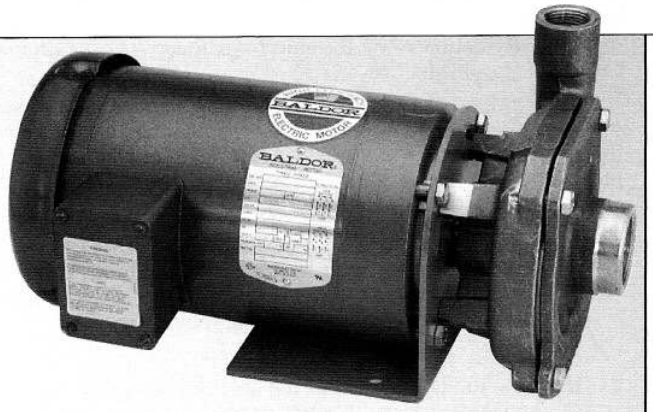
KC2/KP2 PUMPS



INSTRUCTIONS

The care required of this pump, while nominal, is very important. We recommend a careful review of the installation and maintenance covered in this instructional pamphlet to ensure extended trouble-free service.

LOCATION

The motors used on Ampco pump units have been selected as the best for the anticipated environment. For greatest service life, mount the pump and motor where the environment is relativity clean, dry, and non-corrosive. Standard totally enclosed motors may be installed where dirt, moisture and mild corrosion are present or in outdoor locations. Specialty motors may be required for moist, corrosive, or explosive environments. Motor drain plugs (if not equipped with automatic drains) must be removed periodically to drain accumulated condensation. Pump units should be located where daily visual inspection is possible and no surrounding structure interferes with ventilating air over or through the motor.

INSTALLATION

Installation of Ampco pumps should be made as close to the supply of liquid as possible, with short and direct suction piping. Avoid high points in the piping where air pockets can form. The suction and discharge piping should be simple with the connections properly aligned to prevent any strain from being placed on the pump casing. Provisions should be made for pipe expansion and contraction in services handling hot or cold liquids. Base-mounted pedestal pumps must be realigned AFTER installation and piping is completed.

ROTATION

Check direction of rotation **BEFORE** starting the pump. Correct rotation is counter clockwise as viewed from the pump inlet. Incorrect rotation may cause catastrophic failure. Close coupled pumps will be equipped with single phase motors properly sequenced or with three phase motors labeled to indicate required power sequence ABC or CBA for correct rotation. Use a phase sequence indicator to identify power source sequence. For base mounted pumps disconnect the coupling and check motor rotation while disconnected from the pump.

MAINTENANCE

Daily observation of Ampco pumps while in operation is the ounce of prevention needed to extend the service life. Mechanical seals are selected for maximum life with due consideration to the economy of the installation. The seal is the only expendable item. Other pump parts are designed for indefinite life expectancy, except as they may be corroded and/or eroded by aggressive products or by misapplication such as undersizing, oversizing, cavitation, etc. Bearings on some pedestal pumps and some motors are prelubricated and require no additional lubrication. Schedule for regreasing other types of bearings will vary, depending on size speed, duty, and environment. For guidance, a steady running, indoor installation in a relatively clean atmosphere at 40C (104F) ambient should not require grease for two years. Care should also be taken not to over grease motors. Pumps handling corrosive or otherwise aggressive solutions should be flushed with clean water after each use because stagnant conditions are usually most corrosive. In seawater, Ampco Alloy pumps provide cathode protection for stainless steel parts. To prevent crevice corrosion and pitting, drain and then flush out the pump with fresh water when inactive for periods greater then one week.

Ampco KC2 and KP2 pumps fitted with standard mechanical seals have all-metal seal parts of 316 stainless steel, carbon rotating face, ceramic stationary seat, and Buna-N elastomers. Other seal types are supplied when specified. Optional materials such as Viton, EPDM, or Teflon elastomers, Tungsten Carbide, Silicon Carbide, or Ni-Resist faces can be supplied when requested. The mechanical seal should be replaced at the first sign of leakage where the shaft enters the pump. Leakage may cause motor bearing damage. Also, since the primary seal surfaces are lapped to precise flatness, the seal should be replaced whenever the pump is dismantled to the point of separating the seal faces. Always keep a replacement seal kit on hand. It includes a complete seal along with the gasket and o-ring required to rebuild the pump.

There may be other pump assemblies, parts and seal arrangements not shown or otherwise described in this pamphlet, that require the same philosophy of seal positioning. It is suggested that highlights of these instructions be applied while paying close attention to parts arrangement during dismantling.

DISMANTLE AND REPLACE PARTS AS FOLLOWS:

Before attempting any service on the pump or motor, disconnect or lock out electrical power to the pump motor. If the pump and motor are to be removed as a unit, note the wiring configuration. Use colored or numbered tape to mark the wire connections of the motor and power source, to retain correct direction of rotation when reconnecting. Incorrect rotation may cause catastrophic failure.

It is recommend that the complete unit be removed and serviced on a workbench. For the close-coupled KC2 disconnect the power marking the wires for reconnection. For the base mounted KP2, disengage the coupling and remove the pump and pedestal.

1. Remove the suction cover by unbolting the four capscrews (9/16 wrench). Note the condition of the gasket, which will adhere either to the suction cover or the casing.

2. Unscrew the impeller from the shaft, turning in a counter-clockwise direction. Loctite used during assembly may require heating impellers of all type KC2 and KP2 to assist in removal. Apply approximately 350F heat to the center of the impeller. A screwdriver slot on the motor shaft opposite the pump is provided for steadying the shaft. Use of a strap wrench on the impeller hub is recommended to prevent marring. Otherwise, file or polish out wrench marks before reusing impeller.

The fluid end of the pump is now sufficiently dismantled for completing most repairs and replacements, including the mechanical seal.

3. If it is necessary to repair or replace the motor of a close coupled assembly or the bearing adapter of a pedestal assembly, unbolt the capscrews fastening the pump to motor or pedestal, thus disengaging the casing and bracket.

The mechanical seal is the only expendable pump part. It is suggested that the complete mechanical seal, both stationary and rotating members, be replaced whenever dripping or leakage occurs at the shaft, or whenever parts are removed to the point of separating the primary sealing surfaces.

4. Remove the rotating parts of the mechanical seal from the impellers shaft like extension (see drawing). The seals flexible bellows may stick tightly to the impeller stem. Bathe in oil to soften the adhesive, or cut away with knife. Remove the o-ring from the shaft I.D.

5. The stationary seat and its cup gasket or o-ring may be removed while the casing is in an assembled position with a wire hook (coat hanger wire). Insert the hook between the I.D. of the seat and the shaft and pull forward, or remove the casing and press out the seat.

6. Thoroughly clean impeller stem, seat cavity and motor shaft with solvent and dry with a clean cloth.

An anti-seize lubricant was originally applied to the I.D. of the impeller that fits over the shaft and is retained by an o-ring. Either preserve this lubricant or add fresh lubricant to the I.D., not the shaft, and replace the o-ring. One drop of oil applied on the shaft will prevent the o-ring from binding on the shaft while assembling the impeller.

7. Lightly oil bore and finger press stationary seat with gasket or o-ring into its cavity. Seat (usually ceramic) is fragile. Do not abuse.

8. Clean the polished face of the stationary seat with a lint-free cloth or tissue, and lightly coat this surface with an SAE-10 or equivalent oil. Care should be taken that the cleansing material and the oil are free of foreign particles. Do not use grease or allow grease onto the sealing surfaces.

9. Place the rotating portion of the mechanical seal on the shaft like extension of the impeller that may be lightly oiled (SAE 10W-30) to facilitate sliding of the bellow by softening an adhesive film on the seal (Use soap, glycerin, etc. if oil is not permitted i.e. EPDM). Do not use grease, as this would prevent the adhesive film from resetting. Final adherence to the impeller stem is essential for shaft, impeller, and seal to rotate as a unit. First place the spring retainer and spring over the impeller shaft. Then press the carbon rotating subassembly down the impeller shaft until it engages the spring. Do not continue to slide the assembly down the shaft once the rotating assembly has engaged the spring. Inspect the carbon sealing face and remove any foreign particles with a lint-free cloth or tissue. Do not allow grease on the sealing surfaces.

10. Place the impeller with mechanical seal in place on the drive shaft. A slight extra push is required to start the o-ring onto the shaft. Proceed to screw the impeller clockwise onto the treaded shaft, utilizing the slot on the opposite end of the shaft to steady the shaft. Hand tighten or use a strap wrench, or other non-marring device such as a jar opener.

11. The pump assembly is completed by reinstalling the suction cover plate and its gasket. Be sure casing and gasket surfaces are relativity clean and free of foreign particles.

12. Your pump is now ready to be reinstalled into its accompanying pipe system and the motor reconnected.

One way to damage a new seal is to run it dry. Be sure the pump is in place and primed before operating or checking rotation.

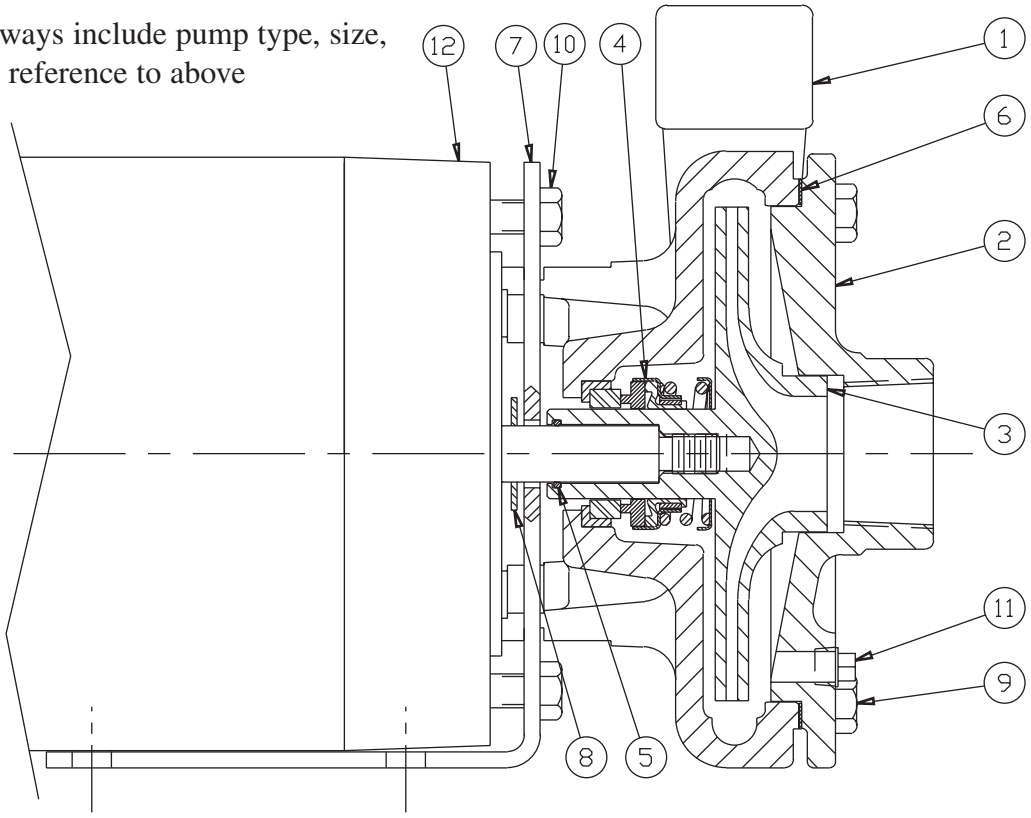
NOTE: Starting motor in direction of unthreading impeller will result in jamming and damaging bearing and possibly other motor and pump parts. Motor connections should have been marked to avoid this possibility. Also, an economical phase sequence indicator will identify your A-B-C connections. If a reassembled pump unit is not going to be put back in service immediately, or if there is a real possibility for incorrect start up rotation, a suitable thread-locking compound may be used (i.e. Loctite #271).

KP2 PUMPS

AMPCO PUMPS COMPANY
PARTS BREAKDOWN

DETAIL NO.	PART NAME
1	CASING
2	COVER
3	IMPELLER
5	BEARING ADAPTER
14	OUTBOARD BEARING
14A	INBOARD BEARING
16	SLINGER
17A	CAP SCREW
17B	CAP SCREW
21	GASKET (CASING/COVER)
21A	O-RING (IMPELLER)
22	EXT. RETAING RING
22A	INT. RETAINING RING
22B	WAVE SPRING WASHER
23	BRACKET
26	SHAFT
27	KEY - COUPLING
120	MECHANICAL SEAL

NOTE: Please be sure to always include pump type, size, and serial number with any reference to above numbers and names.



COMMON TROUBLES AND THEIR CAUSES

It is to the users advantage to be familiar with a systematic procedure to determine reasons and causes for unsatisfactory pump operation. The following list of troubles and causes is intended to assist users in determining the cause of any pumping trouble. Faulty installations can then be corrected and a clear description given the manufacturer if assistance is required. Human judgment should not be relied on to measure operating conditions. Use proper instruments to measure values of pressure, suction lift, speeds, temperature rise of motors, etc. When motor speeds are incorrect, check connections and measure voltage at motor terminals.

1. **No liquid delivered**
   a. Pump and suction line not completely primed
   b. Speed too low
   c. Required discharge too high
   d. Suction lift too high
   e. Impeller, piping, or fittings completely plugged up
   f. Wrong direction of rotation

2. **Not sufficient capacity**
   a. Air leaks in suction pipe or shaft seal
   b. Speed too low
   c. Required discharge head too high
   d. Suction lift too high or insufficient NPSH available
   e. Impeller, piping, or fittings partially plugged
   f. Insufficient positive suction head for hot water or other volatile liquids
   g. Liquid viscosity too high
   h. Mechanical problems - wear rings worn, impeller damaged, shaft seal defective
   i. Wrong direction of rotation
   j. Suction pipe entrance too close to surface of liquid
   k. Air pockets in pipe high points

3. **Not sufficient pressure**
   a. Speed too low
   b. Mechanical problems - wear rings worn, impeller dam aged, shaft seal defective
   c. Small impeller diameter
   d. Air or gas in liquid
   e. Wrong direction of rotation
   f. Air pockets in pipe high points

4. **Pump operates for a while, then quits**
   a. Leaky suction line
   b. Air leaking in through shaft seal
   c. Suction lift too high or insufficient NPSH available
   d. Air or gas in liquid
   e. Suction piping and fittings not completely freed of air during priming
   f. Air pockets in pipe high points

5. **Pump takes too much power**
   a. Speed too high
   b. Pumping too much water because required head is lower than anticipated
   c. Viscosity and/or specific gravity is higher than specified
   d. Mechanical problems - binding at wear rings from distortion due to piping strains, shaft bent, impeller rubbing casing, stuffing box too tight
   e. Wrong direction of rotation

SOME TYPICAL APPLICATIONS

Your Ampco Pump was selected for a specific service. Other Ampco pump styles are available to successfully handle many additional applications including the following partial list. Ask you Ampco representative for complete information.

abrasive slurries
activated carbon filter slurries
acetone
alum solution
amide solution
anodizing solutions
beer
beer filter slurry (diatomaceous earth)
brine solutions
cane juice
carbon suspension
carbon tetrachloride
caustic
chromic acid
cleaning solutions
dye
deionized water
ethylene glycol
fatty acid
fermentation gas
formaldehyde
glycerin
hydrofluosilicic acid
hydrofluoric acid
lard oil and fatty acid
luminescent solutions
marine sanitary service
marine water desalting equipment
mineral water
molasses
nitric acid
oleic acid
phosphoric acid
plating solutions
potassium acetate
polyethyl benzene
salt water (oil field)
sludge fuel
sodium chloride
sodium fluoride
sodium hydroxide
solvent
spin bath solution (rayon)
starch
sugar liquor
stillage with solids
sulfuric acid
tall oil
tea
vinegar
vegetable oil
vinyl liquor
water solutions (corrosive and/or abrasive)
whey
wort (beer and molasses)
yeast cream

Consult Ampco for applications not listed.

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