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CKA Birla Group |

nbc[®]

**TAKE YOUR
PRODUCTIVITY TO
A NEW LEVEL!**



Bearings for Agriculture Applications

WHO IS
NBC



Founded in 1946, NBC is India's first bearings manufacturer and the last word in quality and durability. In 2020, the company acquired leading European manufacturer, Kinex Bearings to further boost its expertise.

75 years since its beginning, NBC remains India's leading bearings manufacturer and exporter. NBC is also the world's only bearings manufacturer to receive the prestigious Deming Grand Prize for Total Quality Management.



1946 India's
first bearing
manufacturer



250+ million
bearings
manufactured/
annum



3100+ variants
of bearings
offered



5 manufacturing
locations



Leading
exporter



Happy customers
in 30+ countries



R&D and
Innovation
Centre



2800+People



Automotive



Industrial



Railway



Aerospace

Bearings for Tractors, Farming implements and Agricultural machinery

Agricultural tractors and heavy-duty machinery must withstand harsh operating conditions. The presence of high humidity, impact loads, heavy soils, dust ingress, plant remnants, and saps often take a toll on the machinery and lead to high maintenance costs. Moreover, a sudden increase in rotating speeds and a need for high-performance capacity lead to high mechanical stresses on drive and power transmissions.

The tractor's performance is gauged by its ability to perform under the above-mentioned challenging environment, and a bearing plays a pivotal role here as it:

- Reduces the friction between the wheels
- Keeps the wheels balanced to avoid inevitable changes in speed
- Enhance smoothness to the ride with minimum noise
- Enhance the longevity of the vehicle



NBC is one of the significant bearings suppliers and offers standard bearings & application-specific solutions for tractors, combines, and farming implements.

Major bearing application areas:

Tractors:

- Transaxle
- Rear Axle
- Front Axle
- Engine

Farming implements:

- Rotavator • Cultivator • Harrow • Plough • Trailer • Roto Seed • Drill • Baler
- Planter • Sprayer • Straw Reaper

Machinery

- Combine Harvester

COMPREHENSIVE SOLUTIONS FOR AUTOMOTIVE INDUSTRY



UNITISED TAPERED
ROLLER BEARINGS



UNITISED TAPERED
ROLLER BEARINGS 2



DOUBLE ROW
ANGULAR CONTACT
GEN 1



GEN 2 WHEEL HUB
BEARINGS



CLUTCH RELEASE
BEARINGS



NEEDLE ROLLER
BEARINGS



PRE-SET HUB
BEARINGS



WATER PUMP
BEARINGS



TAPERED ROLLER
BEARINGS



CYLINDRICAL ROLLER
BEARINGS



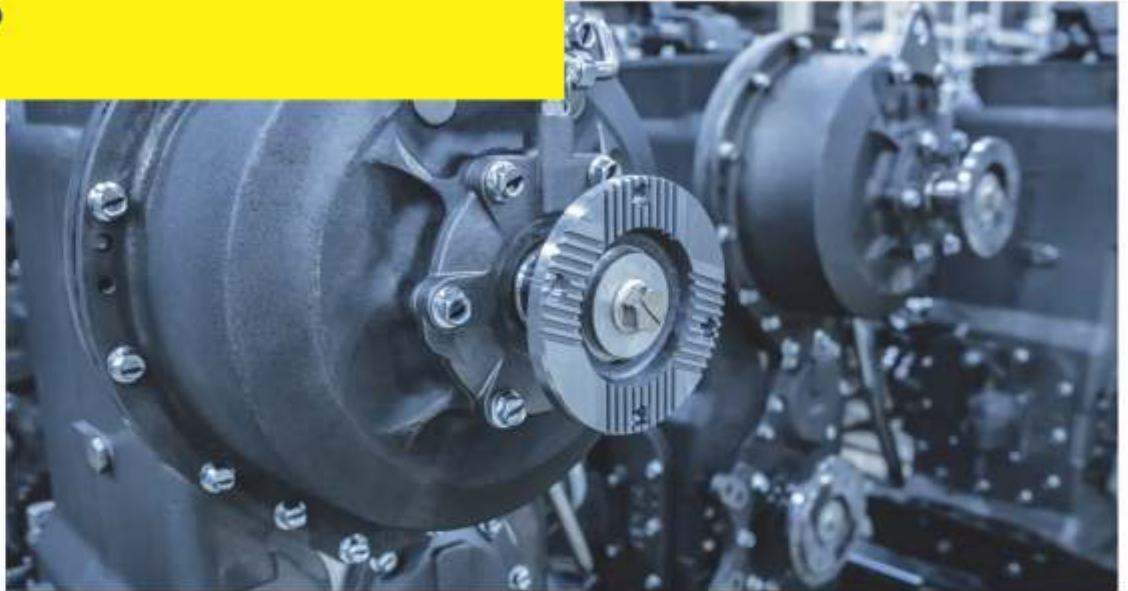
DEEP GROOVE
BALL BEARINGS



PINION BEARINGS



POWER DENSE - Special heat treatment,
Integrated solutions



Transaxle

A mechanical component, the transaxle combines the function of an automobile's transmission, differential, and axle into a unified assembly. The primary function of a transaxle is to transfer engine power into forwarding motion. The crucial application areas of bearing in tractor transmission are creeper reduction, main gear reduction, range gear reduction, tail pinion shaft, and power take-off.

Critical application demands of bearings:

- Cyclic bearing loads
- Contaminated operating conditions
- Less friction
- Higher Service life & reliability

NBC offers specific bearing solutions with:

- Extra capacity bearing in the same envelope with modification of geometry
- Special heat treatment for high temperatures and contaminated environments
- Power-dense solution for a high-load application
- Modified geometry for low friction
- Special designed bearings for high stiffness application
- ML (More Life) bearings for excellent performance in the field



Front Axle

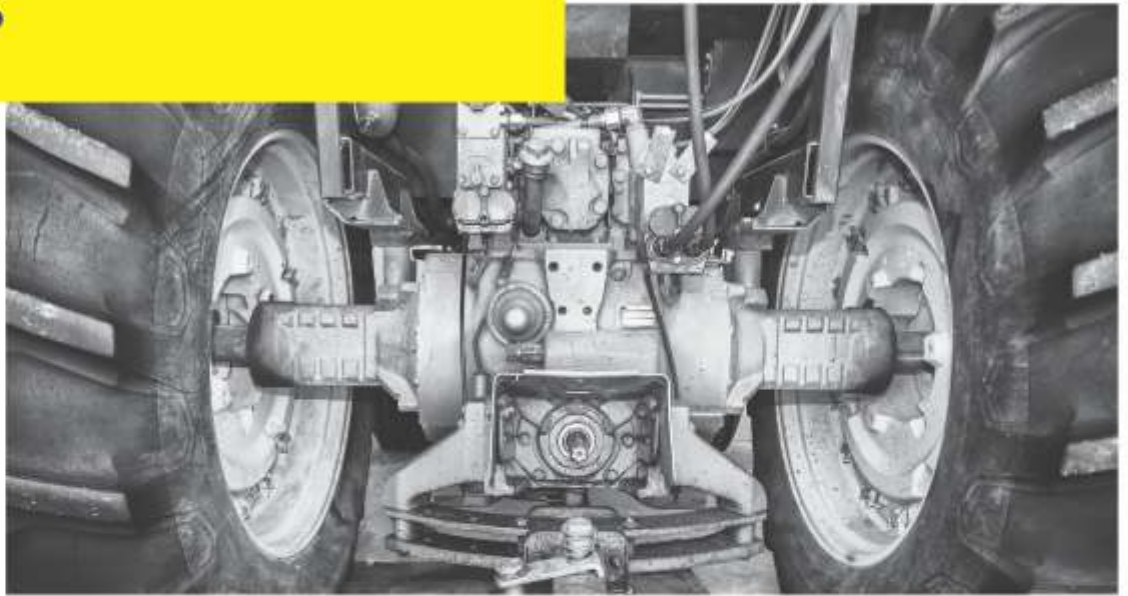
An essential part of the tractor, the front axle bears the total weight of the front part of the tractor and helps in the movement of agricultural machines by assisting with steering and processing shocks on uneven surfaces.

Critical application demands of bearings:

- Easy to assemble & dis-assemble
- Durability under a contaminated environment
- Longer service life
- Lesser & easy maintenance

NBC offers specific bearing solutions with:

- Extra Capacity Bearing in the same envelope with modified geometry
- Power Dense Solutions for high tonnage application
- Unitized Bearing Solution for compact assembly and ease of service
- Optimized design and heat treatment for increased durability and warranty target



Rear Axle

One of the crucial components present in the differential is the rear axle that transmits input power from the differential to the wheels. Furthermore, the rear axle also bears the torsional load and the self-weight of the tractor.

Critical application demands of bearings:

- High load-carrying capacity
- Lower friction & consistent tail pinion shaft preload retention
- Operation under severe contamination
- Cyclic loading
- More extended durability & service life

NBC offers specific bearing solutions with:

- Custom-made boundary dimensions
- High load carrying capacity
- Improved Internal geometry solution
- Fuel-efficient bearings for enhanced performance



Engine

NBC offers bearings for engine accessories such as hydraulic pump motors, tensioner pulleys, pulley bearings for alternator and water pumps, and flywheel bearings for high temperature & high-speed applications.

Critical application demands of bearings:

- High speed and continuous loading
- High operating temperatures and contamination
- Optimization of weight for an integrated solution
- Effective sealing and low torque requirement

NBC offers specific bearing solutions with:

- Application-specific design with a special focus on bearing cage, internal geometry, and sealing
- Sealing configuration optimization for low torque and contaminated environment
- Stabilization heat treatment for high-temperature application
- Advanced heat treatment for meeting durability and warranty targets

FARMING IMPLEMENTS



Tractor implements are key add-ons to the tractor to make it multifunctional. NBC offers bearings for various agricultural implements such as Rotary Tillers, Power Harrows, Power Cutters, Loaders, Transplanter, Baler, Rotavator, Cultivator, Harrow, Plough, Trailer, Roto Seeds, Drill, Planter, Sprayer and Straw Reapers.

Critical application demands of bearings:

- Shock load-carrying capacity
- Durability under a contaminated environment
- Minimum maintenance
- Cost-effectiveness

NBC offers specific bearing solutions with:

- Maintenance-free solutions greased-for-life bearings for wheel application
- Low torque solutions for higher efficiency
- Integrated solutions for implements like tillage disc
- Oil impregnated bearing



Combine Harvester

A combine harvester, a complex machine, is a vital tool in farming for threshing, gathering, and winnowing. Bearings play a crucial role in operating throughout the functioning of the machine as it is present in harvesting, driving, threshing, separating, and chopping unit. Any unexpected damage to the bearing can lead to disruption of the entire operation of the equipment.

Critical application demands of bearings:

- Massive radial load
- Contamination like debris, dirt, and water
- Higher resistance to massive radial load and solid impact
- Resistance to high temperature

NBC offers specific bearing solutions with:

- Robust sealing solutions
- Power-dense solution for a high-load application
- Modified geometry for low friction
- Special designed bearings for high stiffness application
- ML (More Life) bearings for excellent performance in the field

NBC ADVANCED SOLUTIONS

SENSOR BEARINGS

NBC's Sensor Bearings are a special kind of bearings in which sensors are integrated within the bearing unit to measure critical parameters like Shaft Speed (RPM), the direction of rotation, and temperature. They are compact, reliable, simple, and ready to mount.



Features

- High speed, low torque and low noise bearing
- Integrated with sensor bearings to measure speed, temperature and direction of rotation

Benefits

- Compact & robust design yielding reliable results & ready to use
- On-board condition monitoring of system
- Hassle-free & integrated solution for EV OEM

OIL IMPREGNATED BEARINGS

Oil impregnated bearings composed of 70-80% of lubricating synthetic oil. Oil is moulded and solidified with polymer to form a casing which acts as a lubricant reservoir throughout bearing's life.



Features

- Superior lubricant – synthetic oil
- Lesser torque due to no churning phase
- Excellent performance in water and dusty environment

Benefits

- Long life and maintenance-free
- Higher operational reliability
- No re-lubrication needed

NBC ADVANCED SOLUTIONS

CRS (CONTROLLED COMPRESSIVE RESIDUAL STRESS) BEARINGS

The special proprietary process enhances the fatigue life of the bearing multiple times. Our unique surface treatment induces high residual compressive stress compared to conventional methods.



Features

- Introduced compressive residual stresses to enhance fatigue life
- Resistance to bending and higher radial load
- Improved surface texturing helps the lubricant retention

Benefits

- Higher operational reliability
- Higher performance and higher power density
- Improved lubricant effectiveness

BLACK OXIDE BEARING

The black oxide conversion treatment applied to the rings and rolling elements improves lubricant adhesion on the raceway, enhancing the bearing's performance by reducing smearing wear and micro pitting, especially during run-in periods.



Features

- Increased wear resistance during the initial running-in period
- Improved adhesion properties of the lubricant

Benefits

- Longer operating time
- Increased wear resistance

NBC ADVANCED SOLUTIONS

HCR- WEAR RESISTANT BEARINGS

Wear resistance coating on rolling elements helps avoid metal to metal contact in low film thickness and protects against adhesive and abrasive wear.



Features

- Optimized coating with metal-containing amorphous carbon with a multilamellar structure
- No columnar structure provides high adhesion strength
- High dimensional accuracies

Benefits

- Low coefficient of friction even in dry condition: Resistant to adhesive wear and micro pitting
- Enhanced fatigue life in insufficient lubrication condition
- Debris tolerance: removes dents created in the contaminated application

INSUOHM BEARING

Electrical insulation coating prevents electrical pitting in the bearings and hence improves bearing life in motor bearings.



Features

- Improves bearing's life in the electrical current passage
- High insulation resistance
- High dimensional stability after coating

Benefits

- Increased machine uptime
- Reduced overall operating costs
- Insulation over a wide range of operating temperatures

NBC ADVANCED SOLUTIONS

SLC (LOW CARBON STEEL) BEARING

NBC has developed an SLC bearing to enhance the life of these bearings. Special heat treatment is given to the bearings made of low carbon steel, which develops a hard surface and tough core on the components.



Features

- Hard, wear/fatigue surface
- Tough, crack-resistant core
- Compressive residual stresses

Benefits

- Better performance under shock loads and misalignment
- Improved contamination resistance
- Enhanced bearing life

HYBRID BALL BEARINGS

Hybrid bearing also known as anti-friction ball bearing consists of rolling element made of silicon nitride in place of steel. Silicon nitride rolling elements perform exceptionally well in high-speed operating conditions.



Features

- Lower friction
- Reduced weight
- Current insulation

Benefits

- High-speed capability
- Less wear under slippage
- Higher operational reliability

NBC ADVANCED SOLUTIONS

LOW TORQUE BEARING

Various studies show that only 13 to 15% of the energy is used to move the vehicle; the rest of the energy is lost due to mechanical and frictional losses. The low torque bearing technology reduces energy consumption by reducing torque in the bearing.



Features

- Optimization of bearing raceways curvature
- Effective sealing solution
- Modified cage geometry

Benefits

- Low carbon emissions
- Reduced heat loss and friction losses
- Enhanced fuel economy

OPTIMILE BEARING

The Optimile bearing has an extended life because of heat treatment processes, thereby improving the steel grain structure at the surface and core.



Features

- Improves the yield strength and rolling contact fatigue properties
- Offers better resistance to wear and seizure

Benefits

- Higher capacity of bearing within a given size (improved yield strength)
- Greatly extended bearing's life in a contaminated environment
- Downsizing possible, higher power density

NBC ADVANCED SOLUTIONS

MCS (MEDIUM CARBON STEEL) BEARING

In automotive applications, the bearings should be capable of taking shock-load in severe contaminated lubrication conditions. Medium Carbon Steel bearings offer optimal performance due to their modified intrinsic microstructure properties.



Features

- High amount of retained austenite and hardness after heat treatment
- Consists of carbides or/and carbonitrides
- Hard surface and tough core

Benefits

- Higher resistance to fractures and cracks
- Better performance in a contaminated environment

HIGH-SPEED ELECTRIC MOTOR BEARINGS

Electric Motor Bearings (EMB) are for high-speed applications where expectations are of lightweight, low friction, high transient ramp capability, high RPM, and low noise.



Features

- Lightweight cage design
- Optimized internal design
- Grease with noise suppression properties

Benefits

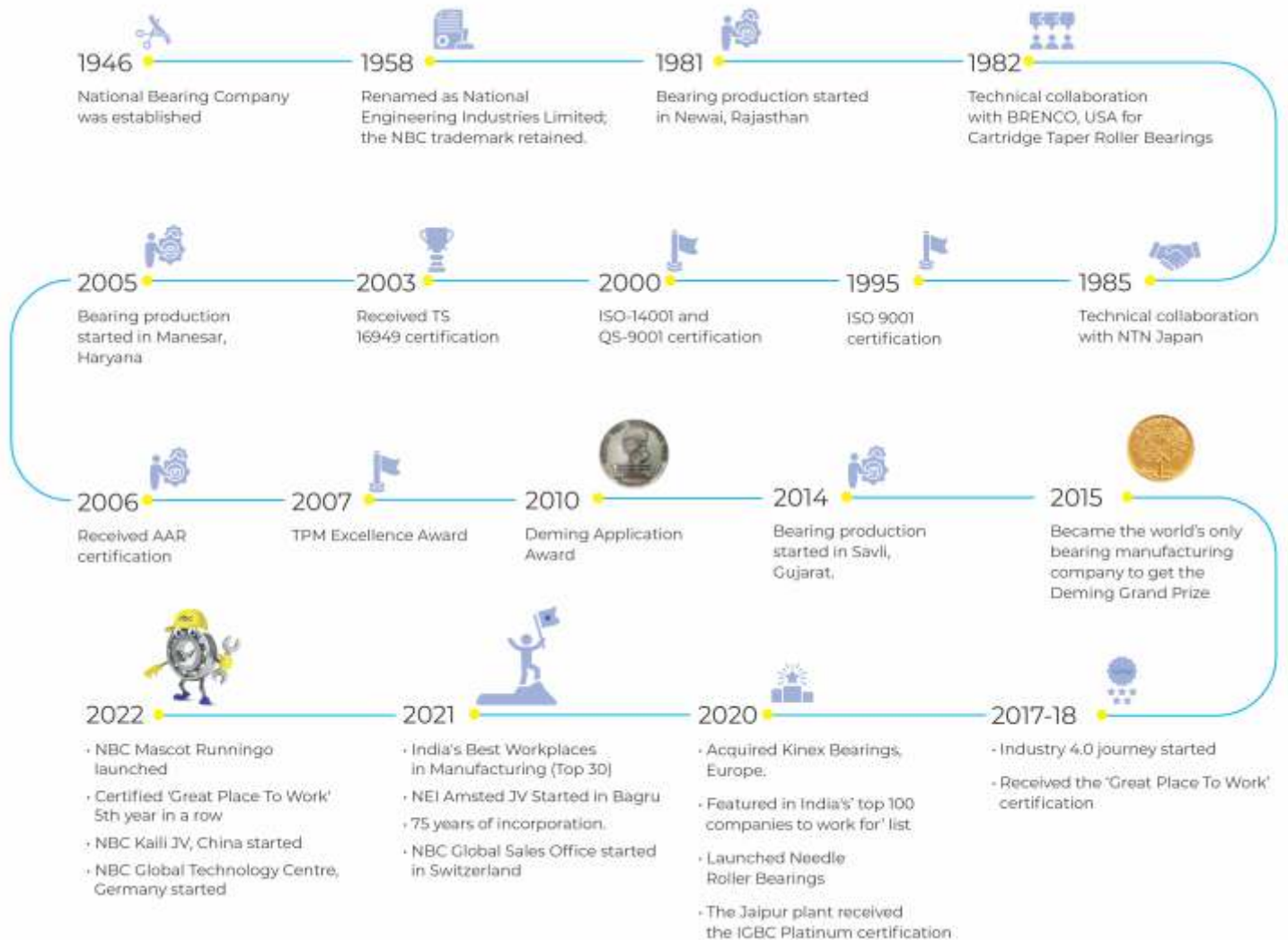
- High-speed stability
- Low noise
- Energy efficient bearing

OTHER PRODUCTS FROM NBC

Since the challenges faced by industries are many, NBC offers a diverse range of exceptional bearings. NBC bearings are available in sizes from 06 mm bore to 2000 mm outer diameter.



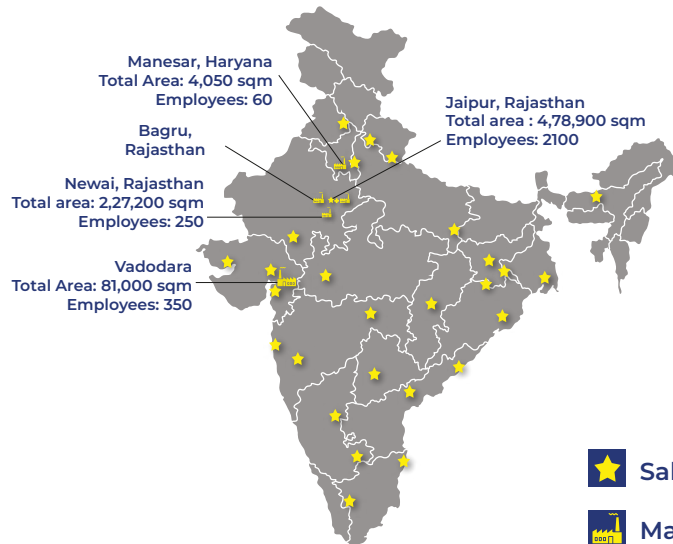
NBC MILESTONES



OUR GLOBAL REACH

The NBC Bearings: Product, Technology & Services

NBC provides a wide range of bearings and associated service solutions to diverse industries such as Industrial, Automotive, Railways, and Aerospace. As a company that has been established for over 75 years, NBC Bearings has an international presence with offices and R&D centers across the globe. For us, engineering goes beyond manufacturing; it is the fusion of Product, Technology, and Services that make us different and the most preferred choice of our customers worldwide.



Over 550 stockists and thousand of retailers across India



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