

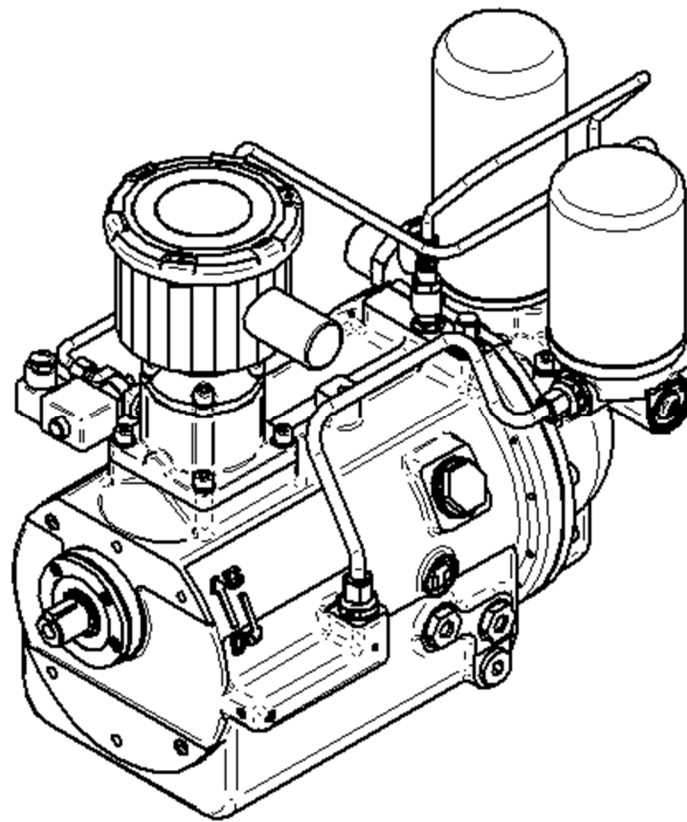


TM.P. S.p.A. - Termomeccanica Pompe

Gruppo Termomeccanica

Supplementary Technical
Manuall – SCI8DT05
Integrated Compressor

SCI 8DT05 INTEGRATED COMPRESSOR



MAINTENANCE MANUAL



FOREWORD

1. DOCUMENTATION OBJECT AND LAYOUT

The documentation of the SCI8DT05 integrated compressor contains information and instructions

aimed at:

- Operative Staff:

- Workshop Staff:

- Technical Staff:

with the object of:

using the system at its best, optimizing its performances during operation;

performing the emergency interventions and ensuring the continuity/quality of the service in case of failure.

keeping the apparatus at the best of its performances operating, controlling and providing its preventive and corrective maintenance, including the monitorings and tests that are to be performed during the scheduled interventions.

The Maintenance Manual is laid out in a single Volume, divided as follows:

Single Volume

Sections 1.-2.-3.-4.-5.-6.

The contained information are laid out in Sections divided into Units/Apparatus in order to allow the easy access thereto by the involved staff.



2. MANUAL CONTENT

The Manual provides the following information:

- a global view of the machine;
- The various functions of the single Units and the related mode of employ;
- The data procedures and information pertaining Functional Description, Periodical and Corrective Maintenance, Failure Search.

NOTE

MAINTENANCE OPERATIONS MUST BE CARRIED OUT BY SKILLED STAFF, CAREFULLY OBSERVING THE SPECIFIED PROCEDURES AND MODALITIES.

The operations are amply illustrated in order to ease the sorting out of the particular or group at issue.

The information provided are processed per unit/component subjected to wear and/or to preventive maintenance operations:

a. Description and Functioning

This subject provides the description and the functioning of the subsystems/components in order to provide the Staff in charge of the maintenance with a full picture of the characteristics and functions of the SCIDT05 integrated compressor that are required to carry out the maintenance operations.

b. Failure identification

This subject enables the skilled technicians to identify the failed unit/apparatus or component by means of the failure search procedures. For each failure, the symptom, the probable cause and the cure are provided.

c. Scheduled maintenance

This subject includes the materials that are to be inspected, as well as the implementation procedures. Moreover, the recommended frequency, method and materials are provided as well.



d. Disassembly /Installation

This subject provides the procedures for disassembly and installation of components, sets, subsets and combinations of parts. The procedures illustrate all the operations in a logical sequence with a step-by-step method of disassembly and installation.

e. Adjustments/Tests

This subject provides all the procedures and the parameters required to assess the running efficiency and the integrity of the system, subsystem, unit, component or parts connected thereto contributing to the running operativeness thereof.

f. Inspections/Monitorings

This subject provides the detailed procedures to assess the efficiency of a part, set, system, component or parts connected thereto contributing to the running operativeness thereof.

If an adjustment/test is required, prior to an inspection, it is provided.

g. Special tools

This subject provides, for what may concern any special tool used in the maintenance and repair activities, the following information:

1. What it is for.
2. Directions.
3. Directions for the adjustments.
4. Directions for the maintenance (e.g., inspections, lubrications, scheduled maintenance, failure search, repair).
5. Directions for the conservation.
6. Replaceable parts.

Every special tool is identified by a code and a description.

h. Cleaning/Painting

This subject illustrates the methods and the processes required for the cleaning and/or the painting of specific parts or areas.

The directions are provided in a logical operation-by-operation sequence.



The required directions and precautions for the Staff safety and to prevent possible damages of the material are also provided. The required material is identified.

3. INSTRUCTIONS FOR THE INTERVENTION

The interventions must be carried out with tools that are specific and suited to the plant at issue.

The replacement of groups or of details must exclusively be carried out using original components.

The numeric values of the technical data are generally expressed by means of the International System (I.S.). However, numeric expression of the traditional Technical System, reported inside brackets when adoptable.

The precautions to adopt are indicated throughout the text in two different ways:

- a) With the word ATTENTION for indications related to the Staff safety to management and maintenance.
- b) With the word NOTE for indications that are useful to prevent damages to the components, that might compromise the plant normal running.

4. GENERAL DIRECTIONS

- a. Obtain as many information as possible. Try to single out the essential information on what has happened, under what conditions, and whether it is a “local” or a “plant” problem (the latter influences more than one system).
- b. The first operation to make in order to try and solve the system failure is to make it reoccur and LEAVE IT IN THE FAILURE STATE. If it is possible (unless it is extremely obvious) try to make the problem reoccur before attempting a failure search. This action modality allows to:
 1. Assess the problem nature and record the information in the failure report.
 2. Start out with something concrete to avoid random attempts to correct the failure condition.
- c. Once the problem causing the failure condition has reoccurred, it is important to leave it in the failure state. Avoid temptations to use apparatuses in failure until the full efficiency has not been recovered, as the problem might have disappeared for the time being, only to reappear later on.



- d. After the problem has been made to reoccur (“captured” in its failure state), it is usually necessary to “ISOLATE” the same. If the problem consists of a physical or partial breakdown, the problem will be easy to isolate. However, the actual causes of the majority of problems are less obvious. Every time a part or a component of the system are removed and replaced or repaired for any reason whatsoever, it becomes necessary to perform an operative running test of the system in order to make sure that the part or the component are working correctly in the system. The performance of a running test is required before restarting the compressor.
- e. The job is easier when, once that the problem has been made to reoccur, the specific system is isolated while left in the failure condition. Now the system is in the failure state and the information/manuals/drawings indicating the system operation should be referred to before altering it.
The first operation is that of studying them to understand the system working modalities. It should be kept in mind that, since the system is in failure, the same will not work as it should. Proceed with caution, leave the system in failure and use the failure isolation techniques until the problem has been localized.
No procedure can be of help in performing this first operation. Whether to isolate the system or not by a circuit breaker, valves or by one switch at the time, this depends from the extent and from the nature of the system, as well as from individual preferences. Nevertheless, the only efficient method is that of a controlled isolation instead of random attempts at looking for “this” or “that”.
- f. Once the failed piece has been singled out, replace it with a new one and check how it runs. Then install again the failed piece and check if the failure reoccurs. In such a case, finally replace the failed piece, check the system once more, verifying carefully that all the parts that were examined in order to isolate the failure have been replaced correctly in their normal working position. Sometimes, a failure can seem to be solved just by touching a certain component. One should make sure that a certain component was indeed failed by installing it again in the system, checking whether the same system reaches once more a failure state.
- g. Once the job has been carried out, note down any thing deemed to be useful to solve the failure. This simple habit may save hours of work in the future when a failure similar to the one solved reoccurs.



5. RELATED DOCUMENTATION

All the Units/Apparatuses component of the SCIDT05 integrated compressor, as well as the single parts constituting them are individuated in the Illustrated Catalog of Spare Parts.

6. PRECAUTIONARY MEASURES

A list of general precautionary measures is highlighted herebelow. Other specific precautionary measures related to specific maintenance operations are reported in the text where the specific operation is described.

The sentences reported herebelow apply in all or in part every time the words **WARNING!** and **NOTE** appear in any of the procedures reported in the present manual. Failure to observe this measures may cause serious harm to the staff carrying out the job or to people nearby.

NOTE

The use of an air jet, that must anyhow be lower than 8 bar, to dry the parts after a solvent cleaning thereof, causes the dispersion in air of dirty specks or of solvent droplets; this can cause skin or eye irritations.

Do not point an air jet in use towards another person. Improper air jet use can cause injuries.

The use of goggles is mandatory when operating an air jet.

The use of solvents, of chemical agents and of lubricants can entail consequences on health or safety. The makers of such products should be contacted to obtain data regarding their recommended precautionary measures, which should be observed.

It must be ensured beforehand that the compressor is not run during any test on an apparatus or component while it is on the system (during system tests, etc.) since this could cause harm to the staff or damages to the part itself. Disassemble it carefully, making sure that no component may cause injury.

A hoist of suitable capacity must be available at all times during the removal, installation and maintenance procedures.



WARNING!

The prevention of electrical shocks in the carrying out of electrical tests requires that electrical components, contacts and containers be not hand-held and that the body be not in contact with the workbench. Failure to observe these measures can cause serious injuries or death.

All air and/or current feeds of such device and/or of a component thereof must be choked before removing from the housing such device and/or a component thereof.



7. UPDATES

The content of this manual can be updated with new information, drawings, modifications and configuration changes of the system in which the apparatus works.

TERMOMECCANICA COMPRESSORI can include such modifications and/or add the needed information on the basis of possible discrepancies that crop up and are confirmed during the maintenance activities, or consequent to configuration changes performed on the machine.

The updates of this manual must be requested by the client compiling the DISCREPANCY TECHNICAL REPORT and forwarding it to TERMOMECCANICA COMPRESSORI to the address specified herebelow. The forwarding of this report suffices to ensure the manual updating.

TM.P. TERMOMECCANICA POMPE S.p.A.
Via del Molo, 3
19126 LA SPEZIA
ITALY
Phone: 0187552286
Fax: 0187552247
E-mail: tmc.aftersale@termomeccanica.com

8. PURCHASE OF COPIES, REVISIONS AND VARIATIONS

Copies of this manual and the related updates/revisions can be obtained ordering them at the above reported address.



9. DISCREPANCIES EVIDENCED IN THE TECHNICAL PUBLICATIONS

(TECHNICAL REPORT OF DISCREPANCY)

DID YOU FIND DISCREPANCIES IN A TERMOMECCANICA COMPRESSORI TECHNICAL MANUAL? FILL OUT THE MANUAL IDENTIFICATION, DESCRIBE THE DISCREPANCY IN DETAIL AND FORWARD THIS MODULE TO TERMOMECCANICA COMPRESSORI.

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ADDITION AND VARIATION RECORD

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1. INTRODUCTION

1.1. Particulars

The SCIDT05 Integrated Compressor consists of a cast iron casing inside which a pair of rotors turns.

On this casing all the components required for its running and for some of the compressor adjustments are machined.

Moreover, inside of the casing all the oil ways required for the intake return of the oil reclaimed inside the oil separator, the air ways required for the exhausting and the air discharge thereof and the entire lubrication loop, excluding the cooling system are machined.

The SCIDT05 integrated compressor has been designed to be used in various applications, coupled with electrical motors as well as with internal-combustion engines.

The compressor designed by TERMOMECCANICA COMPRESSORI is further constituted by the following significant parts:

- Intake air filter
- Solenoid valve for idling/loading
- Safety valve
- Oil filter
- Oil scavenge gauge
- Minimum pressure valve
- Thermostatic valve
- Tank oil level sight glasses
- Intake valve
- Oil separator cartridge

The parts are illustrated in figure 1-1.

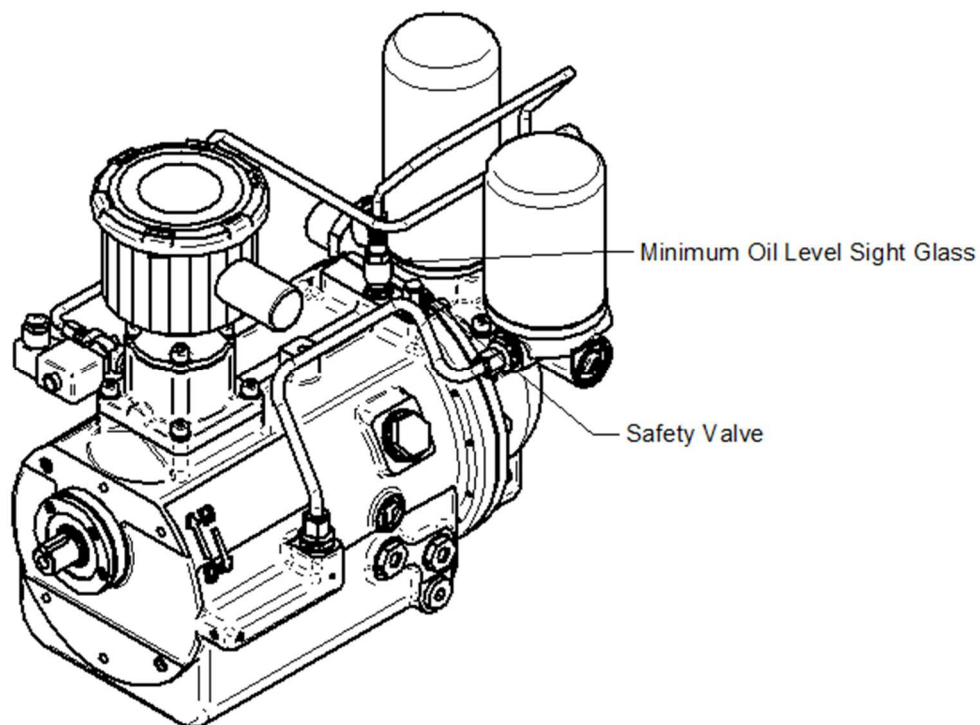
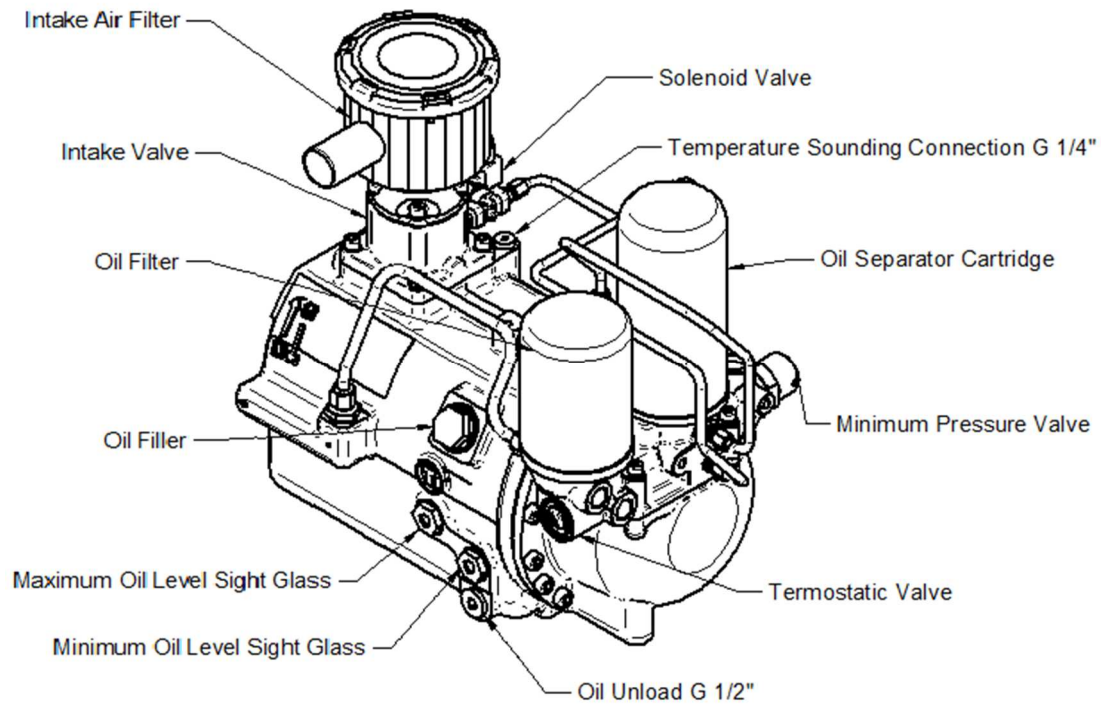


Fig. 1-1 SCI8DT05 Compressor – identification parts



2. FUNCTIONAL DESCRIPTION

2.1. Introduction

In this Section a functional description of the SCI8DT05 Integrated Compressor is provided.

The description is divided into sections and is complete with figures identifying all the main components that concur to the functioning of the apparatus/unit.

The main technical data of the SCI8DT05 Integrated Compressor are:

Machine type:	positive displacement compressor, with two screws and oil injection
Operation:	direct by coupling or belt
Driving Rotor Size:	outside diameter: 74mm L/D : 1.65
Rate of air flow:	min. 0.7 m ³ / min. max. 1.8 m ³ / min.
Male rotor speed:	min. 3250 rpm min. max. 7500 rpm.
Required Power:	min. 5 KW/ max. 16 KW
Delivery pressure:	min. 7 bar a./ max. 14 bar a.
Rate of oil flow:	min. 21 lt/min. max. 32 lt/min.
Weight:	52 Kg
Size mm:	L = 535; W = 311; H = 456
Moment of inertia:	0.03377 Kg m ²
Noise:	< 78 dBa



2.2. Oil separator cartridge

The oil coalescence separator cartridge (figure 2-1) completes the operation of separating the oil from the compressed air which started inside the casing by means of a flapping labyrinth and a successive speed change.

The filter is of the spin-on cartridge kind, easy to replace, ensuring a percentage of oil in air lower than 5 ppm. (at a 80°C temperature)

A good functioning of the oil separator depends on the operative temperature of the compressor, on the quality of the oil and on the general maintenance of the machine.

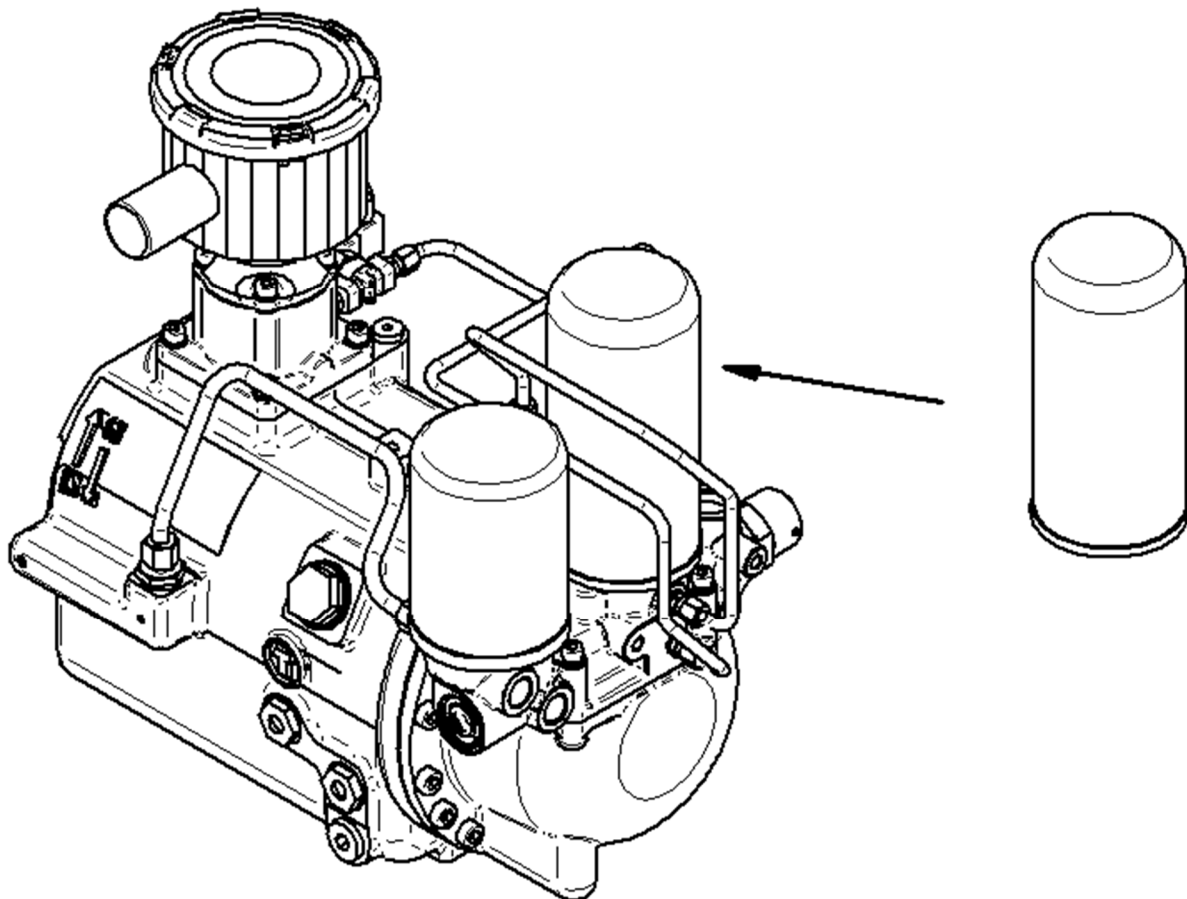


Fig. 2-1 Oil separator cartridge



2.3. Intake air filter

The intake air filter (figure 2-2) consists of a container in plastic specifically designed to reduce the noise generated by the air intake and by the paper cartridge having a filtration grading of 0.010 mm.

The function performed by the intake air filter is crucial, as it prevents the contact between the impurities of the environment in which the compressor is set with the parts in motion, hence preventing the lubricating oil pollution.

A bad maintenance of the intake air filter entails a reduction of the working life of the bearings, as the polluted oil does not perform its lubricating function correctly anymore, and an overall decay in the performances of the compressor.

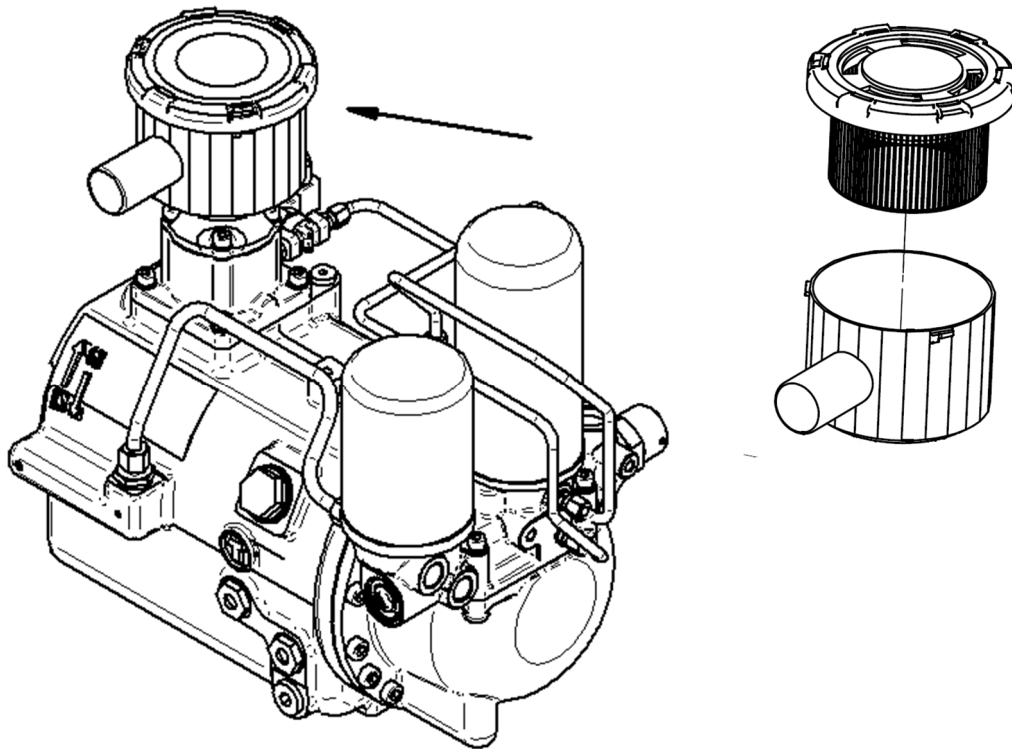


Fig. 2-2 Intake air filter



2.4. Intake valve

The intake valve (figure 2-3), performs the double function of:

- keeping the compressed air and the oil present in the group of rotors from being discharged in the environment at the moment of the compressor stopping under any discharge pressure condition;
- closing the intake during idle running in order to reduce the power consumption of the compressor.

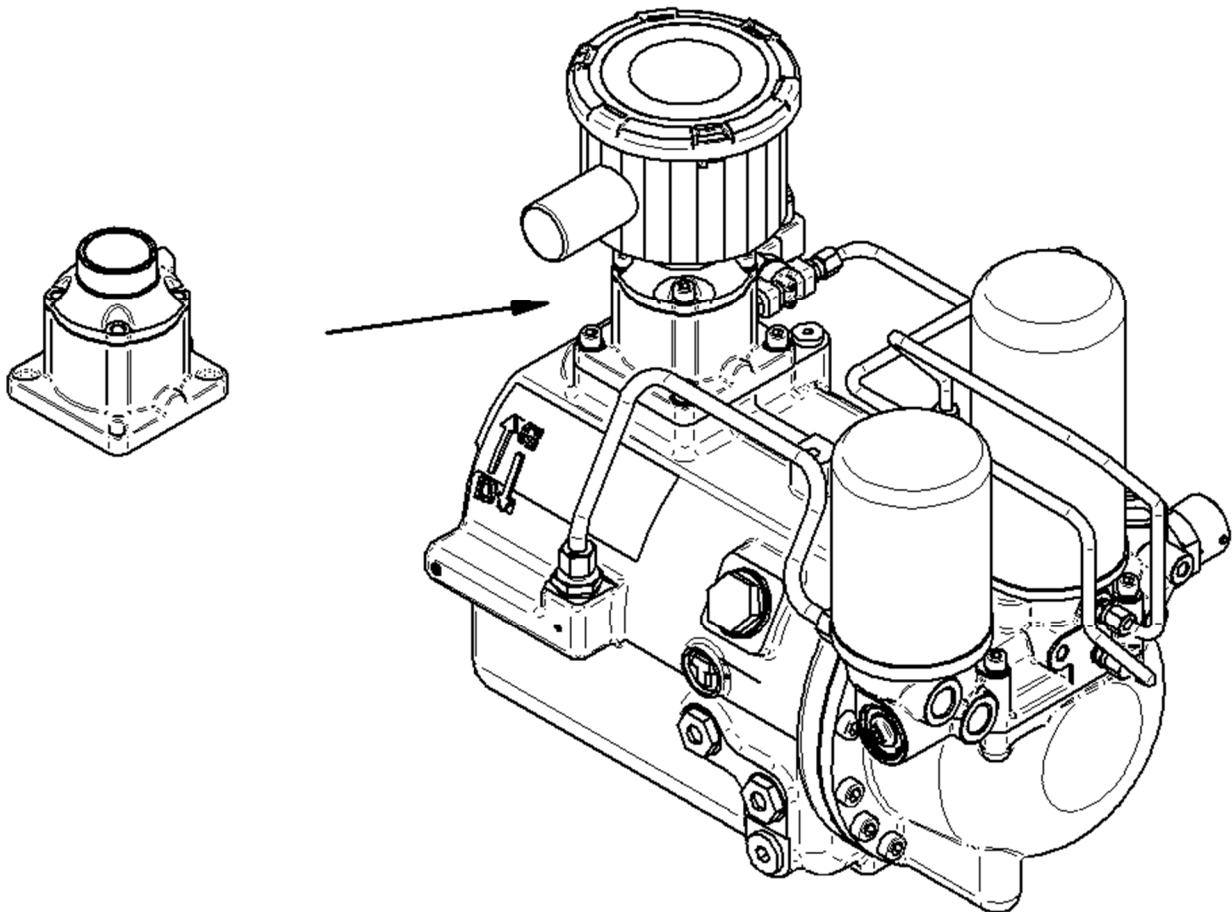


Fig. 2-3 Intake valve



2.5. Oil filter

The oil filter (figure 2-4), placed at the beginning of the lubrication line, retains the solid particles present inside the lubrication circuit that might damage rotors and bearings. The filter, made of a wire net having a filtration grading of 0.025 mm, can be easily inspected. Its replacement is closely related to the intake filter maintenance and to the oil quality.

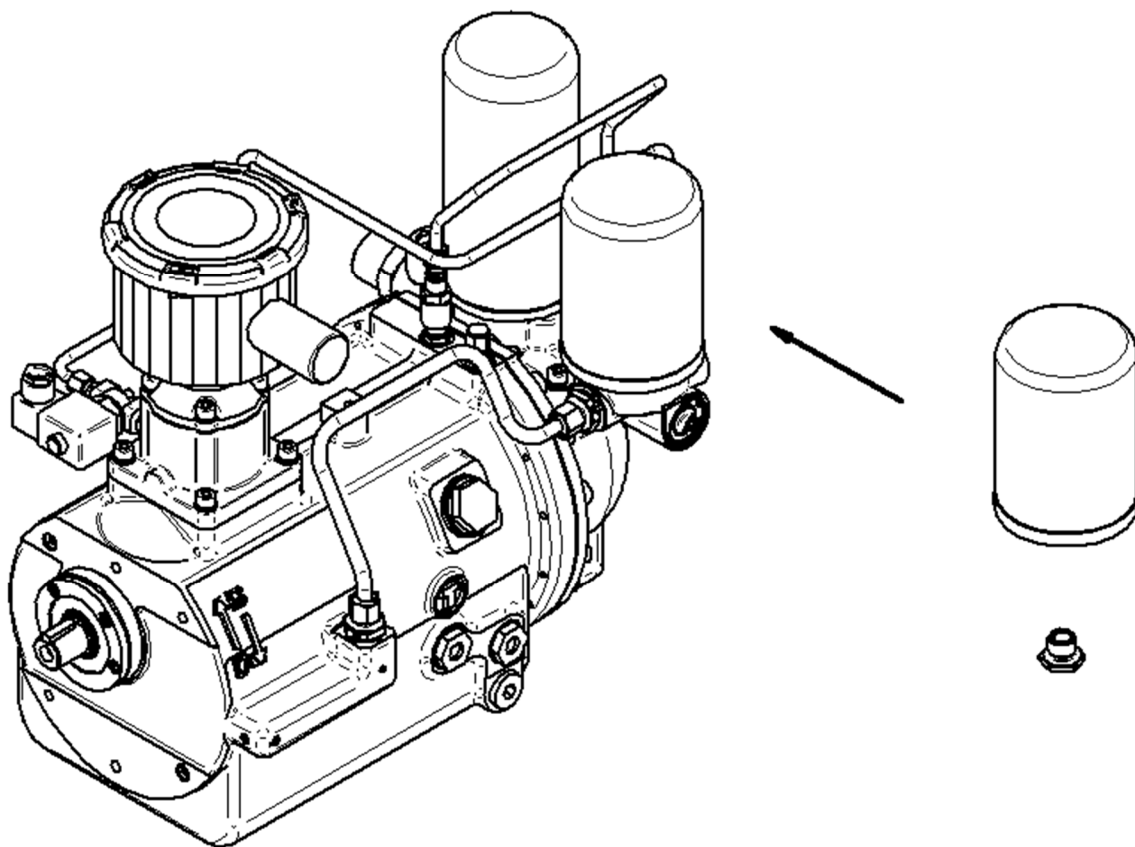


Fig. 2-4 Oil filter cartridge and oil filter connection



2.6. Oil level

The minimum oil level can be checked by means of the oil level sight glass provided for the purpose (figure 2-5).

The oil level must not sink below the lower half of the sight glass when the compressor is not running.

The maximum oil level can be checked by means of the oil level sight glass provided for the purpose. The oil level must not exceed the middle of the sight glass.

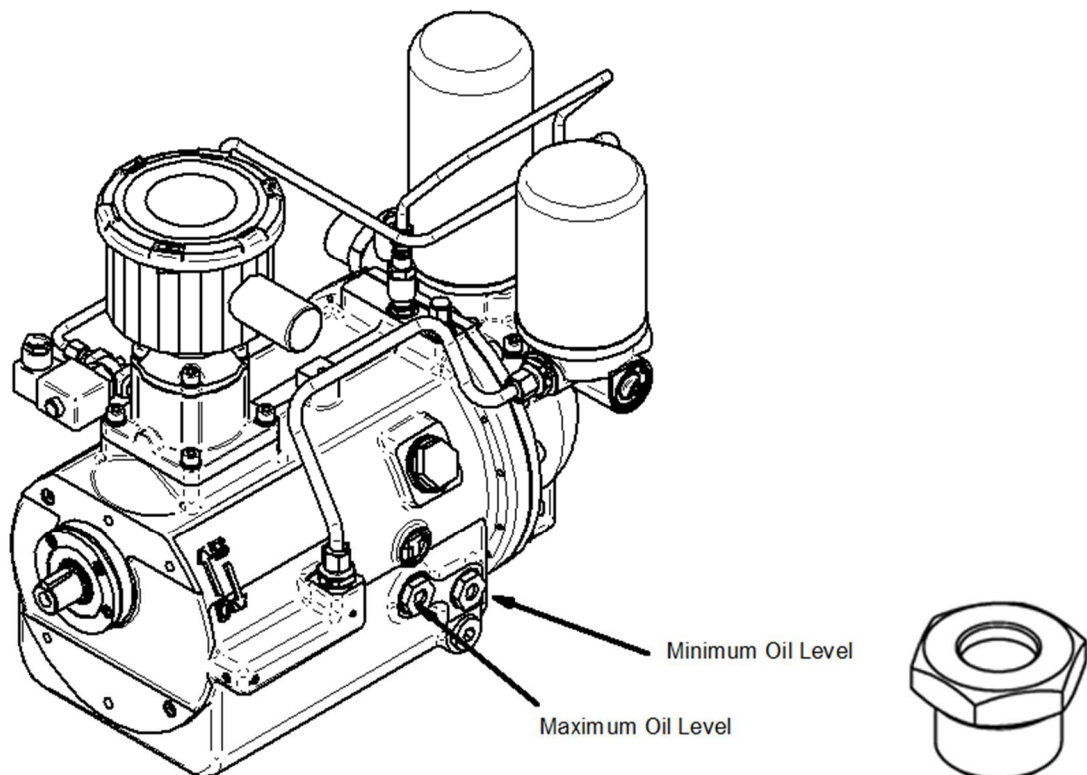


Fig. 2-5 Oil level sight glasses



2.7. Oil filling

The oil filler (figure 2-6), is placed directly on the compressor casing and is marked by a filler cap.

The accessing to the filler cap must be carried out only in absence of internal pressure.

The maximum level of the oil can be checked by means of the oil level sight glass.

The maximum oil level must not exceed the middle of the sight glass.

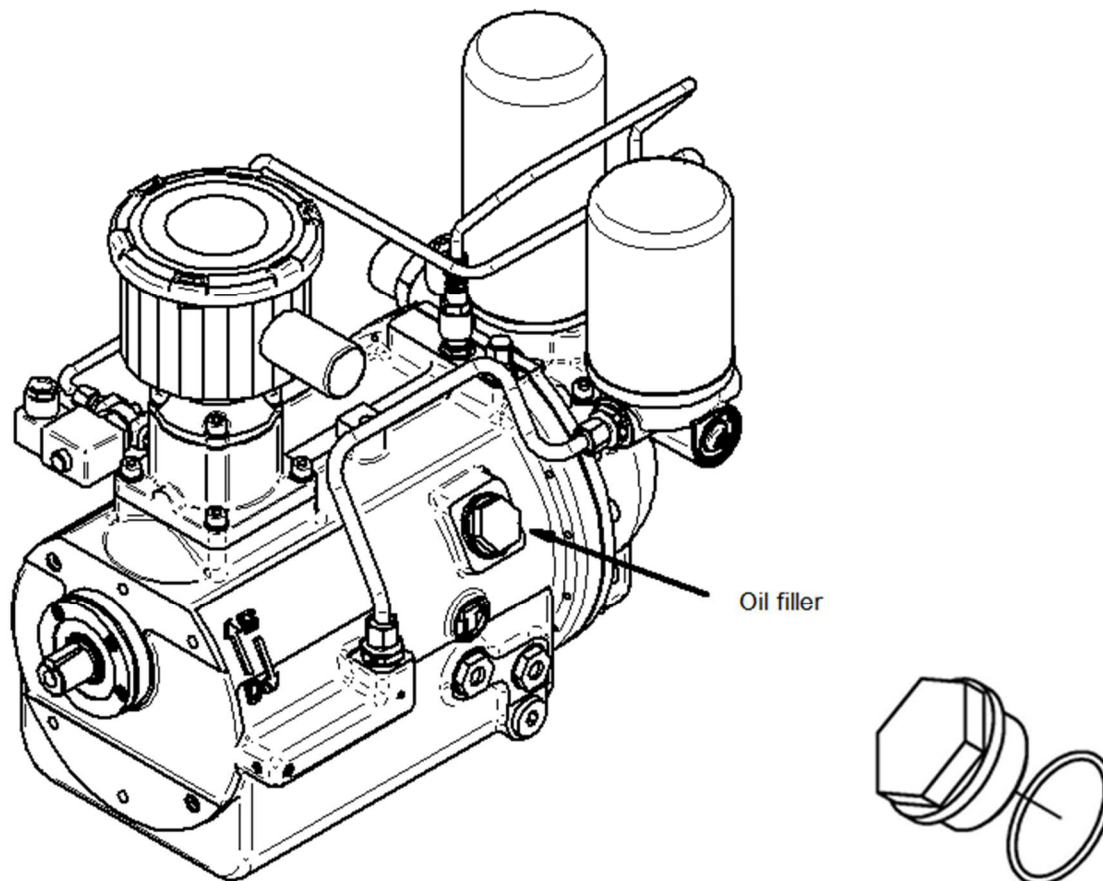


Fig. 2-6 Oil filler



2.8. Safety valve

The pneumatic safety valve (figure 2-7), protects the compressor casing from possible overpressures caused by the oil separator cartridge clogging, the minimum pressure valve blocking, and by any failure of the external adjusting systems (pressure switch control). The safety valve is set to open at 15 barg pressure.

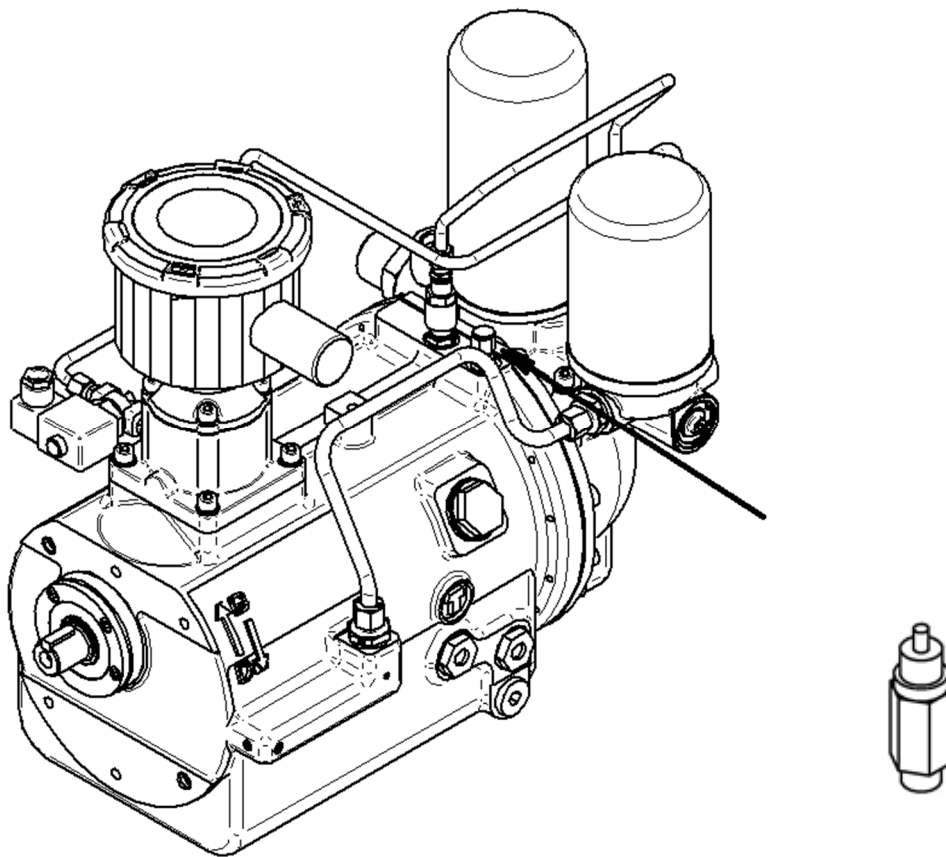


Fig. 2-7 Safety valve



2.9. Solenoid valve

The solenoid valve (figure 2-8), normally open, is controlled with a pressure switch (not included in the compressor) that keeps it closed during the loaded running phase.

Once the required pressure has been reached, the solenoid valve opens, discharging all the air intaken by the compressor inside the intake filter.

The solenoid valve automatically empties the compressor casing each time it is stopped, in order to ensure the restarting thereof in absence of pressure.

In the standard configuration, the solenoid valve requires a 24V feeding, (a.c. 50/60 Hz).

On request, it is possible to purchase a solenoid valve fed with different voltages and frequencies.

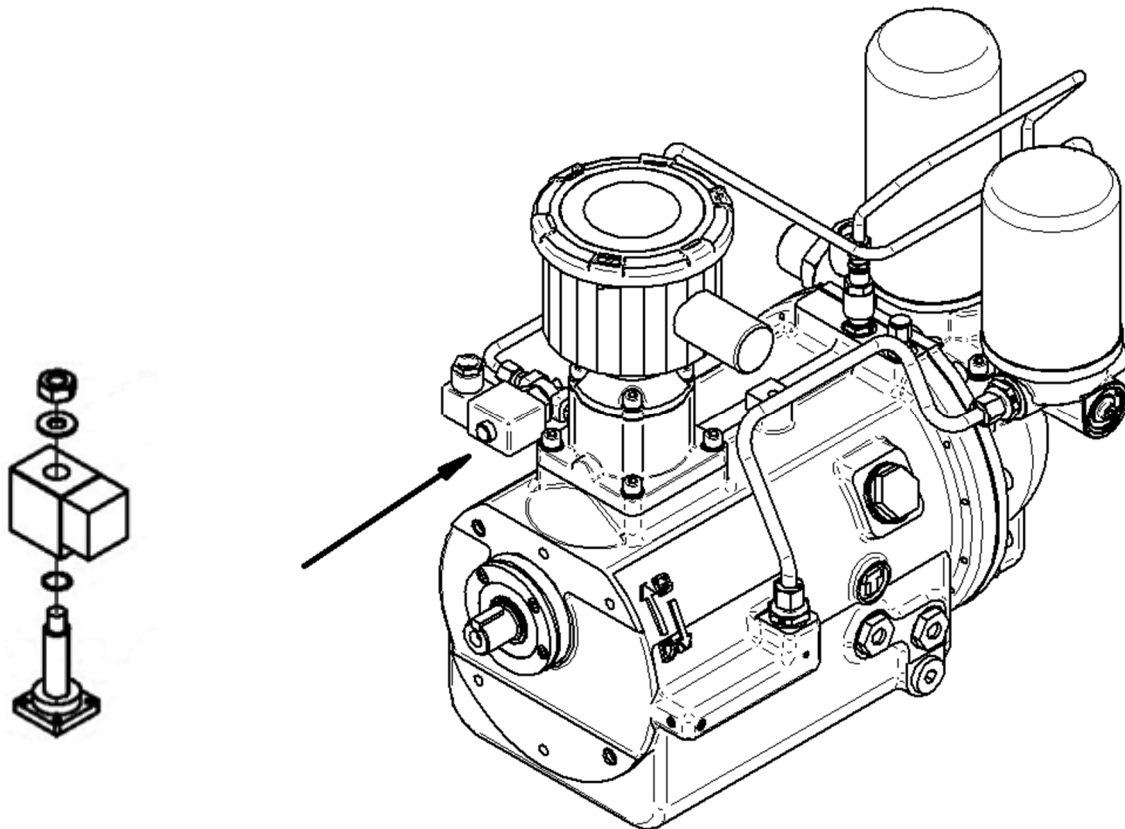


Fig. 2-8 Solenoid valve pilot



2.10. Oil scavenge gauge

By means of the oil scavenge sight glass (figure 2-9), it is possible to assess the amount of oil recovered from the oil separator cartridge through the scavenge pipe and nozzle.

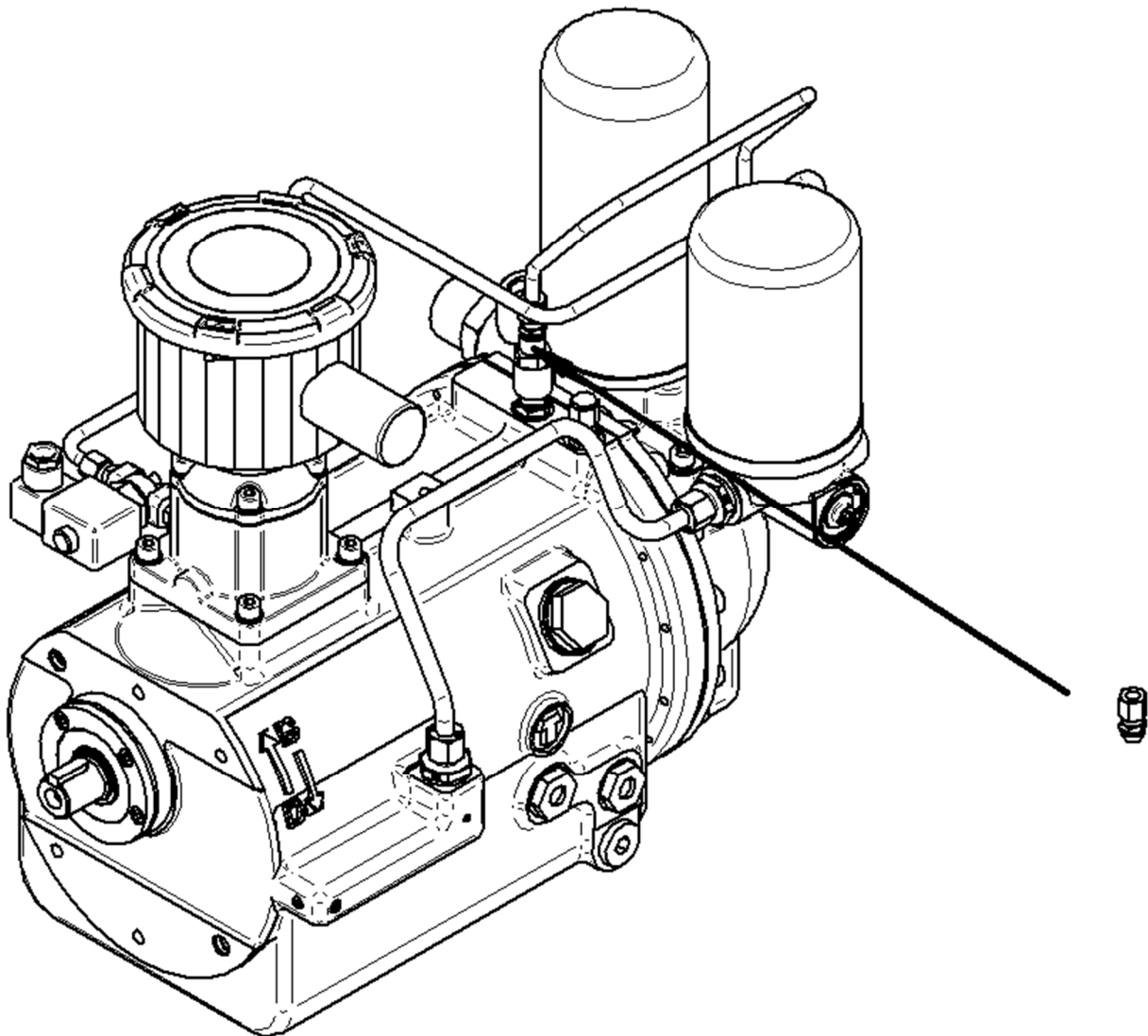


Fig. 2-9 Oil scavenge gauge



2.11. Nozzle for the scavenge of oil from separator

The oil retained by the oil separator cartridge collects on the bottom thereof, and it is necessary to re-circulate it by injecting it in a portion of the compressor having a pressure that is lower than the one present in the oil separator cartridge.

This operation is carried out with a scavenge pipe to which a nozzle is fastened (figure 2-10), with a 0.6 mm calibrated hole regulating the capacity of the air and oil that are recycled in the circuit.

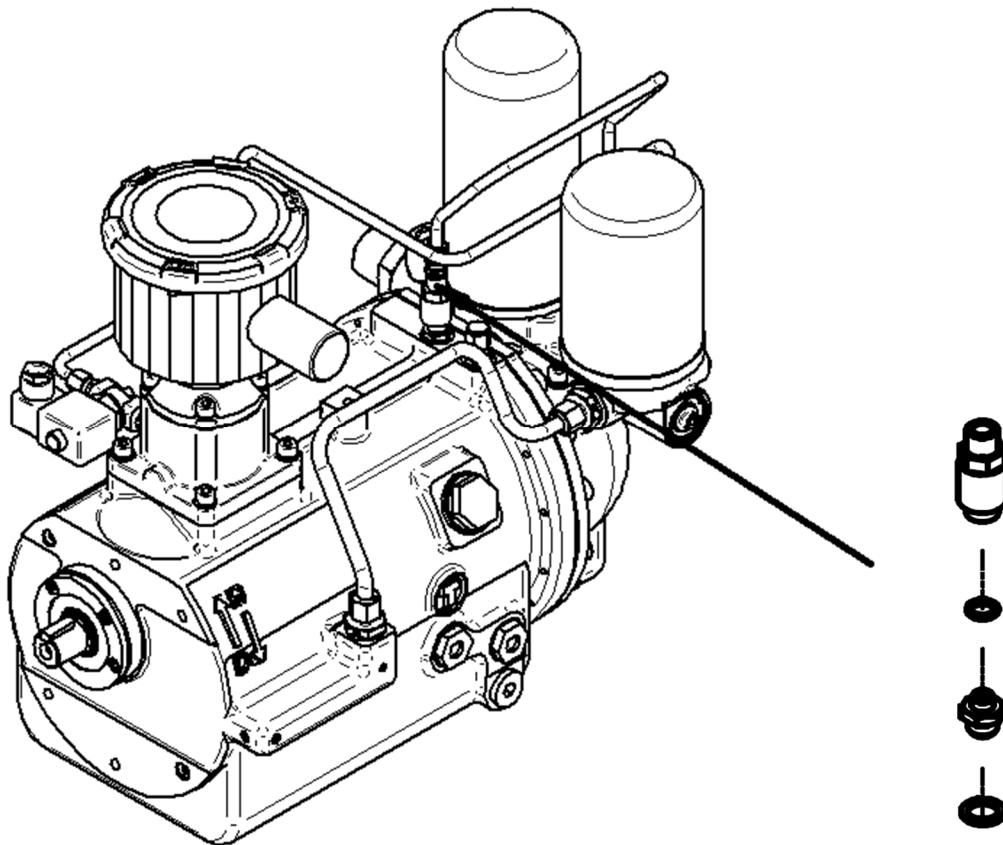


Fig. 2-10 Nozzle for the scavenge of oil from the separator



2.12. Thermostatic valve

The thermostatic valve (figure 2-11), consists of a thermosensitive element, changing its length as a function of temperature changes, and of a sliding piston.

The sliding piston, operated by the thermosensitive element expansion, gradually starts to close the internal oil way as 71 °C temperature is reached and, at the same time, it starts to open the oil way to the air cooler. When 85°C temperature is reached, all the oil flows to the oil cooler.

The function of the thermostatic valve is that of keeping the oil injection temperature to a minimum value of 71 °C in order to avoid a condensing of the intaken air moisture inside the oil itself, which would alter the lubricating characteristics thereof.

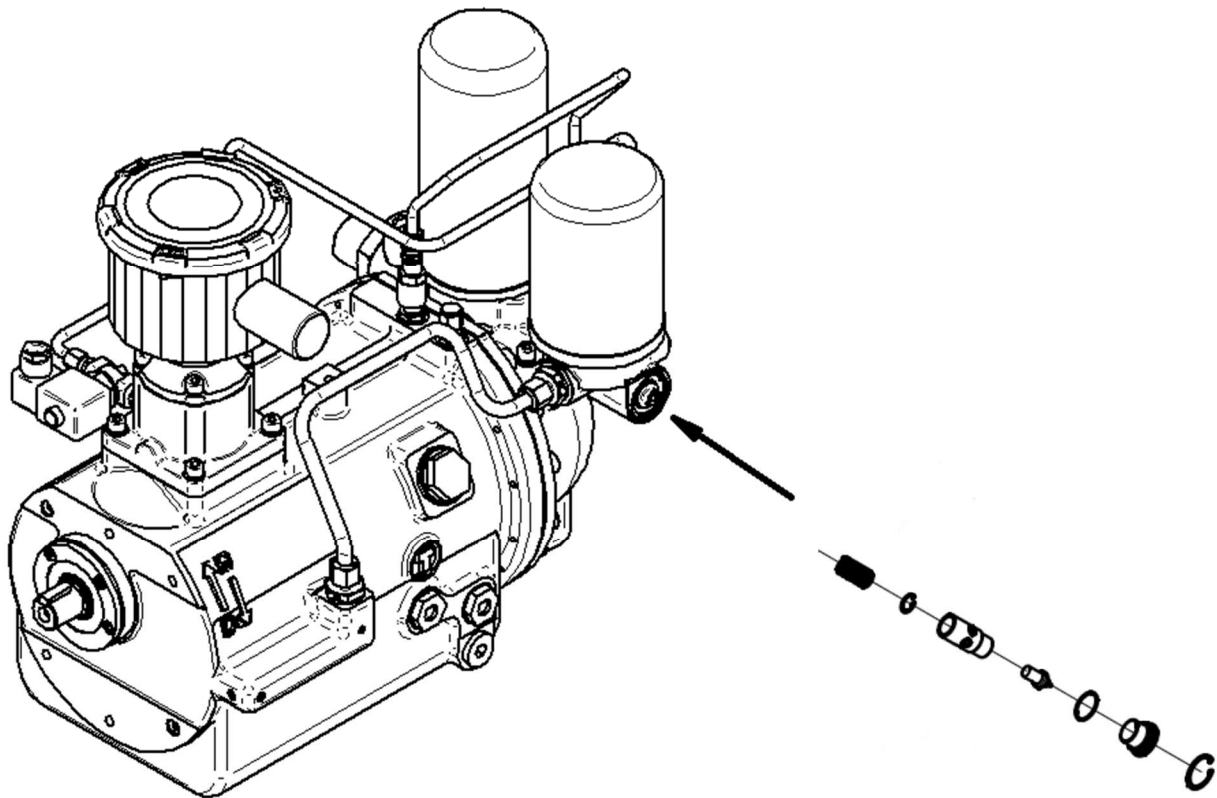


Fig. 2-11 Thermostatic valve



2.13. Minimum pressure valve

The task of the minimum pressure valve (figure 2-12), placed on the compressor discharge side is that of maintaining a minimum pressure value inside the casing until the air network pressure equals the internal pressure of the compressor.

At the same time, it performs a non return valve function, isolating the group from the air network when the compressor is stopped.

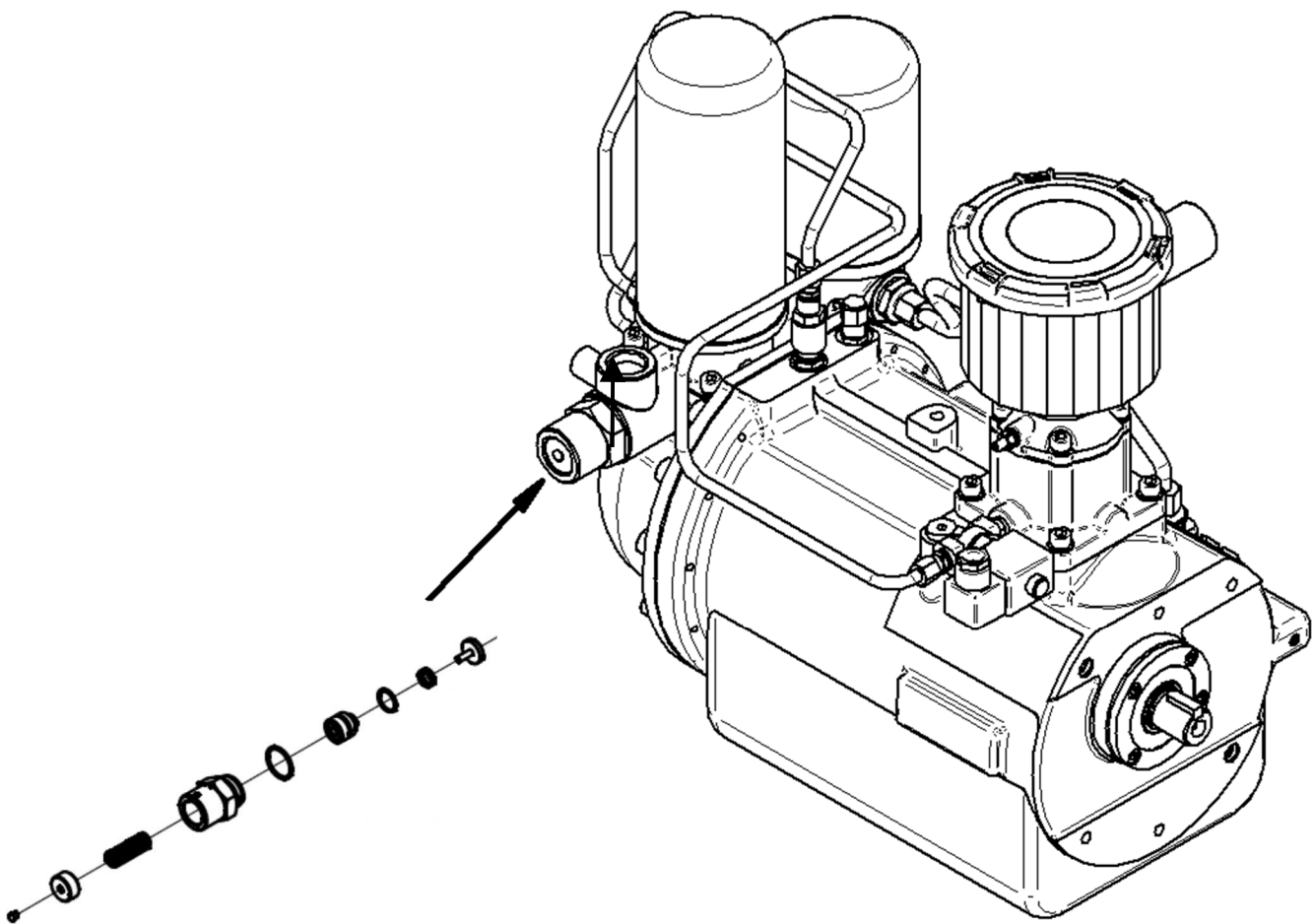


Fig. 2-12 Minimum pressure valve



2.14. Oil emptying plug

The oil emptying plug (figure 2-13), placed directly on the compressor casing, eases the oil change operations at the required maintenance intervals.

By means of the oil emptying plug, and therefore of its removal, the periodical operations of checking the presence of condensate in the oil can be carried out

All OPERATIONS and MANEUVERS must be CARRIED OUT IN ABSENCE OF INTERNAL PRESSURE.

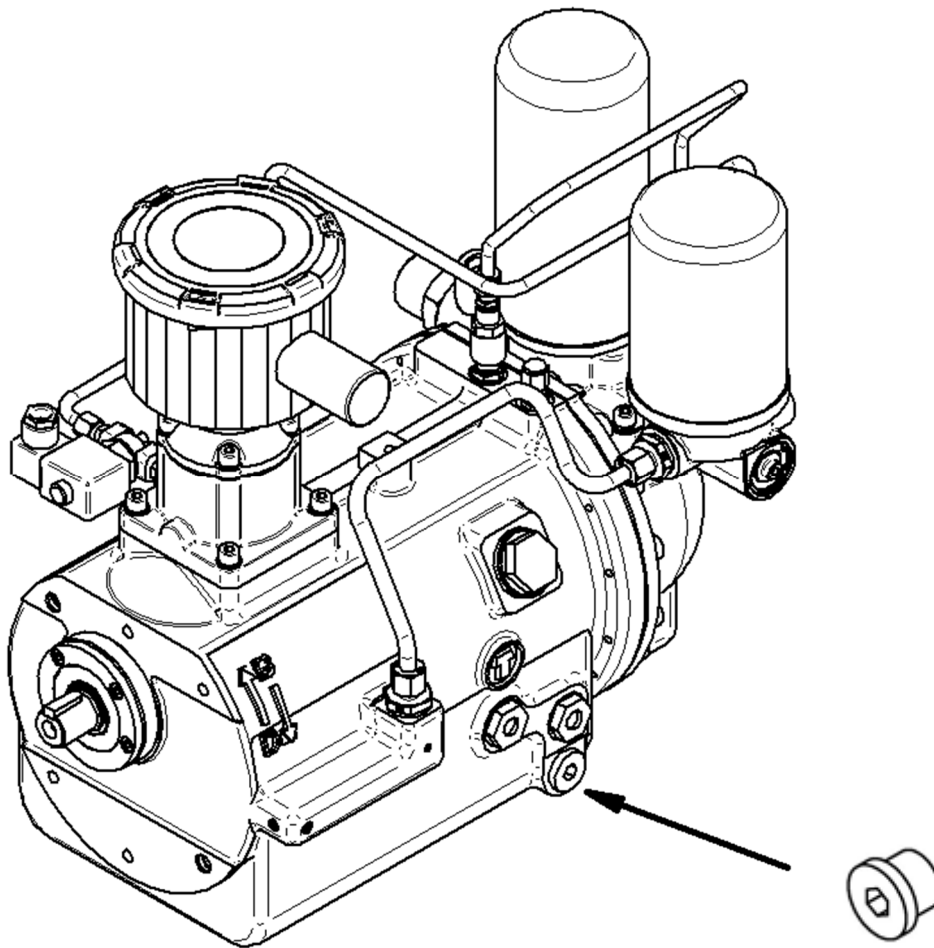


Fig. 2-13 Oil emptying plug



3. PREVENTIVE MAINTENANCE

3.1. Introduction

The purpose of this section is that of providing the maintenance staff with the procedures and data that are required for a correct and swift performance of the maintenance operations for the SCI8DT05 Integrated Compressor.

The scheduled maintenance operations for the SCI8DT05 Integrated Compressor correspond to the carrying out of the following tests:

- a. Maintenance procedures.
- b. Performance checks.

The scheduled maintenance procedures are reported as cards, and all the information pertaining to each card are summarized in the maintenance procedures index

The section is divided as follows:

- a. Maintenance Card Index.
- b. Maintenance Procedures.
- c. Performance check.

Explanations regarding the use of the maintenance procedure index and of the maintenance cards are provided here below.



3.1.1. Use of the maintenance procedure index

The maintenance procedure index reported in table 3-1 provides the index and the cross references of all the maintenance procedures, listed according to their periodicity. This index is the basic document on which the maintenance program is realized and the tasks are assigned to the staff in charge.

The information provided by the maintenance procedure index are:

- a. The configuration of the apparatus to which the document relates;
- b. The list of the reference publications where further information on the maintenance of the apparatus at issue can be found;
- c. A list of all the maintenance operations according to their periodicity, in a decreasing order;
- d. The maintenance periodicity code;
- e. The level of the staff in charge of the maintenance;
- f. The man hours needed to carry out the procedure.

3.1.2. Use of the scheduled maintenance cards

The scheduled maintenance cards reported in tables 3-2 - 3-6 provide all the technical information required to perform the maintenance procedure of interest. Every scheduled maintenance card is divided into the following blocks:

- a. **SYSTEM.** The system to which the subsystem object of the maintenance belongs is indicated.
- b. **SUBSYSTEM.** The Subsystem object of the maintenance is indicated.
- c. **UNIT.** The Unit object of the maintenance is indicated.
- d. **PERIODICITY CODE.** The abbreviations of the adopted periodicities are the following:
 - 1/1 = corresponding to about 100 hrs of running.
 - 30/1 = corresponding to about 3.000 hrs of running
 - 200/1 = corresponding to about 20.000 hrs of running and to about 7 years.



- e. **STAFF LEVEL.** The competence level or the professional aptitude of the Staff in charge of maintenance, is indicated with the following abbreviations:

B = Basic
I = Intermediate
- f. **MANHOURS.** The time expressed in man hours (hours and tenths of hours) needed to carry out the maintenance is indicated.
- g. **TOTAL MANHOURS.** The total time needed to perform the maintenance is indicated.
- h. **ENGAGEMENT OF APPARATUS.** The time, expressed in hours and tenths of hours, during which the apparatus is engaged for the maintenance is indicated.
- i. **DESCRIPTION.** The title assigned to the maintenance is indicated.
- l. **SAFETY PRECAUTIONS.** Precautions for the safety of the staff in charge of the apparatus maintenance are indicated.
- m. **TOOLS AND EXPENDABLE MATERIALS.** All the tools, materials and measures needed to perform the maintenance procedure are listed.
- n. **PROCEDURE.** The procedure for the maintenance execution is described, and the precautions needed to prevent harm to the staff or material damages are recalled case wise.



Table 3-1 Scheduled maintenance index– SCI8DT05 Integrated Compressor

SYSTEM, SUBSYSTEM OR UNIT	REFERENCE MANUALS	DATE		
SCI8DT05 Integrated Compressor	Maintenance manual SCI8DT05 Integrated Compressor			
The present card applies to the following configuration: SCI8DT05 Integrated Compressor				
DESCRIPTION OF OPERATION	PERIOD. CODE.	STAFF LEVEL.	MAN HOURS	
Oil level check.	1/1	B	0.05	
Oil separator cartridge replacement.	30/1	B	0.05	
Intake air filter replacement.	30/1	B	0.20	
Oil and oil filter replacement.	30/1	I	0.50	
Disassembly and complete compressor overhaul.	200/1	I	8	
P. 1 of 1				



Table 3-2 Scheduled maintenance procedures - SCI8DT05 Integrated Compressor

SYSTEM SCI8DT05 Integrated Compressor	SUBSYSTEM Compressor casing	PERIODICITY CODE 1/1
		STAFF. MANHOURS 0.05
UNIT Oil level sight glass		TOTAL MANHOURS 0.05
DESCRIPTION 1. Oil level check		ENGAGEMENT OF APPARATUS 0.05
SAFETY PRECAUTIONS Observe the general safety regulations		
TOOLS AND EXPENDABLE MATERIALS 1. Standard equipment 2. Mineral oil– synthetic oil		
PROCEDURE: 1. Oil level check (refer to figure 3-1) a. The oil level must not sink below the lower half of the sight glass (5) when the compressor is not running. b. When needed, add oil of the same kind present in the machine. Refer to Section 5 of maintenance manual, for the lubricants to use. c. For the topping up of the oil proceed as follows: <i>Warning! Use exclusively very clean containers and funnels for the oil filling.</i> 1. Unscrew filler cap (1) and gasket (2) placed on the compressor casing. 2. Pour the new oil from filler up to the maximum level. The maximum oil level corresponds to the middle of the oil level sight glass (3) 3. Retighten filler cap (1).		
P. 1 of 2		Date

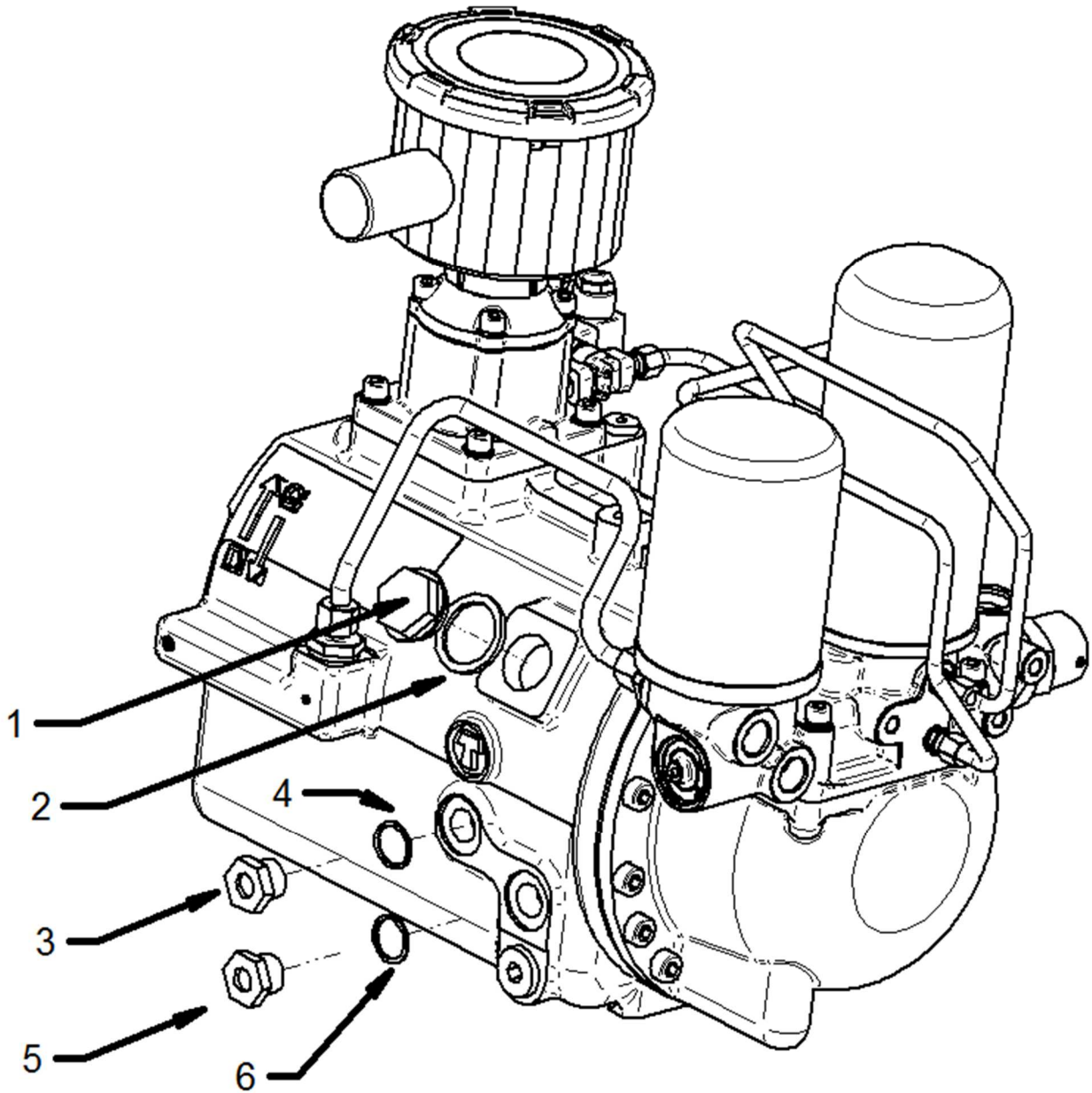


Fig. 3-1 SCI8DT05 Integrated Compressor– Oil level sight glasses/oil topping up



Table 3-3 Scheduled maintenance procedures - SCI8DT05 Integrated Compressor

SYSTEM SCI8DT05 Integrated Compressor	SUBSYSTEM Discharge Cover	PERIODICITY CODE 30/1
		STAFF. MANHOURS 0.05
UNIT Oil separator cartridge		TOTAL MANHOURS 0.05
DESCRIPTION 1. Replacement of oil separator cartridge		ENGAGEMENT OF APPARATUS 0.05
SAFETY PRECAUTIONS Observe the general safety regulations		
TOOLS AND EXPENDABLE MATERIALS 1. Standard equipment 2. Band wrench 3. Oil separator cartridge		
PROCEDURE: 1. Replace oil separator cartridge (refer to figure 3-2) a. Unscrew and remove oil separator cartridge (1) using the band wrench. b. Unscrew and remove the separator oil recovery pipe (2) and the gaskets (3). c. Mount the gaskets (3) and the separator oil recovery pipe (2). d. Screw the new oil separator cartridge (1) by hand.		
P. 1 of 2		DATE

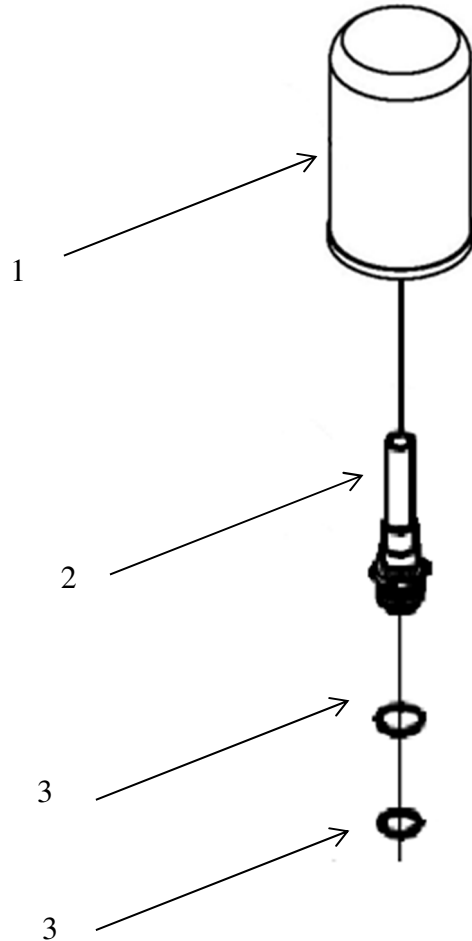


Fig. 3-2 SCI8DT05 Integrated Compressor– Oil separator cartridge

P. 2 of 2

DATE



Table 3-4 Scheduled maintenance procedures - SCI8DT05 Integrated Compressor

SYSTEM SCI8DT05 Integrated Compressor	SUBSYSTEM Air intake filter	PERIODICITY CODE 30/1
		STAFF MANHOURS 0.20
UNIT Air intake filter		TOTAL MANHOURS 0.20
DESCRIPTION 1. Air intake filter replacement		ENGAGEMENT OF APPARATUS 0.20
SAFETY PRECAUTIONS Observe the general safety regulations		
TOOLS AND EXPENDABLE MATERIALS 1. Standard equipment 2. Air intake filter		
PROCEDURE: 1. Replace air intake filter (refer to figure 3-3) a. Unscrew and remove air intake filter (1) from its housing (2). b. Replace new air filter cartridge (1) in its housing (2).		
P. 1 of 2		DATE

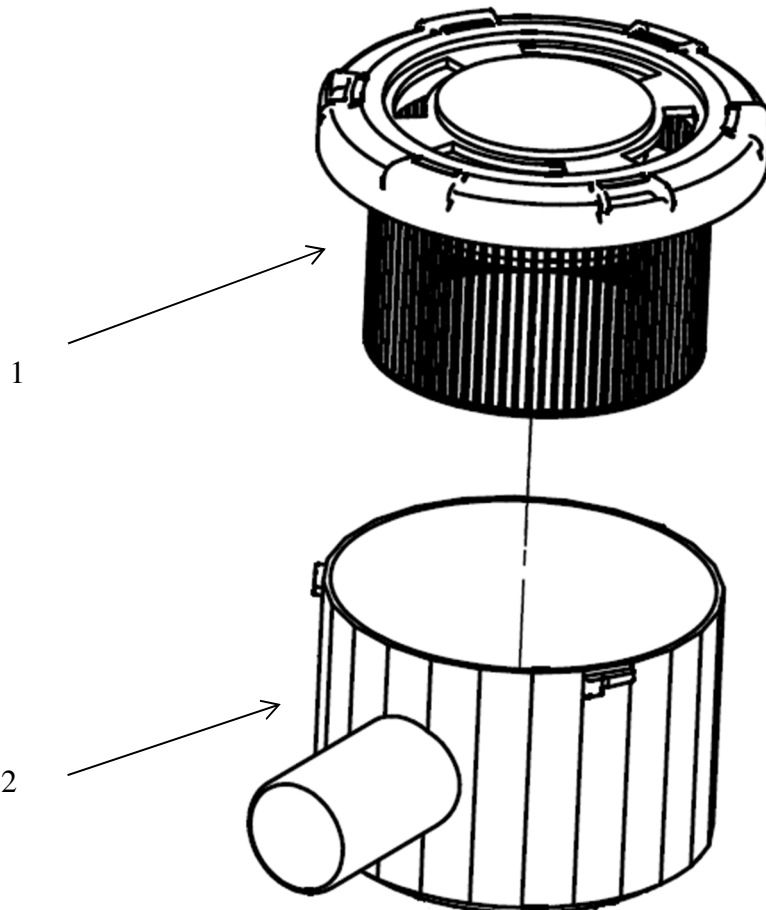


Fig. 3-3 SCI8DT05 Integrated Compressor–Intake air filter



Table 3-5 Scheduled maintenance procedures - SCI8DT05 Integrated Compressor

SYSTEM SCI8DT05 Integrated Compressor	SUBSYSTEM Compressor casing	PERIODICITY CODE 30/1
UNIT Compressor casing		STAFF MANHOURS 0.50
DESCRIPTION 1. Oil change 2. Oil filter replacement		TOTAL MANHOURS 0.50
SAFETY PRECAUTIONS Observe the general safety regulations		ENGAGEMENT OF APPARATUS 0.50
TOOLS AND EXPENDABLE MATERIALS 1. Standard equipment 2. Oil filter 3. Mineral oil– synthetic oil		
PROCEDURE: 1. Oil change (refer to figure 3-4) Warning! Use exclusively very clean containers and funnels for the oil filling. Dispose of the spent oil according to the norms existing in the country where the compressor is operated. a. Unscrew filler cap (1) and the gasket (2) placed on the compressor casing. b. Position a drain tray under oil emptying plug (3) to collect the spent oil. c. Open the oil emptying plug (3) slowly, and completely drain the oil from the group. d. Close the oil emptying plug (3). 2. Oil filter replacement (refer to figure 3-4) a. Unscrew the oil filter (4).		
P. 1 of 3		DATE



PROCEDURE (Continues):

- b. Remove oil filter (4).
- c. Insert the new filter (4) in the housing.
- d. Pour the new oil from filler up to the maximum level. The oil maximum level corresponds to the middle of the oil level sight glasses placed (5) over the thermostatic valve.
- f. Retighten filler cap (1).
- g. Refer to section **5.3.** of the maintenance manual, for the lubricants to use.

WARNING

The first oil and filter change should be done after not more than 50 operating hours.

Following changes should be done once a year or after 3000 operating hours.

Note

It is possible to change only the filtering cartridge (4)

- 3. Filtering cartridge change (refer to figure 3-4)
 - a. Unscrew the oil cartridge (4).
 - b. Tighten the new oil cartridge (4).

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DATE

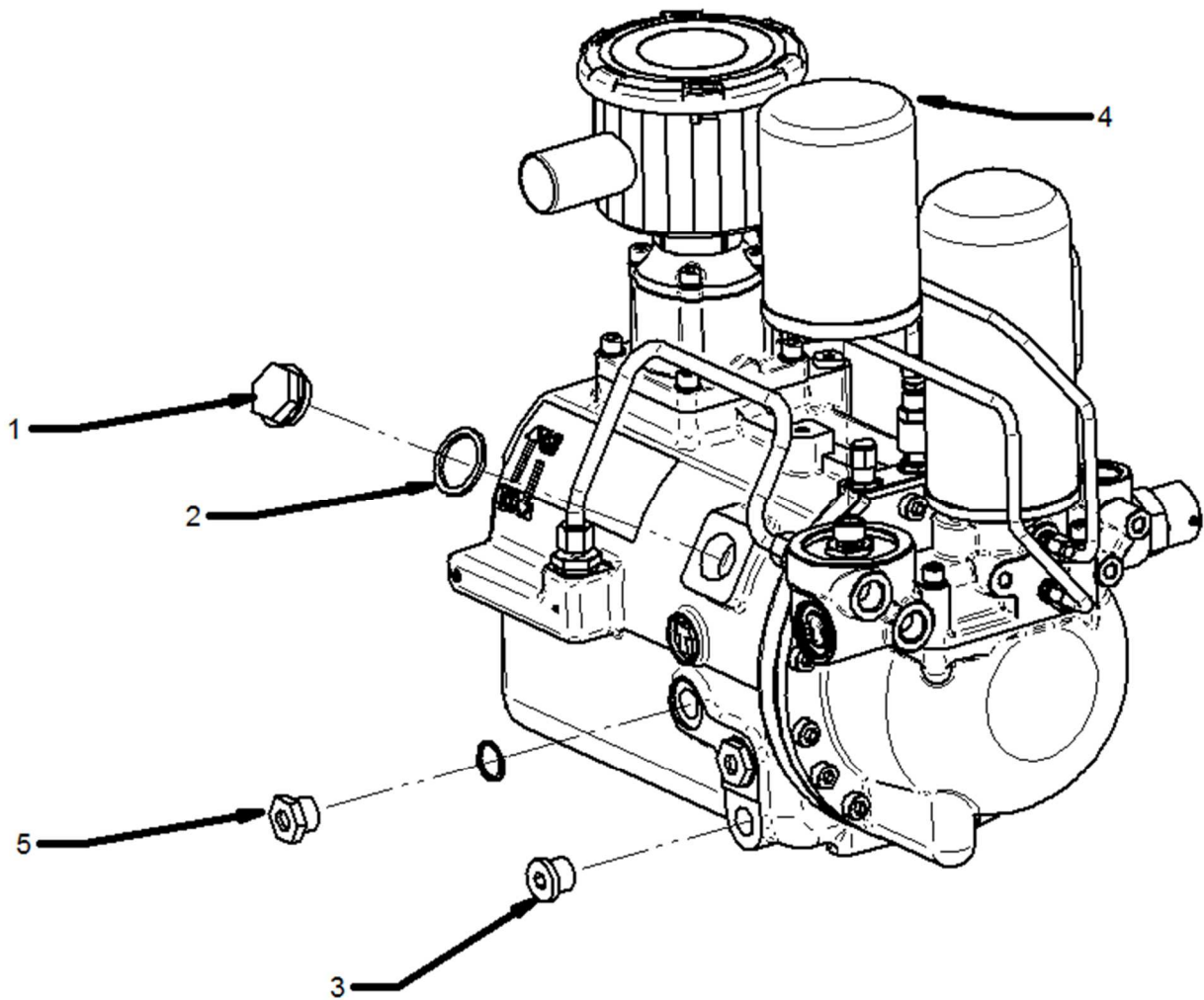


Fig. 3-4 SCI8DT05 Integrated Compressor– Oil and oil filter change



Table 3-6 Scheduled maintenance procedures - SCI8DT05 Integrated Compressor

SYSTEM SCI8DT05 Integrated Compressor	SUBSYSTEM SCI8DT05 Integrated Compressor	PERIODICITY CODE 200/1
UNIT SCI8DT05 Integrated Compressor		STAFF MANHOURS 8.00 TOTAL MANHOURS 8.00 ENGAGEMENT OF APPARATUS 8.00
DESCRIPTION 1. Disassembly for complete overhaul		
SAFETY PRECAUTIONS Observe the general safety regulations		
TOOLS AND EXPENDABLE MATERIALS 1. Standard equipment 2. Hoisting equipment and semi live skid		
PROCEDURE: 1. Disassembly for complete overhaul Warning! <i>The compressor is heavy (abt. 74 kg). Pay the utmost attention during the operations. Deactivate the electric motor (or the internal combustion engine) and, for a higher degree of safety, remove the power fuses from the control board. Clean externally the compressor and the removable parts. Disconnect the compressor outer connections (ancillary tubing, instrumentation, etc).</i>		
P. 1 of 2		DATE



PROCEDURE (Continues):

- a. Disconnect the compressor from the baseplate or the frame and remove the compressor, after withdrawing the coupling spacer.
- b. Pay the utmost attention that during the compressor removal from the base plate or the frame the required supports be positioned onto firm ground.
- c. Remove the semi coupling and the key on the compressor shaft.
- d. All the worn out and damaged parts must be replaced. The rusty parts must be replaced or repainted.
- e. Refer to Section 5 of the maintenance manual and to the Illustrated Catalog for the disassembly directions points to check and adjustment procedures.

P. 2 of 2

DATE



3.1.3. Post - overhaul setting at work of the Compressor

This section contains the operative directions concerning how to manage the various functions and adjustments, after the disassembly and the complete overhaul of the SCI8DT05 Compressor.

a. Compressor repositioning

Insert the key and the semi coupling on the compressor shaft.

Position the compressor on the base plate or the frame after the insertion, when needed, of the coupling spacer, and anchor it with its clamping screws.

Align the compressor and the motor so that the transversal, longitudinal and angular shaft misalignments do not exceed the maximum ones that can be compensated by the coupling, according to the instructions of the coupling manufacturer.

b. Filling of the oil circuit of the compressor

Fill up the compressor with an amount of abt. 3.5 dm³ of mineral or synthetic oil, of which 0.5 dm³ are to be poured directly to the rotors through the intake valve. Refer to Section 5 of the maintenance manual, for the lubricants to use.

c. Connection check

Make sure that all the connections with the apparatus and the compressor have been completed.

d. Direction of rotation check

Make sure that the driving rotor is operated in the direction of rotation indicated by the arrow highlighted on the compressor casing. The arrow is marked with a "G".



e. Compressor starting

After having performed the operations described in the preceding points **a.-d.**, the starting can be performed, with the following modalities:

1. Start the motor.
2. Wait for the discharge pressure to reach the preset operative value.
3. Make sure that anomalous vibration, noise values etc are not detectable.



4. FAILURE SEARCH

4.1. Introduction

This section contains directions and information required to locate failures or discharge anomalies on the SCI8DT05 Integrated Compressor.

A failure logical table is provided as an aid for the failure search. This logical scheme is based on the failure indications observed in the process of failure search.

The table includes the symptoms and the probable causes related to the failure isolation

Each cause implies a specific cure, thereby gradually reducing the uncertainty field. Therefore, the functional area of the set wherein the failure is located will gradually be reduced, and lastly the information needed to complete the isolation and to perform the repair will be provided.

Table 4-1 indicates the inconvenients and the cures that can be applied to eliminate the inconvenient found.

In particular, for each failure found the corresponding corrective actions are listed to locate the failed subsystems and/or components and restore the normal operative conditions.

NOTE - *In the realization of the logical failure schemes, the assumption was made that the incoming feeds and signals be present and that the harness be in order. The technical staff in charge of the failure search will have to make sure of the aforesaid.*

If, after having performed the indicated operations, the failure persists, contact the nearest Termomeccanica service center.



Table 4-1 SCI8DT05 Integrated Compressor- Failure search (1 of 3)

UNIT	SYMPTOM	CAUSE	CURE	REF.
Compressor	The compressor idles	Air leak towards the intake and/or from the solenoid valve for the idling	Solenoid valve not in order (not closing), remove and check the solenoid valve for the idling. Replace it if necessary	Maintenance manual sect. 5.2. para 5.
Air intake filter	Capacity or pressure of the compressor inferior to the nominal values	Air intake filter obstructed	Remove and check the filter. Replace it if necessary	Maintenance manual sect. 5.2. para 1.
Solenoid valve for the idling		Solenoid valve for the idling	Solenoid valve not in order (not closing), remove and check the solenoid valve for the idling. Replace it if necessary	Maintenance manual sect. 5.2. para 5.
Safety valve		Safety valve	Safety valve is unsealed. Remove and check it. Replace it if necessary	Maintenance manual sect. 5.2. para 6.
Oil separator cartridge		Oil separator cartridge obstructed	Oil separator cartridge not in order. Check and replace it if necessary	Maintenance manual sect. 5.2. para 7.
Compressor		Compressor not in order.	Call Termomeccanica Compressori Service Centre	
Air intake filter		Excessive amount of oil discharged through the air intake filter when the compressor is stopped	Excessive amount of oil.	Check the oil level and restore the right level.
Air intake filter	Oil separator cartridge obstructed		Oil separator cartridge not in order. Check and replace it if necessary	Maintenance manual sect. 5.2. para 7.



Table 4-1 SCI8DT05 Integrated Compressor- Failure search (2 of 3)

UNIT	SYMPTOM	CAUSE	CURE	REF.
Compressor	Compressor overheats	Oil level is too low. Poor lubrication.	Check oil, and add it if necessary. Check the absence of obstruction in the outer lubrication circuit	Maintenance manual sect.. 3.1.2. Table 3-2 and sect. 5.3.
Oil filter		Oil filter obstructed Oil filter not in order	Check the component, replace it if necessary	Maintenance manual sect. 5.2. para 4.
Thermostatic valve		Thermostatic valve not functioning.	Remove the valve and check it. Replace parts requiring it	Maintenance manual sect. 5.2. para 3.
Minimum pressure valve	Safety valve intervenes	Minimum pressure valve malfunctioning	Remove the valve and check it. Replace parts requiring it	Maintenance manual sect. 5.2. para 8.
Compressor	Oil level is too high	Excessive filling Excessive condensate	Remove oil in excess Drain water from the oil emptying plug	
	Too much oil in the compressed air	Excessive filling Oil separator cartridge is not functioning	Remove oil in excess Replace oil	
		Wrong oil quality, produces foam		Maintenance manual sect. 3.1.2. Table 3-6 and sect. 5.3.
	Lowering of oil level.	Low charge	Top up the oil	Maintenance manual sect. 3.1.2. Table 3-2 and sect. 5.3.
Various leaks (from seals, gaskets, etc....) Oil separator cartridge not functioning.		Check the seals, in case replace them. Disassemble the compressor and perform a complete overhaul	Maintenance manual sect. 5.2.	

**Table 4-1 SCI8DT05 Integrated Compressor- Failure search (3 of 3)**

UNIT	SYMPTOM	CAUSE	CURE	REF.
Compressor	Scanty air flow rate	Air intake filter obstructed. Intake valve not opening correctly Solenoid valve not completely closed. Inadequate lubrication.	<ul style="list-style-type: none">- Check, replace air intake filter- Check, replace intake valve- Check, replace solenoid valve- Check absence of obstruction in the outer lubrication circuit	Maintenance manual sect. 5.2. para 1. Maintenance manual sect. 5.2. para 5.
	High absorption	Oil separator cartridge obstructed. Minimum pressure valve opening in an abnormal way.	<ul style="list-style-type: none">- Check and/or replace Oil separator cartridge.- Check and/or replace minimum pressure valve.	Maintenance manual sect. 5.2. para 7. Maintenance manual sect. 5.2. para 8.
Shaft	The compressor shaft is locked	<ul style="list-style-type: none">- Foreign matter entry- Seizure- Wrong lubrication	Call Termomeccanica Compressori Service Centre	



5. COMPLETE OVERHAUL

5.1. Introduction

The complete overhaul implies the SCI8DT05 Compressor disassembly, the thorough cleaning and an accurate check of all the parts thereof; the replacement of all the rubber parts and of other worn out or defective parts. The rusty parts must be replaced or repainted.

This section contains the directions needed to disassemble, replace and overhaul all the parts constituting the SCI8DT05 Compressor.

The maintenance staff must strictly observe the maintenance procedures, and particularly the general safety regulations.

In table 5-1 the driving torques recommended, function of the size of bolts having a 8.8 resistance rate are listed.

The list of the instruments related to the standard equipment, needed to perform the scheduled maintenance operations and the complete overhaul is shown in table 5-2.

Table 5-1 Driving torques

Size	Driving torque [Nm]
M6	12
M8	30
M10	59

**Table 5-2 Commercial maintenance tool list**

The following list reports the tools recommended to perform the majority of the maintenance tasks. Maker names are listed exclusively as a reference.

Quantity	Part description	Maker/type	Notes
1	Tool case	526.ABS/T6	
1	Screwdriver set (0.5 – 6)	USAG 326	
1	Screwdriver set (0 – 3)	USAG 326 TC4	
1	Non-metallic screwdriver for compensator	USAG 322 C	
1	Torque screwdriver	STAHLWILLE 76/25	
1	Bladed knife	STANLEY 199	
1	Scissors	USAG 207	
1	Wrench set (6 – 22)	USAG 252	
1	Allen wrench set (3 – 10)	USAG 280	
1	Pliers	USAG 156 NT	
1	Tweezer	USAG 40	
1	45-degrees tweezer	USAG 141	
1	Cutting pliers	BAHCO 2112	
1	Articulated wrench set	USAG 613	
1	Wrench 34	USAG 252	



5.2. SCI8DT05 Compressor

Warning! *The SCI8DT05 Compressor is heavy (abt. 52 kg). Pay the utmost attention during the operations.*

1. Intake air filter overhaul.

Tools and Expendable materials

- (1) Standard equipment
- (2) Intake air filter

Refer to figure 5-1.

a. Disassembly

- 1.1 Unlock and remove the intake air filter (1) from the support (2)

b. Checks

Inspect for possible wear signs or damages.

c. Assembly

Assemble in the reverse order of the disassembly.

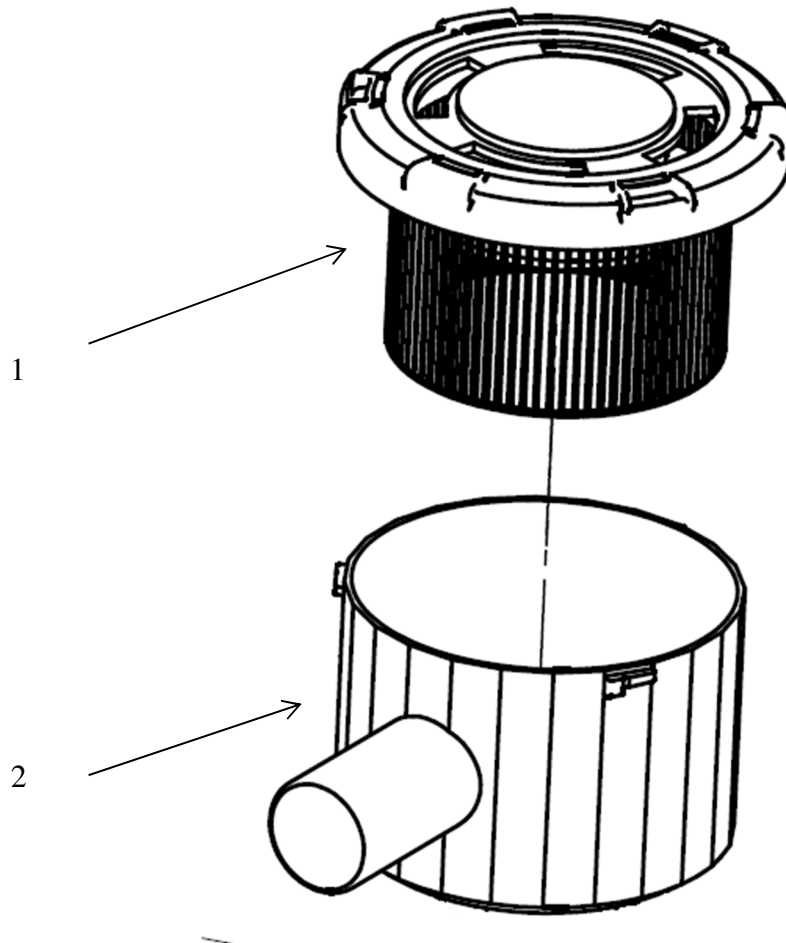


Fig. 5-1 Intake air filter disassembly



2. Intake valve overhaul

Tools and Expendable Materials

- (1) Standard equipment
- (2) Setscrew wrench 6mm – Pliers for Seger ring
- (3) Gasket set – Intake valve – Loctite 243 - Solvent

Refer to figure 5-2.

a. Disassembly

- 2.1 Remove the intake air filter (1)
- 2.2 Unscrew the fittings (2) to remove the pipe (3)
- 2.3 Unscrew the solenoid valve group from intake valve (4)
- 2.4 Unscrew and remove the 4 socket head screws (5) of intake air valve
- 2.5 Remove the entire intake air valve
- 2.6 Remove the gasket (6)

b. Checks

Inspect for possible wear signs or damages.
Clean thoroughly all the parts of the valve with a solvent.

c. Gasket replacement

Termomeccanica Compressori recommends that the gaskets be replaced during the complete overhaul.

Position the new gaskets in the housings provided for the purpose taking care of their assembling direction.

Spread a layer of silicone grease on the new gaskets.

Note *The SCI8DT05 Compressor is delivered with the intake valve already calibrated by TERMOMECCANICA COMPRESSORI.*

d. Assembly

Assemble in an order reversed to the disassembly one.

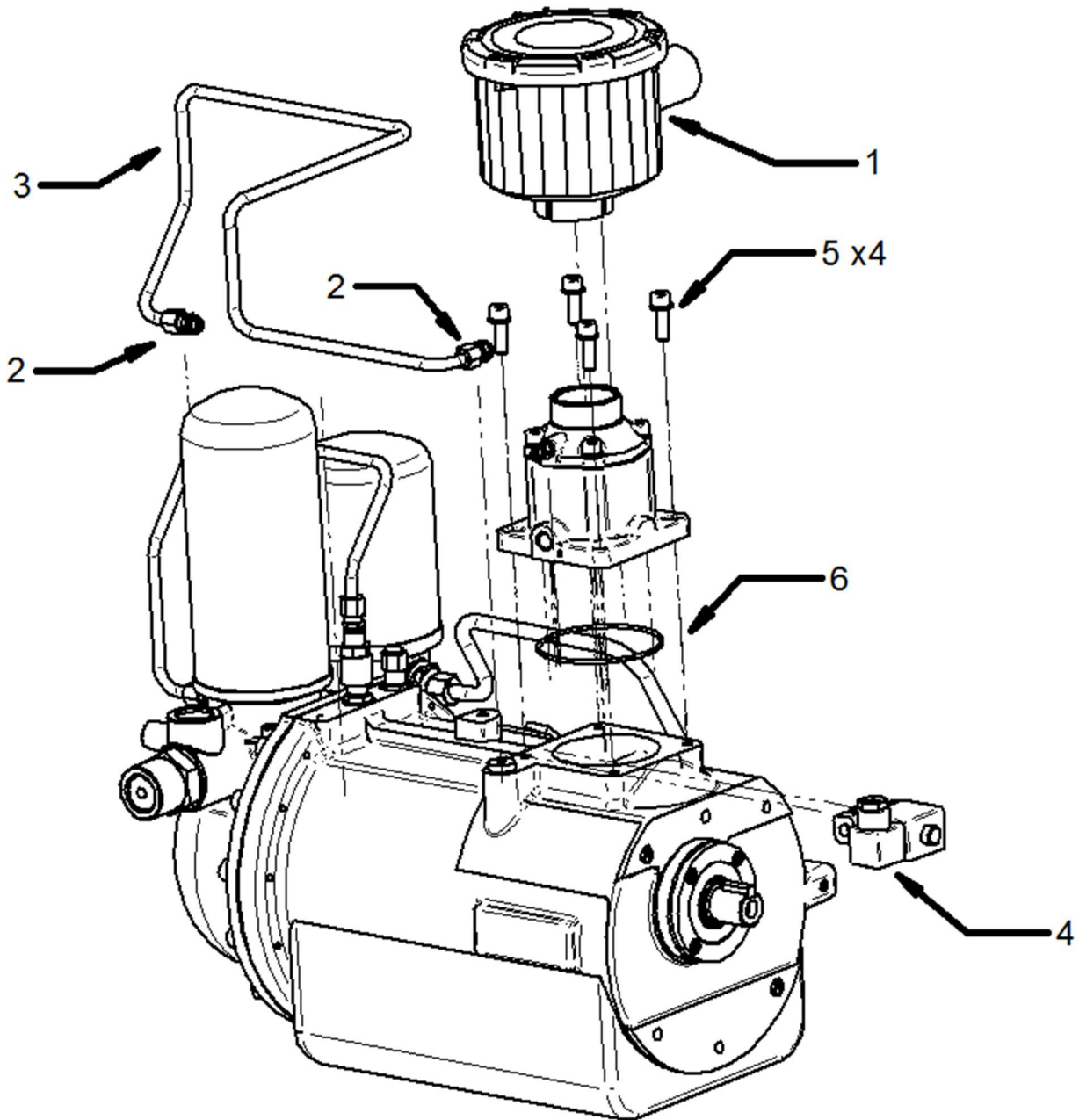


Fig. 5-2 Intake valve disassembly



3. Thermostatic valve overhaul

Tools and Expendable materials

- (1) Standard equipment
- (2) 6 mm Setscrew wrench
- (3) Gasket set – Thermosensitive element – Thermostatic valve

Refer to figure 5-3.

a. Disassembly

- 3.1 Remove seeger ring (1)
- 3.2 Remove the thermostatic valve (2).

b. Checks

Clean thoroughly the seeger ring facing surface on the compressor casing.

c. Assembly

Assemble in an order reversed to the disassembly one.

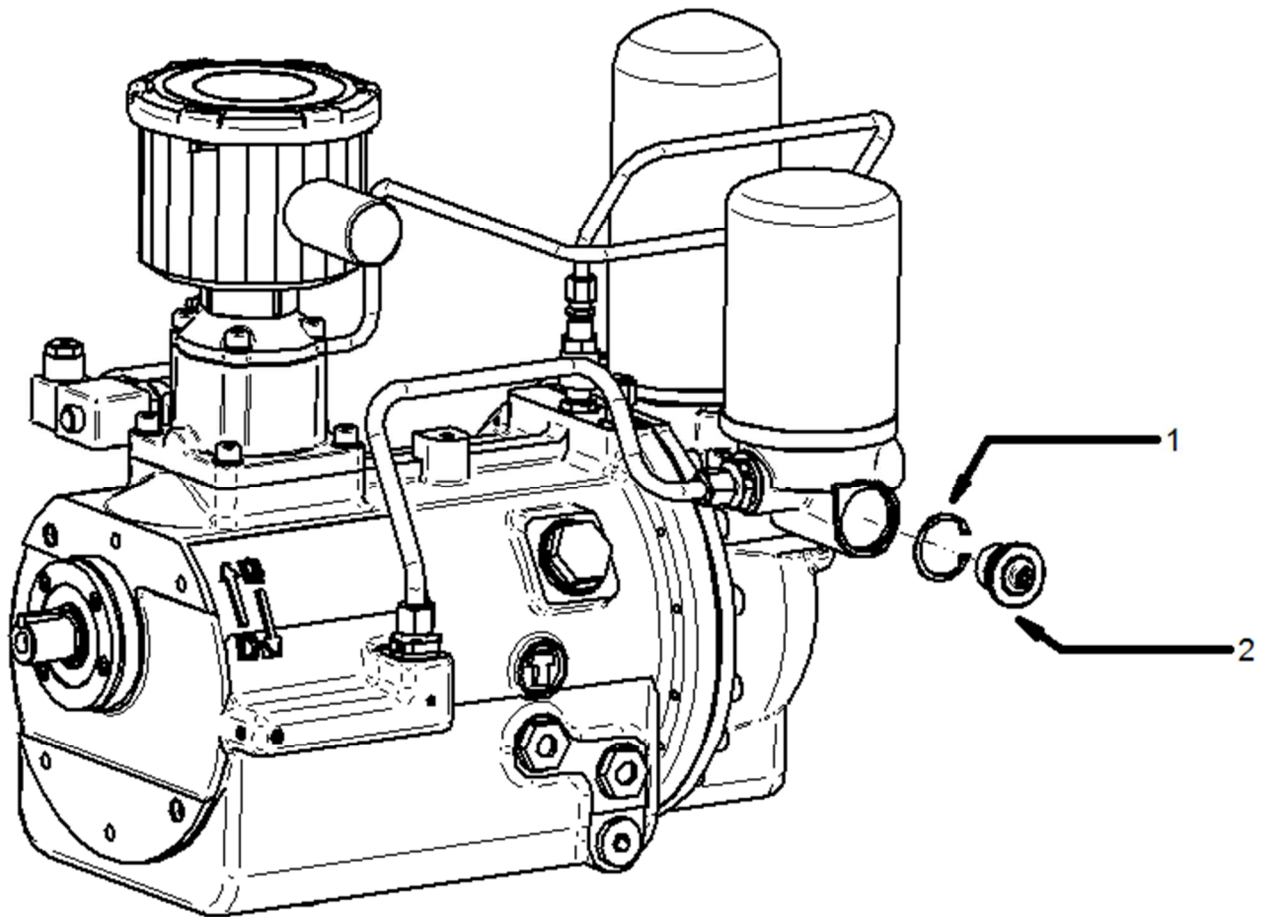


Fig. 5-3 Thermostatic valve disassembly



4. Oil filter overhaul

Tools and Expendable materials

- (1) Standard equipment
- (2) 5 mm Setscrew wrench
- (3) O-ring set – Oil filter

Refer to figure 5-4.

a. Disassembly

- 4.1 Unscrew and remove the oil filter (1).

b. Checks

Clean thoroughly the faces of contact on the compressor casing as well as on the cap of the oil filter

c. O-rings replacement

Termomeccanica Compressori recommends that the O-rings be replaced during the complete overhaul.

d. Oil filter replacement

Termomeccanica Compressori recommends that the oil filter (or at least the oil filter cartridge) be replaced during the general overhaul.

e. Assembly

Assemble in an order reversed to the disassembly one.

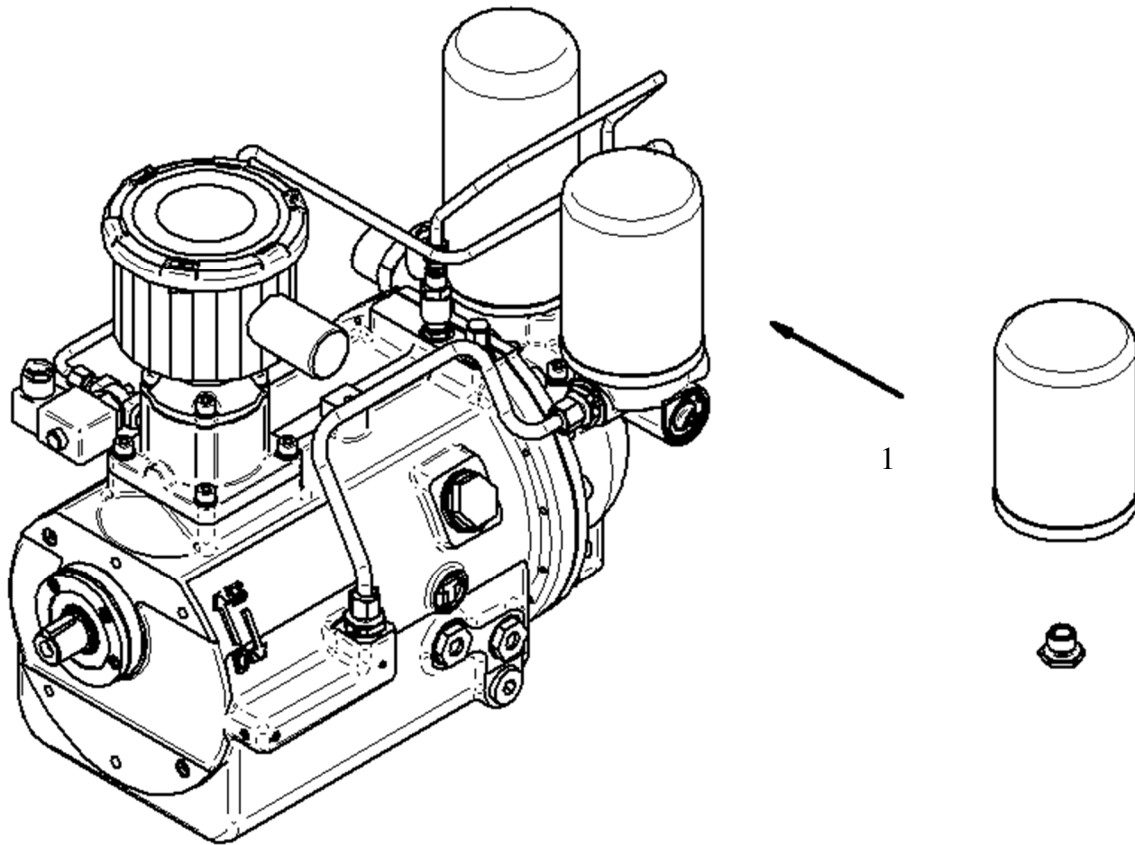


Fig. 5-4 Oil filter disassembly



5. Overhaul solenoid valve for the idling

Tools and Expendable materials

- (1) Standard equipment
- (2) Solenoid valve for the idling

Refer to figure 5-5.

a. Disassembly

- 5.1 Unscrew and remove the solenoid valve (1) from the intake valve (2) and the fitting (3)

b. Checks

Clean thoroughly the face on the compressor casing.

c. Solenoid valve replacement

Termomeccanica Compressori recommends that the solenoid valve be replaced during the complete overhaul.

d. Assembly

Assemble in an order reversed to the disassembly one.

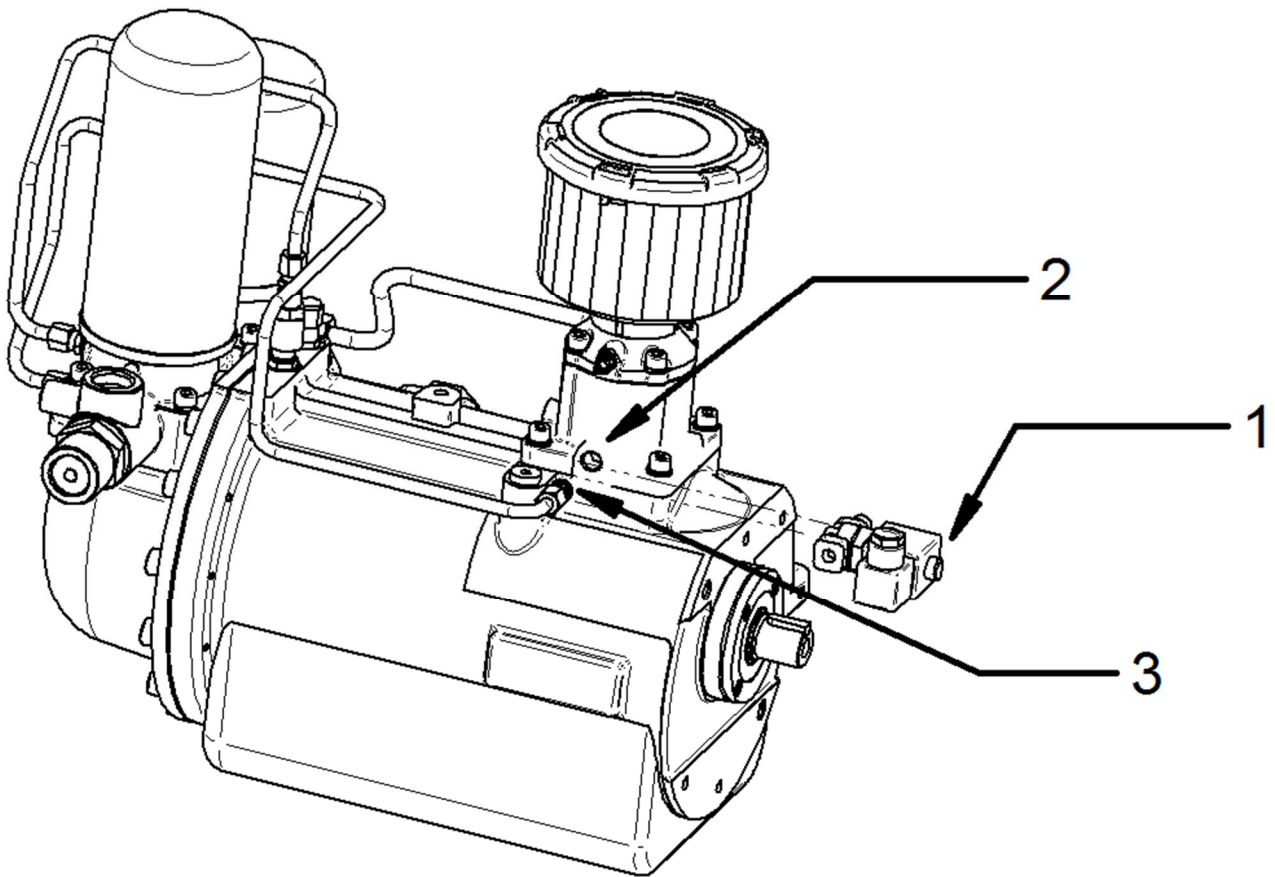


Fig. 5-5 Disassembly of the solenoid valve pilot



6. Safety valve overhaul

Tools and Expendable materials

- (1) Standard equipment
- (2) Safety valve - Loxeal 5810 union sealer

Refer to figure 5-6.

a. Disassembly

- 6.1 Unscrew and remove safety valve (1).

b. Checks

Clean thoroughly the faces and the threads of the safety valve and of the compressor casing. Check the valve opening at the calibrated pressure.

c. Safety valve replacement

After having performed the checks of which at **b.**, if the safety valve does not open at the calibrated pressure, the same must be replaced.

d. Assembly

Assemble in an order reversed to the disassembly one making sure to pack the thread with Loxeal 5810 union sealer.

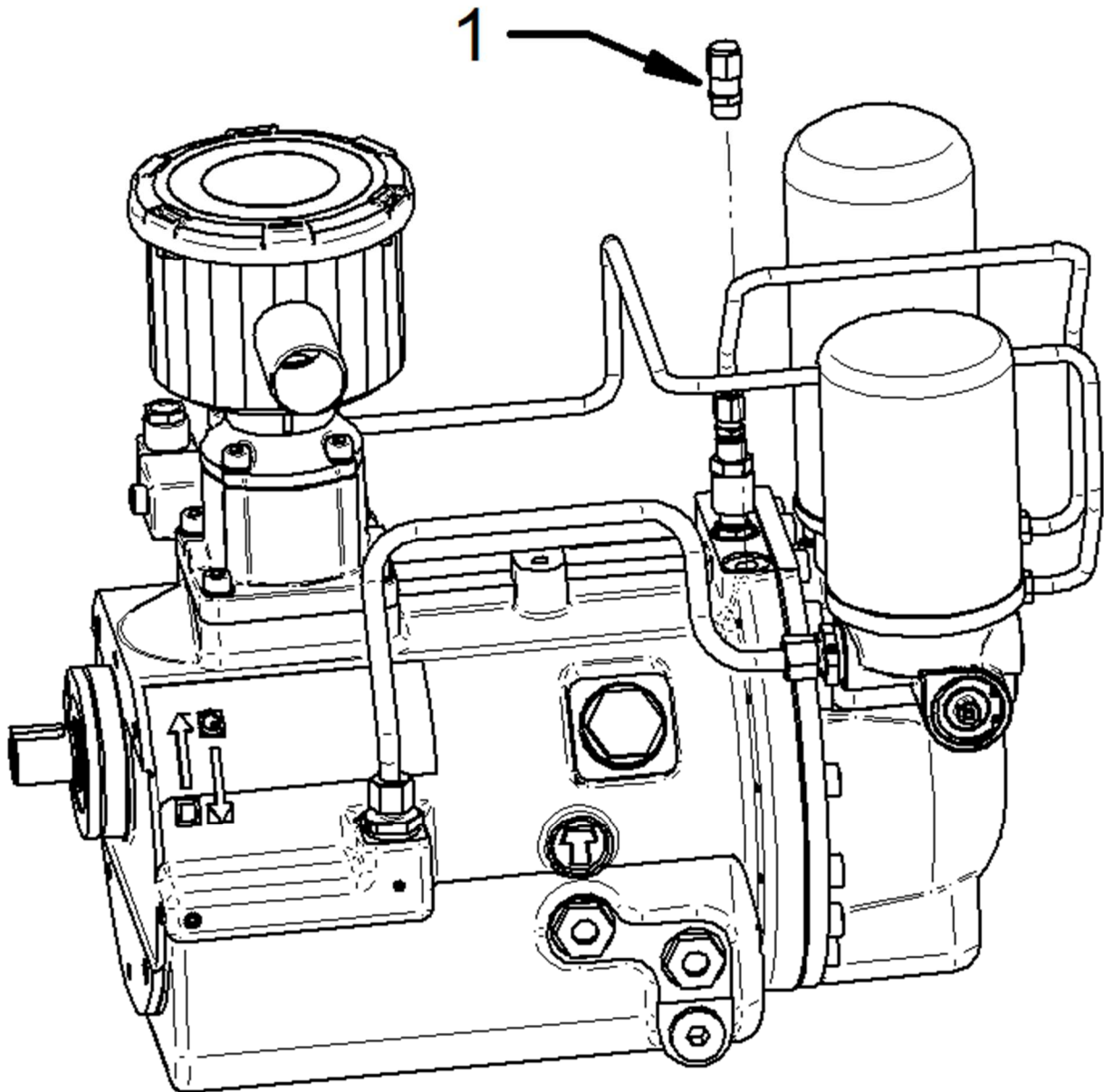


Fig. 5-6 Safety valve disassembly



7. Overhaul oil separator cartridge and oil scavenge circuit.

Tools and Expendable materials

- (1) Standard equipment
- (2) Band wrench
- (3) Gasket set - oil separator cartridge




Refer to figure 5-7.

a. Disassembly

- 7.1 Unscrew and remove oil separator cartridge (10) using the band wrench.
- 7.2 Unscrew and remove separator oil recovery pipe (11) and the gasket (12).
- 7.3 Unscrew and remove oil scavenge gauge (7) from the fitting.
- 7.4 remove the gasket (8).
- 7.4 Unscrew and remove oil scavenge nozzle (9).

b. Checks

Clean thoroughly:

-  the inside of the filter support on the compressor cover.
-  the faces of the gasket on the compressor cover.
-  the oil scavenge nozzle.

c. Gasket replacement

Termomeccanica Compressori recommends that the gaskets be replaced during the complete overhaul.

d. Assembly

Warning *To avoid a permanent deformation of the oil separator gasket and of the body thereof, Termomeccanica recommends to perform the oil separator cartridge tightening **only manually**.*

Assemble in an order reversed to the disassembly one. Assemble the new oil separator cartridge greasing the gasket under the cartridge with a little oil.

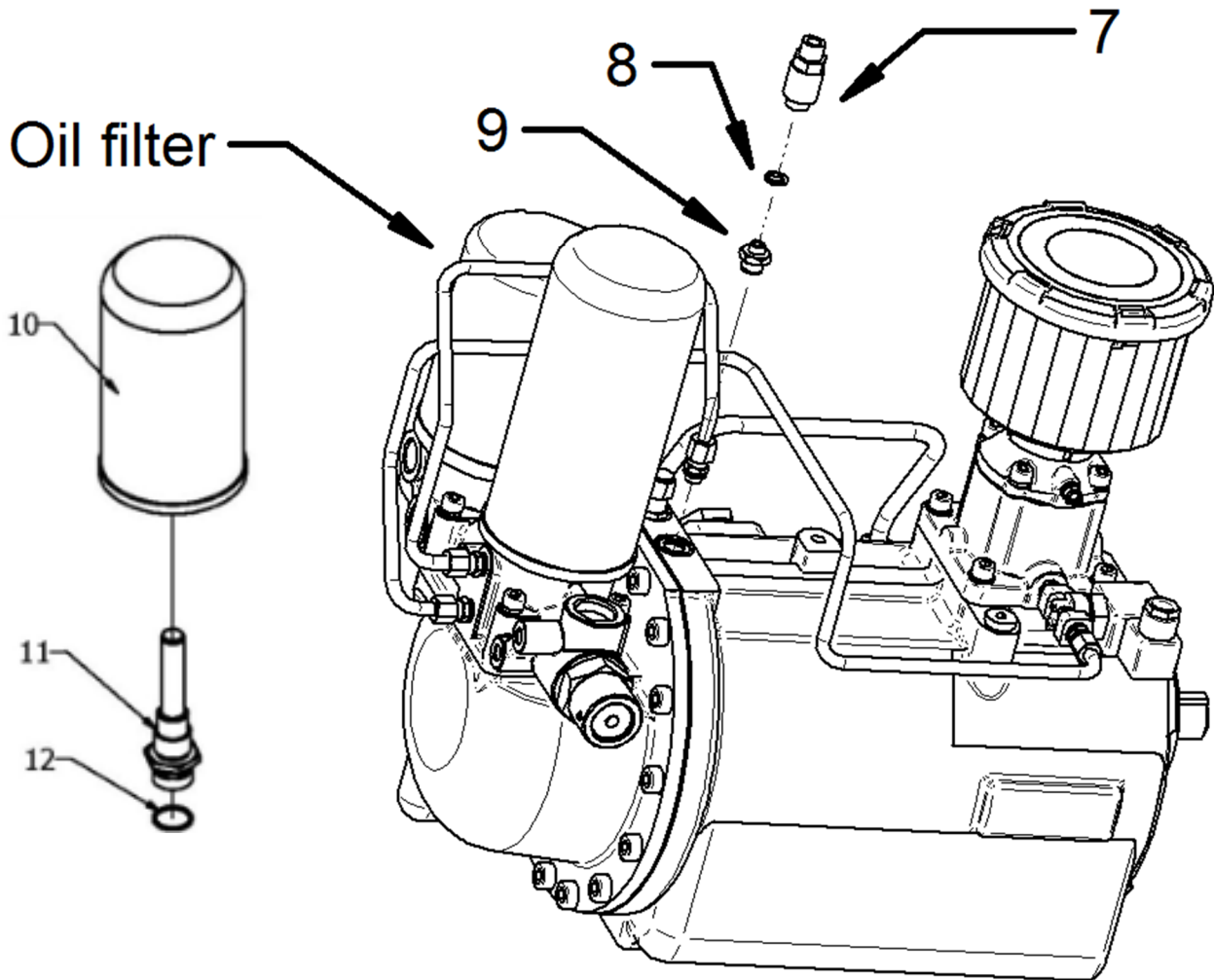


Fig. 5-7 Oil filter cartridge disassembly



8. Overhaul minimum pressure valve

Tools and Expendable materials

- (1) Standard equipment
- (2) Allen wrench 42mm - Allen wrench 10mm - Setscrew wrench 3mm
- (3) Minimum pressure valve - solvent

Refer to figure 5-8.

a. Disassembly

- 8.1 Unscrew and remove minimum pressure valve (1) from its seat machined on the compressor cover.

b. Checks

Clean thoroughly all the metallic components with the solvent suitable to the purpose.

c. Replacement of wearing parts

Termomeccanica Compressori recommends that the wearing internal parts be replaced during the complete overhaul.



d. Assembly

Warning *The minimum pressure valve must be brought back to its original calibration value observing the instructions reported at e..*

Assemble in an order reversed to the disassembly one.

e. Test

To calibrate the minimum pressure valve operate as follows:

- (1) Start the compressor.
- (2) Let the compressor run with 0 barg pressure downstream of the minimum pressure valve.
- (3) Check the relative pressure values upstream and downstream of the minimum pressure valve. The readings must be equal to:
 - ⌚ 0 barg downstream of the minimum pressure valve.
 - ⌚ 3.5 barg upstream of the minimum pressure valve.
- (4) To bring the pressure upstream of the minimum pressure valve to the desired value tighten the regulation screw (1) to increase the pressure and unscrew the regulation screw (1) to decrease the pressure.
- (5) Tighten lock nut once the desired calibration value is reached.

Note *The SCI8DT05 Compressor is delivered with the minimum pressure valve already calibrated by TERMOMECCANICA COMPRESSORI.*

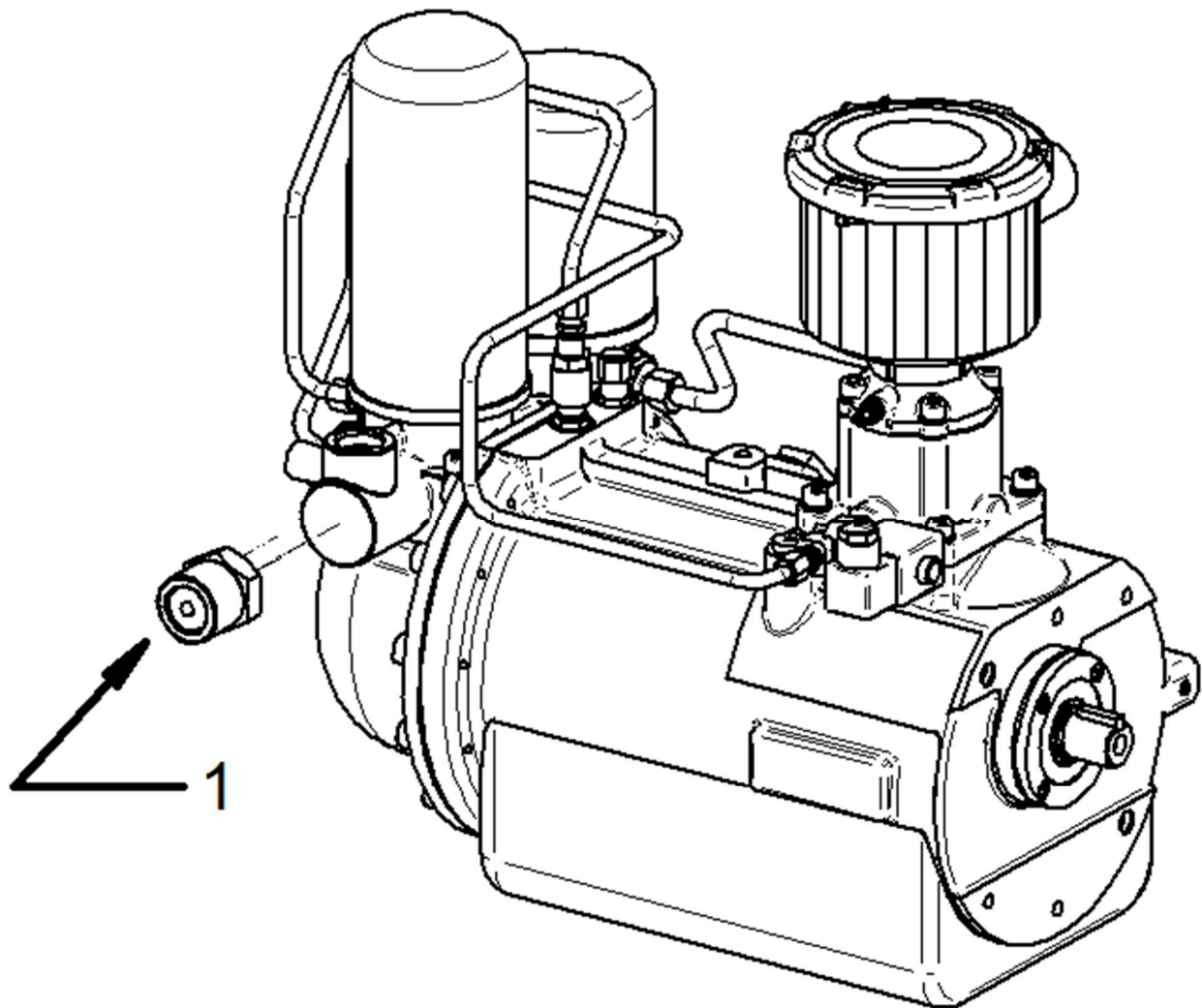


Fig. 5-8 Minimum pressure valve disassembly



9. Disassembly procedure of seal cover, seal ring and inner ring.

Tools and Expendable materials

- (1) Standard equipment
- (2) 5mm Setscrew wrench
- (3) Heating ring

Refer to figure 5-9.

a. Disassembly

9.2 Unscrew and remove screws (1) and remove the seal cover (4) and gasket (5).

9.3 Remove safety plate (2).

9.4 Remove the seal ring (3) from the seal cover (4).

9.5 Withdraw the inner ring (6).

- Heat the inner ring (6), using the heating rings, then remove it.

As an alternative, the same inner ring is incised with the utmost care, until, due to the state of internal tension, the inner ring relaxes.

b. Checks

Inspect for possible wear signs or damages.

When performing the compressor disassembly always replace the following parts:

- seal ring (3), inner ring (6) and gasket (5).

Clean thoroughly the metallic parts with a solvent.

Blow air on the parts in a thorough way.



c. Assembly

Tools and Expendable materials

- (1) Standard equipment
- (2) Dynamometric key
- (3) Special tool n° 1
- (4) Special tool n° 2
- (5) Electric Plate
- (6) Loctite 222
- (7) Solvent
- (8) Silicone grease

Refer to figure 5-9.

- 9.6 Thoroughly clean the seal cover (4) with solvent.
- 9.7 Thoroughly blow the items.
- 9.8 Mount the seal ring (3) on the seal cover (4). To carry out the assembly, first of all, apply a film of Loctite 222 on the external surface of the seal ring (3). Then, by using the special tool n° 2 and acting on it with a pressing, as evenly as possible, place the seal ring (3) on the seal cover (4).
- 9.9 Heat the inner ring (6) at the temperature of $100 \div 110^{\circ}\text{C}$, and then assemble it on its seat on the shaft sending it to contact.
- 9.10 Insert the gasket (5).
- 9.11 Place the special tool n° 1 on the male rotor shaft sending it to contact the inner ring (6).
- 9.12 Slightly lubricate the special tool n° 1 external surface and the lips of the seal ring (3) with silicone grease.
- 9.13 Place the seal cover (4), paying great attention not to damage the lips of the seal ring (3).
- 9.14 Withdraw the special tool n° 1 from the shaft.
- 9.15 Screw down the screws (1) with a driving torque of 12Nm.
- 9.16 Assemble the plate (2) on the seal cover (4).

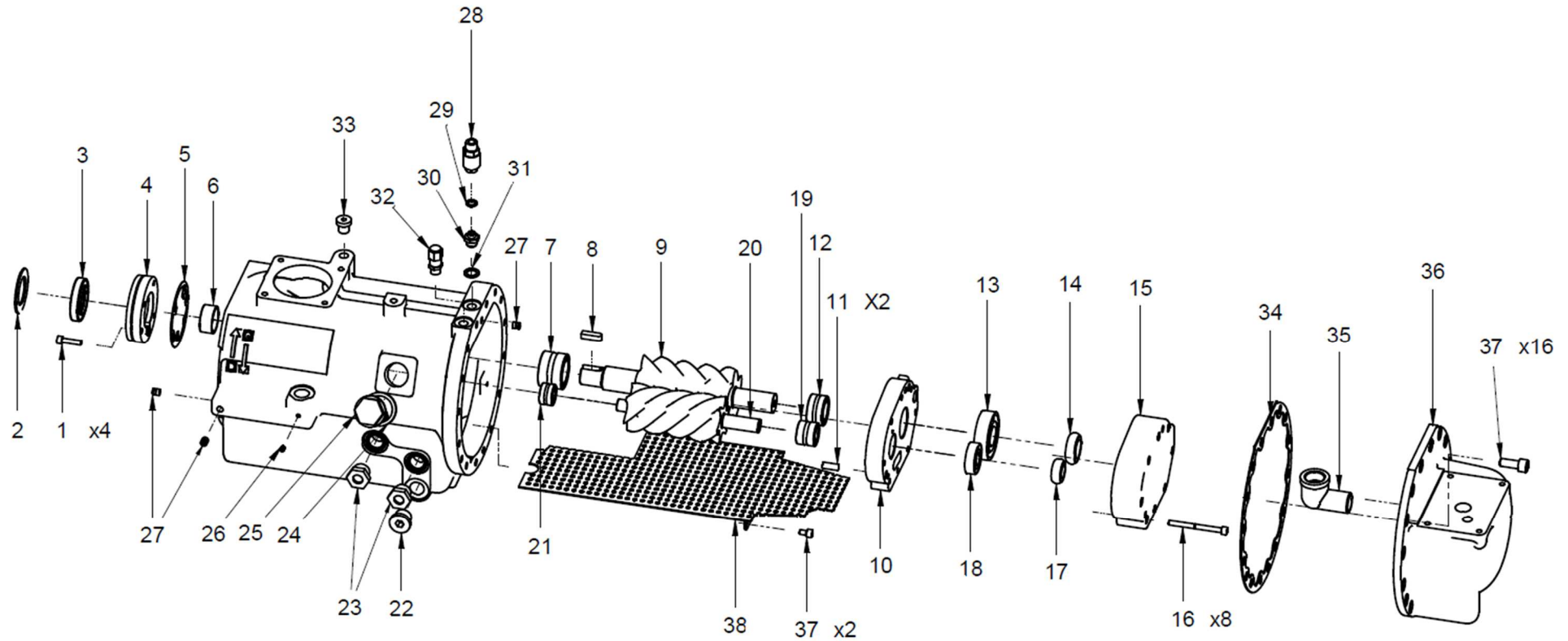


Fig. 5-9 Assembly of discharge cover and discharge casing, of ring nuts and of rotor



10. Bearings overhaul

Tools and Expendable materials

- (1) Standard equipment.
- (2) SKF heating ring.
- (3) SKF percussion tool.
- (4) Extractor of bearings from SKF housings.
- (5) Electric plate.
- (6) Special tool n. 3.
- (7) Dynamometric key.
- (8) Loctite 573.
- (9) Solvent
- (10) Bearings - seal
- (11) 2 M10 x 80 screws
- (12) Heatless glove
- (13) Special tool 4
- (14) Oven

Refer to figure 5-11.

a. Disassembly

11.1 Unscrew and remove screws (37).

11.2 Remove cover (36) and gasket (34) from compressor casing.

11.3 Unscrew and remove screws (16).

11.4 Remove internal cover (15) and discharge casing (10) with the rotors on using two M10x80 screws as extractors. During this operation extreme attention must be paid in order not to damage the rotors (9 and 20).

11.5 Remove thrust collars (14 and 17). To perform the aforesaid operation one of the following methods can be adopted:

(1) Use a press

- Position the discharge casing with the rotors onto a support suitable to the purpose under the press.
- Then operate the same press letting it work on the end of the rotor shaft. Its action will allow the rotor withdrawing. The operator must be ready to catch the same rotor, thereby avoiding the damage thereof during the withdrawing.



(2) Destroy the collars

- In this case, the same collars are incised with the utmost care one at the time, until, due to the state of internal tension, the collar yields/fails. This operation is very delicate, as the rotor end could be damaged.

11.6 Remove bearings (13 and 18).

11.7 Remove rotors (9 and 20) from discharge casing (10).

11.8 Remove inner ring of journal bearings (12, 19, 21 and 7) from rotors (9 and 20) To perform the operation, the inner ring is first heated using the heating ring suitable to the purpose and then withdrawn. As an alternative, destroy the inner rings following the procedure as in 9.5.

b. Checks

Check all the particulars.

The rotors should not show any anomaly. They must be replaced if dents, scores, seizures are noticed, or if the bearing housings are worn out.

Pay special care to the housing of the thrust collars (14) and (17). Such housings must be in perfect conditions (absence of wear traces, ovalization, etc.) and possess as minimum diameter:

Ø 24.99 for the male rotor.

Ø 16.99 for the female rotor.

The compressor casing and the discharge casing (10) must be replaced if symptoms of seizure are detected (pay special attention to the pressurized side).

When performing the compressor disassembly always replace the following parts:

- bearings (12, 19, 21 and 7).
- thrust collars (14) and (17).

Clean thoroughly the metallic parts with a solvent.

Blow air on the parts in a thorough way.

c. Assembly

11.9 Heat the inner rings of bearings (12 and 7) on the plate at a temperature in the range 100°C-110°C, then assemble the aforesaid rings on the ends of rotor (9), driving them to beat.



- 11.10 Heat the inner rings of bearings (21 and 19) on the plate at a temperature in the range 100°C-110°C, then assemble the aforesaid rings on the ends of rotor (20), driving them to beat.
- 11.11 Assemble outer rings of the bearings (12) and (19) on the discharge casing using the percussion tools provided for the purpose, paying special attention in that they are subject to the inner plane by 0,1mm (rotors side) of the same discharge casing.
- 11.12 Assemble outer rings of bearings (21) and (7), on the compressor casing, using the percussion tools provided for the purpose, paying special attention in that they are subject to the inner plane by 0,1mm (rotors side) of the same casing.
- 11.13 Insert rotors (9) and (20) in the discharge casing (10).
- 11.14 Place the group rotors (9 and 20) – discharge casing (10) on the special tool N°3 and bring the rotors to beat on the discharge casing tightening the thrust screws of the special tool.
- 11.15 Assemble thrust bearings (13) and (18) with the percussion tool suitable to the purpose, making sure they beat on the discharge casing (10).
- 11.16 Heat thrust collars (14) and (17) in the oven at a temperature 340°C (17) and 280°C (14).
- 11.17 Assemble thrust collars (14) and (17), pushing them against bearings (13) and (18) with a force of about 30 N until the collars cool down and lock (30-40 seconds).
- 11.18 Release the thrust screws of the special tool N°3 and check with the thickness gauges the clearance between rotors (9 and 20) and discharge casing (10). The clearance must be between 0,02 and 0,03mm.
- 11.19 Ensure that pins (11) are correctly positioned.
- 11.20 Strew with Loctite 573 sealer the plane of contact of compressor casing with discharge casing (10), making sure of following the seats of the screws.
- 11.21 Strew with Loctite 573 sealer the plane of contact of internal cover (15) with discharge casing (10), making sure of following the seats of the screws.
- 11.22 Insert subset rotors-discharge casing in compressor casing.
- 11.23 Position internal cover (15) beating on discharge casing (10).



- 11.24 Tighten screws (16) with a driving torque of 12 Nm.
- 11.25 Position gasket (34) between cover (36) and compressor casing.
- 11.26 Position cover (36) beating on compressor casing.
- 11.27 Tighten screws (37) with a driving torque of 59 Nm.

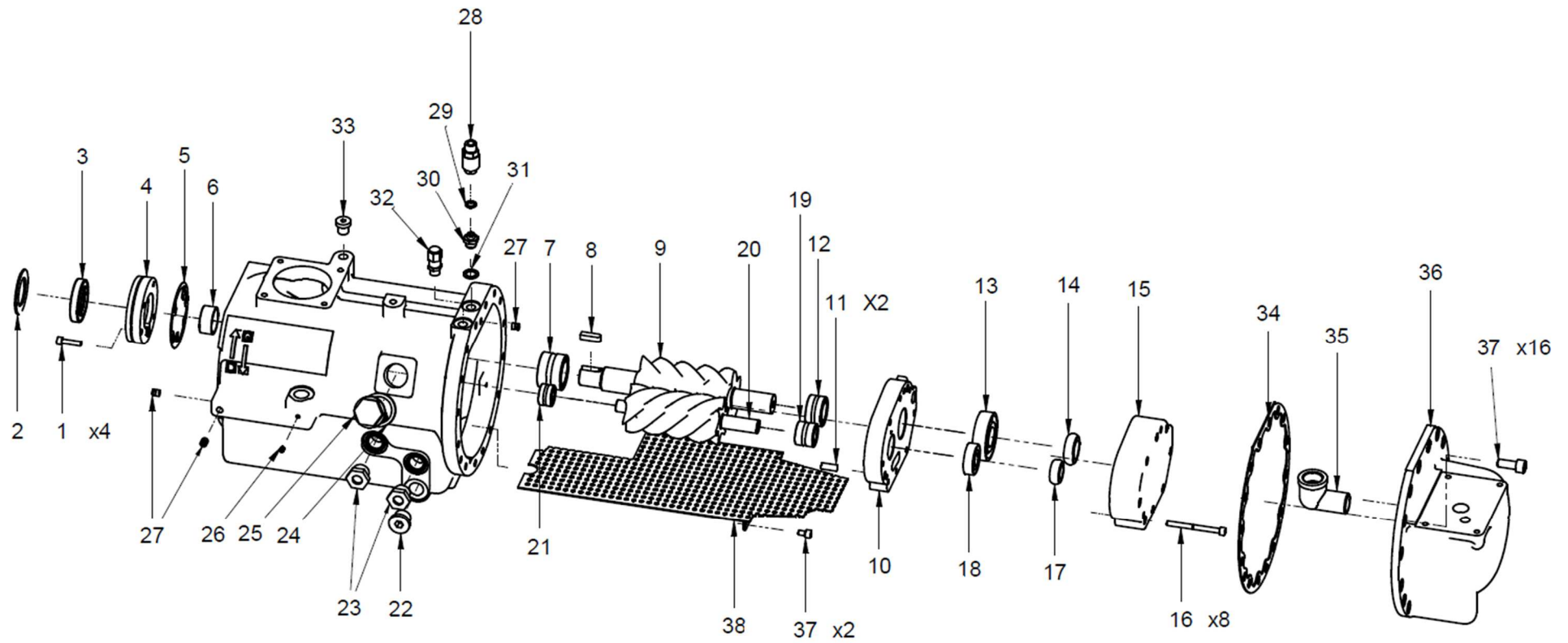


Fig. 5-11 Bearings disassembly



5.3. Lubricants

The use of a mineral lubricant having additives conferring antirust, antioxidant, anti wear characteristics and having antifoam properties is recommended.

The selection of the degree of viscosity depends on the conditions of use, and in general reference can be made to the data reported in table 5-3.

Warning! *Observe the directions for use and strictly observe the safety instructions of the maker in the lubricants application.*

Warning! *When contacting air, many lubricants produce aggressive fumes, and may irritate the skin and the eyes. In case of contact, read and observe the directions reported on the container.*

Table 5-3 Grade of viscosity

Temperature	Grade of viscosity
0° - 30° C	ISO VG 46
constantly below 0	ISO VG 32
constantly above 30° C	ISO VG 68

**a. Mineral oils**

The use of one of the following mineral oils reported in table 5-4 is recommended.

Table 5-4 Mineral oils

Type	ISO rating	Viscosity Index
SHELL COMPTELLA 46	46	100
AGIP DICREA 32	32	102
AGIP DICREA 46	46	99
AGIP DICREA 68	68	100
IP VERETUM 32	32	102
IP VERETUM 46	46	100
IP VERETUM 68	68	100
CASTROL 943 AW 32	32	105
CASTROL 943 AW 46	46	105
CASTROL 943 AW 68	68	105
MOBIL RARUS 424	32	109
MOBIL RARUS 425	46	100

Warning!

The first oil change must be performed after no more than 50 hours of operation. The successive changes must be performed every year or every 3000 hours of operation.

**b. Synthetic oils**

Alternatively to the mineral oils, synthetic oils can be used as well, capable of prolonging the time between oil changes and the working life of the various components (filters etc..). The list is reported in table 5-5.

Table 5-5 Synthetic oils

Type	ISO rating	Viscosity Index
CASTROL TRIBOL 1550/32	32	125
CASTROL TRIBOL 1550/46	46	130
CASTROL TRIBOL 1550/68	68	135
MOBIL RARUS SHC 1025	46	131



5.4. Painting

The areas of the compressor where the paint is damaged must be repaired to prevent further decay.




The areas to paint must be clean, dry and free of rust. If the rust is already present it will be necessary to perform a sanding of the area at issue and an integral cleaning thereof before applying the paint in accordance with the following directions.

ELECTROSTATIC PAINTING

This is carried out by means of suitable equipment that permits atomization of the paint product and brings the particles to a high electric potentiality by means of a high voltage source.

These particles are attracted by means of the electrostatic field of the surface to be painted that has a charge that is opposite to that of the particles.

Main features of this method are:

-  a complete coating effect;
-  a good distribution of the product;
-  limited product loss.



5.5. Cleaning and Storage

It is important that the compressor be kept free of dirt, so as to reduce risks of malfunctioning.

The cleaning of the outer parts must be performed with water, but special attention should be paid to the use of cleaning devices employing high pressure or steam, especially in the housings of the electrical components (motor).

To remove grease use Varsol or the like.

After the cleaning operations the compressor needs to be dried.

If the compressor should be kept stored it is necessary to periodically rotate the shaft (every three months) adding 0,2 – 0,5 dm³ of oil.

The compressor should be stored in a dry room and it is necessary to apply protective materials on external surfaces after the first three months.



6. SPECIAL TOOLS

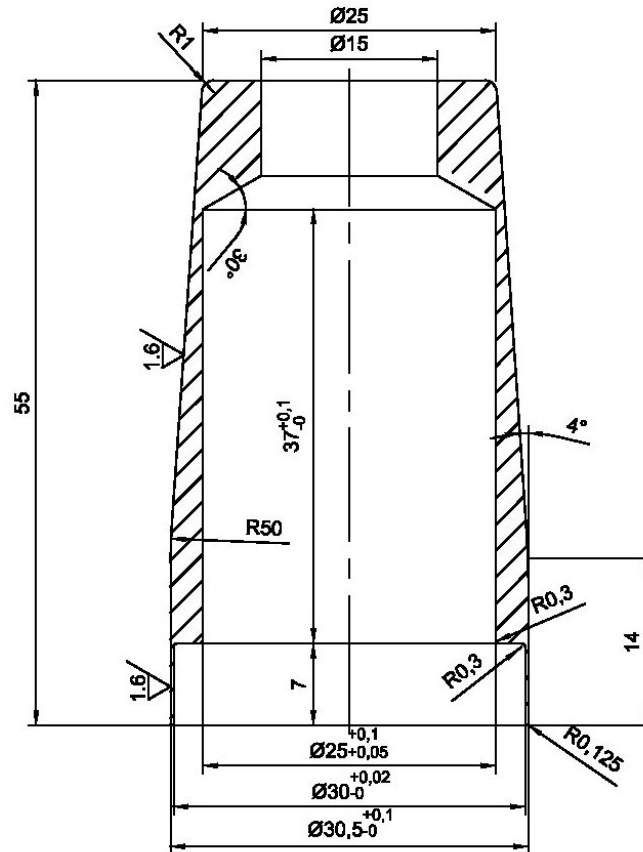
6.1. Introduction

This section contains all the special tools needed for the disassembly, the assembly and the adjustments.



6.1.1. Tool for the seal ring (cone) assembling (N°1)

The special tool n. 1 is used to assemble the seal ring. The tool is applied on the protrusion of the male rotor.



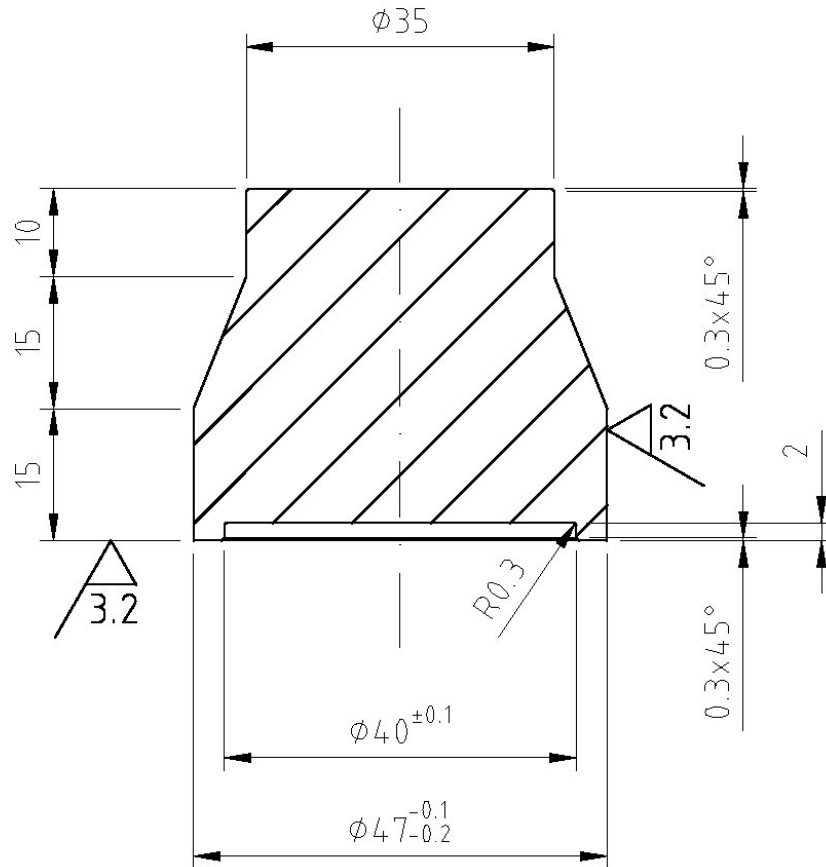
Dwg. No. ATA08G0003

Fig. 6-1 Special tool N°1



6.1.2. Tool for seal ring on the seal cover assembly (N° 2)

The special tool n. 2 is used to assemble the seal ring on the seal cover.



MATERIAL : C45

DWG. No. ATA08G0004

Fig. 6-2 Special tool N° 2



6.1.3. Tool for the rotors assembling (N°3)

The special tool n. 3 is used to assemble the rotors.

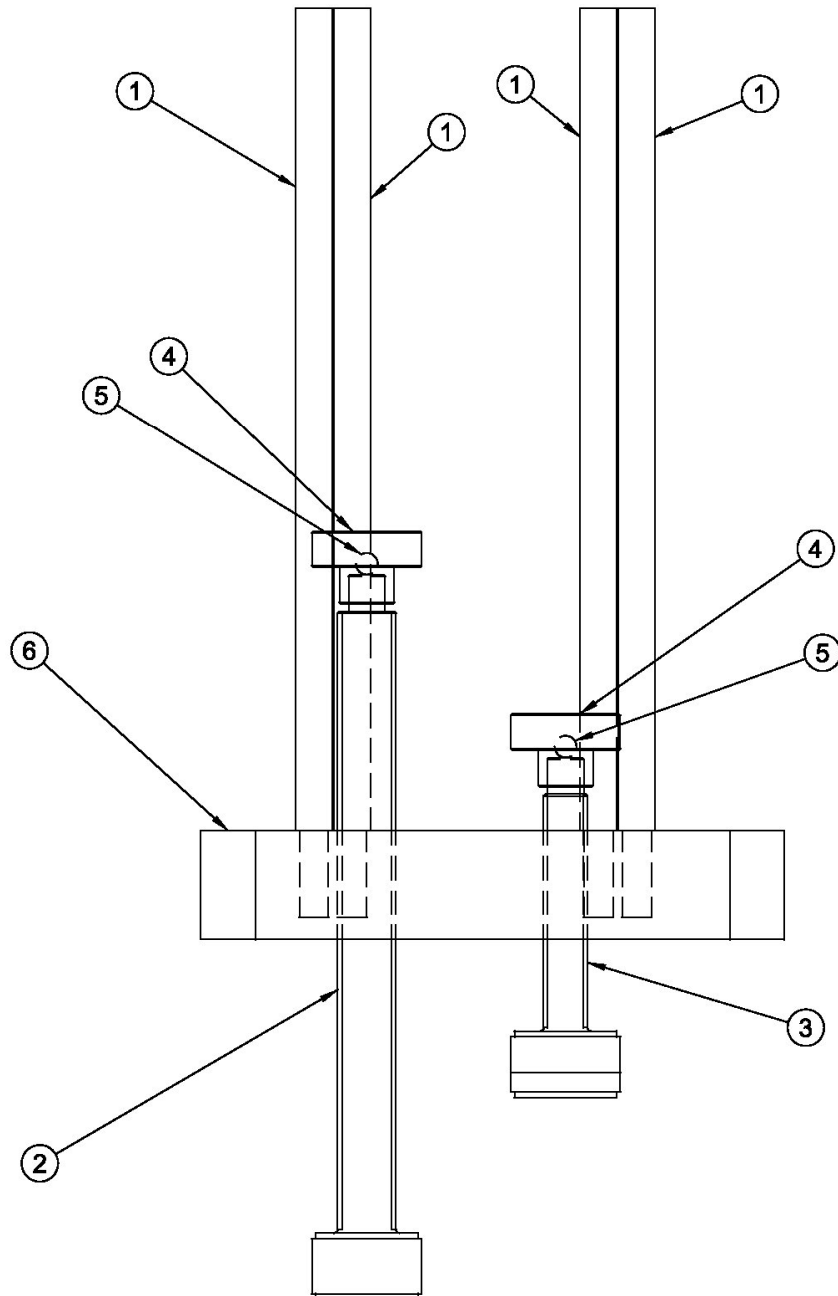


Fig. 6-3 Special tool N°3

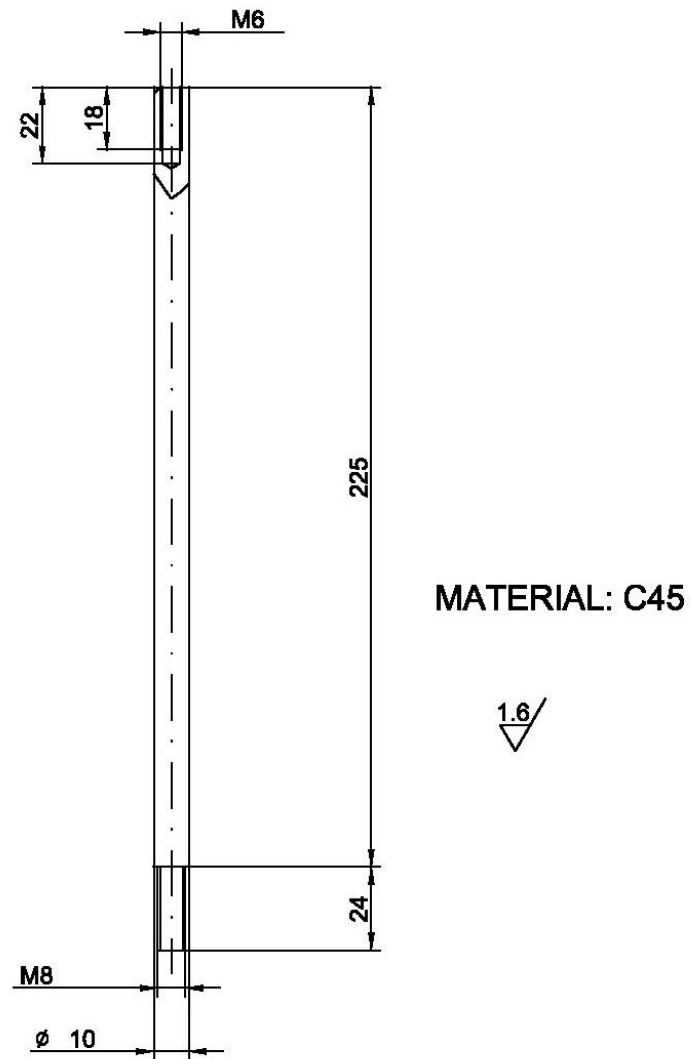


Fig. 6-4 Special tool N°3 (part 1, n. 4Pz)

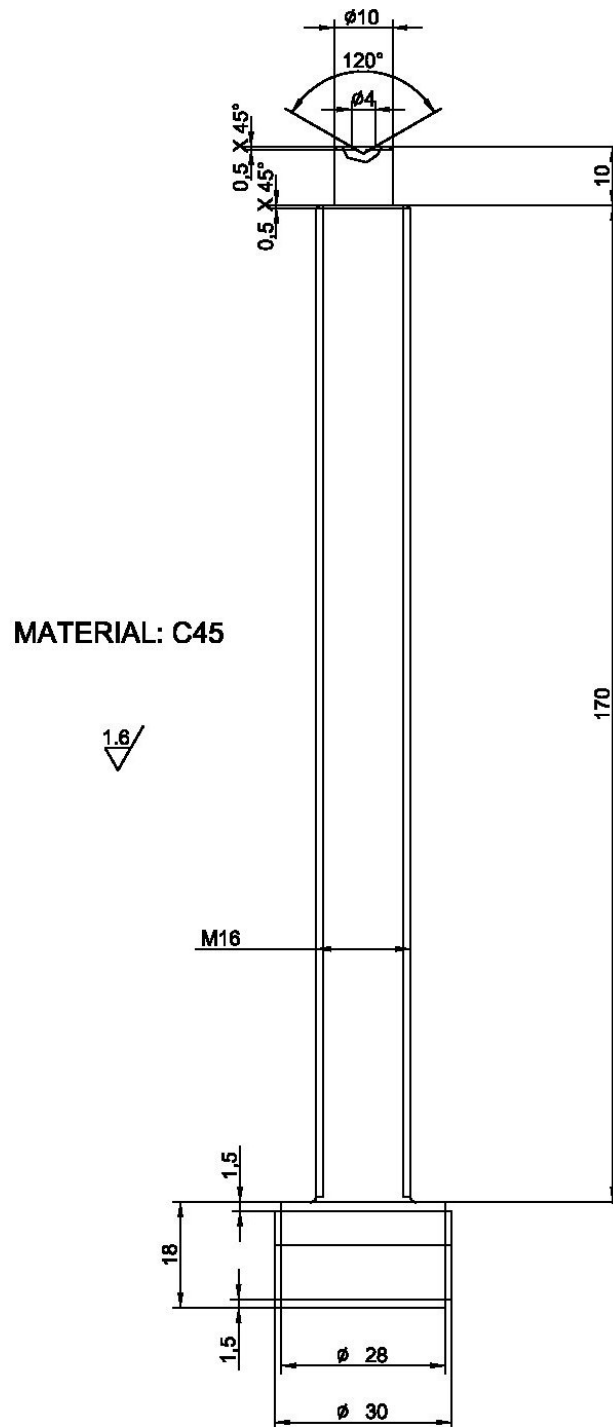


Fig. 6-5 Special tool N°3 (part 2, n. 1Pz)

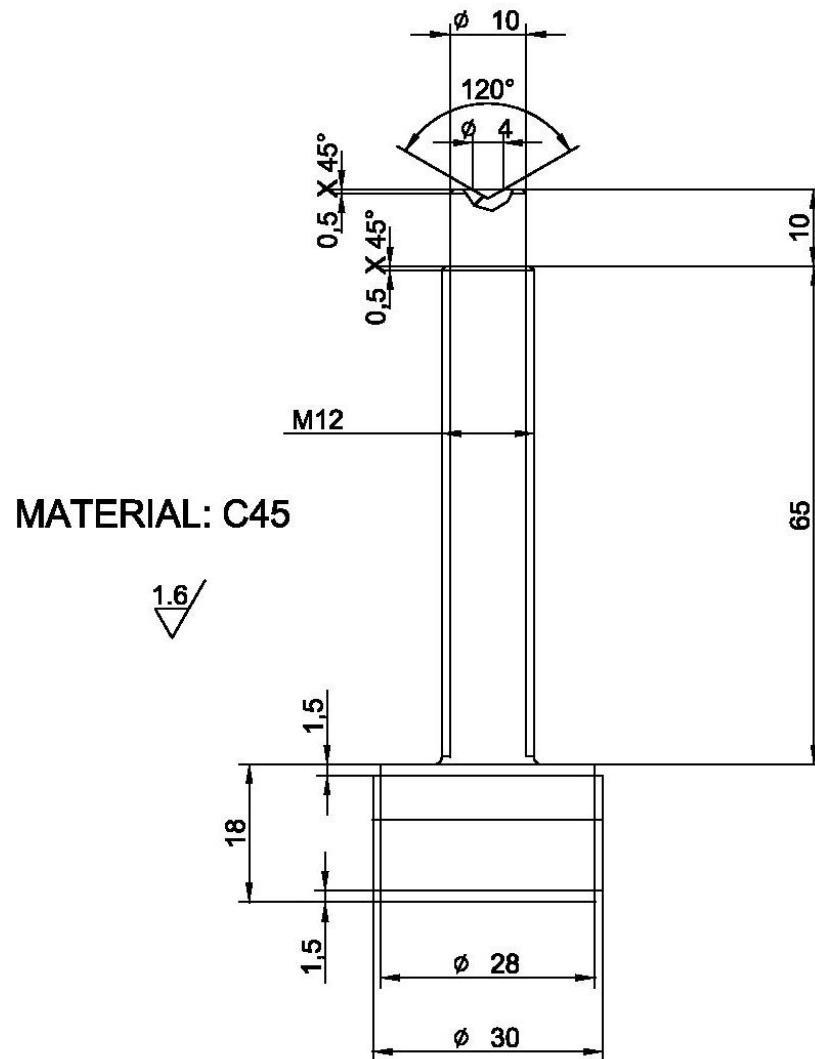


Fig. 6-6 Special tool N°3 (part 3, n. 1Pz)

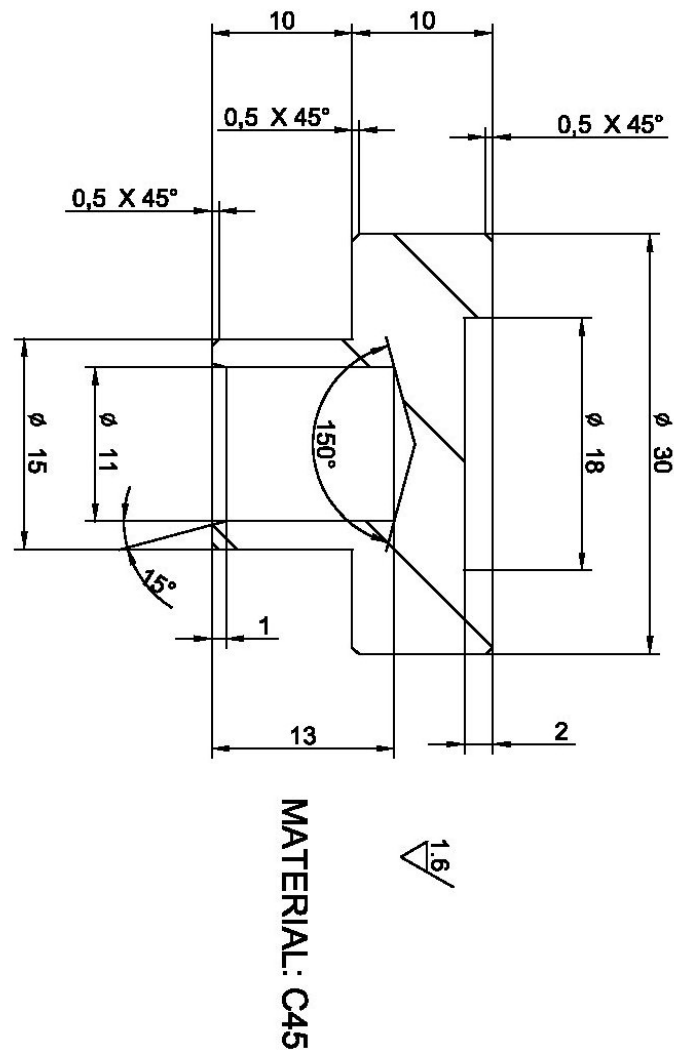


Fig. 6-7 Special tool N°3 (part 4, n. 2Pz)

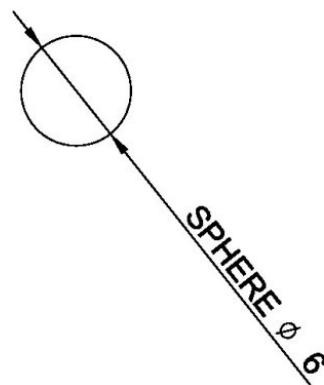


Fig. 6-8 Special tool N°3 (part 5, n. 2Pz)

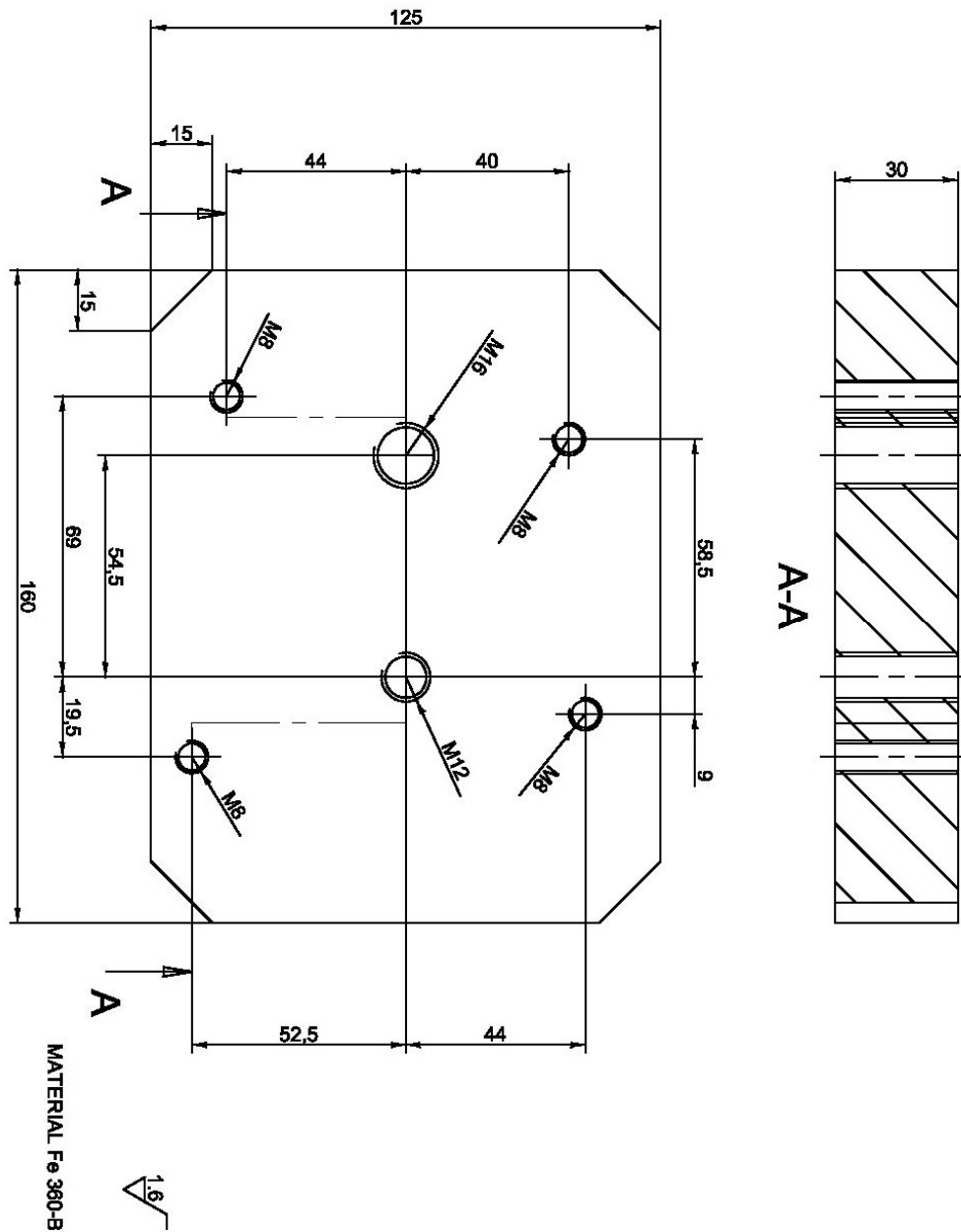


Fig. 6-9 Special tool N°3 (part 6, n. 1Pz)