

## ENGINES OR PUMPS

**F01 MACHINES OR ENGINES IN GENERAL; ENGINE PLANTS IN GENERAL; STEAM ENGINES**

**F01C** **ROTARY-PISTON OR OSCILLATING-PISTON MACHINES OR ENGINES** (internal-combustion aspects F02B 53/00, F02B 55/00)

1. This subclass covers:
  - rotary-piston or oscillating-piston engines for elastic fluids, e.g. steam;
  - rotary-piston or oscillating-piston engines for liquids and elastic fluids;
  - rotary-piston or oscillating-piston machines for elastic fluids;
  - rotary-piston or oscillating-piston machines for liquids and elastic fluids.
2. In this subclass, the following expression is used with the meaning indicated:
  - "rotary-piston machine" includes the German expressions "Drehkolbenmaschinen", "Kreiskolbenmaschinen" and "Umlaufkolbenmaschinen".
3. Attention is drawn to the Notes preceding class [F01](#), especially as regards the definitions of "rotary-piston machine", "oscillating-piston machine", "rotary piston", "co-operating members", "movement of co-operating members", "teeth or tooth-equivalents" and "internal-axis".

In this subclass non-limiting references (in the sense of paragraph 39 of the Guide to the IPC) may still be displayed in the scheme.

1/00	<p><b>Rotary-piston machines or engines</b> (with axes of co-operating members non parallel <a href="#">F01C 3/00</a>; with the working-chamber walls at least partly resiliently deformable <a href="#">F01C 5/00</a>; with fluid ring or the like <a href="#">F01C 7/00</a>; rotary-piston machines or engines in which the working fluid is exclusively displaced by, or exclusively displaces, one or more reciprocating pistons <a href="#">F01B 13/00</a>)</p> <p><b>NOTE</b></p> <p>Group <a href="#">F01C 1/30</a> takes precedence over groups <a href="#">F01C 1/02</a> - <a href="#">F01C 1/28</a>.</p>	
1/02	<ul style="list-style-type: none"> <li>of arcuate-engagement type, i.e. with circular translatory movement of co-operating members, each member having the same number of teeth or tooth-equivalents</li> </ul>	
1/0207	<ul style="list-style-type: none"> <li> <ul style="list-style-type: none"> <li>{both members having co-operating elements in spiral form}</li> </ul> </li> </ul>	
1/0215	<ul style="list-style-type: none"> <li> <ul style="list-style-type: none"> <li> <ul style="list-style-type: none"> <li>{where only one member is moving}</li> </ul> </li> </ul> </li> </ul>	
1/0223	<ul style="list-style-type: none"> <li> <ul style="list-style-type: none"> <li> <ul style="list-style-type: none"> <li>{with symmetrical double wraps}</li> </ul> </li> </ul> </li> </ul>	
1/023	<ul style="list-style-type: none"> <li> <ul style="list-style-type: none"> <li>{where both members are moving}</li> </ul> </li> </ul>	
1/0238	<ul style="list-style-type: none"> <li> <ul style="list-style-type: none"> <li> <ul style="list-style-type: none"> <li>{with symmetrical double wraps}</li> </ul> </li> </ul> </li> </ul>	
1/0246	<ul style="list-style-type: none"> <li> <ul style="list-style-type: none"> <li>{Details concerning the involute wraps or their base, e.g. geometry}</li> </ul> </li> </ul>	
1/0253	<ul style="list-style-type: none"> <li> <ul style="list-style-type: none"> <li> <ul style="list-style-type: none"> <li>{Details concerning the base}</li> </ul> </li> </ul> </li> </ul>	
1/0261	<ul style="list-style-type: none"> <li> <ul style="list-style-type: none"> <li> <ul style="list-style-type: none"> <li>{Details of the ports, e.g. location, number, geometry}</li> </ul> </li> </ul> </li> </ul>	
1/0269	<ul style="list-style-type: none"> <li> <ul style="list-style-type: none"> <li> <ul style="list-style-type: none"> <li>{Details concerning the involute wraps}</li> </ul> </li> </ul> </li> </ul>	
1/0276	<ul style="list-style-type: none"> <li> <ul style="list-style-type: none"> <li> <ul style="list-style-type: none"> <li>{Different wall heights}</li> </ul> </li> </ul> </li> </ul>	
1/0284	<ul style="list-style-type: none"> <li> <ul style="list-style-type: none"> <li> <ul style="list-style-type: none"> <li>{Details of the wrap tips}</li> </ul> </li> </ul> </li> </ul>	
1/0292	<ul style="list-style-type: none"> <li> <ul style="list-style-type: none"> <li>{Ports or channels located in the wrap}</li> </ul> </li> </ul>	
1/04	<ul style="list-style-type: none"> <li> <ul style="list-style-type: none"> <li>of internal-axis type</li> </ul> </li> </ul>	
1/045	<ul style="list-style-type: none"> <li> <ul style="list-style-type: none"> <li> <ul style="list-style-type: none"> <li>{having a C-shaped piston}</li> </ul> </li> </ul> </li> </ul>	
1/06	<ul style="list-style-type: none"> <li> <ul style="list-style-type: none"> <li>of other than internal-axis type (<a href="#">F01C 1/063</a> takes precedence)</li> </ul> </li> </ul>	
1/063	<ul style="list-style-type: none"> <li> <ul style="list-style-type: none"> <li>with coaxially-mounted members having continuously-changing circumferential spacing between them</li> </ul> </li> </ul>	
1/067	<ul style="list-style-type: none"> <li> <ul style="list-style-type: none"> <li> <ul style="list-style-type: none"> <li>having cam-and-follower type drive</li> </ul> </li> </ul> </li> </ul>	
1/07	<ul style="list-style-type: none"> <li> <ul style="list-style-type: none"> <li> <ul style="list-style-type: none"> <li>having crankshaft-and-connecting-rod type drive</li> </ul> </li> </ul> </li> </ul>	
1/073	<ul style="list-style-type: none"> <li> <ul style="list-style-type: none"> <li> <ul style="list-style-type: none"> <li>having pawl-and-ratchet type drive</li> </ul> </li> </ul> </li> </ul>	
1/077	<ul style="list-style-type: none"> <li> <ul style="list-style-type: none"> <li> <ul style="list-style-type: none"> <li>having toothed-gearing type drive</li> </ul> </li> </ul> </li> </ul>	
1/08	<ul style="list-style-type: none"> <li>of intermeshing engagement type, i.e. with engagement of co-operating members similar to that of toothed gearing</li> </ul>	
1/082	<ul style="list-style-type: none"> <li> <ul style="list-style-type: none"> <li>{Details specially related to intermeshing engagement type machines or engines}</li> </ul> </li> </ul>	
1/084	<ul style="list-style-type: none"> <li> <ul style="list-style-type: none"> <li>{Toothed wheels}</li> </ul> </li> </ul>	
1/086	<ul style="list-style-type: none"> <li> <ul style="list-style-type: none"> <li>{Carter}</li> </ul> </li> </ul>	
1/088	<ul style="list-style-type: none"> <li> <ul style="list-style-type: none"> <li>{Elements in the toothed wheels or the carter for relieving the pressure of fluid imprisoned in the zones of engagement}</li> </ul> </li> </ul>	
1/10	<ul style="list-style-type: none"> <li> <ul style="list-style-type: none"> <li>of internal-axis type with the outer member having more teeth or tooth-equivalents, e.g. rollers, than the inner member</li> </ul> </li> </ul>	
1/101	<ul style="list-style-type: none"> <li> <ul style="list-style-type: none"> <li>{Moineau-type}</li> </ul> </li> </ul>	
1/102	<ul style="list-style-type: none"> <li> <ul style="list-style-type: none"> <li>{with a crescent shaped filler element located between the intermeshing elements}</li> </ul> </li> </ul>	

- 1/103 . . . {the two members rotating simultaneously around their respective axes}
- 1/104 . . . {one member having simultaneously a rotational movement about its own axis and an orbital movement}
- 1/105 . . . . {and having an articulated driving shaft}
- 1/107 . . . with helical teeth
- 1/113 . . . the inner member carrying rollers intermeshing with the outer member
- 1/12 . . of other than internal-axis type
- 1/123 . . . {with tooth-like elements, extending generally radially from the rotor body cooperating with recesses in the other rotor, e.g. one tooth}
- 1/126 . . . {with elements extending radially from the rotor body not necessarily cooperating with corresponding recesses in the other rotor, e.g. lobes, Roots type}
- 1/14 . . . with toothed rotary pistons
- 1/16 . . . . with helical teeth, e.g. chevron-shaped, screw type {(for non-parallel axes of movement [F01C 3/00](#))}
- 1/165 . . . . . {having more than two rotary pistons with parallel axes}
- 1/18 . . . . with similar tooth forms ([F01C 1/16](#) takes precedence)
- 1/20 . . . . with dissimilar tooth forms ([F01C 1/16](#) takes precedence)
- 1/22 . . of internal-axis type with equidirectional movement of co-operating members at the points of engagement, or with one of the co-operating members being stationary, the inner member having more teeth or tooth- equivalents than the outer member
- 1/24 . . of counter-engagement type, i.e. the movement of co-operating members at the points of engagement being in opposite directions
- 1/26 . . of internal-axis type
- 1/28 . . of other than internal-axis type
- 1/30 . . having the characteristics covered by two or more groups [F01C 1/02](#), [F01C 1/08](#), [F01C 1/22](#), [F01C 1/24](#) or having the characteristics covered by one of these groups together with some other type of movement between co-operating members
- 1/32 . . having both the movement defined in group [F01C 1/02](#) and relative reciprocation between the co-operating members
- 1/321 . . . {with vanes hinged to the inner member and reciprocating with respect to the inner member}
- 1/322 . . . {with vanes hinged to the outer member and reciprocating with respect to the outer member}
- 1/324 . . . with vanes hinged to the inner member and reciprocating with respect to the outer member
- 1/328 . . . . and hinged to the outer member
- 1/332 . . . with vanes hinged to the outer member and reciprocating with respect to the inner member
- 1/336 . . . . and hinged to the inner member
- 1/34 . . having the movement defined in group [F01C 1/08](#) or [F01C 1/22](#) and relative reciprocation between the co-operating members
- 1/344 . . . with vanes reciprocating with respect to the inner member
- 1/3441 . . . . {the inner and outer member being in contact along one line or continuous surface substantially parallel to the axis of rotation}
- 1/3442 . . . . . {the surfaces of the inner and outer member, forming the working space, being surfaces of revolution}
- 1/3443 . . . . . {with a separation element located between the inlet and outlet opening}
- 1/3445 . . . . . {the vanes having the form of rollers, slippers or the like}
- 1/3446 . . . . {the inner and outer member being in contact along more than one line or surface}
- 1/3447 . . . . . {the vanes having the form of rollers, slippers or the like}
- 1/3448 . . . . {with axially movable vanes}
- 1/348 . . . . the vanes positively engaging, with circumferential play, an outer rotatable member
- 1/352 . . . . the vanes being pivoted on the axis of the outer member
- 1/356 . . . with vanes reciprocating with respect to the outer member
- 1/3562 . . . . {the inner and outer member being in contact along one line or continuous surface substantially parallel to the axis of rotation}
- 1/3564 . . . . . {the surfaces of the inner and outer member, forming the working space, being surfaces of revolution}
- 1/3566 . . . . {the inner and outer member being in contact along more than one line or surface}
- 1/3568 . . . . {with axially movable vanes}
- 1/36 . . having both the movements defined in sub-groups [F01C 1/22](#) and [F01C 1/24](#)
- 1/38 . . having the movement defined in group [F01C 1/02](#) and having a hinged member ([F01C 1/32](#) takes precedence)
- 1/39 . . . with vanes hinged to the inner as well as to the outer member
- 1/40 . . having the movement defined in group [F01C 1/08](#) or [F01C 1/22](#) and having a hinged member
- 1/44 . . . with vanes hinged to the inner member
- 1/46 . . . with vanes hinged to the outer member
- 3/00 Rotary-piston machines or engines with non-parallel axes of movement of co-operating members (with the working-chamber walls being at least partly resiliently deformable [F01C 5/00](#))**
- 3/02 . . the axes being arranged at an angle of 90 degrees
- 3/025 . . {of intermeshing engagement type, i.e. with engagement of co-operating members similar to that of toothed gearing}
- 3/04 . . with axially sliding vanes
- 3/06 . . the axes being arranged otherwise than at an angle of 90 degrees
- 3/08 . . of intermeshing-engagement type, i.e. with engagement of co-operating members similar to that of toothed gearing
- 3/085 . . . {the axes of cooperating members being on the same plane}
- 5/00 Rotary-piston machines or engines with the working-chamber walls at least partly resiliently deformable**
- 5/02 . . the resiliently-deformable wall being part of the inner member, e.g. of a rotary piston
- 5/04 . . the resiliently-deformable wall being part of the outer member, e.g. of a housing

5/06	• the resiliently-deformable wall being a separate member	19/085	• • {Elements specially adapted for sealing of the lateral faces of intermeshing-engagement type machines or engines, e.g. gear machines or engines}
5/08	• • of tubular form, e.g. hose		
<b>7/00</b>	<b>Rotary-piston machines or engines with fluid ring or the like</b>	19/10	• Sealings for working fluids between radially and axially movable parts
<b>9/00</b>	<b>Oscillating-piston machines or engines</b>	19/12	• for other than working fluid
9/002	• {the piston oscillating around a fixed axis}	19/125	• • {Shaft sealings specially adapted for rotary or oscillating-piston machines or engines}
9/005	• {the piston oscillating in the space, e.g. around a fixed point (rotary piston machines or engines with non-parallel axes of rotation between co-operating members <a href="#">F01C 3/00</a> )}	<b>20/00</b>	<b>Control of, monitoring of, or safety arrangements for, machines or engines</b>
9/007	• {the points of the moving element describing approximately an alternating movement in axial direction with respect to the other element}	20/02	• specially adapted for several machines or engines connected in series or in parallel
<b>11/00</b>	<b>Combinations of two or more machines or engines, each being of rotary-piston or oscillating-piston type (<a href="#">F01C 13/00</a> takes precedence; combinations of two or more pumps <a href="#">F04</a>; fluid gearing <a href="#">F16H</a>)</b>	20/04	• specially adapted for reversible machines or engines
11/002	• {of similar working principle}	20/06	• specially adapted for stopping, starting, idling or no-load operation
11/004	• • {and of complementary function, e.g. internal combustion engine with supercharger}	20/08	• characterised by varying the rotational speed
11/006	• {of dissimilar working principle}	20/10	• characterised by changing the positions of the inlet or outlet openings with respect to the working chamber
11/008	• • {and of complementary function, e.g. internal combustion engine with supercharger}	20/12	• • using sliding valves
	<b>NOTE</b>	20/125	• • • {with sliding valves controlled by the use of fluid other than the working fluid}
	Multi-stage steam engines or similar machines are not considered as having complementary function	20/14	• • using rotating valves
<b>13/00</b>	<b>Adaptations of machines or engines for special use; Combinations of engines with devices driven thereby (aspects predominantly concerning driven devices, see the relevant classes for these devices)</b>	20/16	• • using lift valves
13/02	• for driving hand-held tools or the like	20/18	• characterised by varying the volume of the working chamber (by changing the positions of inlet or outlet openings <a href="#">F01C 20/10</a> )
13/04	• for driving pumps or compressors	20/185	• • {by varying the useful pumping length of the cooperating members in the axial direction}
<b>17/00</b>	<b>Arrangements for drive of co-operating members, e.g. for rotary piston and casing</b>	20/20	• • by changing the form of the inner or outlet contour of the working chamber
17/02	• of toothed-gearing type ( <a href="#">F01C 1/077</a> takes precedence)	20/22	• • by changing the eccentricity between cooperating members
17/04	• of cam-and-follower type ( <a href="#">F01C 1/067</a> takes precedence)	20/24	• characterised by using valves for controlling pressure or flow rate, e.g. discharge valves ( <a href="#">F01C 20/10</a> takes precedence)
17/06	• using cranks, universal joints or similar elements ( <a href="#">F01C 1/07</a> takes precedence)	20/26	• • using bypass channels
17/063	• • {with only rolling movement}	20/265	• • • {being obtained by displacing a lateral sealing face}
17/066	• • {with an intermediate piece sliding along perpendicular axes, e.g. Oldham coupling}	20/28	• Safety arrangements; Monitoring
<b>19/00</b>	<b>Sealing arrangements in rotary-piston machines or engines (sealings in general <a href="#">F16J</a>)</b>	<b>21/00</b>	<b>Component parts, details or accessories not provided for in groups <a href="#">F01C 1/00</a> - <a href="#">F01C 20/00</a></b>
19/005	• {Structure and composition of sealing elements such as sealing strips, sealing rings and the like; Coating of these elements (vane construction <a href="#">F01C 21/0809</a> ; piston rings and ring sealings of similar construction in general <a href="#">F16J 9/00</a> )}	21/001	• {Injection of a fluid in the working chamber for sealing, cooling and lubricating (sealing only <a href="#">F01C 17/00</a> ; lubrication only <a href="#">F01C 21/04</a> ; cooling only <a href="#">F01C 21/06</a> ; injecting water or steam in internal combustion engines <a href="#">F02B 47/02</a> , <a href="#">F02D 21/00</a> , <a href="#">F02M 25/00</a> )}
19/02	• Radially-movable sealings for working fluids	21/002	• • {with control systems for the injection of the fluid}
19/025	• • {Radial sealing elements specially adapted for intermeshing engagement type machines or engines, e.g. gear machines or engines}	21/003	• {Systems for the equilibration of forces acting on the elements of the machine (interstice adjustment other than by fluid pressure <a href="#">F01C 21/102</a> )}
19/04	• • of rigid material	21/005	• • {Internal leakage control}
19/06	• • of resilient material	21/006	• • {Equalization of pressure pulses (silencing for compressors <a href="#">F04C 29/06</a> )}
19/08	• Axially-movable sealings for working fluids	21/007	• {General arrangements of parts; Frames and supporting elements}
		21/008	• {Driving elements, brakes, couplings, transmissions specially adapted for rotary or oscillating-piston machines or engines (brakes, couplings, transmissions per se <a href="#">F16</a> , <a href="#">B60</a> )}

21/02	• Arrangements of bearings ( <a href="#">bearing constructions F16C</a> )	21/18	• Arrangements for admission or discharge of the working fluid, e.g. constructional features of the inlet or outlet
21/04	• Lubrication ( <a href="#">of machines or engines in general F01M</a> )	21/183	• • {Arrangements for supercharging the working space ( <a href="#">similar arrangements for internal combustion engines F02B 33/00, F02B 27/00</a> )}
21/045	• • {Control systems for the circulation of the lubricant}	21/186	• • {for variable fluid distribution}
21/06	• Heating; Cooling ( <a href="#">of machines or engines in general F01P</a> ); Heat insulation ( <a href="#">heat insulation in general F16L</a> )		
21/08	• Rotary pistons ( <a href="#">reciprocating pistons in general F16J</a> )		
21/0809	• • {Construction of vanes or vane holders}		
21/0818	• • • {Vane tracking; control therefor}		
21/0827	• • • • {by mechanical means}		
21/0836	• • • • • {comprising guiding means, e.g. cams, rollers}		
21/0845	• • • • • {comprising elastic means, e.g. springs}		
21/0854	• • • • {by fluid means}		
21/0863	• • • • • {the fluid being the working fluid}		
21/0872	• • • • • {the fluid being other than the working fluid}		
21/0881	• • • {the vanes consisting of two or more parts}		
21/089	• • • {for synchronised movement of the vanes}		
21/10	• Outer members for co-operation with rotary pistons; Casings ( <a href="#">casings for rotary engines or machines in general F16M</a> )		
21/102	• • {Adjustment of the interstices between moving and fixed parts of the machine by means other than fluid pressure}		
21/104	• • {Stators; Members defining the outer boundaries of the working chamber}		
21/106	• • • {with a radial surface, e.g. cam rings}		
21/108	• • • {with an axial surface, e.g. side plates}		
2021/12	• {Control of working fluid admission or discharge}		
2021/125	• • {Arrangements for supercharging the working space}		
2021/14	• • {for variable fluid distribution}		
2021/16	• {Other regulation or control}		
2021/1606	• • {Variation of the working chamber}		
2021/1612	• • • {by changing the eccentricity of an element with respect to another element}		
2021/1618	• • • {by changing the positions of the inlet and outlet openings with respect to the working chambers}		
2021/1625	• • • • {with sliding or rotating valves, adjustable in position}		
2021/1631	• • • • • {with sliding valves controlled by the use of fluid other than the working fluid}		
2021/1637	• • • {by changing the form of the radially inner or the radially outer contour of the working chamber}		
2021/1643	• • {by using valves regulating pressure and flow rate, e.g. discharge valves}		
2021/165	• • • {using a by-pass channel}		
2021/1656	• • • • {being obtained by displacing a lateral sealing face}		
2021/1662	• • • {with venting means}		
2021/1668	• • {with several machines or engines connected in series or in parallel}		
2021/1675	• • {with reversible machines or engines}		
2021/1681	• • {by varying the rotational speed}		
2021/1687	• • {Safety arrangements}		
2021/1693	• • {Stopping or starting, idling or no-load operation}		