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MOTION & CONTROL TECHNOLOGY
NSK
NIPPON SEIKO

HIGH-INTEGRAL SEALS FOR WHEEL HUB BEARINGS

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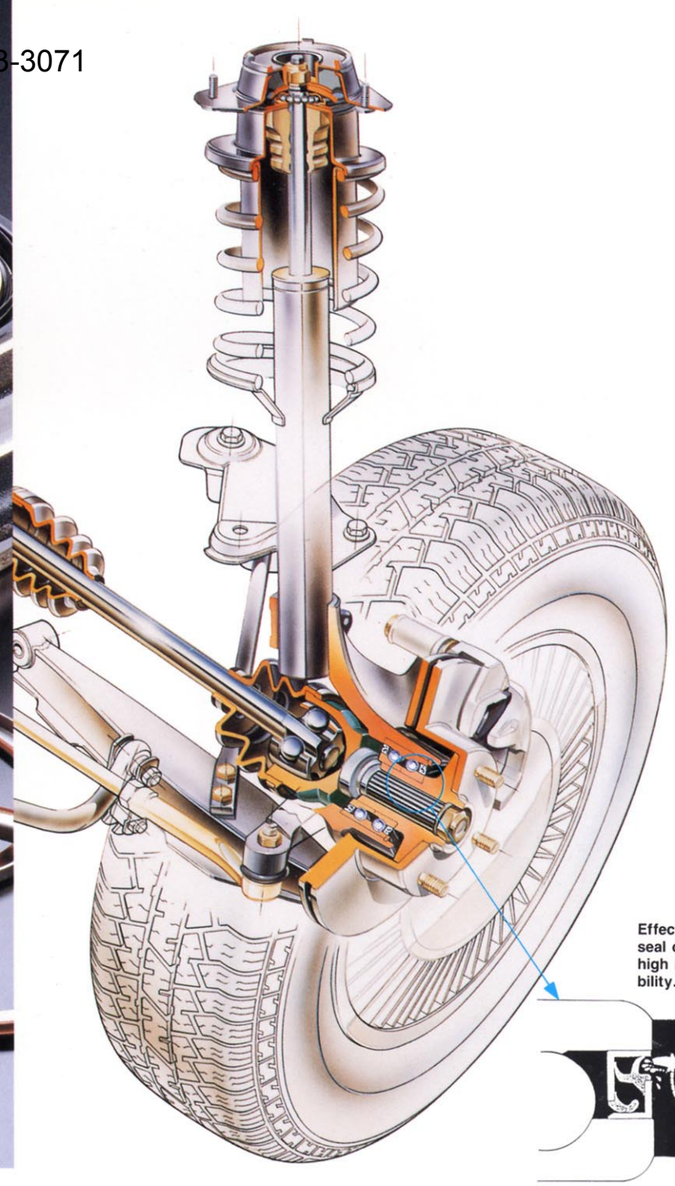
NSK HIGH-INTEGRAL SEALS

For modern automobiles, particularly passenger cars, maintenance-free wheel-hub unit bearings are now often used.

These integrated assemblies are factory-packed with grease and never require relubrication. In order to make this possible, their seals must be highly effective and reliable. This is particularly true of certain recreational vehicles designed for off-road service since they are often subjected to much mud and water.

Conventional seals usually consist of a combination of a slinger and external mud-water seal or a slinger plus a mud-water seal integrated into the bearing. Such a combination requires considerable space inside the hub and also adds weight and the cost of assembly. In addition, the performance of some combinations is marginal.

Many years ago, **NSK** recognized the importance of effective seals on bearing performance and life and began developing new more effective types. One result of this research is called "High-Integral Seals". Tests have proven that they are, not only impervious to mud and water, but also have low torque and long life.



Effective mud-water seal contributes to high bearing reliability.

FEATURES OF HIGH-INTEGRAL SEALS

1. **Small Size**
   Since the width is as small as 4mm, the size (and weight) of the hub assembly is smaller.
2. **Superior Mud and Water Resistance**
   Tests and driving experience prove that the mud and salt water resistance is two to ten times better than conventional seals (see Fig. 2).
3. **Superior Corrosion Resistance**
   The seal core material is stainless steel for corrosion resistance and improved reliability.
4. **Low Torque**
   The unique and patented design of the seal lips (see Fig. 1) results in less torque than most externally installed seals (see Fig. 3).
5. **Lower Cost of Wheel Hubs**
   The compact size and integration in the bearing allows greater hub design flexibility and eliminates the need to install an external seal and to grind the seal sliding surface.

Fig. 1 Design of High-Integral Seals

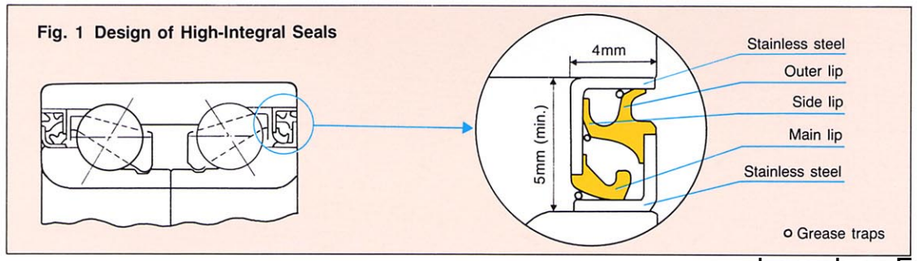


Fig. 2 Comparison of Turbid Water Resistance of High-Integral Seals and Other Popular Seals

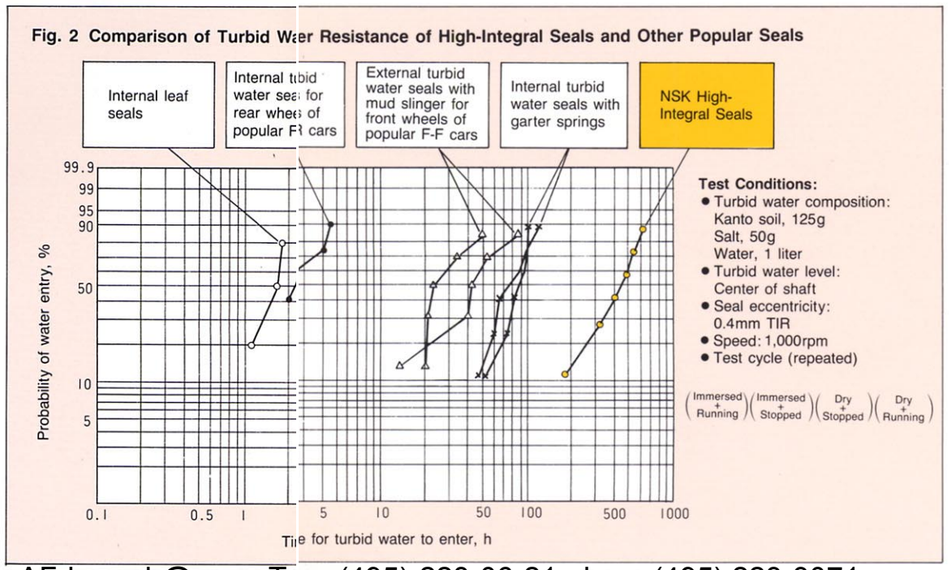
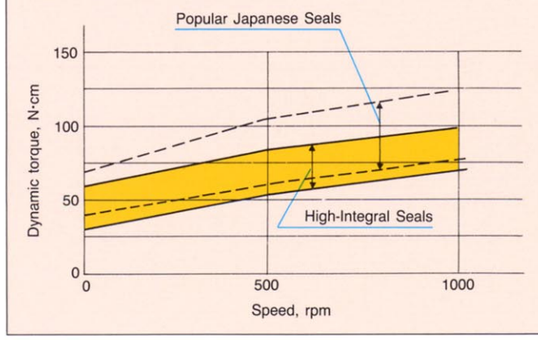


Fig. 3 Dynamic Torque Variation with Speed



* When inquiring about wheel-hub bearings with High-Integral Seals, please provide NSK with the following information:
- Bearing boundary dimensions
- Operating conditions (load, speed, temperature, etc.)
- Main dimensions of surrounding parts
- Fitting and assembly conditions
- Vehicle technical data (wheel offset, etc.)

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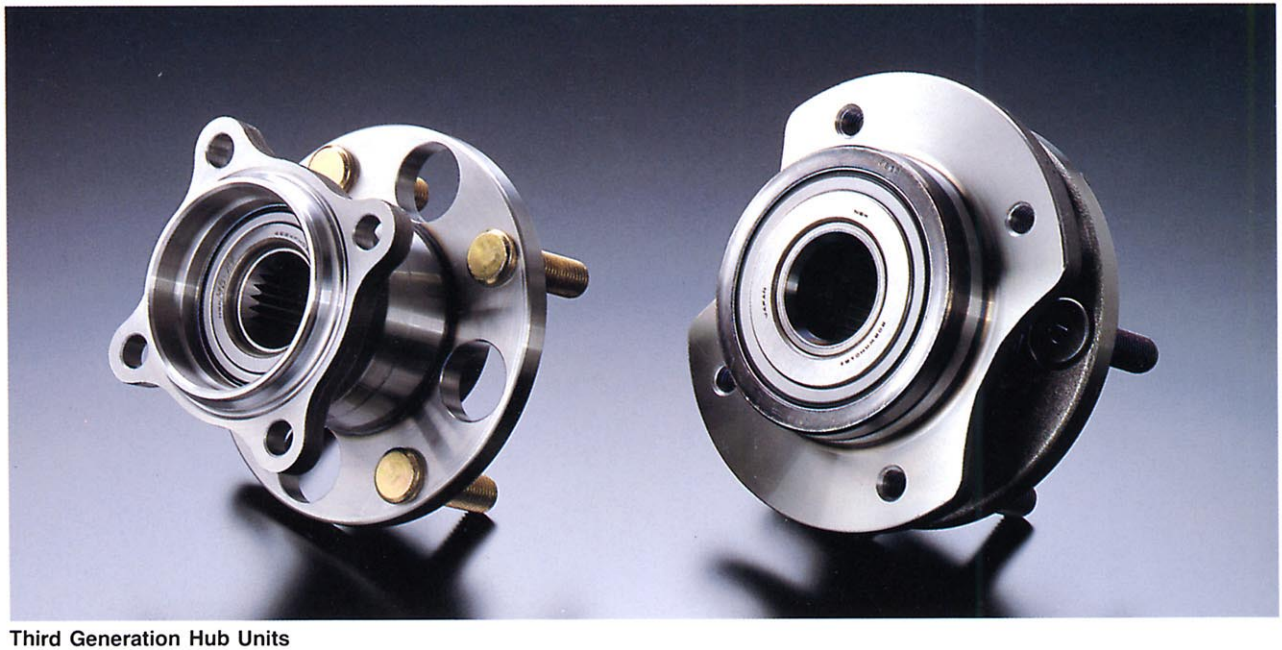
Examples of Wheel Hub Units with Built-In High-Integral Seals



Third Generation Hub Units

Second Generation Hub Units

First Generation Hub Units

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