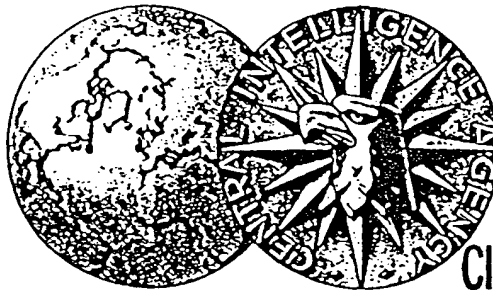


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# SOVIET ROLLING STOCK AND MOTOR VEHICLE INDUSTRIES



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## SOVIET ROLLING STOCK AND MOTOR VEHICLE INDUSTRIES

## SUMMARY

## 1. ROLLING STOCK INDUSTRY.

Industrial facilities for the production of railroad rolling stock in the USSR are located primarily in the Central Industrial Region and the Ukraine, although important plants have also been established in the Urals and East Siberia. Data on the production of rolling stock since the end of the war have been virtually indeterminate; in 1947 output may have approximated 830 locomotives and 60,000 freight cars (in terms of 2-axle units; actual production of freight cars, however, was to a great extent of 4-axle cars. See footnote.) At the close of 1947 the park of rolling stock, perhaps amounting to 26,000 steam locomotives and 815,000 freight cars (in terms of 2-axle units), was less than one-half of the United States in motive power and less than one-fourth in carrying capacity.

By 1955 the annual output of rolling stock in the Soviet Union may amount to 2,800 steam locomotives and 200,000 freight cars (in terms of 2-axle units). This would permit a locomotive park approaching in motive power the present inventory of locomotives in the United States, but the Soviet freight car park would still be substantially below that of the United States in aggregate capacity.

## 2. MOTOR VEHICLE INDUSTRY.

The Soviet automotive industry at present is concentrated in the Central Industrial Region. The bulk of the output is manufactured at two large plants, one located at Gorki and the other at Moscow. In 1947 production of motor vehicles in the USSR probably amounted to approximately 170,000 vehicles, over nine-tenths of which were trucks. At the close of 1947, the Soviet truck park probably was in the neighborhood of 1,000,000 vehicles, of which perhaps only 60-70 percent were actually in operable condition.

By 1955 the USSR may have increased the annual output of motor vehicles to 675,000 units, which would permit a park of approximately 2.6 million trucks. Because of anticipated technical improvements in Soviet vehicles and other factors, the proportion of the truck park in operable condition should be increased materially by that year.

Note: The information in this report is as of 30 June 1948.

The intelligence organizations of the Departments of State, Army, Navy, and the Air Force have concurred in this report.

Both production and park of freight cars in the USSR are measured in terms of 2-axle units. The 2-axle unit is an artificial measure based on number of axles rather than carrying capacity; hence, each 4-axle car produced, or in the freight car park, represents two 2-axle units. The 2-axle unit in terms of carrying capacity is therefore a variable measure, depending in different circumstances on the proportion of various size cars included. In the preparation of this study data were not available whereby the carrying capacity of the 2-axle unit could be calculated with reasonable accuracy in all contexts. Wherever possible, however, the capacity of the 2-axle unit is indicated in the text.

SOVIET ROLLING STOCK AND MOTOR VEHICLE INDUSTRIES  
ROLLING STOCK INDUSTRY

1. PRODUCTION.

The great bulk of goods are transported within the USSR by railroad facilities; in 1947 Soviet railroads carried approximately 85 percent of the total traffic within the country. Consequently, the plants manufacturing rolling stock rank as the most important of those producing inland transportation equipment.

The highest prewar output of rolling stock in the USSR amounted to approximately 1,500 locomotives (1935), 85,000 freight cars (in terms of 2-axle units) (1935), and 1,500 passenger cars (1934). During the immediate prewar years, however, production was substantially lower than the record levels, amounting in most of those years to 900-1,200 locomotives, 50,000-60,000 freight cars, and 800-1,200 passenger cars.

During the war Soviet output of rolling stock was negligible. Many plants, particularly locomotive factories, were in occupied areas and consequently damaged or destroyed; some railroad-equipment works were converted to the production of war matériel and others were evacuated to the east, thereby disrupting output of rolling stock. Not until 1946 was the production of rolling stock once again of consequence. Since the end of the war actual data on Soviet output of locomotives and freight cars have been virtually indeterminate. Output of steam locomotives may have amounted roughly to 300 units in 1946 and 830 units in 1947. Although small numbers of electric and Diesel locomotives also were produced, most of the output since the end of World War II have been steam locomotives. The principal models of steam locomotives now in production are rated in tractive effort at approximately 46,000 to 55,000 pounds compared to the average of 54,000 pounds for steam locomotives in use by United States railroads. Production of freight cars, in terms of 2-axle units, may have been about 30,000 in 1946 and 60,000 in 1947; in 1947 the 2-axle unit is believed to represent a carrying capacity in the neighborhood of 22 tons. Much of the output in those years, however, were actually 4-axle cars, having cargo capacities approximating 50 tons and about equal in size to those in the United States.

At the close of 1947 the park of rolling stock in the USSR was in general still slightly below mid-1941 levels. In December 1947 the inventory of rolling stock in the Soviet Union included about 26,000 steam locomotives and 815,000 freight cars (in terms of 2-axle units of about 18 tons). In terms of motive power, the Soviet park at present is less than one-half that of the United States and, in terms of carrying capacity, less than one-fourth.

2. PLANT.

In prewar years the rolling stock industry in the USSR was centered in the Central Industrial Region and the Ukraine. Among the major plants were those located at

Kolomna, Gorki, Bryansk, Bezhitsa, and Kalinin in the Central Industrial Region and at Kharkov, Voroshilovgrad, and Dneprodzerzhinsk in the Ukraine. Beginning with the Third Five-Year Plan, a number of plants were established eastward of the original centers, predominantly in the Urals and East Siberia; major plants are those at Nizhni-Tagil, Ulan Ude, and Krasnoyarsk. Nevertheless, the main centers of production at present, particularly for locomotives, are in general still west of the Urals; more than a third of the planned output of rolling stock in 1950 is expected to be produced in the plants of the Ukraine alone.

### 3. FUTURE PROSPECTS, WITH SPECIAL REFERENCE TO 1955.

Under the Fourth Five-Year Plan, the USSR expects by 1950 to produce rolling stock at the annual rate of 2,200 steam locomotives, 300 Diesel locomotives, 220 electric locomotives, 146,000 freight cars (in terms of 2-axle units), and 2,600 passenger cars. On the basis of available information, it appears that the planned output of steam locomotives, freight cars, and passenger cars should be approximately achieved. Production of Diesel and electric locomotives, however, probably will not materially exceed one-half of the planned output.

Assuming an increase in output in 1951-55, except for Diesel and electric locomotives, roughly equivalent to one-half that between average prewar output (1937-41) and expected output in 1950, the production of rolling stock in 1955 will amount to approximately 2,800 steam locomotives and 200,000 freight cars (in terms of 2-axle units). Disregarding possible imports and exports, this rate of production would permit an equipment inventory of nearly 40,000 steam locomotives and 1.8 million freight cars (in terms of 2-axle units). Although the Soviet locomotive park by 1955 would thus approach the present United States park in motive power, the Soviet freight car park, in terms of aggregate capacity, would still be substantially below the present freight car park in the United States. The production of Diesel and electric locomotives by 1955 should be at least at the planned rate for 1950; at this rate, the total number of these two types in the USSR in 1955 would still amount to less than a tenth of the total locomotive park.

## MOTOR VEHICLE INDUSTRY

## 1. PRODUCTION.

In comparison with the United States, the USSR at present produces relatively few motor vehicles. In the immediate prewar period, the output of the Soviet automotive industry amounted to only about one-twentieth that of the United States. In that period the USSR ranked about on a par with France and Canada in terms of the total number of vehicles produced. Because of the heavy emphasis given to the production of trucks, however, the USSR ranked second in the world as a producer of trucks, exceeded only by the United States.

Average Annual Output of Motor Vehicles<sup>1</sup>  
By Major World Producers, 1936-38  
(in thousands of vehicles)

	TOTAL	PASSENGER CARS	TRUCKS <sup>2</sup>
United States	3,917	3,195	722
United Kingdom	473	362	111
Germany	327	261	66
France	206	182	24
USSR	183	18	165
Canada	178	135	43
Italy	64	53	11

In the immediate prewar years (1937-40), output of motor vehicles in the USSR averaged about 204,000 units annually, of which approximately 85 percent, or about 175,000 units, were trucks. During the war, Soviet production decreased markedly largely because of the partial conversion of the automotive industry to the production of military matériel. Other deterrent factors, although probably less important, included the evacuation of equipment to the Urals and the wartime destruction of productive facilities. Output in 1943 appears to have been substantially under 100,000 vehicles. The reduced wartime output, however, was offset by imports of lend-lease vehicles; during the period June 1941 to September 1945, over 47,000 jeeps and 362,000 trucks were received in the USSR from the United States. Since the termination of hostilities in Europe, production of motor vehicles in the USSR has gradually increased, probably amounting to 95,000 units in 1945, 130,000 in 1946, and 170,000 in 1947. In those years production of trucks accounted for materially more than nine-tenths of the total output.

<sup>1</sup> Insofar as possible, the data represent production plus exports of parts and components assembled abroad; contrariwise, vehicle assembled from imported parts have been excluded, as far as possible, from the production data of the importing countries.

<sup>2</sup> Usually includes buses and special vehicles.

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Information on the total park of motor vehicles in the Soviet Union is far less satisfactory than for other factors relating to the automotive industry. The total number of trucks at the close of 1947, however, probably approximated the prewar (mid-1941) level, or in the neighborhood of 1,000,000 vehicles, assuming relatively high rates of retirement since the war.

Of more importance, the *usable* park of motor vehicles in the USSR has been markedly less than the total number of trucks and passenger cars in the country because of the small capacity and low productivity of repair establishments as well as the frequent necessity for repairs. In 1937, it was reported that only 55 to 60 percent of the vehicles in the USSR were actually in operable condition. This situation seems to have been prevalent throughout the prewar years. Probably but little improvement has been made to date.

For an adequate understanding of Soviet capabilities, certain special characteristics of the Soviet automotive industry and of Soviet vehicles must be briefly indicated. The first has been previously mentioned: the extreme emphasis on the production of trucks, which since the end of the war have accounted for materially more than nine-tenths of the total output of motor vehicles.

A second characteristic is the increasing obsolescence of the vehicles produced in the USSR relative to the motor vehicles manufactured in other major producing countries. Because of the overwhelming dependence to date of the Soviet automotive industry on foreign prototypes, particularly United States models, the degree of obsolescence may be roughly gauged by the average time lag between Soviet designs in production and the date of initial manufacture of similar designs in other countries. By 1940 the average time lag amounted to roughly 8 years; the obsolescence of Soviet designs was not decreased, of course, during the war.

A third characteristic is the relatively low quality of production primarily due to inferior plant equipment and inferior mechanical skills of labor.

A fourth characteristic of Soviet vehicles, and perhaps the most significant, has been the short vehicle life between major repairs. This factor has been influenced principally by difficult operating conditions—the rigorous climate, inferior gasoline and lubricants, poor roads, and inadequate maintenance and repair facilities—and by the lack of technical adaptation of motor vehicles to those conditions, rather than by poor quality and inferior performance standards of Soviet vehicles. Hence, short life of motor vehicles between major repairs in the USSR is a characteristic not only of Soviet vehicles but also of imported passenger cars and trucks. In prewar years, it appears that the mileage between major repairs for Soviet vehicles averaged 6,000 to 12,000 miles; moreover, reports on lend-lease vehicles imported from the United States and the United Kingdom indicate that major repairs were needed at the end of 6,000 to 9,000 miles. Repairs are not only frequently required, but also apparently are often greatly delayed because of the inadequacy of repair establishments. As indicated above, before the war as much as 45 percent of the total number of motor vehicles in the USSR have been inoperable at one time. Only recently, and for the newest models,

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have technical improvements been adopted by the Soviet industry to lengthen repair intervals and facilitate quick major overhauls.

## 2. PLANT.

The production of motor vehicles is concentrated largely in the Central Industrial Region. The two major automotive works are the Molotov plant (GAZ) at Gorki and the Stalin plant (ZIS) at Moscow. At the present time, virtually the entire output of motor vehicles in the USSR is produced at these plants. Two smaller motor vehicle factories are also located in the Central Industrial Region—a truck plant (YaAZ) at Yaroslavl and a passenger car factory in Moscow. These four plants, along with component and accessory plants which were also concentrated in the Central Industrial Region and assembly plants at Omsk in West Siberia and Rostov-on-Don, formed the prewar motor-vehicle industry in the USSR.

During the war and under the present five-year plan, there has been a marked attempt to disperse the automotive industry more widely. A number of new plants have been at least partially established; in general, however, such plants appear to have produced only negligible numbers of motor vehicles during 1947. During the war the Ural Motor Works, centered at Miass near Chelyabinsk in the Urals, was established, in part with equipment evacuated from the "ZIS" plant in Moscow. Other motor vehicle plants under construction, all of which apparently are to produce trucks, are located at Minsk in Byelorussia, Kutaisi in Georgia, Ulyanovsk on the Volga River in Kuibishev Province, Dnepropetrovsk in the Ukraine, and Novosibirsk in West Siberia. Most, if not all, of these plants probably will be in partial operation in 1948.

## 3. FUTURE PROSPECTS, WITH SPECIAL REFERENCE TO 1955.

Under the present five-year plan, the USSR expects by 1950 to produce motor vehicles at the annual rate of 500,000 units, of which 428,000, or about 85 percent, are to be trucks, 65,000 passenger cars, and 6,400 buses. About 70 percent of the output is scheduled to be manufactured at the two largest plants located at Gorki and Moscow. On the basis of available information and in view of the many difficulties involved, it seems probable that the USSR will not achieve more than about 80 percent of the projected goal, or an output of about 400,000 vehicles in 1950.

Assuming an increase in output of motor vehicles in 1951-55 roughly equivalent to that which is expected to take place in 1946-50, production in 1955 will amount to approximately 675,000 vehicles, of which perhaps about four-fifths, or 540,000 vehicles, will be trucks. At this rate of production and disregarding possible imports and exports of motor vehicles, the Soviet truck park at the beginning of 1955 would be in the neighborhood of 2.6 million vehicles.

The Soviet automotive industry no doubt will continue to rely heavily on foreign prototypes for design. There seems to be no indication at present that the time lag between initial production of a model in foreign countries and production in the USSR will shorten, and it may possibly become longer. By 1955 the newer Soviet vehicles



may approximate present United States models in design and performance.

More important than comparability in specifications between Soviet and foreign vehicles will be the degree to which trucks and passenger cars are adapted to Soviet conditions and the extent to which the rigors of automotive operation in the USSR are overcome. In general, considerable improvements in Soviet vehicles may be expected by 1955. Although the factors cannot be safely predicted, technical improvements designed to lengthen the life of Soviet vehicles in the face of difficult operating conditions should be widely adopted by that time. Moreover, any substantial improvement in roads, in gasoline and lubricants, and in maintenance and repair facilities will, in turn, improve the operating efficiency of the average vehicles in the USSR. Hence, by 1955 the proportion of the motor vehicles park which is actually in operable condition should be increased materially over prewar levels.

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