

WMC Resources

Kwinana Nickel Refinery

GOULDS 3196 - Pump Overhaul Record

Machine Number:	
Pump Type: (eg 3196)	
Pump Frame: (eg MTX)	
Size: (3 x 4)	
Date:	
WMC Purchase Order:	
Overhauled by:	
Approved by:	

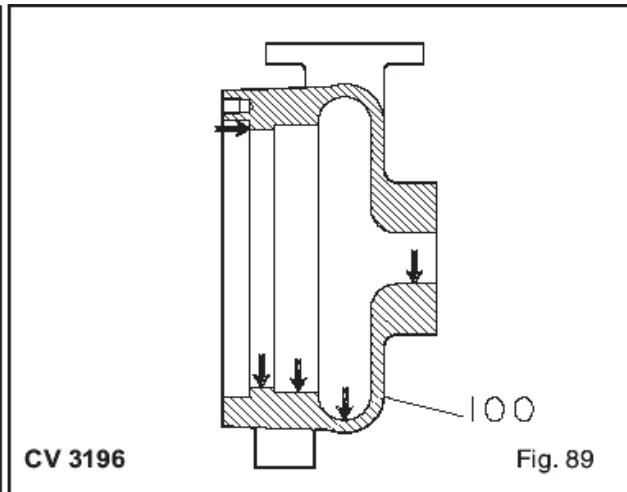
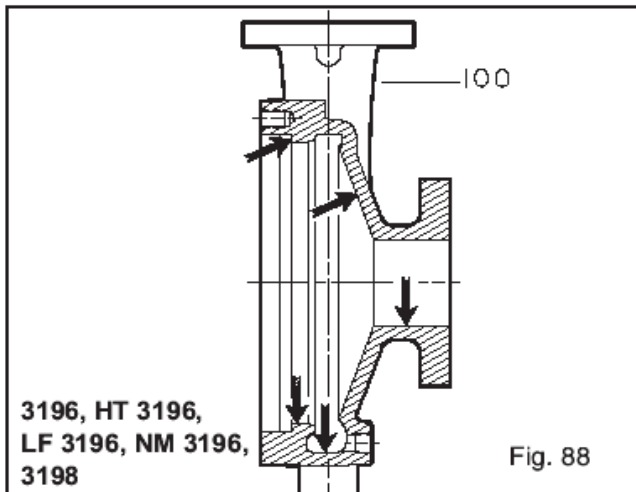
Reference: GOULDS Pumps Installation, Operating and Maintenance Instructions ANSI Family. ANSIFAM IOM -7/04

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.

1. 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).

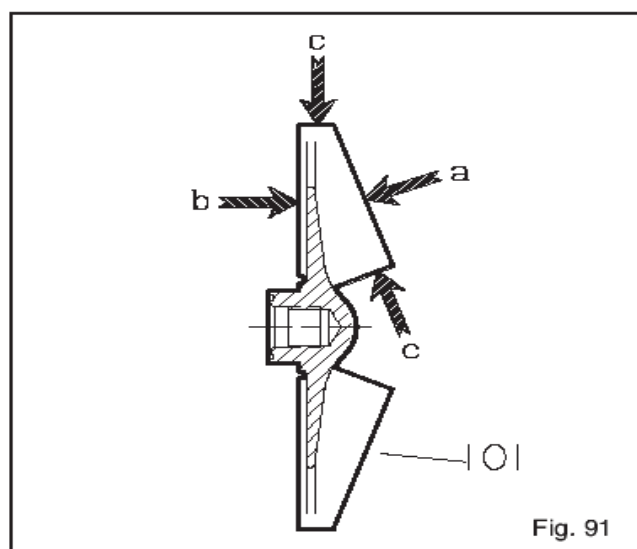


	Yes	No	Action
Localised wear /grooving > 3.2 mm			
Pitting > 3.2 mm			
Gasket seat surface irregularities			

2. Impeller

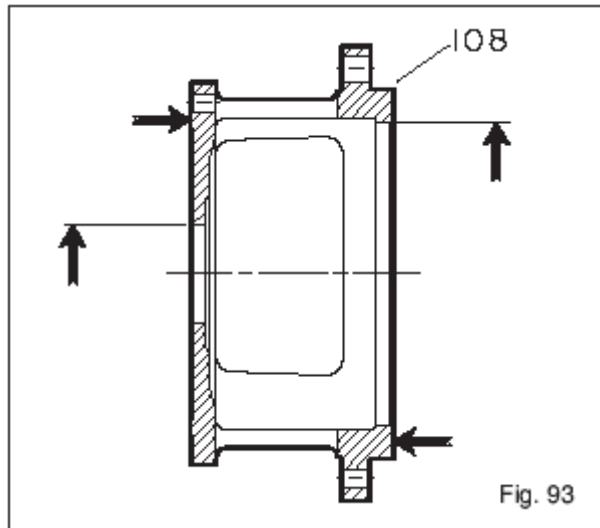
Inspect impeller (101) for the following as shown in Fig. 91:

1. Vanes for damage or wear in area "a" Replace if grooved deeper than (1.6 mm) or if worn evenly more than (0.8 mm)
2. Pumpout vanes for damage area "b" Replace if worn more than (0.8 mm).
3. Leading and trailing edges of the vanes for cracks, pitting, and erosion or corrosion damage area "c"



3. Frame Adapter

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



4. Shaft and Sleeve - All Except 3198

Check shaft (122) and sleeve (126) for the following as shown in Fig. 94 and Fig 95.

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

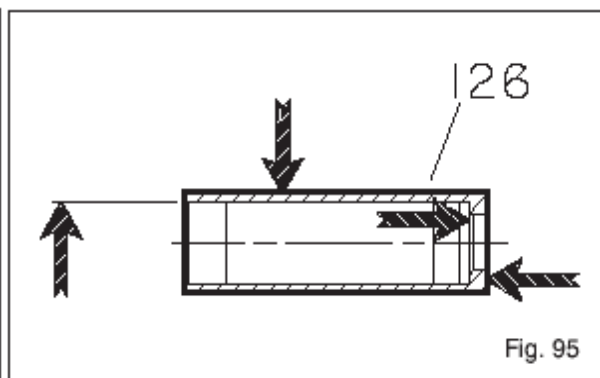
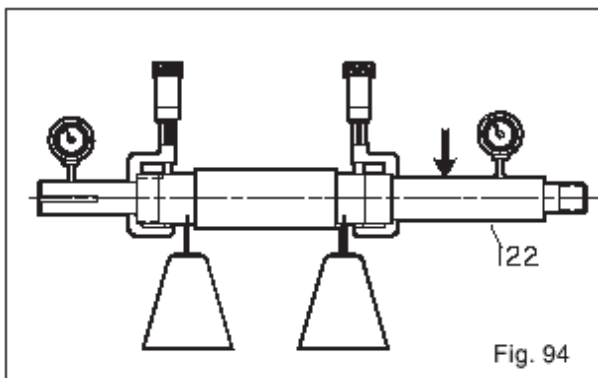


Table - Bearing Fits

(mm)	STX	MTX	LTX	XLT-X, X-17	Measured
Shaft OD I/B	35.013/35.002	45.013/45.002	55.015/55.002	65.015/65.002	
Brg ID I/B	35.000/34.998	45.000/44.998	55.000/54.985	65.000/64.985	
Clearance	-0.025/-0.002	-0.025/-0.002	-0.030/-0.002	-0.030/-0.002	
Shaft OD O/B	30.011/30.002	45.013/45.002	50.013/50.002	65.015/65.002	
Brg ID O/B	30.000/29.990	45.000/44.998	50.000/49.988	65.000/64.985	
Clearance	-0.021/-0.002	-0.025/-0.002	-0.025/-0.002	-0.030/-0.002	

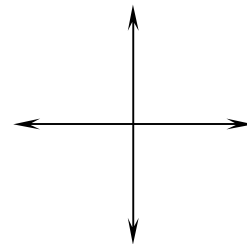
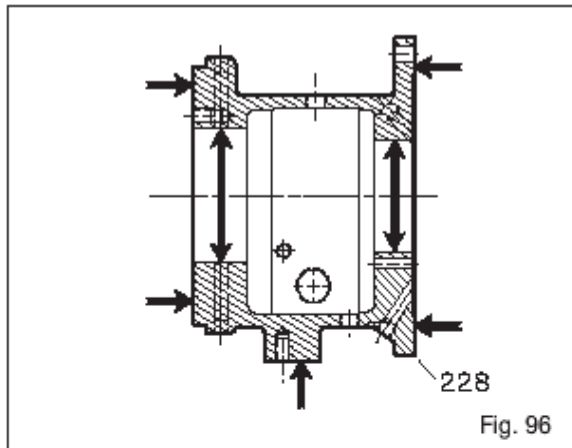
Table – Shaft / Sleeve runout

(mm)	Acceptable (mm)	Measured (mm)
Less Sleeve	0.026	
With Sleeve	0.051	
Comments		

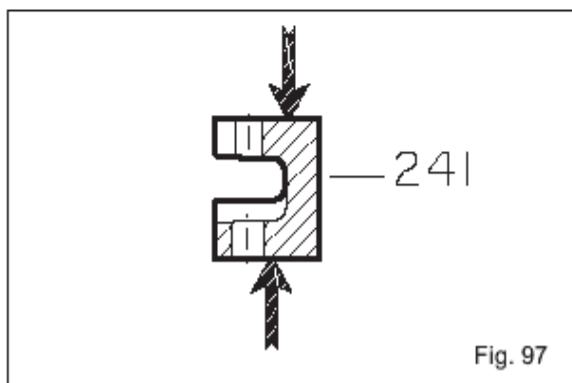
5. Bearing Frame

Check bearing frame (228) and frame foot (241) for the following as shown in Fig. 96 and Fig 97.

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
2. Check bearing fits. If any are outside the tolerance in table replace the bearing frame (228)
3. Make sure all lubrication passages are clear.
4. If frame has been exposed to liquor, inspect for corrosion or pitting.



Measure diameters 90 Degrees opposite. Record largest reading for ID, smallest for OD



(mm)	STX	MTX	LTX	XLT-X, X-17	Measured
Frame ID I/B	72.000/72.019	100.000/100.022	120.000/120.022	140.000/140.025	
Brg OD I/B	72.000/71.987	100.000/99.985	120.000/119.985	140.000/139.982	
Clearance	+0.032/0.000	+0.037/0.000	+0.037/0.000	+0.043/0.000	
Comments					

6. Dynamic Seal Repeller (3196, CV 3196, LF 3196 only)

Inspect vanes of dynamic seal repeller (262) (where fitted) as shown in Fig. 98

1. Inspect for damage. Replace if grooved deeper than 1.6 mm or if worn evenly more than 0.8 mm.
2. Inspect sleeve surface for grooves, pitting or other damage. Replace if damaged.

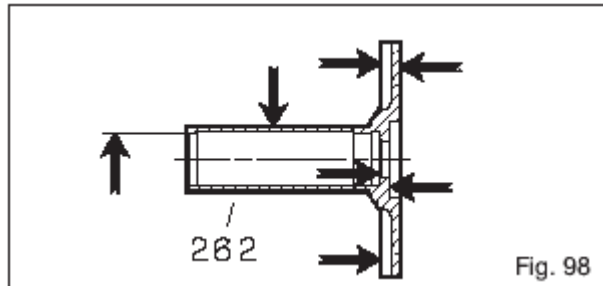


Fig. 98

	Yes	No	Action
Localised wear /grooving > 1.6 mm			
Even wear/grooving > 0.8 mm			
Sleeve grooved, pitted or damaged			

7. Seal Chamber / Stuffing Box Cover and Dynamic Seal Backplate

Inspect seal chamber/stuffing box cover (184), dynamic seal backplate (444) and gasket surface as shown in Figs. 99 - 107

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

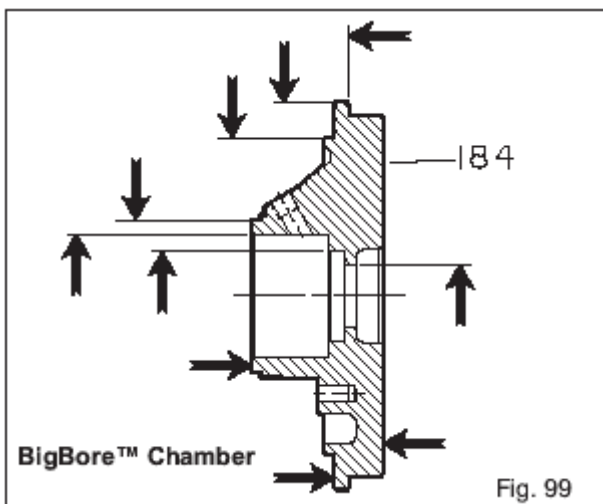


Fig. 99

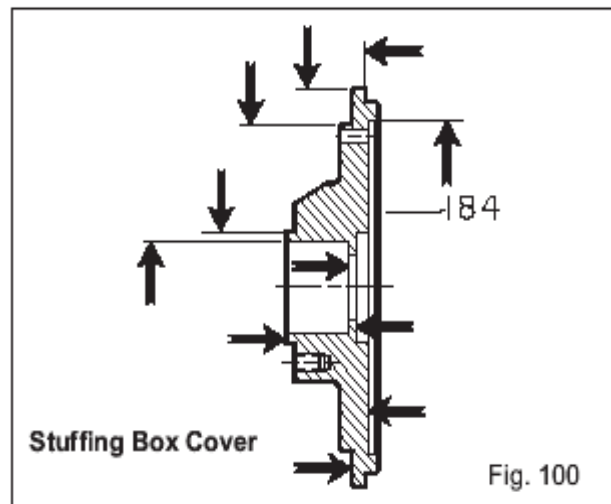
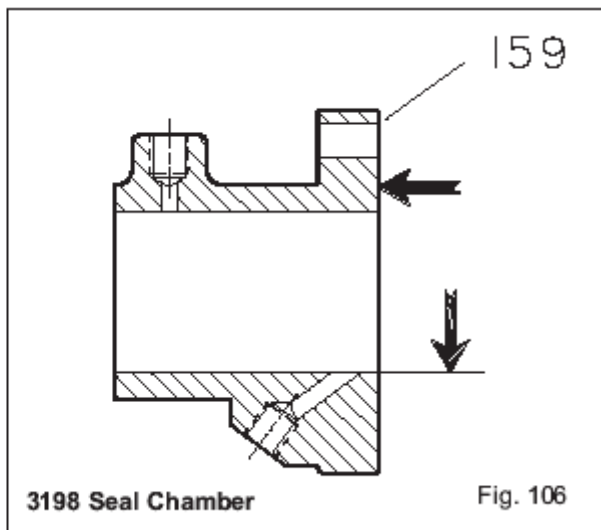
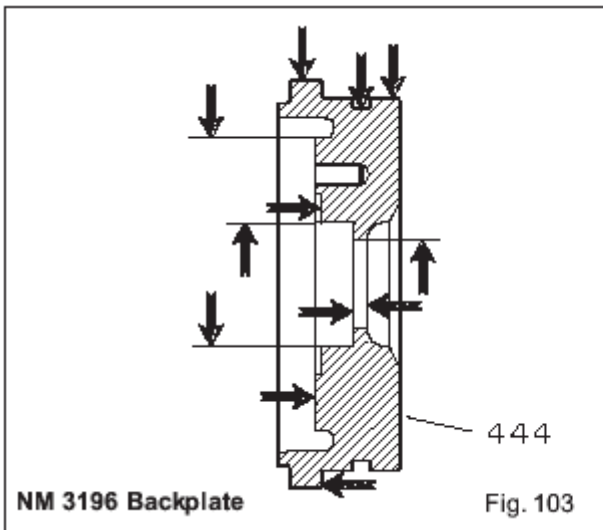
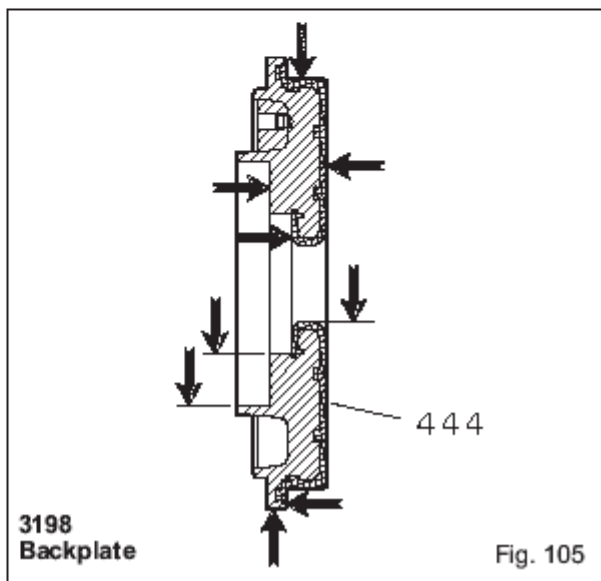
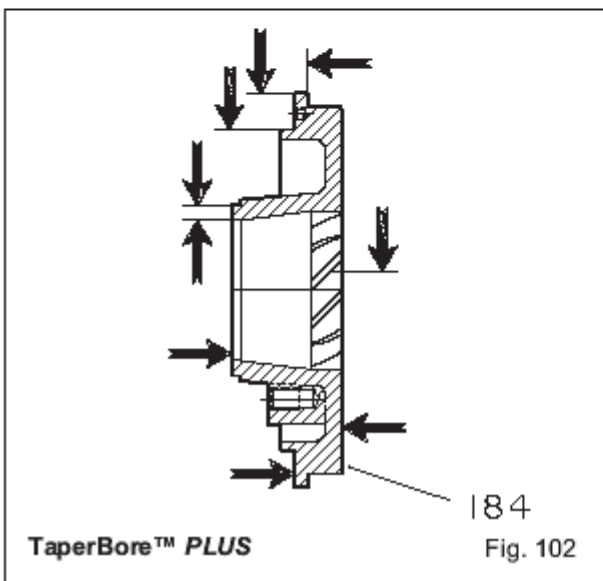
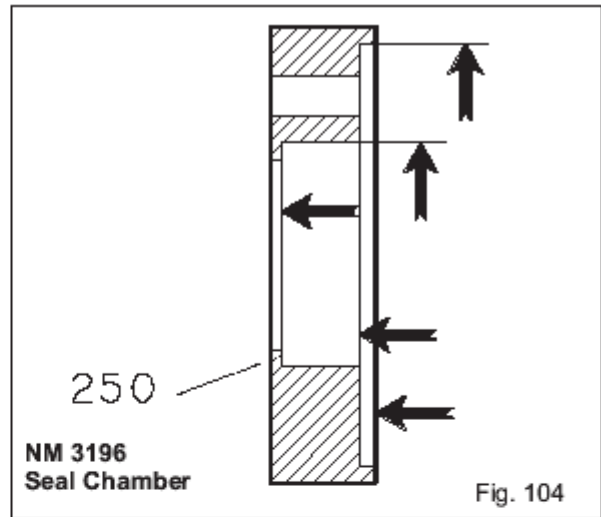
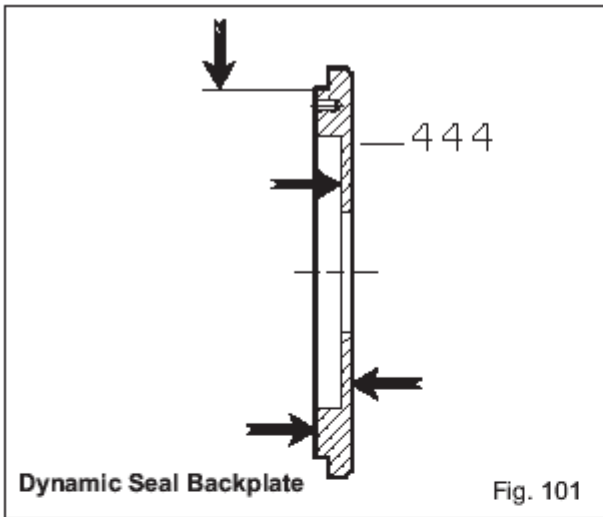


Fig. 100



	Yes	No	Action
Localised wear / pitting > 3.2 mm			
Comments			

7. Bearings

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.

8. Bearing Housing

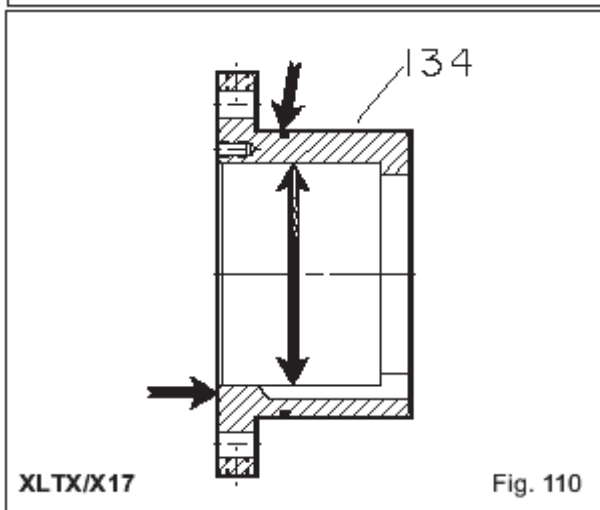
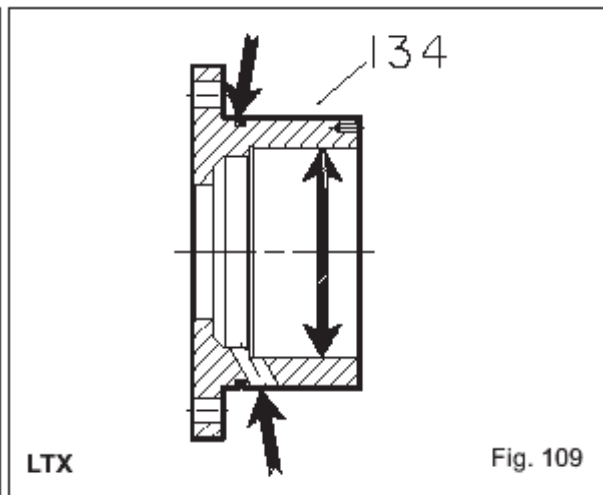
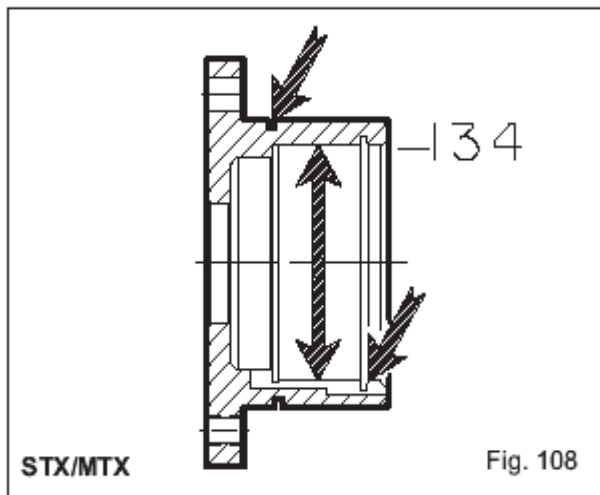
Inspect the bearing housing (134) and check the dimensions of the housing bore. Replace the bearing housing if the dimensions exceed the values given in the table below.

1. 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).

XLT-X, X17 - Gasket surface must be clean (Fig. 110).



↑
 ← →
 ↓

Measure diameters 90
 Degrees opposite. Record
 largest reading for ID,
 smallest for OD

(mm)	STX	MTX	LTX	XLT-X, X-17	Measured
Housing OD I/B	72.000/72.019	100.000/100.022	110.000/110.022	140.000/140.025	
Brg OD O/B	72.000/71.987	100.000/99.985	110.000/109.985	140.000/139.982	
Clearance	+0.032/0.000	+0.037/0.000	+0.037/0.000	+0.043/0.000	
Comments					

9. Endplay and runout

Assemble the pump rotating element and bearing frame as described in the manufacturers Installation, Operation and Maintenance Instructions.

1. Support frame assembly in horizontal position as shown in (Fig. 139).
2. Check shaft endplay. Move shaft forward then backward by hand, noting indicator movement. If total indicator reading is greater than values in the table below, disassemble and determine cause.

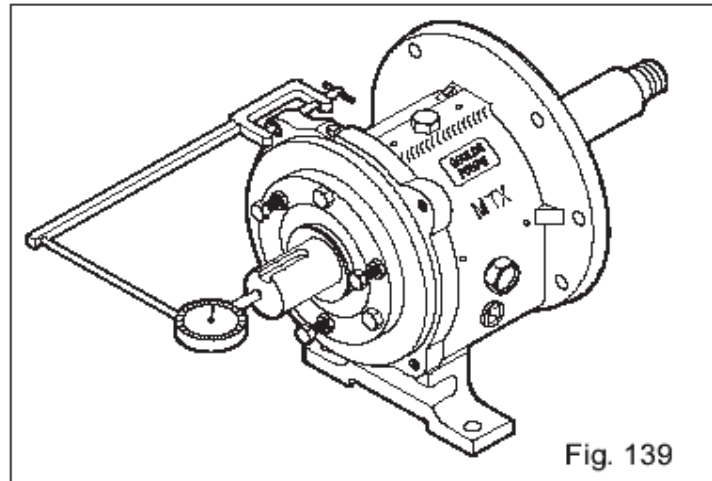


Fig. 139

Bearing Type Fitted	STX (mm)	MTX (mm)	LTX (mm)	XLT-X, X-17 (mm)	Measured
Double Row	0.028 / 0.047	0.033 / 0.054	NA	0.036 / 0.058	
Duplex	0.018 / 0.026	0.022 / 0.030	0.026 / 0.038	0.026 / 0.038	
Comments					

3. Check shaft/sleeve runout. Put on shaft sleeve (126) if used, and thread on impeller, hand tight. Rotate shaft 360 degrees. If total indicator reading is greater than 0.05 mm, disassemble and determine cause. Remove impeller and shaft sleeve (Fig. 140).
4. Check frame face run out. Rotate shaft so indicator rides along the fit for 360 degrees. If total indicator reading is greater than 0.025 mm disassemble and determine cause (Fig. 141).

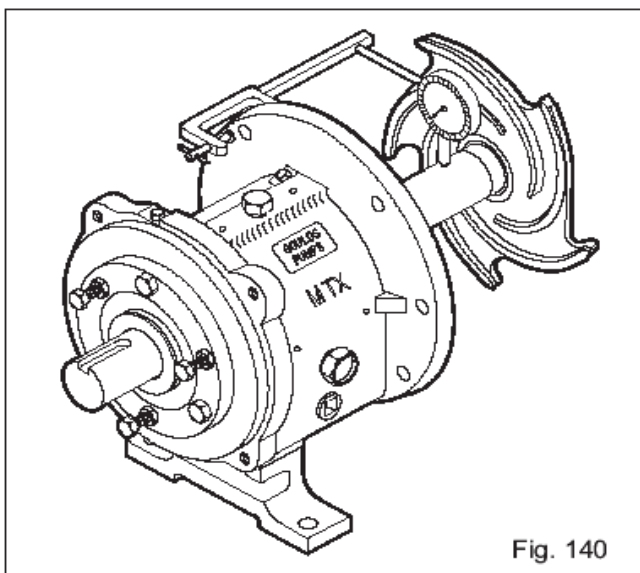


Fig. 140

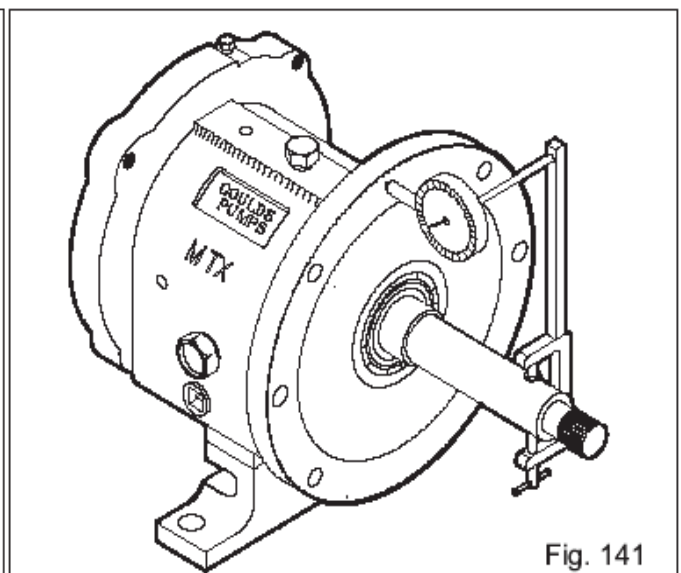


Fig. 141

	Acceptable (mm)	Measured (mm)
Shaft / Sleeve runout	0.050	
Frame face runout	0.025	
Comments		

10. Adaptor fit

Install frame adaptor onto frame assembly as described in the manufacturers Installation, Operation and Maintenance Instructions.

1. Check adaptor. Rotate shaft through 360 Degrees. If total indicator reading is greater than 0.13mm, determine the cause and correct before proceeding (Fig. 143).

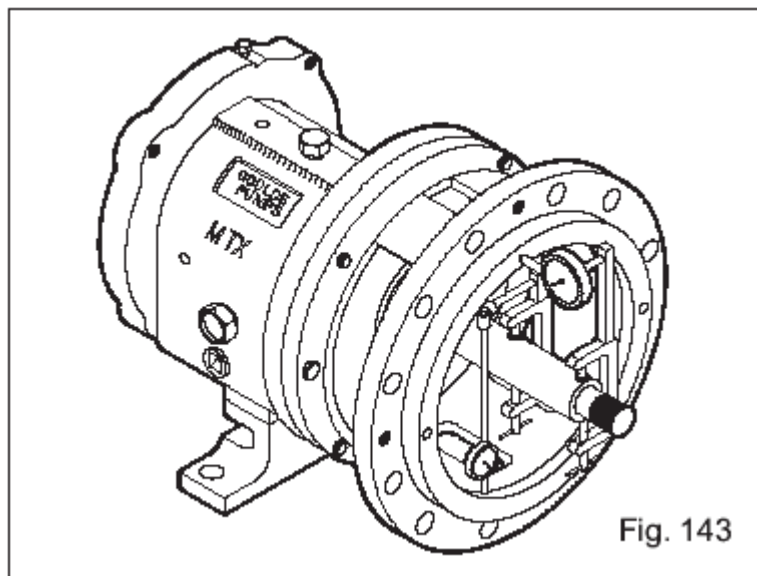


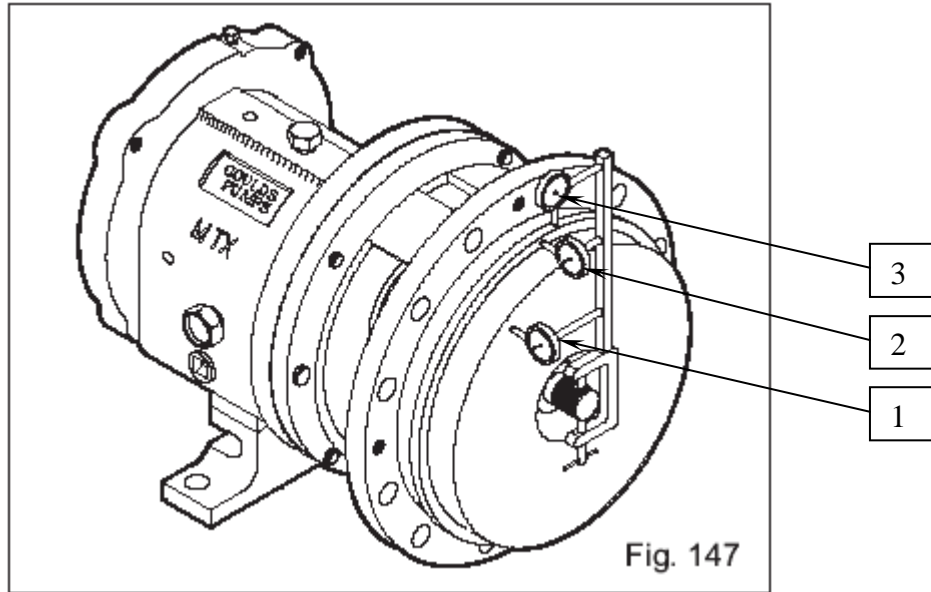
Fig. 143

	Acceptable (mm)	Measured (mm)
Adaptor face runout	0.130	
Adaptor ID runout	0.130	
Comments		

11. Pumps with Mechanical Seals

Install seal chamber cover or backplate (184) as described in the manufacturers Installation, Operation and Maintenance Instructions.

1. Check seal chamber cover run-out. Rotate indicator through 360 degrees. If total indicator reading is greater than 0.13 mm, determine cause and correct before proceeding (Fig. 147).



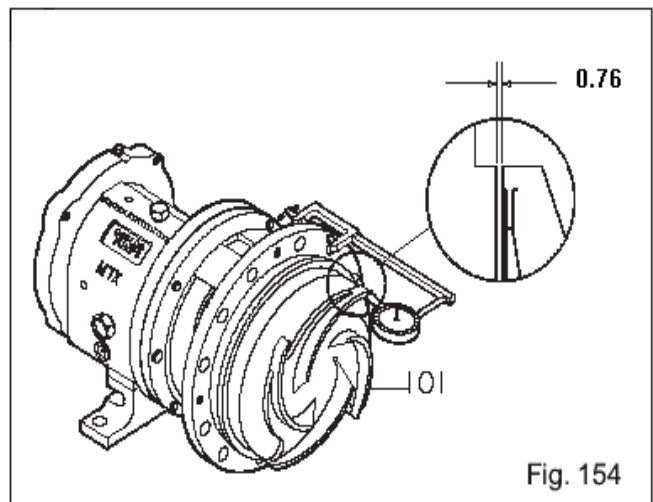
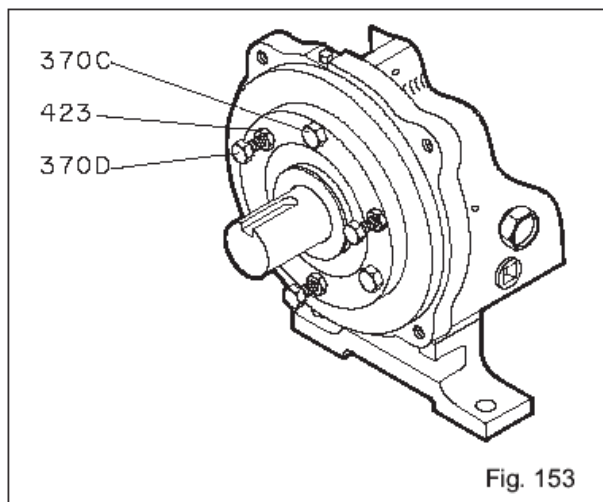
	Acceptable (mm)	Measured (mm)
Seal Chamber face runout (1)	0.130	
Seal Chamber spigot face runout (2)	0.130	
Seal Chamber spigot OD runout (3)	0.130	
Comments		

12. Impeller clearance and runout

Install impeller (101) as described in the manufacturers Installation, Operation and Maintenance Instructions.

- Loosen clamp bolts (370C), and jacking bolts (370D). Measure gap between impeller (101) and seal chamber/stuffing box cover (184) with a feeler gauge. When 0.76 mm clearance is reached, tighten clamp bolts (370C), jacking bolts (370D), and locking nuts (423) (Fig. 153)

NOTE: This approximates the impeller position when set at 0.015 in. (.38 mm) from casing. Final impeller adjustment must be made after installation into casing.



2. Check impeller (101) runout. Check vane tip to vane tip. If total indicator reading is greater than 0.13 mm, determine cause and correct before proceeding (Fig. 154).

	Acceptable (mm)	Measured (mm)
Impeller clearance to backplate	0.760	
Impeller runout	0.130	
Comments		

13. Impeller diameter and Mechanical Seal

Impeller Dia	Impeller Dia		No: of Vanes	
Type and Model of Seal fitted				
Mechanical Seal Pressure Test to 100 PSI	Yes	No		
COMMENTS				
Check that the M/Seal Ports are the same orientation as pre disassembly.				