OCCASION

This publication has been made available to the public on the occasion of the 50th anniversary of the United Nations Industrial Development Organisation.

DISCLAIMER

FAIR USE POLICY

CONTACT

Please contact publications@unido.org for further information concerning UNIDO publications.

For more information about UNIDO, please visit us at www.unido.org

UNITED NATIONS INDUSTRIAL DEVELOPMENT ORGANIZATION
Vienna International Centre, P.O. Box 300, 1400 Vienna, Austria
Tel: (+43-1) 26026-0 · www.unido.org · unido@unido.org

ID

Distr.
LIMITED

ID/WG.167/6
20 August 1974

ORIGINAL: English

United Nations Industrial Development Organization

Meeting of Experts/Decision Makers for
Promotion and Development of Machine Tool
Industries in Developing Countries of
Asia and the Far East

Tbilisi, Georgia, USSR
5 - 15 October 1974

COUNTRY STUDY REPORT
MACHINE TOOL INDUSTRY IN BURMA[1]

S.C. Banerjee *

---

* Deputy Director General, Directorate General of Technical Development, Ministry of Industrial Development

[1] The views and opinions expressed in this paper are those of the author and do not necessarily reflect the views of the Secretariat of UNIDO. This document has been reproduced without formal editing.

74-5369

The crucial importance of the role of the machine tool industry for industrial and economic development of India was emphatically stressed in the formulation of the Five Year Plans, beginning from 1950-51. Though certain types of machine tools were produced by a few units before 1947, particularly during the Second World War period, the foundation for an organized, viable and sound machine tool industry was laid when the Government of India took the initiative in building up this industry by setting up a large sized machine tool manufacturing unit in the country. As a result, Hindustan Machine Tools in Bangalore came into being in 1953. This base was further re-inforced by units developed through private entrepreneurship. Though HMT with its five units spread over India has become the nucleus of the country's machine tool industry, the contribution of other units in the total production of machine tools is still predominant. The industry has been making rapid strides, particularly in the recent years, towards bridging the technological and production gaps. Currently, there are about 107 machine tool manufacturing units in the organised sector, including seven units in the public sector with an annual installed capacity of Rs. 900 million worth of machine tools. In addition, hundreds of small scale units spread over the country are engaged in the manufacture of machine tools and accessories.

The production of machine tools in the organized sector alone has gone up from Rs. 47 million in 1951 to Rs. 660 million in 1973-74. This means a 12 times increase over a period of four Five Year Plans. Annexure I portrays the progressive development of the industry for the organised sector. The demand of machine tools for the home market is met not only from the production of the organised sector and imports, but a sizeable portion of this demand is catered by small scale units. No authentic statistics about the production of small scale units in the country is available. The annexure is also revealing as to how the import of machine tools, which is 68% of the total consumption in 1961 has come down to 27% in 1973-74. A significant development in the last decade has been the implementation of heavy machine tool project at Ranchi. This plant is designed to make heavy machine tools like heavy horizontal and vertical boring machines, heavy planing machines, roll rutning lathes, etc.

The production profile of the industry covers a wide range of light, medium, heavy machine tools of conventional as well as of sophisticated design. Among others, the production range includes machine tools like drum type turrets, single and multi spindle automats, high precision multi-tool lathes, copying lathes, gear hobbers and shapers, broaching machines, special purpose machine tools, horizontal boring machines, heavy presses, plastic working machines, grinders of various types, etc. Annexure II brings out production of selected types of machine tool in India.

Annexure III describes the machine tools not covered in the current production programme of the country. Some of these machines are required in quantities whose manufacture may not be techno-economically feasible right now and the import of these will have to be resorted to.

Though the international market for machine tools is highly competitive and sensitive in respect of quality, price and delivery schedule, India has been able to make a breakthrough. The current export is of the order of Rs. 30 million annually.

The Fifth Plan emphasises the need for increasing and diversifying the production of machine tools. The planned capacity and production targets for 1978-79 is Rs. 1,600 million and Rs. 1,370 million respectively. In other words, the plan aims at doubling the current annual production in the course of the next five years. The anticipated production from the seven public sector units may be of the order of Rs. 600 million out of Rs. 1,370 million and the balance is expected to be achieved by the units in the private sector.

It has been recognised that the pre-requisites for setting up viable and sound machine tool industries are an economy, large enough in size and diversified enough in structure, so as to generate the requisite level of internal demand and range of raw materials and technical resources capable of operating and sustaining it. The machine tool industry uses a great variety of ferrous and non-ferrous metals in different forms and needs a high degree of engineering skills. India is fortunate in possessing these in reasonable measure. Adequate capacity sections, suited for machine tool industry has been provided. There are indigenous sources for manufacture and supply of parts of bought out nature like ball bearings, electromagnetic clutches, hydraulics, instruments, electricals, etc. As a result, the average import content in the machine tool industry has come down to a level of 10 to 12 percent.

It has been accepted that the machine tool industry is one of basic, critical and strategic importance from the time planned industrialisation has started in the country. The industry enjoys priority consideration for planning, allocation of foreign exchange, industrial licensing, allocation of scarce raw materials, etc. Though there is no special tax concession, the development rebate allowed in the past to user industries for purchase of capital goods which includes machine tools, had indirectly helped the machine tool manufacturers to boost up production. The development and interests of the machine tool industry are also ably looked after by the development Council set up by the Government and the Indian Machine Tool Manufacturers Association, representing both public and private sector units.

With a view to determining the pattern of installation of machine tools in various industries in the country, Government of India carried out a nation-wide census of machine tools on two occasions, the last one which was more detailed was conducted in 1958. This census reveals that the number of machine tools as installed in the country in 1956, was 3,72,000 Nos. as against 50,000 Nos. in 1951.

External technical assistance in the development of Machine Tool Industry

The development of machine tools industry during the last two decades was primarily based on substantial degree of imported technical know-how. The collaboration with foreign firms has come in the form of lump-sum payment, royalty payment or equity participation. In this process, the Indian industry has gradually absorbed the know-how and developed its own design competence and manufacturing skill to a certain extent. Some manufacturing units have set up their own development and design facilities. Government has also set up Central Machine Tools Institute for conducting research, development of design, testing procedures, etc. The industry can take advantage of the know-how developed by the CMTI. Even then there will be need for import of technical know-how from reputed manufacturers abroad for manufacture of sophisticated machine tools.

Co-operation and Technical Assistance needed

As stated earlier and indicated in Annexure III, several types of machine tools are not currently produced in the country. Those machine tools whose manufacture is considered techno-economically feasible could be taken up for manufacture in the country as a part of diversification. In such cases, imported technology may be sought for by the Indian Industry, having regard to the fact that know-how from Indian sources would not be available.

Appropriate help from foreign countries in the field of research and development of design may also be required and in this direction UNIDO's help may accelerate the process. The Central Machine Tools Institute had already submitted a proposal to UNIDO for assistance in setting up new CMTI Centre for development of NC machine tools.

Specialised training of technical personnel in the design and manufacture of sophisticated machine tools, if it could be arranged through UNIDO, would also be helpful to the Indian industry.

Problems of development and utilisation of capacity

Currently, the utilisation of capacity in the machine tool industry is about 70 per cent of the installed capacity. It is slightly less than the optimum utilisation of 80 to 82 per cent which could be aimed at in the machine tool industry. Even then, the current utilisation factor is reasonably good considering that some of the units are in the initial stages of production of new items. The industry has diversified their products to suit the requirements of end-users to the extent possible on the basis of know-how available with them. Some units in industry have set up their own R and D, to design and adapt machine tools to suit their customers' requirements. The assistance of CMTI is also taken by some units. The work in the field of research, development and design needs specialists of high calibre. There is no doubt shortage of such personnel. There is no manifest difficulty faced by the industry in providing managerial and organisational skill in operating machine tool factory. While larger units have quality control and testing arrangements, smaller units are not adequately equipped for the purpose. There is need to strengthen the quality control and testing arrangements in the country to cover the production of smaller units. The industry is conscious of the necessity for up-dating old designs, incorporating special features and bringing more improvement in the product. There is no difficulty in the country [redacted] in the matter of getting skilled labour, as a number of industrial training institutes and arrangements for in-plant training in the units cater to the need for skilled labour.

Consideration for introduction of [redacted] Machine Tools in the country

With the growing need for cost reduction, accuracy and durability, there has of late been a shift towards the use of NC machines in the advanced countries in the production line. In India also the need for use of NC machine tools is being gradually felt and some industries had already installed such machines. It is anticipated that the demand for use of NC machines will also emanate from the Aircraft and Defence Industries. This shift for the use of NC machines has been taken note of by the industry. A beginning has already been made in the design and manufacture of NC machine tools through the efforts of IIT, CMTI and BEL. M/s Hindustan Machine Tools have also entered into collaboration with a reputed foreign firm for joint development of certain types of NC machines. CMTI Bangalore has also under consideration a project for establishing a NC Centre for metal working

machines where facilities for training of personnel for use and maintenance of NC machines, programming, preparation of tapes, etc. could be provided. Already certain NC machine tools like NC vertical milling machine and NC lathe is being taken up for batch production. NC Machining Centre (Vertical) with automatic tool change is under development.

Assistance which India can render to developing countries

The Indian Industry is on the look out for boosting export of machine tools to both developing and developed countries. HMT have plans to set up an international export organisation for export of machine tools not only of their own make but also those to be manufactured by other units in the country. Apart from the physical export, the Indian Machine Tools Industry is in a position to provide package assistance to other developing countries to set up factories for manufacture of general purpose machine tools. The package assistance will, inter-alia, cover preparation of feasibility report, project report, training of personnel, setting up of the factory, supply of substantial capital equipment and technical know-how for production. HMT had already entered into technical collaboration with Philippines for setting up a factory in that country for manufacture of general purpose machine tools.

[illegible]

[illegible]

Year	Production in [illegible]	Imports	Exports	%age of import to total consumption
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	1.0	[illegible]
[illegible]	[illegible]	[illegible]	1.0	[illegible]
[illegible]	[illegible]	[illegible]	1.0	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible] ([illegible])	[illegible]	[illegible]	[illegible]
[illegible]	[illegible] ([illegible])	[illegible]	[illegible]	[illegible]
[illegible]	[illegible] ([illegible])	[illegible]	[illegible]	[illegible]
[illegible]	[illegible] ([illegible])	[illegible]	[illegible]	[illegible]
[illegible]	[illegible] ([illegible])	[illegible]	[illegible]	[illegible]
[illegible]	[illegible] ([illegible])	[illegible]	[illegible]	[illegible]
[illegible]	[illegible] ([illegible])	[illegible]	[illegible]	[illegible]
[illegible]	[illegible] ([illegible])	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]

[illegible]

ANNEX II

Production of selected machine tools in the organised sector

Sl. No.	Description of machine tool	1971 Value Rs. million	1971 Qty. in equivalent Nos.	1972 Value Rs. million	1972 Qty. in equivalent Nos.	1973 Value Rs. million	1973 Qty. in equivalent Nos.
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
1.	Automatics	34	483	[illegible]	[illegible]	[illegible]	[illegible]
2.	Boring machines	27	63	[illegible]	[illegible]	[illegible]	[illegible]
3.	Gear cutting machines	17	90	[illegible]	[illegible]	[illegible]	[illegible]
4.	Grinding machines	[illegible]	1700	[illegible]	[illegible]	[illegible]	[illegible]
5.	Capstans & Turrets	87	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
6.	Lathes	60	[illegible]	75	[illegible]	[illegible]	[illegible]
7.	Milling machines	[illegible]	780	[illegible]	[illegible]	[illegible]	[illegible]
8.	Presses	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
9.	Others	[illegible]	7350	[illegible]	[illegible]	[illegible]	[illegible]
	TOTAL:	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]

ANNEX III

BROAD LIST OF MACHINE TOOLS WHICH ARE NOT IN THE INDIGENOUS MANUFACTURING PROGRAMME AT PRESENT

I. TURNING MACHINES

1. High accuracy tool room lathes.
2. Relieving lathe.
3. Spinning and flow turning lathes.
4. Front automatic chucking lathes.
5. Crankshaft lathes.
6. Camshaft and profile turning lathes.
7. Centreless bar turning (bar peeling) machines.

II. DRILLING MACHINES

1. Turret type drilling machine.
2. Deephole drilling machines.

III. MILLING MACHINES

1. Plano-milling machines.
2. Flute milling machines.
3. Spline milling hobbing machines.
4. Keyway/slot milling machines.
5. Copying/duplicating and profile milling machines.
6. Die sinking machines.
7. Longitudinal and circular dividing machines.

IV. GRINDING MACHINES

1. High precision tool room cylindrical grinder suitable for grinding of gauges.
2. Surface grinder, rotary table type both horizontal and vertical spindle.
3. Slideway grinder.
4. Shear and knife grinder.
5. Face and side mill cutter grinder.
6. Hob grinder.
7. Gear shaper cutter grinder.
8. Thread chaser grinder.
9. Tap grinder.
10. Optical profile grinder.
11. Spline grinder.
12. Camshaft grinding machines.
13. Jig grinders.
14. Specialised internal and external grinders required for the rolling bearing industry.

V. BORING MACHINES

Jig borers.

VI. THREADING MACHINES

1. Thread milling machines.
2. Thread grinding machines.
3. Thread whirling machines/attachments.

VII. SHAPING AND SLOTTING MACHINES

1. Traversing head type shaping machines.
2. Hydraulic shaping machines.
3. Die and punch shaping machines.
4. Key seating machines.

VIII. GEAR CUTTING GENERATING FINISHING AND TESTING MACHINES

1. Spiral and bevel gear generators
2. Gear lapping machines.
3. Gear shaving machines.
4. Gear rolling machines.
5. Worm milling machines.
6. Gear grinding machines.
7. Gear tooth rounding and chamfering machines.
8. Gear tooth deburring machines.
9. Rack shaping and rack milling machines.
10. Worm grinders.
11. Gear testing machines all types.
12. Gear quenching presses.

IX. LAPPING HONING AND POLISHING MACHINES

1. Lapping machines all types
2. Honing machines all types.
3. Superfinishing machines and attachments.
4. Polishing machines unit head type.

X. WIRE WORKING MACHINES

1. Wet type fine wire drawing machines suitable for drawing wires thinner than 45 S.W.G.
2. Wire straightening and cutting off machines.
3. Spring coiling machines.
4. Wire weaving machines.
5. Wire braiding machines.

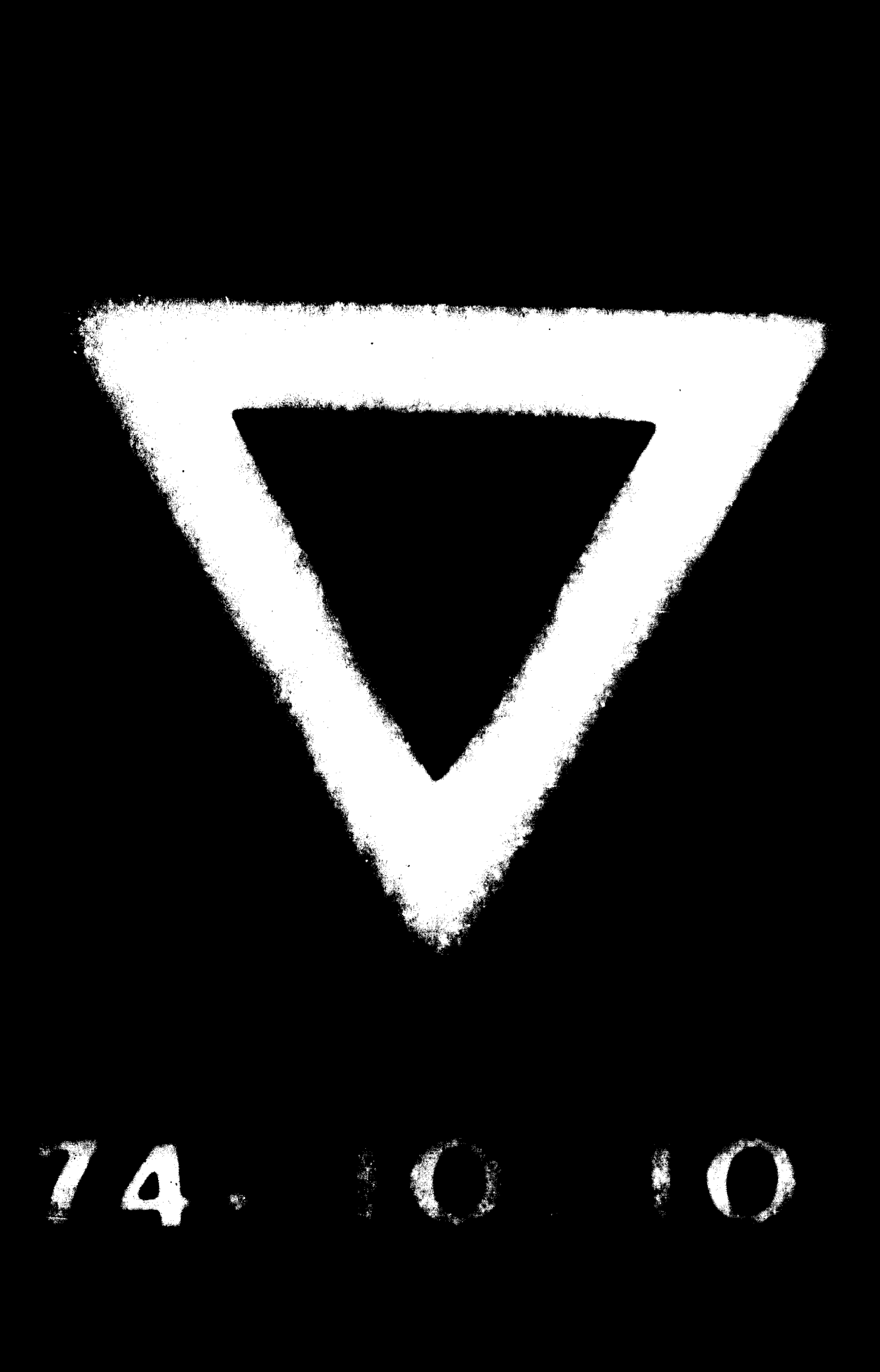
XI. HAMMERS AND FORGING MACHINES

1. Double acting counterblow hammers.
2. Die forging hammers other than conventional electro-pneumatic types.
3. Rotary swaging machines.
4. Forging rolls.
5. Heading and upsetting machines both cold and hot.

XII. PRESSES AND SHEET METAL WORKING MACHINES

1. Extrusion presses.
2. Powder compacting presses.
3. Gang slitting machines.
4. Rotary flanging presses.

[redacted]


74.10.10