

1. Installation Precautions for AWD Transfer Case Gears

The installation precision of transfer case gears directly determines the instantaneous response of power shifting and the overall system noise levels. During the installation process, the following protocols must be strictly followed:

Cleanliness Control: Before installation, ensure that the housing interior and all bearing seats are free of metal shavings or impurities. Microscopic particles can cause abnormal wear on tooth surfaces during power distribution cycles.

Backlash Calibration: Use a dial indicator to precisely measure gear backlash, ensuring it stays within design tolerance ranges. This prevents high-temperature galling caused by insufficient clearance or mechanical impact caused by excessive clearance.

Contact Pattern Inspection: Apply a marking compound to the tooth surfaces for a no-load test to confirm that the meshing point is centered. This ensures that the precision profiles, machined via **Gleason CNC technology**, distribute loads evenly and avoid tooth chipping from edge loading.

Thermal Shrink-Fit Assembly: For precision-fit gears, oil heating or induction heating is recommended for interference fitting. Striking gear faces with hard objects is strictly prohibited to avoid damaging the $\pm 0.01\text{mm}$ geometric tolerances.

2. Break-in Period Maintenance for Agricultural Ring and Pinion Sets

Agricultural machinery operates under severe loads. Proper maintenance during the initial break-in period of newly replaced ring and pinion sets (final drive gears) can significantly extend component life:

Initial Load Control: During the first 50 operating hours (the break-in period), avoid prolonged full-load operations or aggressive clutch engagement under extreme terrain conditions. This prevents high surface stress from disrupting the microscopic "seating" process of the gear teeth.

First Oil Change Cycle: The gear oil must be replaced immediately after the break-in period ends. Fine metal particulates generated during break-in must be flushed out to prevent secondary scratching of the case-hardened surface layers.

Lubricant Specification Matching: Always use extreme-pressure (EP) gear oil that meets heavy-duty ratings. This ensures a resilient oil film is maintained to resist impact loads under high-torque agricultural conditions.

Temperature Monitoring & Noise Inspection: Periodically check the axle housing temperature during operation. If abnormal heat or rhythmic mechanical knocking occurs, stop the machine immediately to inspect meshing clearances and prevent fatigue failure due to localized overheating.