

ECLA**EUROPEAN CLASSIFICATION****F02N**

STARTING OF COMBUSTION ENGINES (starting of free-piston combustion engines [F02B71/02](#); starting of gas-turbine plants [F02C7/26](#)); **STARTING AIDS FOR SUCH ENGINES, NOT OTHERWISE PROVIDED FOR**

Notes

1. Attention is drawn to the notes preceding class F01.
2. The starting of engines which are not explicitly stated to be combustion engines will be classified in this subclass insofar as their starting is equivalent to that of combustion engines.

Guide heading: **Muscle-operated starting apparatus**

F02N1/00 **Starting apparatus having hand cranks** (with intermediate power storage [F02N5/00-F02N15/00](#))

F02N1/00B . [N: Safety means ([F02N1/02](#) takes precedence)] [N9507]

F02N1/02 . having safety means preventing damage caused by reverse rotation

F02N3/00 **Other muscle-operated starting apparatus** (with intermediate power storage [F02N5/00-F02N15/00](#))

F02N3/02 . having pull-cords

F02N3/04 . having foot-actuated levers

Guide heading: **Power-operated starting apparatus; Muscle-operated starting apparatus with intermediate power storage**

F02N5/00 **Starting apparatus having mechanical power storage**

F02N5/02 . of spring type

F02N5/04 . of inertia type

F02N7/00 **Starting apparatus having fluid-driven auxiliary engines or apparatus**

F02N7/02 . the apparatus being of single-stroke piston type, e.g. pistons acting on racks or pull-cords

F02N7/04 . . the pistons acting on screw-threaded members to effect rotation

F02N7/06 . the engines being of reciprocating-piston type (of internal-combustion type [F02N7/10](#))

- F02N7/08
 - . the engines being of rotary type
- F02N7/10
 - . characterised by using auxiliary engines or apparatus of combustion type (by using explosive cartridges [F02N13/00](#))
- F02N7/12
 - . . the engines being of rotary type, e.g. turbines ([F02N7/14](#) takes precedence)
- F02N7/14
 - . . the starting engines being readily removable from main engines, e.g. of portable type
- F02N9/00**
Starting of engines by supplying auxiliary pressure fluid to their working chambers
- F02N9/02
 - . the pressure fluid being generated directly by combustion (by using explosive cartridges [F02N13/00](#))
- F02N9/04
 - . the pressure fluid being generated otherwise, e.g. by compressing air
- F02N11/00**
Starting of engines by means of electric motors (arrangement or mounting of prime-movers consisting of electric motors and internal combustion engines for mutual or common propulsion [B60K6/20](#)) [M1204]
- F02N11/00A
 - . [N: said electric motor being also used as a drive for auxiliaries, e.g. for driving transmission pumps or fuel pumps during engine stop] [N1204]
- F02N11/00B
 - . [N: using a plurality of electric motors] [N1204]
- F02N11/02
 - . the motors having longitudinally-shiftable rotors
- F02N11/04
 - . the motors being associated with current generators
- F02N11/06
 - . . and with ignition apparatus
- F02N11/08
 - . Circuits [N: or control means] specially adapted for starting of engines [C1012]
- F02N11/08A
 - . . [N: characterised by means for initiating engine start or stop ([F02N11/08B](#) takes precedence)] [N1012]
- F02N11/08A2
 - . . . [N: Remote means] [N1012]
- F02N11/08A4
 - . . . [N: using a timer] [N1012]
- F02N11/08B
 - . . [N: comprising means for controlling automatic idle-start-stop] [C1012]
- F02N11/08B2
 - . . . [N: Conditions for starting or stopping the engine or for deactivating the idle-start-stop mode][N1012]
- F02N11/08B2D
 - [N: related to action of the driver] [N1012]
- F02N11/08B2F
 - [N: related to prevention of engine restart failure, e.g. disabling automatic stop at low battery state] [N1012]
- F02N11/08B2P
 - [N: related to special engine control, e.g. giving priority to engine warming-up or learning] [N1012]
- F02N11/08B2V
 - [N: Vehicle conditions ([F02N11/08B2D](#), [F02N11/08B2F](#) take precedence)] [N1012]
- F02N11/08B2V2
 - [N: Environmental conditions thereof, e.g. traffic, weather or road conditions] [N1012]
- F02N11/08B2V4
 - [N: State of vehicle accessories, e.g. air condition or power steering] [N1012]

- F02N11/08B4 . . . [N: with means for restarting the engine directly after an engine stop request, e.g. caused by change of driver mind] [N1012]
- F02N11/08D . . [N: with means for detecting successful engine start, e.g. to stop starter actuation] [N1012]
- F02N11/08G . . [N: characterised by means for controlling the engagement or disengagement between engine and starter, e.g. meshing of pinion and engine gear] [N1012]
- F02N11/08G2 . . . [N: during engine shutdown or after engine stop before start command, e.g. pre-engagement of pinion] [N1012]
- F02N11/08M . . [N: specially adapted to the type of the starter motor or integrated into it] [N1012]
- F02N11/08P . . [N: characterised by the electrical power supply means, e.g. battery] [N1012]
- F02N11/08P2 . . . [N: comprising several power sources, e.g. battery and capacitor or two batteries] [N1012]
- F02N11/08R . . [N: Details of the switching means in starting circuits, e.g. relays or electronic switches] [N1012]

- F02N11/10 . Safety devices ([F02N11/08](#) takes precedence)
- F02N11/10B . . [N: for preventing engine starter actuation or engagement (preventing unauthorised use or theft of vehicles [B60R25/04](#))] [N1012]
- F02N11/10B2 . . . [N: according to the vehicle transmission or clutch status] [N1012]
- F02N11/10B4 . . . [N: when the engine is already running ([F02N11/08D](#) takes precedence)] [N1012]
- F02N11/10C . . [N: for stopping or interrupting starter actuation] [N1204]
- F02N11/10D . . [N: for diagnosis of the starter or its components] [N1204]

- F02N11/12 . Starting of engines by means of mobile, e.g. portable, starting sets
- F02N11/14 . Starting of engines by means of electric starters with external current supply ([F02N11/12](#) takes precedence)

- F02N13/00** **Starting of engines, or driving of starting apparatus by use of explosives, e.g. stored in cartridges**

- F02N13/02 . Cartridges specially adapted therefor (gas cartridges in general [F42B3/04](#))

- F02N15/00** **Other power-operated starting apparatus; Component parts, details, or accessories, not provided for in, or of interest apart from groups [F02N5/00](#) to [F02N13/00](#)**

- F02N15/00B . [N: Starters comprising a brake mechanism]
- F02N15/00D . [N: Assembling or mounting of starting devices] [N1204]
- F02N15/02 . Gearing between starting-engines and started engines; Engagement or disengagement thereof
- F02N15/02B . . [N: the gearing including disengaging starter jaws]
- F02N15/02C . . [N: the starter comprising an intermediate clutch]
- F02N15/02C1 . . . [N: of the overrunning type]
- F02N15/02C2 . . . [N: of the friction type]

F02N15/02C3	. . . [N: of the centrifugal type]
F02N15/02C4	. . . [N: of the pawl type]
F02N15/02C5	. . . [N: of the jaw type]
F02N15/04	. . the gearing including disengaging toothed gears
F02N15/04B	. . . [N: the gearing including a speed reducer]
F02N15/04B1 [N: of the planetary type]
F02N15/06	. . . the toothed gears being moved by axial displacement
F02N15/06B [N: Starter drives]
F02N15/06B1 [N: with resilient shock absorbers]
F02N15/06B2 [N: with blocking means]
F02N15/06C [N: the starter being of the coaxial type]
F02N15/06D [N: the starter comprising an electro-magnetically actuated lever]
F02N15/06E [N: starter drive being actuated by muscular force]
F02N15/08	. . the gearing being of friction type
F02N15/10	. Safety devices not otherwise provided for
F02N19/00	Starting aids for combustion engines, not otherwise provided for [N1006]
F02N19/00B	. [N: Arrangements thereof] [N1006]
F02N19/00D	. [N: Aiding engine start by using decompression means or variable valve actuation] [N1006]
F02N19/00F	. [N: Aiding engine start by starting from a predetermined position, e.g. pre-positioning or reverse rotation] [N1006]
F02N19/02	. Aiding engine start by thermal means, e.g. using lighted wicks (using electrically-heated glow-plugs F02P19/02) [N1006]
F02N19/04	. . by heating of fluids used in engines (heating of lubricants F01M5/02) [N1006]
F02N19/06	. . . by heating of combustion-air by flame generating means, e.g. flame glow-plugs [N1006]
F02N19/08 Arrangement thereof [N1006]
F02N19/10	. . . by heating of engine coolants [N1006]
F02N99/00	Subject matter not provided for in other groups of this subclass [N1006]
F02N99/00C	. [N: Starting combustion engines by ignition means] [N1006]
F02N99/00C2	. . [N: Generation of the ignition spark] [N1006]
F02N99/00C4	. . [N: Providing a combustible mixture inside the cylinder] [N1006]
F02N99/00C6	. . [N: Providing a combustible mixture outside the cylinder] [N1006]