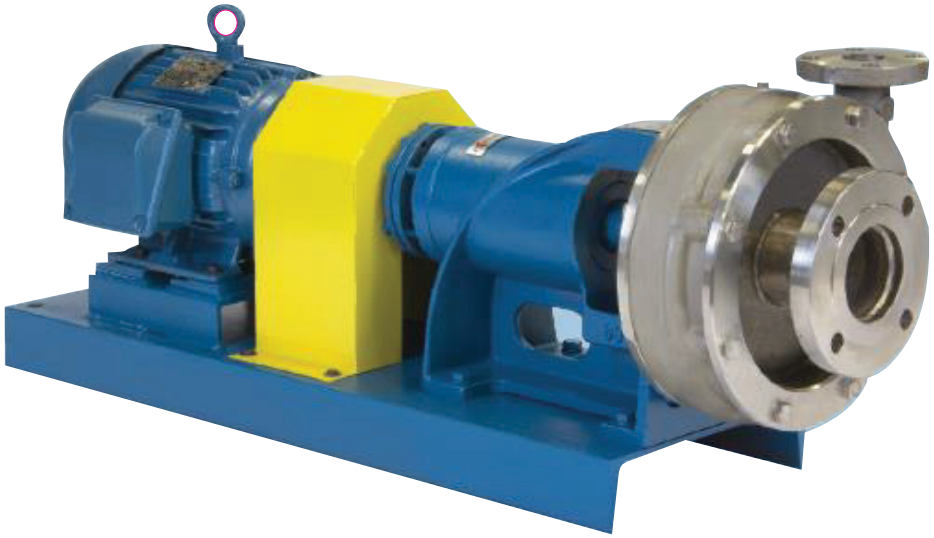
Haynes Pump



6050
SERIES PUMP

MAINTENANCE INSTRUCTIONS AND PARTS LIST

MANUFACTURED BY:

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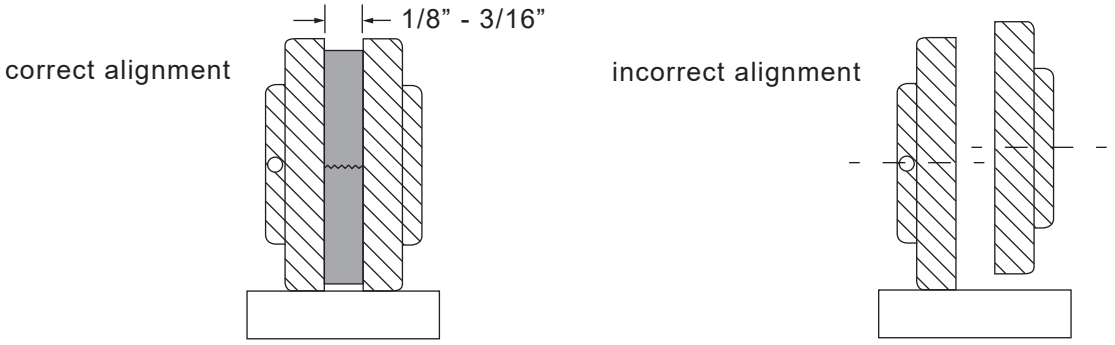
INSTALLATION

1. The Haynes 6050 Series pumps are completely assembled, carefully adjusted and lubricated at the factory.
   Generally, the motor has been mounted and aligned at the factory before shipment. The customer just has to set the unit into place, being certain the support plate is heavy enough to hold the entire unit and is level and resting evenly on its supports.
2. Piping - The pump suction and discharge connections **do not** indicate the required suction and discharge pipe sizes. The pipe diameter must be selected according to the requirements of the pumping system and recommended friction losses for the liquid being pumped.
   Usually it is advisable to increase the size of both the suction and discharge pipes at the pump nozzles to have minimum acceptable friction loss. The suction pipe should never be smaller in diameter than the pump suction nozzle. An eccentric reducer, installed flat side up, is required to eliminate possible air or vapor pockets at the pump suction inlet.
   Both suction and discharge pipes must be supported independently near the pump so that, when piping is connected to the pump, no strain will be transmitted to the pump. Piping should be arranged with as few bends as possible and, preferably with long radius elbows wherever possible.
   DO NOT DRAW CASING TO PIPING WHEN CONNECTING as this will cause strain and excessive wear on the unit.
3. If the customer elects to mount the motor in the field, he should install motor half of coupling on motor shaft and set motor on base. The alignment of motor shaft and pump shaft is obtained by utilizing shims supplied by manufacturer. Added shims may be necessary to obtain alignment per coupling manufacturer's instructions or as shown below.
   Note: Both vertical and horizontal alignment is required and shown below.



4. Rotate shaft by hand, checking for rubbing or high spots. If either is noted, check for:
   a. Pipe strain
   b. Coupling misalignment
   c. Improper impeller adjustment
5. Connect power lines to motor in accordance with wiring diagram on the motor. Jog motor control to test for rotation. Rotation should be clockwise looking into pump from motor end.
6. Priming - **Note** - Before starting the pump, the casing and suction line must be filled with liquid. The pump **must not be run** until it is completely filled with liquid, because of the danger of damaging parts of the pump which depend upon liquid for lubrication.

7. The pump should operate smoothly. If the pump vibrates, there is severe distortion of the pump as a result of excessive strain in the support base, pipe strain, misalignment between pump and motor, improper impeller adjustment, or a combination of these.

LUBRICATION

1. Pump bearings are properly lubricated at the factory before shipment. Periods of subsequent lubrication depend on local conditions, hours of operation, load, speed, temperature, etc. It is recommended that the ball bearings be periodically inspected and greased.
2. A lithium base grease of medium consistency with corrosion resistant inhibiting properties must be used for the ball bearings.
3. The motor is to be lubricated per the motor manufacturer's recommendations.

DISASSEMBLY

The disassembly instructions apply to the series of pumps in general and may vary slightly on special units. If complete disassembly is not necessary, use only those steps which apply. **Close gate valve in discharge and suction piping.** Inspect all parts removed to determine whether suitable for reuse.
Note: Special precautions must be observed when handling mechanical seals so as not to damage the lapped faces of the seal.

Unless casing #22 is damaged, it may not be necessary to remove the suction and discharge piping from the casing to service the power frames #11.

1. Disconnect power supply to the motor and remove motor coupling buffer #1.
2. Remove all cooling or lubrication lines.
3. Remove drain plug #31.
4. Remove cap screws #34 and power frame hold down screws to separate power frame from casing.
5. Remove the cotter pin #30 and unscrew the impeller nut #29 by turning it counter-clockwise, while holding the shaft #12 with a wrench at the drive coupling #1. For pumps with straight bored impellers (sizes 4x3x12 - 8x8x12), remove cap screw and washer #28 while holding shaft as above.
6. To remove impeller #26 from shaft, use three special cap screws, 1/2” x 13 x 2-1/2” long. Screw these cap screws into the three tapped holes in the impeller shroud. The cap screws will tighten against the seal housing, forcing the impeller and impeller washer off the shaft. Lift the impeller key #27 from its seat. Use wheel puller to remove the impeller from the shaft of pumps with straight bored impellers.
7. Remove cap screws #32 and dislodge casing adapter #19 from power frame assembly along with gasket #18.
8. Remove packing gland cap screws #33. At this time, the packing box housing #16 and packing gland #15 can be removed off of the shaft and away from power frame.
9. Remove packing #17 from packing box housing and clean bore of housing.
10. If pump is fitted with single mechanical shaft seal, remove seal rotating assembly (spacer, spring and holder, retainer, seal face carbon) and stationary seal seat.
    Note: Special precautions must be observed when handling a mechanical seal. Do not drop the seal face carbons or floating seats, nor scratch the lapped faces of these parts.

If pump is fitted with a double mechanical shaft seal, unscrew gland bolts and nuts and remove seal housing from power frame, exposing seal assembly. Grasp the seal firmly by hand and twist it on the shaft to break the seal between the bellows and the shaft. Remove seal assembly following the same precautions as mentioned above.

11. Remove pump half of coupling buffer #1 and key #2 from pump shaft. Unscrew three locking bolts #4, then pull shaft, bearings, bearing housing and bearing cap out as one complete unit.
12. Remove two bearing cap screws and cap to expose top bearing.
13. Remove bearing lock nut #8 by bending up metal locking tabs on bearing lock washer #9 and turning nut counter-clockwise. Lift off bearing lock washer.
14. Using a bearing puller, remove thrust bearing #10 and housing #7 as a unit. Press radial bearing #13 off of shaft.
15. Wash bearings, bearing cover and housing to remove old grease. Check and replace if nicked or damaged.
16. When installing new bearings, grease seals should also be replaced.

Note: When ordering any parts; specify model number and serial number of units. Example; Model 6051 - Serial 1234-01 or Mfg. 123456-1

ASSEMBLY

1. Press radial bearing #13 onto shaft until it seats against shaft shoulder. Slide bearing housing #7 onto shaft, press top thrust bearing #10 onto shaft.. Install bearing lock washer #9 and screw bearing lock #8 sufficiently tight to insure bearing lock washer and thrust bearing are secure against shoulder of the shaft. Lock nut in place by bending locking tab on lock washer into slot on bearing nut. Slide bearing housing over bearing until seated in housing. Pack housing with grease (Shell #2 Alvania or equal) before installing bearing cap #6 with two clamping screws.
2. Place shaft assembly into power frame from the motor end. Install the three cap screws #5 and three locking bolts #4 into power frame head.
3. Install grease seal #14 with spring side facing radial bearing into lower end of power frame.
4. Mount power frame assembly to the base.

Pumps with Packing

1. Install packing #17 into packing box. Place packing gland #15 onto shaft before installing packing box. Slide packing box onto shaft until it seats against power frame flange. Install **new** packing box gasket #18 before bolting up casing adapter #19 with cap screws #32.

Pumps with Seals

Note: Before installing any new seal or replacing old seals, inspect and clean all parts. Remove all burrs, nicks, etc. from shaft.
Protect the lapped faces of the stationary seal and rotating seal washer during installation.

Single Seal

1. Apply light oil to the outer surface of the stationary seal seat and press into seal housing.
2. Apply light oil to the inside of the seal bellows and slide the rotating seal assembly onto the shaft.
3. Install impeller key onto shaft. Take seal spacer and install on shaft and push against seal assembly until it temporarily lodges against impeller key.

Assembly of Liquid End

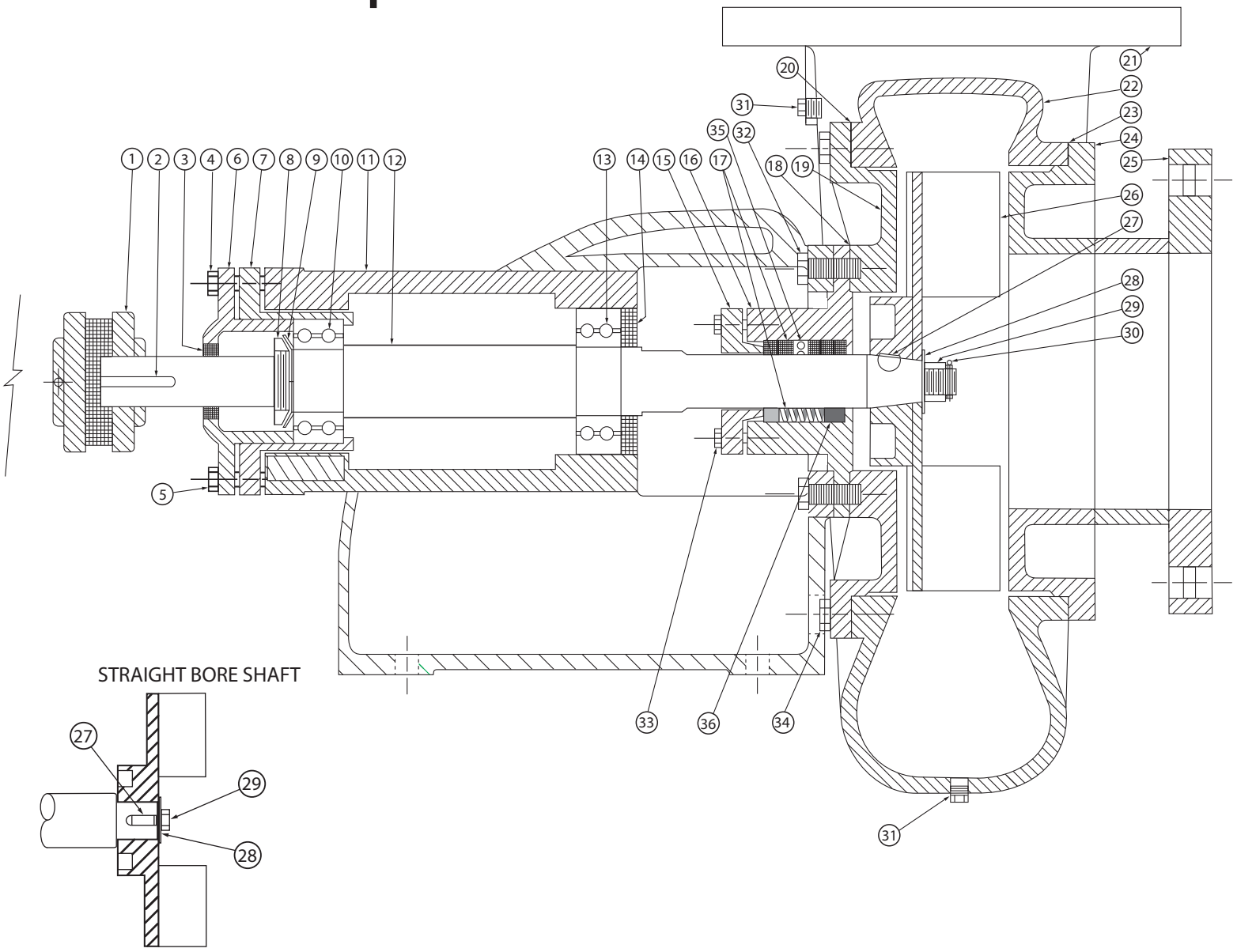
1. Slide impeller onto shaft over the impeller key. **Place a wooden block over impeller vanes and tap on the wood** to set impeller on the shaft taper. Replace impeller washer on the shaft and the castellated impeller nut. Tighten nut securely. Re-tap wood block to make sure impeller is seated properly. Re-Tighten impeller nut if necessary. **Do not use impeller nut to draw impeller onto shaft.** Replace cotter pin.
2. For pumps with straight bored impellers; install impeller key, slide impeller on shaft, put on washer and tighten impeller screw.
3. Install gasket #18 on casing adapter before positioning casing up against casing adapter. Make sure that the discharge is in the correct position, install and tighten screws securely.

Impeller Adjustment and Final Assembly

With unit mounted on base and liquid end completely assembled.

1. Replace coupling buffer and shaft key on pump shaft.
2. Adjust adjusting bolts #5 until shaft and impeller turns freely by hand. When in proper position, tighten locking bolts.
3. Turn Shaft again by hand and make certain that the shaft and impeller turn freely. If shaft binds or impeller rubs, check for pipe strain and, if required, back off impeller and additional 1/4 turn. The correct clearance between impeller and suction face is .020” to .030”.
4. Install motor and coupling buffer on base and process with installation as described in that section. Check coupling alignment as in Installation Instructions.

6050 Series Pump



STRAIGHT BORE SHAFT

1 - Coupling Assembly
2 - Shaft Key-Coupling End
3 - Bearing Cap Seal*
4 - Bearing Housing-Locking Screws
5 - Bearing Housing-Adjusting Screws
6 - Bearing Cap
7 - Thrust Bearing Housing
8 - Thrust Bearing Lock Nut*
9 - Thrust Bearing Lock Washer*
10 - Thrust Bearing*
11 - Power Frame
12 - Shaft
13 - Radial Bearing*
14 - Grease Seal*
15 - Packing/Seal Gland
16 - Packing/Seal Box Housing
17 - Packing/Mechanical Seal*
18 - Packing/Seal Box Housing Gasket*
19 - Casing Adapter
20 - Casing Adapter Gasket*
21 - Discharge Flange
22 - Casing
23 - Suction Head Gasket*
24 - Suction Head
25 - Suction Head Flange
26 - Impeller
27 - Impeller Key*
28 - Impeller Washer*
29 - Impeller Nut/Bolt*
30 - Cotter Pin*
31 - Pipe Plug
32 - Packed/Seal Box Housing Cap Screw
33 - Packing/Seal Gland Adjustment Screws
34 - Casing Cap Screws
35 - Lantern Ring
36 - Seal Spacer

* Recommended Spare Parts