

1-8 GENERAL INFORMATION AND MAINTENANCE

When tightening a threaded fastener, torque is applied in three distinct areas, the head, the bearing surface and the clamp load. About 50 percent of the measured torque is used in overcoming bearing friction. This is the friction between the bearing surface of the bolt head, screw head or nut face and the base material or washer (the surface on which the fastener is rotating). Approximately 40 percent of the applied torque is used in overcoming thread friction. This leaves only about 10 percent of the applied torque to develop a useful clamp load (the force which holds a joint together). This means that friction can account for as much as 90 percent of the applied torque on a fastener.

TORQUE WRENCHES

See Figures 24, 25 and 26

In most applications, a torque wrench can be used to assure proper installation of a fastener. Torque wrenches come in various designs and most automotive supply stores will carry a variety to suit your needs. A torque wrench should be used any time we supply a specific torque value for a fastener. A torque wrench can also be used if you are following the general guidelines in the accompanying charts. Keep in mind that because there is no worldwide standardization of fasteners, the charts are a general guideline and should be used with

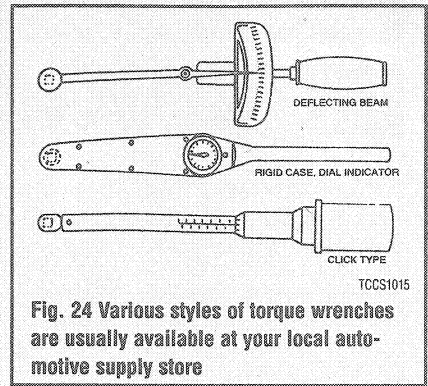



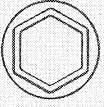


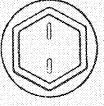




Fig. 24 Various styles of torque wrenches are usually available at your local automotive supply store

| | Mark | Class | | Mark | Class |
|--------------------------------------------|------------------------------------------------------------------------------------------------------------|-------|-------------|-----------------------------------------------------------------------------------------------|-------|
| Hexagon head bolt |  Bolt head No. 4 | 4- | 4T |  No mark | 4T |
| | | 5- | 5T | | |
| | | 6- | 6T | | |
| | | 7- | 7T | | |
| | | 8- | 8T | | |
| | | 9- | 9T | | |
| | | 10- | 10T | | |
| 11- | 11T | | | | |
| |  No mark | 4T | | | |
| Hexagon flange bolt w/ washer hexagon bolt |  No mark | 4T | |  Grooved | 6T |
| Hexagon head bolt |  Two protruding lines | 5T | | | |
| Hexagon flange bolt w/ washer hexagon bolt |  Two protruding lines | 6T | Welded bolt | | |
| Hexagon head bolt |  Three protruding lines | 7T | | | |
| Hexagon head bolt |  Four protruding lines | 8T | | | |

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Fig. 25 Determining bolt strength of metric fasteners—NOTE: this is a typical bolt marking system, but there is not a worldwide standard