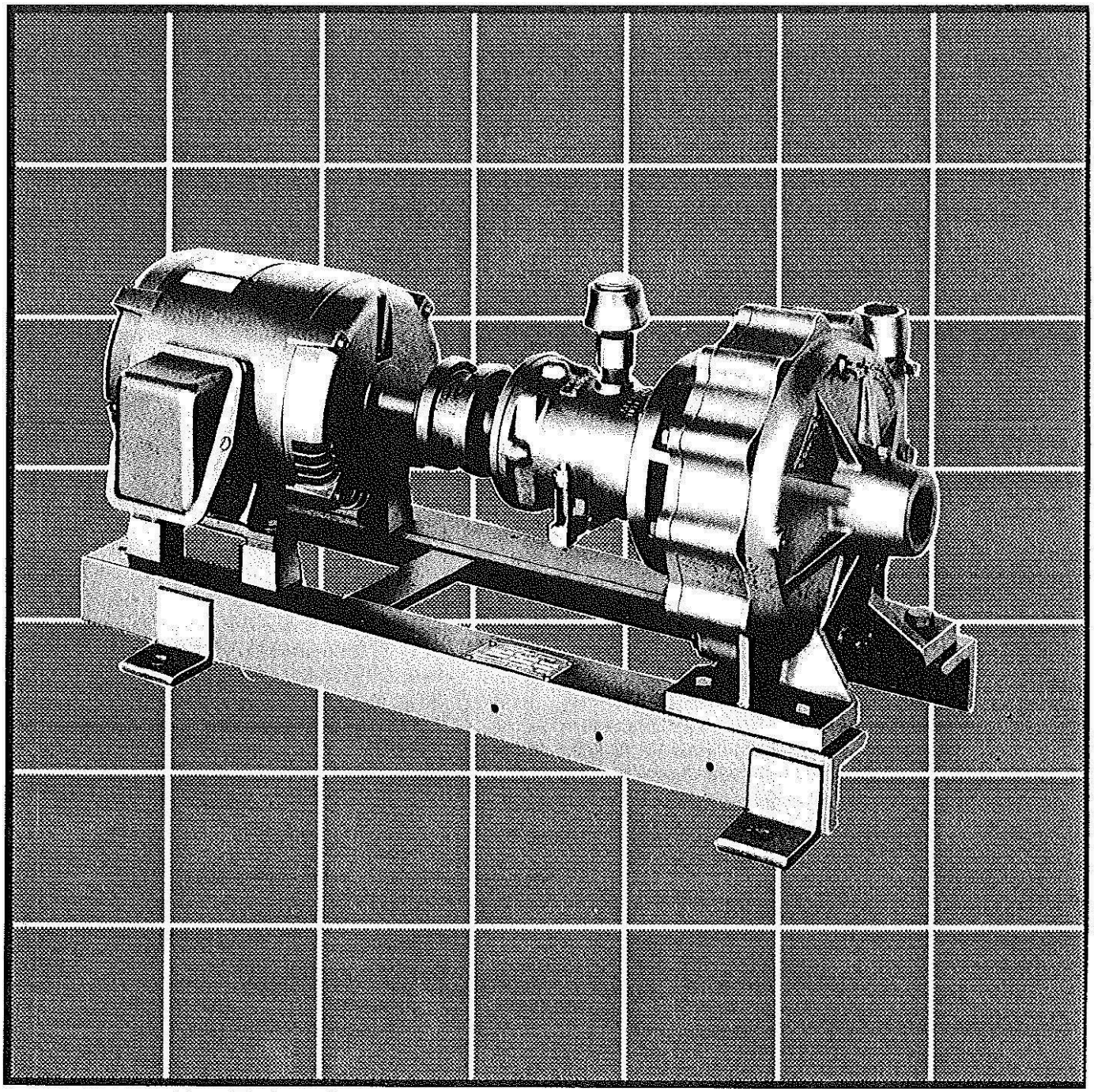
Form 3559D

PUMP SECTION - B9 and AB9 Centrifugal Pumps
Installation, Operation & Maintenance Manual



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INTRODUCTION

The Dunham-Bush Type B9 Pump is radially split, horizontal, cantilevered, single stage, volute type, centrifugal pump. These pumps are supplied with an end face mechanical shaft seal installed which is especially selected for reliability and life on the particular pump application. Pumps are usually supplied as complete units including the motor which is connected to the pump through a flexible coupling which has been selected for required torque transmission, quiet operation and misalignment capability. All components are supplied on a rigid structural steel base which has been designed to eliminate any "sound box" effect.

Section I

HOW TO INSTALL

A. LOCATION

1. For satisfactory operation of any centrifugal pump it is necessary that adequate net positive suction head (NPSH) is available at the pump suction connection (NPSH is the total head in feet absolute, less the vapor pressure of the liquid in feet absolute, available to the pump). For this reason the pump should be located as close to the liquid source as possible.

2. Adequate head room should be provided for the use of lifting equipment.

3. Adequate space should be allowed for inspection during pump operation.

B. FOUNDATION

The foundation should be solid and substantial enough to absorb mechanical vibration. In general, concrete foundations are the most satisfactory. Where concrete foundations are used foundation bolts should be supplied (located as shown on dimensional drawings) which are imbedded in the concrete. It is recommended that each bolt be fitted with a pipe sleeve approximately 2½ times the bolt diameter and with a washer to support the head of the bolt in the sleeve. After the concrete is poured, the pipe sleeves remain in place allowing the foundation bolts to be shifted for alignment with the holes in the base (see Figure 1 and 2).

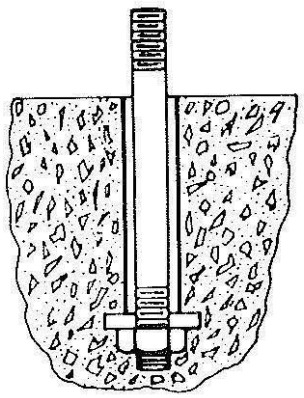

Fig. 1

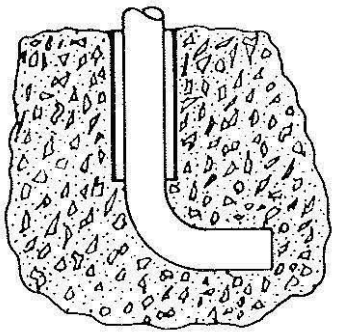

Fig. 2

C. MOUNTING PUMP

1. Uncrate pump leaving all instructions attached and install at its' place of operation.

2. Locate leveling plates and shims at each foundation bolt.

3. Level base across driver end, shimming as necessary.

4. Level base across pump end, shimming as necessary.

5. Level base lengthwise and tighten nuts on the foundation bolts evenly.

D. PIPING

1. Both suction and discharge piping should be as short and as direct as possible. There should be as few as possible fittings and bends. Bends where used should, if possible, be made with a long radius.

2. Piping should be adequately supported near the pump to prevent strains being transmitted to the pump when tightening the flange bolts, or when pipe expansion may be expected due to operating temperature.

3. Pipes at the suction and discharge should be as large or larger than the openings in the pump.

4. Gate valves and pressure gages should be installed in both the suction and discharge line to facilitate pump maintenance and performance checks.

E. SUCTION PIPING

1. Suction lines must be free of vapor trapping pockets.

2. In horizontal lines leading to the pump only eccentric reducers should be used. (see Fig. 3 & 4)

3. The suction line must be free from air leaks and adequate provisions should be made for the expansion of hot lines.

4. It is recommended that a strainer be installed near the pump suction nozzle to catch scale or other foreign material. A pressure gauge installed on each side of the strainer can be used for measuring the pressure drop across the strainer.

5. If a strainer or foot valve is to be used on the inlet end of the suction line, the free area through the strainer or valve should be approximately 2½ to 4 times the area of the suction pipe.

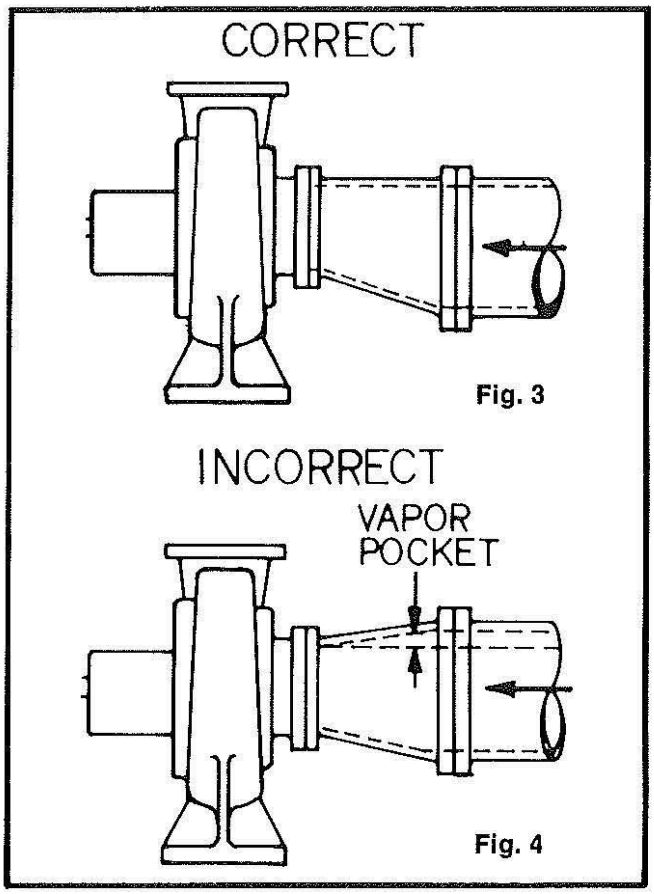

Fig. 3

Fig. 4

F. DISCHARGE PIPING

1. On some installations, a check valve and a balancing cock in addition to a gate valve may be required in the discharge line. The check valve is used to prevent liquid from running back through the pump in case of failure of the driver. The balancing cock is used to control the pumps operating capacity by providing a changeable control of the piping system curve. The gate valve is used in priming, starting and when shutting down the pump.

2. When valves are required in the discharge line, they should be located as near as possible to the pump.

3. In some applications when the pump may be operated with zero flow, provisions should be made for recirculating a portion of the liquid from the discharge to the suction to reduce the possibility of the pump overheating.

G. PIPING FOR SPARE PUMPS

The operating and spare pumps in high temperature service should be piped so that hot liquid from the discharge of the operating pump circulates continuously through the by-pass to the spare pump and back to the suction of the operating pump. This can greatly reduce thermal shock when the spare pump is started.

H. INSTALLING PUMP

1. Make up the piping connections to the discharge and suction nozzle. All piping must be properly supported by hangers and not by the pump.

2. Fill bearing bracket assembly with American No. 31 or Sunoco Sunvis 754 Oil until oil level is between the high and low level marks on the sight glass (with pump stopped). Periodic inspections should be made to assure that adequate oil level is maintained. NOTE: Standard design of B9 & AB9 pumps includes oil lubed sleeve bearings. On some special orders grease lubed ball bearings are supplied – on these pumps delete this step.

3. Wire the pump motor for the voltage required per wiring diagram on motor nameplate or in cover of motor terminal box. All wiring must be in accordance with local regulations. If motor is damaged due to improper wiring, guarantee is void.

I. ALIGN PUMP & DRIVER

1. Woods type J are standardly supplied on these pumps. They are assembled and aligned at the factory but the alignment must be checked due to loading, off-loading, transportation and leveling of base. The coupling size is die stamped in the coupling flange. Alignment should be accomplished both before initial start-up and after pump reaches operating temperature.

a. Check parallel misalignment by placing a straight edge across the two coupling flanges (see Fig. 5) and measure the offset at various points around the periphery of the coupling to determine the maximum offset. This value should not exceed the value under Fig. 7 and should be as close to zero as possible.

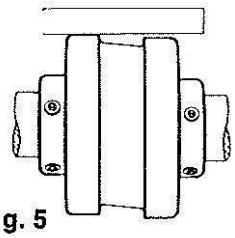

Fig. 5

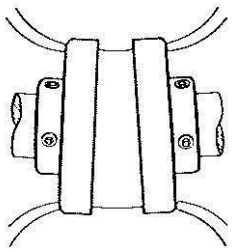

Fig. 6

b. Check angular misalignment by using a micrometer or micrometer calipers to measure the gap between the two flanges (see Fig. 6). Measure this gap at intervals around the periphery of the coupling to determine the minimum and maximum gap. The differences in these two values should not exceed the values given in Fig. 7 and should be as close to zero as possible. If the angular misalignment was adjusted, go back and recheck the parallel alignment.

NOTE:

– If the shaft does not extend completely through the bore of the flange, it must engage the bore a distance equal to or greater than the diameter of the shaft. For example, a flange with a 1 inch bore must grasp at least 1 inch of the shaft.

Flange Size	Type J	
	Parallel	Angular
3J	.010"	.035"
4J	.010"	.043"
5	.015"	.056"
5J	.015"	.056"
6	.015"	.070"
6J	.015"	.070"
7	.020"	.081"
7J	.020"	.081"
8	.020"	.094"
8J	.020"	.094"

Fig. 7

– In no case should the distance between shafts be less than 1/8 inch.

– If the coupling is being used on a sleeve bearing electric motor, the coupling should be made up with the motor armature at its' electrical center.

– DO NOT rotate the coupling while making alignment checks.

2. Where a D/B strap coupling has been supplied the same method of alignment can be applied. Alignment should be within 0.062" parallel and 0.125 angular.

3. Check the safety codes in your locality to see if protective guards and/or shields are required.

Section II
OPERATION

A. STARTING PUMP

1. Open suction and discharge valves to pump. These pumps have a mechanical seal and must not be run dry. Open cock at top of case to vent out any air.
   Note: a. If pump is above the level of the liquid to be pumped, close the discharge valve. If the pump is below the level of the liquid, open the discharge valve 1½ to 2 turns.

   b. Prime the pump. All air and vapor must be removed. The pump case and suction pipe must be filled with liquid before the pump is started.

2. Rotate the pump shaft by hand to be sure pump is not binding. Checking for sticking should also be done after a prolonged pump shutdown.

3. Start pump and check for correct rotation according to the arrow on the case. If running in wrong direction, on single phase change according to manufacturer's diagram and on three phase, change any two leads to the motor. Disconnect power before changing wiring.

4. If the pump is fitted with a flushing line, open the line and admit flushing liquid to the seal chamber for 10 to 15 minutes.

5. Lack of capacity and head may indicate the passage ways of the pump impeller have become clogged with foreign matter or motor speed is low. If speed of motor is low and unit is operated on single phase current, check the wiring connections at the motor. If wired for 230 volt current, but actually operating on 115 volt current, the motor will never come up to proper speed and may burn out. On single phase and three phase pumps if voltage is low the motor will never come up to proper speed. If low voltage occurs, notify local power company. Slugging of air is another cause of low capacity and head on a closed system. Be sure the system is properly vented of all air - see further notes under Trouble Shooting Section IV.

WARNING – DO NOT ATTEMPT TO OPERATE PUMP WITH CLOSED SUCTION VALVE

6. As soon as the pump is up to full speed, open the discharge valve slowly. Do not let the pump run with the discharge valve closed.

7. Check pressure gauges on each side of the strainer in the suction line. A pressure drop across the strainer indicates it is becoming clogged with dirt or scale. In this case, the pump should be shut down and the screen cleaned or replaced. A clogged strainer can cause damage to the pump.

8. The pump should be shut down if it fails to develop its rated discharge pressure at operating speed, or if bearings overheat or there is undue vibration or noise.

B. OPERATING AT REDUCED CAPACITY

If the pump is connected to a constant speed driver, capacity can be reduced by throttling the discharge. If the pump is connected to a variable speed driver, reduction of both the head and the capacity can be accomplished either by reducing the speed or by throttling the discharge.

When throttling the discharge, a by-pass connection may be used to by-pass sufficient liquid to prevent overheating and vaporization of the liquid in the pump.

C. OPERATING ROUTINE

1. Check bearing temperatures periodically. If there is overheating, check the oil level in the reservoir and the oil temperature. When ambient temperature is normal, the skin temperature should not exceed 175°F on pumps equipped with sleeve type bearings.

   a. Normal inspection consists of periodic checks of oil gauge for proper oil level which is between the high and low level marks on the sight glass with the pump stopped.

   b. Replacement of the oil in the bearing bracket depends upon the application of the pump, breakdown or contamination of the oil. The major cause of premature bearing failure is oil contamination and as such the oil should be changed after the first 100 hours of operation. Thereafter 2000 hours is normal for oil changes for average pump applications. This may be accomplished by disconnecting power to pump and removing oil level gauge then flushing out with kerosene or fuel oil. Replace oil level gauge and fill bearing bracket with oil until oil level is between high and low oil level marks.

2. Lubricating pump motor should be done per motor manufacturer's recommendations.

3. Check seals for leakage.

4. Check suction and discharge pressure gauges. If the differential pressure drops critically, shut down the pump at once.

D. STOPPING

The pump should be shut down rapidly to keep liquid in the pump and prevent parts from seizing. After stopping the driver, close the discharge valve and then the inlet valve, in that order. When pumps are operating in parallel, it is sometimes necessary to close the discharge valve immediately after stopping the driver to prevent reverse rotation. If pumps are to remain idle under freezing conditions precautions such as draining the case should be taken to avoid damage.

Section III
MAINTENANCE

A. DISASSEMBLY

There are two methods of removing the bearing assembly sliding the motor back or disassembling the coupling. Use system best suited, disconnecting power to pump as the first step.

1. Sliding the Motor

   This method is normally used when the motor is connected with flexible electrical conduit.

   a. Remove the four cap screws securing the motor to base.

   b. Loosen the two Allen head set screws (28) in pump half of coupling.

   c. Slide motor and coupling back until coupling back until coupling disengages pump shaft.

2. Disassembling the Coupling

   a. Loosen Allen Head Set Screws (Ref. Fig. 5) from half couplings.

   b. Slip half couplings apart and remove sleeve.

3. If D/B Strap Coupling is Supplied (Ref. Fig. 8)

   a. Remove three (four on some larger models) hex socket cap screws (18E), lock washers (18F), flat washers (18G) from motor half of coupling allowing the coupling to be parted.

   b. Loosen the Allen Head Set Screws (18D) in motor half of coupling and slide back as far as possible.

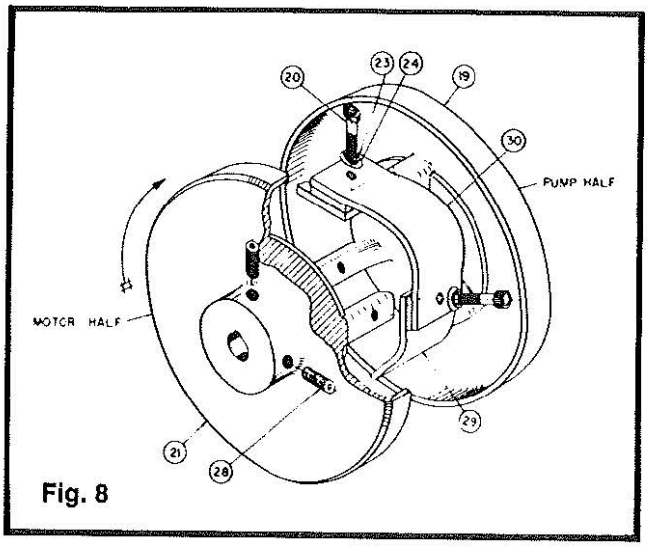

Fig. 8

4. Close valves in the suction and discharge lines and open cocks in pump case to drain pump or drain system.

   (For numbers referenced in the following paragraphs – See Figure 9.)

5. Remove the twelve ½" 13 hex head cap screws (33), holding head (11) to case (1), remove bearing bracket (14) and head assembly (11) from the case (1) as a unit.

6. Remove impeller retaining nut (4) by turning counter clockwise.

7. Remove impeller (7) and key (5) from shaft (28).

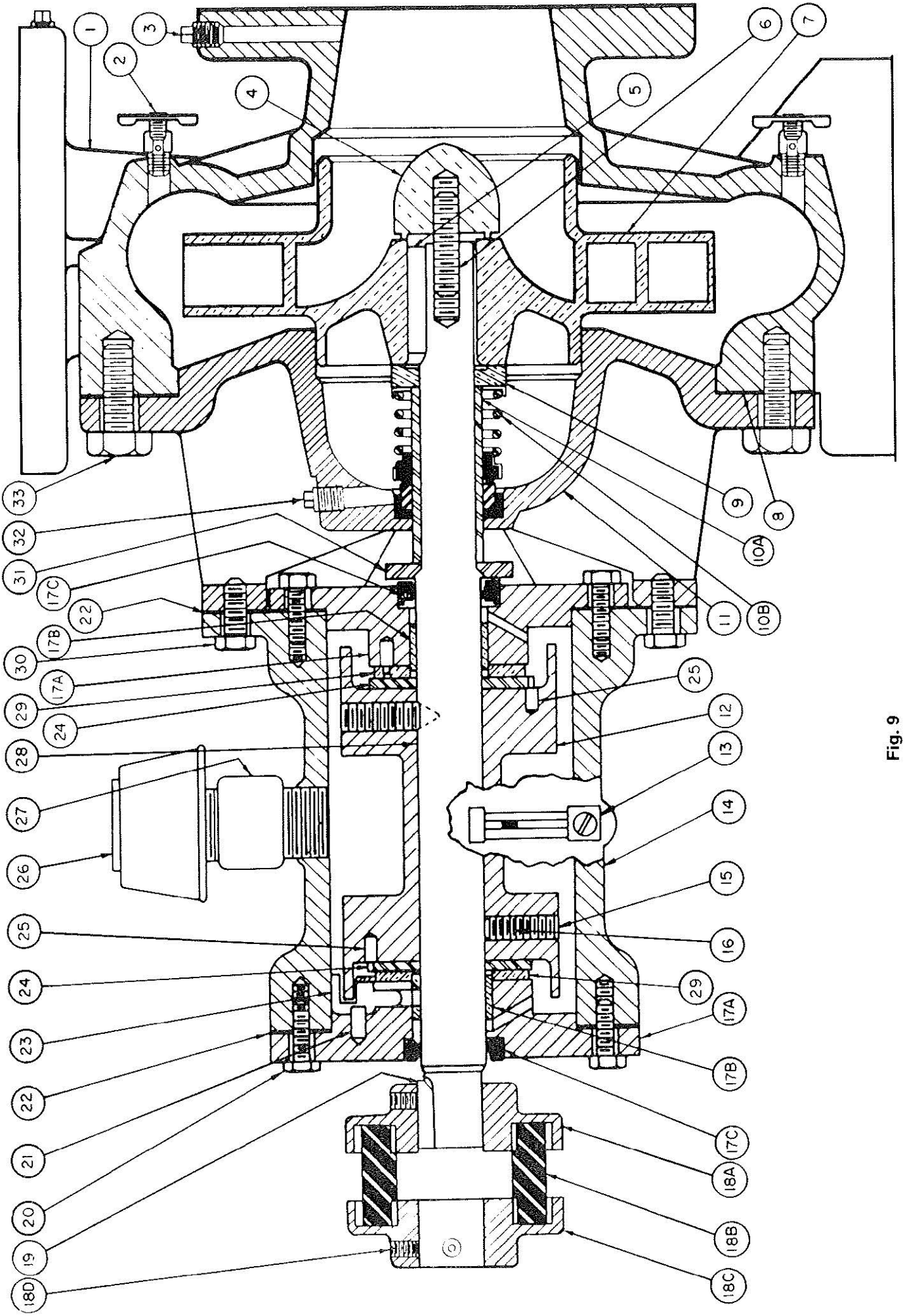
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Fig. 9

8. Slip spacer (9) from shaft (28).

9. Remove sleeve (10A) and mechanical seal (10B) as a unit. NOTE: Mechanical seal stationary seat will remain in head.

10. Remove the four cap screws (30) from head (11) and pull head (11) off the shaft (28).

11. Remove stationary member of old seal from head (11).

12. Clean pump shaft (28) with solvent. NOTE: If mechanical seal only is to be replaced refer to assembly instructions step 40.

13. Remove slinger (31) from shaft (28).

14. Remove cap screws (20) holding inboard bearing flange (17) to bearing housing (14).

15. Remove inboard bearing flange (17) and old inboard gasket (22) and clean surfaces.

16. Remove the four cap screws (20) holding outboard flange (17) to bearing housing (14).

17. Remove outboard flange (17) and old outboard gasket (22) and clean surfaces.

18. Remove shaft (28) with rotor (12) and thrust washers from bearing housing (14).

19. Remove demister (26) from bearing housing (14).

20. Remove locking screw (15) and set screw (16) from rotor (12).

21. Slide rotor (12) from shaft (28).

B. INSPECTION AND REPAIR

22. Clean all parts and inspect for wear or damage giving particular attention to:

    a. Check sleeve bearing surfaces (17B) in bearing flange assemblies (17) for wear or scoring.

    b. Check thrust washers (24) and (29) for wear or scoring.

    c. Inspect oil seals (17C) in bearing flange assemblies (17) for wear or cuts.

    d. Check shaft (28) for wear or scoring and for straightness. Shaft must be straight within 0.0015 inch total indicator runout.

    e. Inspect mechanical seal faces for wear, scratches or gouges. NOTE: these are precision lapped faces and extreme care must be exercised not to handle or scratch them. If faces indicate that seal replacement is necessary the complete assembly should be replaced (Parts 9, 10A & 10B).

    f. Polish out any scratches on shaft (28) or replace.

23. Wash demister screen once yearly under normal operating conditions. Under severe operating conditions it should be cleaned more often.

C. ASSEMBLY

24. Place rotor (12) on shaft (28).

25. Install set screws (16) being sure the set screws are tight with point in countersink in shaft (28).

26. Install locking set screws (15) on top of set screw (16) tightening securely.

27. Place shaft (28) with rotor (12) thru bearing housing (14) making sure that impeller end of shaft is in the correct position.

28. Place bearing housing (14) in a horizontal position.

29. Install drive pins (25) in the holes of the rotor (12) with the small end of the drive pin facing out.

30. Place thrust washers (24) onto rotor (12) with polished faces out such that the drive pin (25) engages the hole in the thrust washer (24).

31. Install bearing stop pins (21) into both flanges (17) with slot out.

32. Insert bearing stop (23) into slot of bearing stop pin (21) with radiused point towards flange center.

33. Slide bearing stop (23) downward so that radiused point enters hole in hub of flanges (17). Be sure that yoke of bearing stop (23) faces away from flange (see Figure 9).

34. Install drive pins (25) with the large end into hub of flanges (17).

35. Place the stationary thrust washers (29) (with grooves facing out) on the hub faces of flanges (17). Fit hole in washer (29) onto drive pins (25).

36. Place gaskets (22) on flange faces (17). Note: It may be necessary to use 2 gaskets, the shaft end play in the assembled unit should be between .015" to .030".

37. Flanges (17) may now be placed on pump shaft (28). NOTE: Care should be taken during this assembly to avoid damage to the oil seal lip (17C). Flanges (17) will only fit in one position relative to bearing housing (14) due to one hole being supplied off cen-

ter. This assures the bearing stop (23) which feeds oil to the thrust washer (24) and stationary thrust washer (29) of being on top.

38. Make up cap screws (20) inboard and outboard end. These cap screws should be made up to 25 ft. lb torque.

39. Replace slinger (31) with chamfer facing bearing housing (14) on pump shaft (28).

40. Lightly lubricate O.D. of new seal's stationary member and with the seat face toward impeller, press firmly in recess of head (11) being sure the seat is level and square.

41. Reassemble head (11) to bearing bracket (14) with the four cap screws (30). Be sure slinger (31) with chamfer toward shoulder of shaft and sleeve (10A) is on shaft (28).

42. Place film of white lead in ID and ends of sleeve (10A).

43. Assemble rotating element of mechanical seal (10B) on sleeve (10A).
Refer to Figure 10.
    a. Lightly lubricate O.D. of Sleeve with rubber lubricant (1), but position towards slinger end of sleeve.

    b. Slide rotating member (2) on sleeve (1).

    c. Place spring (3) on sleeve and mate to shoulder of rotating member.

    d. Place spring retainer (4) on sleeve as shown in Fig. 8.

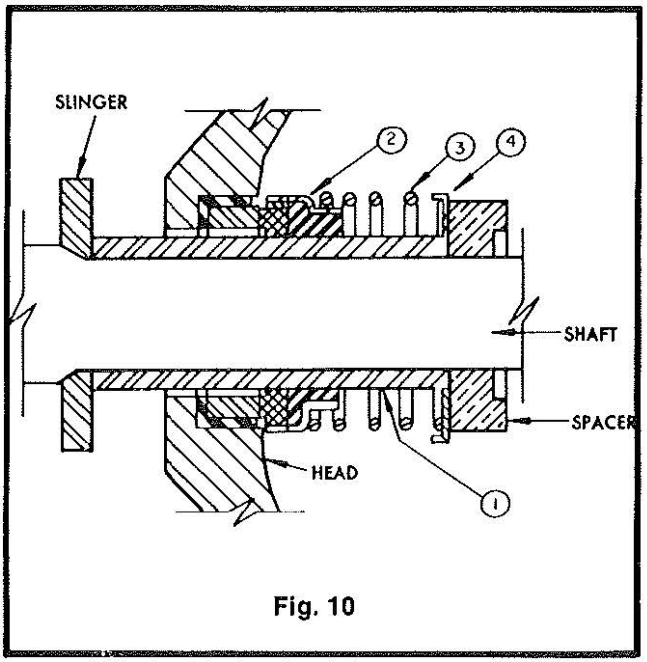

Fig. 10

44. Slide seal assembly (10) onto shaft (28) but do not yet butt sleeve to slinger (31).

45. Install spacer (9) on shaft against seal spring retainer. NOTE: Relief in spacer (9) is towards the impeller.

46. Slide key (5) into keyway of shaft (28) and install impeller (7) on shaft being sure key (5) fits properly between impeller (7) and shaft (28).

47. Replace impeller nut (4) turning clockwise. This will make up seal faces. Make sure that in this operation the slinger (31) makes up square. NOTE: The rubber bellows of the rotating seal element is designed to take a sealing set to the sleeve. It is therefore essential that steps 43 thru 46 be accomplished with the least time delay as practicable —otherwise the seal faces will not properly mate.

48. Check concentricity of rotating element, using a rigidly supported dial indicator. Take readings on impeller hub. Rotate the shaft slowly by hand. If it turns freely and the total indicator reading does not exceed .004 inch, the assembly is accurately aligned (Fig. 11).

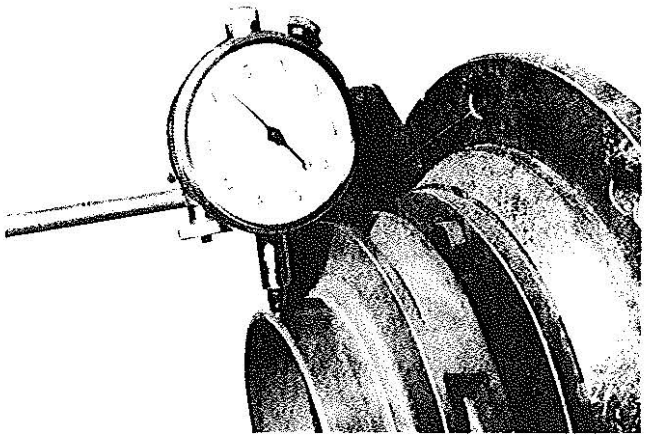

Fig. 11

49. If the shaft binds or if the total indicator reading exceeds .004 inch locate the cause of trouble as follows:

    a. Check to see that contact faces of adjoining parts are free of burrs and raised edges and are square to the shaft centerline.

    b. Check shaft for straightness.

    c. Check all parts for burrs, dirt or rough surfaces.

50. Place gasket on head and reassemble to case with the twelve ½" 13 hex head cap screws.

51. Recouple motor and pump.

52. Check alignment of pump and driver per Section I subsection I.

53. Reconnect power and follow SECTION II for pump operation.

Section IV

Operating troubles and their probable causes are as follows:

A. INSUFFICIENT OR NO DISCHARGE.

1. Wrong direction of rotation.
2. Pump not primed.
3. Suction line not full of liquid.
4. Air or vapor in suction line.
5. Suction pipe not submerged enough.
6. Available NPSH not sufficient.
7. Pump not up to rated speed.
8. Too much system head.

B. INSUFFICIENT PRESSURE

1. Wrong direction of rotation.
2. Suction line not full of liquid.
3. Air or vapor in liquid.
4. Air leaks in suction line.
5. Suction line not submerged enough.
6. Available NPSH not sufficient.
7. Pump not up to rated speed.
8. Mechanical Defects:
   a. Excessive clearance between impeller hubs and head or case.
   b. Impeller damaged.
   c. Internal leakage

C. CAVITATION AND NOISE

1. Air or gas in liquid.
2. Suction line not filled with liquid.
3. Suction line not submerged enough.
4. Available NPSH not sufficient.

D. PUMP LOSES SUCTION AFTER STARTING

1. Suction line not full of liquid.
2. Air leaks in suction line.
3. Air or vapor in liquid.
4. Air or vapor in suction line.
5. Suction line not submerged enough.
6. Available NPSH not sufficient.

E. EXCESSIVE POWER CONSUMPTION

1. Speed too high.
2. Insufficient head.
3. Mechanical defects:
   a. Misalignment.
   b. Shaft bent.
   c. Rotating element dragging.
   d. Piping improperly supported.

F. BEARINGS OVERHEAT

1. Improper or poor grade of oil.
2. Dirt in bearings.
3. Dirt or moisture in oil.
4. Failure in oiling system.
5. Bearings too tight.
6. Misalignment.
7. Pipe improperly supported.

G. VIBRATION

1. Suction line not full of liquid.
2. Air or vapor in suction line.
3. Misalignment.
4. Worn or loose bearings.
5. Rotating element out of balance.
6. Shaft bent.
7. Foundation not rigid.
8. Vibration in the driver.
9. Wrong location of control valve.
10. Pipe improperly supported.

Section V

B9 AND AB9 REPAIR PARTS

Item	Part Name	Quantity	Part Number								
			1" AB9C Pumps	1" AB9D Pumps	1¼" AB9D Pumps	2" AB9D Pumps	2½" AB9D Pumps	2½" B9C Pumps	2½" B9E Pumps	3"B9C Pumps	4" B9C Pump
1	Case (C.I.)	1	D2-717		D2-716	D2-715	D2-714	D2-49		D2-50	D2-64
	Case (Bronze)		D2-722		D2-723	D2-724	D2-725				
2	Drain Cock	2	P-9								
3	Plug	2	P-2								
4	Impeller Nut	1	C8938								
5	Impeller Key	1	C10025								
6	Impeller Stud	1	C10035								
7	Impeller	1	N/A	E6141	E6181	E6188	E6204	C2-145	C2-322	C2-180	C2-178
8	Case Gasket	1	D5450					C2-261		D5450	
9	Spacer	1	C10060								
10	Seal Replacement Kit	1	ML 7825								
10A	Sleeve	1	C10062 (Part of Seal Replacement Kit)								
10B	Seal	1	Spec 860 (Part of Seal Replacement Kit)								
11	Head (Cast Iron)	1	D2-764					D2-84		D2-70	
	Head (Bronze)		D2-765								
12	Rotor	1	B2-188								
13	Oil Gage	1	Spec 938								
14	Bearing Housing	1	C2-176								
15	Locking Screw	1	P-137								
16	Set Screw	2	P-139								
17	Bearing Flange	2	B2-121								
17A	Flange	1	Integral Part of Bearing Flange B2-2616								
17B	Bushing	1	Integral Part of Bearing Flange B2-2616								
17C	Oil Seal	1	Integral Part of Bearing Flange B2-2616								
18	Coupling Complete	1	See Table 2								
18A	Pump Flange	1	See Table 2								
18B	Sleeve	1	See Table 2								
18C	Motor Flange	1	See Table 2								
18D	Set Screw	4	Part of Flange								
19	Pump Key	1	C6084								
20	Screw	16	P-130								
21	Bearing Stop Pin	2	A2-89								
22	Flange Gasket	3	A2-88								
23	Bearing Stop (Wiper)	2	A2-90								
24	Thrust Washer	2	A2-134								
25	Drive Pin	4	A2-135								
26	Demister	1	Spec 2679								
27	Extension	1	P-164								
28	Pump Shaft	1	B2-108								
29	Stationary Thrust Washer	2	A2-148								
30	Screw	4	P-142								
31	Slinger	1	A2-91								
32	Plug	2	P-5								
33	Screw	12	P-150								

NOTE:
1 For Impeller diameters see table 1.
2 For Motor and Coupling Data see table 2 & 3.
3 Sleeve bearing assembly complete is part No. C2-181.
4 Ball bearing assembly complete is part No. B2-2111.
5 12 oz. can of bearing oil is part ML 5132.
6 Consult factory for Base, Coupling guard, spacer and other similar parts data.

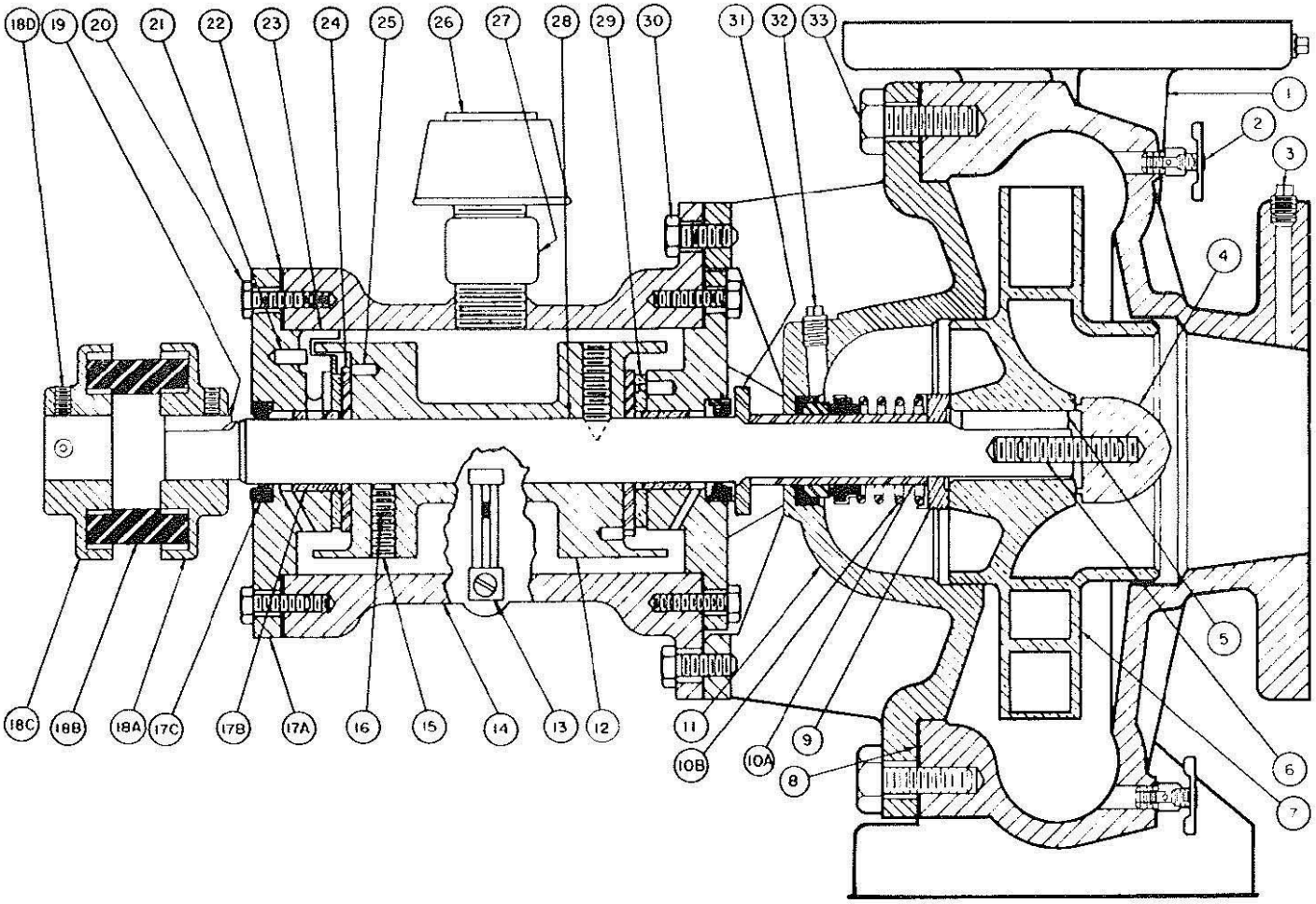

TABLE 1 — MODEL IDENTIFICATION AND IMPELLER DIAMETERS

FOR FOUR DIGIT SERIAL NUMBERS BELOW 7207

Standard AB9 Pump Models	
Model Number	Impeller Diameter
¾ HP 1" AB9C-1	6¾"
¾ HP 1¼" AB9D-1	4 15/16"
¾ HP 2" AB9D-1	4 15/16"
1 HP 1" AB9C-1	7 5/16"
1 HP 1¼" AB9D-1	5 15/32"
1 HP 2" AB9D-1	5⅜"
1½ HP 1" AB9C-1	8 7/16"
1½ HP 1¼" AB9D-1	6⅜"
1½ HP 2" AB9D-1	5 29/32"
1½ HP 2½" AB9D-1	5 21/32"
2 HP 1" AB9C-1	9"
2 HP 1¼" AB9D-1	7 3/16"
2 HP 2" AB9D-1	6½"
2 HP 2½" AB9D-1	6⅛"
3 HP 1" AB9D-1	9"
3 HP 1¼" AB9D-1	8¼"
3 HP 2" AB9D-1	7 1/16"
3 HP 2½" AB9D-1	6¾"
5 HP 1¼" AB9D-1	9"
5 HP 2" AB9D-1	8 7/16"
5 HP 2½" AB9D-1	7 15/16"
7½ HP 2" AB9D-1	9"
7½ HP 2½" AB9D-1	9"
10 HP 2½" AB9D-1	9"

Standard B9 Pump Models				
Model Number	Motor HP	Model Identification Code		Impeller Diameter
B9-1	1	2½"	B9E-1	5 1/16"
B9-2	1½	2½"	B9E-1	5 11/16"
B9-3	2	2½"	B9E-1	6⅛"
B9-4	3	2½"	B9C-1	6 5/16"
B9-5	3	2½"	B9E-1	7⅛"
B9-6	5	2½"	B9E-1	7⅞"
B9-7	5	4"	B9C-1	6⅝"
B9-8	7½	3"	B9C-1	8⅜"
B9-9	7½	4"	B9C-1	7¼"
B9-10	10	3"	B9C-1	8 1/16"
B9-11	10	4"	B9C-1	7¾"
B9-12	10	3"	B9C-1	9"
B9-13	15	4"	B9C-1	8⅝"
B9-14	20	4"	B9C-1	9"

NOTE: Units with 4 digit serial numbers between 6907 and 7207 may have a "U" or "T" added to the model number, this specifies U-frame or T-frame Motors. Prior to 6907 all motors on standard pumps were U-frame.

Units with 4 digit serial numbers of 7207 or larger include the impeller diameter in the model number. Typical examples are:
7½ HP 2½" AB9D0S-1

9 inches and 0 eighths inches for 9" Diameter
S means Cataloged Trim

For units with 5 digit serial numbers consult factory for repair parts information. These are special pumps and may require special parts.

Base Mounted Repair Parts Table 1

TABLE 2 — MOTOR AND COUPLING DATA

Motor Data										Coupling Data AB9 and B9 (⅞" Pump Shaft)	
Motor HP	Frame Size	Shaft Dia.	T-Frame Motors 115/230-1-60	200-3-60	230/460-3-60	Frame Size	Shaft Dia.	U-Frame Motors 115/230-1-60	208/220/440	Part Number Size	x(Spfy Mtr Shft)
¾ HP	56	⅝"	2911	2869	2875	56	⅝"	2161	2162	3J	ML 7384 x
1 HP	143T	⅞"	2912	2705	2698	182	⅞"	922	925	4J	ML 7385 x
1½ HP	145T	⅞"	2913	2706	2699	184	⅞"	923	926	4J	ML 7385 x
2 HP 1ø	182T	1⅛"	2914			213	1⅛"	924		4J	ML 7385 x
2 HP 3ø	145T	⅞"		2713	2718	184	⅞"		927	4J	ML 7385 x
3 HP 1ø	184T	1⅛"	2915			215	1⅛"	932		5J	ML 7386 x
3 HP 3ø	182T	1⅛"		2714	2719	213	1⅛"		928	5J	ML 7386 x
5 HP	184T	1⅛"		2715	2720	215	1⅛"		929	6J	ML 7411 x
7½ HP	213T	1⅜"		2716	2721	254U	1⅜"		930	6J	ML 7387 x
10 HP	215T	1⅜"		2654	2653	256U	1⅜"		931	7J	ML 7412 x
15 HP	254T	1⅝"		2752	2663	284U	1⅝"		968	8J	ML 7389 x
20 HP	256T	1⅝"		2753	2664	286U	1⅝"		615	8J	ML 7389 x

TABLE 3 — COUPLING PARTS

Woods Type Sleeve	
Size	Part No.
3J	3099
4J	3077
5J	3081
6J	3086
7J	3090
8J	3102
No. 7	3113
No. 8	3114
No. 9	3115
No. 10	3116
No. 11SF	3117
No. 12E	3118

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