Dodge heavy-duty gearing: comparison of different mounting configurations

The purpose of this document is to define the characteristics of different mounting configurations used in heavy-duty gearing drive packages, and to compare the advantages and disadvantages of each design.

Shaft Mounted: Belted Input

Characteristics:

- Reducer is shaft mounted to the driven shaft
- Motor is mounted on a motor mount attached to the reducer, and is connected to the reducer via belts and sheaves encased in a belt guard
- Final reducer output speed is determined by the reducer ratio and v-belt ratio

Advantages:

- Output speed can be varied by changing the sheaves, which allows customers to adjust the speed without purchasing a new gearbox or using a vfd
- Can achieve the exact output speed requirement (is not limited by gearbox ratio)
- Multiple motor mount height positions to accommodate space constraints
- Least expensive drive system arrangement
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Disadvantages:

- More components than a beltless drive (sheaves, belts, motor mount, guard), which can lead to additional maintenance and longer installation and removal time
- More space required compared to direct (beltless) drives

Shaft Mounted: Direct Coupled (c-face) Input

Characteristics:

- Reducer is shaft mounted to the driven shaft
- Motor is direct coupled (c-faced) to the reducer
- Final output speed is determined by the reducer ratio (no v-belt drive)

Advantages:

- Beltless design eliminates the need for a motor mount, belt guard, and v-belt drive
- More compact design, which helps accommodate applications with space constraints
- C-face to C-face design reduces assembly time
- Reduced maintenance requirements due to fewer components than belt driven drives
- Multiple ratios available for a wide range of output speeds
- Reducer can be mounted in multiple positions

Disadvantages:

- Output speed is limited to the ratio offering (may not be able to achieve the exact required output rpm)
- Fixed ratio; unable to vary the speed like can be done by changing the sheave sizes on a v-belt drive

Swingbase: shaft mounted with coupled input

Characteristics:

- The motor and reducer are mounted on a common base. The motor is coupled to the reducer, typically using a flexible style coupling.
- The entire assembly is shaft-mounted to the driven equipment. For solid output shaft reducers, moment couplings are used to connect to the driven shaft. For hollow output reducers, twin tapered bushings are used to connect to the driven shaft.
- A torque-arm is used to hold the assembly in place while in operation.

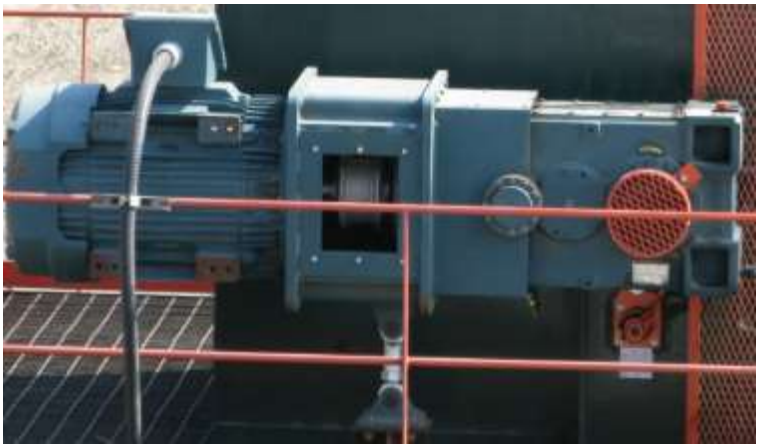
Advantages:

- Can be used with large motors in high hp applications
- No support structure is required since the assembly is shaft mounted, making it ideal for space constrained or hard to access applications
- Moment couplings offer a user-friendly design that allows the drive assembly to be easily removed for maintenance and repair purposes

Disadvantages:

- Overhung loads must be considered since the driven equipment must be designed to support the entire weight of the drive assembly
- Motor and reducer must be fully aligned for assembly
- Right-angle reducers only; cannot use offset parallel

Tunnel Housing: shaft mounted with flanged input



Characteristics:

- The motor and reducer are flange mounted (c-face or d-flange) inside a tunnel housing.
- The entire assembly is shaft-mounted to the driven equipment. For solid output shaft reducers, moment couplings are used to connect to the driven shaft. For hollow output reducers, twin tapered bushings are used to connect to the driven shaft.
- A torque-arm is used to hold the assembly in place while in operation.

Advantages:

- Considered to be an "alignment free" drive (the motor and reducer are flange mounted as opposed to being coupled), which allows for faster and easier installation and replacement
- Can be used with large motors in high hp applications
- No support structure is required since the assembly is shaft mounted, making it ideal for space constrained or hard to access applications
- Moment couplings offer a user-friendly design that allows the drive assembly to be easily removed for maintenance and repair purposes

Disadvantages:

- Requires a c-face or d-flange motor, which is typically not as readily available as a foot mounted motor
- Overhung loads must be considered since the driven equipment must be designed to support the entire weight of the drive assembly
- Right-angle reducers only; cannot use offset parallel

Base Plate: foot mounted with coupled input

Characteristics:

- The motor and reducer are foot mounted to a common base. The motor and reducer are connected with a coupling, and the reducer is coupled to the driven equipment
- Commonly used for very high hp applications that cannot be shaft mounted

Advantages:

- Both right-angle or offset parallel reducers can be used
- Maintenance friendly design for ease of access to components for maintenance and repair
- No weight on the driven equipment
- Overhung loads do not have to be considered since the drive assembly doesn't "float" like a shaft mounted assembly

Disadvantages:

- Typically results in higher installation costs due to sight prep work
- Requires more space than shaft mounted arrangements
- Multiple alignments are required at installation