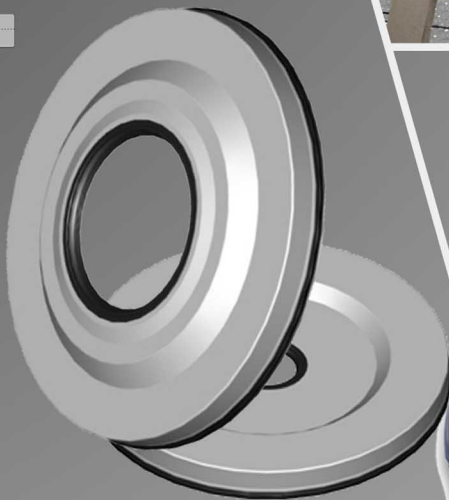
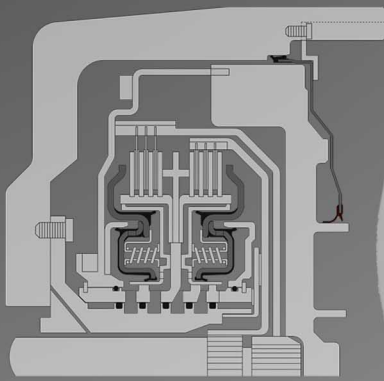
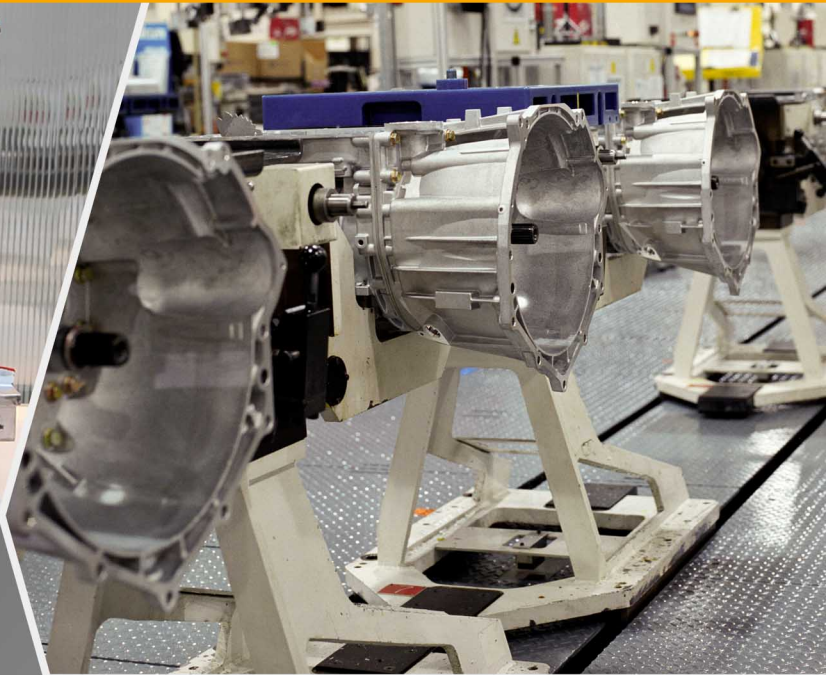
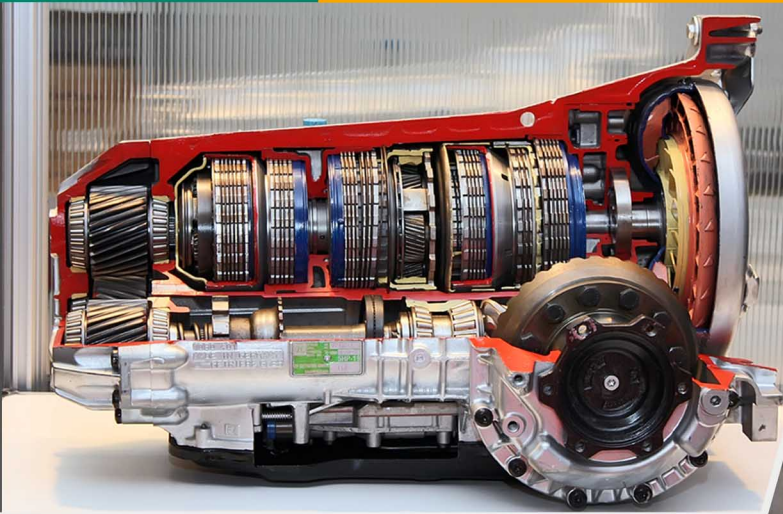




# Transmission Front Cover Seals





## ► Transmission Front Cover Seals

NAK offers a Transmission Front Cover Seal for the automotive applications to provide a better sealing function and also to protect the system from failure due to cross-contamination of the unit by ingress of oils or dust. A Transmission system is a critical component within the Powertrain and NAK implements its expertise achieved through decades of research and innovation in order to provide a better sealing function in all conditions.

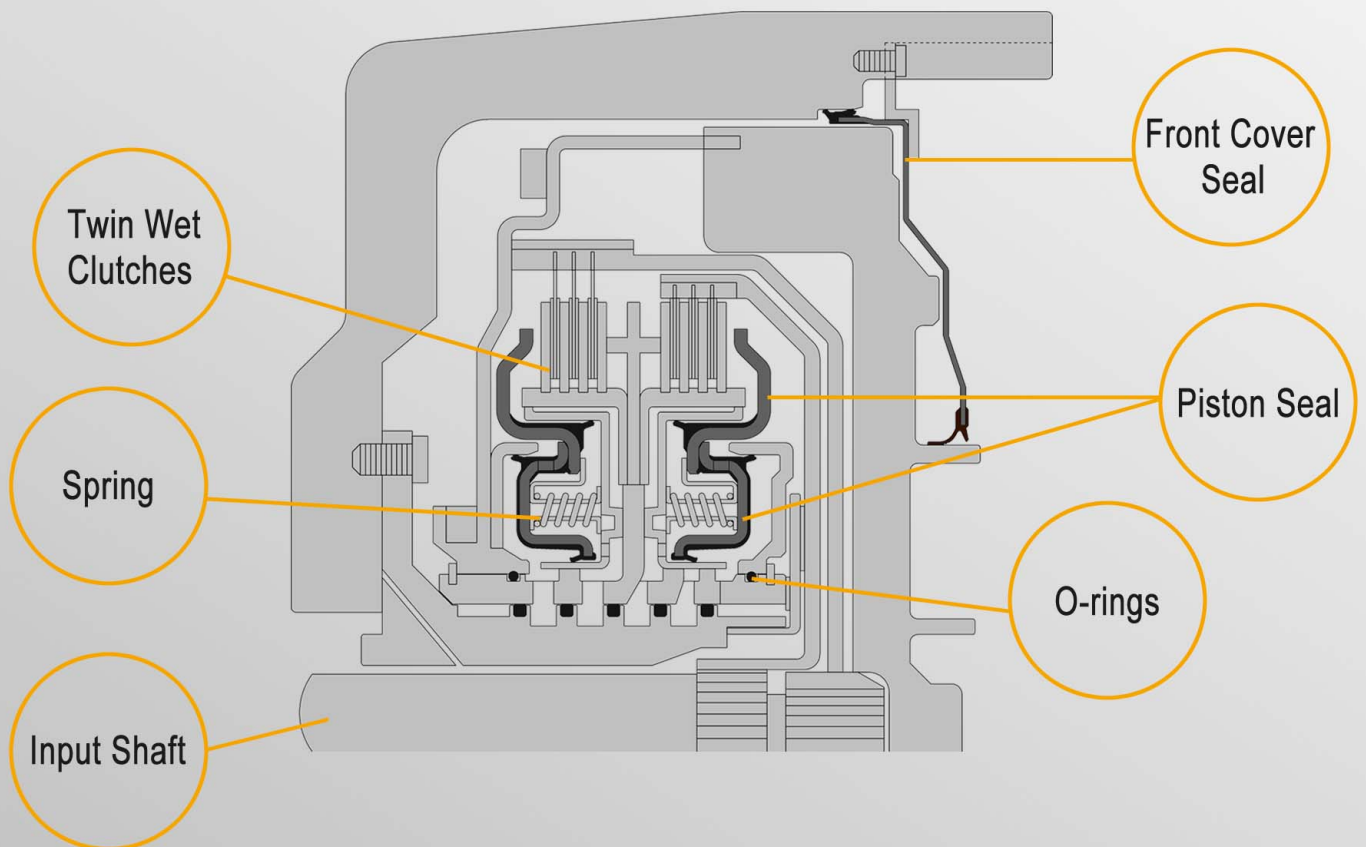
Nowadays, the Powertrain has become more subtle and the requirement for better sealing of the transmission system has driven the research in finding new ways to solve the major concerns that arise with this system. For the transmission front covers, at NAK we supply products related to the Dual Clutch Transmission.

On the other hand, Dual Clutch Transmissions combine the high efficiency of a Manual Transmission with the convenience of an automatic transmission by using two different clutches for engagement and release, simultaneously. The mode of operation is fully automatic but maneuverable between semi-automatic to manual modes albeit still carried out by the transmissions electro-hydraulics. Thus, shift quality and driving comfort can be significantly improved even without the lack of torque transmission. In spite of such advantages, controllability plays a crucial role in determining the overall performance of a Dual Clutch Transmissions.



## ► Available Designs

The sealing module contains a cover plate for the O.D. providing a static sealing and a rotary shaft seal for the dynamic sealing function combined together as a single unit. The sealing module is based on a design to integrate static and the rotary shaft seal directly on to the cover. NAK provides two types of front cover seals for the Dual Clutch Transmission (DCT). The static sealing is achieved by a rubber covered O.D. and dynamic sealing for the Inner diameter (I.D.) with a preliminary rubber lip design or a PTFE bonded lip design.

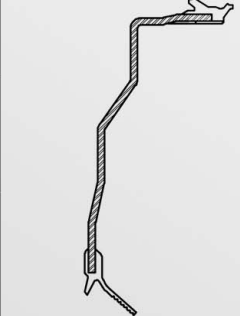
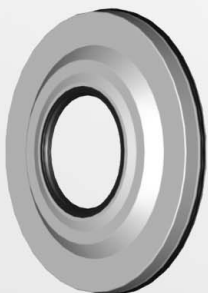


Use of the rubber material for static sealing of the O.D. enables to eliminate the possibility of damage as in the case of O-ring displacement. For the rotary shaft seal (I.D.) we provide two possible designs in which one has a rubber lip design and the other with a reinforced PTFE lip design. Both of lip designs contain the helix design for creating the low friction ability.

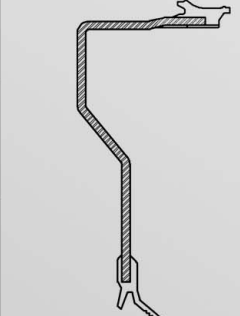
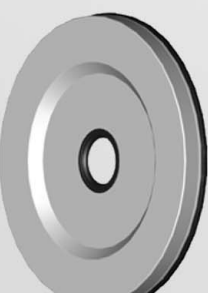
## ► Product Description

Seal Types for different design considerations of the transmission system.

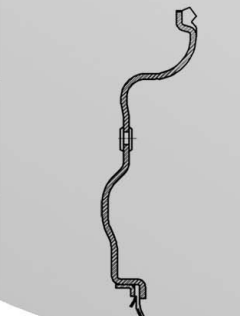

### 1. Transmission covers design with a rubber lip configuration. (Model 1)

Element	Cross Section	3D Model
Rubber O.D.		
Reinforced Metal Case		
Rotary lip seal – rubber material		

### 2. Transmission covers design with a rubber lip configuration. (Model 2)

Element	Cross Section	3D Model
Rubber O.D.		
Reinforced Metal Case		
Rotary lip seal – rubber material		

### 3. Transmission covers design with a rubber lip + PTFE bonding configuration.

Element	Cross Section	3D Model
Rubber O.D.		
Reinforced Metal Case		
Rotary lip seal – PTFE material		



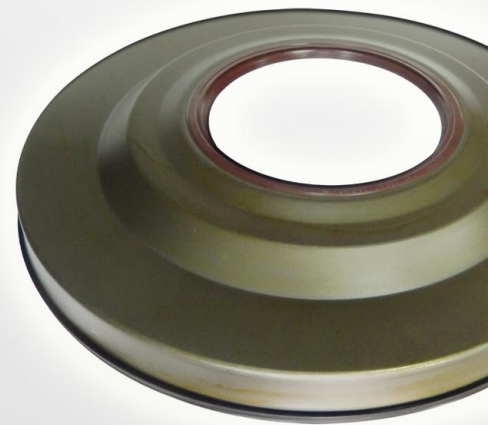
## ► Technical Information

### Rubber Material Selection

For the rubber material related to transmission cover seals, we generally use FKM. Mentioned below are the advantages associated with the selection of a FKM (Dynamic sealing) and AEM (Static sealing) materials.

### **FKM**

- ✓ *Excellent chemical resistance*
- ✓ *Low gas permeability*
- ✓ *Good weather resistance*
- ✓ *Good temperature resistance -25 °C to 225 °C*
- ✓ *Excellent resistance to oil (especially polar oil) and solvent*



### **AEM**

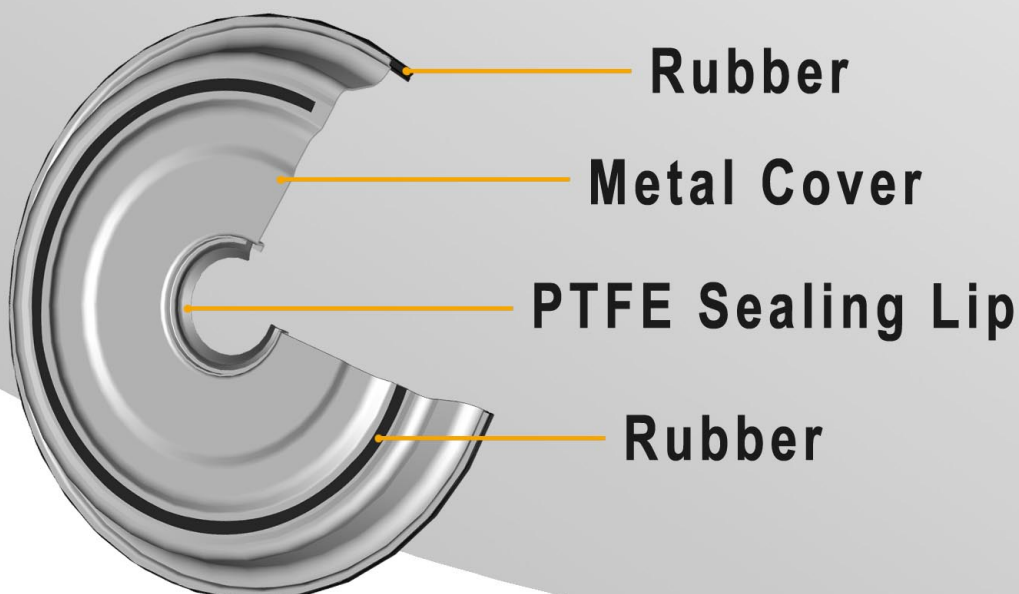
- ✓ *Excellent vibration damping*
- ✓ *Good heat aging characteristics*
- ✓ *Good long-term sealing performance*
- ✓ *Good temperature resistance -30 °C to 150 °C*
- ✓ *Excellent compression set resistance*

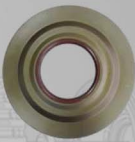
## PTFE Material Selection

For the application of Transmission covers, NAK provides a wide range of materials including PTFE and Teflon based products. Among different materials, PTFE are the foremost trend for the future development of this product as nowadays the transmission system operation requires complex sealing conditions to maintain proper functioning of the unit.

## PTFE

- ✓ *Low Coefficient of Friction*
- ✓ *Good Thermal Resistance*
- ✓ *Dry Running Capability*
- ✓ *High Chemical Resistance*
- ✓ *Temperature Cycling*
- ✓ *High Surface Speeds*



Item No.	Transmission Model	OEM No.	Photo	Type	Size	Material	Drawing No.
1	Getrag DCT450 (MPS6)	7M5R 7570 AB		KBC3R2	117.87*286.97*26.5/43	VN803,MK701/Q////	61535
2	Getrag DCT470	2502A034		KBC3R2	48*282*27	VN803,MK802/Q////	64862
3	Volkswagen 02E	02E 301 205B		PA68	47*245.5*34.3	MK701/Q//MSM1300T, PMW//	58011

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  - 2.2 are misused, abused or misapplied;
  - 2.3 are used in a critical environment or specific equipment without NAK's prior written consent;
  - 2.4 are not used in accordance with the printed user instruction materials; or
  - 2.5 are damaged due to natural deterioration, decomposition or transformation of chemical structure.
3. The products may be applied in critical environment or specific equipment only upon official confirmation of the sample by NAK's technical personnel and the passing of tests conducted by buyer.



 Factory  Service office & warehouse



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