

# DISASSEMBLY & REASSEMBLY

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## REQUIRED TOOLS

- |                            |                              |                   |
|----------------------------|------------------------------|-------------------|
| ● Wrenches                 | ● Brass Drift Punch          | ● Cleaning Agents |
| ● Screwdriver              | ● Snap-Ring Pliers           | ● Feeler Gauges   |
| ● Lifting Sling            | ● Torque Wrench with Sockets | ● Hydraulic Press |
| ● Rubber Mallet            | ● Allen Wrenches             | ● Leveling Blocks |
| ● Induction Bearing Heater | ● Dial Indicator             |                   |
| ● Bearing Puller           | ● Micrometer                 |                   |

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## DISASSEMBLY



### WARNING

*Pump components can be heavy. Proper methods of lifting must be employed to avoid physical injury and/or equipment damage. Steel toed shoes must be worn at all times.*



### WARNING

*The pump may handle hazardous and/or toxic fluids. Proper personal protective equipment should be worn. Precautions must be taken to prevent physical injury. Pumpage must be handled and disposed of in conformance with applicable environmental regulations.*

**NOTE:** Before disassembling the pump for overhaul, ensure all replacement parts are available.



### WARNING

*Lock out power supply to driver motor to prevent accidental startup and physical injury.*

1. Shut off all valves controlling flow to and from pump.



### WARNING

*Operator must be aware of pumpage and safety precautions to prevent physical injury.*

2. Drain liquid from piping, flush pump if necessary.



*If pump is a Model NM3196 or a 3198 there may be a risk of static electric discharge from plastic parts that are not properly grounded. If pumped fluid is non-conductive, pump should be drained and flushed with a conductive fluid under conditions that will not allow for a spark to be released to the atmosphere.*



## WARNING

**Allow all system and pump components to cool before handling them to prevent physical injury.**

3. Disconnect all auxiliary piping and tubing.
4. Remove coupling guard. Refer to Coupling Guard Installation and Disassembly Section in *Appendix II*.
5. Disconnect Coupling.

**NOTE: Refer to Appendix V for C-Face adapter disassembly instructions, if required.**

6. Remove coupling guard pump endplate.
7. If oil lubricated, drain oil from bearing frame by removing bearing frame drain plug (408A). Replace plug after oil is drained. Remove oil reservoir, if equipped (Fig. 40).

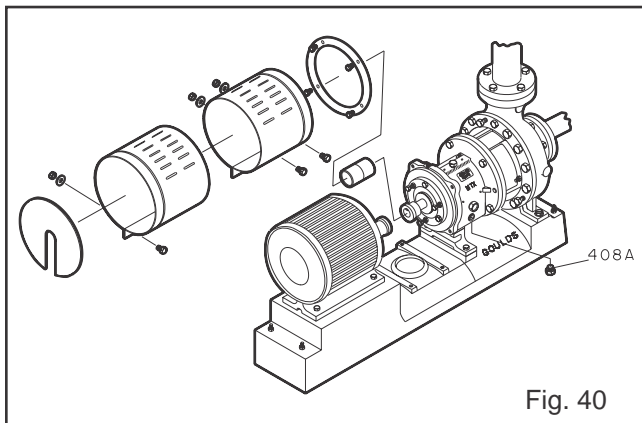


Fig. 40

**NOTE: Oil analysis should be part of a preventive maintenance program and is helpful to determine cause of a failure. Save oil in a clean container for inspection.**

8. All, except with C-Face adapter: Place sling from hoist through frame adapter (108) or frame (228A) for STX (Fig. 41).

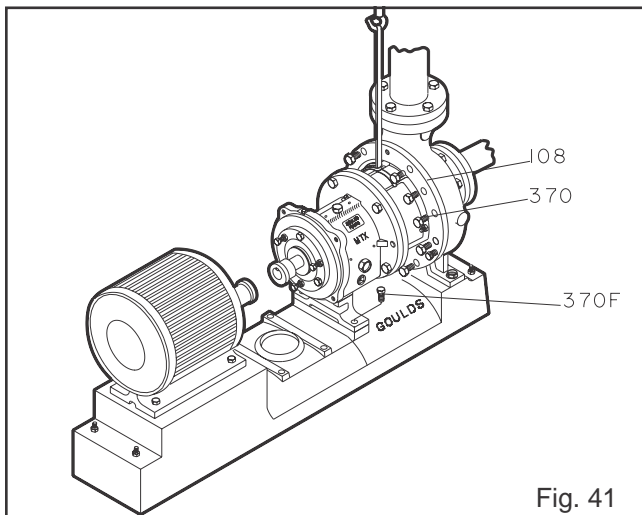


Fig. 41

*C-Face adapter:* Place one sling from hoist through frame adapter (108) or frame (228A) for STX and a second sling from hoist through the C-Face adapter (Fig. 42).

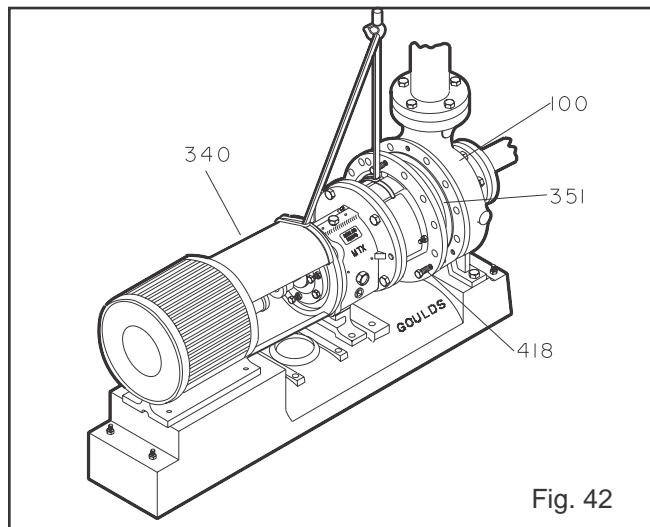


Fig. 42

9. Remove bearing frame foot hold down bolts.

10. Remove casing bolts (370).



## WARNING

**Never apply heat to remove parts. Use of heat may cause an explosion due to trapped fluid, resulting in severe physical injury and property damage.**

11. Remove back pull-out assembly from casing (100). Tighten jack screws (418) evenly to remove back pull-out assembly (Fig. 43).

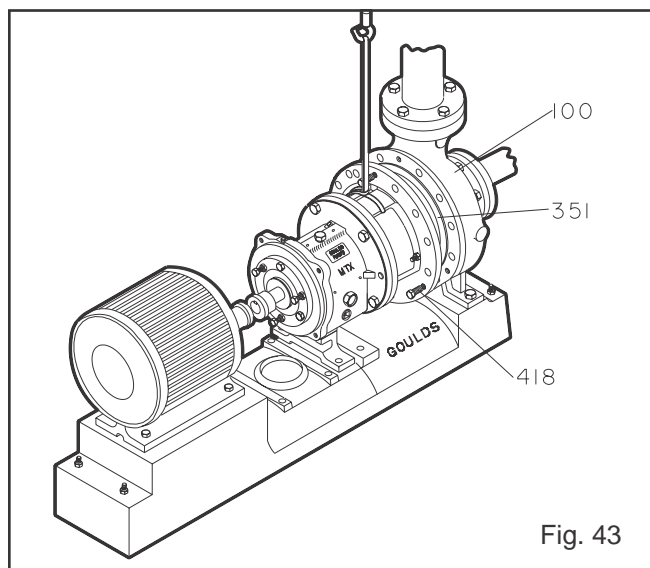


Fig. 43

**NOTE: Penetrating oil can be used if adapter to casing joint is excessively corroded.**

**NOTE: Remove and then mark shims from under frame foot. Save for reassembly.**



## WARNING

**Never remove the back pull-out assembly unassisted, physical injury can occur.**

12. Remove casing gasket (351) and discard. (Replace with new gasket during reassembly.)

13. Remove jack screws (418).

**NOTE: Casing gasket (351) may partially adhere to casing due to binders and adhesives in the gasket material. Clean all gasket surfaces.**

14. Move back pull-out assembly to clean workbench.

15. Support frame adapter (108) securely to workbench.

16. Remove coupling hub (Fig. 44).

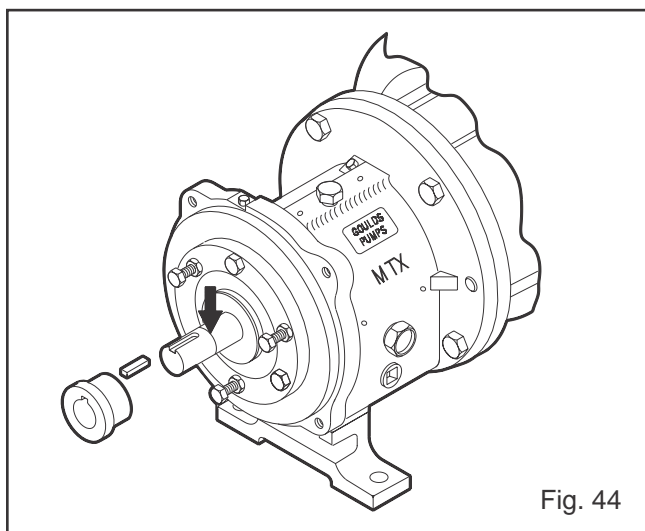


Fig. 44

**NOTE: Blue and scribe shaft for relocating coupling hub during reassembly.**

## REMOVAL OF IMPELLER



## WARNING

**Never apply heat to remove an impeller. The use of heat may cause an explosion due to trapped fluid, resulting in severe physical injury and property damage.**



## WARNING

**Wear heavy work gloves when handling impellers (101) as sharp edges may cause physical injury.**

### STX, MTX, & LTX

1. Slide Goulds shaft wrench (A05107A or A01676A) over the shaft (122) and key.

2. Rotate the impeller clockwise (viewed from the impeller end of the shaft), raising the wrench off of the work surface.
3. Quickly turn the impeller counterclockwise (viewed from the impeller end of the shaft), impacting the wrench handle on the workbench or a solid block until the impeller loosens (Fig. 45).

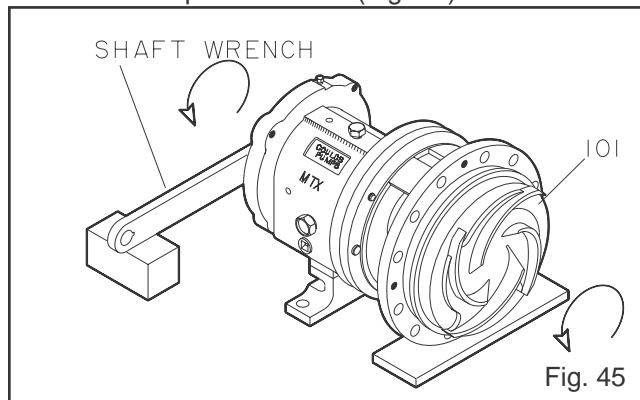
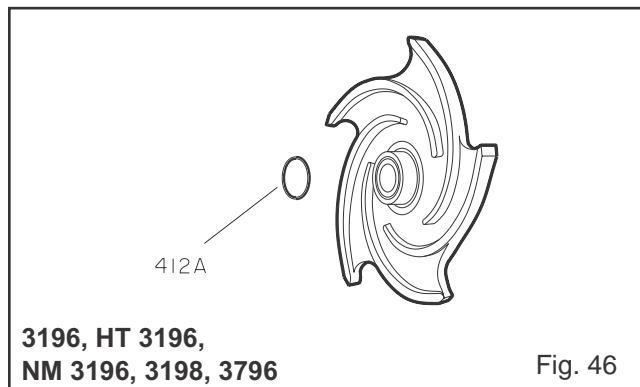


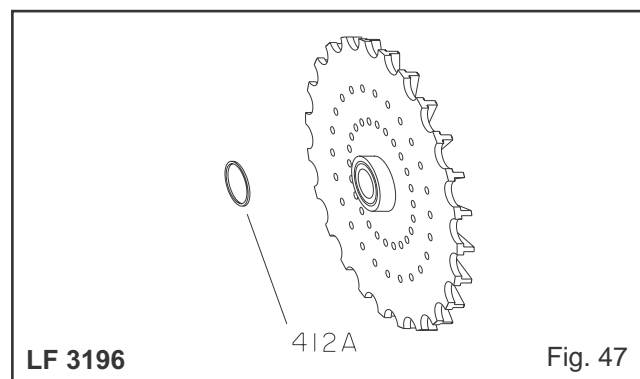
Fig. 45

4. Remove impeller O-ring (412A) and discard (Fig. 46, 47, 48). Replace with a new o-ring during reassembly.



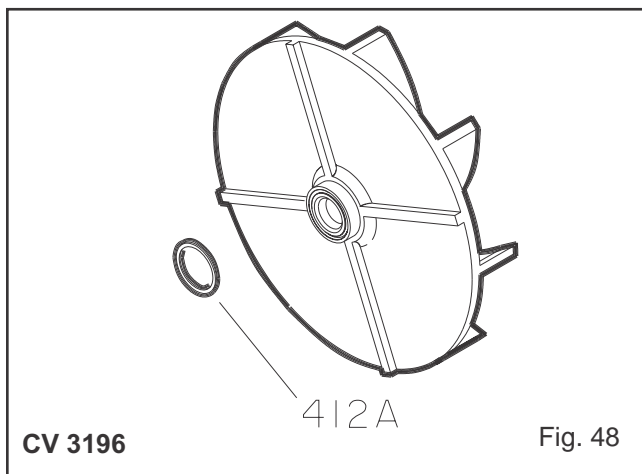
3196, HT 3196,  
NM 3196, 3198, 3796

Fig. 46



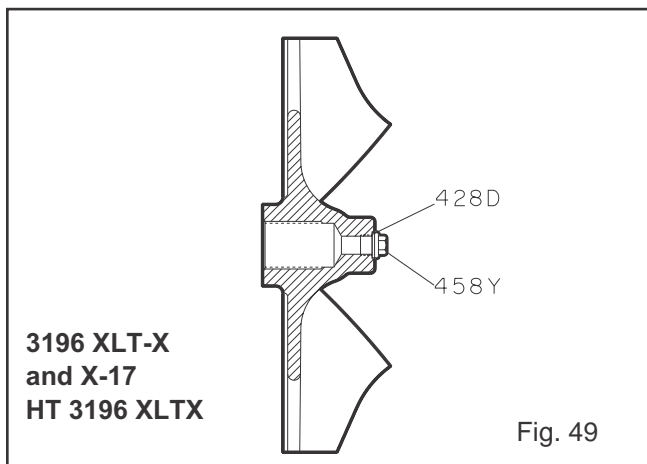
LF 3196

Fig. 47



## XLT-X & X17

1. Remove impeller plug (458Y) from the front of the impeller (101) and discard the Teflon® gasket (428D) (Fig. 49).



2. Spray penetrating oil through the plug hole into the cavity at the end of the shaft. Wait 15 minutes. Rotate the shaft several times while waiting to distribute the oil.
3. Slide Goulds shaft wrench (A05107A) over the shaft (122) and key.
4. Rotate the impeller clockwise (viewed from the impeller end of the shaft), raising the wrench off of the work surface.
5. Quickly turn the impeller counterclockwise (viewed from the impeller end of the shaft), impacting the wrench handle on the workbench or a solid block until the impeller loosens (Fig. 45).

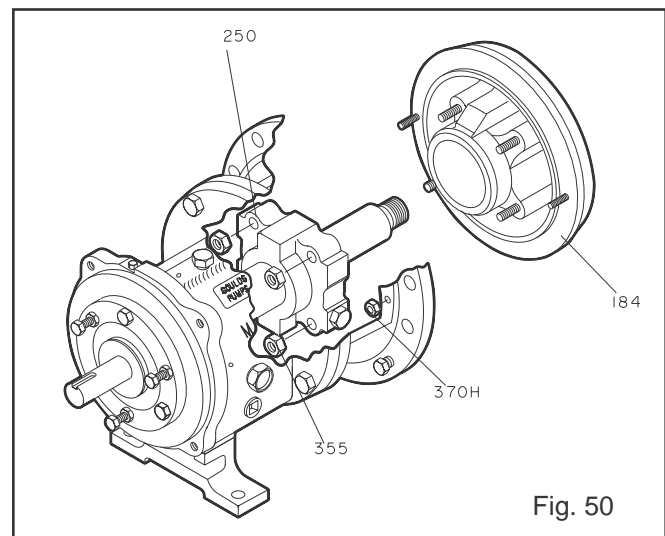
6. If the impeller cannot be loosened after several attempts, place a socket wrench over the cast nut on the impeller hub and turn the impeller counterclockwise (viewed from the impeller end of the shaft). Be sure the impeller wrench is resting on the workbench or a solid block and the power end is secure on the work surface.
7. Remove impeller O-ring (412A) and discard (Fig. 46, 47, 48). Replace with a new o-ring during reassembly.

**NOTE:** It is recommended that the frame foot (241) be clamped to the workbench when using this method to remove the impeller.

**NOTE FOR ALL MODELS:** If the impeller cannot be removed by the previous methods, cut the shaft between the gland and the frame, remove the impeller, stuffing box cover, gland, sleeve and shaft end as a unit. Do not use heat.

## REMOVAL OF SEAL CHAMBER COVER (MECHANICAL SEAL) - 3196, CV 3196, HT 3196, LF 3196, 3796

1. Remove gland stud nuts (355).
2. Remove seal chamber stud nuts (370H).
3. Remove seal chamber (184). (Fig. 50)



4. Remove shaft sleeve (126), if used.

**NOTE:** Mechanical seal is attached to sleeve (126). Rotary portion of seal needs to be removed from sleeve by loosening set screws and sliding it off the sleeve. Refer to mechanical seal instructions.

5. Remove gland (250) with stationary seat and O-ring (360Q) (Fig. 51).

**NOTE:** Be careful not to damage the stationary portion of the mechanical seal. It is seated in the gland bore.

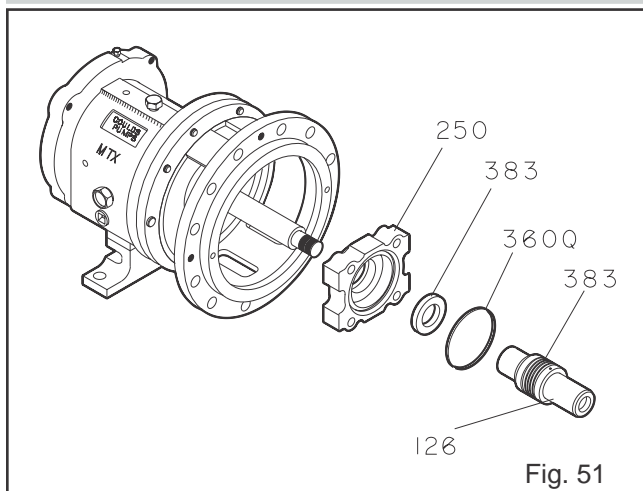


Fig. 51

## REMOVAL OF SEAL CHAMBER COVER AND/OR BACKPLATE - NM 3196 & 3198

1. Remove the gland or seal chamber stud nuts (355).
2. Remove the backplate and stud nuts (370H).
3. Remove the backplate (184) (Fig. 52).

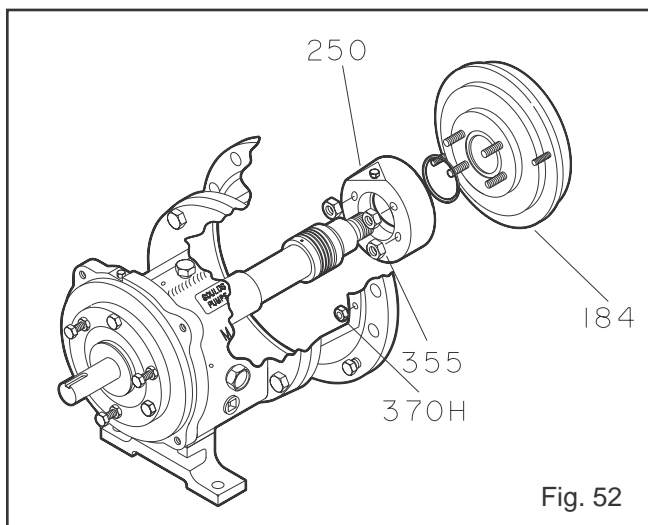


Fig. 52

4. Remove the shaft sleeve (126).

**NOTE:** The mechanical seal is attached to the sleeve (126). The rotary portion of the seal needs to be removed from the sleeve by loosening the set screws and sliding off the sleeve. Refer to the mechanical seal instructions.

**NOTE:** The Teflon® sleeve on the 3198 must be cut off the shaft to be removed. First remove the mechanical seal from the sleeve. Now, the sleeve can be removed by slicing the sleeve lengthwise with a sharp knife.

5. Remove the stationary seat and the gland or seal chamber with the gland gaskets (Figs. 53 & 54).

**NOTE:** Be careful not to damage the stationary portion of the mechanical seal. It is either clamped between the backplate and the gland or seated in the seal chamber bore.

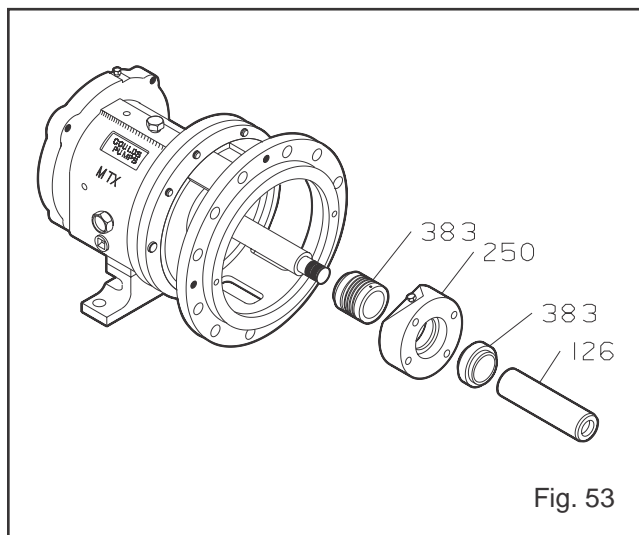


Fig. 53

6

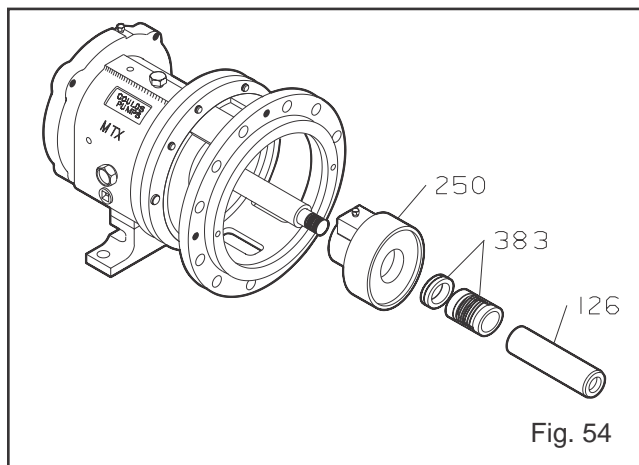


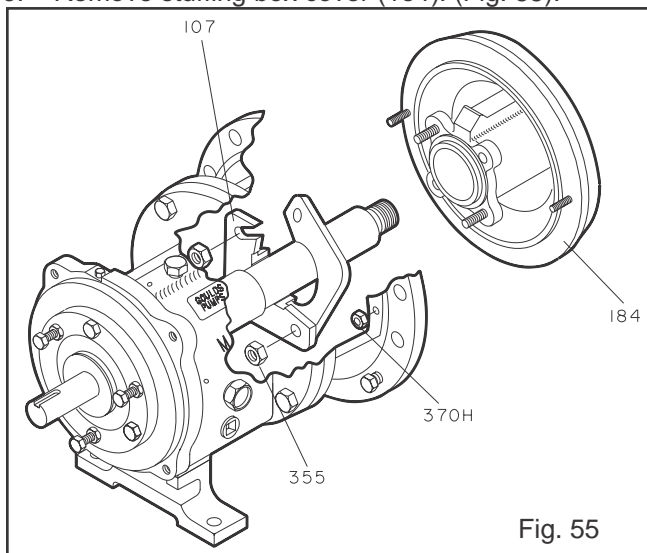
Fig. 54

## REMOVAL OF STUFFING BOX COVER (PACKED BOX) - 3196, CV 3196, HT 3196, LF 3196, & 3796

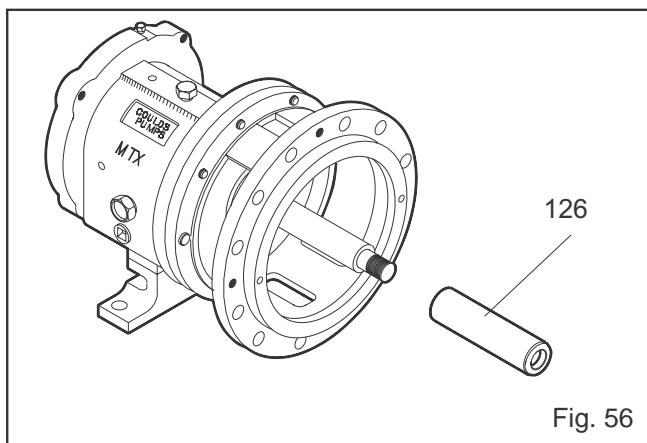
1. Remove gland stud nuts (355), and gland (107).
2. Remove stuffing box cover stud nuts (370H).



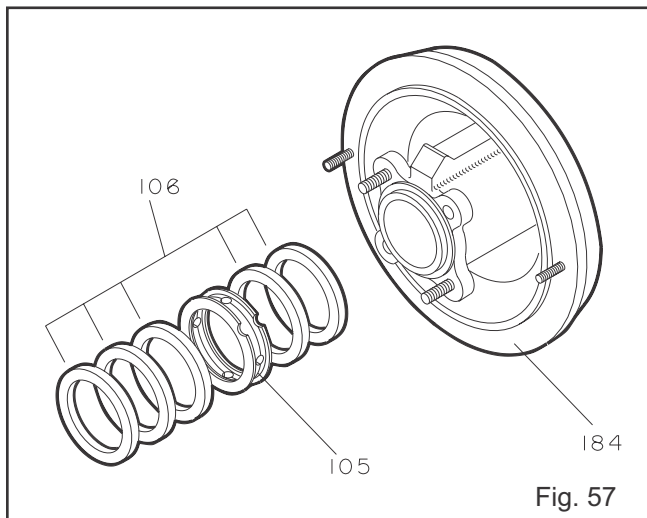
3. Remove stuffing box cover (184). (Fig. 55).



4. Remove shaft sleeve (126) (Fig. 56).

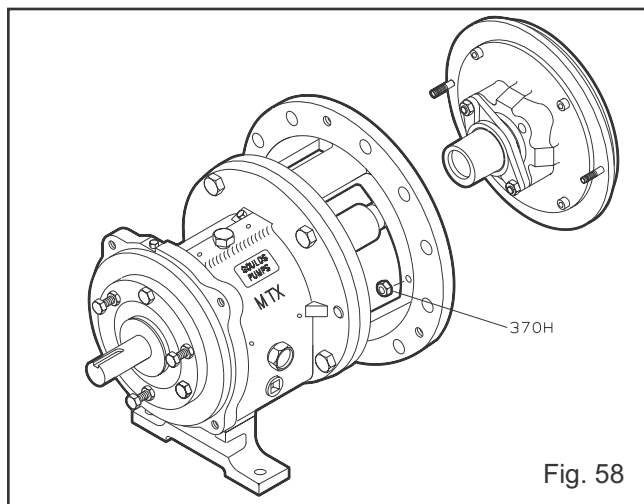


5. Remove packing (106) and lantern ring (105) from stuffing box cover (184) (Fig. 57). No lantern ring is provided with self-lubricating graphite packing.

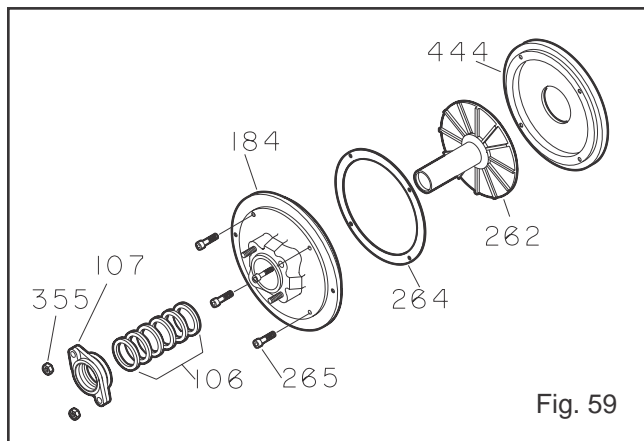


## REMOVAL OF DYNAMIC SEAL - 3196, CV 3196, LF 3196

1. Remove stud nuts (370H).
2. Remove dynamic seal assembly (Fig. 58).

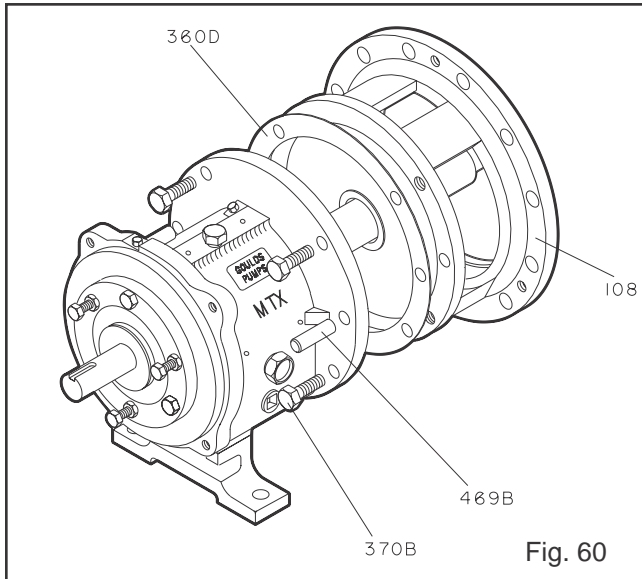


3. Remove socket head cap screws (265) (Fig. 59).
4. Remove stuffing box cover (184) and gasket (264).
5. Remove repeller (262) from backplate (444).



## REMOVE FRAME ADAPTER - MTX, LTX, XLT-X, X17

1. Remove dowel pins (469B), and bolts (370B).
2. Remove frame adapter (108) (Fig. 60).
3. Remove and discard gasket (360D). Replace with new gasket during reassembly.

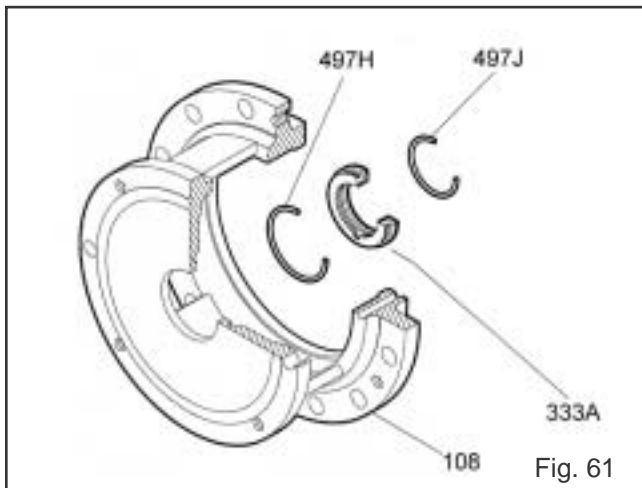


**NOTE:** The 3198 frame adapter is not interchangeable with any other model's adapter.

## REMOVE INBOARD LABYRINTH OIL SEAL (333A)

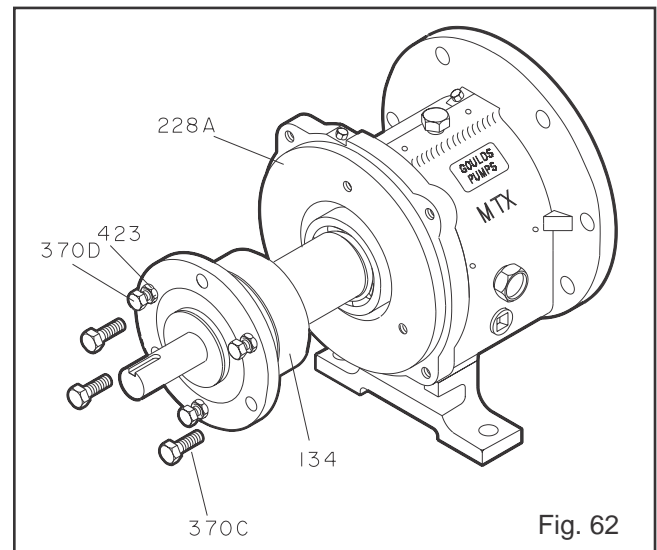
1. It is an O-ring fit into the bearing frame (228A) for STX, frame adapter (108) for MTX, LTX, XLT-X and X17. Remove O-rings (497H), (497J) if necessary (Fig. 61).

**NOTE:** Labyrinth oil seal O-rings (497H, J) are part of 3196 maintenance kits or can be obtained separately.



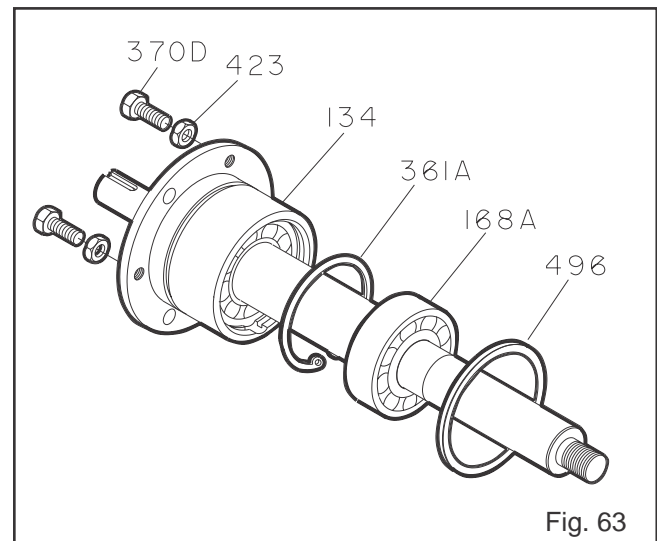
## DISASSEMBLY OF POWER END - STX, MTX

1. Remove clamp screws (370C). Back off jam nuts (423). Tighten jack screws (370D) evenly, this will start bearing housing (134) out of bearing frame (228A) (Fig. 62).
2. Remove the shaft assembly from the bearing frame (228A).



3. Remove jack screws (370D) with nuts (423) (Fig. 63).
4. Remove bearing housing O-ring (496).
5. Remove outboard bearing retaining snap ring (361A).

**NOTE:** Snap ring cannot be removed from the shaft until bearings are removed.



6. Remove bearing housing (134) from shaft (122) with bearings (112A, 168A) (Fig. 64).

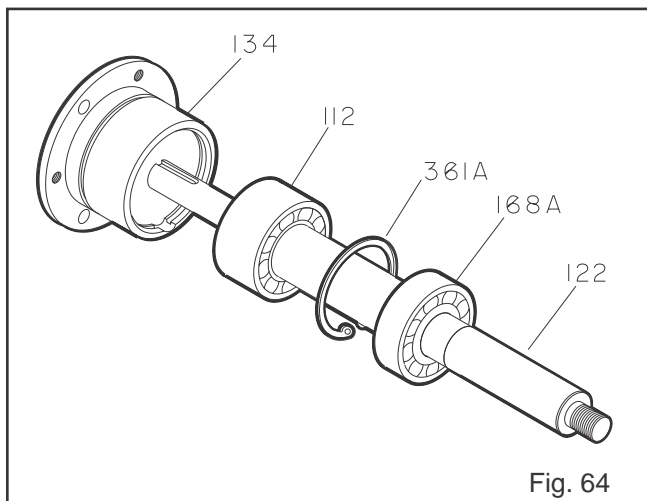


Fig. 64

7. Remove outboard labyrinth seal (332A) from bearing housing (134). Remove O-rings (497F), (497G) if necessary (Fig. 65).

**NOTE: Labyrinth oil seal O-rings (497F, G) are part of 3196 maintenance kits or can be obtained separately.**

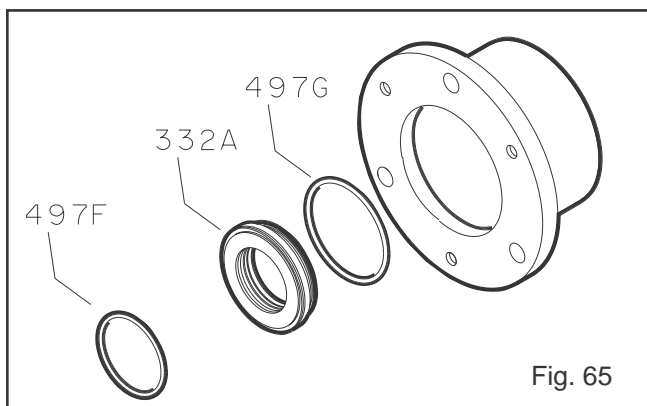


Fig. 65

8. Remove bearing locknut (136) and bearing lock washer (382) (Fig. 66).
9. Remove inboard bearing (168A).
10. Remove outboard bearing (112A).

**NOTE: When pressing bearings off shaft, use force on inner race only.**

**NOTE: Save bearings for inspection.**

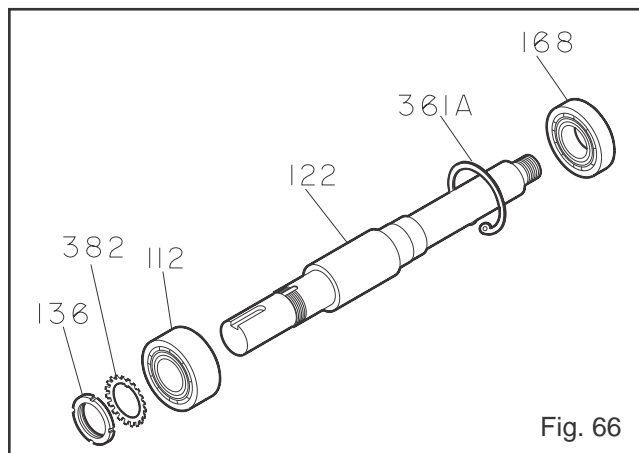


Fig. 66

## DISASSEMBLY OF POWER END - LTX

1. Remove clamp screws (370C). Back off jam nuts (423). Tighten jack screws (370D) evenly, this will start bearing housing (134) out of bearing frame (228A) (Fig. 67).
2. Remove shaft assembly from bearing frame (228A).

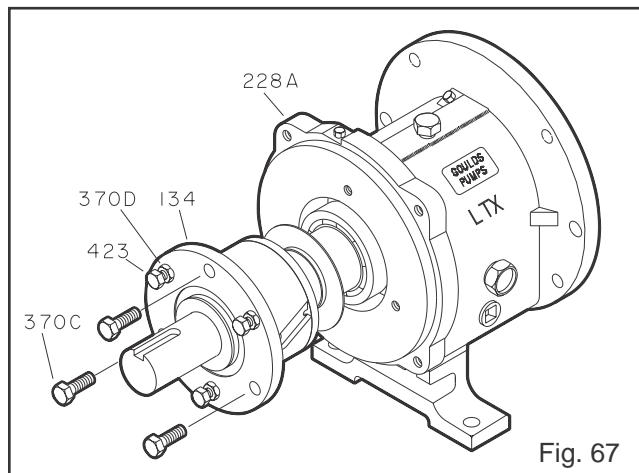
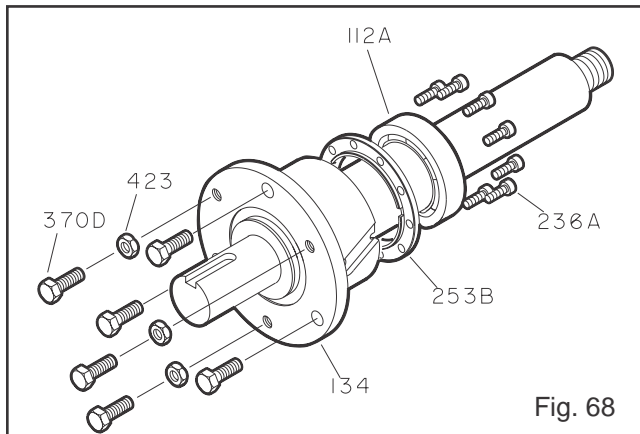


Fig. 67

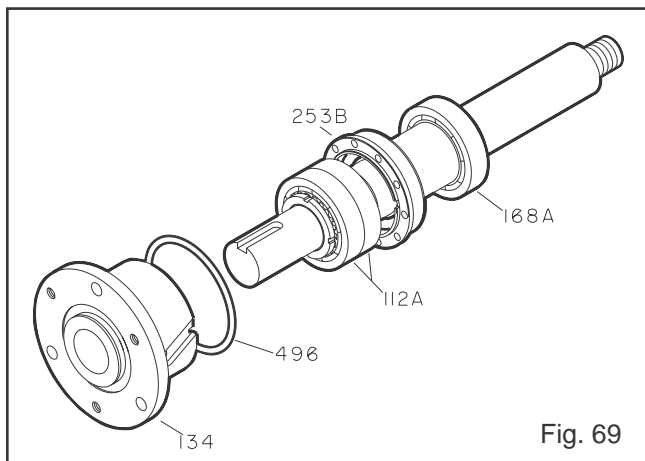


3. Remove jack screws (370D) with nuts (423) (Fig. 68).
4. Remove clamp ring screws (236A). Separate clamp ring (253B) from bearing housing (134).

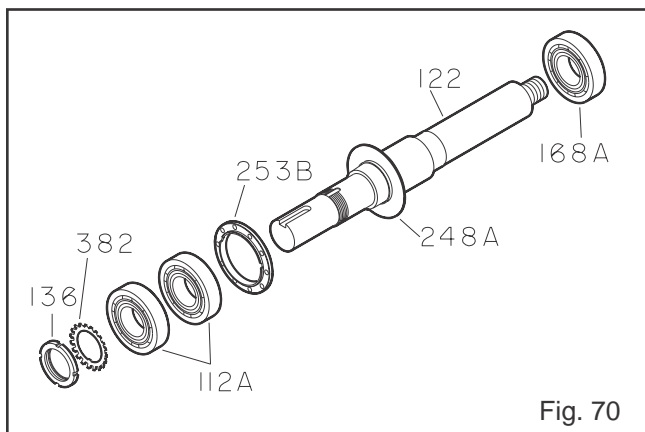
**NOTE: Clamp ring cannot be removed from the shaft until bearings are removed.**



5. Remove bearing housing (134) from shaft (122) with bearings (112A, 168A) (Fig. 69).



6. Remove bearing housing O-ring (496).
7. Remove inboard bearing (168A) (Fig. 70).



8. Remove bearing locknut (136) and bearing lockwasher (382).
9. Remove outboard bearings (112A). Remove clamp ring (253B).

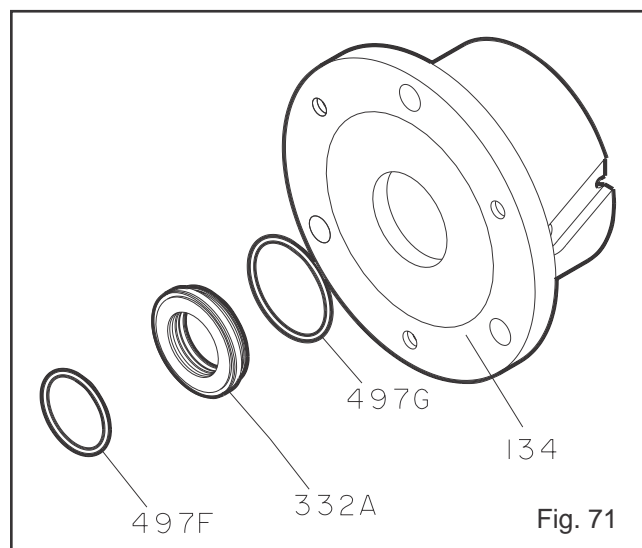
**NOTE: When pressing bearings off shaft, use force on inner race only.**

**NOTE: Save bearings for inspection. Do not reuse bearings.**

**NOTE: Do not remove oil flinger (248A) unless it is damaged.**

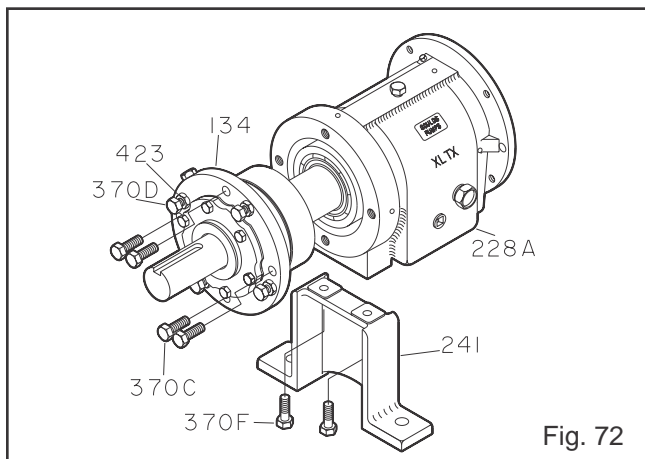
10. Remove outboard labyrinth seal (332A) from bearing housing (134). Remove O-rings (497F), (497G) if necessary (Fig. 71).

**NOTE: Labyrinth oil seal O-rings (497F, G) are part of 3196 maintenance kits or can be obtained separately.**



## DISASSEMBLY OF THE POWER END - XLT-X, X17

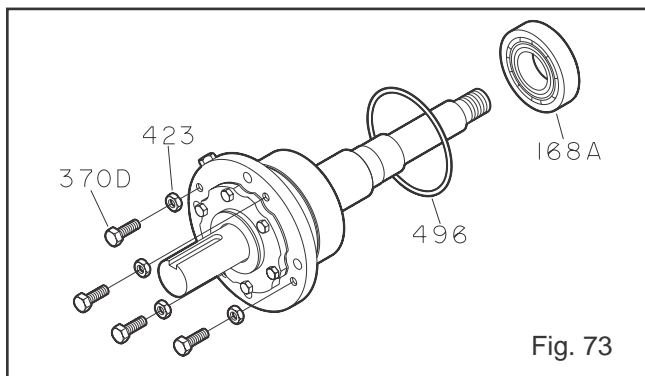
1. Remove bearing frame to frame foot bolts (370F) and frame foot (241) (Fig. 72).



2. Remove clamp screws (370C). Back off jam nuts (423). Tighten jack screws (370D) evenly, this will start bearing housing (134) out of bearing frame (228A).
3. Remove shaft assembly from bearing frame (228A).
4. Remove jack screws (370D) with nuts (423) (Fig. 73).
5. Remove bearing housing O-ring (496).
6. Remove inboard bearing (168A).

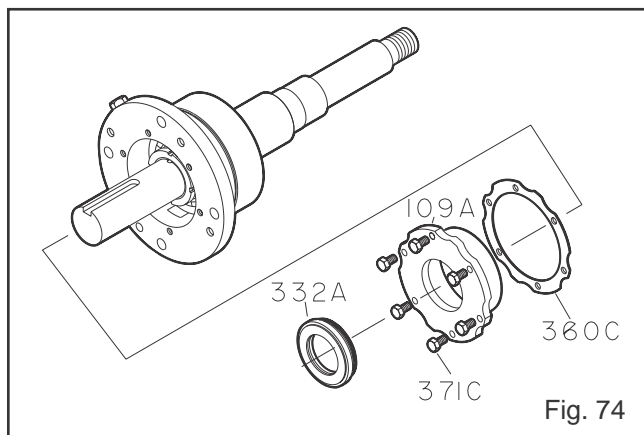
**NOTE:** When pressing bearings off shaft, use force on inner race only.

**NOTE:** Save bearings for inspection.

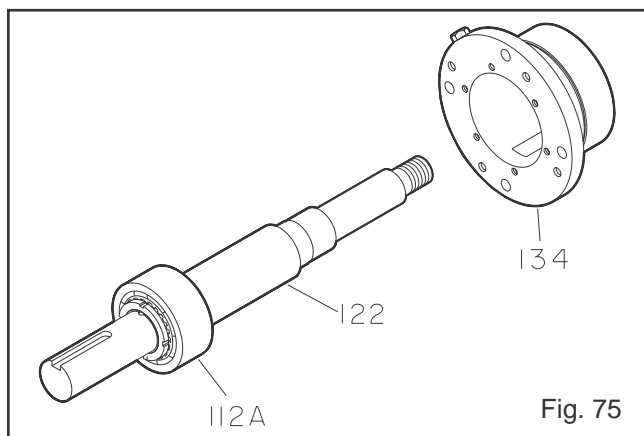


7. Remove bolts (371C), bearing end cover (109A) and gasket (360C) (Fig. 74).
8. Remove outboard labyrinth seal (332A) from end cover (109A). Remove O-rings (497F), (497G) if necessary.

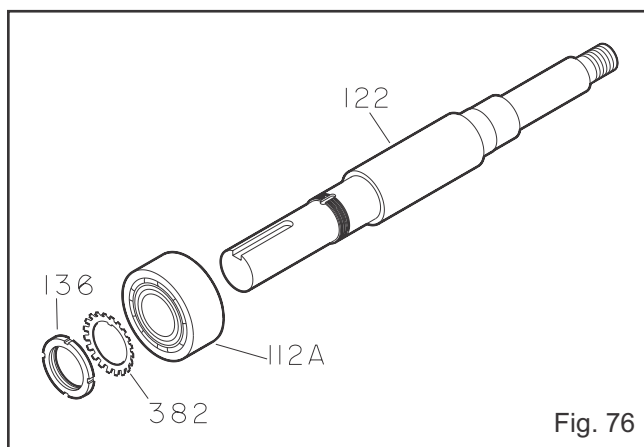
**NOTE:** Labyrinth oil seal O-rings (497F, G) are part of 3196 maintenance kits or can be obtained separately.



9. Remove bearing housing (134) from shaft (122) with bearing (112A) (Fig. 75).



10. Remove bearing locknut (136) and bearing lockwasher (382) (Fig. 76).



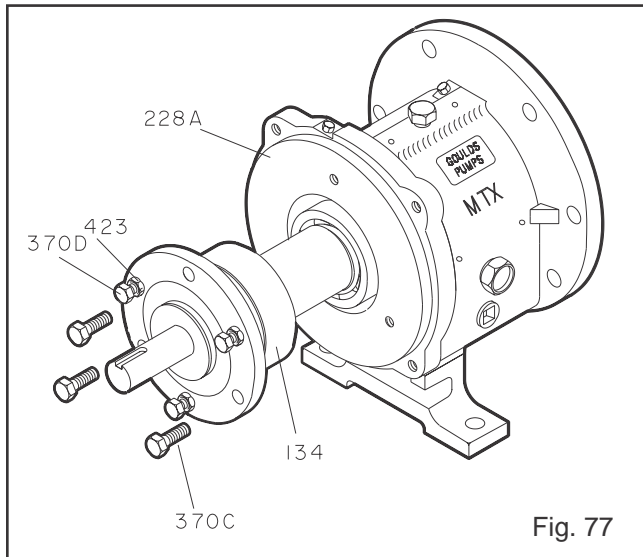
11. Remove outboard bearing (112A).

**NOTE:** When pressing bearings off shaft, use force on inner race only.

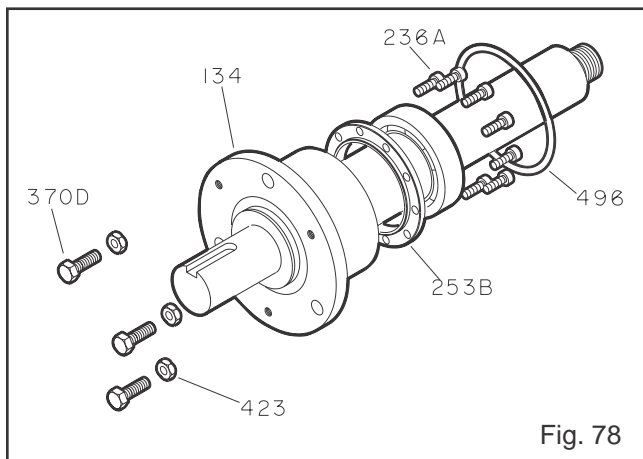
**NOTE:** Save bearings for inspection.

## DISASSEMBLY OF POWER END - STX, MTX with Duplex Bearings

1. Remove clamp screws (370C). Back off jam nuts (423). Tighten jack screws (370D) evenly, this will start bearing housing (134) out of bearing frame (228A) (Fig. 77).
2. Remove shaft assembly from bearing frame (228A).



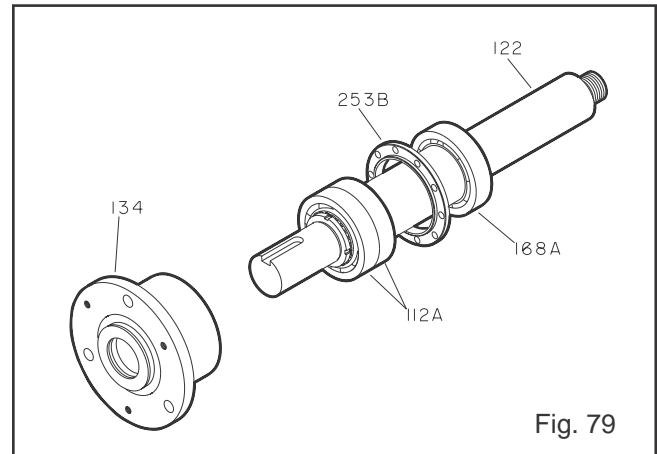
3. Remove jack screws (370D) with nuts (423) (Fig. 78).



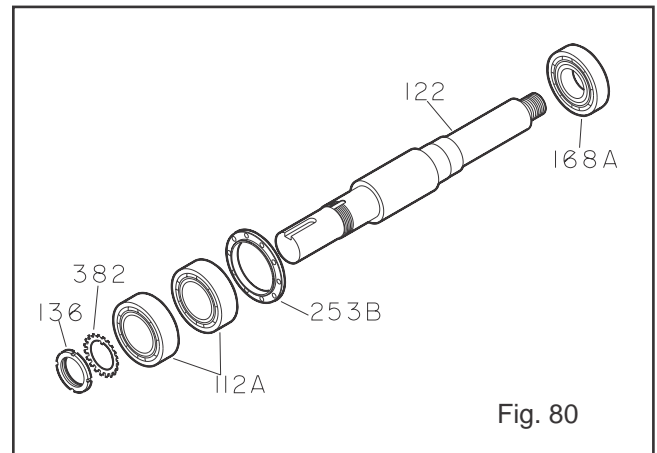
4. Remove bearing housing O-ring (496).
5. Remove clamp ring screws (236A). Separate clamp ring (253B) from bearing housing (134).

**NOTE: Clamp ring cannot be removed from the shaft until bearings are removed.**

6. Remove bearing housing (134) from shaft (122) with bearings (112A, 168A) (Fig. 79).



7. Remove inboard bearing (168A) (Fig. 80).



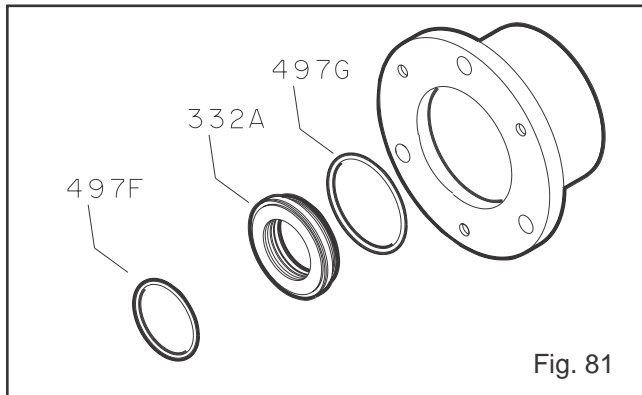
8. Remove bearing locknut (136) and bearing lockwasher (382).
9. Remove outboard bearings (112A).

**NOTE: When pressing bearings off shaft, use force on inner race only.**

**NOTE: Save bearings for inspection.**

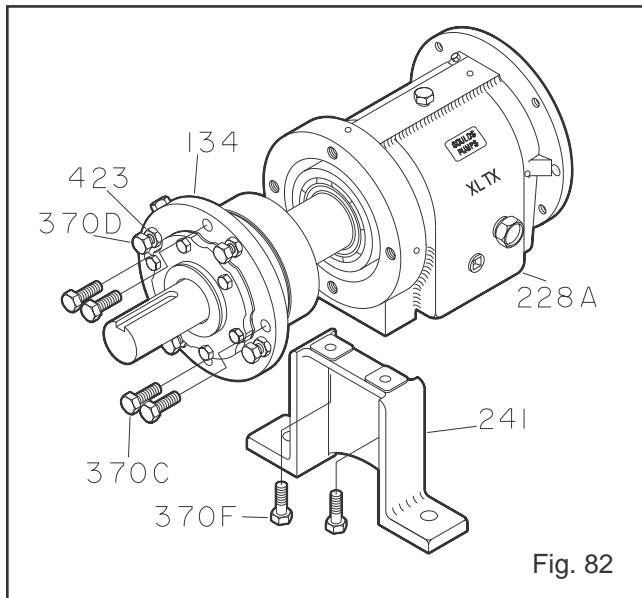
10. Remove outboard labyrinth seal (332A) from bearing housing (134). Remove O-rings (497F), (497G) if necessary (Fig. 81).

**NOTE: Labyrinth oil seal O-rings (497F, G) are part of 3196 maintenance kits or can be obtained separately.**



## DISASSEMBLY OF POWER END - XLT-X, X17 With Duplex Bearings

1. Remove bearing frame to frame foot bolts (370F) and frame foot (241) (Fig. 82).

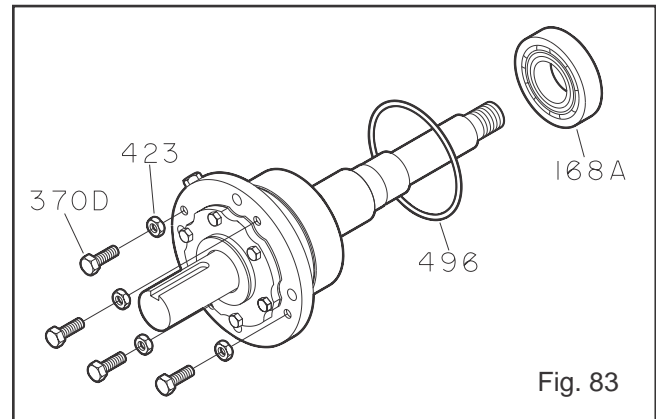


2. Remove clamp screws (370C). Back off jam nuts (423). Tighten jack screws (370D) evenly, this will start bearing housing (134) out of bearing frame (228A).
3. Remove shaft assembly from bearing frame (228A).

4. Remove jack screws (370D) with nuts (423) (Fig. 83).
5. Remove bearing housing O-ring (496).
6. Remove inboard bearing (168A).

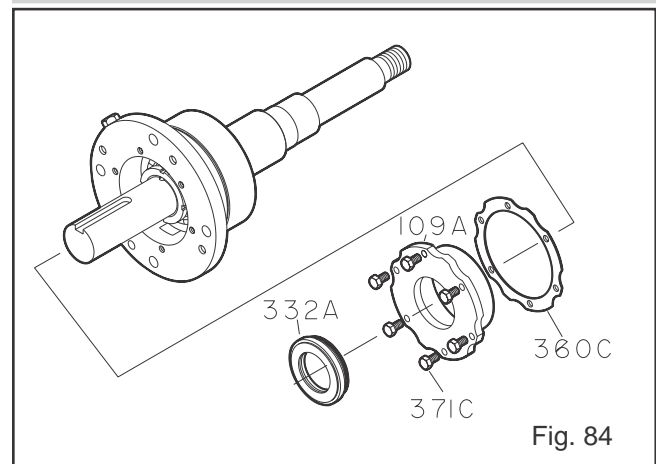
**NOTE: When pressing bearings off shaft, use force on inner race only.**

**NOTE: Save bearings for inspection.**



7. Remove bolts (371C), end cover (109A) and gasket (360C) (Fig. 84).
8. Remove outboard labyrinth seal (332A) from end cover (109A). Remove O-rings (497F), (497G) if necessary.

**NOTE: Labyrinth oil seal O-rings (497F, G) are part of 3196 maintenance kits or can be obtained separately.**



9. Remove bearing housing (134) from shaft (122) with bearings (112A) (Fig. 85).

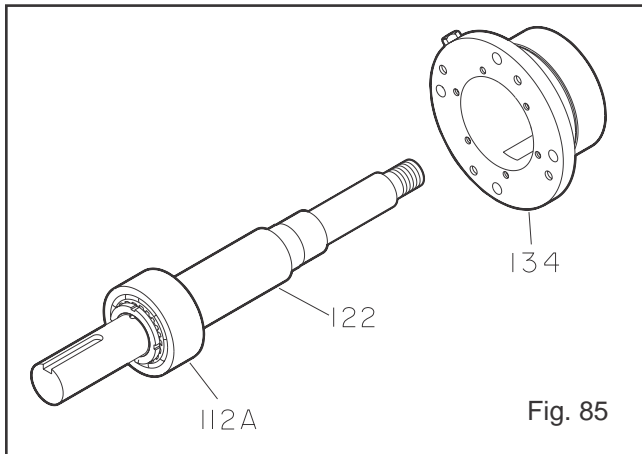


Fig. 85

10. Remove bearing locknut (136) and bearing lockwasher (382) (Fig. 86).

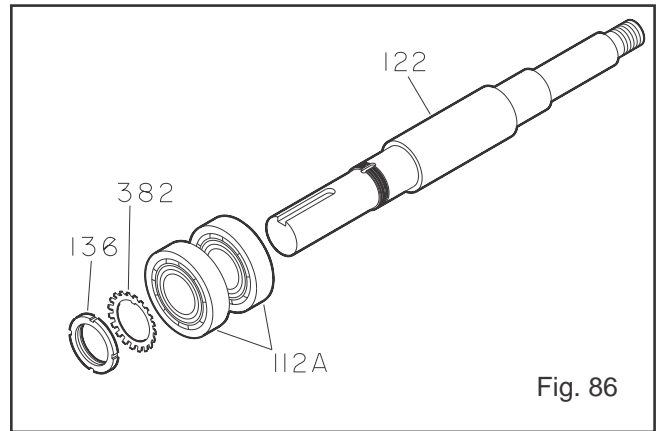


Fig. 86

11. Remove outboard bearing (112A).

**NOTE:** When pressing bearings off the shaft, use force on the inner race only.

**NOTE:** Save bearings for inspection.

## ALL MODELS

### DISASSEMBLY OF BEARING FRAME

1. Remove oil fill plug (113A), oil drain plug (408A), sight glass (319), sight oiler plug (408J), four (4) oil mist/grease connection plugs (408H), and oil cooler inlet and outlet plugs (408L, 408M) or oil cooler from bearing frame (228A).
2. MTX, LTX: Remove bearing frame foot-to-frame bolts (370F), and frame foot (241).

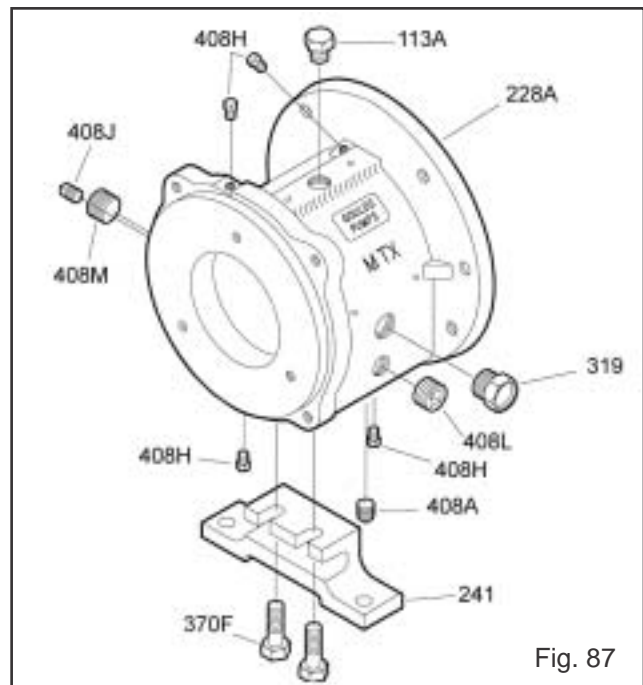


Fig. 87



# INSPECTIONS

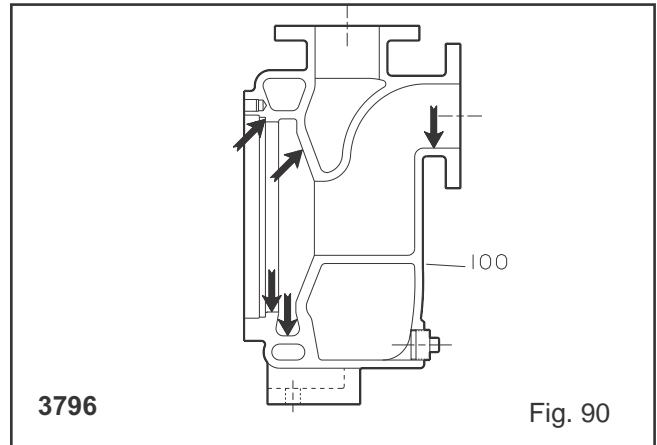
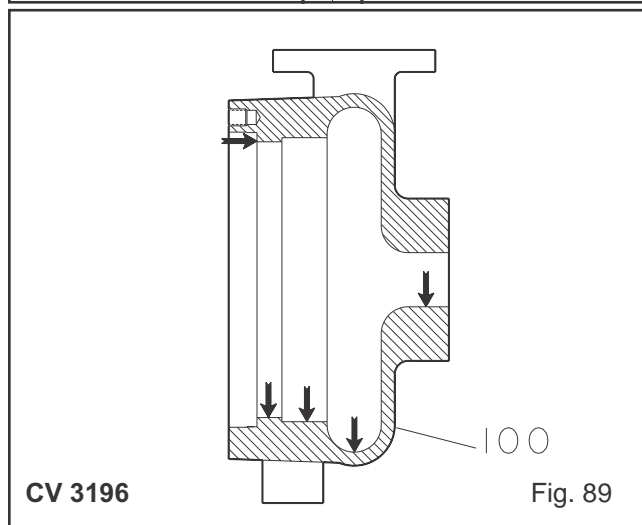
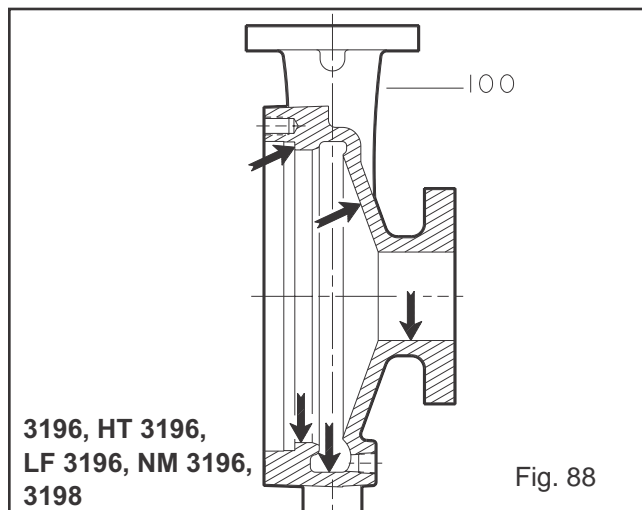
The pump parts must be inspected to the following criteria before they are reassembled to insure the pump will run properly. Any part not meeting the required criteria should be replaced.

**NOTE: Clean parts in solvent to remove oil, grease or dirt. Protect machined surfaces against damage during cleaning.**

## Casing

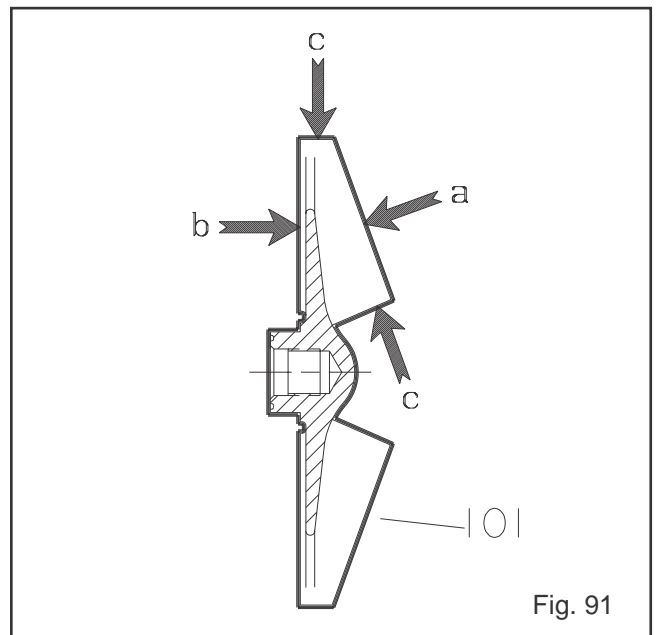
The casing (100) should be inspected for cracks and excessive wear or pitting. It should be repaired or replaced if it exceeds the following criteria (Figs. 88, 89 & 90).

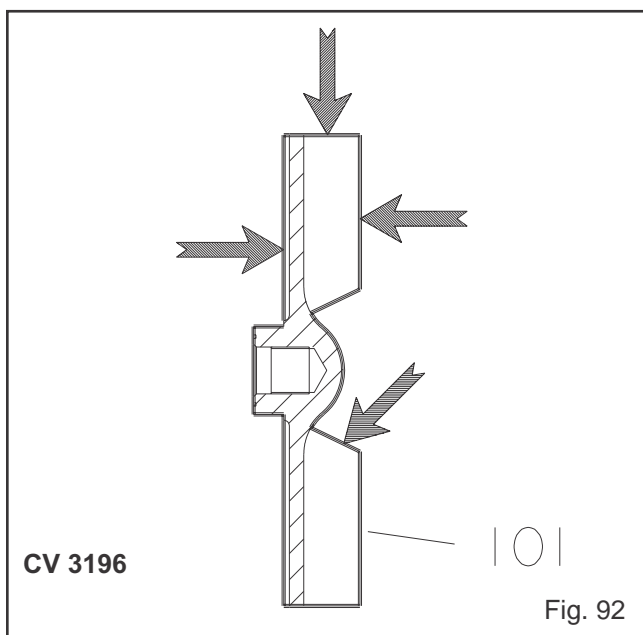
1. Localized wear or grooving greater than 1/8 in. (3.2 mm) deep.
2. Pitting greater than 1/8 in. (3.2 mm) deep.
3. Inspect case gasket seat surface for irregularities.



## Impeller

1. Inspect impeller (101) vanes for damage. Replace if grooved deeper than 1/16 in. (1.6 mm) or if worn evenly more than 1/32 in. (0.8 mm). (Area "a" in Fig. 91).
2. Inspect pumpout vanes for damage. Replace if worn more than 1/32 in. (0.8 mm). (Area "b" in Fig. 91).
3. Inspect leading and trailing edges of the vanes for cracks, pitting, and erosion or corrosion damage. (Area "c" in Fig. 91.).



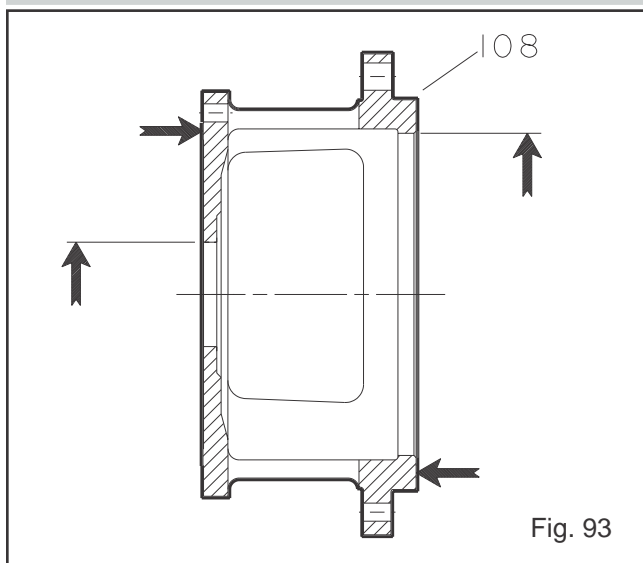


**NOTE:** For CV 3196 impeller, the face of the impeller is cast, not machined. The face runout need not be checked.

### Frame Adapter

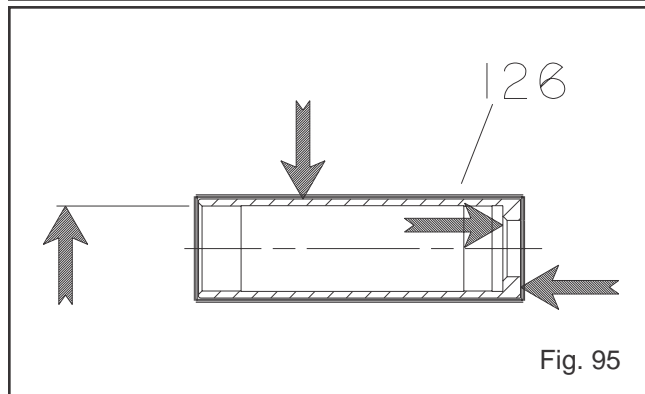
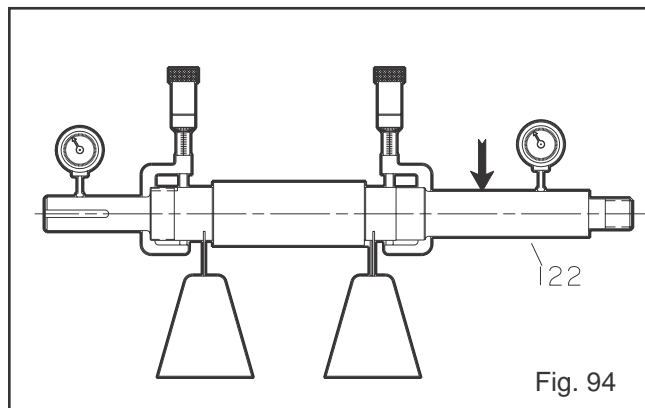
1. Check frame adapter (108) for cracks or excessive corrosion damage. Replace if any of these conditions exist (Fig. 93).
2. Make sure gasket surface is clean.

**NOTE:** The 3198 frame adapter is not interchangeable with any other model's adapter.



### Shaft and Sleeve - All Except 3198

1. Check bearing fits. If any are outside the tolerance in Table 8, replace the shaft (122) (Fig. 94).
2. Check shaft straightness. Replace shaft if runout exceeds values in Table 12.
3. Check shaft and sleeve (126) surface for grooves, pitting. Replace if any are found (Fig. 95).

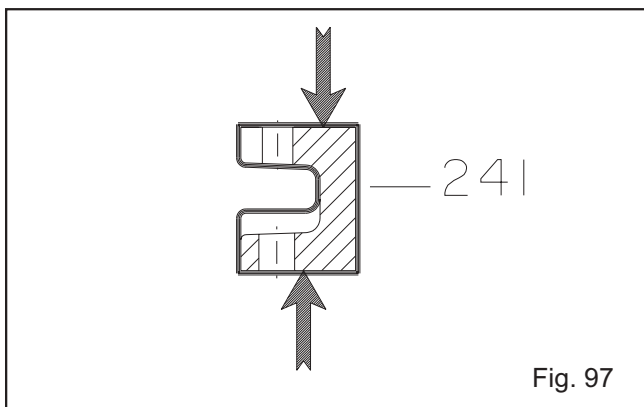
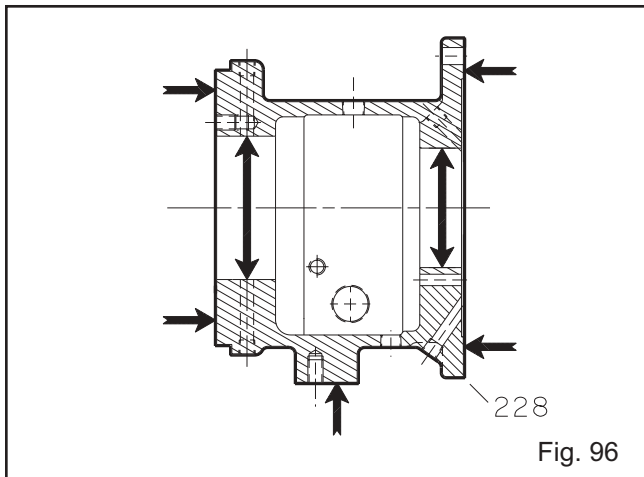


### Shaft and Sleeve - 3198

The 3198 is offered with a metallic sleeve which uses the standard 3196 (ANSI products) shaft. It is also offered with a Teflon® sleeve. The use of the Teflon® sleeve requires a special shaft and a different inboard labyrinth oil seal. The inspection procedures are the same as those listed above for the balance of the products.

## Bearing Frame

1. Visually inspect bearing frame (228) and frame foot (241) for cracks. Check frame inside surfaces for rust, scale or debris. Remove all loose and foreign material (Figs. 96, 97).
2. Make sure all lubrication passages are clear.
3. If frame has been exposed to pumpage, inspect for corrosion or pitting.
4. Inspect inboard bearing bore according to the Alignment Troubleshooting table found in the *Installation* section.



## C-Face Adapter

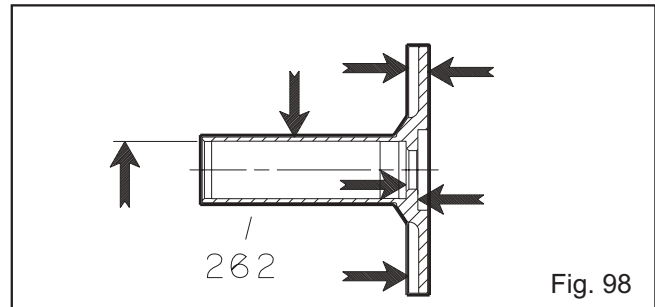
For C-Face adapter inspections, See *Appendix V*.

## Dynamic Seal Repeller

(3196, CV 3196, LF 3196 only)

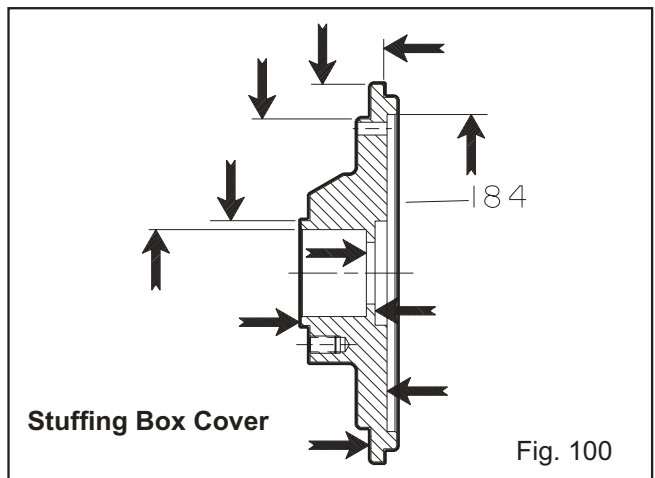
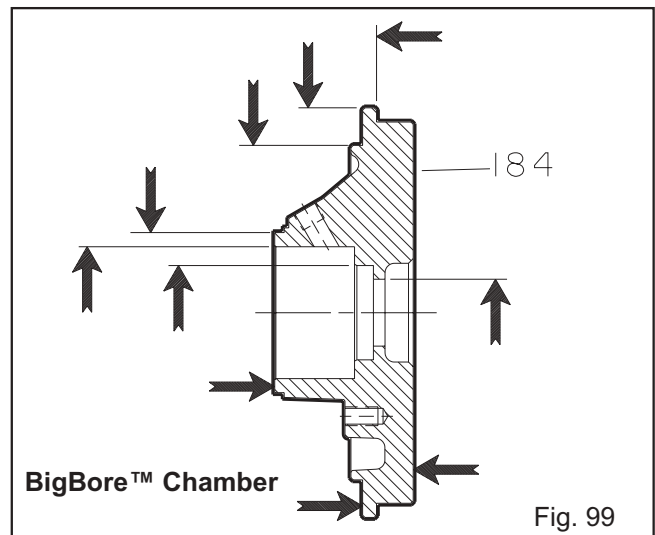
1. Inspect dynamic seal repeller (262) vanes for damage. Replace if grooved deeper than 1/16 in. (1.6 mm) or if worn evenly more than 1/32 in. (0.8 mm) (Fig. 98).

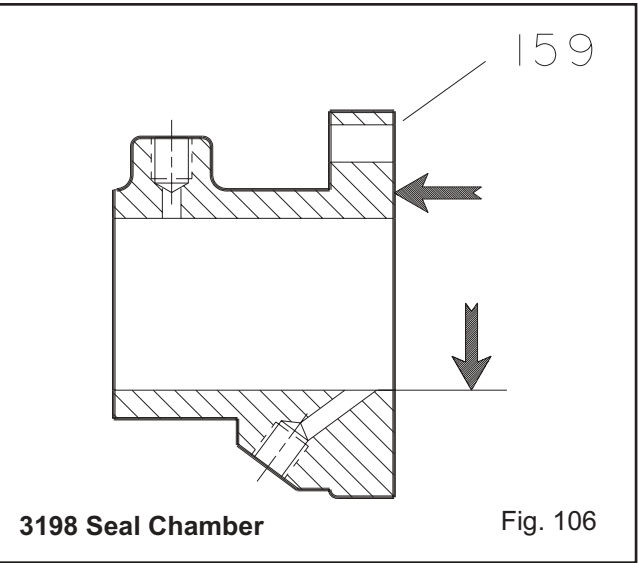
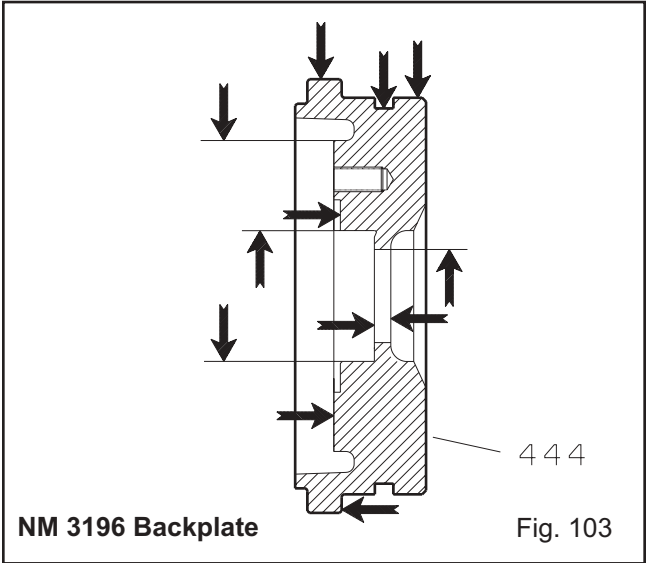
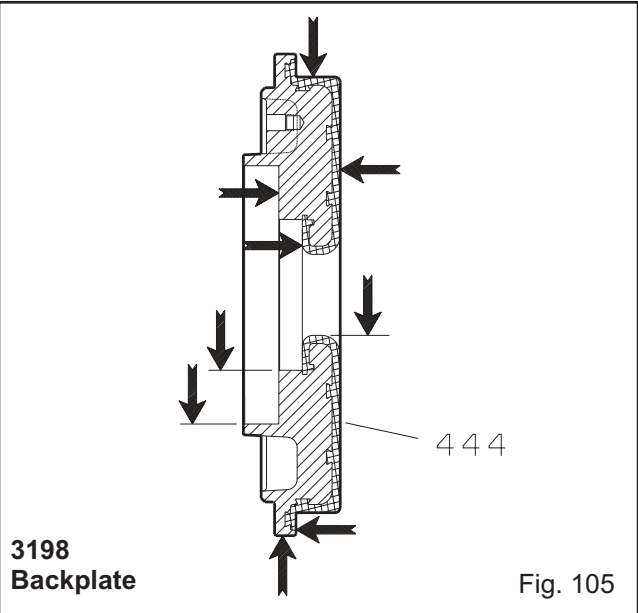
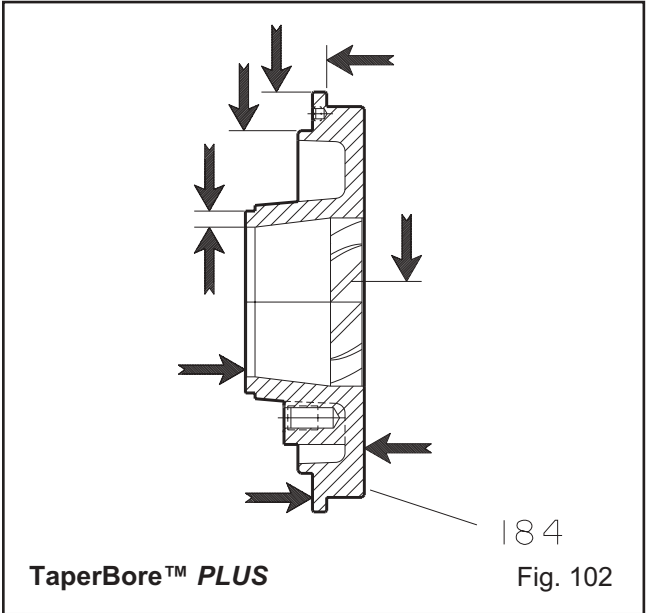
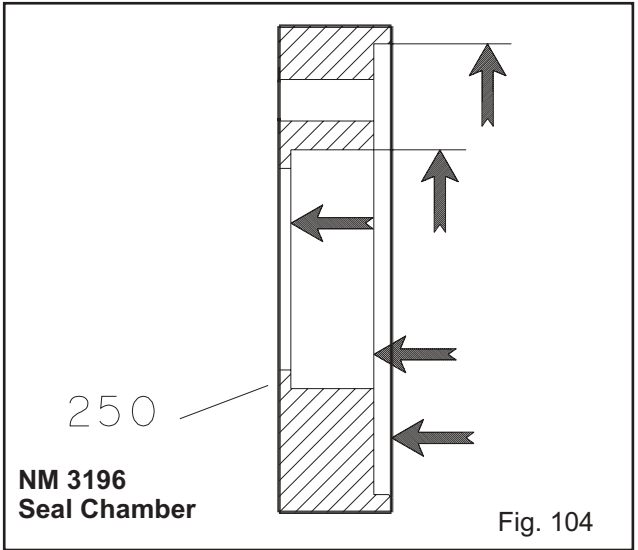
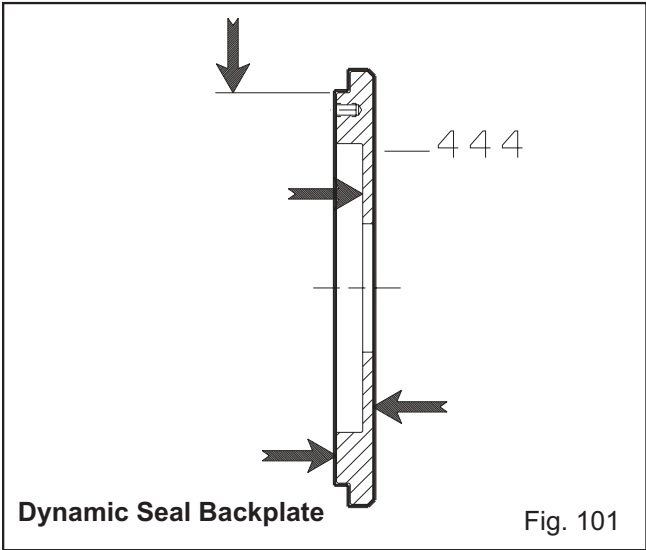
2. Inspect sleeve surface for grooves, pitting or other damage. Replace if damaged.

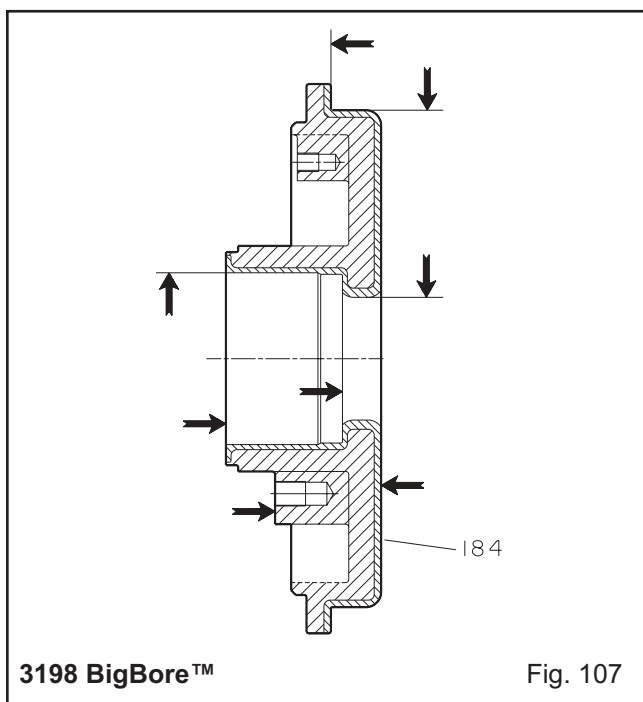


## Seal Chamber/Stuffing Box Cover and Dynamic Seal Backplate

1. Make sure seal chamber/stuffing box cover (184) and dynamic seal backplate (444) gasket surface is clean at adapter face (Figs. 99 - 107).
2. Replace if there is any pitting or wear greater than 1/8 in. (3.2 mm) deep.







## Bearings

1. Ball bearings (112A, 168A) should be inspected for contamination and damage. The condition of the bearings will provide useful information on operating conditions in the bearing frame. Lubricant condition and residue should be noted, oil analysis is often helpful. Bearing damage should be investigated to determine cause. If cause is not normal wear, it should be corrected before pump is returned to service.

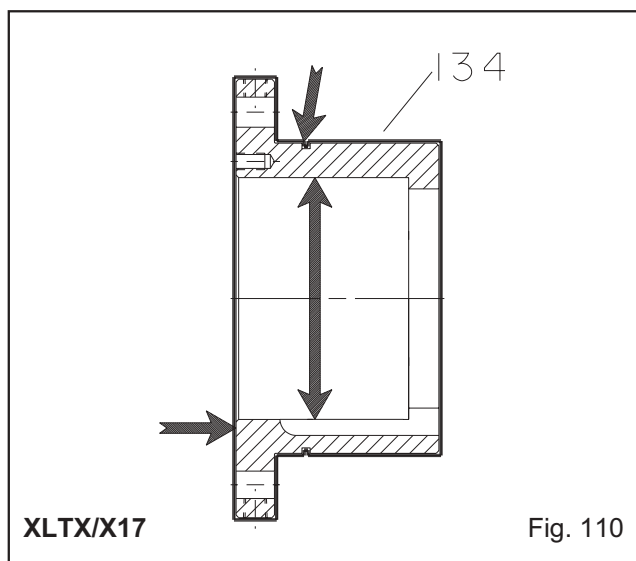
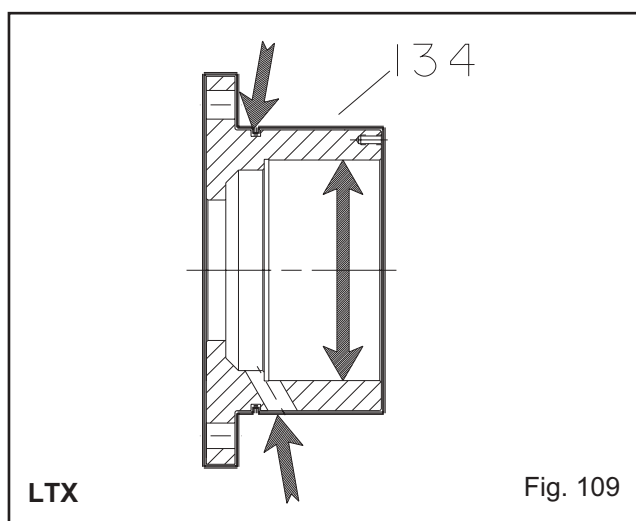
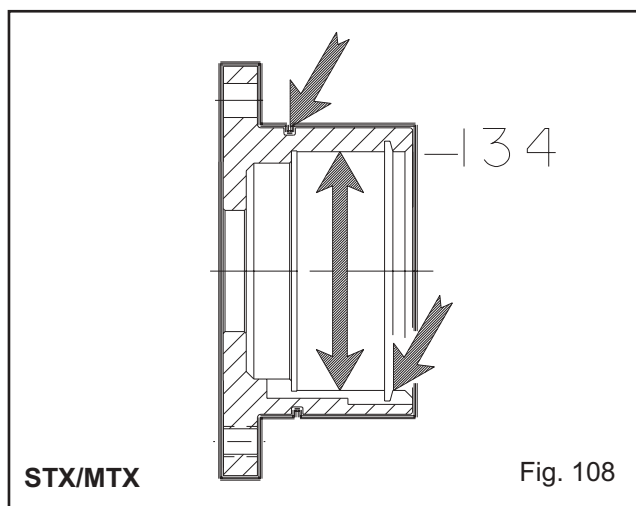
### DO NOT RE-USE BEARINGS.

## Bearing Housing

1. Inspect bearing housing (134) bore according to *Table 8*. Replace if dimensions exceed *Table 8* values.
2. Visually inspect for cracks and pits.
  - STX, MTX* - Snap ring groove must not be cracked (Fig. 108).
  - LTX* - Grooves and holes must be clear (Fig. 109).
  - XLTX-X, X17* - Gasket surface must be clean (Fig. 110).

## Labyrinth Seals

1. Labyrinth seal (332A, 333A) O-rings should be inspected for cuts and cracks. Replace as needed.





**Table 8**  
**Bearing Fits & Tolerances**

**According to ABEC I standard**

	<b>STX</b> in. (mm)	<b>MTX</b> in. (mm)	<b>LTX</b> in. (mm)	<b>XLT-X, X-17</b> in. (mm)
<b>Shaft O.D.</b>	1.3785	1.7722	2.1660	2.5597
<b>Inboard</b>	(35.013)	(45.013)	(55.015)	(65.015)
	1.3781	1.7718	2.1655	2.5592
	(35.002)	(45.002)	(55.002)	(65.002)
<b>Clearance</b>	0.0010 (0.025) tight 0.0001 (0.002) tight	0.0010 (0.025) tight 0.0001 (0.002) tight	0.0012 (0.030) tight 0.0001 (0.002) tight	0.0012 (0.030) tight 0.0001 (0.002) tight
<b>Bearing I.D.</b>	1.3780	1.7717	2.1654	2.5591
<b>Inboard</b>	(35.000)	(45.000)	(55.000)	(65.000)
	1.3775	1.7712	2.1648	2.5585
	(34.988)	(44.988)	(54.985)	(64.985)
<b>Frame I.D.</b>	2.8346	3.9370	4.7244	5.5118
<b>Inboard</b>	(72.000)	(100.000)	(120.000)	(140.000)
	2.8353	3.9379	4.7253	5.5128
	(72.019)	(100.022)	(120.022)	(140.025)
<b>Clearance</b>	0.0012 (0.032) loose 0.0000 (0.000) loose	0.0015 (0.037) loose 0.0000 (0.000) loose	0.0015 (0.037) loose 0.0000 (0.000) loose	0.0017 (0.043) loose 0.0000 (0.000) loose
<b>Bearing O.D.</b>	2.8346	3.9370	4.7244	5.5118
<b>Inboard</b>	(72.000)	(100.000)	(120.000)	(140.000)
	2.8341	3.9364	4.7238	5.5111
	(71.987)	(99.985)	(119.985)	(139.982)
<b>Shaft O.D.</b>	1.1815	1.7722	1.9690	2.5597
<b>Outboard</b>	(30.011)	(45.013)	(50.013)	(65.015)
	1.1812	1.7718	1.9686	2.5592
	(30.002)	(45.002)	(50.002)	(65.002)
<b>Clearance</b>	0.0008 (0.021) tight 0.0001 (0.002) tight	0.0010 (0.025) tight 0.0001 (0.002) tight	0.0010 (0.025) tight 0.0001 (0.002) tight	0.0012 (0.030) tight 0.0001 (0.002) tight
<b>Bearing I.D.</b>	1.1811	1.7717	1.9685	2.5591
<b>Outboard</b>	(30.000)	(45.000)	(50.000)	(65.000)
	1.1807	1.7712	1.9680	2.5585
	(29.990)	(44.988)	(49.988)	(64.985)
<b>Housing I.D.</b>	2.8346	3.9370	4.3307	5.5118
<b>Outboard</b>	(72.000)	(100.000)	(110.000)	(140.000)
	2.8353	3.9379	4.3316	5.5128
	(72.019)	(100.022)	(110.022)	(140.025)
<b>Clearance</b>	0.0012 (0.032) loose 0.0000 (0.000) loose	0.0015 (0.037) loose 0.0000 (0.000) loose	0.0015 (0.037) loose 0.0000 (0.000) loose	0.0017 (0.043) loose 0.0000 (0.000) loose
<b>Bearing O.D.</b>	2.8346	3.9370	4.3307	5.5118
<b>Outboard</b>	(72.000)	(100.000)	(110.000)	(140.000)
	2.8341	3.9364	4.3301	5.5111
	(71.987)	(99.985)	(109.985)	(139.982)