



Product Brochure

Torque-Arm® II



We provide motors, generators and mechanical power transmission products, services and expertise to save energy and improve customers' processes over the total lifecycle of our products, and beyond.



The legacy continues

The Dodge® Torque-Arm II surpasses all other reducers on the market because of its industry proven design and patented features.

This powerful line of shaft mounted speed reducers –in 12 case sizes through 400 hp (300 kW)— offers unparalleled torque ratings and is quickly becoming the new industry standard. Improved features include: an all-new backstop concept, a patented sealing system, a steel motor mount system, a state-of-the-art, totally modular design with an expanded ratio range to 40:1 and a patented twin tapered bushing system.

The increased ratings on the Torque-Arm II line are comparable to the next larger sized TXT reducer and are the result of the extended gear centers, wider gear faces and optimized tooth geometry. The new backstop design features centrifugal lift-off sprags for extended life and can be used with lubricants containing EP additives.

In addition, the Torque-Arm II line has a patented, premium sealing system that uses an HNBR oil seal protected by a metal excluder seal with rubbing lip. This harsh duty sealing system makes this reducer series a perfect fit for today's harsh duty industries such as aggregates, mining, cement, asphalt, mixing & milling and ethanol.

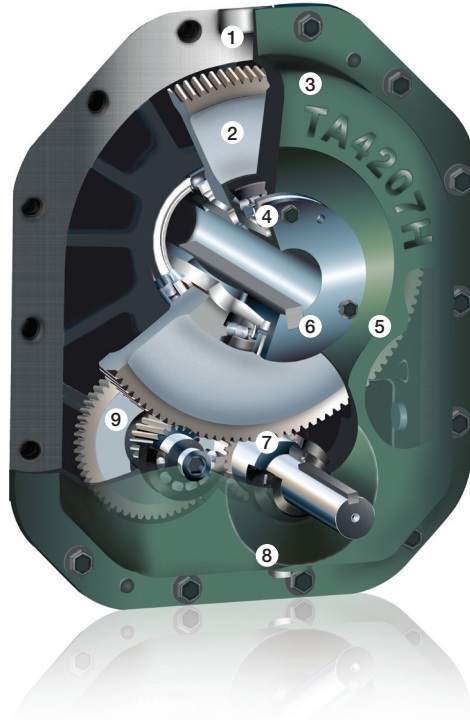
The new steel motor mount adjusts to multiple center distances and mounts in shaft mount and screw conveyor positions. Its patented twin tapered bushing system –in standard length, short shaft, and metric versions– offers all the features of our standard twin tapered Torque-Arm bushing design which are unique to Dodge. The patented insertable tapered wedge enables the optional extended tapered bushing kit to be applied for shorter shaft lengths; allowing the replacement of straight bore or single bushed reducers.



Dodge® Torque-Arm® II, gear-reducers for all of your industry needs

Design/Construction features and benefits

- 1) Three large pry slots make rebuilding easy
- 2) Proven, AGMA-rated, case-carburized gear design ensures high efficiency. Has Class I starting load capability of 200%
- 3) Totally modular construction, one reducer for shaft mount, screw conveyor, vertical and flange mount applications
- 4) Premium HNBR oil seals are protected by a patented labyrinth metal shield and excluder lip auxiliary seal on all shafts. No lubrication required. Factory tested
- 5) 100% cast iron housing (Class 30) eliminates bearing cap leak paths and maximizes surface area for heat dissipation
- 6) Patented twin-tapered bushings are available in standard, short shaft, and metric versions
- 7) Heavy duty tapered roller bearings provide 25,000 hours average life and 5,000 L-10 minimum hours life—even in the heaviest load conditions
- 8) Magnetic drain plug and new filter breather are standard
- 9) Extended gear centers and increased gear tooth contact provide dramatically increased torque and horsepower ratings.



Dodge Torque-Arm II gear reducers are in conformance with the European ATEX Directive 94/9/EC (ATEX 100a) - Equipment and Protective Systems Intended for use in Potentially Explosive Atmospheres and are certified Dodge Torque Arm II, Sizes TA0107 through TA12608, Equipment Group I, Category M2 c/ Equipment Group II Category 2 GD c T4 TAMB -22°F to 122°F (-30°C to 50°C).

Product capabilities

- Twelve reducer sizes with modular accessories
- All reducers can be shaft mounted, screw conveyor, vertical and flange mounted.
- HP through 400 (to 300 kW), and torque ratings through 500,000 lb-in (56480 Nm).
- Standard 5, 9, 15, 25 and up to 40: 1 gear ratios.
- Nearly 300: 1 speed reduction with V belt drives.
- Bushing bores 1 inch through 7 inch (25.4 mm to 177.8 mm).
- All highly efficient helical gearing design.
- Meets or exceeds AGMA standards including 5,000 hour L-10 bearing life, 25,000 hour average life.
- Smooth, rugged class 30 cast iron housings with pry slots.
- 36 month - 18 month warranty protection.
- TA II products are in conformance with ATEX directive 94//9/EC guidelines
- New Premium HNBR oil sealing system and filter breather

Testing and development

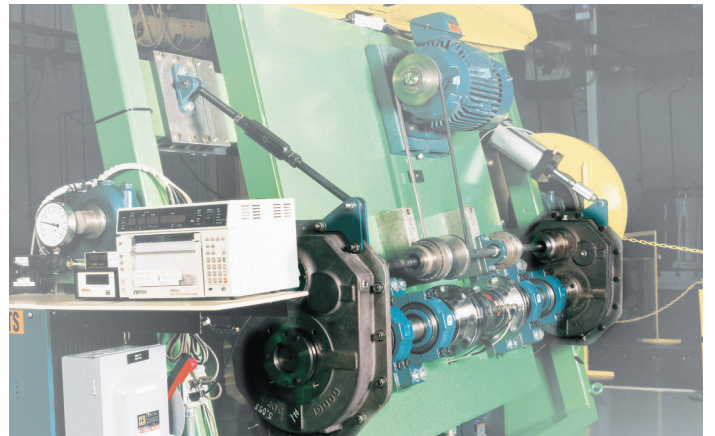
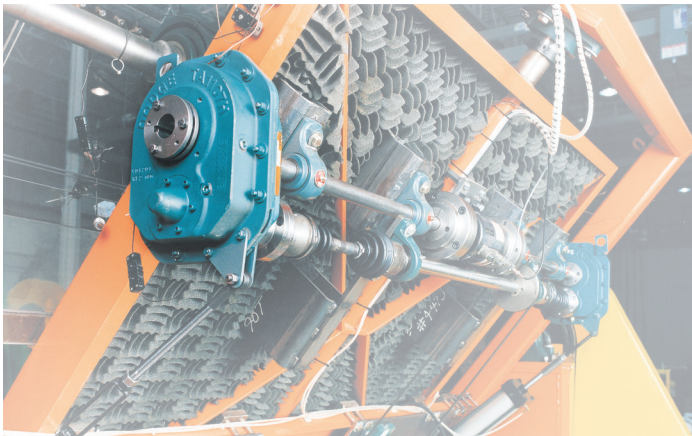
It's what makes the Torque-Arm® II different and even better than the original Torque-Arm and all competition.

Using QFD techniques, Dodge began product development by asking our customers to tell us what they liked and/or disliked about our original Torque-Arm and other speed reducers on the market. From these comments, our engineering team developed specifications, which became the blueprint for the Torque-Arm II reducer's state of the art design.

First and second generation prototypes were built in production quantities and tested in our own lab under full load conditions. All designs used for the prototypes were developed using our proprietary in-house development programs for gearing design, bearing selection, and shaft design. In addition, all reducers were modeled using Pro-ETM modeling software and analyzed using FEM techniques.

Each size and ratio for each generation prototype was subjected to rigorous mechanical, structural, and thermal testing, and all models were evaluated for design optimization, structural strength, and stress and deflection. The prototypes were also used to perform manufacturing capability studies to verify that the design tolerances could be maintained under manufacturing conditions.

It was the knowledge gained from these tests that influenced our final design specifications. To ensure optimum performance, each size and ratio of the final design was also put through the same thorough, stringent design analysis and testing as the prototypes.



Modular concepts



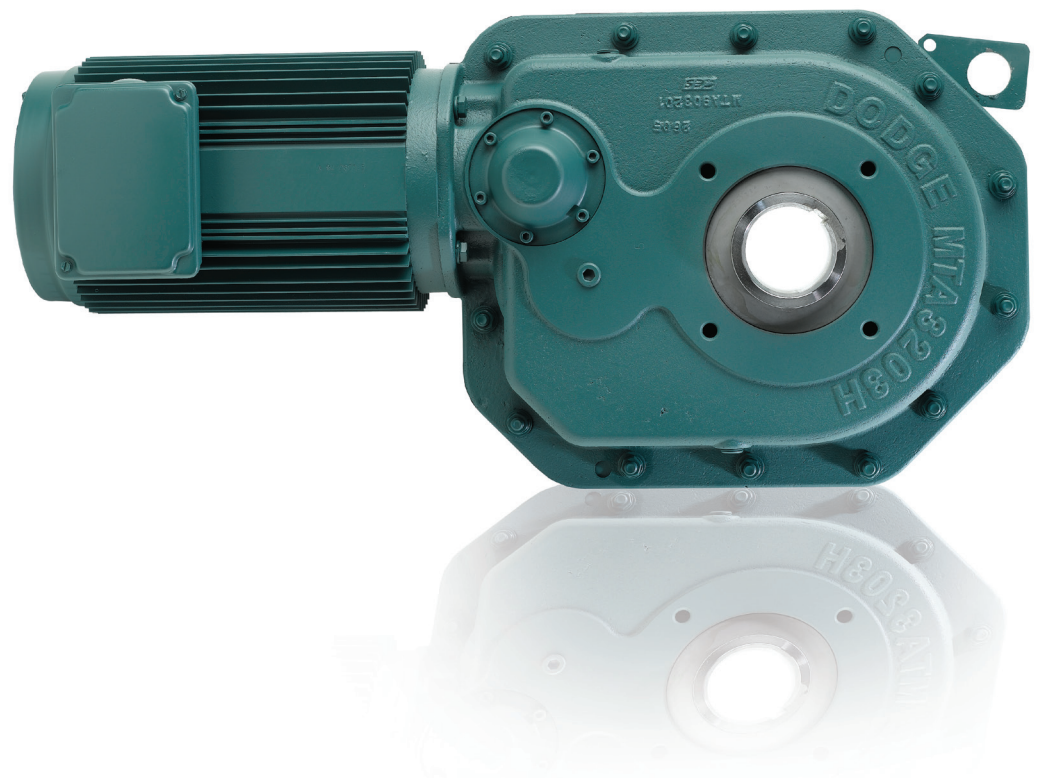
Shaft mounted reducer with twin tapered bushing and motor mount



Screw conveyor drive with adapter, drive shaft and motor mount

Motorized Torque-Arm® II

- Heavy Duty AGMA rated design
- Tapered roller bearings on all helical shafts
- Premium HNBR oil seals
- Industry leading backstop design
- Standard Screw Conveyor Adapter and drive shaft
- Standard and short shaft twin-tapered bushings
- Standard stock torque arm rod kit
- EZ Class I & II selection tables
- Rugged, high efficiency, case carburized helical/bevel gearing
- Part numbered product concept
- Reduced assembly time
- Reduced guarding costs
- Reduced maintenance requirements
- Optional metal end covers
- Reducer mounts in multiple positions
- Three piece coupled design utilizes standard Reliance Electric NEMA c-face motors in two motor speeds and multiple gear ratios to provide a wide spectrum of output speeds
- Space saving integral gearmotor design uses VFD to adjust output speeds for individual applications



Modular accessories

Standard twin-tapered bushing system:

an easy on, easy off, no-wobble bushing system featuring a fully split, ductile iron 8° taper and reliable twin support. Available in inch and metric bores. increased bore capability in many sizes.



Short-shaft twin tapered bushing kits:

(Patent numbers 5,667,333 and 5,951,198) eliminate the need for full-length shafts. Constructed with ductile iron, it has all the features of our standard bushing system. Available in both inch and metric bores.



Modular motor mount:

attached and supported by two angle iron brackets with equally spaced holes, which align with the spacing of the cast slots of the gear case. This way, the motor mount can be adjusted up or down depending on the customer's requirements. It can also be mounted on the side of the reducer for screw conveyor applications.



Backstop option:

helps prevent reverse rotation in high stop-start loads, and results in less wear and longer life. Its centrifugal throw-out design eliminates sprag sliding and reduces wear. It operates with standard and EP lubricants and requires no external lubrication.



TA rod kit includes:

standard brackets functions as a belt-tensioning device, and offers universal mounting options.



CEMA bolt-on adapter:

features double-lip seals on both surfaces. the adapter center is open for contaminate drop out for optimized sealing.



Adjustable packaging adapter kit:

bolts to the standard adapter and provides a proven sealing option for hostile environments. Packing can be retightened.



Screw conveyor drive shafts:

made from high alloy steel and engineered to CEMA dimensions. They are three-bolt drilled and their tapered fit ensures simple installation. The rugged locking plate (patent pending) also provides a mechanical shaft removal feature.



Bolt-on belt guard package:

requires no drilling or straps. It allows multiple height adjustments, features a lift-off cover construction, and has an open metal inspection feature.

Contact:

www.abb.com/mechanicalpowertransmission

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