

WARCO's working principle

Last Updated Thursday, 10 April 2008

Starting from the complete configuration of all the components required for the motion transmission (picture to the left) we can examine every single step of the Warko CVT's assembly to understand its working principle.

Following the motion transmission process, we will see that the motion deriving from the engine shaft is transmitted to the main gear, named sun gear.

From the sun gear, the motion is transmitted to a certain number of gears, called satellites or planet gears, laid out in a crown shape on it.

Each satellite is connected by means of a little shaft and two joints to a frustum cone-shaped body, hereinafter called "satellite cone". The side surface of the satellite cones is concave according to a given radius of curvature.

All the satellite cones transmit via friction the motion to a central "barrel"-shaped hub.

Finally, the motion is transmitted to the output shaft by means of an internal gearing.

(not in picture)

The lateral surface of the hub is convex according to a given radius of curvature, which is inferior than the radius of concavity of the cones. In this way, there will be only a (theoretical) contact point between a cone and the hub.

Since the cone can oscillate on the hub, it realizes all the possible couplings with the diameters of the same hub. The contact between the satellite cones and the hub is kept and forced by a pneumatic (or hydraulic) system (not shown) which pushes all the satellite cones against the hub and the outside ring named Reaction Ring.

The concavity radius of the satellite cones and the convexity radius of the hub are calculated in such a way so as to keep the external diameter constant = the internal diameter of the Reaction Ring

A 3D demo of the working principle is available in the video section

Here the animated working principle with sectioned Reaction Ring

Here the download of 3D animation (available online in the video section)