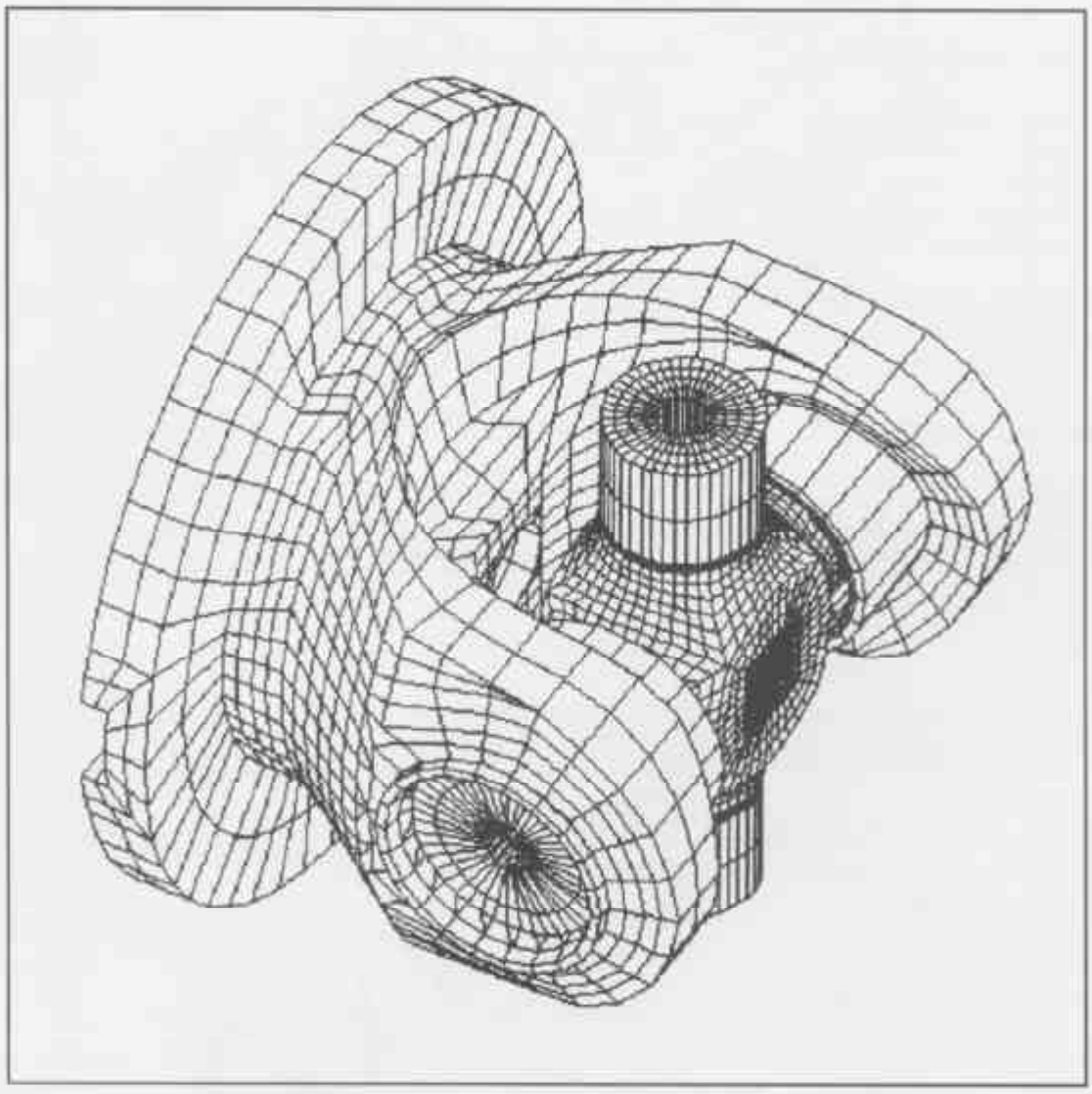
UNIVERSAL JOINT TROUBLE SHOOTING

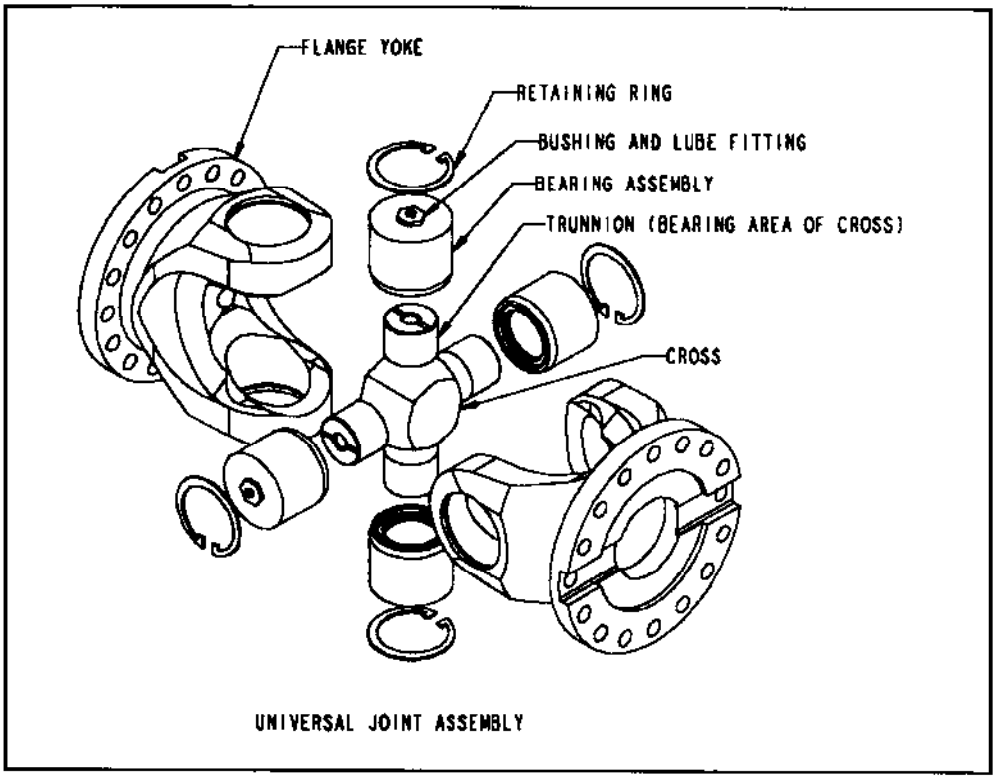


Ameridrives Coupling Products

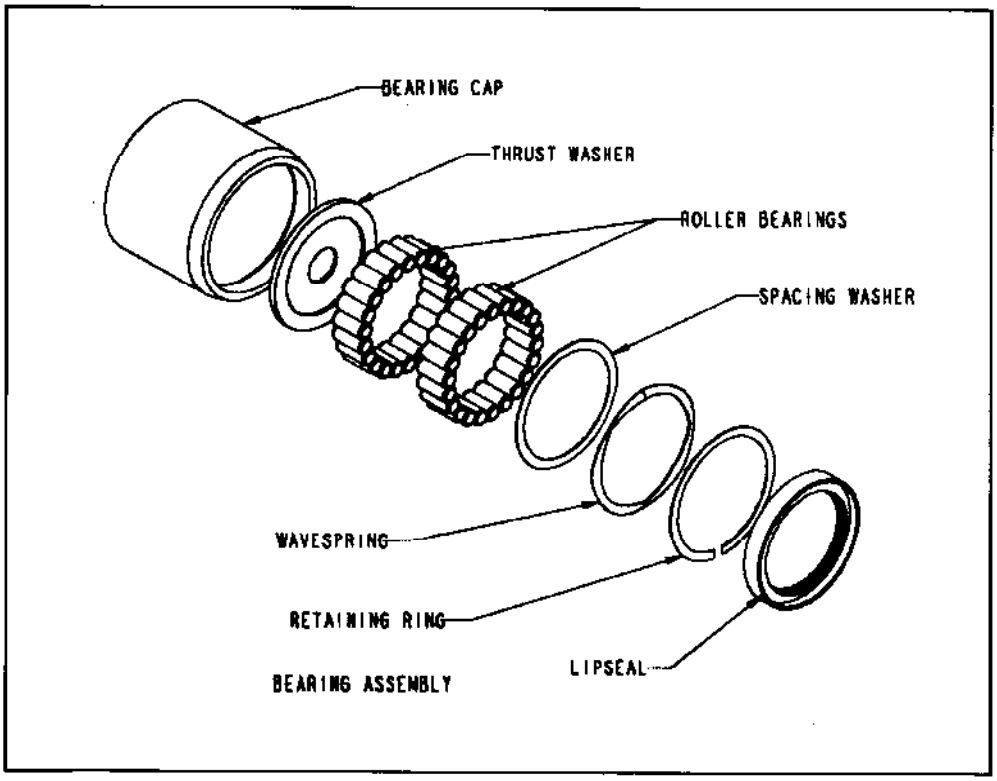
AN AMERIDRIVES INTERNATIONAL COMPANY

AMERIDRIVES UNIVERSAL JOINT
Trouble Shooting

The purpose of this guide is to offer a general failure analysis which can be performed through a visual inspection of worn or failed universal joint components. Following is a parts description breakdown along with a list of the most common problems, probable causes, and necessary corrective action for universal joints.



UNIVERSAL JOINT ASSEMBLY



BEARING ASSEMBLY

Problem	Probable Cause	Corrective Action
Complete Unit		
Excessive lubrication escaping past seals	Seals not compatible with environment. Seal damaged during assembly.	Replace seal with seal suited to operating environment. Avoid damaging seals during assembly procedures.
Tightness in bearings	Worn bearing surfaces or tight fits. Deformed crosses and yokes from high loads.	Replace bearings. Replace yokes and crosses if they are deformed.
Caked lubrication	Indicates lubrication is breaking down. Lubrication may breakdown due to contamination or high operating temperature.	Replace bearings if necessary. Use an uncontaminated lubrication recommended by lubrication manufacturer. If high operating temperatures exist contact the lubrication manufacturer.
Noise or vibration	Worn bearings, keys, splines, bent shaft, or loose connections on the universal joint.	Repair or replace damaged components. A balanced universal joint may be required.
Excessive backlash	Worn splines or bearings.	Replace damaged components.
Overheating	Insufficient lubrication, excessive loads, worn bearings, excessive operating speeds.	Determine cause and correct. Continued operation at excessive temperatures may result in bearing failure.
Crosses		
Fractured or distorted cross	Torque overloads, over misalignment, or axial overloads.	Check all drive train components for indications of torque overloads. Reduce loads or increase universal joint size to match ratings. Check actual misalignment. Reduce misalignment if it exceeds the universal joint capacity. Check flange to flange or shaft to shaft length requirement and universal joint length capacity. Correct if required.

Problem	Probable Cause	Corrective Action
Yokes		
Fracture	Excessive loads	Check universal joint loads against rating. Reduce loads or increase size if required.
Distorted bearing eye	Excessive loads	Check distance between retainer grooves in yoke eyes in four places to determine if distored. Replace yoke and bearing assemblies if distorted. Reduce loads or increase universal joint size if necessary.
Trunnion and Bearing Surfaces		
Brinelling	Vibration or shock loading	False brinelling appears as bright rectangular marks and is caused by internal bearing vibration. Correct by isolating bearings and using greases with antiwear additives. True brinelling is caused by static or impact loads which exceed elastic limit of the material. Bearing surfaces with indications of true brinelling must be replaced.
Spalling	High dynamic loading	Spalling is a fatigue failure of bearing surfaces resulting from high loading. Check load rating on universal joint. Bearing replacement is required.
Blue or black surfaces	Overheating	Overheating results from lubrication failure. Lack of lubrication and excessive speeds are two causes of lubrication failure. Replace bearings and increase frequency of lubrication.
Irregular dents on surface	Lubrication contamination	This is a common cause of bearing failure and results when an abrasive substance is present on a loaded bearing surface. Replace bearings and eliminate sources of contamination.
Galling on end of trunnion	Excessive or uneven angles. Out of balance assembly. Lubrication failure.	Check angles, runnouts, and lubrication. Correct as required.
Corrosion	Lubrication contamination	Greases contaminated with corrosives can pit and discolor bearing surfaces. If pitting is present in non-load carrying areas, corrosion is a probable cause. Check both grease and seals.

Note: The causes of bearing failures are difficult to determine if the surfaces are not examined in the early stages of failure. The initial failure mode may introduce additional failure modes.

Ameridrives INTERNATIONAL
Coupling Products
Erie, PA USA 16512-4000
(814) 480-5000

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