

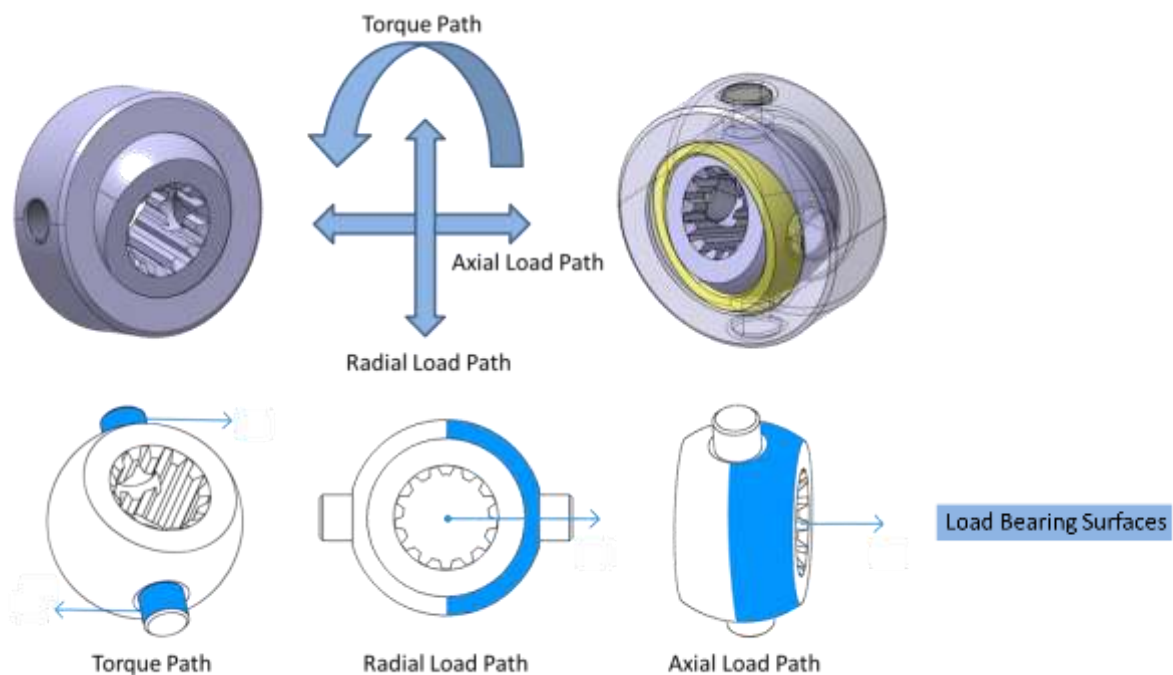
## Punk® Geometric Philosophy – A revolution for a variety of existing and new applications

The unique geometric philosophy utilised in the Punk® technology range can be applied to rotating systems as a means of transmitting torque whilst accommodating angular misalignment. In torque coupling applications, the use of matched pairs allows both angular and parallel misalignment to be accommodated. This philosophy allows a number of new functions to be achieved.

The geometry comprises a system of two or three nested rings with cooperating male and female spherical surfaces with a common centre point. Within the system, each adjacent pair of spherical surfaces is connected by a pair of cylindrical keys received into a pair of cylindrical keyways and/or by pairs of axles received into a pair of bores. These constrain relative rotational motion between the rings to a single plane. The axles/keys connecting the two spherical interfaces (in the three ring system) are placed on planes that are normal to each other.

- A two ring system can be used to accommodate angular misalignment in a single plane (x or y axis)
- A three ring system can be used to accommodate angular misalignment in two planes (x and y)

Within the system axial and radial loads are carried by the spherical surfaces, whilst torque is carried by the axles and/or keys.



Using this philosophy, novel designs for a wide variety of functions is possible, including:

- Hub centre steering
- Torque couplings
- Lead screw nuts - angular misalignment compensation (new function)
- Conical actuation (new function)
- Concentric flexible drive shafts (new function)
- Torque reacting/transmitting ophiomorphic robot mechanism (new function)
- Self-aligning gears (new function)