BRITISH STANDARD

BS 1553-2: 1950

Graphical symbols for power generating plant —

Graphical symbols for general engineering

UDC 620.4:003.62

Co-operating organizations

The Mechanical Industry Standards Committee, under whose supervision this British Standard was prepared consists of representatives from the following Government departments, and scientific and industrial organizations:

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Air Ministry*
Associated Offices Technical Committee
Association of Consulting Engineers Incorporated
British Chemical Plant Manufacturers' Association
British Compressed Air Society
British Electrical and Allied Manufacturers' Association*
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Institution of Mechanical Engineers*
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The Government departments and scientific and industrial organizations marked with an asterisk in the above list, together with the following, were directly represented on the committee entrusted with the preparation of this standard:

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North East Coast Institution of Engineers and Shipbuilders
Society of Chemical Industry

This British Standard, having been approved by the Mechanical Industry Standards Committee and endorsed by the Chairman of the Engineering Divisional Council, was published under the authority of the General Council on 21 September 1950

ISBN 0 580 32492 3

Amendments issued since publication

Amd. No.	Date	Comments

Contents

Foreword

In order to keep abreast of progress in the industries concerned, British Standards are subject to periodical review. Suggestions for improvements will be recorded and in due course brought to the notice of the committees charged with the revision of the standards to which they refer.

A complete list of British Standards, numbering over 9,000, fully indexed and with a note of the contents of each, will be found in the BSI Catalogue which may be purchased from BSI Sales Department. The Catalogue may be consulted in many public libraries and similar institutions.

It has long been felt that, except in the electrical engineering field, there has been a lack of uniformity in the method adopted for the preparation of schematic diagrams of engineering plant generally and that there is need for standardized symbols by which particular items of the plant can conveniently be identified, applying equally to different branches of engineering.

To meet this need, the preparation of a series of British Standards for graphical symbols for general engineering has been undertaken.

This Part, which provides graphical symbols for Power Generating Plant, forms Part 2 of this series.

Part 1, published separately, deals with graphical symbols for Pipes, Valves and Fittings. Part 3 deals with Compressing plant.

For other relevant British Standards, see list on page 7.

A British Standard does not purport to include all the necessary provisions of a contract. Users of British Standards are responsible for their correct application.

Compliance with a British Standard does not of itself confer immunity from legal obligations.

Summary of pages

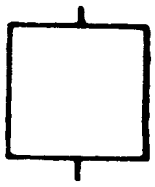
This document comprises a front cover, an inside front cover, pages i and ii, pages 1 to 12 and a back cover.

This standard has been updated (see copyright date) and may have had amendments incorporated. This will be indicated in the amendment table on the inside front cover.

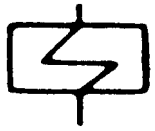
Section 11. Steam plant

Group 11A. Steam generators

11A1 Boiler, general symbol.

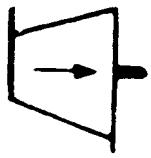


11A2 Superheater, Flue-gas re-heater or Economizer.
Additional connections may be shown as required for air, flue gas, etc.

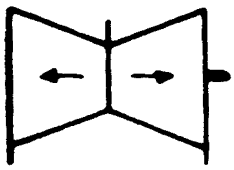


Group 11B. Prime movers

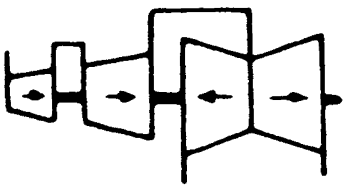
11B1 Steam turbine, general symbol or single-flow turbine cylinder.



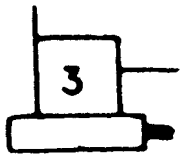
11B2 Double-flow steam-turbine cylinder.
NOTE Multi-cylinder turbines may be shown by combinations of these symbols.



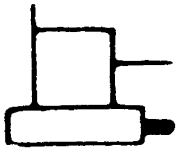
Example:— Three-cylinder turbine with double-flow exhaust cylinder.
In such cases as mixed-flow, pass-out, or bled-steam turbines, additional connections may be shown on the turbine cylinder.



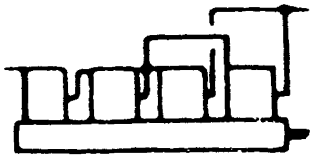
11B3 Reciprocating steam engine, general symbol.
Number of cylinders may be shown by a figure within the symbol.



11B4 Reciprocating steam-engine cylinder.
NOTE Any number of these symbols may be combined to show a complete engine.

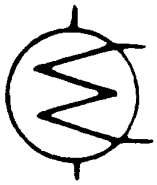


Example:— Four-cylinder triple-expansion engine.

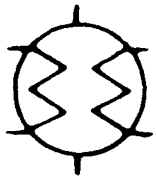


Group 11C. Condensers

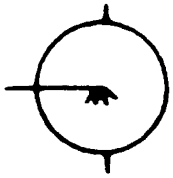
11C1 Surface condenser unit.



11C2 Surface condenser unit, divided on water side.

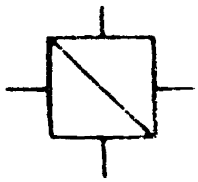


11C3 Jet condenser unit.

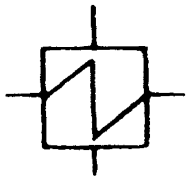


Group 11D. Heat exchangers

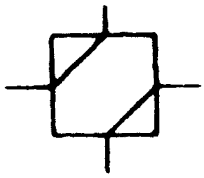
11D1 Live-steam re-heater.



11D2 Feed-water heater, de-superheater, attemperator or water cooler, surface type.

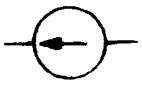


11D3 Air pre-heater.



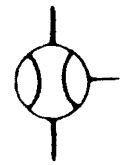
Group 11E. Pumps, ejectors and fans

11E1 Pump, general symbol.



11E2 Pump, positive-displacement.

11E3 Air ejector, steam-jet or thermo-compressor type.



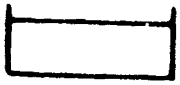
11E4 Forced-draught fan.

11E5 Induced-draught fan.

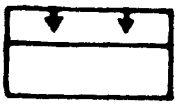
NOTE The use of reference letters other than those given in **11E2**, **11E4**, and **11E5** is not recommended, because it is not usually important to specify the type of pump or fan on a diagram.

Group 11F. Tanks and de-aerators

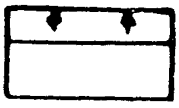
11F1 Open tank.
Connections may be shown as required.



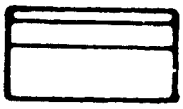
11F2 Closed tank, vacuum type.



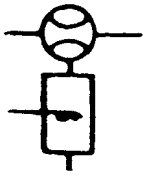
11F3 Closed tank, pressure type.



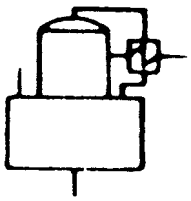
11F4 Closed tank, steam-sealing type.



11F5 De-aerator.



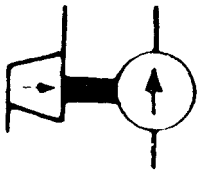
11F6 De-aerator with storage tank and vent condenser.



Group 11G. Miscellaneous

11G1 Shaft extension or mechanical coupling between machines.

Example:— Turbine-driven pump



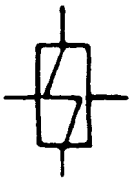
11G2 Gearing, general symbol.

11G3 Clutch, general symbol.

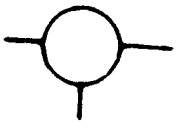
11G4 Flash box.

11G5 Air cooler.

11G6 Oil cooler or oil heater.



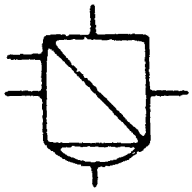
11G7 Steam receiver.



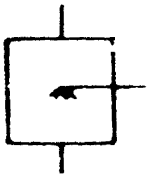
11G8 Steam separator.

11G9 De-superheater or attemperator, spray type.

11G10 Evaporator.



11G11 Feed-water heater, contact type.



11G12 Cooling tower.

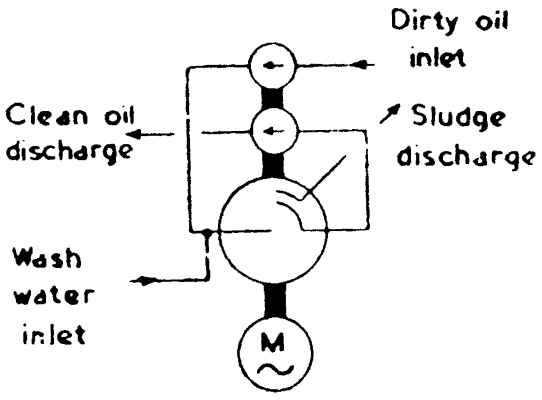
11G13 Open-ended screen.

11G14 Centrifugal clarifier.

11G15 Centrifugal separator with heavy and light fraction discharges.

11G16 Centrifugal separator, as **11G15** with wash-water connection.

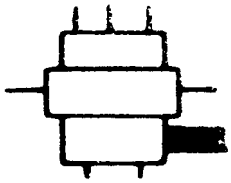
Symbols **11G14** to **11G16** may be used in conjunction with other symbols as required. Example:— A.C. motor-driven centrifugal oil separator with positive wash-water inlet and discharge pumps.



11GI7 Heat load, e.g., Process plant.

Section 12. Reciprocating internal-combustion engines

12A1 Reciprocating internal-combustion engine, general symbol.



The top three connections of this symbol represent fuel inlet, air inlet and exhaust. The centre two connections represent jacket-cooling medium inlet and outlet (where fitted). The bottom two connections represent lubricating-oil inlet and outlet (where fitted).

Particulars of the engine may be shown by means of symbols from the following lists, inset in the appropriate portion of the general symbol.

in the top rectangle:

Cycle:	Two-stroke	2S
	Four-stroke	4S

In the centre rectangle:

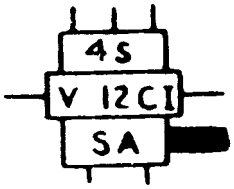
Cylinder arrangement:	In line	L
	Vee	V
	Radial	R
	"H" type	H
	Opposed	O
Number of cylinders:	Shown by a figure.	
Method of ignition:	Compression ignition	CI
	Spark ignition	SI

In the bottom rectangle:

Action:	Single-acting	SA
	Double-acting	DA

Example:

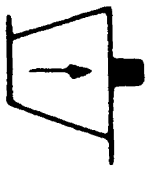
Four-stroke, V-type, 12-cylinder, compression-ignition single-acting internal-combustion engine.



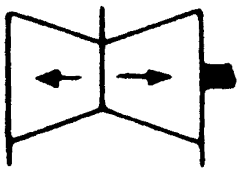
NOTE Symbols for ancillary equipment should be taken from appropriate items in other parts of this standard.

Section 13. Gas turbines

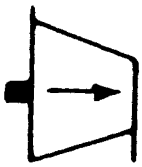
13A1 Gas turbine general symbol or single-flow turbine cylinder.



13A2 Double-flow gas-turbine cylinder.



13A3 Compressor, general symbol.



13A4 Combustion chamber, general symbol.

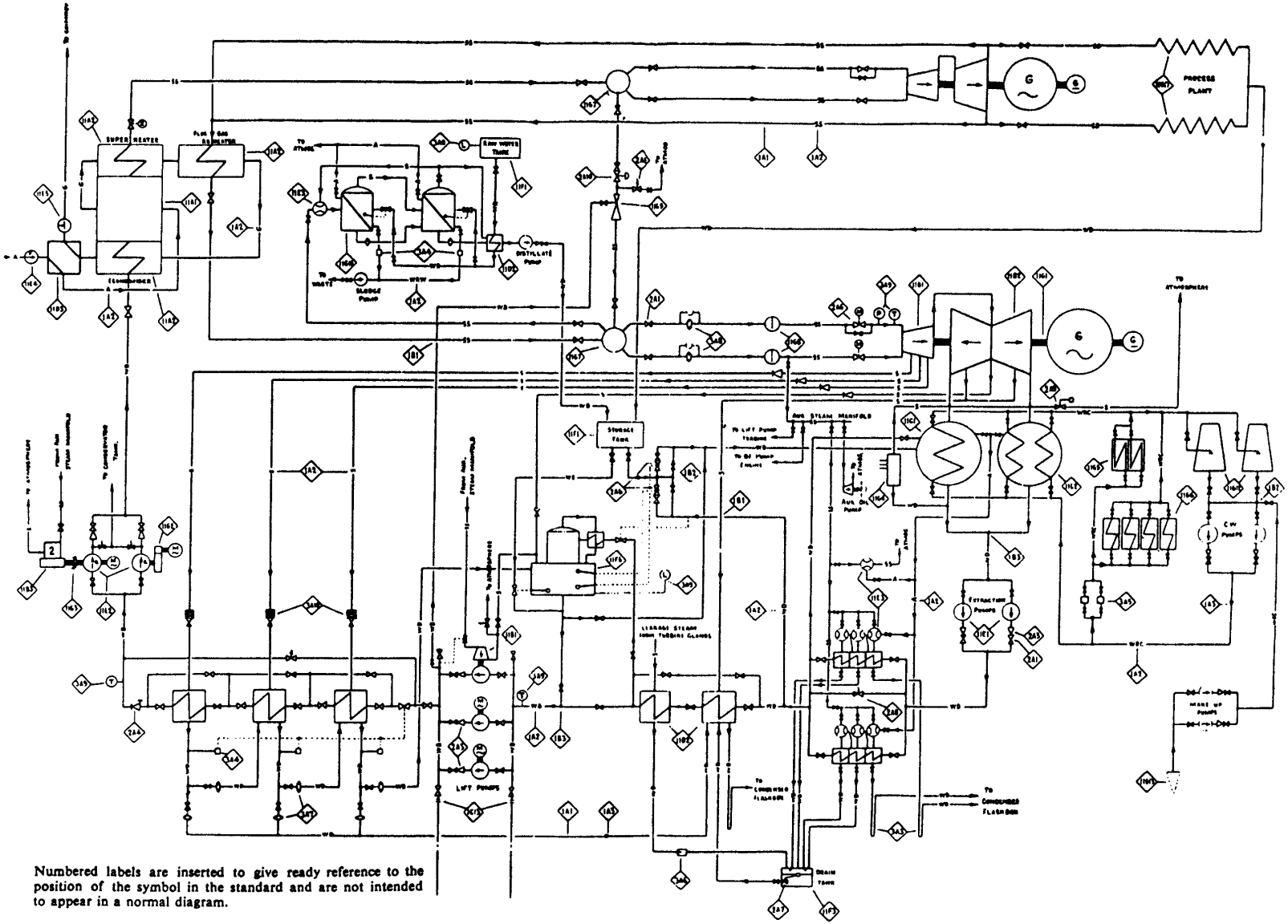
NOTE Symbols for ancillary equipment should be taken from appropriate items in other parts of this standard.

British standards on allied subjects

BS 1553, *Graphical symbols in general engineering.*
BS 1553-1, *Pipes and valves.*
BS 1553-3, *Compressing plant.*
BS 1553-4, *Heating and ventilating plant.*
BS 974, *Symbols for use in diagrams of chemical plant.*
BS 1646, *Graphical symbols for instrumentation.*
BS 308, *Engineering drawing-office practice.*
BS 1192, *Architectural and building drawing-office practice.*

For letter symbols and abbreviations, reference should be made to:
BS 1991, *Letter symbols, signs and abbreviations — Part 1: General.*

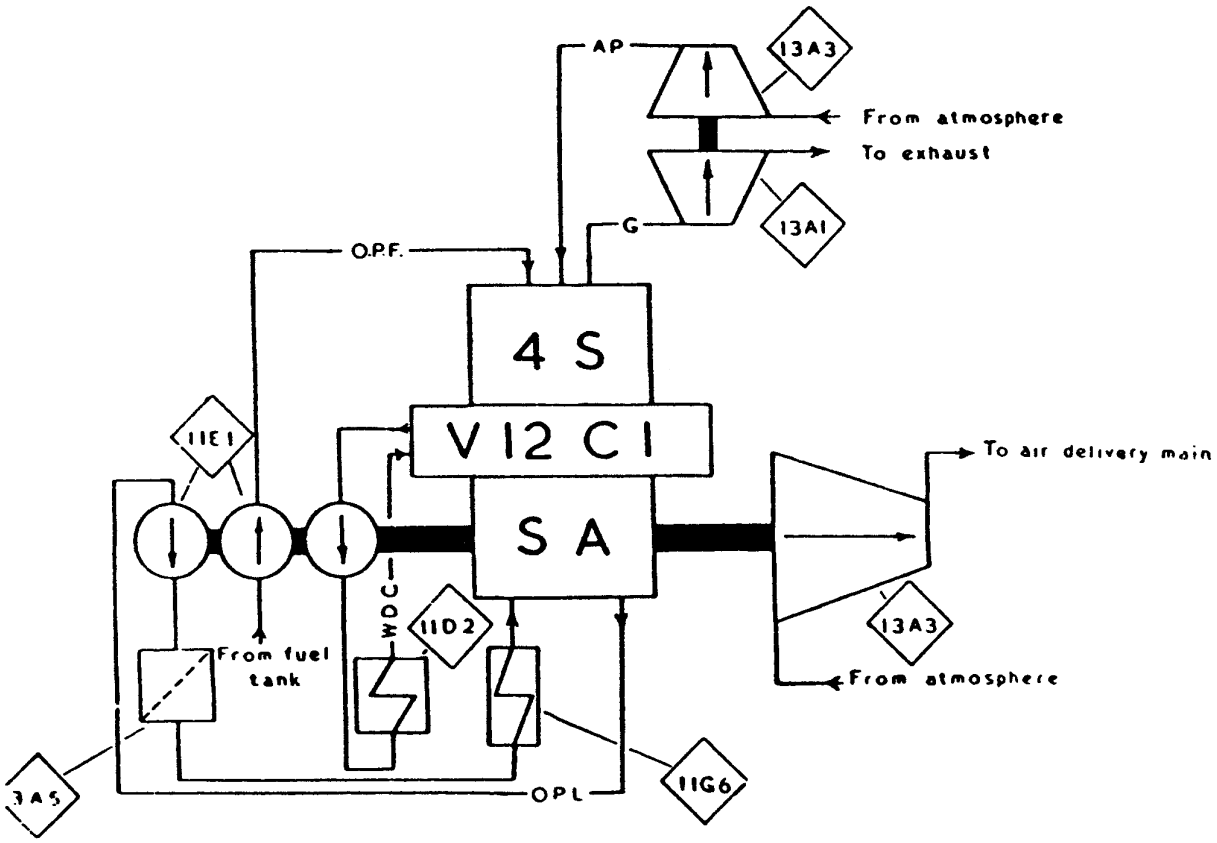
Typical diagram of steam power generating plant



Numbered labels are inserted to give ready reference to the position of the symbol in the standard and are not intended to appear in a normal diagram.

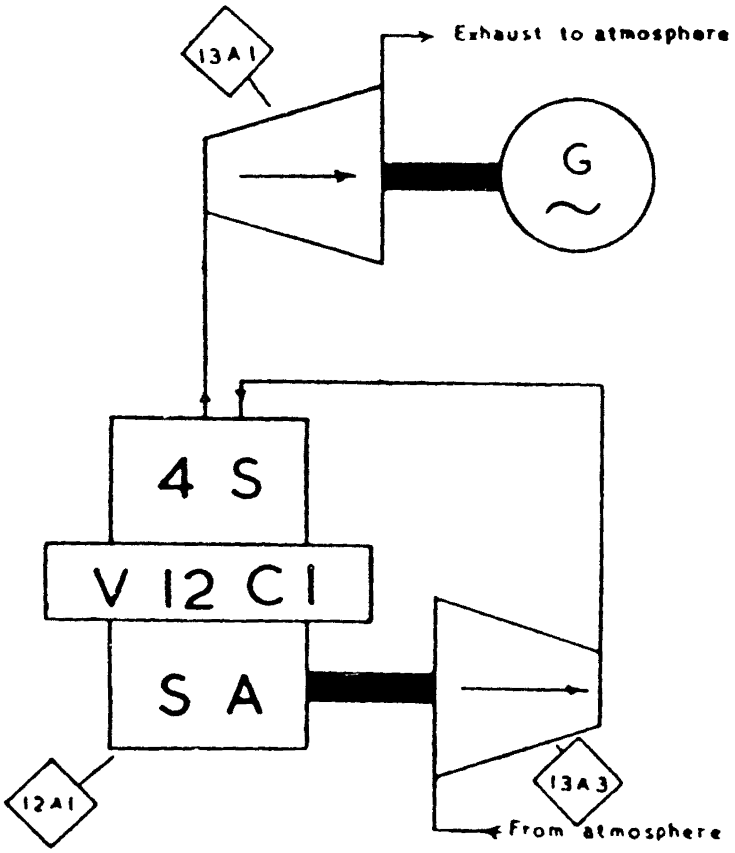
This is a representative diagram using as many as possible of the symbols, etc., shown in the standard, but is not to be regarded as a standard diagram with regard to the method of combining the various items of plant or the method of layout of the diagram as a whole. It is recommended that diagrams should be arranged so that the main flow of fluids, etc., is in a clock-wise direction.

Typical diagram showing A 4-S V-12 SA diesel engine driving an air compressor, and some ancillary equipment directly associated with the engine



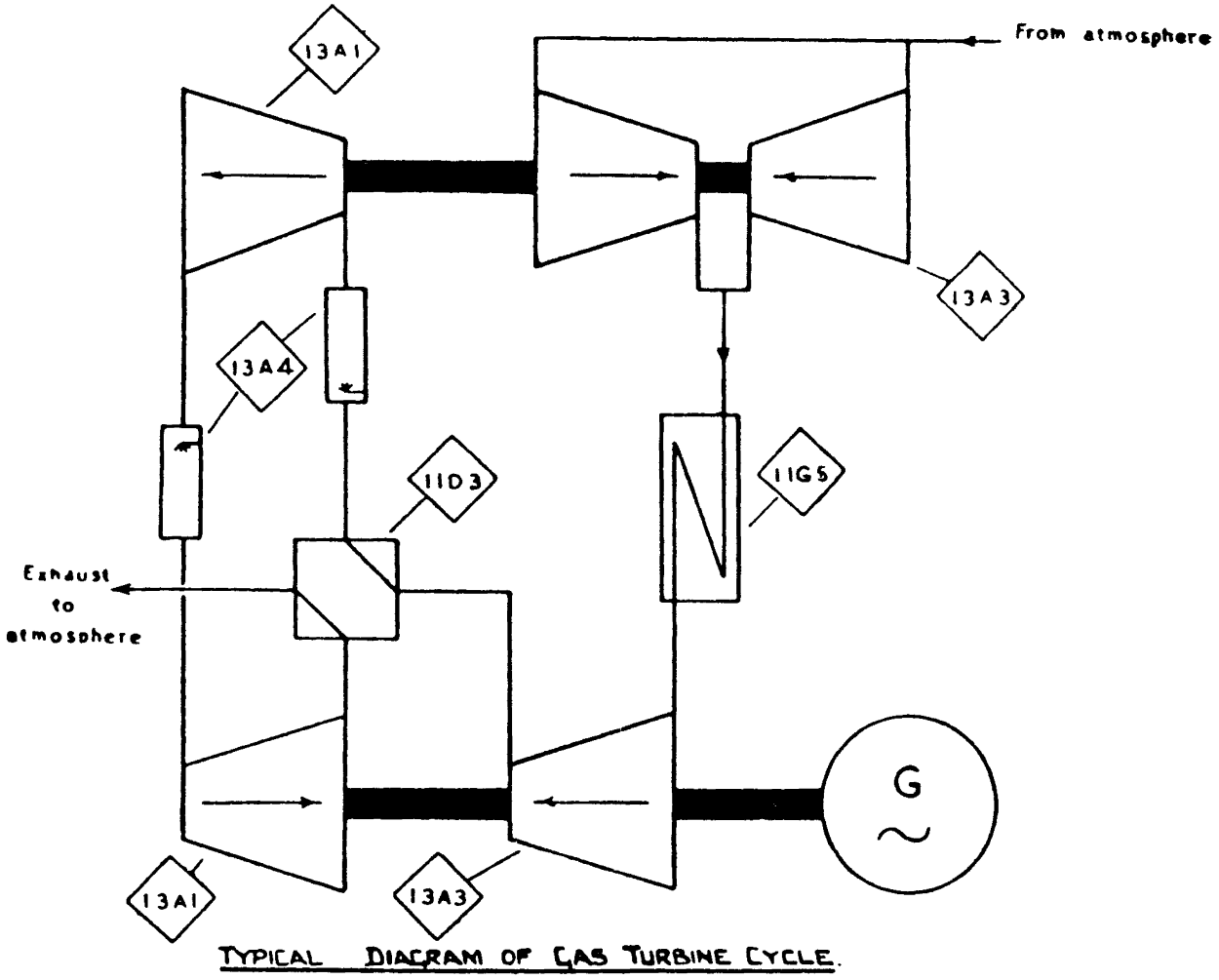
NOTE Numbered labels are inserted to give ready reference to the position of the symbol in the standard and are not intended to appear in a normal diagram. No. 3A5 appears in Part 1 of this standard.

Typical diagram showing A 4-S V-12 SA diesel engine used as a gas generator for a power gas turbine ancillary equipment is omitted



NOTE Numbered labels are inserted to give ready reference to thc position of the symbol in the standard and are not intended to appear in a normal diagram.

Typical diagram of gas turbine cycle



NOTE Numbered labels are inserted to give ready reference to the position of the symbol in the standard and are not intended to appear in a normal diagram.

Index of symbols

(The references are to the item numbers in the tables.)

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