

## Engine Repair

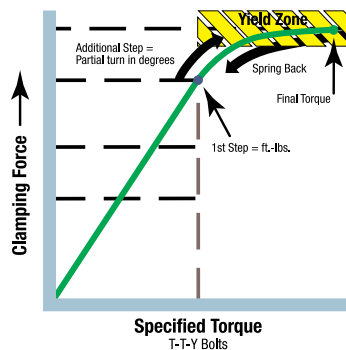
# T-T-Y Head Bolt Sets (ES)

### Understanding Torque-to-Yield Head Bolts

Although Torque-to-Yield (T-T-Y) head bolts are becoming more common, some people still don't fully understand how they work.

Bolts on T-T-Y applications are tightened to their yield point, creating a more even clamping force over the entire area of the gasket.

During engine assembly at the factory, precision machines tighten the bolts so they are just in the "yield zone". Technicians making repairs in the field do not have access to this type of equipment. Engineers have found that by tightening head bolts to specified torque and then tightening them an additional partial turn, technicians can reach the yield zone.



Fel-Pro® engineers suggest technicians use a gauge such as the affordable Fel-Pro Torque-to-Angle Indicator (part number TRQ-1). It fits easily on the 1/2" drive of a torque wrench and eliminates uncertainty about the additional torquing required for T-T-Y head bolts.



NOTE: There is no way to visually tell if a bolt is the Torque-To-Yield design – the only way to tell is by its torque specifications.

### Are T-T-Y Head Bolts Reusable?

The torque-to-yield procedure stretches the bolts into their elastic range. On some engines, this stretching approaches the bolts' elastic limit and the bolts are permanently stretched. If these bolts are removed and reused, it is likely that either the head gasket will fail due to false torque readings or that the bolts may break. Each engine manufacturer offers guidelines as to whether torque-to-yield head bolts are reusable. Some guidelines allow limited reuse, while others recommend you never reuse the bolts. Since technicians may not know how many times a T-T-Y bolt has been removed and reinstalled, we recommend never reusing a T-T-Y head bolt.



### T-T-Y Head Bolt Info in the Catalog

The Fel-Pro catalog offers replacement head bolts for many T-T-Y applications, where required by the engine manufacturer.

