F02P

IGNITION, OTHER THAN COMPRESSION IGNITION, FOR INTERNAL-COMBUSTION ENGINES; TESTING OF IGNITION TIMING IN COMPRESSION-IGNITION ENGINES ([N: anti-pollution means for internal-combustion engines F02B17/00]; specially adapted for rotary-piston or oscillating-piston engines F02B53/12; [N: ignition of gas turbine plants F02C7/26; ignition of jet propulsion plants F02K9/95; starting of combustion engines F02N9/00]; ignition of combustion apparatus in general, glowing plugs F23Q; measuring of physical variables in general G01; controlling in general G05; data processing in general G06; electrical components in general see Section H; [N: ignition coils H01F38/12]; sparking plugs H01T13/00)

Definition statement

This subclass/group covers:

Systems and arrangements for causing ignition in internal combustion engines.

Details of electrically actuated spark ignition systems, this includes the generation and supply of the ignition energy to the spark plugs.

Testing of and feedback about the ignition.

Control of the engine by using parameters of the ignition, e.g. the ignition timing or the ignition strength.

Informative references

Attention is drawn to the following places, which may be of interest for search:

Ignition of gas turbine plants	F02C 7/26
Ignition of jet propulsion plants	F02K 9/95

F02P 1/00

Installations having electric ignition energy generated by magneto- or dynamo- electric generators without subsequent storage [N: (combination starter-magneto F02N11/06; magneto- or dynamo-electric generators H02K21/00)]

Definition statement

This subclass/group covers:

Installations wherein spark ignition is generated by a spark plug fed by a coil responsive to the field changes of a magnet fixed on a flywheel and rotating with it. This is used in most of small engines without battery, as well as on small piston airplanes.

F02P 1/08

Layout of circuits

Definition statement

This subclass/group covers:

Circuits specially adapted to ignition circuits without batteries

Informative references

Attention is drawn to the following places, which may be of interest for search:

Details of inductive ignition circuits	F02P 3/02
Details of capacitive ignition circuits	F02P 3/06
Control of ignition timing	F02P 5/00

F02P 1/083

[N: for generating sparks by opening or closing a coil circuit]

Definition statement

This subclass/group covers:

Circuits wherein the current which has been generated after a change of magnetic fields is transformed in (high) voltage by opening (here mechanically) the coil-plug circuit.

F02P 1/086

[N: for generating sparks by discharging a capacitor into a coil circuit]

Definition statement

This subclass/group covers:

Circuits with switching capacitors to increase the voltage created by opening the coil-plug circuit.

F02P 3/00

Other installations

Definition statement

This subclass/group covers:

Ignition installations comprising a battery, a switching circuit and an ignition transformer.

F02P 3/02

having inductive energy storage, e.g. arrangements of induction coils [N: (ignition coils structurally combined with sparking plugs F02P13/00; constructional details of ignition coils H01F38/12)]

Definition statement

This subclass/group covers:

Circuits wherein a current is drawn into a coil storing magnetic energy and wherein the current is subsequently interrupted and the magnetic energy is discharged between the electrodes of a spark plug. In this group are mostly found:

- the cabling of the coils;
- the connection of the ignition coil to the spark plug connectors;
- rod-type spark plugs.

Informative references

Attention is drawn to the following places, which may be of interest for search:

Ignition coils structurally combined with sparking plugs	F02P 13/00
Constructional details of ignition coils	H01F 38/12

F02P 3/06

having capacitive energy storage (piezo-electric or

electrostatic ignition F02P3/12)

Definition statement

This subclass/group covers:

Circuits for capacitive discharge ignition (CDI) wherein a discharge current from a capacitor is used to generate the spark, usually by discharging the output to an ignition coil.

Informative references

Attention is drawn to the following places, which may be of interest for search:

Piezo-electric or electrostatic ignition	F02P 3/12

F02P 3/10

Low-tension installation, e.g. using surface-discharge sparking plugs

Definition statement

This subclass/group covers:

Ignition installations having plugs with a high resistive, e.g. carbon, surface where a spark slowly propagates.

Informative references

Attention is drawn to the following places, which may be of interest for search:

Sparking-plugs characterised by a discharge along a surface	H01T 13/52

F02P 3/12

Piezo-electric ignition; Electrostatic ignition

Definition statement

This subclass/group covers:

Ignition installation using a shock on a piezo-electrical crystal to trigger a spark.

F02P 5/00

Advancing or retarding ignition; Control therefor

Definition statement

This subclass/group covers:

Control of the ignition timing and arrangements therefore.

F02P 5/045

[N: combined with electronic control of other engine functions, e.g. fuel injection (in general F02D37/02)]

Definition statement

This subclass/group covers:

Conjoint control of ignition timing and other engine functions like control of fuel injection, e.g. control of fuel amount or air control, e.g. by throttle control.

Informative references

Attention is drawn to the following places, which may be of interest for search:

Conjoint control of engines including ignition timing control	F02D 37/02

F02P 5/1502

[N: using one central computing unit]

Definition statement

This subclass/group covers:

Ignition installations with an electronic control unit which is the main application of modern ignition control.

Informative references

Attention is drawn to the following places, which may be of interest for search:

Control of ignition timing related to knocking	F02P 5/152

F02P 5/152

dependent on pinking (detecting or indicating knocks in internal-combustion engines G01L23/22)

Definition statement

This subclass/group covers:

Ignition control of pinking/knocking i.e. undesired too early ignition which results in a shock against all the mechanical pieces (pistons, valves, rods, crankshaft) resulting in a very characteristic noise. This phenomenon arises mostly in acceleration with a warm engine. When knock is detected by a microphone or high frequency vibrations in pressure, ionic or light sensor, the ignition should be directly retarded and afterwards, slowly set back to where it belongs to be.

References relevant to classification in this group

This subclass/group does not cover:

Detection of knocking without engine control	G01L 23/22

Informative references

Attention is drawn to the following places, which may be of interest for search:

Engine control related to roughness or misfiring	F02D 41/1498

F02P 7/00

Arrangements of distributors, circuit-makers or -breakers [N: e.g. of distributor and circuit-breaker combinations] or pick-up devices (advancing or retarding ignition or control therefor F02P5/00; such devices per se, see the relevant classes of Section H, e.g. rotary switches H01H19/00, contact-breakers, distributors H01R39/00 , generators H02K)

Definition statement

This subclass/group covers:

Distributors, i.e. mechanical arrangements for distributing ignition signals as well as circuit makers and breakers, i.e. mechanical means for opening and closing ignition circuits. Furthermore it covers pickup-devices, i.e. means for detecting the current working phase or crank angle.

Informative references

Attention is drawn to the following places, which may be of interest for search:

Rotary switches per se	H01H 19/00
Contact-breakers, distributors per se	H01R 39/00

F02P 7/06

of circuit-makers or -breakers, or pick-up devices adapted to sense particular points of the timing cycle

Definition statement

This subclass/group covers:

Pick-up devices which provide position information to the ignition timing control unit;Circuit-makers or -breakers.

F02P 7/067

Electromagnetic pick-up devices, [N: e.g. providing induced current in a coil]

Definition statement

This subclass/group covers:

Pick-up devices for detecting the engine position or cycle with electromagnetic means.

Informative references

Attention is drawn to the following places, which may be of interest for search:

Means for retrieving engine position for fuel injection control	F02D 41/009

F02P 7/0775

[N: Electronical verniers]

Definition statement

This subclass/group covers:

Means for generating higher frequency signals to increase the precision of crank (or cam) angle detection for ignition control.

F02P 9/00

Electric spark ignition control, not otherwise provided for

Definition statement

This subclass/group covers:

Electric control of sparks not provided for in previous groups, e.g. for controlling the intensity or length of the spark discharges.

F02P 9/005

[N: by weakening or suppression of sparks to limit the engine speed]

Definition statement

This subclass/group covers:

Systems for weakening or suppressing the spark for maximum speed control. Contains also engine speed limitation via ignition advance.

F02P 9/007

[N: by supplementary electrical discharge in the pre-ionised electrode interspace of the sparking plug, e.g. plasma jet ignition]

Definition statement

This subclass/group covers:

Plasma jet ignition plugs or similar arrangments.

F02P 11/00

Safety means for electric spark ignition, not otherwise provided for

Definition statement

This subclass/group covers:

Means for protecting the engine or associated parts using ignition elements.

F02P 13/00

Sparking plugs structurally combined with other parts of internal-combustion engines ([N: connection of ignition coil to spark plug connector F02P3/02]; with fuel injectors F02M57/06; [N: spark plug connectors per se H01T13/04 to H01T13/06; predominant aspects of sparking plug, see H01T13/40 to H01T13/44]; predominant aspects of the parts, see the relevant subclasses)

Definition statement

This subclass/group covers:

Combination of spark plugs with other elements of the engine, e.g. combination of a spark plug with a sensor.

Informative references

Attention is drawn to the following places, which may be of interest for search:

Fuel injectors combined with spark plugs	F02M 57/06
Rod-type coils	F02P 3/02
Constructional details of ignition coils	H01F 38/12
Spark plug connectors per se	H01T 13/04 to H01T 13/06

Special rules of classification within this group

Make the distinction with rod-type coils ("Stabspulen"), which are coils meant to be plugged on the plug connector and should be classified in F02P 3/02, and some very similar coils with electrodes really meant to be screwed in the cylinder head instead of the plug which should be classified in F02P 13/00

F02P 15/00

Electric spark ignition having characteristics not provided for in, or of interest apart from, groups F02P1/00 to F02P13/00 [N: and combined with layout of ignition circuits (not combined F02B, F02C, F02G, F02K)]

Special rules of classification within this group

The type of ignition should be classified here while the way to generate and store the ignition energy should be classified in F02P 3/01 and F02P 3/05

F02P 15/02

Arrangements having two or more sparking plugs

Definition statement

This subclass/group covers:

Two or more spark plugs in one cylinder.

Informative references

Attention is drawn to the following places, which may be of interest for search:

Multiple ignition simultaneously at different places in one cylinder or in several cylinders	F02P 15/08

F02P 17/00

Testing of ignition installations, e.g. in combination with adjusting (testing fuel injection apparatus F02M65/00; testing ignition installations in general F23Q23/00); Testing of ignition timing in compression-ignition engines

Definition statement

This subclass/group covers:

Testing and diagnosis of ignition installations in engines, e.g. for adjusting the ignition control or setup.

Informative references

Attention is drawn to the following places, which may be of interest for search:

Testing of ignition installations in general	F23Q 23/00
Testing of fuel injection apparatus	F02M 65/00
Testing of sparking plugs	H01T 13/60

F02P 17/12

Testing characteristics of the spark, ignition voltage or current (testing of sparking plugs H01T13/60)

Definition statement

This subclass/group covers:

Testing of ignition by evaluating the quality of the ignition using ionic current measurements or primary or secondary current evaluation.

F02P 19/00

Incandescent ignition, e.g. during starting of internal combustion engines; Combination of incandescent and spark ignition

Definition statement

This subclass/group covers:

Ignition systems providing an incandescent heat source to induce or support ignition.

F02P 19/02

electric, e.g. layout of circuits of apparatus having glowing plugs

Definition statement

This subclass/group covers:

Circuits and control means for glow plug, e.g. supply of current to the glow plugs, control of activation and deactivation and monitoring of the glow plugs.

Informative references

Attention is drawn to the following places, which may be of interest for search:

Glow plug per see	F23Q 7/001

F02P 21/00

Direct use of flames or burners for ignition

Definition statement

This subclass/group covers:

Ignition system that directly uses flames or burners to cause ignition in internal

combustion engines, e.g. flame glow plugs..

Informative references

Attention is drawn to the following places, which may be of interest for search:

Burners used to heat incandescent heat spot	F02P 19/04

F02P 23/04

Other physical ignition means, e.g. using laser rays

Definition statement

This subclass/group covers:

Ignition systems using laser ignition or high frequency electromagnetic waves causing plasmaignition or corona discharge ignition.

Informative references

Attention is drawn to the following places, which may be of interest for search:

Plasma jet ignition	F02P 9/007
Lasers in general	H01S 3/00

F02P 23/045

[N: using electromagnetic microwaves]

Definition statement

This subclass/group covers:

Ignition systems generating high frequency waves in the microwave range for causing ignition.