

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