


**COGENT**
**Fluid Equipment  
Service Center**

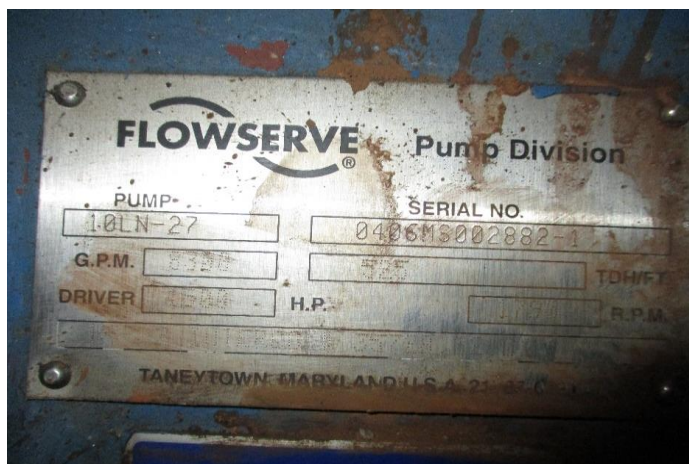
Opportunity Number	OP-548976	Date	5/2/2022
PQ/Order Number	7043208	Salesman	Jason Robertson
Customer	City of Independence, MO	Customer Stock #	
Contact Name, First	Anthony	Service Type	Service
Contact Name, Last	Dahl	Brand	Fluid Equipment
Contact Phone	816-325-7704	Market	Municipal
Contact Cell		Fluid Being Pumped	Wastewater
Contact Email	adahl@indepmo.org	Equipment Location/Station	

Manufacturer	Flowserve
Model	10LN-27
Serial #	0406MS002882-1
Item Type / Description	Split Case Pump
Additional Items	None
Level of Repair	L2 - Full DCI with Clearances Noted, Sandblasting, Estimate with Pictures, and Repair Report

DCI Technician	Greg Hoggard	DCI Date	4/27/2022
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**Pump As Found/Received**
**Notes:**

Pump was inspected on site due to high vibration. Inspection concluded the issue not to be bearing related. The pump was removed from service and returned to our shop for complete disassembly and inspection.



**Initial Inspection**

Rotation	CCW from Coupling End	Ends Stamped?	Yes	Pump Paint	Blue					
Total End Float	N/A	Impeller Setting	17 1/8" to Thrust Shldr	Impeller Diameter	29.135"					
Splitline Gasket Thick.	1/32"	Bearing Housing Gasket T	.018"	Bearing Spacer Ring Thick	N/A					
Debris in Pump?	No	Debris Description:	N/A							
Item Rec. With Pump:	x	Coupling	x	Piping	x	Gauges		Baseplate		Driver
All Piping, Tubing, Gauges, Etc Photographed?	Yes									
List All Fasteners & Fittings:										
Additional Notes:										

**Pump Seals****Thrust End Seal**

Manufacturer	Durametallic
Model/Serial	RO
Stuffing Box Bore	6.693"
Clearance	.003"
Seal Sleeve ID	5.120"
Shaft/Sleeve OD	5.118"
Clearance	.002"

**Radial End Seal**

Manufacturer	Durametallic
Model/Serial	RO
Stuffing Box Bore	6.693"
Clearance	.003"
Seal Sleeve ID	5.120"
Shaft/Sleeve OD	5.118"
Clearance	.002"

**Notes:**

Repair seals as needed - Faces are S/C rotating, Carbon rotating.

**Thrust End Seal Disposition**

Refinish &amp; Reuse

**Radial End Seal Disposition**

Refinish &amp; Reuse

## Shaft Sleeves & Shaft Sleeve Locknuts

### Thrust End

Sleeve Material	Bronze
Sleeve Condition	Minimal Wear
Locknut Material	Bronze
Locknut Condition	Minimal Wear

### Radial End

Sleeve Material	Bronze
Sleeve Condition	Minimal Wear
Locknut Material	Bronze
Locknut Condition	Minimal Wear

### Notes:

Sleeves show minimal signs of wear. Clean and reuse.



Thrust Shaft Sleeve Disposition	Reuse
Thrust Sleeve Locknut Disposition	Reuse
Radial Shaft Sleeve Disposition	Reuse
Radial Sleeve Locknut Disposition	Reuse

## Impeller

Impeller Material	Bronze
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### Impeller Dimensions

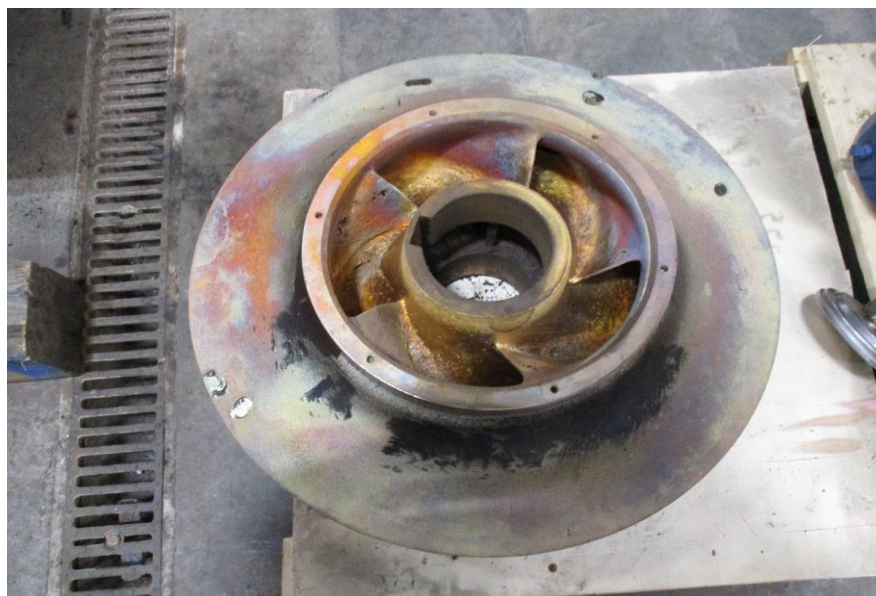
Trim	29.135"
Bore Diameter	4.507"
Shaft Diameter	4.507"
Clearance	0.000"
Wear Ring Width	1 11/16"

### Impeller Condition

Vane Condition	Severely Worn
Number of Vanes	5
# of Balance Holes	0
Hub Face Condition	Minimal Wear
Condition of Keyway	Minimal Wear
Wear Ring Material	Bronze

### Notes:

Extreme cavitation damage. Coupling side wear ring has separated from the impeller ring. Replace impeller.



Impeller Disposition	Replace
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**Clearances As Received - Thrust End**

Case Ring Fit	13.974"	Case Ring OD	13.974"	Clearance	.000"
Case Ring ID	13.035"	Impeller Ring OD	12.930"	Clearance	.105"
S.B. Bushing Fit	N/A	S.B. Bushing OD	N/A	Clearance	N/A
S.B. Bushing ID	5.160"	Sleeve OD	5.110"	Clearance	.050"
Sleeve ID	4.505"	Shaft OD	4.502"	Clearance	.003"
Bearing Saddle ID	N/A	Housing OD	N/A	Clearance	N/A
Bearing Housing ID	7.4815"	Bearing OD	7.480"	Clearance	.0015"
Bearing ID	3.543"	Shaft OD	3.5437"	Interference	.0007"

**Clearances As Received - Radial End**

Case Ring Fit	13.974"	Case Ring OD	13.971"/13.976"	Clearance	.003" cl/.002" int
Case Ring ID	13.060"	Impeller Ring OD	12.925"	Clearance	.135"
S.B. Bushing Fit	N/A	S.B. Bushing OD	N/A	Clearance	N/A
S.B. Bushing ID	5.165"	Sleeve OD	5.100"	Clearance	.065"
Sleeve ID	4.503"/4.507"	Shaft OD	4.502"	Clearance	.001"/.005"
Bearing Saddle ID	N/A	Housing OD	N/A	Clearance	N/A
Bearing Housing ID	7.4815"/7.4822"	Bearing OD	7.480"	Clearance	.0015"/.0022"
Bearing ID	3.543"	Shaft OD	3.5438"	Interference	.0008"

**Case Wear Rings****Thrust End**

Wear Ring Material	Bronze
Sealing Face Cond.	Worn
Width of Ring	2"

**Radial End**

Wear Ring Material	Bronze
Sealing Face Cond.	Worn
Width of Ring	2"

**Notes:**

Rings have erosion damage. Replace rings.

**Thrust Wear Ring Disposition****Replace****Radial Wear Ring Disposition****Replace**

## Casing

Case Material	Ductile Iron
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General Case Cond.	Minimal Wear
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Cutwater Condition	Upper	No Signs of Wear
	Lower	No Signs of Wear

Flange Condition	Suction	No Signs of Wear
	Disch.	No Signs of Wear

Upper Case Half	
Flatness Deviation	.001"
General Condition	Minimal Wear
Thrust End Seal Fit	6.693"
Thrust End Face Cond.	Minimal Wear
Radial End Seal Fit	6.693"
Radial End Face Cond.	Minimal Wear

Lower Case Half	
Flatness Deviation	.0015"
General Condition	Minimal Wear
Thrust End Seal Fit	6.693"
Thrust End Face Cond.	Minimal Wear
Radial End Seal Fit	6.693"
Radial End Face Cond.	Minimal Wear

Location of Any Stripped Holes:

Location of Any Cracks:

Notes:
Clean and reuse. Retap all threaded holes. Cut and set a new 1/32" split line gasket.



## Casing Disposition

Reuse

## Bearing Housings & Misc

### Thrust End Housing

Lubrication	Oil	
Oil Condition	Bronze in oil	
Housing Condition	No Signs of Wear	
Bearing Model	6318	
Cond. of End Cover	IB	No Signs of Wear
Mounting Faces	OB	No Signs of Wear
Condition of End	IB	No Signs of Wear
Covers	OB	No Signs of Wear
Oil Ring Material	Bronze	
Oil Ring Condition	Worn	
Oil Ring Sleeve Cond.	No Signs of Wear	

### Deflectors

Material	Bronze (Isolators)
Deflector ID	N/A
Deflector OD	N/A

### Radial End Housing

Lubrication	Oil	
Oil Condition	Bronze in oil	
Housing Condition	No Signs of Wear	
Bearing Model	6318	
Cond. of End Cover	IB	No Signs of Wear
Mounting Faces	OB	No Signs of Wear
Condition of End	IB	No Signs of Wear
Covers	OB	No Signs of Wear
Oil Ring Material	Bronze	
Oil Ring Condition	Worn	
Oil Ring Sleeve Cond.	No Signs of Wear	

### Notes:



Thrust Bearing Housing Disposition	Reuse
Radial Bearing Housing Disposition	Reuse
Oil Rings Disposition	Replace
Deflector Disposition	Replace

**Shaft**

<b>Shaft Material</b>	4140 Steel Alloy
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<b>Bearing Condition</b>	Upper	No Signs of Wear
	Lower	No Signs of Wear

<b>Bearing Shaft Fit</b>	Thrust	3.5437"
	Radial	3.5438"

<b>Thread Condition</b>	Thrust	Minimal Wear
	Radial	Minimal Wear

**Notes:**

Shaft is broken in two pieces approximately one inch inside of the coupling end shaft sleeve.  
Reason for breakage is not evident.

**Shaft Disposition****Replace**

**Additional Notes & Findings****Item 1:**

Shaft is broken in coupling end sleeve area.

**Item 2:**

Impeller has severe cavitation damage throughout the suction passages.



**Conclusions**

<b>O-Rings Condition</b>	Squared	<b>Bin Location</b>	I4B/Floor
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**Primary Cause of Failure**


Cavitation and shaft breakage. Rebuild pump with wear parts, such as bearings, o-rings, and misc hardware. Impeller will be dynamically balanced to ISO G2.5 before installation. After assembly, paint pump and package for return.

**Additional Notes & Suggestions****Parts Required**

Ball Bearings	660 BRZ, 1PC 11" ID X 15" OD X 6" LG	Impeller
Shaft	660 Bronze - 5 7/8" ID x 6 3/8" OD x 4" long	60" x 60" x 1/32" Gasket material
Bolting	O-rings	Mechanical Seal Repair Kit

<b>Inspection Reviewed By</b>	Greg Hoggard	<b>Date</b>	4/28/2022
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# SERVICE ESTIMATE

<b>Customer:</b> City of Independence, MO <b>Contact :</b> Anthony Dahl <b>Date:</b> 05/02/2022 <b>Phone:</b> 816-325-7704 <b>Fax:</b> 816-325-7722 <b>Project:</b> High Service Pump 2 Repair  <b>Quote #:</b> 7043208 <b>Opp #:</b> OP-548976	<b>Fluid - Municipal Kansas City</b> 4525 NW 41st St, Suite 400  Riverside, MO 64150 <b>Phone:</b> 816-795-8511 <b>Fax:</b> 816-795-8926   <b>FLUID EQUIPMENT</b> A COGENT COMPANY
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Dear Anthony,

We are pleased to offer the following estimate for your review.

Line No	Quantity	Description of Unit	Net Each	Net Ext.
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1		<b>Flowserve 10LN-27 Split Case Pump - Repair</b> Serial Number - 0406MS002882-1	<b>Materials</b> <b>Labor</b>	<b>\$69,777.97</b> <b>\$17,275.00</b>
			<b>Total</b>	<b>\$87,052.97</b>

2		<b>Installation, Startup and Alignment of 10LN-27 Flowserve Pump</b>	<b>Total</b>	<b>\$5,071.00</b>
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Delivery: ..... 12 - 14 week(s) after receipt of P.O.  
FOB Point: ..... Shipping Point  
Terms of Payment: ..... Net 30  
Quote Validity: ..... 15 Days

Thank you for the opportunity to provide you with this estimate. Please let us know how you would like to proceed.

**Quoted By:**  
**Alexis Davis**  
adavis@cogentcompanies.com

**Salesrep:**  
**Jason Robertson**  
jrobertson@fluidequip.com  
816-606-0153

## STANDARD TERMS AND CONDITIONS

Price is FOB shipping point and does not include any freight charges. Price does not include any applicable duties or sales tax, use tax, excise tax, value-added or other similar taxes that may apply to this equipment and/or project. Unless specifically stated, price does not include manual or automatic controls, starters, protective or signal devices, wiring, anchor bolts, gauges, vibration isolation devices, installation, startup or testing.

If the price is included in a proposal, the price is firm for receipt of an order within 15 days of the date shown on the proposal. Any additional terms and conditions included in the proposal are specifically included in these terms and conditions.

Unless otherwise expressly agreed to in writing by Seller, all shipments are FOB Seller shipping point at which point title also transfers.

Payment terms are net 30 days with approved credit. An interest charge of 1-1/2% per month will be added to balances over 30 days. Retainage of any invoiced amount is unacceptable unless specifically agreed to by Company at the time of order, and shall in no case exceed a period of 120 days. If payments are not timely received by Company, and this account is turned over to an attorney for collections, Customer agrees to pay all reasonable costs and attorney fees incurred in collection of the past due amounts.

Payment of 'commercial transaction' invoices by credit card will be charged a fee based upon Cogent's average discount rate for credit card transactions for the prior calendar year. This fee will change annually and is currently 2.55%.

All equipment either rented from or through Company is subject to all of the terms and conditions listed on the back of the rental contract. Pricing does not include any overtime running of power equipment.

In no event shall Company's obligations and liabilities under this Agreement include any direct, indirect, punitive, special, incidental or consequential damages or losses that Customer may suffer or incur in connection with this sale, service or rental, including, but not limited to, loss of revenue or profits, damages or losses as a result of Customer's inability to operate, perform its obligations to third persons or injuries to goodwill; nor shall Company's liability extend to damages or losses Customer may suffer or incur as a result of such claims, suits or other proceedings made or instituted against Customer by third parties. Customer remises, releases and discharges Company from any and all liability or damages which might be caused by failure to deliver any equipment within the agreed time by Company.

Customer shall be responsible for determining the good operating condition of all materials and equipment prior to accepting the materials and equipment. NO WARRANTY OR GUARANTEE, EXPRESS OR IMPLIED, INCLUDING ANY WARRANTY AS TO MERCHANTABILITY OR FITNESS FOR ANY PARTICULAR PURPOSE IS MADE UNLESS THE SAME IS SPECIFICALLY SET FORTH IN WRITING AND ACCEPTED IN WRITING BY COMPANY, BUT IN SUCH CASE THE WARRANTY OR GUARANTEE IS LIMITED AS ABOVE PROVIDED. Notwithstanding the foregoing, Company will pass through to the Customer any warranty provided by the manufacturer of any equipment supplied by Company.

Customer covenants and agrees to defend, indemnify and hold Company harmless from any claims, damages or liability arising out of the use, maintenance or delivery of the equipment or materials purchased or rented hereunder. Customer shall further defend, indemnify and hold Company harmless from any and all damages to third persons or to property caused by Customer's use or possession of the equipment or materials, to the fullest extent allowable by law.

In connection with a proposal, if Customer has any further questions or comments regarding the proposal, please feel free to contact Company. If the proposal meets with Customer's approval, please sign, date and mail or fax a copy of the proposal back to Company's office, and the identified equipment will be ordered and/or scheduled for delivery.

This agreement shall be governed by the laws of the state where the Company's branch office is located from which the equipment is rented or purchased. Customer further agrees that venue and jurisdiction shall be appropriate in the county in which Company's branch office is located from which the equipment was rented or purchased. Any provisions hereof which may prove unenforceable under any law shall not affect the validity of any other provision hereof.

Revised March 2022