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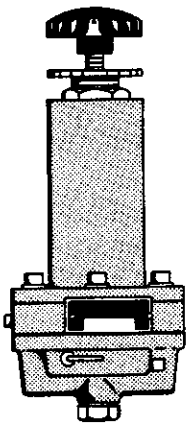
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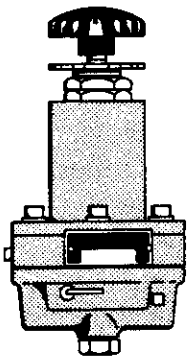
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SERVICE INSTRUCTIONS
MODEL SERIES 43 & 44
SUB-ATMOSPHERIC
NULLMATIC® PRESSURE REGULATORS

SD44
Issue: 7
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MODEL SERIES 43



MODEL SERIES 44

GENERAL DESCRIPTION

The Model Series 43 and 44 Sub-Atmospheric Regulators are pilot-operated regulators with bellows-sensing elements. They are used in absolute and compound pressure ranges. The Model Series 43 regulator is barometrically compensated for use in absolute pressure ranges; the Model Series 44 is used for compound (vacuum-pressure) ranges.

All Model Series 43 and 44 Nullmatic Pressure Regulators use the pneumatic null-balance principle of operation. Unbalances between the regulator setting and the output are corrected by a pilot circuit which holds the output pressure constant regardless of wide changes of flow or supply pressure.

A vacuum pump is used to provide the sub-atmospheric pressures. Both Model Series 43 and 44 have tapped exhaust connections for use with this pump.

MODEL DESIGNATION

44 — 20

Model Series
43 or 44

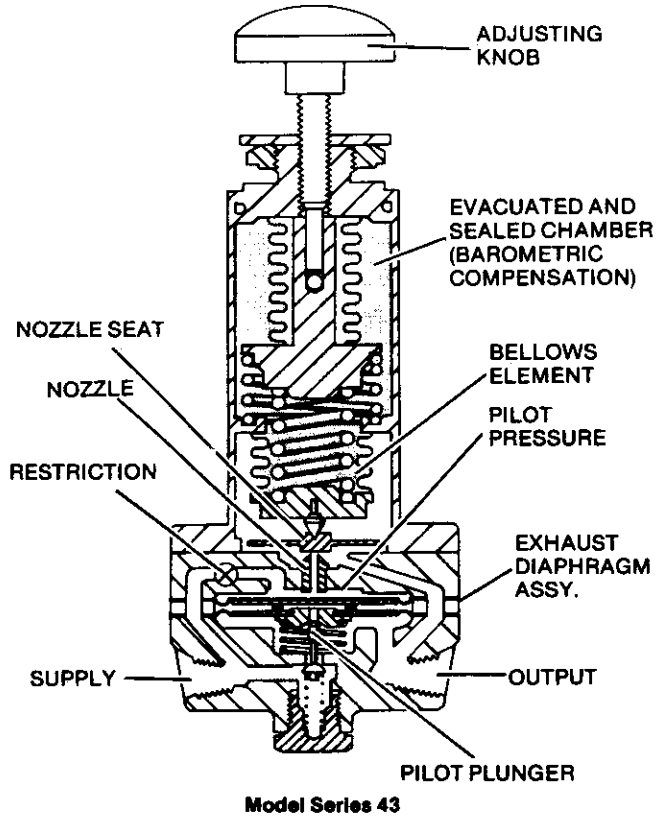
Range
43-20 – 1 to 20 psia
43-50 – 1 to 50 psia
44-20 – 28" Hg (Vacuum) to 0 to 5 psig
44-50 – 28" Hg (Vacuum) to 0 to 35 psig

GENERAL SPECIFICATIONS

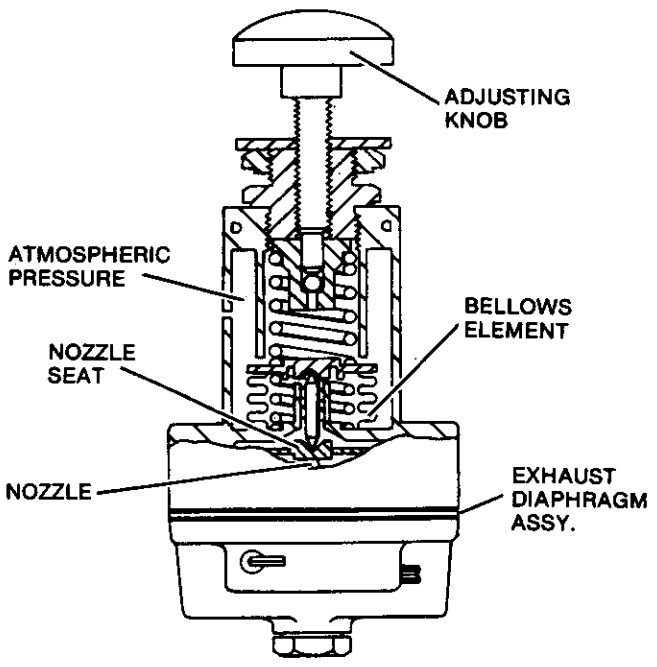
	43 Series	44 Series
Recommended Supply Pressure:	At least 5 psig higher than the maximum regulated pressure	
Maximum Supply Pressure:	20 psig (43—20) 55 psig (43—50)	35 psig (44—20) 70 psig (44—50)
Overrange Protection:	The application of the maximum rated supply pressure to any connection will not damage the instrument.	
Adjustment Sensitivity:	Each regulator can be adjusted ±0.001" Hg of desired pressure.	
Pilot air Consumption:	0.06 scfm (43—20 & 43—50)	0.06 scfm (44—20) 0.10 scfm (44—50)
Ambient Temp. Limits:	−40°F to +180°F	

PRINCIPLE OF OPERATION (See Fig. 1)

The Model Series 43 and 44 Nullmatic Pressure Regulators use the pneumatic null-balance principle of operation. Unbalances between the regulator setting and the output are detected by a bellows-sensing element. These unbalances are corrected by a pilot circuit which operates a booster-pilot valve within the regulator.



Model Series 43



Model Series 44

FIGURE 1 Schematic

The pilot-operating pressure is furnished by a supply of the gas which is being controlled. This gas flows through a fixed restriction into a pilot chamber above the exhaust diaphragm assembly. Supply is also furnished to the underside of the pilot valve. A vacuum pump is connected to the exhaust diaphragm assembly.

To change the controlled pressure, the adjusting knob is rotated clockwise or counterclockwise. This changes the spring force on the sensing bellows. A change in force on the bellows changes the clearance between the nozzle and nozzle seat. A change in clearance varies the pilot pressure on top of the exhaust diaphragm assembly. The exhaust diaphragm assembly operates the pilot plunger to change the output until the output balances the force on the sensing bellows.

INSTALLATION

MOUNTING

Refer to Figure 2 for mounting dimensions.

The regulators may be mounted in any position without affecting their operation. They can be pipe-mounted or panel-mounted on panels up to 3/16" thick. A 1-3/32" diameter hole is required for panel-mounting.

Caution

Exceeding the specified ambient temperature limits can adversely affect performance and may cause damage.

PNEUMATIC CONNECTIONS

The supply and output connections are 1/4" N.P.T. The exhaust connection is 1/8" N.P.T. as shown in Figure 2.

1/4" O.D. tubing is recommended for piping to the regulator, although any scale-free piping may be used.

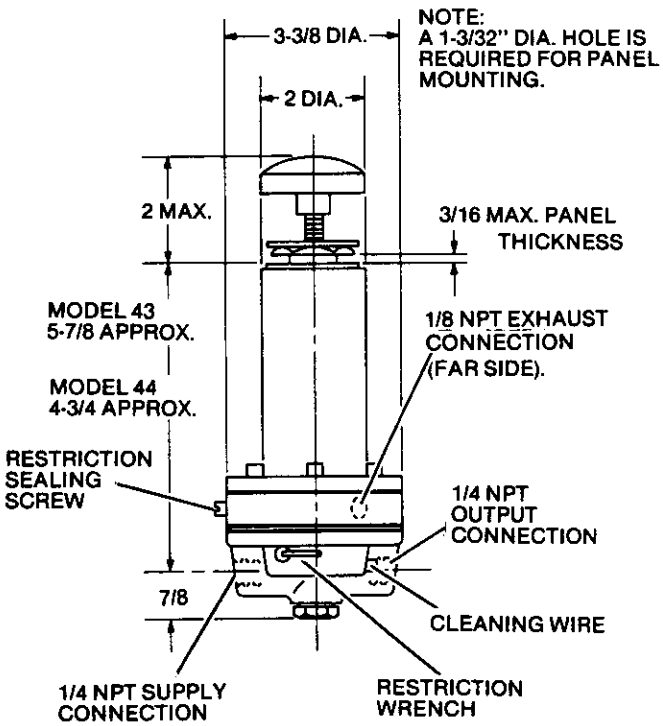


FIGURE 2 Installation

Blow out all piping before connections are made to prevent the possibility of dirt or chips entering the regulator.

Use pipe sealant sparingly, and then only on the male threads. A non-hardening sealant is strongly recommended.

Connect the regulator to a source of clean, dry, oil-free instrument air. See SUPPLY AIR REQUIREMENTS.

Caution

Pressure in excess of the following to the supply, output or exhaust port may cause damage:

Model 43-20 — 20 psig
Model 43-50 — 55 psig
Model 44-20 — 35 psig
Model 44-50 — 70 psig

A typical piping arrangement is shown in Figure 3.

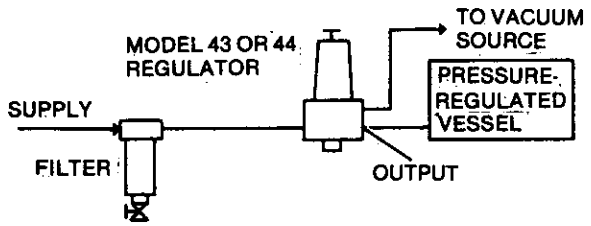


FIGURE 3 Piping

SUPPLY AIR REQUIREMENTS

Connect the regulator to a source of clean, dry, oil-free supply air. Failure to do so will increase the possibility of a malfunction or a deviation from specified performance.

Caution

Synthetic compressor lubricants in the air stream at the instrument may cause the regulator to fail.

There are many types of synthetic lubricants. Some may not be compatible with the materials used in construction of the regulator. Wetting of these materials by such an oil mist or oil vapor, etc., may cause them to deteriorate. This may ultimately result in failure of the regulator. The following materials are in contact with the supply air: brass, stainless steel, Neoprene and nylon.

The requirements for a quality air supply can be found in the Instrument Society of America's "Quality Standard for Instrument Air" (ISA-S7.3). Basically this standard calls for the following:

Particle Size — The maximum particle size in the air stream at the instrument should be no longer than 3 microns.

Dew Point — The dew point — at line pressure — should be at least 10°C (18°F) below the minimum temperature to which any part of the instrument air system is exposed at any season of the year. Under no circumstances should the dew point — at line pressure — exceed 2°C (35.6°F).

Oil Content — The maximum total oil or hydrocarbon content, exclusive of noncondensibles, should not exceed 1 ppm under normal operating conditions.

MAINTENANCE

LUBRICATION

An occasional application of light grease to the adjusting screw threads will facilitate easy turning of the adjusting knob. No other lubrication is required.

CLEANING

Restriction

The restriction can be removed for cleaning by first removing the restriction sealing screw (see Fig. 2) and then the restriction. A set screw wrench is provided in the bottom forging for removal of the restriction. Also, a cleaning wire is provided in the bottom forging. It should be run through the restriction several times.

Valve Plunger

To clean the valve plunger and its supply and exhaust seats, the plunger must be removed from the regulator. Turn off the supply source and remove the retaining nut on the bottom forging. The valve plunger and spring will drop out when this nut is removed, be careful not to lose them. The valve plunger must be clean on both the supply and exhaust seating surfaces. If necessary, use a non-abrasive solvent. The supply and exhaust seats in the regulator must also be clean. The supply seat is readily accessible; the exhaust seat can be reached by using a tobacco pipe cleaner. Here again, use non-abrasive solvents. When re-installing, see the Parts List for parts orientation and tighten the retaining nut securely.

DISASSEMBLY

Before disassembling, back-off the adjusting knob to relieve spring tension. Also, make a diagonal mark across all mating parts to provide easier alignment of the parts during reassembly. Refer to the Parts List, remove the body screws and disassemble the regulator.

ASSEMBLY

The exhaust diaphragm assembly and exhaust ring must be positioned so that none of the holes on the bottom forging are blocked. Refer to the Parts List and reassemble the regulator.

TROUBLE ANALYSIS

Symptom		Cause	Remedy
Series 44	Series 43		
No Output	Full vacuum	No supply	Turn on supply
		Clogged restriction.	Clean restriction.
Output cannot be increased to full value.	Output cannot be increased to atmospheric pressure.	Supply setting too low.	Raise to recommended value.
		Valve plunger being held open on exhaust seat by a chip (pipe dope, Teflon tape, thread shavings, pipe scale, etc.) Usually detected by a heavy exhaust.	Remove valve plunger and clean its seats.
Output cannot be reduced to atmospheric pressure.	Cannot achieve full vacuum.	Valve plunger not seating.	Remove valve plunger and clean its seats.

WARRANTY

The Company warrants all equipment manufactured by it and bearing its nameplate, and all repairs made by it, to be free from defects in material and workmanship under normal use and service. If any part of the equipment herein described, and sold by the Company, proves to be defective in material or workmanship and if such part is within twelve months from date of shipment from the Company's factory, returned to such factory, transportation charges prepaid, and if the same is found by the Company to be defective in material or workmanship, it will be replaced or repaired, free of charge, f.o.b. Company's factory. The Company assumes no liability for the consequence of its use or misuse by Purchaser, his employees or others. A defect in the meaning of this warranty in any part of said equipment shall not, when such part is capable of being renewed, repaired or replaced, operate to condemn such equipment. This warranty is expressly in lieu of all other warranties, guaranties, obligations, or liabilities, expressed or implied by the Company or its representatives. All statutory or implied warranties other than title, are hereby expressly negated and excluded.

Warranty repair or replacement requires the equipment to be returned to one of the following addresses.

Equipment manufactured or sold by MOORE PRODUCTS CO.:

MOORE PRODUCTS CO.
Sumneytown Pike
Spring House, PA 19477

Equipment manufactured or sold by MOORE INSTRUMENT CO.:

MOORE INSTRUMENTS LTD/LTEE
2KM West of Mississauga Rd. Hwy. 7
Brampton, Ontario, Canada

Equipment manufactured or sold by MOORE PRODUCTS CO. (U.K.) LTD.:

MOORE PRODUCTS CO. (U.K.) LTD.
Copse Road
Lufton, Yeovil
Somerset, BA22 8RN
England

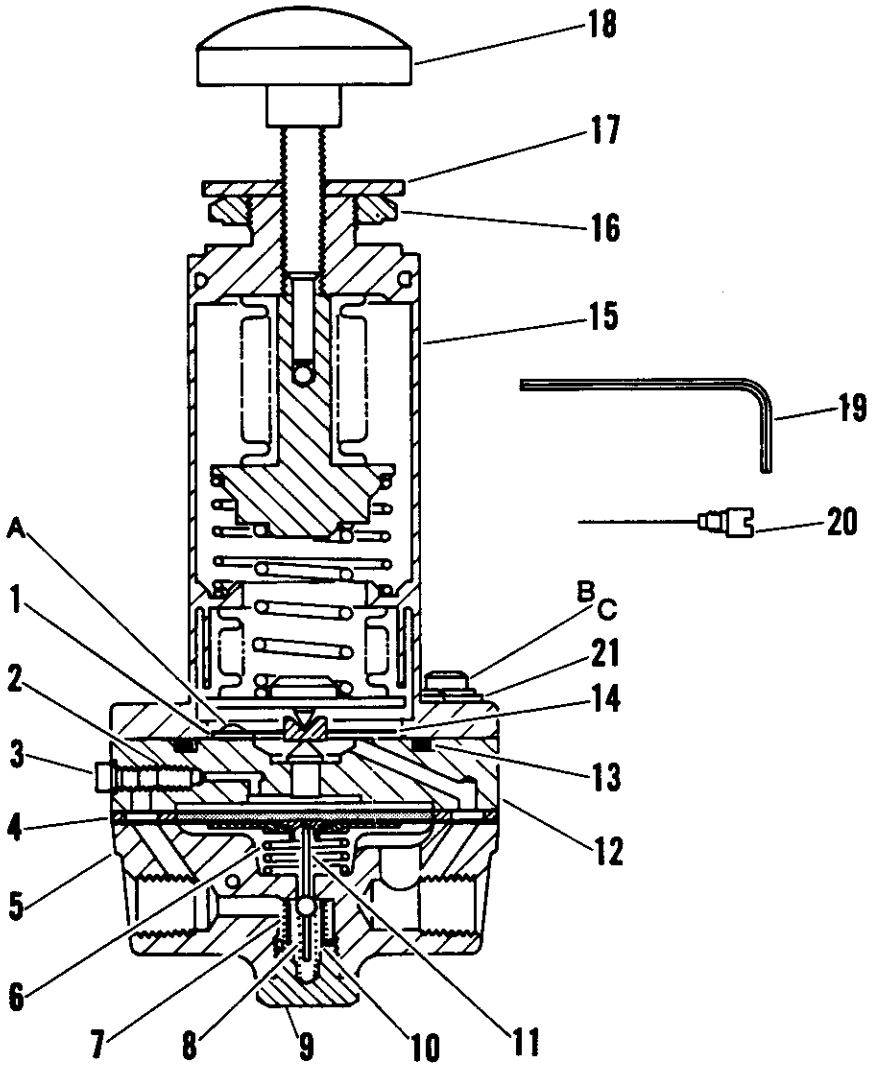
The warranty will be null and void if repair is attempted without prior authorization by a member of the MOORE PRODUCTS CO. Service Department.

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MODEL 43 SUB-ATMOSPHERIC PRESSURE REGULATOR

Drawing No. 12672PL

MODEL	B/M
43-20	12672-20S4



Item	Part No.	Description	Req'd
1	3850-7	Washer	2
* 2	8777-22	Restriction Screw	1
* 3	2900-23	Sealing Screw	1
* 4	3683-3	Exhaust Diaphragm Assy.	1
5	3537-60	Bottom Forging Assy. (Incl. Items 7, 8, 9, 10, 11, 19, 20)	1
* 6	1447-13	Spring	1
7	10342-26	Screen Retaining Spring	1
* 8	2155-7	Plunger Spring	1
9	10342-25	Retaining Nut	1
10	10342-27	Pilot Screen	1
*11	2155-3	Pilot Plunger	1
12	12585-25	Nozzle Ring Sub-Assy.	1
*13	2938-6	"O" Ring	1

Item	Part No.	Description	Req'd
14	12585-14	Leaf Spring Assy.	1
15	12585-20	Bellows Housing Sub-Assy.	1
16	1352-6	Jam Nut	1
17	1447-41	Locknut	1
17a	3603-5	Locknut (Optional Not Shown)	1
18	3683-14	Adjusting Screw	1
*19	3092-33	Restriction Wrench	1
*20	1033-22	Cleaning Wire	1
21	118-36	Washer	6
A	1-0630	#4-40 x 1/4 Rd. Hd.	2
B	1-3568	#1/4-20 x 1-1/2 Soc. Hd.	6
C	1-7303	#1/4 Med. Lwr.	6

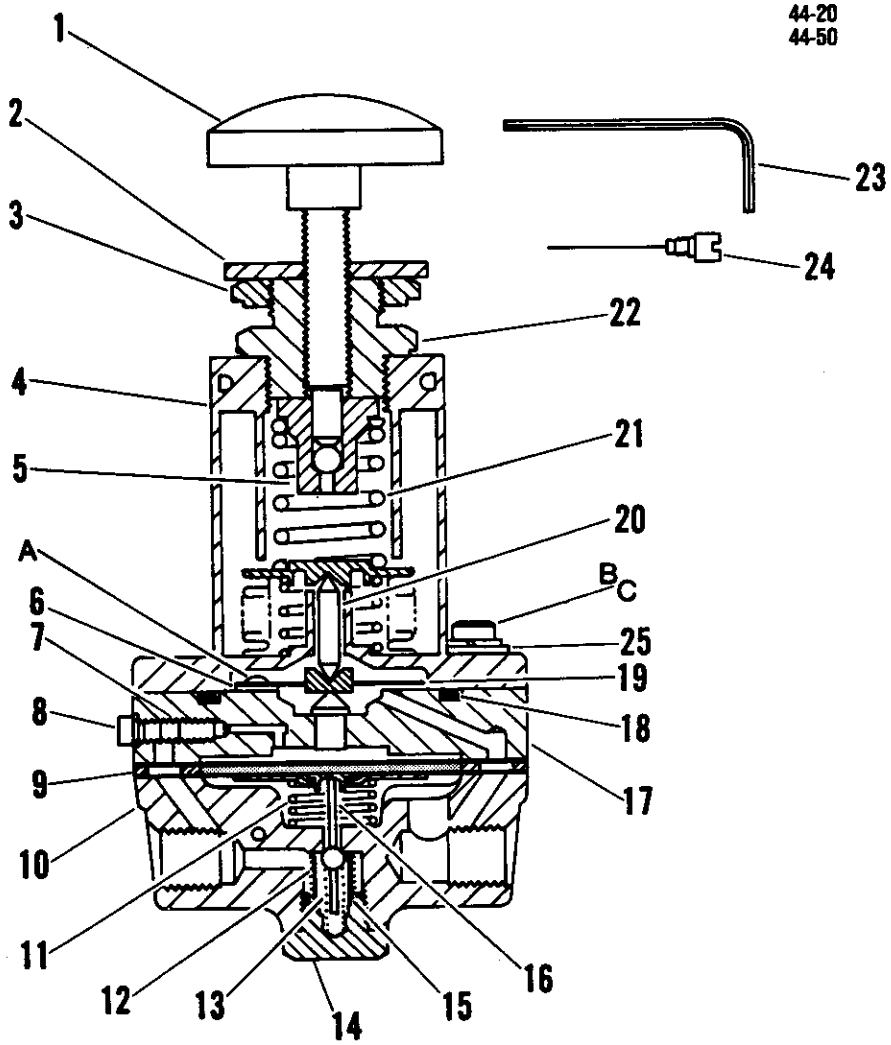
* Recommended on-hand spare parts. Always specify range, serial no., or other nameplate information when ordering Spare Parts.

MOORE

MODEL 44 SUB-ATMOSPHERIC
PRESSURE REGULATOR

Drawing No. 12699PL

MODEL	B/M
44-20	12699-20S4
44-50	12699-50S4



Item	Part No.	Description	Req'd
1	1447-22	Adjusting Screw	1
2	1447-41	Locknut	1
2a	3603-5	Locknut (Optional Not Shown)	1
3	1352-6	Mounting Nut	1
4a	12699-9	Housing Sub-Assy. (Model 44-20)	1
4b	12699-10	Housing Sub-Assy. (Model 44-50)	1
5	3684-10	Spring Seat	1
6	12699-12	Spacer	2
* 7	8777-22	Restriction Screw	1
* 8	2900-23	Sealing Screw	1
* 9	3683-3	Exhaust Diaphragm Assy.	1
10	3537-60	Bottom Forging Assy. (Incl. Items 12, 13, 14, 15, 16, 23 & 24)	1
*11	1447-13	Spring	1
12	10342-26	Screen Retaining Spring	1
*13	2155-7	Plunger Spring	1
14	10342-25	Retaining Nut	1

Item	Part No.	Description	Req'd
15	10342-27	Pilot Screen	1
*16	2155-3	Pilot Plunger	1
17	12699-13	Nozzle Ring Sub-Assy.	1
*18	2938-6	"O" Ring	1
19	12585-14	Leaf Spring Assy.	1
20	12699-5	Pusher	1
21a	1775-2	Spring (Model 44-20)	1
21b	7075-1	spring (Model 44-50)	1
22	3684-7	Bushing	1
*23	3092-33	Restriction Wrench	1
*24	1033-22	Cleaning Wire	1
25	118-36	Washer	6
A	1-0630	#4-40 x 1/4 Rd. Hd.	6
B	1-3568	#1/4-20 x 1-1/2 Soc. Hd.	6
C	1-7303	#1/4 Med. Lwr.	6

* Recommended on-hand spare parts. Always specify range, serial no., or other nameplate information when ordering Spare Parts.

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