



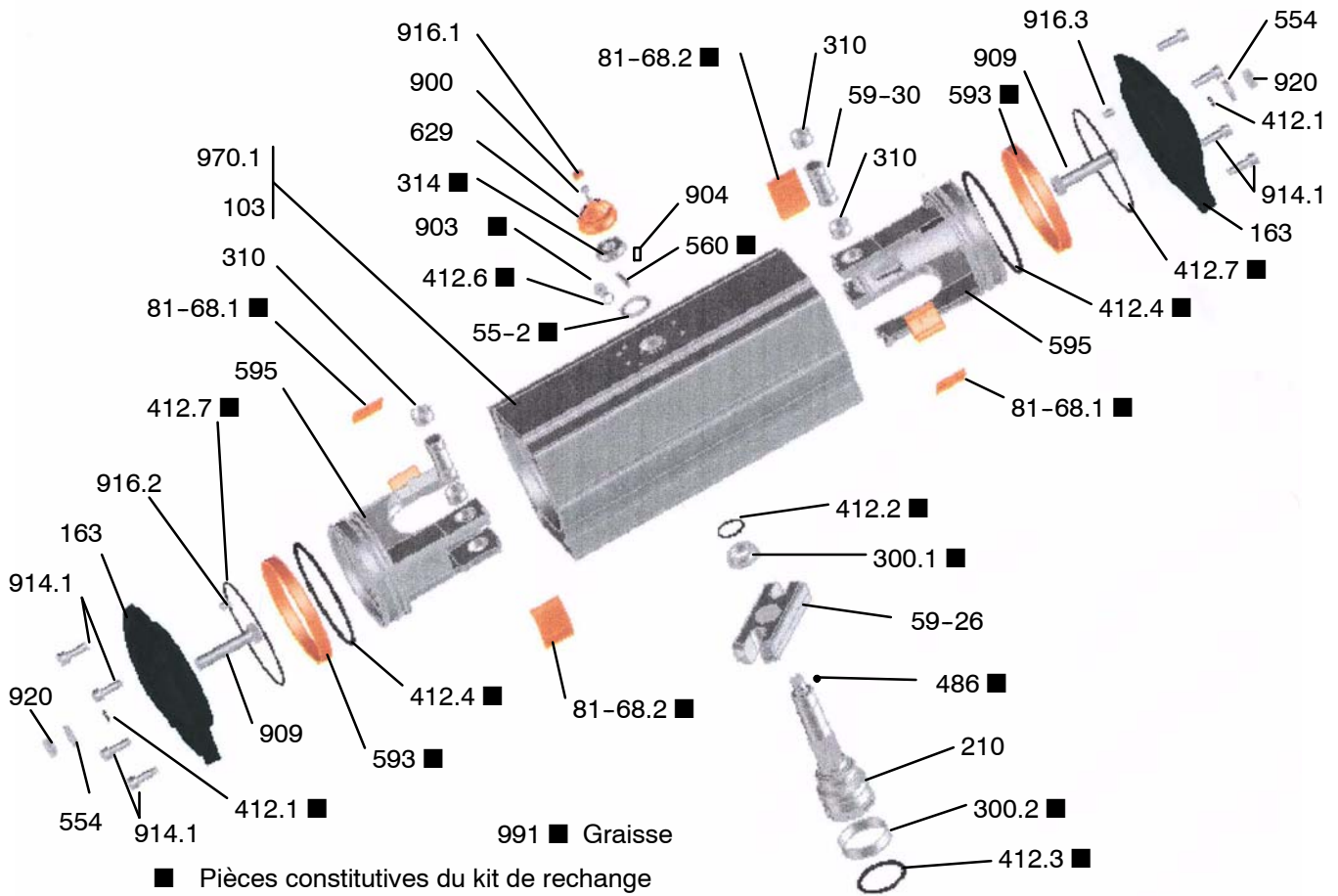
**INSTALLATION
MAINTENANCE**

- **General over view**
- **Tooling**
- **Installation**
- **Adjustement of opening or closing adjustable end stops**
- **Actuator dysassembly**
- **Actuator re-assembly**
- **Trouble shooting**
- **Kits sheets** ACTAIR 100 Ref. 8516.8100-90
 ACTAIR 200 Ref. 8516.8200-90

Nr. 42 057 221

KSB is ISO 9001 approved

The purpose of this manual is to describe the installation / maintenance procedures and actions to be carried out in case of breakdowns or faulty operations of the pneumatic actuators type ACTAIR 100 and 200.



Item	Designation	Item	Designation
55-2	Friction washer	412.7	O-ring
59-26	Scotch-yoke	486	Ball
59-30	Roller	554	Washer
81-68.1	Piston guide	560	Pin
81-68.2	Piston guide	593	Piston bearing
103	Housing	595	Piston
163	Cylinder head	629	Pointer
210	Shaft	900	Cheese head screw
300.1	Upper bearing	903	Plug
300.2	Lower bearing	904	Socket screw
310	Self lubricating bearing	909	Adjustable end stop
314	Thrust washer	914.1	Hexagon socket head screw
412.1	O-ring	916.1	Plug
412.2	O-ring	916.2	Cylindric plug
412.3	O-ring	916.3	Triangular plug
412.4	O-ring	920	Hexagonal nut
412.6	O-ring	970.1	Identity plate
991	Grease		

RECOMMENDED TOOLS (not supplied)

- Pneumatic screwing machine
- Open ended spanner 16
- Allen key 4 and 5
- 2 screwed rods M16 mini length 150mm

CONSUMABLE

- Grease EPEXELF MO2 (Elf) or RETINAX AM (Shell) or equivalent

INSTALLATION
BEFORE ANY ACTION

- Index the mounting position of the actuator onto the valve (Position N or M)
- Index the position of the pointer 629 on the shaft 210

ADAPTATION

The adaptation onto the valves is achieved either directly or through adaptors parts :

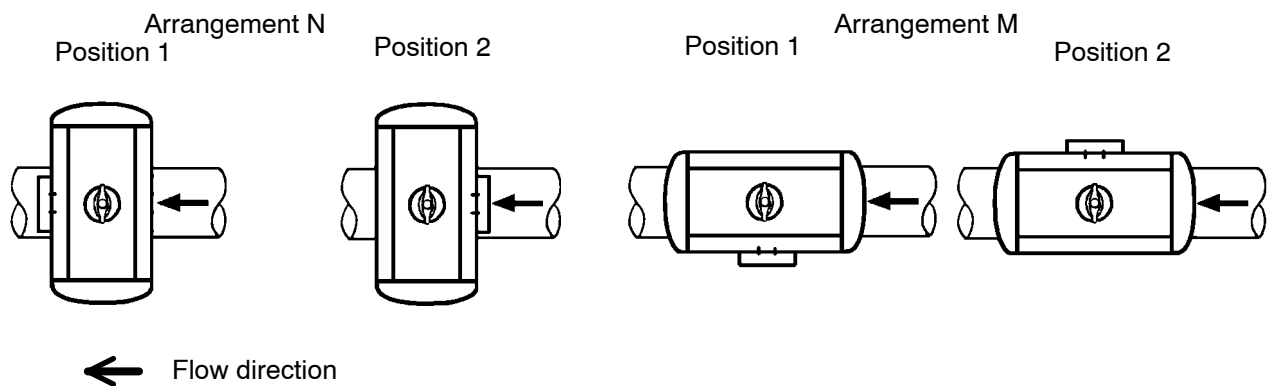
- interchangeable inserts manufactured to the size and the shape of the different valve shafts
- adaptor flanges for the coupling.

ACTUATOR POSITION ONTO THE VALVE

If the open or closed position are not known, it is then necessary to apply air pressure in order to obtain clockwise operation : then, the actuator is in a closed position.

The actuator can be positioned in four positions, at 90° intervals.

Standard arrangement is the N position 1



The arrangement position can be modified on site by the following procedure described below and following the specific assembly operations in accordance with maintenance procedure.

TRANSFORMATION Arrangement N ↔ Arrangement M

- Disconnect the actuator from the valve,
- Remove the screw 900 and the pointer 629,
- Remove the ball 486 out of the groove using a screwdriver, pin punch, . . .
- Insert the ball 486 in the perpendicular groove,
- Mount the pointer at 90° in initial position and thread the screw 900,
- When driving a valve with flat ended shaft, remove the insert of shaft 210, rotate 90° and re-insert in the shaft,
- Reconnect the actuator onto the valve at 90° of the initial position.

ADJUSTMENT OF STANDARD CLOSING ADJUSTABLE END STOPS ($\pm 2^\circ$)

Adjustable end stops are adjusted in the factory.

This is of utmost importance for the perfect tightness of the valve.

After any intervention on the actuator, the correct adjustment of the adjustable end stops must be verified.

If need be, this adjustment will be modified as per the following procedure :

Adjustment to carry out on the unit valve + actuator attached

- Disconnect the air supply,
- Unlock the nuts 920,
- Unscrew one of the two adjustable end stops 909 of several turns,
- Adjust the other adjustable end stop 909, by pressurizing the internal chamber (between the 2 pistons) and verifying the required position then lock the screw 909 with nut 920,
- Disconnect the air supply, adjust the first adjustable end stops 909 until contact is made with the piston 595, then lock it with nut 920. In the same way, pinion 877 must not be put in rotation.

WARNING : During the adjustment operations, the O-rings 412.4 should not be damaged.

CASE OF ACTAIR 100 and 200 WITH ADJUSTMENT OF OPENING ADJUSTABLE END STOPS

Follow the same procedure of adjusting.

An **O** is ungraved on the driving shaft of pinion 877 of an actuator with **O**pening adjustable end stops.



SPECIFIC CASE : ACTUATOR EQUIPPED WITH A DECLUTCHABLE MANUAL OVERRIDE

Adjustment to carry out on the unit valve + declutchable manual override + actuator attached

Under pressure, in automatic operation, the stop in position of the unit must be made on pneumatic actuator adjustable end stops.

Mandatory adjustment chronological operation to respect :

- Disconnect the air supply,
- Unscrew of several turns (4 to 5 turns) the two adjustable end stops of the declutchable manual override
- Unlock the nuts 920,
- Unscrew one of the two adjustable end stops 909 of several turns,
- Adjust the other adjustable end stop 909, by pressurizing the internal chamber (between the 2 pistons) and verifying the required position, then lock the screw 909 with nut 920,
- Disconnect the air supply, adjust the first adjustable end stops 909 until contact is made with the piston 595, then lock it with nut 920. In the same way, pinion 877 must not be put in rotation.
- Connect the air supply, screw the closing adjustable end stops of the manual override until contact with the wheel, then unscrew 1/2 turn and lock its counter-nut
- Put the unit in opening position and let the pressure in the actuator
- Screw the opening adjustable end stops of the manual override until contact with the wheel, then unscrew 1/2 turn and lock its counter-nut
- Check the correct operation of the unit

ACTUATOR DYSASSEMBLY

- Identify both the pointer and the mounting position of the actuator onto the valve.
- Disconnect the air supply
- Remove the actuator and the accessories from the valve and place it on a work bench
- Disconnect all accessories of the actuator
- If the actuator has a pointer 629, remove the plug 916, the screw 900 and the pointer 629
- Remove cylinder heads 163
- Extract cylinder head O-ring 412.7
- Remove nuts 920, washers 554 and O-ring 412.4 of the cylinders head 163
- Put the actuator, shaft 210 in horizontal position

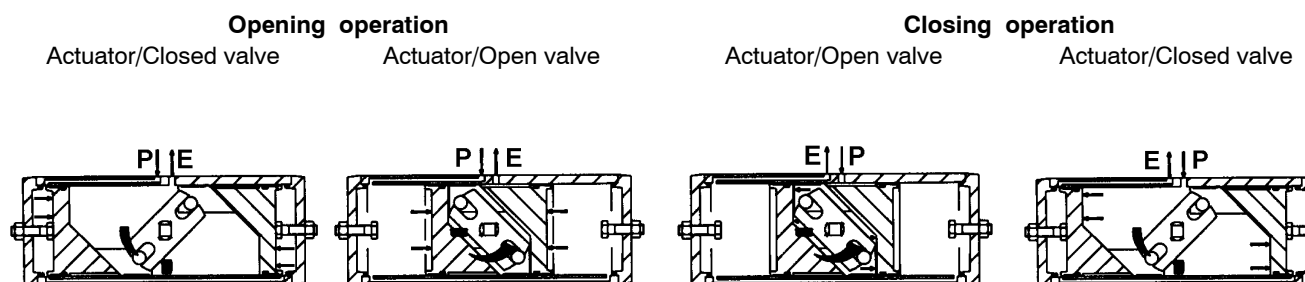
Before the next sequence :

Note the angular position P1 of shaft 210 when pistons 595 are not in movement

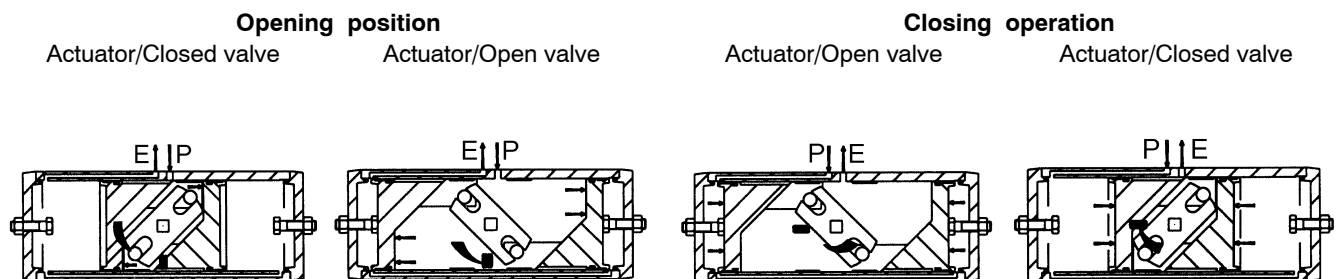
In the same way, note P2 position of pistons 595 compared to the shaft 210

Two operating functions are possible with figures to below :

Clockwise closing version / Adjustable end stops on closing position



Clockwise closing version / Adjustable end stops on opening position



- Screw in a M16 threaded rod in each piston 595 then pull symmetrically to extract the pistons.
- Remove rollers 59-30, piston guides 81-68.1 and 81-68.2 then dismantle 412.3 and the piston bearings 593
- Extract the pin 560, the thrust washer 314 and the friction washer 55-2

Before the next sequence :

- Note P3 direction of assembly of the scotch-yoke 59-26 (position of the face with indexing towards top or bottom)
- Note P4 angular position P4 between the scotch-yoke 59-26 and the shaft 210.

WARNING : When dismantling shaft 210, hold the scotch-yoke 59-26 so as not to damage the housing 103

- Remove the shaft 210, the O-ring 412.2 and the lower bearing 300.2
- Extract the upper bearing 300.1 and the O-ring 412.1

ACTUATOR RE-ASSEMBLY

PREPARATION OF PARTS

All constitutive parts of the spare kits must be used.

O-rings, bearing and piston guide must be lubricated with grease defined in the paragraph : consummables.

WARNING : FOR ACTUATORS DELIVERED BEFORE THE END OF SEPTEMBER 98, DO NOT GREASE THE GROOVE OF THE SPRING RETAINING RING

- Mount pistons 595,
O-rings 412.3,
piston guide 81.68.1 and
piston bearings 593

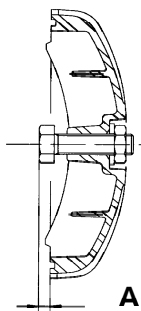


- Fit on the shaft 210, O-ring 412.2,
lower bearing 300.2.

Fit O-rings 412.7 on the cylinder heads 163
 - Put in place O-rings 412.4, washers 554 and nuts 920



The standard position of the adjustable end stop is as below :



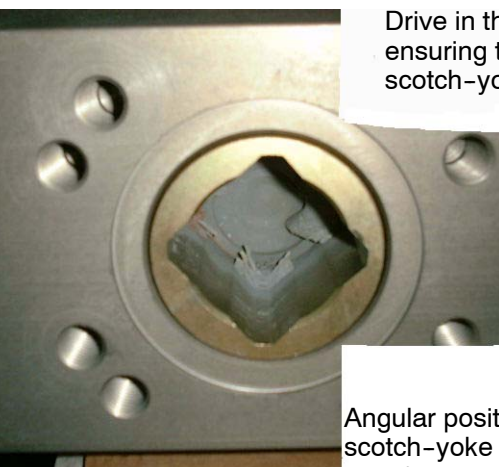
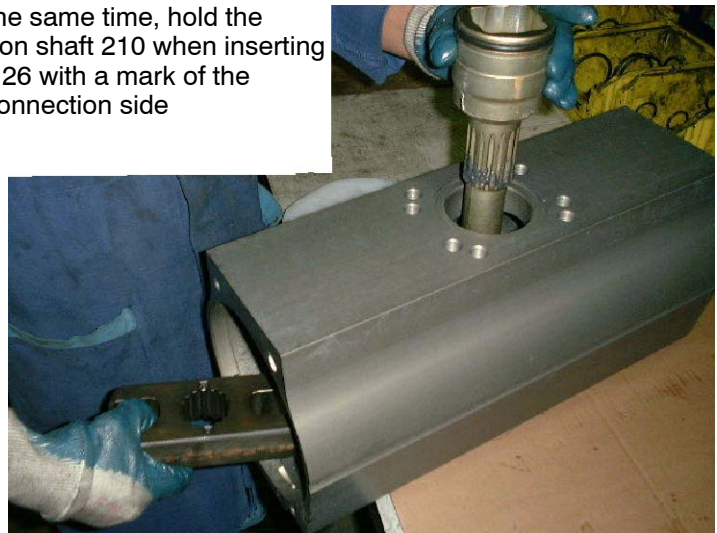
Position dimension of the adjustable end stop 909

ACTUATOR	A (mm)
ACTAIR 100	27.1
ACTAIR 200	29.8

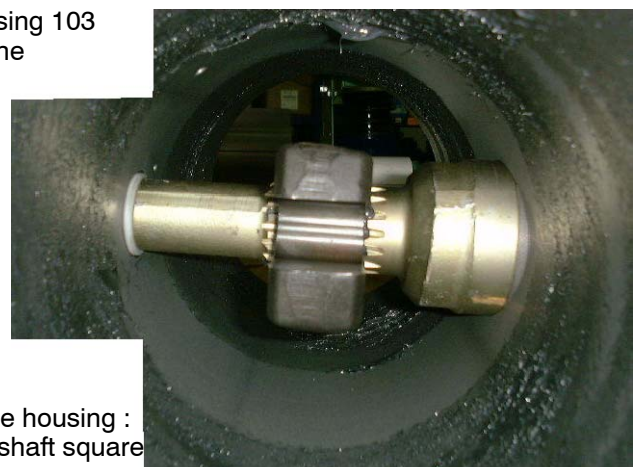
- Place the housing face down visualisation side, grease the interior of the housing then fit the O-ring 412.1 and the upper bearing 300.1 in the housing 103



Set in place and at the same time, hold the lower bearing 300.2 on shaft 210 when inserting the scotch-yoke 59-26 with a mark of the scotch-yoke valve connection side



Drive in the sub-unit shaft in the housing 103 ensuring the grooves meet those of the scotch-yoke 59-26.



Angular position of the scotch-yoke in the housing : scotch-yoke parallel to the housing and shaft square to 45° in accordance with these pictures.

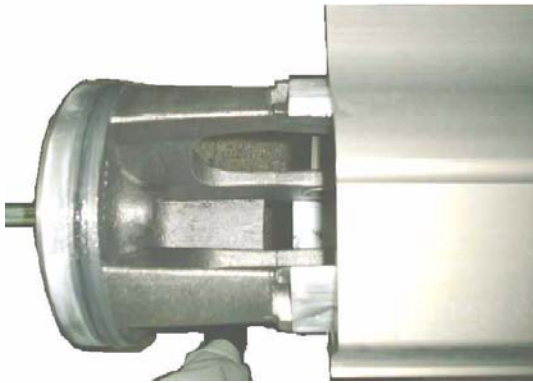
- Put in place the friction washer 55-2, the thrust washer 314 and the pin 560 on the shaft.



PISTONS INSTALLATION

- Orientate the shaft 210 in position P1 already noted during the dysassembly.

- Fitting direction of pistons shall be the same as those noted during the disassembly (position 2).



- Insert pistons complete with roller using a M16 threaded rod



- Push simultaneously the 2 pistons 595 until they come to as stop.
- Check that the shaft square is parallel to the housing 103.
- Extract the threaded rods.

- Assemble the cylinder heads 163 on housing



- Carry out one operation without load opening and closing to check the correct operation of the actuator (stroke, tightness).

CONNECTION ONTO THE VALVE

- Re-mount the sub-unit pointer 629 - screw 900 - plug 916 and/or accessories on the actuator in its initial position.
- Connect the actuator on the valve in its initial position,
- Check the good operation of the unit valve- pneumatic actuator - accessories.
- If necessary, adjust adjustable end stops : see § adjustment of standard closing adjustable end stops.

TROUBLE SHOOTING

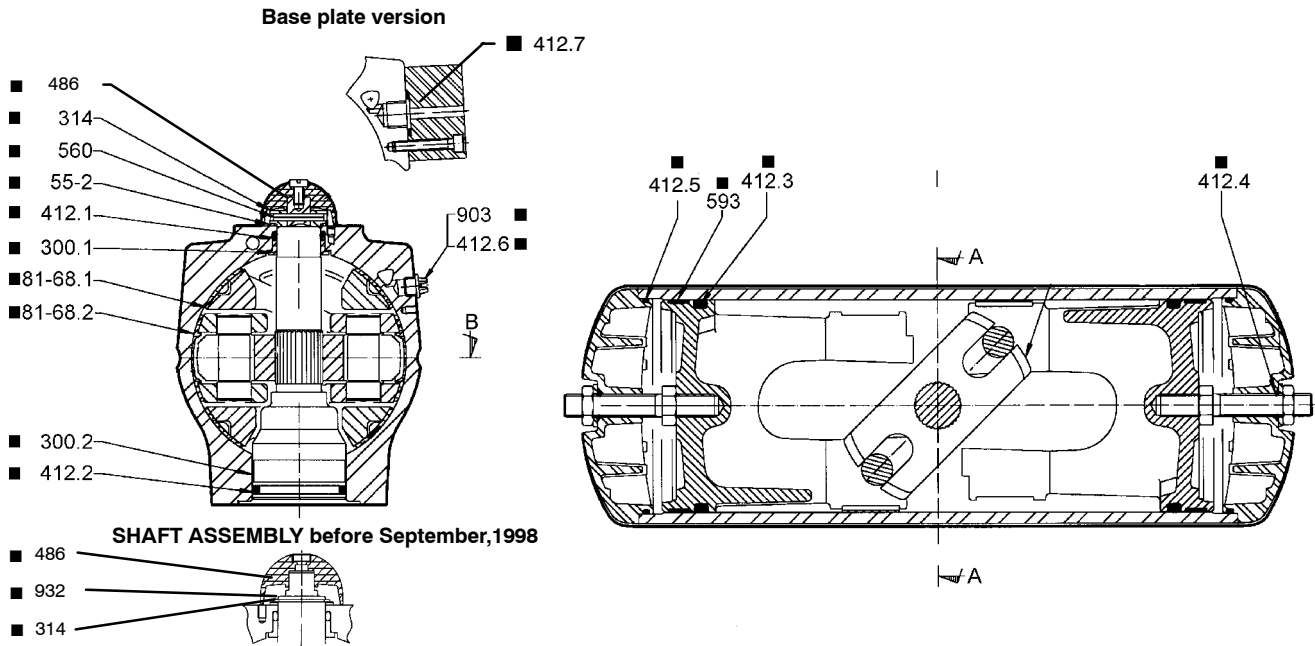
At cylinder heads 163	
Axial at pinion 877	External leakage
At plugs 903	
Non operation	
Incomplete operation or on stroke	
Irregular operation	
Reverse operation	
Disfunctioning of the apparatus	
Reverse or incorrecte indication	
Not possible connection, valve side	
Not possible connection, accessories side	
Damaged O-rings 412.4 and 412.7	Change O-rings 412.4 and 412.7
Damaged O-rings 412.1 and 412.2	Change O-rings 412.1 and 412.2
Damaged plugs 903 and O-rings 412.6	Change plug 903 and O-rings 412.6
Absence or insufficient pressure	Check solenoid, restrictors, pressure, connexions
Blocked valves	Check the valve and/or the interface-with the pipe
Internal leakage	Change O-rings 412.3
External leakage	See external leakage
Rupture of internal components	Consult the manufacturer for technical advices
Wrong applicabilities	Consult technical leaflet Nr 8515 Consult the technical leaflet of the valve
Declutchable manual override	Disconnect the air supply Clutch the manual override
If distribution AMTRONIC : possible presence of screws 904	Disconnect AMTRONIC Remove screws 904
Wrong adjustment of adjustable end stops	Refer to § adjustment of adjustable end stops
Wrong adjustment of positioner function AMTRONIC	Consult technical leaflet Nr 2316
Overtorque of the valve	Contact the manufacturer
Wrong interface	Check the driving and/or adapter flanges Consult technical leaflet ACTAIR Nr8515 or contact the manufacturer
Air flow too low	Check solenoid, restrictors, pressure, connections and passage section of the air supply
Closed actuator / Opened valve or Closed valve / Opened actuator	Put valve and actuator in the same position
Inverted pneumatic connections	Check the pneumatic connection
Wrong definition of the solenoid	Check solenoids definition
Wrong assembly of the actuator onto the actuator	Check arrangement positions on ACTAIR technical leaflet ACTAIR Nr 8515
Loss air pressure	Pressurize the equipment and keep it under pressure
Internal or external leakages with flow control equipment + AMTRONIC or varying input signal	See internal or external leakages Check the O-ring of the mounting plate between ACTAIR and AMTRONIC
Wrong adjustment of limit switches cams	Check the adjustment according to the technical leaflet AMTRONIC Nr 2316
Control and remote indication non compatible	Check accessories technical leaflet

KITS SHEETS

ACTAIR 100 Ref. 8516.8100-90

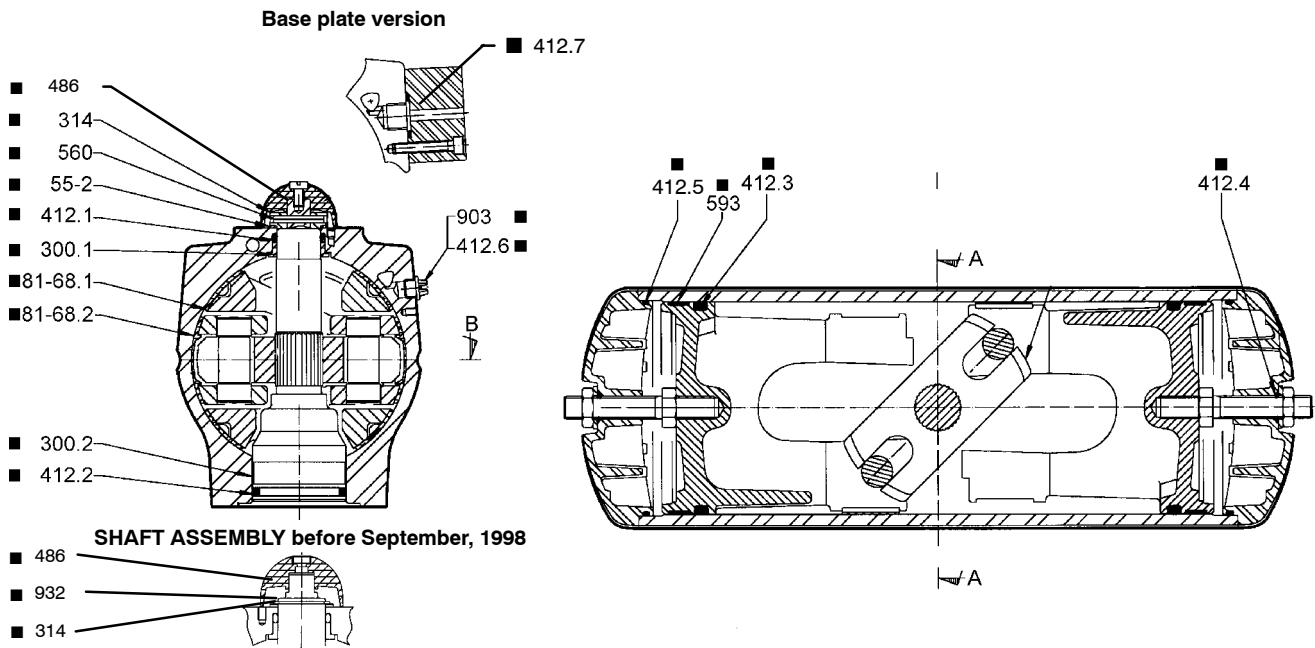
ACTAIR 200 Ref. 8516.8200-90

CODING CODIFICATION KODIERUNG	Temperature range Plage de température Temperatur	Specificities Spécificités Spezifikationen
42 088 713	-20 °C to • à • bis +80 °C	* O-rings item 412.1 ; 412.2 ; 412.3: Nitril
42 088 873	-40 °C to • à • bis +80 °C	* O-rings item 412.1 ; 412.2 ; 412.3: Nitril low temperature
42 088 874	-20 °C to • à • bis +120 °C	* O-rings item 412.1 ; 412.2 ; 412.3: Viton



Item*	Qty	Designation	Désignation	Benennung	Materials / Matériaux Werkstoffe	Dimensions (mm)
300.1	1	Upper bearing	Palier supérieur	oberes Lager	Acetal	
300.2	1	Lower bearing	Palier inférieur	unteres Lager	Stainless steel + PTFE	
314	1	Thrust washer	Rondelle butée	Anschlagscheibe	Stainless steel	
412.1*	1	O-ring	Joint torique	O-Ring	*	Ø 30,80 x 3,6
412.2*	1	O-ring	Joint torique	O-Ring	*	Ø 56,52 x 5,33
412.3*	2	Piston O-ring	Joint de piston	Kolbendichtung	*	Ø 135,89 x 6,99
412.4	2	O-ring	Joint torique	O-Ring	Nitril	Ø 15,50 x 3,53
412.5	2	O-ring	Joint torique	O-Ring	Nitril	Ø 142,47 x 3,53
412.6	2	O-ring	Joint torique	O-Ring	Nitril	Ø 12 x 1,5
412.7	2	O-ring	Joint torique	O-Ring	Nitril	Ø 13,6 x 2,7
486	2	Ball	Bille	Kugel	Stainless steel	
55-2	1	Friction washer	Rondelle de frottement	Unterlegscheibe	Acetal	
593	2	Piston bearing	Segment de piston	Kolbenring	Acetal	
560	1	Pin	Goupille		Stainless steel	
81-68.1	4	Piston guide	Patin	Gleitschuh	Acetal	
81-68.2	2	Piston guide	Patin	Gleitschuh	Acetal	
903	2	Plug	Bouchon	Verschlußschraube	Polyamide 6-6	
932	1	Spring retaining ring	Circlips	Sicherungsring	Stainless steel	

CODING CODIFICATION KODIERUNG	Temperature range Plage de température Temperatur	Specificities Spécificités Spezifikationen
42 088 714	-20 °C to • à • bis +80 °C	* O-rings item 412.1 ; 412.2 ; 412.3: Nitril
42 088 875	-40 °C to • à • bis +80 °C	* O-rings item 412.1 ; 412.2 ; 412.3: Nitril low temperature
42 088 876	-20 °C to • à • bis +120 °C	* O-rings item 412.1 ; 412.2 ; 412.3: Viton



Item*	Qty	Designation	Désignation	Benennung	Materials / Matériaux Werkstoffe	Dimensions (mm)
300.1	1	Upper bearing	Palier supérieur	oberes Lager	Acetal	
300.2	1	Lower bearing	Palier inférieur	unteres Lager	Stainless steel + PTFE	
314	1	Thrust washer	Rondelle butée	Anschlagscheibe	Stainless steel	
412.1*	1	O-ring	Joint torique	O-Ring	*	Ø 30,80 x 3,6
412.2*	1	O-ring	Joint torique	O-Ring	*	Ø 69,22 x 5,33
412.3*	2	Piston O-ring	Joint du piston	Kolbendichtung	*	Ø 177,17 x 6,99
412.4	2	O-ring	Joint torique	O-Ring	Nitril	Ø 15,50 x 3,53
412.5	2	O-ring	Joint torique	O-Ring	Nitril	Ø 183,75 x 3,53
412.6	2	O-ring	Joint torique	O-Ring	Nitril	Ø 12 x 1,5
412.7	2	O-ring	Joint torique	O-Ring	Nitril	Ø 13,6 x 2,7
486	2	Ball	Bille	Kugel	Stainless steel	
55-2	1	Friction washer	Rondelle de frottement	Unterlegscheibe	Acetal	
593	2	Piston bearing	Segment de piston	Kolbenring	Acetal	
560	1	Pin	Goupille	Kugel	Stainless steel	
81-68.1	4	Piston guide	Patin	Gleitschuh	Acetal	
81-68.2	2	Piston guide	Patin	Gleitschuh	Acetal	
903	2	Plug	Bouchon	Verschlußschraube	Polyamide 6-6	
932	1	Spring retaining ring	Circlips	Sicherungsring	Stainless steel	



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