

DIFFERENTIAL GEARBOX

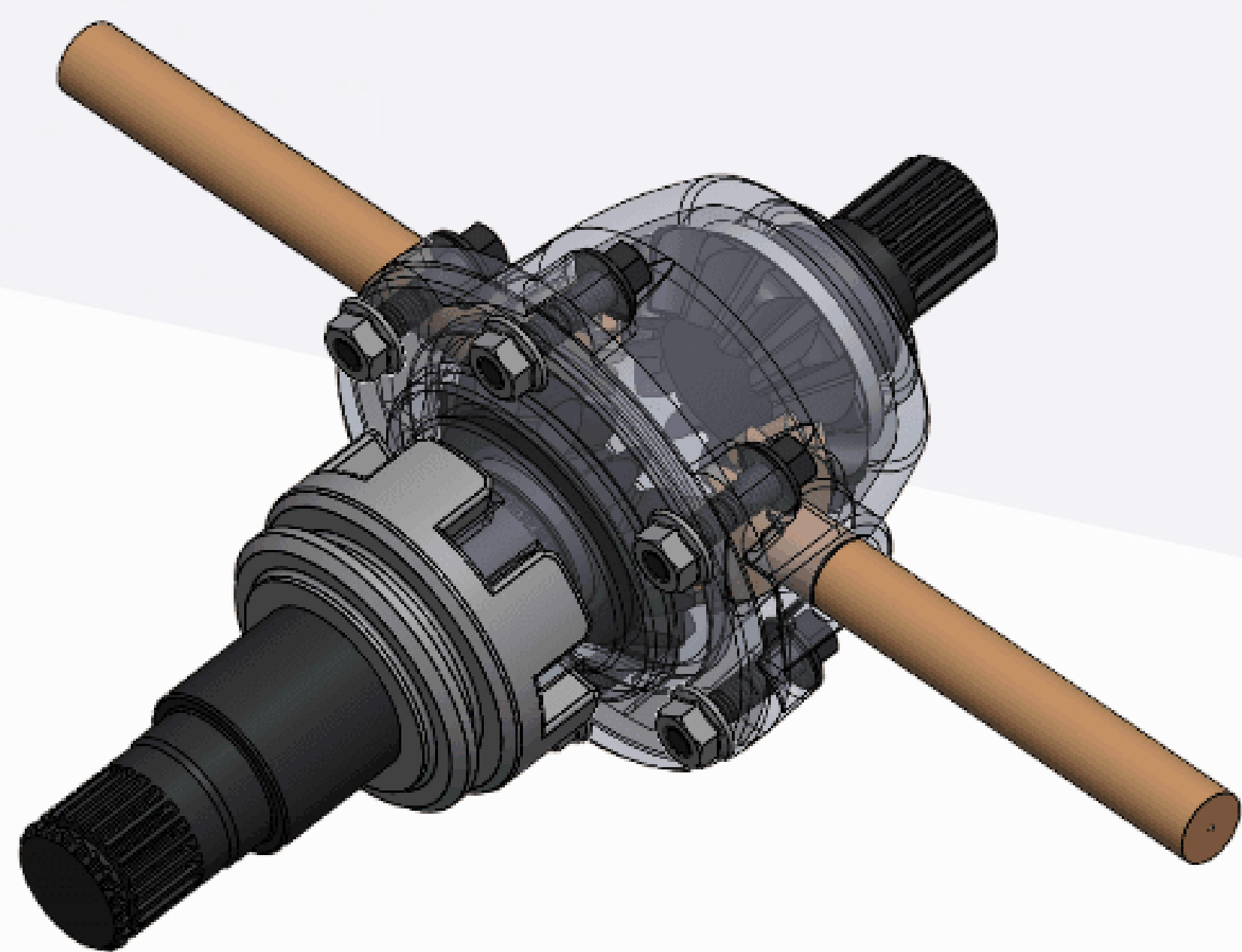


Figure 1: Assembly model

A differential gearbox is a crucial component in automotive and industrial applications, designed to allow wheels on the same axle to rotate at different speeds while transmitting power. It divides the force equally between the wheels while permitting them to follow paths of different lengths, such as when turning a corner or navigating uneven terrain. Differential gearboxes are vital in automobiles for smooth turning, in heavy machinery for power distribution, and in robotics for precise mobility and maneuvering.

How it works in automotive:

- Straight Driving: When driving straight, all wheels rotate at the same speed. The differential gears remain static relative to one another.
- Turning: During a turn, the outer wheel travels a greater distance than the inner wheel. The spider gears rotate to accommodate this speed difference, allowing the vehicle to corner smoothly without tire slippage.

Main components:

1. Crown Gear: Supports power distribution and provides structural connection.
2. Differential Housing: Encloses the gears and ensures smooth operation.
3. Drive Shaft: Transfers rotational energy from the engine or transmission.
4. Spider Gear: Allows the wheels to rotate at different speeds during turning.
5. Side Gear: Transmits power to the axle shafts connected to the wheels.
6. Ring: Secures the side gear within the housing and ensures proper alignment.
7. Differential Carrier: Supports the rotating parts and minimizes friction.

ITEM NO.	PART NUMBER	DESCRIPTION	QTY.
1	Part 5	Side Gear	1
2	Part 2	Differential Housing	1
3	Part 7	Differential Carrier	1
4	Part 3	Drive Shaft	1
5	Part 1	Crown Gear	1
6	Part 6	Ring	1
7	Part 4	Spider Gear	1
8	ISO - Straight miter gear 2.75M12T 14.5PA 8FW --- 12O13H120MD0.8N	Power Transmitter	2
9	ISO 4162 - M6 x 25 x 25-S	Hexagonal Flange Bolt	6
10	ISO - 4161 - M6 - N	Hexagonal Flange Nut	6

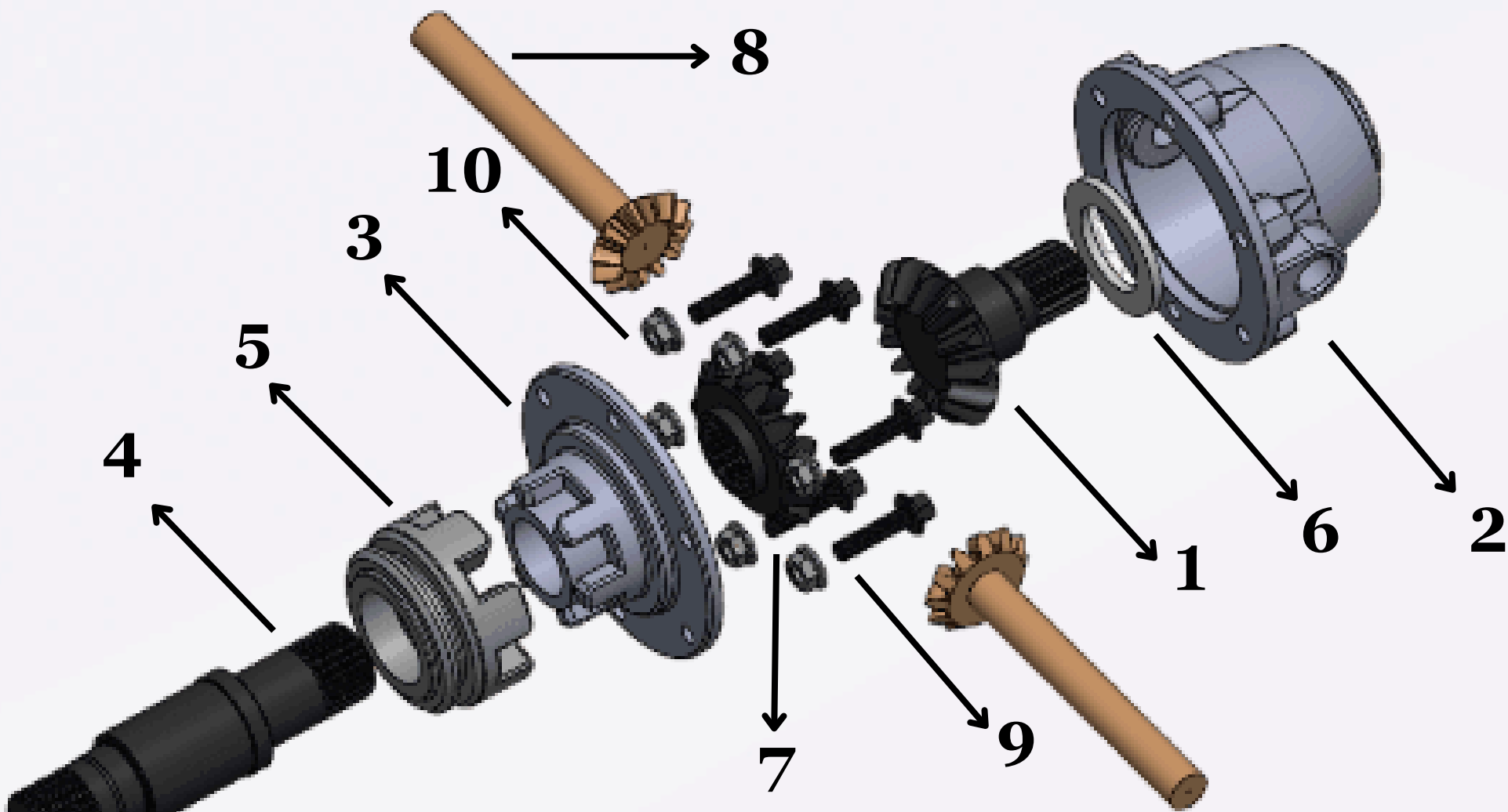


Figure 2: Exploded view