

Invoice No: 111721-001

Date: 11/22/2021

TO: Crompton International

www.crompton.com

Baton Rouge, Louisiana, USA

Subject: Falk 2210YN2 Reducer Inspection in Virginia, USA MO#7-465680-01 for Pichichi Sugar Mill.

Date Travel Depart : 11/18/2021

Onsite Inspection: 11/19-20/2012

Date Travel Return: 11/21/2021

DETAIL CONTACT: Juan Pablo Victoria, Crompton International, Cali, Colombia and Pedro Sales Manager.

REQUIRED FROM PEDRO, Contact name And Cell No of storage facility before departure for coordination of Inspection.

TOOLS and EQUIPMENT feedback and assistance, Address and Locations, Facility safety Entry Requirements, Name's and titles of customers representative's.

Administered By: Mark Allan Farrington© DBA Mark A. Farrington, My Gear Man Company

Remittance Pay in the amount of:

\$5400.00

Pay to:

Mark A. Farrington

Marine Credit Union: Account No. 427284-001

ADDRESS: 80 Rees Street, Fond du lac, Wisconsin, 54935

Field Service Inspection Report for Invoice # 111721-001 My Gear Man Company

Submitted by: Mark A. Farrington Date: 11/20/2021

Inspection Date: 11/19/2021

Inspection Location: Dismal River Road, Oakwood, VA. USA

Contacts: People in charged

Subject Inspection - #2 Falk 2210YN2-S, MO# 7-465680-01, 42.61:1 01/21-1974 140T10 HS Coupling. [LS SET WORN]

Subject Inspection- #1 Falk 2210YN2-S, MO# 7-465679-01, 42.61:1 (See Photo No1 by name plate #2 speed reducer [Recommend Purchase])

Photo No 1



I received a PO from Cromprion to inspect (1) Falk gear reducer MO# ending in 680-01. When I got to the jobsite it was discovered that there are (2) Falk Reducers. And the customer took me to the one ending in MO# 679-01 which we inspected 1st and in more detail.

The second ended in MO 7-465680-01. OF THE # 2 FALK REDUCERS, I highly RECOMMEND MO 679-01 the reducer we inspected first on site.

Type #1 Inspection Field Service Inspection. NOTE: Remove inspection covers and windows and conduct visual inspection of bearings, gears, and pinions wear condition, while rotating the subject gear reducer 360 degrees on the low-speed output shaft. Conduct axial and radial bearing shaft radial tests where possible from exterior of the subject gear reducer. No bearing retainers or covers will be removed.

INSPECTION REPORT- SUBJECT GEAR REDUCER #1 NAMEPLATE MO#7-465679-01.

EXTERIOR- The subject #1 Falk gear reducer needs an industrial grade paint job on its exterior before shipping. Customer (potential) recommends an Industrial Grade Paint in the Color of Blue (See photo No 2).

Photo No 2



FOUNDATION/WELDMENTS- If there is time before painting exterior implement an NDT - Dry Crack Check (RED Dye Penetrant) on housing weldments and take photos before repainting the exterior.

HOUSING FOUNDATION RAILS - Tilt and crib under the reducer to drain the old lube oil. FLUSH THE INTERIOR WHILE IN THIS POSTION. Clean the bottom of the housing foundation rails.

A Civil Engineer with have to design a new solid foundation for installation, which includes a solid sole plate, solid shim, rebar, grout, etc. **DESIGN OR PHOTO**

Long term Storage- DETERMINE WHAT LONGTERM STORGE LUBE PRODCET CAN BE ADDED TO THE HOUSING FOR PROTECTION AND IS ALLOWABLE FOR PORT OF ENTRY IMPORT AND EXPORT SHIPPING.

DETERMINE THE EXACT REDUCER SHIPPING WEIGHT OF THE REDUCER. **30 tons seems excessive, Call OEM Rexnord/Falk, maybe 30 tons is for (2) gear reducers shipping.**

360 Degree Visual Rotation Inspection: (PINION= DRIVER and GEAR=DRIVEN GEAR ELEMENT) The High Speed PINION assembly drives the High Speed Gear, that is pressed onto the Low Speed Pinion Assembly, then the Low Speed Pinion Assembly Drives the Low Speed Gear Assembly. **PHOTO**S MO. 679-01 & 680-01.

There are (3) Shaft Assemblies (6) Bearings, (6) Bearing Retainers, and (2) (1) input (1) output Falk Couplings. Inspection starting with the OUTPUT LOW SPEED SHAFT #3. Spare parts like lube seals, shim and gasket sets, bearings, price and availability should be made by customer for the gear reducers.

3. LOW SPEED (Output) GEAR ASSEMBLY – Gear Keyed and Pressed on Low Speed Shaft with (2) Large Roller Bearings and bearing retainers for setting (Shim and Gasket required) bearing end floats for equal component expansion during normal operations.

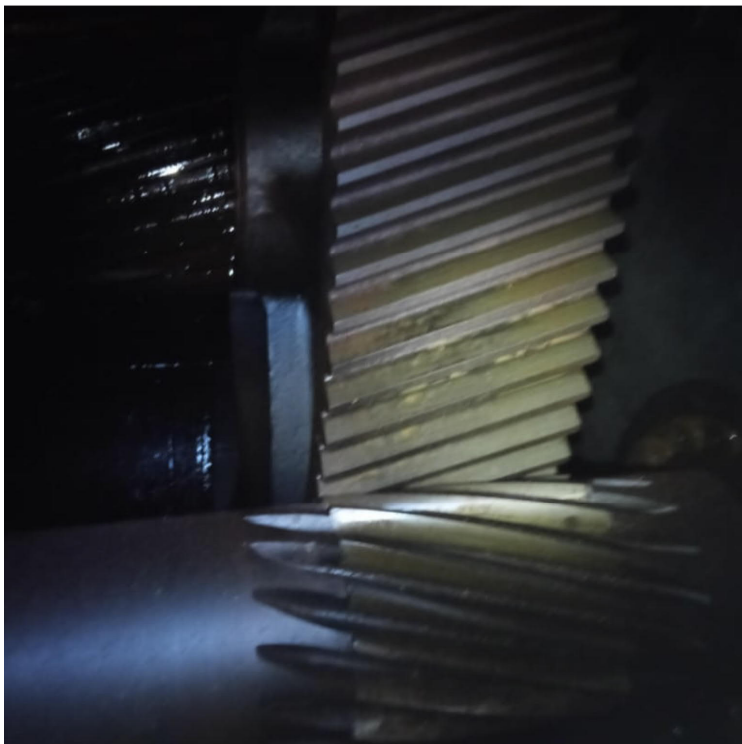
2. Intermediate LOW SPEED (SOS) PINION Assembly- High Speed Gear pressed on (SOS) pinion with (2) Spherical Roller Bearings and (2) Bearing retainers.

1. High Speed PINION ASSEMBLY - (1) High Speed (SOS) Pinion Shaft with (2) Bearings and (2) Seal Cages.

VISUAL INSPECTION by Mark Farrington and Photo's by Engineer Carlos and Engineer Juan Pablo.

#1 HIGH SPEED PINION SHAFT ASSEMBLY- The tooth running contact is normal with no stress or abnormal wear is visually noted on any pinion tooth flanks on either the contact or pressure side of the HS Pinion teeth. It is very evident that this enclosed gear set has never been operated in the opposite direction of rotation. (See Photo No 3) PHOTOS HIGH SPEED GEAR #1 Inspection MO# 679-01.

Photo No 3 HIGH SPEED GEAR #1 Inspection MO# 679-01



#2 HS GEAR PRESSED ON LOW SPEED PINION SHAFT ASSEMBLY- HS GEAR PRESSED ONTO -LS (SOS) PINION shows no abnormal or destructive wear on either tooth flanks. (The HS Pinion and HS Gear set in this subject Falk gear reducer has only been operated in one direction of rotation) (See photo No 4)

PHOTO HS GEAR MO#679-01

Photo No 4 HS GEAR MO#679-01



#2.1 The Low Speed (SOLID ON SHAFT/SOS) PINION-Has a slight amount of micro pitting or corrective pitting just below the pitch diameter on the Dedendum of (3) adjacent pinion driving teeth. This is a normal gear tooth wear occurrences for THROUGH HARNDENED and lapped gear sets that surface hardness is measured using the BRINELL Hardness Chart verses the Hardened and Ground Gear process that requires a Rockwell hardness measurement. When you are trying to compare pinion wear to gear wear, it important to use the right COMPONET measuring methods to identify the manufacturing process per part.)

CONCLUSION – #1 REDUCER 679-01- The subject through hardened Falk Gear hob cut and lapped gear set are show no Destructive wear or damage in the subject set of gearing+.

Because all the rotating elements or components are designed and manufactured as symmetrical. The High Speed and Low Speed Shafts have double ended shaft design configurations that allow for the flipping the gear shafts 180 degrees in their respective housing bores for operation on the opposite tooth flanks. Which is a value-added feature in design and manufacturing of the Falk Reducers.

THROUGH HARDENED GEARS normally wear at the dedendum or lower half of the pinion or gear teeth. It starts with micro pitting and it accumulated in mass over time until the whole dedendum is washed away or out. This normal process is called 'WASHOUT" and it is a normal occurrence for this gear manufacturing process. A gear or pinion is considered "WORNOUT" when the dedendum "WASHOUT" exceeds .025" in depth across its full-face width. [#2 Reducers looks bad but, I would guess that the washout depth doesn't exceed .010" at its worst point across 40% of its face width. (See photo No 5) #1 LS pinion wear pattern.

Photo No 5 (Low Speed gear and pinion speed reducer MO # 679-01



(SEE PHOTO OF LS PINION #2 Inspection verses LS PINION #1) The #2 (680-01) has what I will call 20% "Dedendum Washout" on 1 side of the LS pinion tooth flank and the other side is like new. The #1 Reducer has .001% corrective or micro-pitting "DEDEMNUM WASHOUT" and the other side is new!

So in reality you have (2) sets of unused gear tooth flanks and #1 reducer 679-01 is like new with no break through washout and the #2 reducer 680-01 is 35% dedendum wash out on 1 tooth flank side and a new tooth flank on the other side of each tooth.

Which also means you can change the input and output shaft configurations by changing the seal retainers and cages around and resetting the shaft floats or just remove the reducer housing cover and flip the (3) gear shafts 180 degrees. For this reason alone I highly recommend the purchase both Falk Gear Reducers located at West River Conveyor & Machinery Company.

My Appraisal is that anyone in the material process business should purchase Falk Reducer Inspection #1 ending in MO# 679-01. Because it has a lot of gear life (70%) remaining on its tooth flanks. The Bearings, seals, shim and gaskets Price and Available should be made immediately with any purchase.

By: Mark Allan Farrington DBA Mark A. Farrington, My Gear Man Company, 2607 Bowen Street, Oshkosh, Wisconsin, 54901 14142387979