04685-00

This is the hazard alert symbol: ⚠ When you see this symbol, be aware that personal injury or property damage is possible. The hazard is explained in the text following the symbol. Read the information carefully before proceeding.

The following is an explanation of the three different types of hazards:

⚠ **DANGER**	Severe personal injury or death can occur if hazard is ignored.
⚠ **WARNING**	Severe personal injury or death will occur if hazard is ignored.
⚠ **CAUTION**	Minor injury or property damage can occur if hazard is ignored.

GENERAL INFORMATION

The air motor is designed to be driven by compressed air and under no circumstances be driven with any other gases. The air motor must not be driven by fluids, particles, solids or any substance mixed with air, particularly combustible substances likely to cause explosions.

⚠ **DANGER** Do not drive with flammable or explosive gases or operate the unit in an atmosphere containing them.

⚠ **CAUTION** The air motor is designed for air only. Do not allow corrosive gases or particulate material to enter the motor. Water vapor, oil-based contaminants, or other liquids must be filtered out.

Ambient temperature should not exceed 121°C (250°F).

INSTALLATION

The muffler is shipped with the air motor, but not installed. Install a moisture trap and filter in the air line ahead of motor. For efficiency of output and control of speed, use air lines the same size or in the next pipe size larger than the intake port of the motor. A single rotation motor will operate properly in only one direction. A reversible motor will work equally in both directions. A 4-way valve which can be connected by piping to both air ports of the motor will make reversing possible. When coupling or connecting the motor to a driven member, avoid any end or side thrust on the shaft and especially do not hammer on the shaft itself or on the coupling or pulley you might attach.

LUBRICATION - USE A DETERGENT SAE #10 AUTOMOTIVE ENGINE OIL (GAST PART #AD220)

An automatic air line lubricator, must be installed in the air line just ahead of the air motor. The lubricator should be adjusted to feed one drop of oil for every 50-75 CFM of air going through the motor. Air consumption figures for various models at various speeds and airline pressures can be obtained from your local Gast representative or the factory. Lubrication is necessary for all internal moving parts and rust prevention. Excessive moisture in the air line can cause rust formation in the motor and might also cause ice to form in the muffler due to expansion of air through the motor. The moisture problem can be corrected by installing a moisture separator in the line and also by installing an aftercoolor between the com-pressor and air receiver.

MOUNTING THE AIR MOTOR

⚠**WARNING** Beware of any exposed and/or movable parts. Proper guards should be in place to prevent personal and/or property damage.

The air motor should be mounted on a solid base plate, preferably of metal which in turn should be anchored to a sheif, the floor, or other machinery.

OPERATION

⚠**WARNING** Solid or liquid material exiting the unit can cause eye or skin damage. Keep away from air stream.

⚠**WARNING** Always disconnect the air supply before servicing.

⚠**CAUTION** Do not allow the air motor to "run free" at high speeds with no loads. Excessive internal heat build up, loss of internal clear ances and rapid motor damage will result. See table below for air motor limitations.

⚠**WARNING** Some models may exceed 85dB(A) sound level. Hearing protection should be worn when in close proximity to these models.

Air Motor Performance Limits

Motor Size	Maximum R.P.M.	Maximum Pressure psig	Maximum Torque lb.-inch	Maximum Air Consumption cfm
1AM	10,000	100	5.4	21
1UP	6000	80	6.0	27
2AM	3000	100	26.0	30
4AM	3000	100	56.0	72

Maximum Torque and Air Consumption can vary depending on specific operating conditions.

STARTING

The starting torque is less than the running torque and could vary depending on the position at which the vanes stop in relation to the air intake port. The speed and torque can be

regulated by using a pressure regulator or a simple shut-off valve to obtain desire power and conserve air.

SHUTDOWN AND STORAGE PROCEDURE

1. Turn off air intake supply and remove plumbing.
2. Remove air motor from the connecting machinery.
3. Use clean, dry air at low pressure to "flush out" condensates, such as water.

⚠**WARNING** Solid or liquid material exiting the unit can cause eye or skin damage. Keep away from the air stream.

4. Re-lubricate the air motor with a squirt of oil in the chamber. Rotate the shaft by hand several times.
5. Plug or cap each port. The unit is now ready for storage.

SERVICING

If unit requires more than installation of a service kit, it is usually quickest and least expensive to send the unit in for repair.

⚠ **WARNING** To prevent explosive hazard DO NOT drive this air motor with combustible gases. Injury and/or property damage can result.

⚠ **WARNING** DO NOT USE KEROSENE OR OTHER COMBUSTIBLE SOLVENTS.

⚠ **WARNING** Eye protection is REQUIRED. Keep face away from exhaust port and do not flush unit with flammable solvent.

⚠ **WARNING** Foreign material exiting the air motor can be hazardous.

⚠ **CAUTION** Do not drive the air motor in excess of the recommended speeds.

If the motor is sluggish or inefficient, try flushing with solvent".

-To flush a unit, disconnect air line and muffler.
-Add several teaspoons or spray solvent directly into the motor.
-Rotate the shaft by hand in both directions for a few minutes.
-Reconnect the air line and slowly apply pressure until there is no trace of solvent in exhaust air.
-Flush unit in a well ventilated area.
-Re-lubricate the motor with a squirt of oil in the chamber.

NOTE: If the vanes need replacing or foreign material is present in motor chamber, an experienced mechanic may remove the end plate opposite the drive shaft end. DO NOT PRY WITH A SCREWDRIVER. It will dent the surface of the plate and body causing leaks.

A puller tool should be used which will remove the end plate while maintaining the position of the shaft. New vanes should have the edge with the corners cut on angle or the notched edge (if reversible) towards the bottom of the vane slot.

HAZARD PREVENTION

"Recommended solvent for air motors and lubricated pumps is Gast Flushing solvent part # AH255 or AH255A, Loctite Safety Solvent, or Inhibisol Safety Solvent.

Air Motor Clearance Chart

US/IMPERIAL (IN) / METRIC (mm)		
Model	Total End Clearance	Top Clearance
1AM/1UP	0.0020 / 0.0508	0.0015 / 0.0381
2AM	0.0025 / 0.0635	0.0015 / 0.0381
4AM	0.0035 / 0.0889	0.0015 / 0.0381

GAST WARRANTY

REGARDLESS OF CAUSE, if a product you buy from Gast does not work right, Gast will repair or replace it once, at no charge, for up to one year from the date of shipment from the factory.

In the course of repair or replacement, Gast may send you written recommendations on how to prevent a problem from happening again. Gast reserves the right to withdraw this warranty if you do not follow these recommendations. Customer is responsible for freight charges both to and from Gast in all cases.

This warranty does not apply to electric motors, electrical controls and gasoline engines, which Gast obtains from other manufacturers. A motor or engine carries only the warranty of the company that makes it.

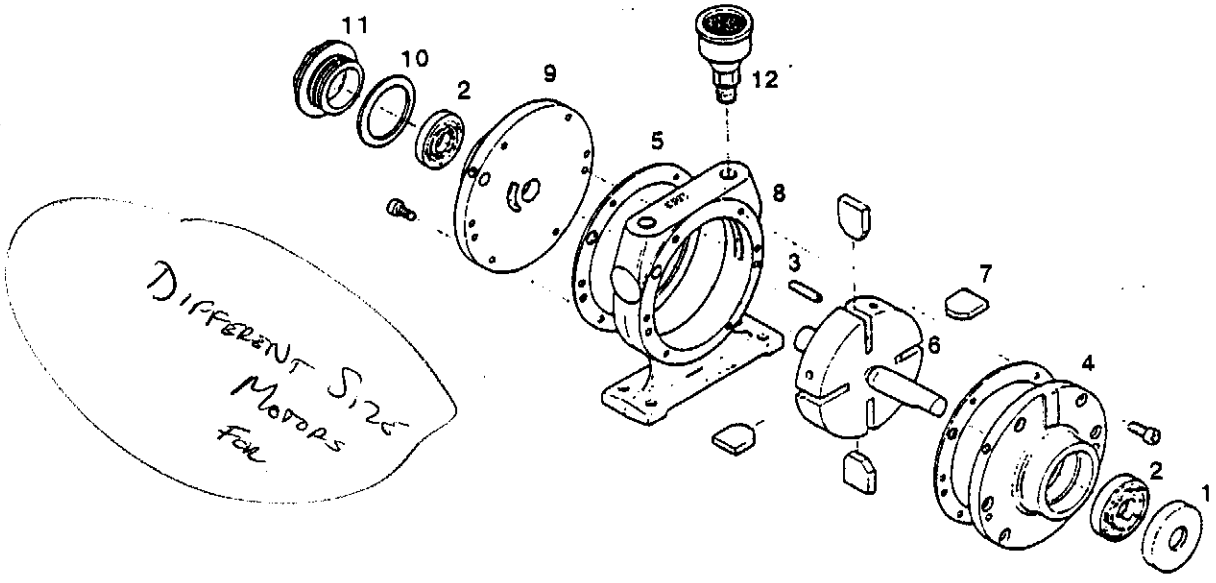
THIS WARRANTY IS EXCLUSIVE AND IS IN LIEU OF ALL OTHER WARRANTIES, WHETHER WRITTEN, ORAL OR IMPLIED, INCLUDING THE WARRANTY OF MERCHANTABILITY AND OF FITNESS FOR ANY PARTICULAR PURPOSE. GAST'S LIABILITY IS IN ALL CASES LIMITED TO THE REPLACEMENT PRICE OF ITS PRODUCT. GAST SHALL NOT BE LIABLE FOR ANY OTHER DAMAGES, WHETHER CONSEQUENTIAL, INDIRECT, OR INCIDENTAL, ARISING FROM THE SALE OR USE OF ITS PRODUCTS.

Gast's sales personnel may modify this warranty, but only by signing a specific, written description of any modifications.

Troubleshooting Guide

Reason	Low Torque	Low Speed	Won't Run At All	Runs Hot	Runs Good Then Slows Down
Dirt, foreign material	X	X	X		
Internal rust	X	X	X		
Misalignment	X	X	X	X	X
Insufficient air pressure	X	X			
Too small of airline		X			
Restricted exhaust		X			X
Poor lubrication	X	X	X	X	
Jammed machine	X	X	X		X
Compressor too small		X			X
Compressor too far from unit		X			X

½ HP

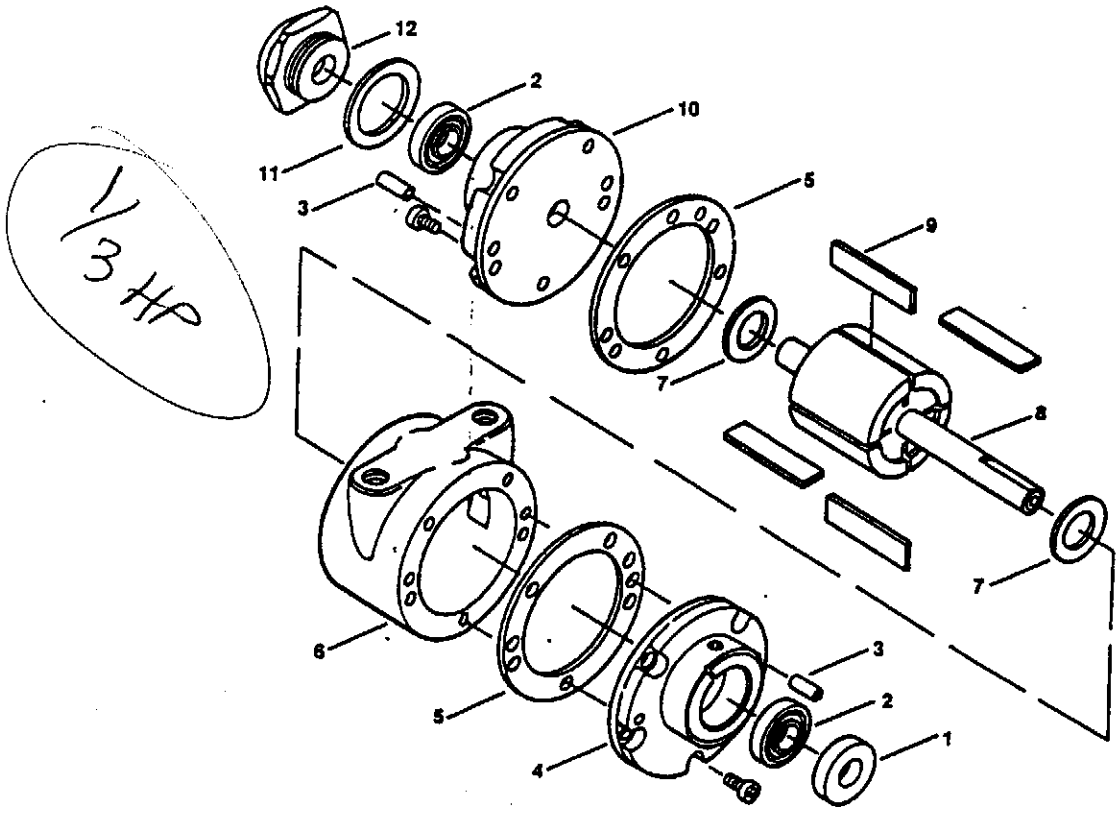


DIFFERENT SIZE MOTORS FOR

Ref. No.	Description	Part Qty	2AM-FCC-1	2AM-NCW-7A	2AM-FCW-13	2AM-NCC-16	2AM-NCC-43A	2AM-ACC-88
♦1	Shaft Seal	1	AC466B	AA466B	AA466B	AA466B	B2328	B2328
♦2	Bearing, Drive End	1	AA299J	AA299J	AA299J	AA299J	AB519	AB519
♦2	Bearing, Dead End	1	AA299J	AA299J	AA299J	AA299J	AA299J	AA299J
3	Dowel Pin	4	AB162	AB162	AB162	AB162	AB162C	AB162C
4	End Plate, Drive	1	AC720	AC726	AC722	AC724	AG708	AK425A
♦5	Body Gasket	2	B330	B330	B330	B330	B330	B330
6	Rotor Assembly	1	AA470A	AA489A	AA489A	AA470A	AM449A	AM449B
♦7	Vane	4	AA13B	AA13B	AA13B	AA13B	AA13B	AA13B
8	Body	1	AA477	AA467	AA477	AA467	AA467	AA467F
9	End Plate, Dead	1	AC721	AC723	AC723	AC721	AC721	AB622N
♦10	End Cap, Gasket	1	AA46	AA46	AA46	AA46	AA46	AA46
11	End Cap	1	AM307D	AM307D	AM307D	AM307D	AM307D	AM307D
12	Muffler Assembly	1	AC980	AC980	AC980	AC980	AAC980	AC980
	Felt	1	AC983	AC983	AC983	AC983	AC983	AC983
	Service Kit	1	K202	K202	K202	K202	K203A	K203A

♦Denotes parts included in the Service Kit.
Parts listed are for stock models. For specific OEM models consult the factory.
When corresponding or ordering parts please give complete model and serial numbers.

1AM / 1UP PARTS ORDERING INFORMATION

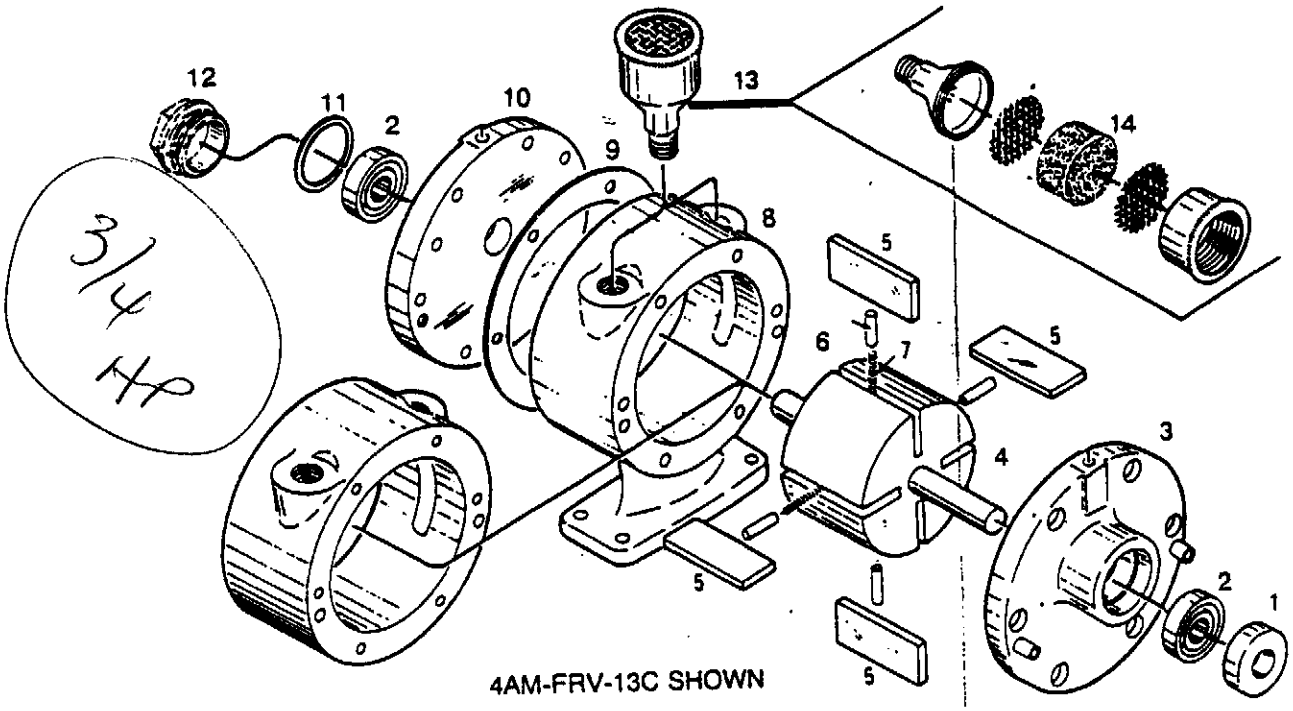


Ref. No.	Description	Part Qty	1AM-NCC-12	1AM-NCW-14	1AM-NRV-39A	1AM-NRV-56	1AM-NRV-63A	1AM-NRV-60
♦1	Seal	1	AC190A	AC190A	AC190A	AC190A	AC190A	AC190A
♦2	Bearing	2	AG549	AG549	AG549	AG549	AG549	AG549
3	Dowel Pin	4	D324A	D324A	D324A	D324A	D324A	D324A
4	End Plate, Drive	1	AC537	AC539	AC520	AC520	AC520	AC520
♦5	Body Gasket	2	AC527	AC527	AC527	AC527	AC527	AC527
6	Body	1	AC521	AC521	AC191	AC191	AC191	AC191
♦7	Cam Ring	2			AC195	AC195	AC195	AC195
8	Rotor Assembly	1	AC524	AC536	AC187	AC187	AC193B	AC607
♦9	Vane	4 8	AC205A	AC205A	AC259A	AC259A	AC259A	AC259A
10	End Plate, Dead	1	AC538	AC540	AC192	AC192	AC192	AC192
♦11	End Cap Gasket	1	AC229	AC229	AC229	AC229	AC229	AC229
12	End Cap	1	AC228A	AC228A	AC228A	AC228A	AC228A	AC228A
	Muffler	1	AF350	AF350	AF350	AF350	AF350	AF350
♦	Foam	1	AG896	AG896	AG896	AG896	AG896	AG896
	Service Kit	1	K200	K200	K201	K201	K278	K278

♦Denotes parts included in the Service Kit.
Parts listed are for stock models. For specific OEM models consult the factory.
When corresponding or ordering parts please give complete model and serial numbers.

Ref. No.	Description	Part Qty	1UP-NCC-1A	1UP-NCW-2A	1UP-NRV-3A	1UP-NRV-10
♦1	Shaft Seal	1	AC190A	AC190A	AC190A	AC190A
♦2	Bearing	2	AG549	AG549	AG549	AG549
3	Dowel Pin	4	D324A	D324A	D324A	D324A
4	End Plate, Drive	1	AC616	AC520B	AC520	AC520
♦5	End Plate Gasket	2	AC527	AC527	AC527	AC527
6	Body	1	AE899	AE899	AE898	AE898
♦7	Cam Ring	2			AC195	AC195
8	Rotor Assembly	1	AE896	AE895	AE897	AE319
♦9	Vane	4 8	AE893	AE893	AE894	AE894
10	End Plate, Dead	1	AC617	AC192A	AC192	AC192
♦11	End Cap, Gasket	1	AC229	AC229	AC229	AC229
12	End Cap, Dead	1	AC228A	AC228A	AC228A	AC228A
	Muffler	1	AF350	AF350	AF350	AF350
♦	Foam	1	AG896	AG896	AG896	AG896
	Service Kit	1	K285	K285	K286	K298

♦Denotes parts included in the Service Kit.
Parts listed are for stock models. For specific OEM models consult the factory.
When corresponding or ordering parts please give complete model and serial numbers.



4AM-FRV-13C SHOWN

									Metric	
Ref. No.	Description	Part Qty	4AM-FRV-13C	4AM-NRV-22B	4AM-FRV-24	4AM-NRV-50C	4AM-NRV-54A	4AM-NRV-70C	4AM-ARV-119	4AM-ARV-120
♦1	Shaft Seal	1	AA466B	AA466B	AA466B	B2328	AA466B	B2328	B2328	B2328
♦2	Bearing, Dead	1	AA299J	AA299J	AA299J	AA299J	AA299J	AA299J	AA299J	AA299J
♦2	Bearing, Drive	1	AA299J	AA299J	AA299J	AB519	AA299J	AB519	AB519	AB519
3	End Plate, Drive	1	AC727	AC665	AC727	AG707	AC665	AG707	AK425A	AK425A
4	Rotor Assembly	1	AB617	AB617	AM426	AM455A	AM411	AM319A	AM455C	AM455B
♦5	Vane	4 8	A8876	AB876	AB876	AB876	AB876	AB876	AB876	AB876
♦6	Push Pin	4 8	AM467	AM467	AM467	AM467	AM467	AM467	AM467	AM467
♦7	Vane Spring	2 4	AM466	AM466	AM466	AM466	AM466	AM466	AM466	AM466
8	Body	1	AM425	AM410	AM425	AM410	AM410	AM410	AM410M	AM410M
♦9	Body Gasket	2	B330	B330	B330	B330	B330	B330	B330	B330
10	End Plate, Dead	1	AC728	AC728	AC727	AC728	AC728	AC728	AB622M	AB622M
♦11	End Cap, Gasket	1	AA46	AA46		AA46	AA46	AA46	AA46	AA46
12	End Cap, Dead	1	AM307D	AM307D		AM307D	AM307D	AM307D	AM307D	AM307D
13	Muffler Assembly	1	AC980	AC980	AC980	AC980	AC980	AC980	AC995	AC995
♦14	Muffler Felt	1	AC983	AC983	AC983	AC983	AC983	AC983	AC993	AC993
	Service Kit	1	K205	K205	K205	K206A	K279	K280A	K206C	K206B

♦Denotes parts included in the Service Kit.
Parts listed are for stock models. For specific OEM models consult the factory.
When corresponding or ordering parts please give complete model and serial numbers.

04685-00,

OPERATING AND MAINTENANCE INSTRUCTIONS FOR:

GR11, GR20, & GR25 GEAR REDUCERS and WORM TYPE GEAR REDUCERS

IMPORTANT INFORMATION

⚠ **WARNING** Gast air-powered gearmotors are not self locking. In applications where a brake is required for safety, in case of air pressure failure, contact your Distributor.

Before starting a stored unit or re-starting an inactive unit, the oil level should be returned to the proper level. See Recommended Oil Chart.

SPECIFICATIONS FOR GR11 GEAR REDUCERS

Speed Range: (Reducer output Shaft) 33.3 RPM to 400 RPM

Gear Reduction: 15:1

Maximum Allowable End Thrust: (Reducer output Shaft) 100 lbs. with 0 overhung load.

Maximum Allowable Overhung Load: (Reducer output Shaft) Ranges from 100 lbs. at 400 RPM with 0 end thrust to 200 lbs. at 33.3 RPM with 0 end thrust.

SPECIFICATIONS FOR GR20 GEAR REDUCERS

Speed Range: (Reducer ouput Shaft) 30 RPM to 300 RPM

Gear Reduction: 10:1

Maximum Allowable End Thrust: (Reducer output Shaft) Ranges from 200 lbs. at 300 RPM with 0 overhug load to 800 lbs. at 30 RPM with overhung load.

Maximum Allowable Overhung Load: (Reducer output Shaft) Ranges from 200 lbs. at 300 RPM with 0 end thrust to 600 lbs. at 33.3 RPM with 0 end thrust.

SPECIFICATIONS FOR GR25 GEAR REDUCERS

Speed Range: (Reducer ouput Shaft) 20 RPM to 200 RPM

Gear Reduction: 15:1

Maximum Allowable End Thrust: (Reducer output Shaft) Ranges from 135 lbs. at 200 RPM with 0 overhug load to 535 lbs. at 20 RPM.
Maximum Allowable Overhung Load: (Reducer output Shaft) Ranges from 135 lbs. at 200 RPM with 0 end thrust to 400 lbs. at 20 RPM.

WORM GEAR REDUCERS

IMPORTANT INFORMATION

A breather plug is shipped along with the gear reducer. It must be installed in place of the top pipe plug (used for shipping), to allow proper venting.

⚠ **CAUTION** Operation without venting can cause internal pressure to build and will damage internal parts of the gear reducer.

Before starting a stored unit or re-starting an inactive unit, the oil level should be returned to the proper level.

RECOMMENDED OIL FOR GEARBOX

To assist in selection of proper lubrication we have listed names by company.

MANUFACTURER	50 to 125° F (10 to 52°C) Ambient Temperature AGMA Compound No. 8
Amoco	American Cyl. Oil 680
Cities Service Oil Co.	Citgo Cyl. Oil 680-7
Gulf Oil Corporation	Senate 680
Mobil Oil Company	Extra HECLA, Super C.O. or Mobil Gear 680
Kendall	Kendco 206 Comp.
Texaco Incorporated	Honor Cyl. Oil 680 or Meropa 680
Shell Oil Company	Valvata Oil J-680 or Omala 680
Unocal	Steaval C-200

For service, parts, or repair of the WORM GEAR REDUCER, contact the manufacturer shown on the gear reducer label.

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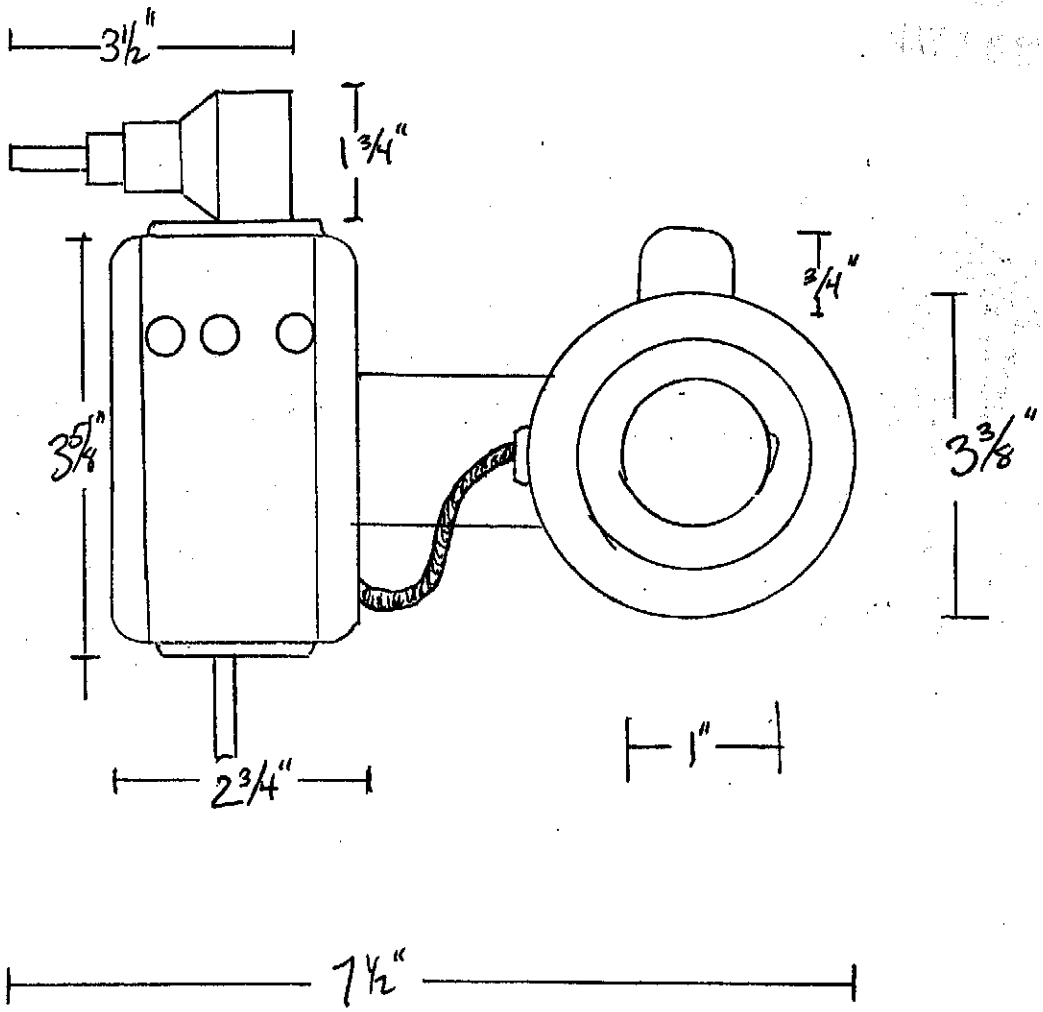


Maximum Depth 3½"

Cole Parmer's P/N...

Type	Link Item#	Item Description	Link Qty/ Avl to Sel
P	00011JH	BEARING	2
		A8	14
P	00011JI	GREASE SEAL	1
		A9	5
P	00011KH	RETAINING RING	2
		A12	0
P	00011KI	INTERNAL RING GEAR	1
		A13	21
P	00011KJ	DRIVE GEAR	1
		A14	6

Base Item # 04685-00 MIXER,AIR,50-1200RPM,1/3HP

Type	Link Item#	Item Description	Link Qty/ Avl to Sel
P	00009IU	SERVICE KIT	1
		K200	0
P	00011JB	AIR MOTOR	1
		A1	0
P	00011JC	TOP HOUSING	1
		A2	0
P	00011JD	GEAR PIN	4
		A4	30
P	00011JE	PLANETARY GEAR ASSY	4
		A56	26

Type	Link Item#	Item Description	Link Qty/ Avl to Sel
P	00011KM	MUFFLER	1
		A19	0
P	00011KN	COUPLING	1
		A22	0
P	00011KO	PROPELLER	1
		A25	0

Worm Gear Reducer Series A-F
Gear Reducer Specifications
All output shafts are in the standard location.

Model	Air Motor	Ratio
AG803	4AM	20:1
AG805	4AM	40:1
AG807	4AM	60:1
AG809	6AM	10:1
AG811	6AM	20:1
AG816	8AM	20:1

Service, Parts or Repair
For service, parts or repair of the worm gear reducer, contact the manufacturer listed on the nameplate.

Change output shaft direction of worm gear reducers

1. Remove drain plug and drain oil from unit.
2. Remove end cover and seal cage cap screws. While supporting output shaft, remove end cover and shims from unit. Keep shims with cover.
3. Remove output shaft and seal cage together from extension side. Keep shims with seal cage.
4. Insert seal cage, shims and sub-assembly into housing from the side opposite from which they were removed.
5. Insert seal cage cap screws and tighten with light pressure.
6. Assemble end cover with shims. Insert end cover cap screws and tighten with light pressure.
7. Turn high speed shaft in both directions to check that gear train is running freely.
8. Cross-tighten seal cage and end cover cap screws.

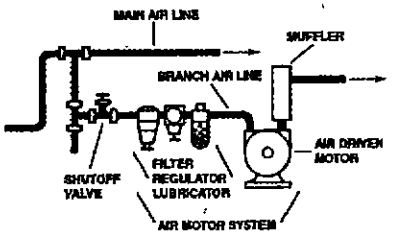
PART NO. 45-200 D170PL (Rev. P)

TROUBLESHOOTING CHART

Problem					
Low Torque	Low Speed	Won't Run	Runs Hot	Runs Well Then Slows Down	Reason & Remedy For Problem.
•	•	•			Dirt or foreign material present. Inspect and flush.
•	•	•			Internal rust. Inspect and flush.
•	•				Low air pressure. Increase pressure.
	•				Air line too small. Install larger line(s).
				•	Restricted exhaust. Inspect and repair.
•	•	•		•	Motor is jammed. Have motor serviced.
	•			•	Air source inadequate. Inspect and repair.
	•			•	Air source too far from motor. Reconfigure setup.

Mounting
This product can be installed in any orientation. Mount the motor to a solid metal base plate that is mounted to a stable, rigid operating surface. Use shock mounts to reduce noise and vibration. Install a pressure regulator or simple shut-off valve to control motor.

Connection



Check the direction of the motor airflow. A single rotation motor will operate properly only in one direction. Single rotation motors require a sound absorber to be connected to the air port. Remove the plastic shipping plugs from the ports. Save plugs for future use during shutdown.

Install a 5-micron filter in the air line before the connection to the motor. Next install an air pressure regulator to control motor speed and torque.

An automatic air line lubricator should be installed in the air line as close as possible and no more than 18 inches (1/2 meter) from the air motor. Install the lubricator level with or above the air motor so that the oil mist will blow directly into or fall down into the motor.

Fill the oil reservoir to the proper level with Gast #AD220 or SAE 10W high detergent or non-detergent motor oil. For food processing applications, White Rex 426 food grade motor oil is FDA approved. Adjust lubricator to feed 1 drop of oil for every 50 CFM of air while the unit is running, or 1 drop of oil per continuous minute of run time. Do Not overfeed oil or exhaust air may become contaminated.

Clean the compressed air connection with low pressure air to remove any dirt from the line before connecting to the ports.

Use the proper sized fasteners. For the most efficient output and control of speed, use air lines that are the same size as the motor inlet port if the connection is less than 7 feet (2 meters). For longer connections, use the next pipe size larger than the motor intake port. Connect lines to motor in the proper direction.

A reversible motor will work equally well in both directions. Connect a 4-way valve with piping to both air ports of motor to make reversing possible. Connect the sound absorber on the exhaust air port or valve connection.

Do not add any thrust to the end or side of the shaft when making connections.

Do not use a hammer on the shaft or connections.

Lubricating the drive shaft will make assembly easier. Use a puller for removal of pulleys, couplings and pinions on the motor shaft. Check that the tension on the belt pulley matches the manufacturer's specifications. Do not exceed the maximum radial and axial forces on the shaft. If the motor shaft is connected to the part to be driven without a coupling, check that the radial offset and axial force effect will not cause problems.

Use only belts with < 10⁹ electrical leakage resistance to prevent static electrical problems. Ground the motor.

Accessories
A muffler is shipped with the air motor (except 16AM) but is not installed. Consult your Gast Distributor/Representative for additional filter recommendations. Install a moisture trap and 5 micron filter in the air line ahead of motor.

Air consumption data at various speeds and pressures are available from your Gast Distributor/Representative or the factory.

OPERATION

⚠ WARNING

Injury Hazard
Air stream from product may contain solid or liquid material that can result in eye or skin damage
Do Not use combustible gases to drive this motor.
Wear hearing protection. Sound level from motor may exceed 85 db(A).
Failure to follow these instructions can result in eye injury or other serious injury.

Check all connections before starting motor. It is your responsibility to operate this product at recommended speeds, loads and room ambient temperatures. Do not run the motor at high speeds with no load. This will result in excessive internal heat that may cause motor damage.

The starting torque is less than the running torque. The starting torque will vary depending upon the position of the vanes when stopped in relation to the air intake port.

Use a pressure regulator and/or simple shut-off valve to regulate the motor's speed and torque. This will provide the required power and will conserve air. Open the air supply valve to the motor. Set the pressure or flow rate to the required speed or torque. Adjust the lubricator to feed one drop of oil for every 50-75 CFM (1.5-2 M³ per minute) of air moving through motor. Check the oil level daily. The gear reducer does not need lubrication.

Operate the motor for approximately 2 hours at the maximum desired load. Measure the surface temperature of the motor on the casting opposite the pipe ports. The maximum surface temperature listed on the motor is for normal environmental and installation conditions. For most air motors, the maximum surface temperature should not exceed 266°F/130°C. Do not continue to operate the motor if the measured surface temperature exceeds temperature listed on the motor. If your measured temperature does exceed listed value, consult with your Gast Distributor/Representative for a recommendation.

MAINTENANCE

WARNING

Injury Hazard

Disconnect air supply and vent all air lines.

Wear eye protection when flushing this product.

Air stream from product may contain solid or liquid material that can result in eye or skin damage.

Flush this product in a well ventilated area.

Do Not use kerosene or other combustible solvents to flush this product.

Failure to follow these instructions can result in eye injury or other serious injury.

It is your responsibility to regularly inspect and make necessary repairs to this product in order to maintain proper operation.

Lubrication

Use Gast #AD220 or a detergent SAE #10 automotive engine oil for lubricating. Lubricating is necessary to prevent rust on all moving parts. Excessive moisture in air line may cause rust or ice to form in the muffler when air expands as it passes through the motor. Install a moisture separator in the air line and an after cooler between compressor and air receiver to help prevent moisture problems.

Manual Lubrication

Shut the air motor down and oil after every 8 hours of operation. Add 10-20 drops of oil to the air motor intake port.

Automatic Lubrication

Adjust inline oiler to feed 1 drop of oil per minute for high speed or continuous duty usage. Do Not overfeed oil or exhaust air may become contaminated.

Check intake and exhaust filters after first 500 hours of operation. Clean filters and determine how frequently filters should be checked during future operation. This one procedure will help assure the motor's performance and service life.

Flushing

Flushing this product to remove excessive dirt, foreign particles, moisture or oil that occurs in the operating environment will help to maintain proper vane performance. Flush the motor if it is operating slowly or inefficiently.

Use only Gast #AH255B Flushing Solvent. DO NOT use kerosene or ANY other combustible solvents to flush this product.

1. Disconnect air line and muffler.
2. Add flushing solvent directly into motor. If using liquid solvent, pour several tablespoons directly into the intake port. If using Gast #AH255B, spray solvent for 5-10 seconds into intake port.
3. Rotate the shaft by hand in both directions for a few minutes.
4. **You must wear eye protection for this step.** Cover exhaust with a cloth and reconnect the air line.
5. Restart the motor at a low pressure of approximately 10 PSI/0.7 bar until there is no trace of solvent in the exhaust air.
6. Listen for changes in the sound of the motor. If motor sounds smooth, you are finished. If motor does not sound like it is running smoothly, installing a service kit will be required (See "Service Kit Installation").

Check that all external accessories such as relief valves or gauges are attached and are not damaged before operating product.

Cleaning sound absorber

1. Remove the sound absorber.
2. Clean the felt filter.
3. **You must wear eye protection for this step.** Lubricate motor with 3-4 drops of oil.
4. Check the air compressor.
5. Listen for changes in the sound of the motor. If motor sounds smooth, you are finished. If motor does not sound like it running smoothly, installing a service kit will be required (See "Service Kit Installation").

Shutdown

It is your responsibility to follow proper shutdown procedures to prevent product damage.

1. Turn off air intake supply.
2. Disconnect air supply and vent all air lines.
3. Disconnect air lines.
4. Remove air motor from connecting machinery.
5. Remove the muffler.
6. **Wear eye protection, Keep away from air stream.** Use clean, dry air to remove condensation from the inlet port of the motor.
7. Lubricate motor with a small amount of oil into the intake port. Rotate shaft by hand several times to distribute oil.
8. Plug or cap each port.
9. Coat output shaft with oil or grease.
10. Store motor in a dry environment.

Disposal (Please note current regulations) Parts of the air motor or air powered gear motor, shafts, cast iron or aluminum castings, gear wheels as well as rolling contact bearings may be recycled as scrap metal.

Estimated Ball Bearing Life of Lubricated Air Motors

Air Motor Model	Shaft speed in RP	Ball Bearing Life hours L_{10}
1AM	10,000	28,000
1UP	6,000	14,000
2AM	3,000	30,000
4AM	3,000	14,000
6AM	3,000	6,500
8AM	2,500	8,000
16AM	2,000	15,000

Based on running pressure of 60 PSI and coupling connection to motor load. The direction, magnitude and location of applied loads to the motor shaft will change expected bearing life. Driving the motor with wet dirty compressed air can reduce expected bearing life. The above are life estimates not warranted minimum values.

SPUR & WORM GEAR REDUCERS - OPERATING AND MAINTENANCE INSTRUCTIONS

General Information:

The product nameplate specifies all information required when ordering parts or requests for information. The type of lubricant required for unit is also specified on the nameplate.

Product Use Criteria:

- All worm gear reducers require that the air motor be mounted so that the inlet and exhaust ports are at a 90° angle to the centerline of the reducer output shaft.
- Gear reducers are NOT self-locking. If a brake is required for safety, as in the case of air pressure failure, etc., contact your Gast Distributor/Representative.
- Some worm gear reducers may be shipped with a plug in the top pipe plug. The plug must be removed and the breather plug installed for proper operation.
- Check the oil level in spur gear reducers which have been stored or not operated for a period of time.
- Gear motors require proper lubrication. Insufficient oil level can cause loss of performance, damage or failure of the gear reducer.

Spur Gear Reducer Specifications

Model	GR11	GR20	GR25
Speed Range (Reducer Output Shaft)	33.3 to 400 RPM	30 to 300 RPM	20 to 200 RPM
Gear Reduction	15:1	10:1	15:1
Maximum Allowable End Thrust With Zero Overhung Load. (Reducer Output Shaft)	100 lbs/45,4 kg	200 lbs/90,8 kg @300 RPM to 600 lbs/363,2 kg at 30 RPM	250 lbs/113,5 kg at 200 RPM to 600 lbs/363,2 kg at 20 RPM
Maximum Allowable Overhung Load With Zero End Thrust. (Reducer Output Shaft)	100 lbs/45,4 kg at 333 RPM to 200 lbs/90,8 kg at 33.3 RPM	200 lbs/90,8 kg at 300 RPM to 600 lbs/272,4 kg at 30 RPM	200 lbs/90,8 kg at 200 RPM to 600 lbs/272,4 kg at 20 RPM
Lubrication	Use a 300 ssu at 100°F/38°C turbine quality lubricant – Gast #AG292A, Gulf Harmony 53, Shell Tellus 33, Socony DTE heavy medium or Humble Nuto 53. **For horizontal operation,** remove both plugs and add oil to top hole until other hole overflows. **For vertical operation,** fill to overflow point of upper most hole.		