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Third edition
2022-04

Reciprocating internal combustion engines — Vocabulary of components and systems —

Part 6: Lubricating systems

Moteurs alternatifs à combustion interne — Vocabulaire des composants et des systèmes —

Partie 6: Systèmes de lubrification

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Foreword

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The procedures used to develop this document and those intended for its further maintenance are described in the ISO/IEC Directives, Part 1. In particular, the different approval criteria needed for the different types of ISO documents should be noted. This document was drafted in accordance with the editorial rules of the ISO/IEC Directives, Part 2 (see www.iso.org/directives).

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This document was prepared by Technical Committee ISO/TC 70, *Internal combustion engines*.

This third edition cancels and replaces the second edition (ISO 7967-6:2005), which has been technically revised.

The main changes are as follows:

— the definitions of supplementary lubrication, rotating centrifugal lubricating oil filter, back-flushing lubricating oil filter, automatic lubricating oil filter, lubricating oil pump, lubricator, dipstick and filter housing have been modified;

— the definitions of lubricating oil filter, two-stage lubricating oil filter, full-flow lubricating oil filter, bypass lubricating oil filter, spin-on lubricating oil filter and duplex lubricating oil filter have been modified according to ISO 11841-1;

— the following terms have been added: detachable lubricating oil filter, oil gallery, dirty oil gallery, main oil gallery, PCJ oil gallery, piston-cooling jet valve, oil temperature control valve, variable oil pump, anti-drain valve, drain valve and bypass valve.

A list of all parts in the ISO 7967 series can be found on the ISO website.

Any feedback or questions on this document should be directed to the user's national standards body. A complete listing of these bodies can be found at www.iso.org/members.html.

Introduction

The ISO 7967 series establishes a vocabulary for components and systems of reciprocating internal combustion engines.

The ISO 2710 series gives a classification of reciprocating internal combustion engines and defines basic terms for such engines and their characteristics.

Reciprocating internal combustion engines — Vocabulary of components and systems —

Part 6: Lubricating systems

1 Scope

This document defines terms relating to lubricating systems.

2 Normative references

There are no normative references in this document.

3 Terms and definitions

ISO and IEC maintain terminology databases for use in standardization at the following addresses:

— ISO Online browsing platform: available at https://www.iso.org/obp

— IEC Electropedia: available at https://www.electropedia.org/

3.1 Terms related to types of lubricating system

3.1.1
non-pressurized lubrication
system in which lubricating oil is not supplied by pump pressure, but is deposited on the surfaces to be lubricated

EXAMPLE Lubricating oil is supplied by splashing, dripping or oil mist.

3.1.2
oil-in-gasoline lubrication
petroil lubrication
system in which lubricating oil is added to the fuel in a certain proportion and is deposited on the engine parts to be lubricated

3.1.3
force-feed lubrication
pressurized lubrication
system in which the moving parts of the engine are supplied with lubricating oil from one or more pumps

3.1.4
gravity-feed lubrication
gravity oiling
system in which the moving parts of the engine are supplied with lubricating oil under the influence of gravity

3.1.5
drip-feed lubrication
system in which the moving parts of the engine are supplied with lubricating oil in the form of drops

3.2 Terms related to lubricating systems

3.2.1
main running gear lubrication
type or combination of lubricating systems in which the crankshaft bearings, connecting rod bearings, piston-pin bearings, crosshead guiderails, bearings and guideways of the valve gearing, and in some cases also the cylinders and the piston slideway of the cylinders, are supplied with lubricating oil

3.2.2
dip lubrication
non-pressurized lubricating system in which the lubricating oil is taken from the sump or oil pan by dipping moving parts and is thrown into the crankcase and/or the bearings

EXAMPLE Lubricating oil is taken from the sump or oil pan by dipping on the connecting rod.

Note 1 to entry: See Figure 1.

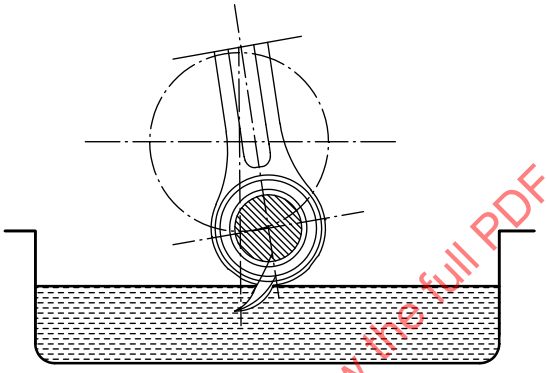


Figure 1 — Dip lubrication

3.2.3
wet sump force-feed lubrication
force-feed lubricating system in which the lubricating oil is collected in the engine sump, which serves as a *lubricating oil tank* (3.3.21)

Note 1 to entry: See Figure 2.

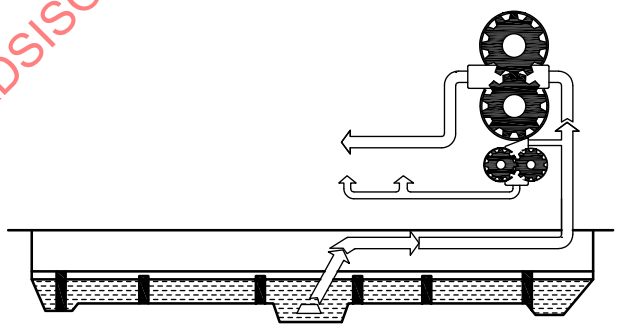


Figure 2 — Wet sump force-feed lubrication

3.2.4
dry sump force-feed lubrication
force-feed lubricating system in which the lubricating oil is collected in a separate *lubricating oil tank* (3.3.21), continuously scavenged from the engine sump and passed back to the lubricating oil tank

Note 1 to entry: See Figure 3.

Note 2 to entry: Figure 3 shows a lubricating system with an oil pan which has an intermediate lubricating oil chamber. Usually, in dry sump systems, lubricating oil is collected into a separate lubricating oil tank.

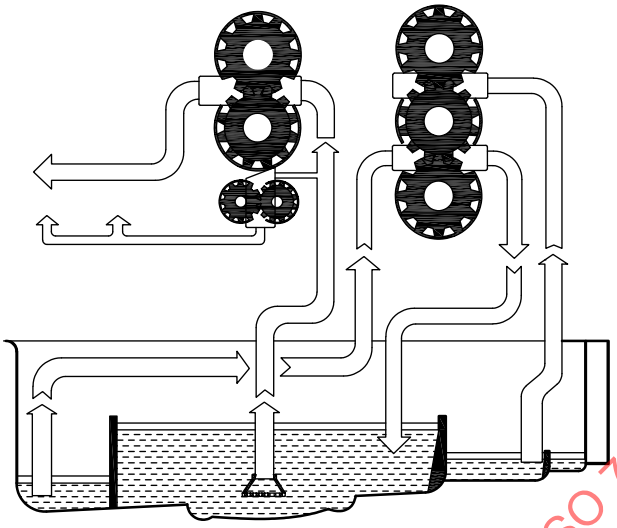


Figure 3 — Dry sump force-feed lubrication

3.2.5
splash lubrication
method of lubricating the engine by relying on lubricating oil thrown by moving parts of the engine

3.2.6
cylinder lubrication
type or combination of lubricating systems for specially supplying the cylinder liners with lubricating oil

3.2.7
supplementary lubrication
method of lubricating engine parts more than is needed in ordinary working conditions to increase the supply of lubricating oil

3.2.8
independent lubrication
method of lubricating the engine parts in which all the lubricating oil is supplied from a source that is independent of the engine

3.3 Terms related to lubricating system components

3.3.1
lubricating oil filter
filter for the cleaning of lubricating oil

[SOURCE: ISO 11841-1:2000, 3.2.4, modified — Notes deleted.]

3.3.2
lubricating oil suction strainer
coarse filter at the entry to the lubricating oil pump suction pipe

Note 1 to entry: See Figure 4.

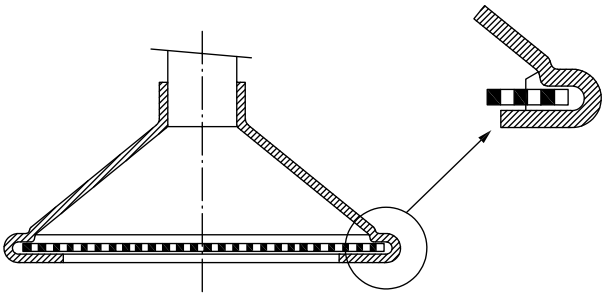


Figure 4 — Lubricating oil suction strainer

3.3.3
single-stage lubricating oil filter
filter in which the lubricating oil passes through only one grade of *filter element* (3.4.3)

Note 1 to entry: See Figure 5.

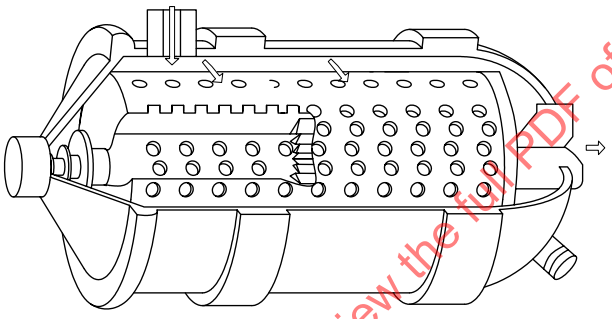


Figure 5 — Single-stage lubricating oil filter

3.3.4
two-stage lubricating oil filter
filter in which the filtration is carried out in two serially connected stages of either the same or different filtration efficiencies

[SOURCE: ISO 11841-1:2000, 3.3.2, modified — Notes deleted.]

3.3.5
rotating centrifugal lubricating oil filter
centrifuge
filter for separation of solid particles or contaminants by centrifugal force due to spinning of the lubricant oil

Note 1 to entry: See Figure 6.

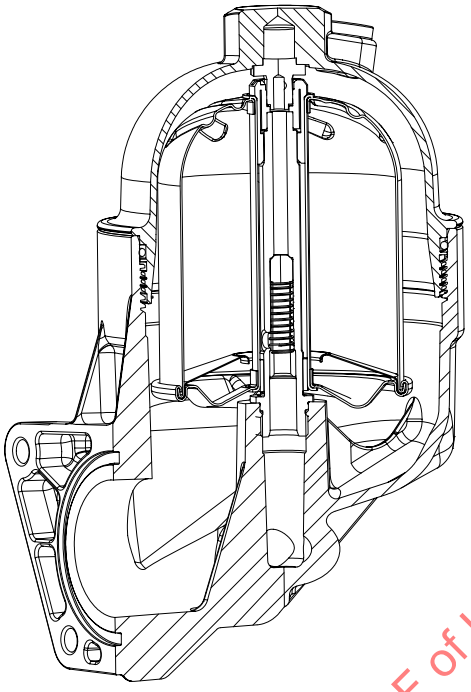


Figure 6 — Rotating centrifugal lubricating oil filter

3.3.6
full-flow lubricating oil filter
filter through which the total volume of fluid delivered to a system flows

Note 1 to entry: See Figure 7.

[SOURCE: ISO 11841-1:2000, 3.4.1, modified — Note 1 to entry added.]

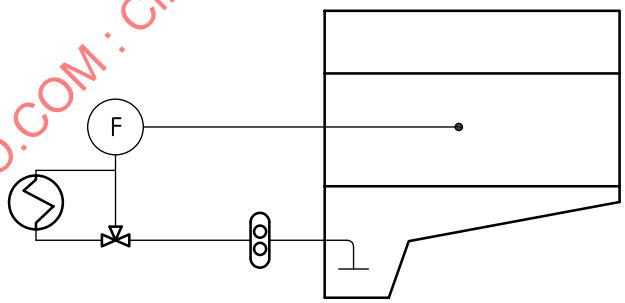


Figure 7 — Full-flow lubricating oil filter

3.3.7
bypass lubricating oil filter
filter through which a partial flow, which is branched off from the total volume, flows

Note 1 to entry: See Figure 8.

[SOURCE: ISO 11841-1:2000, 3.4.2, modified — Notes deleted and Note 1 to entry added.]

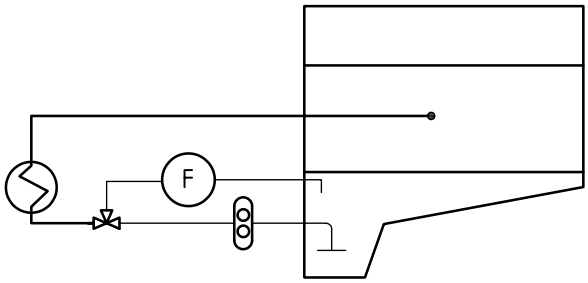


Figure 8 — Bypass lubricating oil filter

3.3.8
spin-on cartridge lubricating oil filter
filter that is screwed onto a filter head or cover, or indirectly on a mounting base on the engine block, and which is replaced as a whole together with its integrated *filter element* (3.4.3) for maintenance

Note 1 to entry: The spin-on cartridge lubricating oil filter may include the filter element bypass component and the *anti-drain valve* (3.3.27).

Note 2 to entry: The spin-on cartridge lubricating oil filter is also referred to as a throwaway type filter. The complete unit, i.e. the spin-on filter with head or cover, is also referred to as a complete or box filter.

Note 3 to entry: See Figure 9.

[SOURCE: ISO 11841-1:2000, 3.7.1, modified — Notes 1 and 3 to entry added.]

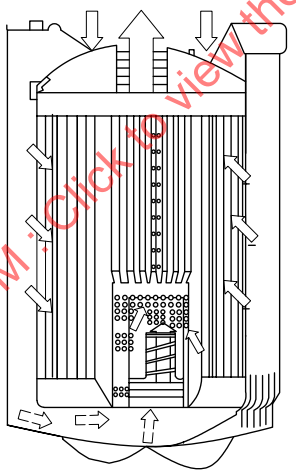


Figure 9 — Spin-on cartridge lubricating oil filter

3.3.9
detachable lubricating oil filter
lubricating oil filter that can be taken off, and in which the element is disposable and replaceable during maintenance

Note 1 to entry: *Filter housing* (3.4.1) and *filter cover* (3.4.2) are reusable.

3.3.10
duplex lubricating oil filter
filter usually with two units, one of which is shut off during maintenance while the other continues to function

Note 1 to entry: Operation is not interrupted when replacing the contaminated filter element or spin-on filter, and the operation is suggested in idle speed condition.

Note 2 to entry: See Figure 10.

[SOURCE: ISO 11841-1:2000, 3.7.3, modified — Note 2 to entry added.]

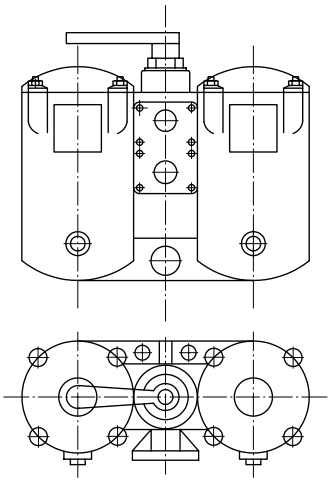
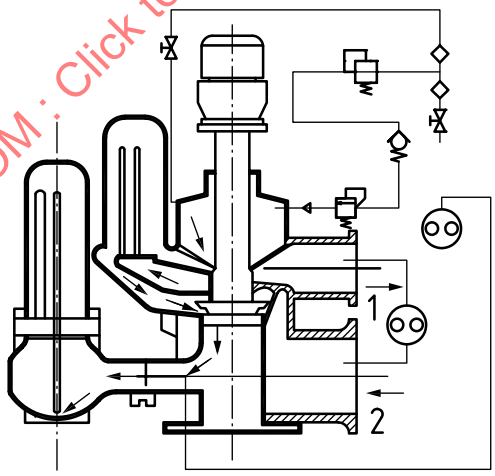


Figure 10 — Duplex lubricating oil filter

3.3.11
back-flushing lubricating oil filter
filter in which inner elements or cartridges can be cleaned continuously [or intermittently by disconnecting the *filter elements* (3.4.3)] using reverse flow (back-flushing)

Note 1 to entry: No interruption of the operation is necessary.

Note 2 to entry: See Figure 11.



Key
1 outlet
2 inlet

Figure 11 — Back-flushing lubricating oil filter

3.3.12
automatic lubricating oil filter
filter in which the cleaning of the *filter elements* (3.4.3) is done automatically and back-flush is an integral part of the filter construction

Note 1 to entry: No interruption of the operation is necessary. The cleaning procedure can be started manually (semi-automatic) or by a contactor (fully automatic).

3.3.13
lubricating oil pump
pump providing the force-feed circulation of the lubricating oil and its delivery to the moving parts of the engine

Note 1 to entry: It can also provide the force to drive some parts, e.g. *rotating centrifugal lubricating oil filter* (3.3.5).

3.3.14
lubricating oil scavenging pump
pump which draws lubricating oil from the engine sump and pumps it into the oil tank on dry sump engines

3.3.15
lubricator
pump which supplies a given quantity of lubricating oil periodically to specific parts of the engine

Note 1 to entry: Lubricator may also refer to the person doing the lubricating job or the oil used for lubricating.

3.3.16
oil pressure relief valve
valve to prevent the lubricating oil pressure in the lubricating system from rising above a predetermined value

3.3.17
oil pressure regulating valve
valve which regulates the lubricating oil pressure in any part of the lubricating system to a predetermined value

Note 1 to entry: See Figure 12 for oil pressure regulating valve.

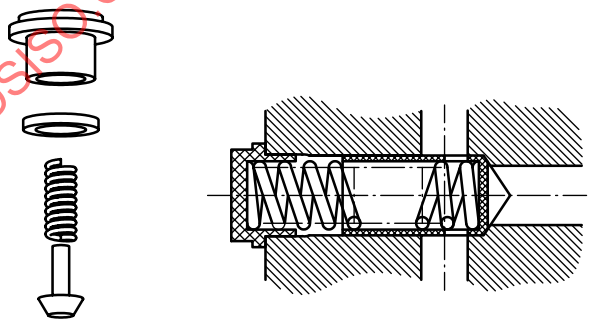


Figure 12 — Oil pressure regulating valve

3.3.18
oil level indicator
component or system which indicates the lubricating oil level

EXAMPLE Sight glass, window nut, remote reading gauge, *dipstick* (3.3.19).

3.3.19
dipstick
stick with graduation marks, located in the oil tank or oil sump, for checking the quantity or level of lubricating oil in the engine

Note 1 to entry: The dipstick is usually used as a kind of *oil level indicator* (3.3.18).

Note 2 to entry: See Figure 13.

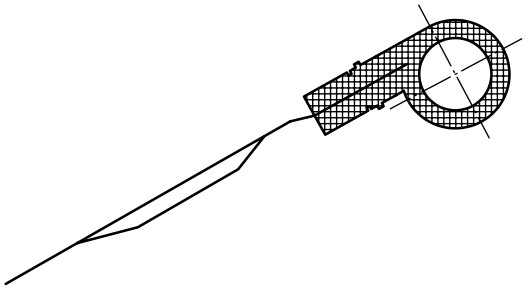


Figure 13 — Dipstick

3.3.20
oil pressure gauge
component used to indicate and measure the lubricating system oil pressure

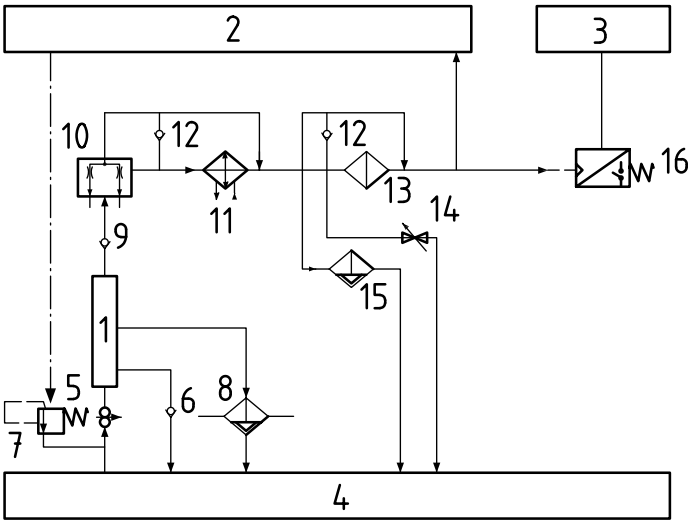
3.3.21
lubricating oil tank
vessel which acts as a reservoir from which the *lubricating oil pump* (3.3.13) draws lubricating oil

Note 1 to entry: The tank may be formed by the engine sump (wet sump system) or may be a separate vessel (dry sump system).

3.3.22
oil gallery
gallery which allows the passage of oil from the sump, via the oil pump, to all parts of the engine that have moving parts in contact or that have components needing cooling that are otherwise hard to reach

3.3.23
dirty oil gallery
gallery located between the oil pump outlet and the oil cooler and filter unit, filled with dirty oil

Note 1 to entry: See Figure 14.



Key

1	dirty oil gallery	2	main oil gallery
3	PCJ oil gallery	4	lubricating oil tank
5	lubricating oil pump	6	safety valve
7	pressure control valve	8	oil separator
9	anti-drain valve	10	oil temperature control valve
11	oil cooler	12	bypass valve
13	oil filter	14	drain valve
15	rotating centrifugal lubricating oil filter	16	piston-cooling jet valve

Figure 14 — Lubricating system

3.3.24
main oil gallery
gallery which transports suitable oil to moving parts or other parts which need driving power, usually located in the engine body

Note 1 to entry: See Figure 14.

3.3.25
PCJ oil gallery
gallery which transports oil to the piston-cooling jet

Note 1 to entry: See Figure 14.

3.3.26
piston-cooling jet valve
valve which regulates the lubricating oil pressure of the *PCJ oil gallery* (3.3.25) to get the precise volume of the piston-cooling jet

Note 1 to entry: It is located between the *main oil gallery* (3.3.24) and the PCJ oil gallery.

3.3.27
anti-drain valve
valve that prevents the filter from emptying when the engine is stopped

Note 1 to entry: See Figure 15.

[SOURCE: ISO 11841-1:2000, 5.1.4, modified — term revised and Note 1 to entry added.]

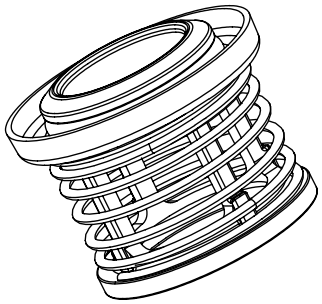


Figure 15 — Anti-drain valve

3.3.28
oil temperature control valve
valve which regulates the oil flow through the oil cooler

Note 1 to entry: The oil flows into the oil filter without cooling at a low temperature and flows through the oil cooler and oil filter in turn at a high temperature.

Note 2 to entry: See Figure 16.

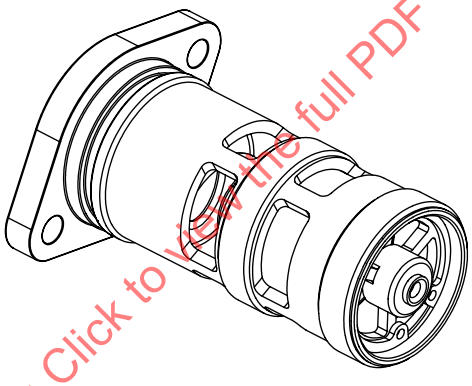


Figure 16 — Oil temperature control valve

3.3.29
variable oil pump
oil pump whose output flow is adjusted in real time according to the actual demand in different working conditions

Note 1 to entry: The variable oil pump usually includes a solenoid valve whose opening can be controlled by full MAP.

3.4 Terms related to lubricating oil filter components

3.4.1
filter housing
part of a filter, the purpose of which is to hold and locate the *filter element* (3.4.3) or *filter insert* (3.4.4) constructed as a ported enclosure that directs the flow of fluid through the filter element

Note 1 to entry: The filter housing is usually made of metal or composite materials.

Note 2 to entry: See Figure 17.

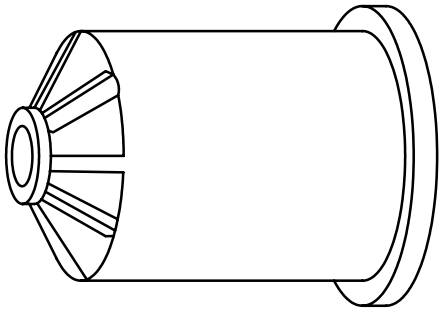


Figure 17 — Filter housing

3.4.2
filter cover
part of a filter, the purpose of which is to close the *filter housing* (3.4.1) and to clamp the *filter element* (3.4.3)

Note 1 to entry: See Figure 18.

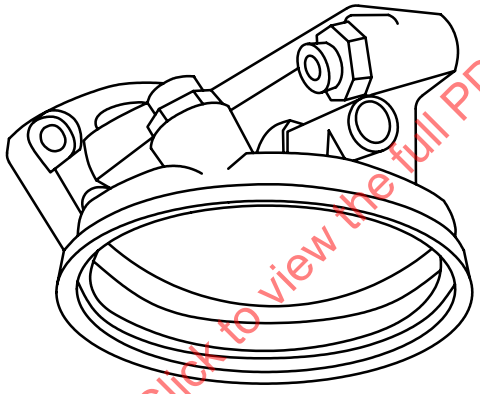


Figure 18 — Filter cover

3.4.3
filter element
part of a filter, the purpose of which is to retain the insoluble contaminant

Note 1 to entry: See Figure 19.

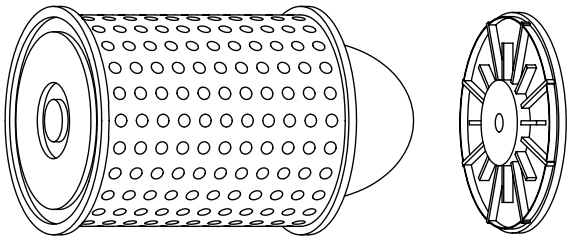


Figure 19 — Filter element

3.4.4
filter insert
combination of a *filter element* (3.4.3) or several elements with supporting parts

Note 1 to entry: See Figure 20.

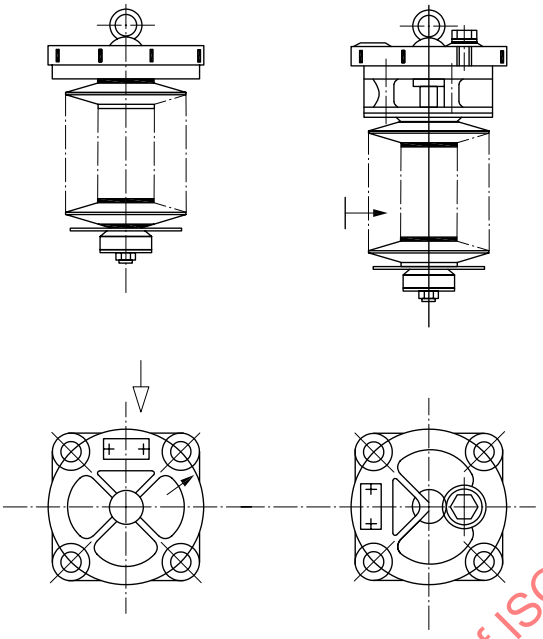


Figure 20 — Filter insert

3.4.5
rotor drum
part of a *rotating centrifugal lubricating oil filter* (3.3.5) where the filtering takes place

Note 1 to entry: The term “rotor” is used in separately driven centrifuges and “drum” in free-jet centrifuges.

Note 2 to entry: See Figure 21.

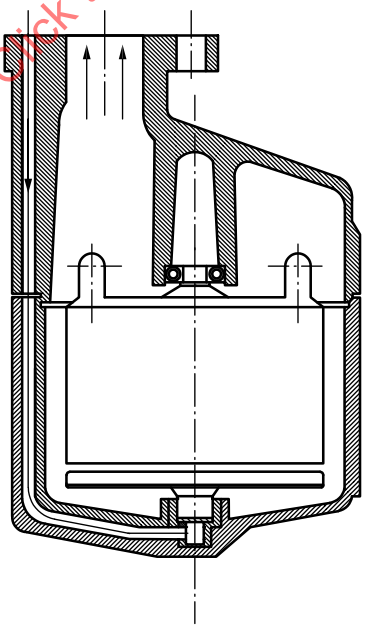


Figure 21 — Rotor drum