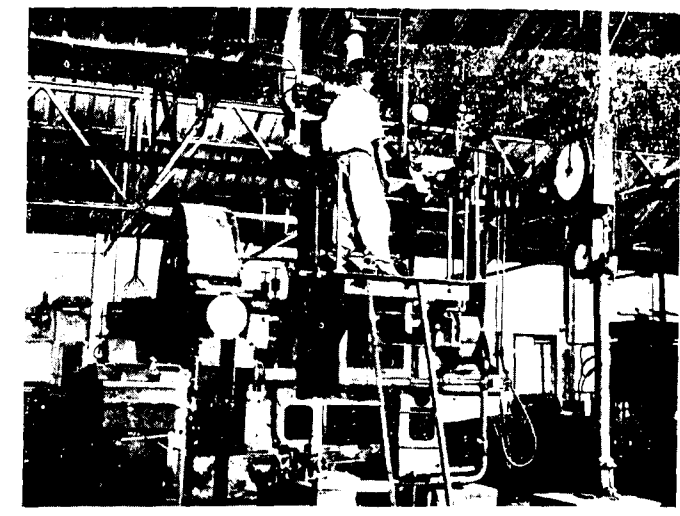
shape of a first-class battery at a truly competitive price. It is noteworthy that in spite of the protection granted to the battery industry by Government—which might have been used to maintain high prices—Standard Batteries Ltd., have always been leaders in the trend towards lower prices for batteries.

The Company's network of distributors covers the whole of India, with facilities for servicing in all important towns throughout the country.

Building export markets

Experimental supplies of 'Standard' batteries have been made to Burma and the Middle East, and to other neighbouring countries. Further efforts are being made to expand the export market, to build up a steady export business.

This Rubber Mixing Mills mixes rubber with chemicals to make a compound which is later turned into hard rubber containers and covers.



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WHY ADDITIVES?

In dealing with this important subject, Mr. Arnold Miller, a distinguished Member of the Armour Research Foundation in his :—The Chemistry of Lubricating Oil Additives (Arnold Miller, Armour Research Foundation, Chicago, Illinois) Writes as follows :—

At the turn of the century, the sole functions of a lubricant were to reduce friction and wear of moving parts and to act as a mild heat-transfer medium. Bearing loads were low and static : comparatively low operating speeds were the order of the day. Bearing metals such as tin-base babbitt or cast iron, used under the mild conditions then prevalent were generally highly resistant to corrosion. At that time, refined petroleum oils and waxes and simple calcium and sodium-base greases were more than adequate for the lubrication requirements of existing machines.

Mechanical improvements and advancements leading to the development of the internal combustion engine and all of its ramifications increased the severity of operating conditions in terms of high bearing loads greater speeds, and elevated temperatures. Speed became the watchword. Metallurgists developed bearing alloys, of much greater load-bearing characteristics, but in many cases, these materials were sensitive to the ravages of corrosion. Under these severe conditions, it soon became evident that the demands placed upon effective lubricants were not being met by even the most highly refined petroleum oil. It became necessary to develop chemical additives which, when blended in the proper concentrations with petroleum stocks, improved the existing properties and/or added new important characteristics to the lubricant blends so that they might function efficiently in modern high-speed engines.

We now come to the purpose of this article, to call attention to a new British discovery (secret process) called "Dextrol 905," by United Lubricants Ltd., London.

First of all, we deal with its properties, and the results achieved as applicable to the Motor and Transport industry ; and secondly, in regard to its Industrial debut.

Internal Combustion and Diesel Engines—Dextrol 905 extends oil life

Many conventional oils already contain Additives. They are usually anti-oxidants. They are added because by the chemical nature of petroleum oil hydrocarbons the most important chemical reaction of the oil from the lubricant standpoint is that of partial oxidation. This chemical change results in the formation of peroxides and organic acids. Both of these classes of substances may attack and damage the metal parts of the machine. THE CHEMICALS CONTAINED IN DEXTROL 905 ARE IMPERVIOUS TO ACIDS, EVEN THE STRONGEST SULPHURIC AND NITRIC ACIDS ARE WITHOUT ACTION ON THIS SUPER ADDITIVE.

The acids, on the other hand, may go through a process whereby the molecules combine into large aggregates that settle out to form "sludge." Or under proper conditions, they may adhere to the metal parts of an engine in the form commonly called carbon or

lacquer—deposits that gum up the piston rings or other moving parts. Furthermore, as each molecule of oil is oxidized into a peroxide or an acid, a hydrocarbon molecule is destroyed.

Dextrol 905 extends oil life by reducing friction, by offsetting acid oxydation, by protecting the hydrocarbon molecules and by REDUCING the amount of metal particles and other impurities which produce catalytic action and speed up the oxidation process.

See how metal particles disappear when our Additive is tested on the bearing machine, compare the amount of such particles against the same test carried out with conventional oils.

Dextrol 905 combats friction, reduces heat and keeps your oil cleaner

Heat, friction and impurities determine the life of your oil. Our customers testify to the longer oil life obtained since commencing to use Dextrol 905.

DEXTROL 905

The Universal Oil Additive. Add 10% to your Sump, Gear Box and Back Axle

To OBTAIN :—

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Industrial Uses

DEXTROL CONCENTRATE 905

Technical Data

* SPECIFIC GRAVITY (AT 15 C)	1.0309
* FREEZING POINT	7 F
* FLASH POINT (PENSKEY MARTENS)	345 F
* BOILING POINT	415 F
* POUR POINT	12 F
* NON TOXIC	
* IMPERVIOUS TO ACID AND ALKALI	
* HARMLESS AND SAFE TO USE IN ALL CUTTING, TAPPING, GRIND- ING, BROACHING, MILLING, SCRE- WING, ROLLING, SLIDE LUBRICA- TION AND GENERAL MACHINE SHOP OILS AND GREASES	

WHEREVER WHEELS TURN OR METAL MEETS METAL
USE DEXTROL CONCENTRATE 905

Dextrol concentrate 905 improves finish to component Here is the proof:—

The British Transport Commission says—

Dextrol 905

"I enclose herewith details of some initial tests carried
out at my Derby Locomotive Works, with the
above mentioned compound. This is for your
information and records:

Further extended tests are at the moment being
completed and as soon as the final figures have
been arrived at I will let you know the results.

So far it appears that tap life has been trebled, with
10% of the additive used with my existing cutting
lubricate.

Yours faithfully,
J. F. HARRISON

Tests carried out at Derby Locomotive Works with Dex- trol concentrate 905 in which case 10% Dextrol was added to the existing cutting compound

Drill size 2.31/32" 72 R.P.M. @ 120 cuts/inch.

Without Dextrol Feed Motor amps. 7.2 finish to
component prior.

With 10% Dextrol under same conditions as above,
motor load dropped to 6 amps.

Drill chatter was eliminated. Finish to component
good.

Drill size 2.1/4" 83 R.P.M.

Without Dextrol Motor Feed amps. 9.

With 10% Dextrol Motor load dropped.

Speed increased to 100 R.P.M. Chatter completely
eliminated. Finish to component good.

Annual 1957

Screwing:—

Without Dextrol Screwing 2" Dia.

Motor load 2.8 amps.

With 10% Dextrol Motor load reduced to 2.

Finish to component good."

*10% Dextrol concentrate 905 trebles tap life

*Dextrol Concentrate improves finish to component.

*Increased R.P.M.'s mean increased production.

*Elimination of drill chatter means longer tool life.

*Decreased motor load means less friction and heat.

Marconi's Wireless Telegraph Company Ltd., say—

"Referring to your recent discussions with engineers of our
Transmitter Development Group, I am enclosing prints
of four photographs showing the result of tests carried out
on twelve sections of sintered bronze rod which had been
degreased and, in most cases, subsequently vacuum,
impregnated with a variety of lubricating materials.

The sections were mounted on bars and each was indepen-
dently loaded against 5' diameter copper cylinder, a pull
of 5 lbs. at the contact point being required to lift the
section off the cylinder. The cylinder was then rotated
approximately 30,000 revolutions at a peripheral speed
of 10 feet per minute corresponding to 30,000 feet of
contact travel or approximately 9 months of practice
usage.

The sections and cylinders were then cleaned and the amounts
of wear measured to obtain comparative indications of
wear to be expected with the use of each lubricating material
in contacts operating in similar conditions in our trans-
mitters. It was found that the contact impregnated with
"905" concentrate suffered the least wear and left the
cleanest surface on the copper cylinder. We are now
using the "905" Concentrate in our production contacts.

Yours faithfully
R. P. RAIKES
Publicity Manager.

Extract from "The Engineer" August, 1956

Boundary Lubrication

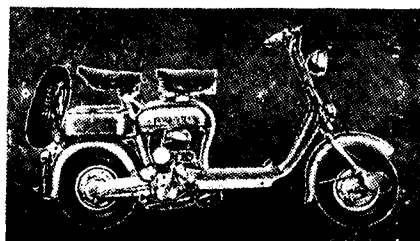
A Lubricant of extreme film strength has been evol-
ved. This material is the result of a discovery, rather
than progress along the established theories of surface-
active agents and the present hypothesis of its action
is that it is highly penetrative and forms and enduring
deposit in the fine irregularities of a metal surface.
There is, moreover, no tendency for this film to become
the base of any further deposits, so that there is no risk
of lubrication by this means being overdone.

The effectiveness of this technique was demonstrated
to us on the American Timken testing machine, running
a bearing outer race against a parallel roller. A variety
of lubricants were tested and it was shown that seizure
took place under loads of the order of 100 lb. for engine

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oil, 120 lb. for soluble oil, and 170 lb. for sulphurised cutting oil : water as a lubricant carried 110 lb without seizure. The addition of about 10 per cent of "Dextrol" 905 (which was seen to emulsify immediately in the water) allowed most of these lubricants to remain effective under the highest loads applicable roughly 700 lb. Interestingly enough, seizure could be induced with the additive bearing oils : a detergent multi-grade engine oil rose from 110 lb to cause seizure to 500-550 lb. The sulphurised cutting oil, at first, seized under 280 lb. but at every subsequent attempt the failing load was higher : this is explained by the fact that the surface-active agent in the cutting oil was inhibiting the action of the additive and as the original agent was destroyed by overheating the additive came into its own. As an extreme test for the additive, sulphuric acid was mixed with the water emulsion lubricant, without any apparent adverse effect.

A striking feature of the demonstration was that, with the conventional lubricants, the roller was abraded to a depth of about 1/16" in each test. With the additive in use, it was not possible under similar or aggravated conditions to do more than polish the surface of a small spot. It was also shown that, once the additive had been in action, the lubricant feed could be discontinued for at least a short interval without seizure occurring.

The additive freezes at 28 deg. Cent. and boils at 270 deg. Cent. It is non-inflammable and serves to raise the flash point of any oil to which it is added, so that such applications as mining machinery are envisaged. Its cost is such that it is expected that low-grade oils supplemented with the concentrate will oust high-grade oils from many applications. The extreme film strength engendered in any oil is regarded as valuable in an internal combustion engine, particularly when running in : for this purpose, it is included in "Dextrol 905" which conveys also oxidation resistance, dispersant and anti-acid properties, and improved viscosity index to engine oils.

"Oiliness," is of course, put to a most severe test by cutting tools, and "Dextrol" 905 has been applied with success to various metal forming operations. Advantages that have been observed have been that the effort needed, both to make the cut and to drive the slides has been usefully reduced, that speeds and feeds can be increased and that tool lives tend to improve. One interesting instance was the broaching

of a splined bore : on occasions the broach had jammed in the jib, so that the workpiece had to be cut away in order to salvage the tool. Seizure was heralded by a howling noise and a great increase in driving force and it was therefore practicable to provide the operator with a can of concentrate to apply when these symptoms appeared. The additive immediately reduced the load on the tool from around 1,200 lb to 450 lb and, of course, prevented a stoppage of the machine.

SALIENT FACTS

Tapping Machine Test

- (a) 40% Reduction in Power.
- (b) Better cuts.
- (c) Improved surface finish.

CONDITIONS

Drilling

- E.N. 30-B annealed Nickel Chrome Moly : steel
- 5/8" Drill. Speed 60 feet per minute.
- 0.010 inches per rev. feed.
- (a) Surface finish with soluble oil = 160 M.I.
- (b) Surface finish with soluble oil plus 10% D.905 = 90 M.I.
- 1. Marked cleaner cuts.
- 2. Improved surface finish.
- 3. Decreased torque of approximate 40%.

CONDITIONS

Reaming

- Reaming E.N. 3-A normalised condition.
- speed 30 feet per minute 10 thou. per rev. feed.
- (a) Improved finish.
- (b) Reduced torque.
- (c) 12 Thou. depth of cut (higher than normal).
- (d) Normal Oil—finish 260 M.I.
- Normal Oil with 10% D.905 finish 150 M.I.

CONDITIONS

Impact Extrusion

- Using phosphated slugs a reasonable improvement was shown where D.905 was used, instead normal technical lubricant.
- A very marked improvement was found when D.905 Base was used as the lubricant on phosphated slugs.
- The greatest movement of all was found when untreated slugs were used in conjunction with D.905 as lubricant.
- Scoring internally completely overcome.

Deep Drawing

- (a) Perfect cup completely free of scoring.
- (b) Produced at 4.5 on pressures—previously impossible to use successfully.
- (c) First occasion when cylindrical steel plate had been used untreated except for simply dipping into D.905. Finished job produced satisfactorily with that size of plate and at that particular pressure.

We feel that this information is of great importance to our transport users, and in view of our Industrial Development, to our Industrial users. George Vint & Co. Ltd., Palmerston House, Haywards Heath, Sussex, or any office of George Vint & Bhalla (India) Private Ltd., will be glad to supply further information direct to enquiries.

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Bosch Fuel Injection Pumps

The first patent application for a Diesel engine was filed on 28-2-1892 and already in the year 1896 the first Stationary Diesel engine was built. Still, it took some more decades before the economic Diesel system could be utilised for vehicle engines also. This was mainly due to the problems faced with the fuel feeding. An injection pump had to be created which was to be standardized in principle but at the same time usable for as many types of engines as possible—without too many modifications of the basic pump type. Also, of course, this pump had to be suitable for economic high precision manufacturing in big quantities.

Thirty years ago, in April 1927, Messrs. Robert Bosch GmbH (Germany) brought their first injection pumps into the market. As it was found later-on, this was as significant for the development of fast-running Diesel engines without compressor as the creation of the Bosch Magneto had been in 1887 for the solution of the ignition problem in petrol engines.

The history of the Bosch Fuel Injection Pump began in 1911, when

the company took up a new line of mechanical precision products by manufacturing lubricating pumps which had as working element, one delivery plunger and one control plunger for every outlet, so as to deliver the oil under pressure and in the appropriate (controlled) quantity at a time. The lubricating pump very soon brought the Bosch engineers in contact with the idea of fuel injection also. Still a lot

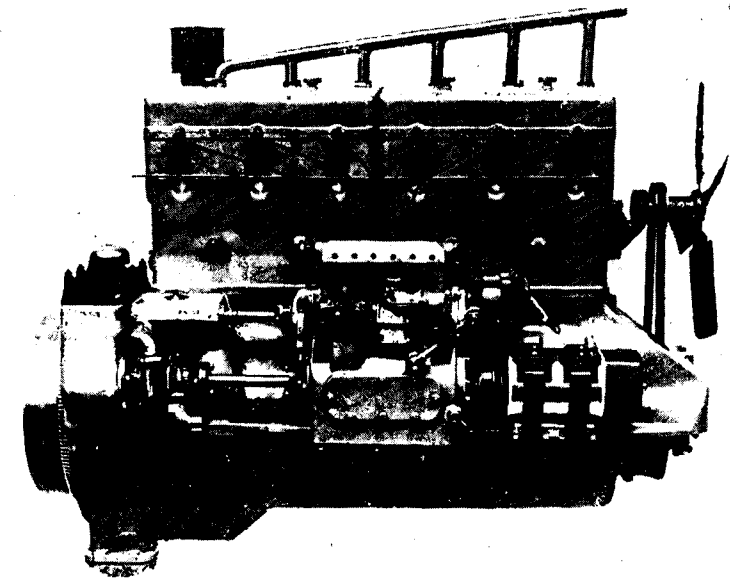
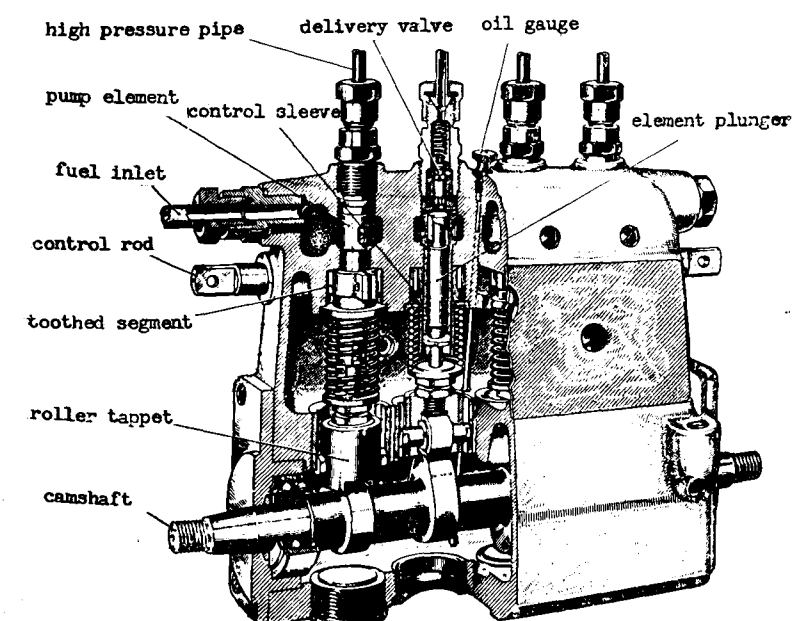


Photo shows a vehicular type Diesel Engine Mercedes Benz OM 5 with Bosch injection pump of the year 1927



A sectional drawing of the pump

of difficulties had to overcome when designing injection equipment for light, fast-running Diesel engines—particularly as the Diesel engines for vehicles being under construction at that time were carefully kept secret.

Extensive development work finally brought a successful solution. The Bosch Injection Pump of the year 1927 found the same confidence and appreciation as once the Bosch Magneto. Three years later already 10,000 pieces had been delivered, in 1934 it was 1,00,000 and in 1950 one million was reached. A comparison of the pump No. 20,00,000 which left the factory in 1955, shows that the construction of 1927 has remained the same in principle. This is probably the best approval for those who had collaborated in the careful development and precise manufacture of Bosch Injection Pumps. Today these pumps are produced not only in Germany, but, for instance, also in India where the Motor Industries Co. Ltd., (MICO), Bangalore, took up the progressive manufacture in 1953. So Mico-Licence-Bosch Fuel Injection Pumps and Injectors form part of an ever increasing number of indigenous Diesel engines for vehicular as well as for stationary purposes.

The Multi-Fuel ENGINE

Observations by Professor Dr. Ing. h.c. Fritz Nallinger, Member of the Board of Directors and Chief Engineer of Daimler-Benz A.G. on:

"The Multi-Fuel Engine"

Recently, numerous articles about multi-fuel engines have been published in technical journals, daily newspapers and even in illustrated weeklies. These articles were not promoted by our firm because we neither have nor have had any intention of carrying out a publicity campaign for the multi-fuel engine.

The multi-fuel engine which we, too, have developed seems to be, in our opinion, justified for tactical purposes only. It will hardly get any significant importance in the economic and commercial field and and the pure Diesel engine, the *sine qua non* for maximum economy,

will continue to lead in the commercial vehicle sector.

We developed multi-fuel units from our OM 321, OM 315 and OM 326 engines. They are genuine multi-fuel engines which can even be run on fuels of high aromatic content without any limitation of the octane rating or addition of oil or gas oil. The kinds of fuels usually to be employed are: normal petrols, super petrols, military grades of fuel and petrol-benzol mixture. The latter, however, cannot be used for starting. In addition, fuels for jet propulsive units, engine kerosene, normal Diesel fuels and lubricating oils may be used.

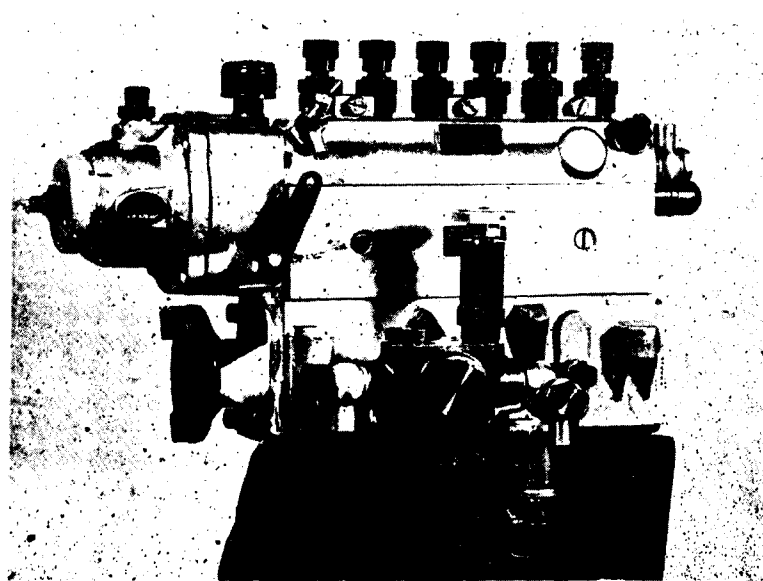
Measurements of the pressure distribution in the principal combustion chamber and prechamber, with reference to the angle of crank

rotation, have shown that our multi-fuel engines run practically without diesel-knock even when using the most varied fuels. It should here be mentioned that Golden Esso Extra, which was also used for these tests, has an octane rating of 99 ROZ.

Our multi-fuel engines render equal outputs, when being operated on Mogas and on gas oil, if, owing to the lower calorific value of Mogas, the quantity injected has been increased by adjusting the injection pump, owing to the lower calorific value of Mogas. The low specific consumption of this engine with four valves and central prechamber is one of its interesting features. The engine can be started as easily as our Diesel engines, *i.e.*, down to a temperature of 4° F (—20°C) without necessitating special measures, unless highly aromatic fuels are used. If the cooling water is warmed up, the engine can be started at temperatures of as low as —40°F (—40°C) even while the battery is cold. As soon as the engine has fired, it can immediately be subjected to full load without smoking. Tests on the stand have shown that even after the engine has been idling for two hours and has then been suddenly subjected to full load, it attains its maximum output after a few seconds only, without developing smoke.

In conclusion, it should be mentioned that our multi-fuel engines have proved excellent qualities in most severe trials and have been highly esteemed by neutral experts.

Mico Licence Bosch fuel Injection pump of the latest type made in Bangalore for Perkins P-6 engines



First in India

THE MADRAS MUSEUM

To the Government of Madras goes the credit of starting the first provincial museum in the whole of India. In the early years of the Madras Museum its chief interest was in the natural resources of the State and in its flora and fauna and ethnology. Surveys, for example, of the existence of iron ores, coal and building stones were carried out, and the results were published by the Madras Museum in the earliest years of its history. Interesting experiments were conducted on sylvicultural problems, some of the exotic trees now standing on the Museum grounds being the relics of such experiments.

The Madras Museum now has galleries devoted to Botany and Economic Products, Geology, Zoology, Archaeology, Arts and Crafts of Southern India, Ethnology, Prehistory and Numismatics.

Archaeological galleries

In the Museum's archaeological galleries—easily ranking with the finest in the country—Hindu temple architecture and Hindu sculptural art are illustrated by chronologically arranged series of Tamil, Telugu, Kannada and North Indian sculptures of many periods such as Pallava, Chola, Pandya, Vijayanagar, Chalukya, Nolamba, Hoysala, Gandhara, Gupta, Pala and Sena.

The finest specimens of early Buddhist sculpture in the stupas of the Krishna valley are from Amaravati in Guntur district. These consist of fine marble panels depicting numerous scenes from the life of the Buddha and the stories of the Jatakas such as the taming of the wild elephant, the division of the relics of the Buddha, the court scene, and the translation of the Buddha's bowl to heaven. Besides these world famous sculptures are the superb crystal reliquary caskets and gold ornaments from Bhattiprolu and the bronzes from Amaravati and Nagapattinam. Miniature models of the stupas of Sanchi and Amaravati give an impression of the glory of the classical age of stupa building. The evolution of the scripts of India is also illustrated in a series of stone inscriptions.

Historical collections

The Museum has a large collection of coins from all over India representing all the epochs of Indian History from the Satamanas and Puranas dating from about

Mauryan times to the English East India Company days.

The extensive trade relations between India and the Mediterranean in the early centuries of the Christian era are evidenced by the large number of Roman and Venetian coins unearthed in South India and preserved in this Museum. Antiquities from Arikamedu, an Indo-Roman trading station in South India, concerned principally with the manufacture and export of textiles and beads of semi-precious stones, form another price-less collection. The history of South India in the Hindu period is writ large on the four hundred copper-plate grants housed in this Museum while arms, guns, cannon, war trophies and historical documents of the East India Company reveal phases of British Indian history.

The natural history galleries of the Museum give a complete picture of the marine and terrestrial fauna of Southern India. Extensive collections represent outstanding types in each and every one of the groups, like corals, insects, worms, molluscs, and other invertebrates, fishes, reptiles, birds and mammals. A number of miniature diorama cases exhibit animals like the cobra and the starred tortoise in their natural habitat and a section is entirely devoted to a collection of foreign and exotic fauna.

Among the skeletons, a huge 60-foot whale skeleton is an impressive exhibit.

Botany

In the botanical galleries are exhibited specimens of the rich flora of Southern India of Scientific as well as economic importance. The classified exhibits include, besides representatives of the various taxonomic groups, such economic products as timbers, fibres, lac, resins, oil seeds and other raw materials used in medicine and industry.

Besides exhibits illustrative of descriptive geology, mineralogy and palaeontology, the greater part of the geological galleries illustrate minerals of industrial importance such as mica, manganese and corundum and industries such as glass, precious stone, building stones and lignite. A special exhibit is the illustration of fluorescence of minerals under ultra-violet light.

Pre-historic period

The life of ancient man in India over a hundred thousand years ago to the beginnings of the historic period is depicted in the prehistoric section of the Museum by a wealth of artifacts characteristic of the stone, bronze and iron ages in succession. World famous collections of palaeolithic and neolithic tools, ancient pottery, ornaments, beads, weapons of war, agricultural implements and ritual objects associated with urn burials and rude stone monuments or megaliths help us in understanding the culture and way of life of the ancient South Indians.

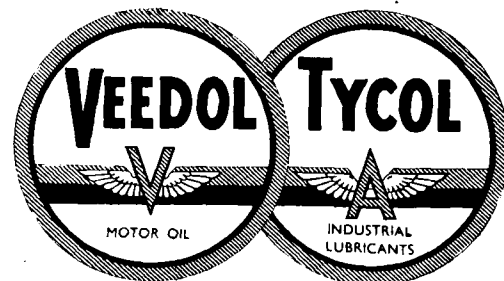
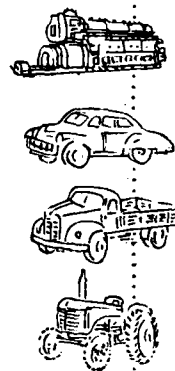
The ethnological galleries of this Museum give the visitor an insight in the ways of life of some of the principal aboriginal tribes of Southern India. Among these are the pastoral Todas with their buffalo-cult the food-gathering Kadars of Cochin and the Chenchus of Andhra; the Khonds, the Savaras and the Gadabas with their bison dance and the picturesque Lambadis of Telengana. Besides these, other exhibits such as dress, ornaments, weapons, writing implements, musical instruments and ritual objects enable us to understand the wealth and diversity of rural and tribal arts and crafts.

National Art Gallery

The opening of the National Art Gallery by the Prime Minister of India in 1951 synchronised with the inauguration of the Centenary Celebrations of the Museum. Exhibited in this gallery are some of the finest bronze sculptures of Southern India. Among these are the well-known dancing Siva of Tiruvalangadu and the exquisite Rama group. Paintings of the Rajput, Moghul, Ravi Varma, Andhra and Tanjore Schools are exhibited besides the works of some contemporary artists and sculptures such as Shri D. P. Roy Chowdhury. South India has been famous for its wood carvings, ivory carvings, brass lamps and brass ware, and printed textiles, specimens of which are exhibited in the National Art Gallery.

The research publications of this Museum maintain international standards of scholarship and have built up extensive exchange relations with most foreign countries. The Bulletins of the Madras Government Museum on temple architecture, metal images, coins and musical instruments have gained great popularity. The natural history and anthropological publications have established themselves as books of reference among students and scholars.

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Pilgrim Centres and Historic Sites

The pilgrim centres of Madras State draw visitors from all over India and the world.

Chidambaram has one of the most important South Indian Temples, wherein is enshrined Nataraja-Siva the dancer in the cosmic dance. The temple is famous for the Chit Sabha, four Courts, the huge image of Nandi, the exquisite carvings on the outer gopurams and the Sivaganga tank colonnade.

Kancheepuram, the Golden City, is sacred alike to worshippers of Siva and Vishnu. It is the best place for a close study of the antiquity of Southern India, of the Dravidian Civilization. It was the capital of the Pallavas while Saivism, Vaishnavism, Buddhism and Jainism have all had their influence on Kancheepuram in turn.

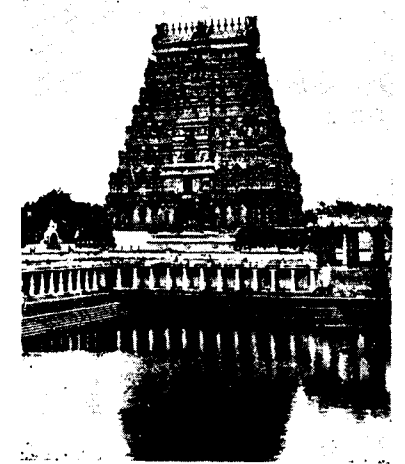
Kumbakonam draws mammoth crowds once in every twelve years, when the Mahamakha festival takes place. It is believed that this place was once the capital of the Cholas, as ruins of an ancient structure in a nearby village called Cholamaligai (palace of the Cholas) can be seen today.

Madurai, capital of the Pandya Kings, is the city of festivals. Believed to have been built in the reign of Viswanath Naik, the city testifies to the high order of the town-planning art in ancient India. The Meenakshi temple is a work of art: The 1,000-pillar mandapam and other pavilions like the Ashtasakti and Puthu Mandapams are wondrous sights.

Palani in Madurai District is a hill shrine dedicated to Lord Subramanya, the son of Siva. The temple stands on a picturesque hill, a continuation of the Kodaikanal range.

Rameswaram is an island off the mainland connected by the Madras-Dhanushkodi line. The Ramanathaswami temple, an excellent example of South Indian architecture, is in the form of a quadrangular enclosure 667 feet broad and 1,000 feet long. Its vast pillared corridors extend to about 4,000 feet—nearly six furlongs.

Srirangam, situated three miles to the north of Tiruchirappalli, is a picturesque island lying between the Cauvery and the Coleroon. The famous Ranganatha temple lies in the heart of the island.



Tank and temple of
Shiva at
Chidambaram

Historic sites

Mahabalipuram (Mamallapuram or the Seven Pagodas of the Pallavas) is famous for its monolithic rock-out shrines popularly known as rathas, ornamented caves excavated out of the rock on hill sides and structural buildings and temples. Of the ruined stone temples, there is only one survival.

The rathas are named after the Pandava brothers and their wife Draupadi, but they were originally Siva shrines. Mahabalipuram is about 50 miles away from Madras city by road.

Gingee in North Arcot is an ancient fortified city, closely connected in popular tradition with a legendary hero Raja Desing. It has been preserved in all its ancient glory.



Sri Ranganathar
Temple
Srirangapatnam
Mysore

Some Tourist Centres of Madras

Madras has certain unique charms to attract the tourist. The two mountain ranges of the country meet in the State at a very pleasant hill station—Ooty. Again, the three high seas encircling the sub-continent meet at the Kanyakumari shore—the land's end of India.

While these are enough to satisfy those with a penchant for piquant sights the seeker after the abiding beauties of the creations of man's skill and nature's bounty can have his choice in several other hill stations, health resorts, monumental temples and in the symbols of an abiding civilization.

The State has three well-known Hill Stations in Ooty, Kodaikanal and Yercaud and several health resorts, such as Courtallam. Situated on the summit of the Nilgiris—the Blue Mountains—Ooty commands an altitude of 7,500 feet rendering the air delightfully keen and bracing. The season at Ooty lasts from March to October and it can be reached by a good motorable road. It can also be reached by train by the Nilgiri Express. Coonoor, is a subsidiary hill station of the Nilgiris, on the way to Ooty. The chief attraction of Ooty to the motorist lies in the availability of vast level grounds at high altitude in a measure and manner unknown in other hill stations. Good motorable roads, pathways for hikers and horses, bring every beauty spot of the hills within easy reach of the tourist.

It is temperate all the year round with rainfall that is never more than 30 to 40 inches distributed throughout the year, falling as uncertain showers and drizzles but never in avalanches. The temperature on the whole seldom rises above 60°F and rarely falls below 50°F. Therefore its cold is bracing and its sun is never scorching.

Until recently the summer capital of Madras, Ooty came to be settled by Europeans from 1824 onwards. In the wake of the Government House, various Maharajas of the Indian States and other wealthy folk built manorial houses in the midst of tall silver oaks, blue gum trees, wattles and a wealth of other flora and fauna. Today Ooty has some five thousand well-designed houses of varying sizes dotted over the hills. They are very pretty in themselves and enhance the beauty of the place.

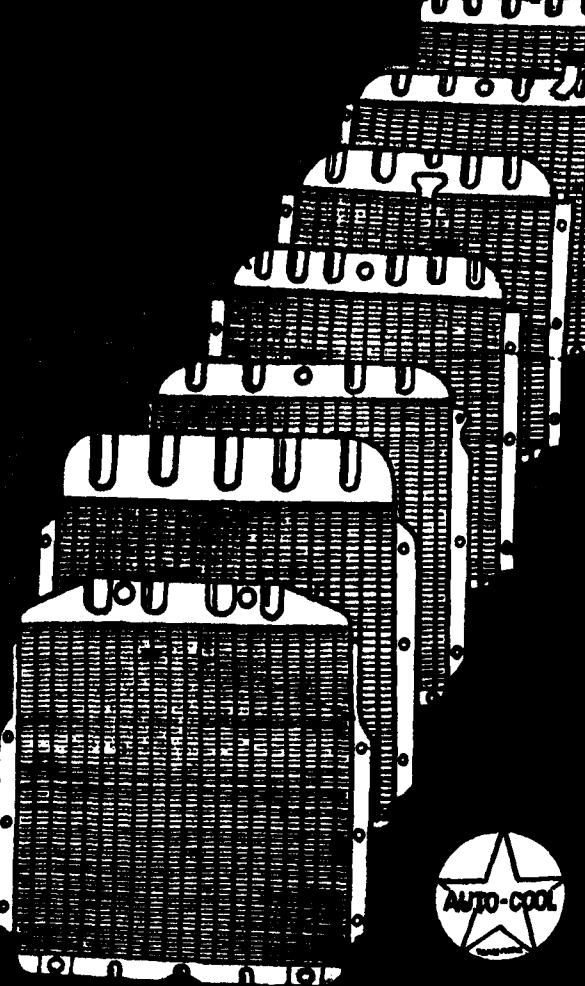
As the residents grew in number and the popularity of the hill station among visitors spread, amenities began to be provided.

Racing, golf, tennis, fishing, hunt meets and wild game shooting are some of the main attractions that draw the sportsman tourist to Ooty. The Wendoor Downs of Ooty afford pleasurable walks and miles of driving pleasure.

The Downs are easily reached from any of the three principal hotels of Ooty, being only a mile and a half

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natural state. Rest houses are available in the sanctuary and visitors can ride elephants cover the expanse of the sanctuary.

Besides the two mountain ranges, there are also several isolated blocks of hills in the State, important among them being the Sheveroy, the Pachamalais and Kollimalais of Salem and the Javadi hills in the North Arcot District. The Palni hills in Madurai District bears a beautiful hill station in Kodaikanal, the seat of the best known Meteorological Observatory in Asia.

The nearest railway station of Kodaikanal is the Kodaikanal Road Railway Station. From this point, a delightful run on the Ghat Road past rugged scenery for 50 miles brings the tourist to the "jewel" among the hill stations, Kodaikanal. Commanding an altitude of 7,000 feet Kodai records the lowest maximum in summer and the highest minimum in the winter, and for this reason, coupled with its low average humidity, it is more a health resort, than a paradise of pleasure. The best attractions of Kodai are its two vast shimmering lakes and several waterfalls, and as a hill station, it affords all amenities to the tourist, such as good hotels, several boarding houses, numerous bungalows and plenty of social life. The season at Kodai is from April to August. Some of the best scenic beauties of Kodai are the Dolphin's Nose, the Pillar Rocks, Coaker's Walk, the Pine Wood Walk, Pig Valley Walk and the Perumal Peak. Every facility for sports is available in Kodai including the best Golf Links and the best grounds for fishing.

A little expedition to Pillar Rocks would be exciting. The place is five miles from the lake. Three rocks stand shoulder to shoulder about 400 feet high, and sweep the plains from their peaks. Just at their foot is a pretty little cluster of trees, like the sholas of Ooty, where you can picnic rest. But it is the Perumal Peak or the Big Mountain that should be the ultimate ambition of any one visiting Kodaikanal. It is an all-day, all-out excursion and demands great exertion.

Sri Courtallanathar temple, Courtallam



Annual 1957



A view of the Kodaikanal lake

You can do the first seven miles by car along the main Ghat Road. Start your climb from the vicinity of Maryl and which is the cottage of the American Mission or what is known as the Neutral Saddle. The panorama embraces the entire country—Madurai, Virudhunagar, Tiruchirappalli, Palani, even the Nilgiris and the Kodai Plateau.

Courtallam

Courtallam, known as Spa of South India is a health resort on the plains. It is situated near Tenkasi at an elevation of about 550 feet on the southern arm of a deep bay in the Western Ghats. Long before it was discovered as a health resort, Courtallam was attracting for centuries crowds of pious pilgrims because of its waterfall and the temple.

Courtallam is within a short distance of Tenkasi Railway Station on the Madras-Trivandrum line, and it can also be reached by road right from Madras.

Unlike the hill stations Ooty and Kodai, Courtallam as a health resort is within the reach of poor and middle classes. It is becoming increasingly popular due to the interest evinced by the Madras Government to provide more amenities. Neat looking bungalows are fast springing up around the falls and the temple.

The season at Courtallam begins with the setting in of the South-west Monsoon in June and continues right up to the end of September.

Around the place is a network of branch roads connecting it by short routes with all the main roads of the neighbourhood. Possessing as it does fine waterfalls, delightful forest scenery, a temple of repute and during certain months of the year, an exceptionally cool climate, Courtallam, has long been a favourite resort of the people, whose desire is to relax and have a quiet time. Its annual rainfall is 58 inches, more than twice the average for the district. From June to September, the hills which overlook the Courtallam "bay" are over-cast with storm clouds, beaten up through the

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Ariyankavu pass by the winds of the South-west Monsoon ; and at a time when the rest of the district gets practically no rain, heavy showers are constantly falling along the slopes of the hills and over a few square miles of the country at their foot. Whether rain falls or not, the wind blowing through the hanging clouds reduces the temperature by ten or fifteen degrees below the average of the district and substitutes a delightful climate for raging winds and sand storms.

The natural scenery for which the place is justly famous is strongly reminiscent of the west coast. The road from Tenkasi leads up a gentle incline through wide stretches of paddy fields, green for nine months of the year and fringed with dense topes of cocoanut, jack, mango and arecanut trees, which drink moisture from a network of channels. Nearer the hills, the wet fields rise in tiers, deriving their supply from the numerous little tanks that intercept the hill streams before they join the Chitrar.

To the botanist and the sportsman, the jungle around Courtallam is equally delightful. As early as 1835, Courtallam neighbourhood was explored and actually 1,200 species of flowering plants were collected in an area of twenty square miles. It was calculated that at least 2,000 species were to be found and that the ferns were almost equal in number, Sambhur and higher up the hills, ibex are fairly numerous ; spotted deer are less common. Tigers make occasional descents, and pigs may be met with the jungle at any time or place. Jungle-fowl and spur-fowl are plentiful.

A road view in Ooty



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AIR TRANSPORT IN INDIA has come to stay

In the mellow light of westering sunshine that September evening, Joseph Lynn ran his eyes carefully over the huge balloon straining at the mooring lines and entered the box. And with the let-go signal, the balloon floated, smoothly skyward, amidst tumultuous cheers from the spectators.

A second attempt made by him from the same site touched near-disaster. The balloon descended plumb towards the sea, and he dodged death by inches. As he and his companion, Mr. Goary, threw themselves out into a passing boat and safety, the balloon blew up.

The scene was Lal Bag Gardens, Bombay ; the occasion : the first balloon ascents made in India.

These experiments overtly expressed the initial working of man's ingenuity the world over to wrest the secrets of aerial flight—and the halting beginnings of aviation in India, way back in 1877.

Today, the scene is different. More than what Mr. Lynn and other pioneer aviators could have imagined then have left the realm of conjecture. Air transport in India has come to stay.

Indian operators, both scheduled and non-scheduled, flew last year about 28.5 million miles—enough to cover some 60 round trips to the moon and back ! And between them they carried nearly 645,000 passengers and 182 million lbs. of cargo and mail.

Experimentation figured largely in air flights till 1911 the world over. In February that year, the Posts and Telegraphs Department of the Government of India, participating in the Industrial Exhibition held at Allahabad sponsored what is believed to be the first 'airmail' service in the world. It was a hop across the Jumna, from Allahabad to Naini, carrying the first official airmail. At the controls was the French aviator, M. Picquet.

With World War I, aeroplane flights in India were off for the duration. Pioneering attempts were witnessed later, off and on, but no planned approach came till 1927, when the Government set up a Civil Aviation Department. By the early thirties, air transport in India was showing organised patterns, leavened though by "imperial" interests. Progress was slow.

Three foreign airlines operated to and across India in 1938, while four Indian air transport companies operated scheduled services. The scheduled air route mileage for India in 1938 had been estimated at 6,700 the corresponding figure, for Britain being 25,477 miles and the U.S.A. 71,199. Even so, the Indian operators

had shown their mettle. They ran regular services pat on schedule—and with safety.

World War II gave a fresh fillip to civil aviation in India. Geared to war effort, services and frequencies under Government control spread out further. From the impact of war there emerged new techniques, and a generation more air-minded than its predecessor. Post-war development plans made some headway and, by 1947, there were nine Indian air transport operators.

Taken, by and large, civil aviation in India has done pretty handsomely during the last decade than in the previous two.

Amongst the significant sign-posts of development during the first decade of Independence are the introduction of the All-up Mail Scheme (all domestic mail by air) ; the Night Air Service (with planes from Delhi, Bombay, Calcutta and Madras converging on Nagpur, the focal point) ; the nationalisation of air services (two Air Corporations, one for internal and the other for external scheduled services) ; and the addition to the Indian fleet of new and yet more powerful aircraft.

By any yardstick, these are major achievements. And their cumulative effect is reflected in the fact that since 1947, passenger traffic has increased by nearly 105 per cent, cargo loads have gone up more than 17 times, mail loads more than eight, and miles flown more than 150 per cent.

Nationalisation of air services has helped planned utilisation of resources as well as development. Eight operators running internal scheduled services in 1953 were knit into one Corporation—the Indian Airlines Corporation.

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RECENTLY WAS A SEASONAL SERVICE TO LEH—THE HIGHEST AIRPORT IN THE WORLD.

Of the ten Viscounts—passenger capacity, 44—the I.A.C. has ordered, the first five are expected to arrive by October this year. The Viscounts are meant to take over the main trunk routes, the night airmail services and the routes to adjacent countries. The introduction of Skymasters in place of Dakotas on the night airmail service is just another instance of improvement of the Indian fleet.

Before August, 1947, India's external air services were confined only to Burma and Ceylon. The "Moghul Princess," the first of Air India International's Constellations, took off from Bombay, on its inaugural Bombay-London service, on June 8, 1948.

Today, the world's cities which Indian air transport serves read literally from A to Z : Aden, Bangkok, Beirut, Cairo, Damascus, Darwin, Dusseldorf, Geneva, Hong Kong, Kabul, London, Nairobi, Paris, Prague, Rangoon, Rome, Singapore, Sydney, Tokyo and Zurich. Air-India International has seven flights a week to U.K. alone.

No blind eye to the future, either. Mirroring the age to which it belongs, India's Air-India International has planned to bring into the highly competitive field of international air operation, three Boeing jets early in 1960. Capable of flying at over 600 miles an hour, above the weather, vibrationless, at altitudes of 40,000 feet, these pure jets are intended to carry some 120 passengers, both first and tourist. If present anticipations are any criteria, they are likely to reduce flying time between Bombay and London to just over nine hours.

Successful air transport implies more than mere aircraft. A high standard of airports, navigational aids and maintenance services are required to call the cues, as it were, for aircraft to undertake safe and speedy flights.

The Civil Aviation Department at present operates 84 aerodromes, three of which are international airports : Santa Cruz (Bombay) ; Dum Dum (Calcutta) and Palam (Delhi). Varied types of precision equipment, including those for night flying and air traffic control, have been provided at important airports. Round-the-clock vigil on the operation and maintenance of aircraft is kept at major aerodromes to ensure airworthiness of aircraft and safety of operations.

No less important is the provision of navigational aids. A net-work radio beacons, ranges and direction-

finding stations criss-cross the country to enable pilots to fly from one airport to another in complete safety.

One of the biggest wireless transmitting stations ever built in India, to cater to the needs of the aeronautical communication service is nearing completion at Dum Dum. Costing Rs. 65 lakhs, the station is expected to handle, on an average 4,000 messages daily on point-to-point circuits, besides the messages on air-ground channels. With 65 transmitters, the station will work on 80 different wavelengths and on 37 separate radio circuits.

The efficiency of crew and ground organisation is a pivotal factor in the matter of safety and regularity of air transport. Today, a host of key personnel—pilots, engineers, aerodrome officers, control operators, radio operators, pilot instructors and technicians are trained at the Civil Aviation Training Centre at Allahabad. Last year, the Allahabad Centre trained 376 candidates.

The role of Flying Clubs in imparting training in flying has assumed a new significance in Independent India. Twelve such clubs have been set up at Delhi, Bombay, Madras, Patna, Barrackpore, Bhubaneshwar, Lucknow, Jullunder, Nagpur, Jaipur, Indore and Bangalore.

Government of India have decided to subsidise the Hyderabad State Aero Club, now in Andhra, from the date the Club starts imparting training. By way of subsidies, the Government paid to the Flying Clubs a sum of Rs. 17.74 lakhs in 1955-56.

To promote airmindedness among the youth of the country, fifty scholarships have been awarded at the various Flying Clubs. Twelve of these went to girl candidates.

Air transport agreements concluded with foreign countries during the last decade epitomises the ever-increasing progress made by civil aviation in India.

Air agreements exist at present with 15 countries—Afghanistan, Australia, Ceylon, Egypt, France, Iraq, Japan, the Netherlands, Pakistan, Phillipines, Sweden, Switzerland, Thailand, the United Kingdom and the U.S.A. Temporary arrangements for the operation of scheduled services exist with another eight—Norway, Denmark, Sweden, Burma, Nepal, Italy, West Germany and Lebanon.

India is a member of the International Civil Aviation Organisation since its inception and a resident member on the Council of I.C.A.O.

Civil Aviation in India is striving for bigger strides in progress, but what has been achieved since Independence has been both remarkable and purposive.

A Report on the Indian Railways

The staggering growth of passenger and goods traffic has been the outstanding feature of the first ten years of the Indian railways' independent existence. Marked progress has also been made in the drive to make the country self-sufficient in railway equipment and in improving conditions of travel, particularly in third class.

Few amongst the 500 excited men and women who rode the first train in India—and in Asia—on April 16, 1853 could have foreseen the staggering growth of the Indian railways that has come about in over a century of their existence.

Few, indeed, would then have hazarded a guess that the first stretch of rail track from Bombay to Thana, a mere 21 miles would be the beginning of a network of rails which would eventually become the world's fourth largest.

COMPARED TO THE EARLIER PERIODS, THE PHYSICAL EXPANSION OF THE INDIAN RAILWAY SYSTEM SINCE THE LAST WAR HAS BEEN NEGLIGIBLY SMALL ; YET THE INCREASES IN TRAFFIC HAVE BEEN PHENOMENAL. PARTICULARLY SINCE THE ATTAINMENT OF INDEPENDENCE IN 1947-48, THE UPWARD TREND IN TRAFFIC—BOTH FREIGHT AND PASSENGER—HAS BEEN STRIKING.

During the years since the beginning of the last war the Indian people have demonstrably become more travel-minded. For every million of the population, the railways of undivided India carried an average of 4,100 passengers daily in 1931-32 (including Burma) and 4,390 in 1941-42. With partition, in 1947-48, a proportion of passengers as well as passenger coaches went to Pakistan. Yet in 1956-57, in India alone, an estimated 10,650 persons per million of the population travelled daily by rail.

To put it differently : whereas the average Indian performed only 1.74 railway journeys in 1941-42, he undertook 3.81 journeys last year—a reflection, no doubt, of the increased economic activity in the country.

Figures in the following paragraphs relate to Government railways only, and those for 1956-57 are rough estimates.

37.5 lakhs travel daily

Today, more than one per cent of the Indian people board the trains daily. Their total number on Govern-

ment railways was 981 million in 1947-48, the year of independence, and an estimated 1,370 million last year, representing altogether an increase of 40 per cent in the first ten years of independence.

The number of individual rail journeys undertaken in 1956-57 is expected to exceed 3.75 million daily—41.5 per cent more than in the year of independence.

With more Indians travelling more often, the work-load on passenger trains has increased, too. Every day passenger trains in India travelled 211,000 miles in 1947-48 and an estimated 306,000 miles in 1956-57, representing a 45 per cent increase during the decade.

A more accurate indication of the work-load is the passenger coach-vehicle miles index. The daily average here has increased from 33.6 lakhs in 1947-48 to 49.8 lakhs in 1956-57, representing a 48 per cent rise in ten years (B.G. and M.G. only).

The number of passenger coaches available to the Indian railways has not kept pace with the staggering increase in passenger traffic and this, inevitably, has led to overcrowding in trains. IT HAS UNFORTUNATELY NOT BEEN POSSIBLE TO SUBSTANTIALLY ALLEVIATE THE DISCOMFORT RESULTING FROM OVER-CROWDING ON ACCOUNT OF INADEQUACY OF PASSENGER COACHES AND LINE CAPACITY. EFFORTS ARE NOW BEING MADE TO EVEN OUT THE INCIDENCE OF OVER-GROWDING ON VARIOUS LINES, BUT ANY SIGNIFICANT OVERALL RELIEF IN THE NEAR FUTURE APPEARS TO BE UNLIKELY.

Goods traffic spurts

Much the same story unfolds itself on a study of the growth of goods traffic. A distinguishing feature here is that increases have been sharper during the last three or four years than during the earlier years of the country's independent existence. Indeed, if one is looking for striking evidence that India's economy is really on the

march under the impetus of planned development during the past few years, one need only look at the figures of goods traffic carried by the Indian railways.

A study of the figures of goods operation given in the tell-tale table below makes interesting reading :

Year	Tonnage carried (million)	Index increase (base 1947-48 = 100)
1947-48	69.8	100
1950-51	91.4	131
1951-52 (1st Plan)	96.7	139
1952-53 („)	97.1	139
1953-54 („)	98.1	140
1954-55 („)	105.8	152
1955-56 („)	114.1	163
1956-57 (2nd Plan)	126.0 (Est.)	181

The conclusion that the country's economy is "up and doing" is irresistible when it is realised that out of the estimated 81 per cent increase in goods traffic during the first decade of independence, 41 per cent came about during the first seven years, the remaining 40 per cent being crowded in the last three years.

The remaining four years of the second Plan period hold the prospect of a rising pressure of goods traffic—only on a more massive scale than anything experienced in the past. With 1947-48 as the base year at 100, the index of goods traffic in 1960-61, the last of the second Plan period, may shoot up to at least 258.

Resources lag behind

Have the rolling stock resources risen commensurately with the increase in goods traffic? The reply is "no." During the ten years since 1947-48, goods wagons on the line have risen only by 20.6 per cent and locomotives by 21.4 per cent. As already stated, the corresponding goods traffic increase has been of the order of 81 per cent.

The conclusion is self-evident. The railways have been getting more work out of their rolling stock through greater operational efficiency. This is proved by the fact that the (internationally recognised) composite index of operational efficiency, expressed in terms of net ton miles per wagon day, rose by 76 per cent on broad gauge and 31.5 per cent on metre gauge in the ten-year period since independence.

That the supply of additional material and manpower resources has lagged far behind the stupendous

traffic increases since independence, is also clear from other indicators : the capital-at-charge has risen during the ten-year period by 50.5 per cent, from Rs. 709 crores to 1,067 crores ; the total staff on the pay rolls is estimated to have increased by 40 per cent, from 7.55 lakhs to 10.5 lakhs. As against this, the corresponding traffic increases during this period are—passenger : 40 per cent ; goods : 81 per cent.

Although the total number of workers has gone up by 40 per cent, the total pay bill has risen by 58 per cent. It was Rs. 101 crores in 1947-48 and Rs. 160 crores in 1956-57.

Self-sufficiency drive successful

It would be appropriate in this ten-yearly report on the nation's premier transport system to refer briefly to achievements in certain other directions.

In any record of achievement of the Indian railways, a high place would assuredly go to their successful drive towards self-sufficiency. Dependence on foreign sources of supply has been eliminated in regard to passenger coaches, while all but a few specialised types of goods wagons are now manufactured within the country. A large range of other equipment, formerly imported, is now made in the country, and a separate Development Cell in the Railway Board's Equipment Directorate endeavours continuously to enlarge the scope of indigenous manufacture.

Two landmarks in the drive towards self-sufficiency have been the establishment of the Chittaranjan Locomotive Works in 1950 and the Integral Coach Factory in 1955—both pioneers in their respective fields, and the recipients of high praise from distinguished visitors in India and abroad.

The launching of the Ganga Bridge Project and the Calcutta Electrification Project have been two other notable events of the decade of independence. The latter will come to fruition when the first electric train runs in the Calcutta area in the near future. A number of new railway lines have been constructed or lines dismantled during the war restored, throwing open several undeveloped areas to the full impact of modern development.

Passenger amenities

The outstanding progress made in the field of passenger amenities has been another freely acknowledged achievement of the Indian railways since political freedom

became a reality. This progress has steamed from a complete reorientation of approach to the problem of comfort of third class passengers.

The dream of sleeping accommodation for third class passengers came true in 1954-55, even though on a limited scale. Reservation of seats in third class for long-distance passengers is another much appreciated amenity provided in recent years. The introduction of a number of all-third class Janata trains and of air-conditioned trains are two other steps which most aptly illustrate the anxiety of the Indian railways to make travel more comfortable for the ordinary passenger.

The provision for amenities for rail-users was Rs. 11.64 crores during the first five years beginning from 1947-48 ; The figure for the succeeding five years including the estimate for 1956-57 is Rs. 15 crores—or about 30 per cent more.

Staff welfare

Staff quarters and welfare activities have claimed an increasingly larger financial appropriation each year. Taking three-yearly totals since 1947-48, these have been : Rs. 16.33 crores ; Rs. 22.11 crores and Rs. 29.17 crores.

During the nine years ending 1955-56, 66,000 new residential quarters have been built, and at the end of the Plan period there were a total of 336,000 quarters for the staff.

Other increases : schools from 135 to 156 ; staff canteens from 26 to 169 ; hospitals from 61 to 80 ; and dispensaries from 283 to 426.

The estimated expenditure on staff quarters and welfare measures averaged Rs. 4.1 crores per annum during the first Plan period. During the second, the average annual provision is Rs. 10 crores.

Task ahead

The Indian railways, the country's largest peoples' owned enterprise and the world's second largest State-owned railway system, are set for greater achievements in the future years.

An idea of the expansion ahead of the Indian railways can be had from the fact that for every Rs. 1,000 spent by them during the first Plan period, they have been allotted over Rs. 2,655 in the second.

And it is recognised that even this is much too inadequate.

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Bicycling for health by elderly persons is strongly advocated by the "Herald of Health" in an editorial, extracts from which are given below :

We read recently the report of a speech made by Dr. Paul Dudley White who has become world-famous as a Cardiologist and has been the consultant to President Eisenhower.

Dr. White was speaking on the necessity of the people of America taking some step in order to be sure that they have a definite programme toward positive health. He suggested that exercise is one of the best ways of taking this step.

Dr. White is a cyclist and he advocates that cycle paths should be constructed in and around cities as a great answer to the soft push-button life of the city dwellers of today.

Interestingly enough, Dr. White urges that these cycling paths be used primarily by the senior citizens as a means of keeping themselves busier both physically and mentally.

The noted heart specialist declared, "Constant hard work never killed or hurt anybody." "Nothing is worse than for our senior citizens to retire and then drowse.....day in and day out." He says that the most active retired persons are those who live the longest. If we are to improve the world's health, a definite, positive programme of health protection must be developed to augment medical and surgical research.

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Cycling for positive health

"These things must go hand in hand if we are to conquer heart disease, cancer, arthritis and other major diseases," says Dr. White. Major factors in such a programme would be diet, and the omission of alcohol and tobacco, he stated. He believes that diet probably is of first importance to all of us.

We will have "a great resurgence toward conquering disease during the next decade." Dr. White predicted. He asks patience moral and financial support of various research programmes.

In stressing the importance of exercise, Dr. White pointed out that in America there are approximately 23 million bicycles wheeling over the land, but he stresses that these are being ridden mostly by children between four and fifteen years of age and that by the time those youngsters are sixteen, in the nature of things in America, they have their eyes on the family car. We recognize that the condition does not hold true in Southern Asia or in most other countries of the world. In Europe, for example, bicycles are still the common man's —and woman's transportation. There is an increasing tendency in America, for example, in colleges and cities to organize cycling clubs, and in the university city, Ann Arbor, where the University of Michigan is located, and where cars are prohibited among students, about 15,000 bicycles are used in that one city alone. Many of these cycles are being used by older students and professors. Some of the other colleges, notably Smith, has for generations been conspicuous because of its insistence upon the use

of the bicycle. It is because of the devotion of college girls all over America to the cycling tradition that the universally worn garment is called a "pedal pusher."

Obviously, we are not writing to an American audience, but we are presenting a situation that exists there as the basis for Dr. White's discussion on cycling and the basis for his recommendations. He suggests, for instance, that the mayors of Chicago, Baltimore, San Francisco and other such cities should construct paved bicycling paths for their citizens, such as are provided in London and in other European cities at the present time. Your editor is not so ancient, but he can recall that there were plenty of cycle paths in American towns and villages some years ago, even as there still are in some of our larger cities in Southern Asia, old bridle paths that could be very easily converted to cycle paths. It would be a shame to have these old bridle paths absorbed into the congestion of modern city

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life. They should be salvaged in some way and made useful for recreational pursuits by the city-dwellers whom we are forced to look upon as unfortunate people.

Dr. White points out that despite the "scorchers," heart-disease was less frequent some time back than it is now and he strongly advocates the return to a cycling hobby as a method of actually preventing the early onset of circulatory and heart difficulties.

We would, of course, not recommend that any oldster who has retired or who has done no active work for many years or even for just a few years, or who is particularly heavy, should go and purchase a bicycle and immediately go out for a five-of-ten-mile ride! That would be a very ridiculous thing to do. However, we would, with Dr. White, recommend to our readers who are a bit on the inactive side and who are lacking in open-air pursuits, that they obtain for themselves a cycle and ride it just a little bit to begin with, to tone up the muscles of the arms, the legs, the backs, the abdomen and to give a little more vigour to the lungs and to strengthen the circulatory system. Then gradually and intelligently they should increase the amount of effort that is spent on this activity so that they will in time build up their physique to the place where they will be better off physically than they have been for a great many years.

I think it is well recognized that one of the causes of so many heart-attacks is sudden over-exertion. If a person has been living a very sedentary life, if he has been very inactive and has not been

Annual 1957

THE BICYCLE

In Road Transport

BY N. K. AIYAR

In a talk on 'The role of Bicycle in Road Transport' delivered at the Indian Institute of Road Transport, Madras in September 1957 Sri N. K. Aiyar said :

The bicycle plays a very important part in road transport in India. Even so, it is not very often that this fact is recognised.

The bicycle is styled as the poor man's mode of transport. In my opinion, it is not too correct to say, that it is the poor man's transport. At best, it can be called the doing and heavy physical work for some time, if he should suddenly exert himself in a very strenuous way it might do irreparable damage to his heart, which has been weakened by his file of inactivity. The body in order to be strong must be kept active and alert at all times rather than being allowed to get sluggish as it does with so many when they achieve what they call "success" or when they retire.

Cycling is an exercise which brings into play almost of all of the muscles of the body and while it is a mild form of exercise, still it does encourage deep breathing and thus stimulates that circulation. So along with Dr. White, we would also like to add our little voice and say, 'For good health ride your bicycle.'

transport for the lower middle class. Amongst this category, I include some of the factory workers, whose earnings often far exceed those of many white-collared employees. It is, in short, a boon to the low income group.

Bicycle is essentially a transport for short distances. Many people prefer this way of movement, instead of using the common carriers, like buses, as they often reach their destinations quicker by this means. Moreover, apart from the capital investment involved, transport by cycle is much cheaper than by public carriers. As against perfect road surfaces required by motorised transport, the cycle can negotiate any kutchra or rough road.

ON A MODEST ESTIMATE, THERE ARE THIRTY TO FORTY LAKHS OF BICYCLES ON THE ROADS IN INDIA TODAY. Assuming that a major portion of these operate in mofussil areas, where there are no good roads, still a substantial portion is in use in the cities. By virtue of their use, a larger number of the population in many cities does not seek other means of transport, such as suburban trains or buses. To that extent, the congestion on the latter means of transport is reduced. The introduction of cycle rickshaws have also

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tended to shift the burden to some extent, from public carriers.

The bicycle industry in India was started more than fifteen years ago, but due to the Second World War, the industry did not make any substantial progress for some years. With the ushering in of independence in 1947 and the impetus and encouragement given by the Central Government to the development of Indian industries, the bicycle industry has made enormous strides, during the last seven years.

Besides the four major manufacturing units, T.I. Cycles, Sen-Raleigh Industries, Hind Cycles and Atlas Cycles, two of whom have foreign collaboration, there are a number of medium and small scale manufacturers, who have been given licences under the Industries Development Act. In all, the manufacturers and assemblers total about sixty-six. When all these factories are in full production, it is estimated that they will be able to meet the entire demand of the Indian market and also have an exportable surplus. It is anticipated that more than seven lakhs of bicycles will be produced in India in the current year, 1957.

The bicycle industry has received Tariff protection since 1947. The recent Tariff enquiry, third of its kind, held in February 1957, has recommended the extension of the protection for another three years, i.e., till the end of 1960, and the Government have accepted this suggestion. The Tariff protection has, no doubt, given a great fillip to the development of the bicycle industry in India. The Tariff Commission anticipates that by the end of the Second Five-year Plan period, i.e., 1960-1961, the annual require-



Mr. N. K. Iyer

ments of bicycles in India will be about 12.5 lakhs per annum, and there may be exports to the extent of 2.5 lakhs, or a total production of fifteen lakhs per year.

Although many factories have started manufacturing bicycles in India, the price is still a factor to be reckoned with. The quality of some of the bicycles manufactured in India, no doubt, compare very favourably with the imported ones. Even with Duty concessions on imported raw materials, the prices of Indian bicycles are high. It is, therefore, not easy for a poor man to own a bicycle, as the cost might be almost five to six times his average monthly earnings. If the prices could be brought down within the reach of the average buyer, there would certainly be a tremen-

dous increase in the demand for bicycles.

THE USERS OF BICYCLES ARE RAPIDLY ON THE INCREASE. The domestic servant who used to walk to the bazaar a few years ago requires a bicycle for his work. The newspaper boy, the vegetable seller, the milk man, the dhobi and other small traders and service men use the bicycles for their daily work. The school children have taken to cycling instead of using their school buses. With the spread of female education and the craze for higher studies overtaking the kitchens, more number of girls have also taken to cycling. The Policemen and Postmen are regular users of bicycles. The Community Projects officials, Social Welfare Organisers and similar employees use bicycles in large numbers for their daily rounds. Picnic parties use bicycles for their week-end trips, in growing numbers. In the mofussil, even the agricultural labourer has started using the bicycle for short trips like going to his field, to the nearest town to arrange for credit or for purchase of farm implements. In Northern India entire family shiftings are done by means of cycles. These are besides the enormous increase in the use of bicycles by office-going and factory people. All these must contribute to reduce the pressure on other means of transport, which, already are being subjected to their maximum strain.

Coming to the difficulty of more people being able to possess bicycles, as I have said earlier, the price factor is the stopper. If only the prices of bicycles could be brought down, while maintaining a high quality, the number of bicycles in use in India would be considerably higher. No doubt, certain progressive employers are encouraging their workers to buy bicycles by financing loans through their own offices or through Co-operative Societies. Certain other employers reserve a portion of the annual bonus payable to their workers for the purpose of buying bicycles for them. Although this may be done to ensure workers' attendance on time, at their places of work, the effort is extremely praise-worthy. The employers are benefitted by such methods and the workers are also equally benefitted because of their being able to possess an easy mode of transport which they can call their own and which will be at their service any time. Besides the industrial and commercial employers, the Government could very well finance their numerous employees, through Co-operative Societies or other Governmental financing bodies, for the purchase of bicycles. Another suggestable method to employers to enable their employees to own bicycles, will be for them to guarantee the credit to their employees, who themselves can obtain cycles on hire purchase arrangements, from some business houses. If all this is done, a large number of employees will go in for bicycles and consequently it will help reduce the pressure on road and rail transport, at least for short distances, to a great extent.

Besides the low investment cost in purchase of bicycles, the maintenance

cost is also practically nil. The normal life-expectancy of a good bicycle is more than ten years. There are also a good number of bicycles, more than twenty years old, which are still running on the roads in India. Of course, these may be imported ones. Some of the Indian made bicycles are as good as the imported machines, especially because the raw materials used, the processes of manufacture employed, the inspection tests they undergo, are all identical to those in Western countries and so they compare favourably with their foreign counterparts. Even assuming that the life-expectancy of the cycle to be ten years, the cost to the buyer works out to about Rs. 12 to Rs. 15 per annum and this is the cheapest mode of transport as compared to any other means of the road.

It may not be out of place to mention here that the Corporation of Madras and a few other Municipalities in the Madras State, recognising the importance of the bicycle as a means of cheap transport and its popular use, have withdrawn the taxation on it which was about Rs. 2 per half-year. This has considerably lessened the operating cost per year to the cyclists and has been an inducement to owning of bicycles.

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The bicycle occupies a worthy place in the system of road transport in India. It has, no doubt, contributed, to relieve the congestion on public vehicles to a substantial degree. With its evergrowing popularity, it is bound to further accelerate the reduction in pressure on public conveyance in the future.

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MOTORINDIA

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The History and Growth of the Madras Motor Parts Dealers' Association

BY V. KUNJITAPADAM

It is not prudent, while talking about the AUTOMOBILE INDUSTRY IN INDIA, to compare ourselves with the West. In the Western countries, the Automobile is considered as a necessity. In the East, more so in India, it is still looked upon more as a luxury than a necessity.

When this industry was in its infancy in our land say about 40 years ago, the sound of a horn will attract the school-going children and they will at once rush to the Trunk Road of the village for having a darsan of the wonderful automobile passing by with its long *BOA HORN OIL SIDE LAMPS* and various, now incipid, gadgets. Today in the same village most children can identify the makes, models, the year of manufacture, etc., of cars passing by, just at the sound of the horn or the peculiars squeaks and rattles of each Car or Truck.

COMPARING OURSELVES TO-DAY ONLY WITH THE EASTERN COUNTRIES, WE SEE THAT MALAYA HAS 780 AUTOMOBILES FOR EVERY ONE LAKH POPULATION, CEYLON 500, PHILIPPINES 386; WHILE INDIA HAS A RECORD OF ONLY 79 AUTOMOBILES FOR EVERY LAKH OF POPULATION. AREA-WAR, FOR EVERY ONE THOUSAND SQUARE MILES, CEYLON HAD 1,300 AUTOMOBILES, MALAYA 850, PHILIPPINES 650 AND INDIA ONLY 250.

Even this record of India was registered under various stages,

events that contributed to a fillip being after the last World War.

After the outbreak of hostilities in 1940, the country was facing a crisis in this industry. It was facing a problem of how to keep the existing Automobiles 'on the road.' Thanks are due to somebody, whoever it may be, to have copied the idea of using Charcoal Gas Fuel for generating the power required for cranking the engine. Maintenance was indeed a problem, that of spare parts one of the biggest. Wear and tear was terrible. Vehicles were consuming 3 to 4 times more spare parts than what was normally required. Wartime restrictions were coming. Prices of imported spare parts shot up hundredfold. Mushroom industries to make replacement parts were attempted at all places.

If I remember right, there were about 10 shops in Madras City dealing in AUTOMOBILE SPARES AND ACCESSORIES, then, of which five of them were Vehicle Dealers, rather their spare parts shops were obligatory additions to their franchises. The other five were independent Importers and Dealers, supplying the needs of all vehicles. They were more or less styled as non-genuine parts dealers inasmuch as they independently imported replace-



V. Kunjitapadam

ments parts from factories other than the vehicle manufacturers.

The soaring up of prices with lesser availability opened up opportunities to trade and scope for the manufacture of indigenuous duplicate parts. This opened the eyes of Parts specialists who interested themselves at this stage in getting into business. In less than 3 years after 1940, the number of shops opened in Madras and other principal towns of this Presidency (as States were then called) such as Bangalore, Coimbatore, Madura, Trichinopoly and Bezwada increased considerably. At the end of the year 1943, in the Madras City alone, there were about 40 shops with a good range of stocks. A good lot of money was

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invested and these shops were manned by experienced and trained Partsmen.

By this time naturally, war conditions had made the Government of India alive to the situation. To maintain an equitable distribution, prevention of hoarding and profiteering, the rationing system of parts under Permit System was introduced.

FOUNDED IN 1944

It was on the 11th hour, exactly the eleventh day of January 1944 the Motor Parts Dealers Association was founded with the sole object, to repeat from the minutes of the first meeting, "To promote the lawful and legitimate interest of Motor Parts Trade in general and conserve the rights of the members in particular." It was resolved to approach main Importers and Agents and establish a retail selling price for all main items with a fixed percentage of discount to cover inter-dealer transactions and to stick to those retail selling prices so fixed, so that the consumer will confidently get parts at the authorised or established selling prices. IN CASE OF ANY TRANSACTIONS DONE IN VIOLATION OF THIS PRINCIPLE, THE DEALER CONCERNED SHALL BE ANSWERABLE TO THE ASSOCIATION NOT WITHSTANDING ANY PENALTY IMPOSED ON SUCH DEALER BY LAW.

It may be worthwhile mentioning here an Association of this type was a necessity by that time inasmuch as there was none in this part of country to take care of the trade and consumers interest, in particular the motor spare parts trade.

When the Motor Spare Parts Control Order was promulgated in the year 1943, providing for regis-



Mr. P. Chandriah, last year's president

tered dealers and approved sub-dealers to effectively control the IMPORT AND DISTRIBUTION OF MOTOR SPARE PARTS, this Association that had sprung up was welcomed by many who became Members at once. Almost all the Members of the Association were recognised either as REGISTERED DEALERS or APPROVED SUB-DEALERS by the Government, as it was recognised that the main object of this Association was embracing the background of the control order.

Sri V. Kunjitapadam was the first President, Sri V. V. Mohana Krishnan, Secretary and Sri V. S. Mani Iyer, the Treasurer.

THE LIST OF PRESIDENTS, SECRETARIES AND TREASURERS FOR THE VARIOUS YEARS UP-TO-DATE IS APPEARING ELSEWHERE. THIS ASSOCIATION IS NOW OCCUPYING A UNIQUE PLACE IN THE HISTORY OF THE AUTOMOBILE INDUSTRY IN SOUTH INDIA, IF NOT OUR WHOLE LAND.

Readers will appreciate that it will not be possible, to trace all the events and the part played by individuals in the achievements of the Association in the several years past, through these columns. They are all reported in the yearly annual reports. Let me confine myself however, in tracing the nature of our work. The Association deal with—

1. the Import Control of the Government, to ensure equity in the matter of the Licensing System, Quota, etc., take up with the Authorities, should there be any procedural difficulties,

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2. keep contact with the I.C.T. at Ports and Central Headquarters, in assisting the dealers as well as the authorities in the matter of correct assessment of Imports,

3. maintain the link with other similar association in India concerned not only with Motor Spare Parts, but also, other trade interests, Chamber of Commerce, etc.,

4. represent to Government of any difficulties in the interpretation of rules made under Sales Tax, and other Taxes, both local and central,

5. represent at all Commissions, Tribunal, enquiry, etc., invited by the Government, offer evidences produce data, supply information, to enable the Government effectively deal with the issues in the best manner possible, and,

6. do all that is possible to maintain fair prices, fair deal, healthy competition, amongst its Members in particular and the Trade in general by several acts that includes, issuing of bulletins, keeping up regular office hours, observing holidays, settling trade disputes, etc. The Association has introduced a system of an inter-dealer transaction rebate of 1% among the members, to foster the cordiality and progress, at all times.

Besides being purely interested in our trade and trade alone, how often and at what all hours the Members have been alive to the requirements of public life, Civil, Social, Cultural and other human relations and activities, portraying the spirit and background of the Association, could well be imagined by the following events.

In the year 1953, when the Worshipful Mayor of Madras introduced the Mobile Medical Depots in the City, the Association collected



Mr. V. R. Mohanakrishnan, the first Secretary of the Association

special donations from the Members and presented a Mobile Medical Van to the Corporation of Madras at a cost of Rs. 6,000.

In the year 1956, to relieve the cyclone affected people, members made a lofty and generous gesture by individual special contributions; the Association presented a cheque for Rs. 4,115 to His Excellency the Governor of Madras for the Relief Fund.

The association has now a greater task to take up in the years to come. The country is in its implementation of the plans. The Second Plan is now on the anvil, shaping the Industrial Life of Our Land. The Trade must respond from all directions and support the Government in finding the necessary finances, realign its function by taking active part in the production and distribution of indigenously made motor parts, accessories and other items, at proper prices.

There is no doubt that this association is now fully keyed up to readily undertake any work that may be necessary to achieve our objective.

For the benefit of our readers we give below list of past presidents, secretaries and treasurers as also

the names of present office bearers and a complete list of members, etc.

We give below the names of the President, Secretary and other office-bearers of the Association for the current year for the information of our readers.

Mr. V. Kunjitapadam, President; **Mr. P. Chandriah, Vice-President**; **Mr. V. Narayanaswamy, Honorary Secretary**; **Mr. K. Vasudevan, Joint Secretary**, **Mr. S. M. Subramaniam, Treasurer** and **Messrs. S. Natarajan Indersain, Sardar Manohar Singh, T. S. Krishnamoorthi, S. S. Kalyanpur, V. A. Neelakanta Iyer and M. K. Govindaswami, Committee Members.**

PAST PRESIDENTS OF THE ASSOCIATION

Mr. V. Kunjitapadam, 1944; Mr. K. S. Narayana Iyengar, 1944-45; Mr. V. Kunjitapadam, 1945-46; Mr. Inder Sain, 1946-47 to 1948-49; Mr. V. Kunjitapadam, 1949-50; Mr. Inder Sain, 1950-51 and 1951-52; Mr. V. Kunjita-

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padam, 1952-53; Mr. L. L. Narayanan, 1953-54 and 1954-55; Mr. P. Chandriah, 1955-56; and Mr. V. Kunjitapadam, 1956-57.

SECRETARIES OF THE ASSOCIATION

Mr. V. R. Mohanakrishnan, 1944; Mr. S. Krishnamoorthy Iyer, 1944-45; Mr. Prem Raj, 1945-46; Mr. A. M. S. Mani, 1946-47 to 1950-51; Mr. S. Natarajan, 1951-52; Mr. V. R. Mohanakrishnan, 1952-53; Mr. S. Natarajan, 1953-54 to 1955-56; and Mr. V. Narayanaswami, 1956-57.

TREASURERS OF THE ASSOCIATION

Mr. V. S. Mani Iyer, 1944; Mr. T. K. Subramaniam, 1944-45; Mr. S. P. Ratnam, 1945-46; Mr. T. S. Pasupathy, 1946-47 to 1948-49; Mr. S. Krishnamoorthi, 1949-50 to 1952-53; Mr. S. S. Kalyanpur, 1953-54 to 1954-55; Mr. V. A. Neelakanta Iyer, 1955-56; and Mr. S. M. Subramaniam, 1956-57.

MEMBERS

The following is the list of firms who are members of the Madras Motor Parts Dealers Association and their addresses:—

Abdul Rahim, 14/1, General Patters Road, Mount Road, Madras-2.
Abdulla & Bros., 20, Harris Road, Mount Road, Madras-2.
Anand Automobiles, 24, General Patters Road, Mount Road, Madras-2.
Arasan & Co., 7-A, Imperial Bank Street, Mount Road, Madras-2.
Associated Accessories Private Ltd., 11, General Patters Road, Mount Road, Madras-2.
Auto & General Supplies Company, 1/18, Mount Road, Madras-2.
Automobile Components, 7, Imperial Bank Street, Mount Road, Madras-2.
Automotive Agencies Private Ltd., 12, Smith Road, Madras-2.



Mr. S. M. Subramaniam, Treasurer of the Association

Automotive & Allied Industries, Private Ltd., 52, General Patters Road, Madras-2.
Auto Parts Trading Co., 22, General Patters Road, Madras-2.
Auto Sales Company, 2, Imperial Bank Street, Mount Road, Madras-2.
Bajaj Bros., 159, Broadway, Madras-1.
Balakrishnan Bros., L.G., Transport House, Coimbatore Road, Karur.
Balu Automobiles, Trichy Road, Salem.
Bangalore Automobiles, Post Box No. 13, Salem.
Bashyam Reddi, N. V., Pugh's Road, Cuddalore N.T.
Bawa Motors, 10, Imperial Bank Street, Mount Road, Madras-2.
Bharat Agencies, 22/1, Sri Narasimharaja Road, Bangalore City.
Bharat Automobiles, 1/4, Sri Narasimharaja Road, Bangalore City.
Bharat Auto Stores, 99, Butterworth Road, Teppakulam Post, Trichinopoly.
Bharat Motors, 35, Mount Road, Madras-2.
Bharat Trading Co., 40, North Veli Street, Madras.
Bombay Motor House, 28-A, General Patters Road, Mount Road, Madras-2.

Canara Sales Corporation, Post Box No. 85, Mangalore-3.

Ceylon Agencies, 17, Mount Road, Madras-2.

Chakrapany Chetty & Sons, G.N., P.O. No. 29, Trichinopoly Cantonment.

Chari Trading Co., "Wellington", Mount Road, Madras-2.

Chimanlal Desai & Co., 6, Sunkurama Chetty Street, Madras-1.

Continental Distributing Co., P.B. No. 2223, Mount Road, Madras-2.

Eastern Automobiles & Engineering Co. (P.), Ltd., 24, General Patters Road, Mount Road, Madras-2.

Foreign Agencies, The., 153, Brodies Road, Mylapore, Madras-4.

Gajaraj & Co., Jail Road, Coimbatore.

Gemini Automobiles, 12-A, General Patters Road, Mount Road, Madras-2.

General Automobiles, 18, General Patters Road, Mount Road, Madras-2.

George Vint & Bhalla (India) Private Ltd., 7, Woods Road, Mount Road, Madras-2.

Globe Traders, 34, General Patters Road, Mount Road, Madras-2.

G. M. Automobiles, 18, Byran Jung Bahadur 2nd Street, Mount Road, Madras-2.

Gover, D. V., 5, Imperial Bank Street, Mount Road, Madras-2.

Hidustan Auto Stores, High Road, Chittoor.

Indian Engineering & Training Co., 26, Wallers Road, Madras-2.

Jayaraja Nadar & Sons, S.G., 14, Workshop Road, Simakal, Madurai.

Jaswant Vora & Co., 8, Imperial Bank Street, Mount Road, Madras-2.

Jupiter Agencies, The, 1, Motilal Street, T.Nagar, Madras-17.

New Motor House, 16, General Patters Road, Madras-2.

Neson's, 48, General Patters Road, Madras-2.
 Nishat Trading Co., 52, General Patters Road, Madras-2.
 Overseas Manufacturer Sales Co., 22, General Patters Road, Madras-2.
 Pioneer (Madras) Private Ltd., 23, Mount Road, Madras-2.
 Premier Auto Electric Private Ltd., 4, Pattullo Road, Madras-2.
 Presidency Motors, 33, General Patters Road, Madras-2.
 Rane (Madras) Ltd., 5, Pattullo Road, Madras-2.
 Rayala Corporation (Madras) Private Ltd., 1/155, Mount Road, Madras-2.
 Radhakrishna Automobiles, 17, Mount Road, Madras-2.
 Radhakrishna Motor Stores, 17, Mount Road, Madras-2.
 Ramanathan Company, A., 24, Tamil Sangam Road, Madurai.
 Ravindra Trading Co., 43-A, General Patters Road, Madras-2.
 Reliance Trading Co., 3, General Patters Road, Madras-2.
 Rudolphus & Co., 51-4, General Patters Road, Madras-2.
 Sat Pal Brothers, General Patters Road, Madras-2.
 Shenbaga Nadar, A.R. A. & P. V. P. Valasubramania Nadar, P.B. No. 63, Madurai.
 Shenbaga Nadar, A.R. A. & P. V. P. Valasubramania Nadar, 3/14, Macdonalds Road, Tiruchirappalli.
 Singson & Co. (India), 1/2, Imperial Bank Street, Madras-2.
 Spence Ltd., 24, General Patters Road, Madras-2.
 Sri Ramadas Motor Transport Private Ltd., P. B. No. 42, Subhas Road, Kakinada.
 Kannappan Motor Stores, 34, General Patters Road, Madras-2.
 Kasim Brothers, M. M., 14 and 15, Harris Road, Mount Road, Madras-2.
 Kapur Auto Agencies, 14-A, General Patters Road, Madras-2.



Mr. V. Narayanaswamy, Hony. Secretary of the Association

Khaliq Automobiles, 12, Imperial Bank Street, Madras-2.
 Kishore Automobiles, 22, General Patters Road, Madras-2.
 Lakshmi Motors, 35, General Patters Road, Madras-2.
 Madras Ball Bearing House, 17-A, General Patters Road, Madras-2.
 Madras Mercantile Agencies Private Ltd., The, 1/18, Mount Road, Madras-2.
 Madras Sales Corporation, 22, General Patters Road, Madras-2.
 Madura Auto Stores, 13-A, North Veli Street, Madura.
 Manickam & Co., P.B. No. 50, 156, North Veli Street, Madura.
 Mani's Modern Mart, 35, General Patters Road, Madras-2.
 Marikar (Motors) Ltd., 18, General Patters Road, Madras-2.
 Meenambigai Motors Works, Virudhunagar.
 Modern Automobiles, 4/17-A, Mount Road, Madras-2.

Modern Automobiles, Arunachala Achari Street, Salem.
 Modern Auto Stores, Bangalore Road, Vellore (North Arcot District).
 Modern Distributing Co., 65, Singanna Chetty Street, Madras-2.
 Modern Motors, 16, General Patters Road, Madras-2.
 Motor & Allied Agencies, 14, Mount Road, Madras-2.
 Motor & General Trading Co., 159, Mount Road, Madras-2.
 Narayanan, M. P., 81 and 82, Harris Road, Mount Road, Madras-2.
 Narayan Automobiles, 8, Imperial Bank Street, Madras-2.
 Nataraja Pillai & Co., K., 30 West Gate, Madura.
 Nathan Trading Co., 99, Poona-malee High Road, Madras.
 Sreedara Murugan Stores, Salem Main Road, Kallakurichi (South Arcot District).
 Upper India Trading Co., 1/18, Mount Road, Madras-2.
 Vijay Trading Co., 8, Imperial Bank Street, Madras-2.
 Viswam Motors, P.B. No. 38, Rajahmundry.
 Motor Sales Co., 60, General Patters Road, Madras-2.
 Coimbatore Automobiles, 10-22, Avanashi Road, Coimbatore.
 Scott & Pickstock Private Ltd., 2, Armenian Street, Madras-1.
 Y. Venkanna Chowdry, 52, G.N. Road, T. Nagar, Madras-17.

We give below for the benefit of our readers and the Trade, particulars about auto parts and allied firms who have responded to our request by sending us the history of their organizations. We had planned to publish a complete survey

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giving details of the rise and growth of the various firms particularly in the whole of South India, but we regret we could not give a complete picture since a number of firms have not returned the questionnaire forms filled in with details. However, we are extremely thankful to the following firms who have been kind enough to send us details about their business and its growth. Details received hereafter will be published in our regular issues.

RANE (MADRAS) LIMITED, 5, Patullos Road, Mount Road, Madras-2, was founded in the year 1929 by the late Mr. T. R. Ganapathy Iyer as a Firm dealing mainly in Automobile Spares. It was developed extensively and gradually by the late Mr. Iyer so that Car and Truck Sales, Distributorship of well known Car Parts, etc., all became part of the expanded Firm's activities.

Direct Importers of Spare Parts, Rane's are also dealers for Dodge Cars and Trucks for South India including Kerala State.

They are also sole-distributors in South India for Mico Licence Bosch Plugs, Zenith Carburettors, Borg-Warner Products and Detroit Gears.

Rane's are also, in the light of the changing circumstances in the country, moving forward in the matter of manufacture of vital automobile parts and it is learnt that a big scheme for the manufacture of Valves in collaboration with a well-known British Firm is now fairly well on the road to progress. When completed this scheme will enable India draw all her requirements from within the country thus saving a sizeable amount of precious Foreign Exchange.



Mr. T. G. K. Raman, Working Director of Ranes, a prominent member of the Association is now planning manufacture

The Directors responsible for the present expansion plans include Mr. L. L. Narayan, the Managing Director of the Firm and also Mr. T. G. K. Raman, Working Director.

THE MODERN AUTOMOBILES 4/17-A, Mount Road, Madras-2, was founded in 1936 by the present partners of the firm. Dealers in automobile parts and accessories for all makes of cars and trucks. Modern Automobiles from the beginning were direct importers of these spares. During the war they were one of the five firms in the City who were allotted quotas by the War Transport Department for the supply of spares. They are major stokists of Ford Genuine spares almost from their inception; they also specialise in Tata Mercedes parts.

The management is in the able hands of Messrs. P. Chandriah and S. M. Subramaniam.

MODERN DISTRIBUTING CO., 65, Singanna Chetty Street, Chintadripet, Madras-2, was founded in 1947 by Messrs. P. Chandriah and S. M. Subramaniam. They are

Importers of all car and truck parts and specialise in Dodge, Jeep and Perkins parts and accessories. Supply of truck parts is a speciality with this firm.

Sri N. Ramachandra Iyer, a leading business associate of Messrs. General Motors India, Ltd., Bombay, founded the Firm of Messrs. **BAHARAT MOTORS** at Madras in the year 1946. Sri V. Kunjita-padam (popularly known as Mr. Kunju) took full charge of running and building up this venture. As dealers for Messrs. General Motors India Limited, Bombay for the **BEDFORD TRUCKS, OLDS-MOBILE CARS**, the Firm had marked distinct progress to occupy a prominent place in the field within a few years, with their attached Showrooms at Mount Road and well-laid out Service Station at Greames Road. Their Spare Parts Service has been unique.

Messrs. Bharat Motors, which has now been taken over by a private limited Company, Messrs. N. R. Private Limited with Sri N. Ramachandra Iyer as Managing Director and Sri V. Kunjita-padam as General Manager are now covering the Madras State and a few Districts of Andhra as Dealers for the Fordson Major Tractors and Implements. Here again, the Firm has supplied quite a number of Tractors and Implements which are in use with the Madras Corporation, The Highways Department, leading Transport Operators and Industries, besides Agricultural Farms.

They are one of accredited Dealers of Messrs. Simpson & Co., Ltd., for Perkins Diesel Engines, Conversion Kits and Spare Parts and they undertake fitment of these in their specialised workshops.

This Firm is ably assisted by Sri S. Srinivasan who is in charge of their

Parts Department and Sri V. Krishnamurthy, Sales and Service Department.

'Courtesy reigns supreme' in this organisation and the Firm has built up a goodwill and has a number of plans of development on the anvil.

THE EASTERN AUTOMOBILE AND ENGINEERING Co., Private Ltd. is a Firm registered in the year 1953. Sri V. Kunjitapadam is the Managing Director of this Firm.

The Board of Directors to this Company consists of eminent men in the Automobile field including Sri N. Ramachandra Iyer of Messrs. United Overseas Service Private Ltd., Bombay and Sri V. Balasubramaniam of the Eastern Agencies, Bangalore and Sri S. Devisankaran. They deal in Motor Spare Parts and Accessories. Special lines of this Firm include WAXPOL Products, AUTOCOOL Radiators, Perkins Diesel Parts.

This Firm has a branch at Vizagapatam under style "WESTERN AUTOMOBILES" one of the leading Dealers in motor spare parts and accessories. They are distributors for Lambretta Scooters in the Vizagapatam and Srikakulam Districts.

THE WESTERN AUTOMOBILES, Vizagapatam, a branch of the Eastern Automobile & Engineering Company Private Limited, Madras was established in the year 1954. They are one of the leading Automobile Spare Parts and Accessories Dealers. As Lambretta Distributors for Vizagapatam and Srikakulam Districts, they have done very well. They are fast developing a Service Station with up-to-date equipment, to meet the longfelt need of the Operators in that area.

Mr. V. Sivaraman, who is in charge of the Show there is an amiable young man, with a very pleasant disposition, which is in fact an adornment to this budding set-up.

Sri V. Balasubramaniam, the Proprietor of Messrs. **EASTERN AGENCIES,** Sri Narasimharaja Road, Bangalore City, needs no introduction to our readers. The Eastern Agencies was started in May 1943. By hard work, fair deal and close contacts Mr. Balu has marked so steady a progress that this Firm occupies one of the foremost Automobile spare parts organisation of the 'City Beautiful'. Mr. Balu has got a knack of getting things in the right time, right from the source and offer at the right place at a competitive rate, which has naturally attracted his large clientele.

They are one of the Government recognised suppliers and they carry quite a comprehensive range of parts, components, accessories and major assemblies for almost all makes of Trucks and Buses.

MADRAS MERCANTILE AGENCIES PRIVATE LTD., 1/18, Mount Road, Madras-2, was started in 1942 by Mr. V. Kunjitapadam in partnership with Mr. V. Narayanaswami, both of them having then put in a long service in Messrs. Simpson & Co., Ltd. of Madras. In 1946, this concern was transformed into a Private Ltd. Company, and two years later in 1948, Mr. Kunju, as is familiarly called here, severed his connections from them. Since then, Mr. V. Narayanaswami, who took over the management of the affairs of the Company, is the Managing Director of the firm. At present, Madras Mercantile Agencies, concentrates solely on brake lining and clutch facings, as they are the sole distri-

butors for Mintex products manufactured by the British Belting & Asbestos Ltd. of England. They carry fair stocks of Mintex Brake Lining in rolls, ready drilled set lining and Clutch facings for all popular makes of cars and trucks. This firm has the support of big fleet operators and Government Transports in view of the quality products they handle. Incidentally, we may mention that Mr. Narayanaswami is the present Secretary of the Madras Motor Parts Dealers Association.

MOHSIN & COMPANY, 15, General Patters Road, Madras-2, was founded by Mr. Ghulam Abbas, Proprietor of the Firm. Specialists in Rubber Hose and Fan Belts, Mohsins are the sole distributors for Aeroplane Brand Carriage Rubber Tyres. They also deal in Auto Bus body materials, Plastic seat covers, Furnishing Rubber Accessories, etc., and have their head office at 112, Mannady Street, Madras-1.

KANNAPPAN MOTOR STORES, 34, General Patters Road, Mount Road, Madras-2, was founded in the year 1944 by the late Mr. M. V. Kannappan, whose name was so familiar in the automobile field in Madras. Dealing in Motor Spares and Accessories, they are also stockists for Tyres, Tubes, Batteries, Castrol Engine and Brake Oils. The firm is now in the efficient management of Mr. M. K. Govindaswami, a member of the Executive Committee of the Madras Motor Parts Dealers Association.

KHALIQ AUTOMOBILES, was founded in the year 1951 at Madurai by Mr. Athaj K. T. M. Husain Sahib. After a successful completing up of business, they found it necessary to expand and open a branch at Madras at 12, Imperial Bank Street,

Mount Road. Dealing in all motor spare parts and accessories, they are also stockists for and importers of truck and car parts, Atlas parts, Payen gaskets and oil seals, Morse Tuning chains for cars and trucks, German and Japan made goods and a large variety of imported items. They are also authorised distributors for Tyres, Batteries and oils and specialist in Ford trucks, Jeep and Perkins Diesel. Khaliq Automobiles are leading Members of the Madras Motor Parts Dealers Association.

L. G. BALAKRISHNAN & BROTHERS, Transport House, Karur, was founded in the year 1924 by Sri L. R. G. Naidu and has grown steadily since then and is now successfully working at Coimbatore and Dindigul. Under the able management of Messrs. L. G. Balakrishnan, L. G. Varadarajulu, L. G. Ramamoorthy and L. G. Nithianandam, Messrs. Balakrishnan & Brothers are automobile engineers and dealers and stockists for Perkins Engines and Spares. They specialise in Diesel Engine conversions, bus body building and engine reconditioning.

RUDOLPHUS & CO., 51/4, General Patters Road, Madras-2, was founded in 1939 by Mr. A. D. Rudolphus. Dealers in Automobile and Diesel Engines and Stockists for Diesel Parts, for Perkins, Fordson, Mercedes, etc., as well as Conversion Kits, they are specialists in Conversion Kits job. Rudolphus also manufacture Rudco Trailers.

AUTOMOTIVE AGENCIES PRIVATE LTD., 12, Smith Road, Madras-2, was founded in the year 1939 by Mr. J. Mukherji and has now three established offices in Calcutta, Bombay and Delhi as well. They are Sales Representatives for whole of India and are authorised distributors for famous manufacturers producing the British



Mr. G. C. Pattabiram, who has just returned from a three week tour of Russia

Kelsey Wheels, Airtex and Master Products, Perfection gears and clutches, Atlas Parts, Safe-stop Brake linings, pistons, etc. The management at present includes Mr. J. Mukherji, Managing Director and Mr. P. Mitral, Director. Mr. P. N. Mookerji is the Manager of the Madras Office.

G. N. CHAKRAPANI CHETTIAR & SONS, was founded in 1926 by Mr. G. N. Chakrapani Chettiar and is now ably managed by Messrs. G. N. Chakrapani Chettiar, G. C. Pattabiram, G. C. Subbukrishna and G. Ramasamy. They have offices at Madura, Tiruchirappalli and Tinneveli and are well known automobile dealers and engineers. The firm stocks Lucas parts, Exide batteries, etc., and are Sales Representatives for Burmah-Shell Petrol and Lubricants. They also specialise in body building. In Madura, Ramnad and Tinneveli districts they are dealers for Standard and Vanguard cars and in Tinneveli for Perkins engines.

M. M. KASIM BROTHERS, 14 & 15, Harris Road, Madras-2, was founded in 1949 by Messrs. M. M. Kasim and M. M. Ibrahim. Dealers in motor spare parts of various kinds, they are also specialists in surplus disposal truck parts.

THE INDIAN ENGINEERING & TRADING CO., Wallers Road, Madras, was founded in 1949 by its Proprietor, Mr. D. V. D'Monte. Dealers in Diesel Spares for Industrial and Vehicles Engines, Trucks, Tractors and Road Rollers, they also specialise in fuel injection equipment. They are Agents for Hercules Industrial Diesel Engines for South India. In all the above mentioned parts, they are direct importers and have ready stock for their numerous customers.

SINGSON & CO. (INDIA), 1/2, Imperial Bank Lane, Madras-2, was founded in 1948 by Sri Manohar Singh Sabharwal. Dealers of motor parts and accessories, they are also stockists for the French "PU-GUEOT" car parts. Singsons also manufacture "Singson" brand Hangers and Shackle plates for Chevrolet and Ford trucks. They specialise in all automobile parts for all models of American and English cars and trucks Perkins P-6. Mr. Manohar Singh Sabharwal is ably assisted by Mr. Surinder Singh Sabharwal. Mr. Manohar Singh is a prominent member of the Madras Motor Parts Dealers Association.

SRI LAKSHMI AUTO STORES, opposite Post Office, Tiruvannamalai, was founded in 1948 by Mr. V. Ramachandira Row. Dealers in motor spare parts and oils, they are also stockists for Ford Chevrolet Perkins parts and Wakefield oils, etc.

NISHAT TRADING CO., 52, General Patters Road, Madras-2, was founded in 1937 at Bombay and in 1951 at Madras by Sri Sardar Sahib Singh. Dealers in parts for trucks, Perkins, Tata Mercedes and other accessories, they are also stockists for all truck parts and conversion kits, besides being importers of all motor parts and authorised distributors for Donflex

clutch discs and brake linings. They specialise in Diesel and Tata Mercedes Truck parts and Diesel conversion kits and parts. The Manager of the Madras Office is Mr. Roshan Singh and the Sales Department is handled by Mr. Venkataraman. Their office in Bombay is one of the oldest and established Importers and their General Manager there is Mr. S. Balwant Singh Chadha.

GEMINI AUTOMOBILES, 12-A, Imperial Bank Lane, Madras-2, was founded early this year by Mr. M. Nizamuddin. Dealing in Perkins and Benz Diesels, they are also stockists for Truck parts. Their speciality is Diesel Engines.

THE ELITE AUTO PRODUCTS MANUFACTURING COMPANY, Lila House, Fench Road, Bombay-7, was established in 1955 by the partners Mr. G. C. Agarwal and N. J. Mirchandani. They have a factory at Dhaisar, near Bombay which is now in the process of expansion. They manufacture Lucas parts type of electrical accessories for cars. Mr. Agarwal, originally a textile technologist, started a motor garage in 1951 and was running the same till he started the partnership business in 1955.

RAVINDRA TRADING CO., 43, General Patters Road, Madras-2, was founded by Mr. Punjab Singh Chadha, Sardar Bishan Singh Chadha and Surinder Singh Kohli. Authorised dealers for Donflex clutch disc and brake linings, they are also specialists in Perkins P-6, Conversion kits for all American and English vehicles.

VIJAY TRADING CO., 8, Imperial Bank Street, Madras-2, was established in 1953 by the partners, Messrs. S. Panchapagesan, S. Natarajan, K. V. Venkataraman. They specialise in Diesel Conversion Kits and Perkins Diesel parts.



Mr. N. S. Murty whose firm S.R.M.T. of Kakinada is manufacturing many useful items

THE GENERAL AUTO-MOBILES, 18, General Patters Road, Madras-2, was established in 1940 by the Proprietor Mr. G. Radhakrishnan. Dealers in spare parts for English cars, they have parts for practically all the English cars, and is popular among auto dealers in Madras.

SAT PAL BROTHERS, 53/1, General Patters Road, Madras-2, was established in 1952 and the partners of the firm are Messrs. Satpal, E. Kishan and D. Bushan. They are dealers in Perkins parts, Tyres, Tubes, Batteries as well as all kinds of spare parts for English and American cars and trucks.

ABDUL RAHIM, 14/1, General Patters Road, Madras-2, was established in 1930 and since then have been serving the trade and the automobile owner quite efficiently. The Proprietor of the firm is Mr. Abdul Rahim and they are dealers in Motor Glass and Rubber Accessories and V. Belts, lines in which they specialise.

MARIKAR (MOTORS) LTD., 18, General Patters Road, Madras-2, was founded by the late Mr. H. O. L. Marikar in the year 1940. Dealers in automobiles, automobile spare

parts and accessories, motor cycles, Perkins Diesel Engines, Dunlopillo Products, etc., they are also stockists for G.E.C. Batteries, Ferodo products and Dunlopillo products. They are authorised dealers for Studebaker cars and trucks, Hindustan cars, Perkins P-6 Diesel Engines, Royal Enfield Motor cycles and Radios and Refrigerators. Present Directors of the firm are, Messrs. A. M. Marikar, Hassan Marikar, Parayeth E., Raman Menon, P. S. Padmanabhan, N. Sundereswaran, and Dr. A. K. Kunjalu. They are direct importers of spare parts and accessories against licences. They have offices at Trivandrum, Kottayam, Alleppey, Ernakulam, Trichur, Calicut and Coimbatore.

UPPER INDIA TRADING CO. PRIVATE LTD., Bharat Insurance Buildings, 1/18, Mount Road, Madras-2, was founded by Lala Devi Dayal as early as 1920 and now has offices at Bombay, Delhi and New Delhi as well. Dealers in automobile spare parts and accessories of all kinds, they are also stockists for Ferodo Brake and Clutch liners and authorised distributors for Lockheed products in Madras and Kerala States. Upper India are specialists in Auto novelties. Their Directors at present are : Messrs. Devi Dayal, Ramlal Shiv Ram, Indersain and Kul Bhushan. The managers of their various offices are Messrs. Indu Bhushan, Balraj, B. I. Chandhok and Kul Deep.

MADRAS SALES CORPORATION, Mount Road, Madras-2 was established in the year 1941 by Mr. V. R. Mohanakrishnan. Dealers in all kinds of spare parts for English and American cars and trucks as well as Diesels, they are the biggest stockists of English Covmo Pistons and W. & G. wires. Mr. Mohanakrishnan was the first secretary of the Madras Motor Parts Dealers Association.



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The advertisement features a central collage of various products including a large HIMCO box, a water distilling still, a non-ferrous metals melting furnace, and several ignition parts. A parrot is perched on the left side, and a track bond is shown at the bottom left. The text is arranged around the products, with the company name and address at the bottom.

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