

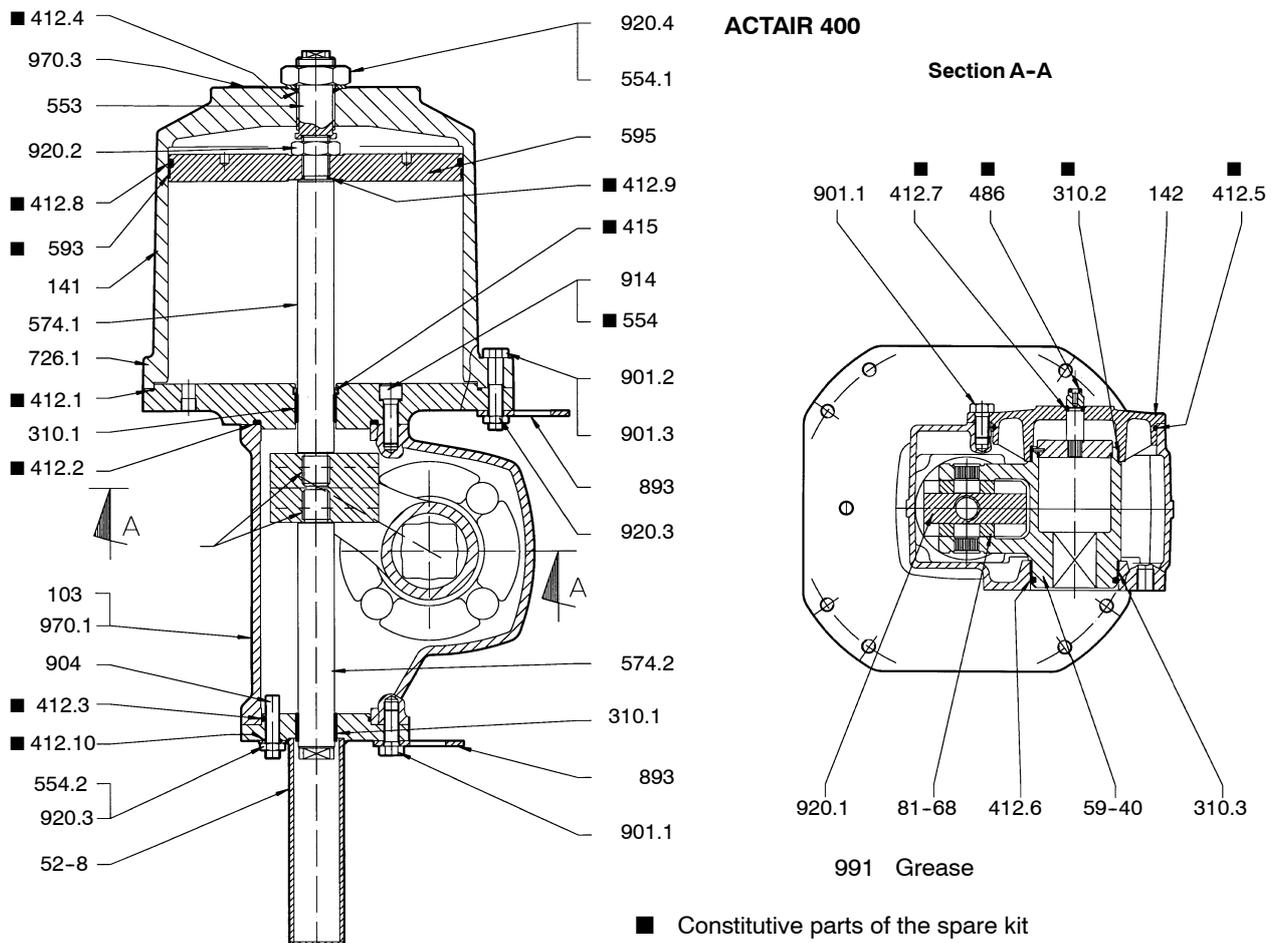


## INSTALLATION MAINTENANCE

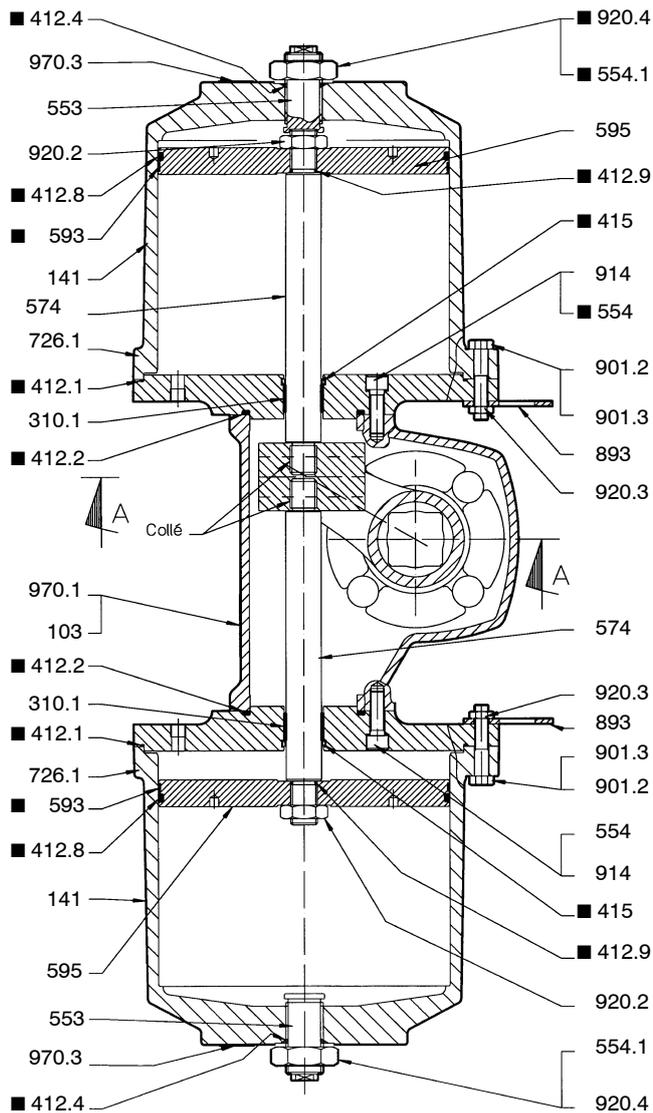
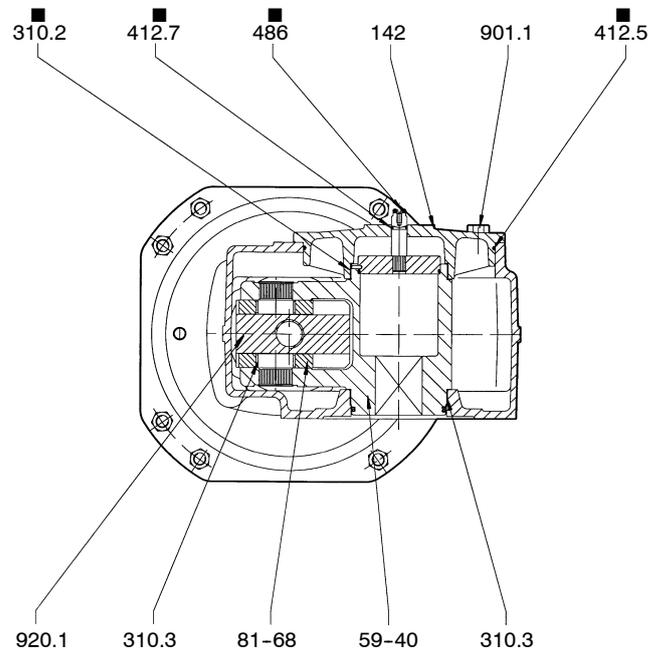
- **General over view**
- **Tooling**
- **Installation**
- **Adjustement of opening or closing adjustable end stops**
- **Actuator dysassembly**
- **Actuator re-assembly**
- **Trouble shooting**

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 400 to 1600.



Item	Designation	Item	Designation
52-8	Protection sleeve	553	Thrust
59-40	Chuck	554	Washer
81-68	Pressure pad	554.1	Washer
103	Gear casing	554.2	Plain washer
141	Cylinder	574.1	Rod
142	Cover	574.2	Rod
310.1	Self lubricating strip	593	Guiding strip
310.2	Bearing	595	Piston
310.3	Self lubricating strip	726.1	Guiding flange
412.1	O-ring	893	Support plate
412.2	O-Ring	901.1	Hexagon-head screw
412.3	O-Ring	901.2	Hexagon-head screw
412.4	O-Ring	901.3	Hexagon-head screw
412.5	O-Ring	904	Grub screw
412.6	O-Ring	914	Screw
412.7	O-Ring	920.1	Nut
412.8	O-Ring	920.2	Hexagon nut
412.9	O-Ring	920.3	Hexagon nut
412.10	O-Ring	920.4	Hexagon nut
415	Lip seal ring	970.1	Identity plate
486	Ball	970.3	Instructions label for stop
		991	Grease

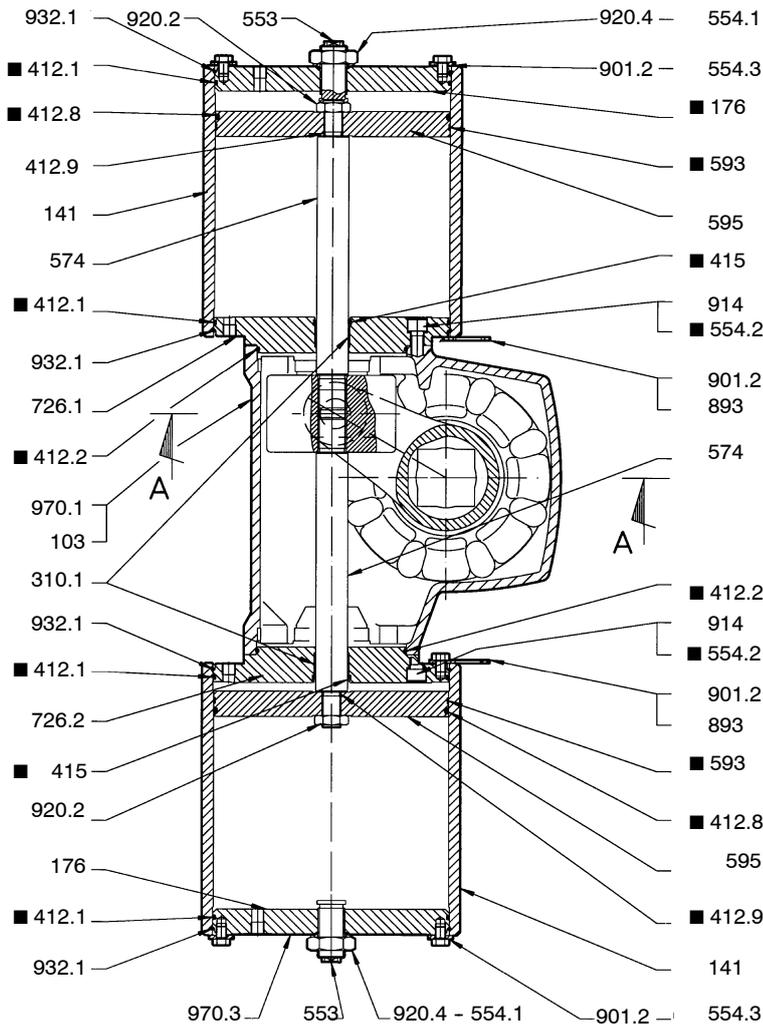

**ACTAIR 800**
**Section A-A**


991 ■ Grease

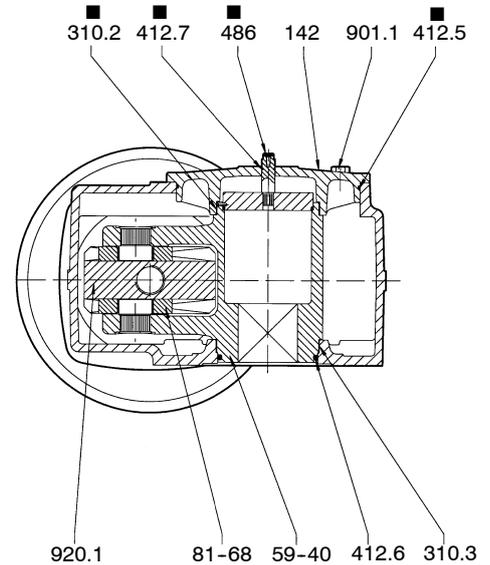
■ Constitutive parts of the spare kit

Item	Designation	Item	Designation
59-40	Chuck	554	Washer
81-68	Pressure pad	554.1	Washer
103	Gear casing	574	Rod
141	Cylinder	593	Guiding strip
142	Cover	595	Piston
310.1	Self lubricating strip	726.1	Guiding flange
310.2	Bearing	893	Support plate
310.3	Self lubricating strip	901.1	Hexagon-head screw
412.1	O-ring	901.2	Hexagon-head screw
412.2	O-ring	901.3	Hexagon-head screw
412.5	O-ring	914	Hexagon socket head screw
412.6	O-ring	920.1	Nut
412.7	O-ring	920.2	Nut
412.8	O-ring	920.3	Nut
412.9	O-ring	920.4	Nut
415	Lip seal ring	970.1	Identity plate
486	Ball	970.3	Instructions label for stop
553	Thrust	991	Grease

ACTAIR 1600



Section A-A



Item	Designation	Item	Designation
59-40	Chuck	553	Thrust insert
81-68	Pressure pad	554	Washer
103	Housing	554.1	Washer
141	Cylinder	574	Piston rod
142	Cover	593	Guiding strip
310.1	Self-lubricating bearing	595	Piston
310.2	Self-lubricating bearing	726.1	Flange
310.3	Self-lubricating bearing	726.2	Flange
412.1	O-ring	893	Soleplate
412.2	O-ring	901.1	Hexagon nut
412.5	O-ring	901.3	Hexagon nut
412.6	O-ring	914	Screw
412.7	O-ring	920.1	Nut
412.8	O-ring	920.2	Nut
412.9	O-ring	920.4	Nut
415	Leap seal ring	932.1	Retaining ring
486	Ball	970.1	Instructions label for stop
991	Grease	970.3	Identity plate

**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 :

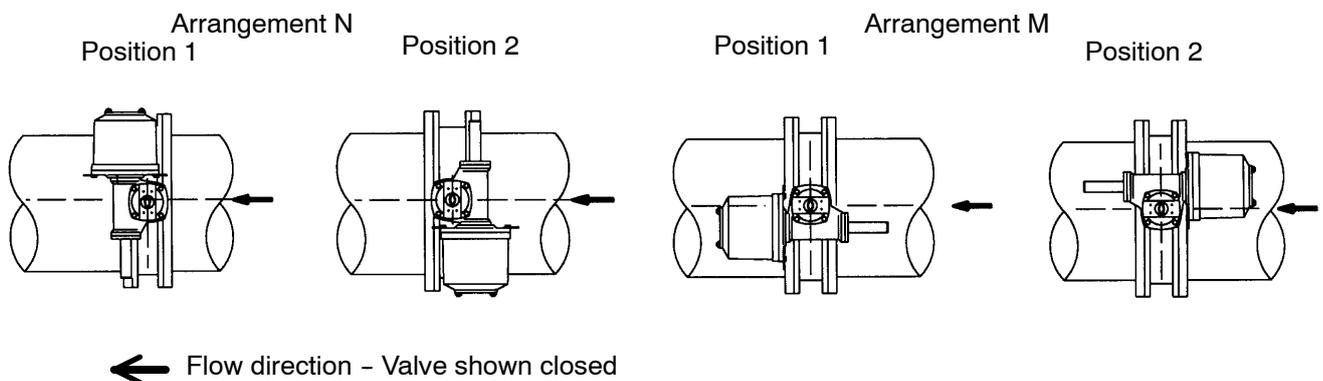
- interchangeable inserts manufactured to the size and the shape of the different valve shafts
- adaptor flanges for the coupling.

**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,
- Reconnect the actuator onto the valve at 90° of the initial position.

## ADJUSTMENT OF STANDARD CLOSING STOPS ( $\pm 2$ DEG.)

### 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, it is necessary to check the limit stops for correct adjustment.

Such adjustment may have to be retouched if need be by following the procedure below:

#### Adjustment to be performed on the coupled Valve + Actuator

- Bring the ACTAIR into Closed position and disconnect the air supply,
- Unlock the nuts 920,
- Adjust the stop screw 553 and ensure that the desired position is obtained by pressurizing the inner chamber (between the piston and the guide flange) then lock the stop screw 553 by means of the nut 920.

CAUTION: Take care not to damage the O-rings 412.4 during the adjustment steps.

#### CASE OF ACTAIR 800 and 1600:

**These actuators are also equipped with opening stops.**

Follow the same adjustment procedure as above to set the Opening stop.

## SPECIAL CASE: ACTUATOR WITH DECLUTCHABLE MANUAL OVERRIDE

### Adjustment to be performed on the coupled Valve + Declutchable manual override + Pneumatic Actuator

In automatic operation with control air, the whole unit must be stopped in position via the stops of the pneumatic actuator.

The adjustment sequence below must be strictly followed:

- Disconnect the air supply,
- Loosen by several turns (min. 4-5) the 2 adjustable stop screws on the disengageable reducer,
- Bring the actuator into its closed position and remove the control air supply,
- Loosen the nut 920 on the Closing stop,
- Set the stop screw 553 and ensure that the desired position is obtained by pressurizing the inner chamber (between the piston and the guide flange) then lock the stop screw 553 by means of the nut 920,
- Maintain the air pressure inside the actuator,
- Screw the Closing stop on the emergency control until it contacts the wheel then unscrew it by one quarter turn (1/4) and tighten its locknut,
- ACTAIR 400 : Bring the whole unit in Open position and maintain the air pressure inside the actuator,
- ACTAIR 800 and 1600 : Adjust the actuator's Opening stop
- Screw the Opening stop on the emergency control until it contacts the wheel then unscrew it by one quarter turn (1/4) and tighten its locknut,
- Check the whole unit for correct operation.

**ACTUATOR REMOVAL**

- First note the indicator's position and the actuator's mounting position on the valve.
- Disconnect the air supply.
- Uncouple the actuator and its accessories from the valve and place it on the work bench.
- Remove all the actuator's accessories
- If the unit has an indicator 629, remove the subunit comprised of the plug 916, screw 900 and indicator 629.

**REMOVAL ON CAP 142 SIDE**

Loosen the 4 screws 901.1

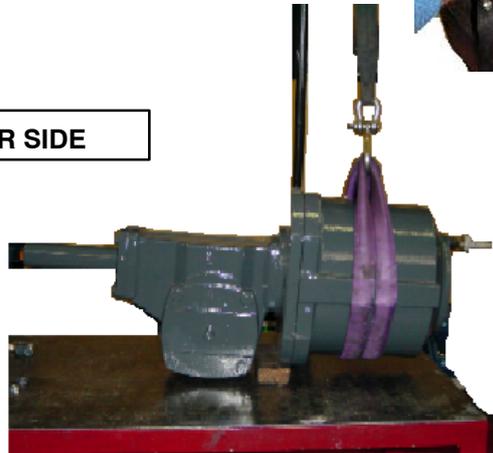


Remove the cap 142, O-ring 412.5, guide strip 310.2 and O-ring 412.7



**REMOVAL ON CYLINDER SIDE**

**ACTAIR 400**  
CYLINDER REMOVAL  
Sling the cylinder



- Unlock the nuts 920.3 diagonally and remove the screws 901.2 and the supporting plates 893.
- Remove the cylinder 141 taking care not to damage it.



- Unlock the nuts 920.4 taking care not to misadjust the stop screw 553.
- Then remove the washer 554.1 and O-ring 412.4.
- Remove the O-ring 412.8 and guide strip 593 from the piston.

NOTE: Some units are fitted with a metal foil inserted under the guide strip: this metal foil must be left in place when replacing the guide strip.

**SLEEVE REMOVAL:**

- Unlock the screw 901.1, remove the supporting plates 593 then remove the sleeve subunit 52.8 and remove its O-ring 412.3.



**ACTAIR 800 and 1600**

- Repeat the above steps to remove both cylinders.

**REMOVAL OF PISTON 595 to be performed only if the stem seal 415 is damaged and/or defective**

**ACTAIR 400**

- Unscrew the piston; if necessary heat slightly to break the adhesive film.
- The rotation of stem 574 must be blocked for the following steps to be performed correctly:  
CAUTION: Do not damage the stem's surface finish during this procedure.
- Loosen the nut 920.2.
- Remove the O-ring 412.9.
- Loosen the screw 914, remove the washers 554 and flange 726.1
- Remove the O-rings 412.1 and 412.2 and the lip seal 415.

**ACTAIR 800 and 1600**

Repeat the above steps to remove both cylinders.

**REMINDER OF ACTAIR CONFIGURATION**

ACTAIR 400

**Opening operation**

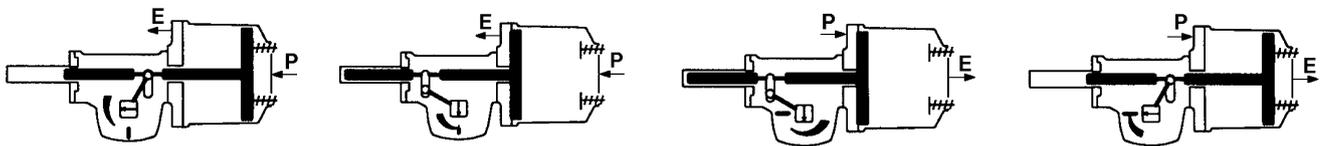
Actuator/Valve closed

Actuator/Valve open

**Closing operation**

Actuator/Valve open

Actuator/Valve closed

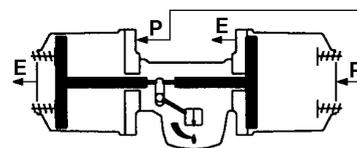
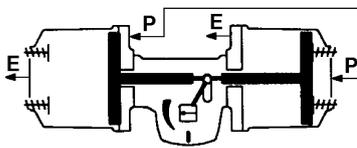


ACTAIR 800 and 1600

**Opening operation**

Actuator/Valve closed

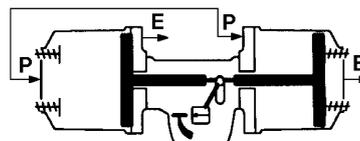
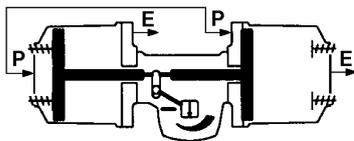
Actuator/Valve open



**Closing operation**

Actuator/Valve open

Actuator/Valve closed



**ACTUATOR REFITTING**

**PREPARATION OF THE PARTS**

All the items included in the spare parts kit must be used.

The O-rings and seals and the guide strips must be lubricated (used the grease specified under Consumables) or oiled prior to fitting.

**CAP REFITTING**

- Ensure that the cap is clean.
- Lubricate the housing of the guide strip 310.2 and insert the latter.
- Insert the O-ring 412.5 and lubricate it on the cap 142.



- Refit the O-ring 412.7..  
Lubricate it as well as the upper part of the control column.



Refit the cap with great caution.  
Take care not to damage the O-rings and the guide strip.  
If necessary, use a wooden hammer to finish the insertion and refit the 4 screws 901.1

### PISTON 592 REMOVAL

- On the flanges 726.1, refit the O-rings 412.2 and the lip seal 415 with the lips facing towards the piston and lubricate them.
- Lubricate the stem 574.1 (ACTAIR 400) or 574 (ACTAIR 800 and 1600).
- Slide the flange 726.1 onto the stem 574 taking care not to damage the lip seal 415.
- Insert the washers 554 and re-tighten the screws 914.
- Clean and degrease the threaded end of the stem 574.1 (ACTAIR 400) or 574 (ACTAIR 800 and 1600) to remove any adhesive residue.
- Replace the tool onto the stem.
- Screw the piston 595 until contact and coat the threaded portion of the stem 574.1 with Loctite 542 sealant or equivalent.
- Refit the degreased O-ring 412.9 d and re-tighten the nut 920.2 (maximum torque 60 Nm)
- Remove any excess adhesive. Allow to cure as instructed by the adhesive manufacturer.

### CYLINDER REMOVAL

#### ACTAIR 400 :

##### SLEEVE REMOVAL

- Lubricate the stem 574.2
- Place the O-ring 412.3 onto the sleeve 52.8.
- Mount the sleeve 52-8 on the housing via the supporting plates 893 and screws 901.1.



##### CYLINDER REMOVAL

- Sling the cylinder

- Insert the guide strip 593 and O-ring 412.8 onto the piston and lubricate them (if a metal foil is present, see page 8)
- Carefully clean the interior of the cylinder and lubricate it.
- Lubricate the stem 574.1 (ACTAIR 400) or 574 (ACTAIR 800 and 1600)



- Refit the cylinder with caution.
- Refit the screws 901.2, plates 893, and nuts 920.3, and tighten diagonally.
- On the stop screws 553, refit the O-rings 412.4 and washers 554.1 and tighten the nuts 920.4.

#### ACTAIR 800 and 1600

- Repeat the same steps for the 2nd cylinder.

- Connect the actuator to the control air network and check the actuator for correct operation (stroke, tightness) under 5 bar of control air pressure.

**COUPLING ONTO THE VALVE**

- Refit the indicator 629 and/or the accessories in their initial position on the actuator.
- Couple the actuator onto the valve in its initial position.
- Check the whole unit valve + pneumatic actuator - accessories for correct operation.
- If necessary readjust the limit stops: see Adjustment of standard closing stops.

**TROUBLE SHOOTING**

At cylinder heads 163	External leakage
Axial at pinion 877	
At plugs 903	
Non operation	
Incomplete operation or on stroke	
Irregular operation	
Reverse operation	
Disfonctionning 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 actuator choice	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

concerned

This leaflet is not contractual and may be amended without notice.

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