Intelligent In-wheel Unit

Axle Unit* that NTN proposes for next-generation electric vehicles (*consists of an in-wheel motor, an electric brake and a multi-axis load sensor)

Features

(1) Compact, lightweight in-wheel motor that combines a high-speed, high-efficiency, high-output motor and the world’s fastest cycloid decelerator with large load capacity;
(2) Increased fuel efficiency and driving safety.

Applications

• Electric vehicles, Hybrid vehicles, fuel cell vehicles

Construction

In-wheel motor
Electromechanical brake
Load sensor

Sensor information
Steering angle
Accelerator opening
Wheel speed (motor speed)
Driving power (motor current)
Braking power
Ground load
Cornering force

Vehicle controller
Motor control
Brake control
Steering angle control
Suspension control
Low Friction Hub Bearing

Improves vehicle fuel efficiency by reducing straight-line driving friction!

Features

(1) Use of a combined-groove curvature for the raceway
   Reduction of rolling friction while maintaining the same bearing durability as conventional type
(2) A reduced initial preload range
   Reduction of rolling friction
(3) Use of a low friction seal

Construction

-15% - 40%

Applications

- Wheel hub bearings for passenger cars
Improves advanced-vehicle safety control with the world’s most precise load measuring technology!

Features

(1) Able to detect ground-contact loads for the four wheels separately.
(2) Loads detectable at any time from the vehicle being stopped to traveling at a high speed.
(3) Three-axis (Fx, Fy, Fz) loads detectable with high accuracy (±5% FS).
   ⇒ Precise vehicle control through very accurate assessment of road conditions.
(4) Loads measured close to the tires (hub bearings).
   ⇒ Road condition changes detected in a response time of 0.05 sec.
   (conventionally, 0.2 sec.), which represents a difference of 4.2 m distance traveled at 100 km/hour.

Applications

Wheel hub bearings for passenger cars
  ● Vehicle stability control

Construction

Fx : Driving force, controlling force
Fy : Cornering force
Fz : Vertical force
Light and High Drive Shaft for Rear Wheel Drive Cars

Reduced weight and torque increase
the fuel efficiency and ride comfort of luxury cars!

Features (compared to conventional products)
(1) Lightweight: weight reduced by 16%.
(2) Highly efficient: torque loss reduced by 40%.

Applications
• Automotive drive shaft
  For use in the rear wheels of RWD and 4WD automobiles

Construction (comparison with conventional products)
• Balls with reduced diameter and a smaller and lighter inner ring, outer ring and cage;
• Lighter shaft with a thin-walled, hollow body;
• Optimally angled ball slots helps reduce frictional resistance occurring on balls in axially shifting motion, reducing heat generation.
Low Torque Thrust Needle Roller Bearing

Greater fuel economy, 50% less rotational torque than conventional products!

Features (comparison with conventional products)

(1) 50% reduction in bearing rotational torque
(2) Limited bearing temperature rise

Applications

- Transmission for gasoline-fuelled vehicles and hybrids

Construction

‘Fully crowned rollers’, arc-shaped in axial direction at outside cylindrical surface, are used.

Rollers contact the cage at the center of roller end surface where circumferential speed of roller is slow.

Smoothed outside diameter pocket surface of the cage
World’s Smallest Bore Hydrodynamic Bearing

Achieving the world’s smallest bore in a hydrodynamic bearing, thanks to a special grooving technique!

Features

(1) World’s smallest bore hydrodynamic bearing:
0.6 mm shaft diameter using precision repeatable performance of electrocasting

(2) Integration with plastic parts is possible:
Integral molding is made possible by plastic injection molding

(3) Quieter sound level and high reliability:
Rotational shaft is supported by hydrodynamic effect

Construction

Applications

• Fan motor for mobile equipment
Desktop Type Microscopic Coating Applicator

Ideal for the R&D or production of prototype/small-volume liquid crystal

Features

(1) Repair ink coating function
   1) Able to apply liquids such as a drug on the order of picoliters.
   2) Unique coating method using a needle eliminates nozzle clogging.

(2) Compact desktop size for easy operation
   1) Footprint occupied by the applicator is about a 30 cm square.
   2) Powered by 100 V AC.
   3) Easily operated with a mouse.

Applications

R&D or small-volume production of:
- Biological products and new drugs,
- Prototype electronic circuits (ICs), or
- Liquid materials such as conductive paste,
- Assembly of micro-machines and other microscopic components.
High Performance Large Type Gantry XY Table

Large type precision positioning drive unit attains light weight, high rigidity, and low cost Helps shorten setup time and reduce drive motor output!

Features

Function and performance responding to production equipment and inspection equipment for large type glass substrates etc. are realized.

- Light weight: 60% compared with conventional type (Upper-axis beam)
- High rigidity: 120% compared with conventional type (Upper-axis beam)
- Table traveling speed: 120% compared with conventional type (Max. speed: 2,000 mm/s)

Applications

- Making and inspecting flat panels;
- Making solar panels.