



ITEM #	QTY.	PART #	DESCRIPTION
1	1	AD642A-P	CAP, DRIVE END, 290-A-2P
2 *	1	AC849A-P	SHAFT SEAL, 290-A-2P
3 *	1	AD649-P	O RING, 290-A-2P
4 *	1	AD638A-P	BEARING, DRIVE END, 290-A-2P
5	4	AB162C-P	DOWEL PIN, 290-A-2P
6	1	AD667-P	END PLATE, DRIVE END, 290-A-2P
7 *	2	AD641-P	BODY GASKET, 290-A-2P
8	1	AD665-P	BODY, 290-A-2P
9	1	AB136-P	DRIVE KEY, 290-A-2P
10	1	AD648-P	ROTOR ASM, 290-A-2P

ITEM #	QTY.	PART #	DESCRIPTION
11 *	2	AD655A-P	PUSH PIN, 290-A-2P
12 *	4	AD692-P	VANE SPRING, 290-A-2P
13 *	4	AD691-P	VANE, 290-A-2P
14	1	AD651-P	END PLATE, DEAD END, 290-A-2P
15 *	1	AB519-P	BEARING, DEAD END, 290-A-2P
16 *	1	AD644-P	END CAP GASKET, 290-A-2P
17	1	AD643-P	CAP, DEAD END, 290-A-2P
18	1	AC990-P	MUFFLER ASSEMBLY (NOT SHOWN)
19 *	1	AC993-P	FELT (NOT SHOWN)
	1 *	K208-P	KIT, SERVICE, 290-A-2P

\* Service Kit includes items 2, 3, 4, 7, 11, 12, 13, 15, 16 and 19

## Air Motor Operating and Maintenance Instructions

**WARNING:** Air Motor **MUST** be operated with filter/regulator/lubricator (FRL). See chart below for recommended air pressure: Do NOT exceed 60 PSI. Failure to properly install/operate air motor will void Manufacturer's Limited 1 Year Warranty!

### A. Installation

1. Install a filter, regulator, and lubricator (FRL) in air line ahead of motor. Morse can supply an FRL Kit for field installation at extra cost.
  - See chart below for appropriate FRL Kit.
  - See FRL literature sheet for operating instructions.
2. Use air lines the same size, or the next appropriate pipe size larger than the intake port of the motor. To run the unit properly, see recommended air pressure (PSIG) and standard cubic feet per minute (SCFM) in the chart below. DO NOT EXCEED 60 PSIG. The air line size is dependent upon the length of the line and number of restrictions. For example, in order to run the unit at 40 PSIG and 40 SCFM, a 100 ft. line or hose would require a 5/8" I.D.

Series	Serial Number Range	Air Pressure (Minimum PSI)	Air Consumption (SCFM)	Air Motor Connection Size	FRL Connection Size	FRL Kit
195	237663 to _____	20	22	1/2"	3/8"	90020-P
	000000 to 237662	40	22	1/4"	1/4"	90010-P
400, 405, 410	ALL	40	40	1/2"	3/8"	3869-P
510, 515, 520, 525	ALL	40	40	1/2"	3/8"	3869-P
611, 620	ALL	40	40	1/2"	3/8"	3869-P
201	ALL	40	22	1/4"	1/4"	90010-P
1-300 *	ALL	40	40	1/2"	3/8"	90020-P
2-300 *	ALL	60	60	1/2"	3/8"	90020-P
305	ALL	40	22	1/4"	1/4"	90010-P
310 *	ALL	50	60	1/2"	3/8"	90020-P
456 *	ALL	40	40	1/2"	3/8"	90020-P
1-5154	238730 to _____	20	22	1/2"	3/8"	90020-P
	000000 to 238729	40	22	1/4"	1/4"	90010-P
2-5154	ALL	40	40	1/2"	3/8"	90020-P

\* FRL is included and factory installed

### B. Lubrication

1. Use a detergent SAE #10 automotive engine oil.
2. The lubricator should be adjusted to feed one drop of oil per minute.

### C. Caution

1. Do not allow air motor to run at high speeds without a load and improper lubrication. Rapid motor damage and/or failure will occur.
2. For further operating and maintenance instructions, please refer to literature sheet supplied with motor.

**IMPORTANT ADDITIONAL OPERATING ADVICE** for air-motor driven hydraulic power options for 400, 405, 500 and 600 series.

Avoid unproductive "idling" of the air motor. Shut off air flow when not lifting or running power tilt. A Shut Off Valve should be installed conveniently close to the air motor. Air flow should be shut off when hydraulic power is not in use. Allowing the air motor to run while not performing useful work will waste energy, make unnecessary noise, cause excessive wear on the air motor and the hydraulic pump.

Regulate the air pressure to be adequate for lifting drums, but avoid excessively high pressure. An appropriately-sized set of Filter, Regulator, Lubricator should be installed to deliver air at recommended pressure and with proper lubrication for the air motor (See chart above for Morse part numbers).

Hydraulic control valves are "open center" type which means that when the hydraulic functions are not being used (the motor is "idling"), oil is pumped through the valves and back to the reservoir. Unlike an AC motor which regulates its own speed, the air motor tends to run faster with less load. High air pressure with ample air flow can cause the motor to run so fast as to damage itself, generate heat in the gear-pump that can spoil the lubricity of the hydraulic oil and damage the gears in the pump. Such damage will result in loss of effective hydraulic pressure to the extent that the unit may fail to lift heavy drums.