

Universal Decimal Classification —

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UDC 621.4 Heat engines (other than
steam engines)

UDC 025.45:621.4

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Foreword

The English version of the Universal Decimal Classification (UDC) is being prepared and published as BS 1000 by the British Standards Institution (BSI) at the original joint request of the British Society for International Bibliography (BSIB) and the Association of Special Libraries and Information Bureaux (ASLIB), now amalgamated as Aslib. It has the approval of the Lake Placid Education Foundation, New York, proprietors of the Dewey Decimal Classification, from which the UDC derives. The first English Full Edition is the 4th International edition authorized by the International Federation for Documentation (FID), The Hague, Netherlands.

This section is part of the English Full Edition. It should be used in conjunction with the Abridged English Edition, BS 1000A, which refers to many other subjects of interest not listed in this schedule, and provides a conspectus of the whole scheme, together with an introduction to its use. For further practical information about the principles, application and utilization of the scheme, users should refer to BS 1000C.

This edition of UDC 621.4 includes modifications authorized in “Extensions and Corrections to the UDC” up to and including Series 9, No. 1, dated June 1975. Subsequent issues of “Extensions and Corrections to the UDC” should be consulted to keep the schedule up to date. Further information about this and other UDC publications is given on page 15. British Standards related to this part of BS 1000 are listed on the inside back cover.

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 18, an inside back cover 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.

Scope

Under 621.4 is classed information about heat engines other than steam engines. Heat engines in general, and the generation and technical applications of steam, come under 621.1. Matters common to 621.1, 621.4 and 621.5 are classed under 621.1.

Related subjects

- 533 Mechanics of gases. Aeromechanics.
 Plasma physics
- 536 Heat. Thermodynamics
- 541.12 Chemical mechanics
- 621.039.5 Nuclear fission reactors
- 621.039.6 Controlled thermonuclear devices.
 Fusion reactors
- 621.1 Generation, distribution and use of
 steam. Steam engines. Boilers
- 621.3 Electrical engineering
- 621.5 Pneumatic energy, machinery and tools.
 Refrigeration and liquefaction
 techniques and plant
- 621.6 Fluids handling, storage and
 distribution plant and equipment
- 623 Military engineering
- 629 Transport vehicle engineering
- 662.6/.9 Fuels

Auxiliary signs and subdivisions

Full information about the common and special auxiliary signs and subdivisions (often abbreviated to “common and special auxiliaries”) will be found in BS 1000A and BS 1000C.

Colon sign of relation. For the classification of information for the public, as in abstracts and bibliographies, maximum use of colon combinations rather than of common or special auxiliaries is recommended. The use of the colon sign of relation is preferable for multiple entry systems, as it will help prevent the concealment of information. This usually results in longer notation, however, and for information for more restricted use, the application of auxiliaries, where available, may be simpler and more convenient provided that there is an adequate alphabetical subject index.

Common auxiliaries. The common auxiliaries of language = . . . , form (0 . . .), place (1/9), race and nationality (= . . .), time “. . . ”, point of view .00 . . . , materials –03 . . . and persons –05 . . . are applicable throughout the UDC. However, they should be used mainly to express concepts not otherwise provided for in the schedules.

Special auxiliaries. Special auxiliary subdivisions are provided under 621.41, 621.43, 621.438 and 621.45. They may be detached and applied to any subdivision of the number at which they are listed, *e.g.*

- | | |
|------------------|--|
| 621.45.018.5 | Development tests |
| 621.452.32 | Turbojet engines |
| 621.452.32.018.5 | Development tests for turbojet engines |

The –1/–3 and –5/–9 special auxiliaries listed at 62 are applicable throughout the schedule.

Typographic presentation

The arrow → means either “see” or “see also” according to the context.

The symbol ≈ “subdivide as” means that the number preceding it may be subdivided in the same way as, and with meanings analogous to the subdivisions of, the number which follows it.

SCHEDULE

621.4 HEAT ENGINES (OTHER THAN STEAM ENGINES)

Heat engine machinery details may be denoted by the –1/–3 and –5/–9 special auxiliaries listed at 62

Principal divisions

621.41	HOT AIR ENGINES	621.43–447	Mixture introduction with dependent fuel introduction and control of main air and auxiliary air when required
Special auxiliary subdivisions for 621.41			
621.41.01	Theory	.1	With non-automatic mixture control
	621.41.01 $\cong$ 621.43.01	.2	With automatic mixture control
Principal divisions (continued)		–448	Mixture introduction controlled by atomizer with nozzle control
621.412	Engines with alternate heating and cooling of air. Closed cycle hot air engines	–46	Parts of carburettors
.413	Engines with alternate induction and exhaust of hot air or gas	–461	Carburettor bodies
.2	Open cycle hot air engines	.1	With single wall
.3	Open cycle hot gas engines	.2	With double wall
.415	Auxiliary attachments for hot air engines. Air pumps, firing devices etc	.3	Carburettor connections
621.43	INTERNAL COMBUSTION ENGINES	–462	Carburettor valves
Special auxiliary subdivisions for 621.43		.1	Inlet valves. Mixing valves
621.43–4	INTRODUCTION OF FUEL. FORMATION OF MIXTURE. CARBURATION	.2	Mixing valves for gaseous fuels
	<i>Only processes are classed here For vaporization, carburation and mixture-forming devices</i> →621.43.03	.3	Mixing valves for liquid fuels
–41	Introduction of fuel and additives to liquid fuel engines in general	–463	Spray nozzles
–42	Pressure atomization by internal pressure (jet atomization)	.1	With one hole
–421	Atomization of fuel	.2	With more than one hole
–422	Atomization of compressed mixture	.3	Conical with slits and holes
–43	Pressure atomization by external pressure (injection)	.4	Conical with annular orifice
–432	Atomization by compressed air or other compressed gas	.7	Conical with variable orifice
–433	Atomization by induction air	–464	Atomizer screens
–434	Atomization by air during compression	.1	Notched
–44	Fuel introduction, supply. Mixture formation	.2	Heated
–441	Generalities	–465	Carburettor control apparatus
.1	Constant introduction	.1	Slide valves
.2	Quantity control	.2	Stop valves
.3	Throttle control	.3	Discs
–442	Main air and fuel introduction	.4	Flap valves
.1	Introduction of main air	.5	Throttle flap valves
.2	Independent main air control	–466	Mixing chambers
.3	Dependent main air control	.1	With float and valve
–443	Main and auxiliary air introduction	.2	With valve
.1	With non-automatic control	.5	With heated wall
.2	With automatic control	.7	With vane wheel
–444	Introduction of fuel, main air and mixture	–469	Devices for preventing carburettor fire
.1	With non-automatic fuel control		→614.8 Accidents. Risks. Hazards. Prevention, personal protection, safety
.2	With automatic fuel control	621.43.01	62–78 Protective devices, protective measures for operating personnel and the public
–445	Introduction of mixture, main air and auxiliary air	.011	THEORY
.1	With non-automatic mixture control	.013	Mechanical fundamentals: processes, principles, studies
.2	With automatic mixture control		Matters concerning liquids, gases and vapours
–446	Mixture introduction with nozzle-operated supply variation	.1	Scavenging process
.1	With non-automatic mixture control		→621.43.058.2 Scavenging
.2	With automatic mixture control	.2	Induction
		.3	Vaporization
		.35	Vapour lock formation in fuel lines
		.37	Ice formation in spray carburettors

621.43.013.4	Atomization	621.43.031.2	Suction pumps
.6	Swirl. Turbulence	.3	Compressors
.7	Compression		621.43.031.3 $\cong$ 621.51
.9	Expansion. Exhaust. Residues	.5	Pumps with annular space
.016	Matters relating to the theory of heat	.7	Special pumps for air circulation
.4	Temperatures. Heat transfer. Heat loss.	.9	Position of charging pumps on the engine
	Influence of walls	.92	Coaxial with working cylinder
	<i>Further particulars may be denoted by the –5 special auxiliaries listed at 62, e.g. 621.43.016.4–57 Starting temperature</i>	.921	On head or base of working cylinder
		.922	In front of cylinder, beyond the crankshaft
.7	Thermodynamic matters	.923	Between piston and crank casing
.018	Efficiency. Power	.93	In front part of working cylinder
.2	Mechanical efficiency	.95	Concentric to axis of working cylinder
.3	Thermal efficiency from the point of view of fuel consumption	.96	Parallel to axis of working cylinder
.4	Thermodynamic efficiency	.97	Inclined or perpendicular to axis of working cylinder
.6	Attainable speed	.98	With independent drive
.7	Power output	.032	Fuel pumps for liquid fuels between reservoir and carburettor
.71	Power output units	.1	Suction pumps
.72	Brake horsepower	.6	Pressure pumps
.73	Altitude performance		621.43.032.6 $\cong$ 621.6, e.g.
.76	Indicated horsepower		621.43.032.67 Centrifugal pumps. Axial flow pumps. Turbo pumps
.8	Installations for determination of efficiency and power output	.69	Jet pumps
	→531.78 Measurement of work, force and pressure	.8	Pipelines
.82	Brake dynamometers. Dynamometric brakes	.033/.035	Spray carburettors
.86	Indicators	.033.2	Simple spray carburettors with adjustable main or auxiliary air inlet
.87	Reducing gear for indicators	.21	Mechanically adjustable
.019	Chemical, physicochemical matters. Combustion	.22	Automatically adjustable
.2	The explosive mixture. Combustibility. Limits of reaction	.3	Spray carburettors with independent auxiliary air valves
	→541.12 Chemical mechanics	.31	Mechanically adjustable
	<i>Further particulars may be denoted by the –5 special auxiliaries listed at 62, e.g. 622.43.019.2–57 Ease of starting</i>	.32	Automatically adjustable
.22	Air requirement	.4	Spray carburettors with adjustable fuel flow cross-section and air and mixture passages connected to it
.25	Combustion properties	033.41	Mechanically adjustable
.26	Coefficients	.42	Automatically adjustable
.265	Cetane number	.5	Valve carburettors with variable fuel inlet and variable main air inlet
.266	Critical compression pressure	.51	Main air inlet dependent
.4	Explosion process	.52	Main air inlet independent
.6	Constant pressure combustion process	.6	Carburettors with automatically adjustable interconnected inlets for fuel and air
.7	Deposits on cylinder wall etc	.7	Valve carburettors with inlet and mixer valves
.8	Premature ignition. Knock. Delayed ignition	.71	For gaseous fuels
	→621.43.047.5 Pre-set sparking	.72	For liquid fuels
	621.43.057.5 Addition of chemicals to prevent knocking etc	.8	Spray carburettors with compensating jets, brake air jets etc
.86	Coefficients. Knock resistance	.9	Spray carburettors with other special means of regulating fuel supply. Float chamber regulation
.862	Octane number, value	.034.3	Spray carburettors with phased atomization
.863	HUC number (effective compression ratio)	.31	Simple
.866	Octane power number, value	.32	With air blast tube
.9	Combustion products. Exhaust gases	.5	Spray carburettors with adjustable mixture cross-section
621.43.03	VAPORIZATION, CARBURATION, MIXTURE-FORMING DEVICES	.51	Of simplest kind
	<i>The fuel may be denoted by the –6 special auxiliaries listed at 62</i>		
.031	Pressure charging. Induction charging. Fuel pumps. Charging pumps		

621.43.034.3.52	With adjustable mixture cross-section and main and auxiliary air cross-sections dependent on it	621.43.036.4	Fuel vaporizers exploiting heat from pipes and cylinders 621.43.036.4 $\cong$ 621.43.036.2
.521	Mechanically adjustable	.5	Carburettor and vaporizer heating
.522	Automatically adjustable	.52	Indirect heating. Preheating by combustion. Mechanical generation of heat
.53	With adjustable mixture cross-section and dependent variable mixture throttle cross-section	.54	Electrical heating of fuel, air and mixture preheaters and fuel vaporizers
.531	Mechanically adjustable	.6	Surface carburettors
.532	Automatically adjustable	.61	With liquid bath
.54	With adjustable mixture cross-section and dependent variable fuel supply cross-section	.62	With wetted (trickled) surfaces
.541	Mechanically adjustable	.63	With porous vessels
.542	Automatically adjustable	.64	With wicks. Wick carburettors
.55	With variable mixture cross-section and with spray orifice on throttle housing. Throttle valve carburettors	.65	With rotating parts
.6	Spray carburettors with multiple mixing chambers	.7	Other carburettors, vaporizers
.61	With two mixing chambers in parallel	.72	Carburettors, vaporizers in interior of cylinder
.62	With more than two mixing chambers in parallel	.75	Carburettors for molten materials
.63	With two mixing chambers in series, particularly twin jet carburettors with idler opening on throttle valve	.9	Mixing devices
.7	Arrangement of two or more independent carburettors	.91	Mixing devices in the mixture line, fixed or movable
.71	With several mixing chambers	.92	Compound mixers, particularly post-gasifiers and post-vaporizers
.72	For two or more fuels	.037	Pressure carburettors
.8	Carburettors with mixture enrichment by special additives	.1	With atomization of fuel by pressure from pre-compressed combustion air
.81	By addition of water or steam	.2	With atomization of fuel by internal pressure (jet atomization)
.82	By addition of chemicals	.21	With pressure atomization of fuel in suction line, mechanically driven fuel pump
.035	Other spray carburettors	.22	With pressure atomization of fuel, fuel pump driven by combustion air flow
.2	Starting carburettors. Carburettors with air cleaning. Carburettors with fire protection	.3	With fuel atomization by centrifugal effect
.036	Carburettors with preheaters and vaporizers	.4	With compressed air or compressed gas atomization in the induction line
.1	Generalities	.5	With pressure atomization of compressed mixture (mixing pump in mixture pipe). Mixing pumps
.11	Carburettors with fuel preheating	.038	Fuel injection devices, particularly for diesel and semi-diesel engines
.12	Carburettors with air preheating	.1	Injection devices with compressed air atomization
.13	Carburettors with mixture preheating	.11	Compressed air from working cylinder
.14	Carburettors with fuel and air preheating	.12	Compressed air from independent source
.15	Carburettors with fuel, air and mixture preheating	.2	Injection devices with fuel atomization by exhaust gases, steam or other means
.17	Preheaters as independent devices	.3	Injection devices with pressure atomization. Jet atomization
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.2	Fuel, air and mixture preheating with waste heat	.52	Fuel distribution pumps
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