## CPC COOPERATIVE PATENT CLASSIFICATION

F MECHANICAL ENGINEERING; LIGHTING; HEATING; WEAPONS; BLASTING (NOTE omitted)

## **ENGINES OR PUMPS**

2210/34 . . Laminar flow

F05 INDEXING SCHEMES RELATING TO ENGINES OR PUMPS IN VARIOUS SUBCLASSES OF CLASSES F01-F04

F05D INDEXING SCHEME FOR ASPECTS RELATING TO NON-POSITIVE-DISPLACEMENT MACHINES OR ENGINES, GAS-TURBINES OR JET-PROPULSION PLANTS

2200/00	Mathematical features	2210/40	Flow geometry or direction
2200/10	Basic functions	2210/41	upwards due to the buoyancy of compressed air
2200/11	Sum	2210/42	Axial inlet and radial outlet
2200/12	Subtraction	2210/43	Radial inlet and axial outlet
2200/13	Product	2210/44	• • bidirectional, i.e. in opposite, alternating
2200/14	Division		directions
2200/15	Inverse	2220/00	Application
2200/20	Special functions	2220/00	in ram-jet engines or ram-jet driven vehicles
2200/21	Root	2220/10	within closed fluid conduits, e.g. pipes
2200/211	Square root	2220/20	in turbines
2200/212	Cubic root	2220/30	in steam turbines
2200/22	Power	2220/31	in gas turbines
2200/221	Square power		
2200/222	Cubic power		for a special turbine stage
2200/23	Logarithm		<ul><li> the first stage of a turbine</li><li> an intermediate stage of the turbine</li></ul>
2200/24	exponential		_
2200/25	Hyperbolic trigonometric, e.g. sinh, cosh, tanh		the last stage of the turbine
2200/26	trigonometric		for the first stone of a compressor or a law.
2200/261	Sine	2220/3217	for the first stage of a compressor or a low pressure compressor
2200/262	Cosine	2220/3218	for an intermediate stage of a compressor
2200/263	Tangent		for the last stage of a compressor or a high
2200/264	Cotangent	2220/3219	pressure compressor
2200/30	miscellaneous	2220/323	• • • for aircraft propulsion, e.g. jet engines
2200/31	odd	2220/324	to drive unshrouded, low solidity propeller
2200/32	even	2220/325	to drive unshrouded, high solidity propeller
2200/33	bigger or smaller	2220/326	to drive shrouded, low solidity propeller
2200/34	biggest or smallest	2220/327	to drive shrouded, high solidity propeller
2200/35	first	2220/328	providing direct vertical lift
2200/36	last	2220/329	in helicopters
2210/00	XX7 1 1 61 1 1	2220/34	. in ram-air turbines ("RATS")
2210/00	Working fluids	2220/36	specially adapted for the fan of turbofan engines
2210/10	• Kind or type	2220/40	in turbochargers
2210/11	liquid, i.e. incompressible	2220/50	for auxiliary power units (APU's)
2210/12	gaseous, i.e. compressible	2220/60	<ul> <li>making use of surplus or waste energy</li> </ul>
2210/13	mixed, e.g. two-phase fluid	2220/62	with energy recovery turbines
2210/132	• • • Pumps with means for separating and	2220/64	for domestic central heating or production of
2210/14	evacuating the gaseous phase	2220/04	electricity
2210/14	Refrigerants with particular properties, e.g. HFC  Properties	2220/70	• in combination with
2210/20	Properties	2220/70	a steam turbine
2210/30	Flow characteristics	2220/722	as part of an integrated gasification combined
2210/31	with Mach-number kept constant along the flow		cycle
2210/32	. Pressure kept constant along the flow	2220/74	a gas turbine
2210/33	Turbulent flow		

2220/75	equipment using fuel having a low calorific value,	2230/64	using positioning or alignment devices for
2220/13	e.g. low BTU fuel, waste end, syngas, biomass	2230/04	aligning or centring, e.g. pins
	fuel or flare gas	2230/642	• • using maintaining alignment while permitting
2220/76	an electrical generator		differential dilatation
2220/762	of the direct current (D.C.) type	2230/644	• for adjusting the position or the alignment, e.g.
2220/764	of the alternating current (A.C.) type		wedges or eccenters
2220/7642	of the synchronous type	2230/68	using auxiliary equipment for lifting or holding
2220/7644	• • • of the asynchronous type, i.e. induction type	2230/70	Disassembly methods
2220/7646	Double fed induction generators (DFIGs)	2230/72	. Maintenance
2220/766	via a direct connection, i.e. a gearless	2230/80	Repairing, retrofitting or upgrading methods
	transmission	2230/90	. Coating; Surface treatment (manufacture with
2220/768	equipped with permanent magnets		deposition of material F05D 2230/30)
2220/77	of the linear type	2240400	
2220/80	in supersonic vehicles excluding hypersonic	2240/00	Components
	vehicles or ram, scram or rocket propulsion		NOTE
2220/90	• in vehicles adapted for vertical or short take off and		Commonants are the basic elements of construction
2220/70	landing (v/stol vehicles)		Components are the basic elements of construction
	randing (vision veineres)	2240/10	• Stators
2230/00	Manufacture	2240/11	Shroud seal segments
2230/10	by removing material	2240/12	Fluid guiding means, e.g. vanes
2230/11	by electrochemical methods	2240/121	related to the leading edge of a stator vane
2230/12	by spark erosion methods		
2230/13	using lasers	2240/122	related to the trailing edge of a stator vane
2230/14	Micromachining	2240/123	related to the pressure side of a stator vane
2230/18	Manufacturing tolerances	2240/124	related to the suction side of a stator vane
2230/20	essentially without removing material	2240/125	related to the tip of a stator vane
		2240/126	Baffles or ribs
2230/21	• by casting	2240/127	Vortex generators, turbulators, or the
2230/211	• • • by precision casting, e.g. microfusing or		like, for mixing (by creating turbulence
	investment casting		<u>F05D 2260/2212</u> )
2230/22	by sintering	2240/128	Nozzles
2230/23	by permanently joining parts together	2240/1281	Plug nozzles
2230/232	by welding	2240/129	Cascades, i.e. assemblies of similar profiles
2230/233	Electron beam welding		acting in parallel
2230/234	Laser welding	2240/14	Casings or housings protecting or supporting
2230/235	TIG or MIG welding		assemblies within
2230/236	Diffusion bonding	2240/15	Heat shield
2230/237	Brazing	2240/20	• Rotors
2230/238	Soldering	2240/24	• • for turbines
2230/239	Inertia or friction welding	2240/241	of impulse type
2230/24	by extrusion	2240/242	of reaction type
2230/25	by forging	2240/242	of the Archimedes screw type
2230/26	by rolling		• • • • • • • • • • • • • • • • • • • •
		2240/30	Characteristics of rotor blades, i.e. of any element
2230/30	• with deposition of material		transforming dynamic fluid energy to or from rotational energy and being attached to a rotor
2230/31	Layer deposition	2240/201	
2230/311	by torch or flame spraying	2240/301	Cross-sectional characteristics
2230/312	by plasma spraying	2240/302	characteristics related to shock waves,
2230/313	by physical vapour deposition	22 12 22 -	transonic or supersonic flow
2230/314	by chemical vapour deposition	2240/303	related to the leading edge of a rotor blade
2230/40	Heat treatment	2240/304	related to the trailing edge of a rotor blade
2230/41	Hardening; Annealing	2240/305	related to the pressure side of a rotor blade
2230/411	Precipitation hardening	2240/306	related to the suction side of a rotor blade
2230/42	by hot isostatic pressing	2240/307	related to the tip of a rotor blade
2230/50	Building or constructing in particular ways	2240/31	with roughened surfaces
2230/51	in a modular way, e.g. using several identical or	2240/35	Combustors or associated equipment
2230/31	complementary parts or features	2240/36	. Fuel vaporizer
2230/52	using existing or "off the shelf" parts, e.g. using	2240/40	Use of a multiplicity of similar components
4430/34	standardized turbocharger elements	2240/40	Bearings
2220/52	<del>-</del>		E
2230/53	by integrally manufacturing a component, e.g. by	2240/51	Magnetic
2220/54	milling from a billet or one piece construction	2240/511	with permanent magnets
2230/54	by sheet metal manufacturing	2240/515	Electromagnetic
2230/60	Assembly methods	2240/52	Axial thrust bearings
2230/61	using limited numbers of standard modules which	2240/53	Hydrodynamic or hydrostatic bearings
	can be adapted by machining		

2240/54	Radial bearings	2250/283 honeycomb
2240/55	Seals	2250/29 . machined; miscellaneous
2240/56	Brush seals	2250/29 hollowed
2240/57	. Leaf seals	2250/292 tapered
2240/57	Piston ring seals	2250/293 lathed, e.g. rotation symmetrical
2240/581	Double or plural piston ring arrangements, i.e. two or more piston rings	E
2240/50	Lamellar seals	• Arrangement of components
2240/59	Shafts	2250/31 . according to the direction of their main axis or
2240/60		their axis of rotation
2240/61	Hollow	2250/311 the axes being in line
2240/62	. Flexible	2250/312 the axes being parallel to each other
2240/63	Glands for admission or removal of fluids from	2250/313 the axes being perpendicular to each other
22.40/70	shafts	2250/314 the axes being inclined in relation to each other
2240/70	Slinger plates or washers	2250/315 the main axis being substantially vertical
2240/80	• Platforms for stationary or moving blades	2250/32 according to their shape
2240/81	Cooled platforms	2250/321 asymptotic
2240/90	Mounting on supporting structures or systems	2250/322 tangential
2240/91	on a stationary structure	2250/323 convergent
2250/00	Geometry	2250/324 divergent
2230/00		2250/33 symmetrical
	NOTE	2250/34 translated
	Geometry indicates the shape or form of a	2250/35 . rotated
	component or the configuration or arrangement of	2250/36 in inner-outer relationship, e.g. shaft-bearing
	components in a machine or in a plant	arrangements
		2250/37 circumferential
2250/10	. Two-dimensional	2250/38 angled, e.g. sweep angle
2250/11	triangular	. Movement of components
2250/12	rectangular	2250/41 with one degree of freedom
2250/121	square	2250/411 in rotation
2250/13	trapezoidal	2250/42 with two degrees of freedom
2250/131	polygonal	2250/43 with three degrees of freedom
2250/132	hexagonal	2250/44 by counter rotation
2250/14	elliptical	2250/50 • Inlet or outlet
2250/141	circular	2250/51 . Inlet
2250/15	spiral	2250/511 augmenting, i.e. with intercepting fluid flow
2250/16	parabolic	cross sectional area greater than the rest of the
2250/17	hyperbolic	machine behind the inlet
2250/18	patterned	2250/512 concentrating only, i.e. with intercepting fluid
2250/181	ridged	flow cross sectional area not greater than the
2250/182	crenellated, notched	rest of the machine behind the inlet
2250/183	• • zigzag	2250/52 Outlet
2250/184	sinusoidal	2250/53 of regenerative pumps
2250/185	serpentine-like	2250/60 • Structure; Surface texture
2250/19	machined; miscellaneous	2250/61 corrugated
2250/191	perforated	2250/611 undulated
2250/192	bevelled	2250/62 • smooth or fine
2250/193	milled	2250/621 polished
2250/20	Three-dimensional	2250/63 coarse
2250/21	pyramidal	2250/70 . Shape
2250/21	parallelepipedal	2250/70 • Shape 2250/71 • curved
2250/221	cubic	
2250/23	prismatic	2250/712 concave
2250/231	cylindrical	2250/713 inflexed
2250/232	conical	2250/72 symmetric
2250/24	• ellipsoidal	2250/73 asymmetric
2250/241	spherical	2250/74 given by a set or table of xyz-coordinates
2250/25	-	
2250/25	helical	2250/75 given by its similarity to a letter, e.g. T-shaped
2250/26	<ul><li>helical</li><li>paraboloid</li></ul>	2250/80 • Size or power range of the machines
2250/26 2250/27	<ul><li>. helical</li><li>. paraboloid</li><li>. hyperboloid</li></ul>	<ul><li>2250/80 . Size or power range of the machines</li><li>2250/82 . Micromachines</li></ul>
2250/26	<ul><li>helical</li><li>paraboloid</li></ul>	2250/80 • Size or power range of the machines

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2250/282 . . . cubic pattern

2260/00	Function	2260/4041 the driven magnets encircling the driver
2260/02	Transport and handling during maintenance and	magnets
22 (0/10	repair	2260/406 • through hydraulic systems
2260/10	Particular cycles	2260/407 • through piezoelectric conversion
2260/12	. Testing on a test bench	2260/408 through magnetohydrodynamic conversion
2260/14	Preswirling	2260/42 • Storage of energy
2260/15	. Load balancing	2260/43 in the form of rotational kinetic energy, e.g. in
2260/16	Fluid modulation at a certain frequency	flywheels
2260/20	. Heat transfer, e.g. cooling	2260/50 • Kinematic linkage, i.e. transmission of position
2260/201	by impingement of a fluid	2260/52 involving springs
2260/202	by film cooling	2260/53 using gears
2260/203	by transpiration cooling	2260/532 of the bevelled or angled type
2260/204	by the use of microcircuits	2260/54 using flat or V-belts and pulleys
2260/205	Cooling fluid recirculation, i.e. after cooling	2260/55 using chains and sprockets; using toothed belts
	one or more components is the cooling fluid	2260/56 • using cams or eccentrics
2260/207	recovered and used elsewhere for other purposes	2260/57 . using servos, independent actuators, etc.
2260/207	using a phase changing mass, e.g. heat absorbing by melting or boiling	2260/60 • Fluid transfer
2260/208	·	2260/601 using an ejector or a jet pump
	. using heat pipes	2260/602 . Drainage
2260/209	using vortex tubes	2260/6022 of leakage having past a seal (seals
2260/211	by intercooling, e.g. during a compression cycle     by water injection	F05D 2240/57; glands F05D 2240/63)
2260/212 2260/213	<ul><li>by water injection</li><li>by the provision of a heat exchanger within the</li></ul>	2260/604 . Vortex non-clogging type pumps
2200/213	cooling circuit	2260/605 Venting into the ambient atmosphere or the like
2260/221	Improvement of heat transfer	2260/606 • Bypassing the fluid
2260/2212	by creating turbulence (vortex generators,	2260/607 • Preventing clogging or obstruction of flow paths
2200/2212	turbulators or the like for mixing	by dirt, dust, or foreign particles
	F05D 2240/127)	2260/608 . Aeration, ventilation, dehumidification or moisture removal of closed spaces
2260/2214	by increasing the heat transfer surface	2260/609 . Deoiling or demisting
2260/22141		2260/61 . Removal of CO <sub>2</sub> (removal of CO <sub>2</sub> from waste
2260/231	. Preventing heat transfer	gases <u>B01D 53/62</u> )
2260/232	characterized by the cooling medium	$\frac{\text{gases BOTD 35/02}}{\text{2260/611}}  .  \text{Sequestration of CO}_2$
2260/2322	steam	2260/70 • Adjusting of angle of incidence or attack of rotating
2260/234	of the generator by compressor inlet air	blades
2260/24	• for draft enhancement in chimneys, using solar or	2260/71 as a function of flow velocity
2200/21	other heat sources	2260/72 . by turning around an axis parallel to the rotor
2260/30	Retaining components in desired mutual position	centre line
2260/31	Retaining bolts or nuts	2260/74 by turning around an axis perpendicular the rotor
2260/311	• • • of the frangible or shear type	centre line
2260/32	by means of magnetic or electromagnetic forces	2260/75 the adjusting mechanism not using auxiliary
2260/33	with a bayonet coupling	power sources, e.g. by "servos"
2260/34	Balancing of radial or axial forces on regenerative	2260/76 the adjusting mechanism using auxiliary power
2200/21	rotors	sources
2260/35	Reducing friction between regenerative impeller	2260/77 the adjusting mechanism driven or triggered by
	discs and casing walls	centrifugal forces
2260/36	• • by a form fit connection, e.g. by interlocking	2260/78 the adjusting mechanism driven or triggered by
2260/37	by a press fit connection	aerodynamic forces
2260/38	by a spring, i.e. spring loaded or biased towards a	2260/79 Bearing, support or actuation arrangements
	certain position	therefor
2260/39	by a V-shaped ring to join the flanges of two	2260/80 • Diagnostics
	cylindrical sections, e.g. casing sections of a	. Modelling or simulation
	turbocharger	2260/82 • Forecasts
2260/40	Transmission of power	2260/821 . Parameter estimation or prediction
2260/402	through friction drives	2260/83 • Testing, e.g. methods, components or tools therefor
2260/4021	through belt drives	2260/84 . Redundancy
2260/4022	through endless chains	2260/85 • Starting
2260/4023	through a friction clutch	2260/90 • Braking
2260/403	through the shape of the drive components	2260/901 using aerodynamic forces, i.e. lift or drag
2260/4031	as in toothed gearing	2260/902 using frictional mechanical forces
2260/40311	of the epicyclical, planetary or differential	2260/903 using electrical or magnetic forces
	type	2260/904 using hydrodynamic forces
2260/404	through magnetic drive coupling	

220094 — Functionality given by mechanical stress related 2201/12 — Albitude cycle fatage [LTC1] of high cycle fat			
cycle fatigue [HCF]  particularly aimed at mechanical or thermal stress reduction  Preventing corrosion (coating or surface treatment [1632 223190)  2260/966   Preventing corrosion (coating or surface treatment [1632 223190)  2260/976   Preventing counteracting or reducing vibration or noise  2260/976   by mistuning rotor blades or staror vanes with irregular interblade spacing, artfoil shape  2260/972   by means of "anti-noise"  2260/973   by Helmholtz resonators  2260/973   by Helmholtz resonators  2260/974   counteracting thermacoustic noise  2260/977   Reducing windage losses  2260/979   Reducing windage losses  2260/979   Lubrication  2270/080   Lubrication  2270/080   Lubrication  2270/080   Lubrication  2270/080   Control  2270/080   Lubrication  2270/080   Lubrication  2270/080   Lubrication  2270/081   control of tatalional speed (n)  2270/081   control rotational speed (n)  2270/081   control rotational speed (n)  2270/082   do fell results possible  2270/083   control acceleration (n)  2270/083   Spoot rotational speed (n)  2270/083   control acceleration (n)  2270/084   spoot rotational speed (n)  2270/085   Tolerances  2270/085   Tolerances  2270/087   to control acceleration (n)  2270/080   to fell results possible  2270/081   control acceleration (n)  2270/081   to control acceleration (n)  2270/081   to control acceleration (n)  2270/081   to control acceleration (n)  2270/082   to to control acceleration (n)  2270/083   to fell results a bight as possible  2270/085   Tolerances  2270/087   to match engine to driven device  2270/081   in particular the electrical frequency of driven generator  2270/087   to match engine to driven device  2270/087   in particular the electrical frequency of driven generator  2270/087   to match engine to driven device  2270/087   to match engine to driven device  2270/088   to produce clean exhaust gases  2270/089   with a slittle store a health gased  2270/089   to match engine combination and teach of the control limits  2270/089   to match engine combined in a	2260/94	• Functionality given by mechanical stress related	2270/12 to maintain desired vehicle trajectory parameters
220096 Preventing corrosion (coating or surface treatment reduction problems of the control streams of the control			
reduction Proventing corrosion (coaling or surface treatment FOSD 221099)  2260964 Proventing corrosion (coaling or surface treatment FOSD 2210990)  22609761 by misturing rotor blades or stator vanes with irregular interblude spacing, artfol shape 22609632 by Plenholtz resonators 2260964 counteracting themacoustic oise 22700173 . by the Counted effect 22700974 by means of "anti-noise" 22700183 by Flenholtz resonators 22700975 counteracting themacoustic oise 2270097 by means of "anti-noise" 22700976 counteracting themacoustic oise 2270097 by means of "anti-noise" 22700977 bedieve memocoustic oise 2270098 counteracting themacoustic oise 2270099 counteracting themacoustic oise 2270099 clarification of the control system 2270099 clarification counteracting themacoustic oise 2270091 clarification of the control system 2270090 control 2270001 control rotational speed (n) 22700102 counteracting the control system 2270002 counteracting theory 2270002 counteracting theory 2270002 counteracting theory 2270003 counteracting theory 2270003 counteracting theory 2270004 counteracting themacoustic caves 2270005 counteracting themacoustic oaction of the control system 2270006 counteracting themacoustic oaction of the control system 2270007 counteracting themacoustic caves with the counter of the control oaction of the control system 2270008 counteracting themacoustic caves with the counter of the control system 2270009 counteracting themacoustic oaction of the control oaction o	2260/941	•	
Preventing corrosion (coating or surface treatment by 1920 2240096   Preventing, counteracting or reducing vibration or noise   227016   1	2200/ )+1	-	•
2270.09 226.09 237.00 237.00 2	2260/95	Preventing corrosion (coating or surface treatment)	combustion chambers (counteracting noise or
noise  2260/961	2260/96		
2260966 . by mistuning rotor blades or stator vanes with irregular interblade specific, airfold shape 2270173 . by a plasma generator, e.g. control of ignition irregular interblade specific, airfold shape 2270173 . by the Coanda effect 2270184 . by Helmboltz resonators 2260966 . counteracting thermacoustic noise 2270030 . counteracting thermacoustic noise 2270030 . la radial flow machines 2270030 . la radial flow machines 2270030 . la pintion, e.g. ignition by warming up of fuel or oxidizer in a resonant acoustic cavity 2270030 . labrication 2270030 . pintion, e.g. ignition by warming up of fuel or oxidizer in a resonant acoustic cavity 2270030 . purpose of the control system 2270030 . purpose of the control system 2270031 . o ocornol rotational speed (n) 2270032 . to prevent underspeed 2270032 . to prevent underspeed 2270032 . to the prevent underspeed 2270032 . to the prevent underspeed 2270032 . to keep rotational speed constant 2270040 . to control acceleration (n) 2270040 . to control acceleration (n) 2270041 . to keep rotational speed constant 2270042 . by keeping it below damangingly high values 2270044 . by making it as high as possible 2270055 . Thurst 2270065 . Thurst 2270066 . of file working fluid 2270067 . to inferce the output of the engine 2270068 . by keeping it below damangingly high values 2270069 . in particular the electrical frequency of driven generator 227007 . to insprove fred economy 227007 . to insprove fred economy 227007 . to insprove fred economy 227008 . in particular the electrical frequency of driven generator 227008 . by with as link snoke as possible 227009 . to one power the economy 227009 . to insprove fred economy 227009 . to insprove fred economy 227009 . in particular the electrical frequency of driven generator 227009 . to improve fred economy 227009 . to improve fred economy 227009 . in particular the electrical frequency of driven generator 227009 . to ope with emeragencies 227009 . to ope with emeragencies 227009 . in particular to deline speed 227009 . in particular t	2200/70		-
siregular interblade spacing, airful shape 2260903 by by means of 'rath-noise' 2260904 counteracting thermacounsic noise 226094 . counteracting thermacounsic noise 226097 Reducing windage losses 226097 . Reducing windage losses 226099 learned thermacounsic noise 226099 learned thermacounsic noise 226099 learned thermacounsic noise 2270000 learned the counter specific cavity 2270001 . Pressure 2270001 . Inlet pressure 2270031 . Outlet pressure 2270033 . Outlet pressure 2270030 . differential pressure 2270033 . Temperature 227002 . to control totalional speed (n) 227003 . Pressure 227002 . to control totalional speed (n) 227002 . to prevent underspeed 227002 . to prevent underspeed 227002 . of infiferent spools or shafts 2270030 . Mass flow 2270042 . by keeping it below damagingly high values 2270042 . by keeping it below damagingly high values 2270042 . by keeping it below damagingly high values 227005 . to affect the output of the engine 227005 . Thurst 2270062 . Thurst 2270063 . Explicitly mentioned power 2270063 . Explicitly mentioned power 2270064 . in particular the electrical frequency of driven generatur 227007 . to improve free leconomy 227008 . to mach engine to driven device 2270081 . in particular the electrical frequency of driven generatur 2270092 . in particular the electrical frequency of driven generatur 2270093 . in particular sudden load see 2270094 . by making it should be pressure 2270095 . in particular sudden load see 2270096 . in particular sudden load see 2270097 . to improve free leconomy 2270098 . to prevent underspeed 2270099 . in particular sudden load see 2270099 . in particular sudden load see 2270099 . in particular sudden load conditions 2270090 . in particu	2260/961		· · ·
2260962 by means of "anti-noise" 2270030 so performance of a machine 2270030 control parameters 227020 so positive in a resonant acoustic noise 2270301 control parameters 2270303 cont			, , , , , , , , , , , , , , , , , , ,
2260963 . by Helmboltz resonators 226097 . counteracting thermoacoustic noise 226097 . Reducing windage losses 226097 . in radial flow machines 226098 . Lubrication 226099 . Ignition, e.g. ignition by warming up of fuel or oxidizer in a resonant actuatic cavity 227000 . Ignition, e.g. ignition by warming up of fuel or oxidizer in a resonant actuatic cavity 2270001 . Purpose of the control system 2270002 . to control rotational speed (n) 227001 . Purpose of the control system 2270021 . to prevent overspeed 2270022 . to prevent underspeed 2270022 . to prevent underspeed 2270023 . of different spools or shafts 2270030 . Mass flow 2270023 . of different spools or shafts 2270030 . in variable speed operation 227004 . to control acceleration (u) 227004 . to control acceleration (u) 227005 . Torque 227005 . Torque 227005 . Torque 227005 . Torque 227006 . make negitate to driven device 227006 . m particular de electrical frequency of driven generator 227007 . in particular at idling speed 227008 . with as little snoke as possible 227008 . in particular at idling speed 227008 . vita as little snoke as possible 227008 . in particular blow-out and relight 227009 . to cope with nemergencies 227009 . in particular blow-out and relight 227009 . in particular blow-out and relight 227009 . to cope with our avail, compressor flow instabilities 227009 . to cope with our avail, compressor flow instabilities 2270001 . in particular sudden load loss 2270002 . due to bigh angle of attack of aircraft 2270010 . to cope with, or avaid, compressor flow instabilities 2270010 . to province engine in a multi-engine system 2270010 . to cope with, or avaid, compressor flow instabilities 2270010 . to province incompressor flow instabilities 2270010 . to province incompressor degradation 2270010 . to cope with, or avaid, compressor flow instabilities 2270010 . to cope with, or avaid, compressor flow instabilities 227001	2260/962		
2260974 Cacharge in hermoacoustic noise 2260972 . in radial flow machines 2260973 . labrication 2260979   Interpretation 2260979   Interpretation 226099   Interpretation 22703015   Interpretation 22703016   Interpretation 22703017   Interpretation 22703018   Interpretation 22703019   Interpretation 2270302   Interpretation 2270303   Interpretation 2270303   Interpretation 2270303   Interpretation 2270303   Interpretation 2270304   Interpretation 2270304   Interpretation 2270304   Interpretation 2270304   Interpretation 2270304   Interpretation 2270305   Interpretation 2270306   Interpretation 2270307   Interpretation 2270308   Interpretation 2270308   Interpretation 2270309   Interp	2260/963		-
227007   Reducing windage losses   2270301   Pressure   2270301   Interpressure   2270301   Interpressure   2270301   Interpressure   22703013   Outlet pressure   22703014   Outlet pressure   22703015   Outlet pressure   2270301   Outlet pressure   2270302   Outlet pressure   2270301   Outlet pressure   2270302   Outlet pressure   2270303   Outlet pressure   2270303   Outlet pressure   2270304   Outlet pressure   2270306   Outlet pressure   Outlet pr	2260/964		
2270/072   . in radial flow machines   2270/081	2260/97		
2270/08   Lubrication   Labrication   2270/3015	2260/972		
Sentition, e.g. ignition by warming up of fuel or solidizer in a resonant acoustic cavity	2260/98	Lubrication	1
2270/030	2260/99	• Ignition, e.g. ignition by warming up of fuel or	
2270/00   Control   2270/3032   excessive temperatures, e.g. caused by overheating or control rotational speed (n)   2270/304   Spool rotational speed (2270/302   to prevent overspeed   2270/306   Mass flow   2270/302   to prevent underspeed   2270/306   Mass flow   2270/022   to prevent underspeed   2270/306   of the working fluid   2270/024   to keep rotational speed constant   2270/3062   of the working fluid   2270/0362   to keep rotational speed constant   2270/3062   of the working fluid   2270/0362   to speed operation   2270/0362   to speed operation   2270/0362   to control acceleration (u)   2270/3062   to speed operation   2270/304   to control acceleration (u)   2270/3062   to speed operation   2270/304   to speed operation   2270/305   to speed operation   2270/31   Air pressure   2270/31   Air pressure   2270/31   Air temperature   2270/31   Air temperature   2270/31   Air temperature   2270/31   Air temperature   2270/32   Explicitly mentioned power   2270/33   Aix temperature   2270/34   Aix temperature   2270/35   Aix temperature   2270/35   Aix temperature   2270/35   Aix temperature		oxidizer in a resonant acoustic cavity	•
227001	2270/00	Control	
227002 . to control rotational speed (n) 2270021 . to prevent overspeed 22700305 . Tolerances 2270022 . to prevent underspeed 2270306 . Mass flow 2270003 . of different spools or shafts 22703061 . of the working fluid 2270024 . to keep rotational speed constant 2270040 . to keep rotational speed constant 2270040 . to control acceleration (u) 2270040 . to control acceleration (u) 2270040 . to control acceleration (u) 2270041 . by making it as high as possible 2270041 . by making it as high as possible 2270051 . Thrust 2270052 . Torque 2270052 . Torque 2270053 . Explicitly mentioned power 2270053 . Explicitly mentioned power 2270060 . to match engine to driven device 2270061 . in particular the electrical frequency of driven 2270061 . in improve fuel economy 2270070 . to improve fuel economy 2270071 . to improve fuel economy 2270081 . with as little smoke as possible 2270083 . by monitoring combustion conditions 2270083 . in particular breed and the explication and the explic			
2270021   to prevent overspeed   2270/305   Toleranes   2270/022   to prevent underspeed   2270/306   Mass flow   2270/306   of the working fluid   of the auxiliary fluid for heating or cooling purposes			
2270022 to prevent underspeed 2270023 of different spools or shafts 2270306 of the working fluid 2270024 . to keep rotational speed constant 2270307 . of the working fluid 227004 . to control acceleration (u) 227004 . to control acceleration (u) 227004 . by keeping it below damagingly high values 2270044 . by making it as high as possible 22700152 . by keeping it below damagingly high values 22700163 . to affect the output of the engine 22700164 . by making it as high as possible 22700165 . Thrust 2270056 . Torque 2270057 . Torque 2270066 . to match engine to driven device 2270067 . in particular the electrical frequency of driven generator 227007 . to improve fuel economy 227007 . to improve fuel economy 2270081 . with as little smoke as possible 2270081 . with as little Smoke as possible 2270083 . by monitoring combustion conditions 2270083 . with as little flow as possible 2270083 . in particular blow-out and relight 2270093 . in particular sudden load loss 2270093 . in particular sudden load loss 2270093 . with as little MOx as possible 2270093 . with as little MOx as possible 2270093 . in particular sudden load loss 2270094 . by using back-up controls 2270095 . by temporary overriding set control limits 2270096 . caused by working fluid flow velocity profile distortion 2270010 . caused by water or hail ingestion 2270010 . caused by water or hail ingestion 2270010 . caused by water or hail ingestion 2270010 . caused by water or bail ingestion 2270010 . cope with, or avoid, compressor flow instabilities 2270070 . coursed by working fluid flow velocity profile distortion 2270010 . cope of the or a sudden load flow 2270010 . caused by working fluid flow velocity profile distortion 2270010 . cope of the or a sudden load flow 2270010 . cope of the or a sudden load flow 2270010 . cope of the or a sudden load flow 2270010 . cope of the or a sudden load flow 2270010 . cope of the		• • • •	
2770/022 . of different spools or shafts 2270/3062 . of the working fluid 2270/024 . to keep rotational speed constant 270/3062 . of the auxiliary fluid for heating or cooling purposes 2270/04 . to control acceleration (u) 270/309 . Rate of change of parameters 2270/042 . by keeping it below damagingly high values 270/3109 . Rate of change of parameters 2270/042 . by keeping it below damagingly high values 2270/311 . Air humidity 2270/042 . by highing it as high as possible 2270/311 . Air pressure 2270/051 . Thrust 2270/051 . Thrust 2270/312 . Air temperature 2270/052 . Torque 2270/331 . Mechanical loads 2270/053 . Explicitly mentioned power 2270/331 . Mechanical loads or fatigue criteria 2270/053 . Explicitly mentioned power 2270/332 . Maximum loads or fatigue criteria 2270/060 . to match engine to driven device 2270/333 . Noise or sould levels 2270/334 . Vibration measurements 2270/071 . in particular the electrical frequency of driven generator 2270/071 . in particular at idling speed 2270/340 . Type of control system 2270/071 . in particular at idling speed 2270/342 . passive or reactive, e.g. using large wind vanes 2270/082 . with as little smoke as possible 2270/42 . passive or reactive, e.g. using large wind vanes 2270/083 . by monitoring combustion conditions 2270/064 . redundant, i.e. failsafe operation 2270/090 . to cope with emergencies 2270/54 . by electronic means, e.g. electronic tubes, transistors or ICs within an electronic circuit 2270/091 . in particular blue-dout and relight 2270/094 . by using back-up controls 2270/095 . by temporary overriding set control limits 2270/094 . by using back-up controls 2270/095 . by temporary overriding set control limits 2270/094 . caused by water or hall ingestion 2270/095 . by temporary overriding set control limits 2270/094 . caused by water or hall ingestion 2270/095 . or caused by water or hall ingestion 2270/095 . or caused by water or hall ingestion 2270/095 . or caused by water or hall ingestion 2270/095 . or caused by water or hall ingestion 2270/095			
2270/024 to keep rotational speed constant 2270/030 in variable speed operation 2270/030 in variable speed operation 2270/041 . to control acceleration (u) 2270/042 by keeping it below damagingly high values 2270/044 . by making it as high as possible 2270/045 . to affect the output of the engine 2270/051 Thrust 2270/052 . Torque 2270/052 . Torque 2270/053 . Explicitly mentioned power 2270/053 . Explicitly mentioned power 2270/06 . to match engine to driven device 2270/061 . in particular the electrical frequency of driven generator 2270/071 . to improve fuel economy 2270/071 . in particular tidling speed 2270/071 . in particular tidling speed 2270/081 . with as little smoke as possible 2270/081 . with as little smoke as possible 2270/082 . with as little NOx as possible 2270/083 . by monitoring combustion conditions 2270/083 . by monitoring combustion conditions 2270/093 . to cope with emergencies 2270/094 . in particular blow-out and relight 2270/095 . by temporary overriding set control limits 2270/096 . caused by warking fluid flow velocity profile distortion 2270/097 . to to improve fuel economy 2270/097 . to prove fuel economy 2270/081 . with as little NOx as possible 2270/082 . with as little NOx as possible 2270/083 . by monitoring combustion conditions 2270/098 . by temporary overriding set control limits 2270/099 . to cope with emergencies 2270/090 . to cope with emergencies 2270/091 . in particular sudden load loss 2270/092 . in particular sudden load loss 2270/093 . of one engine in a multi-engine system 2270/096 . caused by warking fluid flow velocity profile distortion 2270/097 due to high angle of attack of aircraft 2270/1024 due to high angle of attack of aircraft 2270/1024 due to high angle of attack of aircraft 2270/1024 due to high angle of attack of aircraft 2270/1024 due to bigin angle for attack of aircraft 2270/1024 due to bigin angle for attack of aircraft 2270/1024 due to bigin angle for attack of aircraft 2270/1024 b			
2270/03 in variable speed operation 2270/04 to control acceleration (u) 2270/04 to control acceleration (u) 2270/04 to by keeping it below damagingly high values 2270/031		-	
2270/042			, ,
2270/042 . by keeping it below damagingly high values 2270/31 . Air humidity 2270/05 . to affect the output of the engine 2270/31 . Air humidity 2270/35 . to affect the output of the engine 2270/31 . Air humidity 2270/35 . Thrust 2270/33 . Air temperature 2270/35 . Thrust 2270/33 . Air temperature 2270/35 . Explicitly mentioned power 2270/331 . Mechanical loads 2270/35 . Explicitly mentioned power 2270/331 . Noise or sound levels 2270/36 . in particular the electrical frequency of driven generator 2270/061 . in particular at idling speed 2270/335 . Output power or torque 2270/071 . in particular at idling speed 2270/40 . Type of control system 2270/081 . with as little smoke as possible 2270/40 . Type of control system 2270/082 . with as little smoke as possible 2270/40 . redundant, i.e. failsafe operation 2270/083 . by monitoring combustion conditions 2270/50 . Control logic embodiments 2270/091 . in particular sudden load loss 2270/092 . in particular sudden load loss 2270/092 . in particular blow-out and relight 2270/092 . in particular blow-out and relight 2270/093 . of one engine in a multi-engine system 2270/094 . by using back-up controls 2270/095 . by temporary overriding set control limits 2270/096 . caused by water or hall ingestion 2270/65 . Pneumatic actuators 2270/62 . due to high angle of attack of aircraft 2270/102 . due to high angle of attack of aircraft 2270/102 . due to high angle of attack of aircraft 2270/104 . by limiting mechanical stresses 2270/104 . proportional-differential 2270/114 . by limiting mechanical stresses 2270/105 . proportional-differential 2270/104 . proportional-differential 2270/114 . by limiting mechanical stresses 2270/105 . proportional-differential 2270/104 . proportional-differential 2270/114 . by limiting mechanical stresses 2270/105 . proportional-differential 2270/114 . by limiting mechanical stresses 2270/105 . proportional-differential 2270/104 . proportional-differential 2270/114 . by limiting mechanical stresses 2270/105 . proportional-differential 2270/104 .			* *
2270/051			
2270/05			
2270/051 Thrust			-
2270/052 Torque 2270/033 Explicitly mentioned power 2270/332 Maximum loads or fatigue criteria 2270/06 to match engine to driven device 2270/333 Noise or sound levels 2270/06 in particular the electrical frequency of driven generator 2270/07 to improve fuel economy 2270/336 Dutput power or torque 2270/071 in particular at idling speed 2270/40 Type of control system 2270/08 to produce clean exhaust gases 2270/42 passive or reactive, e.g. using large wind vanes 2270/081 with as little smoke as possible 2270/44 . active, predictive, or anticipative 2270/082 with as little NOx as possible 2270/46 detudinant, i.e., failsafe operation 2270/083 by monitoring combustion conditions 2270/083 by monitoring combustion conditions 2270/09 indirectly, at the exhaust 2270/09 in particular adden load loss 2270/092 in particular blow-out and relight 2270/093 of one engine in a multi-engine system 2270/094 by using back-up controls 2270/096 caused by water or hail ingestion 2270/096 caused by water or hail ingestion 2270/096 caused by water or hail ingestion 2270/097 due to high angle of attack of aircraft 2270/101 Compressor surge or stall 2270/102 due to high angle of attack of aircraft 2270/102 due to high angle of attack of aircraft 2270/101 to prolong engine life 2270/070 . proportional differential 2270/101 by limiting temperatures 2270/070 . proportional-integral 2270/101 by limiting temperatures 2270/070 . proportional-integral 2270/101 by limiting temperatures 2270/070 . proportional-integral 2270/102 due to high angle of attack of aircraft 2270/101 by limiting temperatures 2270/070 . proportional-integral 2270/102 due to bigh angle of attack of aircraft 2270/101 by limiting temperatures 2270/070 . proportional-integral 2270/102 differential 2270/103 proportional-integral 2270/104			-
2270/053 Explicitly mentioned power 2270/352 Maximum loads or fatigue criteria 2270/061 to match engine to driven device 2270/333 Noise or sound levels 2270/061 in particular the electrical frequency of driven generator 2270/07 to improve fuel economy 2270/335 Output power or torque 2270/071 in particular at idling speed 2270/40 Type of control system 2270/081 with as little smoke as possible 2270/42 . passive or reactive, e.g. using large wind vanes 2270/082 with as little smoke as possible 2270/44 . active, predictive, or anticipative 2270/083 by monitoring combustion conditions 2270/50 . Control logic embodiments 2270/0831 indirectly, at the exhaust 2270/50 . Control logic embodiments 2270/091 in particular sudden load loss 2270/092 in particular sudden load loss 2270/093 of one engine in a multi-engine system 2270/093 of one engine in a multi-engine system 2270/095 by temporary overriding set control limits 2270/095 caused by water or hail ingestion 2270/062 caused by water or hail ingestion 2270/062 caused by water or hail ingestion 2270/062 due to high angle of attack of aircraft 2270/102 due to compressor degradation 2270/070 . differential 2270/101 by limiting temperatures 2270/070 . proportional			-
2270/06 . to match engine to driven device 2270/061 . in particular the electrical frequency of driven generator  2270/07 . to improve fuel economy 2270/071 . in particular at idling speed 2270/071 . in particular at idling speed 2270/08 . to produce clean exhaust gases 2270/08 . to produce clean exhaust gases 2270/08 . with as little smoke as possible 2270/081 . with as little smoke as possible 2270/082 . with as little Nox as possible 2270/083 . by monitoring combustion conditions 2270/083 . by monitoring combustion conditions 2270/090 . to cope with emergencies 2270/090 . to cope with emergencies 2270/091 . in particular sudden load loss 2270/092 . in particular blow-out and relight 2270/093 . of one engine in a multi-engine system 2270/094 . by using back-up controls 2270/096 . caused by water or hail ingestion 2270/096 . caused by water or hail ingestion 2270/097 . to cope with, or avoid, compressor flow instabilities 2270/101 . Compressor surge or stall 2270/102 . caused by working fluid flow velocity profile distortion 2270/102 . due to high angle of attack of aircraft 2270/102 . due to high angle of attack of aircraft 2270/101 . to prolong engine life 2270/102 . due to compressor degradation 2270/103 . by limiting temperatures 2270/104 . by limiting temperatures 2270/104 . proportional-integral 2270/105 . proportional-integral			2270/332 Maximum loads or fatigue criteria
2270/061 . in particular the electrical frequency of driven generator  2270/07 . to improve fuel economy 2270/335 . Output power or torque 2270/336 . Blade lift measurements 2270/36 . Type of control system 2270/08 . to produce clean exhaust gases 2270/40 . with as little smoke as possible 2270/42 . with as little smoke as possible 2270/43 . with as little NOx as possible 2270/44 . active, predictive, or anticipative 2270/083 . by monitoring combustion conditions 2270/083 . in indirectly, at the exhaust 2270/09 . to cope with emergencies 2270/09 . in particular sudden load loss 2270/09 . in particular blow-out and relight 2270/092 . in particular blow-out and relight 2270/093 . of one engine in a multi-engine system 2270/094 . by using back-up controls 2270/096 . caused by water or hail ingestion 2270/100 . to cope with, or avoid, compressor flow instabilities 2270/101 . Compressor surge or stall 2270/102 . caused by working fluid flow velocity profile distortion 2270/102 . due to high angle of attack of aircraft 2270/102 . due to high angle of attack of aircraft 2270/101 . to prolong engine life 2270/101 . by limiting temperatures 2270/104 . by limiting temperatures 2270/105 . proportional-integral 2270/105 . proportional-integral			2270/333 Noise or sound levels
2270/07 . to improve fuel economy 2270/335 . Output power or torque 2270/0707 . to improve fuel economy 2270/336 . Blade lift measurements 2270/071 . in particular at idling speed 2270/40 . Type of control system 2270/081 with as little smoke as possible 2270/44 . active, predictive, or anticipative 2270/082 with as little smoke as possible 2270/46 . redundant, i.e. failsafe operation 2270/083 by monitoring combustion conditions 2270/50 . Control logic embodiments 2270/083 indirectly, at the exhaust 2270/52 . by electrical means, e.g. relays or switches 2270/091 in particular sudden load loss 2270/54 . by electronic means, e.g. electronic tubes, transistors or IC's within an electronic circuit 2270/092 in particular sudden load loss 2270/56 . by hydraulic means, e.g. hydraulic valves within a hydraulic circuit 2270/093 of one engine in a multi-engine system 2270/094 . by using back-up controls 2270/095 . by temporary overriding set control limits 2270/60 . Control system actuates means 2270/095 ot caused by water or hail ingestion 2270/62 . Electrical actuators 2270/62 . Electrical actuators 2270/64 . Hydraulic actuators 2270/65 . Pneumatic actuators 2270/66 . Mechanical actuators 4270/66 . Mechanical actuators 4270/67 caused by working fluid flow velocity profile distortion 2270/102 due to compressor degradation 2270/702 due to to general actuator 2270/702 due to compressor degradation 2270/702			2270/334 Vibration measurements
2270/07  . to improve fuel economy 2270/07  2270/07  . in particular at idling speed 2270/40  . to produce clean exhaust gases 2270/42  2270/08  . to produce clean exhaust gases 2270/42  . passive or reactive, e.g. using large wind vanes 2270/08  . with as little smoke as possible 2270/08  . with as little NOx as possible 2270/08  . with as little NOx as possible 2270/08  . with as little NOx as possible 2270/08  . in particular sudden load loss 2270/09  . to cope with emergencies 2270/50  . in particular sudden load loss 2270/09  . in particular blow-out and relight 2270/09  . in particular blow-out and relight 2270/09  . in particular blow-out and relight 2270/09  . of one engine in a multi-engine system 2270/094  2270/095  . by temporary overriding set control limits 2270/096  . caused by water or hail ingestion 2270/10  . to cope with, or avoid, compressor flow instabilities 2270/102  . caused by working fluid flow velocity profile distortion  distortion 2270/102  . caused by working fluid flow velocity profile distortion  2270/102  . due to high angle of attack of aircraft 2270/102  . due to compressor degradation 2270/101  . to prolong engine life 2270/102  . due to compressor degradation 2270/103  . by limiting temperatures 2270/104  . by limiting temperatures 2270/105  . by limiting mechanical stresses  2270/104  . by limiting mechanical stresses	22707001		2270/335 Output power or torque
2270/071 in particular at idling speed 2270/08 to produce clean exhaust gases 2270/08 with as little smoke as possible 2270/082 with as little smoke as possible 2270/083 with as little smoke as possible 2270/083 by monitoring combustion conditions 2270/083 by monitoring combustion conditions 2270/083 indirectly, at the exhaust 2270/09 to cope with emergencies 2270/09 to cope with emergencies 2270/09 in particular sudden load loss 2270/09 in particular sudden load loss 2270/09 in particular blow-out and relight 2270/092 in particular blow-out and relight 2270/093 of one engine in a multi-engine system 2270/094 by using back-up controls 2270/095 by temporary overriding set control limits 2270/096 caused by water or hail ingestion 2270/100 . to cope with, or avoid, compressor flow instabilities 2270/101 Compressor surge or stall 2270/102 due to high angle of attack of aircraft 2270/102 due to compressor degradation 2270/101 to prolong engine life 2270/102 due to compressor degradation 2270/101 by limiting temperatures 2270/101 by limiting temperatures 2270/102 by limiting mechanical stresses 2270/104 by limiting mechanical stresses 2270/105 . proportional-integral 2270/106 . proportional-integral 2270/107 . proportional-integral	2270/07	9	2270/336 Blade lift measurements
2270/08 to produce clean exhaust gases 2270/081 with as little smoke as possible 2270/082 with as little NOx as possible 2270/083 by monitoring combustion conditions 2270/083 by monitoring combustion conditions 2270/083 indirectly, at the exhaust 2270/090 indirectly, at the exhaust 2270/52 . by electrical means, e.g. relays or switches 2270/091 in particular sudden load loss 2270/092 in particular blow-out and relight 2270/093 of one engine in a multi-engine system 2270/094 by using back-up controls 2270/095 by temporary overriding set control limits 2270/096 caused by water or hail ingestion 2270/100 . to cope with, or avoid, compressor flow instabilities 2270/101 Compressor surge or stall 2270/102 due to high angle of attack of aircraft 2270/1024 due to compressor degradation 2270/102 due to compressor degradation 2270/102 by limiting temperatures 2270/104 by limiting mechanical stresses 2270/104 by limiting mechanical stresses 2270/705 . praportional integral 2270/104 by limiting mechanical stresses		-	2270/40 . Type of control system
2270/081 with as little smoke as possible 2270/082 with as little NOx as possible 2270/083 by monitoring combustion conditions 2270/083 by monitoring combustion conditions 2270/083 by monitoring combustion conditions 2270/083 indirectly, at the exhaust 2270/083 indirectly, at the exhaust 2270/09 to cope with emergencies 2270/09 to cope with emergencies 2270/091 in particular sudden load loss 2270/092 in particular blow-out and relight 2270/093 of one engine in a multi-engine system 2270/094 by using back-up controls 2270/095 by temporary overriding set control limits 2270/096 caused by water or hail ingestion 2270/10 . to cope with, or avoid, compressor flow instabilities 2270/101 Compressor surge or stall 2270/102 caused by working fluid flow velocity profile distortion 2270/102 due to high angle of attack of aircraft 2270/102 due to ompressor degradation 2270/11 . to prolong engine life 2270/11 . to prolong engine life 2270/11 . by limiting mechanical stresses 2270/705	2270/08		2270/42 passive or reactive, e.g. using large wind vanes
2270/082 with as little NOx as possible 2270/083 by monitoring combustion conditions 2270/083 by monitoring combustion conditions 2270/0831 indirectly, at the exhaust 2270/09 to cope with emergencies 2270/09 to cope with emergencies 2270/091 in particular sudden load loss 2270/092 in particular blow-out and relight 2270/093 of one engine in a multi-engine system 2270/094 by using back-up controls 2270/095 by temporary overriding set control limits 2270/096 caused by water or hail ingestion 2270/100 . to cope with, or avoid, compressor flow instabilities 2270/101 Compressor surge or stall 2270/102 due to high angle of attack of aircraft 2270/102 due to compressor degradation 2270/102 due to compressor degradation 2270/102 due to compressor degradation 2270/102 by limiting temperatures 2270/104 by limiting mechanical stresses 2270/105 . by limiting mechanical stresses 2270/106 proportional-integral 2270/1070 . proportional-integral			2270/44 active, predictive, or anticipative
2270/083 by monitoring combustion conditions 2270/0831 indirectly, at the exhaust 2270/09 to cope with emergencies 2270/09 to cope with emergencies 2270/091 in particular sudden load loss 2270/092 in particular blow-out and relight 2270/093 of one engine in a multi-engine system 2270/094 by using back-up controls 2270/095 by temporary overriding set control limits 2270/096 caused by water or hail ingestion 2270/100 . to cope with, or avoid, compressor flow instabilities 2270/101 Compressor surge or stall 2270/102 caused by working fluid flow velocity profile distortion 2270/1024 due to high angle of attack of aircraft 2270/11 . to prolong engine life 2270/11 by limiting temperatures 2270/114 by limiting mechanical stresses  2270/105 . proportional-integral 2270/106 control system actuates means 2270/62 . Electrical actuators 2270/63 . Pneumatic actuators 2270/64 . Hydraulic actuators 2270/65 . Pneumatic actuators 2270/106 . Mechanical actuators (F05D 2270/62 takes precedence) 2270/1070 . Type of control algorithm 2270/108 . integral 2270/109 . integral 2270/109 . integral 2270/109 . proportional-integral 2270/109 . proportional-integral	2270/082		2270/46 • redundant, i.e. failsafe operation
2270/09  . to cope with emergencies  2270/091  . in particular sudden load loss  2270/092  . in particular blow-out and relight  2270/093  . of one engine in a multi-engine system  2270/094  . by using back-up controls  2270/095  . by temporary overriding set control limits  2270/096  . caused by water or hail ingestion  2270/10  . to cope with, or avoid, compressor flow instabilities  2270/101  . Compressor surge or stall  2270/102  . caused by working fluid flow velocity profile distortion  2270/1024  . due to high angle of attack of aircraft  2270/11  . to prolong engine life  2270/112  . by limiting mechanical stresses  2270/104  . proportional-differential  2270/105  . proportional-integral  2270/105  . proportional-integral  2270/105  . proportional-integral	2270/083		2270/50 • Control logic embodiments
2270/09  . to cope with emergencies  2270/091  . in particular sudden load loss  2270/092  . in particular blow-out and relight  2270/093  . of one engine in a multi-engine system  2270/094  . by using back-up controls  2270/095  . by temporary overriding set control limits  2270/096  . caused by water or hail ingestion  2270/101  . Compressor surge or stall  2270/102  . caused by working fluid flow velocity profile distortion  2270/102  . caused by working fluid flow velocity profile distortion  2270/102  . caused by working fluid flow velocity profile distortion  2270/102  . caused by working fluid flow velocity profile distortion  2270/102  . caused by working fluid flow velocity profile distortion  2270/102  . caused by working fluid flow velocity profile distortion  2270/102  . caused by working fluid flow velocity profile distortion  2270/102  . caused by working fluid flow velocity profile distortion  2270/102  . caused by working fluid flow velocity profile distortion  2270/102  . caused by working fluid flow velocity profile distortion  2270/102  . caused by working fluid flow velocity profile distortion  2270/102  . caused by working fluid flow velocity profile distortion  2270/102  . caused by working fluid flow velocity profile distortion  2270/102  . due to high angle of attack of aircraft  2270/701  . proportional  2270/702  . differential  2270/703  . integral  2270/704  . proportional-differential  2270/705  . proportional-integral	2270/0831		2270/52 by electrical means, e.g. relays or switches
2270/092 in particular student rolar	2270/09		
2270/093 of one engine in a multi-engine system  2270/094 by using back-up controls  2270/095 by temporary overriding set control limits  2270/096 caused by water or hail ingestion  2270/10 to cope with, or avoid, compressor flow instabilities  2270/10 Compressor surge or stall  2270/102 caused by working fluid flow velocity profile distortion  2270/102 due to high angle of attack of aircraft  2270/102 due to compressor degradation  2270/103 due to prolong engine life  2270/104 by limiting temperatures  2270/105 by mechanical means, e.g. levers, gears or cams  2270/60 Control system actuates means  2270/62 Electrical actuators  2270/64 Hydraulic actuators  2270/65 Pneumatic actuators  2270/65 Mechanical actuators (F05D 2270/62 takes precedence)  2270/70 . Type of control algorithm  2270/1024 due to high angle of attack of aircraft  2270/702 differential  2270/703 integral  2270/114 by limiting temperatures  2270/705 . proportional-differential  2270/705 . proportional-integral	2270/091	in particular sudden load loss	
2270/094 by using back-up controls 2270/095 by temporary overriding set control limits 2270/096 caused by water or hail ingestion 2270/10 to cope with, or avoid, compressor flow instabilities 2270/10 Compressor surge or stall 2270/10 caused by working fluid flow velocity profile distortion 2270/102 due to high angle of attack of aircraft 2270/1024 due to compressor degradation 2270/11 to prolong engine life 2270/11 by limiting temperatures 2270/104 by limiting mechanical stresses  2270/705 by mechanical means, e.g. levers, gears or cams 2270/60 . Control system actuates means 2270/62 Electrical actuators 2270/62 Hydraulic actuators 2270/65 . Pneumatic actuators 2270/66 . Mechanical actuators (F05D 2270/62 takes precedence) 2270/70 . Type of control algorithm 2270/701 proportional 2270/702 differential 2270/703 . integral 2270/703 . proportional-differential 2270/704 . proportional-integral	2270/092		
2270/095 by temporary overriding set control limits 2270/096 caused by water or hail ingestion 2270/10 to cope with, or avoid, compressor flow instabilities 2270/101 Compressor surge or stall 2270/102 caused by working fluid flow velocity profile distortion 2270/102 due to high angle of attack of aircraft 2270/104 due to compressor degradation 2270/110 to prolong engine life 2270/111 by limiting temperatures 2270/104 by limiting mechanical stresses  2270/705 proportional actuators 2270/706 due to limits 2270/705 due to high angle of attack of aircraft 2270/704	2270/093	of one engine in a multi-engine system	•
2270/096 caused by water or hail ingestion 2270/10 to cope with, or avoid, compressor flow instabilities 2270/10 Compressor surge or stall 2270/102 caused by working fluid flow velocity profile distortion 2270/102 due to high angle of attack of aircraft 2270/102 due to compressor degradation 2270/11 to prolong engine life 2270/11 by limiting temperatures 2270/114 by limiting mechanical stresses  2270/104 due to high angle of attacks of aircraft 2270/705	2270/094	by using back-up controls	
2270/10  1. Caused by Water of hair ingestion  2270/10  2270/10  2270/101  2270/101  2270/102  2270/103  2270/104  2270/104  2270/105  2270/705  2270/705  2270/705  2270/705  2270/706  2270/706  2270/706  2270/707  2270/707  2270/708  2270/708  2270/709  2	2270/095	by temporary overriding set control limits	•
instabilities  2270/101  Compressor surge or stall  2270/102  caused by working fluid flow velocity profile distortion  2270/1022  distortion  2270/1024  conducted high angle of attack of aircraft  2270/1024  conducted high angle of attack of aircraft  2270/1025  conducted high angle of attack of aircraft  2270/1026  conducted high angle of attack of aircraft  2270/1027  conducted high angle of attack of aircraft  2270/1027  conducted high angle of attack of aircraft  2270/1027  conducted high angle of attack of aircraft  2270/103  conducted high angle of attack of aircraft  2270/104  conducted high angle of attack of aircraft  2270/105  conducted high angle of attack of aircraft  2270/107  conducted high angle of attack of aircraft  2270/701  conducted high angle of attack of aircraft  2270/702  conducted high angle of attack of aircraft  2270/703  conducted high angle of attack of aircraft  2270/704  conducted high angle of attack of aircraft  2270/705  conducted high angle of attack of aircraft  2270/706  conducted high angle of attack of aircraft  2270/701  conducted high angle of attack of aircraft  2270/702  conducted high angle of attack of aircraft  2270/703  conducted high angle of attack of aircraft  2270/704  conducted high angle of attack of aircraft  2270/705  conducted high angle of attack of aircraft  co	2270/096	caused by water or hail ingestion	
2270/101 Compressor surge or stall 2270/102 caused by working fluid flow velocity profile distortion  2270/102 due to high angle of attack of aircraft 2270/1024 due to compressor degradation 2270/11 to prolong engine life 2270/112 by limiting temperatures 2270/114 by limiting mechanical stresses  2270/705 Mechanical actuators (F05D 2270/62 takes precedence)  2270/70 Type of control algorithm 2270/701 proportional 2270/702 differential 2270/703 integral 2270/704 proportional-differential 2270/704 proportional-integral	2270/10	to cope with, or avoid, compressor flow	
2270/102 caused by working fluid flow velocity profile distortion			
distortion  2270/1022 due to high angle of attack of aircraft  2270/1024 due to compressor degradation  2270/11 to prolong engine life  2270/112 by limiting temperatures  2270/114 by limiting mechanical stresses  2270/705 . Type of control algorithm  2270/701 proportional  2270/702 differential  2270/703 integral  2270/704 proportional-differential  2270/705 . proportional-integral	2270/101		
2270/1022 due to high angle of attack of aircraft 2270/1024 due to compressor degradation 2270/11 to prolong engine life 2270/112 by limiting temperatures 2270/114 by limiting mechanical stresses 2270/705 . proportional 2270/707 . proportional 2270/708 . proportional-differential 2270/709 . proportional-integral	2270/102		
2270/1024 due to compressor degradation 2270/11 to prolong engine life 2270/112 by limiting temperatures 2270/114 by limiting mechanical stresses 2270/705 differential 2270/703 integral 2270/704 proportional-differential 2270/705 . proportional-integral			
2270/102 to prolong engine life 2270/703 integral 2270/112 by limiting temperatures 2270/704 by limiting mechanical stresses 2270/705 proportional-integral 2270/705 proportional-integral			
2270/112 by limiting temperatures 2270/114 by limiting mechanical stresses 2270/705 proportional-differential 2270/705 proportional-integral			
2270/114 by limiting temperatures  2270/114 by limiting mechanical stresses  2270/705 proportional-integral			
2270/114 • • • by minering incommend subsection			
22/0/116 • • • by preventing reverse rotation • • • proportional-integral-differential		-	
	22/0/116	• • • by preventing reverse rotation	• • proportional-integral-unferential

2270/707	fuzzy logic	2300/1722 Phosphor-bronze alloy
2270/708	with comparison tables	2300/1723 Nickel-Copper alloy, e.g. Monel
2270/709	with neural networks	2300/173 Aluminium alloys, e.g. AlCuMgPb
2270/71	synthesized, i.e. parameter computed by a	2300/174 Titanium alloys, e.g. TiAl
	mathematical model	2300/175 Superalloys
2270/80	• Devices generating input signals, e.g. transducers,	2300/176 Heat-stable alloys
	sensors, cameras or strain gauges	2300/177 Ni - Si alloys
2270/802	Calibration thereof	2300/18 • Intermetallic compounds
2270/803	Sampling thereof	2300/182 Metal-aluminide intermetallic compounds
2270/804	. Optical devices	2300/20 • Oxide or non-oxide ceramics
2270/8041	Cameras	2300/21 • Oxide ceramics
2270/805	Radars	2300/21 Glass
2270/806	Sonars	2300/2102 Glass 2300/2104 MIBA
2270/807	Accelerometers	2300/2104
2270/808	Strain gauges; Load cells	
2270/809	. Encoders	2300/2118 Phosphor
2270/807	. Microphones	2300/211 Silica
2270/81	Displacement measuring means, e.g. inductive	2300/2112 Aluminium oxides
22/0/621	. Displacement measuring means, e.g. muuctive	2300/2114 Sapphire
2300/00	Materials; Properties thereof	2300/2116 Zinc oxide
2300/10	Metals, alloys or intermetallic compounds	2300/2118 Zirconium oxides
2300/11	Iron	2300/212 Aluminium titanate
2300/111	Cast iron	2300/22 . Non-oxide ceramics
2300/12	Light metals	2300/222 Silicon
2300/121	Aluminium	2300/224 Carbon, e.g. graphite
2300/122	Beryllium	2300/226 Carbides
2300/123	Boron	2300/2261 of silicon
2300/124	Lithium	2300/2262 • • • of titanium, e.g. TiC
2300/125	Magnesium	2300/2263 of tungsten, e.g. WC
2300/13	Refractory metals, i.e. Ti, V, Cr, Zr, Nb, Mo, Hf,	2300/228 Nitrides
2000/10	Ta, W	2300/2281 of aluminium
2300/131	Molybdenum	2300/2282 of boron
2300/132	Chromium	2300/2283 of silicon
2300/133	Titanium	2300/2284 of titanium
2300/134	Zirconium	2300/2285 of zirconium
2300/135	Hafnium	2300/229 Sulfides
2300/14	Noble metals, i.e. Ag, Au, platinum group metals	2300/2291 of molybdenum
2300/141	Silver	2300/30 • Inorganic materials other than provided for in
2300/141		groups <u>F05D 2300/10</u> - <u>F05D 2300/2291</u>
2300/142	Platinum group metals, i.e. Os, Ir, Pt, Ru, Rh,	2300/40 • Organic materials
2300/143	Pd	2300/41 Leather
2300/1431	Palladium	2300/42 Cellulosic materials, e.g. wood
2300/1431	Ruthenium	2300/43 Synthetic polymers, e.g. plastics; Rubber
2300/1432	Osmium	2300/431 Rubber
2300/1433	Iridium	2300/432 PTFE [PolyTetraFluorEthylene]
2300/1434	Rhodium	2300/433 Polyamides, e.g. NYLON
2300/1455	Rare earth metals, i.e. Sc, Y, lanthanides	2300/434 Polyimides, e.g. AURUM
		2300/436 • • • Polyetherketones, e.g. PEEK
2300/16	• Other metals not provided for in groups F05D 2300/11 - F05D 2300/15	2300/437 Silicon polymers
2200/1602		2300/44 • Resins
2300/1602	Arsenic	2300/48 • Other organic materials
2300/1604	Antimony	2300/50 • Intrinsic material properties or characteristics
2300/1606	Bismuth	2300/501 • Elasticity
2300/1608	Barium	2300/502 • Elasticity  2300/502 • Thermal properties
2300/161	Manganese	
2300/1612	Lead	2300/5021 Expansivity
2300/1614	Tin	2300/50211 similar
2300/1616	Zinc	2300/50212 dissimilar
2300/1618	Mercury	2300/5023 Thermal capacity
2300/17	Alloys	2300/5024 Heat conductivity
2300/171	Steel alloys	2300/504 Reflective properties
2300/172	Copper alloys	2300/505 Shape memory behaviour
	Bronze	2300/506 Hardness

## F05D

2300/507	Magnetic properties
2300/509	Self lubricating materials; Solid lubricants
2300/51	Hydrophilic, i.e. being or having wettable
	properties
2300/512	Hydrophobic, i.e. being or having non-wettable
	properties
2300/514	Porosity
2300/516	Surface roughness
2300/518	Ductility
2300/52	Translucence
2300/522	Density
2300/60	• Properties or characteristics given to material by
	treatment or manufacturing
2300/601	Fabrics
2300/6012	Woven fabrics
2300/603	Composites; e.g. fibre-reinforced
2300/6031	Functionally graded composites
2300/6032	Metal matrix composites [MMC]
2300/6033	Ceramic matrix composites [CMC]
2300/6034	Orientation of fibres, weaving, ply angle
2300/604	Amorphous
2300/605	Crystalline
2300/606	Directionally-solidified crystalline structures
2300/607	Monocrystallinity
2300/608	Microstructure
2300/609	Grain size
2300/61	Syntactic materials, i.e. hollow spheres embedded
	in a matrix
2300/611	Coating
2300/6111	functionally graded coating
2300/612	Foam
2300/613	Felt
2300/614	Fibres or filaments
2300/615	Filler
2300/70	Treatment or modification of materials
2300/701	Heat treatment
2300/702	Reinforcement