



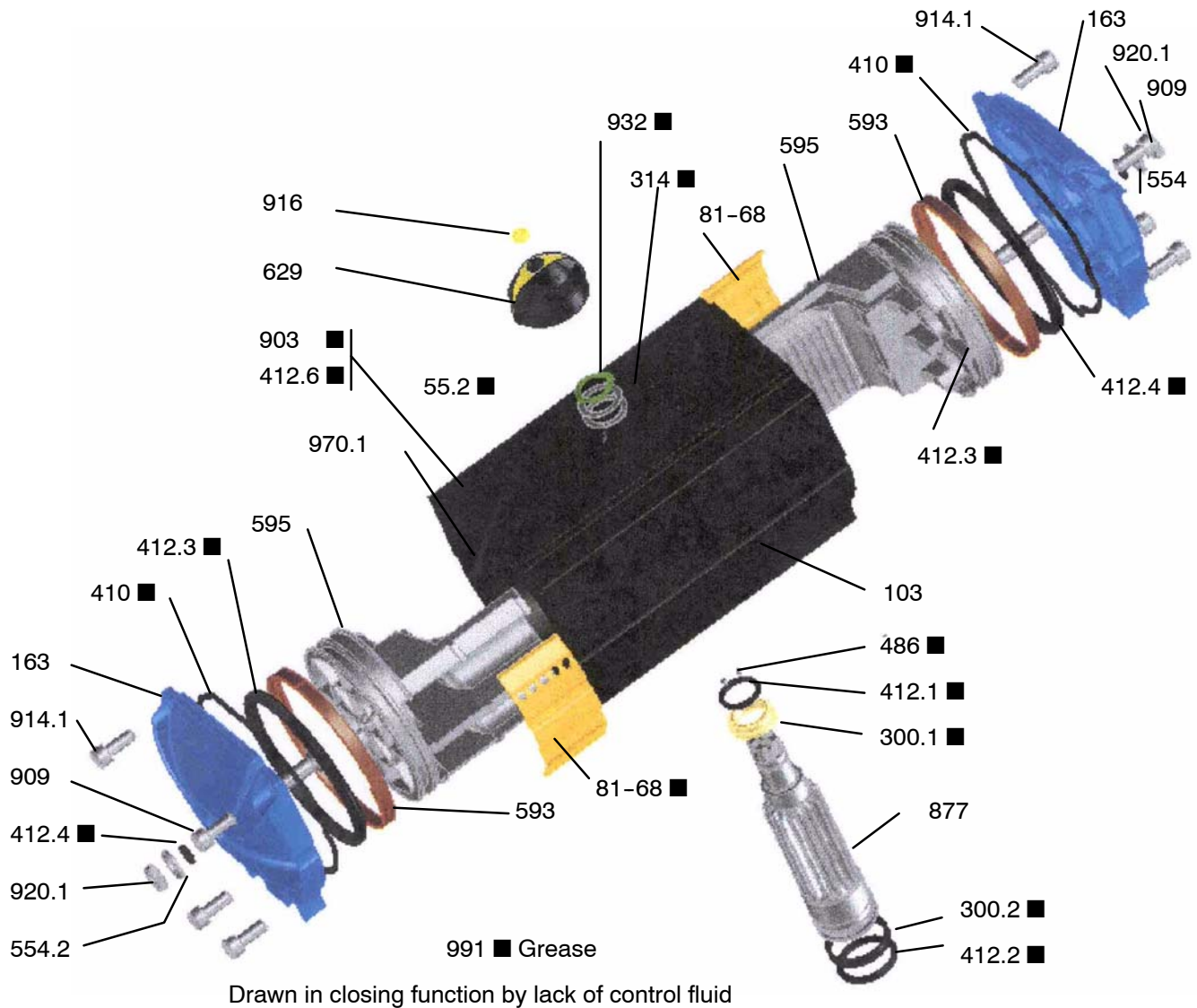
INSTALLATION
MAINTENANCE

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

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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 1.5 to 50 type.



Item	Designation	Item	Designation
55-2	Friction washer	554	Washer
81-68	Piston guide	593	Piston bearing
103	Housing	595	Piston
163	Housing	598	Precompressed spring cartridge
300.1	Upper bearing	629	Pointer
300.2	Lower bearing	877	Pinion
314	Thrust washer	903	Plug
410	Cylinder head gasket	909	Adjustable end stop
412.1	O-Ring	914.1	Hexagon socket head screw
412.2	O-Ring	916	Plug
412.3	O-Ring	920.1	Hexagonal nut
412.4	O-Ring	932	Spring retaining spring
412.6	O-Ring	970.1	Identity plate
486	Ball	991	Grease

RECOMMENDED TOOLS (not supplied)

- Pneumatic screwing machine
- Open ended spanner 16
- Allen key 4 and 5
- Clamp spring retaining ring

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 pinion

ADAPTATION

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

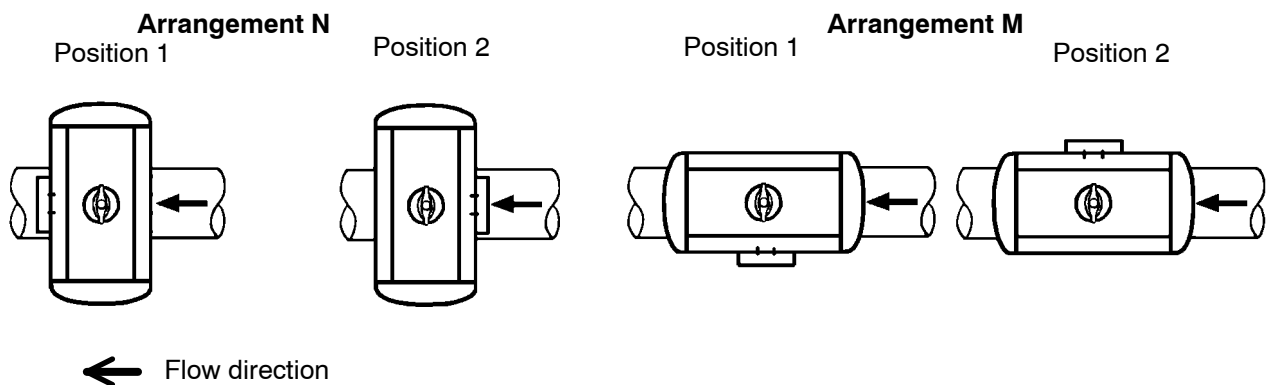
- interchangeable inserts manufactured to size and the shape of the different valve shafts
- adaptor flanges for the coupling.

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 following the procedure below adhering to the specific assembly operations in accordance with the maintenance procedure.

TRANSFORMATION Arrangement N ↔ Arrangement M

- Disconnect the actuator from the valve,
- Remove 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,
- Remove the insert of the pinion, make 90° turn and re-insert in the pinion,
- 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 stopsonly 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 driving shaft of pinion 877 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.

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

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

- Disconnect the air supply,
- Unlock the nuts 920,
- Unscrew one of the two adjustable end stops 909 of several turns and tight the nut.
- Pressurize the chambers between the piston and the cylinder head gasket until compress lightly the spring cartridges,
- Adjust the other adjustable end stop 909, verifying the required position by disconnecting the air supply, then lock the screw 909 with nut 920. (Springs are in "action" while these operations).
- Adjust the first adjustable end stop 909 until contact is made with the piston 595, then lock its nut 920.
In the same way, pinion 877 must not be put in rotation.
- Check the correct operation of the unit.

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



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 on pneumatic actuator adjustable end stops.

Mandatory chronological adjustment operation to be respected:

- 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 stop 909 of several turns and lock its nut
- Pressurize the chambers between the piston and the cylinder head gasket until compress lightly the spring cartridges,
- Adjust the other adjustable end stop 909, verifying the required position by disconnecting the air supply, then lock the screw 909 with nut 920. (Springs are in "action" while these operations).
- Adjust the first adjustable end stop 909 until contact is made with the piston 595, then lock its nut 920.
In the same way, pinion 877 must not be put in rotation.
- Screw the closing adjustable end stop of the manual override until contact with the wheel, then unscrew 1/2 turn and lock its nut,
- Operate the actuator under air supply and let the actuator under pressure. Screw the Opening adjustable end stop of the manual override until contact with the wheel, then unscrew 1/2 turn and lock its 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 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 and a plug 916, remove them
- Remove cylinder heads 163
- Extract cylinder head gaskets 410
- Remove nuts 920, washers 554 and O-rings 412.4 of the cylinders heads 163

Before the next sequence :

Note the angular position P1 of pinion 877 when pistons 595 are not in movement

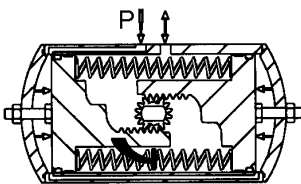
In the same way, note P2 position of the piston teeth 595 compared to the pinion 877.

Two functions are possible in accordance with figures below.

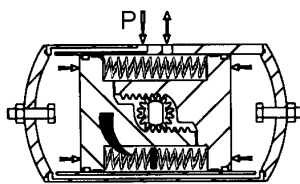
Closure function by lack of control fluid - Adjustable end stop on closing position

Opening operation under fluid pressure

Actuator / Valve closed

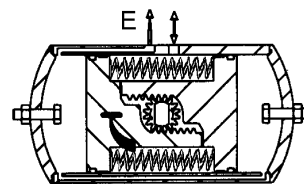


Actuator / Valve open

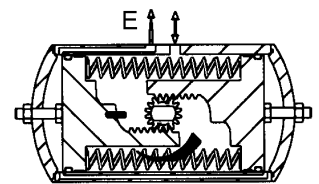


Closing operation under springs action

Actuator/ Valve open



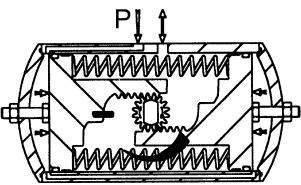
Actuator / Valve closed



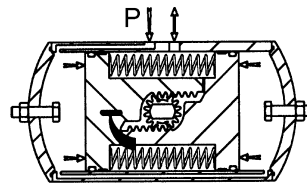
Opening function by lack of control fluid - Adjustable end stop on opening position

Closing operation under fluid pressure

Actuator/Valve open

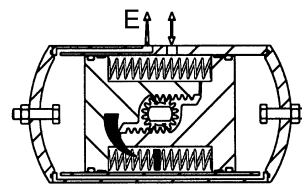


Actuator/Valve closed

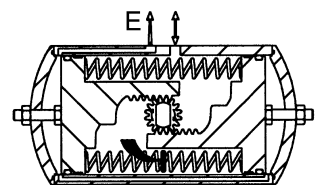


Opening operation under springs action

Actuator/Valve closed



Actuator/Valve open



During the operation under control fluid pressure, the holding is only achieved by the pressure in the chambers.

- Extract pistons 595 out of housing 103 operating the driving square of pinion 877 using a wrench size 16
- Disengage the sub-units spring cartridge out of the pistons 595 notifying its configuration (see page 7)

WARNING :

- Never do not dismantle the sub-unit spring cartridges
- Touch carefully the sub-unit spring cartridges
- Keep them in a dry environment
- Remove piston guide 81-68, piston bearing 593 and O-rings 412.3 of the pistons 595
- Remove spring retaining ring 932, thrust washer 314 and friction washer 55-2
- Extract pinion 877
- Extract bearings 300.1 and 300.2, O-rings 412.1 and 412.2 of the pinion 877

ACTUATOR RE-ASSEMBLY

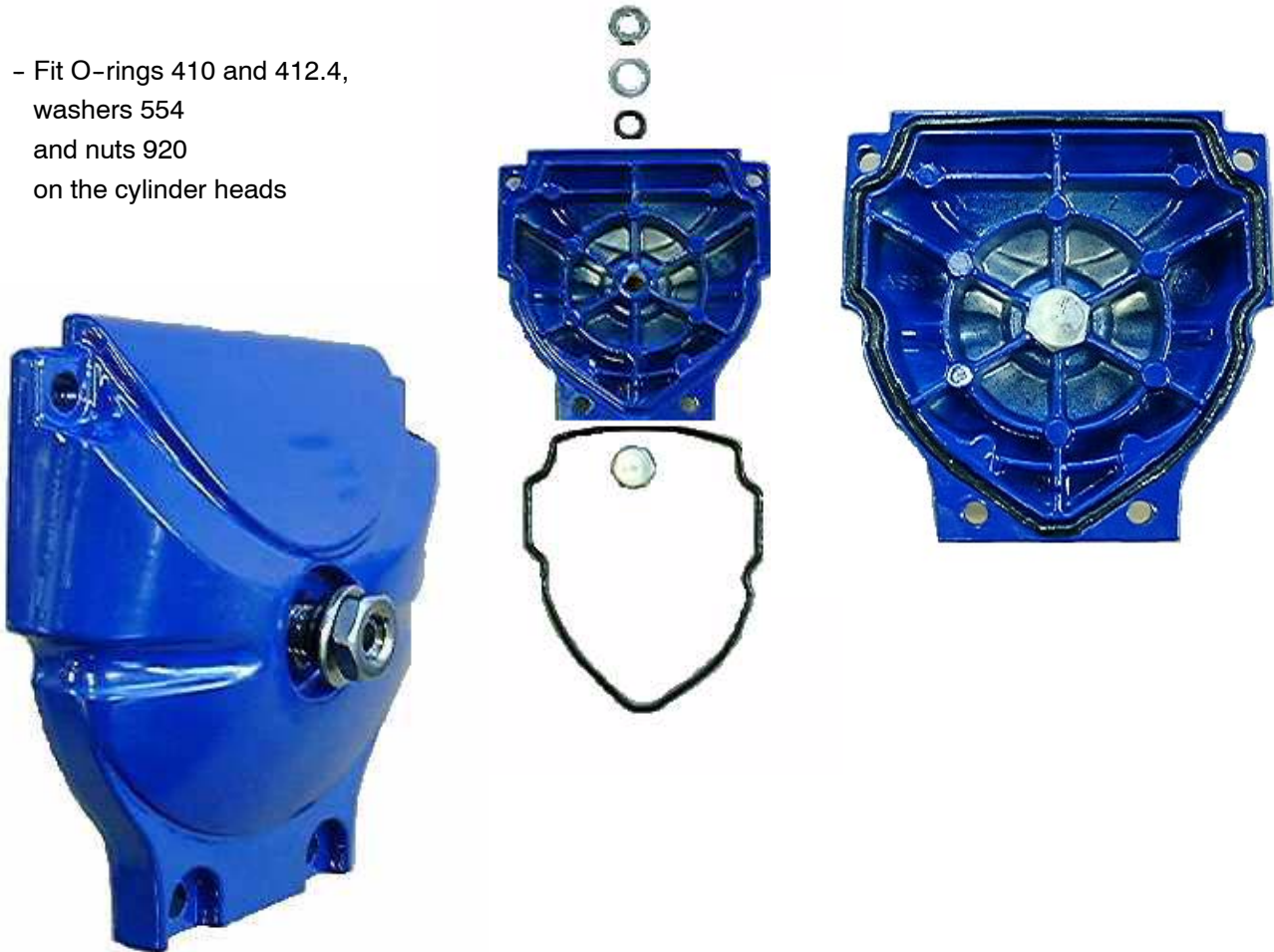
PREPARATION OF PARTS

All constitutive parts of the spare kits must be used.

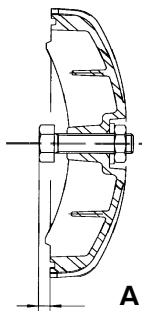
O-rings, bearings and piston guide must be lubricated with grease defined in the paragraph: consummables.

WARNING : DO NOT GREASE THE GROOVE OF THE SPRING RETAINING RING ON THE PINION

- Fit O-rings 410 and 412.4,
washers 554
and nuts 920
on the cylinder heads



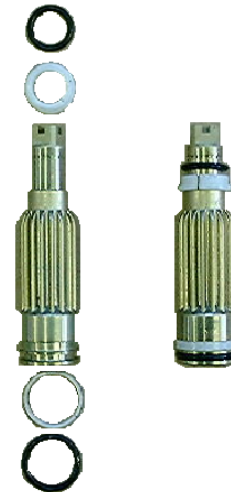
The standard position of the adjustable end stop is as below :



A Position dimension
of the adjustable end stop 909

ACTUATOR	A (mm)
DYNACTAIR 1,5	15,1
DYNACTAIR 3	11,5
DYNACTAIR 6	4,9
DYNACTAIR 12	17,3
DYNACTAIR 25	8,2

Fit O-ring 412.2, lower bearing 300.2, upper bearing 300.1 and O-ring 412.1 on the pinion 877.
Grease the pinion teeth

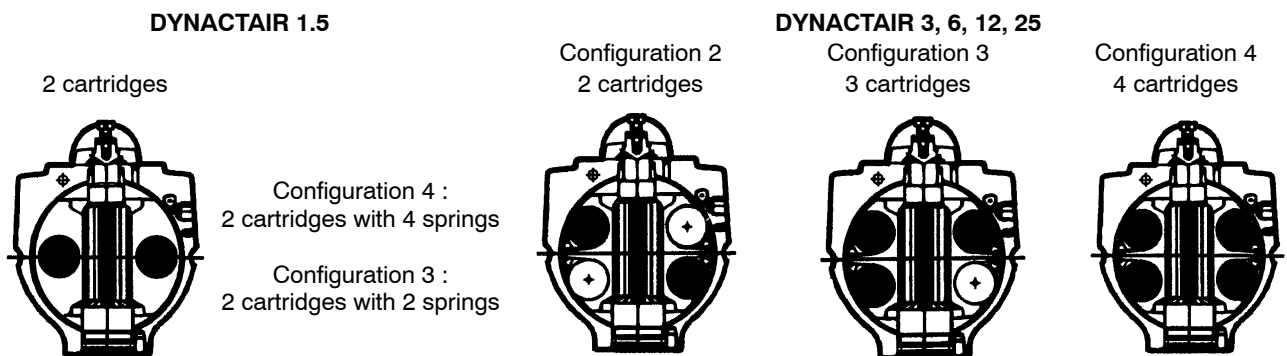


Fit O-rings 412.3, piston guide 81.68 and piston bearings 593 on the piston 595.
Grease the piston teeth.



Insert the sub-unit spring cartridge at the interior of the pistons following its initial configuration.

Configuration of the energy accumulator



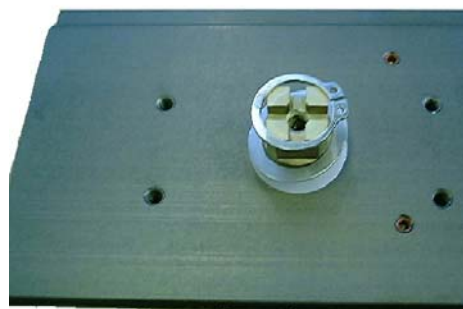
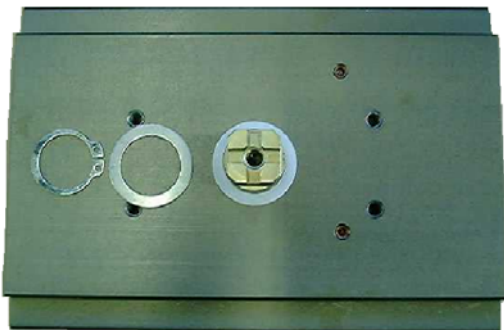
RE-ASSEMBLY

Strictly follow the order of operations

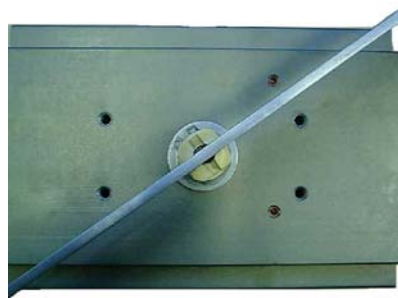
- Grease the cylinder of the housing 103 using a brush or any other appropriate method
- Fit the pinion sub-unit



- Put in place the lubricated friction washer 55-2, the thrust washer 314 and the spring retaining ring 932.
- WARNING : THE SPRING RETAINING RING MUST BE FITTED FLAT FACE TOWARDS THE UPPER SQUARE OF THE PINION AND SHOULD NOT TOO OPENED SINCE IT MADE BE DEFORMED.**



- Orientate the pinion 877 using size 16 spanner in position P1 already noted during the disassembly.
In case of problem, refer to drawing there after



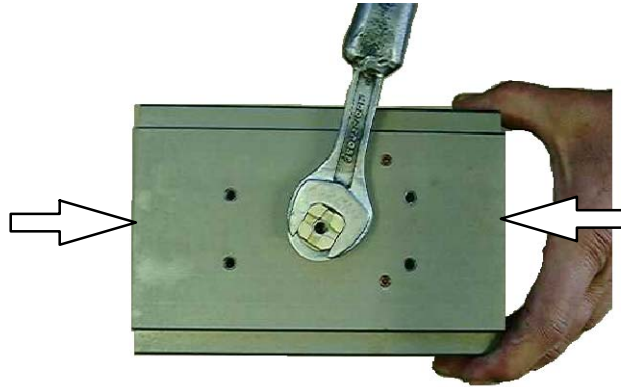
- Insert piston sub-units in the housing 103 in the same position P2, already noted during the disassembly.
In case of problem, refer to drawings

Position of pinion teeth 877 and pistons 595 must be as follows



Drawn adjustable end stop in closing position

- Drive the pistons in the housing operating the pinion 877 with size 16 spanner, and pushing manually on the pistons.



- Check that the 2 pistons 595 are equally inserted in housing 103 and the pinion square 877 shows the correct position on opened - closed position.
Using a spanner, check the correct operation of the assembly closed - open position.
- Refit the 2 sub-unit cylinder head on the housing 103 screwing alternatively and in diagonal the 4 screws for a regularly compressing of the spring cartridges.
- Check the good operation of the actuator (stroke, tightness).

CONNECTION ONTO THE VALVE

- Re-mount the pointer 629 and/or the 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 adjustable end stops

TROUBLE SHOOTING

At cylinder heads 163	External leakages
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	
Connection not possible, valve side	
Connection not possible, accessories side	
Damaged O-rings 412.1 and 410	Change O-rings 412.1 and 410
Damaged O-rings 412.3 and 412.2	Change O-Rings 412.3 and 412.2
Damaged plugs 903 and O-rings 412.6	Change plug 903 and O-ring 412.6
Absence or insufficient pressure	Check solenoïd, restrictors, pressure, connections
Blocked valve	Check the valve and/or the interface with the pipe
Internal leakages	Change O-rings 412.4
External leakage	See external leakages
Rupture of internal components	Consult the manufacturer for technical advices
Wrong applicabilities	Consult technical leaflet Nr 8515 Consult 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 DYNACTAIR Nr. 8511 or contact the manufacturer
Air flow too low	Check solenoïd, restrictors, pressure, connexions and passage section of the air supply
Closed actuator / Opened actuator or Closed actuator	Put valve and actuator in the same position
Inverted pneumatic connections	Check the pneumatic connection
Wrong definiton of the solenoïd	Check solenoïds defintion
Wrong assembly of the actuator onto the actuator	Check arrangement positions on the DYNACTAIR technical leaflet Nr.8511
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 external or internal 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



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