

## F01C

### ROTARY-PISTON OR OSCILLATING-PISTON MACHINES OR ENGINES (internal-combustion aspects [F02B 53/00](#) , [F02B 55/00](#))

#### Definition statement

*This subclass/group covers:*

Positive displacement machines, i.e. devices which could be equally an engine or pump, with rotary or oscillating pistons for elastic fluids or for combination of liquid and elastic fluid.

#### Relationship between large subject matter areas

Related subclasses [F01C](#) and [F04C](#) cover the same type of apparatus using rotary or oscillating pistons for positive displacement. The distinguishing characteristic used for classifying the machines, i.e. devices which could be equally be an engine or pump, is the working fluid used. Machines with rotary or oscillating pistons for working fluids containing elastic fluids, e.g. a combination of liquids and elastic fluids are classified in [F01C](#). If only liquid is used as working fluid for these machines with rotary or oscillating pistons they are classified in [F04C](#). However, devices with rotary or oscillating pistons that are only pumps, i.e. cannot be used as engines, are classified in [F04C](#), irrespective of the working fluid.

Engines with reciprocating pistons or rotary or oscillating pistons wherein the working fluid is a liquid are classified in [F03C](#).

[F04B](#) covers machines or pumps with reciprocating pistons, or other kinds of positive displacement mechanisms with the exception of rotary or oscillating piston type machines or pumps.

Subject matter like cyclically operating valves, lubricating or cooling are classified in subclasses [F01L](#), [F01M](#), [F01P](#) irrespective of their stated application, unless their novel and non-obvious features are peculiar to their application, in which case they are classified only in the relevant subclass of F04. The subclasses [F01L](#), [F01M](#), [F01P](#) do not cover pump or machine features per se.

#### References relevant to classification in this subclass

*This subclass/group does not cover:*

Internal-combustion aspects of rotary-piston or oscillating-piston engines	<a href="#">F02B 53/00</a> , <a href="#">F02B 55/00</a>
Engines with reciprocating pistons or rotary or oscillating pistons wherein the working fluid is a liquid.	<a href="#">F03C</a>

Positive displacement machines for liquids, or pumps in which the working-fluid is displaced by one or more reciprocating pistons or by flexible working members	<a href="#">F04B</a>
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## Informative references

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

Cyclically operating valves for machines or engines	<a href="#">F01L</a>
Lubrication of machines or engines in general	<a href="#">F01M</a>
Gas-flow silencer or exhaust apparatus for machines or engines in general	<a href="#">F01N</a>
Cooling of machines or engines in general	<a href="#">F01P</a>
Combustion engines with pumps for charging	<a href="#">F02B 33/34</a> , <a href="#">F02B 53/08</a>
Internal-combustion aspects of rotary pistons; Outer members for co-operation with rotary pistons	<a href="#">F02B 55/00</a>
Hydraulic motors	<a href="#">F03C</a>
Rotary-piston or oscillating piston machines for liquids	<a href="#">F04C 2/00</a>
Rotary-piston or oscillating piston pumps for elastic fluids	<a href="#">F04C 18/00</a>
Fluid pressure actuators	<a href="#">F15B</a>
Rotary fluid gearing using pumps and motors of the volumetric type for conveying rotary motion	<a href="#">F16H</a>
Sealing in general	<a href="#">F16J</a>

Means for thermal insulation in general	<a href="#">F16L</a>
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### Special rules of classification within this subclass

As a general rule a complete classification will contain at least one class specifying the type of machine concerned, combined with at least one class out of the control group [F01C 20/00](#), or of the sealing group [F01C 19/00](#) or of the accessory group [F01C 21/00](#). The subgroups of [F04C](#) should be used for details not provided for in [F01C](#) and [F03C](#).

In cases where a control or a "Details, component, parts, or accessories" has to be classified which can be used in a number of different types of machines which would be covered by different subgroups, the type of machine considered in the document should be classified by using the corresponding Indexing Code. For details not provided for in [F01C](#), the Indexing Codes of the [F04C](#) scheme should be used.

The Indexing Code [F05C](#) is used to classify materials and material properties.

### Glossary of terms

*In this subclass/group, the following terms (or expressions) are used with the meaning indicated:*

Cooperating members	means the "oscillating piston" or "rotary piston" and another member, e.g., the working-chamber wall, which assists in the pumping action or machine's action
Internal axis type	means that the rotational axes of the inner and outer co-operating members remain at all times within the outer member, e.g., in a similar manner to that of a pinion meshing with the internal teeth of a ring gear
Machine	means a device that could equally be both an engine and a pump and not a device which is restricted to an engine or one which is restricted to a pump
Movement of the cooperating members	is to be interpreted as relative, so that one of the "cooperating members" may be stationary, even though

	reference may be made to its rotational axis, or both may move
Oscillating piston machine	means a positive-displacement machine in which a fluid-engaging, work-transmitting member oscillates, e.g. a vane piston swinging back and forth about a fixed axis
Positive displacement engines	the energy of a working fluid is transformed into mechanical energy, in which variations of volume created by the working fluid in a working chamber produce equivalent movement of mechanical members, e.g. pistons transmitting the energy, the dynamic effect of the fluid being of minor importance
Positive displacement pumps	pumps using pistons or other mechanical members to displace a working fluid in a working chamber, the dynamic effect on the fluid being of minor importance
Pump	means a device for continuously raising, forcing, compressing, or exhausting fluid by mechanical means
Reciprocating piston	means a fluid-engaging, work-transmitting member of an reciprocating-piston type machine or pump that slides alternately back and forth usually along a straight line or path
Rotary piston	means a fluid engaging, work-transmitting member of a rotary-piston machine or pump that can completely rotate about a fixed axis or about an axis moving along a circular or similar orbit when operating, e.g. rotor having vanes or teeth
Rotary piston machine	means a positive-displacement machine in which a liquid-engaging, work-transmitting member rotates

	about a fixed axis or about an axis moving along a circular or similar orbit, e.g. machine with a rotor having vanes or teeth
Teeth or tooth equivalents	include lobes, projections or abutments
Working fluid	means the driven fluid in a pump or driving or driven liquid in a machine. The working fluid can be in a compressible, gaseous state, e.g. steam, called elastic fluid, a liquid state, or a state where there is coexistence of elastic fluid and liquid state

## F01C 1/00

Rotary-piston machines or engines (with axes of co-operating members non parallel [F01C 3/00](#); with the working-chamber walls at least partly resiliently deformable [F01C 5/00](#); with fluid ring or the like [F01C 7/00](#); rotary-piston machines or engines in which the working fluid is exclusively displaced by, or exclusively displaces, one or more reciprocating pistons [F01B 13/00](#) )

### References relevant to classification in this group

*This subclass/group does not cover:*

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>
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>

## F01C 1/08

Of intermeshing engagement type, i.e. with engagement of co-operating members similar to that of toothed gearing

### Informative references

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

Gear teeth manufacturing by metal processing	<a href="#">B23F</a>
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## F01C 1/086

[N: Carter]

### Definition statement

*This subclass/group covers:*

Outer members cooperating with the rotary pistons of intermeshing engagement type machines.

### References relevant to classification in this subgroup

*This subclass/group does not cover:*

Non intermeshing-engagement type machines	<a href="#">F01C 21/10</a>
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### Special rules of classification within this subgroup

If the carter is not the core topic, it is highly desirable to add the Indexing Code [F04C 2240/10](#) or [F04C 2240/30](#).

## F01C 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](#) )

### References relevant to classification in this group

*This subclass/group does not cover:*

Rotary-piston machines with the	<a href="#">F01C 5/00</a>
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working-chamber walls being at least partly resiliently deformable	
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## F01C 5/00

**Rotary-piston machines or engines with the working-chamber walls at least partly resiliently deformable**

### References relevant to classification in this group

*This subclass/group does not cover:*

Rotary-piston peristaltic machines	<a href="#">F04B 43/12</a>
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## F01C 7/00

**Rotary-piston machines or engines with fluid ring or the like**

### Definition statement

*This subclass/group covers:*

Rotary-piston machines or engines in which the rotary-piston is sealed by a mass of liquid rotating inside the housing.

## F01C 9/00

**Oscillating-piston machines or engines**

### Definition statement

*This subclass/group covers:*

Rotary-piston machines or engines in which the rotary-piston moves back and forth inside the working chamber.

### References relevant to classification in this subgroup

*This subclass/group does not cover:*

Rotary-piston machines with coaxially mounted members having continuously-changing circumferential spacing between them	<a href="#">F01C 1/063</a>
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## F01C 9/005

[N: 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 [F01C 3/00](#) )]

### References relevant to classification in this subgroup

*This subclass/group does not cover:*

Rotary-piston machines where the working fluid is expanded in a flexible chamber	<a href="#">F04B 43/12</a>
Rotary-piston machines or engines with non-parallel axes of rotation between co-operating members	<a href="#">F01C 3/00</a>

## F01C 11/00

Combinations of two or more machines or engines, each being of rotary-piston or oscillating-piston type ([F01C 13/00](#) takes precedence; combinations of two or more pumps F04; fluid gearing [F16H](#))

### Definition statement

*This subclass/group covers:*

Combinations of two or more machines or engines, each being of rotary-piston or oscillating-piston type, such as multistage machines and parallel operating machines.

### References relevant to classification in this group

*This subclass/group does not cover:*

Rotary-piston machines or engines with non-parallel axes of rotation between co-operating members	<a href="#">F01C 3/00</a>
Combinations of two or more rotary-piston pumps	<a href="#">F04C</a>
Combinations of engines with devices driven thereby	<a href="#">F01C 13/00</a>



## Informative references

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

Fluid gearing	<a href="#">F16H</a>
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## Special rules of classification within this group

[F01C 13/00](#) takes precedence.

### F01C 13/00

**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)**

## Special rules of classification within this group

Documents classified here should have a main class elsewhere. In particular, aspects predominantly concerning the driven devices are classified in the relevant classes for these devices.

### F01C 17/00

**Arrangements for drive of co-operating members, e.g. for rotary piston and casing**

## Special rules of classification within this group

Documents classified here should have a main class elsewhere.

### F01C 19/00

**Sealing arrangements in rotary-piston machines or engines (sealings in general [F16J](#))**

## Definition statement

*This subclass/group covers:*

Any seal construction or mode not provided by the groups, e.g. labyrinth.

## References relevant to classification in this group

*This subclass/group does not cover:*

Sealing by liquid injection	<a href="#">F01C 21/001</a>
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## Informative references

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

Sealing in general	<a href="#">F16J</a>
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## F01C 19/12

### For other than working fluid

#### Definition statement

*This subclass/group covers:*

Sealing arrangements for fluids other than the working fluid, e.g. lubricant, coolant. Sealing in other locations of the machine, i.e. not between successive working chambers of the machine, e.g. between housing parts, towards the external space etc.

## F01C 20/00

### Control of, monitoring of, or safety arrangements for, machines or engines

#### Special rules of classification within this group

Documents classified here should have a main class elsewhere.

Characterised by varying the volume of the working chamber (by changing the positions of inlet or outlet openings [F01C 20/10](#) )

## F01C 20/18

#### Definition statement

*This subclass/group covers:*

Changing the stroke of a moving element of machines other than those meant for the sub-groups, e.g. with non parallel axes of movement.

#### References relevant to classification in this subgroup

*This subclass/group does not cover:*

By changing the positions of inlet or	<a href="#">F01C 20/10</a>
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outlet openings	
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## F01C 20/22

By changing the eccentricity between cooperating members

### References relevant to classification in this subgroup

*This subclass/group does not cover:*

Internal gear machines with variable eccentricity (i.e. variable in direction and not in quantity)(no change of volume but only relative displacement of the working chamber to the inlet and outlet openings)	<a href="#">F01C 20/10</a>
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## F01C 21/00

Component parts, details or accessories not provided for in groups [F01C 1/00](#) to [F01C 20/00](#)

### Special rules of classification within this group

Documents classified here should have a main class elsewhere.

## F01C 21/007

[N: General arrangements of parts; Frames and supporting elements]

### Definition statement

*This subclass/group covers:*

Supports, elastic suspension, outer frame elements of units, foundations.

### References relevant to classification in this subgroup

*This subclass/group does not cover:*

Flow-sheets, multiple unit assemblies	<a href="#">F01C 11/00</a> , <a href="#">F04C 11/00</a> , <a href="#">F04C 23/00</a>
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## F01C 21/008

[N: Driving elements, brakes, couplings, transmissions specially adapted for rotary or oscillating-piston machines or engines (brakes, couplings, transmissions per se F16, B60)]

### Definition statement

*This subclass/group covers:*

All kinds of transmissions e.g. couplings, timing gears, gear boxes, shafts (as for example elastic, hollow), brakes.

### Relationship between large subject matter areas

Brakes, couplings, transmissions per se: F16, B60

### Informative references

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

Brakes	<a href="#">F04C 15/0084</a>
For pumps and compressors	<a href="#">F04C 15/0057</a> , <a href="#">F04C 29/0042</a>

## F01C 21/0809

[N: Construction of vanes or vane holders]

### Definition statement

*This subclass/group covers:*

Details of vanes of engines but also of pumps and compressors.

## F01C 21/0836

[N: comprising guiding means, e.g. cams, rollers]

### Definition statement

*This subclass/group covers:*

Guiding means including those for vanes guided or driven in synchronism with the piston movement.

## F01C 21/10

## Outer members for co-operation with rotary pistons; Casings (casings for rotary engines or machines in general [F16M](#))

### Definition statement

*This subclass/group covers:*

Details relating to the casing or to the stator of engines but also of pumps and compressors of the type other than intermeshing engagement.

### References relevant to classification in this subgroup

*This subclass/group does not cover:*

Details relating to the casing or to the stator of machines of the intermeshing engagement type	<a href="#">F01C 1/086</a>
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### Informative references

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

Casings for rotary engines or machines in general	<a href="#">F16M</a>
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