

## FINAL DRIVE FAMILY

The Final Drive is the last transmission unit in a vehicle drivetrain, used to match powerpack performance characteristics with the automotive mobility requirements of the vehicle. Directly hull mounted, these units also provide the structural interfaces for other critical components such as the track sprocket carrier and vehicle braking mechanisms.

DB Defence has an extensive history of design and manufacture of Final Drives for both tracked armoured personnel carriers and armoured fighting vehicles across all weight classes.

DB Defence has engineering solutions for the three main variants of Final Drive; these are defined by the differences within the gear train configuration:

- **Epicyclic** highly compact, with co-axial input and output shaft lines
- **Offset** with greater footprint adaptability, ideal for front mounted powerpack installations
- **Offset Epicyclic** giving the combination of the above and enabling greater reduction ratios

Though differing in geometry, these Final Drive variants still share common characteristics and flexibilities within their designs:

- **Mounting:** Units are generally bolted to the hull, with a flanged output shaft for the attachment of the sprocket carrier. Input shafts can be splined, flanged, spade or gear coupled to suit client requirements
- **Brake system interfaces** can be provided for both rotor and stator elements
- **Trunnion mountings and quill shafting** can be provided for main transmission interfacing
- **Vehicle Weight:** 7 to 70 tonnes (but not limited to)
- **Design Ratings:** Unless otherwise stated by the client, ISO 6336 or AGMA 2101

## EPICYCLIC (CO-AXIAL)

An in-line Final Drive with vehicle brake disc incorporated. Offering the greatest torque density for high tractive effort applications, the epicyclic (planetary) gear arrangement consists of an output shaft driven by a planet gear carrier assembly from the central input (sun) gear.

The ring gear (annulus) provides the necessary torque reaction to the hull interface. The gear and load path elements are manufactured from both surface and through-hardened, tempered alloy steels. High Precision rolling element bearings are utilised. Special design configurations such as units with two selectable ratios are available. The main housing can be made from a variety of materials – typically aluminium alloys (forged or cast) for weight and thermal performance benefits, or cast steel for maximum structural impact resistance. Wire trap features can be provided. Oil fill and drain ports are included. Input shaft disconnect mechanisms can be embodied to enable drive disconnection externally.



## OFFSET

Offset Final Drives as illustrated above utilise a single wheel and pinion arrangement for simplicity and highest efficiency for light and medium weight vehicle applications; although two-stage units are also feasible to provide greater reduction ratios or to offset distance between the input shaft and sprocket carrier axes in vehicles with front mounted powerpack assemblies

The offset is generally determined by the vehicle hull (glacis plate) and main transmission output configuration. The gear and load path elements are manufactured from both surface and through-hardened, tempered alloy steels. As for the co-axial type, the main housing can be made from a variety of materials – typically aluminium alloys (forged or cast) for weight and thermal performance benefits, or cast steel for maximum structural impact resistance. Wire trap and drive disconnect features can also be embodied. High Precision rolling element bearings are again utilised



## OFFSET EPICYCLIC

The offset epicyclic design offers a beneficial combination of the prior variants. This is a double stage unit utilising an offset primary gearset driving the sprocket carrier shaft through a secondary planetary reducer.

A balance between the gear stage ratios gives the benefits of both high reduction ratio and tractive effort capacity in a compact envelope. As with the other DBS Final Drive units, the gear and load path elements are manufactured from both surface and through-hardened, tempered alloy steels. The main housing can be made from a variety of materials – typically aluminium alloys (forged or cast) for weight and thermal performance benefits, or cast steel for maximum structural impact resistance. High Precision rolling element bearings are utilised.





## Specification

A range of Final Drive design specifications is given below. Please note special options are also available.

| Gearbox              | Epicyclic                                                     | Offset                                                   | Offset-Epicyclic |
|----------------------|---------------------------------------------------------------|----------------------------------------------------------|------------------|
| Typical Ratio Range  | 3:1 – 5:1                                                     | 3:1 – 6:1<br>(Single Stage)<br>8:1 – 12:1<br>(Two Stage) | 4:1 – 8:1        |
| Vehicle Weight Range | 7 - 70T                                                       |                                                          |                  |
| Power Range          | 200 - 1200kW                                                  |                                                          |                  |
| Housing Material     | < 30T – Cast or Forged Aluminium Alloy, ><br>30T – Cast Steel |                                                          |                  |
| Shaft Interface      | Flanged, Splined, Spade, Gear Coupling, Quill                 |                                                          |                  |
| Design Rating        | ISO 6336 or AGMA 2101                                         |                                                          |                  |

## Ancillary Systems

DB Defence can also provide the following within the solution:

- Oil fill, drain and vent features
- Externally accessible Final Drive disconnect mechanisms
- Brake discs
- Input coupling shafts
- Powerpack trunnion mounting provisions
- Oil cooling provisions (Inlet/outlet porting, inbuilt oil cooler)
- Oil level dipstick assemblies
- Oil level sensing instrumentation
- Speed sensor equipment

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We are certified to ISO 9001:2008, 14001:2015 and 45001:2018. Your DB Defence representative should be consulted prior to product selection and use.

In the interest of continuous technical development DB Defence reserves the right to amend specifications and drawings without prior notification

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