

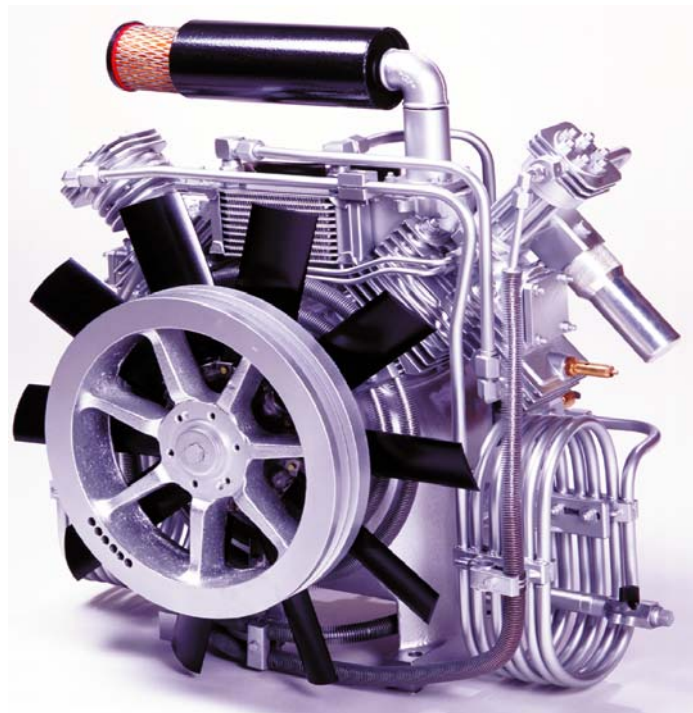


**CompAir**

CompAir UK Ltd



# ***OPERATOR MANUAL*** ***for a*** **5407.3.IAH** **AIR COOLED AIR COMPRESSOR**



In any correspondence please quote;

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# 5407.3.IAH OPERATOR HANDBOOK

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## 1 SAFETY

### 5000 SERIES COMPRESSORS



The use of replacement parts or lubricating oils not supplied, recommended or approved by **CompAir UK Ltd Ipswich**, or the failure to maintain this equipment in accordance with the maintenance instructions, may invalidate the WARRANTY, cause equipment failure, create unsafe or hazardous conditions or result in damage to the equipment.

**CompAir UK Ltd Ipswich** cannot accept responsibility for damage, injury or failure caused by these situations.

**USE ONLY**



**CompAir UK Ltd Ipswich**

**GENUINE PARTS  
AND  
AUTHORISED SERVICE AGENTS**

## 1.1 OWNERSHIP DATA

### TECHNICAL DATA

It is recommended that details taken from the compressor and motor nameplates are recorded below.

|                                                                                   |                        |                                                                                                    |     |
|-----------------------------------------------------------------------------------|------------------------|----------------------------------------------------------------------------------------------------|-----|
|  |                        | Compair UK Ltd<br>Reavell House, White House Road<br>Ipswich, Suffolk<br>IP1 5PB<br>United Kingdom |     |
|  | Sales Order N°         |                                                                                                    |     |
| Machine Type                                                                      |                        | Serial N°                                                                                          |     |
|                                                                                   |                        | Year of Manufacture                                                                                |     |
| Weight                                                                            | kgs                    | Maximum Pressure                                                                                   | bar |
| When Applicable Notified                                                          | Motor Shaft Power      | kW                                                                                                 |     |
| Body Ref. Number 0038                                                             | Compressor Shaft Speed | rpm                                                                                                |     |

### CompAir UK Ltd Ipswich CONTACT DETAILS

|                                                                                                     |                                                                        |
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| Address:<br>CompAir UK Ltd<br>Reavell House<br>53-56 White House Road<br>Ipswich IP1 5PB<br>ENGLAND | Notes:                                                                 |
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**For any comments or queries about the contents of this manual, please write to CompAir UK Ltd. at the above address, marked for the attention of Mr. Owen Dale, Technical Author.**

## 1.2 FOREWORD

### SPECIAL ATTENTION

The **STANDARD BUILD** of all CompAir UK Ltd (Ipswich Operations) products are not intended for use in either Explosive or Potentially Explosive Atmospheres as defined in Directive 95/9/EC.

An Explosive atmosphere is a mixture with air, under atmospheric conditions, of flammable gases, vapours, hazes or dusts in which, after ignition has occurred, combination propagates to the entire unburned mixture and may cause a hazard.

**A Potential Explosive atmosphere is an atmosphere, which could become explosive due to local conditions.**

CompAir UK Ltd Ipswich H5000 Series compressors are designed and manufactured to give optimum performance, with long life and reliability.

This Manual will help you to obtain the best performance from your compressor. It provides the information required to install, commission and operate the compressor and carry out regular maintenance schedules, which will ensure the maximum satisfactory service life.

Included within the Manual is a comprehensive Parts List to allow the user to order spare parts for servicing.

Servicing facilities and the supply of genuine replacement parts are provided through a world-wide network of CompAir companies and CompAir UK Ltd. distributors, backed by the **Service tel+44 (0)1473 242097 and Parts department tel (+44 (0) 1473 242000) Fax (+44 (0) 1473 743468 and Sales (+44 (0) 1473 242000 Fax (+44 (0) 1473 743482 at CompAir UK Ltd., Ipswich (UK)**

The information in this Manual was correct at the time of printing but modifications to parts and procedures may be made without notice which could affect the servicing requirements of the compressor. Before any servicing or maintenance work is undertaken the user is advised to contact the local CompAir Company or CompAir UK Ltd Distributor for revised or up-dated information.

**In any communication concerning the compressor it is essential to quote the MODEL, SERIAL No. and any CONTRACT Ref.**

It is important this Manual is retained with the compressor for reference and should remain with the compressor if it is sold or transferred to another user. Ensure that the new user is made fully aware of the need to study the Safety Section and any Warnings for safe operation given throughout the text.

Protect the environment by using only approved method of disposal of condensates lubricating oil etc.

- Please note:**
- a. Throughout the Manual all pressures quoted are gauge pressures.
  - b. Whilst recyclable materials are used as far as possible, please ensure when disposing of condensate, spent oil, used filter elements and any discarded parts or waste material of any kind make sure that there is no pollution to any natural water-course, drain system and that no burning waste takes place which could cause pollution of the atmosphere.

### 1.3 CAUTION

Use only **CompAir UK Ltd Ipswich Genuine Parts** when carrying out routine maintenance or repair. The use of replacement parts or lubricating oils not supplied or recommended by **CompAir UK Ltd Ipswich** can lead to expensive failures, which will not be covered by warranty.

Substitution of parts not manufactured or approved by CompAir UK Ltd Ipswich can create a potential personnel hazard.

**This is a High Pressure Compressor, for safe and reliable operation use only genuine CompAir UK Ltd Ipswich Parts**

To ensure continued trouble free operation it is important that periodic servicing is carried out in accordance with the information given in this manual - refer to the "Maintenance Section".

Conditions of CompAir UK Ltd Ipswich warranty are stated in our Conditions of Sale. Details of warranty for a particular unit may be obtained from the local CompAir Company or authorised Distributor.

### 1.4 SAFETY PROCEDURES

- **WARRANTY**  
The Conditions of the CompAir UK Ltd Ipswich Warranty are set out in the Standard Conditions of Sale.
- **MAINTENANCE**  
To ensure continued trouble free operation of the compressor it is important that periodic maintenance and servicing are carried out in accordance with the information given in the "Maintenance" section of this Manual. If any replacement or repair is needed use genuine CompAir UK Ltd Ipswich parts.
- \* **WARNING**  
***The use of replacement parts or lubricating oils not supplied or approved by CompAir UK Ltd Ipswich may lead to failures in service which would not be covered by warranty.***

Any unauthorised modifications or failure to maintain this equipment in accordance with maintenance instructions may make it unsafe. ***The use of replacement parts not supplied by CompAir UK Ltd Ipswich may create hazardous conditions over which CompAir UK Ltd Ipswich has no control.***

Such hazardous conditions may lead to accidents that can be life threatening, cause substantial bodily injury or result in damage to the equipment. ***CompAir UK Ltd Ipswich can bear no responsibility for equipment for which unapproved replacement parts are included.***

### SPECIAL NOTE:

**THE FOLLOWING HEALTH AND SAFETY PRECAUTIONS MUST BE READ IN CONJUNCTION WITH ANY OTHER MANUFACTURERS EQUIPMENT SUPPLIED.**

### 1.4.1 GENERAL

*CompAir UK Ltd Ipswich compressor safety relates to the document BS EN1012-1 Compressors and Vacuum Pumps - Safety requirements and the UK Pressure Systems Health & Safety Regulations S.I. No. 128.*

- Most accidents which occur during the operation and maintenance of machinery result of failure to observe basic safety rules or precautions. Recognising a situation that is potentially hazardous can often prevent an accident.
- When handling, operating or carrying out maintenance on the unit, personnel must observe safe engineering practices and all relevant local regulations. The attention of users is drawn to the Health and Safety at Work Act 1974, and the regulations of the Institution of Electrical Engineers.
- CompAir UK Ltd cannot anticipate every possible circumstance, which might represent a potential hazard. The WARNINGS in this manual are therefore not all inclusive. If the user employs an operating procedure, an item of equipment or a method of working which is not specifically recommended by CompAir UK Ltd then they must ensure that the unit will not be damaged or made unsafe and that there is no risk to persons or property.
- Failure to observe these precautions given under "Safety Precautions" may be considered dangerous practice or misuse of the compressor
- Read and understand all WARNINGS, CAUTION AND MANDATORY LABELS on the unit before operating or carrying out maintenance or servicing.

### 1.4.2 WARNINGS, CAUTIONS & NOTES

*The following details for this Safety Section relate to ESSENTIAL SAFETY REQUIREMENTS referred to in Machinery Directive 89/392/EEC, Amended 91/286/EEC.*



- \* Warnings call for attention to operating procedures involving specific hazards which could cause injury or death and are identified by the following



RISK OF DANGER



RISK OF HIGH PRESSURE



RISK OF GAS EXHAUST



RISK OF ELECTRIC SHOCK



RISK OF HOT SURFACE



CONSULT MANUAL

### 1.4.3 GENERAL SAFETY PRECAUTIONS

- When using cleaning solvents, local Health and Safety Regulations must be complied with. Provide good ventilation and use suitable protection such as a breathing filter mask, safety glass, protective apron and gloves.
- Safety footwear should be compulsory in all workshops. Safety helmets must be worn if there is any risk of falling objects.
- If using compressed air for cleaning purposes, ensure safety regulations are complied with and appropriate clothing worn.
- Never direct compressed air onto your skin or at other people. Never use compressed air to clean loose dirt from clothing.
- Before releasing compressed air through a hose make sure the free end is held securely so that it cannot whip and cause injury.
- Avoid injury by using a hoist to lift heavy loads. Check that all chains, hooks, shackles and slings are in good condition and are of the correct capacity. They must be tested and approved according to local safety regulations.
- Cables, chains or ropes should never be applied to lifting eyes. Always use an appropriate shackle or hook, properly positioned. Arrange lifting cables so that there are no sharp bends. Use a spreader bar to avoid side loads on hooks, eyes and shackles and never leave a heavy load unattended.
- When a load is on a hoist stay clear of the danger area beneath and around it. Keep lifting acceleration and speed within safe limits.

### 1.4.4 INSTALLATION PRECAUTIONS

- Competent personnel under a qualified supervisor must only carry out installation work.
- A fused isolator switch must be fitted between the main power supply and the compressor.
- Precautions must be taken to ensure that no injury is caused to passers-by through loose clothing being sucked into compressor intake.
- Ensure that the discharge pipe from the compressor to the user pipework, receiver or storage is free to expand and that no flammable material is within the vicinity. If any such material is close-by take steps to preclude ignition.
- A manual shut-off valve should be fitted in the discharge line to allow the compressor to be isolated. Non return valves cannot be relied upon for isolating parts from a pressure system. A safety valve must be installed between any compressor unit and the isolating valve.
- A pressure-relieving device must be fitted to every pressure vessel, or equipment containing air or gas above atmospheric pressure. Never remove or tamper with safety devices, guards or insulation fitted. In order to limit the risk of Legionnaires Disease, CompAir UK LTD advise caution with the use of cooling towers for water cooling the compressor. Closed circuit or direct mains cooling is preferred.
- Pipework or other parts with a surface temperature above 70°C, which may be accidentally touched in normal operation, must be guarded or insulated. Other high temperature pipework should be clearly marked and all pipework should be clearly marked.

### 1.4.5 OPERATIONAL PRECAUTIONS

- Competent personnel under a qualified supervisor must only operate the compressor.
- *Do not operate compressor with any removable inspection cover removed e.g. crankcase doors, valve covers etc.*
- Never remove or tamper with safety devices, guards or insulation materials.
- The compressor must only be operated at the supply voltage and frequency for which it is designed. Always isolate power before maintenance or servicing.
- When mains power is ON, lethal voltages are present in the electrical circuits and extreme caution is need when essential work is carried out on the electrical system. **ALWAYS CONSULT A QUALIFIED ELECTRICIAN BEFORE ANY SUCH ESSENTIAL WORK.**

- Do not open starter compartment to touch electrical components while voltage is applied unless it is necessary for measurement, test or adjustment. Such work should always be carried out by a qualified Electrician with appropriate tools and protection against an electrical hazard.
- If the unit is equipped with a Remote Control device, attach warning notices stating **"THIS UNIT CAN BE STARTED REMOTELY"** in prominent locations, one on the outside of the unit, the other inside the control compartment.
- As a further safeguard, take adequate precautions that no one is working or checking the unit before attempting to switch on remotely controlled equipment. Attach a **"CHECK THAT ALL PERSONNEL ARE CLEAR OF UNIT BEFORE STARTING"** or similar notice.
- Compressed air and gas piping, together with cooling water piping and other parts, with surface temperature greater than 70°C and may be accidentally touched, should be guarded or insulated.
- If there is any indication that the compressor is overheating it must be shutdown. (A high air or gas temperature switch is fitted as standard to guard against operating with excessive temperature). Beware of burns from hot oil and water when working on a unit recently shutdown.
- Do not operate the unit when guards provided for protection for all rotating and reciprocating parts have been removed for essential maintenance. Secure guards following any servicing or repair.
- Local noise regulations must be observed. Ear defenders are suggested by Noise at Work Regulations 1989 when the level is greater than 85 dB A at one meter. Be aware high noise levels can interfere with communication.

#### 1.4.6 MAINTENANCE & REPAIR PRECAUTIONS

- Competent persons under qualified supervisor must carry out maintenance repair and modifications.
- The compressor will have a preserving oil applied to interior surfaces (Oil lubricated models). Oil free models will have desiccant bags in valve covers and distance pieces.
- Handling components such as seals, gaskets and diaphragms should not present a personnel hazard. Preservation oils again should not present a personnel hazard if handled under normal handling practices.
- Whilst compressors are asbestos free, treat all damaged gaskets as asbestos - when the Asbestos at work regulations apply.
- Viton 'O' seals under normal operating conditions are safe.
- However, should there be a fire within the compressor or these seals are likely to exceed a temperature of 300°C the material will decompose.

• **Degraded Viton gives off Hydrogen Fluoride fumes and if in contact with the skin an acid formed causes severe burns.**

- If Viton seals appear charred or gummy do not touch with unprotected hands: use neoprene or PVC gloves.
- Wash the area with limewater and avoid breathing any fumes. If contamination of the skin occurs washes with limewater and seeks medical advice.

#### Pre-Maintenance Operation

- Isolate the compressor from the main electrical supply. Lock the isolator in the OFF position and remove fuses.
- Attach a label **"WORK IN PROGRESS - DO NOT APPLY VOLTAGE"**.
- Close the isolating valve between the compression unit and user's pipework. Close the isolating valve in the cooling water inlet pipe. Attach a label **"WORK IN PROGRESS - DO NOT OPEN"**.
- Check that all pressurised gas trapped in the system is released to atmosphere or safely to gas storage. Check that all pressure gauges register zero.
- Ensure that the cooling water system has been drained.
- Check that the drain valve on the delivery manifold is clear and gas pressure has been released.
- Check that all interstage drains are open to ensure any gas trapped between stages has been released.

- Stand clear of all valve covers when removing the securing screws.
- When removing valve covers for valve replacement, ensure a minimum of two threads is left engaged on the valve cover securing screws. Lever the valve cover until the 'O' seal is disengaged from the port in the cylinder head. Remove the securing screws and take out valve cover.
- ***Use only lubricating oils and greases approved by CompAir UK LTD to avoid potential hazards especially the risk of explosion or fire and the possibility of decomposition or generation of hazardous gases.***
- Always clean oil spills from the surrounding floor before and after maintenance work.
- Make sure all instructions concerning operation and maintenance are strictly followed and that the complete unit, with all accessories and safety devices, is kept in good order.
- The accuracy of pressure gauges and temperature switches should be regularly checked at least 13 month intervals and thoroughly examined at least every 48 months. They must be renewed or service exchanged when acceptable tolerances are exceeded.
- Protection devices should be tested at each regular service interval and replaced or service exchanged if not functioning correctly. The maximum pressure for safety valves under fault conditions is 1.10 times the set pressure, the set pressure being a minimum of 1.05 times the maximum operating pressure to ensure seat tightness.
- Never use a light source with an open flame for inspection.
- Before dismantling any part of the compressor be sure that all heavy movable parts are secure.
- After completion of any maintenance or repair ensure that no tools, loose items or rags are left on or inside the compressor.
- Do not use any flammable liquid to clean valves, filter elements, cooler passages, pipe bores or any component carrying a flow of air or gas during normal operation. If chlorinated hydrocarbon substances are used for cleaning, safety precautions must be taken against toxic vapours, which may be released.

|                                         |
|-----------------------------------------|
| <b>DO NOT USE CARBON TETRACHLORIDE.</b> |
|-----------------------------------------|

- Precautions must be taken against using acids, alkalis and chemical detergents for cleaning machined parts. These materials cause irritation and are corrosive to the skin, eyes, nose and throat. Avoid splashes and wear suitable protective clothing and safety glasses. Do not breathe mists. Ensure water and soap is readily available.
- When disposing of condensate, old oil, used filter elements and other parts and waste material of any kind make sure that there is no pollution to any drain or natural water course and that no burning of waste takes place which could cause pollution of the atmosphere.
- Keep the compressor clean at all times.
- Protect components and exposed openings by covering with a clean cloth or tape during repair or maintenance work.
- Protect the motor, intake, electrical and regulation components against the entry of moisture e.g. steam cleaning.
- Precautions must be taken when carrying out welding or any repair operation which generates flames or sparks. The adjacent components must be screened with non-flammable material and if oil present, the system must first be cleansed thoroughly by steam cleaning.
- Condensate (oil and water mixture from compression process) must be regarded as trade effluent and is therefore not suitable for discharge into a surface water sewer, soakaway or watercourse.

|                                                                  |
|------------------------------------------------------------------|
| <b>PROTECT THE ENVIRONMENT USE APPROVED METHODS OF DISPOSAL.</b> |
|------------------------------------------------------------------|

#### 1.4.7 PRECAUTIONS IN THE EVENT OF FIRE

- Use extreme caution when handling components that have been subjected to fire or very high temperature. Some components may contain fluoroelastomer materials, which decompose under these conditions to form highly corrosive residues. Skin contact can cause painful and penetrating burns resulting in permanent skin and tissue damage.



## 2 AMENDMENTS

| ISSUE<br>No | REASON                                 | DATE      | PAGE<br>No |
|-------------|----------------------------------------|-----------|------------|
| 1           | NEW                                    | MAY 2004  | ALL        |
| 2           | SERVICE SCHEDULE UPDATED – REPAGINATED | SEPT 2009 | 31         |
| 3           |                                        |           |            |
| 4           |                                        |           |            |
| 5           |                                        |           |            |
| 6           |                                        |           |            |
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| 29          |                                        |           |            |
| 30          |                                        |           |            |



3 LOG SHEET

| COMPRESSOR LOG SHEET |      |             |               |                 |                           |   |   |                     |                           |                                   | REF NO: |
|----------------------|------|-------------|---------------|-----------------|---------------------------|---|---|---------------------|---------------------------|-----------------------------------|---------|
| COMPRESSOR           |      | PRIME MOVER |               | INSTALLED AT:   |                           |   |   |                     | OIL GRADE USED:           |                                   |         |
| TYPE:                |      | TYPE:       |               |                 |                           |   |   |                     | CHECK OIL LEVEL           |                                   |         |
| SPEED:               |      | POWER:      |               |                 |                           |   |   |                     | CHECK WATER IN/OUT TEMPS. |                                   |         |
| SERIAL NO            |      | DRIVE:      |               | DATE INSTALLED: |                           |   |   |                     | CHECK COOLING FAN BLADES  |                                   |         |
| DATE                 | TIME | HRS RUN     | STAGE TEMP °C | DELY TEMP °C    | STAGE PRESSURES BAR / PSI |   |   | DELY PRESS. BAR/PSI | SERVICE PLAN NUMBER       | REMARKS. SIGNED SEE OVER FOR MORE |         |
|                      |      | 50/100      |               |                 | 1                         | 2 | 3 | 4                   | 5                         |                                   |         |
|                      |      | 500         |               |                 |                           |   |   |                     |                           |                                   |         |
|                      |      | 1000        |               |                 |                           |   |   |                     |                           |                                   |         |
|                      |      | 1500        |               |                 |                           |   |   |                     |                           |                                   |         |
|                      |      | 2000        |               |                 |                           |   |   |                     |                           |                                   |         |
|                      |      | 2500        |               |                 |                           |   |   |                     |                           |                                   |         |
|                      |      | 3000        |               |                 |                           |   |   |                     |                           |                                   |         |
|                      |      | 3500        |               |                 |                           |   |   |                     |                           |                                   |         |
|                      |      | 4000        |               |                 |                           |   |   |                     |                           |                                   |         |
|                      |      | 4500        |               |                 |                           |   |   |                     |                           |                                   |         |
|                      |      | 5000        |               |                 |                           |   |   |                     |                           |                                   |         |
|                      |      | 5500        |               |                 |                           |   |   |                     |                           |                                   |         |
|                      |      | 6000        |               |                 |                           |   |   |                     |                           |                                   |         |
|                      |      | 6500        |               |                 |                           |   |   |                     |                           |                                   |         |
|                      |      | 7000        |               |                 |                           |   |   |                     |                           |                                   |         |
|                      |      | 7500        |               |                 |                           |   |   |                     |                           |                                   |         |
|                      |      | 8000        |               |                 |                           |   |   |                     |                           |                                   |         |
|                      |      | 8500        |               |                 |                           |   |   |                     |                           |                                   |         |
|                      |      | 9000        |               |                 |                           |   |   |                     |                           |                                   |         |
|                      |      | 9500        |               |                 |                           |   |   |                     |                           |                                   |         |
|                      |      | 10000       |               |                 |                           |   |   |                     |                           |                                   |         |
|                      |      | 10500       |               |                 |                           |   |   |                     |                           |                                   |         |
|                      |      | 11000       |               |                 |                           |   |   |                     |                           |                                   |         |
|                      |      | 11500       |               |                 |                           |   |   |                     |                           |                                   |         |
|                      |      | 12000       |               |                 |                           |   |   |                     |                           |                                   |         |
|                      |      | 12500       |               |                 |                           |   |   |                     |                           |                                   |         |

[illegible]

## **4 GENERAL DESCRIPTION AND OPERATION**

### **4.1 GENERAL**

This compressor is a high pressure, reciprocating 'V' configuration, four cylinder machine cooled by a large pulley driven variable pitch fan.

Air enters via the intake filter and passes to the first stage cylinder where it is compressed before passing through a heat exchanger to the second stage. On exit from the second stage it flows round a cooling system positioned in the fan airstream and then into a separator for condensate removal. On entering the third stage the air is further compressed before passing through the second cooling coil and condensate removal separator. Final compression takes place in the fourth stage before passing through a finned final cooling system.

### **4.2 RUNNING GEAR**

Main bearings are replaceable, but big end and small end bearings are renewable only as a connecting rod assembly.

### **4.3 VALVES**

First and second stage valves are separate flat plate units for suction and delivery duties whilst the third and fourth stage utilise integral cylinder head combined suction and delivery valve assemblies. All valves are easily accessible, for maintenance and replacement when required.

### **4.4 LUBRICATION**

A cam operated force feed oil pump feeds oil through an oil filter to the bottom of the final stage liner/plunger and then returns to the crankcase.

First, second and third stage cylinders, main, big and small end bearings are all oil mist lubricated. Lubricant returns to the sump for filtration and re-circulation. The specified lubricant must be used at all times to ensure safe and efficient operation with minimum wear and maximum protection against corrosion.

Recommendations are the result of extensive research at CompAir UK Ltd Ipswich Works and all responsibility for the use of any oil other than that recommended is placed on the purchaser and his oil company.

**THE NORMAL GUARANTEE MAY BE INVALIDATED SHOULD A FAILURE BE ATTRIBUTED BY COMPAIR UK LTD, IPSWICH TO THE USE OF A LUBRICANT NOT RECOMMENDED.**

### **4.5 GAUGES**

Pressure gauges may be fitted to this machine to monitor all stages, and final delivery pressure. A tapping in the oil filter body can be connected to a pressure gauge for monitoring oil pressure when required.



## 5 LEADING PARTICULARS

### 5.1 UNIT DESIGNATION

Belt driven, high pressure, air cooled compressor.

### 5.2 TECHNICAL DATA

5407.3.IAH ..... Type Four stage, four cylinder V configuration  
 Cooling ..... Fan activated air  
 Direction of rotation viewed from driving end..... Anti-clockwise  
 Type of valves ..... Single and combined, multi ported

### 5.3 STAGE PRESSURES

#### 5407.3.IAH

Maximum working pressure ..... 414 Bar  
 Minimum working pressure ..... 140 Bar

|                                  | Delivery (Bar) | 1st stage (Bar) | 2nd stage (Bar) | 3rd stage (Bar) |
|----------------------------------|----------------|-----------------|-----------------|-----------------|
| Stage pressures @ ..... 414..... | 4.3/4.8        | 20.0/22.1       | 81.4/90.0       |                 |
| Stage pressures @ ..... 350..... | 4.3/4.8        | 20.0/22.1       | 81.4/90.0       |                 |
| Stage pressures @ ..... 140..... | 4.1/4.6        | 18.7/20.8       | 61.2/69.6       |                 |

Inlet Pressure ..... 0.03 Bar g  
 Safety valve set pressure..... 1st stage ..... 5.86 Bar  
 ..... 2nd stage.. ..... 26.5 Bar  
 ..... 3rd stage... ..... 96.5 Bar  
 ..... Final stage supply..... +5-10%  
 Oil Pressure ..... 0.7 to 2.7 Bar g (warm)  
 Oil Pressure ..... 3 to 5 Bar g (cold)  
 Note:- If the oil pressure rises in excess of 7.5 bar g this could indicate a blocked filter.  
 (see page 12)

### 5.4 GENERAL

Cooling air flow rate (approx.) at 1800 rpm ..... 7000 m<sup>3</sup> / Hr  
 Noise level at 3 metres (approx.) ..... 87 dB (a)  
 First stage piston displacement ..... 39.6 m<sup>3</sup> / Hr

### 5.5 INCLINATION

Maximum permissible inclination of machine  
 In line with crankshaft ..... 20°  
 90° to crankshaft ..... 30°

### 5.6 DIMENSIONS

First stage cylinder bore..... 92mm  
 Second stage cylinder bore ..... 50mm  
 Third stage cylinder bore ..... 22mm  
 Fourth stage cylinder bore ..... 11mm  
 Stroke..... 56mm  
 Final delivery O/D pipe connection ..... 8mm  
 First stage suction connection ..... RP 1

**5.7 SPEEDS**

Maximum Compressor speed ..... 1800 rpm  
 Minimum Compressor speed ..... 900 rpm  
 Mean piston speed ..... 3.35 m/s

**5.8 TEMPERATURES**

Ambient and air inlet temperature ..... Min -10°C  
 ..... Max. 45°C

**NOTE** It is extremely difficult to accurately record air temperature by measuring the surface metal temperature, due to air flow from the fan cooling down the reading. However as a general guide, no metal surface temperature should exceed 160°C.

**5.9 LUBRICANTS**

Recommended oil - synthetic only..... Reavellite 'S' 0 to 45°C... Reavellite 'W' -15 to 10°C  
 Sump capacity..... 4.9 litres  
 Top Up from minimum..... 2.7 litres  
 Recommended grease (for assembly)..... Shell Alvania R3

**5.10 TORQUE SETTINGS****5.10.1 CLASS A - CRITICAL**

All figures  $\pm 5\%$

| ASSEMBLY                    | SIZE     | LBF/FT | NEWTON METRE<br>(Nm) |
|-----------------------------|----------|--------|----------------------|
| 1st stage valve cover       | M6       | 4      | 5.4                  |
| 1st stage valve             | M6       | 3      | 4                    |
| 2nd stage valve cover       | M6       | 4      | 5.4                  |
| 2nd stage valve             | M6       | 3      | 4                    |
| 3rd stage valve to cylinder | M8       | 12     | 16                   |
| 3rd stage valve             | M5       | 4.5    | 6                    |
| 4th stage valve to cylinder | M8       | 12     | 16                   |
| 4th stage valve             | M4       | 2.9    | 4                    |
| Flywheel                    | M10 LH   | 40     | 55                   |
| Oil pump cam                | M10 LH   | 40     | 55                   |
| Oil pump restrictor         | 1/8" BSP | 4      | 5.4                  |
| Balance weight              | M8       | 20     | 27                   |

**5.10.2 CLASS B - ADVISED**

All figures +5% - 15%

| ASSEMBLY            | SIZE | LBF/FT | NEWTON METRE<br>(Nm) |
|---------------------|------|--------|----------------------|
| All Other Fasteners | M6   | 6      | 8                    |
|                     | M8   | 15     | 20                   |
|                     | M10  | 30     | 40                   |
|                     | M12  | 52     | 71                   |

## **6 INSTALLATION**

### **6.1 GENERAL**

Compressor must be situated in a level, well ventilated position clear of fumes, heat or high humidity to ensure efficient performance and also to prevent over temperature problems. If sited in a large building there should be few problems, provided there is a reasonable air gap between the front and back of the compressor and any obstructions. If positioned in a small or confined building, clean cooling air must be directed or ducted towards the compressor fan ensuring that there is also no air flow short circuit. As all motor power is dissipated in heat to the cooling air, it is essential that expired cooling air has an unobstructed passage and exit. Another important factor is that all coolers should be maintained in a clean condition to attain maximum dissipation of compression heat.

Allow sufficient space around the installation to enable safe maintenance working conditions.

Suitable lifting equipment should be readily available.

Protection from severe weather conditions is desirable.

### **6.2 UNPACKING**

Unless the compressor set is delivered uncrated it is possible that certain components will be packed within the crate. To avoid the loss of any items please ensure that any such equipment is located and removed first.

After unpacking, fit any items which were loose and are now required for installation of the set.

### **6.3 HANDLING**

Before attempting to lift the set, ensure that suitable lifting equipment is available. When lifting by crane or hoist ensure that the lifting lugs are used. Check that the lifting tackle is held clear of any components such as switches and belt guard etc.

### **6.4 MOUNTING**

For permanent installation seating must be flat, level and designed to support the weight and any out of balance forces.

### **6.5 BELT DRIVE**

Anti-static banded belts must be used at all times.

Ensure that driving and driven pulley grooves are in line and shafts are parallel before and after fixing. Tensioning procedures follow normal practice. See 5.7 BELT ADJUSTMENT.

### **6.6 CONNECTIONS, PIPEWORK AND FITTINGS**

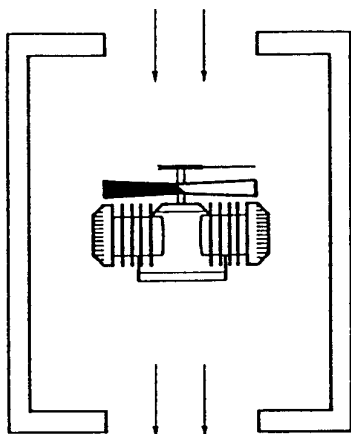
- 3.6.1 All piping and connections must be suitable for the pressures and capacities involved.
- 3.6.2 Ensure all port protection plugs and blanks are removed and that all pipes, especially suction piping are free from jointing compound, pipe scale, swarf, dirt or other foreign matter before final pipe assembly.
- 3.6.3 A suction filter must always be fitted to prevent damage and excessive wear.
- 3.6.4 Safety valves are fitted on all stages as standard equipment. However, safety valves must also be fitted to the receiver and pipework system to protect from excess pressure build up.

## 6.7 ELECTRICAL

The electrical connections to the set must always comply with any local regulations which are applicable, and be suitable for the loads involved. Wiring must be installed by an electrician competent to work with hazardous area stipulations.

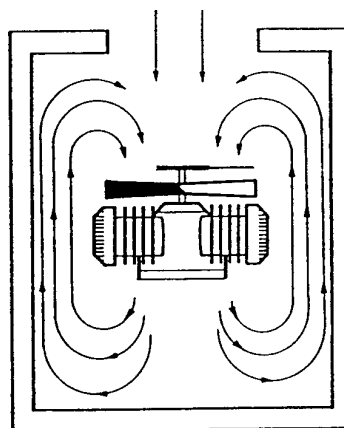
## 6.8 SITING REQUIREMENTS

(Diagrams not to scale)



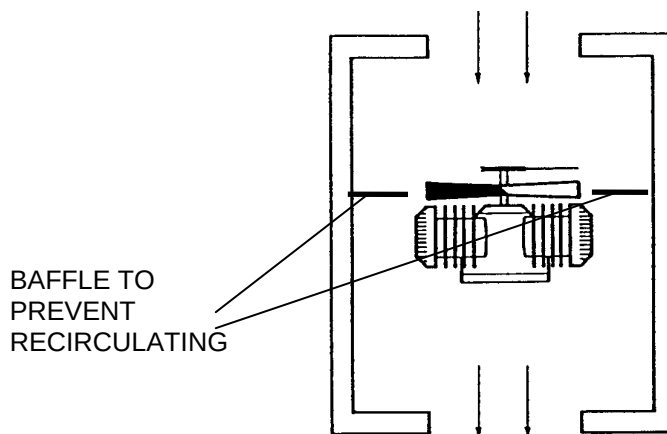
### RECOMMENDED INSTALLATION

COOLING AIR ENTERS, PASSES OVER MACHINE AND AS HEATED AIR, IT IS EXHAUSTED FROM THE MACHINE. ENVIRONMENT



### INCORRECT INSTALLATION

COOLING AIR ENTERS, PASSES OVER MACHINE AND THEN AS HEATED AIR, RE-CIRCULATES IN MACHINE ENVIRONMENT.



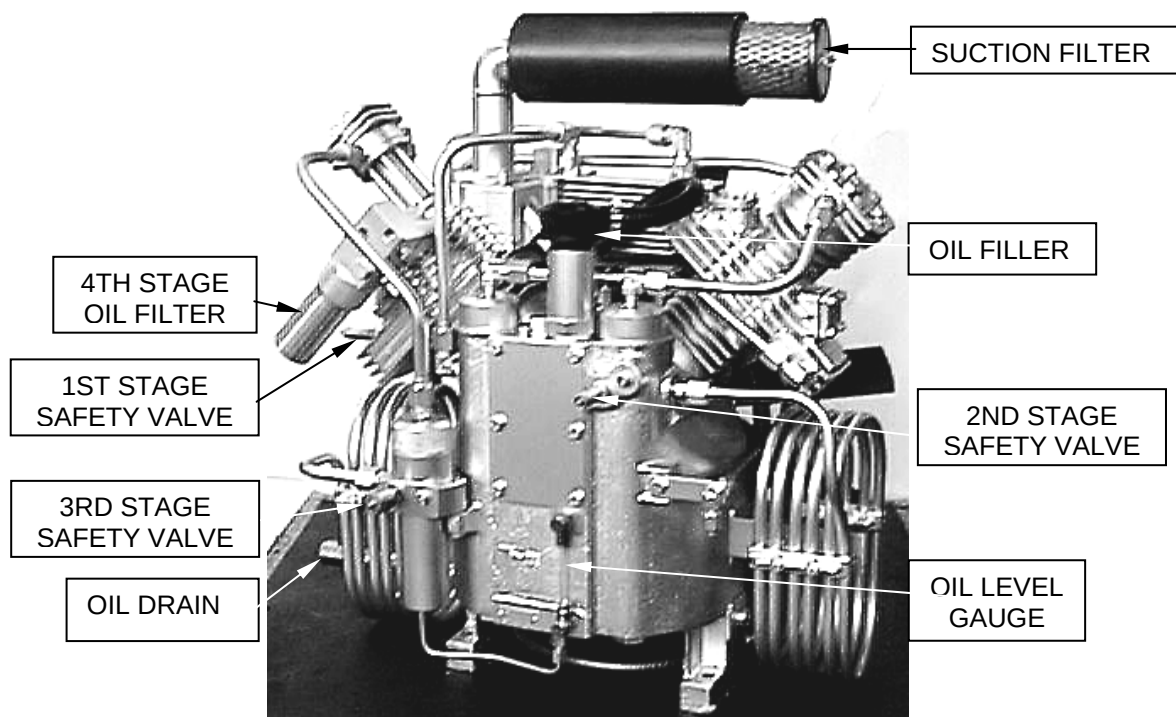
### RECOMMENDED INSTALLATION IN SMALL AREAS

## 7 COMMISSIONING

### WARNING

BEFORE OPERATING THIS EQUIPMENT USERS SHOULD BE MADE AWARE OF AND ENSURE COMPLIANCE WITH THE HEALTH AND SAFETY REGULATIONS APPROPRIATE TO THIS CLASS OF WORK. ATTENTION OF UK USERS IS DRAWN TO THE HEALTH AND SAFETY AT WORK ACT, 1974 & CONTROL OF SUBSTANCES HAZARDOUS TO HEALTH REGULATIONS 1988. TAMPERING WITH SAFETY VALVES IS DANGEROUS AND ALSO INVALIDATES THE GUARANTEE.

### COMMISSIONING OR STARTING A NEW OR OVERHAULED UNIT



### 7.1 IMPORTANT - LUBRICATION

The recommended lubrication is REAVELLITE, a synthetic oil.

There are some materials, e.g. certain rubbers, paints, plastics and metals, which are not compatible with synthetic oils. Components on these compressors are synthetic oil compatible but a problem may exist with ancillary equipment. Consult equipment manufacturer to determine compatibility.

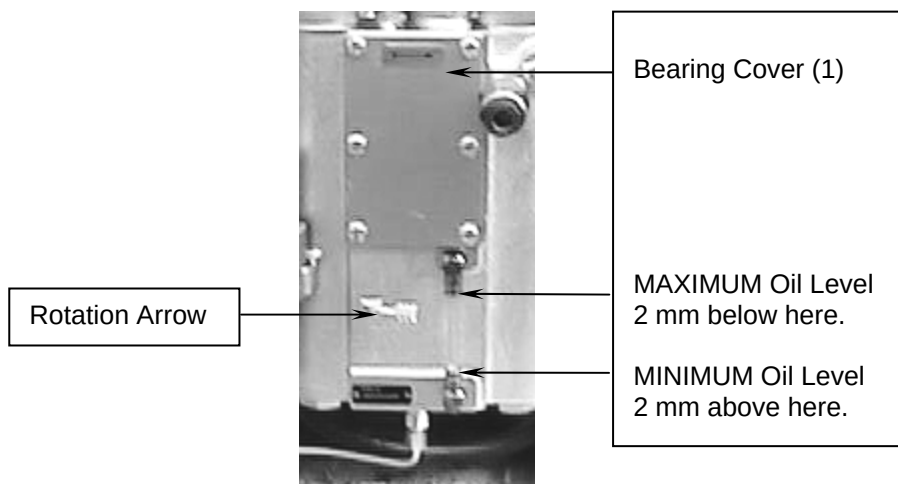
### 7.2 BEFORE STARTING

Before attempting to start a new or overhauled unit the operator should be familiar with all controls and safety devices which are fitted.

Check complete installation, including pipework. Ensure driving belt tension is correct.

Remove dry type suction filter element, blow over with low pressure air and re-insert in casing. Ensure silencer bore and pipework is clean and blank removed from suction pipe.

Ensure crankcase is filled to 2mm to the TOP level on sight glass with REAVELLITE synthetic oil. Do not overfill - over lubrication is harmful. Never allow oil level to go below 2mm from bottom of sight glass.



If machine has been idle for six months or more, remove oil pump bearing cover (1) and lubricate the bearing before starting up. ENSURE FOURTH STAGE PLUNGER IS WELL LUBRICATED WITH RECOMMENDED OIL.

### 7.3 START-UP PROCEDURE

Rotate the compressor at least twice by hand to ascertain free movement. If any restrictions to movement are discovered the cause must be investigated and corrected before attempting to start the compressor.

Operate starter and immediately check rotation, check pressure gauge for stage air flow. Correct rotation, i.e. anti-clockwise when viewed on driving end, it is essential to achieve cooling air flow through fan to compressor.

Check that all pipework and electrical cables are secure and connections are tight. Visually check for any oil leaks. Use soapy water when checking for air leaks.

Check oil pressure.

After 30 minutes operation, check valve covers. Intake pipe to valve covers should be hand warm and outlet pipes hot. Caution must be exercised when checking this.

The set should be run for at least one hour before being put into operational service.

Stop compressor and verify complete blow down, i.e. no residual air pressure remains in any stage of the stopped machine.

Re-check crankcase oil level and top up if necessary.

## 7.4 OIL FILTER - PRESSURE CHECK

If a pressure gauge is not fitted as standard.

Isolate machine from electric supply and release all pressures from machine, pipework and receivers.

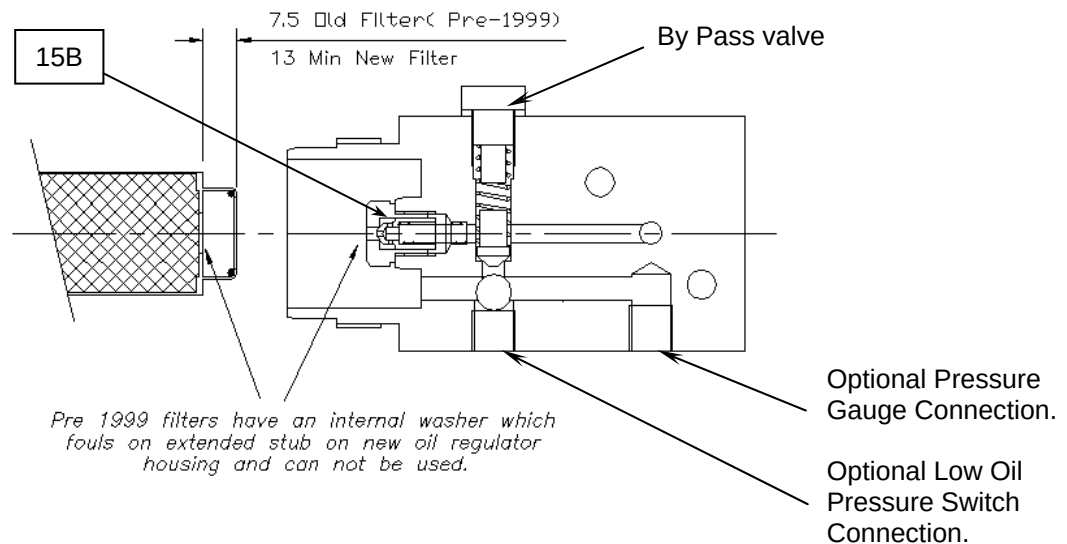
Remove 1/4" BSP plug (10) from the oil regulator body and fit in its place a 0-16 bar certified pressure gauge

Reconnect electric supply and run up to working pressure.

Observe gauge reading, this should be between 0.7 to 2.7 Bar. Note:- If starting from cold the pressure could initially be higher up to 5 Bar.

If the oil pressure rises to 7.5 Bar when warm the indications are the oil filter need replacing.

Isolate machine from electric supply and release all pressures from machine, pipework and receivers.



### NEW FILTER UNIT ARRANGEMENT

Unscrew filter housing (8) remove old oil filter, fit new, replace filter housing tighten hand tight.

Reconnect electric supply and run up to working pressure.

If the oil pressure remains high after changing the oil filter, the restrictor (15B) is possibly blocked.

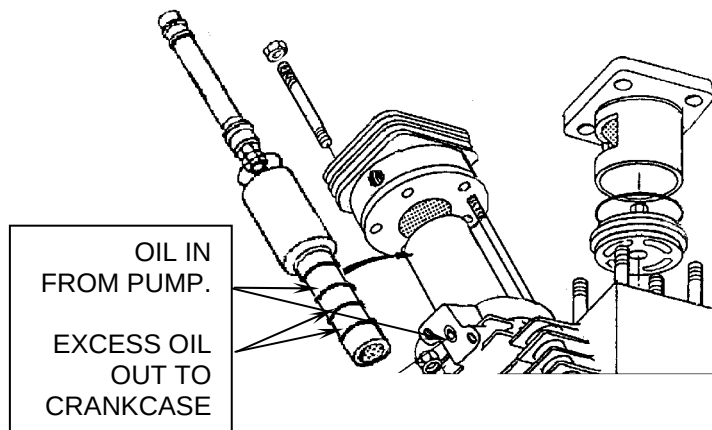
Isolate machine from electric supply and release all pressures from machine, pipework and receivers.

Unscrew filter housing (8) remove oil filter, unscrew restrictor (15B), blow out any restriction blockage and replace. Note: Do not overtighten, torque to 4 lbf/ft (5.4Nm) only. Replace oil filter and filter housing, tighten hand tight.

Reconnect electric supply and run up to working pressure.

Re-check oil pressure.

Finally, stop the compressor ensuring all pressure is released and machine is electrically isolated. Remove oil pressure gauge and replace 1/8" BSP plug if necessary.



## **8 OPERATION AND ROUTINE MAINTENANCE**

### **8.1 OPERATION AND DAILY MAINTENANCE**

Commissioning procedure should be used

- a) For the first commissioning run;
- b) Following overhaul;
- c) After standing idle for a long period.

Crankcase oil needs to be changed after a major overhaul. Starting procedure should be observed after valve overhaul.

Keep exterior of the compressor clean, especially pipe connections and joints, as this will assist in detecting any leaks. Ensure finned final stage cooler coil is clean at all times.

### **8.2 STARTING UP**

Check crankcase oil level, top up, if necessary, with recommended oil to MAXIMUM mark on sight glass.

Operate starter and bring onto load. Check machine rotates anti-clockwise when viewed from the drive end. Oil level will drop in sight glass when machine is running.

Whilst the compressor is running, listen for any noises indicative of mechanical failure. Stop and investigate if

- a) Any uncharacteristic noises commence;
- b) Any safety valve opens.

**THE CAUSE OF A SAFETY VALVE OPENING MUST BE INVESTIGATED AND RECTIFIED. DO NOT ATTEMPT TO PREVENT A VALVE OPENING BY TAMPERING WITH ITS SETTING. THIS IS EXTREMELY DANGEROUS.**

### **8.3 RUNNING ON LOAD**

Stop machine at 30 minute intervals (more often in high humidity conditions) to clear condensate, if an automatic timed drainage system is not fitted.

### **8.4 STOPPING**

Stop compressor from motor control panel.

### **8.5 INHIBITION PROCEDURE**

Condensate drains will automatically be left open.

If machine is to stand idle for more than five weeks (or shorter period if ambient conditions are unfavourable) it is advisable to carry out recommended inhibition procedure;

Fill to the required level with Shell Ensio 20.

Run the compressor.

Switch off the machine.

Release separator drain screws.

Remove first and second stage valve covers and valves.

Clean all valves, valve covers and valve chambers, dry with lint free cloth.

Spray valves, valve cover, valve chambers and cylinders with PX.4. Shake valves to remove excess.

Fit valves, examine 'O' rings of valve covers before assembly and replace if necessary. Tighten valve covers to correct torque setting.

Release third stage suction pipe.

Spray PX.4 into suction side of third stage and rotate machine by hand.

Reassemble third stage suction pipe.

Drain sump of oil.

Seal all openings with threaded plastic plugs.

## 8.6 MAINTENANCE

### **WARNING**

**BEFORE MAINTENANCE OR DISMANTLING, ISOLATE ALL ELECTRICAL SUPPLY FROM MACHINE AND ANCILLARY EQUIPMENT. ISOLATE COMPRESSOR FROM STORAGE PIPEWORK AND RELEASE PRESSURE FROM ALL COMPRESSOR STAGES, PIPEWORK OR STORAGE VESSELS.**

**THE ATTENTION OF UK USERS IS DRAWN TO THE HEALTH & SAFETY AT WORK ACT 1975 AND CONTROL OF SUBSTANCES HAZARDOUS TO HEALTH REGULATIONS 1988.**

Note: Regular servicing is essential if the design performance of the compressor is to be maintained. Maintenance intervals will depend on operating conditions and the following intervals can be used as a guide when the machine is operated under normal conditions, and may be extended with operating experience. Examination and monitoring during commissioning will give a good indication of the machines anticipated maintenance requirements.

Observe the following points:

- A. If pressure gauges are fitted, check stages pressures are within stated limits - if not fitted, check that safety valves are not operating. The stage pressures give an indication of any valve problems. If a stage pressure increases, investigate the valves in the next stage. For a lower pressure than required, check valve on that stage. Always stop machine if a safety valve opens/
- B. Check that oil is visible in sight feed unit.
- C. Examine for oil or air leaks which must be rectified immediately.
- D. Check belt tension after 15 hours running.
- E. In addition to operational checks, inspect all nuts, screws and fittings for tightness. Inspect for oil or air leaks, which must be rectified immediately.

**NEVER TIGHTEN ANY FITTING WHEN IT IS UNDER PRESSURE**

## 8.7 SERVICE SCHEDULE

| Service Kit Number |         |         |         |         |         |                                             |      |                  |                                          |                                |     |
|--------------------|---------|---------|---------|---------|---------|---------------------------------------------|------|------------------|------------------------------------------|--------------------------------|-----|
| HSK1362            | HSK1457 | HSK1465 | HSK1457 | HSK1473 | HSK1481 | 12 Months From Installation/Last Service Or |      |                  |                                          |                                |     |
| Run Hours          | 50      | 1000    | 2000    | 3000    | 4000    | 8000                                        | Task | Preparatory Task | Task Description                         | Parts Provided                 | Qty |
|                    | X       | X       | X       | X       | X       | X                                           | 1    |                  | Change crankcase oil 4.9 litre           | Reavellite S lubricant 5 Litre | 1   |
|                    | X       | X       | X       | X       | X       | X                                           | 2    |                  | Replace Oil Filter                       | Oil Filter                     | 1   |
|                    |         | X       | X       | X       | X       |                                             | 3    |                  | Change air intake element                | Suction filter element         | 1   |
|                    |         |         |         |         |         | X                                           | 4    |                  | Suction Filter                           | Suction Filter                 | 1   |
|                    |         |         |         |         |         | X                                           | 5    |                  | Joint kit                                | Joint kit                      | 1   |
|                    |         |         |         |         |         |                                             |      |                  |                                          |                                |     |
|                    |         | X       |         | X       |         |                                             | 6    |                  | Remove 1st stage suction valve cover     | O Rings                        | 1   |
|                    |         | X       |         | X       |         |                                             |      |                  | Clean 1st stage suction valve            |                                |     |
|                    |         | X       |         | X       |         |                                             | 7    |                  | Remove 1st stage delivery valve cover    | O Rings                        | 1   |
|                    |         | X       |         | X       |         |                                             |      |                  | Clean 1st stage delivery valve           |                                |     |
|                    |         |         | X       |         |         |                                             | 8    | +6+7             | Service 1st stage suction/delivery valve | Valve Kit                      | 1   |
|                    |         |         |         |         | X       | X                                           | 9    | +6               | Replace 1st stage suction valve          | Valve                          | 1   |
|                    |         |         |         |         | X       | X                                           | 10   | +7               | Replace 1st stage delivery valve         | Valve                          | 1   |
|                    |         | X       | X       | X       | X       | X                                           |      |                  | Check condition of 1st stage cylinder    |                                |     |
|                    |         |         |         |         |         | X                                           | 12   |                  | Remove 1st & 4th stage cyl./cover asy    |                                |     |
|                    |         |         |         |         |         | X                                           | 13   | +12              | Remove 1st stage cylinder                |                                |     |
|                    |         |         |         |         |         | X                                           | 14   | +13+12           | Replace 1st stage piston rings           | Piston Ring kit                | 1   |
|                    |         |         |         |         |         | X                                           |      |                  |                                          | cyl O Ring                     | 2   |
|                    |         |         |         |         |         |                                             |      |                  |                                          |                                |     |
|                    |         | X       |         | X       |         |                                             | 15   |                  | Remove 2nd stage suction valve cover     | O Rings                        | 1   |
|                    |         | X       |         | X       |         |                                             |      |                  | Clean 2nd stage suction valve            |                                |     |
|                    |         | X       |         | X       |         |                                             | 16   |                  | Remove 2nd stage delivery valve cover    | O Rings                        | 1   |
|                    |         | X       |         | X       |         |                                             |      |                  | Clean 2nd stage delivery valve           |                                |     |
|                    |         |         | X       |         |         |                                             | 17   | +15+16           | Service 2nd stage suction/delivery valve | Valve Kit                      | 1   |
|                    |         |         |         |         | X       | X                                           | 18   | +15              | Replace 2nd stage suction valve          | Valve                          | 1   |
|                    |         |         |         |         | X       | X                                           | 20   | +16              | Replace 2nd stage delivery valve         | Valve                          | 1   |
|                    |         | X       | X       | X       | X       | X                                           |      |                  | Check condition of 2nd stage cylinder    |                                |     |
|                    |         |         |         |         | X       | X                                           | 21   |                  | Remove 2nd & 3rd stage                   |                                |     |

## Service Schedule 5407 Air

| Service Kit Number                          |         |         |         |         |         |      |      |                  |                                                                                       |                         |     |
|---------------------------------------------|---------|---------|---------|---------|---------|------|------|------------------|---------------------------------------------------------------------------------------|-------------------------|-----|
| HSK1362                                     | HSK1457 | HSK1465 | HSK1457 | HSK1473 | HSK1481 |      |      |                  |                                                                                       |                         |     |
| 12 Months From Installation/Last Service Or |         |         |         |         |         |      |      |                  |                                                                                       |                         |     |
| Run Hours                                   | 50      | 1000    | 2000    | 3000    | 4000    | 8000 | Task | Preparatory Task | Task Description                                                                      | Parts Provided          | Qty |
|                                             |         |         |         |         |         |      |      |                  | <i>cyl./cover asy</i>                                                                 |                         |     |
|                                             |         |         |         |         | X       | X    | 22   | +21              | Remove 2nd stage cylinder                                                             |                         |     |
|                                             |         |         |         |         | X       | X    | 23   | +22+21           | Replace 2nd stage piston rings                                                        | Piston Ring kit         | 1   |
|                                             |         |         |         |         | X       | X    |      |                  |                                                                                       | bottom cyl O Ring       | 1   |
|                                             |         |         |         |         | X       | X    |      |                  |                                                                                       | Top cyl O Ring          | 1   |
|                                             |         |         |         |         |         |      |      |                  |                                                                                       |                         |     |
|                                             |         |         | X       |         |         |      | 24   |                  | Service 3rd stage suction/delivery valve                                              | Valve Kit               | 1   |
|                                             |         |         |         |         | X       | X    | 25   |                  | Replace 3rd stage suction/delivery valve                                              | Valve                   | 1   |
|                                             |         | X       | X       | X       | X       | X    |      |                  | Check condition of 3rd stage liner                                                    |                         |     |
|                                             |         |         |         |         | X       | X    | 26   |                  | Remove 2nd & 3rd stage cyl./cover asy                                                 |                         |     |
|                                             |         |         |         |         | X       | X    | 27   | +26              | Replace 3rd stage piston rings                                                        | Piston Ring kit         | 1   |
|                                             |         |         |         |         | X       | X    |      |                  |                                                                                       | bottom cyl O Ring       | 1   |
|                                             |         |         |         |         | X       | X    |      |                  |                                                                                       | Top cyl O Ring          | 1   |
|                                             |         |         |         |         |         |      |      |                  |                                                                                       |                         |     |
|                                             |         | X       | X       | X       |         |      | 28   |                  | Service 4th stage suction/delivery valve                                              | Valve Kit               | 1   |
|                                             |         |         |         |         | X       | X    | 29   |                  | Replace 4th stage suction/delivery valve                                              | Valve                   | 1   |
|                                             |         | X       | X       | X       |         |      |      |                  | Check condition of 4th stage liner                                                    |                         |     |
|                                             |         |         | X       |         | X       | X    | 30   |                  | Remove 4th stage liner & liner studs                                                  |                         |     |
|                                             |         |         | X       |         |         |      | 31   | +30+9+6          | Replace 4th stage piston rings                                                        | Piston Ring kit         | 1   |
|                                             |         |         | X       |         |         |      |      |                  |                                                                                       | O Rings1st cyl to cover | 1   |
|                                             |         |         | X       |         |         |      |      |                  |                                                                                       | O Rings-liner           | 4   |
|                                             |         |         | X       |         |         |      |      |                  |                                                                                       | O Rings-liner to valve  | 1   |
|                                             |         |         |         |         | X       | X    | 32   | +30+9+6          | Replace 4th stage plunger/liner assy                                                  | plunger/liner assy      | 1   |
|                                             |         |         |         |         | X       | X    |      |                  |                                                                                       | O Rings1st cyl to cover | 1   |
|                                             |         |         |         |         | X       | X    |      |                  |                                                                                       | O Rings-liner to valve  | 1   |
|                                             |         |         |         |         |         |      |      |                  | NOTE-CHANGE OIL & FILTER WHEN THE 4TH STAGE RINGS OR PLUNGER/LINER ASSY. ARE REPLACED |                         |     |
|                                             |         |         |         |         |         |      |      |                  |                                                                                       |                         |     |
|                                             |         |         |         |         | X       |      | 33   |                  | Remove crankshaft pulley                                                              |                         |     |
|                                             |         |         |         |         | X       |      | 34   | +5               | Replace crankshaft / con rod assy                                                     | Crankshaft / rod assy   | 1   |
|                                             |         |         |         |         | X       |      | 35   |                  | Service seperator-1st stage                                                           | O Ring                  | 1   |
|                                             |         |         |         |         | X       |      | 36   |                  | Service seperator-2nd stage                                                           | O Ring                  | 1   |
|                                             |         |         |         |         | X       |      | 37   |                  | Service seperator-3rd stage                                                           | O Ring                  | 1   |

## Service Schedule 5407 Air

| Service Kit Number                          |         |         |         |         |         |      |      |                  |                                                                       |                       |     |
|---------------------------------------------|---------|---------|---------|---------|---------|------|------|------------------|-----------------------------------------------------------------------|-----------------------|-----|
| HSK1362                                     | HSK1457 | HSK1465 | HSK1457 | HSK1473 | HSK1481 |      |      |                  |                                                                       |                       |     |
| 12 Months From Installation/Last Service Or |         |         |         |         |         |      |      |                  |                                                                       |                       |     |
| Run Hours                                   | 50      | 1000    | 2000    | 3000    | 4000    | 8000 | Task | Preparatory Task | Task Description                                                      | Parts Provided        | Qty |
|                                             |         |         |         |         |         | X    | 38   |                  | Replace oil pump cam assy.                                            | Oil pump cam assy.    | 1   |
|                                             |         |         |         |         |         | X    |      |                  |                                                                       | Joint-cover to c/case | 1   |
|                                             |         |         |         |         |         | X    | 39   |                  | 1st stage safety valve                                                | 1st stage R/V valve   | 1   |
|                                             |         |         |         |         |         | X    | 40   |                  | 2nd stage safety valve                                                | 2nd stage R/V valve   | 1   |
|                                             |         |         |         |         |         | X    | 41   |                  | 3rd stage safety valve                                                | 3rd stage R/V valve   | 1   |
|                                             |         |         |         |         |         | X    | 42   |                  | 4th stage safety valve                                                |                       | 1   |
|                                             | X       | X       | X       | X       | X       | X    |      |                  | Check belt tension & condition of all ancillaries                     |                       |     |
|                                             | X       | X       | X       | X       | X       | X    |      |                  | Check tightness of all fasteners(PARTICULARLY COOLER CLAMP FASTENERS) |                       |     |



## **9 DISMANTLING AND REASSEMBLY OF VALVES**

### **9.1 GENERAL**

Keep a spare oiled and maintained set of valves in store for quick compressor servicing. When removed, valves should have a thin carbon layer and be slightly moist with oil. Valve removal is a simple procedure but the following guidelines should be observed.

### **9.2 VALVE REMOVAL AND REFITTING**

#### **9.2.1 FIRST & SECOND STAGE SUCTION AND DELIVERY VALVES**

##### **9.2.1.1 REMOVAL**

Unscrew and remove the four nuts securing the suction valve cover and remove from its locating studs. Similarly remove the delivery valve cover. The suction and delivery valves will now be free in the cylinder head and may be removed from their seats.

##### **9.2.1.2 CLEANING AND INSPECTION**

Check that the airways are not obstructed or heavily coated with carbon, if de-carbonising is necessary, blank the valve apertures to prevent loose particles entering the cylinder. Ensure all loose deposits are removed after cleaning. Inspect the valve seats for cracks or other damage liable to impair sealing efficiency.

##### **9.2.1.3 REFITTING**

Position the suction and delivery valves in their respective locations within the cylinder head, the suction valve has a wider top section and a deeper seat recess in the cylinder head than the delivery valve.

Refit valve covers and securing nuts and tighten evenly to correct torque.

After tightening of the valve cover nuts, there should be a gap of approximately 2mm between the covers and cylinder head; this indicates that the valves are correctly sealed.

#### **9.2.2 THIRD & FOURTH STAGE SUCTION AND DELIVERY VALVE ASSEMBLIES**

##### **9.2.2.1 REMOVAL**

Disconnect all pipe work from the valve assembly. Unscrew the six nuts / setscrews and remove the valve. Remove and discard the sealing 'O' ring from the cylinder.

##### **9.2.2.2 CLEANING AND INSPECTION**

Ensure the 'O' ring groove in the cylinder is free from dirt or damage etc., and that the piston and cylinder wall are free from excessive deposits of carbon.

##### **9.2.2.3 REFITTING**

Ensuring that joint faces are clean, fit a new 'O' ring to the cylinder liner top and locate the valve assembly on the liner. Fit the retaining nuts / setscrews and tighten evenly to the correct torque. Reconnect all pipe work.

## **9.3 VALVE OVERHAUL**

### **9.3.1 FIRST STAGE SUCTION VALVE**

#### **9.3.1.1 DISMANTLING**

- Holding base the of stud (8) with a suitable Allen key, unscrew and remove nut (1) and washer (2).
- Remove seat (3), valve plate (4), spacer (6), springs (5) and guard (7) from stud (8).

#### **9.3.1.2 CLEANING AND INSPECTION**

- The valve components should be degreased using a suitable fluid and stiff brush.
- Carbon deposits may be removed by placing components in boiling water, do not attempt to remove carbon by scraping as this may cause damage to the sealing faces.
- The sealing faces of valve plate and seat should be clean and bright over the whole seat area without any evidence of uneven contact.
- Renew plate if cracked, indented, not flat or having a wear groove which exceeds 1/10th of the plate thickness.
- If the plate or seat shows severe indentation the complete valve assembly must be renewed.
- Inspect the remaining components for cracks, distortion, or other damage liable to impair valve operation.

#### **9.3.1.3 REASSEMBLY**

- Place valve seat (3) on a tubular support with peg (9) uppermost.
- Fit spacer (6) and valve plate (4) engaging peg (9) with hole in spacer.
- Arrange springs (5) as shown and place on the valve plate, engaging pin (9) with holes in the plates.
- Centralise the plates and springs.
- Taking extreme caution not to disturb springs (5), fit guard (7) engaging locating pin (9) with corresponding hole in the guard.
- Holding the valve components firmly together, pass stud (8) through assembly, lift from the support and fit nut (1) and washer (2).
- Tighten nut to correct torque.

### **9.3.2 FIRST STAGE DELIVERY VALVE**

#### **9.3.2.1 DISMANTLING**

- Unscrew and remove nut (16) and washer (15).
- Remove guard (14), springs (13) spacer (12) and delivery plate (17).

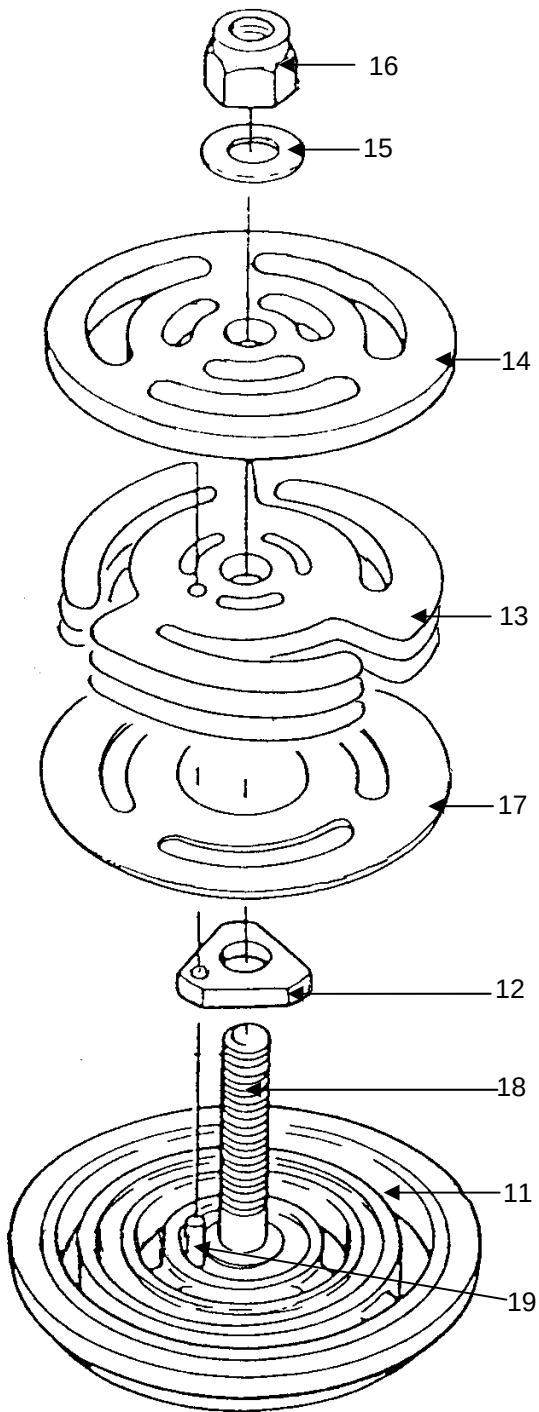
#### **9.3.2.2 CLEANING AND INSPECTION**

(As for the **FIRST STAGE SUCTION VALVE**, above)

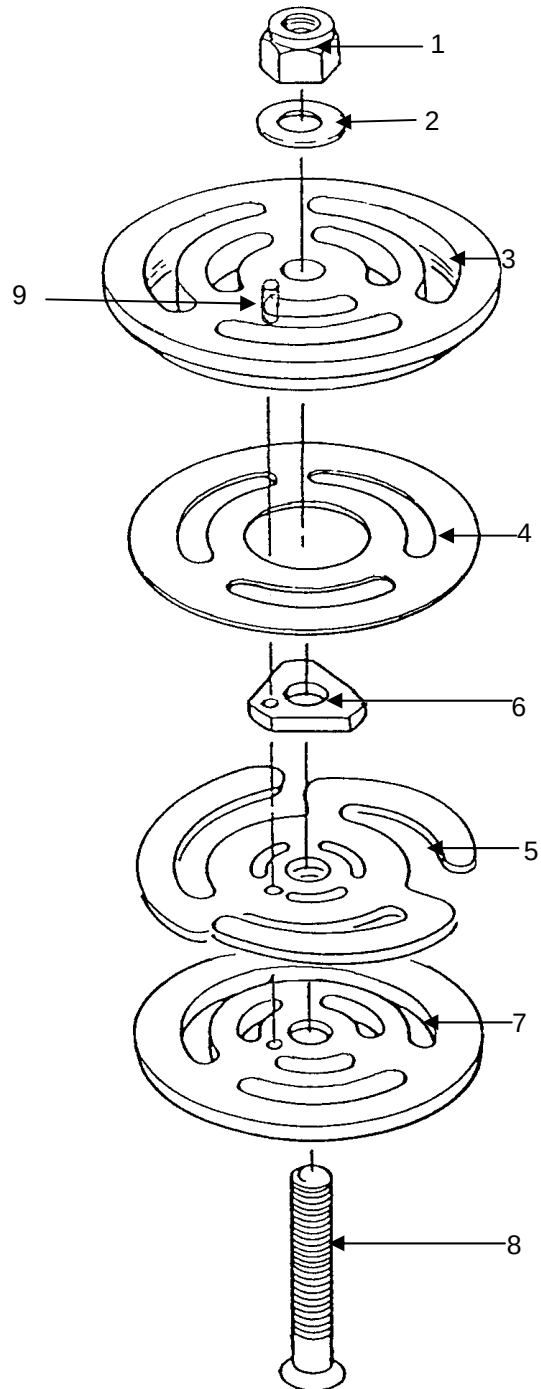
#### **9.3.2.3 REASSEMBLY**

- Fit spacer (12) to seat (11) engaging locating pin (19) with hole in spacer.
- Fit plate (17) over spacer.
- Arrange springs (13) as shown and place on the valve plate, engaging pin with the holes in the plates.
- Centralise the plate and springs.
- Taking extreme care not to disturb the springs, fit guard (14), engaging locating pin with corresponding hole in the guard.
- Holding the components firmly together, fit nut (16) and washer (15).
- Tighten nut.

FIRST STAGE DELIVERY VALVE



FIRST STAGE SUCTION VALVE



### **9.3.3 SECOND STAGE SUCTION VALVE**

#### **9.3.3.1 DISMANTLING**

- Holding stud (8) with a suitably sized Allen key, unscrew and remove nut (1) and washer (2).
- Remove seat (3), suction plate (4), spacer (5) and springs (6) (3 of) from guard (7).

#### **9.3.3.2 CLEANING AND INSPECTION**

- The valve components should be degreased using a suitable fluid and stiff brush.
- Carbon deposits may be removed by placing components in boiling water, do not attempt to remove carbon by scraping as this may cause damage to the sealing faces.
- The sealing faces of valve plate and seat should be clean and bright over the whole seat area without any evidence of uneven contact.
- Renew plate if cracked, indented, not flat or having a wear groove which exceeds 1/10th of the plate thickness.
- If the plate or seat shows severe indentation the complete valve assembly must be renewed.
- Inspect the remaining components for cracks, distortion, or other damage liable to impair valve operation.

#### **9.3.3.3 REASSEMBLY**

- Place valve seat (3) with peg (9) uppermost.
- Fit plate (4) and spacer (5) to the seat, engaging the hole in spacer (5) with locating pin (9).
- Arrange springs (6) as shown and place on plate (4) with the angled arms pointing downward thus holding the spring centres clear of spacer (5), and aligning locating peg with the small hole in the springs.
- Carefully fit guard (7) engaging the locating pin with the small hole in the guard.
- Keeping the assembly held firmly together, fit stud (8) and fit nut (1) and washer (2).
- Tighten nut.

### **9.3.3.4 SECOND STAGE DELIVERY VALVE**

#### **9.3.3.5 DISMANTLING**

- Unscrew and remove nut (16) and washer (15).
- Remove guard (14), springs (13) (4 of), delivery plate (12) and spacer (11) from valve seat (10).

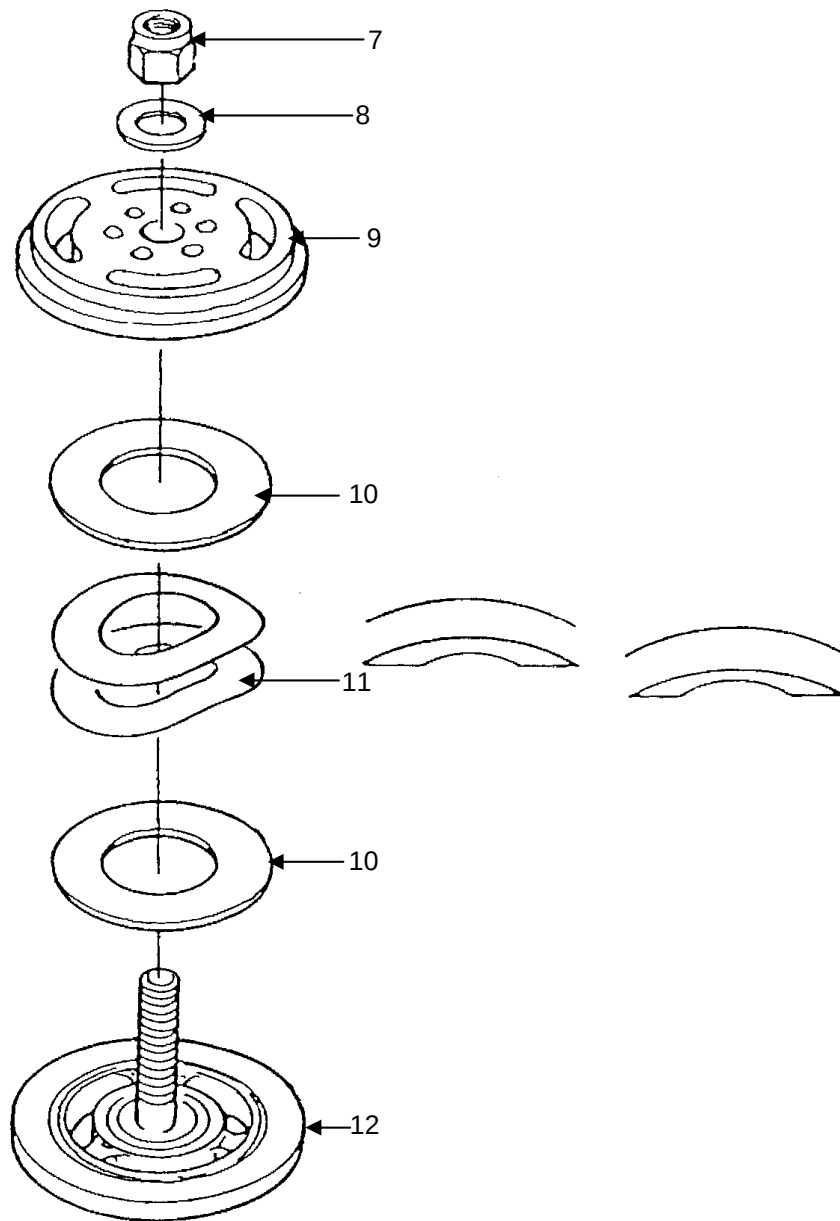
#### **9.3.3.6 CLEANING AND INSPECTION**

(As for the **SECOND STAGE SUCTION VALVE**, above)

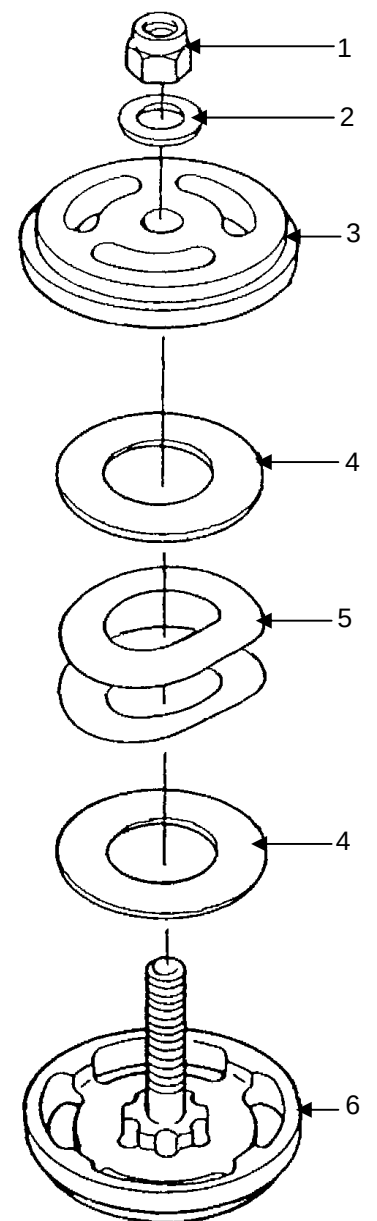
#### **9.3.3.7 REASSEMBLY**

- Fit spacer (11) to seat (10) engaging locating peg (18) with the small hole in the spacer.
- Place delivery plate (12) in position on the seat.
- Arrange springs (13) as shown, aligning the small hole in each spring with locating peg (18).
- Carefully fit guard (14) engaging the small hole in the guard with the locating peg.
- Holding the guard in position, fit washer (15) and nut (16).
- Tighten nut.

**SECOND STAGE DELIVERY VALVE**



**SECOND STAGE SUCTION VALVE**



### **9.3.4 THIRD STAGE SUCTION AND DELIVERY VALVE**

#### **9.3.4.1 DISMANTLING**

- Invert the assembly and remove capscrews (10) which retain base (8) to cylinder head (1).
- Remove suction plate (7), springs (6) (2 of) and plate (5).
- Remove delivery plate (4), delivery valve springs (12) (2 of) and plate (3).
- Remove and discard 'O' ring (2).

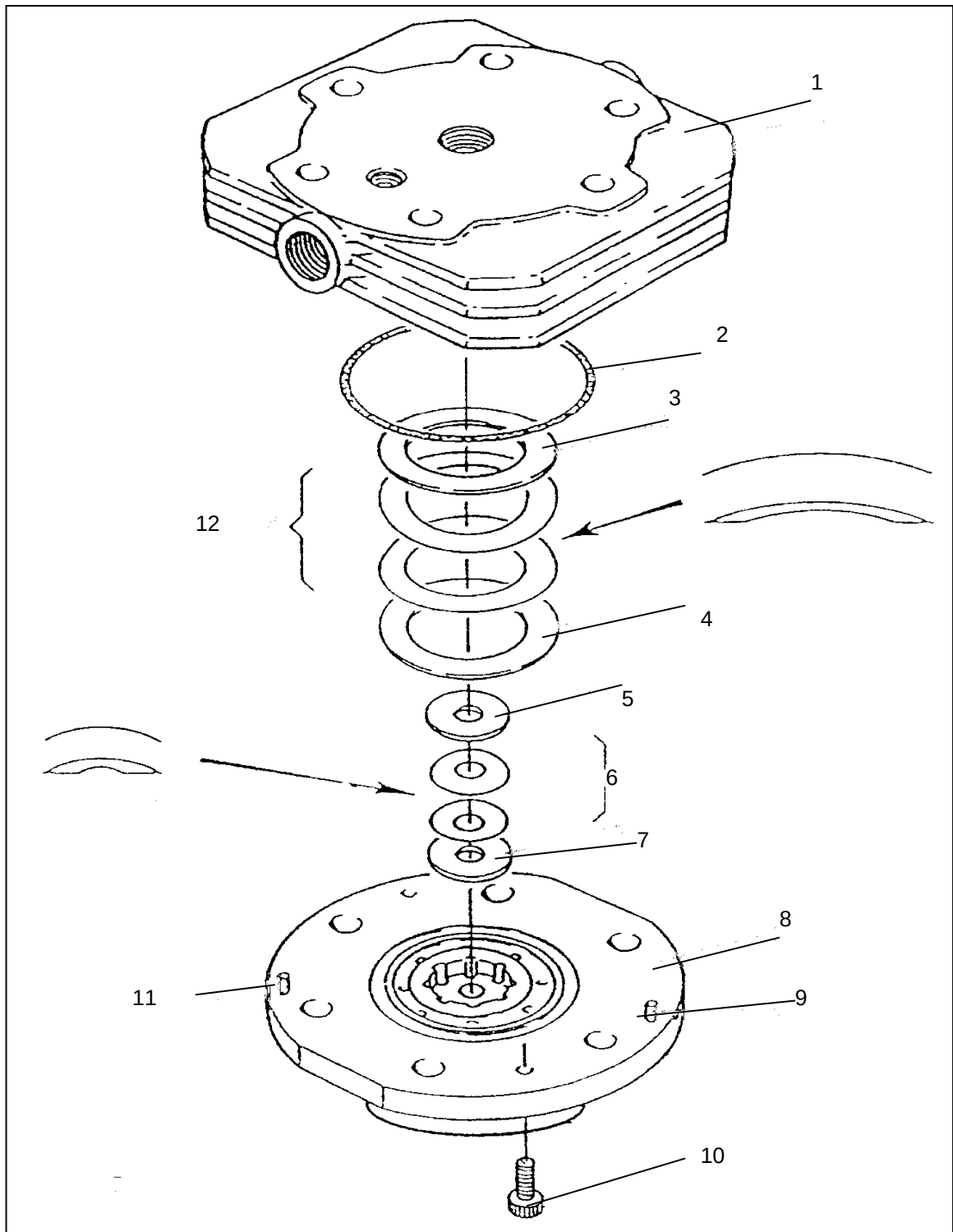
#### **9.3.4.2 CLEANING AND INSPECTION**

- The valve components should be degreased using a suitable fluid and stiff brush.
- Carbon deposits may be removed by placing components in boiling water, do not attempt to remove carbon by scraping as this may cause damage to the sealing faces.
- The sealing faces of valve plate and seat should be clean and bright over the whole seat area without any evidence of uneven contact.
- Renew plate if cracked, indented, not flat or having a wear groove which exceeds 1/10th of the plate thickness.
- If the plate or seat shows severe indentation the complete valve assembly must be renewed.
- Inspect the remaining components for cracks, distortion, or other damage liable to impair valve operation.

#### **9.3.4.3 REASSEMBLY**

- Take base (8) and fit plate (7) followed by springs (6) which should be arranged as shown. Fit suction plate (5).
- Invert cylinder head (1), and fit plate (3), followed by springs (12) which should be arranged as shown.
- Fit delivery plate (4) and place new 'O' ring (2) into the cylinder head groove.
- Ensure the delivery plate (4) is centralised.
- With a small steel rule, or similar thin-bladed implement, placed across the base (8) to retain the suction valve components in position, invert the assembly and fit to the cylinder head.
- Correct location of the base assured by the offset pins (9) and (11) which engage with corresponding holes in the cylinder head.
- Ensure the locating pins are correctly engaged and keeping downward pressure on the base, carefully withdraw the rule; check the base is now in full contact with the cylinder head around its circumference and fit capscrews (10).
- Evenly tighten the capscrews to correct torque.
- If the base does not correctly engage with the head, separate the components and repeat the assembly procedure.

### THIRD STAGE VALVE



NOTE: Unless otherwise stated, information applies to all models

### **9.3.5 FOURTH STAGE SUCTION AND DELIVERY VALVE**

#### **9.3.5.1 DISMANTLING**

- Invert the head assembly and remove capscrews (6 and 7).
- Separate valve base (5) from the valve seat (3) and remove 'O' ring (4), suction plate (9), spring (10), shim (11), spring (12) and plate (13).
- Separate delivery valve seat (3) from the cylinder head (1) and remove 'O' ring (2), delivery plate (14), spring (15), shim (16), spring (17) and plate (18).

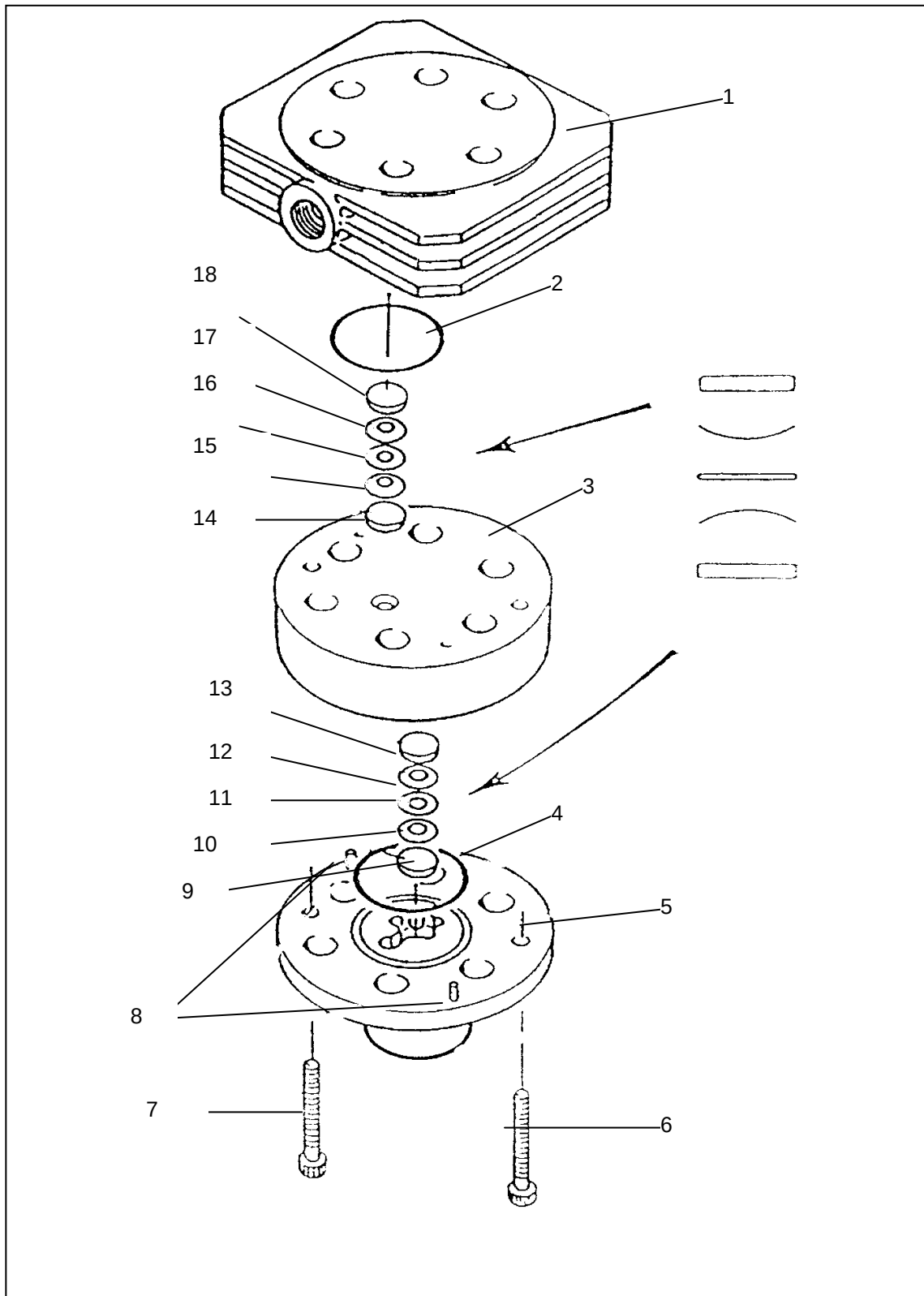
#### **9.3.5.2 CLEANING AND INSPECTION**

- The valve components should be degreased using a suitable fluid and stiff brush.
- Carbon deposits may be removed by placing components in boiling water, do not attempt to remove carbon by scraping as this may cause damage to the sealing faces.
- The sealing faces of valve plate and seat should be clean and bright over the whole seat area without any evidence of uneven contact.
- Renew plate if cracked, indented, not flat or having a wear groove which exceeds 1/10th of the plate thickness.
- If the plate or seat shows severe indentation the complete valve assembly must be renewed.
- Inspect the remaining components for cracks, distortion, or other damage liable to impair valve operation.

#### **9.3.5.3 REASSEMBLY**

- Place valve base (5) with pegs (8) uppermost.
- Fit plate (9), spring (10), shim (11), spring (12) and suction plate (13).
- Fit 'O' ring (4) to its groove.
- Fit valve seat (3) to the base, taking care not to disturb the valve components (the offset locating pins (8) of the base prevent incorrect assembly of the seat).
- Place cylinder head (1) with the valve recess uppermost and fit plate (18), spring (17), shim (16), spring (15) and delivery plate (14), to the recess. Fit 'O' ring (2) to its groove.
- Keeping base (5) and seat (3) held firmly together, fit this assembly on to the cylinder head (1), taking care not to disturb the valve components.
- The offset locating pins ensure correct alignment of the seat and head.
- Fit the capscrews (6 and 7)
- Evenly tighten the capscrews to the correct torque.

# FOURTH STAGE VALVE



NOTE: Unless otherwise stated, information applies to all models



## 10 FAULT GUIDE

These notes are intended only as a guide to the more common aspects of fault location. In the case of difficulty, Service Engineers are available to advise and assist.

Before investigating a potential fault, ensure

- a) Ambient and air inlet temperature is not too high.
- b) Driving unit is in good working order and power supply is adequate.
- c) Lubricant(s) are correct.

| FAULT                                                                                         | SYMPTOM                                          | RECOMMENDATION(S)                                                                                                                                                                                                                                                                                                                                                                                                             |
|-----------------------------------------------------------------------------------------------|--------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>10.1 EXCESSIVE STAGE PRESSURE</b>                                                          | 1. Faulty suction or delivery valve(s)           | Service valve(s) as necessary.<br><b>Note:</b> A suction valve fault usually gives excess pressure in the previous stage.                                                                                                                                                                                                                                                                                                     |
|                                                                                               | 2. Pressure gauge not accurate.                  | Check pressure gauge against gauge of known accuracy.                                                                                                                                                                                                                                                                                                                                                                         |
|                                                                                               | 3. Restriction in pipeline.                      | <b>Existing Installation:</b><br>Check setting and function of all control valves. Clean pipeline filters and service elements as necessary.<br><br><b>New Installation:</b><br>Ensure that protective plugs and blanks have been removed from ports and that all control valves are correctly set. Pipework must be of ample size with a minimum of bends. Joint gaskets should be checked for correct positioning and size. |
| <b>10.1.1 EXCESSIVE THIRD STAGE PRESSURE.</b>                                                 | 1. Fourth stage plunger failure.                 | Remove and examine, replace if necessary.                                                                                                                                                                                                                                                                                                                                                                                     |
| <b>10.2 INSUFFICIENT PRESSURE OR VOLUME</b><br><br>(See also:<br>1. Excessive Stage Pressure) | 1. Blocked suction filter.                       | Remove and service.                                                                                                                                                                                                                                                                                                                                                                                                           |
|                                                                                               | 2. Faulty first stage suction valve.             | Remove and examine.                                                                                                                                                                                                                                                                                                                                                                                                           |
|                                                                                               | 3. (Air) leakage in pipe system or from machine. | Locate and rectify.<br>(e.g. drain valve open)                                                                                                                                                                                                                                                                                                                                                                                |
|                                                                                               | 4. Wear.                                         | If general wear is suspected, strip the machine and examine all working parts.                                                                                                                                                                                                                                                                                                                                                |
|                                                                                               | 5. Loss of drive.                                | Check belt drive.                                                                                                                                                                                                                                                                                                                                                                                                             |
|                                                                                               | 6. Premature opening of final safety valve.      | Renew valve.                                                                                                                                                                                                                                                                                                                                                                                                                  |
|                                                                                               | 7. Intake or outlet valve not closing properly.  | Check and clean valves, replace main parts as necessary.                                                                                                                                                                                                                                                                                                                                                                      |

| FAULT                                                                                                        | SYMPTOM                                               | RECOMMENDATION(S)                                                                                                                                                        |
|--------------------------------------------------------------------------------------------------------------|-------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>10.3 OVERHEATING</b><br><br>(See also:<br>1. Excessive Stage Pressure<br>and<br>2. Insufficient Pressure) | 1. Duty higher than recommended maximum.              | Reduce duty to acceptable level.                                                                                                                                         |
|                                                                                                              | 2. Inlet temperature higher than recommended maximum. | Check that pipework/valves do not form a closed loop, i.e. feeding hot delivered air back into machine inlet.<br><br>Check location. Maximum ambient temperature is 35°C |
|                                                                                                              | 3. Insufficient delivered air.                        | Check and clean valves, replace worn parts as necessary.                                                                                                                 |
|                                                                                                              | 4. Inlet or delivery valves not closing properly.     | Check and clean valves, replace worn parts as necessary.                                                                                                                 |
|                                                                                                              | 5. Cylinder fins clogged or dirty.                    | Clean out cylinder fins.                                                                                                                                                 |
|                                                                                                              | 6. Intercooler and aftercooler tubes dirty.           | Clean tubes with a brush and compressed air.                                                                                                                             |
|                                                                                                              | 7. Belt drive slipping.                               | Adjust belt drive.                                                                                                                                                       |
|                                                                                                              | 8. Air intake filter.                                 | Service air intake filter.                                                                                                                                               |
|                                                                                                              | 9. Wrong rotation.                                    | Reverse motor feed wiring.                                                                                                                                               |
|                                                                                                              | 10. Possible fourth stage plunger failure.            | Dismantle and examine fourth stage plunger. Replace if necessary.                                                                                                        |
| <b>10.3.1 THIRD STAGE OVERHEATING</b>                                                                        |                                                       |                                                                                                                                                                          |
| <b>10.4 EXCESSIVE NOISE</b>                                                                                  | 1. Oil level low.                                     | Check oil level and replenish.                                                                                                                                           |
|                                                                                                              | 2. Pulley loose.                                      | Tighten pulley.                                                                                                                                                          |
|                                                                                                              | 3. Belt drive worn.                                   | Replace banded belts.                                                                                                                                                    |
|                                                                                                              | 4. Vibration in machine.                              | Insecure mounting. Tighten mounting bolts.                                                                                                                               |
|                                                                                                              | 5. Pulley out of line.                                | Inspect and adjust the alignment of the pulley.                                                                                                                          |
|                                                                                                              | 6. <b>5407</b> Low oil pressure.                      | Air trapped in oil pump. Vent pump and oil line.                                                                                                                         |
|                                                                                                              | 7. Worn bearings                                      | Dismantle, examine and replace, if necessary.                                                                                                                            |
| <b>10.5 EXTENDED RUNNING</b>                                                                                 | 1. Speed too low or machine not large enough.         | If speed cannot be uprated, fit additional machine or machine with larger capacity.<br><br>Check belt drive.                                                             |

| FAULT                        | SYMPTOM                                 | RECOMMENDATION(S)                                                                                                                                                               |
|------------------------------|-----------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>10.6 EXCESSIVE WEAR</b>   | 1. Excessive speed and / or pressure.   | Adjust accordingly.                                                                                                                                                             |
|                              | 2. Dirty air and / or suction pipeline. | Clean filter element.                                                                                                                                                           |
|                              | 3. Excessive side or end thrust.        | Pulley out of alignment - realign.<br>Belt too tight / too loose - adjust.                                                                                                      |
|                              | 4. Excessive moisture content in air.   | Check drainage system and regularly check condition of crankcase oil.                                                                                                           |
|                              | 5. Belt wear.                           | Belt too tight / too loose - adjust.                                                                                                                                            |
|                              | 6. Belt slip.                           | Oil or grease on belt - clean or replace                                                                                                                                        |
| <b>10.7 FAILURE TO START</b> | 1. Seizure.                             | If machine does not rotate freely (when unloaded) this indicates a fault of a serious nature. Investigate and check for broken and damaged components before trying to restart. |
|                              | 2. Electrical or control fault.         | Locate and rectify, or consult an electrician.                                                                                                                                  |
| <b>10.8 LOW OIL PRESSURE</b> | 1. Air trapped in oil pump.             | Vent pump and oil line.                                                                                                                                                         |
|                              | 2. Oil regulator dirty.                 | Dismantle and clean.                                                                                                                                                            |
|                              | 3. Fourth stage piston problem.         | Examine fourth stage plunger and renew, if necessary.                                                                                                                           |



## **11 PARTS LISTS**

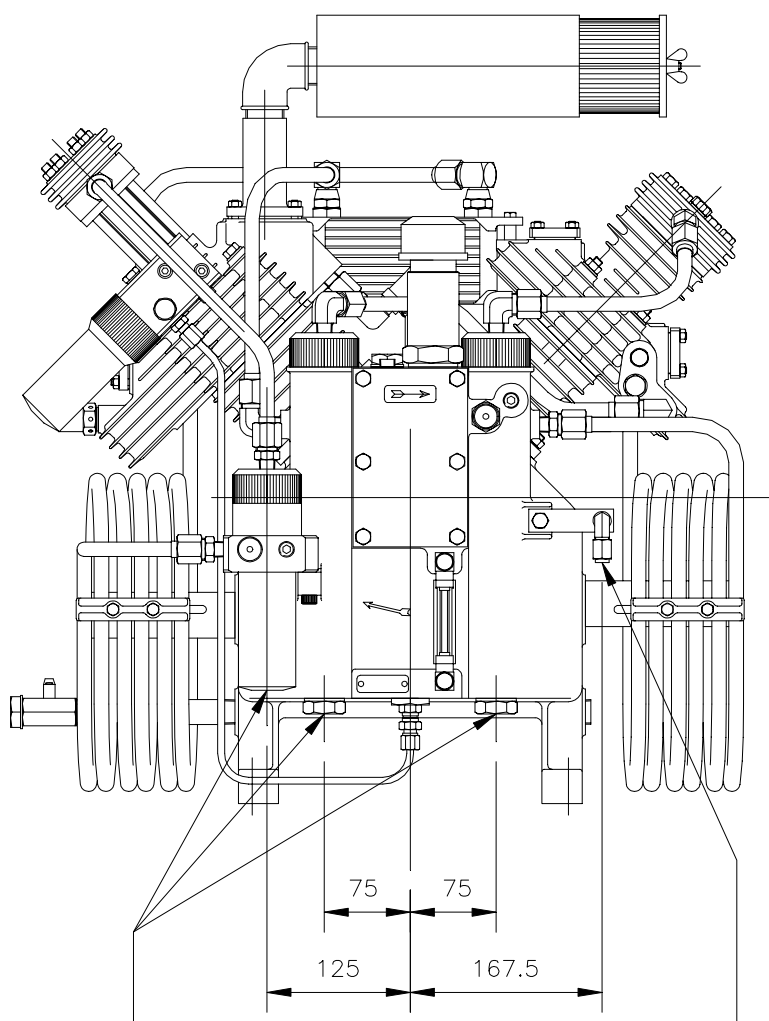
The right is reserved to modify the contents of this list, without notice, and the information given is in no way binding on the manufacturers.

### **11.1 BASIC INDUSTRIAL HIGH PRESSURE COMPRESSOR – 5407.3.IAH**



# 5407 BASIC INDUST & H COMPRESSOR

2 OFF GROOVES FOR SPA BELTS  
 WITH 325 P.C.D.



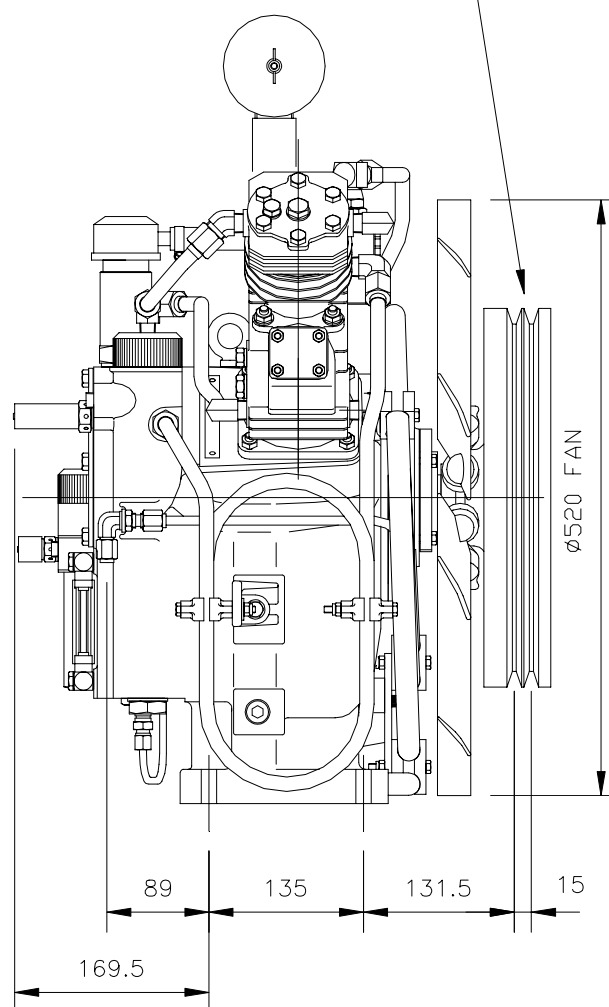
1st, 2nd & 3rd STAGE  
 SEPARATOR DRAIN  
 CONNECTIONS 1/4" BSPT

FINAL DELIVERY  
 CONNECTION FOR  
 8mm O/D TUBE.

## PRESSURE GAUGE TAPPINGS

|                 |           |
|-----------------|-----------|
| LUBRICATION OIL | 1/8" BSPP |
| 1st STAGE       | 1/4" BSPP |
| 2nd STAGE       | 1/4" BSPT |
| 3rd STAGE       | 1/4" BSPT |

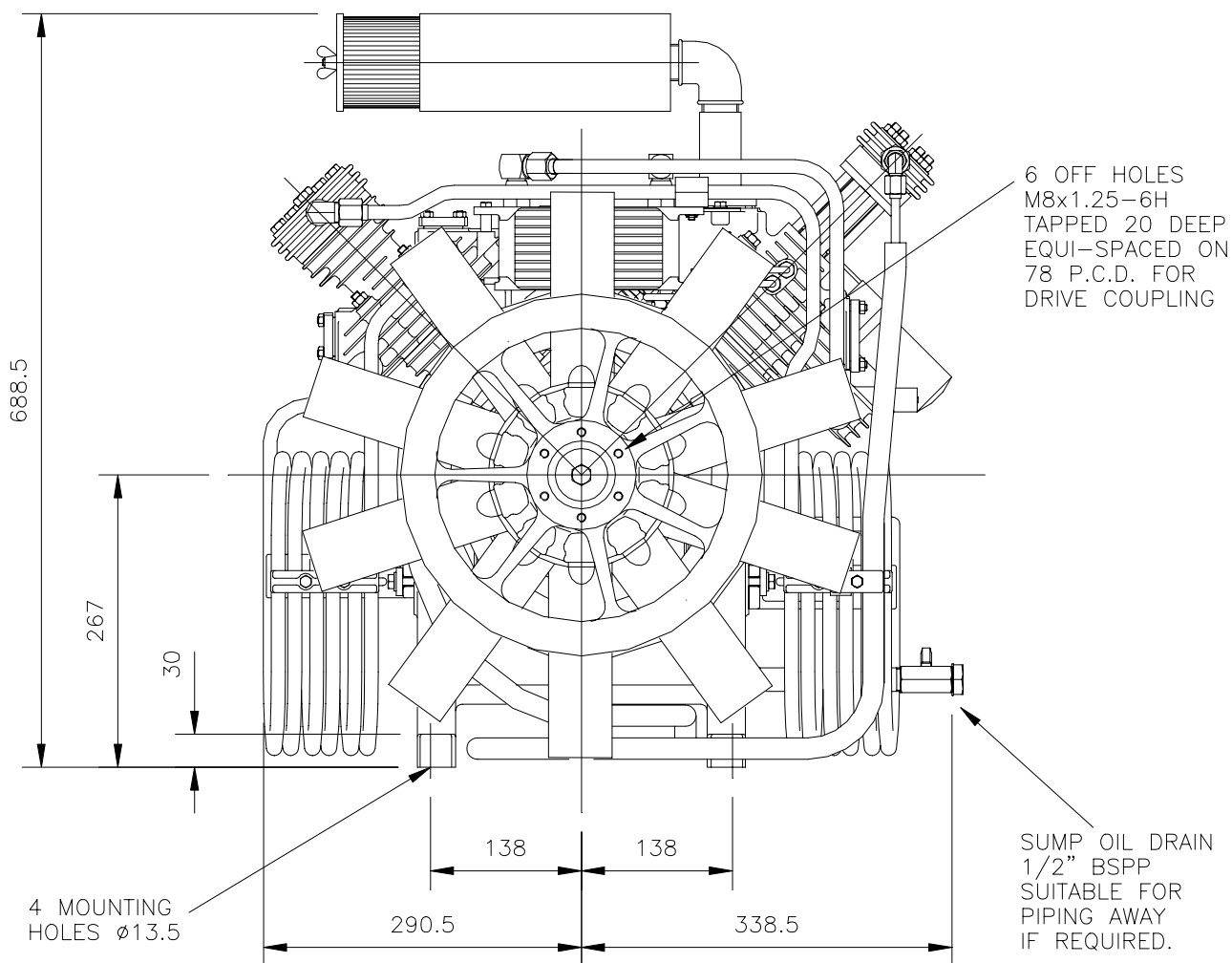
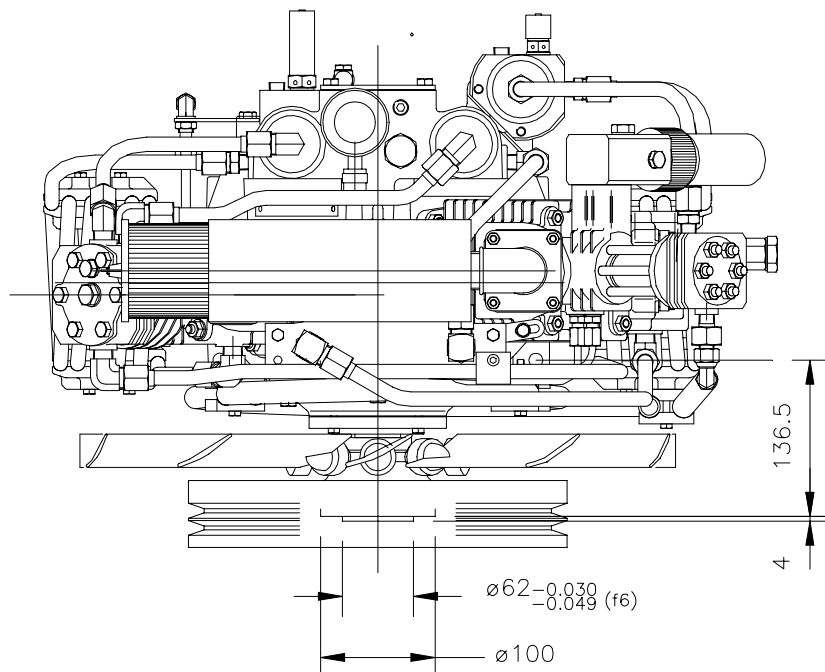
TAPPING FOR LUBRICATION OIL PRESSURE SWITCH 1/4" BSPP  
 TAPPING FOR SEPARATOR DRAIN CONTROL VALVE 1/8" BSPP



COMPRESSOR IS SUITABLE FOR EITHER  
 DIRECT COUPLING OR DRIVING FROM  
 WEDGE BELTS.

APPROX. MASS = 105kg

# 5407 BASIC INDUST & H COMPRESSOR



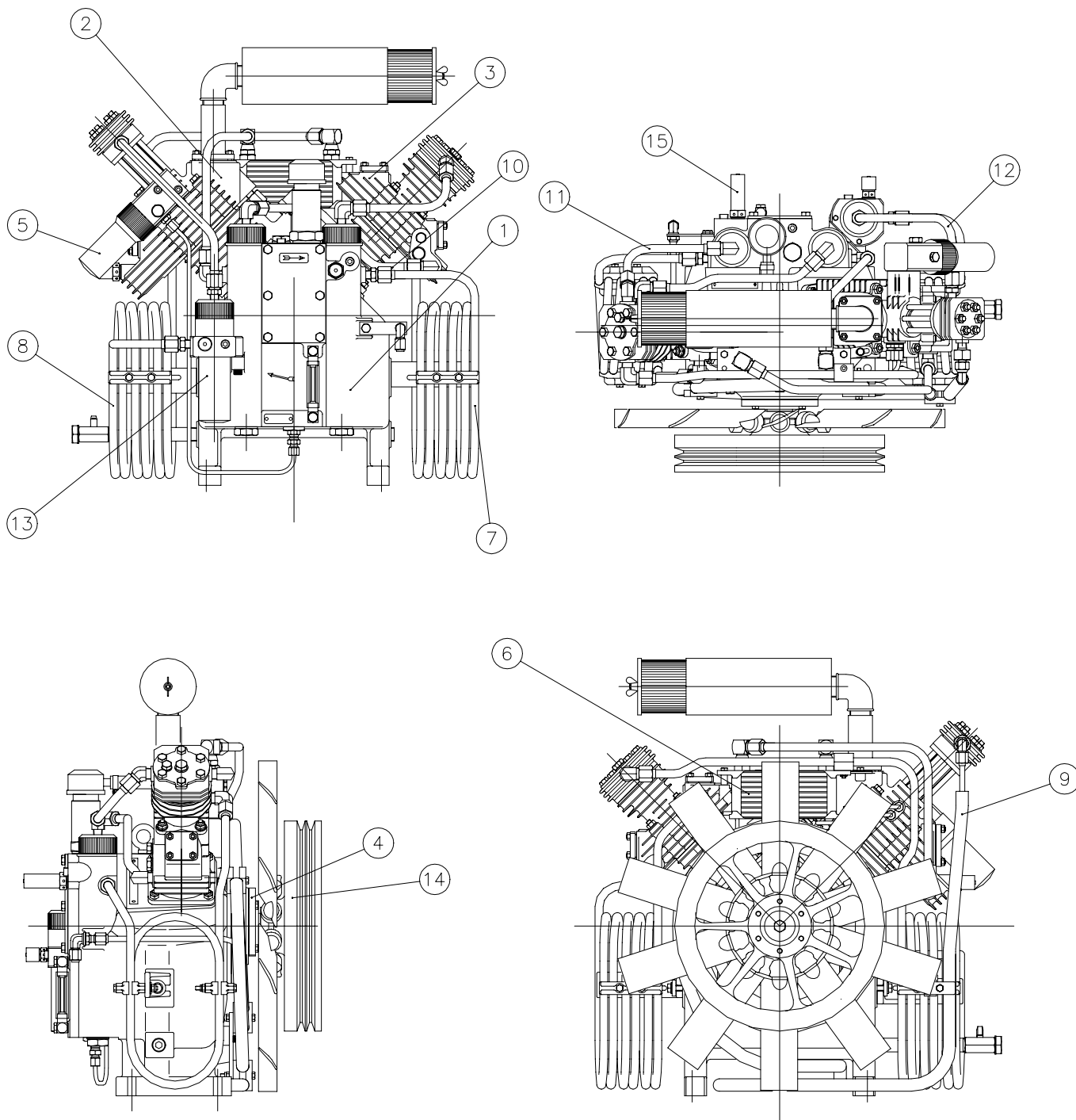
5407.3.1AH

SHEET 2 ISSUE A.2

ISSUE DATE 02/03/2005

THIS IS A HIGH PRESSURE COMPRESSOR - USE GENUINE COMPAIR PARTS ONLY

# 5407 BASIC INDUST & H COMPRESSOR



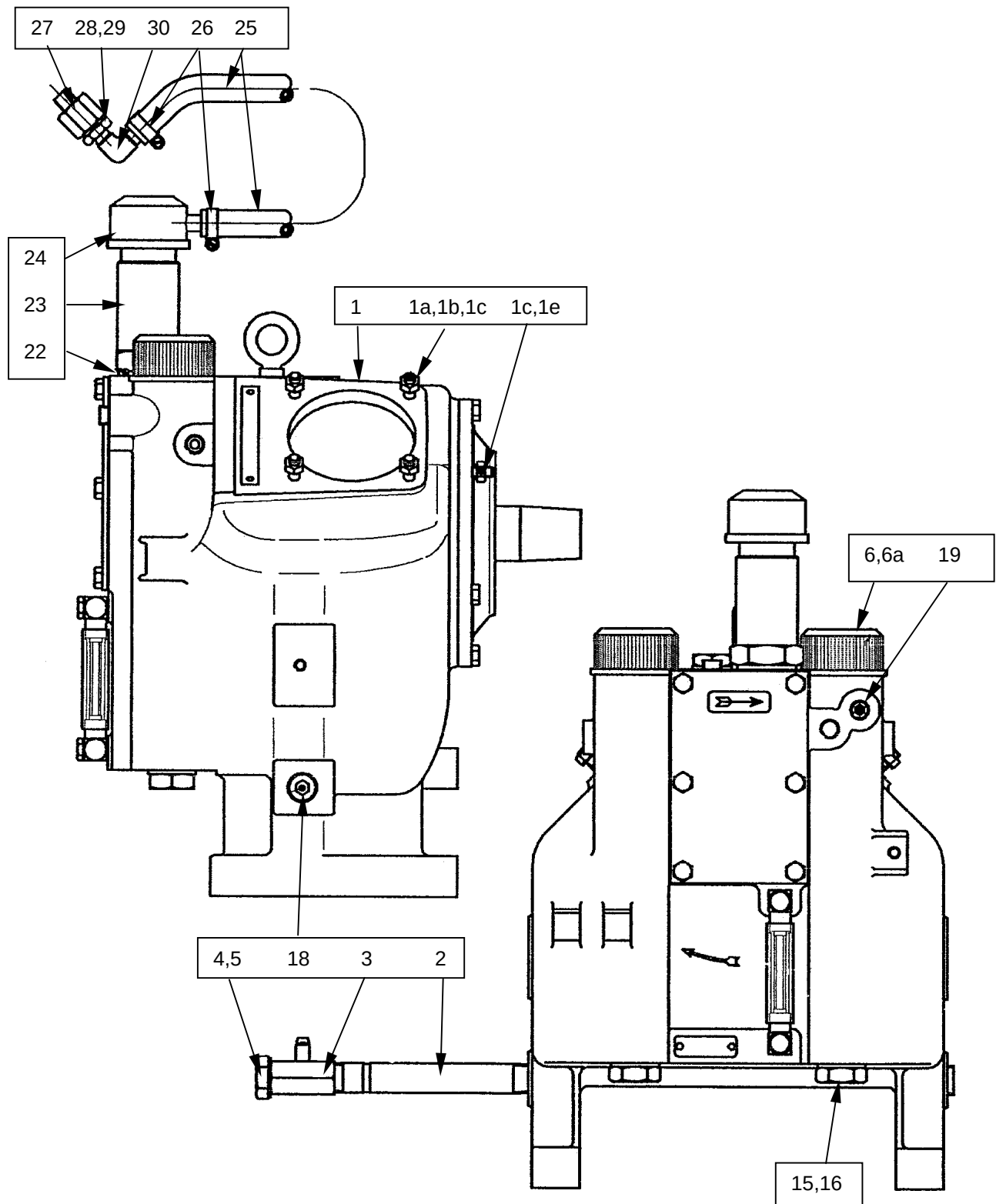
# 5407 BASIC INDUST & H COMPRESSOR

| NO | REF.    | DESCRIPTION                          | SIZE | QTY |
|----|---------|--------------------------------------|------|-----|
| 1  | A30175  | CRANKCASE ASSEMBLY - STANDARD        |      | 1   |
| 2  | E61441  | CYLINDER ASSEMBLY - 1st & 4th STAGES |      | 1   |
| 3  | E61442  | CYLINDER ASSEMBLY - 2nd & 3rd STAGES |      | 1   |
| 4  | D101501 | SHAFT SEAL ASSEMBLY - STANDARD       |      | 1   |
| 5  | E61793  | LUBRICATION ASSEMBLY                 |      | 1   |
| 6  | E61450  | COOLER ASSEMBLY - 1st STAGE          |      | 1   |
| 7  | E61447  | COOLER ASSEMBLY - 2nd STAGE          |      | 1   |
| 8  | E61446  | COOLER ASSEMBLY - 3rd STAGE          |      | 1   |
| 9  | E61781  | COOLER ASSEMBLY - 4th STAGE          |      | 1   |
| 10 | C203453 | SUCTION PIPE - 2nd STAGE             |      | 1   |
| 11 | C203445 | SUCTION PIPE - 3rd STAGE             |      | 1   |
| 12 | C203446 | SUCTION PIPE - 4th STAGE             |      | 1   |
| 13 | D101509 | SEPARATOR ASSEMBLY - 3rd STAGE       |      | 1   |
| 14 | E61421  | FLYWHEEL ASSEMBLY                    |      | 1   |
| 15 | E61449  | SAFETY VALVE ASSEMBLY                |      | 1   |

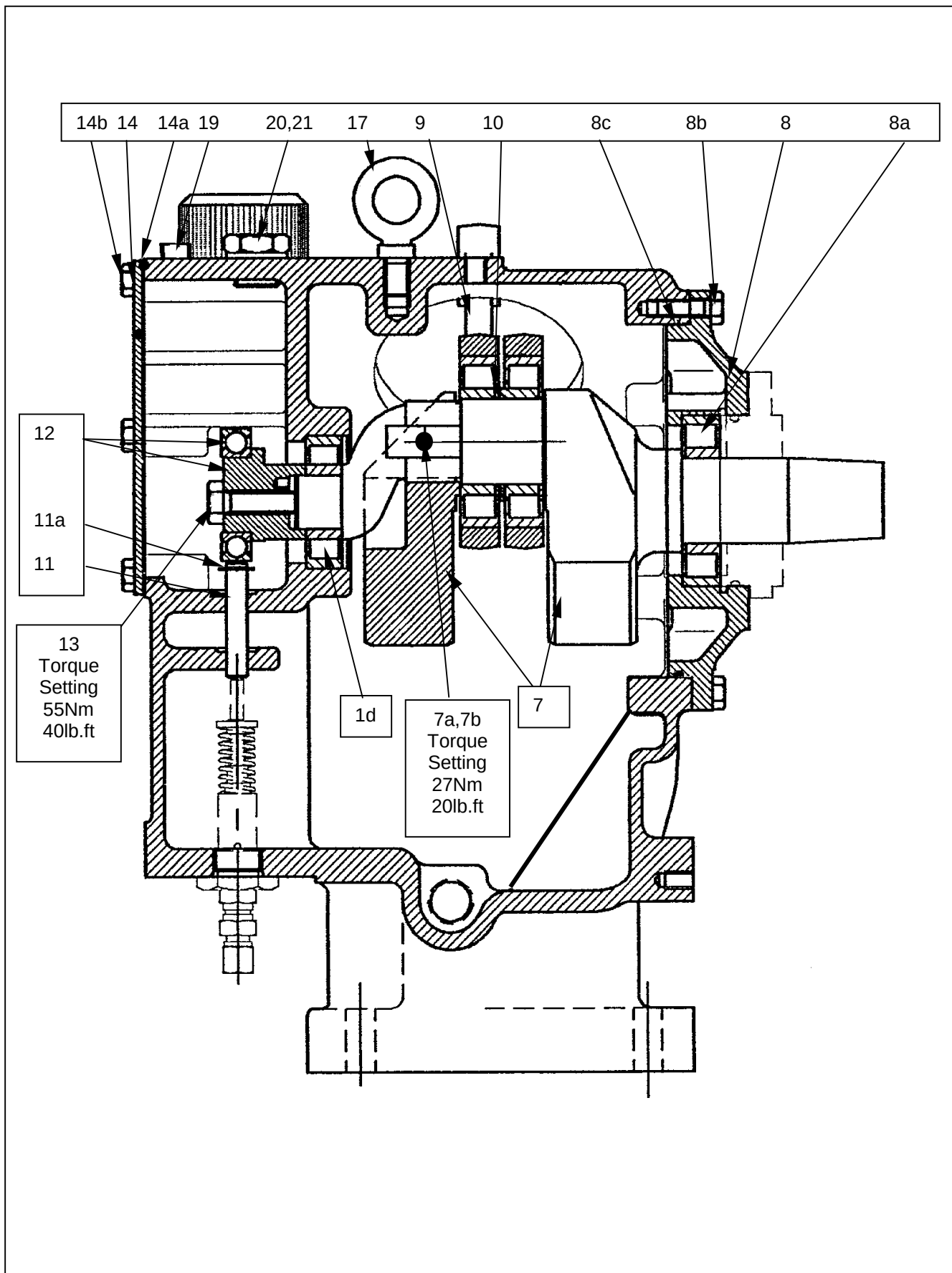
|                                                                  |
|------------------------------------------------------------------|
| <b>11.2 CRANKCASE, CRANKSHAFT &amp; CONNECTING RODS – A30175</b> |
|------------------------------------------------------------------|



## CRANKCASE ASSEMBLY - A30175 AIR COMPRESSORS



## CRANKCASE ASSEMBLY - A30175 AIR COMPRESSORS



## CRANKCASE ASSEMBLY - A30175

### AIR COMPRESSORS PARTS LIST

| REF | PART No                                             | DESCRIPTION                                                                                                                                                | NO OFF |
|-----|-----------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------|--------|
| 1   | A30166.50<br><br>includes<br>1a, 1b, 1c, 1d, 1e, 1f | Crankcase<br>Kurbelgehäuse<br>Carter<br>Krukaskast<br>Cárter<br>Carter                                                                                     | 1      |
| 1a  | D54019.8.28                                         | Stud<br>Schaubbolzen<br>Goujon<br>Tapeind<br>Espárrago<br>Perno                                                                                            | 8      |
| 1b  | PS1113.13                                           | Washer, Shakeproof<br>Unterlegscheibe, Rüttelfest<br>Rondelle-frein non desserrable<br>Schokvaste sluitring<br>Arandela antivibratoria<br>Rondella dentata | 8      |
| 1c  | 95111.5                                             | Nut<br>Mutter<br>Ecrou<br>Moer<br>Tuerca<br>Dado                                                                                                           | 10     |
| 1d  | 96064.174                                           | Bearing, Roller<br>Rolenlager<br>Palier à rouleaux<br>Rollager<br>Cojinete de rodillos<br>Cuscinetto                                                       | 1      |
| 1e  | D100171.8.41                                        | Stud<br>Schaubbolzen<br>Goujon<br>Tapeind<br>Espárrago<br>Perno                                                                                            | 2      |
| 1f  | C203468                                             | Gauge, Level<br>Niveauanzeiger<br>Indicateur de niveau<br>Niveaumeter<br>Indicador de nivel<br>Indicatore di livello                                       | 1      |
| 2   | C203470                                             | Pipe, Drain<br>Ablaßrohr<br>Tuyau de vidange<br>Aftappijp<br>Tubo de drenaje<br>Tubo di Scarico                                                            | 1      |
| 3   | 98650.1983                                          | Valve, Oil drain<br>Ölablaßventil<br>Purgeur d'huile<br>Oliefatapklep<br>Válvula, drenaje de aceite<br>Valvola di scarico olio                             | 1      |

|    |                                   |                                                                                                                                                                                                              |   |
|----|-----------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---|
| 4  | 98660.1155                        | Seal<br>Dichtung<br>Joint<br>Afdichting<br>Sello<br>Guarnizione                                                                                                                                              | 1 |
| 5  | PS1068.4                          | Plug, Blanking<br>Blindstopfen<br>Bouchon d'obturation<br>Blindplug<br>Tapón obturador<br>Tappo cieco                                                                                                        | 1 |
| 6  | C203369.100<br>includes 6a        | Cap<br>Deckel<br>Couvercle<br>Deksel<br>Tapa<br>Tappo                                                                                                                                                        | 2 |
| 6a | 95602.78                          | 'O' Ring<br>O-Ring<br>Joint torique<br>O-Ring<br>Aro tórico<br>O-Ring                                                                                                                                        | 2 |
| 7  | D101496.50<br>includes 7a, 7b     | Crankshaft & Balance Weight - C203386<br>Kurbelwelle - mit Gegengewichten<br>Vilebrequin - avec contrepoids<br>Krukas - met contragewichten<br>Cigüeñal - con contrapesos<br>Albero a gomiti con contrappesi | 1 |
| 7a | 95006.155                         | Bolt<br>Schraube<br>Boulon<br>Bout<br>Perno<br>Bullone                                                                                                                                                       | 1 |
| 7b | 98422.1009                        | Locknut<br>Kontermutter<br>Contre-écrou<br>Borgmoer<br>Contratuerca<br>Dado di serraggio                                                                                                                     | 1 |
| 8  | D101488.100<br>includes<br>8a, 8b | Housing, Bearing<br>Lagergehäuse<br>Logement de palier<br>Lagerhuis<br>Alojamiento de cojinete<br>Alloggiamento del cuscinetto                                                                               | 1 |
| 8a | 98076.1126                        | Bearing, Roller<br>Rollenlager<br>Papier à rouleaux<br>Rollager<br>Cojinete de rodillos<br>Cuscinetto a rulli                                                                                                | 4 |

|     |                                  |                                                                                                                                                                                |   |
|-----|----------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---|
| 8b  | 95602.60                         | Screw, Hexagon Head<br>Sechskantschraube<br>Vis à tête 6 pans<br>Zeskantschroef<br>Tornillo de cabeza hexagonal<br>Vite a testa esagonale                                      | 4 |
| 9   | D101485                          | Rod, Connecting - includes bearings<br>Pleuelstange<br>Bielle<br>Drijfstang<br>Biela de conexión<br>Biella con cuscinetti                                                      | 2 |
| 10  | C203378                          | Spacer<br>Distanzring<br>Entretoise<br>Afstandring<br>Espaciador<br>Distanziale                                                                                                | 1 |
| 11  | C203391.50                       | Plunger<br>Kolben<br>Plonqueur<br>Plunjer<br>Embolo<br>Stantuffo                                                                                                               | 1 |
| 11a | 98650.1010                       | Circlip<br>Sprengring<br>Circlip<br>Borgring<br>Presilla                                                                                                                       | 1 |
| 12  | C201452                          | Cam<br>Nocke<br>Came<br>Nok<br>Leva<br>Camma                                                                                                                                   | 2 |
| 13  | 98500.1003                       | Screw, Hexagon Head - LH Thread<br>Sechskantschraube<br>Vis à tête 6 pans<br>Zeskantschroef<br>Tornillo de cabeza hexagonal<br>Vite a testa esagonale con filettatura sinistra | 1 |
| 14  | C203394.100<br>includes 14s, 14b | Cover plate<br>Verkleidungsblech<br>Tôle de carénage<br>Bekledingsplaat<br>Placa tapadera<br>Piastra di copertura                                                              | 1 |
| 14a | C203393                          | Gasket<br>Dichtungsblech<br>Joint<br>Pakking<br>Junta<br>Guarnizione                                                                                                           | 1 |

|     |            |                                                                                                                                           |   |
|-----|------------|-------------------------------------------------------------------------------------------------------------------------------------------|---|
| 14b | 95000.255  | Screw, Hexagon Head<br>Sechskantschraube<br>Vis à tête 6 pans<br>Zeskantschroef<br>Tornillo de cabeza hexagonal<br>Vite a testa esagonale | 6 |
| 15  | PS1322.6   | Seal<br>Dichtung<br>Joint<br>Afdichting<br>Sello<br>Guarnizione                                                                           | 2 |
| 16  | 98156.3639 | Bush, Reducing<br>Reduzierbuchse<br>Bague de réduction<br>Reductiebus<br>Buje reductor<br>Boccola di riduzione                            | 2 |
| 17  | 98086.1001 | Eye, lifting<br>Hebeöse<br>Anneau de levage<br>Hijsooq<br>Cáncarmo para levantamiento<br>Anello di sollevamento                           | 1 |
| 18  | PS1454.4   | Plug, Blanking<br>Blindstopfen<br>Bouchon d'obturation<br>Blindplug<br>Tapón obturador<br>Tappo cieco                                     | 1 |
| 19  | PS1454.2   | Plug, Blanking<br>Blindstopfen<br>Bouchon d'obturation<br>Blindplug<br>Tapón obturador<br>Tappo cieco                                     | 2 |
| 20  | PS1322.4   | Seal<br>Dichtung<br>Joint<br>Afdichting<br>Sello<br>Guarnizione                                                                           | 1 |
| 21  | PS1814.3   | Plug, Blanking<br>Blindstopfen<br>Bouchon d'obturation<br>Blindplug<br>Tapón obturador<br>Tappo cieco                                     | 1 |
| 22  | PS1322.8   | Seal<br>Dichtung<br>Joint<br>Afdichting<br>Sello<br>Guarnizione                                                                           | 1 |

|    |            |                                                                                                                                                         |   |
|----|------------|---------------------------------------------------------------------------------------------------------------------------------------------------------|---|
| 23 | C203396    | Pipe<br>Dichtung<br>Tuyau<br>Pijp<br>Tubo<br>Tubo                                                                                                       | 1 |
| 24 | 98262.1166 | Filler - Oil<br>Öleinfüllstutzen<br>Remplisseur d'huile<br>Olievulplug<br>Rellenador de aceite<br>Bocchettone olio                                      | 1 |
| 25 | 98315.1127 | Hose, Rubber<br>Gummischlauch<br>Flexible en caoutchouc<br>Rubber slang<br>Manquera de caucho<br>Tubo flessibile, gomma                                 | 1 |
| 26 | PS1180.3   | Clip, Worm drive<br>Schneckengewindeschelle<br>Attache p. filetage vis sans fin<br>Slangklem (met wormwiel)<br>Presilla para tronillo sin fin<br>Manica | 2 |
| 27 | PS1295.17  | Adapter<br>Adapter<br>Raccord<br>Verloopstuk<br>Adaptador<br>Adattatore                                                                                 | 1 |
| 28 | PS1285.7   | Sleeve<br>Muffe<br>Manchon<br>Verloopstuk<br>Manquito                                                                                                   | 1 |
| 29 | PS1286.7   | Nut, coupling<br>Spanmutter<br>Ecrou d'accouplement<br>Moer koppeling<br>Tuerca, acoplamiento<br>Dado                                                   | 1 |
| 30 | 98156.3102 | Elbow<br>Bogenstück<br>Coude<br>Kniestuk<br>Codo<br>Gomito                                                                                              | 1 |

#### Language Support

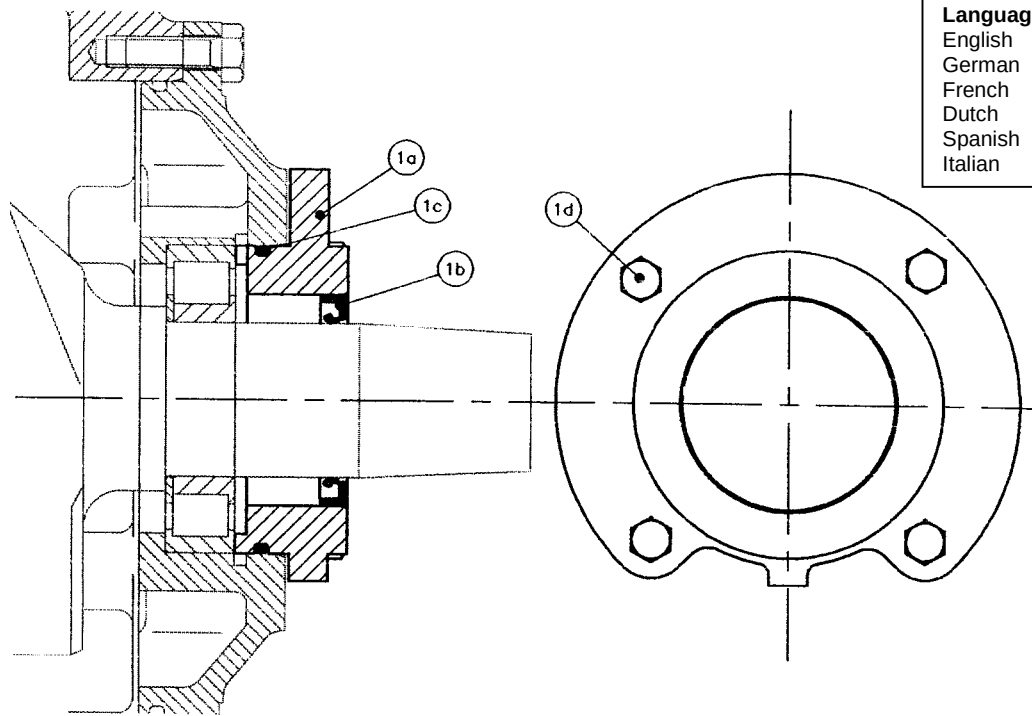
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|                                         |
|-----------------------------------------|
| <b>11.3 OIL SEAL ASSEMBLY – D101501</b> |
|-----------------------------------------|



## OIL SEAL ASSEMBLY D101501 STANDARD COMPRESSORS



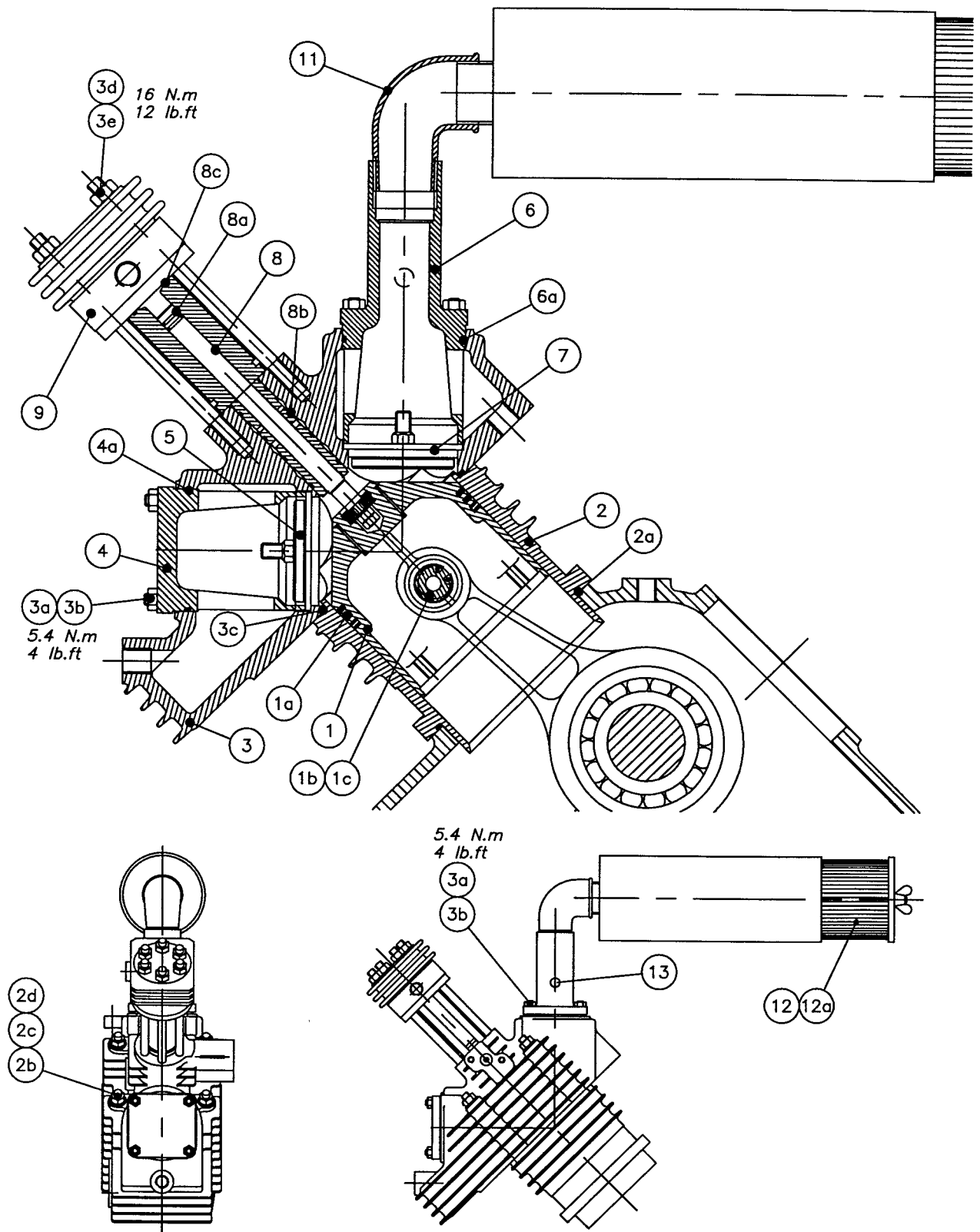
| REF | PART No                     | DESCRIPTION                                                                                                                                 | NO OFF |
|-----|-----------------------------|---------------------------------------------------------------------------------------------------------------------------------------------|--------|
| 1   | D101501                     | Seal, Shaft<br>Dichtung, Welle<br>Joint, d'arbre<br>Asafdichtung<br>Sello de eje<br>Guarnizione albero comprendente                         | 1      |
|     | Includes<br>1a, 1b, 1c & 1d |                                                                                                                                             |        |
| 1a  | D101489                     | Housing, Seal<br>Gehäuse, Dichtung<br>Carter d'étanchéité<br>Afdichtingshuis<br>Alojamiento de sello<br>Guarnizione alloggiamento           | 1      |
| 1b  | 95605.87                    | Seal, Oil<br>Dichtung, Öl<br>Joint, d'huile<br>Olieafdichtung<br>Sello de aceite<br>Paraolio                                                | 1      |
| 1c  | 95602.85                    | 'O' Ring<br>O-Ring<br>Joint torique<br>O-Ring<br>Aro tórico<br>O-Ring                                                                       |        |
| 1d  | 95000.229                   | Screw, Hexagon Head<br>Sechskanantschraube<br>Vis à tête 6 pans<br>Zeskantschroef<br>Tornillo de cabeza hexagonal<br>Vite a testa esagonale | 4      |



|                                                                  |
|------------------------------------------------------------------|
| <b>11.4 1ST &amp; 4TH STAGE CYLINDERS &amp; PISTONS – E61441</b> |
|------------------------------------------------------------------|



## CYLINDER ASSEMBLY - 1st & 4th STAGE AIR COMPRESSORS



## CYLINDER ASSEMBLY - 1st & 4th STAGE. AIR COMPRESSORS PARTS LIST

| REF | PART No                                 | DESCRIPTION                                                                                                                                                                                        | NO OFF |
|-----|-----------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------|
| 1   | D101506.50<br><br>includes<br>1a, 1b,1c | Piston - 1st Stage<br>Kolben - 1. Stufe<br>Piston - 1er étage<br>Zuiger - 1e trap<br>Pistón - 1ª etapa<br>Pistone - 1º stadio                                                                      | 1      |
| 1a  | 98477.1090                              | Ring kit, Piston - 1st Stage<br>Kolbenring-satz - 1. Stufe<br>Jeu segment de piston - 1 er stage<br>Ringenset zuiger - 1e trap<br>Juego anillo pistón – 1ª etapa<br>Kit anelli pistone - 1º stadio | 1      |
| 1b  | C203408                                 | Pin, Gudgeon<br>Kolbenbolzen<br>Axe de piston<br>Zuigerpen<br>Clavija muñón<br>Spinotto                                                                                                            | 1      |
| 1c  | 95650.19                                | Circlip<br>Sprengring<br>Circlip<br>Borgring<br>Presilla<br>Anello di fermo                                                                                                                        | 2      |
| 2   | D100259.100<br>includes<br>2a,2b,2c,2d  | Cylinder - 1st Stage<br>Zylinder - 1. Stufe<br>Cylindre - 1er étage<br>Cilinder - 1 e trap<br>Cilindro – 1ª etapa<br>Cilindro - 2º stadio                                                          | 1      |
| 2a  | 95602.90                                | 'O' Ring<br>O-Ring<br>Joint torique<br>O-Ring<br>Aro tórico<br>O-ring                                                                                                                              | 1      |
| 2b  | D100171.8.101                           | Stud<br>Schaubbolzen<br>Goujon<br>Tapeind<br>Espárrago<br>Perno                                                                                                                                    | 4      |
| 2c  | 95148.14                                | Washer<br>Unterlegscheibe<br>Rondelle<br>Sluitring<br>Arandela<br>Rondella                                                                                                                         | 4      |
| 2d  | 95111.5                                 | Nut<br>Mutter<br>Ecrou<br>Moer<br>Tuerca<br>Dado                                                                                                                                                   | 4      |

|    |                                              |                                                                                                                                                                                                                                 |   |
|----|----------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---|
| 3  | A30180.100<br><br>includes<br>3a,3b,3c,3d,3e | Cover Cylinder - 1st Stage<br>Zylinderdeckel - 1. Stufe<br>Couvercle ducylindre - 1er étage<br>Cilinderdeksel - 1 e trap<br>Tapa de cilindro – 1ª etapa<br>Cilindro - 1º stadio                                                 | 1 |
| 3a | D100171.6.28                                 | Stud<br>Schaubbolzen<br>Goujon<br>Tapeind<br>Espárrago<br>Perno                                                                                                                                                                 | 8 |
| 3b | 95111.4                                      | Nut<br>Mutter<br>Ecrou<br>Moer<br>Tuerca<br>Dado                                                                                                                                                                                | 8 |
| 3c | 95602.90                                     | 'O' Ring<br>O-Ring<br>Joint torique<br>O-Ring<br>Aro tórico<br>O-Ring                                                                                                                                                           | 1 |
| 3d | D100171.8.150                                | Stud<br>Schaubbolzen<br>Goujon<br>Tapeind<br>Espárrago                                                                                                                                                                          | 6 |
| 3e | 95111.5                                      | Nut<br>Mutter<br>Ecrou<br>Moer<br>Tuerca<br>Perno                                                                                                                                                                               | 6 |
| 4  | C200815.100<br><br>includes<br>4a            | Cover, Delivery Valve - 1st Stage<br>Auslaßventildeckel - 1. Stufe<br>Couvercle de soupape de refoulement-1er étage<br>Afdekplaat uitlaatklep - 1e trap<br>Tapa, válvula de reparto – 1ª etapa<br>Copertura valvola - 1º stadio | 1 |
| 4a | 95602.57                                     | 'O' Ring<br>O-Ring<br>Joint torique<br>O-Ring<br>Aro tórico<br>O-Ring                                                                                                                                                           | 1 |
| 5  | 98650.1248                                   | Valve, Delivery - 1st Stage<br>Auslaßventil - 1. Stufe<br>Soupape de refoulement - 1er etage<br>Uitlaatklep - 1e trap<br>Válvula de reparto – 1ª etapa<br>Valvola di mandata - 1º stadio                                        | 1 |
| 6  | C200814.100<br><br>includes<br>6a            | Cover, Suction Valve - 1st Stage<br>Einlaßventildeckel - 1. Stufe<br>Couvercle de soupape d'aspiration - 1er étage<br>Afdekplaat zuigklep - 1e trap<br>Topa, válvula de aspiración – 1ª etapa<br>Copertura valvola - 1º stadio  | 1 |

|    |                                |                                                                                                                                                                                                                                  |   |
|----|--------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---|
| 6a | 95602.57                       | 'O' Ring<br>O-Ring<br>Joint torique<br>O-Ring<br>Aro tórico<br>O-Ring                                                                                                                                                            | 1 |
| 7  | 98650.1247                     | Valve, Suction - 1st Stage<br>Einlaßventil - 1. Stufe<br>Soupape d'aspiration - 1er etage<br>Zuigklep - le trap<br>Válvula de aspiración - 1ª etapa<br>Valvola di aspirazione - 1° stadio                                        | 1 |
| 8  | C203410.50                     | Plunger/Liner Assembly - 4th Stage<br>Laufbuchse/Kolben - 4. Stufe<br>Ensemble Garniture/Plongeur - 4 ème étage<br>Voering/Plunjer Montage - 4e trap<br>Forro/Embollo, Cjto - 4ª etapa<br>Gruppo pistone/camicia del - 4° stadio | 1 |
| 8a | 98477.1181                     | Ring kit, Piston - 4th Stage<br>Kolbenring-satz - 4. Stufe<br>Jeu segment de piston - 4 ème étage<br>Ringenset zuiger - 4e trap<br>Juego anillo pistón - 4ª etapa<br>Set fasce elastiche per pistone - 4° stadio                 | 1 |
| 8b | 95602.15                       | 'O' Ring<br>O-Ring<br>Joint torique<br>O-Ring<br>Aro tórico<br>O-Ring                                                                                                                                                            | 4 |
| 8c | 95602.18                       | 'O' Ring<br>O-Ring<br>Joint torique<br>O-Ring<br>Aro tórico<br>O-Ring                                                                                                                                                            | 1 |
| 9  | C201654                        | Valve 4th Stage<br>Ventil - 4. Stufe<br>Soupape -. 4 ème étage<br>Klep - 4e trap<br>Válvula - 4ª etapa<br>Valvola - 4° stadio                                                                                                    | 1 |
| 10 |                                |                                                                                                                                                                                                                                  |   |
| 11 | 95406.56                       | Elbow<br>Bogenstück<br>Coude<br>Kniestuk<br>Codo<br>Gomito                                                                                                                                                                       | 1 |
| 12 | 98262.1075<br><br>Includes 12a | Filter/Silencer - Suction<br>Filter/Schalldämpfer Ansaug<br>Filtre/Silencieux d'aspiration<br>Aanzuigfilter/demper<br>Filtro/Silenciador de aspiración<br>Filtro di aspirazione                                                  | 1 |

|     |            |                                                                                                                                                                |   |
|-----|------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------|---|
| 12a | 98262.1060 | Element, Air Filter<br>Luftfilterpatrone<br>Elément de filtre à air<br>Luchfilterelement<br>Elemento del filtro de aire<br>Cartuccia del filtro di aspirazione | 1 |
| 13  | 98156.2172 | Plug<br>Stopfen<br>Bouchon<br>Plug<br>Tapón<br>Tappo cieco                                                                                                     | 1 |

**Language Support**

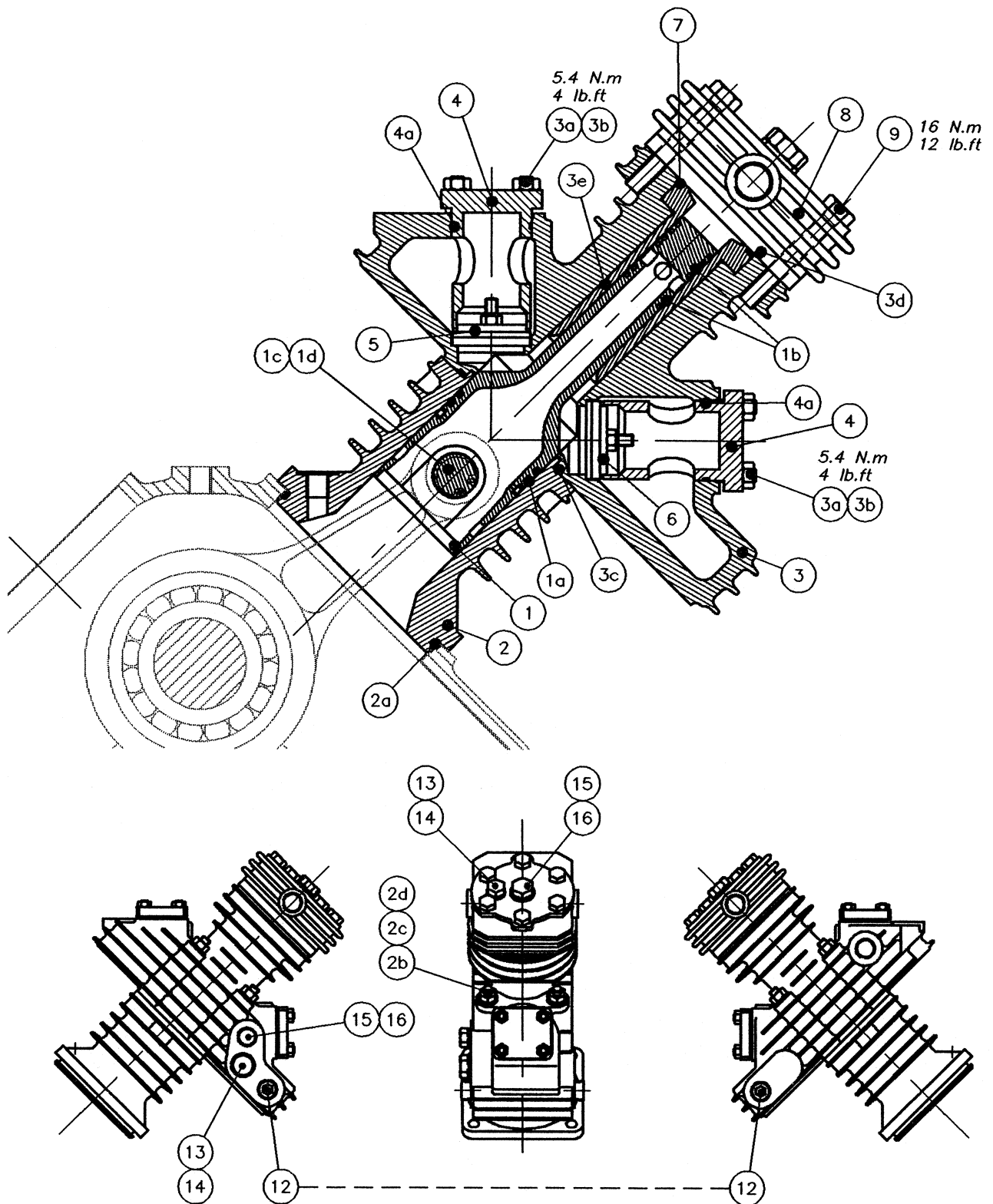
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|------------------------------------------------------------------|
| <b>11.5 2ND &amp; 3RD STAGE CYLINDERS &amp; PISTONS – E61442</b> |
|------------------------------------------------------------------|



## CYLINDER ASSEMBLY - 2nd & 3rd STAGE AIR COMPRESSORS



## CYLINDER ASSEMBLY - 2nd & 3rd STAGE. AIR COMPRESSORS PARTS LIST

| REF | PART No                                       | DESCRIPTION                                                                                                                                                                                       | NO OFF |
|-----|-----------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------|
| 1   | D101507.50<br><br>includes<br>1a, 1b, 1c & 1d | Piston - 2nd Stage/3rd Stage<br>Kolben - 2.Stufe/3.Stufe<br>Piston - 2ème étage/3ème étage<br>Zuiger - 2e trap/3e trap<br>Pistón - 2ª etapa/3ª etapa<br>Pistone - 2° stadio/3° stadio             | 1      |
| 1a  | 98477.1091                                    | Ring kit, Piston - 2nd Stage<br>Kolbenring-satz - 2.Stufe<br>Jeu segment de piston - 2ème étage<br>Ringenset zuiger - 2e trap<br>Juego anillo pistón – 2ª etapa<br>Kit anelli pistone - 2° stadio | 1      |
| 1b  | 98477.1186                                    | Ring kit, Piston - 3rd Stage<br>Kolbenring-satz - 3.Stufe<br>Jeu segment de piston - 3ème étage<br>Ringenset zuiger - 3e trap<br>Juego anillo pistón – 3ª etapa<br>Kit anelli pistone - 3° stadio | 1      |
| 1c  | C203409                                       | Pin, Gudgeon<br>Kolbenbolzen<br>Axe de piston<br>Zuigerpen<br>Clavija muñón<br>Spinotto                                                                                                           | 1      |
| 1d  | 95650.19                                      | Circlip<br>Sprengring<br>Circlip<br>Borgring<br>Presilla<br>Anello di fermo                                                                                                                       | 2      |
| 2   | D100119.100<br><br>includes<br>2a, 2b, 2c, 2d | Cylinder - 2nd Stage<br>Zylinder - 2. Stufe<br>Cylindre - 2ème étage<br>Cilinder - 2 e trap<br>Cilindro – 2ª etapa<br>Cilindro - 2° stadio                                                        | 1      |
| 2a  | 95602.87                                      | 'O' Ring<br>O-Ring<br>Joint torique<br>O-Ring<br>Aro tórico<br>O-ring                                                                                                                             | 1      |
| 2b  | D100171.8.91                                  | Stud<br>Schaubbolzen<br>Goujon<br>Tapeind<br>Espárrago<br>Perno                                                                                                                                   | 4      |
| 2c  | 95148.14                                      | Washer<br>Unterlegscheibe<br>Rondelle<br>Sluitring<br>Arandela<br>Rondella                                                                                                                        | 4      |

|    |                                              |                                                                                                                                                                                   |   |
|----|----------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---|
| 2d | 95111.5                                      | Nut<br>Mutter<br>Ecrou<br>Moer<br>Tuerca<br>Dado                                                                                                                                  | 4 |
| 3  | E60278.100<br><br>includes<br>3a,3b,3c,3d,3e | Cover Cylinder - 2nd Stage<br>Zylinderdeckel - 2. Stufe<br>Couvercle ducylindre - 2ème étage<br>Cilinderdeksel - 2 e trap<br>Tapa de cilindro – 2ª etapa<br>Cilindro - 2º stadio  | 1 |
| 3a | D100171.6.28                                 | Stud<br>Schaubbolzen<br>Goujon<br>Tapeind<br>Espárrago<br>Perno                                                                                                                   | 8 |
| 3b | 95111.4                                      | Nut<br>Mutter<br>Ecrou<br>Moer<br>Tuerca<br>Dado                                                                                                                                  | 8 |
| 3c | 95602.56                                     | 'O' Ring<br>O-Ring<br>Joint torique<br>O-Ring<br>Aro tórico<br>O-Ring                                                                                                             | 1 |
| 3d | 95541.160                                    | Pin, Locating<br>Paßstift<br>Goupille de positionnement<br>Positioneringspen<br>Pasador de colocación<br>Perno di fermo                                                           | 1 |
| 3e | C200525                                      | Liner - 3rd Stage<br>Buchse, Zylinder - 3. Stufe<br>Garniture de cylindre - 3ème étage<br>Cilindrevoering - 3 e trap<br>Forro de cilindro - 3º etapa<br>Camicia - 3º stadio       | 1 |
| 4  | C200604.100<br><br>includes<br>4a            | Cover, Valve - 2nd Stage<br>Ventildeckel - 2. Stufe<br>Couvercle de soupape -2ème étage<br>Ventieldeksel - 2e trap<br>Tapa de válvula – 2ª etapa<br>Copertura valvola - 2º stadio | 2 |
| 4a | 95602.22                                     | 'O' Ring<br>O-Ring<br>Joint torique<br>O-Ring<br>Aro tórico<br>O-Ring                                                                                                             | 2 |

|    |            |                                                                                                                                                                                            |   |
|----|------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---|
| 5  | 98650.1182 | Valve, Delivery - 2nd Stage<br>Auslaßventil - 2. Stufe<br>Soupape de refoulement - 2ème etage<br>Uitlaatklep - 2e trap<br>Válvula de reparto – 2ª etapa<br>Valvola di mandata - 2° stadio  | 1 |
| 6  | 98650.1181 | Valve, Suction - 2nd Stage<br>Einlaßventil - 2. Stufe<br>Soupape d'aspiration - 2ème etage<br>Zuigklep - 2e trap<br>Válvula de aspiración – 2ª etapa<br>Valvola di aspirazione - 2° stadio | 1 |
| 7  | 95602.50   | 'O' Ring<br>O-Ring<br>Joint torique<br>O-Ring<br>Aro tórico<br>O-Ring                                                                                                                      | 1 |
| 8  | 98650.1883 | Valve 3rd Stage<br>Ventil - 3. Stufe<br>Soupape -. 3 ème étage<br>Klep - 3e trap<br>Válvula – 3ª etapa<br>Valvola - 3° stadio                                                              | 1 |
| 9  | 95000.262  | Screw, Hexagon Head<br>Sechskantschtaube<br>Vis à tête 6 pans<br>Zeskantschroef<br>Tornillo de cabeza hexagonal<br>Vite a testa esagonale                                                  | 6 |
| 12 | PS1454.3   | Plug, Blanking<br>Blindstopfen<br>Bouchon d'obturation<br>Blindplug<br>Tapón oburador<br>Tappo cieco                                                                                       | 1 |
| 13 | PS1322.2   | Seal<br>Dichtung<br>Joint<br>Afdichting<br>Sello<br>Guarnizion                                                                                                                             | 2 |
| 14 | PS1814.4   | Plug, Blanking<br>Blindstopfen<br>Bouchon d'obturation<br>Blindplug<br>Tapón oburador<br>Tappo cieco                                                                                       | 2 |
| 15 | PS1322.1   | Seal<br>Dichtung<br>Joint<br>Afdichting<br>Sello<br>Guarnizion                                                                                                                             | 2 |

|    |          |                                                                |   |
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| 16 | PS1814.2 | Seal<br>Dichtung<br>Joint<br>Afdichting<br>Sello<br>Guarnizion | 2 |
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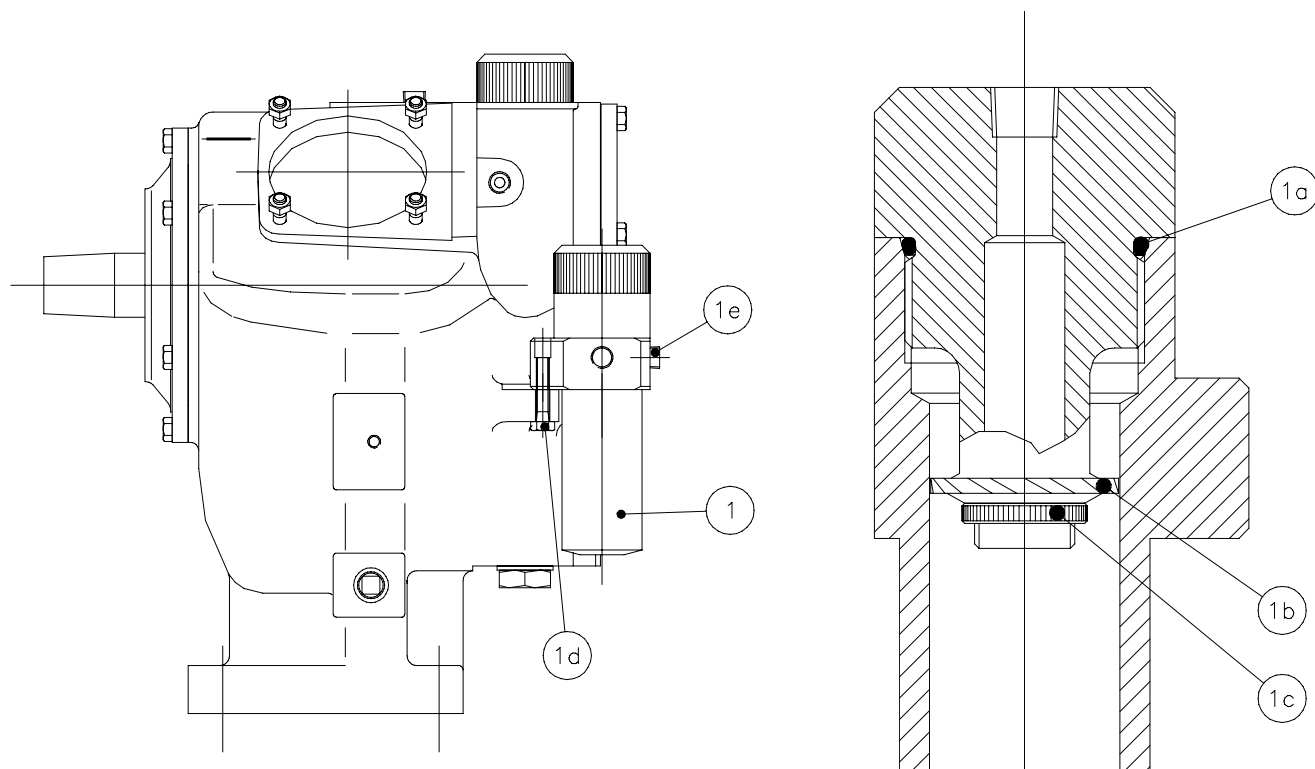
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| <b>11.6 3RD STAGE SEPARATOR – D101509</b> |
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# SEPARATOR ASSY – 3RD STAGE



| REF | PART No.                              | DESCRIPTION                                                                                                                                                                  | No. |
|-----|---------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----|
| 1   | D101509<br>includes<br>1a,1b,1c,1d,1e | Moisture Separator – 3rd Stage<br>Kondensatabscheider – 3. Stufe<br>Séparateur des condensats – 3ème étage<br>Condensafscheider – 3e trap<br>Separador de humedad – 3ª etapa | 1   |
| 1a  | 95602.78                              | 'O' Ring<br>O-Ring<br>Joint torique<br>O-Ring<br>Aro tórico                                                                                                                  | 1   |
| 1b  | 98508.1002                            | Deflector<br>Deflektor<br>Déflecteur<br>Afbuigplaat<br>Placa deflectora                                                                                                      | 1   |
| 1c  | 98152.1143                            | Ring, Lock<br>Verschlußring<br>Segment de verrouillage<br>Sluiring<br>Anillo de cierre                                                                                       | 1   |
| 1d  | 95000.259                             | Screw, Hexagon Head<br>Sechskantschraube<br>Vis à tête 6 pans<br>Zeskantschroef<br>Tornillo de cabeza hexagonal                                                              | 2   |
| 1e  | PS1454.2                              | Plug, Blanking<br>Blindstopfen<br>Bouchon d'obturation<br>Blindplug<br>Tapón obturador                                                                                       | 1   |

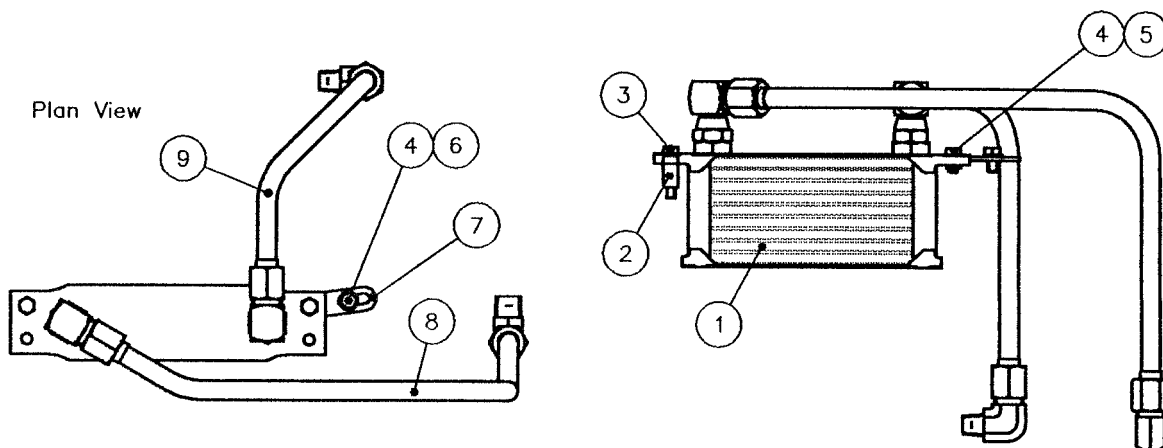
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| <b>11.7 1ST STAGE COOLER ASSEMBLY – E61450</b> |
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## COOLER ASSEMBLY E61450 - 1st STAGE WITH 1ST STAGE SEPARATOR - 5407.2 COMPRESSORS



| REF | PART No   | DESCRIPTION                                                                                                                                                                     | NO OFF |
|-----|-----------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------|
| 1   | C201604   | Cooler - 1st Stage<br>Kühler - 1. Stufe<br>Réfrigérant - 1 <sup>er</sup> étage<br>Koeler - 1e trap<br>Enfriador - 1 <sup>a</sup> etapa<br>Refrigeratore - 1 <sup>o</sup> stadio | 1      |
| 2   | C201200.2 | Spacer<br>Distanzring<br>Eintretoise<br>Afstandring<br>Espaciador<br>Distanziale                                                                                                | 1      |
| 3   | 95000.231 | Screw, Hexagon Head<br>Sechskantschraube<br>Vis à tête 6 pans<br>Zaskantschroef<br>Tornillo de cabeza hexagonal<br>Vite a testa esagonale                                       | 1      |
| 4   | 95000.227 | Screw, Hexagon Head<br>Sechskantschraube<br>Vis à tête 6 pans<br>Zaskantschroef<br>Tornillo de cabeza hexagonal<br>Vite a testa esagonale                                       | 2      |
| 5   | 95111.4   | Nut<br>Mutter<br>Ecrou<br>Moer<br>Tuerca<br>Dado                                                                                                                                | 1      |
| 6   | 95149.13  | Washer<br>Kegelschiebe<br>Rondelle<br>Sluitring<br>Arandela<br>Rondella                                                                                                         | 1      |

|   |         |                                                                                                                                                                                                                                       |   |
|---|---------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---|
| 7 | C201109 | Bracket, Cooler<br>Halierung, Kühler<br>Support de réfrigérant<br>Koelerbeugel<br>Soporte del enfriador<br>Munire di supporto refrigeratore                                                                                           | 1 |
| 8 | C203460 | Pipe, Delivery - 1st Stage<br>Druckrohr - 1. Stufe<br>Tuyau de refoulement - 1er étage<br>Persleiding - 1e trap<br>Tubo de reparto - 1ª etapa<br>Tubo di mandata - 1° stadio                                                          | 1 |
| 9 | C203461 | Pipe, Cooler Outlet - 1st Stage<br>Rohr, Kühlerauslaß - 1. Stufe<br>Tuyau de sortie du réfrigérant - 1er étage<br>Uitlaatleiding koeler - 1e trap<br>Tubo de salida del enfriador - 1ª etapa<br>Tubo refrigeratore uscita - 1° stadio | 1 |

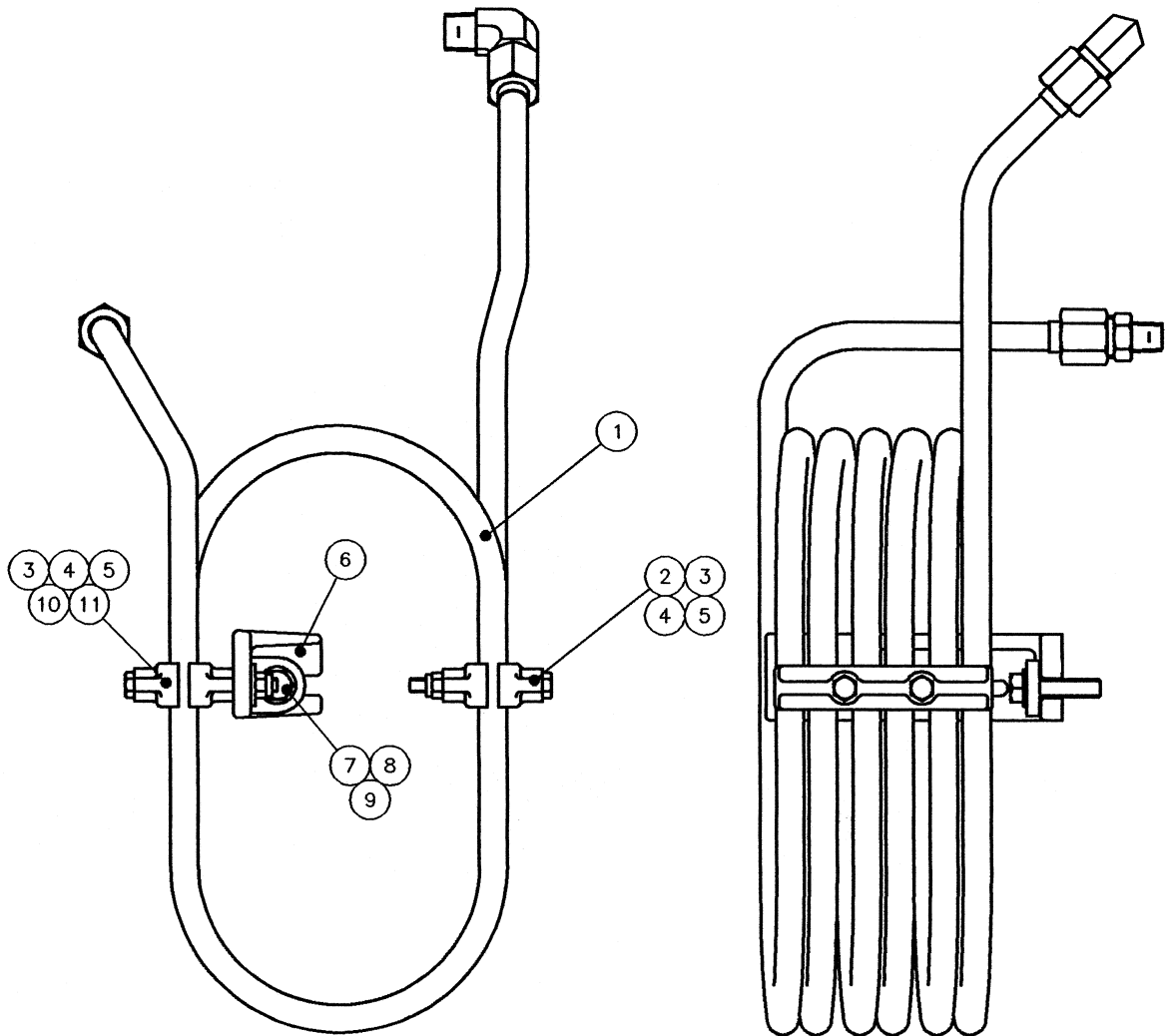
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| <b>11.8 2ND STAGE COOLER ASSEMBLY – E61447</b> |
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## COOLER ASSEMBLY E61447 - 2nd STAGE 5407.2 COMPRESSORS



### 5407.2 COMPRESSORS PARTS LIST

| REF | PART No   | DESCRIPTION                                                                                                                                                                                                                   | NO OFF |
|-----|-----------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------|
| 1   | E61448    | Cooler Coil - 2nd Stage<br>Kühlerspule - 2. Stufe<br>Bobine de réfrigérant - 2 ème étage<br>Pijpenwinding Koeler - 2e trap<br>Serpentina refrigeratore - 2 <sup>a</sup> etapa<br>Bobina refrigeratore - 2 <sup>o</sup> stadio | 1      |
| 2   | 95000.237 | Screw, Hexagon Head<br>Sechskantschraube<br>Vis à tête 6 pans<br>Zaskantschroef<br>Tornillo de cabeza hexagonal<br>Vite a testa esagonale                                                                                     | 2      |
| 3   | C202609   | Strip, Rubber<br>Gummistreifen<br>Bande en caoutchouc<br>Gummistrip<br>Banda de caucho<br>Nastro in gomma                                                                                                                     | 4      |

|    |            |                                                                                                                                                                                             |   |
|----|------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---|
| 4  | C200576    | Clamp, Cooler<br>Halierung, Kühler<br>Support de réfrigérant<br>Koelerklamp<br>Soporte del enfriador<br>Fascetta refrigeratore                                                              | 4 |
| 5  | 95141.6    | Nut, Hexagonal Self-Locking<br>Sechskantmutter, selbstsichernd<br>Ecrou 6 pans à auto-verrouillage<br>Zestantige moer, zelfborgend<br>Tuerca autobloqueante hexagonal<br>Dado autobloccante | 4 |
| 6  | CU41239    | Bracket, Cooler<br>Halierung, Kühler<br>Support de réfrigérant<br>Koelerbeugel<br>Soporte del enfriador<br>Fascetta staffa                                                                  | 1 |
| 7  | PS1742.1   | Washer, Taper<br>Kegelschiebe<br>Rondelle conique<br>Tapse ring<br>Arandela cónica<br>Rondella rastremata                                                                                   | 1 |
| 8  | 95148.14   | Washer<br>Kegelschiebe<br>Rondelle<br>Sluitring<br>Arandela<br>Rondella                                                                                                                     | 1 |
| 9  | 95000.258  | Screw, Hexagon Head<br>Sechskantschraube<br>Vis à tête 6 pans<br>Zaskantschroef<br>Tornillo de cabeza hexagonal<br>Vite a testa esagonale                                                   | 1 |
| 10 | 95006.131  | Bolt, Hexagon Head<br>Sechskantschraube<br>Boulon à tête 6 pans<br>Zaskantbout<br>Perno de cabeza hexagonal<br>Bullone a testa esagonale                                                    | 2 |
| 11 | 98660.1189 | Washer, Large<br>Unterlegschiebe. groß<br>Rondelle, grande<br>Sluitring, groot<br>Arandela, grande<br>Rondella grande                                                                       | 2 |

**Language Support**

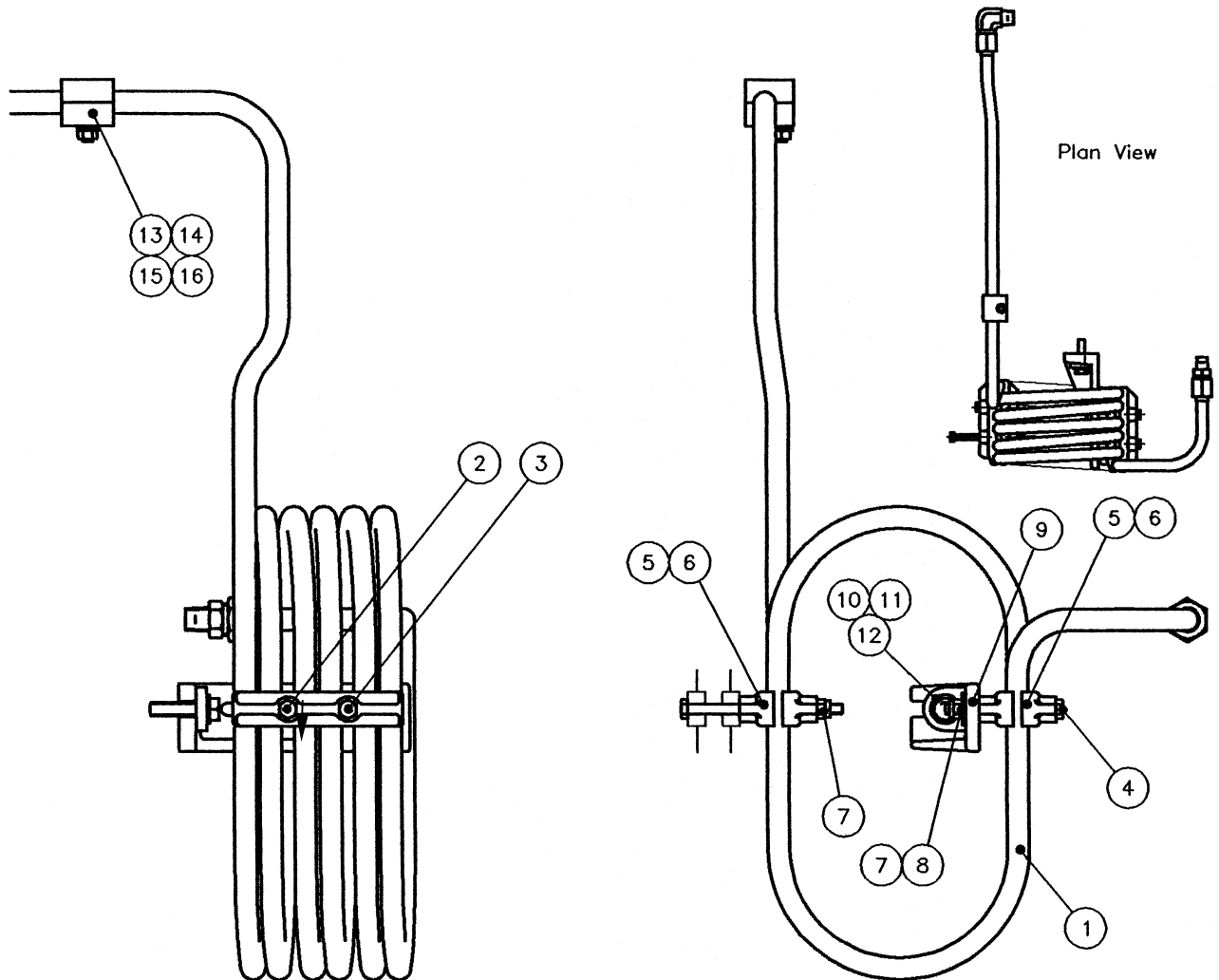
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| <b>11.9 3RD STAGE COOLER ASSEMBLY – E61446</b> |
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## COOLER ASSEMBLY E61446 - 3rd STAGE

### 5407.2 COMPRESSORS



### 5407.2 COMPRESSORS PARTS LIST

| REF | PART No   | DESCRIPTION                                                                                                                                                                                                                   | NO OFF |
|-----|-----------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------|
| 1   | E61443    | Cooler Coil - 3rd Stage<br>Kühlerspule - 3. Stufe<br>Bobine de réfrigérant - 3 ème étage<br>Pijpenwinding Koeler - 3e trap<br>Serpentina refrigeratore - 3 <sup>a</sup> etapa<br>Bobina refrigeratore - 3 <sup>o</sup> stadio | 1      |
| 2   | 95000.237 | Screw, Hexagon Head<br>Sechskantschraube<br>Vis à tête 6 pans<br>Zaskantschroef<br>Tornillo de cabeza hexagonal<br>Vite a testa esagonale                                                                                     | 1      |
| 3   | 95006.135 | Bolt, Hexagon Head<br>Sechskantschraube<br>Boulon à tête 6 pans<br>Zaskantbout<br>Perno de cabeza hexagonal<br>Bullone a testa esagonale                                                                                      | 1      |

|    |            |                                                                                                                                                                                             |   |
|----|------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---|
| 4  | 95006.131  | Bolt, Hexagon Head<br>Sechskantschraube<br>Boulon à tête 6 pans<br>Zaskantbout<br>Perno de cabeza hexagonal<br>Bullone a testa esagonale                                                    | 2 |
| 5  | C200576    | Clamp, Cooler<br>Halterung, Kühler<br>Support de réfrigérant<br>Koelerklamp<br>Soporte del enfriador<br>Fascetta refrigeratore                                                              | 4 |
| 6  | C202609    | Strip, Rubber<br>Gummistreifen<br>Bande en caoutchouc<br>Gummistrip<br>Banda de caucho<br>Nastro in gomma                                                                                   | 4 |
| 7  | 95141.6    | Nut, Hexagonal Self-Locking<br>Sechskantmutter, selbstsichernd<br>Ecrou 6 pans à auto-verrouillage<br>Zestantige moer, zelfborgend<br>Tuerca autobloqueante hexagonal<br>Dado autobloccante | 4 |
| 8  | 98660.1189 | Washer, Large<br>Unterlegschiebe. groß<br>Rondelle, grande<br>Sluitring, groot<br>Arandela, grande<br>Rondella grande                                                                       | 2 |
| 9  | CU41239    | Bracket, Cooler<br>Halterung, Kühler<br>Support de réfrigérant<br>Koelerbeugel<br>Soporte del enfriador<br>Fascetta staffa                                                                  | 1 |
| 10 | PS1742.1   | Washer, Taper<br>Kegelschiebe<br>Rondelle conique<br>Tapse ring<br>Arandela cónica<br>Rondella rastremata                                                                                   | 1 |
| 11 | 95148.14   | Washer<br>Kegelschiebe<br>Rondelle<br>Sluitring<br>Arandela<br>Rondella                                                                                                                     | 1 |
| 12 | 95000.258  | Screw, Hexagon Head<br>Sechskantschraube<br>Vis à tête 6 pans<br>Zaskantschroef<br>Tornillo de cabeza hexagonal<br>Vite a testa esagonale                                                   | 1 |
| 13 | 98150.1040 | Clamp, Pipe<br>Rohrschelle<br>Collier de tube<br>Beugel<br>Sujetador para tubo<br>Fascetta tubo                                                                                             | 1 |

|    |           |                                                                                                 |   |
|----|-----------|-------------------------------------------------------------------------------------------------|---|
| 14 | 95018.170 | Capscrew<br>Kopfchelle<br>Vis à tête<br>Inbusschroef<br>Tapa roscada<br>Vite a testa cilindrica | 1 |
| 15 | 95149.13  | Washer<br>Kegelschiebe<br>Rondelle<br>Sluitring<br>Arandela<br>Rondella                         | 1 |
| 16 | 95111.4   | Nut<br>Mutter<br>Ecrou<br>Moer<br>Tuerca<br>Dado                                                | 1 |

**Language Support**

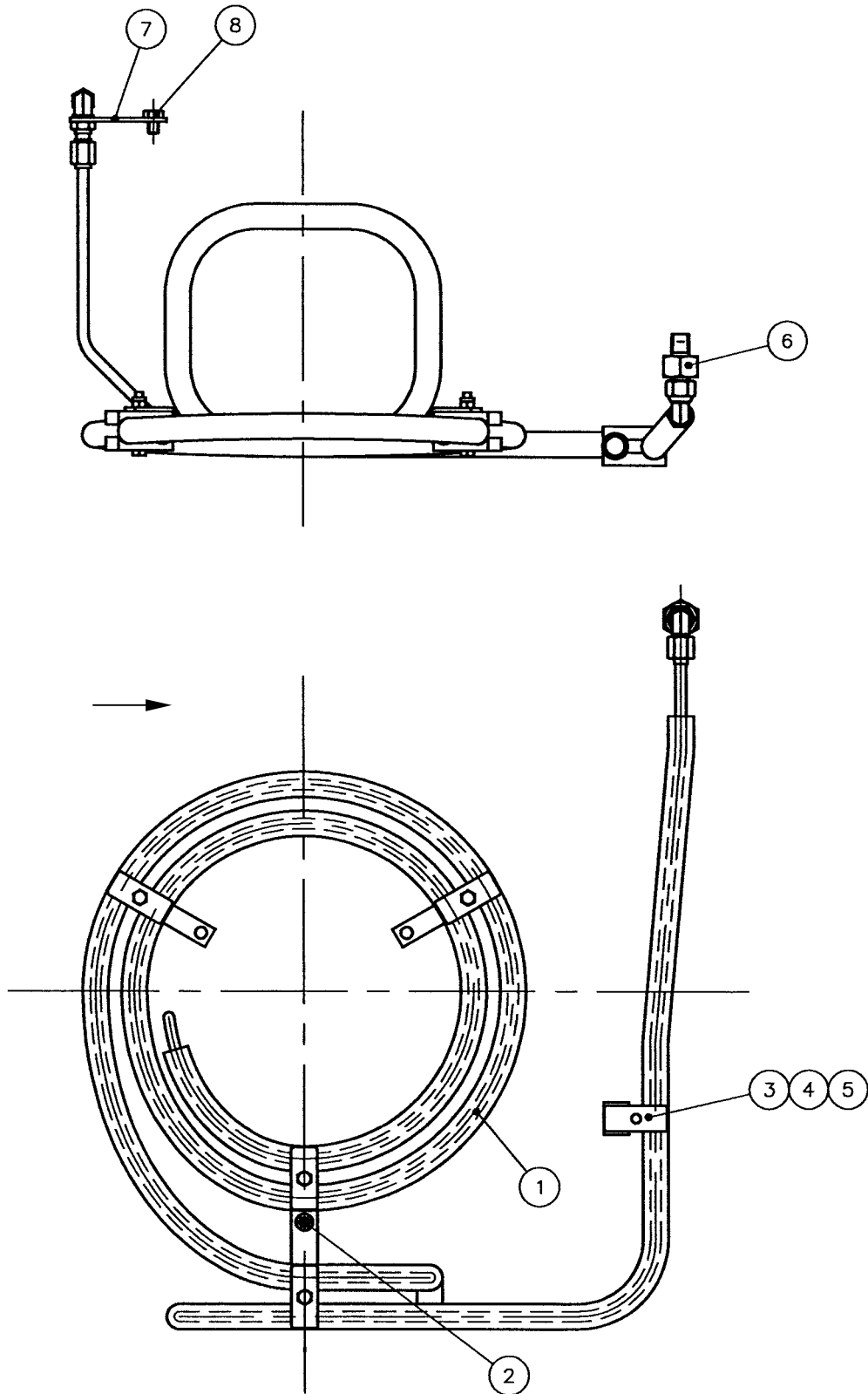
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| <b>11.10</b> | <b>4TH STAGE COOLER ASSEMBLY – E61781</b> |
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## COOLER ASSEMBLY E61781 - 4th STAGE HIGH PRESSURE INDUSTRIAL COMPRESSOR



## HIGH PRESSURE INDUSTRIAL COMPRESSORS PARTS LIST

| REF | PART No    | DESCRIPTION                                                                                                                                                                                                        | NO OFF |
|-----|------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------|
| 1   | A30232     | Cooler Coil - 4th Stage<br>Kühlerspule - 4. Stufe<br>Bobine de réfrigérant - 4 ème étage<br>Pijpenwinding Koeler - 4e trap<br>Serpentina refrigeratore - 4 <sup>a</sup> etapa<br>Bobina refrigeratore 4° stadio    | 1      |
| 2   | 95018.199  | Capscrew<br>Kopfschraube<br>Vis à tête<br>Inbusschroef<br>Tapa roscada<br>Vite a testa cilindrica                                                                                                                  | 1      |
| 3   | C200587    | Clamp, Cooler<br>Halterung, Kühler<br>Support de réfrigérant<br>Koelerklamp<br>Soporte del enfriador<br>Fascetta refrigeratore                                                                                     | 2      |
| 4   | C200879    | Packing<br>Dichtung<br>Garniture<br>Pakking<br>Empaquetadura                                                                                                                                                       | 1      |
| 5   | 98241.1049 | Tie, Cable<br>Kabelklemme<br>Etrier de câble<br>Kabelklem<br>Amarre de cable<br>Vincolare, Cavo                                                                                                                    | 1      |
| 6   | 98156.2809 | Coupling, Stud - High Air Temperature Switch<br>Einschraubstutzen - Temperaturschalter<br>Accouplement de goujon - Thermostat<br>Inschroefkoppeling - Temperaturschakelaar<br>Conectador de espárrago - Termostato | 1      |
| 7   | C201827    | Bracket<br>Halterung<br>Support<br>Beugel<br>Soporte<br>Parentesi                                                                                                                                                  | 1      |
| 8   | 95000.253  | Screw, Hexagon Head<br>Sechskantschraube<br>Vis à tête 6 pans<br>Zaskantschroef<br>Tornillo de cabeza hexagonal<br>Vite a testa esagonale                                                                          | 1      |

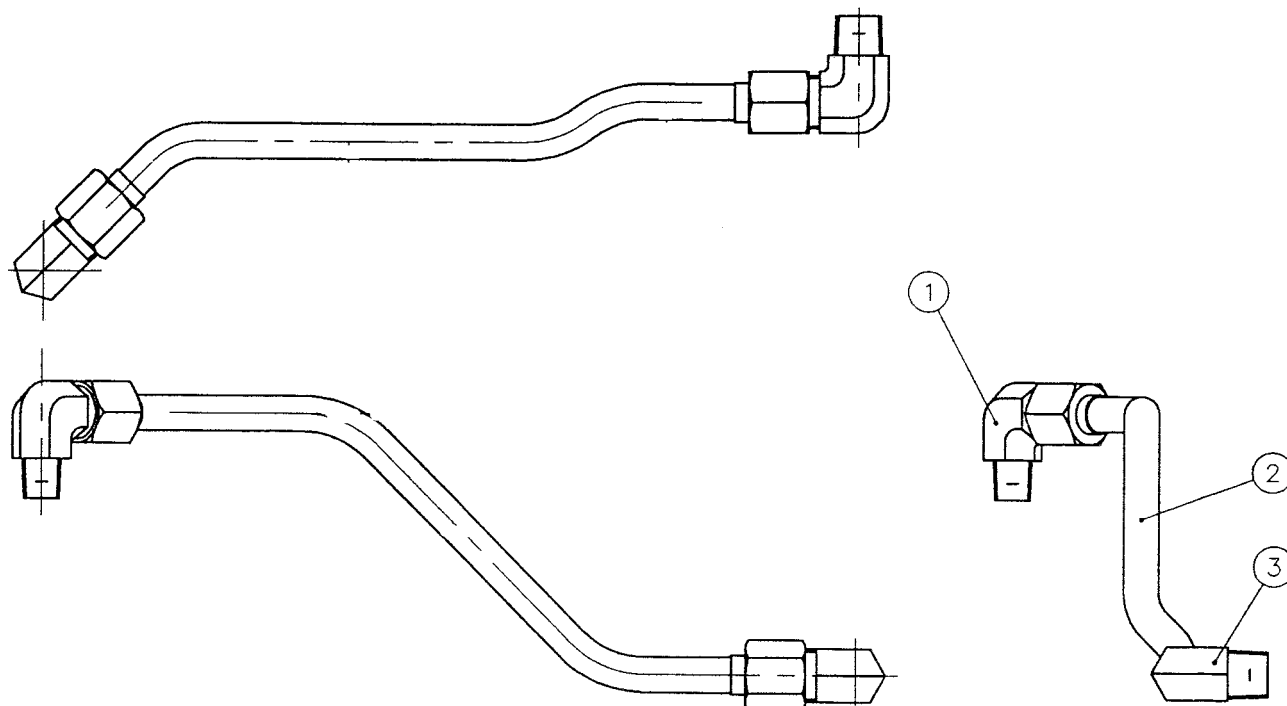
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| <b>11.11      2ND STAGE SUCTION PIPE – C203453</b> |
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## SUCTION PIPE ASSEMBLY 2ND STAGE - C203453 5407.2 COMPRESSOR



### PARTS LIST

| REF | PART No    | DESCRIPTION                                                                                  | NO OFF |
|-----|------------|----------------------------------------------------------------------------------------------|--------|
| 1   | 98156.2610 | Elbow - 90°<br>Bogenstück - 90°<br>Coude - 90°<br>Kniestuk - 90°<br>Codo - 90°<br>Gomito 90° | 1      |
| 2   | 98617.1020 | Tube - Aluminium<br>Rohr -<br>Tube -<br>Pijp -<br>Tubo -<br>Tubo - alluminio                 | 1      |
| 3   | 98156.2611 | Elbow - 90°<br>Bogenstück - 90°<br>Coude - 90°<br>Kniestuk - 90°<br>Codo - 90°<br>Gomito 90° | 1      |

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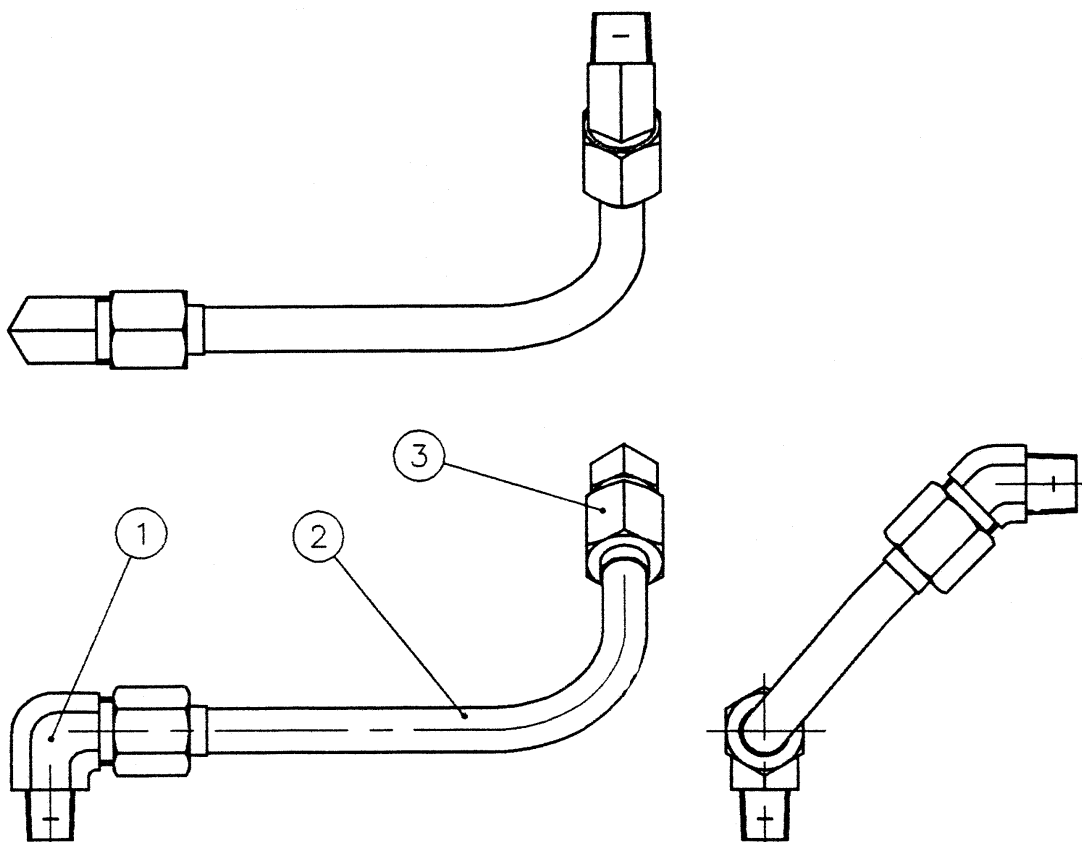
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| <b>11.12      3RD STAGE SUCTION PIPE – C203445</b> |
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## SUCTION PIPE ASSEMBLY 3RD STAGE - C203445 5407.2 & 5407.3 COMPRESSORS



### PARTS LIST

| REF | PART No    | DESCRIPTION                                                                                    | NO OFF |
|-----|------------|------------------------------------------------------------------------------------------------|--------|
| 1   | 98156.2610 | Elbow - 90°<br>Bogenstück - 90°<br>Coude - 90°<br>Kniestuk - 90°<br>Codo - 90°<br>Gomito 90°   | 1      |
| 2   | 98617.1020 | Tube - Aluminium<br>Rohr -<br>Tube -<br>Pijp -<br>Tubo -<br>Tubo - alluminio                   | 1      |
| 3   | 98156.3653 | Elbow - 45°<br>Bogenstück - 45°<br>Coude - 45°<br>Kniestuk - 45°<br>Codo - 45°<br>Gomito - 45° | 1      |

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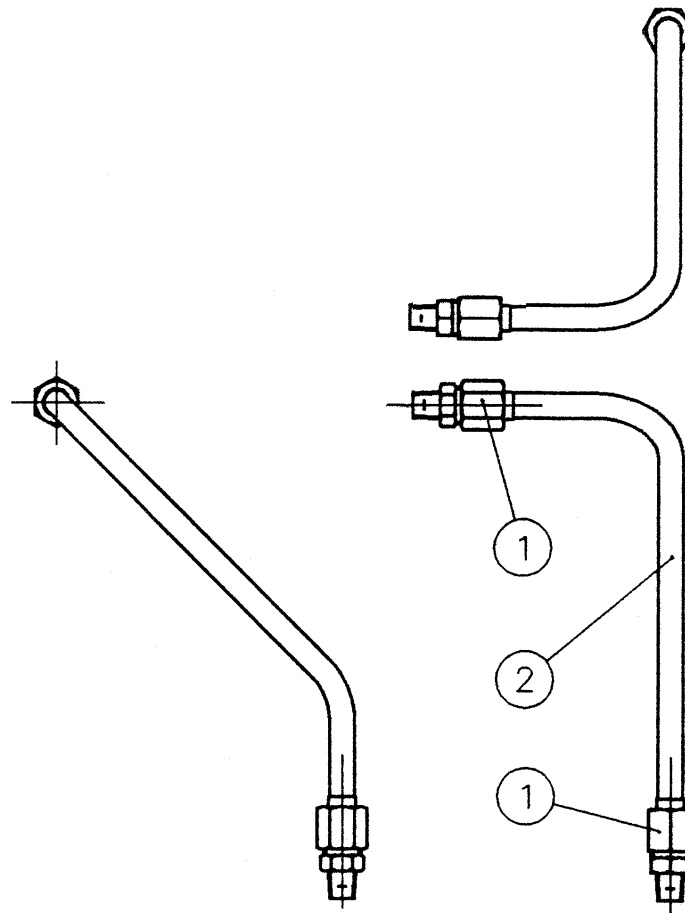
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| <b>11.13      4TH STAGE SUCTION PIPE – C203446</b> |
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## SUCTION PIPE ASSEMBLY 4TH STAGE - C203446 5407.2 & 5407.3 COMPRESSORS



### PARTS LIST

| REF | PART No    | DESCRIPTION                                                                  | NO OFF |
|-----|------------|------------------------------------------------------------------------------|--------|
| 1   | 98156.1801 | Coupling<br>Kuppelstück<br>Accouplement<br>Koppeling<br>Acoplamiento         | 2      |
| 2   | 98617.1020 | Tube - Aluminium<br>Rohr -<br>Tube -<br>Pijp -<br>Tubo -<br>Tubo - alluminio | 1      |

#### Language Support

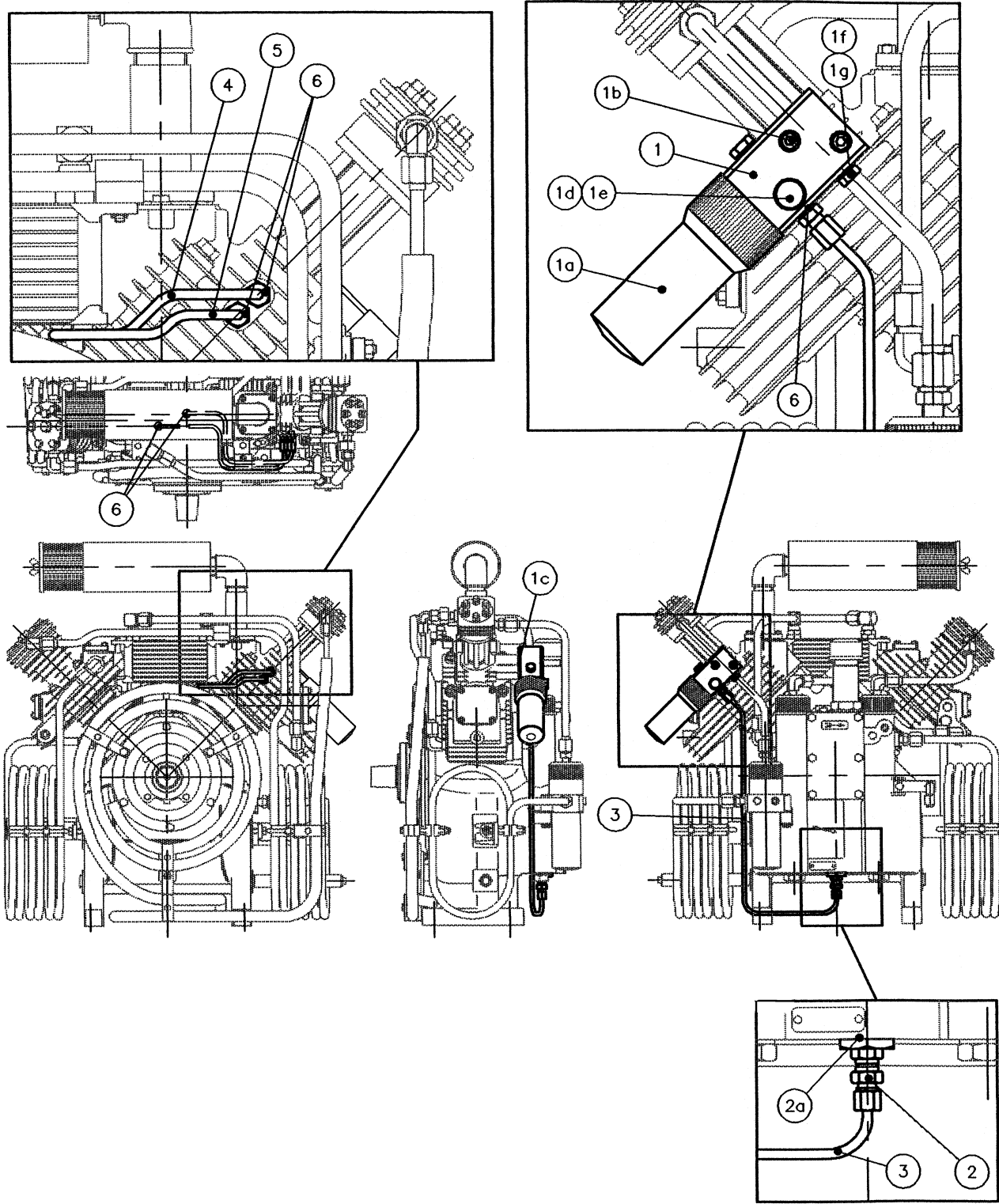
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| <b>11.14      LUBRICATION ASSEMBLY – E61493</b> |
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# LUBRICATION ASSEMBLY INDUSTRIAL COMPRESSORS



## LUBRICATION ASSEMBLY INDUSTRIAL COMPRESSORS PARTS LIST E61493

| REF | PART No     | DESCRIPTION                                                                                                                                              | NO OFF |
|-----|-------------|----------------------------------------------------------------------------------------------------------------------------------------------------------|--------|
| 1   | C203458.100 | Regulator, Oil<br>Ölregler<br>Régulateur<br>Olieregelaar<br>Regulador de aceite<br>Regolatore, Olio                                                      | 1      |
| 1a  | 98262.1148  | Element, Oil Filter<br>Einsatz, Ölfiltre<br>Elément du filtre à huile<br>Oliefilterelement<br>Elemento del filtro de aceite<br>Cartuccia del filtro olio | 1      |
| 1b  | 95018.174   | Capscrew<br>Kopfschraube<br>Vis à tête<br>Inbusschroef<br>Tapa roscada<br>Vite a testa cilindrica                                                        | 2      |
| 1c  | 95602.7     | 'O' Ring<br>O-Ring<br>Joint torique<br>O-Ring<br>Aro tórico<br>O-Ring                                                                                    | 1      |
| 1d  | PS1322.2    | Seal<br>Dichtung<br>Joint<br>Afdichting<br>Sello<br>Guarnizione                                                                                          | 1      |
| 1e  | PS1814.4    | Plug, Blanking<br>Blindstopfen<br>Bouchon d'obturation<br>Blindplug<br>Tapón obturador<br>Tappo cieco                                                    | 1      |
| 1f  | PS1322.1    | Seal<br>Dichtung<br>Joint<br>Afdichting<br>Sello<br>Guarnizione                                                                                          | 1      |
| 1g  | PS1814.2    | Plug, Blanking<br>Blindstopfen<br>Bouchon d'obturation<br>Blindplug<br>Tapón obturador<br>Tappo cieco                                                    | 2      |

|    |                            |                                                                                                                                                  |   |
|----|----------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------|---|
| 2  | C203431<br><br>Includes 2a | Pump, Oil<br>Ölpumpe<br>Pompe d'huile<br>Oliepomp<br>Bomba de aciete<br>Pompa dell'olio                                                          | 1 |
| 2a | 95602.40                   | 'O' Ring<br>O-Ring<br>Joint torique<br>O-Ring<br>Aro tórico<br>O-Ring                                                                            | 2 |
| 3  | C203531                    | Pipe, Oil Feed<br>Ölzufuhr-Rohr<br>Tuyau d'amenee d'huile<br>Olieaanvoerpijp<br>Tubería sumin aciete<br>Tubo alimentazione olio                  | 1 |
| 4  | C203643                    | Pipe, Oil Return<br>Öl-Rückleitung- Baugruppe<br>Tuyau de retour d'huile<br>Olieaterugvoerleiding<br>Tubería retorno aciete<br>Tubo ritorno olio | 1 |
| 5  | C203644                    | Pipe, Oil Return<br>Öl-Rückleitung- Baugruppe<br>Tuyau de retour d'huile<br>Olieaterugvoerleiding<br>Tubería retorno aciete<br>Tubo ritorno olio | 1 |
| 6  | 98660.1152                 | Seal<br>Dichtung<br>Joint<br>Afdichting<br>Sello<br>Guarnizione                                                                                  | 3 |

**Language Support**

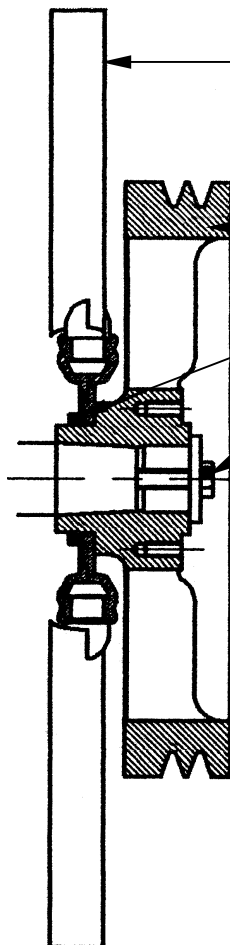
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| <b>11.15      FLYWHEEL ASSEMBLY – E61421</b> |
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## FLYWHEEL ASSEMBLY 2 X SPA E61421 WITH DIRECT DRIVE OPTION



2  
2a > 10/98  
2b < 10/1998

1

3 - 4

5 - 6  
55 nm 40 lb ft

Note:- GRP (red) and GRN (black) should not be mixed on the same fan assembly

### PARTS LIST

| REF | PART No    | DESCRIPTION                                                                                                                                                  | NO OFF |
|-----|------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------|--------|
| 1   | E61420     | Flywheel<br>Schwungrad<br>Volent<br>Vliegwiel<br>Volente                                                                                                     | 1      |
| 2   | 98084.1003 | Fan, Axial<br>Axiallüfter<br>Ventilateur, axial<br>Axiale ventilator<br>Venilador, axial                                                                     | 1      |
| 2a  | 98084.1033 | Blade, Fan - GRN Black<br>Ventilatorflügel - GRN Schwarz<br>Pale de ventilateur - GRN Noir<br>Ventilatrblad - GRN Zwart<br>Paleta del ventilador - GRN Negro | 10     |
| 2b  | 98084.1005 | Blade, Fan - GRP Red<br>Ventilatorflügel - GRP Rot<br>Pale de ventilateur - GRP Rouge<br>Ventilatrblad - GRP Rood<br>Paleta del ventilador - GRP Rojo        | 10     |
| 3   | 95179.5    | Washer, Spring<br>Federring<br>Rondelle élastique<br>Veering<br>Arandela elastica                                                                            | 6      |
| 4   | 95018.168  | Screw, Caphead<br>Schraube<br>Vis<br>Schroefbout<br>Tornillo                                                                                                 | 6      |
| 5   | 98660.1092 | Washer, Retaining<br>Sicherungsscheibe<br>Rondelle de retenue<br>Borgring<br>Arandela de retención                                                           | 1      |
| 6   | 98500.1003 | Screw, Hexagon Head - Left Hand Thread<br>Sechskantschraube<br>Vis à tête 6 pans<br>Zestkantschroef<br>Tonillo de cabeza hexagonal                           | 1      |

#### Language Support

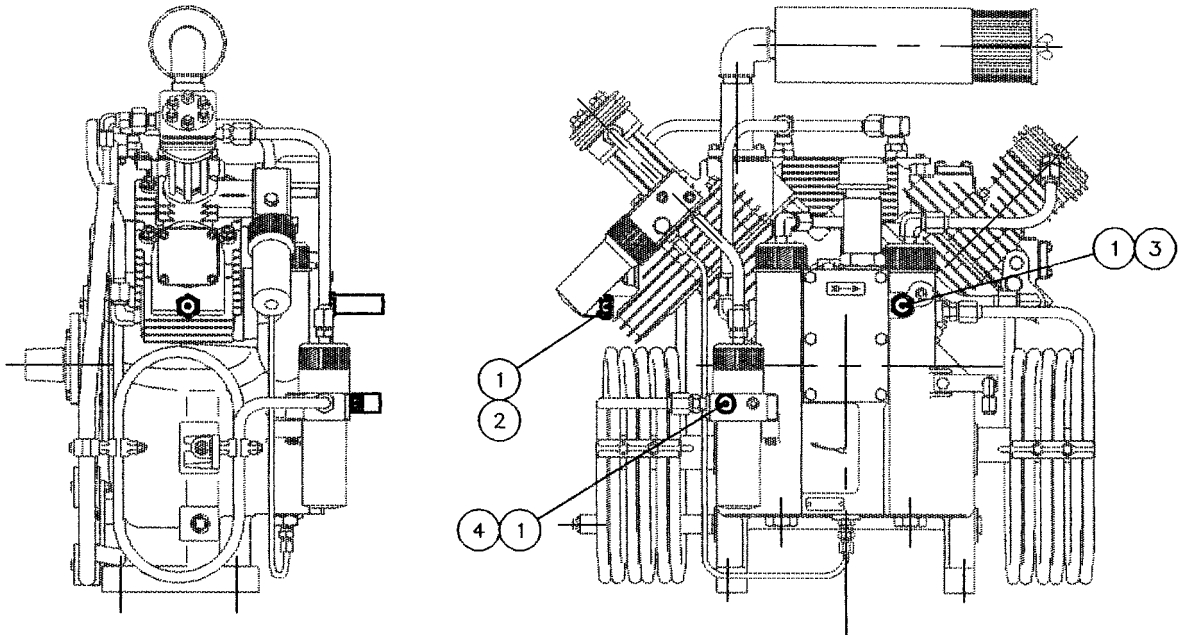
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| <b>11.16      SAFETY VALVES – E61449</b> |
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## SAFETY VALVES E61449 STANDARD COMPRESSORS



### STANDARD COMPRESSORS PARTS LIST

| REF | PART No        | DESCRIPTION                                                                                                                                                                                                                                      | NO OFF |
|-----|----------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------|
| 1   | PS1322.2       | Seal<br>Dichtung<br>Joint<br>Afdichting<br>Sello<br>Guarnizion                                                                                                                                                                                   | 3      |
| 2   | 98650.1163-5.9 | Valve Safety - 1st Stage<br>Sicherheitsventil - 1. Stufe<br>Soupape de sécurité - 1 <sup>er</sup> étage<br>Veiligheidsklep - 1 <sup>e</sup> trap<br>Válvula de seguridad - 1 <sup>a</sup> etapa<br>Valvola di sicurezza - 1 <sup>o</sup> stadio  | 1      |
| 3   | 98650.1163-27  | Valve Safety - 2nd Stage<br>Sicherheitsventil - 2. Stufe<br>Soupape de sécurité - 2 <sup>ème</sup> étage<br>Veiligheidsklep - 2 <sup>e</sup> trap<br>Válvula de seguridad - 2 <sup>a</sup> etapa<br>Valvola di sicurezza - 2 <sup>o</sup> stadio | 1      |
| 4   | 98650.1164-97  | Valve Safety - 3rd Stage<br>Sicherheitsventil - 3. Stufe<br>Soupape de sécurité - 3 <sup>ème</sup> étage<br>Veiligheidsklep - 3 <sup>e</sup> trap<br>Válvula de seguridad - 3 <sup>a</sup> etapa<br>Valvola di sicurezza - 3 <sup>o</sup> stadio | 1      |

#### Language Support

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## **12 ANCILLARY PARTS**

THE FOLLOWING INFORMATION IS FOR COMMON ITEMS THAT MAY BE FITTED TO THE COMPRESSOR ACCORDING TO THE USE FOR WHICH IT IS EMPLOYED

### **12.1 PRESSURE GAUGE – APP070**

#### **PRESSURE GAUGES**

##### **GENERAL**

The pressure gauge should be installed such as to avoid exposure to heat and vibration and to enable easy observation of the dial indication.

##### **IMPORTANT**

It is common practise to install the pressure gauge without an isolating device, so to facilitate calibration or replacement the system must be de pressurised before any work is carried out.

The pressure gauge is liquid filled to provide better damping from pulsation's.

##### **INSTALLATION & COMMISSIONING**

The tightening and loosening of torque applied to the connection should be by means of the spanner flats provided on the stem and should not be by means of grasping the case as this may damage the gauge.

No pressure higher than indicated by the working pressure symbol ▼ must be applied to the gauge during hydrostatic pressure testing of the system. Otherwise the gauge must be isolated or removed during this operation.

No attempt should be made to remove a pressurised gauge. The pressure system must be totally relieved if the gauge can not be isolated otherwise.

The remainder of the pressure medium contained in the element may be hazardous or toxic. This should be considered when handling and storing the removed pressure gauge.

##### **PRESSURE GAUGES IN SERVICE.**

Always open isolating devices always gently and never abruptly, as this may generate sudden pressure surges that may damage the gauge.

The maximum working pressure for which the gauge is suitable, or also the minimum working pressure in cases of vacuum, is indicated on the dial by corresponding marks ▼. Fluctuating pressure always reduces the maximum working pressure of the gauge.

Correct zeroing may be inspected by closing the isolating valve and relieving the gauge from pressure. The pointer must fall within the thickened portion of the zero mark. Unless the gauge temperature is considerably higher or lower than 20°C, a pointer not returning to zero may indicate serious damage to the gauge.

On-site testing of the pressure gauge is feasible by means of special isolating devices enabling connection of a test gauge together with a suitable pressure source.

12.2 PRESSURE SWITCH

12.2.1 LOW OIL PRESSURE – APP088

LOW OIL PRESSURE SWITCH

PART NO: 98524.1042, 98524.1122, 98524.1140 & 98524.1170

OPERATION

Located in the crankcase on water-cooled & large air-cooled compressors, in the oil filter body on air-cooled, the pressure switch stops the compressor when the oil pressure drops to pre-set pressure setting.

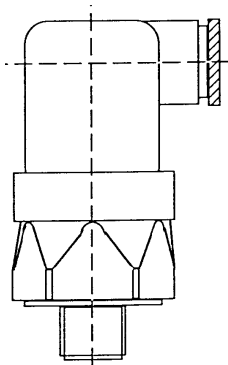
| Part No.   | Compressor Type       | Inlet Pressure       | Setting                   |
|------------|-----------------------|----------------------|---------------------------|
| 98524.1042 | WATERCOOLED           | Standard             | 1 bar (15 psi) falling    |
| 98524.1122 | AIRCOOLED             | Standard             | 0.5 bar (7.5 psi) falling |
| 98524.1042 | AIRCOOLED – GAZPACKS  | over 0.1 bar         | 1 bar (15 psi) falling    |
| 98524.1042 | AIRCOOLED – 5450/5470 | Standard             | 1 bar (15 psi) falling    |
| 98524.1122 | AIRCOOLED – GAZPACKS  | up to 0.1 bar        | 0.5 bar (7.5 psi) falling |
| 98524.1140 | AIRCOOLED – GAS       | Standard             | 1 bar (15 psi) falling    |
| 98524.1169 | AIRCOOLED – IZAR      | up to 0.1 bar        | 0.5 bar (7.5 psi) falling |
| 98524.1170 | WATERCOOLED – GAS     | 24 VDC Gold Contacts | 1 bar (15 psi) falling    |

The switch transforms a change of pressure into an electrical "On" or "Off" signal.

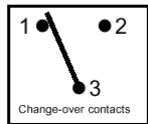
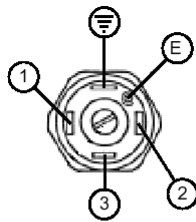
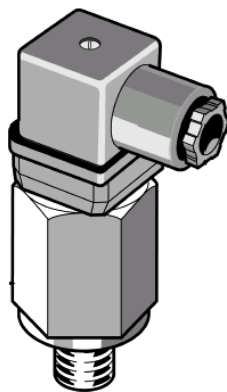
When a pre-set pressure is reached the snap action contact stops the compressor.

INSTALLATION

Either of two makes of low oil pressure switch may be fitted as shown below. Terminal connections are shown for clarity.



Connect Common (1) and  
Normally Open (4) terminals  
to compressor control panel



Connect Common (3) and  
Normally Open (2) terminals  
to compressor control panel

## 12.2.2 COMPRESSOR DELIVERY PRESSURE – APP081

# PRESSURE SWITCH

98524.1004 & 1139

## OPERATION

Located as close as possible to the H.P. delivery line, the pressure switch stops the compressor when the upper pressure limit is attained and triggers off the start when the lower limit is reached. The switch transforms a change of pressure into an electrical 'On' or 'Off' signal. When a pre-set pressure is reached the snap action contact changes state.

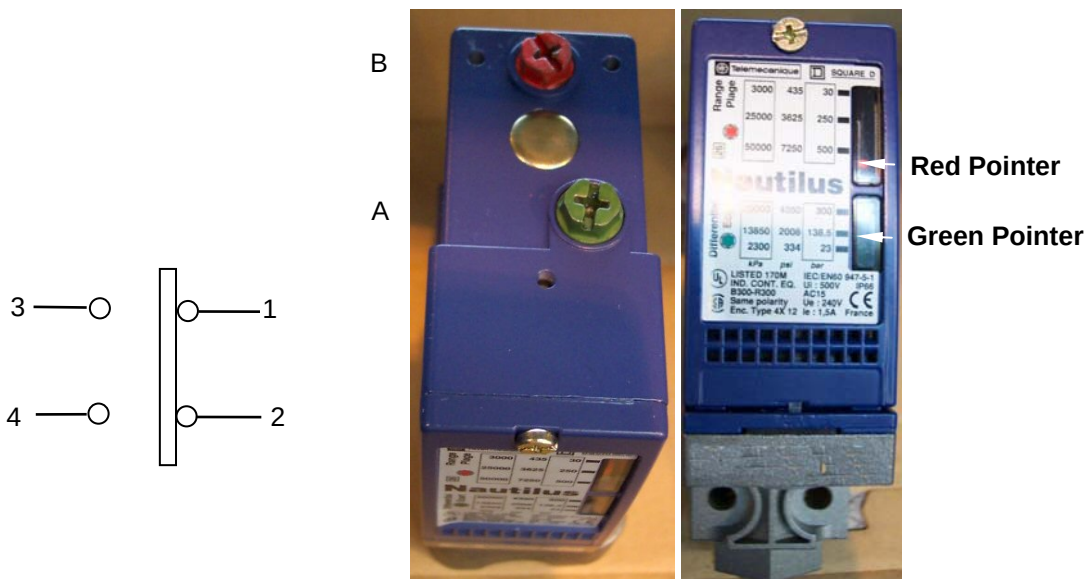
## INSTALLATION

Pressure switches may be mounted in any convenient position close to the H.P. line, provided it is not subject to vibration and that the connecting pipe to the receiver does not exceed five metres.

Mount the switch by the lugs provided on the casing.

Where possible the pressure switch operating line should be taken from the receiver to avoid pressure oscillations.

It is usual to connect 1 and 2 to the compressor electrical control circuit terminals marked pressure switch'.



## SETTING

Example of pressure setting to 200 bar minimum and 225 bar maximum.

Turn screw (A) to raise the GREEN pointer to its highest point.

Turn screw (B) so that the higher setting (225 bar) coincides with the RED pointer.

Turn screw (A) again to set the lower pressure 200 bar on the GREEN pointer.

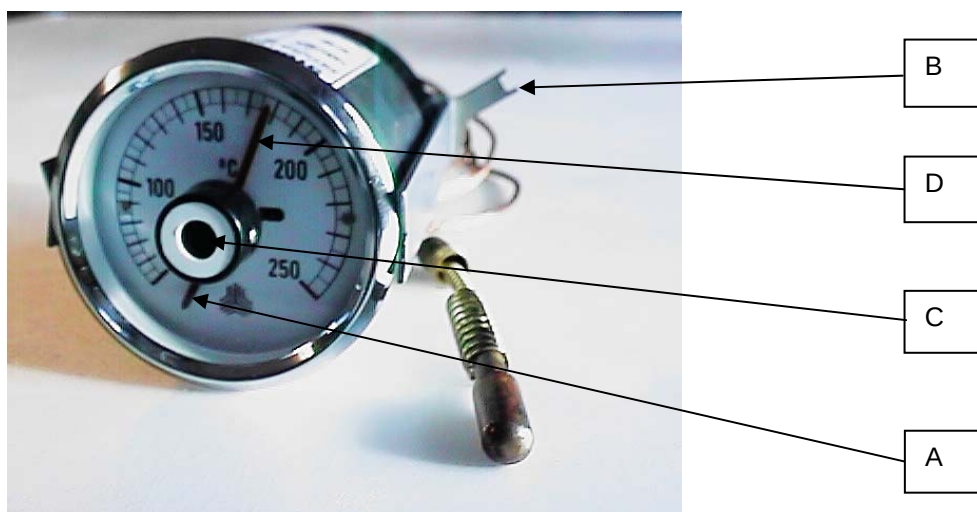
**NOTE: ALWAYS USE A CALIBRATED PRESSURE GAUGE WHEN SETTING PRESSURE SWITCHES, AS THE MARKINGS ON SWITCHES ARE FOR INDICATION ONLY.**

## 12.3 TEMPERATURE CONTROLLER – APP090C

### THERMOMETER SWITCHES C202556, C202749, C202960 & C202964 98288.1093, 98288.1094 & 98288.1215

THESE THERMOMETER SWITCHES ARE SET TO THE FIGURES QUOTED BELOW, THE FOLLOWING INFORMATION IS FOR SETTING INFORMATION ONLY, IF THE TEMPERATURE SWITCH HAS TO BE REPLACED OR RE-ADJUSTED.

IF THE SWITCH NEEDS TO BE RE-ADJUSTED DUE TO A HIGHER AMBIENT TEMPERATURE OR ANY REASONS PLEASE CONTACT COMPAIR UK LTD. IPSWICH FOR MORE INFORMATION.



#### TO SET TRIP INDICATOR POINTER.

RUN COMPRESSOR TO ESTABLISH NORMAL RUNNING TEMPERATURE OF BLACK POINTER [A].

WHEN READING IS STABLE, REMOVE ADJUSTING KEY [B] FROM REAR OF SWITCH AND INSERT INTO FRONT OF CENTRAL KNOB ADJUSTER [C].

ROTATE KEY TO ADJUST RED POINTER [D] TO 10°C ABOVE RUNNING TEMPERATURE POINTER [A].

ADJUSTMENT OF TRIP POINTER MUST BE WITHIN RANGE THAT HAS BEEN PRE-SET AT COMPAIR BEFORE DESPATCH, BUT MAY BE ADJUSTED WITHIN THIS RANGE DEPENDING ON AMBIENT CONDITIONS.

NOTE: DO NOT RESET TEMPERATURE CONTROLLER SETTING IF IT TRIPS, ALWAYS LOCATE AND CORRECT POSSIBLE FAULT BEFORE ANY ATTEMPT IS MADE TO ALTER SETTING. CONTACT CompAir UK Ltd IPSWICH ENGINEERING DEPARTMENT FOR MORE INFORMATION IF THE COMPRESSOR TRIPS WHEN SWITCH IS SET AT MAXIMUM VALUE.

| CONTROLLER<br>PART No | TRIP POINTER<br>STOP SETTING °C | USED ON<br>COMPRESSOR MODEL          |
|-----------------------|---------------------------------|--------------------------------------|
| C202556.1             | 125                             | 5236.1                               |
| C202556.2             | 140                             | 5212                                 |
| C202556.3             | 150                             | 5336,5415                            |
| C202556.4             | 155                             | 5215 & 5217                          |
| C202556.5             | 170                             | 5236.2,5315                          |
| C202556.6             | 180                             | 5415E5317,5417.5417N                 |
| C202556.7             | 205                             | 5436(CU TUBES)                       |
| C202556.8             | 220                             | 5436.1 & 2,5436H,5436N,5436SN & 5437 |
| C202749.1             | 200                             | 5280                                 |
| C202749.2             | 210                             | 5280                                 |
| C202749.3             | 175                             | 5409                                 |
| C202960.1             | 75                              | WATERCOOLED M/C'S DELIVERY           |
| C202960.2             | 60                              | 5211                                 |
| C202960.3             | 55                              | WATER OUTLET                         |
| C202960.4             | 80                              | 5207,5209,5213                       |
| C202960.5             | 50                              | 5417N,5436N                          |
| C202964.1             | 75                              | 5280,5281,5282,5283, DELY            |
| C202964.2             | 60                              | 5450,5470 DELY                       |
| CONTROLLER<br>PART No | TEMPERATURE RANGE<br>°C         | USED ON<br>COMPRESSOR MODEL          |
| 98288.1089            | 50 - 250                        | WATERCOOLED 5000 SERIES              |
| 98288.1121            | 0 - 120                         | WATERCOOLED 5000 SERIES              |
| CONTROLLER<br>PART No | WHERE FITTED                    | USED ON<br>COMPRESSOR MODEL          |
| 98288.1093            | 1st – 5th STG. DELIVERY         | 5450 & 5470                          |
| 98288.1094            | FINAL DELIVERY                  | 5450 & 5470                          |

#### 98288.1215

THE PURPOSE OF THIS SWITCH IS TO PREVENT THE COMPRESSOR FROM STARTING IN LOWER THAN RECOMMENDED AMBIENT TEMPERATURES.IT IS FITTED AT THE COMPRESSOR GAS INLET PORT.THE MINIMUM TEMPERATURE OF -10°C HAS BEEN SET AT THE FACTORY, BUT THIS CAN BE RAISED ON SITE IF REQUIRED BY FOLLOWING THE PROCEDURE BELOW.

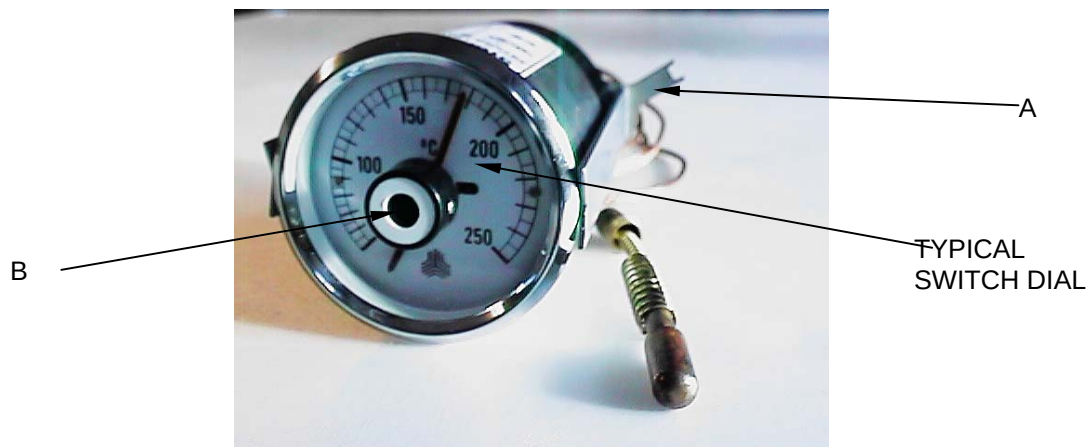
TO SET.

RELEASE ADJUSTING KEY (A) FROM BACK OF INSTRUMENT BY REMOVING SECURING NUT.

INSERT END OF KEY INTO CENTRAL ADJUSTER KNOB (B) AND TURN TO ADJUST SET POINTER TO REQUIRED MINIMUM TEMPERATURE **ABOVE -10°C.**

REPLACE ADJUSTING KEY AND SECURE WITH NUT.

| CONTROLLER<br>PART No | TEMPERATURE<br>RANGE | TRIP POINTER<br>STOP SETTING °C | USED ON<br>COMPRESSOR MODEL             |
|-----------------------|----------------------|---------------------------------|-----------------------------------------|
| 98288.1215            | -40° / +80°C         | -10°C FALLING                   | 5000 SERIES WATER-COOLED<br>COMPRESSORS |



## 12.4 ELECTRIC MOTOR – APP034

### ELECTRIC MOTOR MAINTENANCE

#### **WARNING :**

Isolate power supply to motor before commencing any routine cleaning or maintenance work.

#### **Routine Cleaning :**

Remove the fan cover and ensure that all holes are completely open. Clear any dirt and fluff from behind the fan and along the ribs of the frame.

#### **Periodic Maintenance :**

Remove the cover and the fan which is fitted on the shaft extension.

Slacken and remove bearing cover screws and endshield bolts/studs. The endshields should then be eased off their spigots.

The rotor can now be withdrawn carefully from the stator.

Having dismantled the motor, maintenance can now be carried out to remove all dirt. Dry, compressed air under comparatively low pressure is best as a high velocity stream can force dirt into the spaces between windings, etc.

Grease removing solvents should only be used very sparingly so as not to damage impregnating varnish or insulation.

Bearings are charged with sufficient grease to last at least two years, provided there is little or no grease leakage. When replenishing, use only good quality lithium based grease and avoid overfilling the bearing housing.

Motors should be reassembled in the reverse order from dismantling, taking care not to damage the windings on insertion of rotor, taking care not to damage the windings on insertion of rotor, remembering to ease endshields on bearings and spigots. **DO NOT USE FORCE.**

Before starting, check that the rotor revolves freely. Ensure that the electrical connections are correct and terminal nuts tight.

Refit any pulley, coupling, sprocket etc. which have been removed, being particularly careful to ensure correct alignment with the driven part, as misalignment may lead to ultimate bearing failure and shaft breakage.

## 12.5 BELT DRIVE – APP011

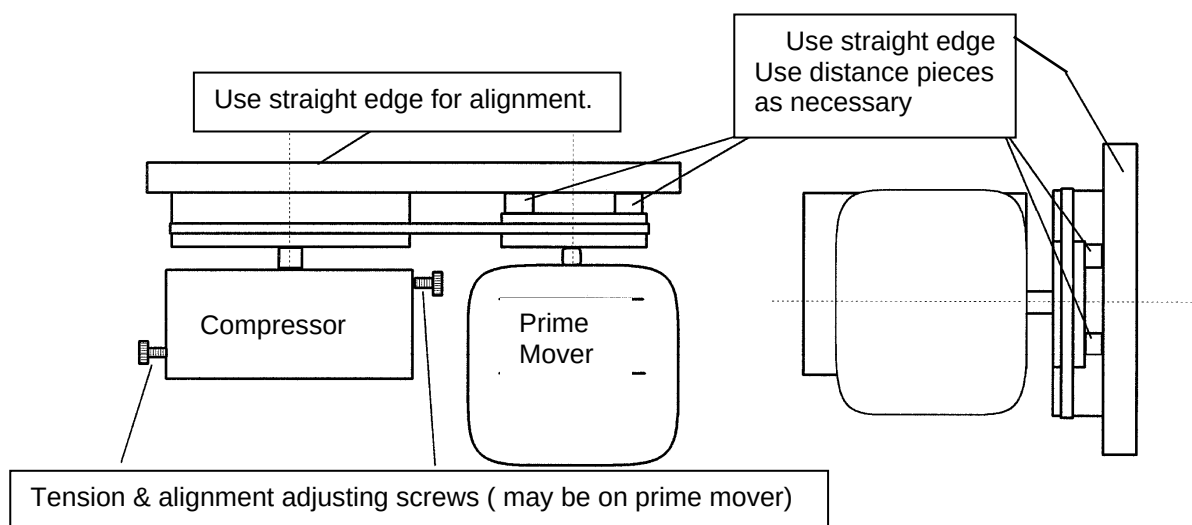
### DRIVE RECOMMENDATIONS (V-BELT TRANSMISSION)

Details of drive arrangements and non isolation pad mountings are available from Reavell Works, Ipswich.  
An overload device must always be fitted to motors.  
Manufacturers terminal box wiring instructions must be observed.  
An hours run meter fitted to the motor starter is recommended for efficient maintenance scheduling.

#### Belt Drive:

It is very important that the driving and driven pulley grooves are in line and both pulley shafts parallel. V-belt tensioning procedures follow normal BS.3790, 1981 practice.

#### TYPICAL DRIVE ARRANGEMENT



#### Belt Drive Tensioning:

Recommended Practice for Installation Tension in Belt Drives:-

It is necessary to be able to measure the belt tensions with sufficient accuracy to avoid belt slip or overloaded bearings or to meet particularly arduous conditions.

Measure the length of the span in millimetres. At the centre of the span apply a force with a spring scale in a direction perpendicular to the span, until the belt is deflected from the normal by an amount equal to 0.015 mm for every millimetre of span length. For example, the deflection for a span of 1 metre would be 1000 mm x 0.015 mm or 15 mm.

In all cases it is essential that the pulley centres be fixed and that the larger pulley be then rotated at least four times before making the measurement. On a multiple belt drive it is essential that a matched set of belts be used and the above procedure be carried out on each belt.

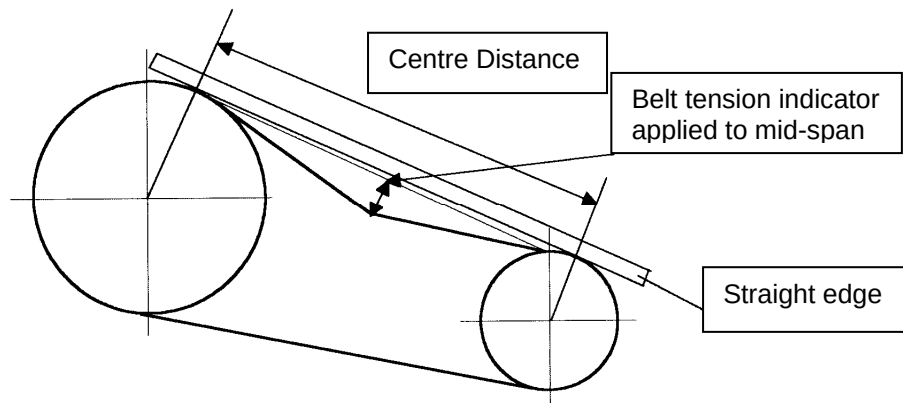
A measured force below the lower value in the table indicates under tensioning, whilst a measured force above the higher value indicates over tensioning. However, when starting up a drive with new belts, the drive should be tensioned to the higher value since the tension falls rapidly in the early stages of running in.

All belts should be watched carefully during the running in period after initial start-up. Retensioning and checking for wear should be carried out every 2000 hours using the above procedure for alignment and tensioning.

## BELT DEFLECTION MEASUREMENT

Required Deflection Force "P" at Centre of Span For Compressor Speed Ranges (Newtons)  
Above follows current BS3790 practice.

## RECOMMENDED TENSIONING FORCE



## ADJUSTMENT METHOD

If belt tension is incorrect, release the compressor holding down screws enough to allow the adjustment screws to be free to slide the compressor on its adjustment slots without being too loose.

Using a suitable straight edge (long enough to span both pulleys), use method as described on page 3 to tension the belt. Note: - When using the adjusting screws it is important to maintain both the correct belt tension and pulley alignment.

Having established the correct deflection and pulley alignment tighten compressor holding down screws, check deflection is correct. If not repeat the whole sequence again.

TABLE

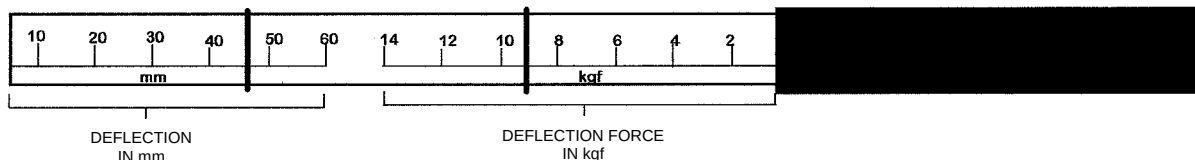
| Belt Section | Force required to deflect belt 16 mm per metre of span |               |                         |
|--------------|--------------------------------------------------------|---------------|-------------------------|
|              | Small Pulley<br>Ø mm                                   | Newton<br>(N) | Kilogram force<br>(kgf) |
| SPZ          | 67 to 95                                               | 10 to 15      | 1.0 to 1.5              |
|              | 100 to 140                                             | 15 to 20      | 1.5 to 2.0              |
| SPA          | 100 to 132                                             | 20 to 27      | 1.5 to 2.7              |
|              | 140 to 250                                             | 27 to 35      | 2.7 to 3.5              |
| SPB          | 160 to 224                                             | 35 to 50      | 3.5 to 5.1              |
|              | 236 to 315                                             | 50 to 65      | 5.1 to 6.6              |
| SPC          | 224 to 355                                             | 60 to 90      | 6.1 to 9.2              |
|              | 375 to 560                                             | 90 to 120     | 9.2 to 12.2             |
| 8V           | 335 & above                                            | 150 to 200    | 15.3 to 20.4            |
| Z            | 56 to 100                                              | 5 to 7.5      | 0.5 to 0.8              |
| A            | 80 to 140                                              | 10 to 15      | 1.0 to 1.5              |
| B            | 125 to 200                                             | 20 to 30      | 2.0 to 3.1              |
| C            | 200 to 400                                             | 40 to 60      | 4.1 to 6.1              |
| D            | 355 to 600                                             | 70 to 105     | 7.1 to 10.7             |

Method of Belt, Tensioning. Using a Belt Tension Indicator.

1. Calculate the deflection distance in mm, on a basis of 16 mm per metre of span.  
Centre distance (m) X 16 = Deflection (mm). If distance & deflection is known, go to .2.
2. Set the lower marker ring at the deflection distance required in mm on the lower scale.
3. Set the upper marker ring against the bottom edge of the top tube.
4. Place the belt tension indicator on top of the belt at the centre of span. And apply a force at right angles to the belt deflecting it to the point where the lower marker ring is level with the adjacent belt, on single belt drives place a straight edge across the two pulleys to act as a datum.
5. Read off the force value indicated by the top edge of the upper marker ring.
6. Compare this force to kgf value shown in the table above.
7. Tighten or loosen belt tensioning screws to achieve the correct value.
8. If the measured force falls within the values given, the drive should be satisfactory.

Note:- If a belt tension indicator is not available, a suitably scaled spring balance and rule will suffice.

#### BELT TENSION INDICATOR



## 12.6 SOLENOID VALVE – APP138

### 3 WAY SOLENOID VALVE PS2197

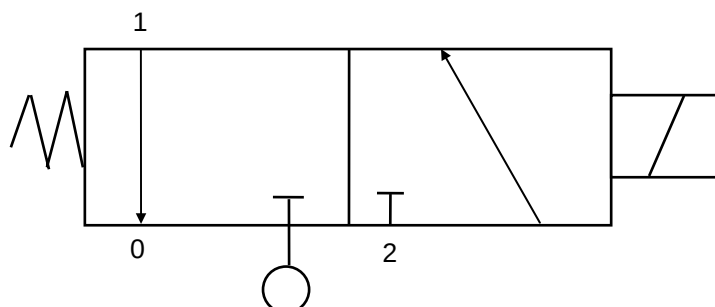
#### OPERATION

3 way normally closed energise to open, continuous duty.  
On starting the solenoid valve opens (energised) this operates the diaphragms which in turn closes the valves within the D.D.Vs. (Diaphragm Drain Valves) thus allowing pressure to build up in the system to the desired pressure. On shutdown the solenoid valve closes (de-energised) this takes the pressure of diaphragms thus allowing the drains to blow any condensate collected within the stage separators.

#### INSTALLATION

| Technical Details |         |       | Current consumption |          |
|-------------------|---------|-------|---------------------|----------|
| Part No           | Voltage | Hz    | Current Inrush      | Hold     |
| PS2197.1          | 230     | 50 AC | 26 VA               | 16 VA    |
| PS2197.2          | 110     | 50 AC | 26 VA               | 16 VA    |
| PS2197.3          | 220     | 60 AC | 26 VA               | 16 VA    |
| PS2197.4          | 110     | 60 AC | 26 VA               | 16 VA    |
| PS2197.5          | 24      | DC    | -                   | 10 watts |
| PS2197.6          | 110     | DC    | -                   | 10 watts |
| PS2197.7          | 230     | DC    | -                   | 10 watts |
| PS2197.8          | 24      | 50 AC | 26 VA               | 16 VA    |
| PS2197.9          | 12      | DC    | -                   | 10 watts |
| PS2197.10         | 24      | 60 AC | 26 VA               | 16 VA    |
| PS2197.11         | 125     | DC    | -                   | 10 watts |
| PS2197.12         | 48      | 50AC  | 26VA                | 16VA     |
| 98516.5121        | 440     | 60    | 26VA                | 16VA     |

Electrical connection    Amps pin to DIN 46242  
Connector                To DIN 43650  
Protection               IP65  
Cable thread size        PG9  
Coil                        Class 'H' 180°C insulation  
Coil duty                 Continuous  
Voltage tolerance from normal    -10% to +10%  
Port Size                 G 1/8"  
Orifice Size              Ø1.6mm  
Maximum working pressure        12 bar g.  
Working fluid            Air, water, gas, fuel oil & non corrosive liquids.  
Ambient temperature range        -15°C to +50°C



## 12.7 HIGH AIR TEMPERATURE SWITCH – APP101

### HIGH AIR/GAS TEMPERATURE SWITCH FUNCTION TEST FOR 5405E, 5406, 5406E, 5307, 5407, 5407H, 5408, 5309 & 5409 98524/1050 CONTACTS NORMALLY CLOSED 98524/1055 CONTACTS NORMALLY OPEN

The switch should be wired back to the starter which should be arranged with suitable terminals.

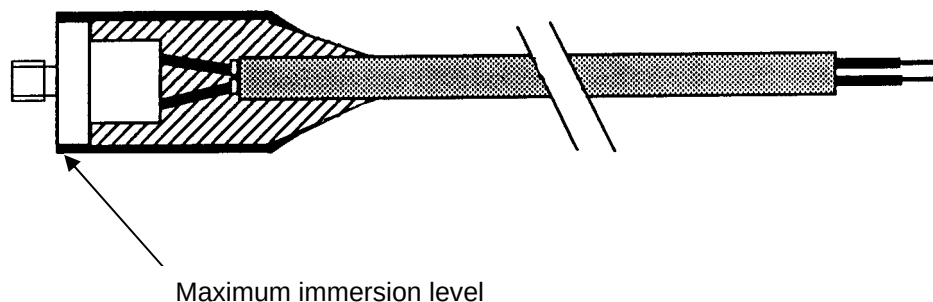
Check high air/gas temperature switch for correct functioning every 1800 hours running, annually or discard and fit new.

#### 98524/1050

- Shut down compressor and electrically inhibit.
- Remove high air/gas temperature switch complete with wires in its entirety.
- Using a suitable electrically heated oil bath fitted with a high temperature cut-out switch, ie. capable of being heated to high temperatures (180°C) with no danger to life.
- Using an 'A' grade calibrated suitable thermometer immersed into the oil.
- Immerse the high air/gas temperature switch threaded end only in the oil and secure in position, do not immerse the electrical connections or coverings.
- Fit a multimeter or similar to electrical connections/terminals.
- Heat up oil to set temperature high 175°C ± 8°C terminals should open.
- Allow oil temperature to fall to 145°C ± 11°C upon which terminals should close.
- If the switch operates outside these parameters the switch is to be scrapped and replaced.

#### 98524/1055

- Shut down compressor and electrically inhibit.
- Remove high air/gas temperature switch complete with wires in its entirety.
- Using a suitable electrically heated oil bath fitted with a high temperature cut-out switch, ie. capable of being heated to high temperatures (180°C) with no danger to life.
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- Fit a multimeter or similar to electrical connections/terminals.
- Heat up oil to set temperature high 175°C ± 11°C terminals should close.
- Allow oil temperature to fall to 145°C ± 11°C upon which terminals should open.
- If the switch operates outside these parameters the switch is to be scrapped and replaced.









# WARNING



The use of replacement parts or lubricating oils not supplied, recommended or approved by **CompAir UK Ltd. Ipswich**, may lead to failure in service which would not be covered by the warranty.

Any unauthorised modifications or failures to maintain this equipment in accordance with the manufacturers maintenance instructions may make it unsafe. The use of replacement parts not supplied by or recommended by CompAir UK Ltd may create unsafe and hazardous conditions or result in damage to the equipment over which CompAir UK Ltd has no control. Such hazardous conditions may lead to accidents that can be life threatening, cause substantial bodily injury or result in damage to the equipment.

CompAir UK Ltd can bear no responsibility for equipment in which unapproved replacement parts are included.



## GENUINE PARTS CompAir UK Ltd

Use **Reavellite** compressor lubricant.  
Advantages:

- Longer life.
- Longer time between oil changes.
- Longer valve life.
- Can be used in new or old compressors.
- Reduces carbon build up.
- Reduces oil consumption.



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