

CPC**COOPERATIVE PATENT CLASSIFICATION****F01M****LUBRICATING OF MACHINES OR ENGINES IN GENERAL** ([lubricating in general F16N](#)); **LUBRICATING INTERNAL COMBUSTION ENGINES; CRANKCASE VENTILATING****NOTE**

Attention is drawn to the notes preceding class [F01](#), specially as regards Note (3).

F01M 1/00**Pressure lubrication**

F01M 1/02

- . using lubricating pumps ([pumps in general F04](#); [lubricating pumps per se F16N](#))

F01M 1/04

- . using pressure in working cylinder or crankcase to operate lubricant feeding devices

F01M 1/06

- . Lubricating systems characterised by the provision therein of crankshafts or connecting rods with lubricant passageways, e.g. bores ([crankshafts, connecting-rods, per se F16C](#))

F01M 1/08

- . Lubricating systems characterised by the provision therein of lubricant jetting means

F01M 1/10

- . Lubricating systems characterised by the provision therein of lubricant venting or purifying means, e.g. of filters

F01M 1/12

- . Closed-circuit lubricating systems not provided for in groups [F01M 1/02](#) to [F01M 1/10](#)

F01M 1/14

- . Timed lubrication ([F01M 1/08](#) takes precedence)

F01M 1/16

- . Controlling lubricant pressure or quantity ([rendering machines or engines inoperative or idling on lubricant pressure failure F01M 1/22](#))

F01M 1/18

- . Indicating or safety devices ([concerning lubricant level F01M 11/06, F01M 11/12](#))

F01M 1/20

- .. concerning lubricant pressure

F01M 1/22

- ... rendering machines or engines inoperative or idling on pressure failure

F01M 1/24

- acting on engine fuel system

F01M 1/26

- acting on engine ignition system

F01M 1/28

- acting on engine combustion-air supply

F01M 3/00**Lubrication specially adapted for engines with crankcase compression of fuel-air mixture or for other engines in which lubricant is contained in fuel, combustion air, or fuel-air mixture** ([separating lubricant from air or fuel-air mixture before entry into cylinder F01M 11/08](#))

F01M 3/02

- . with variable proportion of lubricant to fuel, lubricant to air, or lubricant to fuel-air-mixture

- F01M 3/04 . for upper cylinder lubrication only

- F01M 5/00** **Heating, cooling, or controlling temperature of lubricant (arrangement of lubricant coolers in engine cooling system [F01P 11/08](#)); lubrication means facilitating engine starting**

- F01M 5/001 . {Heating}
- F01M 5/002 . {Cooling}
- F01M 5/005 . {Controlling temperature of lubricant}
- F01M 5/007 .. {Thermostatic control}

- F01M 5/02 . Conditioning lubricant for aiding engine starting, e.g. heating
- F01M 5/021 .. {by heating}
- F01M 5/025 .. {by prelubricating, e.g. using an accumulator}
- F01M 5/04 .. Diluting, e.g. with fuel

- F01M 7/00** **Lubrication means specially adapted for machine or engine running-in**

- F01M 9/00** **Lubrication means having pertinent characteristics not provided for in, or of interest apart from, groups [F01M 1/00](#) to [F01M 7/00](#)**

- F01M 9/02 . having means for introducing additives to lubricant
- F01M 9/04 . Use of fuel as lubricant
- F01M 9/06 . Dip or splash lubrication
- F01M 9/08 . Drip lubrication
- F01M 9/10 . Lubrication of valve gear or auxiliaries
- F01M 9/101 .. {of cam surfaces}
- F01M 9/102 .. {of camshaft bearings}
- F01M 9/103 .. {of valve stem and guide}
- F01M 9/104 .. {of tappets}
- F01M 9/105 .. {using distribution conduits}
- F01M 9/106 .. {Oil reservoirs}
- F01M 9/107 .. {of rocker shaft bearings}
- F01M 9/108 .. {of auxiliaries}
- F01M 9/109 .. {of rotary slide or sleeve valves}

- F01M 9/12 . Non-pressurised lubrication, or non-closed-circuit lubrication, not otherwise provided for

- F01M 11/00** **Component parts, details or accessories, not provided for in, or of interest apart from, groups [F01M 1/00](#) to [F01M 9/00](#)**
- F01M 11/0004 . {Oilsumps}
- F01M 11/02 . Arrangements of lubricant conduits
- F01M 11/03 . Mounting or connecting of lubricant purifying means relative to the machine or engine; Details of lubricant purifying means ([filters B01D](#))
- F01M 11/04 . Filling or draining lubricant of or from machines or engines
- F01M 11/0408 .. {Sump drainage devices, e.g. valves, plugs}
- F01M 11/045 .. {Removing lubricant by suction}
- F01M 11/0458 .. {Lubricant filling and draining}
- F01M 11/06 . Means for keeping lubricant level constant or for accommodating movement or position of machines or engines
- F01M 11/061 .. {Means for keeping lubricant level constant}
- F01M 11/062 .. {Accommodating movement or position of machines or engines, e.g. dry sumps}
- F01M 11/064 ... {Movement}
- F01M 11/065 ... {Position}
- F01M 11/067 {inverted, e.g. for inverted flight}
- F01M 11/08 . Separating lubricant from air or fuel-air mixture before entry into cylinder ([separating in general B01D](#))
- F01M 11/10 . Indicating devices; Other safety devices
- F01M 11/12 .. concerning lubricant level
- F01M 13/00** **Crankcase ventilating or breathing**
- F01M 13/0011 . {Breather valves}
- F01M 13/0033 . {Breather inlet-air filters}
- F01M 13/02 . by means of additional source of positive or negative pressure
- F01M 13/021 .. {of negative pressure}
- F01M 13/022 ... {using engine inlet suction}
- F01M 13/023 {Control valves in suction conduit}
- F01M 13/025 {with an inlet-conduit via an air-filter}
- F01M 13/028 .. {of positive pressure}
- F01M 13/04 . having means for purifying air before leaving crankcase, e.g. removing oil
- F01M 13/0405 .. {arranged in covering members apertures, e.g. caps}
- F01M 13/0416 .. {arranged in valve-covers}

- F01M 13/06 . specially adapted for submersible engines, e.g. of armoured vehicles

F01M 2001/00 Pressure lubrication

- F01M 2001/02 . using lubricating pumps ([pumps in general F04](#); [lubricating pumps per se F16N](#))
- F01M 2001/0207 .. characterised by the type of pump
- F01M 2001/0215 ... Electrical pumps
- F01M 2001/0223 ... Electromagnetic pumps
- F01M 2001/023 ... Piston pumps
- F01M 2001/0238 ... Rotary pumps
- F01M 2001/0246 ... Adjustable pumps
- F01M 2001/0253 .. characterised by the pump driving means
- F01M 2001/0261 ... driven by the camshaft
- F01M 2001/0269 ... driven by the crankshaft
- F01M 2001/0276 ... driven by a balancer shaft
- F01M 2001/0284 .. mounting of the pump
- F01M 2001/0292 .. Sealings

- F01M 2001/06 . Lubricating systems characterised by the provision therein of crankshafts or connecting rods with lubricant passageways, e.g. bores ([crankshafts, connecting-rods, per se F16C](#))
- F01M 2001/062 .. Crankshaft with passageways
- F01M 2001/064 .. Camshaft with passageways
- F01M 2001/066 .. Connecting rod with passageways
- F01M 2001/068 .. Balance shaft with passageways

- F01M 2001/08 . Lubricating systems characterised by the provision therein of lubricant jetting means
- F01M 2001/083 .. for lubricating cylinders
- F01M 2001/086 .. for lubricating gudgeon pins

- F01M 2001/10 . Lubricating systems characterised by the provision therein of lubricant venting or purifying means, e.g. of filters
- F01M 2001/1007 .. characterised by the purification means combined with other functions
- F01M 2001/1014 ... comprising supply of additives
- F01M 2001/1021 ... comprising self cleaning systems
- F01M 2001/1028 .. characterised by the type of purification
- F01M 2001/1035 ... comprising centrifugal filters
- F01M 2001/1042 ... comprising magnetic parts
- F01M 2001/105 .. characterised by the layout of the purification arrangements
- F01M 2001/1057 ... comprising a plurality of filters, parallel or serial
- F01M 2001/1064 ... comprising drains for oil to the carter, e.g. to recover spilled oil during change of filters

- F01M 2001/1071 . . . comprising oil tanks
- F01M 2001/1078 . . . comprising an oil pick-up tube to oil pump, e.g. strainer
- F01M 2001/1085 . . . comprising non-return valves
- F01M 2001/1092 . . . comprising valves bypassing the filter

- F01M 2001/12 . . Closed-circuit lubricating systems not provided for in groups [F01M 1/02](#) to [F01M 1/10](#)
- F01M 2001/123 . . using two or more pumps
- F01M 2001/126 . . Dry-sumps

- F01M 2001/16 . . Controlling lubricant pressure or quantity ([rendering machines or engines inoperative or idling on lubricant pressure failure F01M 1/22](#))
- F01M 2001/165 . . according to fuel dilution in oil

- F01M 2005/00** **Heating, cooling, or controlling temperature of lubricant** ([arrangement of lubricant coolers in engine cooling system F01P 11/08](#)); **lubrication means facilitating engine starting**

- F01M 2005/002 . [{Cooling}](#)
- F01M 2005/004 . . Oil-cooled engines

- F01M 2005/008 . Lubrication means facilitating engine starting

- F01M 2005/02 . Conditioning lubricant for aiding engine starting, e.g. heating
- F01M 2005/021 . . [{by heating}](#)
- F01M 2005/023 . . . Oil sump with partition for facilitating heating of oil during starting
- F01M 2005/025 . . [{by prelubricating, e.g. using an accumulator}](#)
- F01M 2005/026 . . . with an auxiliary pump
- F01M 2005/028 . . . with a reservoir under pressure

- F01M 2011/00** **Component parts, details or accessories, not provided for in, or of interest apart from, groups [F01M 1/00](#) to [F01M 9/00](#)**

- F01M 2011/0004 . [{Oilsumps}](#)
- F01M 2011/0008 . . with means for reducing vibrations
- F01M 2011/0012 . . . with acoustic insulation
- F01M 2011/0016 . . with thermic insulation
- F01M 2011/002 . . with means for improving the stiffness
- F01M 2011/0025 . . with heat exchangers
- F01M 2011/0029 . . with oil filters
- F01M 2011/0033 . . with special means for guiding the return of oil into the sump
- F01M 2011/0037 . . with different oil compartments
- F01M 2011/0041 . . . for accommodating movement or position of engines
- F01M 2011/0045 . . . for controlling the oil temperature
- F01M 2011/005 . . with special anti-turbulence means, e.g. anti-foaming means or intermediate plates
- F01M 2011/0054 . . Fastening to the cylinder block

- F01M 2011/0058 .. Fastening to the transmission
- F01M 2011/0062 .. Gaskets
- F01M 2011/0066 .. with passages in the wall, e.g. for axles or fluid passages
- F01M 2011/007 .. Oil pickup tube to oil pump, e.g. strainer
- F01M 2011/0075 ... with a plurality of tubes
- F01M 2011/0079 .. with the oil pump integrated or fixed to sump
- F01M 2011/0083 .. Dry sumps
- F01M 2011/0087 .. Sump being made of different parts
- F01M 2011/0091 .. characterised by used materials

- F01M 2011/0095 . Supplementary oil tank

- F01M 2011/02 . Arrangements of lubricant conduits
- F01M 2011/021 .. for lubricating auxiliaries, e.g. pumps or turbo chargers
- F01M 2011/022 .. for lubricating cylinders
- F01M 2011/023 .. between oil sump and cylinder head
- F01M 2011/025 .. for lubricating gudgeon pins
- F01M 2011/026 .. for lubricating crankshaft bearings
- F01M 2011/027 .. for lubricating connecting rod bearings
- F01M 2011/028 .. for lubricating balance shafts

- F01M 2011/03 . Mounting or connecting of lubricant purifying means relative to the machine or engine;
Details of lubricant purifying means ([filters B01D](#))
- F01M 2011/031 .. characterised by mounting means
- F01M 2011/033 ... comprising coolers or heat exchangers
- F01M 2011/035 ... comprising oil pumps
- F01M 2011/036 ... comprising pumps for the cooling circuit
- F01M 2011/038 ... comprising lubricant-air separators

- F01M 2011/04 . Filling or draining lubricant of or from machines or engines
- F01M 2011/0408 .. {Sump drainage devices, e.g. valves, plugs}
- F01M 2011/0416 ... Plugs
- F01M 2011/0425 with a device facilitating the change of oil
- F01M 2011/0433 with a device defining the lubricant level during filling
- F01M 2011/0441 for measuring the lubricant level
- F01M 2011/0458 .. {Lubricant filling and draining}
- F01M 2011/0466 ... Filling or draining during running
- F01M 2011/0475 with combustion of used lubricant in the engine
- F01M 2011/0483 .. with a lubricant cartridge for facilitating the change
- F01M 2011/0491 .. Filing cap with special features

- F01M 2011/06 . Means for keeping lubricant level constant or for accommodating movement or position of machines or engines
- F01M 2011/062 .. {Accommodating movement or position of machines or engines, e.g. dry sumps}

- F01M 2011/065 . . . {Position}
- F01M 2011/068 with internal reservoir

- F01M 2011/10 . Indicating devices; Other safety devices
 - F01M 2011/14 . . for indicating the necessity to change the oil
 - F01M 2011/1406 . . . by considering acidity
 - F01M 2011/1413 . . . by considering dielectric properties
 - F01M 2011/142 . . . by considering speed, e.g. revolutions per minute [RPM]
 - F01M 2011/1426 . . . by considering distance
 - F01M 2011/1433 . . . by considering load
 - F01M 2011/144 . . . by considering magnetic properties of the oil
 - F01M 2011/1446 . . . by considering pressure
 - F01M 2011/1453 . . . by considering oil quantity
 - F01M 2011/146 . . . by considering moisture level
 - F01M 2011/1466 . . . by considering quantity of soot
 - F01M 2011/1473 . . . by considering temperature
 - F01M 2011/148 . . . by considering viscosity
 - F01M 2011/1486 . . . by considering duration of operation
 - F01M 2011/1493 . . . by considering total base number [TBN]

F01M 2013/00 Crankcase ventilating or breathing

- F01M 2013/0005 . with systems regulating the pressure in the carter

- F01M 2013/0011 . {Breather valves}
 - F01M 2013/0016 . . with a membrane
 - F01M 2013/0022 . . electromagnetic
 - F01M 2013/0027 . . with a de-icing or defrosting system

- F01M 2013/0038 . Layout of crankcase breathing systems
 - F01M 2013/0044 . . with one or more valves
 - F01M 2013/005 . . having one or more deoilers
 - F01M 2013/0055 . . . with a by-pass
 - F01M 2013/0061 . . . having a plurality of deoilers
 - F01M 2013/0066 in parallel
 - F01M 2013/0072 in series

- F01M 2013/0077 . Engine parameters used for crankcase breather systems
 - F01M 2013/0083 . . Crankcase pressure
 - F01M 2013/0088 . . Rotation speed
 - F01M 2013/0094 . . Engine load

- F01M 2013/02 . by means of additional source of positive or negative pressure
 - F01M 2013/021 . . {of negative pressure}

- F01M 2013/026 . . . with a pump sucking air or clowby gas from the carter
- F01M 2013/027 . . . with a turbo charger or compressor

- F01M 2013/04 . . having means for purifying air before leaving crankcase, e.g. removing oil
- F01M 2013/0411 . . using cooling means
- F01M 2013/0422 . . Separating oil and gas with a centrifuge device
- F01M 2013/0427 . . . the centrifuge device having no rotating part, e..g cyclone
- F01M 2013/0433 . . with a deflection device, e.g. screen
- F01M 2013/0438 . . with a filter
- F01M 2013/0444 . . with means for accomodating movement or position of engines
- F01M 2013/045 . . using compression or decompression of the gas
- F01M 2013/0455 . . with a de-icing or defrosting system (for breathing valves [F01M 2013/0027](#))
- F01M 2013/0461 . . with a labyrinth
- F01M 2013/0466 . . with electrostatic means
- F01M 2013/0472 . . using heating means
- F01M 2013/0477 . . by separating water or moisture
- F01M 2013/0483 . . using catalysis
- F01M 2013/0488 . . with oil trap in the return conduit to the crankcase
- F01M 2013/0494 . . . using check valves

F01M 2250/00 Measuring

- F01M 2250/60 . . Operating parameters
- F01M 2250/62 . . Load
- F01M 2250/64 . . Number of revolutions
- F01M 2250/66 . . Vehicle speed