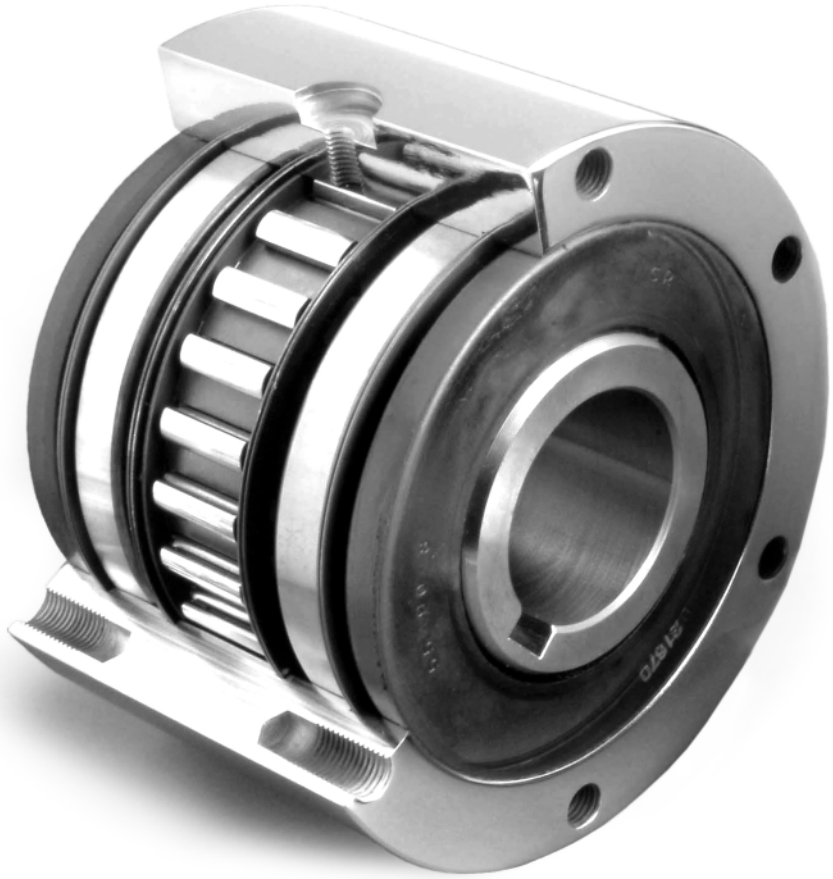
Bulletin E 8.733

Installation, Lubrication, Maintenance Instructions
Ringspann Freewheel Clutches
FRS 300 thru 1000
FRZ 300 thru 1000
FRSG 300 thru 1000



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Introduction

FRS, FRZ and FRSG models are general purpose ball bearing freewheels suitable for overrunning, backstopping and light duty indexing applications.

- Ringspann FR_ Series freewheels mount on a through-shaft with the inner race driven by a key.
- The O.D. of the outer ring is designed as a mounting surface or pilot for attaching the driven member.
- The O.D. of the outer ring is ground concentric with the bore to provide proper alignment and installation.

⚠ WARNING Failure to follow these instructions may result in product damage, equipment damage, and serious or fatal injury to personnel.

Pre-installation Check

Before installing, check:

1. Shaft to Bore fit:

Freewheel Bore	Shaft Fit Guide
0 to 2 inches dia.	Line fit to .002 inches loose
2 to 4 inches dia.	Line fit to .0025 inches loose
4 to 7 inches dia.	Line fit to .003 inches loose

Note: Machine builders may use non-standard shaft fits to mount Ringspann freewheels. In this event, direct any questions concerning shaft fit to the machine builder.

2. Key and keyseat

Hardness: Use a hardened key, from 30 to 40 Rockwell "C" scale. Use materials AISI 1141, 1045 or 4130

Overrunning & Backstopping

Fit: Break edges of the key before installing, to prevent any bearing at these points. Install with a push fit. Be sure the key seats squarely. Do not use force fit.

Length: The key must be equal to the length of the inner ring for proper engagement.

Indexing

Fit: Fit the key up to .001 inch interference on Width dimension to prevent loosening in indexing service. Do no exceed .001 inch tight.

3. Rotation

Determine proper direction of free rotation for application and orientate the freewheel to match based on the directional arrows marked freewheel.

Installation

1. Mount the freewheel and key on the shaft.

   Note: Oil lubricated freewheels may only be used on applications with mounting orientations within 5 degrees of horizontal. Grease lubricated freewheels may be used on applications with non-horizontal orientations.

   Apply pressure only to face of freewheel inner ring.

2. Application of pressure to the outer ring could damage the bearings. For ease of mounting, it is permissible for oil lubricated freewheels to be immersed in hot, clean oil (not exceeding 200°F/93°C) for ten to fifteen minutes prior to mounting.

3. Secure the axial position of the freewheel inner ring onto the shaft. Approved methods of axial retention include the use of shaft collars, keeper plates, retention rings, or retention keys.

4. Mount attaching parts to the freewheel outer ring as required by the application.

   If a torque arm is to be mounted to the freewheel, allow 1/4 to 1/2 inch clearance between stops and torque arm.

   Tapped mounting holes are provided in each end of the outer ring. Center the gear, pulley or sheave on the outer ring. Avoid excessive over-hung loads.

   Check with Ringspann Corporation if the freewheel must support large side loads during overrunning cycle of operation as damage may occur.

5. All Ringspann freewheels are lubricated before leaving the factory. However, check the following Lubricant table for the proper lubricant and fill level for each type application and ambient operating temperature range. Change the lubricant or add oil to proper level, if required.

6. Check for proper rotation by spinning the freewheel by hand.

Lubrication

Proper lubrication and lubricant maintenance are the most important single maintenance factors for long, effective, trouble-free operation of freewheels. Read the following instructions and follow them carefully for maximum performance and utilization of Ringspann freewheels.

Always recheck oil level in freewheel after installation and before start up.

Oil Lubrication

Use oils selected from the following table according to the application and ambient temperature existing at the freewheel.

Note: FRS and FRZ-300 thru 1000 freewheels are shipped from Ringspann half full of Dexron III Automatic Transmission Fluid.

For applications where the ambient temperature exceeds +150°F (+65°C) consult Ringspann.

⚠ CAUTION Do not use lubricants of the EP type (extreme pressure characteristics) or those containing slippery additives such as sulfur phosphate, graphite, or molybdenum disulphide.

Temp. Range	Recommended Oil Lubricant
0°F to 150°F	MOBIL Multi-Purpose ATF (Dexron III)
	TEXACO Havoline ATF (Dexron III)
	CHEVRON ATF (Dexron III)
-20°F to 60°F	MOBIL DTE-15M
	TEXACO Rando-HDZ 46
	CHEVRON Hydraulic Oil AW MV 46
-50°F to 32°F	MOBIL Aero HF
	TEXACO Aircraft Hydraulic Oil 5606G
	CHEVRON Aviation Hydraulic Oil A

Important: Do not mix oils. When switching from one brand or type to another, drain old oil and flush freewheel with mineral spirits, such as MOBIL SOLVASOL or equivalent. Do not use any solvent containing Carbon Tetrachloride.

⚠ WARNING The use of lubricants in freewheel assemblies, other than shown, can compromise proper function that may cause personal injury or property damage and will automatically void any warranty.

Ringspann is not responsible for any lubrication changes made after the freewheel leaves our factory.

Oil Lubrication Maintenance

1. Inspect the oil level once a month or every 160 hours of operation, whichever occurs first. Indexing applications that operate in excess of 150 strokes per minute and severe duty applications may require more frequent oil level inspection.
2. Add oil if necessary to maintain the proper level.

   Overrunning, Backstopping ..... 1/2 full

   Indexing ..... 7/8 full
3. To assure continued efficiency of operation, flush freewheel every 6 months with mineral spirits.

   Do not use any solvent containing Carbon Tetrachloride as seal damage may occur.

   Important: Under severe operating conditions, such as heavy dust or twenty-four hours per day operation, flushing may be required at shorter intervals.

   Flushing will remove waxes and gums formed by vaporization of the oil and helps assure continued efficiency of operation. See “Flushing Procedure”.
4. Flush with mineral spirits and relubricate before use if freewheel has been out of service or in storage for six months or more. Use recommended oils only.

   In cases of dirty or abrasive environment or severe operating conditions (24 hours per day), it is recommended that oil be changed every month.
5. If the freewheel is out of service or in storage for two years or more, new seals should be installed before freewheel is put into service.

Oil Lubrication – Filling Procedure

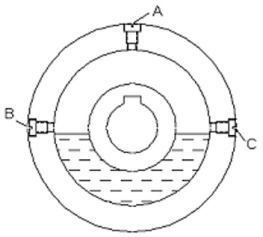

Figure A - (1/2 Full)

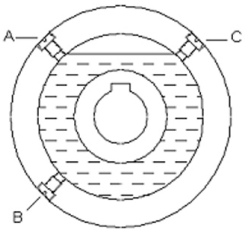

Figure B - (7/8 Full)

Overrunning and Backstopping Applications

1. Rotate freewheel outer ring as shown in Figure A.
2. Remove (A) and (B) plugs and add oil through (A) until oil flows from (B). The freewheel is now 1/2 full.
3. Reinstall (A) and (B) plugs with sealing washers and tighten to prevent leakage.

Indexing Applications (up to 150 strokes per minute)

Note: Contact Ringspann for indexing applications in excess of 150 strokes per minute

1. Rotate freewheel outer ring as shown in Figure B.
2. Remove (A) and (C) plugs and add oil through (A) until oil flows from (C). The freewheel is now 7/8 full.
3. Reinstall (A) and (C) plugs with sealing washers and tighten to prevent leakage.

Flushing Procedure

1. Rotate freewheel outer ring to locate plug (B) in the 6 o’clock position.
2. Remove plug (B) and drain oil from freewheel. Remove plug (C) for better drainage.
3. Reinstall plug (B) and completely fill freewheel with mineral spirits. Reinstall plug (C).

4. Rotate freewheel slowly for several minutes to break up and dissolve any oily residue.
5. Remove plug (B) from 6 o'clock position and drain mineral spirits. Remove plug (C) for better drainage.
6. Reinstall and tighten plug (B).
7. Relubricate the freewheel according to Oil Lubrication Filling Procedure.
8. Reinstall and tighten open plugs to prevent leakage.

Grease Lubrication

Use greases selected from the following table:

FISKE BROS.	Lubriplate "Aero"
	Lubriplate "Low-Temp"
MOBIL	Mobilith SHC-100
	Mobilith AW 2

Note: FRSG-300 thru 1000 freewheels are shipped from Ringspann packed with FISKE BROS. Lubricate "Aero"

- Use no other greases unless a specific recommendation has been made by Ringspann.
- If ambient temperature of freewheel application is below +20°F/-7°C or above +120°F/ + 55°C, consult Ringspann for special lubricant recommendations.
- Grease lubrication may be used if:
    - The freewheel is inaccessible for frequent lubrication maintenance.
    - Conditions do not permit maintenance frequency required for oil lubricated freewheels.
    - The freewheel orientation is vertical (or greater than 5 degrees from horizontal).
    - The freewheel is operated in the presence of severe abrasive dust.
- Do not attempt to convert oil lubricated freewheels to grease lubrication. Any such conversion may result in malfunction and will void any warranty.

Grease Lubrication Maintenance

Add grease to freewheel once per month under normal operating conditions. Under severe operating conditions, such as heavy dust or twenty-four hours per day operation, grease should be added every 2 weeks

Grease Lubrication Procedure

1. Wipe all grease fittings clean and then pump new grease into all fittings until clean grease flows out around the seals on both sides of the freewheel.
2. Lubrication should be done with the freewheel at normal operating temperature.

Note: Freewheels are designed to purge excess grease during operation. Purge will stop as soon as internal temperatures and pressures stabilize.

Use Recommended Greases Only

Freewheel Rebuilding Service

⚠ CAUTION Disassembly and repair of Ringspann freewheels in the field is not recommended and will void any warranty.

Ringspann freewheels are precision devices manufactured under careful controls to meet exacting standards. When reconditioning is required, freewheels should be returned to Ringspann for service

Rotating Equipment

⚠ WARNING Rotating equipment is potentially dangerous and should be properly guarded. The user should comply with all applicable safety codes to guard rotating equipment.

Warranty

Ringspann Corporation "seller" agrees to repair or replace (at its sole option), defective materials or workmanship for a period of one year from the date of delivery. Seller must be notified of such a defect within a reasonable time after discovery (not to exceed thirty (30) days), and the defective product must be delivered, prepaid to the seller's factory with evidence that, it has been properly installed, maintained and operated in accordance with the seller's instructions. Seller's limited warranty excludes remedy for damage or defect caused by abuse; failure to resist corrosion or erosion from any corrosive agent or fluid, due to deposits of foreign material from any fluid; modifications not executed by Seller; improper installation or operation; defects or failures arising out of, in any way related to, or as a result either direct or indirect, of the Buyer's failure to properly advise Seller of all normal and special operating conditions, known to or suspected by Buyer, when Seller is manufacturing the Equipment for a specific operation; or normal wear and tear under usage. This remedy is exclusive and is given in lieu of any warranty of merchantability, fitness, for a particular purpose or any other warranty, whether express or implied. Seller shall not be liable for consequential damages (including but not limited to, loss of use, lost profits, business interruption and the like), incidental damages, indirect damages, whether the claim for such damage is based upon warranty, contract, tort, strict liability or any other theory of recovery.

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