

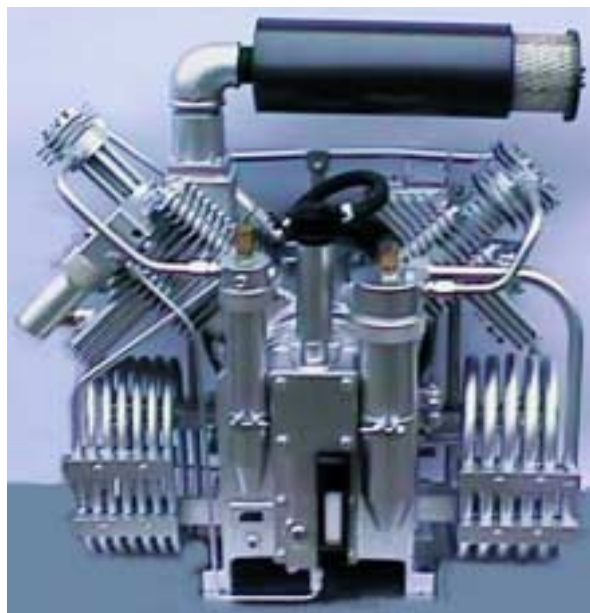
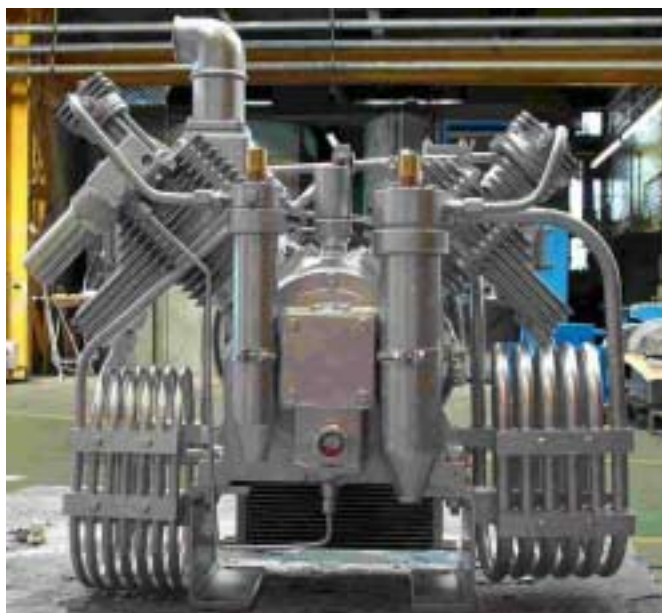
**TO VIEW CONTENTS
USING MOUSE.
FROM TO MENU BAR SELECT WINDOW
PULL DOWN TO SHOW BOOKMARK AND CLICK.
ALTERNATIVELY PRESS (F5) ON THE KEYBOARD.
THE INDEX WILL NOW BE SHOWN ON THE LEFT.**

**SELECT BY CLICKING ON THE PARTICULAR SECTION REQUIRED
IN ADDITION BY CLICKING ON THE (+) MORE INFORMATION WILL BE SHOWN.**

**ADDITIONALLY IN SOME CIRCUMSTANCES INFORMATION CAN BE OBTAINED BY
CLICKING ON A PARTICULAR SECTION REQUIRED IN THE CONTENTS OR INDEX
PAGE OR A PARTICULAR ILLUSTRATION. THIS FEATURE IS NOT ALWAYS
AVAILABLE.**



OPERATOR HANDBOOK
for
H5309.2.1A, H5409.2.1A,
H5409.2.BA & H5409.3.BA
Aircooled Air Compressors



In any correspondence please quote: **JOB NUMBER:**

MACHINE NUMBERS:

PUBLICATION NUMBER:

ISSUE DATE:

CUSTOMER ORDER NUMBER:

(on nameplate)

98407/1242/03/10/02

OCTOBER 2002



CompAir UK Ltd. Ranelagh Road IPSWICH ENGLAND IP2 0AQ

Telephone: +44 (0) 1473 602222 Fax: +44 (0) 1473 601704 Parts Fax: +44 (0) 1473 601282 Service +44 (0) 1473 556027
www.CompAir.com e-mail: ipswich@CompAir.com



CompAir UK Ltd

DECLARATION OF CONFORMITY

CERTIFICATE 'A' CATEGORY 1

98/37/EEC

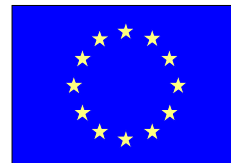
BS EN292:

BS EN1012-1

(Known as the 'Machinery Directive')

(Safety of Machinery)

(Compressors - Safety Requirements)



We **COMPAIR UK LIMITED**

of **RANELAGH ROAD, IPSWICH, ENGLAND IP2 0AQ**



declare that under our sole responsibility for supply / manufacture, the machinery described below,

Machine Type Rotary Compressor

☐

Reciprocating Compressor

☐

Other Pressure Equipment.

☐

Model No. _____

Serial No. _____

is in conformity with the essential Health and Safety Requirements identified in the above directives.

This machine/equipment is exempt from 97/23/EC the Pressure Equipment Directive, reference Article 1 clauses 3.3 & 3.6.

IPSWICH, ENGLAND

Neil A Chamber

Signature and name of responsible person

DATE _____

ENGINEERING DIRECTOR

Position

Notified Body:

Lloyds Register
European Directive Services UK
Hiramford
Middlemarch Office Village
Coventry.
CV4 4FJ
(Notified Body Reference: 0038)

Conformity assessment procedure: Module H (H1 where appropriate)

Language.

English.
French.
German.
Spanish.
Italian.
Dutch.

**DECLARATION OF INCORPORATION****CERTIFICATE 'C' CATEGORY 1**

98/37/EEC (Known as the 'Machinery Directive')
BS EN292: (Safety of Machinery)
BS EN1012-1 (Compressors - Safety Requirements)

We **COMPAIR UK LIMITED**of **RANELAGH ROAD, IPSWICH, ENGLAND IP2 0AQ**

declare that under our sole responsibility for supply / manufacture, the machinery described below,

Machine Type **Rotary Compressor** ☐**Reciprocating Compressor** ☐
Other Pressure Equipment. ☐

Model No. _____

Serial No. _____

to which this declaration relates is in conformity with the essential Health and Safety Requirements identified in the above Directives.

This machine/equipment is exempt from 97/23/EC the Pressure Equipment Directive, reference Article 1 clauses 3.3 & 3.6

STATEMENT**This machinery must not be put into service until the machinery into which it is to be incorporated has been declared in conformity with the provisions of the above Directives.****IPSWICH, ENGLAND***Signature and name of responsible person*

DATE _____

ENGINEERING DIRECTOR

Position

Notified Body:

Lloyds Register
European Directive Services UK
Hiramford
Middlemarch Office Village
Coventry.
CV4 4FJ
(Notified Body Reference: 0038)

Conformity assessment procedure: Module H (H1 where appropriate)**Language.**

English.
French.
German.
Spanish.
Italian.
Dutch.

COMPRESSOR LOG SHEET

COMPRESSOR										PRIME MOVER		INSTALLED AT		REF. NO.	
TYPE:			TYPE:							OIL GRADE USED:					
SPEED:			B.H.P.							CHECK OIL LEVEL					
SERIAL NO:			DRIVE:			DATE INSTALLED:				CHECK WATER IN/OUT TEMPERATURE					
										CHECK COOLING FAN BLADES					
DATE	TIME	*HOURS RUN	STAGE TEMP.°C	FINAL STAGE TEMP.°C	STAGE PRESSURES #(BAR - PSI)					FINAL AIR PRESSURE #(BAR - PSI)	SERVICE PLAN NUMBER	REMARKS SEE OVER FOR MORE	SIGNED		
		#50/100			1	2	3	4	5						
		500													
		1000													
		1500													
		2000													
		2500													
		3000													
		3500													
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		9500													
		10000													
		10500													
		11000													
		11500													
		12000													
		12500													

*FILL IN HOURS RUN AS DETAILED ON SERVICE PLAN FOR PARTICULAR COMPRESSOR TYPE

DELETE AS NECESSARY - † FILL IN APPROPRIATE STAGE TRIP TEMPERATURE READING

SERVICE ENGINEER TO SIGN & FILL IN ANY OTHER COMMENTS IN REMARKS COLUMN

SERVICE TELEPHONE +44 (0) 1473 556027 - PARTS +44 (0) 1473 601282



OPERATOR MANUAL - 5000 SERIES AIR **COMPRESSORS**

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WARNING



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**

OWNERSHIP DATA

TECHNICAL DATA

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

Model Type:	Motor Serial Number:
Serial Number	Motor RPM:
Year:	Motor kW:
Maximum Pressure:	Motor V. Ph. Hz:
Compressor Lubricant:	Motor Bearing Grease: (if applicable)
Capacity M³/hr - CFM	Notes:

CompAir UK Ltd Ipswich CONTACT DETAILS

Contact Name:	Sales Telephone: +44 (0) 1473 602222
Address: CompAir UK Ltd Ranelagh Road Ipswich IP2 0AQ ENGLAND	Notes:
Telephone: +44 (0) 1473 602222	Fax: +44 (0) 1473 601704
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Contact Names:	Service: +44 (0) 1473 556027

For any comments or queries about the contents of this MANUAL please write to CompAir UK Ltd.
Ranelagh Road, Ipswich 1P2 0AQ. England marked for the attention of Mr. Dennis Beeton, Technical
Publications Engineer.

FOREWORD

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

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.

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 and Parts Departments at CompAir UK Ltd, Ipswich (UK) tel: +44 (0) 1473 602222. fax: +44 (0) 1473 601704. Customer Service +44 (0) 1473 556027 or Parts fax: +44 (0) 1473 601282.

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.

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.

SAFETY PROCEDURES

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SAFETY

- **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.

SAFETY

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.

2. WARNINGS, CAUTIONS & NOTES

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



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



RISK OF DANGER



RISK OF ELECTRIC SHOCK



RISK OF HIGH PRESSURE



RISK OF HOT SURFACE



RISK OF GAS EXHAUST



CONSULT MANUAL

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.

3. GENERAL SAFETY PRECAUTIONS (Cont.)

- 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.

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.

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.

5. OPERATION PRECAUTIONS (Cont.)

- 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.

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

- 1. Isolate the compressor from the main electrical supply. Lock the isolator in the OFF position and remove fuses.

- 2. Attach a label "**WORK IN PROGRESS - DO NOT APPLY VOLTAGE**".

- 3. 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**".

- 4. 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.

- 5. Ensure that the cooling water system has been drained.

- 6. Check that the drain valve on the delivery manifold is clear and gas pressure has been released.

- 7. 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.

6. MAINTENANCE & REPAIR (Cont.)

- 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.

DO NOT USE CARBON TETRACHLORIDE.

- 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.

PROTECT THE ENVIRONMENT USE APPROVED METHODS OF DISPOSAL.

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.

***This is a high pressure Compressor
use only:
GENUINE
CompAir UK Ltd Ipswich
PARTS***

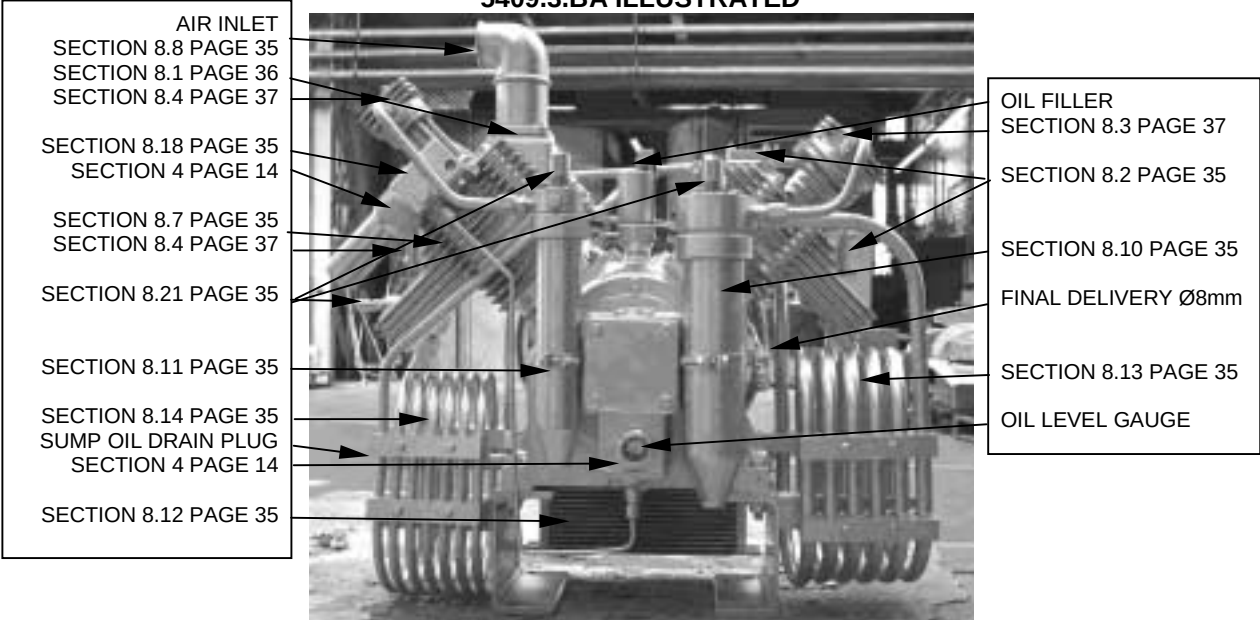
AMENDMENTS

H5309.2.IA, 5409.2.IA, 5409.2.BA & 3.BA. HANDBOOK

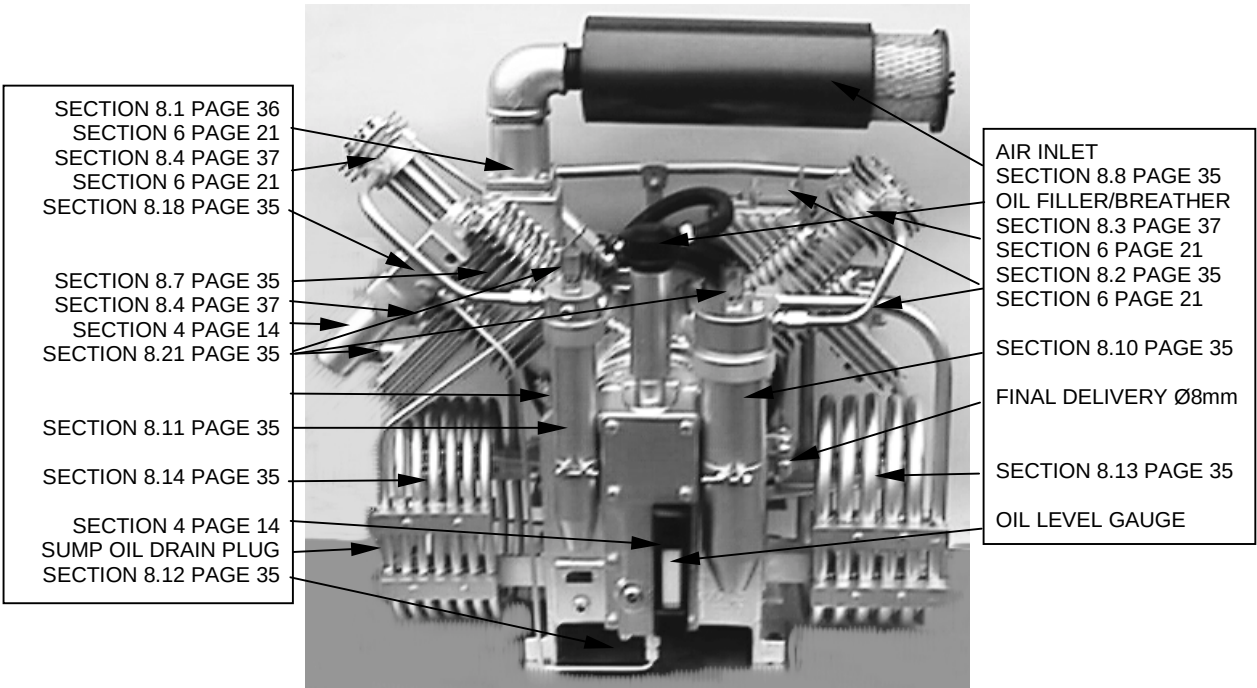
ISSUE No.	MOD NOTE No.	CHANGE - M/C SERIAL No.	DATE	PAGE No's
1	NEW		MAY 1998	ALL
2	2	Add amendment sheet. Renumber pages. Oil level & filter/restrictor recommendations. Correct service plans 1st stage piston ring kit now 98477.1167	JULY 2001	11 to 14 17 to 27
3	3	Add 5409.2.BA & 5409.3.BA Information & page number change. Add service plans. Move others to Section 10	JUNE 2002	1, 3, 7, 47 & 53

PICTORIAL INDEX

5409.3.BA ILLUSTRATED



5409.2.IA ILLUSTRATED



H-5309.2.1A, 5409.2.1A, 5409.2.BA & 5409.3.BA **INDEX**

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SECTION 1

GENERAL DESCRIPTION AND OPERATION

1.1 5409.2

These compressors are high pressure, reciprocating 'V' configuration, four cylinder machines 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 (final stage on 5309.2) the air is further compressed before passing through the second cooling coil and condensate removal separator. Final compression takes place in the fourth stage (third stage on 5309.2) before passing through a finned final cooling system (not on 5309.2).

All stages are protected by safety valves

Note: A Final stage safety valve must be fitted in the system before any restriction occurs, i.e. non-return valve etc.

1.1.1 5309.2

This compressor differs from the 5409.2 by having the fourth stage assembly removed thus making a three cylinder compressor working at a final stage lower pressure.

1.2 RUNNING GEAR

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

1.3 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.

1.4 LUBRICATION

5409.2 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.

5309.2 A cam operated force feed oil pump feeds oil through an oil filter to the top of the crankcase, this supplies oil mist to the moving parts.

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.

1.5	GAUGES
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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.

SECTION 2 LEADING PARTICULARS

	2.1	UNIT DESIGNATION
--	-----	-------------------------

Belt driven, high pressure, air cooled compressor.

	2.2	TECHNICAL DATA
--	-----	-----------------------

5409.2 Type..... Four stage, four cylinder V configuration
5309.2 Type..... Three stage, three cylinder V configuration
Cooling Fan activated air
Direction of rotation viewed from driving end..... Anti-clockwise
Type of valves Single and combined, multi ported

	2.3	STAGE PRESSURES
--	-----	------------------------

5409.2.IA	<u>1st stage (Bar)</u>	<u>2nd stage (Bar)</u>	<u>3rd stage (Bar)</u>	<u>Delivery (Bar)</u>
Maximum.....	2.5 / 2.8	15.1 / 17.0	69 / 77	350
Minimum:.....	2.4 / 2.7	14.1 / 15.8	50 / 57	140

Oil Pressure 1 to 3 Bar g (warm)
Oil Pressure 3 to 7 Bar g (cold)

Note:- If the oil pressure rises in excess of 7.5 bar g this could indicate a blocked filter.(see page 10)

Maximum Inlet Pressure 0.03 Bar g
Safety valve set pressure..... 1st stage 4.1 Bar
Safety valve set pressure..... 2nd stage 21 Bar
Safety valve set pressure..... 3rd stage 97 Bar
Safety valve set pressure..... Final stage supply +5-10%

5409.2 & 3.BA	<u>1st stage (Bar)</u>	<u>2nd stage (Bar)</u>	<u>3rd stage (Bar)</u>	<u>Delivery (Bar)</u>
Maximum.....	2.8 / 3.6	17.3 / 19.0	83 / 91	414
Minimum:.....	2.7 / 3.1	16.5 / 18.2	65 / 73	180

Oil Pressure 1 to 3 Bar g (warm)
Oil Pressure 3 to 7 Bar g (cold)

Note:- If the oil pressure rises in excess of 7.5 bar g this could indicate a blocked filter.(see page 10)

Maximum Inlet Pressure 0.03 Bar g
Safety valve set pressure..... 1st stage 4.1 Bar
Safety valve set pressure..... 2nd stage 21 Bar
Safety valve set pressure..... 3rd stage 104 Bar
Safety valve set pressure..... Final stage supply +5-10%

5309.2.IA	<u>1st stage (Bar)</u>	<u>2nd stage (Bar)</u>	<u>Delivery (Bar)</u>
Maximum.....	2.7 / 3.1	17.1 / 20.1	80
Minimum:.....	2.4 / 2.7	14.1 / 15.8	40

Oil Pressure 1 to 3 Bar g (warm)
Oil Pressure 3 to 7 Bar g (cold)

Note:- If the oil pressure rises in excess of 7.5 bar g this could indicate a blocked filter.(see page 10)

Inlet Pressure 0.03 Bar g
Safety valve set pressure..... 1st stage 4.1 Bar
Safety valve set pressure..... 2nd stage 21 Bar
Safety valve set pressure..... Final stage supply +5-10%

2.4 GENERAL

Cooling air flow rate (approx.) at 1800 rpm	8500 m ³ / Hr
Noise level at 3 metres (approx.)	87 dB (a)
First stage piston displacement	61.9 m ³ / Hr

2.5 INCLINATION

Maximum permissible inclination of machine

In line with crankshaft.....	10°
90° to crankshaft	20°

2.6 DIMENSIONS

First stage cylinder bore	115mm
Second stage cylinder bore	75mm
Third stage cylinder bore.....	28mm
Fourth stage cylinder bore (5409.2 only)	14mm
Stroke	56mm
Final delivery O/D pipe connection (5409.2).....	8mm
Final delivery O/D pipe connection (5309.2).....	¼" BSPT
First stage suction connection	RP 2

2.7 SPEEDS

Compressor speed.....	1800 rpm
Mean piston speed.....	3.35 m/s

2.8 TEMPERATURES (NORMALLY RECOMMENDED)

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.

2.9 LUBRICANTS

Recommended oil - synthetic only	Reavellite
Recommended oil alternative.....	Anderol 555
Sump capacity - 5309, 5409.2.IA	7.4 litres
Top Up from minimum	3.8 litres
Sump capacity - 5409.2.BA & 5409.3.BA	2.15 litres
Recommended grease (for assembly).....	Shell Alvania R3

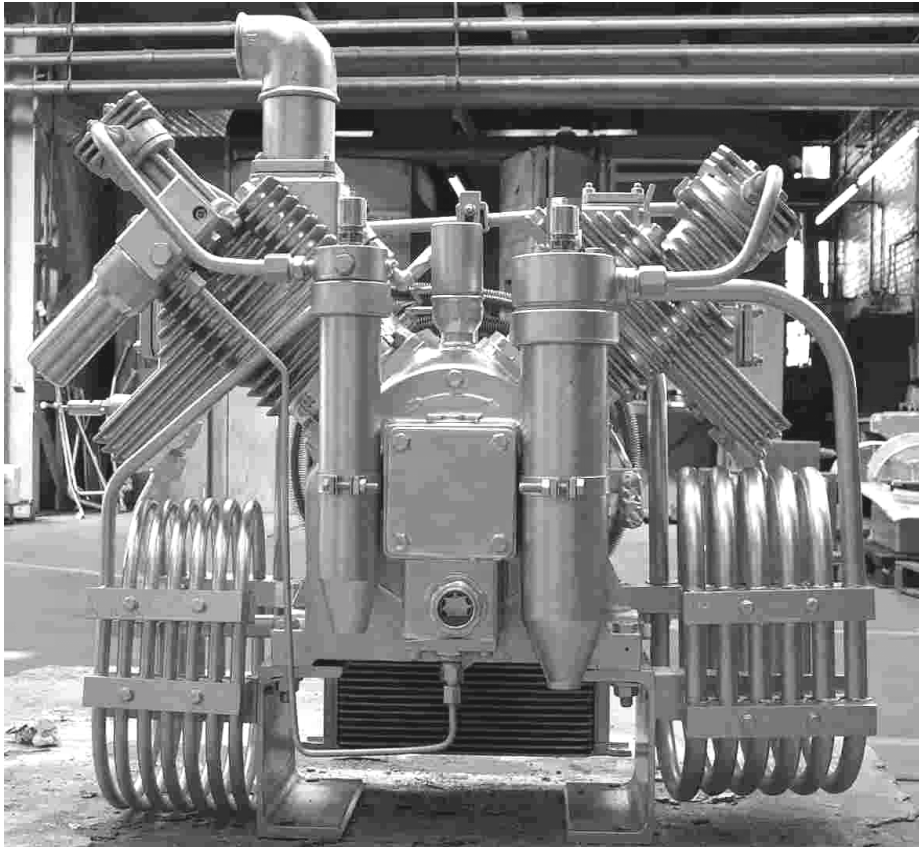
2.10 **CLASS A - CRITICAL TORQUE SETTINGS**

FOR NON LUBRICATED FASTENERS All figures $\pm 5\%$

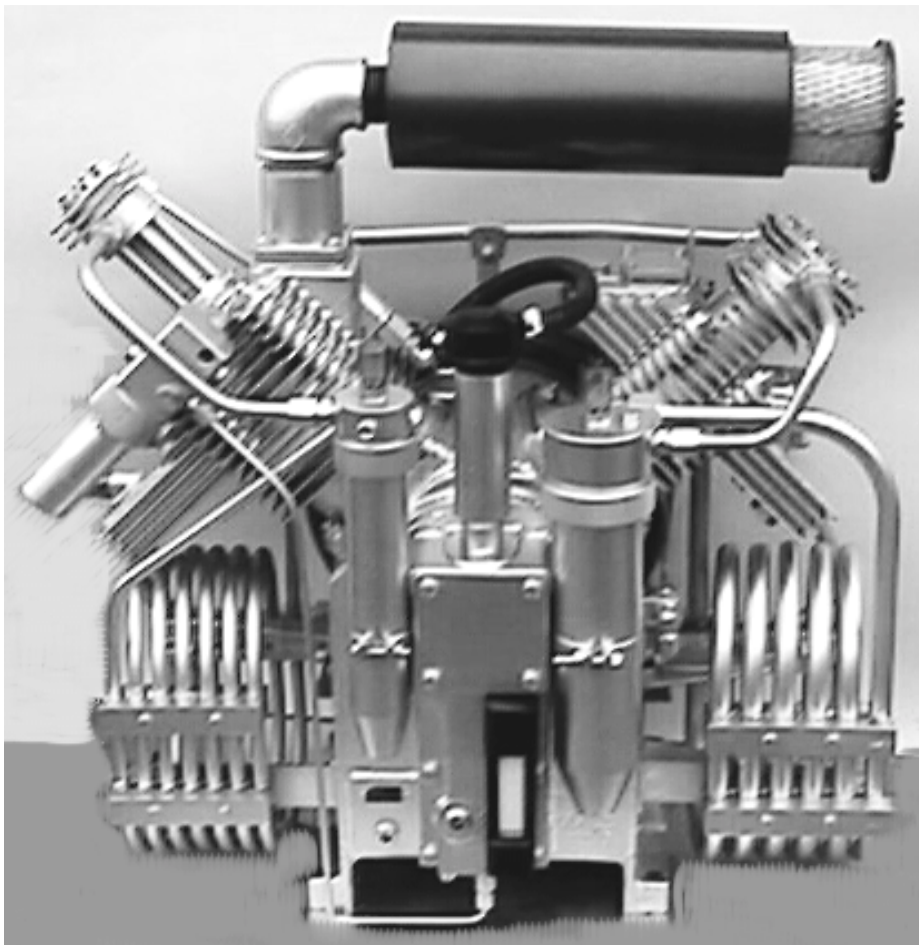
ASSEMBLY	SIZE	NEWTON METRE (Nm)
First stage valve cover	M6	5.4
First stage valve	M8	11
Second stage valve cover	M6	5.4
Second stage valve	M6	4
Third stage valve to cylinder	M8	16
Third stage valve	M5	6
Fourth stage valve to cylinder	M8	16
Fourth stage valve	M4	4
Flywheel	M12 LH	95
Oil pump cam	M12 LH	95
Balance weight	M10	54

CLASS B - ADVISED TORQUE SETTINGS All figures $+5\% - 15\%$

ASSEMBLY OPERATION	SIZE	NEWTON METRE (Nm)
All other fasteners	M6	8
	M8	20
	M10	40
	M12	71



5409.3.BA ILLUSTRATED



5409.2.IA ILLUSTRATED

SECTION 3

INSTALLATION

3.1

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.

3.2

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.

3.3

HANDLING

Before attempting to life 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.

3.4

MOUNTING

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

3.5

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 SECTION 5.7 BELT ADJUSTMENT

3.6

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.

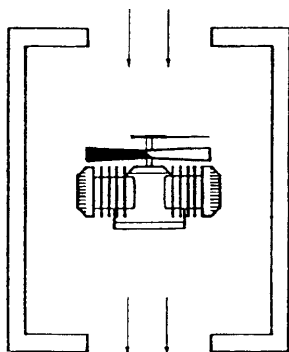
- 3.6.3 A suction filter must always be fitted to prevent damage and excessive wear.
- 3.6.4 Safety valves are fitted on all stages as standard equipment. However, safety valves must also be fitted to the receiver and pipework system to protect from excess pressure build up.

3.7 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.

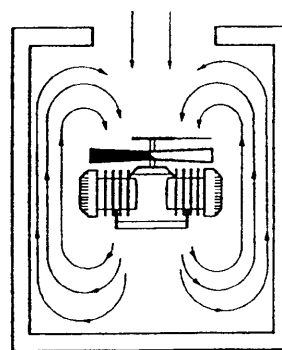
3.8 SITING REQUIREMENTS

(Diagrams not to scale)



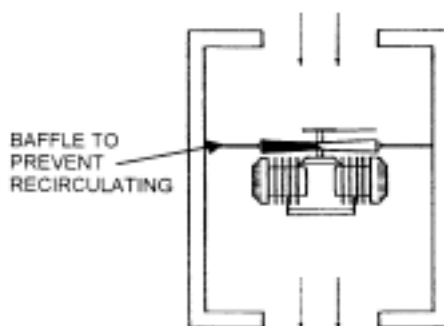
RECOMMENDED INSTALLATION

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

Note: Unless otherwise stated, information applies to all models.

RECOMMENDED INSTALLATION IN SMALL AREAS

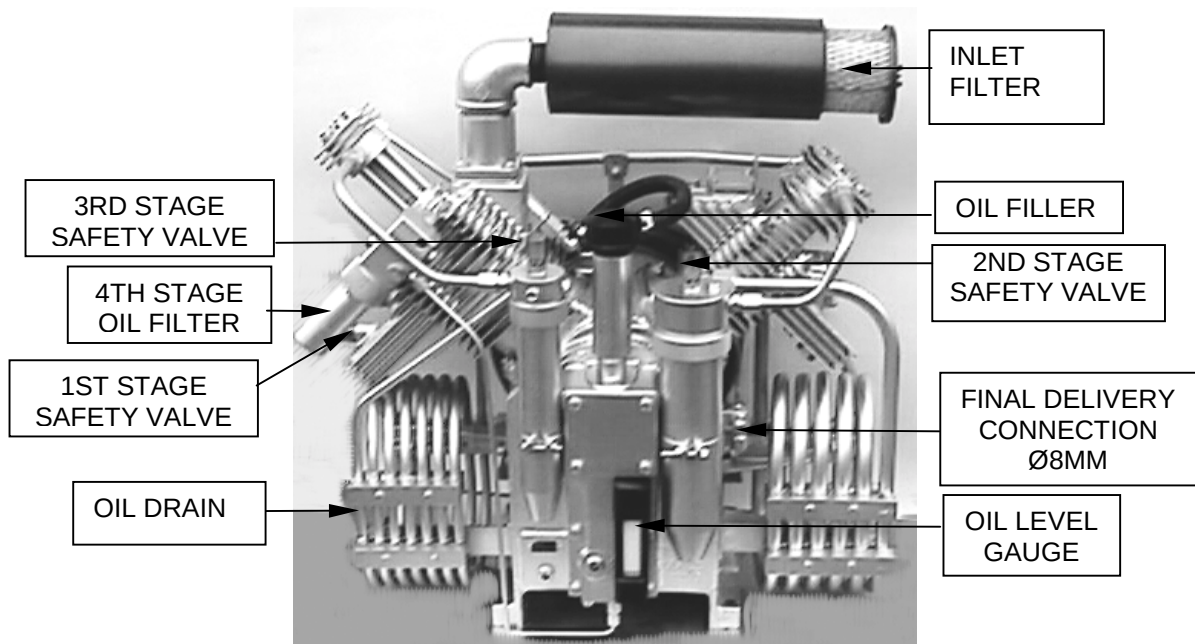
SECTION 4

COMMISSIONING

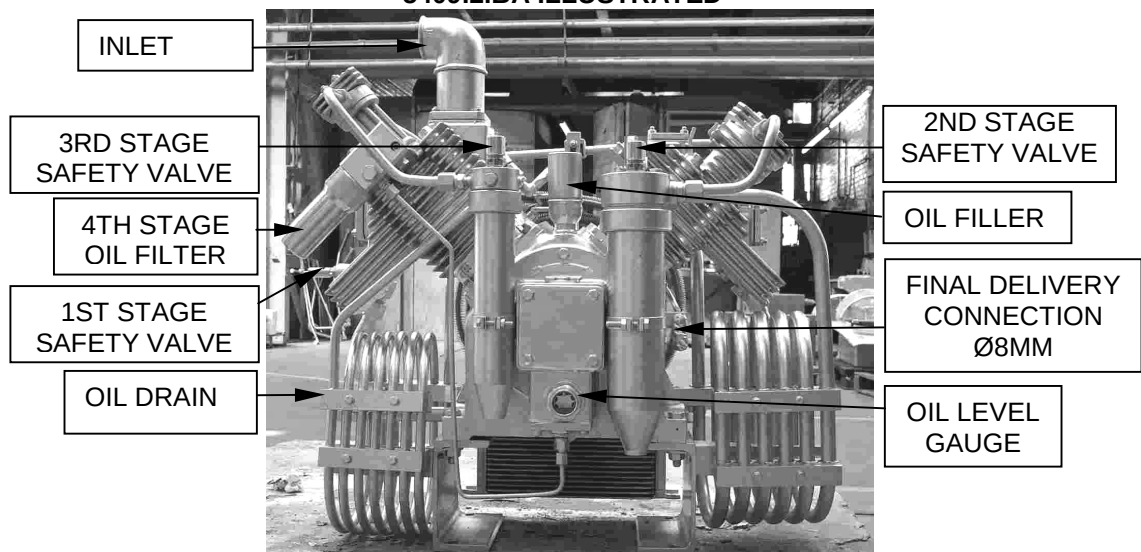
WARNING

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 U.K. 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 5409.2.IA ILLUSTRATED



5409.2.BA ILLUSTRATED



4.1 IMPORTANT - LUBRICATION

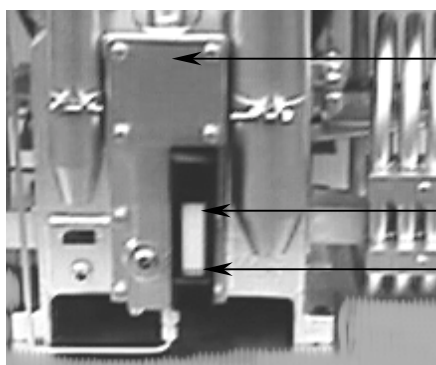
The recommended lubrication is REAVELLITE, a synthetic oil.

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.

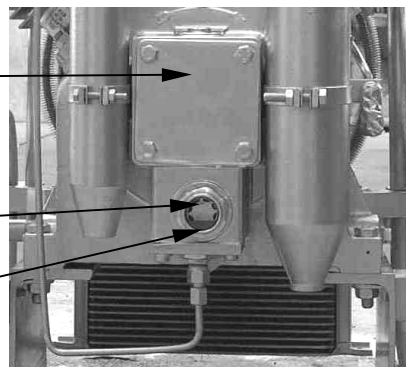
4.2 BEFORE STARTING

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

- 4.2.1 Check complete installation, including pipework. Ensure driving belt tension is correct. See SECTION 5.7.
- 4.2.2 Remove dry type suction filter element, blow over with low pressure air and re-insert in casing.
- 4.2.3 Ensure silencer bore and pipework is clean and blank removed from suction pipe.



5309.2.IA & 5409.2.IA ILLUSTRATED



5409.2.BA ILLUSTRATED

- 4.2.4 Ensure crankcase is filled to the TOP level (BLACK line) on the sight glass with REAVELLITE synthetic oil. Do not overfill - over lubrication is harmful. Never allow to go below the RED line at the bottom of the sight glass.
- 4.2.5 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.

4.3 START-UP PROCEDURE

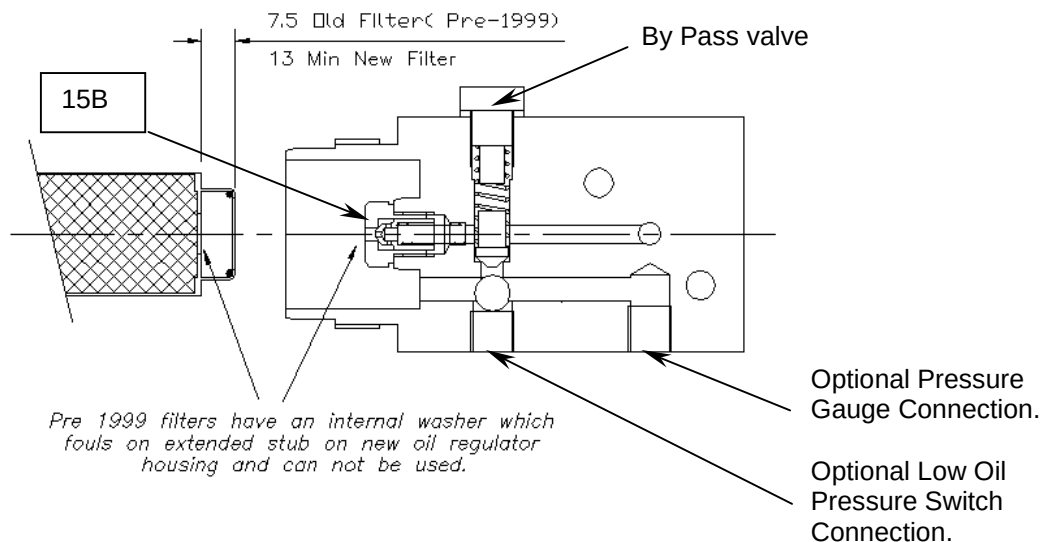
- 4.3.1 Rotate the compressor at least twice by hand to ascertain free movement. If any restrictions to movement are discovered the cause must be investigated and corrected before attempting to start the compressor.
- 4.3.2 Operate starter and immediately check rotation, check pressure gauge for stage 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.
- 4.3.3 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.
- 4.3.4 Check oil pressure if re-commissioning machine.
- 4.3.5 After 30 minutes operation, check valve heads. Intake pipe to valve heads should be

hand warm and outlet pipes hot. Caution must be exercised when checking this.

- 4.3.6 The set should be run for at least one hour before being put into operational service.
- 4.3.7 Stop compressor and verify complete blow down, i.e. no residual air pressure remains in any stage of the stopped machine.
- 4.3.8 Re-check crankcase oil level and top up if necessary.

4.4	OIL FILTER - PRESSURE CHECK (Refer to E61334 & A30199 in PARTS LIST)
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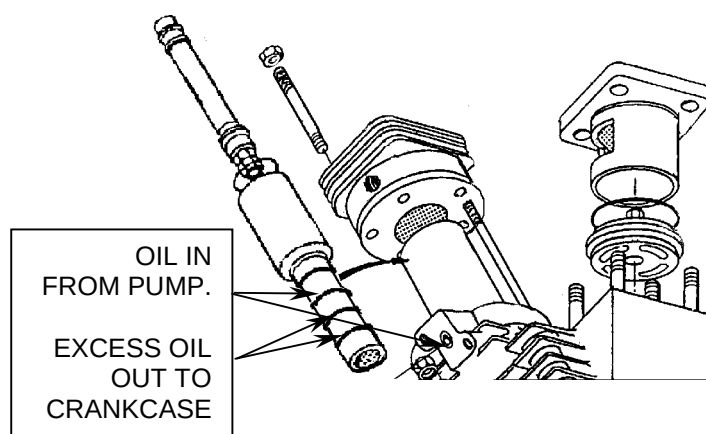
- 4.4.1 If a pressure gauge is not fitted as standard.
- 4.4.2 Isolate machine from electric supply and release all pressures from machine, pipework and receivers.
- 4.4.3 Remove 1/4" BSP plug (10) from the oil regulator body and fit in its place a 0-15 bar certified pressure gauge
- 4.4.3 Reconnect electric supply and run up to working pressure.
- 4.4.4 Observe gauge reading, this should be between 1 to 3 Bar. Note:- If starting from cold the pressure could initially be higher up to 7 Bar.
- 4.4.5 If the oil pressure rises to 7.5 Bar when warm the indications are the oil filter need replacing.
- 4.4.7 Isolate machine from electric supply and release all pressures from machine, pipework and receivers.



NEW FILTER UNIT ARRANGEMENT

- 4.4.8 Unscrew filter housing (8) remove old oil filter, fit new, replace filter housing tighten hand tight.
- 4.4.9 Reconnect electric supply and run up to working pressure.
- 4.4.10 If the oil pressure remains high after changing the oil filter, the restrictor (15B) is possibly blocked.
- 4.4.11 Isolate machine from electric supply and release all pressures from machine, pipework and receivers.

- 4.4.12 Unscrew filter housing (8) remove oil filter, unscrew restrictor (15B) , blow out any restriction blockage and replace. Note: Do not overtighten, torque 4lbf/ft (5.4 Nm) only. Replace oil filter and filter housing, tighten hand tight.
- 4.4.13 Reconnect electric supply and run up to working pressure.
- 4.4.14 Re-check oil pressure.



- 4.4.15 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.

4.5 MAINTENANCE

4.5.1 After First 15 Hours Running Time

Ensuring that alignment and belt tensioning is correct.

4.5.2 After First 50 Hours Running Time

Change oil in crankcase. Fit new oil filter. When changing oil drain whilst warm, allowing time to drain completely. Slowly pour fresh oil into filter neck until oil is visible on the sight glass, continue to fill to the MAXIMUM level mark. Allow time for oil to settle as over filling is harmful to the running of the compressor. Fit new oil filter. Wait 5 minutes, then start the compressor check oil if flowing in the sight glass. With compressor still running, loosen vent screw in bottom of oil pump and bleed until bubble free oil emerges. Stop machine and top-up crankcase. Check belt tension and condition of all ancillaries. Check for oil and air leaks. For tightening torque's see SECTION 2.

- 4.5.3 For further service intervals and procedures see Section 5.6 MAINTENANCE SCHEDULE - RSP5409.2.ia-S, RSP5409.2.ia-SW, RSP5409.2.ba-S, RSP5409.2.ba-SW, RSP5409.3.ba-S, RSP5409.3.ba-SW & RSP5309.2.ia-S, RSP5309.2.ia-SW.

SECTION 5

OPERATION AND ROUTINE MAINTENANCE

5.1 OPERATION AND DAILY MAINTENANCE

Ensure the Commissioning procedure (see SECTION 4) has been carried out before the following:-

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

Crankcase oil must be changed after a major overhaul, this also includes any liner, plunger/liner or piston ring renewal.

Starting procedure only 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.

5.2 STARTING UP

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

- 5.2.1 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.
- 5.2.2 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.

5.3 RUNNING ON LOAD

Stop machine at 30 minute intervals to clear condensate if timed drainage is not fitted.

5.4 STOPPING

Stop compressor from motor control panel or by stopping engine, see engine manufacturers HANDBOOK for details on stopping.

5.5 STANDING IDLE - 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;

- 5.5.1 Fill to the required level with Shell Ensio 30.
- 5.5.2 Run the compressor.

- 5.5.3 Switch off the machine.
- 5.5.4 Release separator drain screws.
- 5.5.5 Remove first and second stage valve covers and valves.
- 5.5.6 Clean all valves, valve covers and valve chambers, dry with lint free cloth.
- 5.5.7 Spray valves, valve cover, valve chambers and cylinders with PX.4. Shake valves to remove excess.
- 5.5.8 Fit valves, examine 'O' rings of valve covers before assembly and replace if necessary. Tighten valve covers to correct torque setting.
- 5.5.9 Release third stage (second stage on 5309.2.IA) suction pipe.
- 5.5.10 Spray PX.4 into suction side of third stage and rotate machine by hand.
- 5.5.11 Reassemble third stage suction pipe.
- 5.5.12 Drain sump of oil.
- 5.5.13 Seal all openings with threaded plastic plugs.

5.6	MAINTENANCE SCHEDULE
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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 U.K. 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. **5409.2** Check that oil is visible in sight feed unit.
- C. Examine for oil or air leaks which must be rectified immediately.

NEVER TIGHTEN ANY FITTING WHEN IT IS UNDER PRESSURE

Note: Valve plates and springs should be replaced at valve inspection periods.

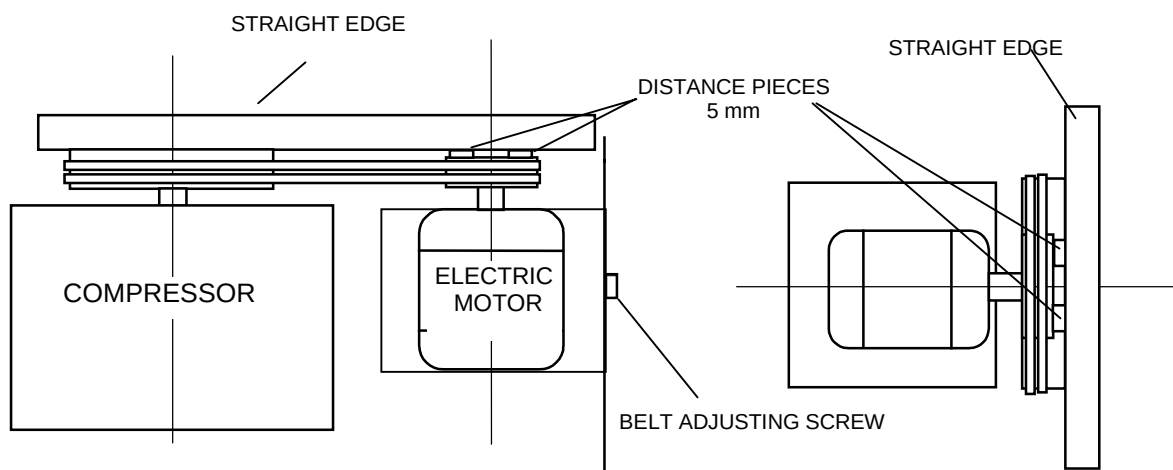
5.6.1 Weekly

In addition to operational checks, inspect all nuts, screws and fittings for tightness. Inspect for oil or air leaks, which must be rectified immediately.

5.6.2	5409.2.IA SYNTHETIC OIL STANDARD
SEE SECTION 10	
5.6.3	5409.2.IA SYNTHETIC OIL WINTER
SEE SECTION 10	
5.6.4	5309.2.IA SYNTHETIC OIL STANDARD
SEE SECTION 10	
5.6.5	5309.2.IA SYNTHETIC OIL WINTER
SEE SECTION 10	
5.6.6	5409.2.BA SYNTHETIC OIL STANDARD
SEE SECTION 10	
5.6.7	5409.2.BA SYNTHETIC OIL WINTER
SEE SECTION 10	
5.6.8	5409.3.BA SYNTHETIC OIL STANDARD
SEE SECTION 10	
5.6.9	5409.3.BA SYNTHETIC OIL WINTER
SEE SECTION 10	
5.7	BELT ADJUSTMENT

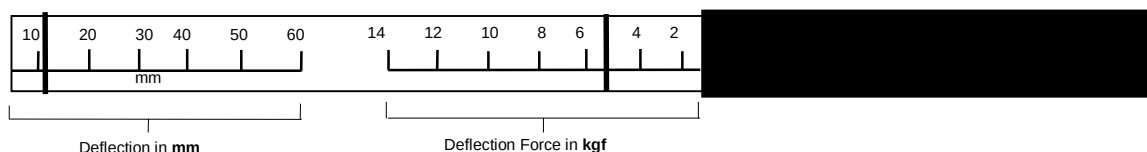
- 5.7.1 Remove belt guard if fitted
- 5.7.2 Examine belts for wear and replace if necessary. Note: Anti-static banded belts may be used on some applications. If oily or greasy, clean before replacing on pulleys.
- 5.7.3 Slide drive unit away from compressor and tension belt to achieve correct deflection when pressed down at a point midway between pulleys. A pencil type belt tension indicator will greatly assist in this procedure.

5.8	BELT DRIVE ALIGNMENT
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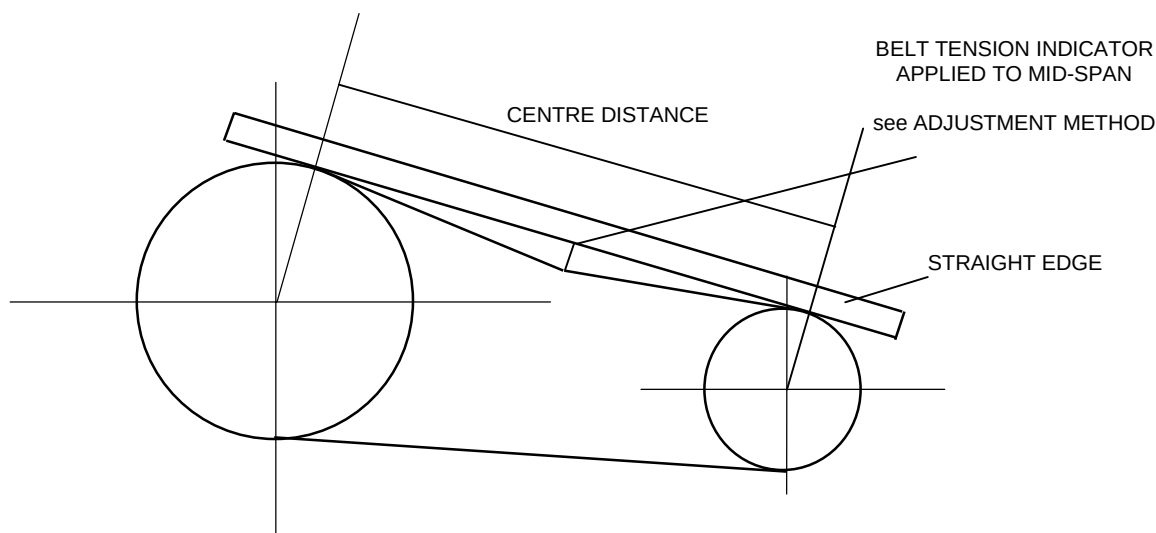


It is very important that the driving and driven pulley grooves are in line and both pulley shafts are parallel, see above, if the pulley faces are not parallel use appropriate size distance pieces to ensure belt grooves are correctly aligned. Check belt tension by method described on following page

BELT TENSION INDICATOR



5.9 RECOMMENDED TENSIONING FORCES



ADJUSTMENT METHOD

If the belt tension is incorrect, correct it by using the adjusting screw provided, using a suitable straight edge (long enough to span both pulleys), established the correct deflection and pulley alignment.

TABLE

Belt Section	Force required to deflect belt 16 mm per metre of span		
Belt Section	Small Pulley Ø mm	Newton (N)	Kilogram force (kgf)
SPA	100 to 132	20 to 27	1.5 to 2.7
SPA	140 to 200	27 to 35	2.7 to 3.5

Method of Belt Tensioning. Using a Belt Tension Indicator.

1. Measure small pulley diameter (motor/engine)
2. Calculate the deflection distance in mm. on a basis of 16 mm. per metre of span.
Centre distance (metres) X 16 = Deflection (mm). If distance & deflection is known, go to .3.
3. Set the lower marker ring at the deflection distance required in mm on the lower scale.
4. Set the upper marker ring against the bottom edge of the top tube.
5. 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.
6. Read off the force value indicated by the top edge of the upper marker ring.
7. Compare this force to kgf value shown in the table above.
8. Tighten or loosen belt tensioner to achieve the correct value.
9. 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.

SECTION 6

DISMANTLING AND REASSEMBLY OF VALVES

SERVICING VALVE ASSEMBLIES

Keep a spare oiled and maintained set of valves in store for quick compressor servicing.

6.1	GENERAL
-----	----------------

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.

6.2	VALVE REMOVAL
-----	----------------------

A. FIRST STAGE SUCTION AND DELIVERY VALVES

i) To Remove

Unscrew and remove the four, 10 mm AF nuts securing the suction valve cover/air filter assembly, 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.

ii) 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.

Valve overhaul and inspection is detailed below.

iii) To Assemble

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, evenly torque nuts. 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.

B. SECOND STAGE SUCTION AND DELIVERY VALVES

Excepting that the second stage suction valve cover is a plain cover, the valve removal and replacement procedure is identical to that for the first stage valves.

C. THIRD STAGE SUCTION AND DELIVERY VALVE/CYLINDER HEAD ASSEMBLY

i) To Remove

Disconnect all pipe work from the third stage cylinder head. Unscrew the six setscrews and remove the head. Remove and discard the sealing 'O' ring from the cylinder.

ii) 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. The overhaul procedure for the cylinder head assembly is detailed below.

iii) To Replace

Ensuring that joint faces are clean, fit a new 'O' ring to the cylinder liner top and locate the head/valve assembly on the studs. Fit the six retaining nuts and evenly torque to SECTION 2.11. Reconnect all pipe work.

D. FOURTH STAGE SUCTION & DELIVERY VALVE/CYLINDER HEAD ASSEMBLY

The removal and replacement procedure for this assembly is identical to that for the third stage unit.

6.3	A. FIRST STAGE SUCTION VALVE
-----	------------------------------

i) To Dismantle

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) (2 of) and guard (7) from stud (8).

ii) 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.

FOR PARTS AND MAINTENANCE KITS SEE PAGE 37

iii) To Assemble

Place valve seat (3) on a tubular support similar to item (10) (note that this is not part of the valve assembly) with peg (9) uppermost. Fit spacer (6) and valve plate (4) engaging peg (9) with hole in the plate and **NOT** with the slots. Arrange springs (5) as shown and place on the valve plate, engaging with pin (9) as for the plate. Centralise the plates and springs. Taking extreme caution not to disturb springs (5), fit guard (7) engaging locating pin (9) with corresponding hold 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.

B. FIRST STAGE DELIVERY VALVE

i) To Dismantle

Unscrew and remove nut (16) and washer (15). Remove guard (14), springs (13) (2 of), space (12) and delivery plate (17).

ii) Cleaning And Inspection

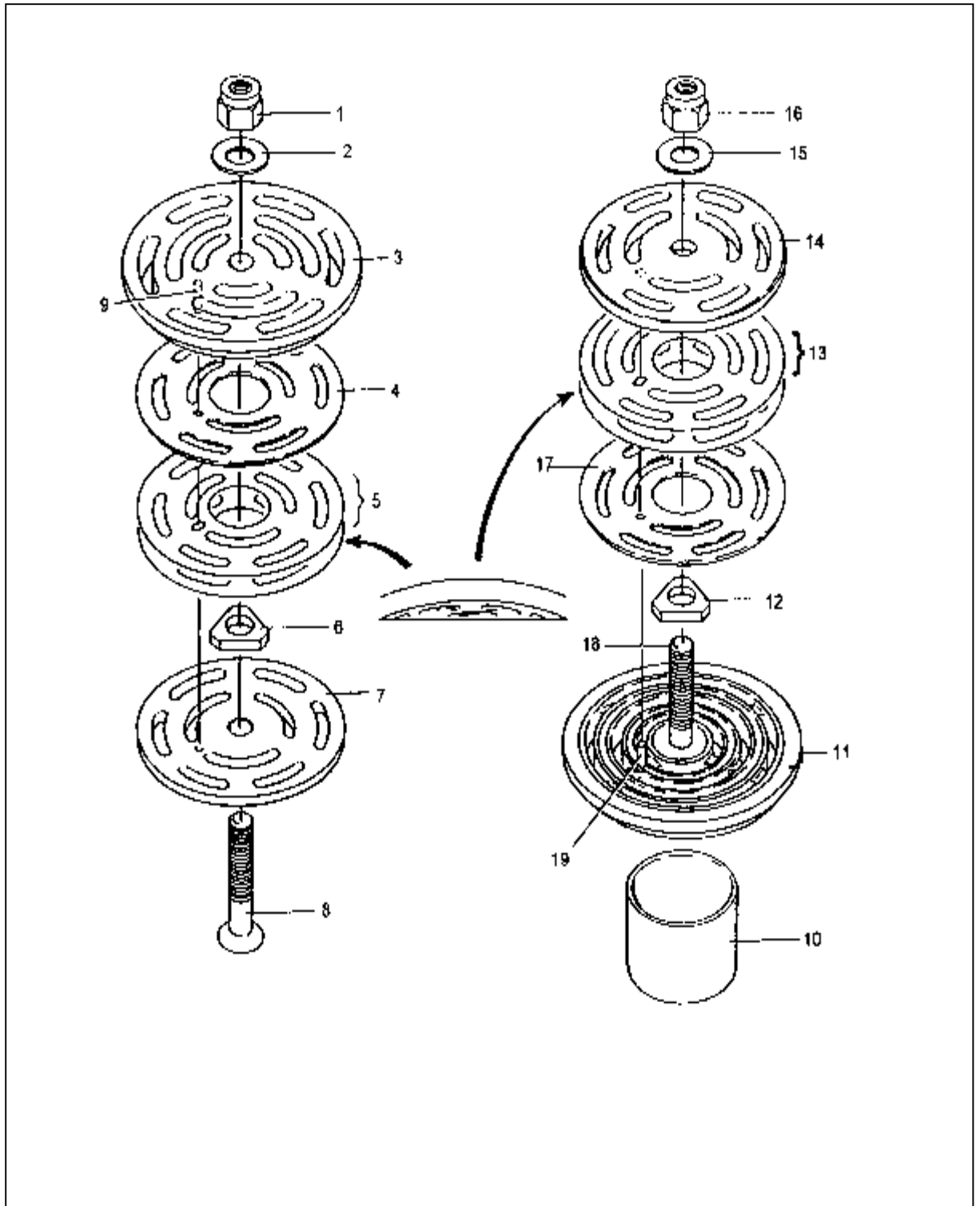
(As for the **FIRST STAGE SUCTION VALVE**, above)

FOR PARTS AND MAINTENANCE KITS SEE PAGE 37

iii) To Assemble

Fit plate (17) to seat (11) engaging locating pin (19) with hole in plate (17) **NOT** with the slots. Fit spacer (12). Arrange springs (13) as shown and place on the valve plate, engaging with the locating pin as for the plate. 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 VALVES



NOTE: Unless otherwise stated, information applies to all models

6.4	A.	SECOND STAGE SUCTION VALVE
-----	-----------	-----------------------------------

i) To Dismantle

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).

ii) 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.

FOR PARTS AND MAINTENANCE KITS SEE PAGE 37

iii) To Assemble

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.

B. SECOND STAGE DELIVERY VALVE**i) To Dismantle**

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).

ii) Cleaning And Inspection

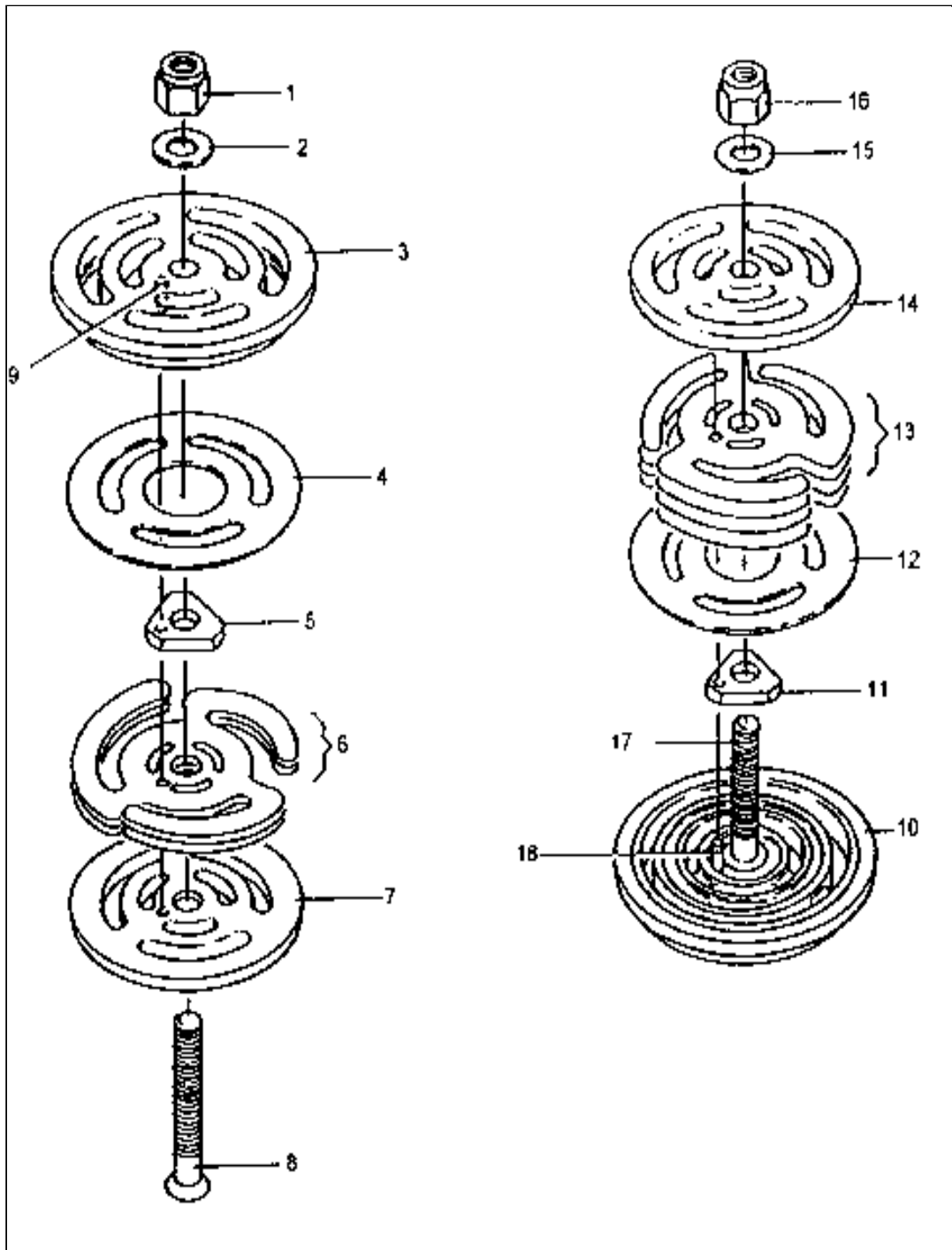
(As for the **SECOND STAGE SUCTION VALVE**, above)

FOR PARTS AND MAINTENANCE KITS SEE PAGE 37

iii) To Assemble

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 VALVES



NOTE: Unless otherwise stated, information applies to all models

6.5	THIRD STAGE SUCTION AND DELIVERY VALVE / CYLINDER HEAD ASSEMBLY
-----	---

i) **To Remove**

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).

ii) **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.

FOR PARTS AND MAINTENANCE KITS SEE PAGE 38

iii) **To Assemble**

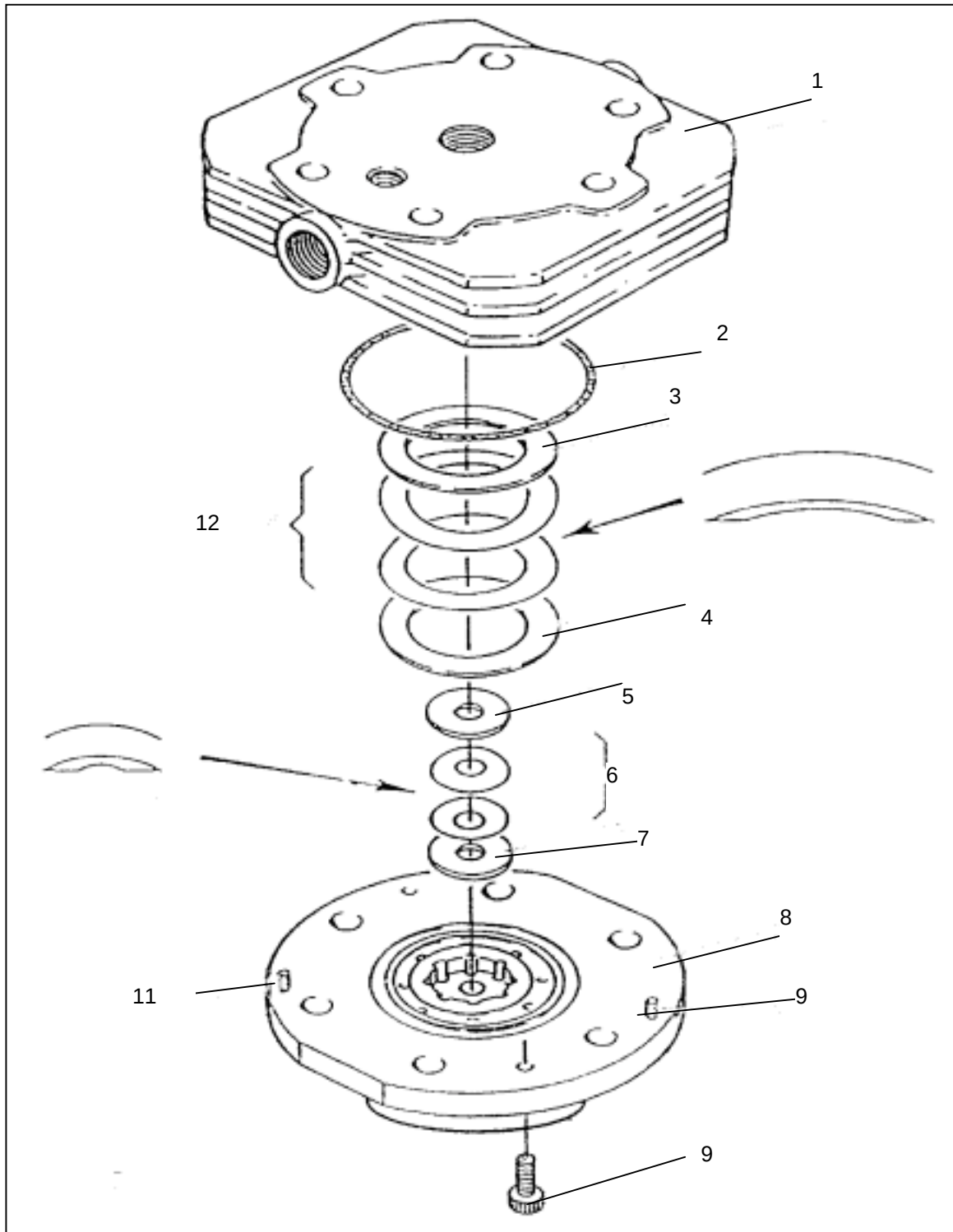
Take base (8) and fit plate (7) followed by springs (6) which should be arranged as shown. Fit suction plate (5).

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 SECTION 2.11.

TORQUE SETTING IS CRITICAL. 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

6.6	FOURTH STAGE SUCTION AND DELIVERY VALVE / CYLINDER HEAD ASSEMBLY
-----	---

i) **To Remove**

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).

ii) **Cleaning And Inspection**

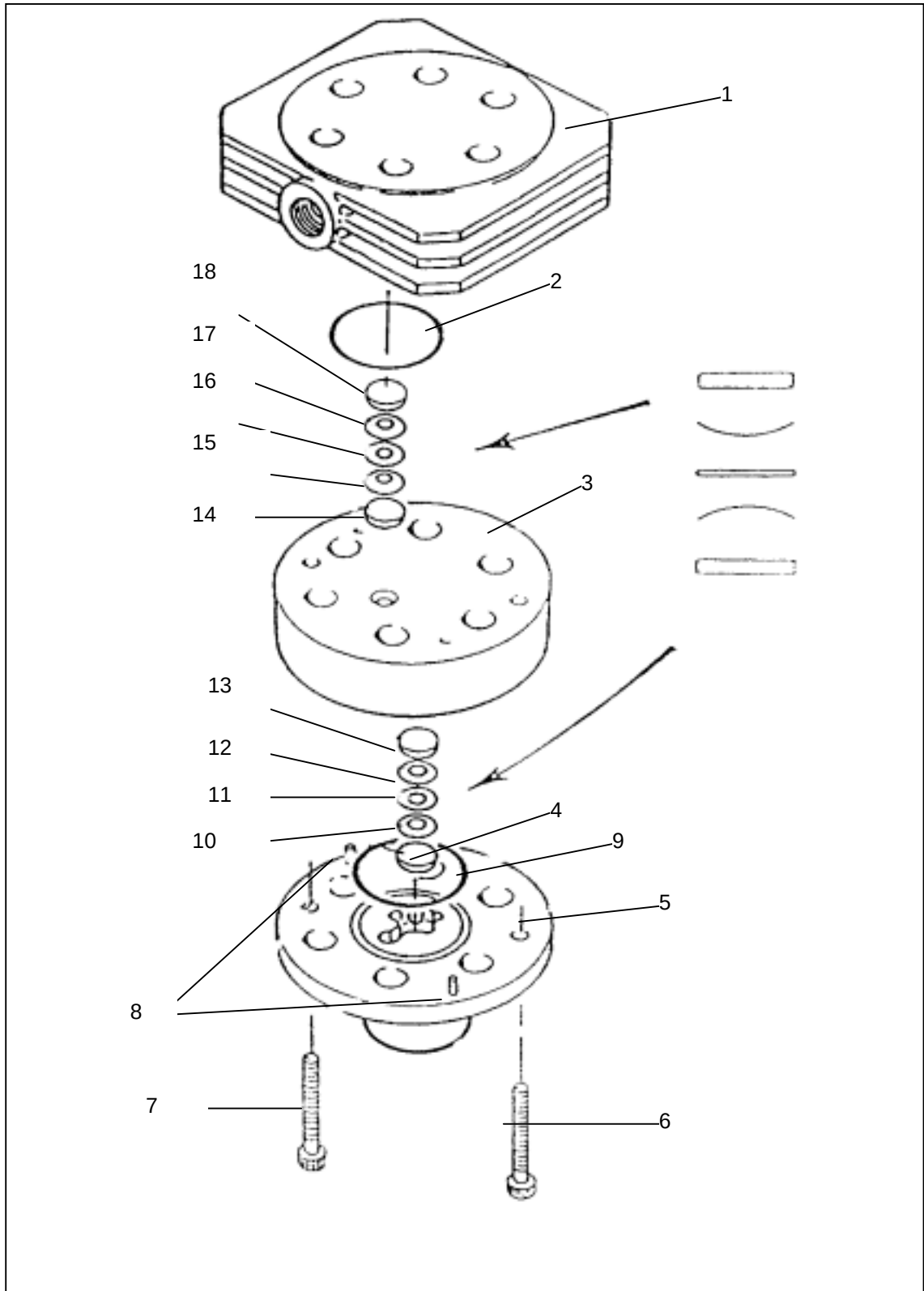
The valve components should be degreased using a suitable fluid and stiff brush. Carbon deposits may be removed by placing components in boiling water, do not attempt to remove carbon by scraping as this may cause damage to the sealing faces. The sealing faces of valve plate and seat should be clean 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.

FOR PARTS AND MAINTENANCE KITS SEE PAGE 38

iii) **To Assemble**

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 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. **TORQUE SETTING IS CRITICAL**.

FOURTH STAGE VALVE



NOTE: Unless otherwise stated, information applies to all models

SECTION 7

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)
7.1 EXCESSIVE STAGE PRESSURES	1. Faulty suction or delivery valve(s) 2. Pressure gauge not accurate. 3. Restriction in pipeline.	Service valve(s) as necessary. Note: A suction valve fault usually gives excess pressure in the previous stage. Check pressure gauge against gauge of known accuracy. Existing Installation: Check setting and function of all control valves. Clean pipeline filters and service elements as necessary. New Installation: 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. Remove and examine, replace if necessary.
EXCESSIVE THIRD STAGE PRESSURE.	1. Fourth stage plunger failure. 5409.2 only	
7.2 INSUFFICIENT PRESSURE OR VOLUME (See also: 1. Excessive Stage Pressure)	1. Blocked suction filter. 2. Faulty first stage suction valve. 3. (Air) leakage in pipe system or from machine. 4. Wear. 5. Loss of drive. 6. Premature opening of final safety valve. 7. Intake or outlet valve not closing properly.	Remove and service. Remove and examine. Locate and rectify. (e.g. drain valve open) If general wear is suspected, strip the machine and examine all working parts. Check belt drive. Renew valve. Check and clean valves, replace main parts as necessary.

FAULT	SYMPTOM	RECOMMENDATION(S)
7.3 OVERHEATING <i>(See also: 1. Excessive Stage Pressure and 2. Insufficient Pressure)</i> THIRD STAGE OVERHEATING	1. Duty higher than recommended maximum. 2. Inlet temperature higher than recommended maximum. 3. Insufficient delivered air. 4. Inlet or delivery valves not closing properly. 5. Cylinder fins clogged or dirty. 5409.2.IA only. 6. Intercooler and aftercooler tubes dirty. 7. Belt drive slipping. 8. Air intake filter. 9. Wrong rotation. 10. Possible fourth stage plunger failure. 5409.2.IA only	Reduce duty to acceptable level. Check that pipework/valves do not form a closed loop, i.e. feeding hot delivered air back into machine inlet. Check location. Maximum ambient temperature is 35°C Check and clean valves, replace worn parts as necessary. Clean out cylinder fins. Clean tubes with a brush and compressed air. Adjust belt drive. Service air intake filter. Reverse motor feed wiring. Dismantle and examine fourth stage plunger. Replace if necessary.
7.4 EXCESSIVE NOISE	1. Oil level low. 2. Pulley loose. 3. Belt drive worn. 4. Vibration in machine. 5. Pulley out of line. 6. Low oil pressure. 7. Worn bearings.	Check oil level and replenish. Tighten pulley. Replace banded belts. Insecure mounting. Tighten mounting bolts. Inspect and adjust the alignment of the pulley. Air trapped in oil pump. Vent pump and oil line. Dismantle, examine and replace, if necessary.
7.5 EXTENDED RUNNING	1. Speed too low or machine not large enough.	If speed cannot be uprated, fit additional machine or machine with larger capacity. Check belt drive.

FAULT	SYMPTOM	RECOMMENDATION(S)
7.6 EXCESSIVE WEAR	1. Excessive speed and / or pressure. 2. Dirty air and / or suction pipeline. 3. Excessive side or end thrust. 4. Excessive moisture content in air. 5. Belt wear. 6. Belt slip.	Adjust accordingly. Clean filter element. Pulley out of alignment - realign. Belt too tight / too loose - adjust. Check drainage system and regularly check condition of crankcase oil. Belt too tight / too loose - adjust. Oil or grease on belt - clean or replace v-belt.
7.7 FAILURE TO START	1. Seizure. 2. Electrical or control fault.	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. Locate and rectify, or consult an electrician.
7.8 LOW OIL PRESSURE	1. Air trapped in oil pump. 2. Oil regulator dirty. 3. Fourth stage piston problem.	Vent pump and oil line. Dismantle and clean. Examine fourth stage plunger and renew, if necessary.

SECTION 8 ILLUSTRATED PARTS LIST

CONTENTS

		5409.2.IA	5409.2.BA	5409.3.BA	COMMON	5309.2.IA
8.1	1st STAGE VALVES	-	-	-	PARTS	-
8.2	2nd STAGE VALVES	-	-	-	PARTS	-
8.3	3rd STAGE CONCENTRIC VALVE	-	-	-	PARTS	-
8.4	4th STAGE CONCENTRIC VALVE	-	-	-	PARTS	-
8.5	MAINTENANCE KITS	-	-	-	PARTS	-
8.6	CRANKCASE, CRANKSHAFT & CONN RODS	A30134	E61403	E61741	-	A30134
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8.10	2nd STAGE SEPARATOR ASSEMBLY	-	-	-	D101396	-
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8.12	1st STAGE COOLER ASSEMBLY	E61318	E61317	E61317	-	E61318
8.13	2nd STAGE COOLER ASSEMBLY	E61341	E61423	E61423	-	E61341
8.14	3rd STAGE COOLER ASSEMBLY	E61342	E61424	E61424	-	E61506
8.15	4th STAGE COOLER ASSEMBLY	E61333	E61333	E61333	-	N/A
8.16	3rd SUCTION PIPE ASSEMBLY	-	-	-	C201197	-
8.17	4th SUCTION TUBE ASSEMBLY	C203178	C203178	C203178	-	N/A
8.18	LUBRICATION ASSEMBLY	A30193	E61334	E61334	-	A30199
8.19	FLYWHEEL ASSEMBLY - EU	-	-	-	D101416	-
8.20	FLYWHEEL ASSEMBLY - USA	-	-	-	D101563	-
8.21	SAFETY VALVES	D101497	D101499	D101499	-	D101733

Note: Standard parts are available where indicated by either a number or letters. The letters indicate that an item is available as a component of an assembly. Non-listed or individual items of assemblies where reference numbers are not indicated, are not standard replacement parts and can only be obtained at the discretion of CompAir UK Ltd Ipswich. The assemblies have been chosen based on the experience gained by our own Parts and Service Departments.

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.

8.1 1st STAGE VALVES

PARTS

ITEM No.	DESCRIPTION	No. PER MACHINE	PART No.	ASSEMBLY REF.
	<u>VALVE COMPLETE - 1st STAGE SUCTION</u>	1	98650.1167	—
J1	NUT	1	—	NB
J2	WASHER	1	—	NB
J3	VALVE SEAT	1	—	—
J4	VALVE PLATE	1	—	NB
J5	SPRING PLATE	1	—	NB
J5/1	SPRING PLATE	1	—	NB
J6	LIFT WASHER	1	—	NB
J7	VALVE GUARD	1	—	—
J8	BOLT	1	—	NB
J9	PEG	1	—	—
	<u>VALVE COMPLETE - 1st STAGE DELIVERY</u>	1	98650.1168	—
J10	VALVE SEAT	1	—	—
J11	LIFT WASHER	1	—	NB
J12	VALVE PLATE	1	—	NB
J13	SPRING PLATE	1	—	NB
J13/1	SPRING PLATE	1	—	NB
J14	VALVE GUARD	1	—	—
J15	WASHER	1	—	NB
J16	NUT	1	—	NB
J17	STUD	1	—	—
J18	PEG	1	—	—
NB	1ST STAGE VALVE MAINTENANCE KIT INCLUDES PARTS J1, J2, J4, J5, J5/1, J8, J11, J12, J13, J13/1, J15 & J16.	1	98650.1771	NB

8.2 2nd STAGE VALVES

PARTS

ITEM No.	DESCRIPTION	No. PER MACHINE	PART No.	ASSEMBLY REF.
	<u>VALVE COMPLETE - 2nd STAGE SUCTION</u>	1	98650.1169	—
K1	NUT	1	—	NC
K2	WASHER	1	—	NC
K3	VALVE SEAT	1	—	—
K4	VALVE PLATE	1	—	NC
K5	LIFT WASHER	1	—	NC
K6	SPRING PLATE	3	—	NC
K7	VALVE GUARD	1	—	—
K8	BOLT	1	—	NC
K9	PEG	1	—	—
	<u>VALVE COMPLETE - 2nd STAGE DELIVERY</u>	1	98650.1170	—
K10	VALVE SEAT	1	—	—
K11	LIFT WASHER	1	—	NC
K12	VALVE PLATE	1	—	NC
K13	SPRING PLATE	4	—	NC
K14	VALVE GUARD	1	—	—
K15	WASHER	1	—	NC
K16	NUT	1	—	NC
K17	STUD	1	—	—
K18	PEG	1	—	—
NC	2ND STAGE VALVE MAINTENANCE KIT INCLUDES PARTS. K1, K2, K4, K5, K6, K8, K11, K12, K13, K15 & K16.	1	98650.1772	NB

8.3 3rd STAGE CONCENTRIC VALVE**PARTS**

ITEM No.	DESCRIPTION	No. PER MACHINE	PART No.	ASSEMBLY REF.
	<u>VALVE COMPLETE</u>	1	98650.1883	—
L1	UPPER BODY	1	—	—
L2	'O' RING	1	95602.54	ND
L3	VALVE / BACKING PLATE - Delivery	2	—	ND
L4	SPRING PLATE - Delivery	2	—	ND
L5	VALVE / BACKING PLATE - Suction	2	—	ND
L6	SPRING PLATE - Suction	2	—	ND
L7	LOWER BODY	1	—	—
L8	PEG	1	—	—
L9	'O' RING	1	95602.50	ND
L10	SETSCREW	2	95018.134	ND
ND	3RD STAGE VALVE MAINTENANCE KIT INCLUDES PARTS L2, L3, L4, L5, L6, L9 & L10.	1	98650.1215	ND

8.4 4th STAGE CONCENTRIC VALVE**PARTS**

ITEM No.	DESCRIPTION	No. PER MACHINE	PART No.	ASSEMBLY REF.
	<u>VALVE COMPLETE</u>	1	C201654	—
M1	UPPER BODY	1	—	—
M2	'O' RING	1	95602.16	NE
M3	VALVE / BACKING PLATE	4	—	NE
M4	VALVE SPRING	4	—	NE
M5	CENTRE PLATE	2	—	NE
M6	MIDDLE BODY	1	—	—
M7	'O' RING	2	95602.18	NE
M8	LOWER BODY	1	—	—
M9	PEG	2	—	—
M10	SETSCREW	2	95018.106	NE
NE	4TH STAGE VALVE MAINTENANCE KIT INCLUDES PARTS M2, M3, M4, M5, M7, & M10.	1	98650.1199	NE

8.5 MAINTENANCE KITS

ASS/Y REF.	DESCRIPTION	No. PER MACHINE	COMPRISING OF ITEMS	PARTS ASS/Y No.
NA	OVERHAUL JOINT KIT	1		98504.1120
NB	OVERHAUL VALVE KIT - 1st STAGE	1		98650.1771
NC	OVERHAUL VALVE KIT - 2nd STAGE	1		98650.1772
ND	OVERHAUL VALVE KIT - 3rd STAGE	1		98650.1215
NE	OVERHAUL VALVE KIT - 4th STAGE	1		98650.1199

Note: The maintenance kits may have more items than listed, but this is to allow for a standard kit being used on all current and past versions of the **5409** and **5309** compressors.

8.6	COMPRESSOR BASIC BUILD LIST:
-----	------------------------------

CRANKCASE ASSEMBLY INDUSTRIAL AIR COMPRESSORS

REF	PART No.	DESCRIPTION	Qty.
10	00001000	1000 Series Head - 100 Series	1
11	00001000	1000 Series Head - 100 Series	1
12	00001000	1000 Series Head - 100 Series	1
13	00001000	1000 Series Head - 100 Series	1
14	00001000	1000 Series Head - 100 Series	1
15	00001000	1000 Series Head - 100 Series	1
16	00001000	1000 Series Head - 100 Series	1
17	00001000	1000 Series Head - 100 Series	1
18	00001000	1000 Series Head - 100 Series	1
19	00001000	1000 Series Head - 100 Series	1
20	00001000	1000 Series Head - 100 Series	2

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DATE 24/11/1988

THIS IS A HIGH PRESSURE COMPRESSOR - USE SOLID CARTRIDGE PISTONS ONLY

CRANKCASE ASSEMBLY INDUSTRIAL AIR COMPRESSORS

REF	PART No.	DESCRIPTION	Qty.
10	00001000	1000 Series Head - 100 Series	1
11	00001000	1000 Series Head - 100 Series	1
12	00001000	1000 Series Head - 100 Series	1
13	00001000	1000 Series Head - 100 Series	1
14	00001000	1000 Series Head - 100 Series	1
15	00001000	1000 Series Head - 100 Series	1
16	00001000	1000 Series Head - 100 Series	1
17	00001000	1000 Series Head - 100 Series	1
18	00001000	1000 Series Head - 100 Series	1
19	00001000	1000 Series Head - 100 Series	1
20	00001000	1000 Series Head - 100 Series	2

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THIS IS A HIGH PRESSURE COMPRESSOR - USE SOLID CARTRIDGE PISTONS ONLY

CRANKCASE ASSEMBLY INDUSTRIAL AIR COMPRESSORS

REF	PART No.	DESCRIPTION	Qty.
10	00001000	1000 Series Head - 100 Series	1
11	00001000	1000 Series Head - 100 Series	1
12	00001000	1000 Series Head - 100 Series	1
13	00001000	1000 Series Head - 100 Series	1
14	00001000	1000 Series Head - 100 Series	1
15	00001000	1000 Series Head - 100 Series	1
16	00001000	1000 Series Head - 100 Series	1
17	00001000	1000 Series Head - 100 Series	1
18	00001000	1000 Series Head - 100 Series	1
19	00001000	1000 Series Head - 100 Series	1
20	00001000	1000 Series Head - 100 Series	2

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CRANKCASE ASSEMBLY INDUSTRIAL AIR COMPRESSORS

REF	PART No.	DESCRIPTION	Qty.
10	00001000	1000 Series Head - 100 Series	1
11	00001000	1000 Series Head - 100 Series	1
12	00001000	1000 Series Head - 100 Series	1
13	00001000	1000 Series Head - 100 Series	1
14	00001000	1000 Series Head - 100 Series	1
15	00001000	1000 Series Head - 100 Series	1
16	00001000	1000 Series Head - 100 Series	1
17	00001000	1000 Series Head - 100 Series	1
18	00001000	1000 Series Head - 100 Series	1
19	00001000	1000 Series Head - 100 Series	1
20	00001000	1000 Series Head - 100 Series	2

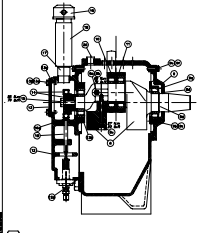
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CRANKCASE ASSEMBLY INDUSTRIAL AIR COMPRESSORS



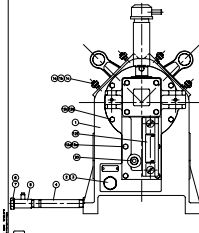
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THIS IS A HIGH PRESSURE COMPRESSOR - USE SOLID CARTRIDGE PISTONS ONLY

CRANKCASE ASSEMBLY
STANDARD AIR COMPRESSORS

[illegible]

E61403 SHEET 08 OF 10 ISSUE F ISSUE DATE 24/11/1996

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

CRANKCASE ASSEMBLY
STANDARD AIR COMPRESSORS

[illegible]

E61403 INVT 04 PAGE 9 ISSUE DATE 24/11/1999

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

CRANKCASE ASSEMBLY
STANDARD AIR COMPRESSORS

REF	PART No.	DESCRIPTION	Mo
1	88407.20	Capacitor Value: 100nF, 50V, 10% Tolerance: 10%	1
1a	88406.10,30	Pin Pin 1 Pin 2 Pin 3	8
1b	PE1113.2	Resistor Value: 10k, 1/4W, 1% Tolerance: 1%	1
1c	88111.8	Resistor Value: 10k, 1/4W, 1% Tolerance: 1%	8
1d	88008.202	Resistor Value: 10k, 1/4W, 1% Tolerance: 1%	4
1e	PE1142.2	Resistor Value: 10k, 1/4W, 1% Tolerance: 1%	4
1f	88111.7	Resistor Value: 10k, 1/4W, 1% Tolerance: 1%	1
2	Q2008.06	Transistor Value: 10k, 1/4W, 1% Tolerance: 1%	1
2	Q20470	Pin Pin 1 Pin 2 Pin 3	1
4	88880.1983	Pin Pin 1 Pin 2 Pin 3	1
5	88880.1180	Pin Pin 1 Pin 2 Pin 3	1
6	PE1188.6	Pin Pin 1 Pin 2 Pin 3	1

E61403 10-007 03 ISSUE F ISSUE DATE 24/11/1998

THIS IS A HIGH PRESSURE COMPRESSOR - USE SECURE CLAMPING PARTS ONLY

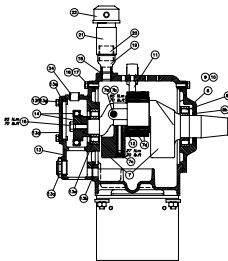
CRANKCASE ASSEMBLY
STANDARD AIR COMPRESSORS

REF	PART No.	DESCRIPTION	Qty.
13	800100-00	Assembly, Bearing 1/2" Dia. x 1 1/2" L x 1/4" Thick 1/2" Dia. x 1 1/2" L x 1/4" Thick	1
13a	800716-1020	Bearing, Ball 1/2" Dia. x 1 1/2" L x 1/4" Thick 1/2" Dia. x 1 1/2" L x 1/4" Thick	1
13b	800431-02	Washer, Flat 1/2" Dia. x 1/16" Thick 1/2" Dia. x 1/16" Thick	2
13c	023840-00	Washer, Flat 1/2" Dia. x 1/16" Thick 1/2" Dia. x 1/16" Thick	1
13d	023840-00	Washer, Flat 1/2" Dia. x 1/16" Thick 1/2" Dia. x 1/16" Thick	1
13e	020001-00	Washer, Flat 1/2" Dia. x 1/16" Thick 1/2" Dia. x 1/16" Thick	1
13f	704601-00	Washer, Flat 1/2" Dia. x 1/16" Thick 1/2" Dia. x 1/16" Thick	4
13g	800010-00	Washer, Flat 1/2" Dia. x 1/16" Thick 1/2" Dia. x 1/16" Thick	1
14	020140-01	Washer, Flat 1/2" Dia. x 1/16" Thick 1/2" Dia. x 1/16" Thick	1
15	800010-1004	Washer, Flat 1/2" Dia. x 1/16" Thick 1/2" Dia. x 1/16" Thick	1
16	704601-00	Washer, Flat 1/2" Dia. x 1/16" Thick 1/2" Dia. x 1/16" Thick	1
17	800010-1004	Washer, Flat 1/2" Dia. x 1/16" Thick 1/2" Dia. x 1/16" Thick	8

E61403 SHEET 00 ISSUE F ISSUE DATE 24/11/1999

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

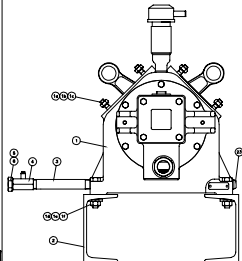
CRANKCASE ASSEMBLY
STANDARD AIR COMPRESSORS



E61403 SHEET 02 OF 02 ISSUE F ISSUE DATE 24/11/1999

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

CRANKCASE ASSEMBLY
STANDARD AIR COMPRESSORS



E61403 SHEET 01 ISSUE F ISSUE DATE 24/11/1999

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

A30197 NEXT ON FILE D FILE DATE 4/13/00
THIS IS A HIGH PRIORITY DOCUMENT -- USE SPECIAL DELIVERY ROUTE ONLY

A30197 BENTON CO. BUREAU BUREAU 4/18/72
THIS IS A HIGH POPULARITY CONCEPT -- USE STRONG MARKS FIRST ONLY

A30197 SEP 14 1996 9 00:00 AM 4/10/96

A30197 REF ID: A66 3 1966 4/18/70

A30197 MAY 11 1966 5 1966 1966 4/10/66

CYLINDER ASSY – 2ND & 3RD STAGE STANDARD COMPRESSORS

REF	PART No.	DESCRIPTION	No.
9	90650.1963	Valve – 2nd Stage Incl: 3. Stage Incl: 3. Stage Incl: 3. Stage Incl: 3. Stage	1
10	90000.262	Socket, Hexagon Head Schraube/vis Vis à tête à pans Schraube/vis Tornillo de cabeza hexagonal	4
11	C200807.2	Oil, Lifting Huile Huile Huile Huile	1
12	P51322.2	Set Couple Joint Arbol Arbol Arbol	2
13	P51814.4	Plug, Blanking Bouchon Bouchon d'aluminium Bouchon Tapa de aluminio	2
14	P51322.1	Set Couple Joint Arbol Arbol Arbol	2
15	P51814.2	Plug, Blanking Bouchon Bouchon d'aluminium Bouchon Tapa de aluminio	2
16	P51322.4	Set Couple Joint Arbol Arbol Arbol	1
17	P51814.3	Plug, Blanking Bouchon Bouchon d'aluminium Bouchon Tapa de aluminio	1

Language Support
English
German
French
Dutch
Spanish

E61315 SHEET 04 ISSUE C ISSUE DATE 18/03/2003

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

CYLINDER ASSY – 2ND & 3RD STAGE STANDARD COMPRESSORS

REF	PART No.	DESCRIPTION	No.
3a	D100171.6.32	Shaft Schachtscheibe Schacht Schacht Schacht	8
3b	90111.4	Shaft Schachtscheibe Schacht Schacht Schacht	8
3c	90602.87	1/2 Ring O-Ring O-Ring O-Ring O-Ring	1
3d	90541.160	Pin, Locating Piquet de positionnement Piquet de positionnement Piquet de positionnement Piquet de positionnement	1
3e	C200810	Linear – 2nd Stage Incl: 3. Stage Incl: 3. Stage Incl: 3. Stage Incl: 3. Stage	1
4	C200808.100	Linear – 2nd Stage Incl: 3. Stage Incl: 3. Stage Incl: 3. Stage Incl: 3. Stage	1
4a	90602.85	1/2 Ring O-Ring O-Ring O-Ring O-Ring	1
5	90650.1170	Valve, Delivery – 2nd Stage Incl: 3. Stage Incl: 3. Stage Incl: 3. Stage Incl: 3. Stage	1
6	C200805.100	Linear – 2nd Stage Incl: 3. Stage Incl: 3. Stage Incl: 3. Stage Incl: 3. Stage	1
6a	90602.85	1/2 Ring O-Ring O-Ring O-Ring O-Ring	1
7	90650.1169	Valve, Delivery – 2nd Stage Incl: 3. Stage Incl: 3. Stage Incl: 3. Stage Incl: 3. Stage	1
8	90602.80	1/2 Ring O-Ring O-Ring O-Ring O-Ring	1

E61315 SHEET 03 ISSUE C ISSUE DATE 18/03/2003

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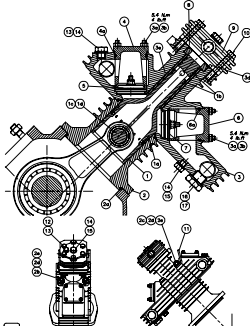
CYLINDER ASSY – 2ND & 3RD STAGE STANDARD COMPRESSORS

REF	PART No.	DESCRIPTION	No.
1	D100336.60	Pinion – 2nd Stage / 3rd Stage Incl: 3. Stage Incl: 3. Stage Incl: 3. Stage Incl: 3. Stage	1
1a	90477.1096	Ring, 4th Pinion – 2nd Stage Incl: 3. Stage Incl: 3. Stage Incl: 3. Stage Incl: 3. Stage	1
1b	90477.1167	Ring, 4th Pinion – 2nd Stage Incl: 3. Stage Incl: 3. Stage Incl: 3. Stage Incl: 3. Stage	1
1c	C200532	Pin, Output Incl: 3. Stage Incl: 3. Stage Incl: 3. Stage Incl: 3. Stage	1
1d	90650.25	Oil Couple Joint Arbol Arbol Arbol	2
2	D100327.50	Cylinder – 2nd Stage Incl: 3. Stage Incl: 3. Stage Incl: 3. Stage Incl: 3. Stage	1
2a	90602.94	1/2 Ring O-Ring O-Ring O-Ring O-Ring	1
2b	D100171.10.105	Shaft Schachtscheibe Schacht Schacht Schacht	3
2c	D100171.10.115	Shaft Schachtscheibe Schacht Schacht Schacht	1
2d	901-68.15	Water Unterlegscheibe Unterlegscheibe Unterlegscheibe Unterlegscheibe	4
2e	90111.6	Shaft Schachtscheibe Schacht Schacht Schacht	4
3	902356.100	Linear – 2nd Stage Incl: 3. Stage Incl: 3. Stage Incl: 3. Stage Incl: 3. Stage	1

E61315 SHEET 03 ISSUE C ISSUE DATE 18/03/2003

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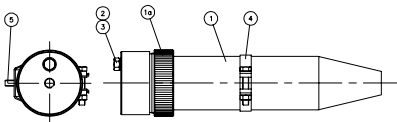
CYLINDER ASSY – 2ND & 3RD STAGE STANDARD COMPRESSORS



E61315 SHEET 01 ISSUE C ISSUE DATE 18/03/2003

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SEPARATOR ASSY - 2ND STAGE



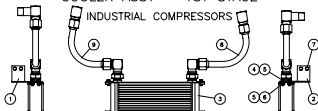
REF	PART No.	DESCRIPTION	No.
1	D100292	Moisture Separator - 2nd Stage Kondensatabscheider - 2. Stufe Séparateur des condensats - 2ème étape Condensatscheider - 2e trap Separador de humedad - 2ª etapa	1
1a	95602.61	"O" Ring O-Ring Joint torique O-Ring Ano tórico	1
2	PS1322.1	Seal Dichtung Joint Afdichting Sello	1
3	PS1814.2	Plug, Blanking Blindstopfen Bouchon d'obturation Blindplug Tapón obturador	1
4	98150.1007	Clip Clip Attache Siangkiem Presilla	1
5	95028.134	Screw, Countersunk Senkschraube Vis à tête fraisée Platkop Schroef Tornillo avellanado	1

Language Support
English
German
French
Dutch
Spanish



COOLER ASSY - 1ST STAGE

INDUSTRIAL COMPRESSORS



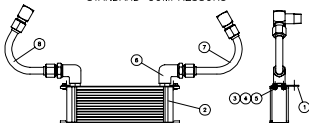
REF	PART No.	DESCRIPTION	No.
1	G203530	Bracket, Cooler - Left Hand Halierung, Kühler - Linkshändig Support de réfrigérant - Gauche Koolerbaugel - de linkskant Soporte del enfriador - Izquierda	1
2	G203529	Bracket, Cooler - Right Hand Halierung, Kühler - Rechtshändig Support de réfrigérant - Droite Koolerbaugel - de rechtskant Soporte del enfriador - Derecha	1
3	96104.1002	Cooler Kühler Réfrigérant Kooler Enfriador	1
4	95000.225	Screw, Hexagon Head Sechskantschraube Vis à tête 6 pans Zeskantschroef Tornillo de cabeza hexagonal	4
5	95149.13	Washer Unterlegscheibe Randelle Shimring Arandela	8
6	95111.4	Nut Mutter Ecosou Muer Tuerca	4
7	95000.227	Screw, Hexagon Head Sechskantschraube Vis à tête 6 pans Zeskantschroef Tornillo de cabeza hexagonal	4
8	G203532	Pipe, Delivery - 1st Stage Druckrohr - 1. Stufe Tuyau de refoulement - 1er étage Parsleiding - 1e trap Tubo de reparto - 1ª etapa	1
9	G203533	Pipe, Suction - 2nd Stage Ansaugrohr - 2. Stufe Tuyau d'aspiration - 2ème étage Ansaugleitung - 2e trap Tubo, aspiración - 2ª etapa	1

Language Support
 English
 German
 French
 Dutch
 Spanish



COOLER ASSY - 1ST STAGE

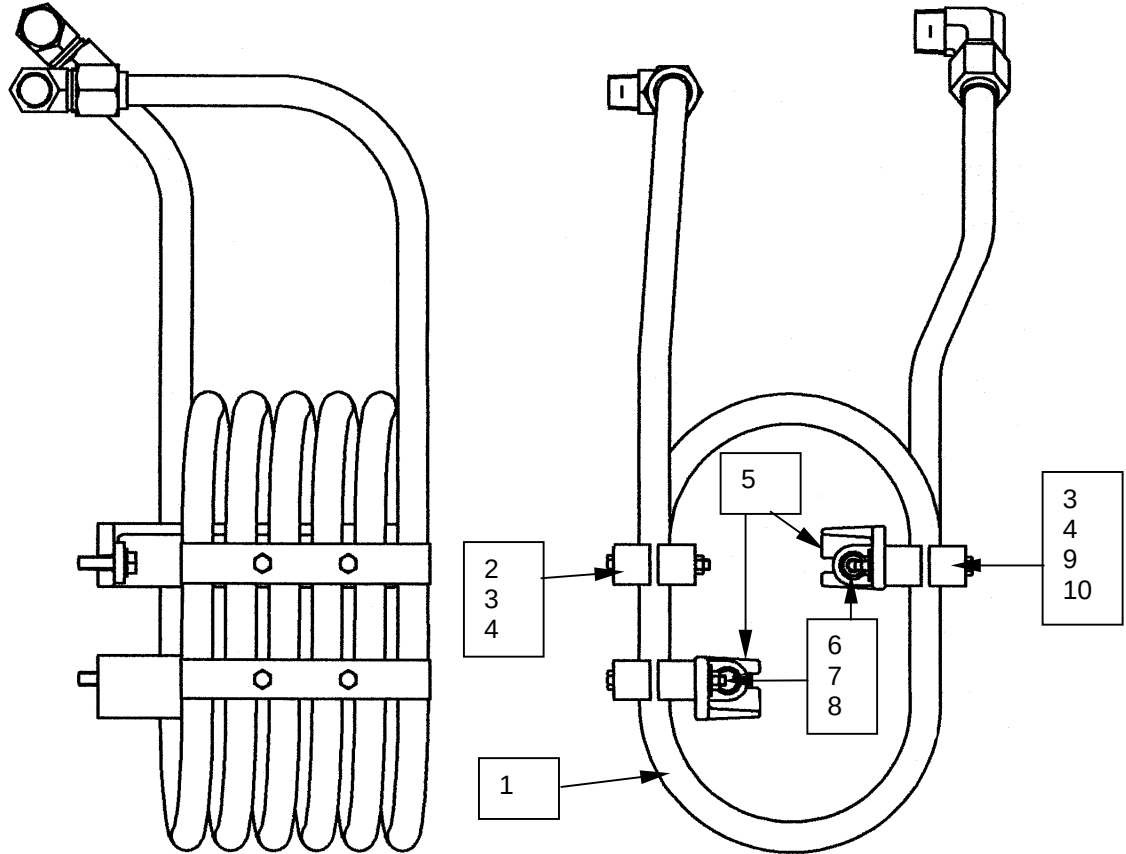
STANDARD COMPRESSORS



REF	PART No.	DESCRIPTION	No.
1	C201148	Bracket, Cooler Halierung, Kühler Support de réfrigérant Kühlerbeuge Soporte del enfriador	1
2	98154.1002	Cooler Kühler Réfrigérant Koeber Enfriador	1
3	95000.227	Screw, Hexagon Head Sechskantschraube Vis à tête 6 pans Zeskantschroef Tornillo de cabeza hexagonal	4
4	95149.13	Washer Unterlegscheibe Rondelle Sluifring Arandela	4
5	95111.4	Nut Mutter Ecosu Moer Tuerca	4
6	95410.5	Elbow Bogenstück Coude Kniestück Codo	2
7	C201195	Pipe, Delivery - 1st Stage Druckrohr - 1. Stufe Tuyau de refoulement - 1er stage Persneling - 1e trap Tubo de reparto - 1ª etapa	1
8	C201196	Pipe, Suction - 2nd Stage Ansaugrohr - 2. Stufe Tuyau d'aspiration - 2ème stage Ansaugleitung - 2e trap Tubo, aspiración - 2ª etapa	1

Language Support
 English
 German
 French
 Dutch
 Spanish

COOLER ASSEMBLY - 2nd STAGE INDUSTRIAL COMPRESSORS



COOLER ASSEMBLY - 2nd STAGE INDUSTRIAL COMPRESSORS PARTS LIST

REF	PART No	DESCRIPTION	NO OFF
1	E60358	Cooler Coil - 3rd Stage Kühlerspule - 3. Stufe Bobine de réfrigérant - 3 ème étage Pijpenwinding Koeler - 3e trap Serpentina refrigeratore - 3 ^a etapa	1
2	95000.237	Screw, Hexagon Head Sechskantschraube Vis à tête 6 pans Zaskantschroef Tornillo de cabeza hexagonal	2

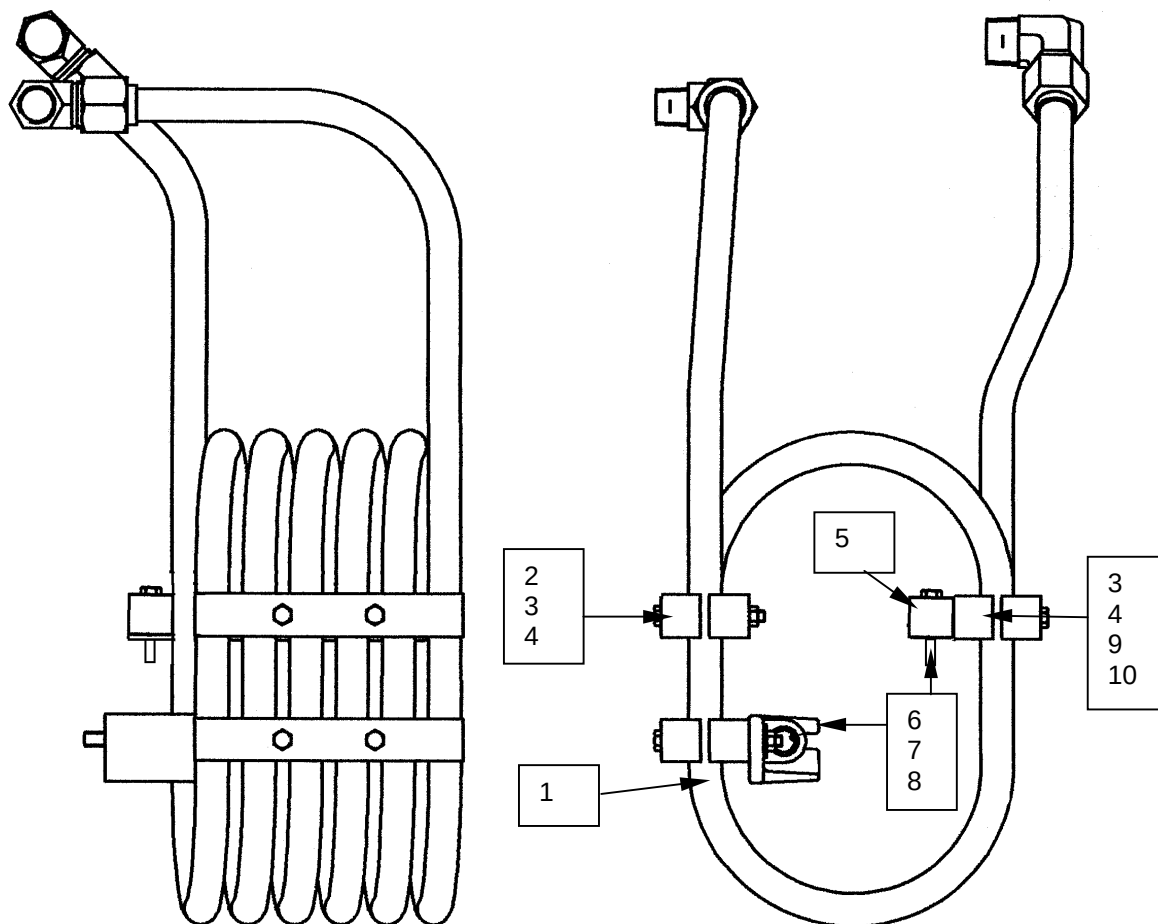
INDUSTRIAL COMPRESSORS PARTS LIST cont.

3	C200926	Clamp, Cooler Halierung, Kühler Support de réfrigérant Koelerklamp Soporte del enfriador	6
4	95141.6	Nut, Hexagonal Self-Locking Sechskantmutter, selbstsichernd Ecrou 6 pans à auto-verrouillage Zestantige moer, zelfborgend Tuerca autobloqueante hexagonal	7
5	D101112	Bracket, Cooler Halierung, Kühler Support de réfrigérant Koelerbeugel Soporte del enfriador	2
6	PS1742.1	Washer, Taper Kegelschiebe Rondelle conique Tapse ring Arandela cónica	2
7	95148.14	Washer Kegelschiebe Rondelle Sluitring Arandela	2
8	95000.257	Screw, Hexagon Head Sechskantschraube Vis à tête 6 pans Zaskantschroef Tornillo de cabeza hexagonal	2
9	95006.132	Bolt, Hexagon Head Sechskantschraube Boulon à tête 6 pans Zaskantbout Perno de cabeza hexagonal	4
10	98660.1189	Washer, Large Unterlegschiebe. groß Rondelle, grande Sluitring, groot Arandela, grande	4

Language Support

English
German
French
Dutch
Spanish

COOLER ASSEMBLY - 2nd STAGE 5409H COMPRESSORS



COOLER ASSEMBLY - 2nd STAGE 5409H COMPRESSORS PARTS LIST

REF	PART No	DESCRIPTION	NO OFF
1	E60358	Cooler Coil - 2nd Stage Kühlerspule - 2. Stufe Bobine de réfrigérant - 2 ^{ème} étage Pijpenwinding Koeler - 2e trap Serpentina refrigeratore - 2 ^a etapa	1
2	95000.237	Screw, Hexagon Head Sechskantschraube Vis à tête 6 pans Zaskantschroef Tornillo de cabeza hexagonal	6

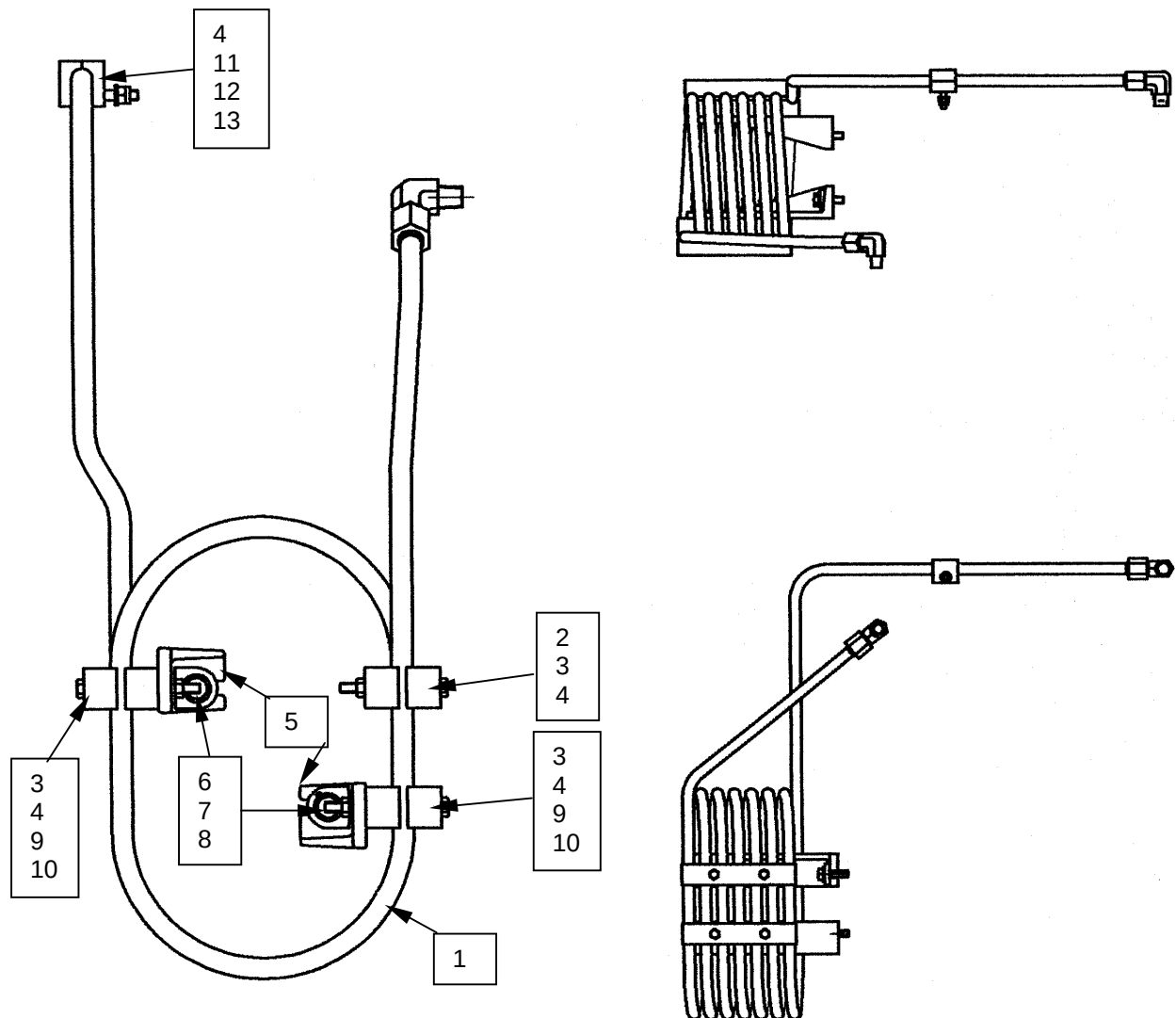
5409H COMPRESSORS PARTS LIST cont.

3	C200926	Clamp, Cooler Halierung, Kühler Support de réfrigérant Koelerklamp Soporte del enfriador	5
4	95141.6	Nut, Hexagonal Self-Locking Sechskantmutter, selbstsichernd Ecrou 6 pans à auto-verrouillage Zestantige moer, zelfborgend Tuerca autobloqueante hexagonal	6
5	CU41239	Bracket, Cooler Halierung, Kühler Support de réfrigérant Koelerbeugel Soporte del enfriador	1
6	PS1742.1	Washer, Taper Kegelschiebe Rondelle conique Tapse ring Arandela cónica	2
7	95148.14	Washer Kegelschiebe Rondelle Sluitring Arandela	1
8	95000.258	Screw, Hexagon Head Sechskantschraube Vis à tête 6 pans Zaskantschroef Tornillo de cabeza hexagonal	1
9	95006.132	Bolt, Hexagon Head Sechskantschraube Boulon à tête 6 pans Zaskantbout Perno de cabeza hexagonal	4
10	98660.1189	Washer, Large Unterlegschiebe. groß Rondelle, grande Sluitring, groot Arandela, grande	2

Language Support

English
German
French
Dutch
Spanish

COOLER ASSEMBLY - 3rd STAGE INDUSTRIAL COMPRESSORS



INDUSTRIAL COMPRESSORS PARTS LIST

REF	PART No	DESCRIPTION	NO OFF
1	E60359	Cooler Coil - 3rd Stage Kühlerspule - 3. Stufe Bobine de réfrigérant - 3 ème étage Pijpenwinding Koeler - 3e trap Serpentina refrigeratore - 3 ^a etapa	1
2	95000.237	Screw, Hexagon Head Sechskantschraube Vis à tête 6 pans Zaskantschroef Tornillo de cabeza hexagonal	2
3	C200927	Clamp, Cooler Halterung, Kühler Support de réfrigérant Koelerklamp Soporte del enfriador	6

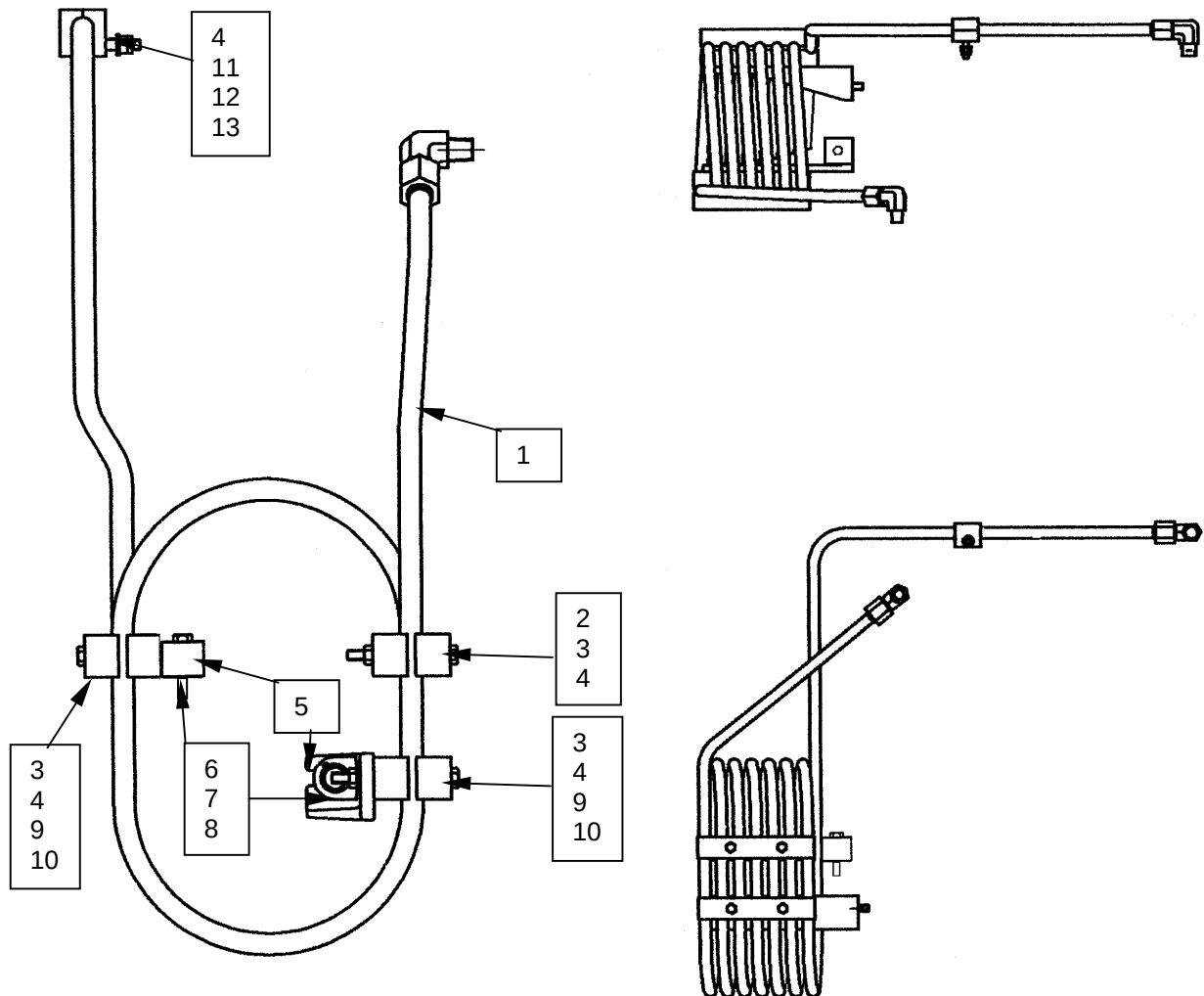
INDUSTRIAL COMPRESSORS PARTS LIST cont.

REF	PART No	DESCRIPTION	NO OFF
4	95141.6	Nut, Hexagonal Self-Locking Sechskantmutter, selbstsichernd Ecrou 6 pans à auto-verrouillage Zestantige moer, zelfborgend Tuerca autobloqueante hexagonal	7
5	D101112	Bracket, Cooler Halterung, Kühler Support de réfrigérant Koelerbeugel Soporte del enfriador	2
6	PS1742.1	Washer, Taper Kegelschiebe Rondelle conique Tapse ring Arandela cónica	2
7	95148.14	Washer Kegelschiebe Rondelle Sluitring Arandela	2
8	95000.257	Screw, Hexagon Head Sechskantschraube Vis à tête 6 pans Zaskantschroef Tornillo de cabeza hexagonal	2
9	95006.132	Bolt, Hexagon Head Sechskantschraube Boulon à tête 6 pans Zaskantbout Perno de cabeza hexagonal	4
10	98660.1189	Washer, Large Unterlegschiebe. groß Rondelle, grande Sluitring, groot Arandela, grande	4
11	98150.1040	Clamp, Pipe Rohrschelle Collier de tube Beugel Sujetador para tubo	1
12	95018.172	Capscrew Kopfchelle Vis à tête Inbusschroef Tapa roscada	1
13	95149.13	Washer Kegelschiebe Rondelle Sluitring Arandela	2

Language Support

English
German
French
Dutch
Spanish

COOLER ASSEMBLY - 3rd STAGE 5409H COMPRESSORS



5409H COMPRESSORS PARTS LIST

REF	PART No	DESCRIPTION	NO OFF
1	E60359	Cooler Coil - 3rd Stage Kühlerspule - 3. Stufe Bobine de réfrigérant - 3 ème étage Pijpenwinding Koeler - 3e trap Serpentina refrigeratore - 3 ^a etapa	1
2	95000.237	Screw, Hexagon Head Sechskantschraube Vis à tête 6 pans Zaskantschroef Tornillo de cabeza hexagonal	4
3	C200927	Clamp, Cooler Halterung, Kühler Support de réfrigérant Koelerklamp Soporte del enfriador	5

5409H COMPRESSORS PARTS LIST cont.

REF	PART No	DESCRIPTION	NO OFF
4	95141.6	Nut, Hexagonal Self-Locking Sechskantmutter, selbstsichernd Ecrou 6 pans à auto-verrouillage Zestantige moer, zelfborgend Tuerca autobloqueante hexagonal	7
5	D100344	Bracket, Cooler Halterung, Kühler Support de réfrigérant Koelerbeugel Soporte del enfriador	2
6	PS1742.1	Washer, Taper Kegelschiebe Rondelle conique Tapse ring Arandela cónica	2
7	95148.14	Washer Kegelschiebe Rondelle Sluitring Arandela	2
8	95000.258	Screw, Hexagon Head Sechskantschraube Vis à tête 6 pans Zaskantschroef Tornillo de cabeza hexagonal	2
9	95006.132	Bolt, Hexagon Head Sechskantschraube Boulon à tête 6 pans Zaskantbout Perno de cabeza hexagonal	2
10	98660.1189	Washer, Large Unterlegschiebe. groß Rondelle, grande Sluitring, groot Arandela, grande	2
11	98150.1040	Clamp, Pipe Rohrschelle Collier de tube Beugel Sujetador para tubo	1
12	95018.172	Capscrew Kopfchelle Vis à tête Inbusschroef Tapa roscada	1
13	95149.13	Washer Kegelschiebe Rondelle Sluitring Arandela	1

Language Support

English
 German
 French
 Dutch
 Spanish

COOLER ASSY - 3RD STAGE WITH FITTING FOR TEMP SWITCH

REF	PART No.	DESCRIPTION	No.
5	D101112	Bracket, Cooler Halterung, K�hler Support de r�frig�rant Soporte del enfriador	2
6	PS1742.1	Washer, Top Lageleiste Rondelle conique Tapis ring Anillo de c�nica	2
7	95148.14	Washer, Unterleiste Rondelle St�ufing Anillo de	2
8	95000.227	Socket, Hexagon Head Sechskantbolzen Vis � t�te � pans Zeskantbolzen Tornillo de cabeza hexagonal	2
9	95004.132	Bolt, Hexagon Head Sechskantbolzen Boulon � t�te � pans Zeskantbolzen Perno de cabeza hexagonal	4
10	95660.1189	Washer, Large Unterleiste, gro� Rondelle, grande St�ufing, gro� Anillo, grande	4
11	95150.1040	Clamp, Pipe Rohrclammer Collier de tube Brazo Sujecedor para tubo	1
12	95018.172	Cap screw Kopfschraube Vis � t�te Schraubvis Tapa rosca	1
13	95148.13	Washer, Unterleiste Rondelle St�ufing Anillo de	1
14	C201975	Bracket, Support Halterung Support Soporte Cajado de soporte	1
15	95179.5	Washer, Spring Federling Rondelle elastique Vieling Anillo el�stico	2
16	95000.229	Socket, Hexagon Head Sechskantbolzen Vis � t�te � pans Zeskantbolzen Tornillo de cabeza hexagonal	2

 Language Support
 English
 German
 French
 Dutch
 Spanish

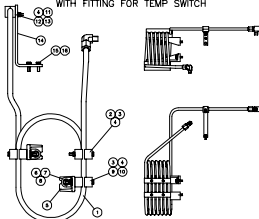
E61506

SHEET 02 ISSUE B

ISSUE DATE 04/05/1999

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

COOLER ASSY - 3RD STAGE WITH FITTING FOR TEMP SWITCH



REF	PART No.	DESCRIPTION	No.
1	E61506	Cooler Coil - 3rd Stage K�hlspirale - 3. Stufe Bobine de r�frig�rant - 3�me stage Serpentina refrigeradora - 3� etapa	1
2	95000.227	Socket, Hexagon Head Sechskantbolzen Vis � t�te � pans Zeskantbolzen Tornillo de cabeza hexagonal	2
3	C200827	Clamp, Cooler K�hlspirale Attache de r�frig�rant Conexi�o Brazo del enfriador	6
4	95141.5	Nut, Hexagonal Self-Locking Sechskantmutter, selbstverriegelnd Ecrou � pans � auto-verrouillage Tornillo de cabeza hexagonal	7

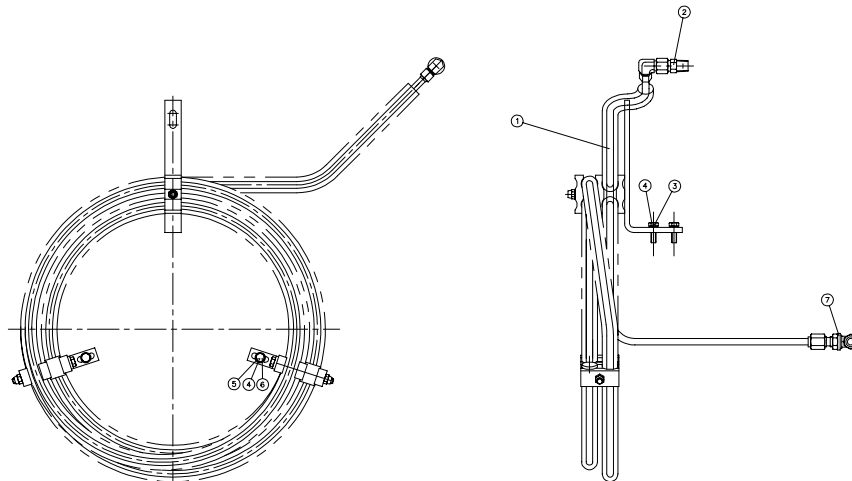
04/05/1999

E61506

SHEET 01 ISSUE B

ISSUE DATE 04/05/1999

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



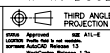
TORQUE WRENCH SETTINGS.		
CLASS 'A' CRITICAL TORQUE SETTINGS FOR NON LUBRICATED FASTENERS.		
TORQUE TO SETTINGS SHOWN ON DRAWING $\pm 5\%$		
CLASS 'B' ADVISED TORQUE SETTINGS FOR NON LUBRICATED FASTENERS.		
TORQUE TO SETTINGS SHOWN BELOW $+5\%$ TO -15%		
M6	8 N.m	(6 lbf.ft)
M8	20 N.m	(15 lbf.ft)
M10	40 N.m	(30 lbf.ft)
M12	71 N.m	(52.5 lbf.ft)

NO	REF.	DESCRIPTION	SIZE	QTY
1	A38136	COOLER COIL		1
2	98156-2809	MALE CONNECTOR	1/4" BSP T x 8 O/D TUBE	1
3	95000.229	HEXAGON SCREW	M6 X 20	2
4	95179.5	SINGLE COIL SPRING TYPE A WASHER	M6	4
5	95000.227	HEXAGON SCREW	M6 X 12	2
6	95149.13	BRIGHT NORMAL WASHER	M6	2
7	C201827	BRACKET FOR COOLER COIL		1
8	98241.049	CABLE TIE		2



DO NOT SCALE - IF IN DOUBT ASK

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© AS ISSUE DATE



MANUFACTURED TO BE AS FOLLOWS UNLESS OTHERWISE STATED
MATERIAL: 30.3 ANGULAR: 30.3°
FINISHED: 41.5 CAST: B56615 CTR
DIMENSIONS IN MILLIMETRES SURFACE FINISH: VALUE IN MICROMETRES
MACHINE: 5000 SERIES

PATTERN No. :
SCALE: 1:1
PROJECT: 5409.IND/H
JOB No. :

DRAWN: C.SIMPSON 13/10/1995
REVISED: K.Thurlow 16/03/2001
APPROVED: K.Thurlow 16/03/2001
ISSUE DATE: 16/03/2001
LAST MOD. No. :

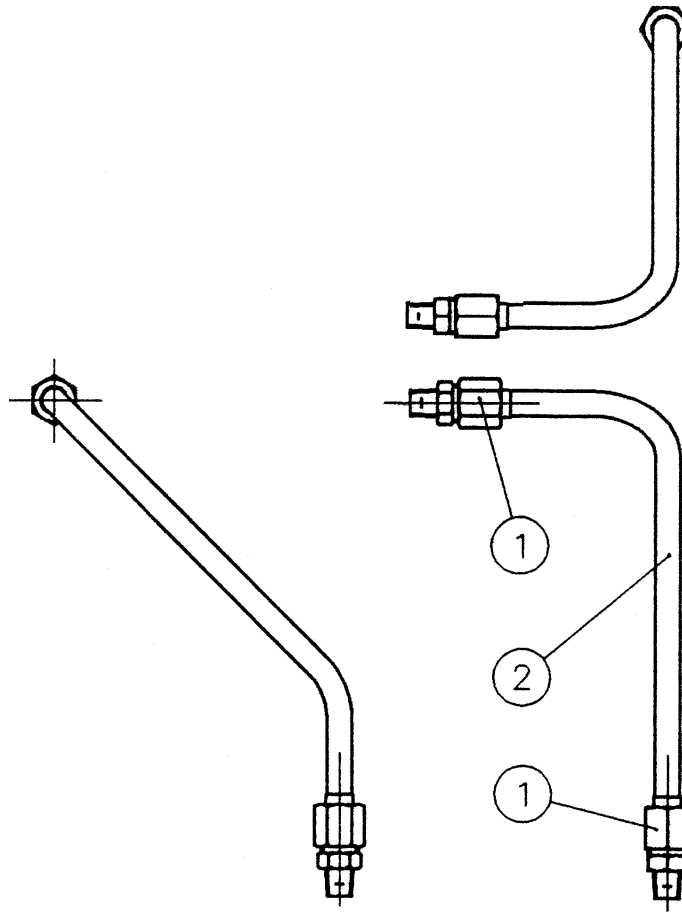
COMPAIR UK LIMITED
IPSWICH OPERATIONS
RIMELASH ROAD
IPSWICH
SUFFOLK
ENGLAND

COOLER ASSY 4TH STAGE
SHT No. 1 OF 1 SHTs
PHASE: DV
DRAWING No.: E61333

ISSUE: A

SUCTION PIPE ASSEMBLY 3rd STAGE - C201197

5409.2 COMPRESSOR



PARTS LIST

REF	PART No	DESCRIPTION	NO OFF
1	98156.1802	Coupling Kupplstück Accouplement Koppeling Acoplamiento	2
2	98617.1020	Tube - Aluminium Rohr - Tube - Pijp - Tubo - Tubo - alluminio	1

Language Support

English
German
French
Dutch
Spanish
Italian

LUBRICATION ASSEMBLY INDUSTRIAL COMPRESSORS

REF	PART No.	DESCRIPTION	No.
1c	95802.7	O-Ring O-Ring Joint torique O-Ring Anillo	1
1d	PS1322.2	Seal Dichtung Joint Afdichting Tubo	1
1e	PS1814.4	Pump, Blanking Blindpomp Pompe d'alimentation Blindpomp Tubo de alim.	1
1f	PS1322.1	Seal Dichtung Joint Afdichting Tubo	1
1g	PS1814.2	Pump, Blanking Blindpomp Pompe d'alimentation Blindpomp Tubo de alim.	1
2	C203193.100	Pump, Oil Pompe Pompe d'huile Oliepomp Bomba de aceite	1
2a	95802.1017	Seal Dichtungsblech Joint Packing Afdicht	1
2b	95000.257	Seal, Hexagon Head Seal Vis à tête hex. Seal Tornillo de cabeza hexagonal	3
3	C203847	Pipe, Oil Feed Alim.-tube Tubo d'alimentation Oliefvoerpijp Tubo de aceite	1
4	C203322	Pipe, Oil Return N-Rückleitung-Boegruppe Tubo de retorno d'huile Oliefvoerpijp Tubo de aceite	1
5	C203149	Pipe, Oil Return N-Rückleitung-Boegruppe Tubo de retorno d'huile Oliefvoerpijp Tubo de aceite	1
6	95802.1152	Seal Dichtung Joint Afdichting Tubo	5

Language Support
 English
 German
 French
 Dutch
 Spanish

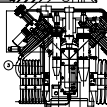
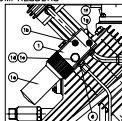
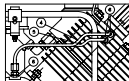
A30193

SHEET 02 ISSUE B

ISSUE DATE 02/03/1999

THIS IS A HIGH PRESSURE COMPRESSOR - USE GENUINE COMP AIR PARTS ONLY

LUBRICATION ASSEMBLY INDUSTRIAL COMPRESSORS



REF	PART No.	DESCRIPTION	No.
1	C203468.100	Regulator, Oil Oiler Regulateur d'huile Oliefregulator Regulador de aceite	1
1a	95002.1148	Element, Oil Filter Element, Oil Filter Element du filtre à huile Oliefilterelement Elemento del filtro de aceite	1
1b	95018.174	Cap screw Kopfschraube Vis à tête Inbusschroef Tapa roscada	2



A30193

SHEET 01 ISSUE B

ISSUE DATE 02/03/1999

THIS IS A HIGH PRESSURE COMPRESSOR - USE GENUINE COMP AIR PARTS ONLY

LUBRICATION ASSEMBLY

STANDARD COMPRESSORS

REF	PART No.	DESCRIPTION	No.
1c	96002.7	1/2" Ring O-Ring O-Ring Ano. 96002	1
1d	PS1322.2	Seal Dichtung Joint Rings Sello	1
1e	PS1814.4	Plug, Blanking Blindbolzen Bouchon d'obturation Blindplug Tornillo obturador	1
1f	PS1322.1	Seal Dichtung Joint Rings Sello	1
1g	PS1814.2	Plug, Blanking Blindbolzen Bouchon d'obturation Blindplug Tornillo obturador	1
2	C203193.100	Pump, Oil Pompe Pompe d'huile Ölpompe Bomba de aceite	1
2a	96002.1017	Gasket Dichtungsblech Joint Passing Junta	1
2b	96000.257	Socket, Hexagon Head Sechskantbolzen Vis à tête à six pans Sechskantbolzen Tornillo de cabeza hexagonal	3
3	C201949	Pipe, Oil Feed Ölrohr-Rohr Tuyau d'alimentation d'huile Ölschlauch Tubo de suministro de aceite	1
4	C202322	Pipe, Oil Return Öl-Rücklauf-Gruppe Tuyau de retour d'huile Ölschlauch Tubo de retorno de aceite	1
5	C201949	Pipe, Oil Return Öl-Rücklauf-Gruppe Tuyau de retour d'huile Ölschlauch Tubo de retorno de aceite	1
6	96000.1152	Seal Dichtung Joint Rings Sello	5

Language Support
 English
 German
 French
 Dutch
 Spanish

E61334

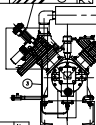
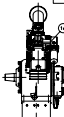
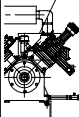
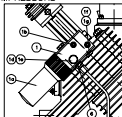
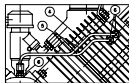
SHEET 02 ISSUE E

ISSUE DATE 02/03/1999

THIS IS A HIGH PRESSURE COMPRESSOR - USE GENUINE COMP AIR PARTS ONLY

LUBRICATION ASSEMBLY

STANDARD COMPRESSORS



REF	PART No.	DESCRIPTION	No.
1	C203488.100	Regulator, Oil Regulator Régulateur d'huile Ölschlauch Regulador de aceite	1
1a	96002.1148	Element, Oil Filter Element, Oil Filter Élément du filtre à huile Ölfilterelement Elemento del filtro de aceite	1
1b	96018.174	Capacitor Kondensator Vis à tête Inductor Tubo inductor	2



E61334

SHEET 01 ISSUE E

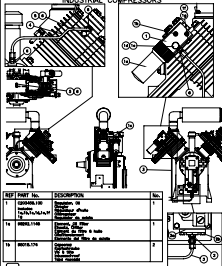
ISSUE DATE 02/03/1999

THIS IS A HIGH PRESSURE COMPRESSOR - USE GENUINE COMP AIR PARTS ONLY

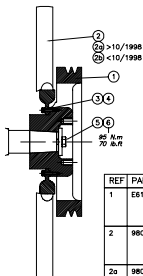
LUBRICATION ASSEMBLY
INDUSTRIAL COMPRESSORS

[illegible]

LUBRICATION ASSEMBLY
INDUSTRIAL COMPRESSORS



FLYWHEEL ASSEMBLY – 2 X SPA



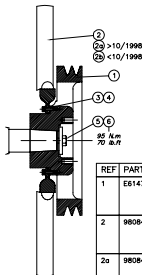
NOTE :-
GRP (red) and GRN (black) fan blades
should not be mixed on the same fan.

REF	PART No.	DESCRIPTION	No.
1	E61128	Flywheel Schwungrad Volant Vliegwiel Volante	1
2	98084.1002	Fan, Axial Axiallüfter Ventilateur axial Axiale ventilator Ventilador axial	1
2a	98084.1029	Blade, Fan – GRN – Black Ventilatorflügel – GRN – Schwarz Pale de ventilateur – GRN – Noir Ventilatorblad – GRN – Zwart Paleta del ventilador – GRN – Negro	12
2b	98084.1005	Blade, Fan – GRP – Red Ventilatorflügel – GRP – Rot Pale de ventilateur – GRP – Rouge Ventilatorblad – GRP – Rood Paleta del ventilador – GRP – Rojo	12
3	95179.5	Washer, Spring Federring Rondelle élastique Veerring Arandela elástica	6
4	98500.229	Screw, Hexagon Head Sechskantschraube Vis à tête 6 pans Zeskantschroef Tornillo de cabeza hexagonal	1
5	D2616	Washer, Retaining Sicherungscheibe Rondelle de retenue Borgring Arandela de retención	1
6	98500.1008	Screw, Hexagon Head – Left Hand Thread Sechskantschraube Vis à tête 6 pans Zeskantschroef Tornillo de cabeza hexagonal	1

Language Support
English
German
French
Dutch
Spanish

FLYWHEEL ASSEMBLY – 2 X SPB

USA SPECIFICATION BELT GROOVES



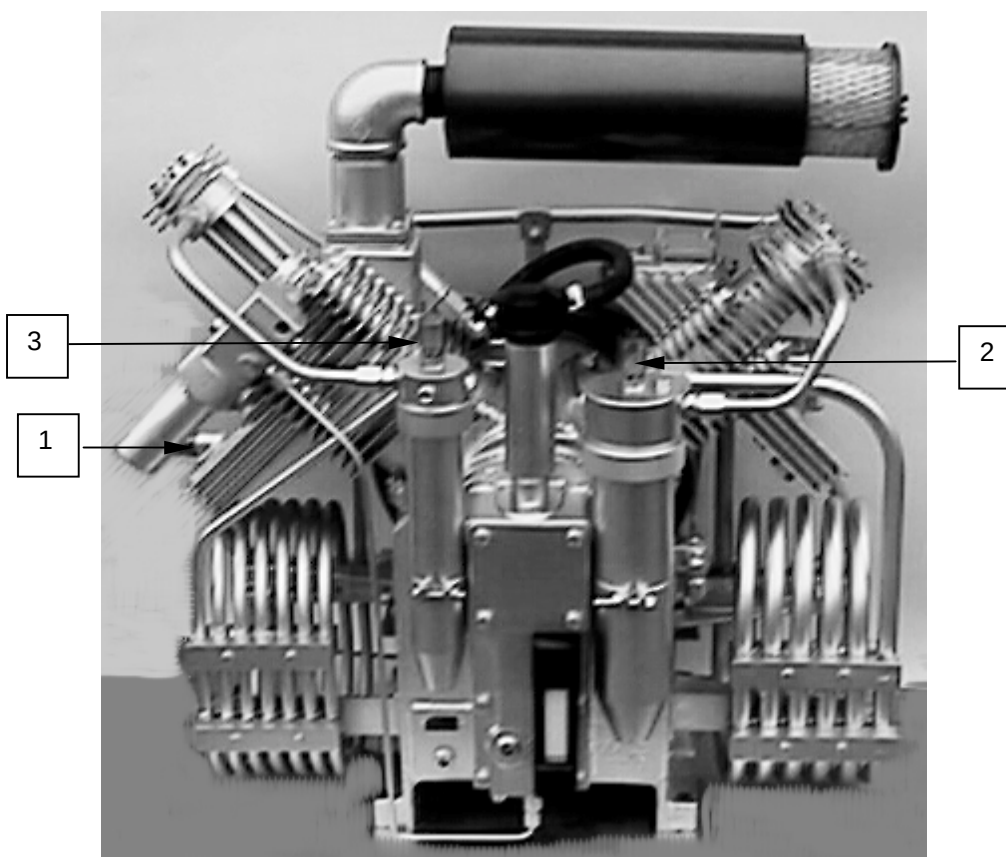
NOTE :-
 GRP (red) and GRN (black) fan blades
 should not be mixed on the same fan.

REF	PART No.	DESCRIPTION	No.
1	E61476	Flywheel Schwungrad Volant Vliegwiel Volante	1
2	98084.1002	Fan, Axial Axiallüfter Ventilateur axial Axiale ventilator Ventilador axial	1
2a	98084.1029	Blade, Fan – GRN – Black Ventilatorflügel – GRN – Schwarz Pale de ventilateur – GRN – Noir Ventilatorblad – GRN – Zwart Paleta del ventilador – GRN – Negro	12
2b	98084.1005	Blade, Fan – GRP – Red Ventilatorflügel – GRP – Rot Pale de ventilateur – GRP – Rouge Ventilatorblad – GRP – Rood Paleta del ventilador – GRP – Rojo	12
3	95179.5	Washer, Spring Federring Rondelle élastique Veerring Arandela elastica	6
4	98500.229	Screw, Hexagon Head Sechskantschraube Vis à tête 6 pans Zeskantschroef Tornillo de cabeza hexagonal	1
5	D2616	Washer, Retaining Sicherungscheibe Rondelle de retenue Borgring Arandela de retención	1
6	98500.1008	Screw, Hexagon Head – Left Hand Thread Sechskantschraube Vis à tête 6 pans Zeskantschroef Tornillo de cabeza hexagonal	1

Language Support
 English
 German
 French
 Dutch
 Spanish



SAFETY VALVES D101497 5409.2.IA COMPRESSOR



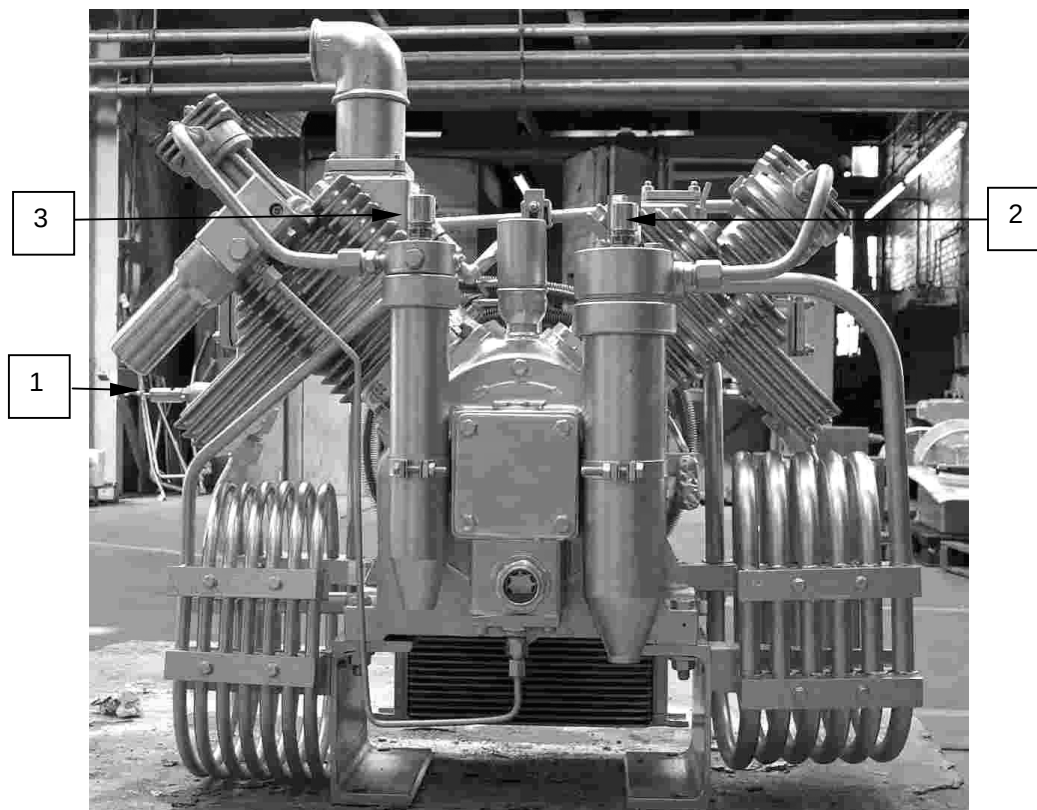
SAFETY VALVES D101497 5409.2.IA COMPRESSORS PARTS LIST

REF	PART No	DESCRIPTION	NO OFF
1	98650.1163-4.1	Valve Safety - 1st Stage Sicherheitsventil - 1. Stufe Soupape de sécurité - 1 ^{er} étage Veiligheidsklep - 1e trap Válvula de seguridad - 1 ^a etapa	1
2	98650.1164-21	Valve Safety - 2nd Stage Sicherheitsventil - 2. Stufe Soupape de sécurité - 2 ^{ème} étage Veiligheidsklep - 2e trap Válvula de seguridad - 2 ^a etapa	1
3	98650.1164-97	Valve Safety - 3rd Stage Sicherheitsventil - 3. Stufe Soupape de sécurité - 3 ^{ème} étage Veiligheidsklep - 3e trap Válvula de seguridad - 3 ^a etapa	1

Language Support

English
German
French
Dutch
Spanish

SAFETY VALVES D101499 5409H COMPRESSOR



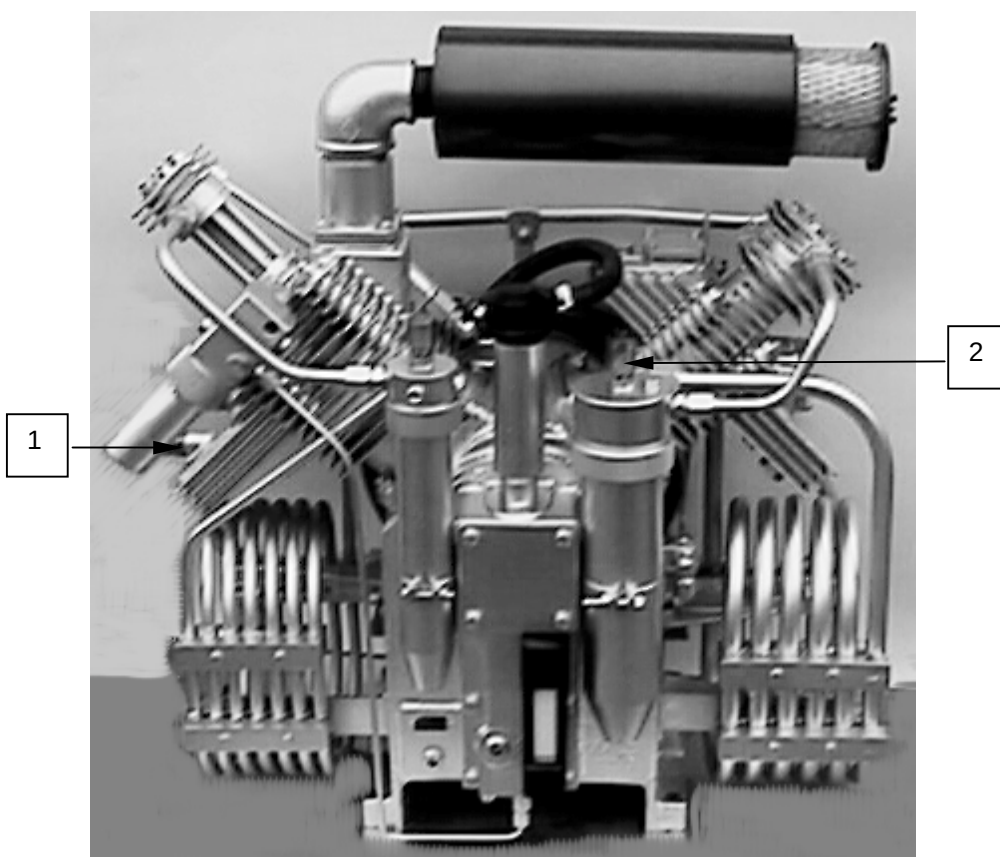
SAFETY VALVES D101499 5409H COMPRESSORS PARTS LIST

REF	PART No	DESCRIPTION	NO OFF
1	98650.1163-4.1	Valve Safety - 1st Stage Sicherheitsventil - 1. Stufe Soupape de sécurité - 1 ^{er} étage Veiligheidsklep - 1e trap Válvula de seguridad - 1 ^a etapa	1
2	98650.1164-21	Valve Safety - 2nd Stage Sicherheitsventil - 2. Stufe Soupape de sécurité - 2 ^{ème} étage Veiligheidsklep - 2e trap Válvula de seguridad - 2 ^a etapa	1
3	98650.1164-104	Valve Safety - 3rd Stage Sicherheitsventil - 3. Stufe Soupape de sécurité - 3 ^{ème} étage Veiligheidsklep - 3e trap Válvula de seguridad - 3 ^a etapa	1

Language Support

English
German
French
Dutch
Spanish

SAFETY VALVES D101733 5309.2.IA COMPRESSOR



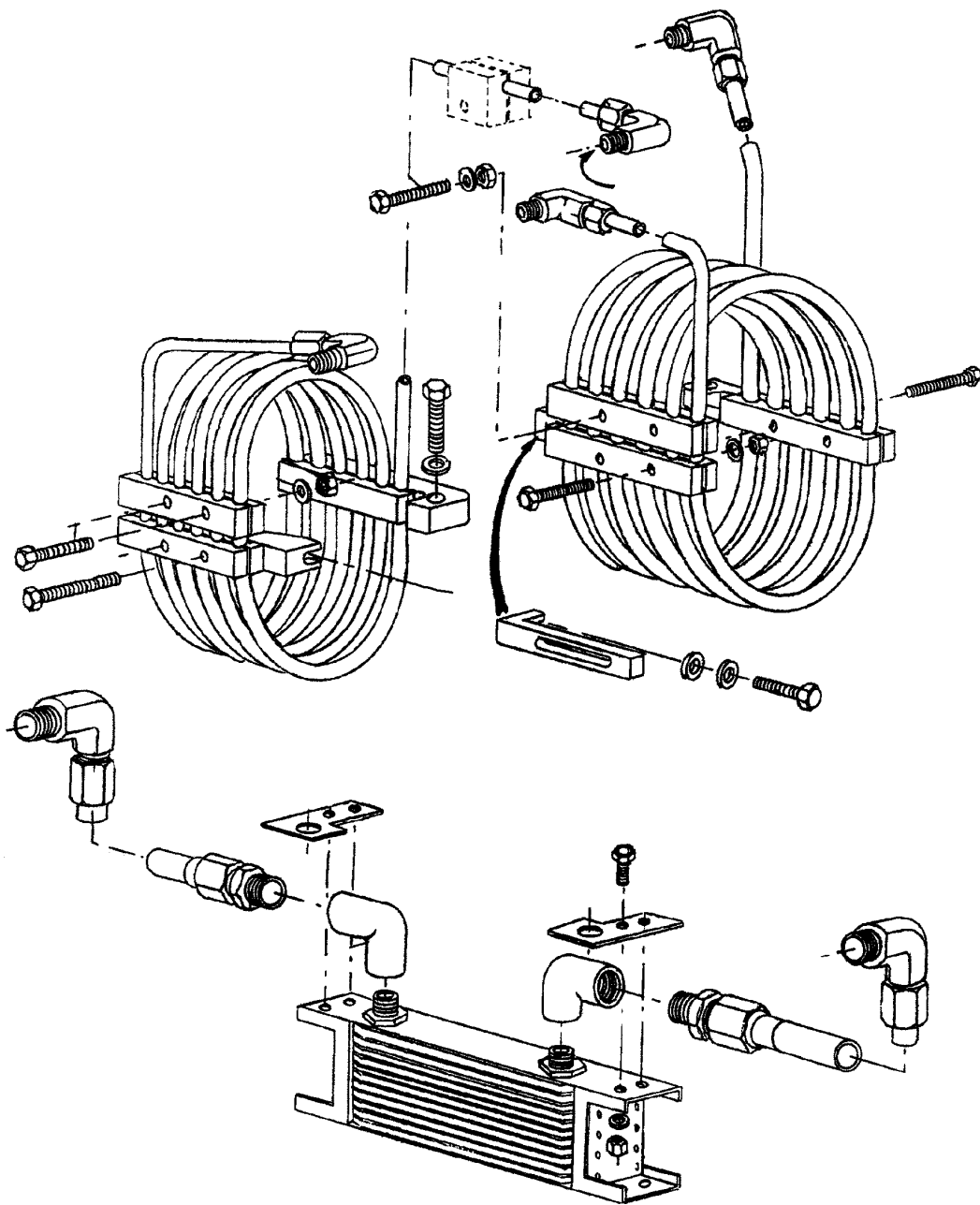
SAFETY VALVES D101733 5309.2.IA COMPRESSORS PARTS LIST

REF	PART No	DESCRIPTION	NO OFF
1	98650.1163-4.1	Valve Safety - 1st Stage Sicherheitsventil - 1. Stufe Soupape de sécurité - 1 ^{er} étage Veiligheidsklep - 1e trap Válvula de seguridad - 1 ^a etapa	1
2	98650.1164-21	Valve Safety - 2nd Stage Sicherheitsventil - 2. Stufe Soupape de sécurité - 2 ^{ème} étage Veiligheidsklep - 2e trap Válvula de seguridad - 2 ^a etapa	1

Language Support

English
German
French
Dutch
Spanish

1ST, 2ND & 3RD STAGE COOLER ASSEMBLIES



SECTION 9

DRAWINGS, TEST CERTIFICATE & ANCILLARY PARTS

NOTE IF THIS MANUAL IS USED AS AN ADD-IN OR IN CONJUNCTION WITH ANOTHER MANUAL
THE DETAILS LISTED BELOW WILL BE IN THAT MANUAL.

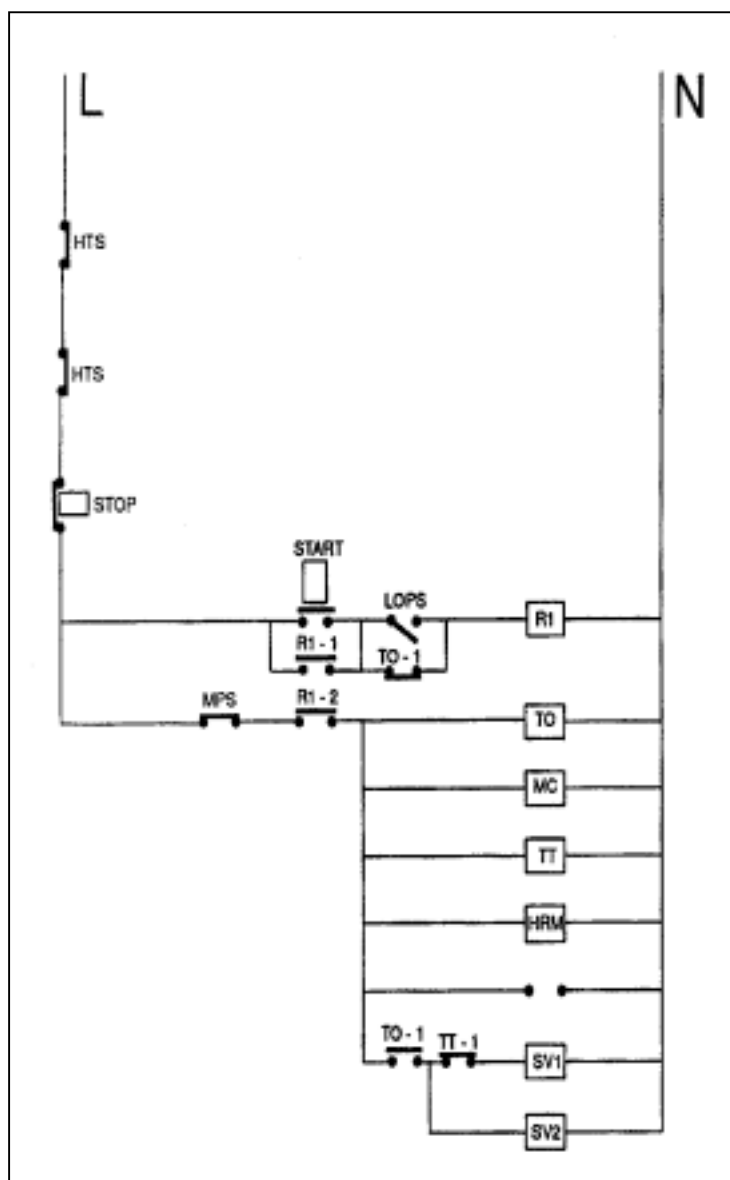
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9.1	WIRING DIAGRAM TYPICAL -----	APP094
9.2	GENERAL ARRANGEMENT -----	CONTRACT SPEC
9.3	P. & I. DIAGRAM-----	CONTRACT SPEC
9.4	AIR/GAS CIRCUIT DIAGRAM-----	APP038
9.5	NON-RETURN VALVE - 98261.1422-----	APP028
9.6	ELECTRIC MOTOR MAINTENANCE -----	APP034
9.7	CONDENSATE COLLECTION SYSTEM-----	APP044
9.8	LOW OIL PRESSURE SWITCH - 98524.1122-----	APP088
9.9	HIGH AIR TEMPERATURE SWITCH - 98524.1050-----	APP101
9.10	HIGH AIR PRESSURE SWITCH - 98524.1075-----	APP095
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9.17	PRESSURE MAINTAINING VALVE 98262.1597-----	APP063
9.18	ANTI-VIBRATION MOUNTS-----	APP003

CONTROL CIRCUIT FOR AUTO STOP/START

OPERATION

START ON LOW PRESSURE SIGNAL FROM MAIN PRESSURE SWITCH. ON REACHING HIGH PRESSURE COMPRESSOR STOPS, UNLOADS & DRAINS.
IF IT RUNS FOR 30 MINUTES WITHOUT STOPPING, DRAINS OPEN FOR 5 SECONDS.



KEY

R.	RELAY.
T.	TIMER.
SV.	SOLENOID VALVE
HTS.	HIGH TEMPERATURE CUT OUT SWITCH.
LOPS.	LOW OIL PRESSURE CUT OUT SWITCH.
MPS.	MAIN PRESSURE SWITCH

10 Sec. delay on. instant off.

Main coil.

Instant on. de-energises 5 sec. every 30 min. re-zeros on re-energising.

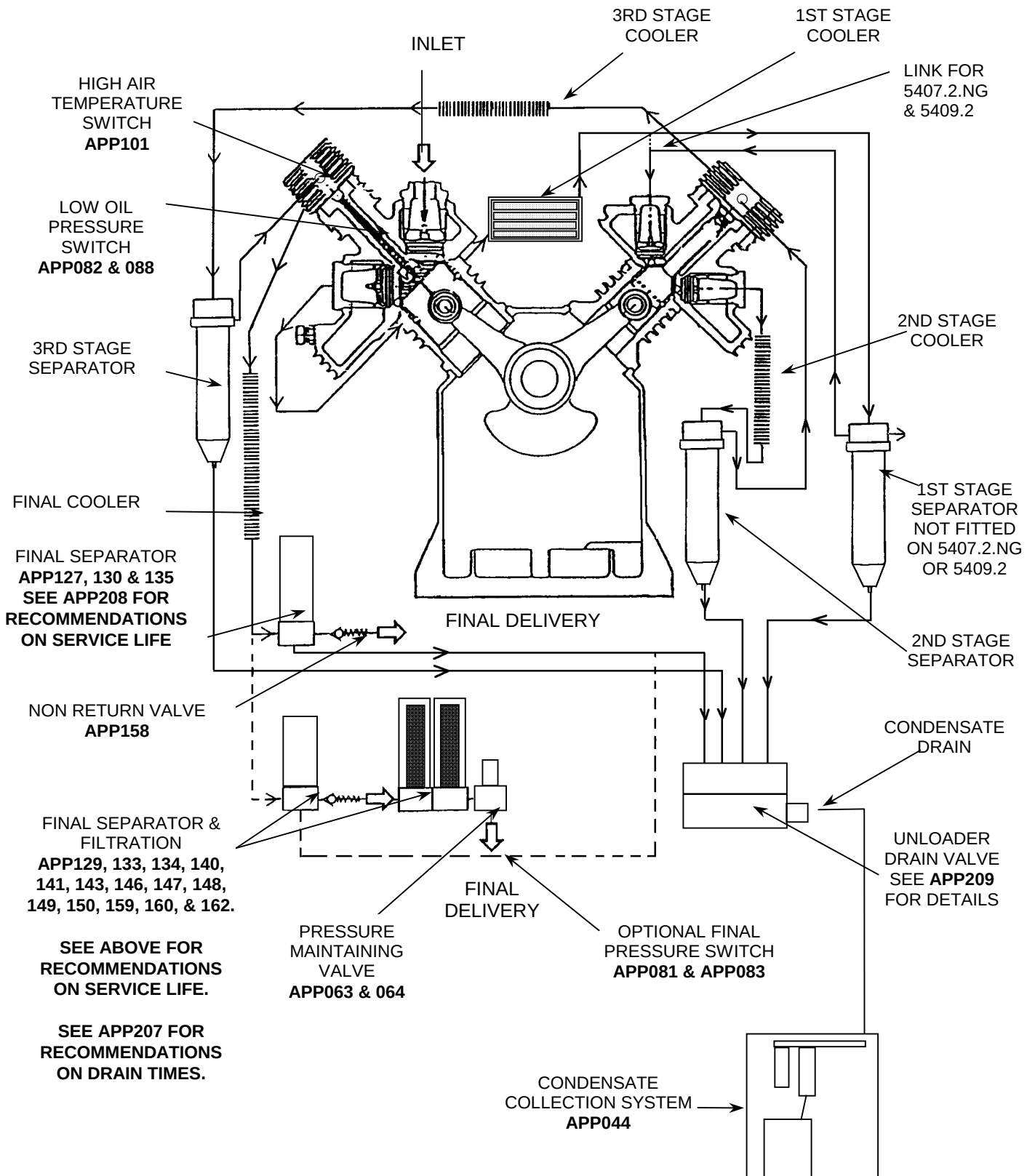
Hours run meter.

For water pump motor if fitted.

For delivery unloaders/drains

Suction unloaders (5236 only)

5407 2 & 5409.2 AIR/GAS CIRCUIT DIAGRAM



NON-RETURN VALVE

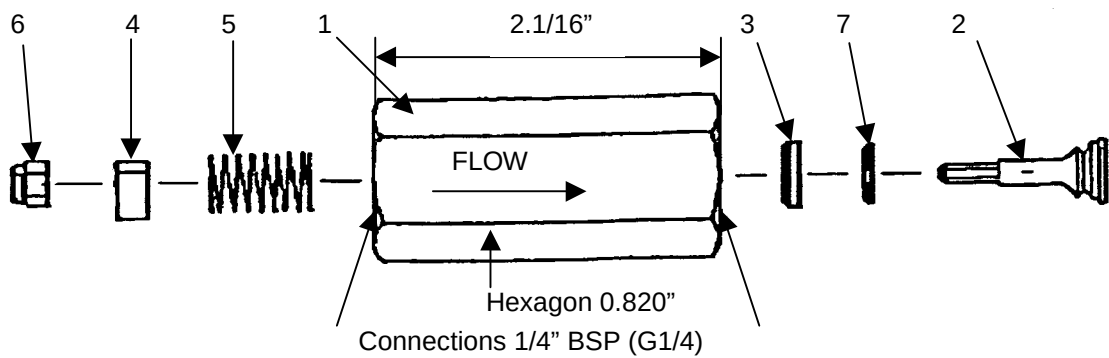
Connections 1/4" BSP (G1/4)

CompAir Part Number 98261/1422

TECHNICAL SPECIFICATION

Maximum Working Pressure - 6000 psi

Body material chromium plated brass - CZ121



Item No.	Description	No Off
1	Body	1
2	Spindle	1
3	'O' ring collar	1
4	Guide Washer	1
5	Spring	1
6	Locknut	1
7	'O' ring	1

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.

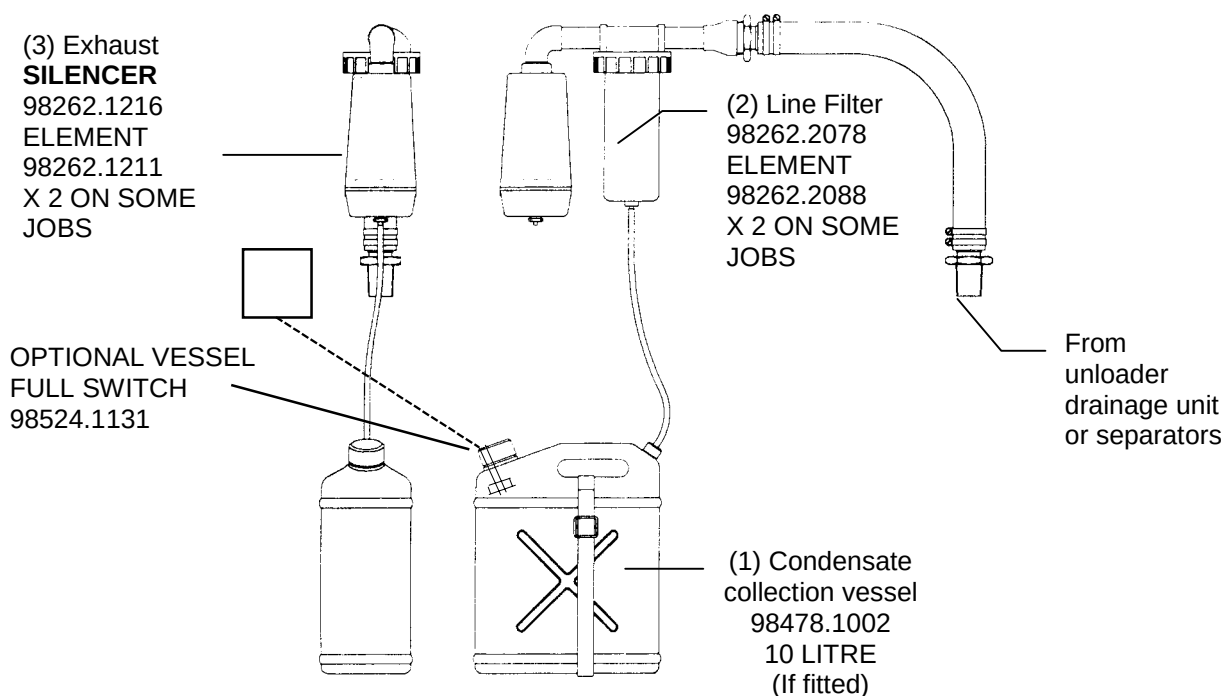
Bearings are charged with sufficient grease to last at least two years, provided there is little or no grease leakage. When replenishing, use only good quality lithium based grease and avoid overfilling the bearing housing.

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.

CONDENSATE COLLECTION SYSTEM



GENERAL DESCRIPTION

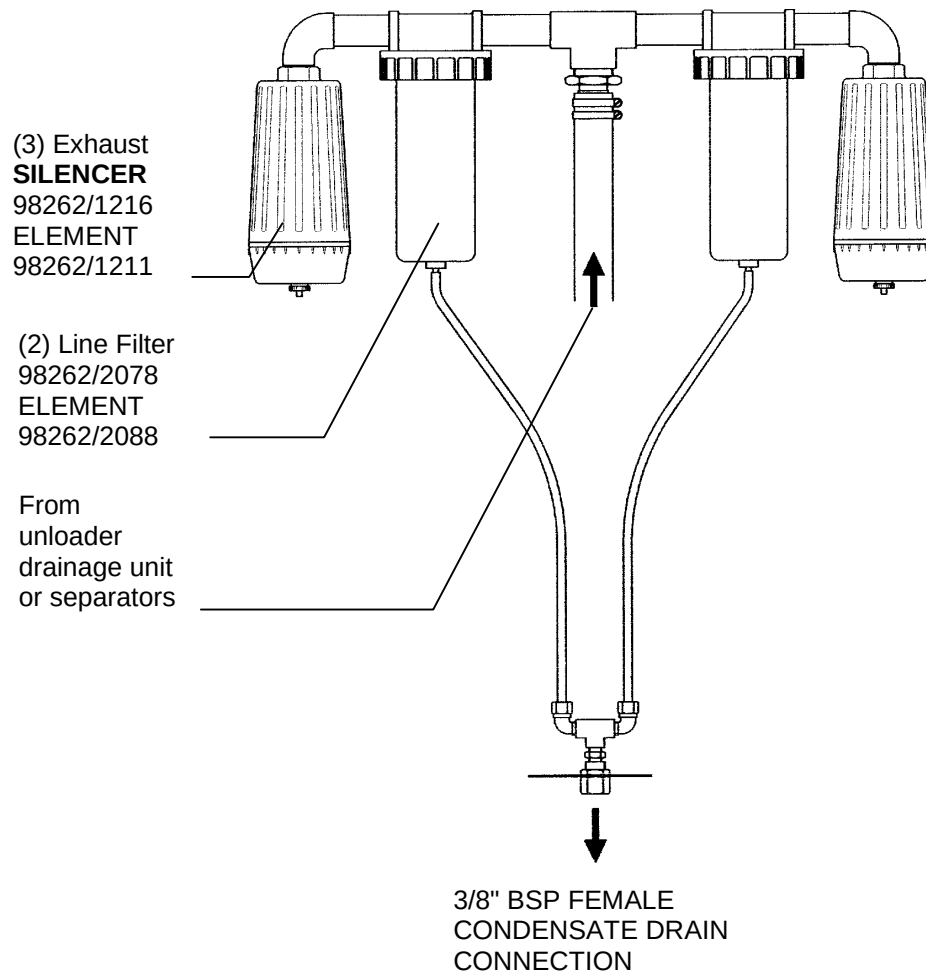
This system is designed to separate and collect condensate from the air/gas, which is discharged from the compressor unloader drain valve system or separators. The condensate is collected in the line filter (2) and clean air/gas is discharged through an exhaust silencer (3) to atmosphere. The condensate is held in the line filter body whilst the drain valves are open and the system is under pressure, condensate is allowed to free drain after the valves close and the pressure is released.

1. The unit is mounted in an elevated position to allow free drainage of the condensate into the condensate collection vessel (1).
2. The inlet is connected to the outlet of the unloader drain valve unit with a suitable hose.
3. The line filter has a valve which is closed whilst the compressor is running, opens and allows the condensate to drain into a condensate collection vessel (1) when the compressor is stopped or the unloader drain valve discharges.

OPERATION & MAINTENANCE

1. Condensate drainage is automatic the amount collected must be monitored and arrangements made for disposal from the condensate collection vessel. The element in the line filter is replaceable and should be replaced when heavily contaminated.
2. Periodically the condensate collection vessel should be cleaned out to remove any accumulated sludge.

CONDENSATE MANUAL DRAIN SYSTEM



LOW OIL PRESSURE SWITCH

PART NO: 98524.1042, 98524.1122 & 98524.1140

OPERATION

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

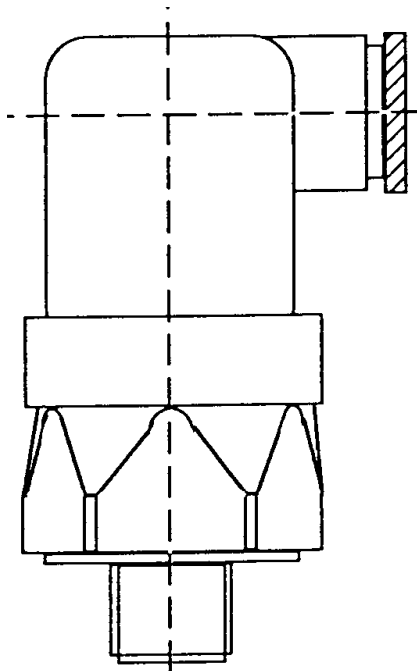
PART NO.	COMPRESSOR TYPE	INLET PRESSURE	SETTING
98524/1042	WATERCOOLED	Standard	1 bar (15 psi) falling
98524/1122	AIRCOOLED	Standard	0.5 bar (7.5 psi) falling
98524/1042	AIRCOOLED GAZPACKS	over 0.1 bar	1 bar (15 psi) falling
98524/1042	AIRCOOLED 5450/5470	Standard	1 bar (15 psi) falling
98524/1122	AIRCOOLED GAZPACKS	up to 0.1 bar	0.5 bar (7.5 psi) falling
98524/1140	AIRCOOLED GAS	Standard	1 bar (15 psi) falling

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

It is usual to connect 1 (C) and 4 (N/O) to the compressor electrical control circuit terminals marked "Oil Pressure Switch".



**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.

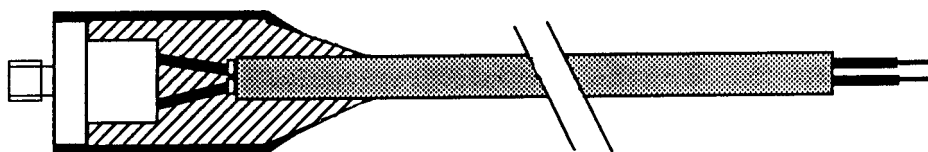
Check high air/gas temperature switch for correct functioning every 1800 hours running, annually or discard and fit new.

98524/1050

- a) Shut down compressor and electrically inhibit.
- b) Remove high air/gas temperature switch complete with wires in its entirety.
- c) 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.
- d) Using an 'A' grade calibrated suitable thermometer immersed into the oil.
- e) 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.
- f) Fit a multimeter or similar to electrical connections/terminals.
- g) Heat up oil to set temperature high 175°C $\pm$ 8°C terminals should open.
- h) Allow oil temperature to fall to 145°C $\pm$ 11°C upon which terminals should close.
- i) If the switch operates outside these parameters the switch is to be scrapped and replaced.

98524/1055

- a) Shut down compressor and electrically inhibit.
- b) Remove high air/gas temperature switch complete with wires in its entirety.
- c) 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.
- d) Using an 'A' grade calibrated suitable thermometer immersed into the oil.
- e) 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.
- f) Fit a multimeter or similar to electrical connections/terminals.
- g) Heat up oil to set temperature high 175°C $\pm$ 11°C terminals should close.
- h) Allow oil temperature to fall to 145°C $\pm$ 11°C upon which terminals should open.
- i) If the switch operates outside these parameters the switch is to be scrapped and replaced.



PRESSURE SWITCH

98524/1075

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.

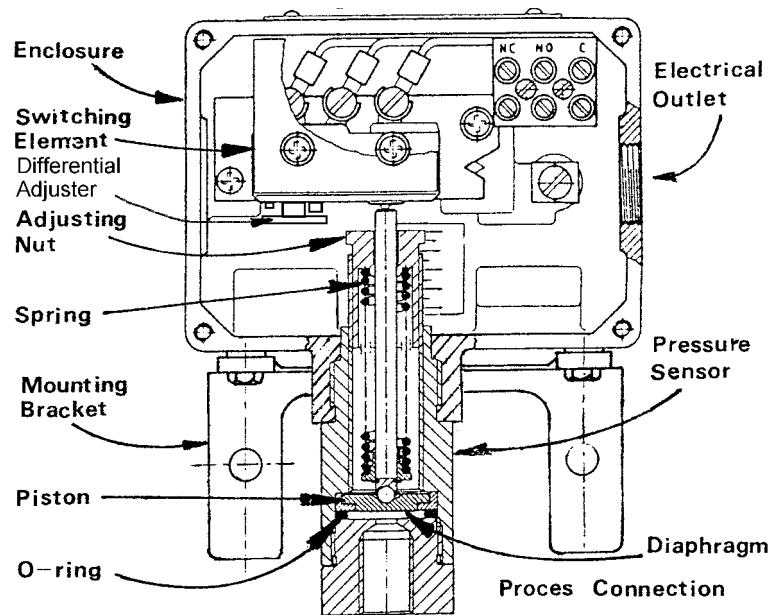
INSTALLATION

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 (c) and (nc) to the compressor electrical control circuit terminals marked 'pressure switch'.



SETTING

Example of pressure setting.

Turn **Adjusting Nut** clockwise to increase actuation point, anti-clockwise to decrease actuation point, until the required maximum pressure is reached.

For SWITCHING ELEMENTS WITH ADJUSTABLE DEAD BAND (SP & SR switching elements) the same procedure has to be utilized to adjust the actuation point on DECREASING pressure. The actuation point on INCREASING pressure is further adjustable by turning the **Differential Adjuster** on the switching element.

PRESSURE SWITCH

98524/1004

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.

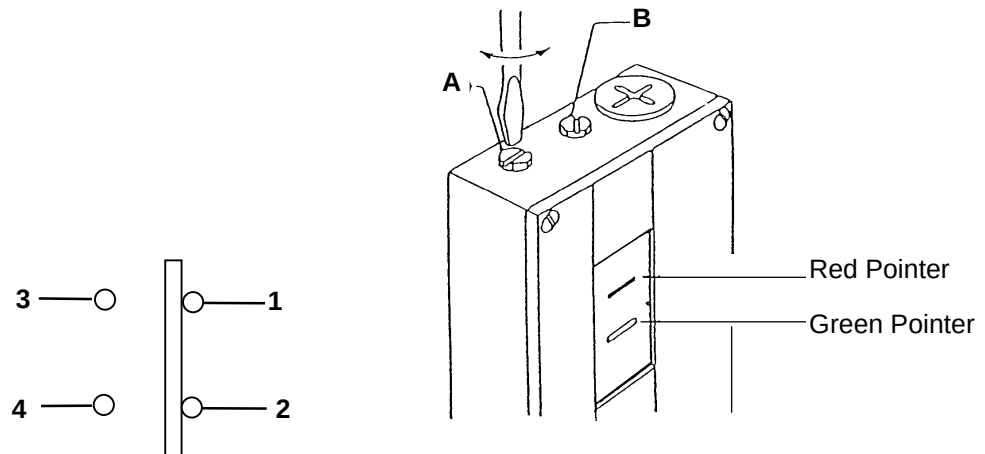
INSTALLATION

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 150 bar minimum and 175 bar maximum.

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

Turn screw (B) so that the higher setting (175 bar) coincides with the RED pointer.

Turn screw (A) again to set the lower pressure 150 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.

HIGH AIR/GAS PRESSURE SWITCH

PART NO: 98524.1054	OPERATING RANGE	50 TO 500 BAR
PART NO: 98524.1057	OPERATING RANGE	15 TO 160 BAR
PART NO: 98524.1133	OPERATING RANGE	0.4 TO 3.5 BAR
PART NO: 98524.1134	OPERATING RANGE	9.5 TO 70 BAR

OPERATION - MANUAL START/AUTO STOP

Located as close as possible to the H.P. or stage delivery line, the pressure switch stops the compressor when the upper pre-set pressure setting is attained.

The snap action contacts switch transforms a rise in pressure into an electrical "Off" signal.

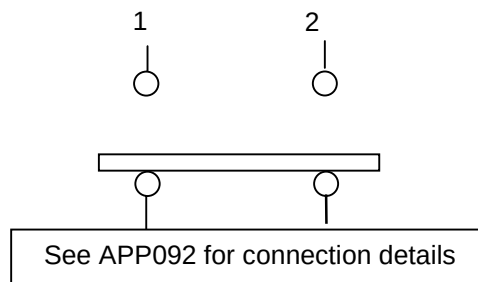
INSTALLATION

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

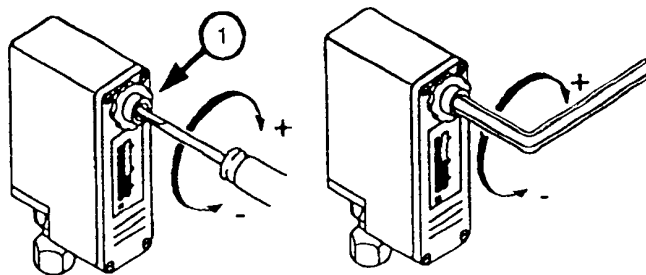
Mount the switch by the lugs provided on the casing.

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" see APP092 COMPUTAIR CARD II wiring diagram page 9 for details of connections.



Setting
Example of pressure setting.



Turn screw anti-clockwise or clockwise to raise or lower the RED pointer to the HIGH setting required.
Note:- The lower setting is pre-determined as the switch has a fixed deferential.

HIGH AIR/GAS PRESSURE SWITCHES

PART NO: 98524/1025, 1049, 1094, 1095, 1096, 1102, 1103, 1104, 1107, 1128, 1135, 1136 & 1137

OPERATION - MANUAL START/AUTO STOP

Located as close as possible to the delivery, inlet air/gas line, the pressure switch stops the compressor when the air/gas pressure rises or falls above or below the pre-set pressure setting.

TYPICAL SETTINGS - Set to actual operating pressures or check contract for details.

Set pressures: 98524/1025	Setting Range 30"hg vac - 15 psig rising	
98524/1094	Setting Range 0.14 - 4 psig rising	
98524/1095	Setting Range 0.35 - 11 psig rising	
98524/1096	Setting Range 1.4 - 28 psig rising	
98524/1102	Setting Range 0.2 - 4 bar g rising	Reset Differential 0.07 bar
98524/1103	Setting range 2 - 28 bar g rising	Reset Differential 0.6 bar
98524/1107	Setting range 0.2 - 4 bar g rising	Reset Differential 0.6 bar
98524/1128	Setting Range 2.5 mbar - 125 mbar	To withstand 2.2 bar overload.
98524/1135	Setting Range 0.2 - 4 bar g rising	Reset Differential 0.07 bar
98524/1136	Setting Range 3 - 70 bar g rising.	
98524/1137	Setting Range 3 - 66.5 bar g rising.	

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.

OPERATION - AUTO START/STOP

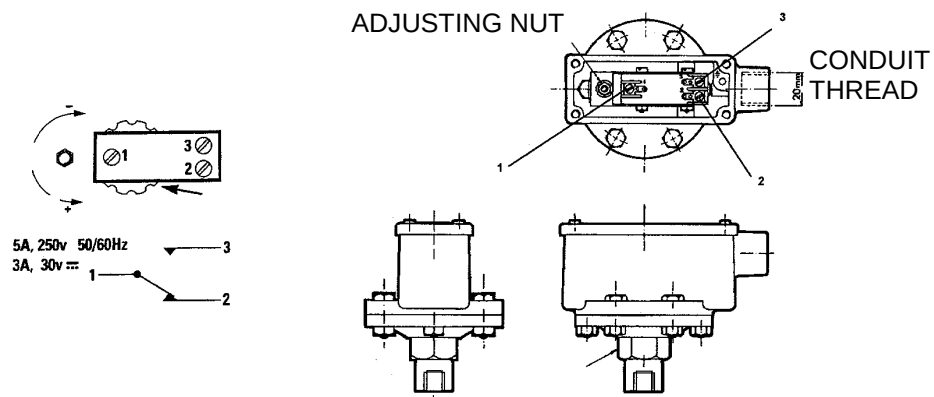
Located as close as possible to the delivery air/gas line, the pressure switch stops the compressor when the upper pre-set pressure setting is attained and triggers off the start when the lower differential pressure limit is reached.

TYPICAL SETTINGS - Set to actual operating pressures or check contract for details.

Set pressures: 98524/1049	Setting Range 2 - 42 bar g rising	
	Set Pressure HIGH 31 bar g rising	Set Pressure LOW 28 bar g falling.
98524/1104	Setting Range 2 - 70 bar g rising	
	Set Pressure HIGH 40 bar g rising	Set Pressure LOW 36 bar g falling.
98524/1137	Setting Range 3 - 66.5 bar g rising	
	Set Pressure HIGH 42 bar g rising	Set Pressure LOW 39 bar g falling.

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

When a pre-set high pressure is reached the snap action contact stops the compressor, after dropping to the lower setting, the compressor restarts.



INSTALLATION

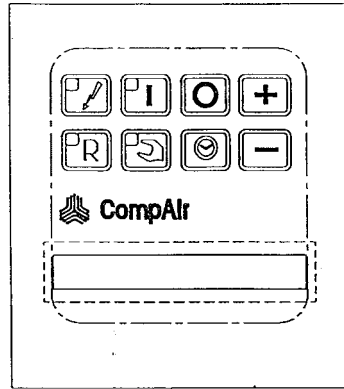
Mount the switch by the bracket provided.

It is usual to connect 1 (C) and 2 (NC) to the compressor electrical control circuit terminals marked "Pressure Switch".

Remove cover to set pressure setting, using a pressure gauge. Note:- Switches are pre-set and do not usually need adjusting. Please confirm with Engineering at CompAir UK Ltd Ipswich if switches are to be adjusted.

- a. Turn adjusting nut clockwise to lower set point.
- b. Turn adjusting nut anti clockwise to raise set point.
- c. To adjust differential use knotted wheel below the microswitch.

INSTALLATION, USE & MAINTENANCE MANUAL

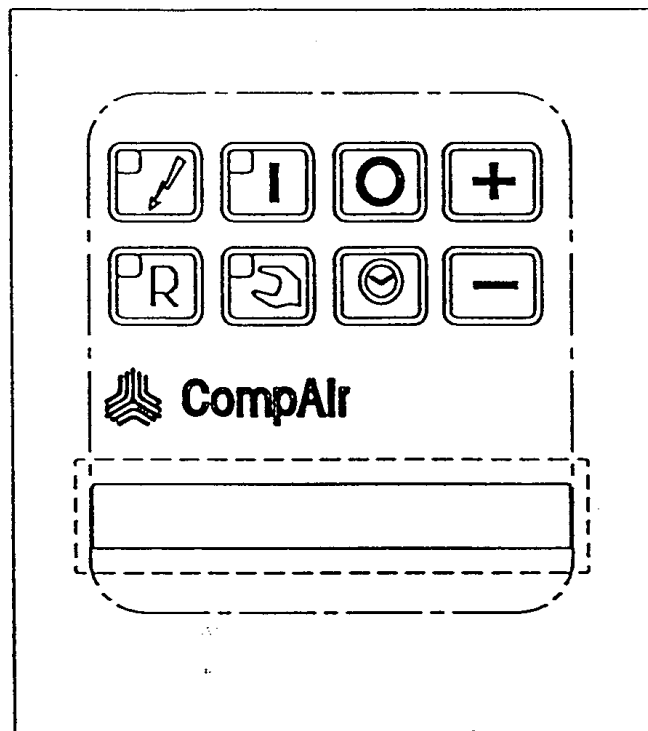


FOR A COMPUTAIR CARD II "BASIC" VERSION

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DIAGRAM



- | | | | |
|--|--|--|--|
| 1.  | 2.  | 3.  | 4.  |
| Yellow light
Power on | Green light
Start | Stop | Plus |
| 5.  | 6.  | 7.  | 8.  |
| Red light
Reset | Red light
Maintenance | Hours | Minus |
| 9.  | Programming | | |

1. FUNCTIONS

- Main motor star/delta control with adjustable star time.
- Automatic stop/start function with a pressure switch and blow down by the interstage drains.
- Drain solenoid valve opening 3 seconds every 15 minutes. (These times are adjustable).

2. PROTECTIONS - FAULTS

2.1 PROTECTIONS

Less than one second main power loss: the compressor stops, blows down and restarts 30 seconds later.

More than one second main power loss: the compressor stops, drains and remains in the 'ready to start' mode.

Manual restart needed press 

2.2 FAULTS

Which stops the compressor:

- Air temperature fault.
- Main motor overload.
- Low oil pressure, (15 seconds delayed after the starting or immediate stop when compressor is on load).
- Interstage over pressure.
- Instantaneous faults (A).

After appearance of a fault which stops the compressor, the RED light (5) is flashing and a message runs.

Rectify the fault.

To restart the compressor and annul the fault, press. 
Volt free contact for remote alarm.

3. AUXILIARIES FUNCTIONS

- Dryer control (start/stop).
- Remote control (start/stop).
- Temperature cooling fan control (optional).

4. INFORMATION

- Hours run meter.
- Starts meter.
- Faults memories (8 more recent faults)
- Air temperature.

5. MAINTENANCE

The card is programmed to show the maintenance required.

When the RED light is flashing, press 
to display the type of maintenance required.

Note:- (Maintenance is continuously running).

When the indicated maintenance is executed, it is necessary to stop the flashing by programming the card again (see CONFIGURATION and MAINTENANCE).

The procedure validates the maintenance done and automatically counts the hours until the next maintenance time.

50 hours : Maintenance, refer to compressor operator handbook.

500 hours : Maintenance, refer to compressor operator handbook.

1000 hours : Maintenance, refer to compressor operator handbook.

1500 hours : Maintenance, refer to compressor operator handbook.



4000 hours : Maintenance, refer to compressor operator handbook.



6. PROGRAMMING

6.1 ACCESS PROCEDURE

Power ON with compressor stopped.

Press  and hold for 6 seconds until a message 'PASS' is displayed.
Enter code by pressing the required access code numbers.

6.2 ACCESS CODES (Note: these numbers do not appear on the screen).

Maintenance configurations : 4 4 3 4 6.
Temperature levels : 8 4 9 8 7.
Fault history : 7 1 5 9 8.

6.3 EXIT PROCEDURE

Press  to exit and store data.

7. PROGRAM ARRANGEMENTS

7.1 CONFIGURATIONS AND MAINTENANCE

Use access procedure.

Enter code 4 4 3 4 6.

'CONFIGURATION' then 'DRAIN FREQUENCY' are displayed successively on the screen.

To obtain the next function, press 

Display	Time	Step	Time	
			Minimum	Maximum
DRAIN 'F'	15 minutes	1	1 minute	20 minutes
DRAIN 'T'	3 seconds	1	1 second	20 seconds
STAR 'T'	3 seconds	1	1 second	9.9 seconds
OIL DEF TIME	15 seconds	1	1 second	30 seconds
SRV	50 hours. To validate the maintenance press 			
	To return to normal screen press 			

All the times above can be modified by using the  or  buttons.
DISPLAY: ENGLISH: No action.

Pressing  will change to GERMAN, SPANISH or FRENCH language.
INPUT TEST: Shows the status of the input devices.
KEYBOARD TEST: Use to test keyboard touch pad
Use exit procedure.

7.2 TEMPERATURE LEVEL ADJUSTMENT

Use access procedure.

Enter code 8 4 9 8 7.

The screen displays 'CONFIGURATION' then the following messages:

To display each parameter on screen press

Display	Temperature	Step	Temperature	
			Minimum	Maximum
T1 LOW	50°C	2	0	149°C
T1 HIGH	60°C	2	0	149°C
T1 FLT	74°C	2	0	149°C

All the temperatures above can be modified by using the  or  buttons.
Use exit procedure.

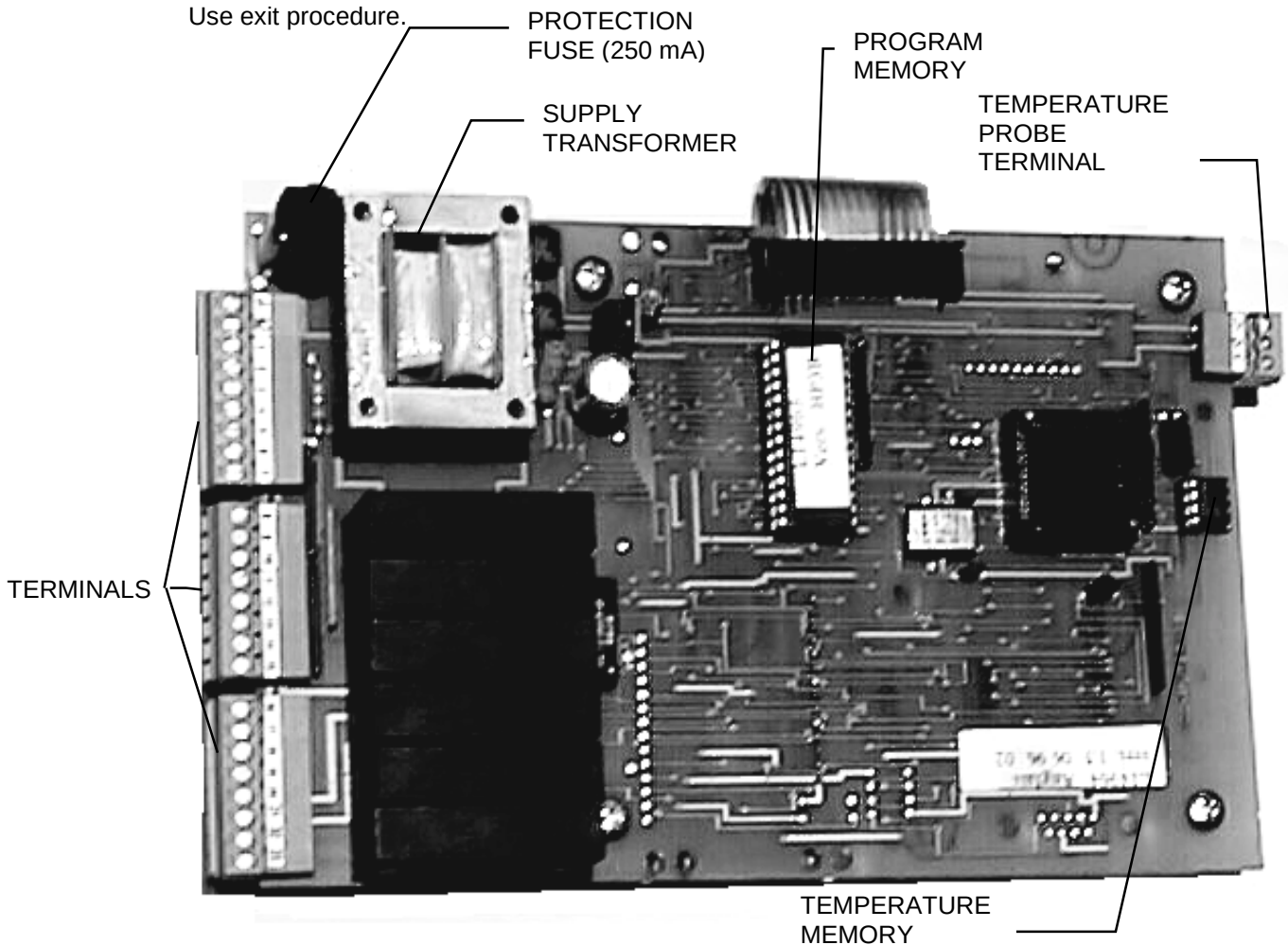
7.3 FAULTS MEMORY

Use access code 7 1 5 9 8.

For 2 seconds the serial number of the card appears, then 4 numbers are displayed and 4 numbers corresponding to the last 8 faults.

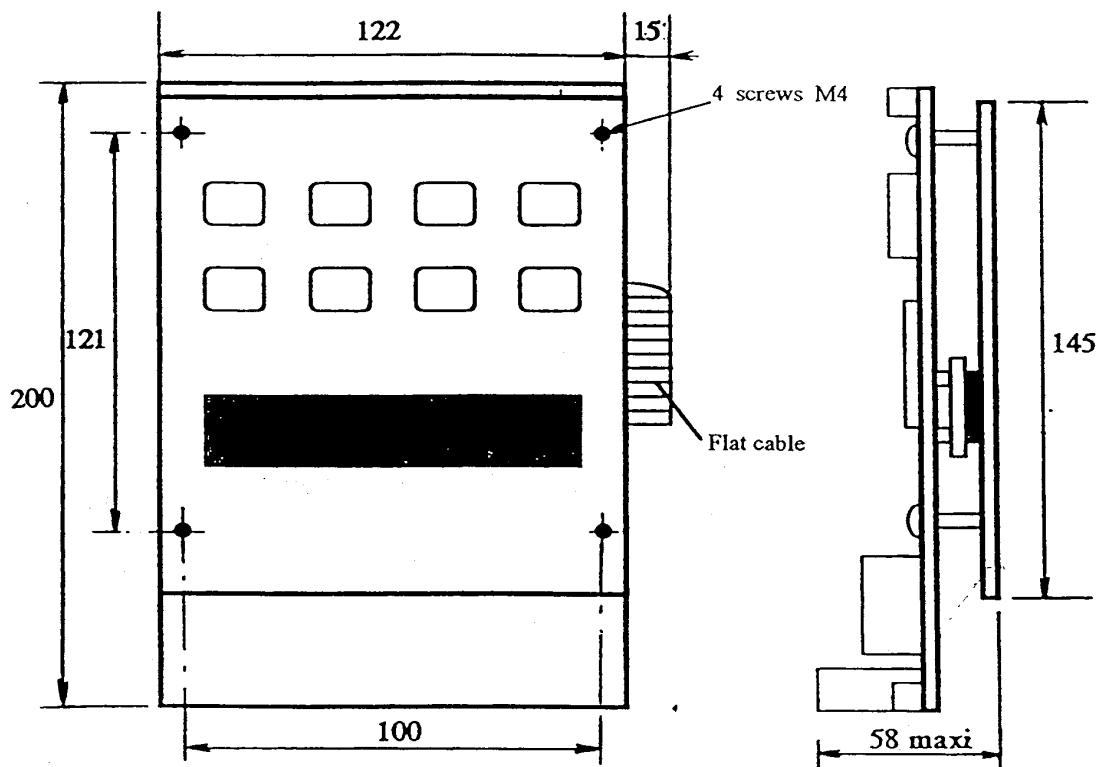
- 01 Main motor overload.
- 02 High 3rd stage pressure.
- 03 High air temperature (temperature probe)
- 04 Main power loss (> 1 second).
- 05 Fault - A -
 - Could either be:
 - a) High air temperature for compressor cylinder.
 - b) Reavellsafe dewpoint monitor for filtration - Check LED on Reavellsafe monitor.
 - c) HLS Condensate
- 06 High 1st stage pressure.
- 07 Low oil pressure.
- 08 High 2nd stage pressure.
- 09 Power fault

Use exit procedure.

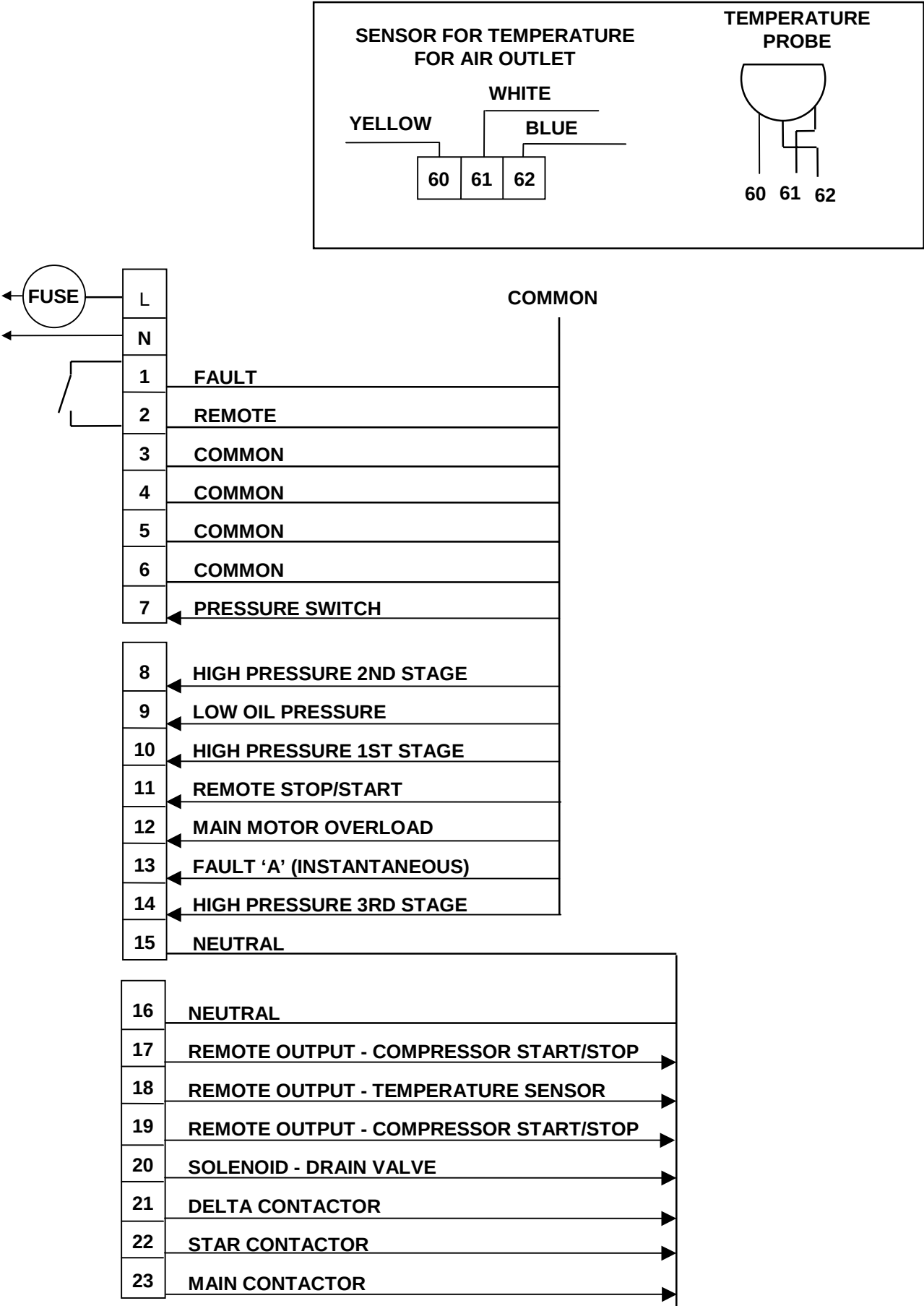


7.4 DIMENSIONS

Dimensions in mm.
Weight: 0.56 kg.



7.5 WIRING DIAGRAM



3 WAY SOLENOID VALVE PS2197

OPERATION

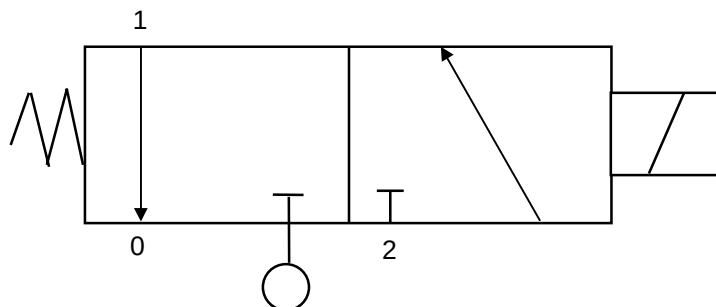
3 way normally closed energise to open, continuous duty.

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

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



UNLOADER DRAIN VALVE ASSEMBLIES

FOR DETAILS OF RECOMMENDED DRAIN TIMES SEE APP207.

OPERATION.

Low pressure air/gas (usually 1st stage) is fed to a solenoid valve which when compressor is running is open, the air holds the unloader drain valves closed, by means of a diaphragm (B) pushing against the pistons (A). Located near to separator/filter drains the Unloader Drain Valve (UDV) is designed to drain any condensate collected during normal operation i.e.

1. When compressor shuts down on Manual Start/Stop operation.
2. When compressor shuts down on Manual Start/Auto Stop operation.
3. When a timed drainage system is used on Auto Start/Stop continuous operation.

MANUAL START/STOP. - MANUAL START/AUTO STOP.

On Shut-Down the solenoid is de-energised, air/gas is shut off, any excess air/gas being vented into the manifold. The pressure on the diaphragm is released taking the pressure off the pistons allowing the valves to open, air/gas/condensate is discharged into the manifold and drain pipe for safe disposal or into a condensate collection vessel if fitted, this must be periodically emptied.

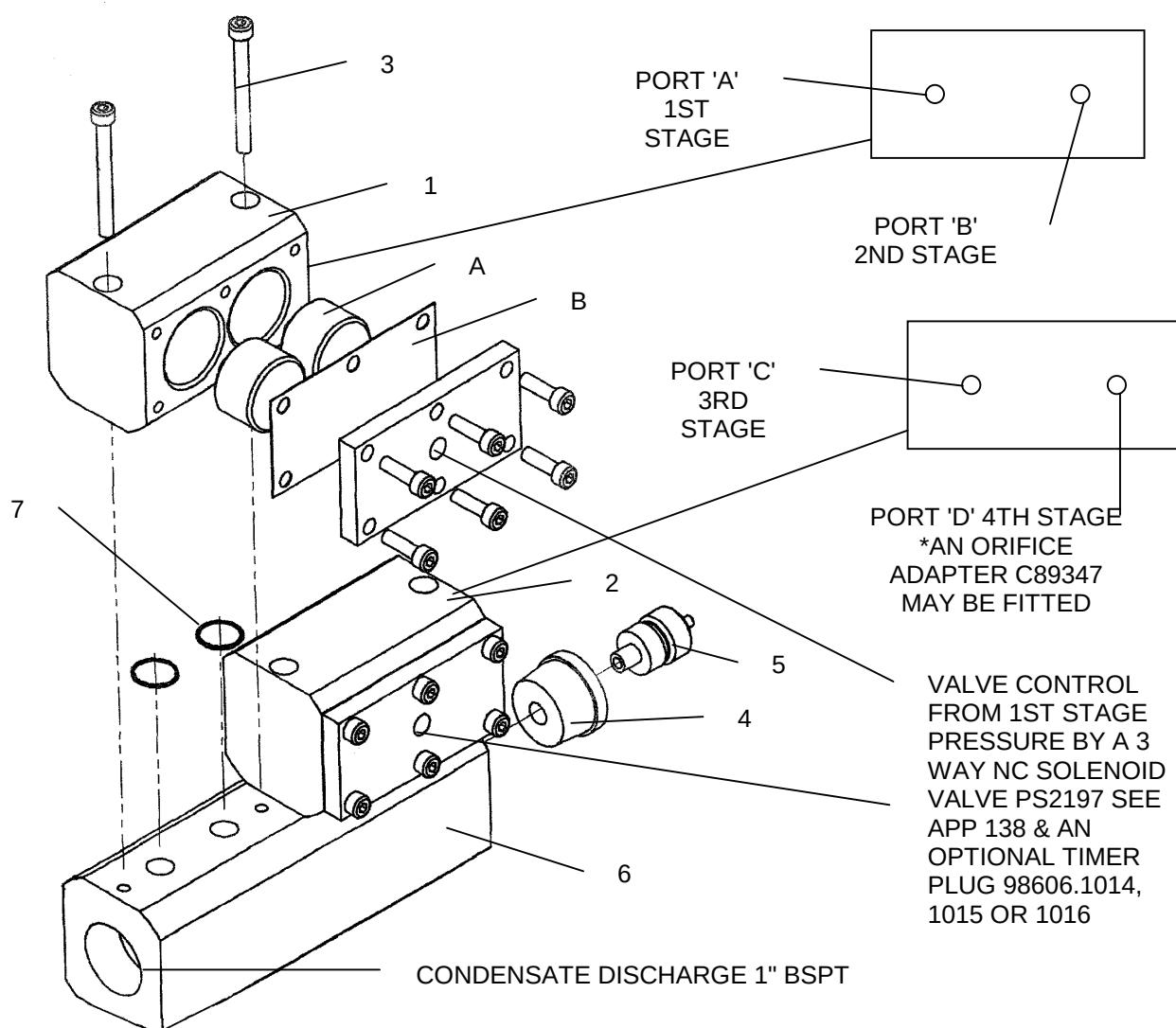
On Start-Up, the solenoid opens. the pressure builds up, the valves close and the cycle repeats itself.

AUTO START/STOP.

For continuous running a timed drainage system should be used, a signal is passed to the solenoid, every 30 minutes from the starter control panel or by means of an optional timer plug, part number 98606.1014,1015 or 1016, this closes the solenoid valve for 5 to 6 seconds duration allowing all condensate collected to be discharged through the unloader drain valve system. (Note in **HIGH AMBIENT/HUMIDITY AREAS** it is recommended the drainage cycle time be more frequent contact **CompAir UK Ltd - Customer Service Tel. +44 (0) 1473 556027** for more information.

The solenoid valve re-opens for normal operation.

INLINE UDV ASSEMBLY D101580



PARTS LIST

ITEM	PART NUMBER	DESCRIPTION	NO OFF
1	D101582	VALVE ASSEMBLY 1ST & 2ND STAGE	1
2	D101581	VALVE ASSEMBLY 3RD & 4TH STAGE	1
3	95019.176	CAPSCREW M6 X 60 LG	4
4	95405.861	REDUCING SOCKET	1
5	98650.1163-4.1	SAFETY VALVE	1
6	C203676	MANIFOLD INLINE 4 POSITION	1
7	95602.15	'O' RING	4
8	PS1454.1	BLANKING PLUG IF FITTED (NOT ILLUSTRATED)	1

SPARES KIT

ITEM	PART NUMBER	DESCRIPTION	NO OFF
A	C203195	PISTON	4
B	C203549	DIAPHRAGM	2

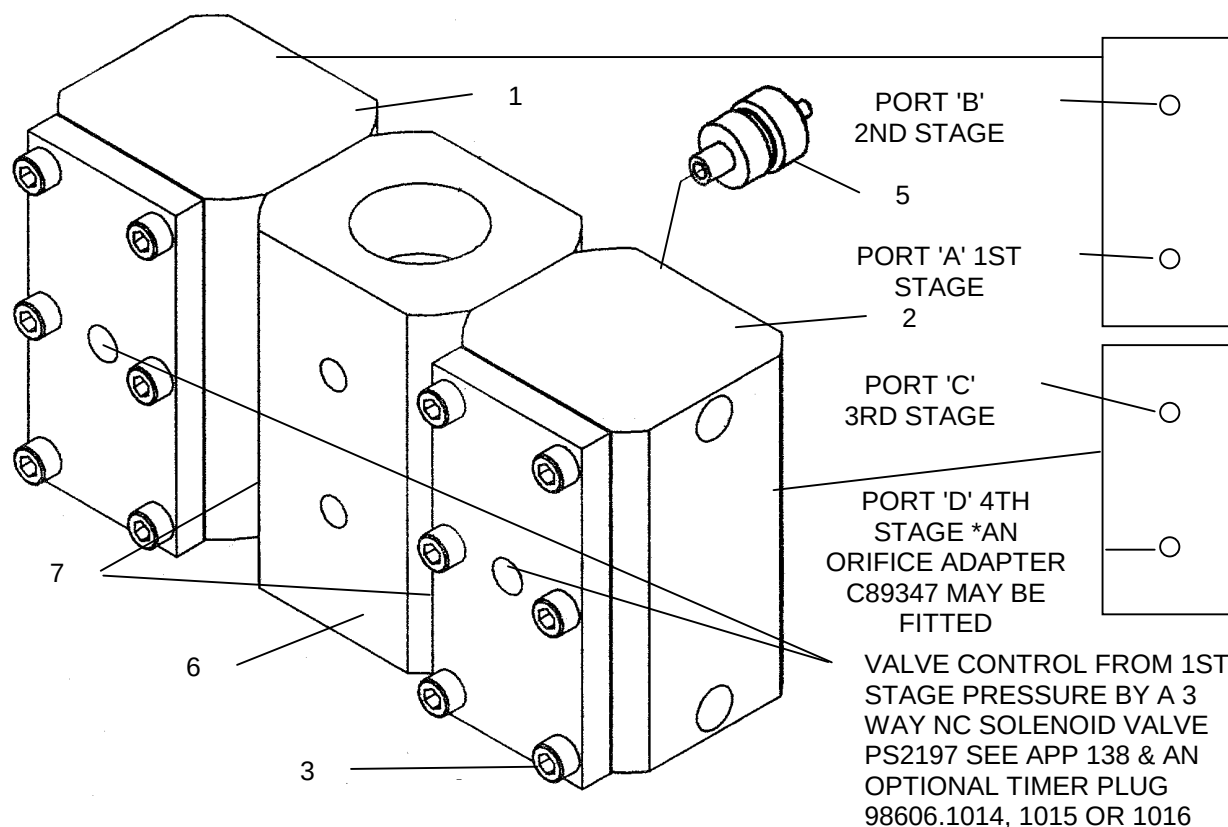
CONNECTION DETAILS

COMPRESSOR TYPE	PORT 'A'	PORT 'B'	PORT 'C'	PORT 'D'
5407.2	1ST STAGE	2ND STAGE	3RD STAGE	4TH STAGE
5307.2	1ST STAGE	2ND STAGE	3RD STAGE	PLUGGED

* AN ADAPTER MAY BE FITTED ON SOME APPLICATIONS TO THE 4TH STAGE DRAIN PORT TO SLOW DOWN THE DRAIN PROCESS TO PREVENT OVERPRESSURE OF THE CONDENSATE COLLECTION SYSTEM.

2 X 2 UDV ASSEMBLY D101608

PARTS AS D100580 UNLESS AS STATED BELOW



PARTS LIST

ITEM	PART NUMBER	DESCRIPTION	NO OFF
1	D101582	VALVE ASSEMBLY 1ST & 2ND STAGE	1
2	D101581	VALVE ASSEMBLY 3RD & 4TH STAGE	1
3	95019.176	CAPSCREW M6 X 60 LG	4
5	98650.1163-4.1	SAFETY VALVE	1
6	C203677	MANIFOLD 2 x 2 POSITION	1
7	95602.15	'O' RING	4
8	PS1454.1	BLANKING PLUG IF FITTED (NOT ILLUSTRATED)	1

SPARES KIT

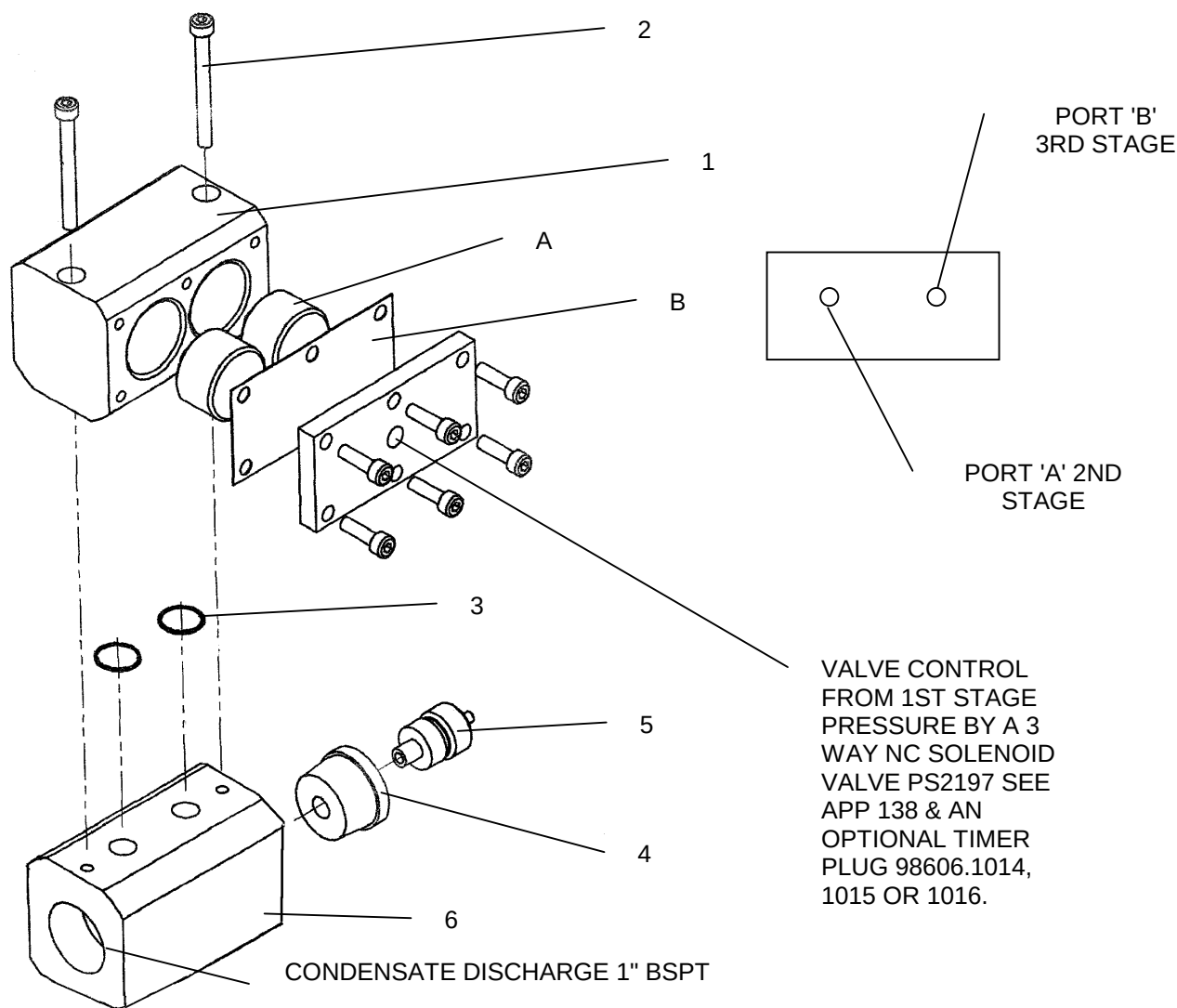
ITEM	PART NUMBER	DESCRIPTION	NO OFF
A	C203195	PISTON	4
B	C203549	DIAPHRAGM	2

CONNECTION DETAILS

COMPRESSOR TYPE	PORT 'A'	PORT 'B'	PORT 'C'	PORT 'D'
5407.2	1ST STAGE	2ND STAGE	3RD STAGE	4TH STAGE
5307.2	1ST STAGE	2ND STAGE	3RD STAGE	PLUGGED

* AN ADAPTER MAY BE FITTED ON SOME APPLICATIONS TO THE 4TH STAGE DRAIN PORT TO SLOW DOWN THE DRAIN PROCESS TO PREVENT OVERPRESSURE OF THE CONDENSATE COLLECTION SYSTEM.

2 VALVE UDV ASSEMBLY D101544
SEE D70549 FOR INSTALLATION



PARTS LIST

ITEM	PART NUMBER	DESCRIPTION	NO OFF
1	C203552	UNLOADER VALVE ASSEMBLY	1
2	95019.176	CAPSCREW M6 X 60 LG	2
3	95602.15	'O' RING	2
4	95405.861	REDUCING SOCKET	1
5	98650.1163-4.1	SAFETY VALVE	1
6	C203551	MANIFOLD	1

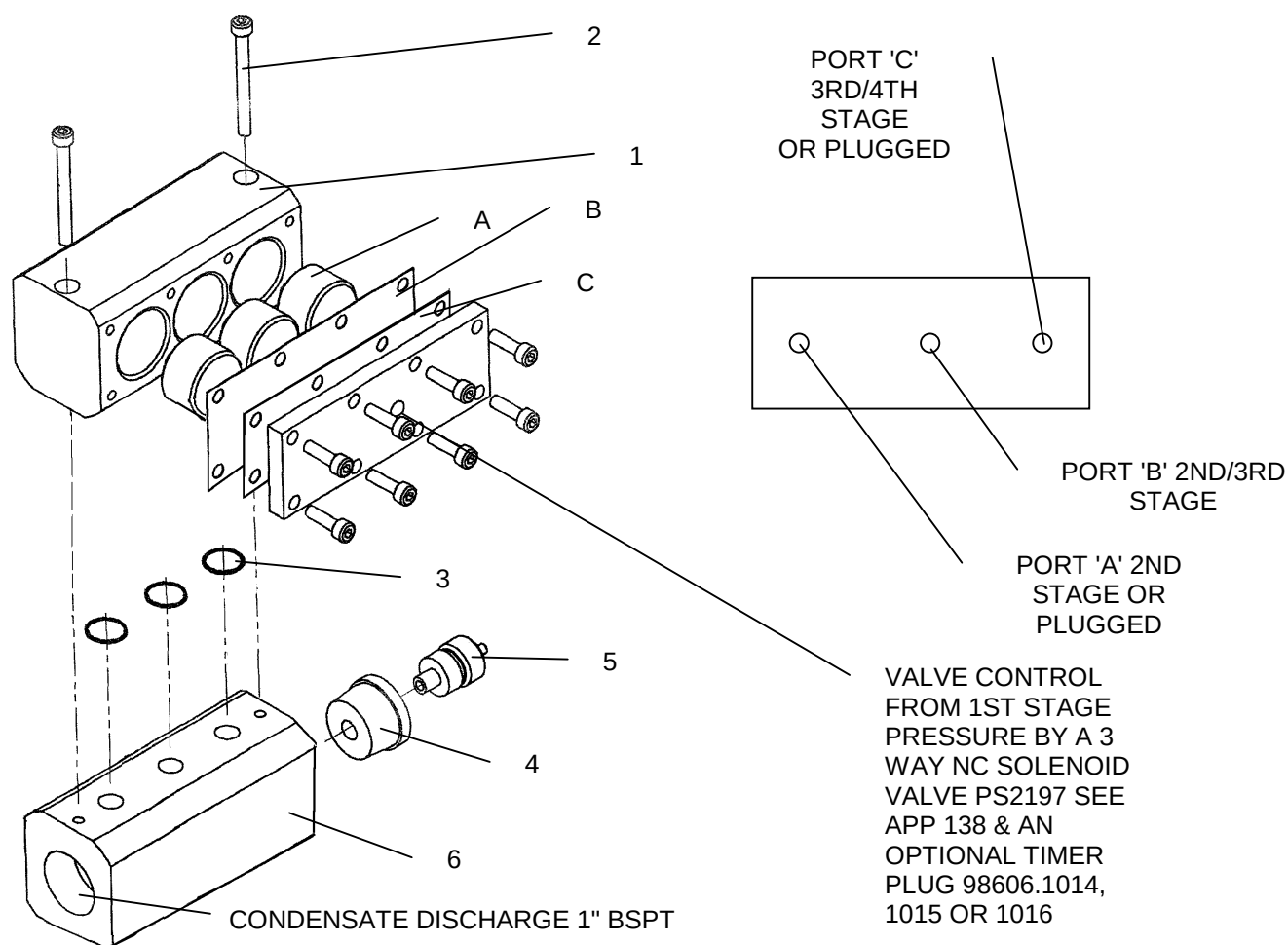
SPARES KIT

ITEM	PART NUMBER	DESCRIPTION	NO OFF
A	C203195	PISTON	2
B	C203549	DIAPHRAGM	1

CONNECTION DETAILS

COMPRESSOR TYPE	PORT 'A'	PORT 'B'
5404	2ND STAGE	3RD STAGE
5405	2ND STAGE	3RD STAGE
5405E	2ND STAGE	3RD STAGE

3 VALVE UDV ASSEMBLY D101438



PARTS LIST

ITEM	PART NUMBER	DESCRIPTION	NO OFF
1	C203279	UNLOADER VALVE ASSEMBLY	1
2	95019.176	CAPSCREW M6 X 60 LG	2
3	95602.15	'O' RING	3
4	95405.861	REDUCING SOCKET	1
5	98650.1163-4.1	SAFETY VALVE	1
6	C203194	MANIFOLD	1

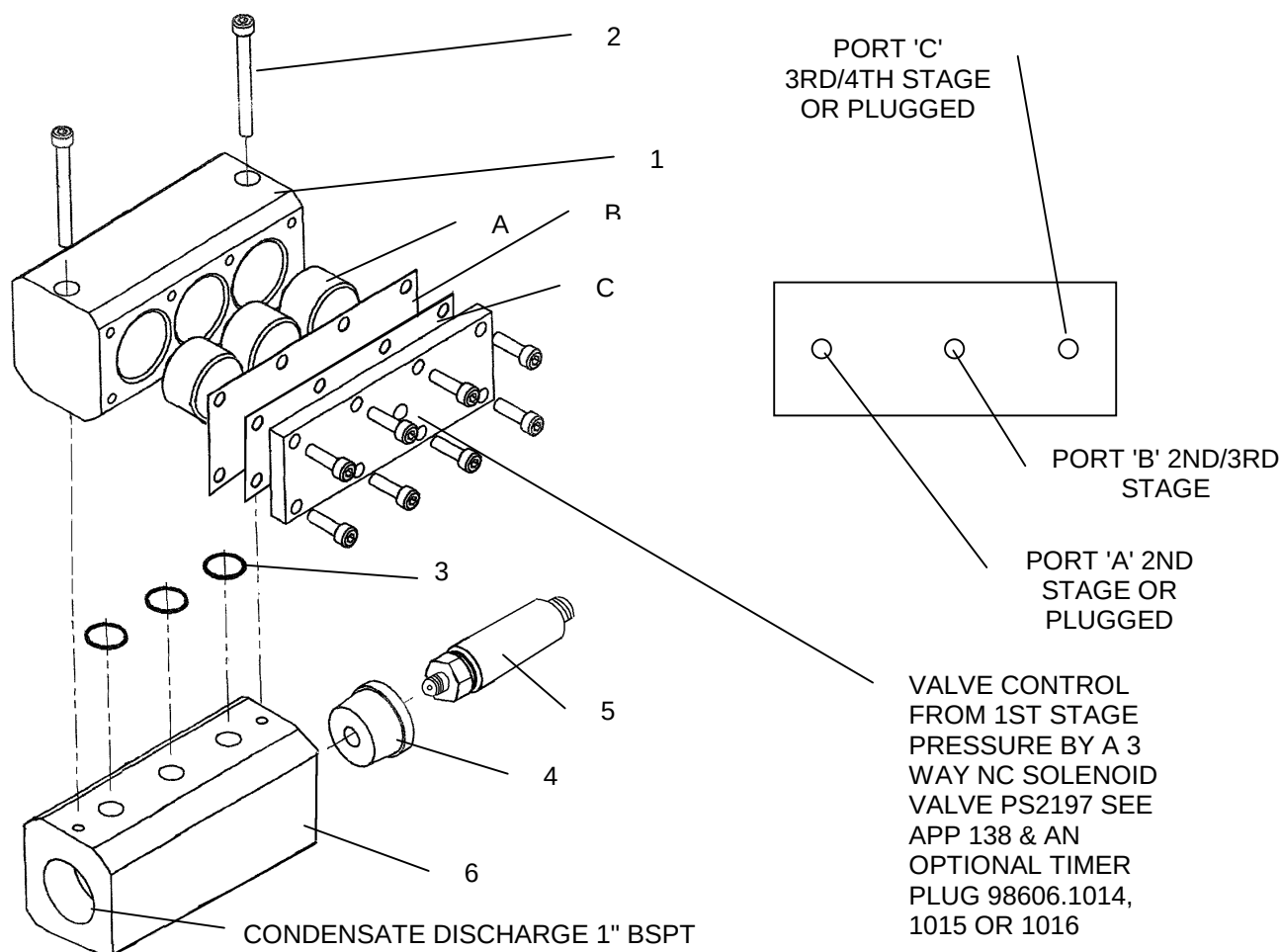
SPARES KIT

ITEM	PART NUMBER	DESCRIPTION	NO OFF
A	C203195	PISTON	3
B	C203198	DIAPHRAGM	1
C	C203197	GASKET	1

CONNECTION DETAILS

COMPRESSOR TYPE	PORT 'A'	PORT 'B'	PORT 'C'
5307	2ND STAGE	3RD STAGE	-
5309	2ND STAGE	3RD STAGE	-
5404	-	2ND STAGE	3RD STAGE
5405	-	2ND STAGE	3RD STAGE
5406	2ND STAGE	3RD STAGE	4TH STAGE
5407	2ND STAGE	3RD STAGE	4TH STAGE
5408	2ND STAGE	3RD STAGE	4TH STAGE
5409	2ND STAGE	3RD STAGE	4TH STAGE

3 VALVE UDV ASSEMBLY D101741



PARTS LIST

ITEM	PART NUMBER	DESCRIPTION	NO OFF
1	C203279	UNLOADER VALVE ASSEMBLY	1
2	95019.176	CAPSCREW M6 X 60 LG	2
3	95602.15	'O' RING	3
4	95405.861	REDUCING SOCKET	1
5	98650.1287-4.6	SAFETY VALVE	1
6	C203194	MANIFOLD	1

SPARES KIT

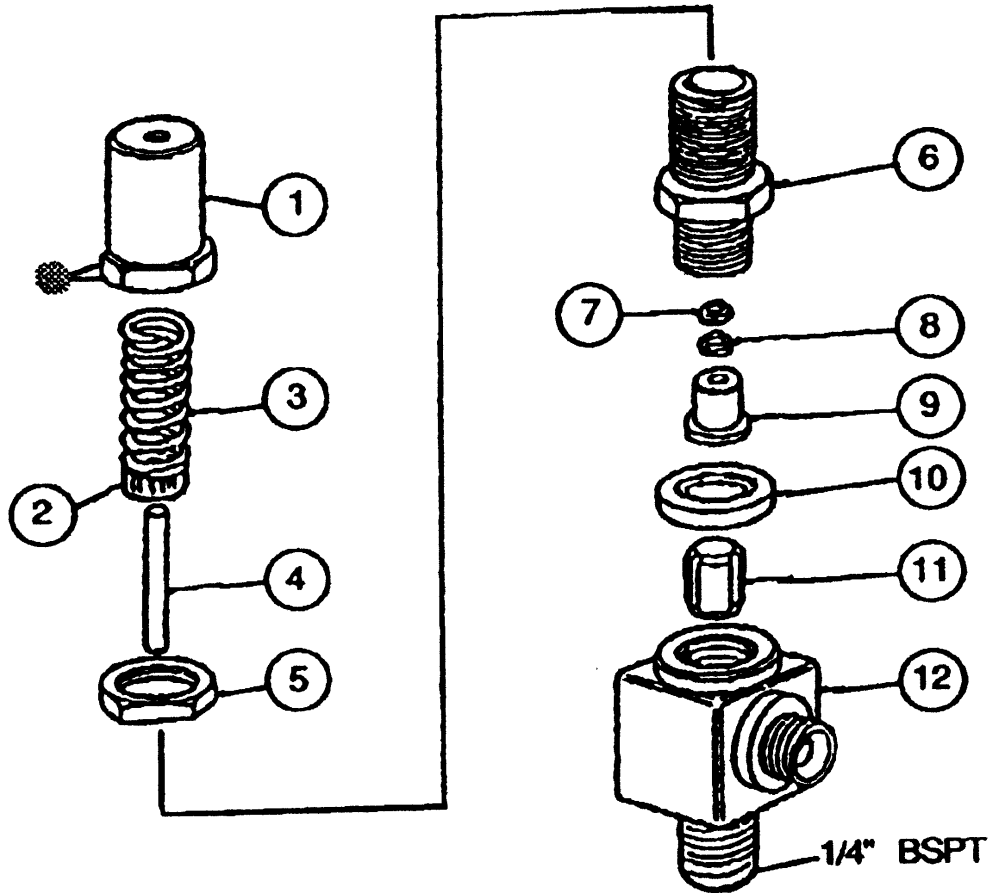
ITEM	PART NUMBER	DESCRIPTION	NO OFF
A	C203195	PISTON	3
B	C203198	DIAPHRAGM	1
C	C203197	GASKET	1

CONNECTION DETAILS

COMPRESSOR TYPE	PORT 'A'	PORT 'B'	PORT 'C'
5307	2ND STAGE	3RD STAGE	-
5309	2ND STAGE	3RD STAGE	-
5404	-	2ND STAGE	3RD STAGE
5405	-	2ND STAGE	3RD STAGE
5406	2ND STAGE	3RD STAGE	4TH STAGE
5407	2ND STAGE	3RD STAGE	4TH STAGE
5408	2ND STAGE	3RD STAGE	4TH STAGE
5409	2ND STAGE	3RD STAGE	4TH STAGE

PRESSURE MAINTAINING VALVE 98261/1595

This valve is fitted to maintain a back pressure through the filters, separators and the compressor. This ensures that these items of equipment reach their optimum working pressure as soon as possible, to give long filter life, good oil separation and low oil consumption.



NOTE:- For use at 207 bar g (3000 psi).

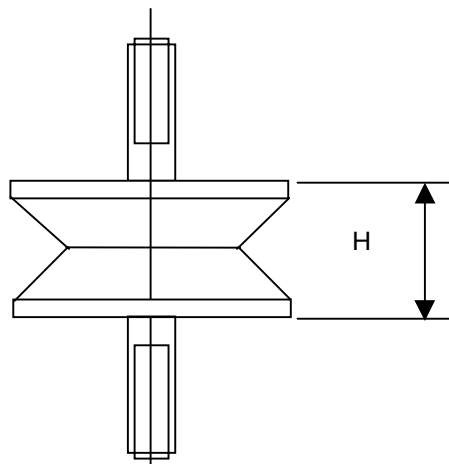
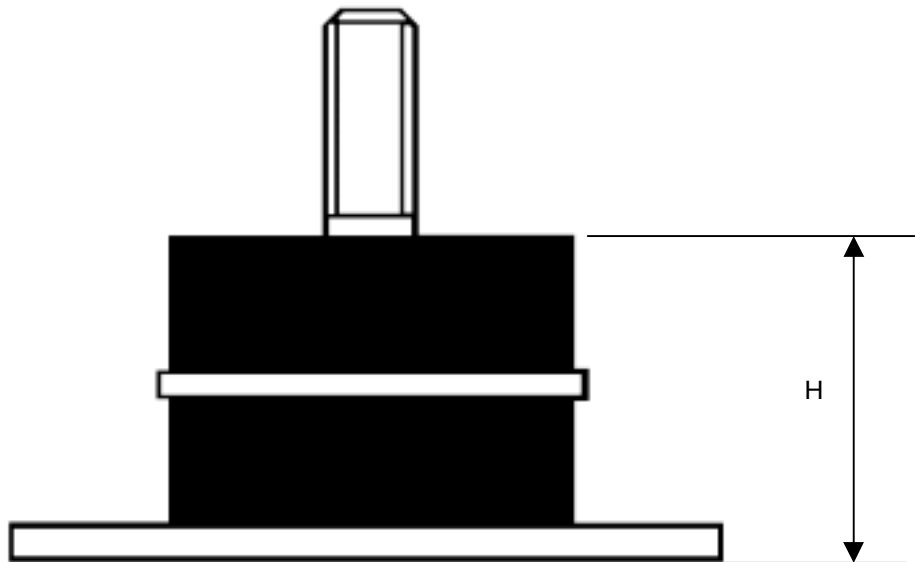
ITEM	PART NO.	DESCRIPTION	NO. OFF
1	98261/1568	Adjuster	1
2	98261/1569	Spring cap	1
3	98261/1547	Spring	1
4	98261/1149	Plunger	1
5	98261/1572	Lock nut	1
6	98261/1596	Plunger housing	1
7	*98261/1550	Anti-extrusion Ring	1
8	*98261/1551	O` Ring	1
9	98261/1552	O` Ring Retainer	1
10	*98261/1054	Bonded seal	1
11	*98261/1153	Piston	1
12	98261/1154	Valve body	1
ex	98261/1664	*Piston/seal Maint. kit	1

AVA TYPE

PART NUMBERS VARIOUS

PREVENTIVE MAINTENANCE

- 1) After installation and initial running in. Record height dimension (H) of each mount.
- 2) After a week or 100 hours running time recheck and record dimension (H)
- 3) Check this dimension every 3 to 6 months depending on usage i.e. regular usage every 3 months.
Note: This dimension may only change a small amount during the life of the mount approximately 1mm.
- 4) Any oil or paint contact with the rubber mount will affect the life and performance, so keep to a minimum by regularly cleaning and clearing any contamination from the surrounding area.
- 5) Under normal working conditions the life expectancy will be 5 to 8 years.
- 6) Temperatures in excess of 70° C will have an adverse effect on the rubber and will shorten the life expectancy.



SECTION 10

RECOMMENDED SERVICE PLANS

CONTENTS

10.1	SERVICE PLAN 5309.2.IA - STANDARD.-----	RSP5309.2.IA.S
10.1.1	SERVICE PLAN 5309.2.IA - WINTER. -----	RSP5309.2.IA.W
10.2	SERVICE PLAN 5409.2.IA - STANDARD.-----	RSP5409.2.IA.S
10.2.1	SERVICE PLAN 5409.2.IA - WINTER. -----	RSP5409.2.IA.W
10.3	SERVICE PLAN 5409.2.BA - STANDARD. -----	RSP5409.2.BA.S
10.3.1	SERVICE PLAN 5409.2.BA - WINTER. -----	RSP5409.2.BA.W
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10.4.1	SERVICE PLAN 5409.3.BA - WINTER. -----	RSP5409.3.BA.W

STANDARD GRADE TEMPERATURE RANGE	0 TO 45°C
WINTER GRADE TEMPERATURE RANGE	-10 TO +15°C

**H-5309 - SYNTHETIC OIL - STANDARD
IMPORTANT - DAILY & BEFORE STARTING
Check oil level top up if necessary**

INITIAL SERVICE 50 HOURS OR ELAPSED TIME 6 MONTHS REPEAT AT 8000 HOURS MAJOR OVERHAUL OR ANY INTERMEDIATE OVERHAUL	Change oil, oil filter element.	No Off	Part RefRSP R-5309i/s.1
	Change oil (<i>sump capacity 7.5 litres</i>) REAVELLITE 'S' 5 Litre	2	98384/1001
	Oil filter element.	1	98262/1148
	Check belt tension & condition of all ancillaries.		
	Check for oil & air leaks.		
	Check tightness of all fasteners. (Particularly cooler clamp fasteners).		
AT 500 HOURS OR ELAPSED TIME 12 MONTHS REPEAT AT 1500, 2500, 3500, 4500, 5500, 6500 & 7500 HOURS.	Renew suction filter element. (<i>Only necessary in very dusty/dirty environments, this can only be established by checking site conditions</i>).	No Off	Part RefRSP R-5309i/s.2
	Suction filter element. (<i>if fitted</i>).	1	98262/1061
	Check belt tension & condition of all ancillaries.		
	Check oil level, top-up if necessary.		
	Check for oil and air leaks.		
	Check tightness of all fasteners. (Particularly cooler clamp fasteners).		
AT 1000 HOURS OR ELAPSED TIME 24 MONTHS REPEAT AT 3000, 5000 & 7000 HOURS	Change oil, oil filter element. Renew suction filter element. Service 3rd stage valve.	No Off	Part RefRSP R-5309i/s.3
	Oil filter element	1	98262/1148
	Service kit 3rd stage valve	1	98650/1215
	Suction filter element. (<i>if fitted</i>)	1	98262/1061
	Check belt tension & condition of all ancillaries.		
	Check for oil and air leaks		
	Check tightness of all fasteners. (Particularly cooler clamp fasteners).		
	Check for excessive crankcase leakage by removing breather pipe.		
AT 2000 HOURS OR ELAPSED TIME 36 MONTHS REPEAT AT 6000 HOURS	Change oil, oil filter element. Service 1st, 2nd & 3rd stage valves. Renew suction filter element.	No Off	Part RefRSP R-5309i/s.4
	Change oil (<i>sump capacity 7.5 litres</i>) REAVELLITE 'S' 5 Litre	2	98384/1001
	Oil filter element	1	98262/1148
	Service kit 3rd stage valve	1	98650/1215
	Service kit 2nd stage valve	1	98650/1772
	Service kit 1st stage valve	1	98650/1771
	'O' ring 1st stage valve covers	2	95602/60
	'O' ring 2nd stage valve covers	2	95602/52
	Suction filter element. (<i>if fitted</i>)	1	98262/1061
	Check unloader valves renew if necessary. (<i>If seats are damaged replace complete unit</i>).		
	Check condition of unloader diaphragm & replace if necessary.		
	Check belt tension & condition of all ancillaries		
	Check condition of all cylinder bores.		
	Check for excessive crankcase leakage by removing breather pipe.		
	Check for oil and air leaks.		
	Check tightness of all fasteners. (Particularly cooler clamp fasteners).		
	Check and clean externally all cooler assemblies particularly the final cooler coil finned area.		
	Ensure fan blades are clean, secure and undamaged.		

AT 4000 HOURS OR ELAPSED TIME 72 MONTHS	Change oil, oil filter element. Renew 3rd stage valve. Service 1st & 2nd stage valves. Renew 2nd & 3rd stage piston rings. Renew suction filter element.	No Off	Part RefRSP R-5309i/s.5
	Change oil (<i>sump capacity 7.5 litres</i>) REAVELLITE 'S' 5 Litre	2	98384/1001
	Oil filter element	1	98262/1148
	3rd stage valve	1	98650/1883
	Service kit 2nd stage valves	1	98650/1772
	Service kit 1st stage valves	1	98650/1771
	Suction filter element (<i>if fitted</i>)	1	98262/1061
	2nd stage piston ring set	1	98477/1096
	3rd stage piston ring set	1	98477/1187
	Joint Kit	1	98504/1120
	<i>Check unloader valves renew if necessary. (If seats are damaged replace complete unit).</i>		
	<i>Check condition of unloader diaphragm & replace if necessary.</i>		
	<i>Check belt tension & condition of all ancillaries</i>		
	<i>Deglaze 2nd & 3rd stage cylinder bores.</i>		
	<i>Check for excessive crankcase leakage by removing breather pipe.</i>		
	<i>Inspect piston ring grooves and piston lands for wear.</i>		
	<i>Check oil pump for wear, replace if worn.</i>		
	<i>Clean out all cooler assemblies.</i>		
	<i>Ensure fan blades are clean, secure and undamaged.</i>		
	<i>Check for oil and air leaks.</i>		
	<i>Check tightness of all fasteners. (Particularly cooler clamp fasteners).</i>		

AT 8000 HOURS MAJOR OVERHAUL	Change oil, oil filter element. Cleanse crankcase, Renew 1st, 2nd & 3rd stage valves. Renew 1st, 2nd & 3rd stage piston rings. Renew 3rd stage liner. Renew conn rod assemblies. Renew all gudgeon pins. Renew crankshaft assembly. Renew suction filter. Renew all safety valves.	No Off	Part RefRSP R-5309i/s.6
	Change oil (<i>sump capacity 7.5 litres</i>) REAVELLITE 'S' 5 Litre	2	98384/1001
	Oil filter element	1	98262/1148
	3 rd stage valve	1	98650/1883
	2 nd stage suction valve	1	98650/1169
	2 nd stage delivery valve	1	98650/1170
	1 st stage suction valve	1	98650/1167
	1 st stage delivery valve	1	98650/1168
	Suction filter.	1	98262/1076
	1 st stage piston ring set	1	98477/1167
	2 nd stage piston ring set	1	98477/1096
	3 rd stage piston ring set	1	98477/1187
	3 rd stage liner	1	C200615
	Joint Kit	1	98504/1120
	Conn rod assembly	2	D101388
	Crankshaft assembly	1	D101411
	Oil seal	1	98505/1006
	Gudgeon pin 1 st stage	1	C200664
	Gudgeon pin 2 nd & 3 rd stage	1	C200032
	Circlips	4	95650/25
	Oil pump cam assembly	1	C201451
	1st stage safety valve	1	98650.1163-4.1
	2nd stage safety valve	1	98650.1164-21
	3rd stage safety valve (check contract for correct valve)	1	as fitted
	Check unloader replace if necessary. (If seats are damaged replace complete unit).		
	Check condition of unloader diaphragm & replace if necessary.		
	Check belt tension & condition of all ancillaries		
	Check condition of 1st & 2nd stage cylinder bores. Replace or de-glaze as necessary.		
	Inspect piston ring grooves and piston lands for wear.		
	Ensure fan blades are clean, secure and undamaged.		
	Check for oil and air leaks		
	Check tightness of all fasteners. After reassembly. (Particularly cooler clamp fasteners).		
	Cleanse all cooler coils internally & externally.		
	Hydraulic pressure test all cooler coils.		
	Cleanse, hydraulic pressure test interstage oil/moisture separators.		
	Replace or calibrate all pressure gauges.		

**H-5309 - SYNTHETIC OIL - WINTER
IMPORTANT - DAILY & BEFORE STARTING
Check oil level top up if necessary**

INITIAL SERVICE 50 HOURS OR ELAPSED TIME 6 MONTHS REPEAT AT 8000 HOURS MAJOR OVERHAUL OR ANY INTERMEDIATE OVERHAUL	Change oil, oil filter element.	No Off	Part Ref. RSP R-5309i/sw.1
	Change oil (<i>sump capacity 7.5 litres</i>) REAVELLITE 'W' 5 Litre	2	98384/1008
	Oil filter element.	1	98262/1148
	Check belt tension & condition of all ancillaries.		
	Check for oil & air leaks.		
	Check tightness of all fasteners. (Particularly cooler clamp fasteners).		
AT 500 HOURS OR ELAPSED TIME 12 MONTHS REPEAT AT 1500 2500, 3500, 4500 5500, 6500 & 7500 HOURS.	Renew suction filter element. (<i>Only necessary in very dusty/dirty environments, this can only be established by checking site conditions</i>).	No Off	Part Ref. RSP R-5309i/sw.2
	Suction filter element. (<i>if fitted</i>).	1	98262/1061
	Check belt tension & condition of all ancillaries.		
	Check oil level, top-up if necessary.		
	Check for oil and air leaks.		
	Check tightness of all fasteners. (Particularly cooler clamp fasteners).		
AT 1000 HOURS OR ELAPSED TIME REPEAT AT 3000 5000 & 7000 HOURS	Change oil, oil filter element. Renew suction filter element. Service 3rd stage valve.	No Off	Part Ref. RSP R-5309i/sw.3
	Oil filter element	1	98262/1148
	Service kit 3rd stage valve	1	98650/1215
	Suction filter element. (<i>if fitted</i>)	1	98262/1061
	Check belt tension & condition of all ancillaries.		
	Check for oil and air leaks		
	Check tightness of all fasteners. (Particularly cooler clamp fasteners).		
	Check for excessive crankcase leakage by removing breather pipe.		
AT 2000 HOURS OR ELAPSED TIME 36 MONTHS REPEAT AT 6000 HOURS	Change oil, oil filter element. Service 1st, 2nd & 3rd stage valves. Renew suction filter element.	No Off	Part Ref. RSP R-5309i/sw.4
	Change oil (<i>sump capacity 7.5 litres</i>) REAVELLITE 'W' 5 Litre	2	98384/1008
	Oil filter element	1	98262/1148
	Service kit 3rd stage valve	1	98650/1215
	Service kit 2nd stage valve	1	98650/1772
	Service kit 1st stage valve	1	98650/1771
	'O' ring 1st stage valve covers	2	95602/60
	'O' ring 2nd stage valve covers	2	95602/52
	Suction filter element. (<i>if fitted</i>)	1	98262/1061
	Check unloader valves renew if necessary. (<i>If seats are damaged replace complete unit</i>).		
	Check condition of unloader diaphragm & replace if necessary.		
	Check belt tension & condition of all ancillaries		
	Check condition of all cylinder bores.		
	Check for excessive crankcase leakage by removing breather pipe.		
	Check for oil and air leaks.		
	Check tightness of all fasteners. (Particularly cooler clamp fasteners).		
	Check and clean externally all cooler assemblies particularly the final cooler coil finned area.		
	Ensure fan blades are clean, secure and undamaged.		

AT 4000 HOURS OR ELAPSED TIME 72 MONTHS	Change oil, oil filter element. Renew 3rd stage valve. Service 1st & 2nd stage valves. Renew 2nd & 3rd stage piston rings. Renew suction filter element.	No Off	Part Ref. RSP R-5309i/sw.5
	Change oil (<i>sump capacity 7.5 litres</i>) REAVELLITE 'W' 5 Litre	2	98384/1008
	Oil filter element	1	98262/1148
	3rd stage valve	1	98650/1883
	Service kit 2nd stage valves	1	98650/1772
	Service kit 1st stage valves	1	98650/1771
	Suction filter element (<i>if fitted</i>)	1	98262/1061
	2nd stage piston ring set	1	98477/1096
	3rd stage piston ring set	1	98477/1187
	Joint Kit	1	98504/1120
	<i>Check unloader valves renew if necessary. (If seats are damaged replace complete unit).</i>		
	<i>Check condition of unloader diaphragm & replace if necessary.</i>		
	<i>Check belt tension & condition of all ancillaries</i>		
	<i>Deglaze 2nd & 3rd stage cylinder bores.</i>		
	<i>Check for excessive crankcase leakage by removing breather pipe.</i>		
	<i>Inspect piston ring grooves and piston lands for wear.</i>		
	<i>Check oil pump for wear, replace if worn.</i>		
	<i>Clean out all cooler assemblies.</i>		
	<i>Ensure fan blades are clean, secure and undamaged.</i>		
	<i>Check for oil and air leaks.</i>		
	<i>Check tightness of all fasteners. (Particularly cooler clamp fasteners).</i>		

AT 8000 HOURS MAJOR OVERHAUL	Change oil, oil filter element. Cleanse crankcase, Renew 1st, 2nd & 3rd stage valves. Renew 1st, 2nd & 3rd stage piston rings. Renew 3rd stage liner. Renew conn rod assemblies. Renew all gudgeon pins. Renew crankshaft assembly. Renew suction filter. Renew all safety valves.	No Off	Part Ref. RSP R-5309i/sw.6
	Change oil (<i>sump capacity 7.5 litres</i>) REAVELLITE 'W' 5 Litre	2	98384/1008
	Oil filter element	1	98262/1148
	3 rd stage valve	1	98650/1883
	2 nd stage suction valve	1	98650/1169
	2 nd stage delivery valve	1	98650/1170
	1 st stage suction valve	1	98650/1167
	1 st stage delivery valve	1	98650/1168
	Suction filter.	1	98262/1076
	1 st stage piston ring set	1	98477/1167
	2 nd stage piston ring set	1	98477/1096
	3 rd stage piston ring set	1	98477/1187
	3 rd stage liner	1	C200615
	Joint Kit	1	98504/1120
	Conn rod assembly	2	D101388
	Crankshaft assembly	1	D101411
	Oil seal	1	98505/1006
	Gudgeon pin 1 st stage	1	C200664
	Gudgeon pin 2 nd & 3 rd stage	1	C200032
	Circlips	4	95650/25
	Oil pump cam assembly	1	C201451
	1st stage safety valve	1	98650.1163-4.1
	2nd stage safety valve	1	98650.1164-21
	3rd stage safety valve (check contract for correct valve)	1	as fitted
	Check unloader replace if necessary. (If seats are damaged replace complete unit).		
	Check condition of unloader diaphragm & replace if necessary.		
	Check belt tension & condition of all ancillaries		
	Check condition of 1st & 2nd stage cylinder bores. Replace or de-glaze as necessary.		
	Inspect piston ring grooves and piston lands for wear.		
	Ensure fan blades are clean, secure and undamaged.		
	Check for oil and air leaks		
	Check tightness of all fasteners. After reassembly. (Particularly cooler clamp fasteners).		
	Cleanse all cooler coils internally & externally.		
	Hydraulic pressure test all cooler coils.		
	Cleanse, hydraulic pressure test interstage oil/moisture separators.		
	Replace or calibrate all pressure gauges.		

**H5409.2.IA SYNTHETIC OIL STANDARD
IMPORTANT - DAILY & BEFORE STARTING
Check oil level top up if necessary**

INITIAL SERVICE 50 HOURS OR ELAPSED TIME 6 MONTHS REPEAT AT 8000 HOURS MAJOR OVERHAUL OR ANY INTERMEDIATE OVERHAUL	Change oil, oil filter element.	No Off	Part Ref RSP R-5409.2.ia/s.1
	Change oil (<i>sump capacity 7.5 litres</i>) REAVELLITE 'S' 5 Litre	2	98384/1001
	Oil filter element.	1	98262/1148
	Check belt tension & condition of all ancillaries.		
	Check for oil & air leaks.		
AT 500 HOURS OR ELAPSED TIME 12 MONTHS REPEAT AT 1500, 2500, 3500, 4500, 5500, 6500 & 7500 HOURS.	Check tightness of all fasteners. (Particularly cooler clamp fasteners)		
	Renew suction filter element. (<i>Only necessary in very dusty/dirty environments, this can only be established by checking site conditions</i>).	No Off	Part Ref RSP R-5409.2.ia/s.2
	Suction filter element. (<i>if fitted</i>)	1	98262/1061
	Check belt tension & condition of all ancillaries.		
	Check oil level, top-up if necessary.		
AT 1000 HOURS OR ELAPSED TIME 24 MONTHS REPEAT AT 3000 5000 & 7000 HOURS	Check for oil and air leaks.		
	Check tightness of all fasteners. (Particularly cooler clamp fasteners)		
	Change oil filter element. Renew suction filter element. Service 4th stage valve.	No Off	Part Ref RSP R-5409.2.ia/s.3
	Oil filter element	1	98262/1148
	Service kit 4th stage valve	1	98650/1199
AT 2000 HOURS OR ELAPSED TIME 36 MONTHS REPEAT AT 6000 HOURS	Suction filter element. (<i>if fitted</i>)	1	98262/1061
	Check belt tension & condition of all ancillaries		
	Check oil level, top-up if necessary.		
	Check for oil and air leaks.		
	Check tightness of all fasteners. (Particularly cooler clamp fasteners)		
AT 2000 HOURS OR ELAPSED TIME 36 MONTHS REPEAT AT 6000 HOURS	Check for excessive crankcase leakage by removing breather pipe.		
	Change oil, oil filter element. Service 1st, 2nd, 3rd & 4th stage valves. Renew 4th stage piston rings. Renew suction filter element.	No Off	Part Ref RSP R-5409.2.ia/s.4
	Change oil (<i>sump capacity 7.5 litres</i>) REAVELLITE 'S' 5 Litre	2	98384/1001
	Oil filter element	1	98262/1148
	Service kit 4th stage valve	1	98650/1199
AT 2000 HOURS OR ELAPSED TIME 36 MONTHS REPEAT AT 6000 HOURS	Service kit 3rd stage valve	1	98650/1215
	Service kit 2nd stage valve	1	98650/1772
	Service kit 1st stage valve	1	98650/1771
	'O' ring 1st stage valve covers	2	95602/60
	'O' ring 2nd stage valve covers	2	95602/52
AT 2000 HOURS OR ELAPSED TIME 36 MONTHS REPEAT AT 6000 HOURS	Suction filter element. (<i>if fitted</i>)	1	98262/1061
	4th stage piston ring set	1	98477/1168
	Check unloader valves renew if necessary. (<i>If seats are damaged replace complete unit</i>)		
	Check condition of unloader diaphragm & replace if necessary.		
	Check belt tension & condition of all ancillaries		
AT 2000 HOURS OR ELAPSED TIME 36 MONTHS REPEAT AT 6000 HOURS	Check condition of all cylinder bores.		
	Check for excessive crankcase leakage by removing breather pipe.		
	Check for oil and air leaks.		
	Check tightness of all fasteners. (Particularly cooler clamp fasteners)		
	Check and clean externally all cooler assemblies particularly the final cooler coil finned area.		
AT 2000 HOURS OR ELAPSED TIME 36 MONTHS REPEAT AT 6000 HOURS	Ensure fan blades are clean, secure and undamaged.		

AT 4000 HOURS OR ELAPSED TIME 72 MONTHS	Change oil, oil filter element. Renew 3rd & 4th stage valves. Service 1st & 2nd stage valves. Renew 4th stage plunger/liner assembly. Renew 2nd & 3rd stage piston rings. Renew suction filter element.	No Off	Part Ref RSP R-5409.2.ia/s.5
	Change oil (<i>sump capacity 7.5 litres</i>) REAVELLITE 'S' 5 Litre	2	98384/1001
	Oil filter element	1	98262/1148
	4th stage valve	1	C201654
	3rd stage valve	1	98650/1883
	Service kit 2nd stage valves.	1	98650/1772
	Service kit 1st stage valves.	1	98650/1771
	Suction filter element (<i>if fitted</i>)	1	98262/1061
	4th stage plunger/liner assembly	1	C203157
	2nd stage piston ring set	1	98477/1096
	3rd stage piston ring set	1	98477/1187
	Joint Kit	1	98504/1120
	<i>Check unloader valves renew if necessary. (If seats are damaged replace complete unit).</i>		
	<i>Check condition of unloader diaphragm & replace if necessary.</i>		
	<i>Check belt tension & condition of all ancillaries</i>		
	<i>De-glaze 2nd & 3rd stage cylinder bores.</i>		
	<i>Check for excessive crankcase leakage by removing breather pipe.</i>		
	<i>Inspect piston ring grooves and piston lands for wear.</i>		
	<i>Check oil pump for wear, replace if worn.</i>		
	<i>Clean out all cooler assemblies including finned area.</i>		
	<i>Ensure fan blades are clean, secure and undamaged.</i>		
	<i>Check for oil and air leaks.</i>		
	<i>Check tightness of all fasteners. (Particularly cooler clamp fasteners).</i>		

AT 8000 HOURS MAJOR OVERHAUL	Change oil, oil filter element. Cleanse crankcase, Renew 1st, 2nd, 3rd & 4th stage valves. Renew 4th stage plunger/liner assembly. Renew 1st, 2nd & 3rd stage piston rings. Renew 3rd stage liner. Renew conn rod assemblies. Renew all gudgeon pins. Renew crankshaft assembly. Renew suction filter. Renew all safety valves.	No Off	Part Ref RSP R-5409.2.ia/s.6
	Change oil (<i>sump capacity 7.5 litres</i>) REAVELLITE 'S' 5 Litre	2	98384/1001
	Oil filter element	1	98262/1148
	4th stage valve	1	C201654
	3rd stage valve	1	98650/1883
	2nd stage suction valve	1	98650/1169
	2nd stage delivery valve	1	98650/1170
	1st stage suction valve	1	98650/1167
	1st stage delivery valve	1	98650/1168
	Suction filter.	1	98262/1076
	4th stage plunger/liner assembly	1	C203157
	1st stage piston ring set	1	98477/1167
	2nd stage piston ring set	1	98477/1096
	3rd stage piston ring set	1	98477/1187
	3rd stage liner	1	C200615
	Joint Kit	1	98504/1120
	Conn rod assembly	2	D101388
	Crankshaft assembly	1	D101411
	Oil seal	1	98505/1006
	Gudgeon pin 1st & 4th stage	1	C200664
	Gudgeon pin 2nd & 3rd stage	1	C200032
	Circlips	4	95650/25
	Oil pump cam assembly	1	C201451
	1st stage safety valve	1	98650.1163-4.1
	2nd stage safety valve	1	98650.1164-21
	3rd stage safety valve	1	98650.1164-97
	4th stage safety valve (check contract for correct valve)	1	as fitted
	<i>Check unloader valves replace if necessary. (If seats are damaged replace complete unit).</i>		
	<i>Check condition of unloader diaphragm & replace if necessary.</i>		
	<i>Check belt tension & condition of all ancillaries</i>		
	<i>Check condition of 1st & 2nd stage cylinder bores. Replace or de-glaze as necessary.</i>		
	<i>Inspect piston ring grooves and piston lands for wear.</i>		
	<i>Check for oil and air leaks</i>		
	<i>Check tightness of all fasteners. After reassembly. (Particularly cooler clamp fasteners).</i>		
	<i>Cleanse all cooler coils internally & externally specially finned areas.</i>		
	<i>Hydraulic pressure test all cooler coils.</i>		
	<i>Cleanse, hydraulic pressure test interstage oil/moisture separators.</i>		
	<i>Replace or calibrate all pressure gauges</i>		

**H5409.2.IA SYNTHETIC OIL WINTER
IMPORTANT - DAILY & BEFORE STARTING
Check oil level top up if necessary**

INITIAL SERVICE 50 HOURS OR ELAPSED TIME 6 MONTHS REPEAT AT 8000 HOURS MAJOR OVERHAUL OR ANY INTERMEDIATE OVERHAUL	Change oil, oil filter element.	No Off	Part Ref RSP R-5409.2.ia/sw.1
	Change oil (<i>sump capacity 7.5 litres</i>) REAVELLITE 'W' 4 Litre	2	98384/1008
	Oil filter element.	1	98262/1148
	Check belt tension & condition of all ancillaries.		
	Check for oil & air leaks.		
	Check tightness of all fasteners. (Particularly cooler clamp fasteners)		
AT 500 HOURS OR ELAPSED TIME 12 MONTHS REPEAT AT 1500, 2500, 3500, 4500, 5500, 6500 & 7500 HOURS.	Renew suction filter element. (<i>Only necessary in very dusty/dirty environments, this can only be established by checking site conditions</i>).	No Off	Part Ref RSP R-5409.2.ia/sw.2
	Suction filter element. (<i>if fitted</i>)	1	98262/1061
	Check belt tension & condition of all ancillaries.		
	Check oil level, top-up if necessary.		
	Check for oil and air leaks.		
	Check tightness of all fasteners. (Particularly cooler clamp fasteners)		
AT 1000 HOURS OR ELAPSED TIME 24 MONTHS REPEAT AT 3000, 5000 & 7000 HOURS	Change oil filter element. Renew suction filter element. Service 4th stage valve.	No Off	Part Ref RSP R-5409.2.ia/sw.3
	Oil filter element	1	98262/1148
	Service kit 4th stage valve	1	98650/1199
	Suction filter element. (<i>if fitted</i>)	1	98262/1061
	Check belt tension & condition of all ancillaries		
	Check oil level, top-up if necessary.		
	Check for oil and air leaks.		
	Check tightness of all fasteners. (Particularly cooler clamp fasteners)		
	Check for excessive crankcase leakage by removing breather pipe.		
AT 2000 HOURS OR ELAPSED TIME 36 MONTHS REPEAT AT 6000 HOURS	Change oil, oil filter element. Service 1st, 2nd, 3rd & 4th stage valves. Renew 4th stage piston rings. Renew suction filter element.	No Off	Part Ref RSP R-5409.2.ia/sw.4
	Change oil (<i>sump capacity 7.5 litres</i>) REAVELLITE 'W' 4 Litre	2	98384/1008
	Oil filter element	1	98262/1148
	Service kit 4th stage valve	1	98650/1199
	Service kit 3rd stage valve	1	98650/1215
	Service kit 2nd stage valve	1	98650/1772
	Service kit 1st stage valve	1	98650/1771
	'O' ring 1st stage valve covers	2	95602/60
	'O' ring 2nd stage valve covers	2	95602/52
	Suction filter element. (<i>if fitted</i>)	1	98262/1061
	4th stage piston ring set	1	98477/1168
	Check unloader valves renew if necessary. (<i>If seats are damaged replace complete unit</i>)		
	Check condition of unloader diaphragm & replace if necessary.		
	Check belt tension & condition of all ancillaries		
	Check condition of all cylinder bores.		
	Check for excessive crankcase leakage by removing breather pipe.		
	Check for oil and air leaks.		
	Check tightness of all fasteners. (Particularly cooler clamp fasteners)		
	Check and clean externally all cooler assemblies particularly the final cooler coil finned area.		
	Ensure fan blades are clean, secure and undamaged.		

AT 4000 HOURS OR ELAPSED TIME 72 MONTHS	Change oil, oil filter element. Renew 3rd & 4th stage valves. Service 1st & 2nd stage valves. Renew 4th stage plunger/liner assembly. Renew 2nd & 3rd stage piston rings. Renew suction filter element.	No Off	Part Ref RSP R-5409.2.ia/sw.5
	Change oil (<i>sump capacity 7.5 litres</i>) REAVELLITE 'W' 4 Litre	2	98384/1008
	Oil filter element	1	98262/1148
	4th stage valve	1	C201654
	3rd stage valve	1	98650/1883
	Service kit 2nd stage valves.	1	98650/1772
	Service kit 1st stage valves.	1	98650/1771
	Suction filter element (<i>if fitted</i>)	1	98262/1061
	4th stage plunger/liner assembly	1	C203157
	2nd stage piston ring set	1	98477/1096
	3rd stage piston ring set	1	98477/1187
	Joint Kit	1	98504/1120
	<i>Check unloader valves renew if necessary. (If seats are damaged replace complete unit).</i>		
	<i>Check condition of unloader diaphragm & replace if necessary.</i>		
	<i>Check belt tension & condition of all ancillaries</i>		
	<i>De-glaze 2nd & 3rd stage cylinder bores.</i>		
	<i>Check for excessive crankcase leakage by removing breather pipe.</i>		
	<i>Inspect piston ring grooves and piston lands for wear.</i>		
	<i>Check oil pump for wear, replace if worn.</i>		
	<i>Clean out all cooler assemblies including finned area.</i>		
	<i>Ensure fan blades are clean, secure and undamaged.</i>		
	<i>Check for oil and air leaks.</i>		
	<i>Check tightness of all fasteners. (Particularly cooler clamp fasteners).</i>		

AT 8000 HOURS MAJOR OVERHAUL	Change oil, oil filter element. Cleanse crankcase, Renew 1st, 2nd, 3rd & 4th stage valves. Renew 4th stage plunger/liner assembly. Renew 1st, 2nd & 3rd stage piston rings. Renew 3rd stage liner. Renew conn rod assemblies. Renew all gudgeon pins. Renew crankshaft assembly. Renew suction filter. Renew all safety valves.	No Off	Part Ref RSP R-5409.2.ia/sw.6
	Change oil (sump capacity 7.5 litres) REAVELLITE 'W' 4 Litre	2	98384/1008
	Oil filter element	1	98262/1148
	4th stage valve	1	C201654
	3rd stage valve	1	98650/1883
	2nd stage suction valve	1	98650/1169
	2nd stage delivery valve	1	98650/1170
	1st stage suction valve	1	98650/1167
	1st stage delivery valve	1	98650/1168
	Suction filter.	1	98262/1076
	4th stage plunger/liner assembly	1	C203157
	1st stage piston ring set	1	98477/1167
	2nd stage piston ring set	1	98477/1096
	3rd stage piston ring set	1	98477/1187
	3rd stage liner	1	C200615
	Joint Kit	1	98504/1120
	Conn rod assembly	2	D101388
	Crankshaft assembly	1	D101411
	Oil seal	1	98505/1006
	Gudgeon pin 1st & 4th stage	1	C200664
	Gudgeon pin 2nd & 3rd stage	1	C200032
	Circlips	4	95650/25
	Oil pump cam assembly	1	C201451
	1st stage safety valve	1	98650.1163-4.1
	2nd stage safety valve	1	98650.1164-21
	3rd stage safety valve	1	98650.1164-97
	4th stage safety valve (check contract for correct valve)	1	as fitted
	Check unloader valves replace if necessary. (If seats are damaged replace complete unit).		
	Check condition of unloader diaphragm & replace if necessary.		
	Check belt tension & condition of all ancillaries		
	Check condition of 1st & 2nd stage cylinder bores. Replace or de-glaze as necessary.		
	Inspect piston ring grooves and piston lands for wear.		
	Ensure fan blades are clean, secure and undamaged.		
	Check for oil and air leaks		
	Check tightness of all fasteners. After reassembly. (Particularly cooler clamp fasteners).		
	Cleanse all cooler coils internally & externally specially finned areas.		
	Hydraulic pressure test all cooler coils.		
	Cleanse, hydraulic pressure test interstage oil/moisture separators.		
	Replace or calibrate all pressure gauges		

**H5409.2.BA SYNTHETIC OIL STANDARD
IMPORTANT - DAILY & BEFORE STARTING
Check oil level top up if necessary**

INITIAL SERVICE 50 HOURS OR ELAPSED TIME 6 MONTHS REPEAT AT 8000 HOURS MAJOR OVERHAUL OR ANY INTERMEDIATE OVERHAUL	Change oil, oil filter element.	No Off	Part Ref RSP H-5409.2.ba/s.1
	Change oil (<i>sump capacity 2.15 litres</i>) REAVELLITE 'S' 1 Litre	3	98384.1020
	Oil filter element.	1	98262.1148
	Check belt tension & condition of all ancillaries.		
	Check for oil & air leaks.		
AT 500 HOURS OR ELAPSED TIME 12 MONTHS REPEAT AT 1500, 2500, 3500, 4500, 5500, 6500 & 7500 HOURS.	Check tightness of all fasteners. (Particularly cooler clamp fasteners)		
	Renew suction filter element. (<i>Only necessary in very dusty/dirty environments, this can only be established by checking site conditions</i>).	No Off	Part Ref RSP H-5409.2.ba/s.2
	Suction filter element. (<i>if fitted</i>)	1	98262.1061
	Check belt tension & condition of all ancillaries.		
	Check oil level, top-up if necessary.		
AT 1000 HOURS OR ELAPSED TIME 24 MONTHS REPEAT AT 3000 5000 & 7000 HOURS	Check for oil and air leaks.		
	Check tightness of all fasteners. (Particularly cooler clamp fasteners)		
	Change oil filter element. Renew suction filter element. Service 4th stage valve.	No Off	Part Ref RSP H-5409.2.ba/s.3
	Oil filter element	1	98262.1148
	Service kit 4th stage valve	1	98650.1199
AT 2000 HOURS OR ELAPSED TIME 36 MONTHS REPEAT AT 6000 HOURS	Suction filter element. (<i>if fitted</i>)	1	98262.1061
	Check belt tension & condition of all ancillaries		
	Check oil level, top-up if necessary.		
	Check for oil and air leaks.		
	Check tightness of all fasteners. (Particularly cooler clamp fasteners)		
	Check for excessive crankcase leakage by removing breather pipe.		
	Change oil, oil filter element. Service 1st, 2nd, 3rd & 4th stage valves. Renew 4th stage piston rings. Renew suction filter element.	No Off	Part Ref RSP H-5409.2.ba/s.4
	Change oil (<i>sump capacity 2.15 litres</i>) REAVELLITE 'S' 1 Litre	3	98384.1020
	Oil filter element	1	98262.1148
	Service kit 4th stage valve	1	98650.1199
	Service kit 3rd stage valve	1	98650.1215
	Service kit 2nd stage valve	1	98650.1772
	Service kit 1st stage valve	1	98650.1771
	'O' ring 1st stage valve covers	2	95602.60
	'O' ring 2nd stage valve covers	2	95602.52
	Suction filter element. (<i>if fitted</i>)	1	98262.1061
	4th stage piston ring set	1	98477.1168
	Check unloader valves renew if necessary. (<i>If seats are damaged replace complete unit</i>)		
	Check condition of unloader diaphragm & replace if necessary.		
	Check belt tension & condition of all ancillaries		
	Check condition of all cylinder bores.		
	Check for excessive crankcase leakage by removing breather pipe.		
	Check for oil and air leaks.		
	Check tightness of all fasteners. (Particularly cooler clamp fasteners)		
	Check and clean externally all cooler assemblies particularly the final cooler coil finned area.		
	Ensure fan blades are clean, secure and undamaged.		

AT 4000 HOURS OR ELAPSED TIME 72 MONTHS	Change oil, oil filter element. Renew 3rd & 4th stage valves. Service 1st & 2nd stage valves. Renew 4th stage plunger/liner assembly. Renew 2nd & 3rd stage piston rings. Renew suction filter element.	No Off	Part Ref RSP H-5409.2.ba/s.5
	Change oil (<i>sump capacity 2.15 litres</i>) REAVELLITE 'S' 1 Litre	3	98384.1020
	Oil filter element	1	98262.1148
	4th stage valve	1	C201654
	3rd stage valve	1	98650.1883
	Service kit 2nd stage valves.	1	98650.1772
	Service kit 1st stage valves.	1	98650.1771
	Suction filter element (<i>if fitted</i>)	1	98262.1061
	4th stage plunger/liner assembly	1	C203157
	2nd stage piston ring set	1	98477.1096
	3rd stage piston ring set	1	98477.1187
	Joint Kit	1	98504.1120
	<i>Check unloader valves renew if necessary. (If seats are damaged replace complete unit).</i>		
	<i>Check condition of unloader diaphragm & replace if necessary.</i>		
	<i>Check belt tension & condition of all ancillaries</i>		
	<i>De-glaze 2nd & 3rd stage cylinder bores.</i>		
	<i>Check for excessive crankcase leakage by removing breather pipe.</i>		
	<i>Inspect piston ring grooves and piston lands for wear.</i>		
	<i>Check oil pump for wear, replace if worn.</i>		
	<i>Clean out all cooler assemblies including finned area.</i>		
	<i>Ensure fan blades are clean, secure and undamaged.</i>		
	<i>Check for oil and air leaks.</i>		
	<i>Check tightness of all fasteners. (Particularly cooler clamp fasteners).</i>		

AT 8000 HOURS MAJOR OVERHAUL	Change oil, oil filter element. Cleanse crankcase, Renew 1st, 2nd, 3rd & 4th stage valves. Renew 4th stage plunger/liner assembly. Renew 1st, 2nd & 3rd stage piston rings. Renew 3rd stage liner. Renew conn rod assemblies. Renew all gudgeon pins. Renew crankshaft assembly. Renew suction filter. Renew all safety valves.	No Off	Part Ref RSP H-5409.2.ba/s.6
	Change oil (<i>sump capacity 2.15 litres</i>) REAVELLITE 'S' 1 Litre	3	98384.1020
	Oil filter element	1	98262.1148
	4th stage valve	1	C201654
	3rd stage valve	1	98650.1883
	2nd stage suction valve	1	98650.1169
	2nd stage delivery valve	1	98650.1170
	1st stage suction valve	1	98650.1167
	1st stage delivery valve	1	98650.1168
	Suction filter.	1	98262.1076
	4th stage plunger/liner assembly	1	C203157
	1st stage piston ring set	1	98477.1167
	2nd stage piston ring set	1	98477.1096
	3rd stage piston ring set	1	98477.1187
	3rd stage liner	1	C200615
	Joint Kit	1	98504.1120
	Conn rod assembly	2	D100287
	Crankshaft assembly	1	D100188.50
	Oil seal	1	98505.1006
	Gudgeon pin 1st & 4th stage	1	C200664
	Gudgeon pin 2nd & 3rd stage	1	C200032
	Circlips	4	95650.25
	Oil pump cam assembly	1	C201451
	1st stage safety valve	1	98650.1163-4.1
	2nd stage safety valve	1	98650.1164-21
	3rd stage safety valve	1	98650.1164-104
	4th stage safety valve (check contract for correct valve)	1	as fitted
	<i>Check unloader valves replace if necessary. (If seats are damaged replace complete unit).</i>		
	<i>Check condition of unloader diaphragm & replace if necessary.</i>		
	<i>Check belt tension & condition of all ancillaries</i>		
	<i>Check condition of 1st & 2nd stage cylinder bores. Replace or de-glaze as necessary.</i>		
	<i>Inspect piston ring grooves and piston lands for wear.</i>		
	<i>Check for oil and air leaks</i>		
	<i>Check tightness of all fasteners. After reassembly. (Particularly cooler clamp fasteners).</i>		
	<i>Cleanse all cooler coils internally & externally specially finned areas.</i>		
	<i>Hydraulic pressure test all cooler coils.</i>		
	<i>Cleanse, hydraulic pressure test interstage oil/moisture separators.</i>		
	<i>Replace or calibrate all pressure gauges</i>		

**H5409.2.BA SYNTHETIC OIL WINTER GRADE
IMPORTANT - DAILY & BEFORE STARTING
Check oil level top up if necessary**

INITIAL SERVICE 50 HOURS OR ELAPSED TIME 6 MONTHS REPEAT AT 8000 HOURS MAJOR OVERHAUL OR ANY INTERMEDIATE OVERHAUL	Change oil, oil filter element.	No Off	Part Ref RSP H-5409.2.ba/sw.1
	Change oil (<i>sump capacity 2.15 litres</i>) REAVELLITE 'W' 1 Litre	3	98384.1021
	Oil filter element.	1	98262.1148
	Check belt tension & condition of all ancillaries.		
	Check for oil & air leaks.		
AT 500 HOURS OR ELAPSED TIME 12 MONTHS REPEAT AT 1500, 2500, 3500, 4500, 5500, 6500 & 7500 HOURS.	Check tightness of all fasteners. (Particularly cooler clamp fasteners)		
	Renew suction filter element. (<i>Only necessary in very dusty/dirty environments, this can only be established by checking site conditions</i>).	No Off	Part Ref RSP H-5409.2.ba/sw.2
	Suction filter element. (<i>if fitted</i>)	1	98262.1061
	Check belt tension & condition of all ancillaries.		
	Check oil level, top-up if necessary.		
AT 1000 HOURS OR ELAPSED TIME 24 MONTHS REPEAT AT 3000 5000 & 7000 HOURS	Check for oil and air leaks.		
	Check tightness of all fasteners. (Particularly cooler clamp fasteners)		
	Change oil filter element. Renew suction filter element. Service 4th stage valve.	No Off	Part Ref RSP H-5409.2.ba/sw.3
	Oil filter element	1	98262.1148
	Service kit 4th stage valve	1	98650.1199
	Suction filter element. (<i>if fitted</i>)	1	98262.1061
	Check belt tension & condition of all ancillaries		
	Check oil level, top-up if necessary.		
AT 2000 HOURS OR ELAPSED TIME 36 MONTHS REPEAT AT 6000 HOURS	Check for oil and air leaks.		
	Check tightness of all fasteners. (Particularly cooler clamp fasteners)		
	Check for excessive crankcase leakage by removing breather pipe.		
	Change oil, oil filter element. Service 1st, 2nd, 3rd & 4th stage valves. Renew 4th stage piston rings. Renew suction filter element.	No Off	Part Ref RSP H-5409.2.ba/sw.4
	Change oil (<i>sump capacity 2.15 litres</i>) REAVELLITE 'W' 1 Litre	3	98384.1021
	Oil filter element	1	98262.1148
	Service kit 4th stage valve	1	98650.1199
	Service kit 3rd stage valve	1	98650.1215
	Service kit 2nd stage valve	1	98650.1772
	Service kit 1st stage valve	1	98650.1771
	'O' ring 1st stage valve covers	2	95602.60
	'O' ring 2nd stage valve covers	2	95602.52
	Suction filter element. (<i>if fitted</i>)	1	98262.1061
	4th stage piston ring set	1	98477.1168
	Check unloader valves renew if necessary. (<i>If seats are damaged replace complete unit</i>)		
	Check condition of unloader diaphragm & replace if necessary.		
	Check belt tension & condition of all ancillaries		
	Check condition of all cylinder bores.		
	Check for excessive crankcase leakage by removing breather pipe.		
	Check for oil and air leaks.		
	Check tightness of all fasteners. (Particularly cooler clamp fasteners)		
	Check and clean externally all cooler assemblies particularly the final cooler coil finned area.		
	Ensure fan blades are clean, secure and undamaged.		

AT 4000 HOURS OR ELAPSED TIME 72 MONTHS	Change oil, oil filter element. Renew 3rd & 4th stage valves. Service 1st & 2nd stage valves. Renew 4th stage plunger/liner assembly. Renew 2nd & 3rd stage piston rings. Renew suction filter element.	No Off	Part Ref RSP H-5409.2.ba/sw.5
	Change oil (<i>sump capacity 2.15 litres</i>) REAVELLITE 'W' 1 Litre	3	98384.1021
	Oil filter element	1	98262.1148
	4th stage valve	1	C201654
	3rd stage valve	1	98650.1883
	Service kit 2nd stage valves.	1	98650.1772
	Service kit 1st stage valves.	1	98650.1771
	Suction filter element (<i>if fitted</i>)	1	98262.1061
	4th stage plunger/liner assembly	1	C203157
	2nd stage piston ring set	1	98477.1096
	3rd stage piston ring set	1	98477.1187
	Joint Kit	1	98504.1120
	<i>Check unloader valves renew if necessary. (If seats are damaged replace complete unit).</i>		
	<i>Check condition of unloader diaphragm & replace if necessary.</i>		
	<i>Check belt tension & condition of all ancillaries</i>		
	<i>De-glaze 2nd & 3rd stage cylinder bores.</i>		
	<i>Check for excessive crankcase leakage by removing breather pipe.</i>		
	<i>Inspect piston ring grooves and piston lands for wear.</i>		
	<i>Check oil pump for wear, replace if worn.</i>		
	<i>Clean out all cooler assemblies including finned area.</i>		
	<i>Ensure fan blades are clean, secure and undamaged.</i>		
	<i>Check for oil and air leaks.</i>		
	<i>Check tightness of all fasteners. (Particularly cooler clamp fasteners).</i>		

AT 8000 HOURS MAJOR OVERHAUL	Change oil, oil filter element. Cleanse crankcase, Renew 1st, 2nd, 3rd & 4th stage valves. Renew 4th stage plunger/liner assembly. Renew 1st, 2nd & 3rd stage piston rings. Renew 3rd stage liner. Renew conn rod assemblies. Renew all gudgeon pins. Renew crankshaft assembly. Renew suction filter. Renew all safety valves.	No Off	Part Ref RSP H-5409.2.ba/sw.6
	Change oil (<i>sump capacity 2.15 litres</i>) REAVELLITE 'W' 1 Litre	3	98384.1021
	Oil filter element	1	98262.1148
	4th stage valve	1	C201654
	3rd stage valve	1	98650.1883
	2nd stage suction valve	1	98650.1169
	2nd stage delivery valve	1	98650.1170
	1st stage suction valve	1	98650.1167
	1st stage delivery valve	1	98650.1168
	Suction filter.	1	98262.1076
	4th stage plunger/liner assembly	1	C203157
	1st stage piston ring set	1	98477.1167
	2nd stage piston ring set	1	98477.1096
	3rd stage piston ring set	1	98477.1187
	3rd stage liner	1	C200615
	Joint Kit	1	98504.1120
	Conn rod assembly	2	D100287
	Crankshaft assembly	1	D100188.50
	Oil seal	1	98505.1006
	Gudgeon pin 1st & 4th stage	1	C200664
	Gudgeon pin 2nd & 3rd stage	1	C200032
	Circlips	4	95650.25
	Oil pump cam assembly	1	C201451
	1st stage safety valve	1	98650.1163-4.1
	2nd stage safety valve	1	98650.1164-21
	3rd stage safety valve	1	98650.1164-104
	4th stage safety valve (check contract for correct valve)	1	as fitted
	<i>Check unloader valves replace if necessary. (If seats are damaged replace complete unit).</i>		
	<i>Check condition of unloader diaphragm & replace if necessary.</i>		
	<i>Check belt tension & condition of all ancillaries</i>		
	<i>Check condition of 1st & 2nd stage cylinder bores. Replace or de-glaze as necessary.</i>		
	<i>Inspect piston ring grooves and piston lands for wear.</i>		
	<i>Check for oil and air leaks</i>		
	<i>Check tightness of all fasteners. After reassembly. (Particularly cooler clamp fasteners).</i>		
	<i>Cleanse all cooler coils internally & externally specially finned areas.</i>		
	<i>Hydraulic pressure test all cooler coils.</i>		
	<i>Cleanse, hydraulic pressure test interstage oil/moisture separators.</i>		
	<i>Replace or calibrate all pressure gauges</i>		

**H5409.3.BA SYNTHETIC OIL STANDARD
IMPORTANT - DAILY & BEFORE STARTING
Check oil level top up if necessary**

INITIAL SERVICE 50 HOURS OR ELAPSED TIME 6 MONTHS REPEAT AT 8000 HOURS MAJOR OVERHAUL OR ANY INTERMEDIATE OVERHAUL	Change oil, oil filter element.	No Off	Part Ref RSP H-5409.3.ba/s.1
	Change oil (<i>sump capacity 2.15 litres</i>) REAVELLITE 'S' 1 Litre	3	98384.1020
	Oil filter element.	1	98262.1148
	Check belt tension & condition of all ancillaries.		
	Check for oil & air leaks.		
AT 500 HOURS OR ELAPSED TIME 12 MONTHS REPEAT AT 1500, 2500, 3500, 4500, 5500, 6500 & 7500 HOURS.	Check tightness of all fasteners. (Particularly cooler clamp fasteners)		
	Renew suction filter element. (<i>Only necessary in very dusty/dirty environments, this can only be established by checking site conditions</i>).	No Off	Part Ref RSP H-5409.3.ba/s.2
	Suction filter element. (<i>if fitted</i>)	1	98262.1061
	Check belt tension & condition of all ancillaries.		
	Check oil level, top-up if necessary.		
AT 1000 HOURS OR ELAPSED TIME 24 MONTHS REPEAT AT 3000 5000 & 7000 HOURS	Check for oil and air leaks.		
	Check tightness of all fasteners. (Particularly cooler clamp fasteners)		
	Change oil filter element. Renew suction filter element. Service 4th stage valve.	No Off	Part Ref RSP H-5409.3.ba/s.3
	Oil filter element	1	98262.1148
	Service kit 4th stage valve	1	98650.1199
AT 2000 HOURS OR ELAPSED TIME 36 MONTHS REPEAT AT 6000 HOURS	Suction filter element. (<i>if fitted</i>)	1	98262.1061
	Check belt tension & condition of all ancillaries		
	Check oil level, top-up if necessary.		
	Check for oil and air leaks.		
	Check tightness of all fasteners. (Particularly cooler clamp fasteners)		
	Check for excessive crankcase leakage by removing breather pipe.		
	Change oil, oil filter element. Service 1st, 2nd, 3rd & 4th stage valves. Renew 4th stage piston rings. Renew suction filter element.	No Off	Part Ref RSP H-5409.3.ba/s.4
	Change oil (<i>sump capacity 2.15 litres</i>) REAVELLITE 'S' 1 Litre	3	98384.1020
	Oil filter element	1	98262.1148
	Service kit 4th stage valve	1	98650.1199
	Service kit 3rd stage valve	1	98650.1215
	Service kit 2nd stage valve	1	98650.1772
	Service kit 1st stage valve	1	98650.1771
	'O' ring 1st stage valve covers	2	95602.60
	'O' ring 2nd stage valve covers	2	95602.52
	Suction filter element. (<i>if fitted</i>)	1	98262.1061
	4th stage piston ring set	1	98477.1168
	Check unloader valves renew if necessary. (<i>If seats are damaged replace complete unit</i>)		
	Check condition of unloader diaphragm & replace if necessary.		
	Check belt tension & condition of all ancillaries		
	Check condition of all cylinder bores.		
	Check for excessive crankcase leakage by removing breather pipe.		
	Check for oil and air leaks.		
	Check tightness of all fasteners. (Particularly cooler clamp fasteners)		
	Check and clean externally all cooler assemblies particularly the final cooler coil finned area.		
	Ensure fan blades are clean, secure and undamaged.		

AT 4000 HOURS OR ELAPSED TIME 72 MONTHS	Change oil, oil filter element. Renew 3rd & 4th stage valves. Service 1st & 2nd stage valves. Renew 4th stage plunger/liner assembly. Renew 2nd & 3rd stage piston rings. Renew suction filter element.	No Off	Part Ref RSP H-5409.3.ba/s.5
	Change oil (<i>sump capacity 2.15 litres</i>) REAVELLITE 'S' 1 Litre	3	98384.1020
	Oil filter element	1	98262.1148
	4th stage valve	1	C201654
	3rd stage valve	1	98650.1883
	Service kit 2nd stage valves.	1	98650.1772
	Service kit 1st stage valves.	1	98650.1771
	Suction filter element (<i>if fitted</i>)	1	98262.1061
	4th stage plunger/liner assembly	1	C203157
	2nd stage piston ring set	1	98477.1096
	3rd stage piston ring set	1	98477.1187
	Joint Kit	1	98504.1120
	<i>Check unloader valves renew if necessary. (If seats are damaged replace complete unit).</i>		
	<i>Check condition of unloader diaphragm & replace if necessary.</i>		
	<i>Check belt tension & condition of all ancillaries</i>		
	<i>De-glaze 2nd & 3rd stage cylinder bores.</i>		
	<i>Check for excessive crankcase leakage by removing breather pipe.</i>		
	<i>Inspect piston ring grooves and piston lands for wear.</i>		
	<i>Check oil pump for wear, replace if worn.</i>		
	<i>Clean out all cooler assemblies including finned area.</i>		
	<i>Ensure fan blades are clean, secure and undamaged.</i>		
	<i>Check for oil and air leaks.</i>		
	<i>Check tightness of all fasteners. (Particularly cooler clamp fasteners).</i>		

AT 8000 HOURS MAJOR OVERHAUL	Change oil, oil filter element. Cleanse crankcase, Renew 1st, 2nd, 3rd & 4th stage valves. Renew 4th stage plunger/liner assembly. Renew 1st, 2nd & 3rd stage piston rings. Renew 3rd stage liner. Renew conn rod assemblies. Renew all gudgeon pins. Renew crankshaft assembly. Renew suction filter. Renew all safety valves.	No Off	Part Ref RSP H-5409.3.ba/s.6
	Change oil (<i>sump capacity 2.15 litres</i>) REAVELLITE 'S' 1 Litre	3	98384.1020
	Oil filter element	1	98262.1148
	4th stage valve	1	C201654
	3rd stage valve	1	98650.1883
	2nd stage suction valve	1	98650.1169
	2nd stage delivery valve	1	98650.1170
	1st stage suction valve	1	98650.1167
	1st stage delivery valve	1	98650.1168
	Suction filter.	1	98262.1076
	4th stage plunger/liner assembly	1	C203157
	1st stage piston ring set	1	98477.1167
	2nd stage piston ring set	1	98477.1096
	3rd stage piston ring set	1	98477.1187
	3rd stage liner	1	C200615
	Joint Kit	1	98504.1120
	Conn rod assembly	2	D101388
	Crankshaft assembly	1	D101411.50
	Oil seal	1	98505.1006
	Gudgeon pin 1st & 4th stage	1	C200664
	Gudgeon pin 2nd & 3rd stage	1	C200032
	Circlips	4	95650.25
	Oil pump cam assembly	1	C201451
	1st stage safety valve	1	98650.1163-4.1
	2nd stage safety valve	1	98650.1164-21
	3rd stage safety valve	1	98650.1164-104
	4th stage safety valve (check contract for correct valve)	1	as fitted
	<i>Check unloader valves replace if necessary. (If seats are damaged replace complete unit).</i>		
	<i>Check condition of unloader diaphragm & replace if necessary.</i>		
	<i>Check belt tension & condition of all ancillaries</i>		
	<i>Check condition of 1st & 2nd stage cylinder bores. Replace or de-glaze as necessary.</i>		
	<i>Inspect piston ring grooves and piston lands for wear.</i>		
	<i>Check for oil and air leaks</i>		
	<i>Check tightness of all fasteners. After reassembly. (Particularly cooler clamp fasteners).</i>		
	<i>Cleanse all cooler coils internally & externally specially finned areas.</i>		
	<i>Hydraulic pressure test all cooler coils.</i>		
	<i>Cleanse, hydraulic pressure test interstage oil/moisture separators.</i>		
	<i>Replace or calibrate all pressure gauges</i>		

**H5409.3.BA SYNTHETIC OIL WINTER GRADE
IMPORTANT - DAILY & BEFORE STARTING
Check oil level top up if necessary**

INITIAL SERVICE 50 HOURS OR ELAPSED TIME 6 MONTHS REPEAT AT 8000 HOURS MAJOR OVERHAUL OR ANY INTERMEDIATE OVERHAUL	Change oil, oil filter element.	No Off	Part Ref RSP H-5409.3.ba/sw.1
	Change oil (<i>sump capacity 2.15 litres</i>) REAVELLITE 'W' 1 Litre	3	98384.1021
	Oil filter element.	1	98262.1148
	Check belt tension & condition of all ancillaries.		
	Check for oil & air leaks.		
AT 500 HOURS OR ELAPSED TIME 12 MONTHS REPEAT AT 1500, 2500, 3500, 4500, 5500, 6500 & 7500 HOURS.	Check tightness of all fasteners. (Particularly cooler clamp fasteners)		
	Renew suction filter element. (Only necessary in very dusty/dirty environments, this can only be established by checking site conditions).	No Off	Part Ref RSP H-5409.3.ba/sw.2
	Suction filter element. (if fitted)	1	98262.1061
	Check belt tension & condition of all ancillaries.		
	Check oil level, top-up if necessary.		
AT 1000 HOURS OR ELAPSED TIME 24 MONTHS REPEAT AT 3000 5000 & 7000 HOURS	Check for oil and air leaks.		
	Check tightness of all fasteners. (Particularly cooler clamp fasteners)		
	Change oil filter element. Renew suction filter element. Service 4th stage valve.	No Off	Part Ref RSP H-5409.3.ba/sw.3
	Oil filter element	1	98262.1148
	Service kit 4th stage valve	1	98650.1199
	Suction filter element. (if fitted)	1	98262.1061
	Check belt tension & condition of all ancillaries		
	Check oil level, top-up if necessary.		
AT 2000 HOURS OR ELAPSED TIME 36 MONTHS REPEAT AT 6000 HOURS	Check for oil and air leaks.		
	Check tightness of all fasteners. (Particularly cooler clamp fasteners)		
	Check for excessive crankcase leakage by removing breather pipe.		
	Change oil, oil filter element. Service 1st, 2nd, 3rd & 4th stage valves. Renew 4th stage piston rings. Renew suction filter element.	No Off	Part Ref RSP H-5409.3.ba/sw.4
	Change oil (<i>sump capacity 2.15 litres</i>) REAVELLITE 'W' 1 Litre	3	98384.1021
	Oil filter element	1	98262.1148
	Service kit 4th stage valve	1	98650.1199
	Service kit 3rd stage valve	1	98650.1215
	Service kit 2nd stage valve	1	98650.1772
	Service kit 1st stage valve	1	98650.1771
	'O' ring 1st stage valve covers	2	95602.60
	'O' ring 2nd stage valve covers	2	95602.52
	Suction filter element. (if fitted)	1	98262.1061
	4th stage piston ring set	1	98477.1168
	Check unloader valves renew if necessary. (If seats are damaged replace complete unit)		
	Check condition of unloader diaphragm & replace if necessary.		
	Check belt tension & condition of all ancillaries		
	Check condition of all cylinder bores.		
	Check for excessive crankcase leakage by removing breather pipe.		
	Check for oil and air leaks.		
	Check tightness of all fasteners. (Particularly cooler clamp fasteners)		
	Check and clean externally all cooler assemblies particularly the final cooler coil finned area.		
	Ensure fan blades are clean, secure and undamaged.		

AT 4000 HOURS OR ELAPSED TIME 72 MONTHS	Change oil, oil filter element. Renew 3rd & 4th stage valves. Service 1st & 2nd stage valves. Renew 4th stage plunger/liner assembly. Renew 2nd & 3rd stage piston rings. Renew suction filter element.	No Off	Part Ref RSP H-5409.3.ba/sw.5
	Change oil (<i>sump capacity 2.15 litres</i>) REAVELLITE 'W' 1 Litre	3	98384.1021
	Oil filter element	1	98262.1148
	4th stage valve	1	C201654
	3rd stage valve	1	98650.1883
	Service kit 2nd stage valves.	1	98650.1772
	Service kit 1st stage valves.	1	98650.1771
	Suction filter element (<i>if fitted</i>)	1	98262.1061
	4th stage plunger/liner assembly	1	C203157
	2nd stage piston ring set	1	98477.1096
	3rd stage piston ring set	1	98477.1187
	Joint Kit	1	98504.1120
	<i>Check unloader valves renew if necessary. (If seats are damaged replace complete unit).</i>		
	<i>Check condition of unloader diaphragm & replace if necessary.</i>		
	<i>Check belt tension & condition of all ancillaries</i>		
	<i>De-glaze 2nd & 3rd stage cylinder bores.</i>		
	<i>Check for excessive crankcase leakage by removing breather pipe.</i>		
	<i>Inspect piston ring grooves and piston lands for wear.</i>		
	<i>Check oil pump for wear, replace if worn.</i>		
	<i>Clean out all cooler assemblies including finned area.</i>		
	<i>Ensure fan blades are clean, secure and undamaged.</i>		
	<i>Check for oil and air leaks.</i>		
	<i>Check tightness of all fasteners. (Particularly cooler clamp fasteners).</i>		

AT 8000 HOURS MAJOR OVERHAUL	Change oil, oil filter element. Cleanse crankcase, Renew 1st, 2nd, 3rd & 4th stage valves. Renew 4th stage plunger/liner assembly. Renew 1st, 2nd & 3rd stage piston rings. Renew 3rd stage liner. Renew conn rod assemblies. Renew all gudgeon pins. Renew crankshaft assembly. Renew suction filter. Renew all safety valves.	No Off	Part Ref RSP H-5409.3.ba/sw.6
	Change oil (<i>sump capacity 2.15 litres</i>) REAVELLITE 'W' 1 Litre	3	98384.1021
	Oil filter element	1	98262.1148
	4th stage valve	1	C201654
	3rd stage valve	1	98650.1883
	2nd stage suction valve	1	98650.1169
	2nd stage delivery valve	1	98650.1170
	1st stage suction valve	1	98650.1167
	1st stage delivery valve	1	98650.1168
	Suction filter.	1	98262.1076
	4th stage plunger/liner assembly	1	C203157
	1st stage piston ring set	1	98477.1167
	2nd stage piston ring set	1	98477.1096
	3rd stage piston ring set	1	98477.1187
	3rd stage liner	1	C200615
	Joint Kit	1	98504.1120
	Conn rod assembly	2	D101388
	Crankshaft assembly	1	D101411.50
	Oil seal	1	98505.1006
	Gudgeon pin 1st & 4th stage	1	C200664
	Gudgeon pin 2nd & 3rd stage	1	C200032
	Circlips	4	95650.25
	Oil pump cam assembly	1	C201451
	1st stage safety valve	1	98650.1163-4.1
	2nd stage safety valve	1	98650.1164-21
	3rd stage safety valve	1	98650.1164-104
	4th stage safety valve (check contract for correct valve)	1	as fitted
	<i>Check unloader valves replace if necessary. (If seats are damaged replace complete unit).</i>		
	<i>Check condition of unloader diaphragm & replace if necessary.</i>		
	<i>Check belt tension & condition of all ancillaries</i>		
	<i>Check condition of 1st & 2nd stage cylinder bores. Replace or de-glaze as necessary.</i>		
	<i>Inspect piston ring grooves and piston lands for wear.</i>		
	<i>Check for oil and air leaks</i>		
	<i>Check tightness of all fasteners. After reassembly. (Particularly cooler clamp fasteners).</i>		
	<i>Cleanse all cooler coils internally & externally specially finned areas.</i>		
	<i>Hydraulic pressure test all cooler coils.</i>		
	<i>Cleanse, hydraulic pressure test interstage oil/moisture separators.</i>		
	<i>Replace or calibrate all pressure gauges</i>		



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