

Vane Pump for 1-Motor Hybrid



Conventional pumps for transmission mainly used internal gear pumps, however the demand for high efficiency due to fuel efficiency regulations expanded the adoption of vane pumps. Since a vane pump vanes slides while it is pressed by the discharge pressure, the oil leakage is small and volumetric efficiency is high. However, it has structural disadvantages in the suppression of cavitation erosion when air is contained in the oil and especially, the starting responsiveness at low temperature compared to internal gear pumps. To counter these issues, we reviewed the designs based on the vane pumps for hydraulic power steering manufactured in JTEKT for many years. As a result, we succeeded in developing the vane pump which suits 1-Motor Hybrid (HEV).

Purposes of Development

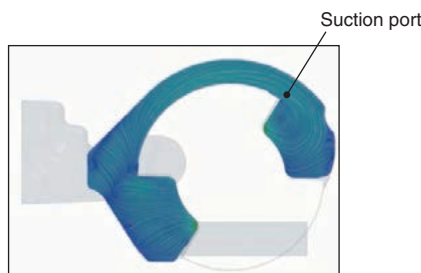
- ①Improvement of cavitation resistance
- ②Improvement of starting responsiveness for use in HEV units

Pump specifications

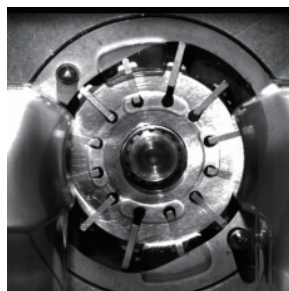
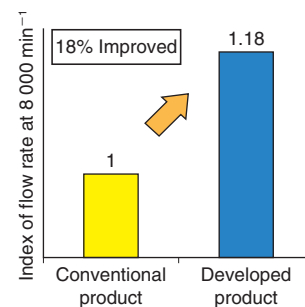
Theoretical discharge	12.8 cm ³ /rev
Rotational speed	Max. 8 100 min ⁻¹
Pressure range	Max. 3.5 MPa

Features

- ①Optimized the suction port shape through fluid simulation technology and suppressed the cavitation
- ②Optimized the design specifications through the visualization of the behavior of pump components and the component behavior simulation at the startup, and improved the starting responsiveness

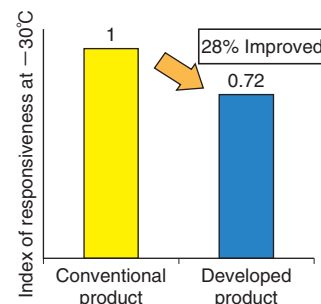


Fluid simulation of suction port shape



Visualization of behavior of pump components

Cavitation resistance performance



Starting responsiveness

(Hydraulic System Engineering Dept., Driveline Systems Business Unit)

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