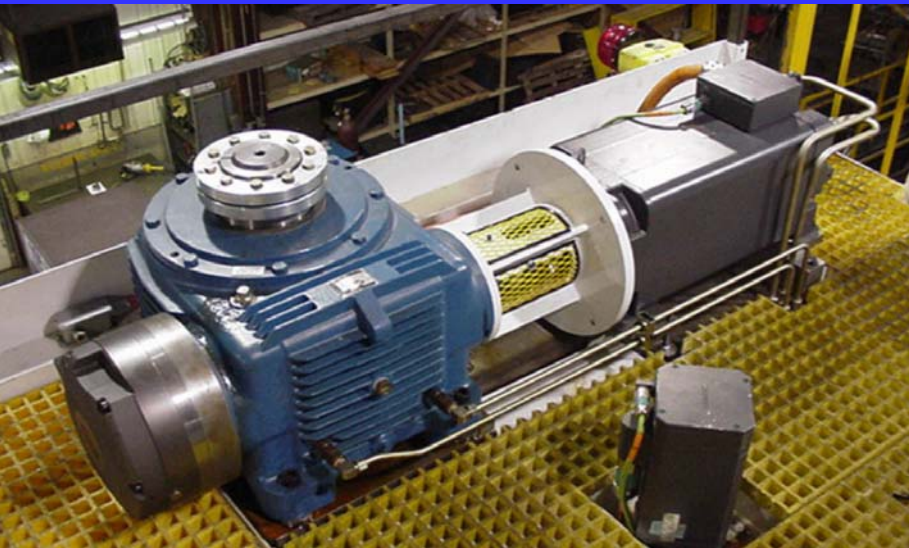


Application case study

Federal Broach switches from hydraulics to electro-mechanical operation



Tooling & Manufacture

Automotive Transmisson

Federal Broach is a major supplier of broach machinery, tooling, and cellular manufacturing systems

Environmental concerns, energy consumption and the move to more fuel efficient vehicles in the US are driving the conversion of broach machines from hydraulic to electro-mechanical operation by Federal Broach & Machine Company, through the installation of Cone Drive gear technology.



engineered to keep you moving

Federal Broach, located in the city of Harrison in Central Michigan, primarily serves the auto, large truck, farm and defense industries. A major supplier of broach machinery, tooling, and cellular manufacturing systems, Federal Broach has worked alongside a number of its customers to help them conform to new Environmental Protection Agency guidelines that reflect concerns over leaks of hydraulic fluid from machine systems.

Cone Drive, part of Textron Fluid & Power, has collaborated with Federal Broach in developing a solution that substitutes electric motor and mechanical gearbox assemblies for the hydraulic components on the large helical broach machines employed manufacturing parts for automotive transmissions. This area currently has a strong business focus because of the move from 5 speed to 6 speed transmission systems as the automotive industry standard to improve fuel efficiency.

Two 8" center distance Cone Drive HP double enveloping worm gear speed reducers and motor combinations drive planetary SKF screws, which raise and lower the table delivering up to 50 tons force to precisely broach the automotive gear components. While two Cone Drive 10" center distance double enveloping worm gear sets create 25 tons force required to turn the broach.

The 8" CD Cone Drive units are supplied with hollow 'keyless' shrink disc output shafts and specified with special thrust bearings on the output shaft.

The three-dimensional functionality of the helical broach machines involves movement of the vertical rising table to present the component parts to the broach for cutting while also rotating the broach tooling to perform the helix profile on the automotive part.

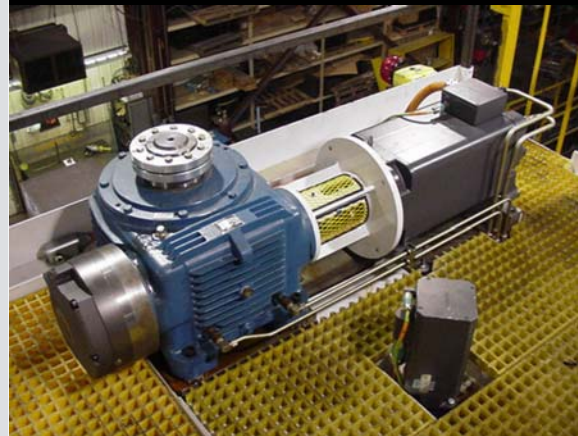
The electro-mechanical operation of the helical broach machines removes the danger of hydraulic fluid spills and contamination while also extending the service life of the machines and increasing their production capacity. The conversion also offers the advantage that the machine installation no longer needs to accommodate the hydraulic power unit in a pit below the base of the machine, simplifying installation and relocation of the helical broach units.

Two sizes of Cone Drive HP double enveloping worm gear speed reducers are specified for the electromechanical helical broach machine – with a 5:1 gear ratio for the 8 inch center distance units, and 40:1 ratio for the larger 10 inch center distance double enveloping gear set.

The Cone Drive HP reducers are designed for applications that require extremely high torque and accuracy in a quiet, compact package. The HP reducers have higher shock resistance, greater endurance to withstand heavy starting and stopping loads and can transmit two to three times as much torque as cylindrical worm gearing. Precision is increased and backlash, chatter and noise are minimized, while interchangeability of parts means rapid manufacturing and delivery for customers.



engineered to keep you moving



Cone Drive

North America: +1 888 994 2663

Central & South America: +1 231 946 8410

Sister companies

David Brown & Benzlers

Africa: +27 11 748 0000

Australia: +61 2 4283 0300

China: +86 21 5396 6360

Europe: +33 3 89 37 01 13

Scandinavia: +46 42 18 68 00

Thailand: +66 38 459044

United Kingdom: +44 (0)1484 465500