AA Type Actuator Positioners

Service Information

AA-1

AB-1

The AA-1, AB-1 and BA-1 Actuator Positioners are pneumatic Positioners 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.

AA-1 Standard configuration, the AB-1 and the BA-1 are constructed from this basic model

BA-1 Basic AA Type positioner with a "Vernier" feature added by the use of an additional diaphragm that is controlled by a separate valve (H-4 CONTROLAIR® Valve)

AB-1 Basic AA Type positioner with a separately controlled stop cylinder.

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

Mount the positioner firmly to the engine frame to prevent relative motion between the operator rod and the engine control arm. The positioner must be installed with the operator rod in the same plane as the engine control arm. Avoid interference with the connecting link which could cause friction and inaccuracy. For wet or dirty installations the positioner should be mounted with the diaphragm cover (ref. 3, page 4) up.

The most satisfactory linkage is a steel rod with ball joints or an adjustable clevis at both ends connected directly from the positioner to the control arm. It is very important to utilize the full travel of the positioner and to match the end travels of the control lever and the positioner rod.

For mounting dimension and pipe connections refer to the outline drawing elsewhere in this catalog.

NOTE: Before installation all air lines should be blown free of any moisture or harmful deposits.

For more information on installation and other applications refer to catalog SC-900.

MAINTENANCE

Periodically disassemble the positioner for cleaning and lubrication. Refer to the appropriate exploded view.

1. Clean all metal parts with a nonflammable solvent and wash all rubber parts in soap and water.
2. Rinse parts thoroughly and blow dry with a low pressure air jet.
3. Inspect all parts and replace those which are worn or damaged.

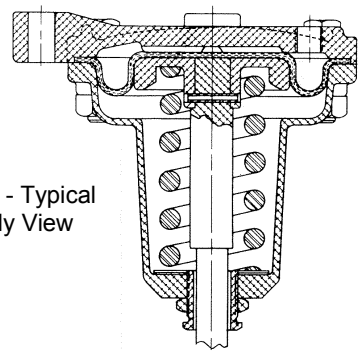


Figure 1 - Typical Assembly View

ADJUSTMENT

It is important to utilize the full travel of the positioner and to match the end travels of the control lever and the operator rod. The operator rod is adjustable in length from 1" to 5 ½ " (25.4 to 139.7 mm), which alters the end travel from $^{7}/_{8}$" to 2 ¼ " (22.2 to 57.2 mm). For decreased rod end travel, loosen the jam nut and screw the operator rod toward the lever arm. Tighten the jam nut to secure this position. Rod end travel can be increased by unscrewing the operator rod and then tightening the jam nut.

If the end travel of the governor control arm exceeds the maximum adjustment of the operating lever, the normal procedure is to drill a hole in the control arm at the point which has a travel range of two inches (50.8 mm). Fasten the connecting link to the new hole and re-adjust 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 and follower (ref. 5, pg. 4) 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 and follower adjusting screw (ref. 9, pg. 4).

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 rod end travel to compensate for inequalities in operating characteristics of the controlled device. If necessary to adjust for incorrect initial pressure, remove or add shims (ref. 7, pg. 4) as needed, or reset the preload on the control valve.

REPAIR AND CONVERSION

In late 1969 improvements were made starting with a stronger, lighter weight push rod and follower assembly (ref. 5, pg. 4) and utilization of the smaller adjusting screw (ref. 9, pg. 4) from the A-2-H Actuator Positioner. (To accommodate the smaller adjusting screw, the main body (ref. 8, pg. 4) was modified.) To further simplify the various models a standard lever arm was designed along with the accompanying bearings, bolt and washers. Finally, the stop cylinder on the AB-1 model was replaced by a readily available unit using TaskMaster® Cylinder components.

When replacement of the main diaphragm body (old style) (ref. 8, pg. 4) is required, it is recommended that a main operator portion be purchased assembled. (Order part number R431005447 Old P/N P -060272-00000) and refer to page 4 for parts included.) New and old push rod and follower assemblies (ref 5, pg. 4) are completely interchangeable. The new and old vernier follower (ref. 20, pg. 6) will function with the new or old lever arm, the old stop cylinder will function with the new lever arm provided the old connecting link (ref. 18, pg. 7) is used, and the new stop cylinder will function with the new or old lever arm.

Fulcrum pins with grease fittings located at one end are no longer available, if replacement ever becomes necessary it is recommended that lever arm conversion kit, part number R431006221 (Old P/N P -063382-00000) or P/N P -063383-00000 be purchased.

In AB models, rubber parts in the stop cylinder should be lubricated with Dow Corning No. 55 Pneumatic Grease.

Reassemble the positioner using the exploded and assembly views as references. No special tools are required. To maintain the same preload on the spring (ref. 6, pg. 4), shims (7A, B & C) must be included. Apply No. 107 Lubriplate, or its equivalent, to all grease fittings.

OPERATION

The positioner has a usual pressure range of 10-60 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 AVENTICS CONTROLAIR®, Type "M" Plus™ Pressure Control or Flexair® Valves. The pressure imposed on the diaphragm (ref. 4, pg. 4) is proportional to the handle travel of the control valve. The movement of the positioner operating rod 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 (ref. 6, pg. 4) against the push rod and follower assembly (ref. 5, pg. 4) returns the operating rod 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.

AA-1
The AA-1 Actuator Positioner, which is larger and more powerful than the A-2-H, is the basic configuration from which the AB-1 and BA-1 are constructed. The AA type actuators have a nominal stoke of 2" (50.8 mm) with a power rating of 1125 in-lb-degrees (127.1 Nm) or a work rating of 10 lbs (4.54 kg) through 2" (50.8 mm).

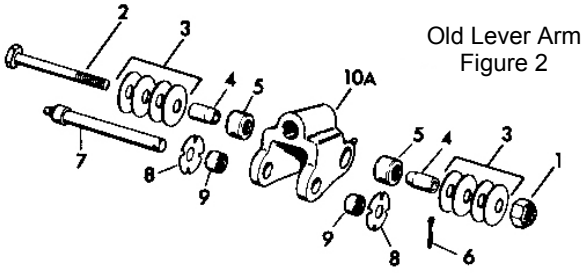
BA-1
The BA-1 Actuator Positioner is similar to the AA-1 but has a vernier feature added by the inclusion of an additional diaphragm. This diaphragm is controlled by a separate valve to provide an adjustment to a maximum of +/- 10% of full travel on the rod end. Normal air pressure on the vernier diaphragm is 35 psi (2.4 bar), being varied between zero and 65 psi (4.5 bar) to increase or decrease the index position.

AB-1
The AB-1 Actuator Positioner is also similar to the AA-1 except that a separately controlled stop cylinder has been added. When air is admitted to the stop cylinder, the operating lever arm is moved 2" (50.8 mm) in the opposite direction. If pressure is present on the main diaphragm, the operating rod will move to idle position and if pressure is vented from the main diaphragm, the arm moves to the stop position.

IDENTITY SCHEDULE

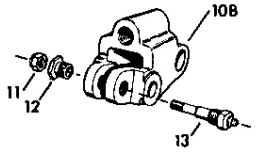
DESIGNATION	DESCRIPTION	NEW PART NO.	OLD PART NO.
AA-1	1/4" Rod Eye	R431005436	P -060263-00001
AA-1	1/4" Rod Eye	R431005436	P -060263-00001
AA-1	1/4" Rod Eye	R431005436	P -060263-00001
AA-1	5/16" Rod Eye	R431005437	P -060263-00002
AA-1	3/8" Rod Eye	R431005438	P -060263-00003
AA-1	3/8" Rod Eye	R431005438	P -060263-00003
AA-1	3/8" Rod Eye	R431005438	P -060263-00003
AA-1	3/8" Rod Eye	R431005438	P -060263-00003
AB-1	1/4" Rod Eye	R431005441	P -060266-00001
AB-1	5/16" Rod Eye	R431005442	P -060266-00002
AB-1	3/8" Rod Eye	R431005543	P -060266-00003
BA-1	1/4" Rod Eye	R431009018	P -060269-00001
BA-1	1/4" Rod Eye	R431009018	P -060269-00001
BA-1	1/4" Rod Eye	R431009018	P -060269-00001
BA-1	5/16" Rod Eye	R431005445	P -060269-00002
BA-1	5/16" Rod Eye	R431005445	P -060269-00002
BA-1	3/8" Rod Eye	R431005446	P -060269-00003
BA-1	3/8" Rod Eye	R431005446	P -060269-00003

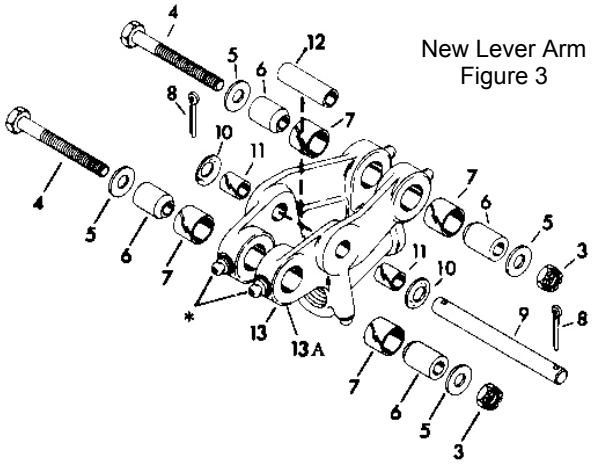
LEVER ARM CONVERSION



Old Lever Arm
Figure 2

BA-1 MODELS ONLY
Note: Shaded areas of Parts List designate BA -1 parts only.





New Lever Arm
Figure 3

PARTS LIST

REF	QTY	DESCRIPTION	OBSOLETE PART NOs.
1	1	NUT, 1/4" Elastic Stop	521909, P -049891-00000
2	1	BOLT, 1/4-20 x 2-3/4 Hex	P -049900-00012, P -049900-00005
3	8	WASHER, Spring	P -050232-00000
4	2	RACE, Inner Bearing	P -050175-00000, P -050175-00001
5	2	BEARING, Needle	537898
6	1	COTTER, 3/32 x 5/8	93260, 2958
7	1	PIN, Fulcrum w/Grease Fitting	850513, 850820, 851094
8	2	WASHER, Spring	534274
9	2	BEARING, Needle	543124
10A	1	ARM, Lever (AA & AB Models)	P -050749-00000
10B	1	ARM, Lever (BA Models)	P -050751-00000
11	1	NUT, 5/16"-24 Elastic Stop	P -049605-00011, 523714
12	1	NUT, Anchor	850545
13	1	PIN, Fulcrum w/Grease Fitting	850556

CONVERSION KITS

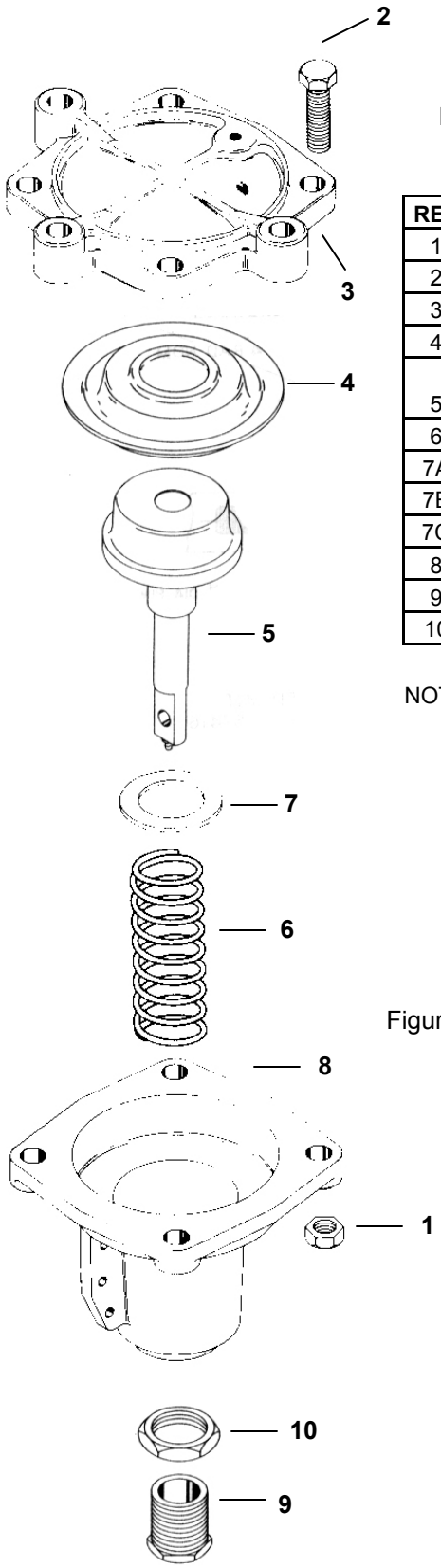
*AA-1, AB-1	R431006221	P -063382-00000
*BA-1	—--	P -063383-00000

PARTS LIST

REF	AA-1, AB-1 QTY	BA-1 QTY	DESCRIPTION	PART NO.
3	1	2	NUT, 1/4"-28	See Kit
4	1	2	BOLT, 1/4-28 x 2-1/4"	See Kit
5	2	4	WASHER	See Kit
6	2	4	BEARING, Sleeve	See Kit
7	2	4	BEARING, Nylon	See Kit
8	2	2	PIN, Cotter	See Kit
9	1	1	PIN, Fulcrum	See Kit
10	2	2	WASHER, Spring	See Kit
11	2	2	BEARING, Nylon	See Kit
12	1	1	SPACER	See Kit
13	-	1	ARM, Lever	See Kit
13A	1	-	ARM, Lever	See Kit

*Does not contain rear grease fittings.

EXPLODED VIEW
STANDARD BODY



STANDARD BODY CONFIGURATION

R431005447 (old p/n P -060272-00000) FOR COMPLETE ASSEMBLY
(Items 1 thru 10, Assembled at Factory)

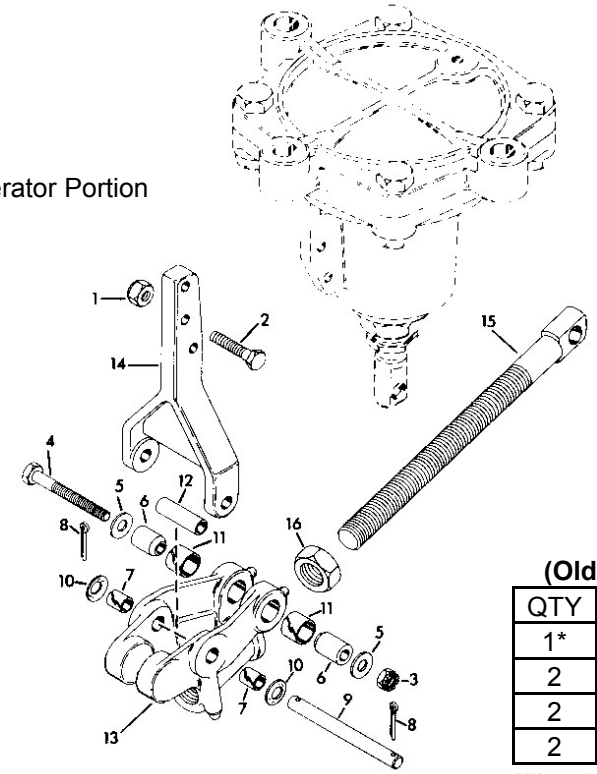
REF	QTY	DESCRIPTION	NEW PART NO.	OLD PART NO.	NOTES
1	4	NUT, 1/2"-20	R431002425	P -049901-00033	
2	4	BOLT, 1/2-20 x 2"	R431002533	P -049910-00018	
3	1	COVER, Diaphragm	R431006405	P -064328-00000	
4	1	DIAPHRAGM	See Repair Kits	See Repair Kits	See note 1.
5	1	PUSH ROD & FOLLOWER Assy	R431005429	P -060257-00000	
6	1	SPRING	R431000016	-520964-00000	
7A	2	SHIM, .010 Spring	R431005425	P -060255-00000	See note 3.
7B	1	SHIM, .031 Spring	R431005426	P -060255-00002	See note 3.
7C	1	SHIM, .125 Spring	R431005427	P -060255-00003	See note 3.
8	1	BODY	R431005422	P -060248-00000	See note 2.
9	1	ADJUSTING SCREW	R431005428	P -060256-00000	See note 2.
10	1	LOCKNUT	R431002450	P -049903-00038	See note 2.

NOTE 1. Recommended spare parts to be retained in stock at all times.
2. Parts not interchangeable with old lever arm design.
3. Maximum quantity required; actual quantity installed at factory.

Figure 4 - Standard Body

EXPLODED VIEW
AA-1 OPERATOR PORTION

Figure 5 - AA-1 Operator Portion



AA-1 REPAIR KIT
PART NO. R431006220
(Old Part No. P -063381-00000)

QTY	DESCRIPTION	REF. NO.
1*	DIAPHRAGM	4 (Page 4)
2	BEARING, Sleeve	6
2	BEARING, Nylon	4
2	BEARING, Nylon	11

*Not shown here, refer to pg 4, ref. 4.

AA-1 OPERATOR & REPAIR KIT

REF	QTY	DESCRIPTION	NEW PART NO.	OLD PART NO.	NOTES
1	3	NUT, 1/4"-20	R431002406	P -049891-00000	
2	3	BOLT, 1/4-20 x 1-1/4"	R431002407	P -049892-00003	
3	1	NUT, 1/4"-28	R431002201	P -049819-00017	See note 2.
4	1	BOLT, 1/4-28 x 2-1/4"	R431002435	P -049902-00037	See note 2.
5	2	WASHER	R431002468	P -049904-00061	See note 2.
6	2	BEARING, Sleeve	See Repair Kit	See Repair Kit	See note 1, 2.
7	2	BEARING, Nylon	See Repair Kit	See Repair Kit	See note 1, 2.
8	2	PIN, Cotter	R431002542	P -049913-00002	See note 2.
9	1	PIN, Fulcrum	R431005433	P -060261-00000	See note 2.
10	2	WASHER, Spring	R431000058	-534274-00000	See note 2.
11	2	BEARING, Nylon	See Repair Kit	See Repair Kit	See note 1, 2.
12	1	SPACER	R431005432	P -060260-00000	See note 2.
13	1	ARM, Lever	R431005452	P -060274-00001	See note 2.
14	1	BAR, Adapter	R431000859	P -027984-00000	
15A	1	ROD, Operator (1/4" Rod Eye)	R431002665	P -050564-00003	
15B	1	ROD, Operator (5/16" Rod Eye)	R431002666	P -050564-00004	
15C	1	ROD, Operator (3/8" Rod Eye)	R431002664	P -050564-00002	
16	1	NUT, Jam	R431002441	P -049903-00003	

NOTE 1. Recommended spare parts to be retained in stock at all times.
2. Parts not interchangeable with old lever arm design.

EXPLODED VIEW
BA-1 OPERATOR PORTION

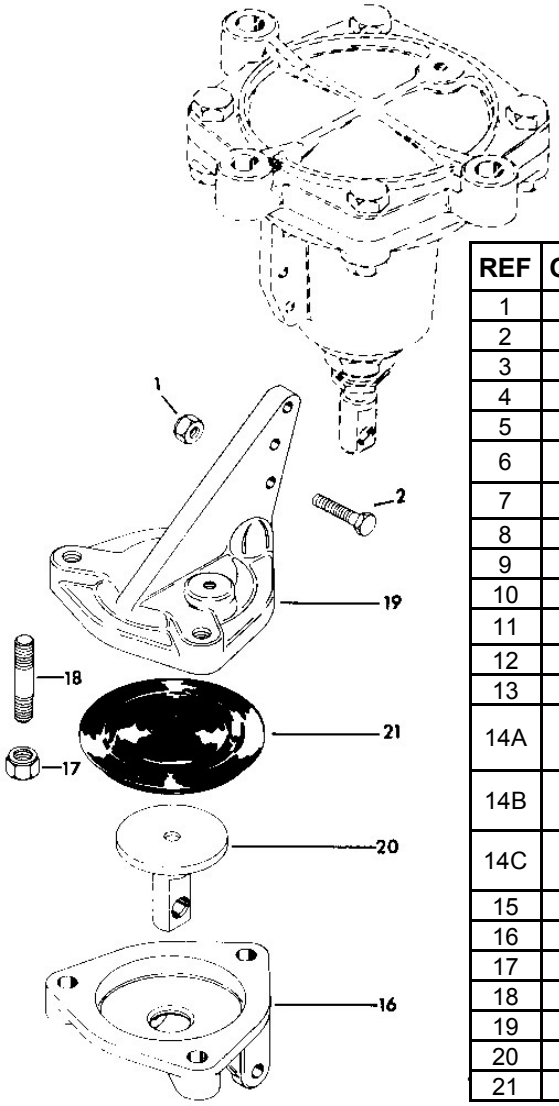
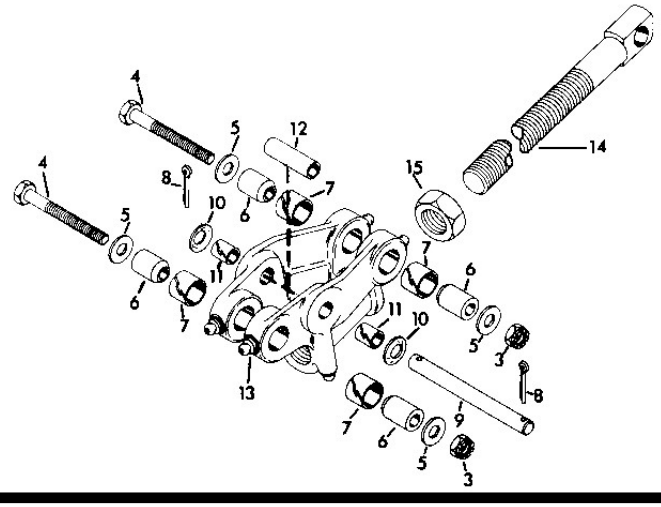


Figure 6 - BA-1 Operator Portion

BA-1 OPERATOR & REPAIR KIT

REF	QTY	DESCRIPTION	NEW P/N	OLD P/N	NOTES
1	3	NUT, 1/4"-20	R431002406	P -049891-00000	
2	3	BOLT, 1/4-20 x 1-1/4"	R431002407	P -049892-00003	
3	2	NUT, 1/4"-28	R431002201	P -049819-00017	See note 2.
4	2	BOLT, 1/4-28 x 2-1/4"	R431002435	P -049902-00037	See note 2.
5	4	WASHER	R431002468	P -049904-00061	See note 2.
6	4	BEARING, Sleeve	See Repair Kit	See Repair Kit	See note 1, 2.
7	4	BEARING, Nylon	See Repair Kit	See Repair Kit	See note 1, 2.
8	2	PIN, Cotter	R431002542	P -049913-00002	See note 2.
9	1	PIN, Fulcrum	R431005433	P -060261-00000	See note 2.
10	2	WASHER, Spring	R431000058	-534274-00000	See note 2.
11	2	BEARING, Nylon	See Repair Kit	See Repair Kit	See note 1, 2.
12	1	SPACER	R431005432	P -060260-00000	See note 2.
13	1	ARM, Lever	R431005451	P -060274-00000	See note 2.
14A	1	ROD, Operator (1/4" Rod Eye)	R431002665	P -050564-00003	
14B	1	ROD, Operator (5/16" Rod Eye)	R431002666	P -050564-00004	
14C	1	ROD, Operator (3/8" Rod Eye)	R431002664	P -050564-00002	
15	1	NUT, Jam	R431002441	P -049903-00003	
16	1	BODY, Small Diaphragm	R431000159	-850539-00000	
17	3	NUT, 3/8"-16	R431002417	P -049901-00010	
18	3	STUD, 3/8"-16	R431002506	P -049906-00025	
19	1	COVER, Small Diaphragm		-850542-00000	
20	1	FOLLOWER	R431005467	P -060288-00000	
21	1	DIAPHRAGM, Small	See Repair Kit	See Repair Kit	See note 1.

NOTE 1. Recommended spare parts to be retained in stock at all times.
2. Parts not interchangeable with old lever arm design.



BA-1 REPAIR KIT
PART NO. R431006219
(Old Part No. P -063380-00000)

QTY	DESCRIPTION	REF. NO.
1*	DIAPHRAGM, Main	4 (Page 4)
2	BEARING, Sleeve	6
2	BEARING, Nylon	7
2	BEARING, Nylon	11
1	DIAPHRAGM, Small	21

*Not shown here, refer to pg 4, ref. 4.

EXPLODED VIEW
AB-1 OPERATOR PORTION

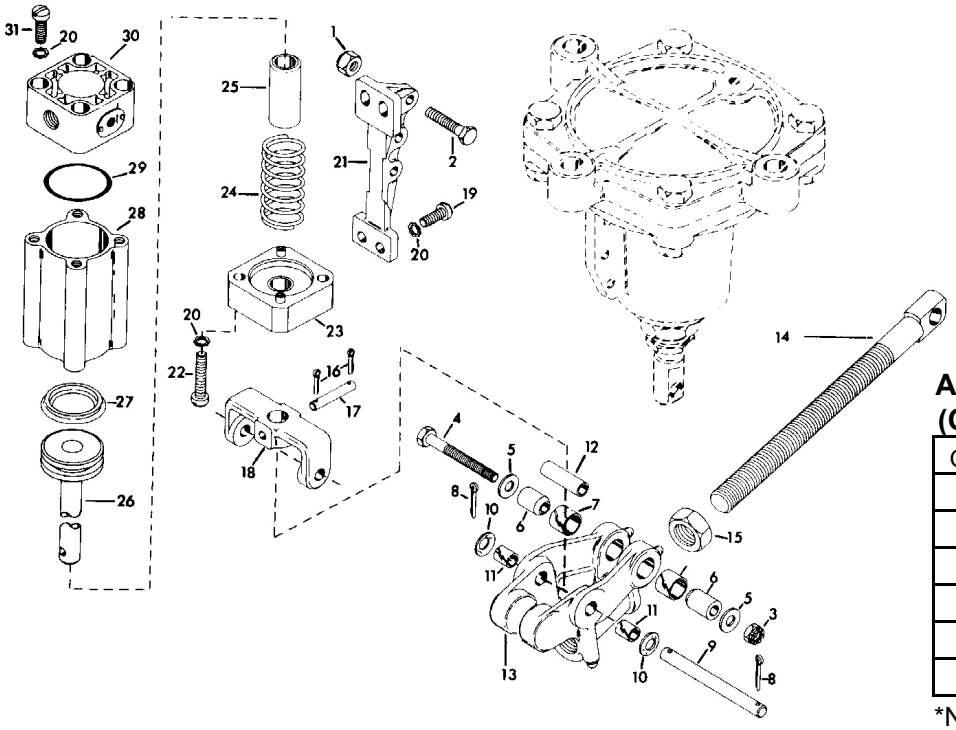


Figure 7 - AB-1 Operator Portion

AB-1 REPAIR KIT - R431006219
(Old Part No. P -063380-00000)

QTY	DESCRIPTION	REF. NO.
1*	DIAPHRAGM, Main	4 (Page 4)
2	BEARING, Sleeve	6
2	BEARING, Nylon	7
2	BEARING, Nylon	11
1	SEAL, U-Cup	27
1	O-RING	29

*Not shown here, refer to pg 4, ref. 4.

AB-1 OPERATOR & REPAIR KIT

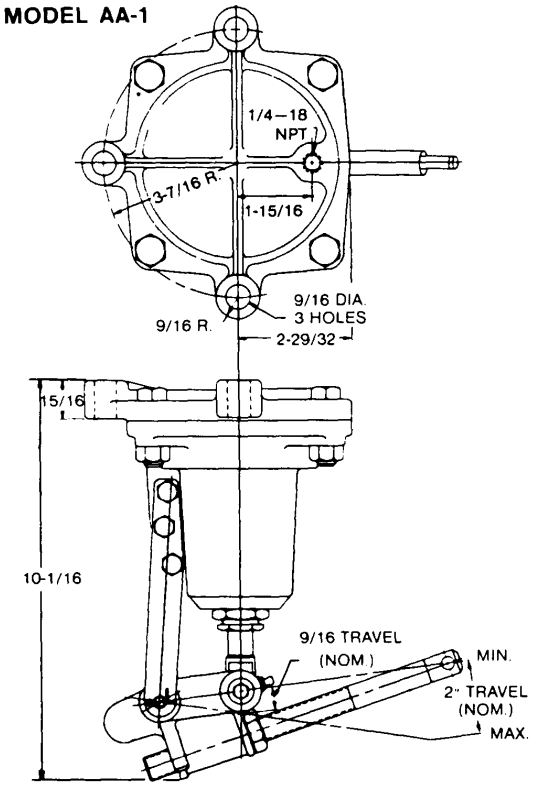
REF	QTY	DESCRIPTION	NEW P/N	OLD P/N	NOTES
1	3	NUT, 1/4"-20	R431002406	P -049891-00000	
2	3	BOLT, 1/4-20 x 1-1/4"	R431002407	P -049892-00003	
3	1	NUT, 1/4"-28	R431002201	P -049819-00017	Note 2.
4	1	BOLT, 1/4-28 x 2-1/4"	R431002435	P -049902-00037	Note 2.
5	2	WASHER	R431002468	P -049904-00061	Note 2.
6	2	BEARING, Sleeve	See Repair Kit	See Repair Kit	Note 1, 2.
7	2	BEARING, Nylon	See Repair Kit	See Repair Kit	Note 1, 2.
8	2	PIN, Cotter	R431002542	P -049913-00002	Note 2.
9	1	PIN, Fulcrum	R431005433	P -060261-00000	Note 2.
10	2	WASHER, Spring	R431000058	-534274-00000	Note 1, 2.
11	2	BEARING, Nylon	See Repair Kit	See Repair Kit	Note 1, 2.
12	1	SPACER	R431005432	P -060260-00000	Note 2.
13	1	ARM, Lever	R431005451	P -060274-00001	Note 2.
14A	1	ROD, Operator (1/4" Rod Eye)	R431002665	P -050464-00003	
14B	1	ROD, Operator (5/16" Rod Eye)	R431002666	P -050464-00004	
14C	1	ROD, Operator (3/8" Rod Eye)	R431002664	P -050464-00002	
15	1	NUT, Jam	R431002441	P -049903-00003	

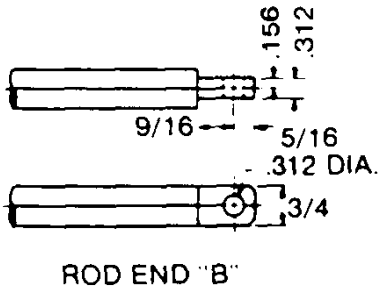
AB-1 OPERATOR & REPAIR KIT

REF	QTY	DESCRIPTION	NEW P/N	OLD P/N	NOTES
16	2	PIN, Cotter	R431002541	P -049913-00001	
17	1	PIN	R431005463	P -060284-00000	
18	1	LINK, Connecting	R431005466	P -060287-00001	
19	4	SCREW, 1/4"-20 x 5/8"	R431002516	P -049908-00032	
20	10	LOCKWASHER	R431002073	P -049564-00000	
21	1	BRACKET, Mounting	R431005464	P -060285-00000	
22	2	SCREW, 1/4"-28 x 1-1/4"	R431002515	P -049908-00031	
23	1	END, Head Complete	R431005458	P -060280-00000	
24	1	SPRING	R431005462	P -060283-00000	
25	1	TUBE, Stop	R431005461	P -060282-00000	
26	1	PISTON & ROD, Complete	R431005453	P -060276-00000	
27	1	SEAL, U-Cup	See Repair Kit	See Repair Kit	Note 1.
28	1	TUBE, Cylinder	R431005465	P -060286-00000	
29	1	O-RING	See Repair Kit	See Repair Kit	Note 1.
30	1	CAP, End	R432009486	P -030901-00102	
31	4	SCREW, 1/4"-28 x 7/8"	R431002514	P -049908-00030	
32	1	CYLINDER, Replace	R431000655	P –026712-00000	26 thru 31

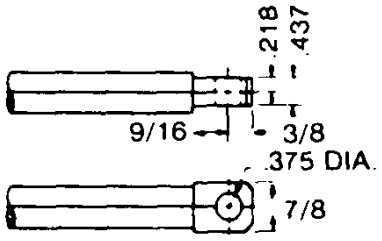
NOTES 1. Recommended spare parts to be retained in stock at all
2. Parts not interchangeable with old lever arm design.

MODEL AA-1





ROD END "B"



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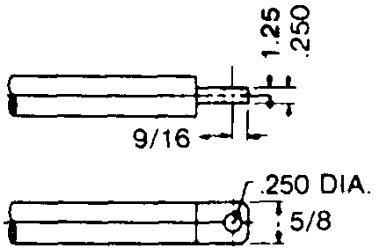

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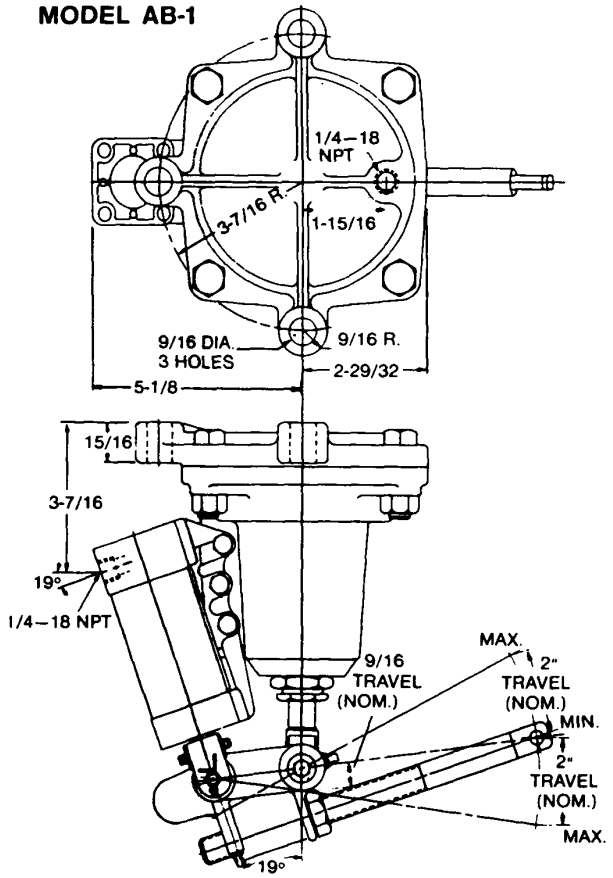
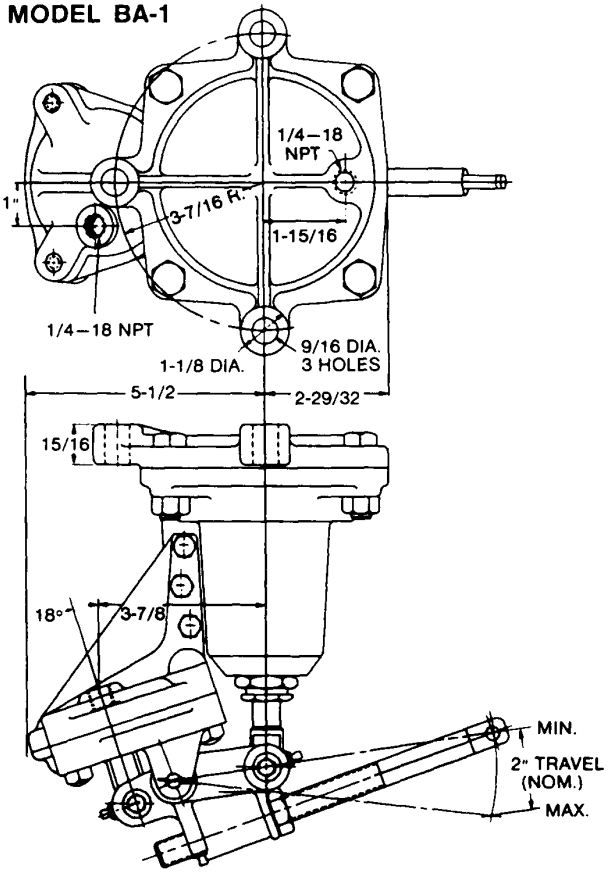
MODEL AB-1



MODEL BA-1



NOTICE TO PRODUCT USERS

1. WARNING: FLUID MEDIA
AVENTICS 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, AVENTICS 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 AVENTICS 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. AVENTICS 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.

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

LIMITATIONS OF WARRANTIES & REMEDIES

AVENTICS warrants its products sold by it to be free from defects in material and workmanship to the following:
For twelve months after shipment AVENTICS 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 AVENTICS 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, AVENTICS 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 AVENTICS Corporation.
AVENTICS reserves the right to discontinue manufacture of any product, or change product materials, design or specifications without notice.

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