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Mr. Theodore L. Thau
Executive Secretary
Advisory Committee on
Export Policy
Department of Commerce

In response to your request, we are forwarding three (3) copies of a memorandum entitled, "The Soviet Motor Vehicle Industry's Need for Gleason Gear Cutting Machine Tools."

Director
Economic Research, CIA
8 May 1970

Attachment: (3)
As stated

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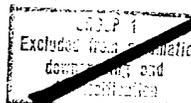
8 May 1970

The Soviet Motor Vehicle Industry's Need for
Gleason Gear Cutting Machine Tools

Background

1. The persistence of the Soviet efforts to buy Gleason gear cutting machines for bevel and differential gear sets for axles for trucks and passenger cars of the ZIL, GAZ, and UAZ plants is easily understandable in the light of the history of the Soviet automotive industry. The industry grew very slowly and improved very little technologically when it had to depend on indigenous resources. It progressed most rapidly when it received large injections of Free World managerial skill, equipment and technology. Rapid progress was achieved only (1) in the early 1930's, when Ford built the Gor'kiy Motor Vehicle Plant and equipped it with Model-A tooling, and (2) most recently in bringing the Volga Motor Vehicle Plant at Tol'yatti into production with the assistance of Fiat engineers, Italian money, and Free World equipment.
2. During the years since the end of World War II the truck industry, although it has grown steadily, has progressed much more slowly than desired by the planners and has stagnated technologically. New models, under development for years have typically come into production four and five years after dates originally announced for them. The existing product mix has become increasingly inadequate with the continued industrialization of the country. More than eighty percent of production consists of trucks with cargo capacities of 2 to 5 tons. Very few trucks are produced for light (pickup) duty or for heavy long distance hauling.
3. This is the last year of a five year plan period that was supposed to show not only a major increase in medium size trucks, especially those with all-wheel-drive, but was intended to provide a large increase in the output of the relatively neglected models in the very light and very heavy classes. None of these goals have been met. The goal for output of all trucks in 1970 was originally set at 600,000-650,000 (compared with 380,000 produced in 1965). The 1970 goal was subsequently raised to 750,000.

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As the following tabulation shows, the rates of expansion of truck production have continued to be disappointingly low during the period and output will not reach the lower end of the range originally planned for 1970.

<u>Year</u>	<u>Production (thousands)</u>	<u>Annual Rate of Growth (Percent)</u>
1965	380	--
1966	408	7.4
1967	437	7.1
1968	478	9.4
1969	505	5.4
1970	527	4.7*

4. All Soviet truck plants have expansion or modernization programs under way. Some programs, like that at GAZ, were in process long before the present five year plan period. The inability of the USSR to keep these expansion programs moving as scheduled probably stems from two factors. The first is the general over-taxing of the resources of the construction industry which presently retards the completion of many large Soviet investment projects. The second is the limitations of the Soviet machine building sector which is not oriented toward the production of the special purpose, highly efficient tools and equipment such as US machine builders have traditionally tailored for the needs of the US automotive industry. Even the assignment of high priorities to the automotive industry in the current five year plan was not able to produce the desired results, because the necessary specialized resources are too scarce to meet requirements -- a lack of experience in design and production of modern vehicles and a lack of experience in machine tool design for the automotive industry. The showcase passenger car plant under construction at Tol'yatti, the largest and most expensive manufacturing

* Planned rate of growth for 1970, published in Vestnik Mashinostroyeniya, February 1970, p. 5.

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facility ever built in the USSR, has been made possible only because of the purchase of thousands of man-years of Fiat automotive experience and the importing of more than a half billion dollars worth of specialized automotive machinery from the Free World on long term credit.

5. The purchase of the Gleason tools is crucial to modernization and expansion programs now under way at the two largest Soviet truck plants, GAZ and ZIL, and at the sole plant for producing light trucks and jeeps, UAZ. Many of the gear cutters at ZIL and GAZ are Gleason machines and over 25 years old, having been procured by the USSR during and immediately after World War II, before the end of Lend-Lease. Most of the others are Soviet-made copies, of whose performance bitter complaints can be read in the Soviet Press.

6. It is possible that UAZ light truck plant has no gear cutting machines and has its gears cut on the same machines that cut gears for the Volga passenger cars at GAZ. No foreigners have been allowed in the UAZ plant, not even the Gleason people who had the unusual opportunity to see GAZ. UAZ got its start as an assembly plant for GAZ vehicles, and it is not known how much of the production process has been transferred to UAZ.

7. If present US policy for not exporting truck technology to the USSR is maintained, the technology to be embodied in the projected heavy truck plant at Naberezhnyye Chelny (Kama Motor Vehicle Plant) will suffer. Not only will the USSR need US equipment for this plant if it is to be up to date technically, but the plant most probably cannot be built in the time period desired by the USSR planners without US managerial and engineering assistance. Unable to close the automotive technology gap from native resources, the USSR already has sought technical and material assistance for the Kama plant from every highly industrialized Free World country. To date, no country has been both able and willing to provide the formidable amount of management and engineering talent, and financing that this billion dollar plus project will require.

Soviet Truck Use

8. The total Soviet motor vehicle park contains between 4.5 million and 5 million trucks, compared with 17 million in the US. The Soviet military forces hold

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less than 5 percent of the park, the state and collective farms about 25 percent, common carrier services about 13 percent and the rest are held by individual enterprises.

9. The Soviet economy does not provide enough trucks for either the military forces or agriculture to satisfy peak requirements. During periods of mobilization, such as occurred when Soviet forces invaded Czechoslovakia in 1968, some trucks of civilian motor transport firms are diverted to military uses. Agriculture, with a park of about 1.2 million trucks, must be assisted during the summer harvest with trucks from military transport battalions as well as from the other civilian sectors. Secretary Brezhnev reported to the October 1968 Plenum that some 600,000 trucks must be diverted from other uses to assist agriculture for three or four months at harvest time.

10. Because of the general shortage of all-wheel-drive trucks, the motor pools of the Soviet military forces contain many conventional drive vehicles. Moreover, many all-wheel-drive vehicles are employed in the civilian economy in rural areas, oil fields and other areas with primitive roads. Because general purpose motor vehicles of both conventional and all-wheel-drive design are extensively used by the military forces and because all-wheel-drive vehicles are widely used in the civilian economy, it is not possible to distinguish by model between Soviet military and civilian trucks.

11. A general increase in the output of all types of trucks (possibly combined with the hard surfacing of the rural highway net) would allow the Soviet armed forces to be better equipped with the all-wheel-drive vehicles that are best suited to tactical operations. An increase in production of all-wheel-drive models is included in the plans of each of the existing plants desiring Gleason gear cutters. Moreover, an all-wheel-drive model is proposed for the perspective Kama plant.

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ANNEX

Individual Soviet Motor Vehicle Plants
For Which Gleason Machines Have Been Requested

The Gor'kiy Motor Vehicle Plant (GAZ)

12. GAZ is the USSR's largest motor vehicle plant. It was established during the first Five Year Plan period with the technical assistance of the Ford Motor Company and equipped with the obsolete Model A Ford production equipment. It started production of Model A Ford trucks and sedans in 1932. In 1969 GAZ produced 253,000 trucks of two to four ton capacity, about 70,000 "Volga" (GAZ-21) passenger cars, and an unknown number of combat vehicles.

13. According to the annual plan, GAZ is supposed to increase output by 5.5 percent in 1970. Moreover, specific mention is made in the plan of increasing the production of the all-wheel-drive trucks GAZ-63A and GAZ-66, and of introducing into production, in the second half of 1970, a new version of the Volga passenger car designated GAZ-24.

14. GAZ produces three general categories of trucks which employ the same basic major components -- engines, axles, transmissions, transfer cases, etc. The various models in current production are listed by category as follows:

a. Conventional Drive

GAZ-51A, 4 x 2, 2 1/2 tons cargo,
6 cylinder engine

GAZ-53A, 4 x 2, 4 tons cargo,
8 cylinder engine

Chassis of both of these models are used
by other plants for mounting bus, dump,
and other bodies.

b. All-Wheel-Drive

GAZ-63, 4 x 4, 2 tons cargo,
6 cylinder engine

GAZ-63A, same but with winch

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GAZ-66*, 4 x 4 tons cargo,
8 cylinder engine
Chassis of both basic models are
produced for mounting special bodies
in other plants

c. Combat (armored) Vehicles

BRDM-2 (also designated BTR-40PB2)

This is an armored car that incorporates the following standard GAZ components: engine, transmission, axles, hand brake, brake master cylinder, shock absorbers, parts of transfer case.

BTR-60PB

This 8-wheeled armored car has a highly specialized chassis but incorporates the following standard GAZ components: Engine, transmission, universal joints. It also uses modified GAZ-63 transfer cases. Drive to the wheels is accomplished in each of the four axles through spiral bevel and differential gears which could be made on the Gleason machinery.

The Likhachev Motor Vehicle Plant (ZIL), Moscow

15. ZIL is the second largest truck enterprise in the USSR and the oldest, having been established in 1924. It contains large numbers of US automotive machine tools and Soviet copies of them. However, no US equipment has been exported to ZIL since passage of the Export Control Act of 1949. As at GAZ, the production processes and product design are based on US practice. In 1969, ZIL produced about 160,000 trucks of from 4 1/2 to 5 ton capacity, and engines and components for larger prime movers, including those used for missiles. ZIL also

* (GAZ-66 is produced in special military versions that incorporate shielded ignition and control of tire pressure from the cab. In the Free World also, only strictly military vehicles employ these features.)

produces a luxury limousine in very small numbers, probably less than 25 per year.

16. About 30 percent of the trucks produced at ZIL are all-wheel-drive (6x6) models, the rest being conventional four wheel trucks. In addition to producing complete trucks, ZIL produces engines for tactical military vehicles produced by the Ural Motor Vehicle Plant in Miass. ZIL also produces some of the parts, including engines, for the all-wheel-drive (8x8) prime movers (BAZ-135) assembled at the Bryansk Motor Vehicle Plant.

a. Conventional Drive

ZIL-130,* 4x2, 5 tons cargo,
8 cylinder engine

b. All-Wheel-Drive

ZIL-157K, 6x6, 4 1/2 tons cargo,
6 cylinder engine

ZIL-131,** 6x6, 5 tons cargo,
8 cylinder engine

Engines and other components for the
BAZ-135, 8x8, 10 ton cargo, prime mover
and missile transporter, and engines for
URAL-375, 6x6, 5 ton truck, an all-wheel-
drive truck of military importance.

The Ul'yanovsk Motor Vehicle Plant (UAZ)

17. UAZ was built as a part of the early post WW II program for reestablishing and expanding the prewar automotive industry. Its first complete product was the GAZ-69, a jeep now called UAZ-69, the production of which it took over from GAZ in 1956. Initially, UAZ was very dependent on GAZ for components, but has become less so

* The ZIL-130E variant of this conventional drive vehicle has a water tight, electrically shielded ignition and electrical system. This feature is usually installed only on tactical (all-wheel-drive) vehicles.

** ZIL-131 is new and eventually will replace the ZIL-156K in production. One reason for a prolonged delay in shifting completely to production of ZIL-131 is a current inability to produce enough axles.

in recent years. In 1969 UAZ produced about 50,000 vehicles, of which about 15,000 were light trucks (UAZ-451 and 452), and about 35,000 were jeeps (UAZ-69 and UAZ-69A). Jeeps are used for command and reconnaissance in the Soviet Army, and also have civilian application.

18. Plans for the future development of UAZ call for the eventual production of 200,000 light trucks per year. Plans also called for the output of 130,000 trucks per year by 1970, but this is now a completely unrealistic figure. UAZ is the only plant in the USSR that currently produces jeeps and light trucks, similar to US "pickup" and panel trucks. Current production consists of the following models:

a. Conventional Drive

UAZ-45IM, 4x2, 1 ton cargo,
4 cylinders, panel
UAZ-451DM, 4x2, 1 ton cargo,
4 cylinders, pickup

b. All-Wheel-Drive

UAZ-452, 4x4, 0.8 tons cargo,
4 cylinder engine panel body
UAZ-452D, 4x4, 0.8 tons cargo,
4 cylinder engine pickup body
UAZ-452A, 4x4, 7-9 persons,
4 cylinder engine ambulance body
UAZ-452V, 4x4, 11 persons
4 cylinder engine, micro-bus body
UAZ-69, 4x4, 2 persons and 1/2 ton cargo,
4 cylinder engine 2 door jeep
UAZ-69A, 4x4, 5 persons and 100 lbs,
4 cylinder engine, 4 door jeep

All these vehicles use the same rear axle (5.125 ratio) and share many other parts. The USSR has no plans to produce passenger cars at UAZ. Some confusion might arise from the fact that in the USSR jeeps are called passenger cars. Many of UAZ's jeeps are used by the armed forces and have been shipped to less developed countries under Soviet military assistance programs.