



CLUTCH AND DECOUPLER PULLEYS

What are clutch and decoupler pulleys?

Clutch and decoupler pulleys, also known as overrunning alternator pulleys or decouplers (OAP or OAD), allow the alternator to spin independently of the rest of the belt drive system in one direction. They feature a one-way clutch that allows the alternator to spin freely during deceleration, helping reduce belt-tension issues. This can improve the reliability and durability of several components, including bearings, belts, tensioners, and other components of the rotating assembly.



What is the difference between a clutch (OAP) and a decoupler pulley

For most applications, you will not notice a significant difference between a clutch and a decoupler pulley. The only difference between the two is that decoupler pulleys feature a torsion spring to dampen vibration. This can be beneficial, but its impact will depend on the specific setup and application.

How they work?

- **During acceleration:** The pulley is engaged, and the alternator spins in a fixed ratio with the engine.
- **During deceleration:** The pulley allows the alternator's rotor to coast and spin at a different speed than the engine, similar to a bicycle freewheel.
- **When the engine shuts off:** It allows the alternator's rotor to spin freely to a stop, eliminating the "chirping" sound that can occur when the belt slips.

Benefits

- **Reduces stress:** It absorbs engine pulsations and deceleration forces, which protect the belt, tensioner, and bearings.
- **Extends component life:** By reducing stress, it prolongs the life of the alternator and other related parts.
- **Reduces noise:** It prevents belt slipping that can occur during engine shutdown or rapid deceleration. This reduces the pulley wear on both the alternator and other rotating components.