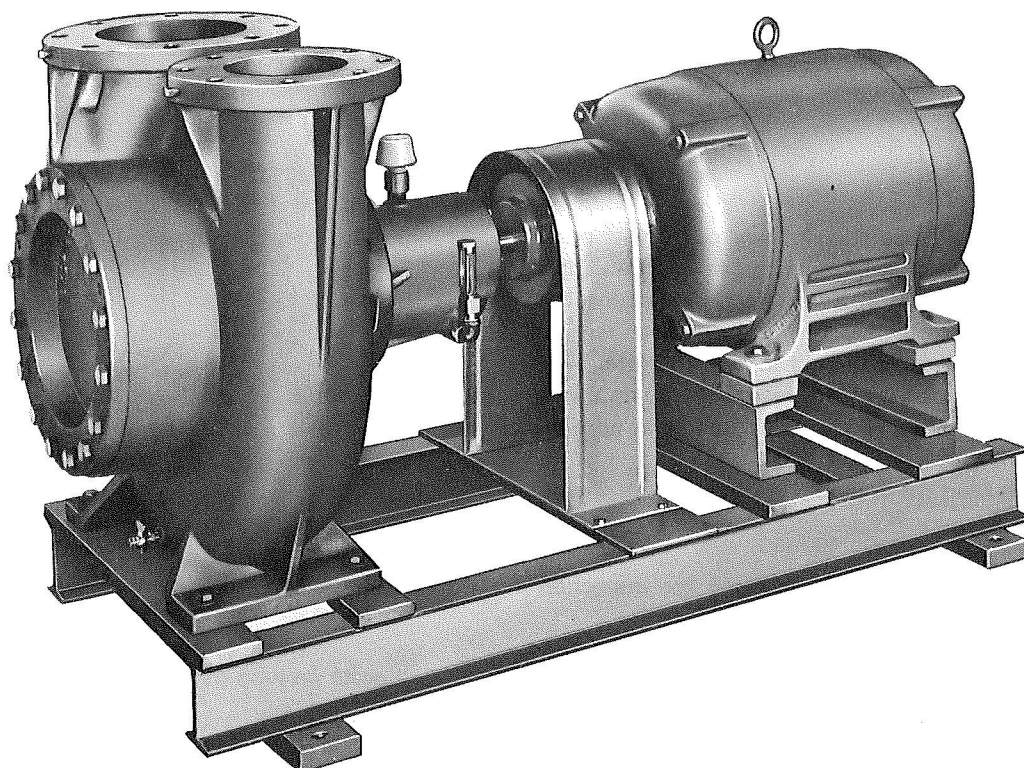


**PUMP SECTION**  
File No. 3563A



**CENTRIFUGAL PUMPS**  
Type F11



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## INTRODUCTION

The Type F pump is a radially split, horizontal, cantilevered single stage, base mounted centrifugal pump, featuring a double volute (to reduce radial hydraulic loads on the impeller and insure long bearing life) and double suction impeller (reducing NPSHR and balancing axial thrust). 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. This flexible coupling has been selected for the required torque transmission, quiet operation and misalignment tolerance. All components are supplied on a rigid structural steel base which has been designed to eliminate any "sound box" effect.

## SECTION I —INSTALLATION

### A. LOCATION

1. For satisfactory operation of any centrifugal pump it is necessary that adequate net positive suction head (NPSH) be 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 Fig. 1 and 2).

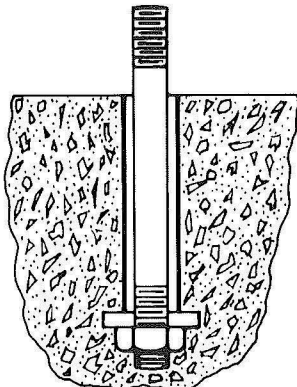


FIGURE 1

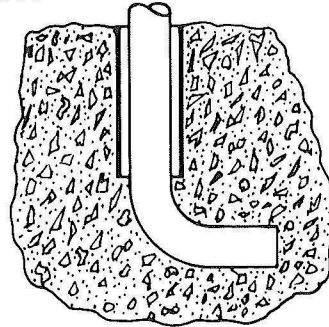


FIGURE 2

### C. MOUNTING PUMP

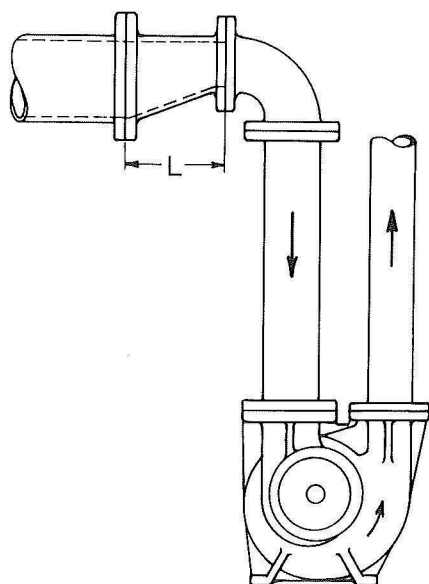
1. Uncrate pump leaving all instructions attached and install at its' place of operation.
2. Locate leveling plates and shims at each foundation bolt.
3. Level base across driver end, shimming as necessary.
4. Level base across pump end, shimming as necessary.
5. Level base lengthwise and tighten nuts 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.

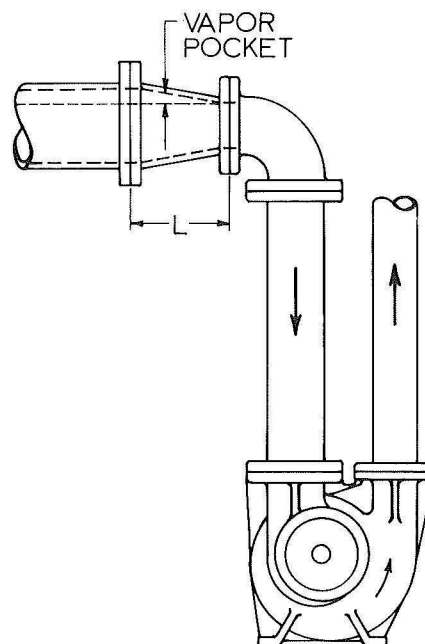


CORRECT

FIGURE 3

**F. DISCHARGE PIPING**

1. On some installations, a check valve and 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.



INCORRECT

FIGURE 4

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 a 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 Rycon No. 21 or Sunoco Sunvis 747 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.

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 S or SB are standardly supplied on these pumps. They are assembled and aligned at the factory but the alignment should be checked due to loading, off-loading, transportation and leveling of base. The coupling size is die stamped in the coupling flange.
  - 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. Do not rotate coupling.

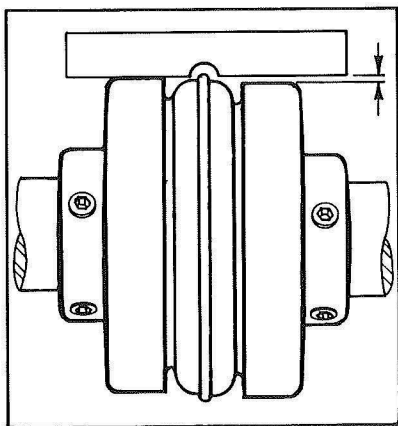


FIGURE 5

Note: Woods type S and SB couplings utilize a wire ring to hold the two halves of the flexible member together. This ring may be removed for alignment or a notched straight edge may be used.

- 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 1 inch bore must grasp at least 1 inch of the shaft.

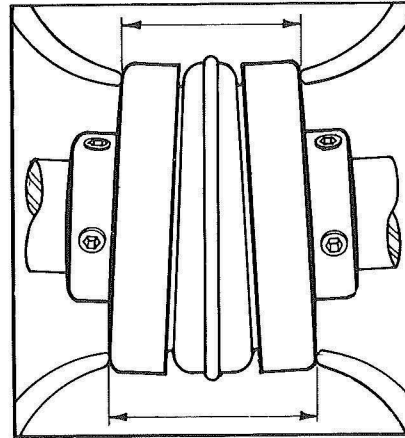


FIGURE 6

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.

The wire ring must be in position in the groove in the center of the sleeve to operate the pump. It may be necessary to pry the ring into position with a blunt screwdriver.

2. Check the safety codes in your locality to see if protective guards and/or shields are required. Coupling guards are standardly supplied and must be replaced before operating the pump.

Flange Size	Type S & SB	
	Parallel	Angular
5	.015"	.056"
5J	.015"	.056"
6	.015"	.070"
6J	.015"	.070"
7	.020"	.081"
7J	.020"	.081"
8	.020"	.094"
8J	.020"	.094"
9	.025"	.109"
10	.025"	.128"
11	.032"	.151"
12	.032"	.175"
13	.040"	.195"
14	.045"	.242"
16	.062"	.330"

## 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 three phase, change any two leads to the motor. Disconnect power before changing wiring.
4. Lack of capacity and head may indicate the passages of the pump impeller have become clogged with foreign matter or motor speed is low. If speed of motor is low, check the wiring connections at the motor. If wired for 460 volt current, but actually operating on 230 volt current, the motor will never come up to proper speed and may burn out. 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!

5. 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.
6. 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.
7. The pump should be shut down if it fails to develop its rated discharge pressure at operating speed, 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 over-

### 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 165°F. American Rycon No. 21 or Sunoco Sunvis 747 oil should be used when adding or changing oil.
  - 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 (REF. FIG. 8 & 9)**

1. Disconnect power to pump.
2. Remove the 16 hex head screws (13) holding head (1) to case (3).
3. Remove head (1) from case (3) using jack screws if necessary. Provisions are made on the head for 3 jack screws. Care must be exercised when using jack screws as binding may occur on inner fit of head to case if head is jacked out unevenly.
4. Remove head gasket (2) from case (3) or head (1) and clean case and head surfaces.
5. Remove impeller screw (15) by turning counter-clock wise.
6. Remove impeller cap (14) and impeller washer (5A).
7. Remove impeller (4) from shaft. Note impeller puller SKB2-332 is available from Dunham-Bush and impeller is drilled and tapped for its use.
8. Remove impeller key (19) and sleeve gasket (5B) from shaft.
9. Remove sleeve (5D) and seal (5C) from shaft. Note: Seal stationary seat will remain in case (3).
10. Remove stationary member of seal (5C) from case (3) with "O" ring mounted.
11. Clean pump shaft with solvent.

NOTE: If mechanical seal only is to be replaced go to assembly instructions Step 42.

**12. Disassemble coupling.**

- A. If no bushing is used between coupling half and shaft.
- (1) Slip ring (18C) from groove in sleeve (18B) and let it hang loose.
  - (2) Remove set screws (18E) from pump flange (18A) and motor flange (18D).
  - (3) Slide flanges apart and remove sleeve (18B) and ring (18C).

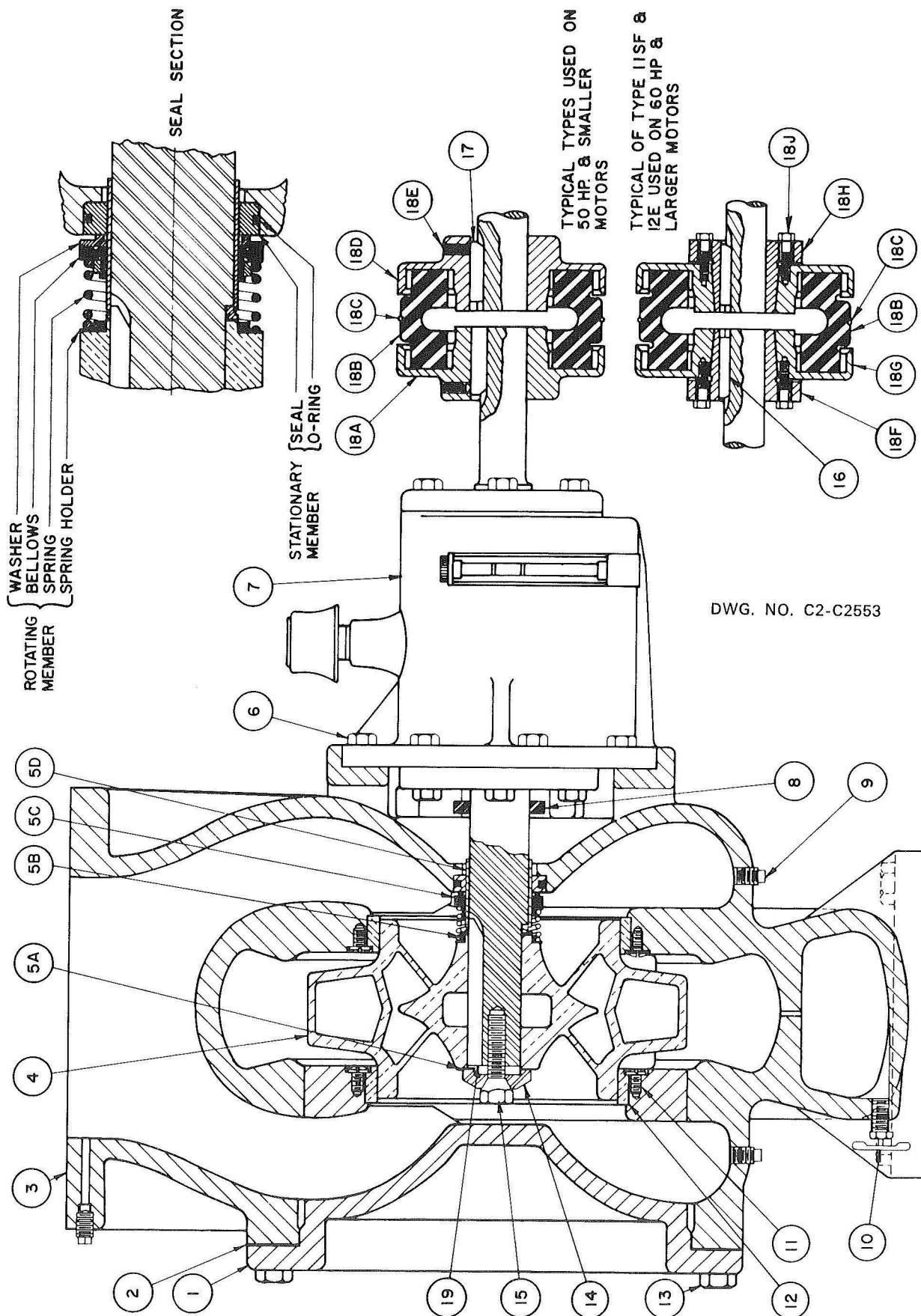
B. If bushings are used between coupling half and shaft.

- (1) Slip ring (18C) from groove in sleeve (18B) and let it hang loose.
  - (2) Remove screws (18J) from bushings (18F & 18H) and loosen bushings (18F & 18H) from flanges (18G).
  - (3) Slide flanges (18G) apart and remove sleeve (18B) and ring (18C).
13. Remove complete bearing assembly (7) by removing the eight cap screws (6) holding bearing assembly (7) to case (3).
  14. Remove pump half coupling (18A, 18G & 18F) and pump key (16) from pump shaft.
  15. Remove wear ring (12) from head (1) by removing binding head screws (11).
  16. Remove wear ring (12) from case (3) by removing binding head screws (11).

Drawing D2-C1206

17. Remove oil gage (41) and drain oil.
18. Remove water slinger (8) from shaft.
19. Remove outboard cap and oil seal (40A & 40B) from housing (34) by removing 6 cap screws (39).
20. Remove inboard cap and oil seal (32A & 32B) from housing (34) by removing 6 cap screws (39).
21. Remove gaskets (33) both inboard and outboard ends and clean surfaces on caps (32A & 40A) and housing (34).
22. Move shaft (31) towards outboard end until bearing (37) clears housing (34).
23. Remove retaining ring (36) from housing (34), then remove shaft (31) with bearings (37 & 42) from housing (34).
24. Remove retaining ring (38) from shaft (31).
25. Remove bearings (37 & 42) from shaft (31) with steady press, do not hammer off as this can easily result in bearing damage or introduction of foreign particles into the bearings.

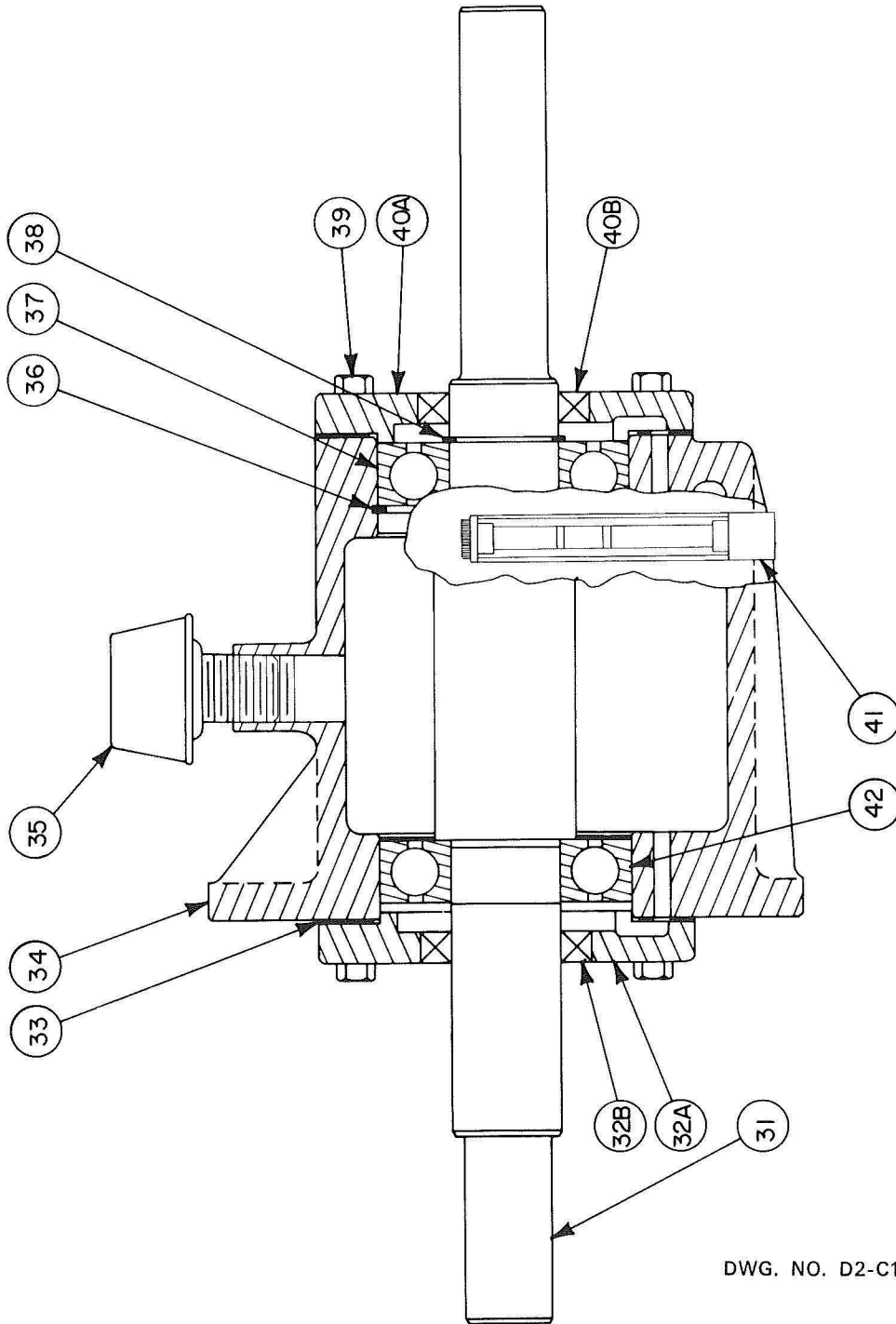
CUTAWAY OF F-11 PUMP



DWG. NO. C2-C2553

FIGURE 8

BEARING ASSEMBLY OF F-11 PUMP



DWG. NO. D2-C1206

FIGURE 9



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## INSTALLATION, OPERATION AND MAINTENANCE MANUAL

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### B. INSPECTION AND REPAIR

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

- a. Inspect oil seals (32B and 40B) for wear, abrasion or cuts.
- b. Check shaft (31) for wear, scoring and for straightness. Shaft must be straight within 0.0015 inch total indicator runout.
- c. Inspect mechanical seal faces for wear, scratches or gouges.

Note: These are precisioned lapped surfaces 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 (seal replacement kit Item No. 5).

d. Polish out any scratches on shaft or replace.

27. Wash demister (35) screen once yearly under normal operating conditions. Under severe operating conditions it should be cleaned more often.

### C. ASSEMBLY

28. Install bearing (42) on inboard end of shaft (31) and bearing (37) on outboard end of shaft, using a square, uniform pressure. Do not hammer or pound these bearings into place as damage and/or introduction of foreign particles will likely result.

29. Replace retainer ring (38) in its groove on the shaft.

30. Slide shaft with bearings through the housing (34), positioning bearing (42) approximately under demister (35) connection.

NOTE: Make sure that the impeller end of the shaft (31) is towards the case mounting flange of the housing (34).

31. Replace retaining ring (36) in housing (34), then slide shaft and bearings into position such that bearing (37) shoulders against retaining ring (36).

32. Install gaskets (33) on caps (32A & 40A).

NOTE: Care must be exercised that the one off set drill through and the oil return hole in (both) the caps (32A & 40A) and the gaskets (33) properly line up.

33. Install caps (32A & 40A) with oil seals (32B & 40B) onto housing bolting together with cap screws (39).

NOTE: (a) If oil seals require replacement it is recommended that they be replaced as an assembly (Part 32 or Part 40).

(b) The off set bolt will insure the proper positioning of the oil return hole.

(c) When placing the cap and oil seal assembly over the shaft, care must be exercised not to cut or gouge the oil seal on the shaft.

(d) On some pumps a garter spring is supplied in this oil seal — care must be exercised that it is not allowed to slip down when bringing the seal over the shaft shoulders.

34. Slide water slinger (8) onto shaft (31) from impeller end of shaft. The slinger should be set so there is approximately 1/2" clearance to the bearing cap (32A).

35. If demister (35) was removed under step 27, replace.

36. Fill bearing assembly (7) with oil, American Rycon No. 21 or Sunoco Sunvis 747, until oil level is between high and low level marks on the oil gauge. Turn shaft by hand and inspect oil seals and gaskets for oil leaks.

37. Place pump key (16) in shaft and place pump half coupling (18A; 18F & 18G) onto shaft, sliding coupling as close as possible towards bearing assembly (7).

38. Shaft should be checked for angular alignment and concentricity.

a. Angular alignment may be checked by fastening a dial indicator to the impeller end of the shaft and indicating to the face of the bearing assembly (7). The shaft is then rotated from the coupling end, TIR should not exceed 0.005".

b. Concentricity may be checked by fastening a dial indicator as above but indicating to the portion of the bearing assembly (7) flange which is parallel to the shaft, TIR should not exceed 0.005". Shaft must be rotated from the coupling end.

c. A check for a bent shaft can be performed by clamping the dial indicator to the bearing assembly flange and indicating to the shaft diameter used for impeller attachment, rotating shaft from coupling end TIR should not exceed 0.005".

39. Replace bearing assembly (7) in case (3) end make up with the eight cap screws. Note there is one off set drill through which will correctly position bearing assembly.

40. Place wear ring (12) into case (3) and position in place using screws (11).

NOTE: There are two reliefs cut in wear ring (12) for acceptance of the heads of these screws.

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## INSTALLATION, OPERATION AND MAINTENANCE MANUAL

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41. Repeat step 40 using wear ring (12), head (1) and screws (11).
42. Place "O" ring of mechanical seal into stationary seat. Make absolutely certain that the recess in the case (3) which accepts the stationary seat is clean and free of burrs. Slide the stationary seat (with lapped face towards impeller) over the shaft and into the recess in the case. This assembly must be positioned square with the case and well seated into its bore.  

Caution: Extreme care must be exercised not to scratch, gouge or in any way mar the lapped face or seal leakage can occur.

NOTE: A light coating of lubricant will facilitate assembly.
43. Place film of white lead in inside diameter and impeller end of sleeve (5D).
44. Assemble rotating element of mechanical seal on sleeve (5D) such that the sealing face is away from the key slot but so the seal spring holder is on the sleeve (ref. seal detail Fig 7).  

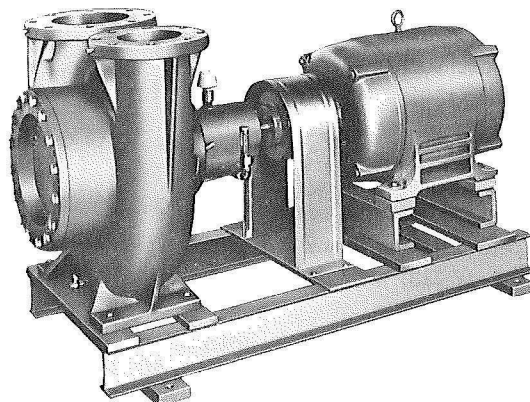
Caution: Extreme care must be exercised not to scratch, gouge or in any way mar the lapped face or seal leakage can occur.

NOTE: A light coating of lubrication on the inside diameter of the seal bellows will facilitate assembly.
45. Slip sleeve and seal assembly over shaft and slide back GENTLY until contact is made between the seal faces.
46. Place impeller key (19) into key slot of shaft, rotate sleeve (5D) until key slot matches and slide key back.
47. Place sleeve gasket (5B) over shaft and position on end of sleeve (5D).
48. Place coating of white lead on bore and seal end of impeller (4) and slide impeller onto shaft.  

NOTE: Care must be exercised not to install the impeller (4) backwards onto the shaft. When installing, the counter bore in the impeller hub must face the head (1).
49. Place (new) impeller washer (5A) on impeller hub and make up impeller cap (14) with impeller screw (15). A coating of white lead should be used on impeller washer (5A).
50. Assemble head (1) and new gasket (2) onto case (3) end make up bolts (13).  

NOTE: One bolt is supplied off set which insures proper positioning of head (1) to case (3).
51. Reposition coupling flanges (18A & 18D) or flange and bushing (18G; 18F & 18H) placing sleeve (18B) and ring (18C) into position. Hand the ring (18C) loosely in the groove next to the teeth. Make sure that the teeth of the sleeve are fully engaged in both flanges.  

Insure that the keys (16 & 17) are properly installed, then tighten flanges into position using set screws (18E) or screws (18J) as supplied.
52. Check coupling alignment per Section I, paragraph 1 and replace coupling guard.
53. Restore power to driver.
54. Follow procedure under Section II for starting pump.

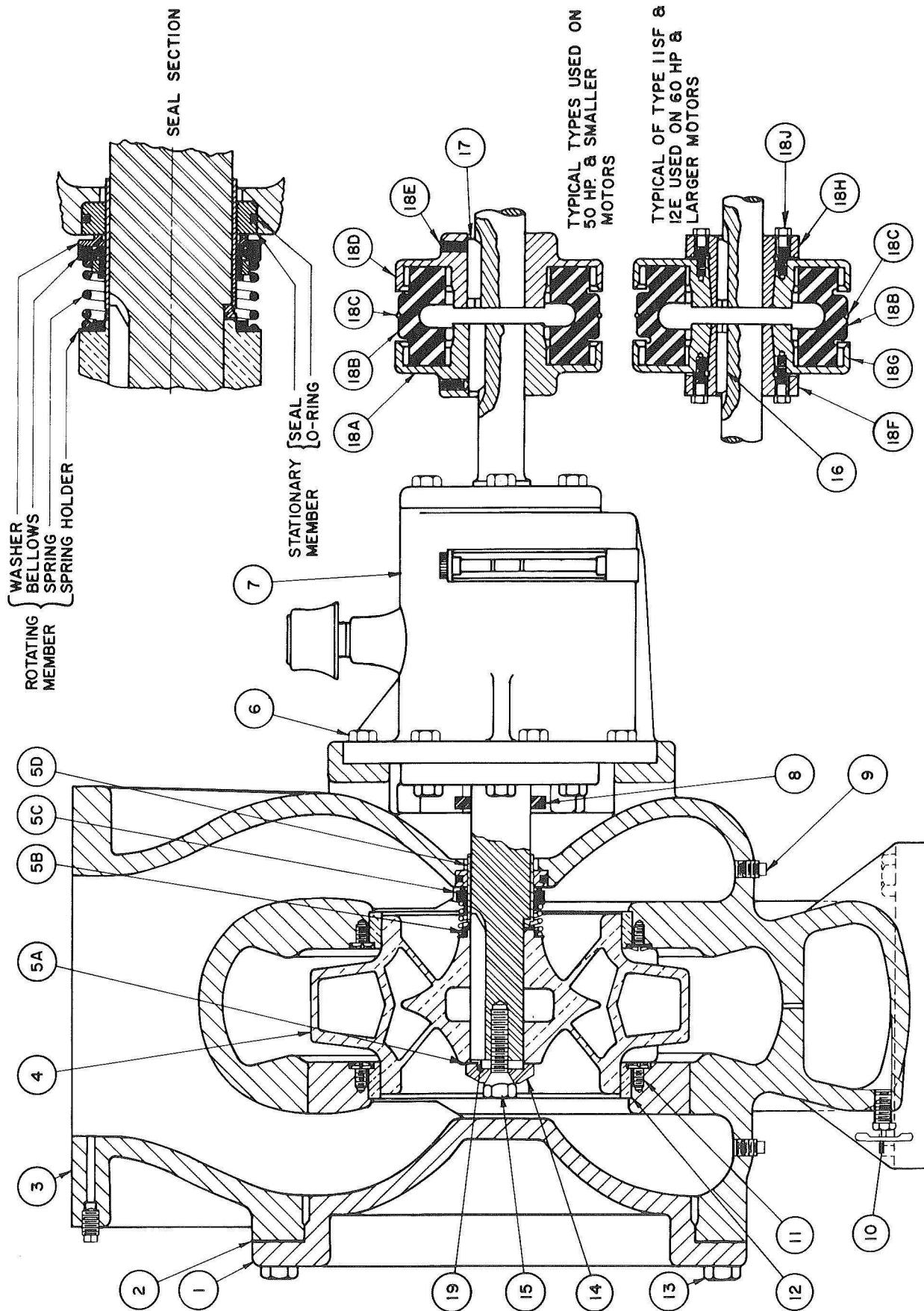


## **SECTION IV –TROUBLE SHOOTING**

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. Wearing rings worn.
    - 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 — REPAIR PARTS CUTAWAY OF FB-11 PUMP



**INSTALLATION, OPERATION AND MAINTENANCE MANUAL**

**FB-11 PARTS LIST**

ITEM	PART NAME	QUAN- TITY	PART NUMBER – ALL MODELS
1	HEAD	1	D2-822
2	HEAD GASKET	1	B2-1770
3	CASE	1	D2-860
4	IMPELLER	1	D2-859
5	SEAL REPLACEMENT KIT	1	ML7837
5A	WASHER – IMPELLER	1	A2-2395 (Part of Seal Replacement Kit)
5B	GASKET – SLEEVE	1	A2-2974 (Part of Seal Replacement Kit)
5C	SEAL	1	2420 (Part of Seal Replacement Kit)
5D	SLEEVE	1	A2-3194 (Part of Seal Replacement Kit)
6	SCREW	8	P-169
7	BEARING ASSEMBLY COMPLETE	1	D2-C1116
8	SLINGER – WATER	1	3308
9	PLUG	4	P-2
10	DRAIN COCK	2	P-170
11	BINDING HEAD SCREW	4	P-129
12	WEAR RING	2	A2-2432
13	SCREW	16	P-167
14	IMPELLER CAP	1	A2-2418
15	IMPELLER SCREW	1	A2-1632
16	PUMP KEY	1	A2-1392
17	MOTOR KEY	1	Supplied with motor
18	COUPLING COMPLETE	1	See Table 2
18A	PUMP FLANGE	1	(Part of type S Coupling Complete)
18B	SLEEVE	1	See Table 3 (Part of Coupling Complete)
18C	RING	1	(Part of Sleeve)
18D	MOTOR FLANGE	1	(Part of Type S Coupling Complete)
18E	SCREW – SET	4	(Part of Type S Coupling Complete)
18F	PUMP BUSHING	1	(Part of Type 11SF or 12 E Coupling Complete)
18G	FLANGE	2	(Part of Type 11SF or 12E Coupling Complete)
18H	MOTOR BUSHING	1	(Part of Type 11SF or 12E Coupling Complete)
18J	SCREW	VARIABLES	(Part of Type 11SF or 12E Coupling Complete)
19	IMPELLER KEY	1	A2-2591

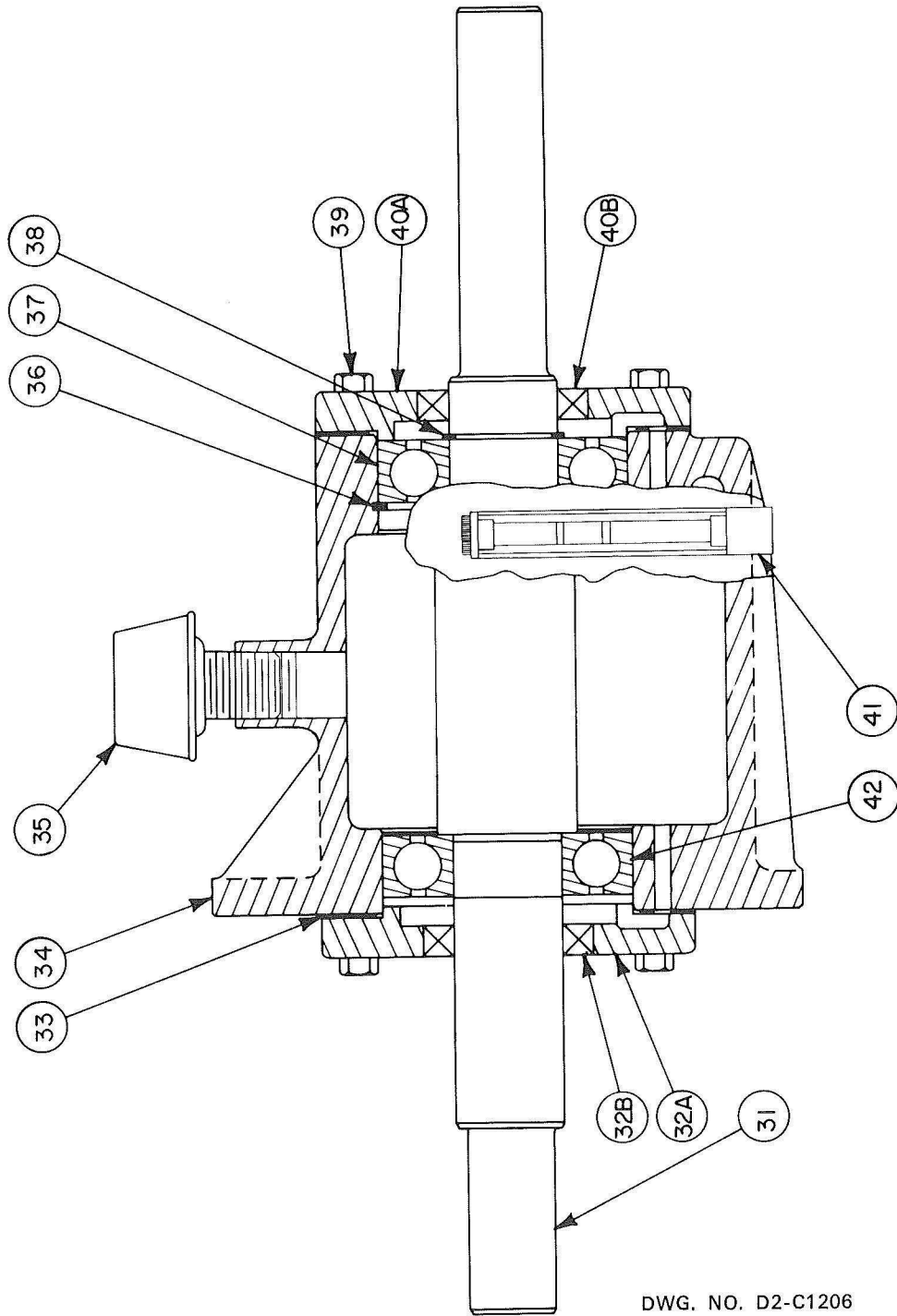
FOR BEARING ASSEMBLY REPAIR PARTS SEE PAGE 15

WHEN ORDERING REPLACEMENT IMPELLERS SPECIFY THE DIAMETER AND INCLUDE SERIAL NUMBER

1 QT. OF BEARING OIL IS PART ML7250

CONSULT FACTOR FOR BASE, COUPLING GUARD, MOTOR SPACERS AND DATA ON OTHER SIMILAR PARTS.

BEARING ASSEMBLY OF FB-11 PUMP



DWG. NO. D2-C1206

FIGURE 8

**FB-11 BALL BEARING ASSEMBLY  
REPAIR PARTS LIST**

ITEM	PART NAME	QUAN- TITY	PART NUMBER
			FB11
	COMPLETE ASSEMBLY		D2-C1116
31	SHAFT	1	C2-1892
32A	CAP	1	B2-1607
32B	OIL SEAL		Part of Cap B2-1607
33	GASKET	2	B2-1644
34	HOUSING	1	D2-790
35	DEMISTER	1	2679
36	RETAINING RING	1	2885
37	BALL BEARING	1	2886
38	RETAINING RING	2	2900
39	SCREW	12	P-143
40A	CAP	1	B2-1607
40B	OIL SEAL		Part of Cap B2-1607
41	OIL GAUGE	1	2919
42	BALL BEARING	1	2886
	PLUG (NOT SHOWN)	1	P-133

1 QT. OIL IS PART ML 7250

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**INSTALLATION, OPERATION AND MAINTENANCE MANUAL**

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