

HAPPY  
*New Year* 2023

Thank you to all of our customers, industry partners and employees. Wishing you a wonderful holiday season!



NTN and Canadian Bearings Announce Happier Smiles "Keep them Warm at Christmas" Campaign

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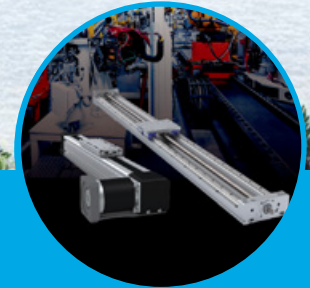
NTN Supports the Dixie Bloor Neighbourhood Center's 2022 Family Sponsorship Campaign

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NTN Canada Celebrates Take Your Child to Work Day

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## LINEAR MOTION

Modular Linear Actuator Comparison: Toothed Belt vs Screw Driven

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## PRESIDENT'S HOLIDAY MESSAGE

When we all pull together and grow forward as a part of a team, we are greater than the sum of our parts. Our success, this year and always, is due to our customers and the trust placed in our products and in us to deliver the Ultimate Bearing Experience! We now move ahead – together into 2023 - with the hope of even-brighter days to come.

And when everyone comes together, it is a wonderful sight to see. It is said that the most precious gift you can give is time...when you give your time, you give a little of yourself and a part of your life to someone else. This is especially true during the holiday season. I am so proud of NTN staff members who have volunteered to help others in our community by collecting a wide range of donations, from clothing to food items for local charities such

as Haven Toronto and the Dixie Bloor Neighbourhood Centre to help bring comfort to those in need. From holiday lunches to clothing drives, these initiatives are made possible by our staff members and industry partners. With their driving force, they gathered great teams of enthusiastic volunteers consisting of employees and distributor colleagues, to make these events a spectacular success and in so doing, bring lots of joy to those less fortunate in our communities.

As we look to close 2022 and prepare for 2023, we look forward to the opportunity for growth into the future, the opportunity to collaborate with each other as we work to get better every day, and the hope that the best is yet to come. From our family to yours, we hope you have a wonderful and safe Holiday season! I would also like leave you with this holiday greeting.

Whatever is beautiful. Whatever is meaningful. Whatever brings you happiness. May it be yours this holiday season and throughout the coming year. Happy Holidays, Merry Christmas!



Handwritten signature of Paul Meo.

**Paul Meo**  
**President & CEO**  
**NTN Bearing Corporation of Canada**



# From our family to yours



## **RYOTARO KITA, Global Coordination - Assistant to President**

Whatever your holiday plans or wherever you may be, I wish you all a safe and relaxing time spent with your beloved ones. May you have a very Merry Christmas and a happy new year!



## **ANDREW GIDGE, Vice President of Manufacturing**

As we say good-bye to 2022, I would like to express my gratitude to each of you for your tremendous efforts and dedication during this past year. Wishing you and your loved ones love much happiness this Holiday Season and a Happy New year!



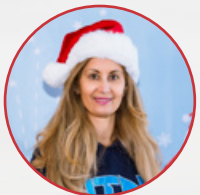
## **SYLVIA SILVEIRA, Vice President, Human Resources & Operations**

May the warmth of your loved ones keep you safe and sound this Holiday Season. Let there be HEALTH, HAPPINESS, PEACE and PROSPERITY in your HOMES! From my family to yours we wish you all a Merry Christmas and a Prosperous New 2023!



## **PHIL SCHMIDTS, Director of Aftermarket Sales**

On behalf of the Aftermarket sales department, I want to wish every Canadian employee a joyous holiday season and thank them for their unwavering dedication to help deliver UBE to our customers while giving back to the communities we live and work in.



## **RITA PAYNE, Director of Marketing & Communications**

As we come to the end of the year, our marketing team would like to wish you a holiday season filled with joy and special moments with friends and family. We hope you have a good rest during your time off, and return next year with renewed energy. Merry Christmas and Happy Holidays to you all! Wishing a new year full of happiness, health and continued success!



## **MARCUS WICKERT, Director of Engineering**

As we approach my 30th Christmas with the NTN family, it is time for us to celebrate our accomplishments, relax and enjoy some down time. Thank you for your support and I send you all my best wishes during this Joyous season and in the New Year.



# Wishing you happy holidays



## **JOE KOSICHEK, Director - UBE Engineering TRIAGE**

My wish for the Holidays: We find those precious moments where we can relax and enjoy the company of the people we dearly love, so we can start the new year refreshed and ready to tackle anything! Happy Holidays Everyone!



## **PETER VORVIS, Sales Manager, Industrial OEM Linear and Automation**

This is a special time of year for us to reflect, and count our blessings. "Thank you" for all your kindness and support, particularly during these unusual times. My Warmest Greetings to you and your families for the Holiday Season.



## **CHRIS REMPEL, Engineering Manager**

Wishing health and happiness to our clients and colleagues over the holiday season. Hoping everyone can disconnect from their daily stresses and enjoy time with loved ones. All the best in 2023!



## **MARIO BORSELLA, Manager, Field Service Engineering Group**

Let's take this time to reflect upon the importance of family and friends. I wish everyone a safe and happy holiday. Merry Christmas and Happy New Year.



## **DEBORAH SMYTH, Human Resources Manager, NTN Bearing Manufacturing Canada**

I would like to wish all our employees and their families a Merry Christmas and enjoyable holiday season spent with loved ones. Thank you so much for your hard work, dedication and perseverance this past year. I wish you all good health, happiness, and prosperity for 2023.



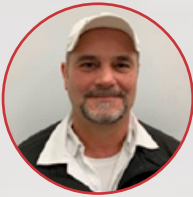


# And a wonderful New Year!



**JOHN KASUNIC, AOE Sales and Engineering Manager**

I want to thank my colleagues at NTN for a great year. We've had many successes in a difficult time I see a bright future for the AOE team and NTN Canada! Merry Christmas everyone.



**YMER DUSHAJ, Production Manager**

On behalf of the Production Team at CMF I would like to wish everyone Happy Holidays! Merry Christmas and a very Happy New Year! All the best to you and your families in 2023!



**CHRISTIAN OTEIZA, Executive Project Manager / Assistant to President & CEO**

As the holiday season is upon us, we find ourselves reflecting on the past year and those who have helped to shape our life. It's been quite a year for us all! I hope that this year has been memorable for you and your loved ones. I look forward to working with you in the years to come.



**ROSEMARIE YAU, Environmental Health and Safety Manager**

I am honored to join the great family of NTN Canada in July this year. As we have accomplished a lot in the areas of compliance; wishing everyone and your family a very healthy and peaceful holidays, that we are refreshed and energized for the greater adventures with friends and colleagues @ NTN in the new year.



**AIDA JANKOVIC, Payroll and Benefits Manager**

Whatever your holiday plans may be, I wish you all a safe and relaxing time spent with those nearest and dearest to you. May you have a very Merry Christmas and a Happy New Year!



# NTN's ULTAGE<sup>®</sup> SAFD Bearing Units Double Bearing Life on Dust Removal Fans

A major producer of hot briquetted iron was experiencing insufficient bearing life on the dust removal fans used in its bag house. The company experienced multiple failures annually, with each failure costing them over \$60,000. In total, the frequent failures were resulting in an annual cost of nearly \$900,000 to maintain production.

NTN's Engineering and Sales support team ran a comprehensive diagnosis of the fans and discovered the competitor's bearings were failing due to housing fracture and bearing seizure as a result of the application conditions.

## The NTN Solution

NTN's team of experts recommended ULTAGE SAFD bearing units as a replacement for the competitor's bearings. ULTAGE SAFD bearing units have ductile iron housings which have been proven to better withstand the high impact loads expected in this application. Additionally, NTN's team recommended that the lubrication be switched from grease to oil to reduce rotational friction and heat, thus further extending replacement intervals.

## The Result

NTN's ULTAGE SAFD bearing units lasted for nine months, giving them double the life of the bearings previously used in the application! The increased uptime, decrease in annual maintenance, and the reduced acquisition cost resulted in \$438,400 in annual cost savings for the customer.



## VALUE ADDED BREAKDOWN

UPTIME IMPROVEMENT

**\$384,000**

MAINTENANCE REDUCTION

**\$42,667**

REDUCED ACQUISITION COST

**\$11,733**

DOCUMENTED COST SAVINGS

**\$438,400**

**ANNUALIZED COST SAVINGS**  
**\$438,400**





# ULTAGE®

## SAFD PREMIUM BEARING UNITS FEATURES & BENEFITS



- Premium ductile iron housing to withstand high impact and extreme low temperature range
- Serialized cap and base eliminate risk of mismatching components during installation, ensuring superior fit
- Lubrication access points - plumb virtually any grease or oil system into the housing without costly modifications
- Integrated flat spots for vibration and temperature monitoring
- Grade 8 bolts provide superior strength to keep the cap and base secure
- Exact machined ISO G7 tolerances with wide bearing seat to accommodate 22200 and 23200 series bearing inserts offers greater flexibility
- Hardened steel ball allowing for quick and easy removal of the cap during inspections and general maintenance
- Unique X-support reinforced housing design delivers ultimate strength in the most demanding applications



## Beyond Bearings

Training. Installation Support. Trouble-shooting. And more.



### Technical Training Unit

On-site, mobile training unit offering specialized, hands-on instruction from NTN engineers



### Product Training School

Three days of in-depth instruction from NTN engineers at headquarters ([go.ntnamericas.com/trainingschool](http://go.ntnamericas.com/trainingschool))



### eKnowledge

WEB-BASED TRAINING PROGRAM

Six online product training modules covering different bearing types and nomenclature ([www.ntnamericas.com/eknowledge](http://www.ntnamericas.com/eknowledge))



### NTN Bearing Finder

Customizable search tool featuring exhaustive data sets, comprehensive part interchanges and interactive CAD drawings ([bearingfinder.ntnamericas.com](http://bearingfinder.ntnamericas.com))

# NTN



## Let's keep them warm at Christmas



### NTN AND CANADIAN BEARINGS ANNOUNCE HAPPIER SMILES “KEEP THEM WARM AT CHRISTMAS” CAMPAIGN IN SUPPORT OF HAVEN TORONTO

NTN Bearing Corporation of Canada and Canadian Bearings Limited are proud to announce their “Happier Smiles” holiday giving campaign in support of Haven Toronto, the only organization in Canada focused on serving elder homeless men.

The companies partnered together to distribute warm clothing and food items at Haven Toronto on Thursday December 15th. Volunteers from both companies also helped cook and serve a delicious holiday meal at Haven Toronto’s drop in center where elder socially isolated men come to feel safe, form friendships, and become part of a community.

The companies were thrilled and humbled to be part of this initiative to support those in need and are thankful for the truly amazing work of everyone who has rallied around this cause. Our combined NTN and CB volunteer groups collected over 5 pallets of used men’s clothing, winter

coats, hats, socks, mittens, scarves and boots, which were packaged and given to help the homeless stay warm this holiday season and beyond.

As poverty and homelessness grow in the province, the Haven Toronto drop in center is seeing more and more new faces. In August 2022, new clients increased by 152% compared to the same time period pre-pandemic as more people were impacted by poverty, homelessness and isolation.

“Haven Toronto is such an incredible organization because of their commitment to the elderly in our community,” said Joao Ricciarelli, President, Canadian Bearings Ltd. “Canadian Bearings is committed to giving back to the Toronto communities we serve, and we know it is more critical than ever that we work to make a





difference in the lives of those in need as many continue to be impacted by the pandemic. We are very proud to be involved with this drive to provide some material comforts and a hot lunch to those in need at Haven Toronto."



"NTN is committed to making a positive impact in our local communities through our Community Spirit program Happier Smiles, Happier Faces," says Paul Meo, NTN Canada. "Our goal was to create a great bonding experience participants will remember and donate as much warm clothing as possible for the elderly at Haven Toronto who really need our help during these very stressful times."

Open every day all year, Haven Toronto provides clients with healthy meals; showers and personal grooming products; laundry facilities; and access to an Emergency Clothing Room. Haven Toronto serves, on average, 400 clients a day and thousands of clients annually. For 89 years now, the charity has helped reduce barriers to health care, housing and food security for some of the most vulnerable people in the community. Every support that Haven Toronto provides is made possible by donations at [www.haventoronto.ca](http://www.haventoronto.ca).



# NTN Receives Bearings Specialist Association Award for KIZEI® Spherical Roller Bearing

NTN won the Bearing Manufacturer Excellence of Innovation in Product Design Award from the Bearings Specialists Association in recognition of the KIZEI spherical roller bearing product line. The award recognizes companies for innovation and excellence in product design or technology.



The unique design of KIZEI spherical roller bearings incorporates the metallic shields with the bearing retainer to form a one-piece protective barrier to keep contaminants out. Additionally, the metallic shields improve grease retention which helps improve bearing life.

In addition to the integration of the metallic shields into the design, KIZEI products also maintain the new standards set forth by

NTN's ULTAGE® spherical roller bearings. Featuring the industry's highest speed and load ratings, as well as wide operating temperatures, ULTAGE is the newest generation of high-performance bearings from NTN and is the new standard in its spherical roller bearing offering.

Furthermore, KIZEI products come in standard ISO dimensions, ensuring interchangeability with 22200 series spherical roller bearings. Unlike the larger sealed spherical roller bearing models that require special tools & accessories for installation, KIZEI utilizes the same mechanisms used with standard open bearings – housing, accessories, mounting, grease, etc. – reducing maintenance costs.



**[KIZEI]®**



NTN's KIZEI spherical roller bearings have been proven to provide superior performance in demanding industries such as mining, metals manufacturing, wood processing, aggregate, cement, infrastructure, and construction.

Additional information on KIZEI spherical roller bearings can be found on HYPERLINK "<https://bearingfinder.ntnamericas.com/>" Bearing Finder. Designed to aid distributors, design engineers, and end users in finding the perfect bearing or related product to use in any application, Bearing Finder is hosted on a proprietary platform that offers a customizable part search tool, interactive and downloadable CAD illustrations, comprehensive part interchanges, and exhaustive data sets.

**To learn more about KIZEI shielded spherical roller bearings, please contact your NTN sales representative.**



## NTN IS PROUD TO SUPPORT THE DIXIE BLOOR NEIGHBOURHOOD CENTER'S



### 2022 Family Sponsorship Campaign



The staff at NTN Bearing Corporation of Canada partnered with the Dixie Bloor Neighbourhood Centre (DBNC) to provide Christmas for less fortunate families in Mississauga. DBNC's annual Family Sponsorship Campaign aims to bring a little joy during the holidays for families who are newcomers and/or lower income. NTN Canada is proud to

contribute to this amazing initiative for the 10th year in a row as Christmas can be a very stressful time for families on fixed or low incomes.

The Dixie-Bloor neighbourhood is one of the areas where Mississauga's low-income and impoverished residents live. Through the Christmas Sponsorship Program, NTN sponsored 6 families and raised \$4,000 which was used to purchase toys, books, household items, boots and warm clothing. By sponsoring families in the DBNC program this holiday season, NTN employees were able to make their Christmas shine brighter and help give kids a Christmas morning they otherwise may not have.

We thank our NTN donors for their contributions. Your generosity will provide hope and dignity, and an improved quality of life to those in need.





# NTN Canada Participates in E-Waste Recycling Drive

Over two weeks in November, NTN employees brought in old laptops, desktops, TVs, CRTs, LCDs, printers and other office electronics for an electronics recycling drive. Recycling electronics is incredibly important as many tech products contain materials that can be either separated, refined, or reused. Proper e-waste recycling helps keep local communities and the rest of the world cleaner.

NTN Canada partnered with COM2 Recycling Solutions to recycle all collected e-waste during our volunteer-led campaign. COM2 Recycling's process involved breaking the electronics into parts, and then further separating all materials. Glass, plastics, and sought-after metals – such as aluminum and copper – were processed and put back into the manufacturing stream. Other components, such as circuit boards and hard drives, were destroyed and shredded.



## DID YOU KNOW?

**E-waste contains hundreds of substances of which many are toxic, lead, arsenic, cadmium, selenium, chromium & flame retardants?**

NTN employees are proud to have filled four pallets with old computers and electronics, representing hundreds of pounds of equipment saved from a landfill. As a technology company, we recognize our responsibility to be prudent when it comes to these resources, and we're proud to do our part in helping the environment.

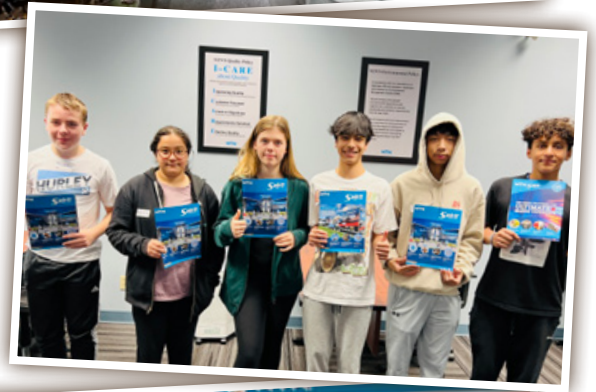


## BRING YOUR CHILD TO WORK DAY 2022

On November 2, NTN Canada celebrated “Take Your Child to Work” day welcoming a group of Grade 9 students to our offices. Our student guests had the opportunity to enjoy a variety of events and presentations, along with a tour of our manufacturing facility. The goal of the event was to provide a forum for employees’ children to better understand where their parents work and the significance and importance of their jobs to the customers we serve. It was also an opportunity for career exploration for the children and a chance to experience a day out in the “real world”.

The hours flew by and at the end of the day, many of the students not only had a great positive shared experience with their parents and co-workers, but also an opportunity to build new relationships with each other. Many of the kids and parents expressed their appreciation for the hard work that the NTN Canada staff put into making this a wonderful day and are hoping to do the event again next year.

Sharing our team culture, our focus on fun, and our passion for “Delivering the Ultimate Bearing Experience” is always a delight, especially when it builds a connection to the future!







## Screw-Driven Actuators

Screw-driven actuators are available in ball screw or trapezoidal/acme types. Ball screws have recirculating tubes or paths that allow the balls to loop back to the beginning of the ball nut. Trapezoidal screws are a plain thread in frictional contact with a brass or plastic nut. They are lower cost but not as popular as ball screws or belt drives due to the frictional wear and resulting loss of accuracy over time that occurs much more rapidly than the two drive types we are focusing on. Trapezoidal screws can be self-locking therefore, no brake is needed to hold the load. Vertical applications should have brakes no matter what screw type is used because machine vibration can cause an acme screw to creep.

Ball screw drives are accurate, repeatable and very efficient, making them capable of applying high force with a relatively small motor and no gearbox. This is due to the rolling friction efficiency of the bearing balls in the nut and the fact that the nut is essentially a gearbox in itself with optional thread pitches (ratios). Not a show-stopping limitation usually, but, screw drives also offer a slender, inline form factor compared to the right-angle projection required from a belt drive motor and gearbox that usually results in much more machine mounting real estate being consumed.

## Modular Linear Actuator Comparison: Toothed Belt vs. Screw Driven

Modular actuators are available in four basic drive types. Three of the four produce the desired movement by converting rotary motion into linear travel. We will be discussing and comparing the two most popular of the four drive types - belt drives and ball screw drives. The pros and cons of each typically allow the customer, integrator, distributor, or manufacturer to quickly arrive at a selection for the actuator along with other factors such as guidance.



Screw drive



Screw drive

Ball screws also have their own limitations and downsides. Their length and speed is limited due to whipping deflection of the screw at higher speeds. Some manufacturers like NTN-SNR offer unique, mid-stroke, traveling supports to prevent this problem. However, the critical speed limitation cannot be overcome. A steeper pitch is needed but still cannot match the speeds that belt actuators can reach. Belt drive systems typically require relubrication of the guidance system but the belt is maintenance-free in comparison to lubrication requirements of the ball nut. Ball nut failures due to lack of this maintenance are costly and result in large amounts of machine downtime, particularly if the screw is damaged as well. Belts are low cost to keep a spare on the shelf and changing the belt out is not as involved as a ball screw.

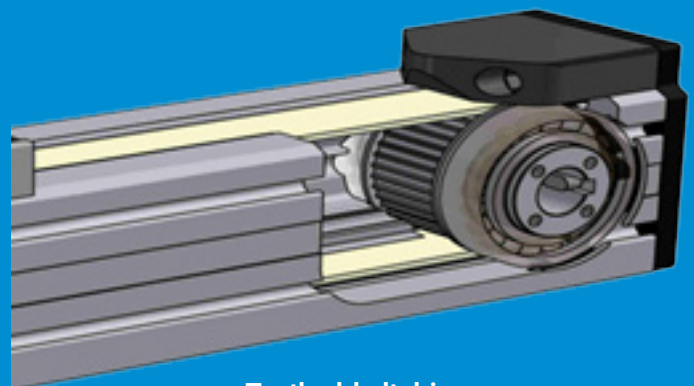
## Toothed-Belt Drive Actuators

The belts used in modular actuators have teeth on the inside for positive driving of the traveling carriage without slippage by the use of toothed pulleys with rotary ball bearings. This ensures the carriage (and load) travel to the intended position commanded by the controller and prevents the carriage from drifting downward if it is oriented vertically. The belts are able to be tightened to a tension level high enough that there is no further stretch of the belt which can cause problems in the smoothness and accuracy of the motion and positioning. This rigid tensioning is due to steel or Kevlar cords



inside the belt. Belt drives can travel very fast, have long travel capability and are maintenance free - until they break that is. And if, or when, that occurs, the cost of a belt is a fraction of that of a ball screw drive.

Belt drives seem the ideal solution but they have some disadvantages when compared to ball screws. They are not as accurate or repeatable and they do not have high stiffness or the ability to be "preloaded" in the traditional sense. This means they also cannot apply or resist rigid force as a ball screw can. A belt drive often requires a gear box as both a speed reducer and torque booster to be able to match the inertia of the of motor and load. This prevents the need to far oversize the motor.



Toothed-belt drive



# NTN WINTER FESTIVE RAVE

*On November 26, NTN Canada held its annual Holiday Celebration for employees. Staff enjoyed some fun on the dance floor as part of NTN's retro 50s, 60s and 70s party theme. Our photo booth captured some of the memorable outfits worn by our guests!*





# NTN CHILDREN'S HOLIDAY PARTY

*On Dec 11, NTN Canada hosted a special Children's Holiday Celebration. The event included lunch, games, a photo booth with Santa, holiday-decorating stations, amazing holiday treats and pony rides! Our young guests radiated happiness as they received new toys and enjoyed special time with Santa.*





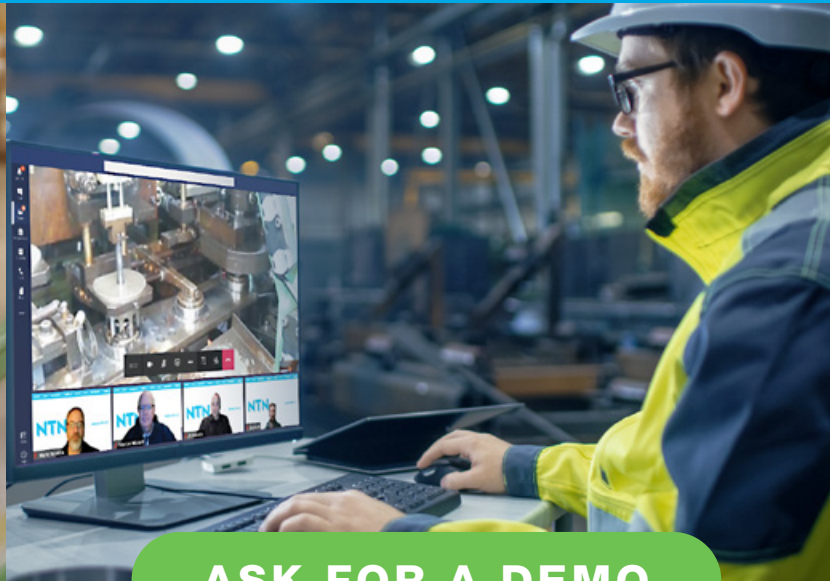


## NTN Canada Hours Schedule

Please take note of our holiday hours in order for us to continue to be of service to you.

We thank you for your business.

Friday	December 23	2022	8 am - 12:30 pm
Monday	December 26	2022	Closed
Tuesday	December 27	2022	Closed
Wednesday	December 28	2022	8 am - 7 pm
Thursday	December 29	2022	8 am - 7 pm
Friday	December 30	2022	8 am - 12:30 pm



**ASK FOR A DEMO**

# NTN TRIAGE Engineering Solutions Powered by INSYNC Remote Diagnostics



NTN CANADA  
**trriage**



**INSYNC**



**FASTER DECISION MAKING:**

Access to NTN's engineering expertise anywhere around the world 24/7 to enable faster decision making and bearing analysis.



**INCREASED SAFETY:**

Remote collaboration enables fewer personnel in the operational environment for increased workplace safety.



**INCREASED EFFICIENCY:**

Carry out bearing maintenance quicker and more cost effectively. NTN's TRIAGE Engineering Solutions powered by INSYNC Remote Diagnostics ensures any bearing maintenance issue can be fixed as efficiently as possible.



**LOWER ENVIRONMENTAL IMPACT:**

Environmentally-friendly products that include energy-saving bearings & recyclable components to reduce carbon footprint.



**Stay Connected**