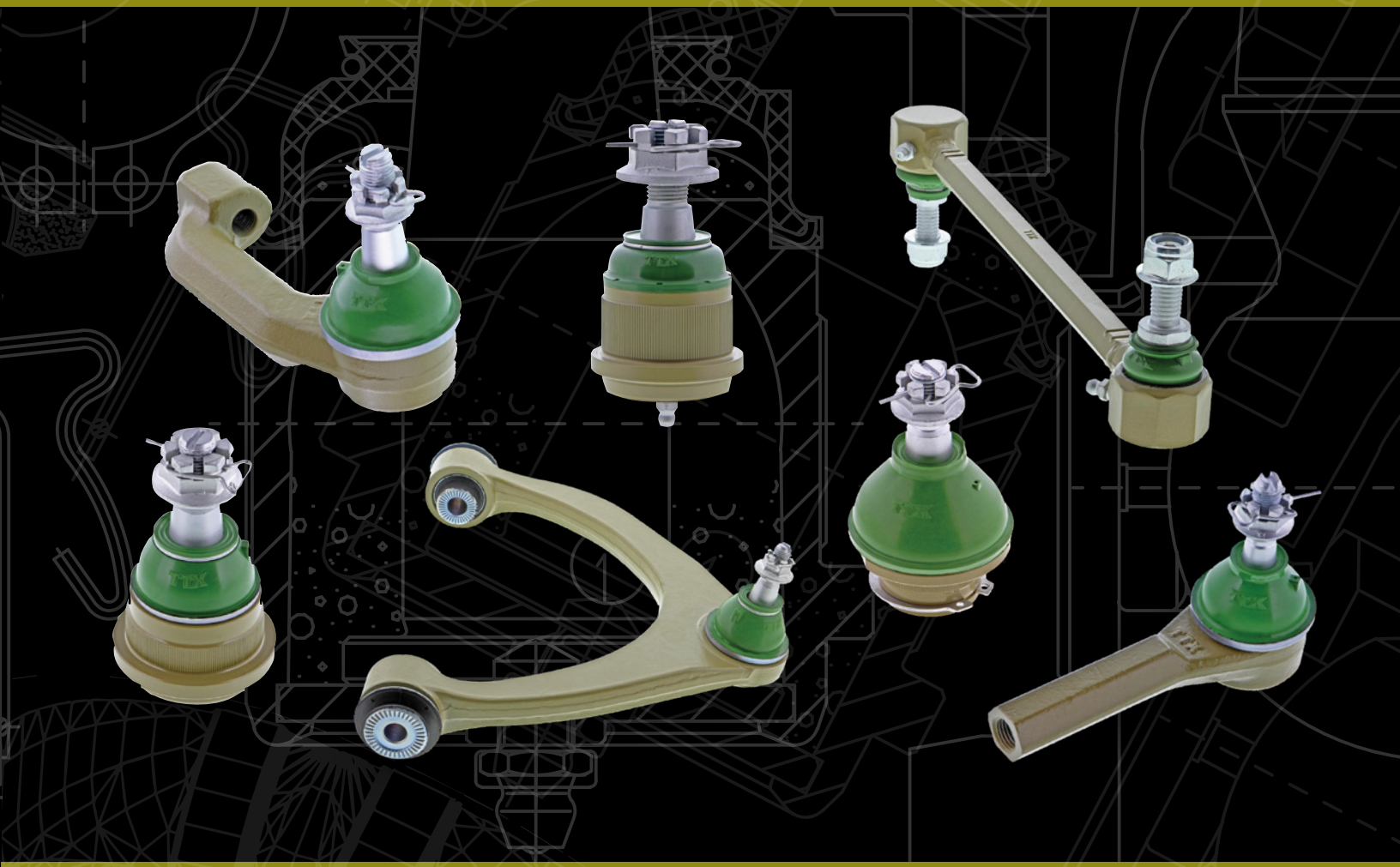
TTX®

TERRAINTOUGH XTREME®



EXCLUSIVE PATENTED CHASSIS SOLUTIONS

FOR WORKING TRUCKS AND FLEET VEHICLES

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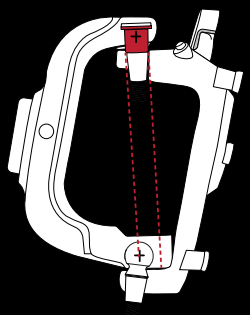
SNAP-IN BEARING TECHNOLOGY



Worn knuckle can lead to off-centre loading

ISSUE:

A memory steer condition arises when a vehicle continues to pull to the right or left, as opposed to returning to a neutral centre position after a turn is completed. This binding is typically the result of an out of spec or improperly installed front end suspension or steering component.

Solid axles, such as certain Dodge RAM applications, may develop imperfections over vehicle service life. This can accelerate under heavy service. They commonly appear as misaligned upper and lower ball joint mounting points on the knuckle.

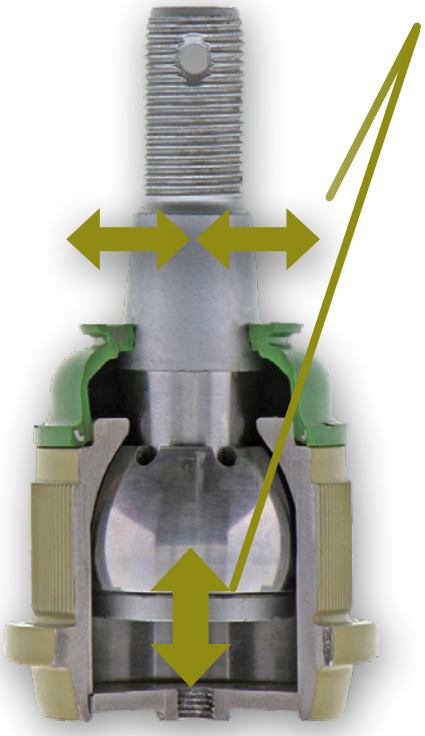
Some upper ball joints may use a plastic bearing, which will deform to compensate for the misaligned point. The constant off-centre loading and plastic bearing may lead to binding or early failure of the part.

Constant off-centre loading can deform bearing

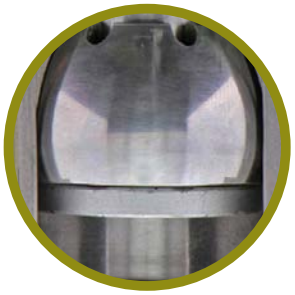
Advanced Engineering

Patented Snap-In Bearing Technology – US Patent # 10605309

Combining extreme durability with innovative engineering, the snap-in bearing is designed from the ground up to address the challenges of Dodge RAM memory steer applications. Patented design allows for pivoting motion which permits the pin to re-align and prevent binding. Design also withstands greater loads in all ranges of movement and provides extended part life.



Patented design allows for continuous and exact pin re-alignment through pivoting motion, preventing binding or memory steer.



Oversized sintered metal bearing with large contact area and stud work together to withstand off-centre loads, extending part life.

Patented Snap-In Bearing technology is exclusively available on:

Ball Joint

TXMS25506- Front Upper 2006-2008 Dodge Ram 1500
2003-2019 Dodge Ram 2500
2003-2019 Dodge Ram 3500

LOCKING BOOTS

OE-style boot attached to housing via flexible ring

Commonly used in applications where there is limited space

ISSUE:

A boot is typically attached to the ball joint housing via a spiral ring.

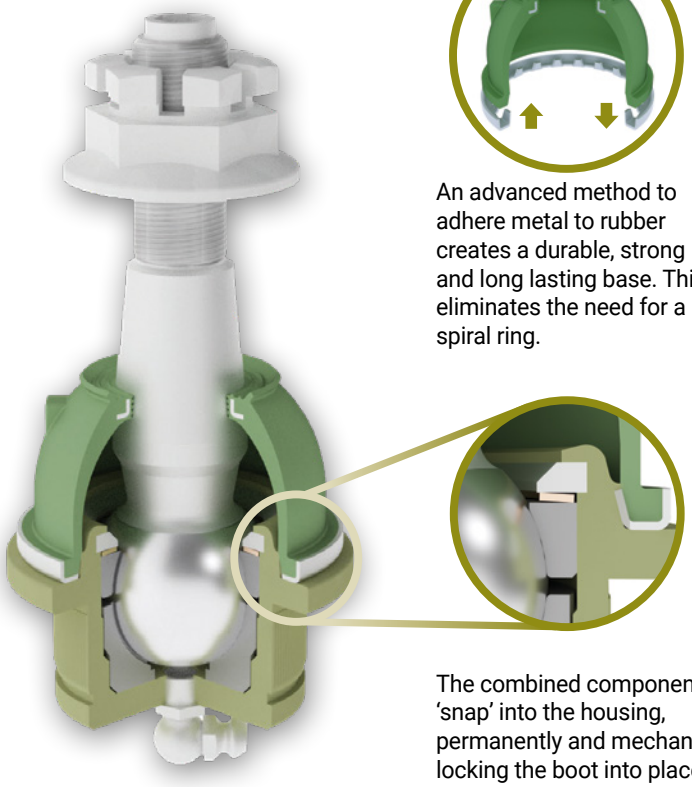
As the ring is flexible, such boots can be easily removed from the housing. Under conditions of heavy use, the seal between the base of the boot and the housing can become damaged or unintentionally loosened.

This can permit contaminant ingress and accelerated wear, reducing part service life.

Best Contaminant Protection in the Industry

Patented Locking Boot – Technology US Patent # 9771971

Engineered to provide protection against contaminant ingress, the locking boot is designed around a 2-step process.



An advanced method to adhere metal to rubber creates a durable, strong and long lasting base. This eliminates the need for a spiral ring.

The combined components 'snap' into the housing, permanently and mechanically locking the boot into place and completing the seal, even during heavy use.

Patented Locking Boot technology is exclusively available on OVER 120 TTX ball joints, control arms, tie rods and stabilizer links, such as:

Ball Joints

TXK80026- Front Upper- 1999-2019 Ford F-350 SD

TXK3134T- Front Upper- 1987-2018 Jeep Wrangler

Control Arms

CTXMS501195- Front Upper- 2011-2019 Chevrolet Silverado 3500 HD

CTXMS25517/18- Front Upper- 2005-2019 Chrysler 300

Outer Tie Rods

TXMS25606- Front Outer- 2008-2019 Dodge Grand Caravan

TXMS50630- Front Outer- 2014-2019 GMC Sierra 1500

STEPPED BEARING TECHNOLOGY

Belleville Spring Disc

Failed Spring Disc

ISSUE:

Belleville spring discs are conically shaped washers, generally found in chassis components. Through their conical shape and impact resistant profile, these provide the tension which keeps the ball joint together.

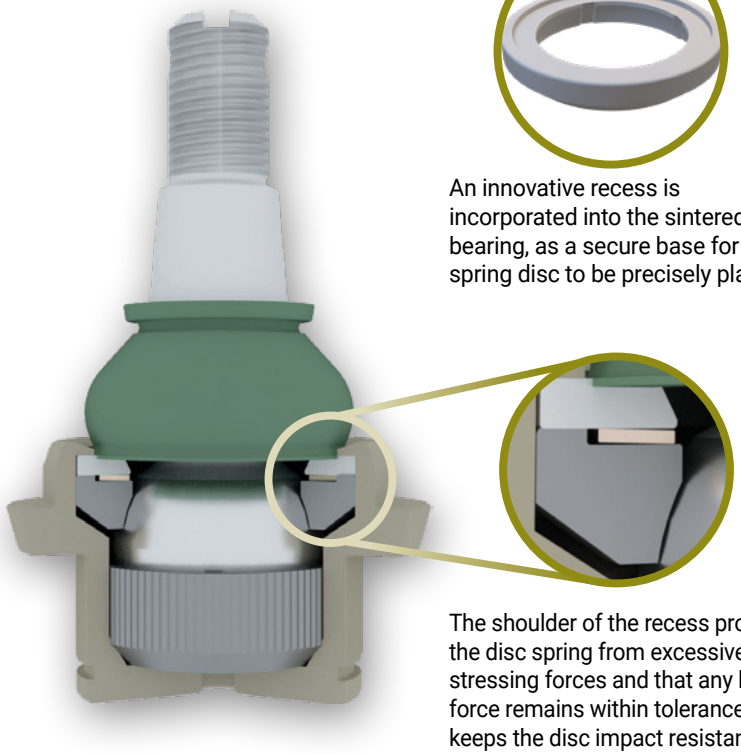
Typically in service, the spring disc encounters a consistent load and deflection force. Over time or extremes of these may flatten or crush the washer. The loss of its impact resistant profile will manifest as 'play', indicating replacement of the component.

Additionally, heavy use conditions may accelerate the development of this play.

Ultra Strong and Longer Lasting Parts

Patented Stepped Bearing Technology – US Patent # 9296271

Engineered to provide exact and self-calibrating preload, the stepped bearing is designed to limit flattening of the Belleville disc spring during part service life. This creates a tighter and stiffer assembly with extra strength under all service conditions. Along with other technology available only on TTX, Stepped Bearings are part of the ultimate engineering solution for ultra strong and longer lasting parts.



An innovative recess is incorporated into the sintered metal bearing, as a secure base for the spring disc to be precisely placed.

The shoulder of the recess protects the disc spring from excessive stressing forces and that any loading force remains within tolerances. This keeps the disc impact resistant over part service life.

Patented Stepped Bearing technology is exclusively available on ALL TTX ball joints, control arms, tie rods and stabilizer links, such as:

Ball Joints

TXMS40546- Front Upper
2004-2019 Ford F-150

TXMS86568- Front Upper
2005-2019 Toyota Tacoma

Control Arms

CTXMS25147/8- Front L/R Upper
2006-2018 RAM 1500

CTXK80669/70- Front L/R Upper
2007-2016 Chevrolet Silverado 1500

Outer Tie Rods

TXMS40646- Front Outer
2011-2019 Ford Explorer

TXES3614- Front Outer
2009-2019 Dodge Journey

Stabilizer Links

TXK7258- Front
1996-2019 Dodge Grand Caravan

TXMS308139- Rear
2012-2019 Nissan NV1500/2500/3500

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DIRECTIONAL BEARING TECHNOLOGY

Housing is used as stud contact surface

ISSUE:

On part types such as ball joints located in a front upper position and outer tie rod ends, there may be a requirement for increased ball stud swing angle in one direction due to a vehicle's suspension geometry.

Bearings are typically equally round on both the inside and outside diameters and are either pressed or held in place by the housing and will function properly, regardless of orientation.

However, directional part types present a challenge due to the elliptical stud opening. A traditional "round" bearing cannot be located inside the housing. Instead and commonly, the housing is machined to "act" as the ball stud contact surface.

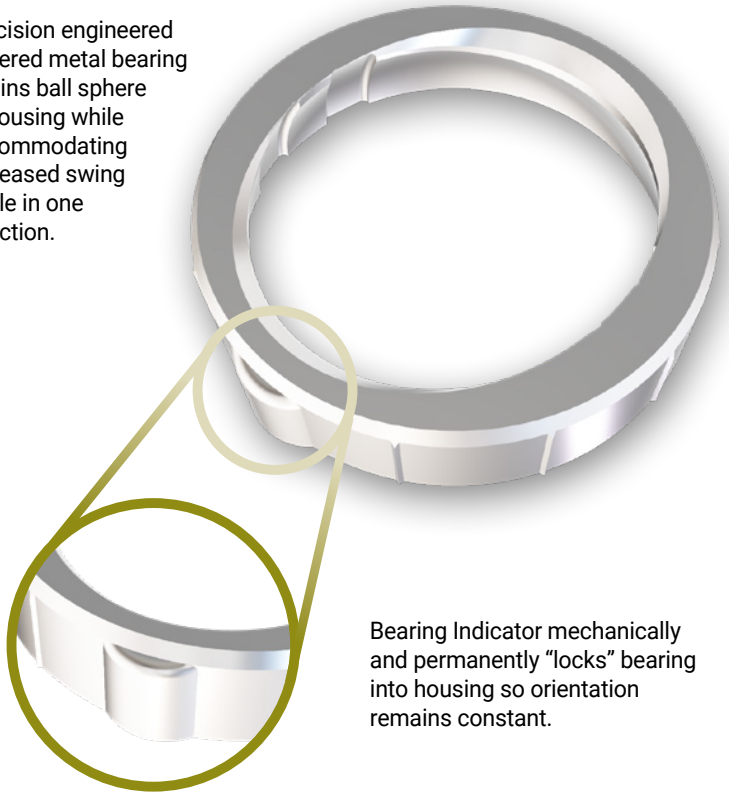
Although this alternative is simple, it has several limitations. Primarily, these include reducing component service life and reduced performance. This wear can be accelerated by heavy use conditions.

Superior Engineering for Superior Part Service Life

Patented Directional Bearing Technology – US Patent # 1052789

The TTX directional bearing is designed to overcome the limitations of elliptical stud openings. Patented design allows for a sintered metal bearing to be located inside directional housings, providing additional contact area and greater pressure distribution for less wear. This optimizes and extends part service life.

Precision engineered sintered metal bearing retains ball sphere in housing while accommodating increased swing angle in one direction.



Bearing Indicator mechanically and permanently "locks" bearing into housing so orientation remains constant.

Directional Bearing technology is exclusively available on OVER 70 TTX ball joints, control arms, tie rods and stabilizer links, such as:

Ball Joints

TXMS40546- Front Upper 2004-2019 Ford F-150

TXMS50574- Front Upper 1996-2002 Chevrolet Express 2500 & 3500

Control Arms

CTXMS501241/2- Front Upper 2015-2019 Chevrolet Colorado

CTXMS25117/8- Front Upper 2005-2019 Chrysler 300 RWD

Outer Tie Rods

TXES3614- Front Outer 2009-2019 Dodge Journey

TXMS40628/9- Front Outer 2013-2019 Ford Escape

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