Power Transmission Solutions for Metal Shredder Applications

Ameridrives® Power Transmission

An Altra Industrial Motion Company

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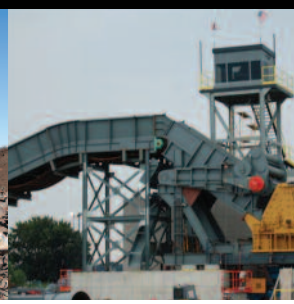


Ameridrives Power Transmission has over 60 years of staff experience in selecting driveshafts for metal shredding applications.

Ameridrives Power Transmission (APT) engineers have worked closely with many shredder manufacturers (OEM's) and recycling yards in the design, installation, and repair of heavy-duty driveshaft assemblies.

Typical application of APT heavy-duty driveshaft assemblies is a direct connection between an electric prime mover and shredder rotor. Electric motor power ranges are 2000-7000 horsepower (1490 – 5220 kW) operating at 500 to 600 rpm. Heavy-duty driveshafts are excellent choices for shredder applications for a number of reasons:

- Driveshafts allow for larger misalignment angles than other types of couplings
- Axial travel section compensates for movement of the shredder rotor and variations within the installation
- Units provide high torque capacity versus rotational diameter
- Universal driveshafts are easier to maintain
- Units provide long service life 7-10 years (when properly selected)

Selection of the heavy-duty cardan shaft is done with consideration of multiple application specifics and customer requirements. B10 life, the expected bearing life between shaft overhauls, is determined via a key bearing life formula applied correctly to each application. Typical life cycle of the bearings is designed for 7-10 years of operation based on the duty cycle. The second key part in proper shaft selection is assuring that the shaft does not see a sudden failure from normal torque loads and/or excessive shock loads. A review of the normal torque expected, adjusted by the proper service factors, assures shaft integrity through the bearing lifespan and beyond. One final aspect of selection is the potential for torsional vibration as a result of system harmonics. System data from the application should be analyzed to assure that the system's natural frequency does not coincide with the rotational speed of the universal joint.

APT offers a wide variety of shaft options to enhance standard shaft installations

In some cases overload protection is desired. For example, the shaft installation at B&B Metals, Newton, WI, includes a shear spacer. In this application, if torque exceeds a certain value the coupling shears and the engine/drive system runs free, separate of the shredder rotor. This was done to safeguard the Waukesha natural gas engines and the clutch/belt drive system. Other options include keyless connections, hydraulic fit couplings, special flange connections, and a short coupled (SC) shaft design.

Fast product availability combined with comprehensive engineering support

APT components are made in North America which allows us to offer quick service on complete assemblies and spare parts. APT application engineers can work directly with your engineering and design personnel to develop a final design that can be supplied usually within standard lead times. When retrofitting or replacement of existing drivelines is required, domestic production and complete design control allows APT to offer other major manufacturers connection types to insure interchangeability. Repair work is also made easier as factory parts are available in the US. This means less down time if problems do occur.

Advantages of Ameridrives shredder shaft assemblies

- Domestic manufacture and design
- Proven designs and decades of experience in heavy steel rolling and shredding applications
- High torque capacity
- High operating angle capacity
- One piece yoke reduces the number of extra bolted connections and serrations to wear and maintain
- Heat treated alloy steel components
- Nitrided splined travel sections available upon request for improved durability
- Ideal loading across entire bearing surface as a result of FEA analysis insuring balanced deflection between the yoke and cross
- Modular bearing assemblies with inner races allows for repeated reuse of the cross body saving on repair costs (sizes 3440 and greater)
- Domestic factory repair facility

Design Features

Radius Shoulder Trunions—Shoulder has generous radius at base of cross trunion to reduce stress.

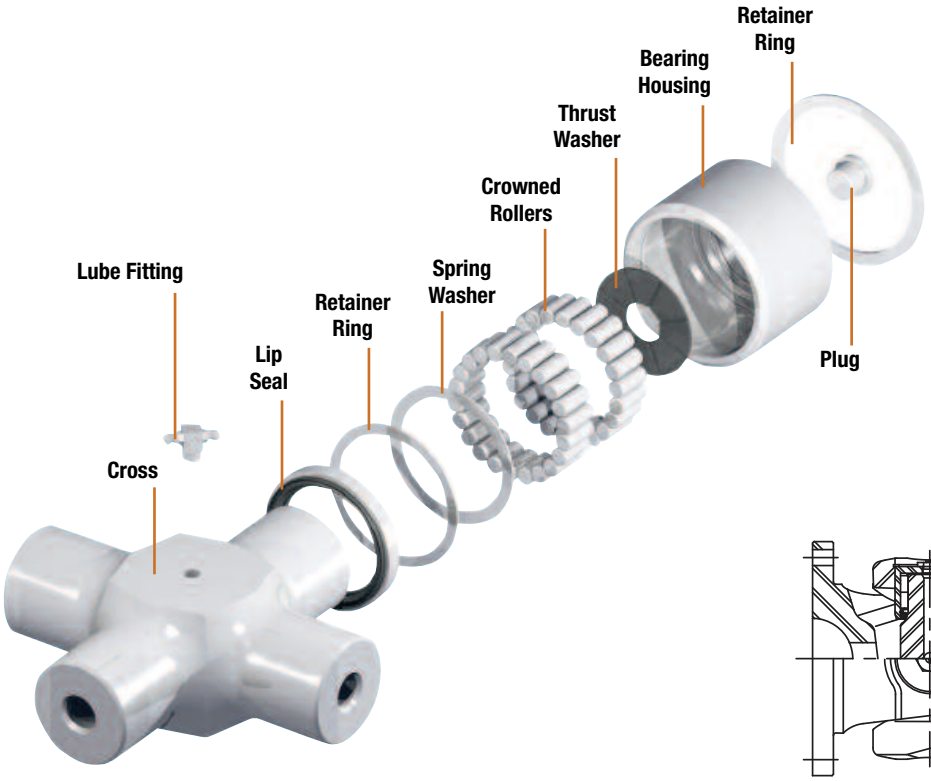
Double-Lip Seal—Abrasion resistant multi-lip extruder type seals to insure integrity of the bearing lube reservoir.

Thrust Bearings—Each cap has a filled nylon compound thrust washer to prevent steel-on-steel contact of the trunion to minimize friction and prevent galling under heavy loads. Filled nylon bearings automatically adjust themselves to compensate for minor deflections.

Crowned Rollers—Eliminate stress concentrations at the ends of the rollers. The reduction in stress contributes significantly to increased bearing (B10) life.

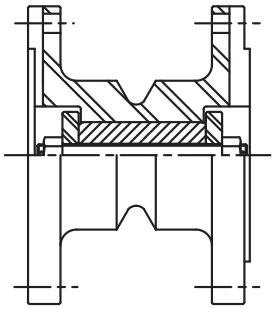
Zero Clearance Assembly—Cross and bearing assembled for zero radial clearance for optimum thrust and radial bearing performance and elimination of radial whirl and associated vibrations.

Contoured Bearing Caps—Allows longer cross journals for increased torque and bearing capacity.

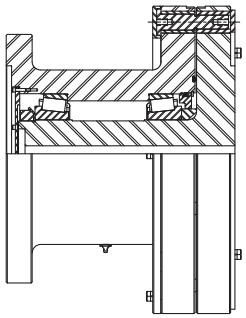


Custom Design Variations

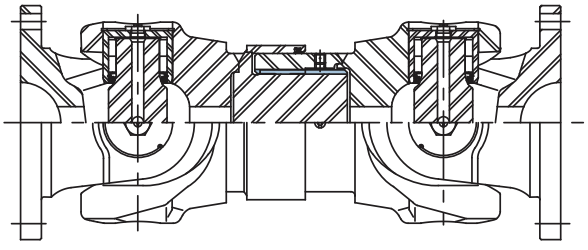
Shear Spacer Assembly



Shear Pin Assembly



Short Travel Capability



Altra Industrial Motion

All Customer Service phone numbers shown in bold

Electromagnetic Clutches and Brakes

Warner Electric

Electromagnetic Clutches and Brakes

New Hartford, CT - USA
1-800-825-6544

For application assistance: 1-800-825-9050

St Barthelemy d'Anjou, France
+33 (0) 2 41 21 24 24

Precision Electric Coils and Electromagnetic Clutches and Brakes

Columbia City, IN - USA
1-260-244-6183

Matrix International

Electromagnetic Clutches and Brakes, Pressure Operated Clutches and Brakes

Brechin, Scotland
+44 (0) 1356 602000

New Hartford, CT - USA
1-800-825-6544

Inertia Dynamics

Spring Set Brakes; Power On and Wrap Spring Clutch/Brakes

New Hartford, CT - USA
1-800-800-6445

Overrunning Clutches

Formsprag Clutch

Overrunning Clutches and Holdbacks

Warren, MI - USA
1-800-348-0881 – Press #1

For application assistance: 1-800-348-0881 – Press #2

Marland Clutch

Roller Ramp and Sprag Type Overrunning Clutches and Backstops

Burr Ridge, IL - USA
1-800-216-3515

Stieber Clutch

Overrunning Clutches and Holdbacks

Heidelberg, Germany
+49 (0) 6221 30 47 0

Engineered Couplings

Ameridrives Couplings

Mill Spindles, Ameriflex, Ameridisc

Erie, PA - USA
1-814-480-5000

Gear Couplings

San Marcos, TX - USA
1-800-458-0887

Bibby Transmissions

Disc, Gear, Grid Couplings, Overload Clutches

Dewsbury, England
+44 (0) 1924 460801

Boksburg, South Africa
+27 11 918 4270

TB Wood's

Elastomeric Couplings

Chambersburg, PA - USA
1-888-829-6637 – Press #5

For application assistance: 1-888-829-6637 – Press #7

General Purpose Disc Couplings

San Marcos, TX - USA
1-888-449-9439

Ameridrives Power Transmission

Universal Joints, Drive Shafts, Mill Gear Couplings

Green Bay, WI - USA
1-920-593-2444

Huco Dynatork

Precision Couplings and Air Motors

Hertford, England
+44 (0) 1992 501900

Charlotte, NC - USA
1-800-825-6544

Linear Products

Warner Linear

Linear Actuators

Belvidere, IL - USA
1-800-825-6544

For application assistance: 1-800-825-9050

St Barthelemy d'Anjou, France
+33 (0) 2 41 21 24 24

Heavy Duty Clutches and Brakes

Wichita Clutch

Pneumatic Clutches and Brakes

Wichita Falls, TX - USA
1-800-964-3262

Bedford, England
+44 (0) 1234 350311

Twiflex Limited

Caliper Brakes and Thrusters

Twickenham, England
+44 (0) 20 8894 1161

Industrial Clutch

Pneumatic and Oil Immersed Clutches and Brakes

Waukesha, WI - USA
1-262-547-3357

Gearing

Boston Gear

Enclosed and Open Gearing, Electrical and Mechanical P.T. Components

Charlotte, NC - USA
1-800-825-6544

For application assistance: 1-800-816-5608

Nuttall Gear and Delroyd Worm Gear

Worm Gear and Helical Speed Reducers

Niagara Falls, NY - USA
1-716-298-4100

Belted Drives and Sheaves

TB Wood's

Belted Drives

Chambersburg, PA - USA
1-888-829-6637 – Press #5

For application assistance: 1-888-829-6637 – Press #7

Engineered Bearing Assemblies

Kilian Manufacturing

Engineered Bearing Assemblies

Syracuse, NY - USA
1-315-432-0700

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06_14_05

P-1902-APT 2/11 Printed in USA