
Installation & Operating Manual (IOM)
GRID Coupling
LGF - V & LGF - H



LGF-V



LGF-H

Installation & Operating Manual /GRID Coupling/ LGF-TYPE V & TYPE H


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1. Introduction & General Guidelines

- LGF type grid couplings are complied with ATEX (explosion protection) to transmit power and torque between drive and driven shaft using grid spring. The flexible nature of spring reducing the magnitude of peak loads and provides flexibility to take misalignments.
- This manual will help you to install and maintain grid coupling before installing/disassembling of coupling. It is advisable to read the manual carefully before starting the work. These special designs are always provided with general assembly drawing which provides detail information of the design and connected equipments.
- Symbol description :

 Caution person may get injured

 Damage the product

 Pay attention

 Potentially explosive warning

2. Before installation information

- GRID couplings are delivered by RTPL with assembled condition which consists components from 1 to 7 as shown in fig. 1.



Sr.No	Component	Qty.
1	Seal	02
2	Grid Spring	01
3	Driving Hub	01
4	Cover "V" type	02
5	Nut	1 set
6	Bolt	1 set
7	Driven Hub	01

Sr.No	Component	Qty.
1	Seal	02
2	Grid Spring	01
3	Driving Hub	01
4	Cover "H" type	02
5	Nut	04
6	Bolt	04
7	Driven Hub	01

Fig. 1 PART LIST

- Inspect coupling assembly for visible damage, if you found contact RATHI.
- Disassemble the coupling by removing grid, nuts & bolts. Clean all parts carefully.
- Remove protective coating/lubricants from bores & keyways.

3. Installation Information



Ensure the system is disconnected from electrical connection and other possible energy transmission before starting the work.

3.1 Finish Bore Instruction (Fig. 2)



- Hub finish bores machined by customer with reference to flange outside diameter.
- Finish bore strictly done within specified limit (H7, Js9).
- Maintain face run-out and concentricity as per below table.

Outside diameter (mm)	Face run-out/ Concentricity(mm)
10-180	0.04
180-400	0.08
400-630	0.1

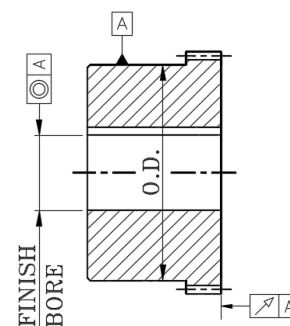


Fig.2 Finish bore

- Provide set screw at distance $LTB / 2$. If it is not possible, suitable distance nearer to midpoint of the length through bore (LTB) is provided.

3.2 Hub Mounting.

- Clean protective coatings/lubricants from bores & keyways.
- Slide cover with mounting seal(01) on the shaft before mounting the hub.

3.2.1 V/H Coupling

- Mount the hubs on their respective shafts flushed with the faces of hubs in fig 3.1. Check half cover are place correctly on shafts.
- With one machine firmly bolted down, set the equipment at a distance 'G' (table 2) by using spacer bar equal to thickness to the reqd. gap 'G' as shown in fig. 3.2.

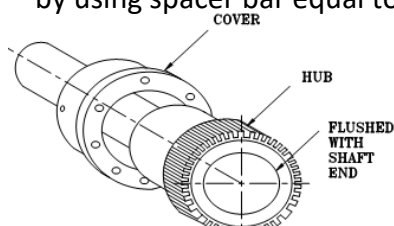


Fig. 3.1

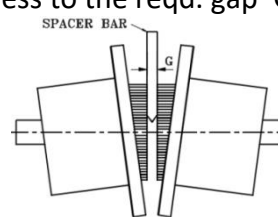


Fig. 3.2

3.2.2 VX/HX Coupling

- Mount the hubs on their respective shafts. Bottom hub shall be flushed with driven shaft (Fig.4.1). Position the top shaft with the spacer plate & tighten bolt (Fig. 4.2). Check covers are placed correctly on shafts.
- When one hub with machine firmly bolted down, set the equipment at a distance 'G', by using spacer bar equal to thickness to the required gap 'G'.

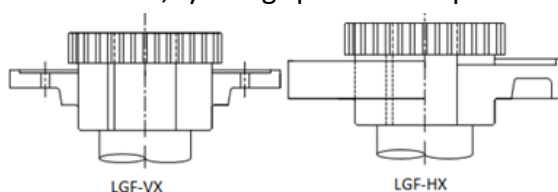


Fig. 4.1

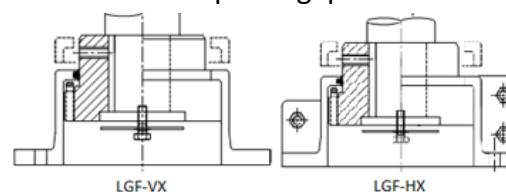


Fig. 4.2

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3.3 Shaft Alignment


-  In order to achieve optimum service life of the coupling, shafts must be aligned.
- Initial misalignment should not be more than 25 % of maximum misalignment (Refer Table 2).

Table 1 : Method of misalignment

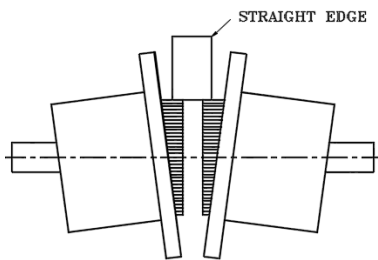
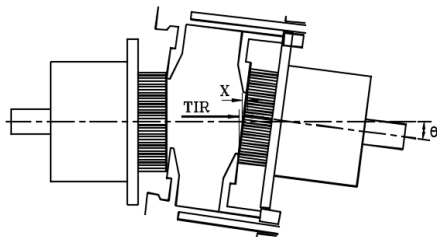
Method	Parallel/Radial	Angular
1	<p>Using straight edge</p> 	<p>Using vernier calliper</p> 
	<ul style="list-style-type: none"> Check the parallel/radial alignment with the help of straight edge resting squarely on both the hubs at 4 places 90° apart. Check the angular misalignment with the help of slip gauges by inserting in the gap at 4 places 90° apart. The difference in max. & min. gap will be the Total Indicated Reading (TIR). Angular misalignment(X)in mm is half the Total Indicated Reading (TIR). 	

Table 2 : Permissible Maximum Misalignment

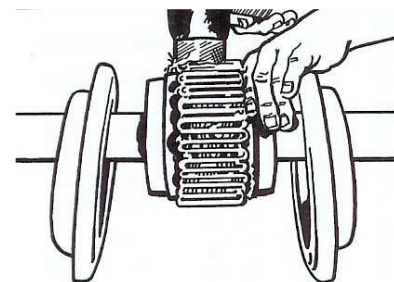
Coupling Size	Gap 'G' $\pm 20\%$	Axial 'X'(mm)	Parallel 'P' (mm)	Grease Qty. (Kg.)
LGF 105	0.8	0.12	0.10	0.03
LGF 120	0.8	0.12	0.10	0.03
LGF 144	0.8	0.12	0.10	0.03
LGF 172	0.8	0.12	0.10	0.06
LGF 190	0.8	0.12	0.10	0.08
LGF 197	0.8	0.12	0.12	0.12
LGF 222	0.8	0.12	0.12	0.12
LGF 254	0.8	0.20	0.15	0.15
LGF 276	0.8	0.20	0.15	0.20
LGF 295	0.8	0.20	0.15	0.25
LGF 324	1.6	0.30	0.20	0.50
LGF 336	1.6	0.30	0.20	0.50
LGF 375	1.6	0.30	0.20	0.75
LGF 425	1.6	0.30	0.20	0.75
LGF 290	1.6	0.30	0.20	1.25
LGF 432	1.6	0.35	0.25	1.25
LGF 492	1.6	0.35	0.25	2.00

- 'G' in above table is given when angular and axial misalignments are zero.
- All misalignments can not be taken by coupling at a time.

3.4 Final Assembly

3.4.1 GRID Assembly -

- Insert gasket (If provided) through the gap & support on either hub or shaft.
- Before inserting the grid segments, thoroughly fill the grooves with the specified lubricant.
- If grids are supplied in two or more segments assemble it.
- Stretch the grid slightly so that it will pass over the coupling teeth and tap all the rags into the respective slots with a soft mallet.



3.4.2 Cover Assembly

i. H-Series (horizontally split cover)

- Fill the lubricant around the grid, wipe off the excess lubricant.
- Position seals and gasket on hubs and lower cover half respectively.
- Assemble covers by keeping match marks on the same side.
- Other than horizontal position, assemble cover halves with the lug and match mark up, or on the high side.
- Fasten the cover halves with bolts & nuts.



ii. V-Series (vertically split cover).

- Remove lube plugs to ease cover assembly.
- Slide cover halves, complete assembly with seal on to hubs.
- Position lube holes at 180° apart. Align cover and gasket bolt holes and fasten flanges together using the bolts & nuts.

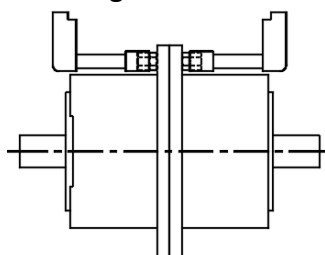


Fig. 6.1 (LHF- H &V)

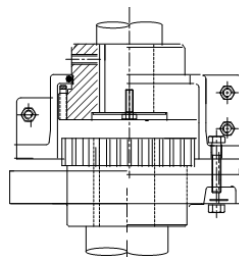


Fig. 6.2 (LHF-HX)

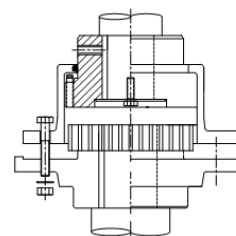


Fig. 6.3 (LGF-VX)

- Assemble only with the help of the fasteners supplied with the coupling.



- Change the grease after the interval of 3 months.

- Use Loctite to prevent the loosening of threads, if required.

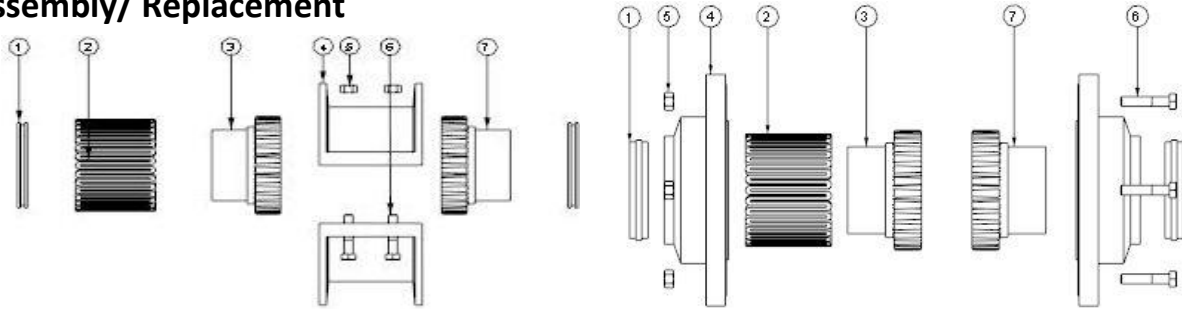


Customer must provide required safety guards, RTPL does not supply safety guards or shields.

3.4.3 Important Notes (Types V, H, HX, VX.)

- In the case of a brake drum/disc type coupling, ensure that the brake drum or disc is mounted on the shaft with the greatest flywheel effect.
- To improve circumferential grease distribution, 'V' type covers should be positioned such that the grease nipples are ideally at 90° to each other, although their actual position will vary with the coupling size.



4 Disassembly/ Replacement




- If it is require to remove the grid, remove cover unit.
- Separate grid springs by inserting round rod or screw driver,using teeth on the hub as a support.
- Remove rubber seal by loosening bolts(6).

5 Safety General Hazard & Environment

5.1 Safety General Hazard

- Proper care and safety must be taken care before work started.
- The relevant safety and environmental regulations must be complied during installation, commissioning, operation, assembly, disassembly and maintenance.
-  • Coupling must be maintained and/or repaired in the presence of skilled or qualified persons for particular work.
-  • During installation or maintenance ensure the drive unit is cut off from the power supply and caution notice should be display on switch.
- Immediate stop the drive unit if anything abnormalities observed on coupling (e.g. cracks, chips, wear, noise or deformation).
- Check all the bolts are tightened as per torque specified in the manual or as specified in the GA drawing.
- The supplied coupling may have to rotate at high speed, it is most important to guard the area in compliance to ATEX and various other local applicable standards.
- This coupling is certified as per ATEX requirement. Please check the suitability of hazardous environment at the time of selection of the coupling or during installation of the coupling.
- All spare parts are to be purchased from manufacturer or authorised dealer only.

 **If the coupling is to be used below ground in potentially explosive areas, the coupling, must be provided with a robust casing to avoid the risk of ignition from e.g. friction, impact or friction sparks.**

The depositing of heavy metal oxides (rust) on the coupling must be avoided by the casing or other suitable precautions.

5.2 Environment

- Our products are complying with EMS standard ISO 14001:2015, any instruction which are impermissible according to standard are not followed.

6 Inspection & Periodic Maintenance

- The grid coupling can be monitored under running condition as well as under idle condition.



- Inspect the coupling once in 6 months in idle condition or whenever it is taken for periodic maintenance.
- During running condition, it is recommended to check the vibration and noise of bearings on either side of the equipments to be under specified limits.
- Check the Grid spring, hub, Covers by visual inspection, for any signs of fatigue failure or cracking .

7 Spare Management & Complaint Handling

7.1 Spare management

- We recommend to store spare items as given below, in order to have continuous operation and to reduce down time due to failures.
- Spare component list. (Fig.1)

Sr.No.	Part descriptions	Components/ part No.	Quantity
1	Grid Springs	2	1 set
2	Bolt	6	1 set
3	cover	4	2 No
4	Driving Hub	3	1 No
5	Driven Hub	7	1 No



7.2 Complaint Handling

- In case of any failure, for proper root cause, fill up Product Performance Datasheet (PPDS) and provide us along with images/videos.

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- Product Performance datasheet (PPDS)

		ANNEXURE Product Performance Data Sheet (PPDS)	Ref.:	
			Date:	
Contact Details	Distributor			
	ZR			
	Customer Details:Name			
	Contact Person			
	Cell No			
	Email ID			
Supply details	Product			
	PO No and Date			
	Invoice No & Date			
	Ref Drawing No			
	Coupling Serial No.			
	Logo: RATHI/Lovejoy/RTFL/OTHER			
	Qty purchased			
	Qty Failed			
Service Details	Application Details: Driver/Driven			
	Equipment Name			
	Installation Date			
	Failure Date			
	Approx service life			
Installation details	Finish bore/Keyway machining by : RTPL / Customer			
	Hub Fitment: Slide fit / Interference / Press fit			
	Method of Hub fitment: Mallet / Jacking / Heating / Hydraulic			
	Fastener Tightening Method: Torque Wrench / Spanners			
	Tightening Torque values			
	Power Rating: KW/RPM/Torque			
	Start/stop frequency			
	Temperature: °C			
	Duty: Hrs / Day			
	Alignment Initial: Axial/Angular/Parallel			
	Alignment after failure: Axial/Angular/Parallel			
	Rathi Installation Instruction: Followed/Not followed			
	Installation skills: Average/Good/Excellent			

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Failure details	Lubrication condition, if applicable	
	Breaking of components: Yes/No	
	Possible Sequence of Component Failure	
	Damage of components: Yes/No	
	Loosening of fasteners: Yes/No	
	Overload/Sudden Peak: Yes/No	
	Loosening of foundation bolts:	
	Loosening of attached piping / ducting: Yes/No	
	Replacement Status : If replaced whether Coupling or Spares	
	Customer analysis of the Failure causes (Attach separate sheet, if required)	
Evidence / Requirement	Failed product photos : Attached / Not attached	
	Failed product being returned to RTPL : Yes / No	
	RTPL visit required: Yes/No	
	Replacement required: Yes/No	
	ZR / Distributor Remarks if any	
Other info	Details of any other Coupling previously in use	
	Failure history	
	Bearing condition of Driver & Driven units (Smooth/Noisy/Vibrations)	
R/002		PAGE 2 OF 2

8 Breakdown & Trouble Shooting

- The coupling must run with low vibration and noise during operation. any abnormal behaviour may damage the product or drive unit.
- Following are some possible causes of failure with corrective actions

SR. NO.	FAILURE MODE	PROBABLE CAUSES	CORRECTIVE ACTIONS	IMAGE
1	Noise during running	No lubrication	Refill the grease upto required limit	
2	Heat Generation	No lubrication Poor lubrication	Refill the grease upto required limit. Refer maintenance guidelines for lubrication frequency	
3	Grease leakage	Improper sealing	Ensure proper sealing to avoid grease leakage	
5	Loose hubs on shaft with sheared keys.	Torsional shock overload	Find & eliminate causes of overload.	
6	Severe corrosion on outer surface	Chemical attack	Apply anticorrosive coating on coupling (*)	

9 Marking Details

- The ATEX marking for REM coupling will be given on outer surface or front side (Fig. 7).
- **Example :**

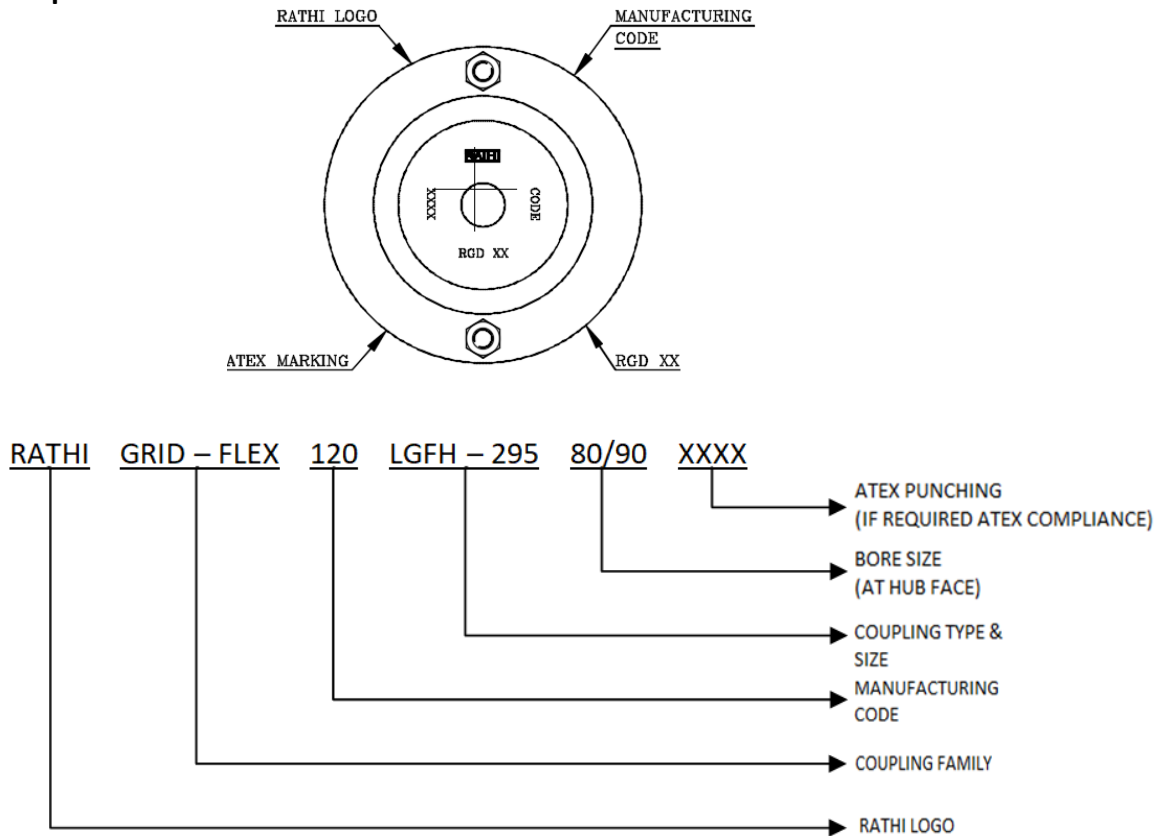


Fig.7. Marking example

- **ATEX Punching sample**
 1. RATHI GRID-FLEX 120 LGHF-295 80 $\text{C} \text{C} \text{E} \text{E} \text{X}$ 2GD -30°C +135°C
- **Where,**
 1. Manufacturing code e.g. 120 for December 2020
 2. Product code e.g. LGF-295
 3. Finish bore size code e.g. 80



ATEX

Declaration of Incorporation

E.C. Machinery Directive (2006/42/EC)

Section 1.0 - Machinery Description:
Flexible Power Transmission Couplings
Types: Metallic (Non-Disc) Coupling

Series:

Section 2.0 - Applicable Harmonized Standards
ISO13709(API 610)for centrifugal pumps
ISO14691 couplings for-General-purpose applications
ISO10441(API 671)(opt)couplings for-Special-purpose applications

Section 3.0 - Declaration:
We, Rathi Transpower Pvt. Ltd. declare that under our sole responsibility for the supply of the machinery defined in Section 1.0 above, the said machinery parts are intended to be incorporated into other machinery or assembled with other machinery to constitute machinery as covered by this Directive.

The machinery parts, covered by this declaration must not be put into service until the machinery into which it is to be incorporated has been declared in conformity with the provisions of the Directive.

Signed

Date :

(Quality Manager)

Format No : 3QA-F-33 Rev 1