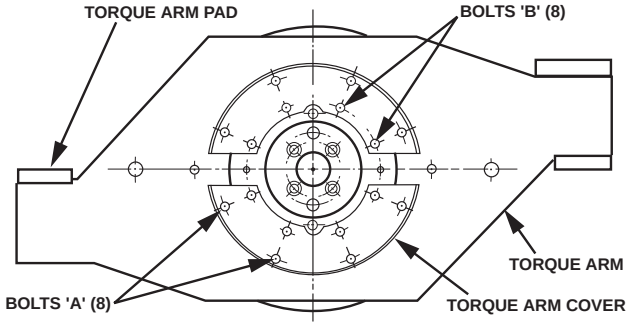
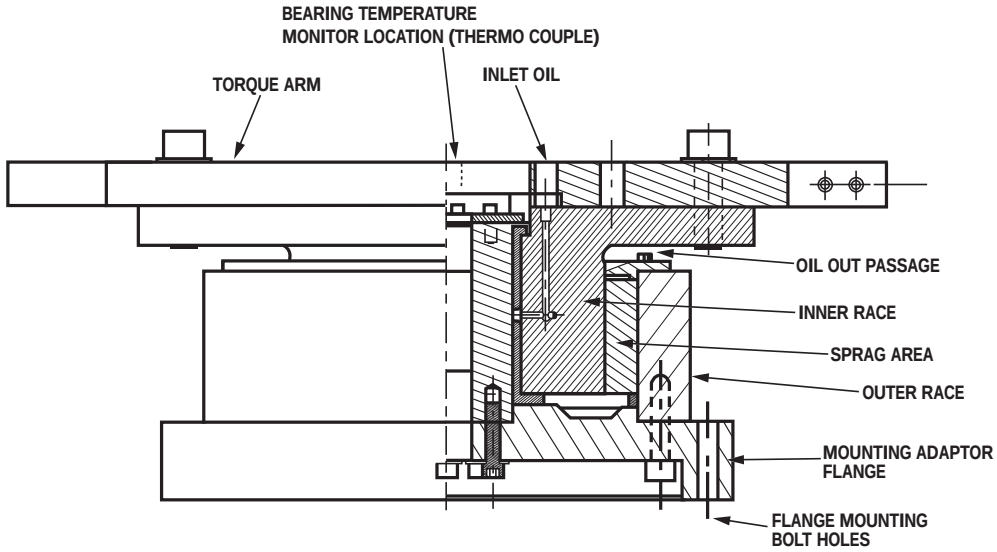
BULLETIN A-3016

P-222-29

Installation Instructions

Centrifugally Disengaged Vertical Backstop ARD (Anti-Rotation Device)





Above drawing is of typical ARD clutch and does not show all mounting adapter designs.

Formsprag Clutch

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www.formsprag.com

Introduction

Formsprag centrifugally disengaging backstop clutches are typically used to prevent reverse rotation of coolant pumps in nuclear power plants.

Formspag Clutch centrifugally disengaging backstops are designed for continuous overrunning in vertical applications which require many years of life.

The outer race is driven through a mounting adapter flange with a mating flange which is bolted or keyed to the customer shaft.

The O.D. of the mounting adapter flange is designed with a pilot for attaching to the driven member.

The O.D. of the outer race is ground concentric with the bore to provide for 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-Lubrication

Before installing check:

1. Flange pilot diameter fit or shaft to bore.
2. Rotation: Check the backstop for the proper rotation in each application. Turn the inner race to check overrunning direction. (Outer race will overrun opposite direction of inner race.)

Installation

The backstop, when mounted on the flange pilot diameter, should be dial gage indicated so that when rotated, the O.D. of the adapter is concentric and square within 0.003” TIR with the center line of rotation.

Adapter screws 1.000-8 UNC are to be tightened with a torque wrench to 706 lb. ft. (Apply oil to all threads before inserting screws.) Use hardened washers under screw head shoulders.

Torque arm cover screws are to be tightened with a torque wrench according to enclosed documentation. Tighten screws ‘A’ before tightening screws ‘B’.

Note: All threaded holes must be cleaned and free of dirt, oil and grease prior to installing fastener. Apply oil to fastener threads before installing fastener.

Torque arm should be checked for freedom after assembly. Torque arm pads are to be shimmed for simultaneous contact with each stop.

Pre-Installation Check

Clutch and Reservoir must be full of oil prior to backstop operation. THIS IS ABSOLUTELY ESSENTIAL AT INITIAL START-UP.

Lubrication

The external oil flow into the clutch should be 1.50 G.P.M. minimum within one (1) minute after startup of the backstop assembly. Before initial operation, the backstop should be inspected to insure that an adequate supply of oil is flowing through the backstop assembly by observing oil overflow at oil out passage.

Lubricant should be a High Grade Petroleum Oil having Rust and Oxidation Inhibitors. Viscosity to be 275 to 375 SSU at 100ºF. Oils meeting this requirement are Shell Turbo #33, Texaco Regal “CR&O”, Terresstic #52 (Exxon Oil Co.) or “DTE” Heavy Medium (Mobil Oil Co.) or equivalent.

Care should be taken that NO slippery additives or extreme pressure additives are added or admitted to the circulated backstop oil or applied to any of the backstop components.

Initial Start-Up

During initial overrunning test, backstop should be stopped if excessive torque arm vibration or movement is noted. Should excessive vibration or movement be noted, a realignment of the outer race adapter to the electric motor pilot may be required.

A Formsprag Clutch representative should be contacted if any unusual or abnormal condition is observed. Operation should not be resumed until the condition is corrected.

Disassembly

Should the inner race be removed and re-installed, which is not recommended unless a Formsprag Clutch representative is present, care must be taken to prevent damage to the journal bearings of the inner race assembly. The inner race should be kept level (square) with the center line and slowly rotated in overrunning direction when inserted into (or removed from) the sprag and outer race assembly.

Do not disassemble the outer race from the adapter sub-assembly or attempt to remove sprags from the retainer sub-assembly.

General Operation

The backstop is not intended to be overrun continuously at speeds below 400 RPM. Operations at speeds below 400 RPM should be kept to a minimum. It is recommended that after ten (10) years or 90,000 hours, whichever comes first, of backstopping operation, the backstop be replaced and returned to Formsprag Clutch for inspection and possible factory reconditioning. Contact Formsprag Clutch for shipping information and necessary arrangements.

The temperature at the thrust bearing should be monitored through the hole provided for thermocouple. Temperature must not exceed 195º.

Inlet oil supply contaminate particle size should not exceed 20 microns.

The Two-Piece adapter sub-assembly must not be taken apart at any time. The sub-assembly is balanced as a sub-assembly.

Preservation and Packaging instructions

Package for Export Shipment as follows:

1. Lightly coat all external surfaces of backstop, torque arm, and bolts with Mobilux #1 grease. Oil dampen all internal surfaces with DTE Heavy Medium oil or equal.
2. Plug all external holes as follows:
   a. All pipe thread holes with plastic cap-plugs.
   b. All straight thread & bolt clearance holes .38 diameter and larger with plastic cap-plugs, .36 diameter and smaller with plastic cap-plugs or grease.

   Cover inner race bore with waterproofed cardboard and tape in place.
3. Shipping box for clutch and torque arm to be adequate for exporting shipment.
4. Container wrapping to be waterproof.
5. Mark external top face of box, “This Side Up,” in addition to normal marking. The backstop is to be positioned so that the inner race is at the top.
6. Pack two bags of moisture absorbent activated Disiccant (Filtrol Corp. Desiccite #25 or equal) into each shipping box.

Re-Shipment

For re-shipment, the backstop should be protected in a similar manner, as above. The original shipping boxes can be re-used. Careful unpacking is required to preserve the original shipping boxes.

Backstop Rebuilding Service

Disassembly and repair of Formsprag Clutch Backstops in the field is not recommended. Formsprag Clutch backstops are precision devices manufactured under careful controls to meet exacting standards. When reconditioning is required, backstops should be returned to Formsprag Clutch.

Rotating equipment is potentially dangerous and should be properly guarded. The user should check for all applicable safety codes in his area and provide a suitable guard.

Warranty

Formsprag LLC warrants that it will repair or replace (whichever in its sole discretion it deems advisable) any product it manufactured and sold which proves to be defective in material or workmanship within a period of one (1) year from date of original purchase for consumer, commercial or industrial use. This warranty extends only to the original purchaser and is not transferable or assignable without Formsprag LLC's prior consent.

This warranty covers normal use and does not cover damage or defect which results from alterations, accident, neglect, disassembly, or improper installation, operation, or maintenance.

Formsprag LLC's obligation under this warranty is limited to the repair or replacement of the defective product. In no event shall Formsprag LLC be liable for consequential, indirect or incidental damages of any kind incurred by reason of manufacture, sale or use of any defective product. Formsprag LLC neither assumes nor authorizes any other person to give any other warranty or to assume any other obligation or liability on its behalf.

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