



**INSTALLATION**

**MAINTENANCE**

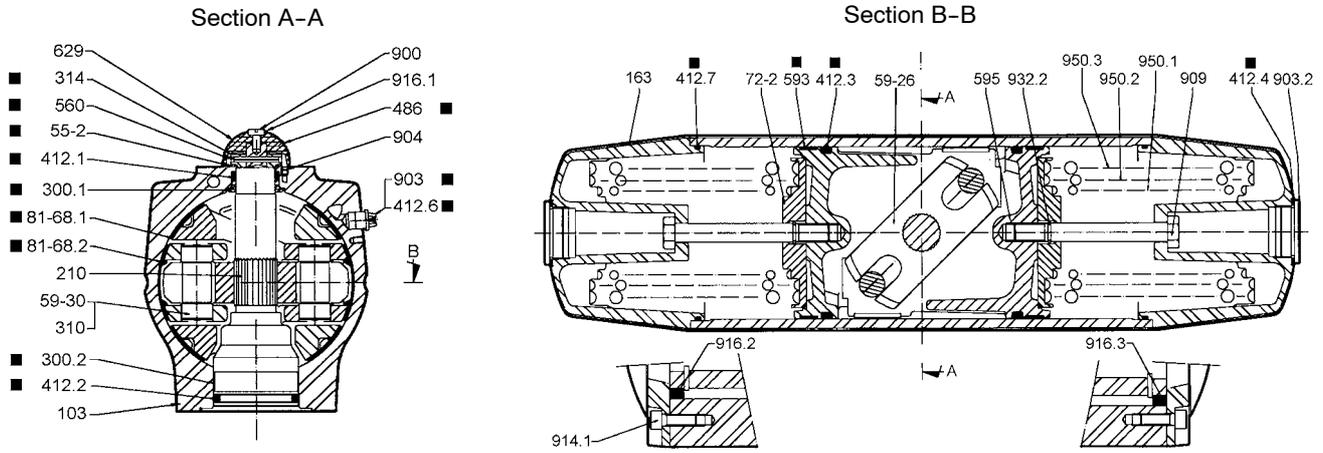
- **General over view**
- **Tooling**
- **Installation**
- **Adjustment of standard adjustable end stops**
- **Actuator disassembly**
- **Actuator re-assembly**
- **Trouble shooting**
- **Kits sheets**

<b>DYNACTAIR 50</b>	<b>Ref. 8519.8050-90</b>
<b>DYNACTAIR 100</b>	<b>Ref. 8519.8100-90</b>

**Nr. 42 057 225**

**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 DYNACTAIR 50 and 100 type .



991 ■ Grease

■ Spare parts of the kit

Item	Designation	Item	Designation
55-2	Friction washer	560	Ball
59-26	Scotch-yoke	593	Piston bearing
59-30	Roller	595	Piston
81-68.1	Piston guide	598	Energy accumulation sub-unit
81-68.2	Piston guide	629	Pointer
103	Housing	900	Cheese head screw
163	Cylinder head	903	Plug
210	Shaft	904	Socket screw
300.1	Upper bearing	909	Adjustable end stop
300.2	Lower bearing	914.1	Hexagon socket screw
310	Self lubricating bearing	916.1	Plug
314	Thrust washer	916.2	Cylindrical plug
412.1	O-ring	916.3	Triangular plug
412.2	O-ring	970.1	Identity plate
412.3	O-ring	991	Grease
412.4	O-ring		
412.6	O-ring		

**RECOMMENDED TOOLS (not supplied)**

- Pneumatic screwing machine
- Open ended spanner 8 and 10
- 2 screws M10 min. length 60mm(DYNACTAIR 50) and 2 screws M10 min. length 80mm (DYNACTAIR 100)
- 2 threaded rods M16 min. length 200
- 1 mallet

**CONSUMABLE**

- Grease EPEXELF MO2 (Elf) or RETINAX AM (Shell) or equivalent
- Glue 243 (Loctite) 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 :

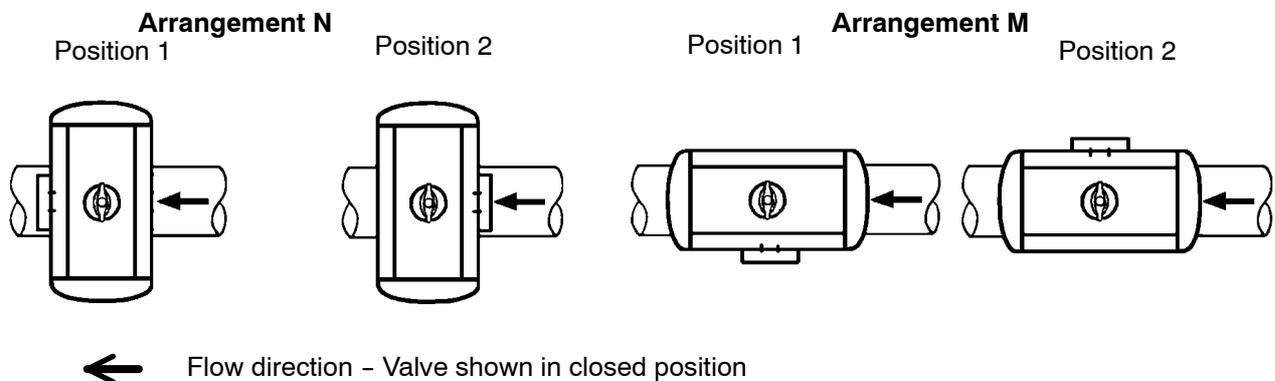
- interchangeable inserts manufactured to the size and the shape of the different valve shafts
- adaptor flanges for the coupling.

**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 at site following the procedure described below and 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 refit 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 ADJUSTABLE END STOPS ( $\pm 2^\circ$ )

### REMINDER :

DYNACTAIR in closure function by lack of control fluid are equipped with adjustable end stops only in closure.  
DYNACTAIR in opening function by lack of control fluid are equipped with adjustable end stops only in opening.  
(an **O** is engraved on the square of the driving shaft 210 of an actuator with adjustable end stops **on Open position**).

### Adjustable end stops are factory set and do not need further adjustment at site.

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.

### 1 - GENERAL

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

#### Adjustment to carry out on the complete unit: valve + actuator

- Unscrew the plugs 903.2 and remove the O-rings 412.4,
- Connect and let the actuator under pressure,
- Adjust the 2 adjustable end stop 909 at the same value, verifying the required position by disconnecting the air supply
  - Case of actuator on closure function : Unscrew the adjustable end stops to increase closure,
  - Case of actuator on opening function : Unscrew the adjustable end stops to decrease opening
- Warning : Great adjustment force of the screws.
- Check the correct operation of the unit.

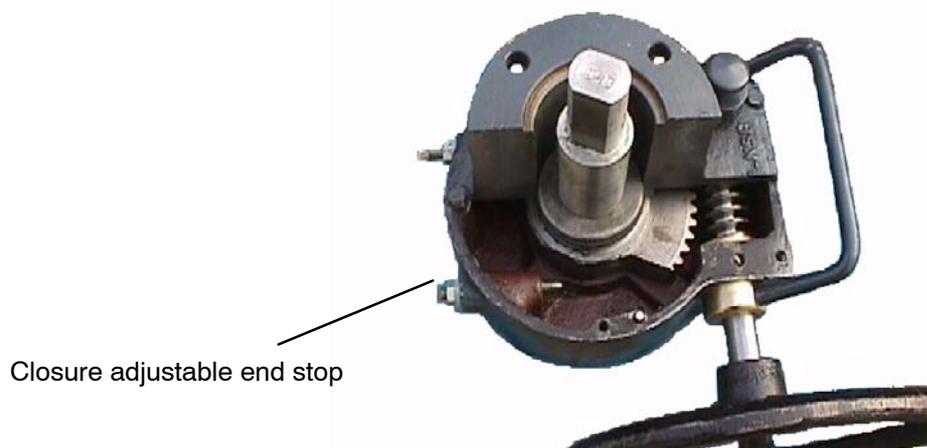
### SPECIFIC CASE : ACTUATOR EQUIPPED WITH A DECLUTCHABLE MANUAL OVERRIDE

#### Adjustment to carry out on the complete unit: valve + declutchable manual override + actuator

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

Mandatory chronological adjustment operation to be respected:

- Unscrew of several turns (4 to 5 turns) the two adjustable end stops of the declutchable manual override
- Unscrew the plugs 903 and remove the O-rings 412.4,
- Connect and let the actuator under pressure,
- Adjust the 2 adjustable end stop 909 with the same value, verifying the required position by disconnecting the air supply
  - Case of actuator on closure function : Unscrew the adjustable end stops to increase closure,
  - Case of actuator on opening function : Unscrew the adjustable end stops to decrease the opening
- Warning : Great adjustment force of the screws
- Disconnect the air pressure to the actuator
- Screw on the closing adjustable end stop of the manual override until contact with the wheel, then unscrew 1/4 turn and lock the nut
- Put the unit in open position and let the actuator under pressure
- Screw the opening adjustable end stops of the manual override until contact with the wheel, then unscrew 1/4 turn and lock the nut

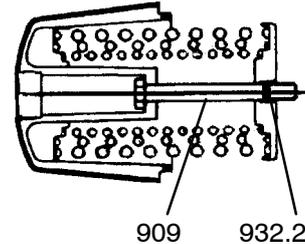


- Check the correct operation of the unit

**ACTUATOR DISASSEMBLY**

- Identify both the pointer and the mounting position of the actuator onto the valve.
- Disconnect the air supply
- Remove the actuator and accessories from the valve and place on a work bench
- Disconnect all accessories of the actuator
- If the actuator has a pointer 629, remove the plug 916.1, the screw 900 and the pointer 629.

**The sub-unit cylinder head + spring cartridge is a device mounted and made safe at the factory using an end stop 909 and a retaining ring 932.2. It is strictly prohibited for safety safe reasons to dismantle this sub-unit. Handle carefully this sub-unit. Keep it in a dry environment.**



- First, assemble one of the two cylinder heads 163
- Unscrew 2 of 4 screws 914.1 in diagonal and replace them by 2 safety screws longer (see paragraph recommended tools) keep these screws tightened until "remove the 4 screws" instruction.
  - DYNACTAIR 50 : Screw M10 min. length 60
  - DYNACTAIR 100 : Screw M10 min. length 80
  - these new screws will only be screwed of 5 threads
- Unscrew of 10 mm the last 2 screws 914.1
- Unscrew the plug 903.2 and remove the O-ring 412.4
- Unscrew the adjustable end stop 909 until the cylinder head 163 contacts the 2 screws 914.1
  - Warning: do not use a motorized screwing machine due to possible damage to the retaining ring 932.2.
- Renew these 2 previous operations till the cylinder head 163 initially rigid can move.
  - Warning: In this position, the sub-unit cylinder head + spring cartridge has reached in this secure prefitting position: no longer unscrew the adjustable end stop 909.
  - Should the operator be unable to free the cylinder head before having completely unscrewed the 2 remaining screws 914.1, he should immediatly stop work and imperatively contact KSB-AMRI.
- Remove the 4 screws
- Unscrew manually and remove the sub-unit cylinder head + spring cartridge and the O-ring of the cylinder head 412.7
- Dismantle the second sub-unit cylinder head + springs cartridge following the same procedure as previously described.
- Put the actuator, shaft 210 in horizontal position

Before the next sequence :

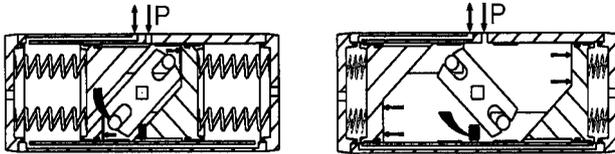
Note the angular position P1 of shaft 210 when pistons 595 are not in movement

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

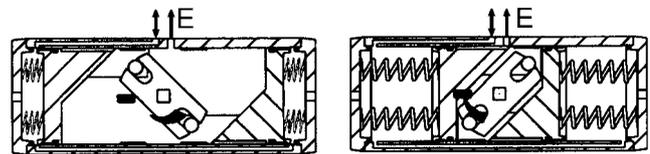
Two functions are possible in accordance with figures below :

**Closing function by lack of control fluid / Adjustable end stop on closing function**

Opening operation under fluid pressure  
Actuator/Valve closed      Actuator/Valve open

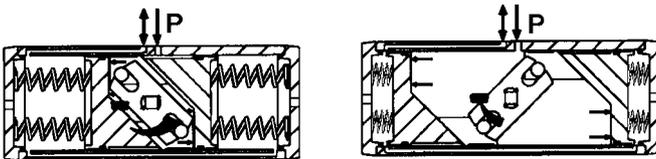


Closing operation under spring action  
Actuator/Valve open      Actuator/Valve closed

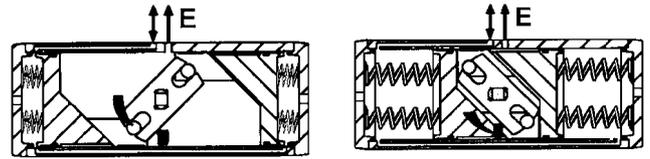


**Opening function by lack of control fluid / Adjustable end stop on opening function**

Closing operation under fluid pressure  
Actuator/Valve closed      Actuator/Valve open



Opening operation under spring action  
Actuator/Valve open      Actuator/Valve closed



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

Before the next sequence :

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

**WARNING :** When extracting 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, bearings and piston guides must be lubricated with grease defined in paragraph : consummable).

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

This year appears on the actuator identity plate.

- Lubricate the housing cylinder 103

- Mount pistons 595,  
O-rings 412.3,  
piston guide 81.68.1 and  
piston bearings 593  
.. then lubricate these parts



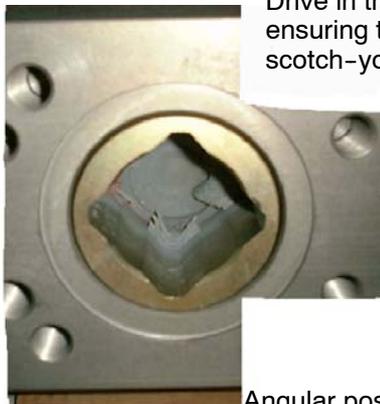
- Fit on the shaft 210, O-ring 412.2.  
The lower bearing 300.2 will be fitted  
when assembly is fitted in housing.

- Fit the O-rings 412.7 on the cylinder heads 163.

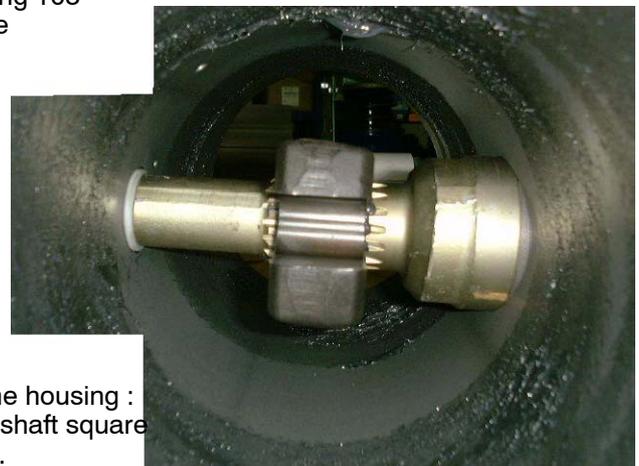
- Place the housing face down visualisation side, grease the interior of the housing then fit the O-ring 412.1 and the upper bearing 300.1 in the housing 103.



Position and at the same time, hold the lower bearing 300.2 on shaft 210 when inserting the scotch-yoke 59-26 with its index towards valve connection side



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



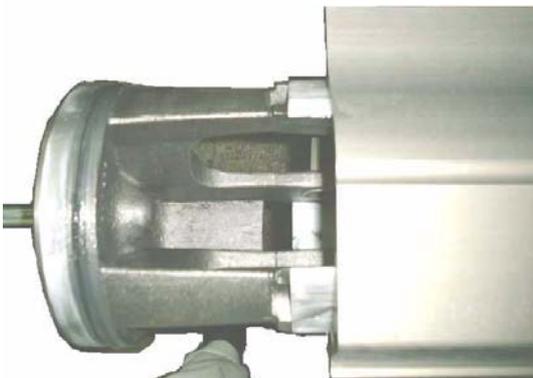
Angular position of the scotch-yoke in the housing : scotch-yoke parallel to the housing and shaft square at 45° in accordance with these pictures.

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



**INSTALLATION OF PISTONS**

- Orientate shaft 210 towards P1 position as indexed during disassembly.
- Fitting direction of pistons shall be the same as those indexed during disassembly (position2)
- Insert rollers 59-30 on the pistons
- Insert pistons complete with roller using a M16 threaded rod



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



- Put in place the spring cartridge sub-unit

- Put the O-ring 412.7 on the cylinder head and lubricate.



- Smear on the ends adjustable of the stops 909 with Loctite glue (see paragraph consummable)

- Insert carefully the sub-unit cylinder head + spring cartridge in the housing till contact.
- Screw the adjustable end stop 909 in the threaded hole of the piston 595 rotating manually the sub-unit cylinder head + spring cartridge in clockwise direction until the O-ring is located at the beginning of the housing.



- Screw the 4 screws 914.1 progressively and in diagonal

- Repeat these operations for the second cartridge.
- Proceed to an opening and closing operation opening and closing to check the correct movement of the actuator (stroke - tightness)
- Set the adjustable end stops of the actuator in accordance with the paragraph adjustment of standard adjustable end stops.



- Put in place the O-ring 412.4 and the plug 903 on each cylinder head.

#### CONNECTION ONTO THE VALVE

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

## TROUBLE SHOOTING

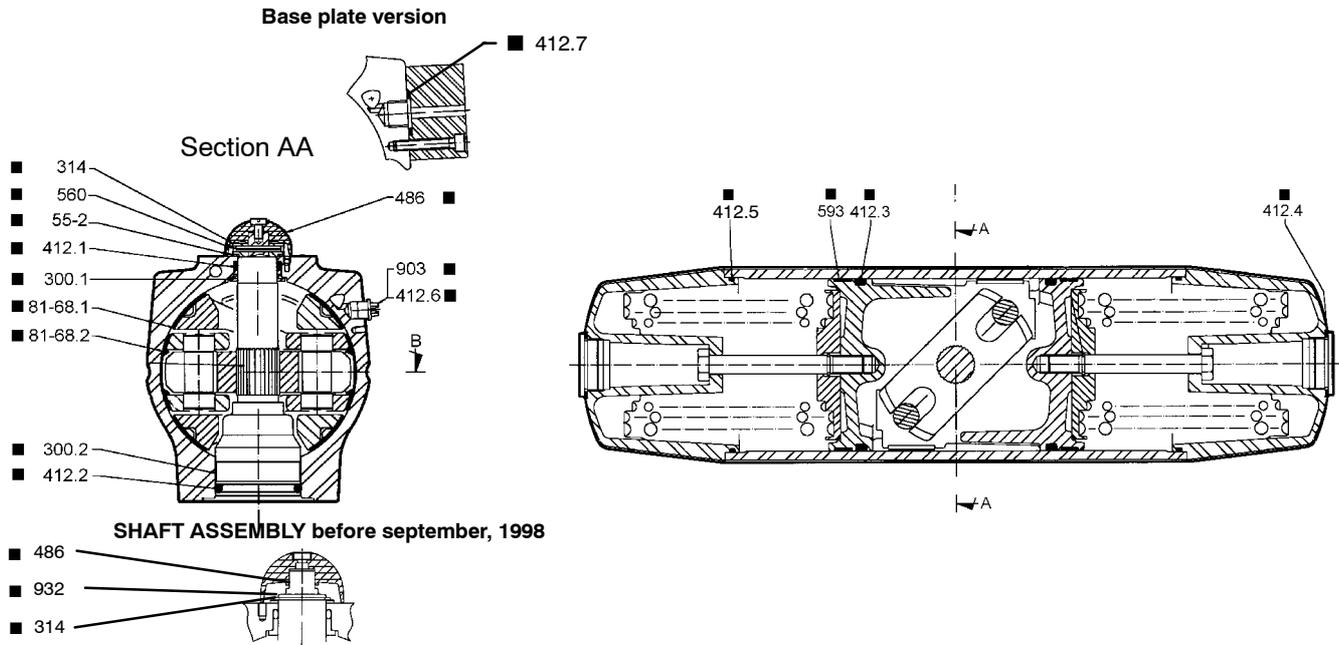
At cylinder heads 163	External leakage
Axial at piston 595	
At plugs 903	
Non operation	
Incomplete operation or on stroke	
Irregular operation	
Reverse operation	
Disfunctioning of the actuator	
Reverse or incorrect indication	
Connection not possible, valve side	
Connection not possible, accessories 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 selection	Consult technical leaflet Nr 8511. Consult the technical leaflet of the valve
Declutchable manual override	Disconnect the air supply Clutch in 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 positioning 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 Nr8511 or contact the manufacturer
Air flow too low	Check solenoid, restrictors, pressure, connections and passage section of the air supply
Closed actuator / Valve open or Closed valve / Actuator open	Put valve and actuator in the same position
Inverted pneumatic connections	Check the pneumatic connection
Wrong definition of the solenoid	Check solenoid definition
Wrong assembly of the actuator onto the actuator	Check arrangement positions on DYNACTAIR technical leaflet Nr 8511
Loss of 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 DYNACTAIR and AMTRONIC
Wrong adjustment of limit switch cams	Check the adjustment according to the technical leaflet AMTRONIC Nr 2316
Control and remote indication non compatible	Check accessories technical leaflet

concerned

**KITS SHEETS**

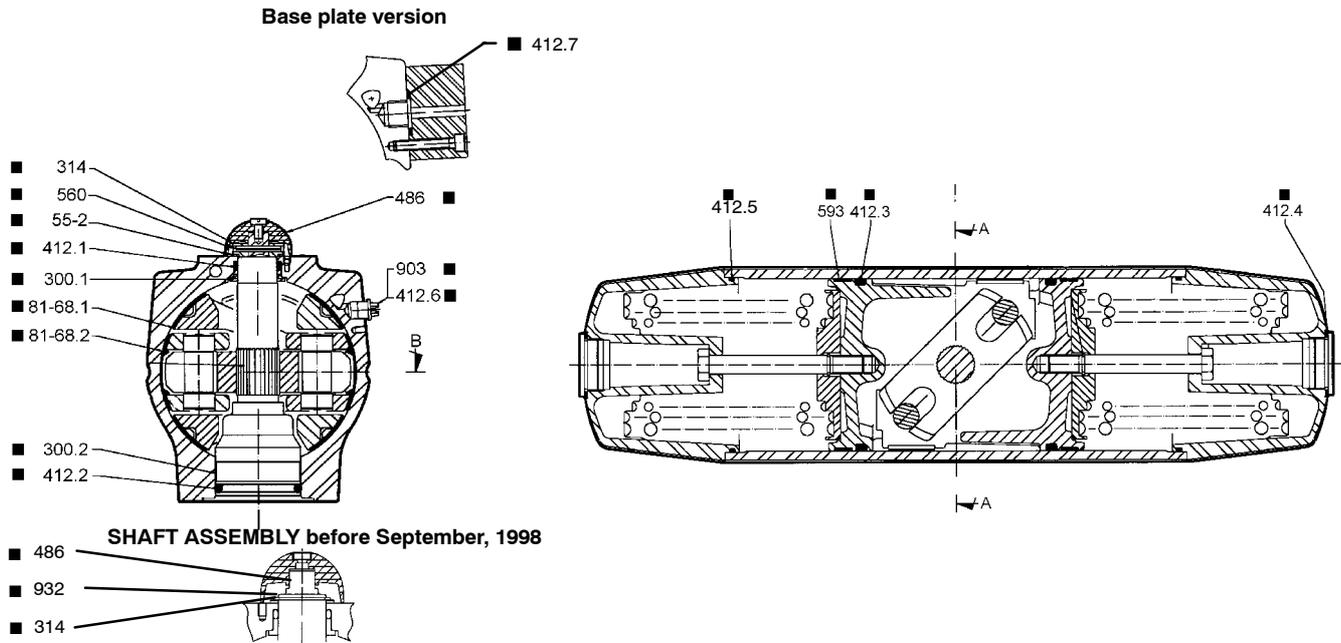
<b>DYNACTAIR 50</b>	Ref. 8519.8050-90
<b>DYNACTAIR 100</b>	Ref. 8519.8100-90

CODING CODIFICATION KODIERUNG	Temperature range Plage de température Temperatur	Specificities Spécificités Spezifikationen
42 088 719	-20 °C to • à • bis +80 °C	* O-rings item 412.1 ; 412.2 ; 412.3: Nitril
42 088 885	-40 °C to • à • bis +80 °C	* O-rings item 412.1 ; 412.2 ; 412.3: Nitril low temperature
42 088 886	-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 41,50 x 3
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	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	

CODING CODIFICATION KODIERUNG	Temperature range Plage de température Temperatur	Specificities Spécificités Spezifikationen
42 088 720	-20 °C to • à • bis +80 °C	* O-rings item 412.1 ; 412.2 ; 412.3: Nitril
42 088 887	-40 °C to • à • bis +80 °C	* O-rings item 412.1 ; 412.2 ; 412.3: Nitril low temperature
42 088 888	-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 de piston	Kolbendichtung	*	Ø 177,17 x 6,99
412.4	2	O-ring	Joint torique	O-Ring	Nitril	Ø 41,50 x 3
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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