

A-2-H Actuator Positioners

Service Information



The A-2-H Actuator Positioner is a pneumatic positioner used where accuracy is required and when the device to be operated has low-force characteristics. Typical applications are positioning the butterfly valve of carburetors and the control arm of diesel engine governors.



WARNING: INSTALLATION AND MOUNTING

The user of these devices must conform to all applicable electrical, mechanical, piping and other codes in the installation, operation or repair of these devices.

INSTALLATION! Do not attempt to install, operate or repair these devices without proper training in the technique of working on pneumatic or hydraulic systems and devices, unless under trained supervision.

Compressed air and hydraulic systems contain high levels of stored energy. Do not attempt to connect, disconnect or repair these products when a system is under pressure. Always exhaust or drain the pressure from a system before performing any service work. Failure to do so can result in serious personal injury.

MOUNTING! Devices should be mounted and positioned in such a manner that they cannot be accidentally operated.

INSTALLATION and ADJUSTMENT

Mount the positioner firmly to the engine frame to prevent relative motion between the operating lever and the engine control arm. The positioner should be installed with its operating lever in the same plane as the engine control arm. Avoid interference with the connecting link which could cause friction and inaccuracy. Adjustable clevis and ball joint lever attachments are available.

Full travel range of the positioner should be utilized and the end travel of the lever attachment and the engine control arm must match. The lever with attachment is adjustable in length from 3 $\frac{3}{4}$ inches to 4 $\frac{1}{2}$ inches (95mm to 114mm), which alters the end travel from 1 $\frac{7}{8}$ inches to 2 $\frac{1}{4}$ inches (48mm to 57mm). For decreased lever travel, loosen jam nut (100) and screw the attachment farther into the operating lever. Tighten the jam nut to secure this position. Lever travel can be increased by unscrewing the attachment and then tightening the jam nut.

If the end travel of the engine control arm exceeds the maximum adjustment of the operating lever, the normal procedure is to drill a hole in the control arm at a point which has a travel range of two inches. Fasten the connecting link to the new hole and readjust the end travel of the control arm and operating lever to match.

As assembled, the adjustable elements of the positioner are matched to provide zero lever travel with indicated preload pressure (usually 10 psi or 0.7 bar), and maximum lever travel with rated top pressure (usually 60 psi or 4.1 bar).

The push rod travel is factory-set to correspond to rated top pressure. If the top pressure of the control valve is greater or less than that of the positioner, the travel of the control valve handle can be made to match the travel of the operating lever by using the push rod travel adjusting screw (15).

Two or more positioners can be matched to provide the same movement for a given change in air pressure. They can also be deliberately mismatched to provide different lever travel to compensate for inequalities in operating characteristics of the controlled device. If necessary to adjust for incorrect initial pressure, remove or add shims (9 and 10) as

OPERATION

The Positioner has a usual pressure range of 10 to 60 psi (0.7 to 4.1 bar) within a temperature range of -40°F to 165°F (-40° C to 74°C). Pressure is supplied by a pressure control valve such as the Rexroth CONTROLAIR® Valve or FLEXAIR® Valve. The pressure imposed on the diaphragm (6) is proportional to the handle travel of the control valve. The movement of the positioner operating lever (14) is also proportional to this movement. Finally, the position of the controlled device is proportional to the handle travel of the control valve.

When supply pressure is reduced, the force of the spring (8) against the push rod and spring seat assembly (7) returns the lever to its new position corresponding to the value of air pressure remaining. Supply pressure of 10 psi (0.7 bar) usually provides idle position with 60 psi (4.1 bar) usually providing full travel or full fuel position.

MAINTENANCE

By removing only the cover (5), the diaphragm (6) can be quickly replaced without removing the positioner from its mounting or disturbing the piping connection.

When complete disassembly is required, clean all metal parts with a nonflammable solvent and wash all rubber parts with soap and water. Rinse thoroughly and blow dry with a low-pressure air jet. Replace those parts which are damaged or worn, giving particular attention to the condition of the diaphragm (6).

Reassemble the positioner using the exploded and assembly views as reference. No special tools are required. To maintain the same preload on the spring (8), shims (9 and 10) must be included. Apply Number 107 Lubriplate, or its equivalent, to all grease fittings.

CONVERSION AND REPAIR KITS

Conversion Kits are available for A-2-H Actuator Positioners of previous designs. If the body castings are still in good condition, these positioners should be converted to the current design at the earliest convenient maintenance period.

KIT Part Number R431005741 (Old Part Number P -061277-00000)

Will convert all A-2-H Actuator Positioners using lever Part Number 521100, prior to those listed in the Identity Schedule below.

REF.	QTY	DESCRIPTION
1	1	NUT, #10-32 Stop
2	1	BOLT, 1/4" Pivot
3	1	BEARING, 1/4" ID.
5	1	COVER, Diaphragm
6	1	DIAPHRAGM
7	1	PUSH ROD and SPRING SEAT ASSEMBLY, Complete
11	1	NUT, 1/4"-28 Stop
12	1	BOLT, 5/16" Pivot
13	1	BEARING, 5/16" ID.
14	1	LEVER

KIT PART NUMBER R431005999 (Old Part Number -062065-00000)

Will convert A-2-H Actuator Positioners listed as "Obsolete" in the Identity Schedule below to current design.

REF.	QTY	DESCRIPTION
5	1	COVER, Diaphragm
6	1	DIAPHRAGM
7	1	PUSH ROD and SPRING SEAT ASSEMBLY, Complete

IDENTITY SCHEDULE

PRESSURE RANGE	WITH ACCESSORIES PART		LESS ACCESSORIES		ACCY. KIT	
	New P/N	Old P/N	New P/N	Old P/N	New P/N	Old P/N
3-15	R431005217	P -059718-00011	R431005216	P -059718-00010	R431004143	P -057415-00000
10-60	R431004010	P -057159-00011	R431004009	P -057159-00010	R431004143	P -057415-00000
10-60	R431004011	P -057159-00012	--	--	R431004145	P -057416-00000
10-60	--	--	R431005745	*P -061289-00010	--	--
15-80	R431004529	P -058430-00011	R431004528	P -058430-00010	R431004143	P -057415-00000
35-90	R431003984	P -057086-00011	R431003983	P -057086-00010	R431004143	P -057415-00000

* Uses body (ref. 17a, page 3) with drain hole for mounting Positioner with lever in top position.

DESCRIPTION OF OPERATION

PARTS LIST

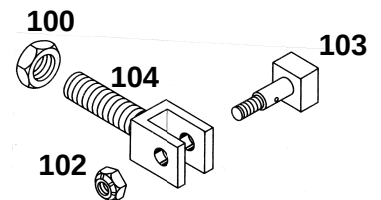
(In order of disassembly)

REF.	QTY	DESCRIPTION	NEW P/N	OLD P/N	NOTES
1	1	NUT, #10-32 Stop	See Repair Kits	See Repair Kits	
2	1	BOLT, 1/4" Pivot	See Repair Kits	See Repair Kits	
3	1	BEARING, 1/4" ID.	See Repair Kits	See Repair Kits	See note 1.
4	4	SCREW, 3/8"-16 x 1" Cap	R431002619	P -050235-00003	
5	1	COVER, Diaphragm	See Repair Kits	See Repair Kits	
6	1	DIAPHRAGM	See Repair Kits	See Repair Kits	See note 1.
7	1	PUSH ROD and SPRING SEAT ASSEMBLY, Complete	See Repair Kits	See Repair Kits	
8A	1	SPRING, 3-15 psi	R431003407	P -054642-00000	
8B	1	SPRING, 10-60 psi	R431000030	-523631-00000	
8C	1	SPRING, 15-80 psi	R431003004	P -052789-00000	
9	1	SHIM, 0.031 Spring [not shown]	R431002462	P -049904-00041	See note 2,3.
10	3	SHIM, 0.010 Spring [not shown]	R431002463	P -049904-00042	See note 2.
11	1	NUT, 1/4-28 Stop	See Repair Kits	See Repair Kits	
12	1	BOLT, 5/16" Pivot	See Repair Kits	See Repair Kits	
13	1	BEARING, 5/16" ID.	See Repair Kits	See Repair Kits	See note 1.
14	1	LEVER	See Repair Kits	See Repair Kits	
15	1	SCREW, Adjusting	R431005428	P -060256-00000	
16	1	NUT, Adjusting Screw Lock	R431002450	P -049903-00038	
17	1	BODY	R431003996	P -057111-00000	
17A	1	BODY (with drain hole)	R431003997	P -057111-00001	See note 4.

- NOTES**
- 1 Recommended spare parts to be retained in stock at all times.
 - 2 Maximum quantity required; actual quantity installed at factory depends on spring tolerances.
 - 3 Positioners R431003983 (Old P/N P -057086-00010) and R431003984 (Old P/N P -057086-00011) use six (6) of item 9 and do not require item 10.
 - 4 * Uses body (ref. 17a, page 3) with drain hole for mounting Positioner with lever in top position.

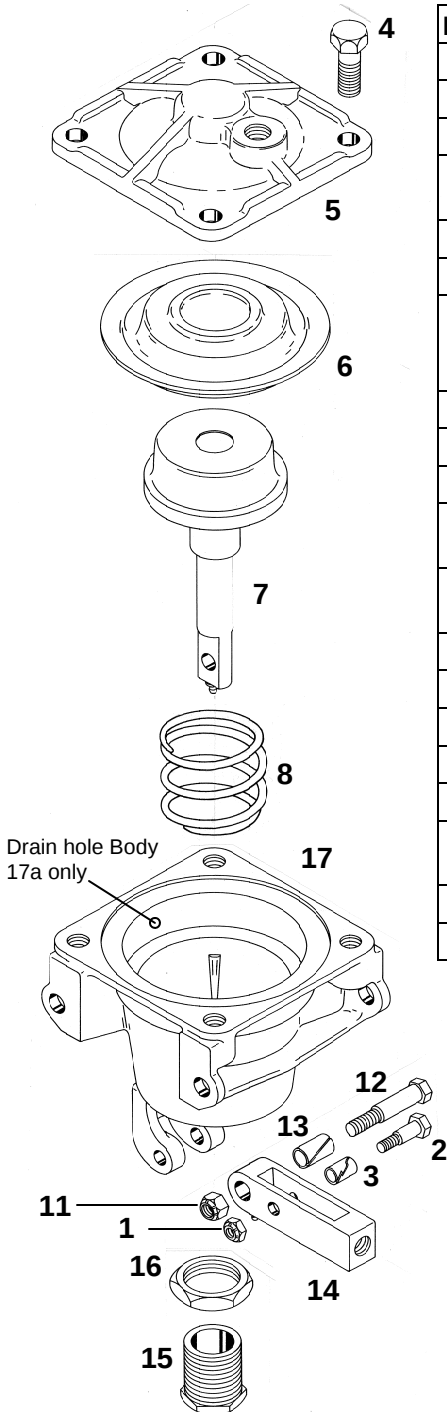
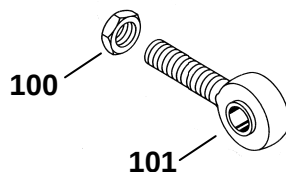
CLEVIS KIT P/N R431004143 (Old P/N P -057415-00000)

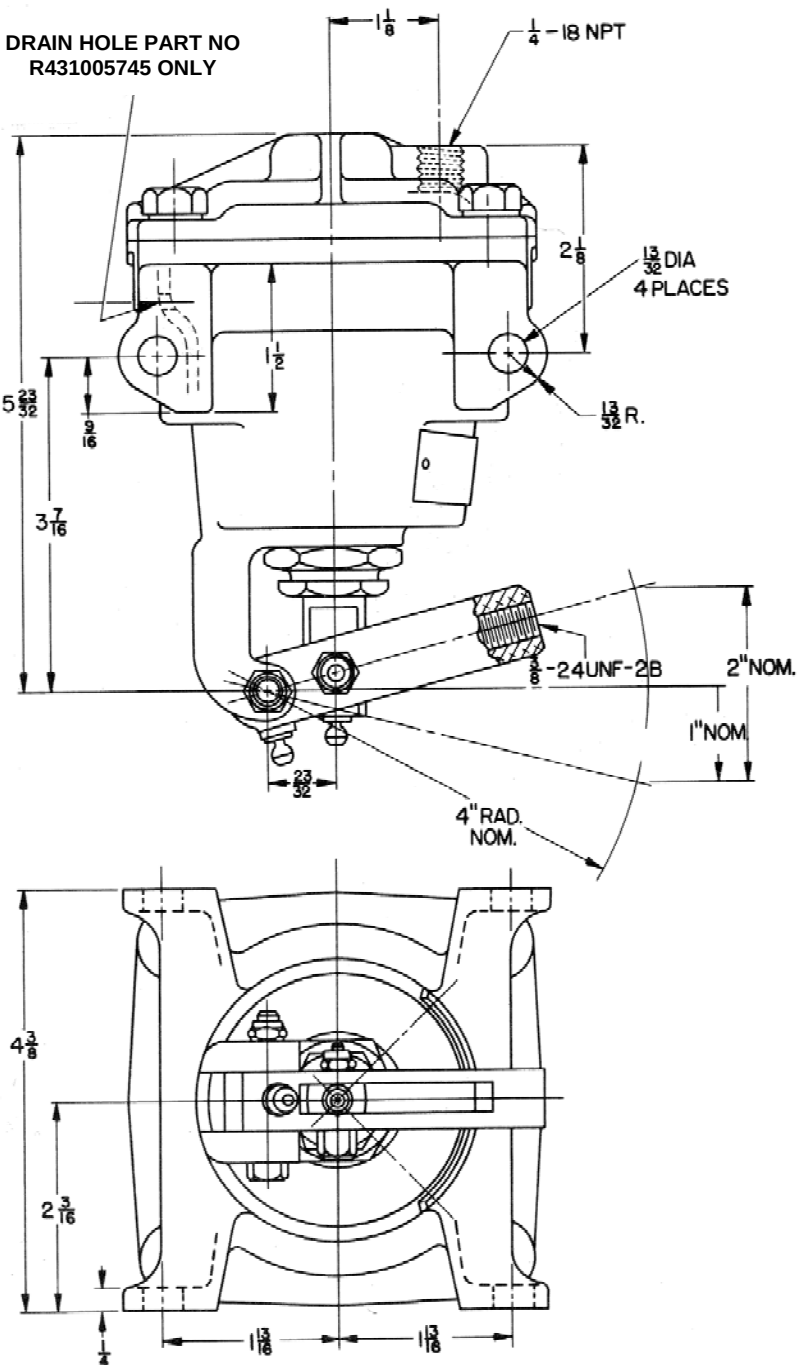
REF.	QTY	DESCRIPTION
100	1	NUT, 3/8"-24 Jam
102	1	NUT, Fulcrum Pin
103	1	PIN, Fulcrum
104	1	CLEVIS



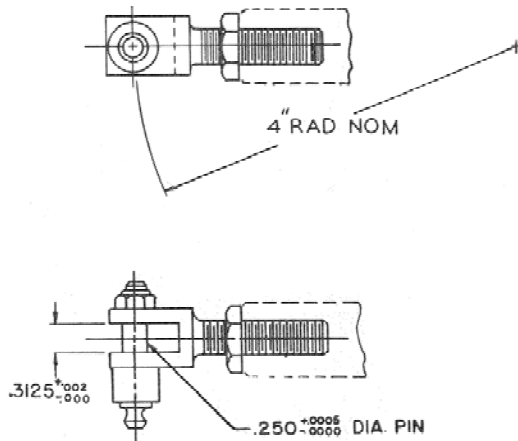
BALL JOINT KIT P/N R431004145 (Old P/N P -057416-00000)

REF.	QTY	DESCRIPTION
100	1	NUT, 3/8"-24 Jam
101	1	BALL JOINT

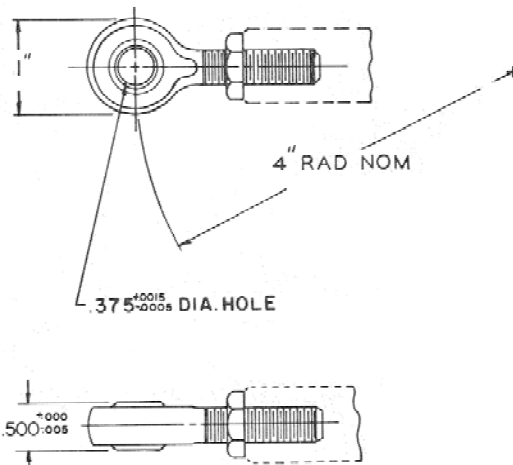




OPERATING LEVER KIT
CP. PART NO. R431004143



OPERATING LEVER KIT
CP. PART NO. R431004145



NOTICE TO PRODUCT USERS

1. WARNING: FLUID MEDIA

Bosch Rexroth pneumatic devices are designed and tested for use with filtered, clean, dry, chemical free air at pressures and temperatures within the specified limits of the device. For use with media other than air or for human life support systems, Bosch Rexroth must be consulted. Hydraulic cylinders are designed for operation with filtered, clean, petroleum based hydraulic fluid; operation using fire-resistant or other special types of fluids may require special packing and seals. Consult the factory.

2. WARNING: MATERIAL COMPATIBILITY

Damage to product seals or other parts caused by the use of noncompatible lubricants, oil additives or synthetic lubricants in the air system compressor or line lubrication devices voids Bosch Rexroth's warranty and can result in product failure or other malfunction. See lubrication recommendations below.

AIR LINE LUBRICANTS! In service higher than 18 cycles per minute or with continuous flow of air through the device, an air line lubricator is recommended.* (Do not use line lubrication with vacuum products.) However, the lubricator must be maintained since the oil will wash out the grease, and lack of lubrication will greatly shorten the life expectancy. The oils used in the lubricator must be compatible with the elastomers in the device. The elastomers are normally BUNA-N, NEOPRENE, VITON, SILICONE and HYTREL. Bosch Rexroth recommends the use of only petroleum based oils without synthetic additives, and with an aniline point between 180° F and 210° F.

COMPRESSOR LUBRICANTS! All compressors (with the exception of special "oil free" units) pass oil mist or vapor from the internal crankcase lubricating system through to the compressed air. Since even small amounts of non-compatible lubricants can cause severe seal deterioration (which could result in component and system failure) special care should be taken in selecting compatible compressor lubricants. It is recommended that users review the National Fluid Power Association "Recommended Guide Lines For Use Of Synthetic Lubricants In Pneumatic Fluid Power Systems" (NFPA T1.9.2-1978).

3. WARNING: INSTALLATION AND MOUNTING

The user of these devices must conform to all applicable electrical, mechanical, piping and other codes in the installation, operation or repair of these devices.

INSTALLATION ! Do not attempt to install, operate or repair these devices without proper training in the technique of working on pneumatic or hydraulic systems and devices, unless under trained supervision. Compressed air and hydraulic systems contain high levels of stored energy. Do not attempt to connect, disconnect or repair these products when a system is under pressure. Always exhaust or drain the pressure from a system before performing any service work. Failure to do so can result in serious personal injury.

MOUNTING! Devices should be mounted and positioned in such a manner that they cannot be accidentally operated.

4. WARNING: APPLICATION AND USE OF PRODUCTS

The possibility does exist for any device or accessory to fail to operate properly through misuse, wear or malfunction. The user must consider these possibilities and should provide appropriate safe guards in the application or system design to prevent personal injury or property damage in the event of a malfunction.

5. WARNING: CONVERSION, MAINTENANCE AND REPAIR

When a device is disassembled for conversion to a different configuration, maintenance or repair, the device must be tested for leakage and proper operation after being reassembled and prior to installation.

MAINTENANCE AND REPAIR! Maintenance periods should be scheduled in accordance with frequency of use and working conditions. All Bosch Rexroth products should provide a minimum of 1,000,000 cycles of maintenance free service when used and lubricated as recommended. However, these products should be visually inspected for defects and given an "in system" operating performance and leakage test once a year. Where devices require a major repair as a result of the one million cycles, one year, or routine inspection, the device must be disassembled, cleaned, inspected, parts replaced as required, rebuilt and tested for leakage and proper operation prior to installation. See individual catalogs for specific cycle life estimates.

6. PRODUCT CHANGES

Product changes including specifications, features, designs and availability are subject to change at any time without notice. For critical dimensions or specifications, contact factory.

*Many Bosch Rexroth pneumatic valves and cylinders can operate with or without air line lubrication; see individual sales catalogs for details.

LIMITATIONS OF WARRANTIES & REMEDIES

Bosch Rexroth warrants its products sold by it to be free from defects in material and workmanship to the following:

For twelve months after shipment Bosch Rexroth will repair or replace (F.O.B. our works), at its option, any equipment which under normal conditions of use and service proves to be defective in material or workmanship at no charge to the purchaser. No charge will be made for labor with respect to defects covered by this Warranty, provided that the work is done by Bosch Rexroth or any of its authorized service facilities. However, this Warranty does not cover expenses incurred in the removal and reinstallation of any product, nor any downtime incurred, whether or not proved defective.

All repairs and replacement parts provided under this Warranty policy will assume the identity, for warranty purposes, of the part replaced, and the warranty on such replacement parts will expire when the warranty on the original part would have expired. Claims must be submitted within thirty days of the failure or be subject to rejection.

This Warranty is not transferable beyond the first using purchaser. Specifically, excluded from this Warranty are failures caused by misuse, neglect, abuse, improper operation or filtration, extreme temperatures, or unauthorized service or parts. This Warranty also excludes the use of lubricants, fluids or air line additives that are not compatible with seals or diaphragms used in the products. This Warranty sets out the purchaser's exclusive remedies with respect to products covered by it, whether for negligence or otherwise. Neither, Bosch Rexroth nor any of its affiliates will be liable for consequential or incidental damages or other losses or expenses incurred by reason of the use or sale of such products. Our liability (except as to title) arising out of the sale, use or operation of any product or parts, whether on warranty, contract or negligence (including claims for consequential or incidental damage) shall not in any event exceed the cost of replacing the defective products and, upon expiration of the warranted period as herein provided, all such liability is terminated. **THIS WARRANTY IS IN LIEU OF ALL OTHER WARRANTIES, EXPRESS OR IMPLIED, WHETHER FOR MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE OR OTHERWISE.** No attempt to alter, amend or extend this Warranty shall be effective unless authorized in writing by an officer of Bosch Rexroth Corporation.

Bosch Rexroth reserves the right to discontinue manufacture of any product, or change product materials, design or specifications without notice.

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