

Once, long ago - well, 30 years ago - Russian race bikes were seen at the world's circuits. Their designers, and riders, dreamed of beating the best from MV Agusta and Honda. But the Vostoks (straight-four, four carbs, dohc) weren't up to the job and, finally, the dream faded.

RUSSIAN MOTORCYCLES

The past; and the future. The motorcycle industry of the former Soviet Union faces enormous difficulties. But Honda and Suzuki have shown an interest. . .

MOTORCYCLES were ridden in Russia as early as 1894. These early designs had been imported by individuals and speculative dealers. Two- and three-wheeled models from America and then European countries became increasingly popular, until 1913, when steps to produce the first Russian-built motorcycle began. With the use of bought-in components from the Swiss proprietary engine factory of Moto-Reve, and the Latvian bicycle works of Alexander Leytner and Co, a lightweight machine was to be assembled at the Dukas factory in Moscow. With the outbreak of the first world war, however, this project came to an incomplete conclusion; it was not until after the great October socialist revolution and the end of the following civil war that work could begin again on building up a domestic motorcycle industry.

In 1924, under the direction of P.N.L'vov, a group of engineers in Moscow introduced a motorcycle known as the Soyuz. Fitted with plunger-type rear suspension, this machine had a 500cc (80x100mm) single-cylinder overhead-valve engine mounted diagonally across the frame, very similar to

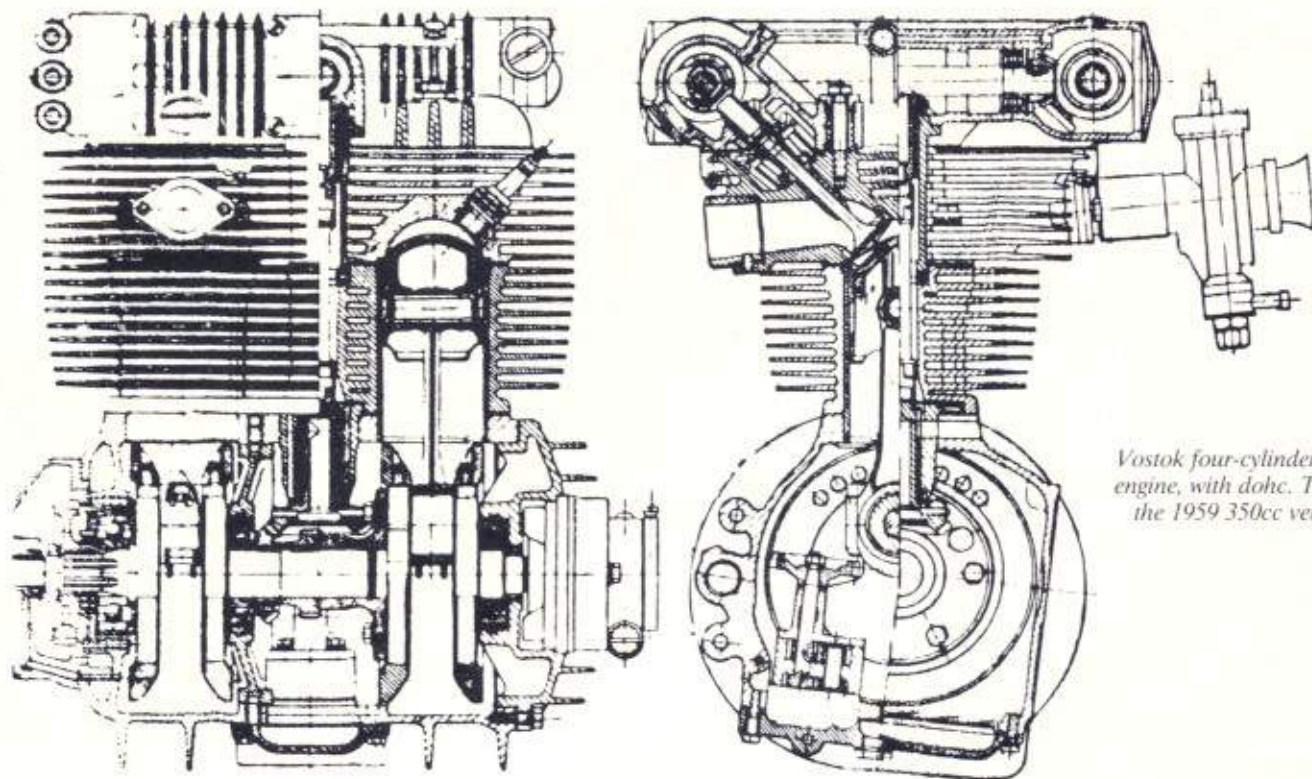
the Panther from Phelon and Moore of this period. Front suspension was provided by a leaf-sprung trailing-link fork, and transmission ran through a three-speed handchange gearbox and exposed chain drive. Further advanced features included a saddle-type petrol tank, rear drum brake, and handlebar-end control levers. Manufacture began the following year, but the factory then decided upon a change of policy, and the Soyuz was discontinued.

Four years later, a second motorcycle design team was set up at the Izhevsk Steel plant in the city of Ustinov, under the direction of a talented engineer, P.V. Mozharov. That year the new group designed, manufactured, and tested five new machines, known as the Izh-1, Izh-2, Izh-3, Izh-4, and Izh-5 models. The first two featured a V-twin engine of 1,200cc mounted across a forged-steel frame of quite massive proportions. The unit-construction engine and three-speed gearbox provided some 24hp, and a top speed of about 65kph. While there was no rear suspension, the front forks were of a leading-link leaf-sprung design, with the use of a central helical spring. Gearchange was by hand, the final drive by

an exposed shaft, and the wheels were interchangeable. The massive frame was similar, in basic design, to that of the well-known Zundapp machines used by the German armed forces some 10 year later, but the machine was of such proportions that the lower frame members were also used as the engine exhaust system. This ungainly giant was often used with a sidecar attached, which may well have been the best way to control the machine, with a wheel-base of 1400mm and wheels of 27 x 4in.

At this time it was not possible to start a production line at Izhevsk, and the P.V. Mozharov design group moved to Leningrad, where they concentrated attention upon their design for a lightweight two-stroke. The first batch of 25 machines were assembled in September 1930, and after successful trials the model went into production the following month. Designated L-300, this simple 300cc two-stroke became the first mass-produced motorcycle in the Soviet Union. The lightweight machine was a combination of forged steel and tubular construction, with girder-type front forks and a rigid rear end, with a single-cylinder engine supported in a forward, sloping position. The pre-unit engine, similar to DKW designs of the period, provided 6hp at 3,000rpm and a top speed of some 75kph. The transmission had a three-speed hand change gearbox, with exposed final chain.

A further team of engineers known as the Ukremto Enterprise assembled a similar lightweight, also in 1930; designated KhMZ-1M, this machine had been built in the city of Kharkov. It featured a single-cylinder side-valve engine with a displacement of 347cc and a power output of 9hp. Transmission ran through a three-speed counter shaft gearbox and an exposed



Vostok four-cylinder race engine, with dohc. This is the 1959 350cc version.

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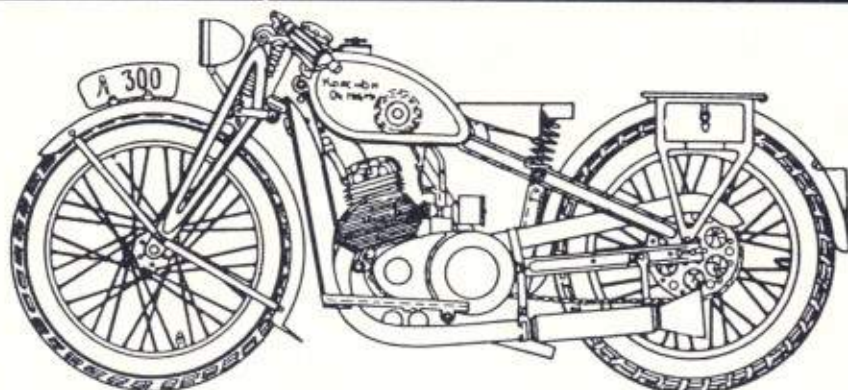
chain. Front forks were a trailing-link design, while the rear wheel was held within a rigid cycle frame. By May of 1931 a total of six of these machines had been assembled, before the project was abandoned for better known ventures.

The following year a special committee for motorcycle engineering was set up at the Heavy Engineering People's Commissariat, and this team organised a further enterprise in 1933. The test workshops of the Izhevsk Steel plant, became known as the Izhevsk Motorcycle Works, and within a short period started to produce the established L-300 design, which became known as the Izh-7. With an ever-growing reputation, the machine was soon in great demand, and as recently as 1990 the factory received letters from happy Izh-7 owners.

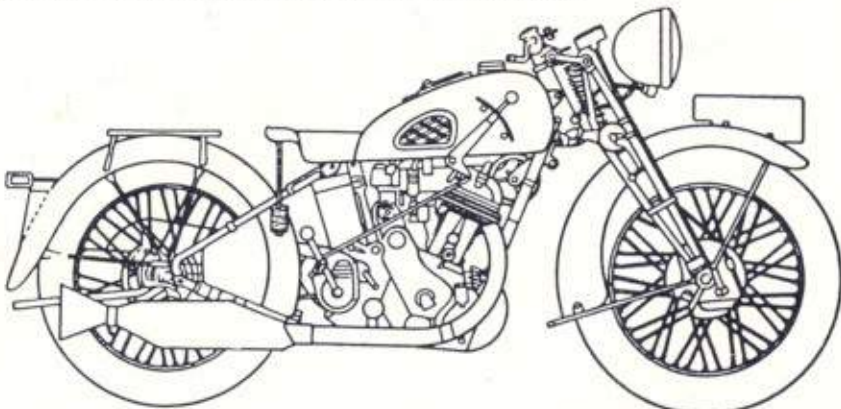
During this period a heavyweight motorcycle with a sidecar was being designed by the leading scientific and technical institute of automobile manufacture, the Scientific-Research Car and Tractor Institute, later to be superseded by the Central Red Labour Banner Scientific-Research Automobile and Vehicle Institute. In 1933 four of these NATI-A750 motorcycles were assembled at the Izhevsk factory to a design provided by the Institute, but after tests and minor modifications production was transferred to the Podolsky works. Re-designated the PMZ-A750, this machine featured a V-twin side-valve 747cc (70 x 97mm) engine and a four-speed hand-change gearbox, mounted within a pressed-steel cycle frame, with a leaf-sprung, trailing-link front fork and a rigid rear end. The engine provided 15hp at 3,600rpm and a top speed of 100kph. Perhaps inspired by Harley-Davidson, these machines were also used in solo form, and remained in production until 1939, when a number were adopted for Soviet military service.

The first Soviet motorcycle to adopt a tubular cradle frame, the TIZ-AM600 of the Tagnarog works, was introduced in 1935. Very similar in general design to contemporary western thinking, this middleweight featured a forward-sloping single-cylinder 595cc (85 x 108mm) side-valve engine and separate four-speed gearbox, with a hand change on the right side of the fuel tank. Equipped with girder-type front fork and rigid rear wheel, cycle frame dimensions provided a wheelbase of 1420mm and ground clearance of 125mm. The AM600 produced 16.5hp at 3,800rpm and a top speed of 95kph, and quickly became known as a sturdy bike with a reliable performance, and stayed in production until 1943.

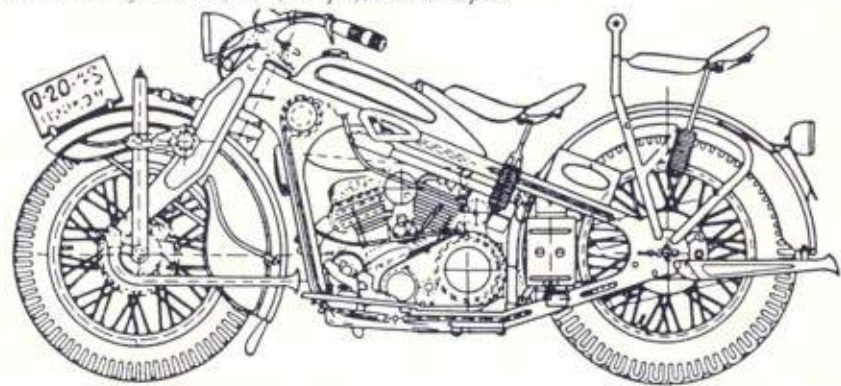
Produced by a team under chief designer V.V. Rogozhin and his deputy D.I. Zibzeyev, series manufacture of the Izh-8 began in January 1938, and the following year the Izh-9 went into production. These two-stroke models both featured a single-cylinder 293cc (74 x 68mm) engine, with the flywheel mounted under a pressed cover on the right side. This engine had a twin-ported



L-300. Introduced in September, 1930. A 292cc (74 x 68mm - oversquare!) single-cylinder two-stroke, this was the first mass-produced Russian motorcycle. Power output was given as 6bhp, at 3,000 rpm, and top speed a shade under 50mph.



This is the TIZ-AM600 of 1935, with inclined 595cc (85 x 105mm) side-valve engine in a tubular cradle frame - the first frame of this type to feature on a Soviet motorcycle. With its tank-side control for the four-speed gearbox, and tank panel, fish-tail silencer and generally robust construction, the AM600 was a match for contemporary Western machines. Performance, too (60mph), was on a par.



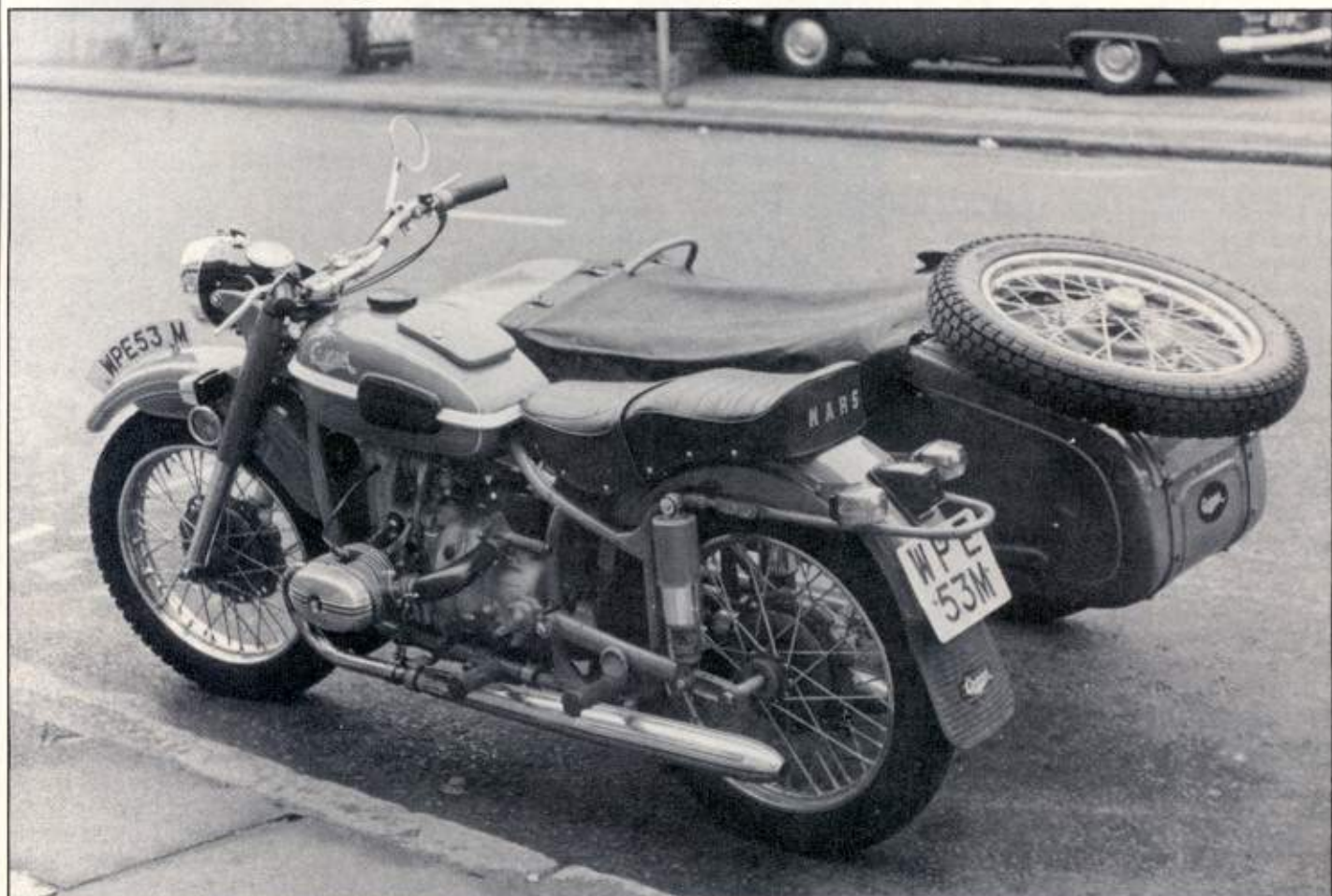
The PMZ-A750, introduced by the Izhevsk concern in 1933 and then transferred to the Podolsky works, where it carried on until 1939. An Indian or H-D relation, with 747cc (70 x 97mm) side-valve vee-twin motor developing 15bhp, at 3,600 rpm. Other statistics: top speed, 62 mph; weight, 450lb; 5in ground clearance.

exhaust system, and produced some 9hp at 4,000rpm, offering a top speed of about 90kph. Transmission ran through a three-speed separate gearbox, with a handchange, and chain final drive. The tubular and forged frame had girder front forks, with a wheelbase of 1370mm and ground-clearance of 105mm. Once again these machines were seen as suitable for the Soviet military and remained in service throughout the war as lightweight dispatch-rider mounts. The Izh-12 was introduced in 1941, with a single-cylinder two-stroke 346cc (72 x 85mm) engine, able to produce 13.5hp and a top speed of 105kph. But within a few days all

motorcycle production ceased at the Izhevsk works, and not for the first time the factory became a weapons manufacturer. Too late for military service, the Izh-12 was reintroduced after the war as the Izh-49, featuring a revised frame with telescopic front forks and plunger-type rear suspension.

Soviet production during immediate post-war years centred on four basic machines. These motorcycles became the initial point of development for a variety of later standard road and competition machines. The Kharkov K-1B was the smallest. Little more than a powered bicycle, this machine was powered by a single-cylinder two-stroke

The Soviets believed in huge production runs. Model development was very limited



In the 1970s the M62 Cossack — 650cc, 28 bhp — followed an old BMW pattern in its telescopic front fork and plunger rear suspension; it was often sold, at a very low price, complete with sidecar.

98cc (48 × 54mm) engine, with a two-speed gearbox and auxiliary cycle pedals. This was followed by the Moskva M-1A, with single-cylinder two-stroke 123cc (52 × 58mm) engine, with three-speed gearbox, also with exposed chain drive. While the K-1B had the old style hand-change gearbox, the M-1A featured unit construction, with foot change. The M-1A had a more robust frame, but was limited to girder-type front forks. Then came the Izhevsk Izh-49, as previously mentioned; this model was a further development of the pre-war Izh-12.

This left all the requirements for a larger solo machine, or the power unit for a sidecar outfit, to be provided by the heavyweight Moskva M-72. Built for strength more than speed, the M-72 had telescopic front forks and plunger-type rear suspension of very generous proportions. The engine had horizontally opposed twin cylinders with side valves, and unit construction four-speed gearbox, with shaft final drive. This 746cc (78 × 78mm) power source could produce 22hp at 4,600rpm, providing a top speed of 110kph solo and 85kph when used with a sidecar.

In February 1946 a conveyor belt system

for the first post-war Soviet motorcycle was set up at the Ishevsk factory. Designated the Izh-350, this machine became the Izh-49 some three years later. As with many Soviet motorcycles of this period, these machines had been influenced by pre-war German designers. This particular model closely followed the DKW NZ-350. While the engine followed general single-cylinder two-stroke design, with a twin-port exhaust system, the frame was also in a German style with channel-section steel pressings. With the adoption of telescopic front forks, the Moskva M-1A became the K-125 during the late 1940s and these machines could be seen to follow the general design of the well-known DKW RT-125. A design copied in numerous machines all over the world, including BSA in Britain, WSK in Poland, MZ in East Germany, and later the Japanese factory of Yamaha.

Military bikes

With such a limited domestic industry, virtually all Soviet motorcycle models have been in military service at some time. Perhaps, however, the most widely known Soviet military machines were the flat-twin

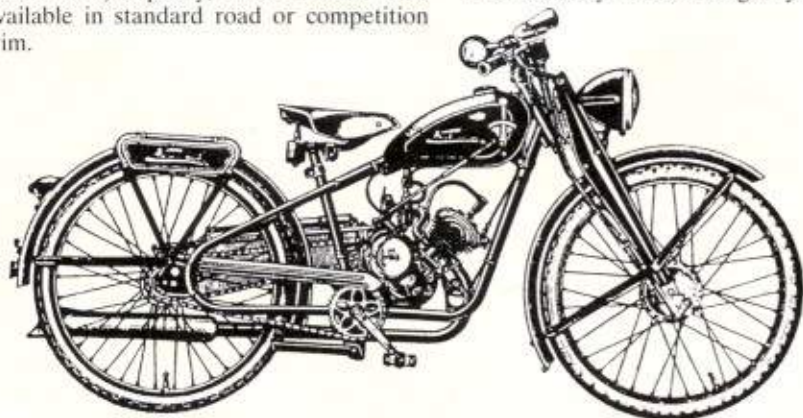
sidecar outfits. Known as the M-72, this model had been based upon the BMW R71, which had been made under licence at the Iskra Zavod plant in Moscow. The M-72 remained in production until the mid 1960s, when it was superseded by the K-750. While the K-750 retained the same side-valve engine, major new features included trailing rear-arm suspension, and adoption of full-width drum brakes. The military K-750 was eventually replaced by the Dnieper MT-12 in the late 1970s, and further changes included use of a four-speed and reverse gearbox. A differential was also incorporated into the final drive, which supplied engine torque in the ratio of one third to the sidecar wheel and two thirds to the rear wheel. A lock gave equal power to each wheel for use on steep hills. With the use of re-profiled camshafts and higher compression, the side-valve engine had an increased output, from 22 to 26hp. The MT-12 also featured a restyled fuel tank, improved lighting equipment, the use of traffic indicators, and redesigned suspension units.

Soviet factories believed in huge production runs, with limited development, and any new models were/are introduced every

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five years or so. While this gives all products a very dated appearance, manufacturing costs are kept to a minimum, and exporting can be seen as profitable. Unfortunately, for this philosophy, the dated looks and lack of development weigh heavy, when compared to modern designs worldwide. As with other state-owned plants, Soviet motorcycles used a large number of common parts among similar production runs. Although with a quite different performance, the Dnieper MT-12, for example, was very similar in general appearance to the MT-10, a 650cc (78 x 68mm) over head-valve machine and a further development of the K-650 from the same factory. As with their predecessors, these machines were manufactured in high numbers and exported to countries throughout the world. With improved facilities in 1946, however, the Izhevsk factory became the major Soviet motorcycle manufacturer, with ever higher numbers being assembled each year. In 1990 the Izhevsk works produced 350,000 machines and these became among of the most popular domestic sales.

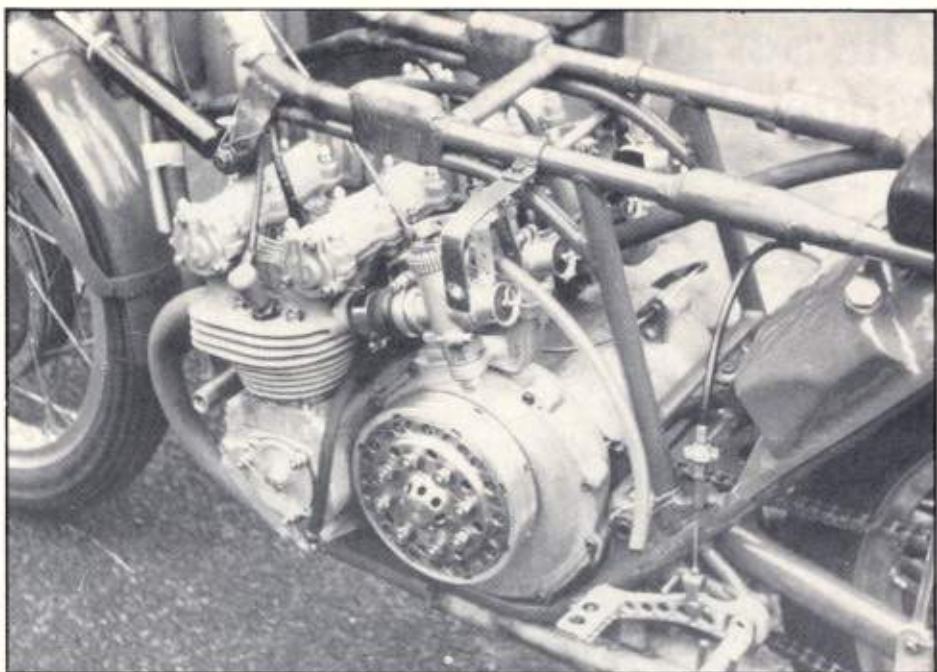
During the late 1940s, Voskhod motorcycles began production. Assembled at the V.V. Degtyarev factory at Kovrovsk, these light machines became highly prized in dirt track and various off-road racing events. Equipped with single-cylinder two-stroke engines of either 124cc (52 x 58) or 174cc (62 x 58mm) capacity, these models were available in standard road or competition trim.



K1B of 1946, basically a motorised pedal cycle. It kept thousands of factory workers mobile during the immediate post-war years. The engine is a 98cc (48 x 54) two-stroke, like that found in British-made autocycles of the same period. Power was quoted at 2.3bhp, at 3,900rpm, and there were two gears. Top speed: about 30mph.

To cope with the more severe conditions, during off-road competition, the Voskhod cylinder head and barrel were modified, with additional finning. The compression ratio was increased from 6.5 to 8.5, and without lighting equipment the machines weighed 8kg less. The carburettor could have a special air-filter. A stronger frame and suspension units were produced, with lighter mudguards to give greater clearance. Further modifications included a range of restyled fuel tanks of various capacities, depending upon entry in different events, and increasing cooling vents for the front and rear drum brakes.

Izhevsk machines have also been pre-

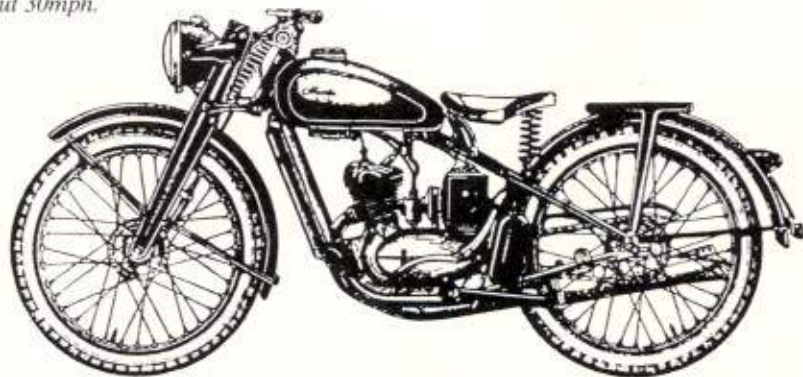


Vostok racer patterned on Gilera/MV Agusta layout in the early 60s, with dohc. Too heavy, not reliable. . .

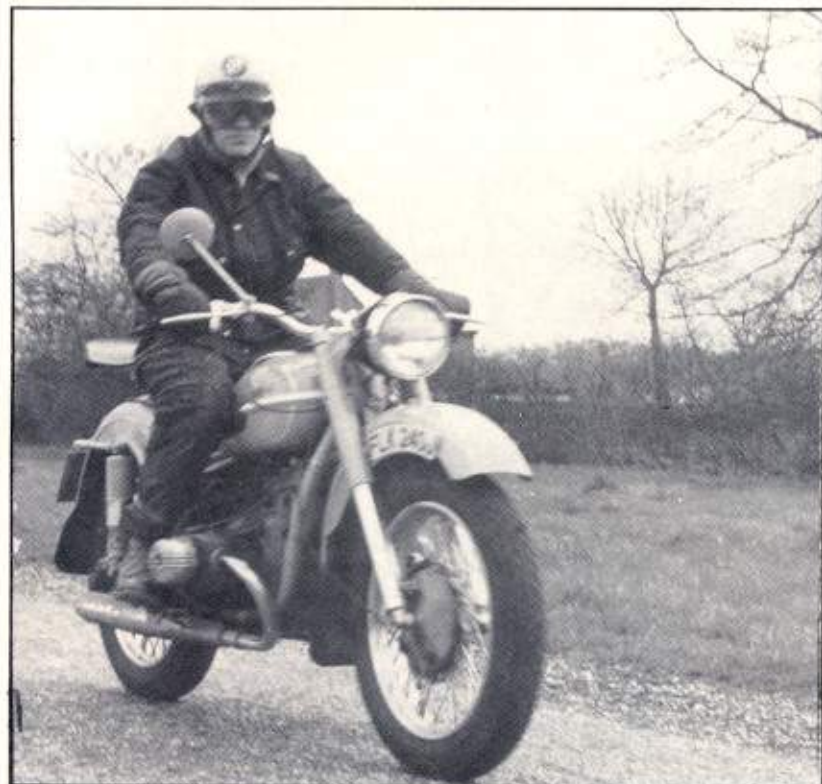
pared for off-road and road-racing events as standard factory models. With very similar modifications to the Voskhod machines, the Izhevsk works produced various models for trials and endurance events, and during the early 1950s the Izh-54 was offered for road-race competition. These machines all featured basically the same single-cylinder two-

stroke 346cc (72 x 85mm) unit-construction engine, with four speed gearbox. The Izh-54 also featured extra finning on the cylinder head and barrel, but with re-designed scavenging passages; with a larger carburettor, engine output was increased from 14 to 18hp. Compression ratio was also increased from 6.5 to 8, and with numerous changes the machines, weight was reduced from 150 to 105kg. The engine was fitted with an extra-long exhaust pipe, without a silencer, and to improve stability the telescopic front forks were equipped with a special reinforcing bridge. The most obvious modification, however, was the larger fuel tank, up from 15 to 28 litres.

Soviet motorcycle sport began as early as 1918, when a race was held from Moscow to Klin and back on July 14. The first all-Union trial run took place in 1929, with a route passing through Nizhny Novgorod, Yaroslavia, and Moscow. As Soviet motorcycle production was launched during the mid-1930s, so racing also became ever more popular, and very soon competitions in moto-cross, moto-ball, enduro, roadracing, hippodrome racing, speedway and ice-



M1A, of 123cc (52 x 58mm), also dating from 1946, and bearing a resemblance - around the engine, at least - to the BSA Bantam, and thus by extension, to the pre-war DKW.



Vostok racers had plenty of potential but failed to dent the supremacy of the Italian and Japanese factories in 1960s race machinery

Ural flat-twin as first imported into the UK.

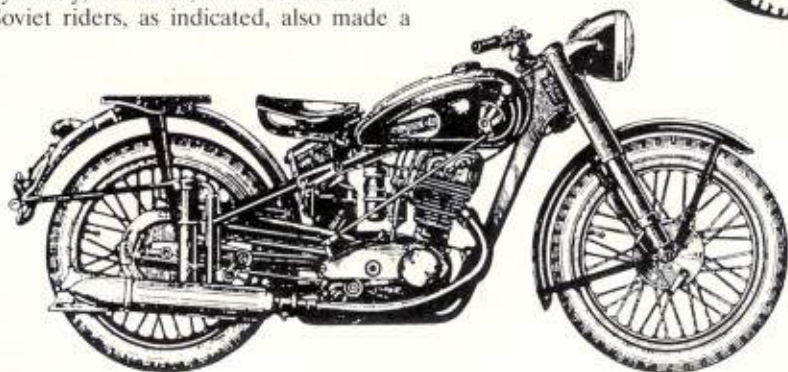
racing became regular events. In 1956 the Motocycling Federation of the Soviet Union joined the Fédération Internationale Motocycliste.

The Soviet Motocycling Federation had made various contributions to international sport. On its initiative, the first speedway races on ice were held in 1936, under the auspices of the FIM, and two European championships followed soon after. Since 1966, individual ice racing world championships have been held on a regular basis, and, on the proposal of the Soviet Federation, team ice racing world championships, as well as team moto-cross world championships. Soviet riders have maintained high positions for many years in individual ice racing; the Soviet speedway riders are also (many times) winners of the individual and team world championships, and their moto-ball players must be Europe's best. Some of the better known riders include such names as Piekhanov, Samorodov, Khlynovsky, Trofimov, and Kurilenko.

Soviet riders, as indicated, also made a

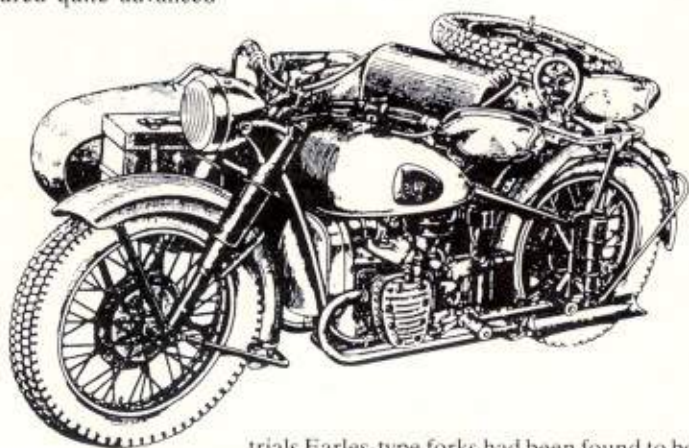
serious attempt upon world road-racing supremacy. During the late 1950s and early 1960s, a series of machines were designed and tested, with the single aim of providing a Soviet winner. Unlike anything previous these limited-production machines continued to be improved and developed. These Vostok machines featured quite advanced

The M72 entered the post-war era with a full record of military service behind it. It was usually fitted with a sidecar, but could be ridden solo at moderate speeds. The side-valve 746cc (78 x 78) flat-twin engine turned out up to 22bhp, was smooth and flexible. Shaft-drive, of course.



IZH-49 (1946) showing many points of similarity with the pre-war DKW 350. Top speed of the 346cc (72 x 85mm) 320lb machine was around 55mph, the four-speed gearbox controlled by hand lever. Note telescopic forks, German-style saddle, rear-springing.

twin and four-cylinder engines, all with a similar double overhead camshaft design. Engine capacities ranged from 123cc to 650cc, and these unit-construction units ran in a full cradle frame, with telescopic front forks and rear swinging arm. During earlier



trials Earles-type forks had been found to be unsuitable. Produced at a time when road-racing was not as specialised as it is today, most of these machines were also offered with alternative gearbox ratios, to be used during sidecar racing.

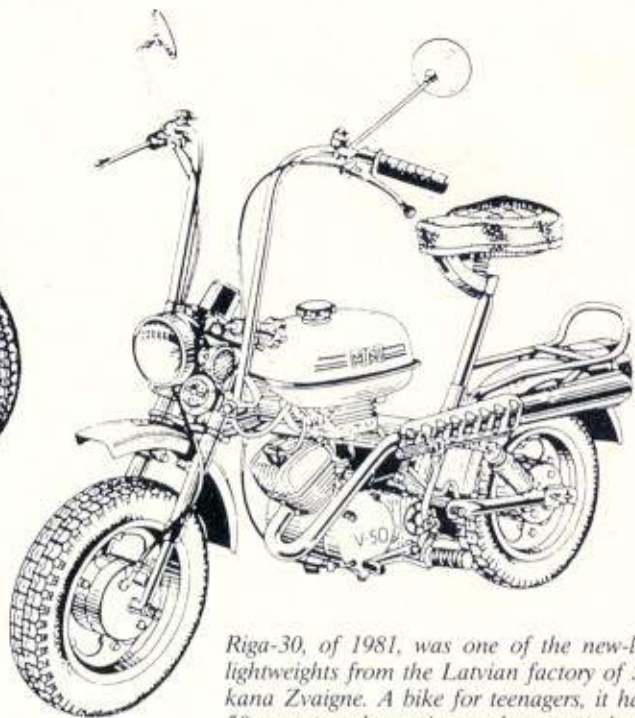
Although the Vostoks were full of potential, they were too heavy and badly cooled. A further major problem was lack of electronic ignition to retain the accurate timing needed under racing conditions. While having some limited success, the Vostok team really struggled in a racing world where technology was moving fast. The Russians left road-racing and directed their efforts elsewhere. . .

However, some of the more advanced designs recently developed in the Soviet

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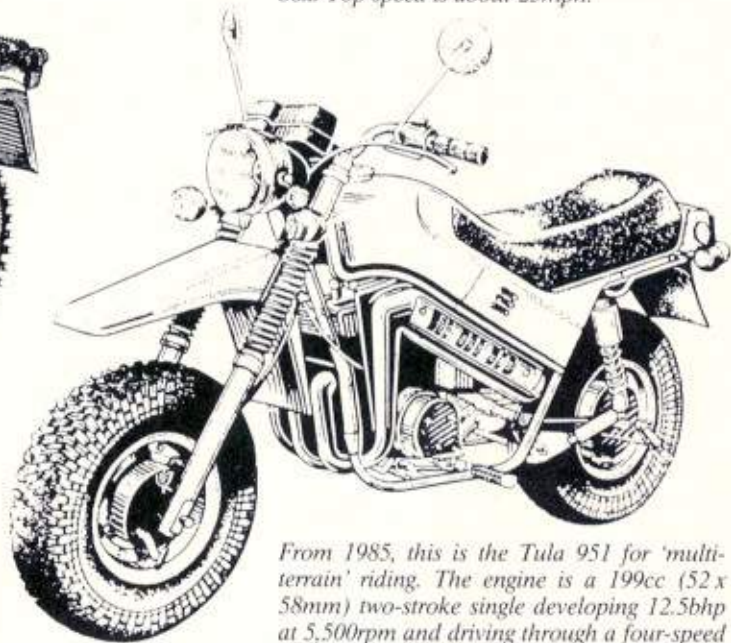
The 1984 IZH 500, with 504cc (89 x 79.4) overhead camshaft single-cylinder engine developing 34bhp on a 9.2:1 compression ratio. With 18in alloy wheels, disc brakes, five-speed gearbox and reasonably contemporary styling, the IZH was a fair performer; note too that rear suspension is by a monshock system.



Riga-30, of 1981, was one of the new-look lightweights from the Latvian factory of Sarkanā Zvaigzne. A bike for teenagers, it has a 50cc two-stroke engine and two-speed gearbox. Top speed is about 25mph.



KM 175. A 174cc two-stroke single dating from 1986. Power is said to be 15bhp, and the transmission incorporates a five-speed gearbox. Designed for endurance use.



From 1985, this is the Tula 951 for 'multi-terrain' riding. The engine is a 199cc (52 x 58mm) two-stroke single developing 12.5bhp at 5,500rpm and driving through a four-speed gearbox.

Union have yet to be fully introduced to the West. The Soviet motorcycle industry of today offers a full range of machines, from the smallest lightweight to a heavyweight with a sidecar attached, and may well return to road-racing once again. Some of the smallest (125cc) machines are produced at the Minsk Autocycle Works. Equipped with indicators, mirrors, rear carrier rack, and a fully enclosed rear chain, all as standard equipment, this lightweight makes an ideal daily work-horse. With, however, drum brakes, 6-volt electrics, and a dated appearance, the Minsk is unable to compete in the world markets.

The Izhvsk, Kovrovsk, and Minsk factories all manufacture two-stroke engines, and a number of these units are also used to power the Tulitsa and Muravey scooters produced by the V.M. Ryabikov Engineering Works at Tula. These machines

include three versions. Basically the front half of a standard scooter, with a 200cc (62 x 66mm) single cylinder two-stroke engine; the 9hp produced is transmitted via shaft drive to the two rear wheels. These small tri-cycles are being used from the Arctic to the Tropics. With their dated appearance, the recent scooter revival is unlikely to help the sales of these two- and three-wheeled models for some years to come. This same engine, however, is also used to power the Tula TMZ 951, designed as a multi-terrain vehicle. With fully enclosed chain drive, high-level exhaust system, and large mudguards, the Tula is well suited for off-road use, with a 12 volt electric system, push-button starting, and

full instrumentation.

Heavyweight four stroke motorcycles, the Dnieper and Ural models are produced at Kiev and Irbit respectively. These well known BMW derivatives are often prepared for road-racing or off-road club meetings. With various tuning kits available, these machines have established numerous national speed records during the post-war years. Some of the most interesting have been purpose built for off-road events, with the sidecar little more than a tubular structure for hand and foot holds for the passenger. Officially used by the police and military in the Soviet Union, these machines have been adopted for similar use in other countries around the world, but found to be a

little too slow for the Moscow police to maintain an effective force against the faster lightweight two-strokes often used in the city.

Several other Soviet factories also produce lightweight motorcycles and motorised cycles. The most well known are the Sarkana Zvaigne Motor Works in Riga and the Lvov Motor Works. Recently, these plants have specialised in motorcycles for training and competition in moto-cross, skioring (races on skis towed by motorcycles), and speedway, particularly for the 12 to 16 year olds. National championships between schools have been held in the Soviet Union since 1967.

In all some two million motorcycles are produced in the Soviet Union every year, with exports throughout the world.

With the decline and eventual fall of communism, the motorcycle industry of the former Soviet Union and most of eastern Europe faces an almost impossible period, in development or even in further production. As countries continue to regain their former independence, many of the trade links established within the communist empire have either been broken or greatly reduced. Unable, however to compete with the far greater affluence of the West, these new democracies cannot take advantage of their newly found freedom. Traditional engineering designed for owner-maintainance, with performance restricted to the standard of unsurfaced roads, cannot compete with commercial standards set in the West. The Russian style of engineering, although still appreciated in some parts of the world, being able to combat the climatic conditions of the arctic wastelands and the heat of central Africa (though even these well-established export markets are now under threat from the famous four of Japan) is in



A 1987 Riga-24, an all-alloy two-stroke lightweight of modest performance.

decline with an ever-shrinking market, Russian motorcycle factories have started to reduce their production for the first time in many years, insufficient funds preventing any development programme.

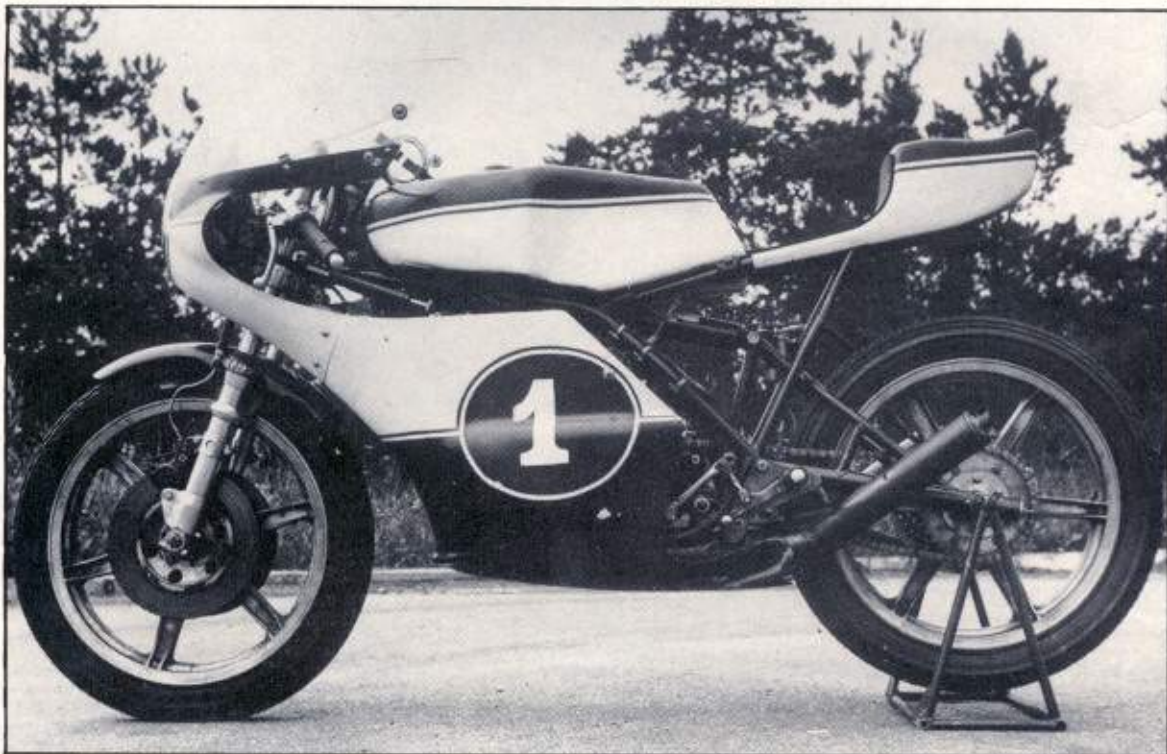
As with many other new markets worldwide, the Japanese have taken a lead in this situation, expanding their electrical and mechanical influence wherever any cooperation has been offered or found. During the summer months of 1992, both Honda and Suzuki visited the former Soviet state of Latvia. With the help of a local newspaper, Suzuki were able to compile an initial market-research programme, alongside some advertising, a questionnaire and a competition, with the promise that the company would return with a full range of models in the near future. Honda meanwhile are currently discussing the potential of production within the Riga motorcycle plant, alongside the once state-maintained machines that had been exported across the Soviet Union.

Motorcycle sport is very popular in the Baltic states, and with a new freedom of

travel, the Latvian motorcycle federation is preparing a more international style of competition for the future. The Latvian combined motocross team set off for Australia in August last year to take part in the ISDT. (Locally available machines to be rented upon arrival.) For some years Latvian riders have been successful in the Baltic road-race and motocross championships, and now hope to expand their reputation world-wide.

It is perhaps fitting to conclude this brief outline of the Soviet motorcycle in Latvia, where the very first steps to produce a Russian motorcycle were made. Without some outside help the Russian industry is likely to fade away; but Latvia could lead the way, once again, in establishing this huge, almost certainly never fully developed, industry. It will be very interesting to see how much Russian influence is incorporated into the Latvian and Japanese partnership, and how it will be accepted across the former Soviet Union and eastern Europe in general.

DAVID ANSELL



Russian lightweight racer of the 1980s: one of the production machines turned out by the IZH works.