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Rekord – The First Industrially Manufactured Diving Apparatus in Czechoslovakia

*By Dušan Šuráni
HDS Czech Republic*

The Rekord diving apparatus has been manufactured since 1959 by the state-owned enterprise *Stavební stroje Zličín (Construction Machinery Zličín)*, in the Ivančice plant close to Brno. It was the first serial production of diving apparatus in Czechoslovakia at a time when local diving was still in its infancy. In 1955-1960 the first diving clubs were formed, however, in Czechoslovakia there was at that time no industrial production of diving equipment for mass diving.

Since Czechoslovak markets did not supply any diving equipment, diving enthusiasts made various devices and regulators for themselves. At home, they were able to create two-stage regulators based on the KP-14 (KP-18) reduction valve used in MIG-15 aircraft and cylinders from discarded firefighting or aircraft equipment. This is how pioneering diving began in the country in the 1950s. Only rarely were a few dozen or so items of the Medi 713 diving equipment imported from the GDR (German Democratic Republic).

Jan Slavíček, head of operations at the state-owned enterprise *Stavební stroje* in Ivančice, was the designer of the Rekord apparatus. In 1958 he made his first twin-hose, two-stage regulator, using an aircraft oxygen reduction valve as its first stage. One year later he designed and manufactured the first regulator, which was called the AV1. (Fig. 1)



Fig. 1 AV1 regulator

Divers later named them after their inventor, 'Slavičkárny'. These single-stage regulators were easy to manufacture and had their serial number plate on the front of the regulator. Slaviček began manufacturing in 1959 and a year later he succeeded in launching the regulator in mass production. The first series of about 50 sets of apparatus went into production using a single seven-litre cylinder, although there were some twin-cylinder sets available. The seven-litre cylinders were surplus German Luftwaffe war production in origin, retested and relabelled for air, with an operating pressure of 15 MPa.

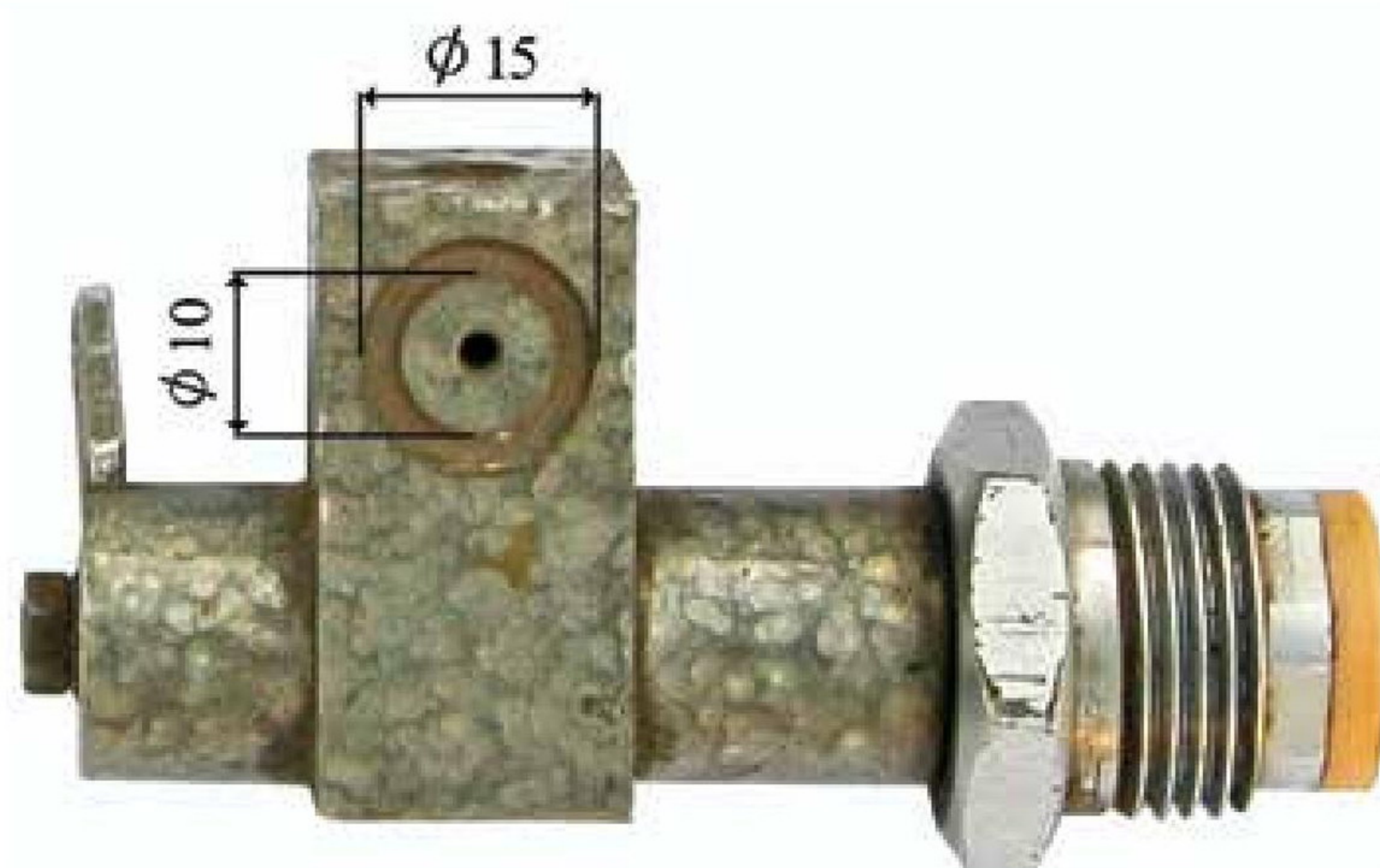
Production of the Rekord apparatus based on two four-litre cylinders with an operating pressure of 15 MPa began in 1961. At that time, they were manufactured and supplied by the Vítkovice Ironworks. More advanced designed AV2 regulators were later supplied with these units, their construction based on the French Mistral regulator. (Fig. 2) These had the serial number plate placed on the backplate of the apparatus. (Fig. 3)



Fig. 2 (*top*) REKORD diving apparatus with AV2 regulator – front and back.

Fig. 3 (*middle*) The serial number label was placed on the backplate.

Fig. 4 (*bottom*) The manifold's solid connector, mounting a lever type reserve (left) and the regulator pillar with a Czechoslovak standard regulator connector.





The twin cylinder manifold consisted of a small diameter high-pressure pipe that connected into a solid connector, mounting both a lever-type air reserve and the regulator pillar. The pillar's regulator connector complied with the Czechoslovak standard, 15x10 mm, but not with the international INT standard. (Fig. 4)

Also, 'Nargilé' (surface demand/ hookah) devices were produced, where the regulator was attached to a back-mounted plate. Air was supplied by a hose from the water surface. (Fig. 5) There was no fundamental design difference between the two regulators - AV1 and AV2 (Figs. 6 and 7). The top cover, body casing and the clamping ring connecting them were the same and both were equipped with a diaphragm of rubberised canvas. The mouthpiece was a simple tubular T- piece with non-return valves and a transverse oval tube mounting a rubber mouthpiece. (Fig. 8) Both were single-stage regulators with upstream valve opening similar to Mistral, however, the AV2 was later equipped with the Venturi jet. Within the regulator body, this Venturi jet protruded from the side of the central body and directed the air jet into the inhalation port. (Fig. 9)

There were also significant differences in the design of the



Fig. 5 (*top*)
LP4 – ‘*Nargilé*’ with AV1 regulator.

Fig. 6 (*middle*)
Disassembled AV1 regulator.

Fig. 7 (*bottom*)
Disassembled AV2 regulator.

exhalation valves. With the AV1, the exhalation rubber disc valve, which had a relatively small diameter, was placed inside the nozzle (sleeve) of the exhalation hose. (Fig. 10) Over the two years of production, the manufacturer was to make some design modifications to the AV2 regulator configuration. It was found that the exhalation (exhaust) valve was ideally located in the middle of the main diaphragm, as the resultant exhaled airflow over the main diaphragm had a positive effect on the performance of the regulator. (Fig. 11) Also, the lever system of the AV2 changed, becoming similar to the Mistral regulator system with the addition of an adjusting screw. (Fig. 12) Significantly, the manufacturer made no mention of these design changes in their literature or publicity. It was only while restoring a number of these regulators that the author discovered the sequence of individual modifications that had been made to the AV2 regulator.

The maximum flow rate for the AV1 was 680 l/min, for AV2 it was 910 l/min. The surface colour of the AV1 regulator and most of the AV2 units was green, with a small series of AV2 regulators being black in colour.

The Rekord equipment was manufactured in compliance with Svazarm requirements (Union for Cooperation with the Army – author's note) and distributed to diving clubs. From 1960 it became possible to buy the equipment in shops selling sports equipment for CZK 1820 (Czechoslovak crowns, approx. £30), their manufacture ceasing in 1964. Between 1959 and 1962 about 200 AV1 regulators were produced and between 1962 and 1964, about 400 AV2 regulators. If we take into account that the complete range of the serial



Fig. 8 (*top*) Metal mouthpiece of AV1 regulator with non-return valves.

Fig. 9 (*middle*) Open AV2 regulator with Venturi jet aimed into the inspiratory hose, with no adjustment possible to the double levers.

Fig. 10 (*bottom*) Back of the AV1 regulator - yoke connection.



Fig. 11 (*top*) Sectional view of the AV2 Regulator. Note that the exhaust valve in the middle of the diaphragm and the radially drilled internal cover above.

Fig. 12 (*bottom*) Open AV2 regulator with the small diameter nozzle bore pointing into the inspiratory hose, with adjustment of the double levers via a top mounted screw.



numbers was used for the devices (1x7 litre, 2x4 litre, 3x4 litre units), a total of approximately 800 pieces would have been produced. However, the author has reason to believe that the numbering was not consistent.

The Rekord equipment played an important role in the development of scuba diving in Czechoslovakia. It was used in training new diving practitioners, in sports competitions and sometimes in working and cave diving environments. Many of the units are still operational and can be found mostly in private diving equipment collections. Currently, you can still see them in use at historical equipment rallies, such as those organized by the Historical Diving Society, Czech Republic.

After 1964 there was a seven-year break in the production of diving equipment for scuba diving in the Czechoslovak Socialist Republic. During this period the state-owned enterprise Chirana produced light diving sets PL-40 and PL-401, exclusively for the needs of the Czechoslovak People's Army, while the state-owned enterprise Meva Roudnice nad Labem produced Saturn devices almost exclusively for fire brigades.

Only in 1971, did the state enterprise Sporklimex begin to manufacture 10 litre and 12 litre Meta and 2x10 litre

Fig. 13 Technical specifications

Name: Rekord

Manufacturer: Stavební stroje n. p. Zličín
plant Brno - site Ivančice.

Number of bottles: 2 pc

Bottle volume: 4 litres

Testing pressure: 22.5 MPa

Operating pressure: 15 MPa

Outer diameter of the bottle: 100 mm

Cylinder length without valve: 62.5 cm

Cylinder valve: air valve with G5/8" thread

Air reserve: approx. 4 MPa

The dimension of the intermediate ring for
connecting the regulators: 15x10 mm

Weight of an empty apparatus with
regulator: approx. 15 kg

Regulators supplied with the Rekord
apparatus: AV1, AV2

Operating depth: 40 m



Fig. 13
Jan Slaviček
– creator and
constructor of AV1
and AV2 regulators
and REKORD
apparatus.
Photo: Petr Katz.

Tajfun units with a regulator. In compliance with Svazarm requirements (see above), these were intended to be used by diving clubs and recreational divers generally. Those for army use were designated SP-20. That, however, is another story from the history of Czechoslovak diving technology.

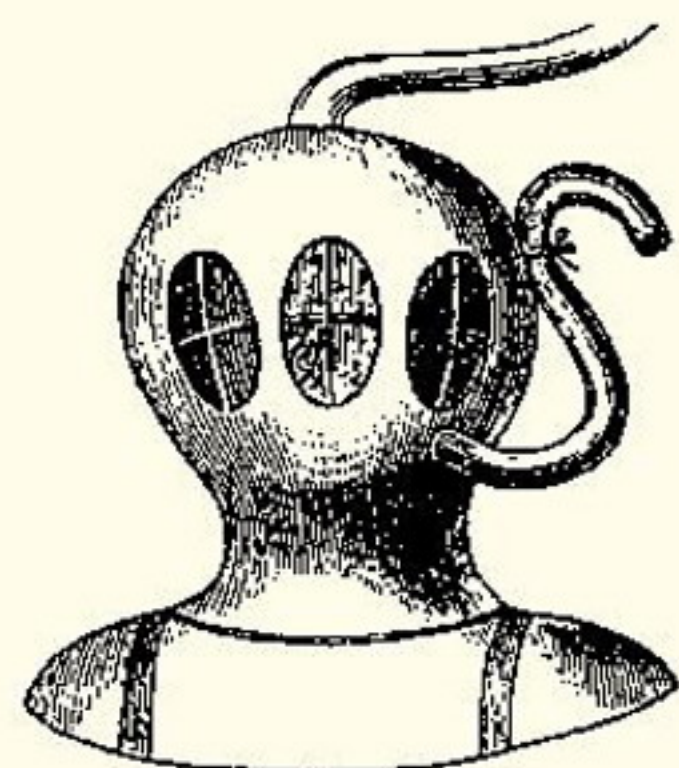
PHOTOS: Dušan Šuráni and Petr Katz

REFERENCES

- Peter Katz, 'Slavičkárna', *Dobrá Voda*, Winter, 2005, p. 14-15
 Petr Katz, *Potápěčské přístroje a automatiky*, CD, version 4, 2012
 D. Skulinova, J. Dvořáček and M. Kowalski, Rekord, *Poseidon* (GDR - German Democratic Republic), No. 1/1963, p. 41
 Dušan Šuráni, <www.vsc-ds>
 D. Šuráni, Auf den Spuren des MEDI 713 in der CSSR, *TauchHistorie*, 04, p. 58-62
 D. Šuráni, Dr. Seveke, Saturn - 2-Schlauch-Legende CSSR, *TauchHistorie*, 06, p. 41-47.

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Dušan Šuráni was born in 1946 in Slovakia and started diving in 1961. He is a member of the Historical Diving Society Czech Republic. For twenty-five years he was a diving instructor and in the diving clubs of České Budějovice, Tábor and Olomouc he trained new diving practitioners. He has been studying the history of diving for many years and he is a collector of diving equipment, which he presents on his website <www.vsc-ds.cz>



The Historical Diving Society
www.thehds.com

The Historical Diving Society was founded in England in 1990 with the aims of promoting and co-ordinating research into the history and development of underwater exploration and the preservation of associated archives and artifacts.

It is now widely represented internationally enabling a worldwide exchange of news, views and research which has uncovered much previously hidden material and in many instances, has dramatically changed the perception of diving history.

In addition to the Journal, the Historical Diving Society publishes a magazine, *Historical Diving Times*, monographs of rare works on diving history, videos on the history of diving, and the proceedings of its annual conference which is attended by speakers and guests from around the world.

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