

## AGRICULTURAL BEARING MARKET. . **GROWING WITH YOU**



Rob Zeller

### SALES OFFICES:

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39255 West 12 Mile Rd.  
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1-800-929-3892  
Fax: (248) 324-1103

#### CORPORATE OFFICE

1600 East Bishop Court  
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America is going green, and continuing concern for our environment coupled with recent federal and state legislation is inspiring unprecedented investment in renewable energy. Ethanol production is expected to increase by as much as 30% annually over the next few years as we lessen our dependence on oil. This means good things are on the horizon for America's farmers. In recent months we have already seen increased farm productivity and higher prices for corn and other crops. As demand for ethanol and corn grows, so will demand for new tractors and tillage equipment as well as service parts - bearings in particular. In this issue of NTN News, we will take a look at NTN's commitment to support the Agriculture Industry.

To focus our efforts on the Agriculture Industry, we recently appointed a Market Manager who ensures that we are meeting the needs of our agricultural distribution customers in every way possible. The Market Manager's job is to understand our customers and end users and to coordinate company-wide efforts to support the industry. Second, we created a new promotional brochure to illustrate the benefits of NTN-BCA bearings. We believe this is an important tool for conveying the quality and features of the BCA product line. Finally, we have implemented inventory and promotional programs to support aftermarket sales of BCA Premium Agricultural Bearings.

Furthermore, NTN is looking at opportunities in addition to bearings for tractors and farm implements. We also are directing our efforts on the more than 200 ethanol refineries across the country currently operating or under construction. We have identified a Market Manager for the ethanol industry to ensure that we have superior service and support for this growing business.

On another note, John Deere recently honored NTN with the prestigious Partner Level Supplier Award for 2006. This is based on a number of factors including high quality products, superb customer service, excellent engineering support, and outstanding inventory management. Only the top 3% of Deere & Company's suppliers are given this award at the enterprise level. As John Deere's largest bearing supplier, we intend to do everything possible to become your best agricultural bearing supplier as well.



(L to R) Rich Rosenbarger, Kevin Austin, Effie Hoffman, Pete Eich, Steve Premo

As the agricultural aftermarket grows, we look forward to growing with you.

Best Regards,  
Rob Zeller, Agricultural Market Manager  
NTN Bearing Corporation Of America



# BCA<sup>®</sup>

An NTN Brand.

## PREMIUM AGRICULTURAL GRADE FLANGE DISC BEARINGS

## FD SERIES

Bearings in tillage equipment are subjected to some of the most severe operating conditions possible. Field debris, dust, and moisture cause untold bearing failures every season. NTN-BCA's flange disc bearing units are designed to prevent bearing failures and optimize equipment uptime.



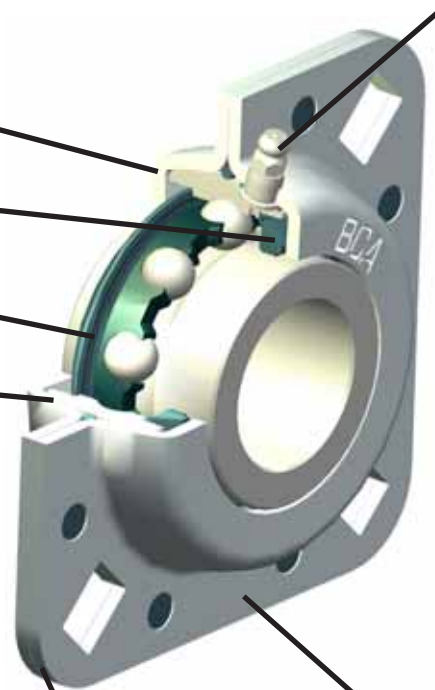
Offered with triple-lip seals;  
Innovative one-piece molded  
integral bearing seals

± 3 degree dynamic  
alignment capability

Close tolerance between stamping  
bore and inner ring O.D. provides extra  
bearing protection

Flexible one-piece  
molded nylon retainer

Grease Fitting



Heavy gauge stampings are heat  
treated and plated for corrosion  
resistance

Stamping halves are riveted together  
around bearing and o-rings, providing  
one-piece integral assembly

## BENEFITS OF NTN-BCA FLANGE DISC BEARINGS

### Years of field experience

*Serving the Farming Community for over 55 years*

### Maximum Seal Effectiveness

*Agricultural Grade triple lip nitrile rubber seals  
Seals bonded to heavy gauge trash guard shields*

### Heavy gauge corrosion-resistant steel housings

*Case hardened and zinc plated stampings  
Grease fitting is permanently installed in the stamping*

### Dynamic Alignment

*Spherical bearing OD allows misalignment relative to the  
housing*

### Broad Product Line Coverage

*Variety of bore options: square, round, and round with  
locking collar*

### Misalignment Tolerant

*Flexible nylon retainer  
C3 internal clearance  
Supports both axial and radial loads*





## WHAT IS THE PRODUCT OFFERING?

### Premium NTN-BCA Agricultural Grade Bearings

- Ball Bearings - Hex, Square & Round Bore
- Disc Harrow Bearings
- Insert Bearings
- Mounted Units
- 2-Bolt and 4-Bolt Flange Units

## SERVING THE AMERICAN FARMER.

### Complete Product Offering

- *Your One Stop Shop!*

### Competitively Priced

- *Maximize Your Profits!*

### Complete Inventory

- *Fast Response Time In Down Situations!*
- *Short Lead Time!*

### Quick Reference Guide

- *Interchange Chart!*

*Besides Agricultural Bearings, NTN Carries A Complete Line Of Radial Ball Bearings*

## WHY CHOOSE NTN-BCA AGRICULTURAL GRADE BEARINGS?

- OEM Preferred
- Broad Application Coverage
- Multiple Configurations
- Tradition of Quality
- Commitment to Service
- Maximize Productivity

# NTN®

# BCA®



**PREMIUM AGRICULTURAL BEARINGS**



*Serving The Farming Community For Over 55 Years*

*NTN-BCA Premium Agricultural Bearing 16 page Brochure*



**PETER LORENTZ**  
Sr. Product Analysis Engineer  
NTN - Wheeling Test Lab

Disc harrows and other severe agricultural applications present significant challenges to bearing performance with regard to water and contamination intrusion. This is due to the fact that bearings are typically exposed to large amounts of dust, dirt, and moisture in the field. NTN and BCA disc harrow bearings both feature triple lip seals to prevent the ingress of moisture and foreign particle contamination under these operating conditions (Figure 1).

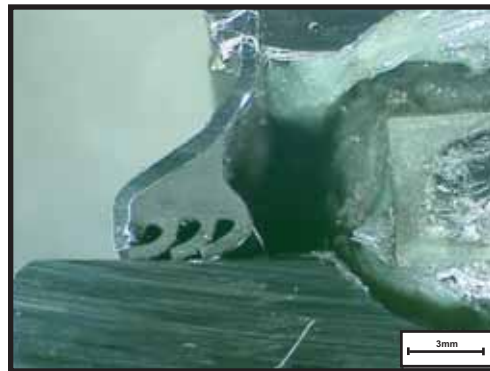


Fig. 1: Cross-section of bearing triple lip seal as installed

In testing these bearings for durability at the NTN Test Lab, the severe contamination environment to which the bearings are exposed is simulated in the Rotating Drum Test Stand (Figure 2).



Fig. 2: Rotating Drum Test Stand

This test stand features a horizontal octagonal shaped drum fitted with four heads located at 90° with respect to each other inside along the drum circumference (Figure 3). Three bearings are mounted on each head at equal distances from each other along the length of the head (Figure 4).

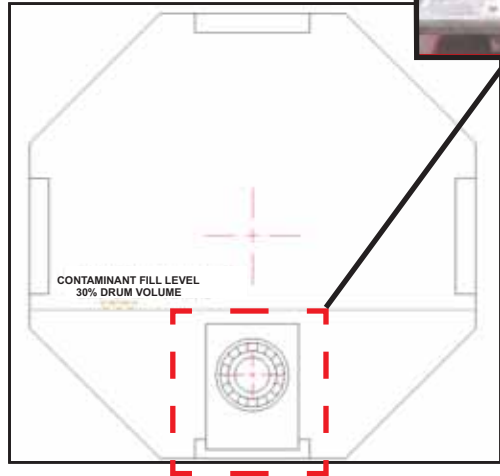


Fig. 3: Drum cross-section schematic

The drum is filled to approximately 30% of its volume with a water/test dust mixture. In operation, the heads spin the bearings at 800 rpm as the drum rotates at 6 rpm slowly moving each head through the water/test dust mixture, with each revolution of the drum. Condition of the test samples is checked after various hours of operation, with seized rotation as the ultimate criteria for failure. One of the major factors affecting bearing durability in this severe contamination environment is the durability of the bearing seal.

## AGRICULTURAL BEARING TESTING

Fig. 4: Head with three mounted test bearings



Bearings equipped with triple lip seals have been shown to significantly out perform bearings equipped with standard single lip seals.

Very little, if any, lip wear was observed on the triple lip seals after testing (Figure 6).

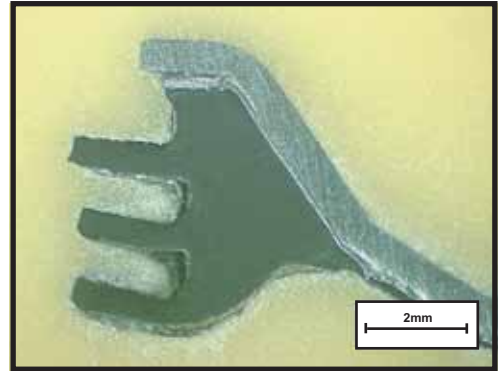


Fig. 6: Post-Test triple lip seal cross-section

NTN's premium agricultural seal designs ensure the highest resistance to contamination, offering you superior performance you can always count on.





## **NTN-BCA CORPORATION - LITITZ PLANT** (*Lititz, PA*)

NTN-BCA has been committed to bearing manufacturing for more than 100 years. Founded in 1898 in Lancaster, PA as the Star Ball Retainer Company, the company merged with the Bretz Company in 1910 to form the Bearing Corporation of America. NTN acquired BCA in 1997, continuing the century long commitment to the innovative development and production of bearing products.

NTN-BCA is heavily involved in tackling important environmental issues. Environmental protection is a core concern of all of NTN's company operations focusing attention on conserving energy and resources. Establishing environmental management systems that strive to reduce air emissions, solid and hazardous waste, wastewater discharges, energy use and toxins are some of the ways NTN is working to further protect the environment, passing on a better world to future generations.

**TS-16949** *Certified*

**ISO-14001** *Environmental Management System Registration*

### THIS PLANT **MANUFACTURES:**

- NEEDLE ROLLER BEARINGS
- RADIAL BALL BEARINGS
- ANGULAR CONTACT BEARINGS
- ROCKER ARM BEARINGS
- CLUTCH RELEASE BEARINGS
- CRADLE BEARINGS
- CAM FOLLOWERS

### PRIMARY **INDUSTRIES:**

- AGRICULTURAL
- AUTOMOTIVE
- CONSTRUCTION
- PAPER MILL



*Lititz Plant*

*The NTN-BCA Lititz manufacturing facility is highly focused on many plant initiative programs for continuous improvement, safety, and customer satisfaction. Reduced grinding cycle time and set-up increase productivity, while improved size control processes assure a constant commitment to quality. These improvement programs also assist in increasing efficiency and eliminating waste.*



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**NTN MVP**

**DAVID PAHL**  
 Senior Territory Manager - Aftermarket Sales

NTN relies on their Territory Managers to provide a high level of service to our customers, insuring that the needs of our customers are met by our organization. David Pahl, Senior Territory Manager for Northern Indiana and Central Illinois, has come full circle since his start in the bearing industry in 1987. He began working for an industrial distributor selling NTN bearings and then joined NTN in 2004. During the past 20 years David has spent a lot of time supporting the steel industry in Northwest Indiana. He likes to call on distributors and end-users because it allows him to get involved in a variety of applications. David is a sports fanatic, following both the Chicago Bears and Indianapolis Colts.

**WE ASKED DAVID TO SHARE SOME PERSONAL INSIGHT ON THE FOLLOWING SUBJECTS...**

**So who did you root for last January, Bears or Colts?**

*The Bears.*

**What are customers looking for right now?**

*The current demand for bearings is high. Customers are more focused on product availability and improved lead-time is a constant request. Strengthening economies throughout the world are creating high global demand. To address this, NTN has been adding production capacity locally at our Macomb, IL plant as well as our plants in Japan.*

**What is the most challenging application in the steel industry?**

*The most challenging application is casters, which is the process of turning liquid steel into a solid block. The reason is because the steel is being produced at a higher temperature than the bearing range, resulting in premature failure. We are using our engineers and expertise with high temperature applications to provide a longer bearing life.*

**What are some differences between ag and general industrial distributors?**

*The agricultural business is cyclical due to planting and harvest seasons whereas general distribution is more stable. However, like all distributors, they are concerned with quality for their customers. NTN's BCA premium agricultural line of bearings is preferred by both OEM's and repair facilities.*