

## 2A-2D CONTROLAIR® VALVE

MASTER & ASSOCIATE UNITS

SERVICE INFORMATION

The 2A-2D CONTROLAIR Valve is a handle operated pneumatic control unit containing two "on-off" three-way pilot valves and a pressure regulating valve. The three-way valves and regulating valve are arranged to supply inlet pressure to "on-off" control lines and graduated pressure to another line. The "on-off" control lines are selected by handle movement through a straight slot in the valve cover. The graduating pressure in the single control line is proportioned to handle position in either quadrant.

### INSTALLATION

Designed for panel mounting, the 2A-2D CONTROLAIR Valve may be installed and removed through the top of the panel. Allow ample clearance for the bottom of the unit.

Piping connections to the CONTROLAIR Valve need not be disturbed to service the unit. The complete assembly can be lifted free leaving the piping bracket undisturbed.

The "associate" and "primary" CONTROLAIR Valve units are paired for mechanical connection between them.

### MAINTENANCE

A complete set of valves, springs and rubber parts should be kept in stock to support each CONTROLAIR Valve in service.

Maintenance periods will be determined by the frequency of use and the working environment of the valve. Dismantle the complete valve for cleaning, inspection and lubrication.

Wash all metal parts with a non-flammable solvent and all rubber parts with soap and water. Blow dry with a low pressure air jet. Arrange the clean parts on a clean white surface in the order of the exploded view. Examine each part carefully for wear or damage. Flex the rubber parts to determine if they are in good condition.

Replace all parts that may not provide satisfactory performance until the next inspection period.

As reassembly proceeds, lubricate all metal-to-metal surfaces with No. 107 Lubriplate and all rubber parts with No. 55 Pneumatic grease. (Dow Corning). Equivalent greases to those recommended can be used.

### ADJUSTMENTS

Two adjustments can be made to the 2A-2D CONTROLAIR Valve. Both adjustments are external. Adjusting Screw 40 varies the pressure setting. Set screw 43 alters the pick-up point of Cam Dog 42.

### CAM DOG ADJUSTMENT

Use the adjustment set-up illustrated in figure 1. Place the CONTROLAIR Valve handle in "Neutral" position. Back off set screw 43 one or two turns. Insert a 1/32" feeler gauge between the end of plunger 50 and cam dog 42. Turn in set

screw 43 until plunger, cam dog and feeler gauge are just touching. Make this adjustment for both valves. Move the handle back and forth on both sides to the slow position and note the gauges for ports 1 and 3 pressure should increase to full supply (120 psi) at the detent position. Pressure must drop to zero when the handle is in "Neutral".

## PRESSURE SETTING ADJUSTMENT

Use the adjustment set up illustrated in figure 1. Adjusting Screw 40 varies the minimum and maximum pressure setting in equal amounts without changing the range of pressure. Place the CONTROLAIR Valve handle in the slow position. Turn adjusting screw 40 in until the gauge from port 8 reads 6 to 8 psi. Move the handle to full increasing pressure position. The maximum pressure should be the same for both quadrants (62 to 66 psi).

## OPERATION

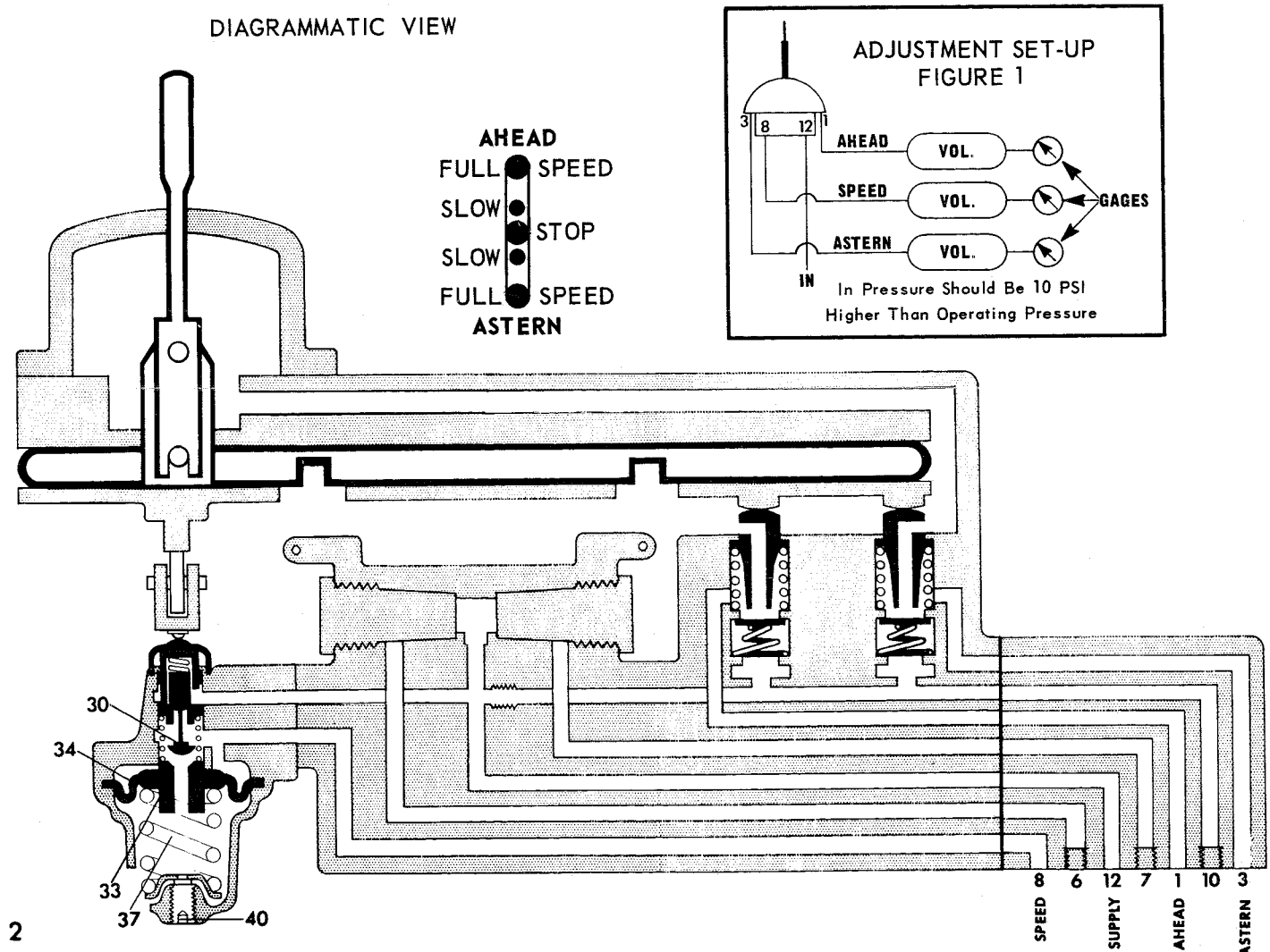
Refer to the diagrammatic view.

With the handle in "Neutral" position, both pilot ports 1 and 3 are open to atmosphere through their respective pilot valves in the 2A-2D CONTROLAIR Valve and port 8 is at minimum pressure.

The handle moves through a straight slot in the cover to move two pilot valve levers to operate two three-way "on-off" valves. The "on-off" valve operated depends on the direction of handle movement. Full inlet pressure from port 12 is admitted to OUT Port 1 or 3. Movement of the handle in the quadrant operates the pressure control valve converting Inlet pressure to Controlled pressure through port 8. The controlled pressure increases or decreases relative to the handle position in the quadrant.

The 2A-2D CONTROLAIR Valve will automatically compensate for downstream pressure changes at port 8. The air pressure changes can be caused by line leakage, temperature changes, or load thrust. If air pressure at the OUT Port 8 increases over that called for by handle position, the diaphragm 34 in the control portion will deflect downward moving exhaust valve seat 33 away from the inlet and exhaust valve unit 30 and vent the excess pressure. If the pressure drops below that called for by the handle position, the control spring 37 will force the diaphragm 34 upward. The exhaust valve seat 33 will move the inlet valve of the inlet and exhaust unit 30 from its seat opening the IN Port 12 to the OUT Port 8 to restore the pressure called for.

DIAGRAMMATIC VIEW



## PARTS LIST

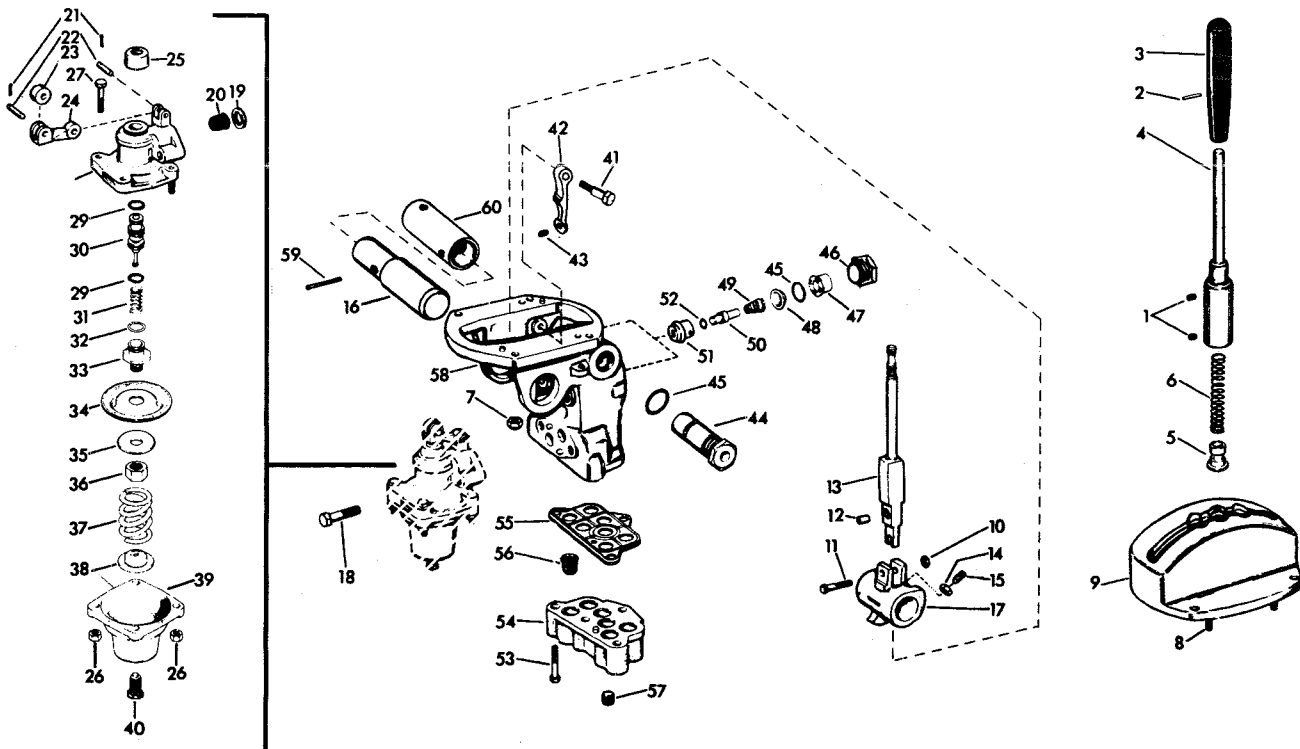
P62366	Master Unit
P62367	Associate Unit

REF.	QTY.	DESCRIPTION	PC. NO.	REF.	QTY.	DESCRIPTION	PC. NO.
1	2	SCREW, 1/4-20 x 5/16	P49905-0015	31*	1	SPRING, Exhaust Valve	P54653
2	1	PIN, 1/8 x 7/8 Roll	P49803-0030	32*	1	O-RING, 11/16 O.D.	P49708-0015
3	1	GRIP, Handle	P60323	33	1	SEAT, Exhaust Valve	P55484
4	1	HANDLE	P50745-0002	34*	1	DIAPHRAGM	P5102-0001
5	1	LATCH, Handle	851057	35	1	FOLLOWER, Diaphragm	P60303
6*	1	SPRING, Handle Latch	850388	36	1	NUT, 9/16-18	P49901-0031
7	4	NUT, 5/16-18	P49605-0015	37*	1	SPRING, Control	P55442
8	4	STUD, 5/16-18 x 1-3/8	P49906-0001	38	1	SEAT, Spring	526347
9	1	COVER, Top	P51169-0001	39	1	HOUSING, Spring	545616
10	1	NUT, 1/4-20	P49903	40	1	ADJUSTING SCREW	526352
11	1	BOLT, 1/4-20 x 1-1/4	P49892-0003	41	2	PIN	851065
12	1	SLEEVE, Cam	526798	42	2	DOG, Cam	850397
13	1	SHAFT, Handle	P61893	43	2	SCREW, 10-32 x 7/16	P49828
14	1	NUT, 3/8-16	P49903-0001	44	2	PLUG	P51174
15	1	SCREW, 3/8-16 x 13/16	P60132	45*	4	O-RING, 7/8 O.D.	P49708-0115
16	1	SHAFT, Cam	P62368	46	2	NUT, Cap	P51175
17	1	CAM	850379	47	2	ASSEMBLY, Supply Valve	P55429-0001
18	2	SCREW, 3/8 x 1-3/4	850563	48	2	SEAT, Inlet Valve	P54145
19*	2	GASKET	558515	49*	2	SPRING, Exhaust Valve	539113
20	2	STRAINER	P55382	50	2	PLUNGER	851059
21	4	PIN, Cotter	P49913-0001	51	2	SPACER, Valve	P55511
22	2	PIN, Lever & Cam Roller	P50686-0008	52*	2	O-RING, 7/16 O.D.	P49708-0011
23	1	ROLLER, Cam	P55496	53	3	SCREW, 3/8-16 x 2"	P49902-0001
24	1	LEVER	528059	54	1	BRACKET, Pipe	850395
25*	1	PROTECTOR, Dirt	526344	55*	1	GASKET, Pipe Bracket	532310
26	4	NUT, 5/16-18	P49901-0020	56	6	STRAINER	P55382
27	2	SCREW, 5/16-18 x 1-3/8	850577	57	3	PLUG, Pipe 1/4	P49909-0001
28	1	BODY, Complete	826874	58	1	BODY, Complete	851045
29*	2	O-RING, 3/4 O.D.	P49708-0113	59	2	PIN, Spirol	P49618-0026
30	1	UNIT, Inlet & Exh. Valve (Includes Ref. No. 29)	545536	60	1	COUPLING	P62377

\*Recommended spare parts to be retained in stock at all times.

NOTE: Shaded Areas Of Parts List Indicate Parts Included In Associate Unit.

### EXPLODED VIEW





# 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.

Bosch Rexroth Corporation  
Pneumatics  
1953 Mercer Road  
Lexington, KY 40511-1021  
Telephone (859) 254-8031  
Facsimile (859) 254-4188  
pneumatics@boschrexroth-us.com  
www.boschrexroth-us.com

**International offices:**

**Asia:**

China  
India  
Japan  
Malaysia

Russia  
Singapore  
South Korea

**Australia**

**Europe:**

Austria  
Belgium  
Bulgaria  
Czech Republic  
Denmark  
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Netherlands  
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Switzerland  
Turkey  
Ukraine

**North America:**

Canada  
Mexico

United States

**South America:**

Argentina  
Brazil

Venezuela

**Factory Automation  
Regional sales offices:**

**Central**

Bosch Rexroth Corporation  
5150 Prairie Stone Parkway  
Hoffman Estates, IL 60192-3707  
Telephone (847) 645-3600  
Facsimile (847) 645-0804

**Great Lakes**

Bosch Rexroth Corporation  
2730 Research Drive  
Rochester Hills, MI 48309  
Telephone (248) 393-3330  
Facsimile (248) 393-2893

**Northeast**

Bosch Rexroth Corporation  
99 Rainbow Road  
East Grandby, CT 06026-0000  
Telephone (860) 844-8377  
Facsimile (860) 844-8595

Bosch Rexroth Corporation  
2315 City Line Road  
Bethlehem, PA 18017-2131  
Telephone (610) 694-8300  
Facsimile (610) 694-8467

**Southeast**

Bosch Rexroth Corporation  
14001 South Lake Drive  
Charlotte, NC 28273-5544  
Telephone (704) 583-4338  
Facsimile (704) 583-0523

**West**

Bosch Rexroth Corporation  
11 Goddard  
Irvine, CA 92618-4600  
Telephone (949) 450-2777  
Facsimile (949) 450-2790

**North American offices:**

Bosch Rexroth Corporation  
Corporate Headquarters  
5150 Prairie Stone Parkway  
Hoffman Estates, IL 60192-3707  
Telephone (847) 645-3600  
Facsimile (847) 645-0804

Bosch Rexroth Corporation  
Industrial Hydraulics  
2315 City Line Road  
Bethlehem, PA 18017-2131  
Telephone (610) 694-8300  
Facsimile (610) 694-8467

Bosch Rexroth Corporation  
Electric Drives and Controls  
5150 Prairie Stone Parkway  
Hoffman Estates, IL 60192-3707  
Telephone (847) 645-3600  
Facsimile (847) 645-6201

Bosch Rexroth Corporation  
Linear Motion and Assembly  
Technologies  
816 E. Third Street  
Buchanan, MI 49107  
Telephone (269) 695-0151  
Facsimile (269) 695-5363

14001 South Lakes Drive  
Charlotte, NC 28273  
Telephone (800) 438-5983  
Facsimile (704) 583-0523

Bosch Rexroth Corporation  
Mobile Hydraulics  
145 Southchase Boulevard  
Fountain Inn, SC 29644-9018  
Telephone (864)967-2777  
Facsimile (864)962-5338

Bosch Rexroth Canada  
3426 Mainway Drive  
Burlington, Ontario L7M 1A8 Telephone  
(905) 335-5511 Facsimile (905) 335-4184  
www.boschrexroth.ca

Bosch Rexroth, S.A. de C.V.  
Calle Neptuno # 72  
Unidad Industrial Vallejo  
CP 07700 Mexico, D.F.  
Telephone (555) 754-1711  
Facsimile (555) 752-5943

Further contacts:  
www.boschrexroth.com/addresses

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