

How are British screw threads different than American?

Although the nominal sizes are similarly labeled the main difference lies in the thread profile and resultant relationship of the pitch diameters. Both systems identify their nominal diameters primarily by fractional inches, however the British Whitworth use a 55°-degree thread angle with radiused root and crest. The customary American profile is 60 degrees with angular root and crest. Even though you may find a diameter and pitch combination that may seem to match it should not be used. The resultant assembly will be significantly weaker since there will be excess play due to the different angles and the threads will be binding on the root and crest rather than the pitch diameters.

One good example of this on Austin Healey 100s, Bugeye Sprites and other British cars of the era (1950s through early 1960's) is the bolt used on the aluminum front plate of the generator (Bracket, drive end) which the adjusting link attaches. This 5/16" BSW (coarse bolt) has the same 18 threads per inch as a common UNC or SAE coarse bolt that you can buy in any hardware store. However, these two bolts should not be interchanged. Yes, the 5/16 UNC or SAE coarse bolt will thread into the tapped hole on the aluminum bracket, but the difference in thread angles (60° versus 55°) will cause premature wear to this softer aluminum bracket and it can never be torqued to the proper value. In addition, these two bolts will require two different spanners (wrenches).



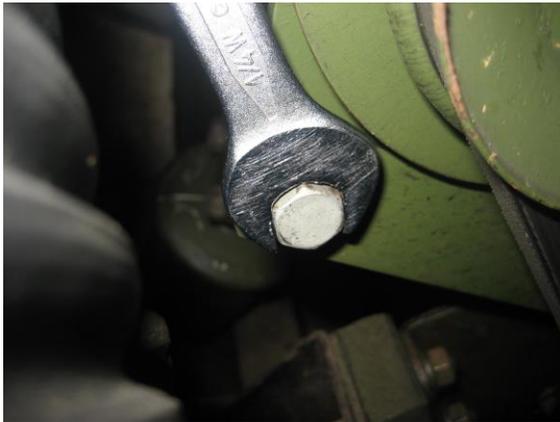
UNC bolt above, BSW bolt below, both 18 tpi.



Each requires a different spanner.



RSB-Regis Screw and Bolt w/ "R" strength rating. UNC bolt on left has no marking so it's a Grade 2



Original BSW generator link bolt on my '60 Bugeye. No letter rating so therefore mild steel? Note that this original bolt is Zinc plated versus black oxide.

The early years, the Austin Healey 100s

These are the cars that were built during the transition from the Whitworth thread form system to the new Unified thread form system, and as such will have the greatest variety of fastener thread forms. Since most of the mechanical components were already in production for many years when the 100 debuted, they carried over with their Whitworth fasteners, and in the case of the engine, it retained Whitworth fasteners until the end of BN2 production.

What this means for the 100 owner who either is going to restore his car or maintain it to a high standard is that he will need a set of Whitworth tools, spanners and sockets and set of taps and dies for some of the most common British Standard Fine (BSF) fasteners and possibly a few of the most common British Association (BA) screws, e.g., no. 2BA.

Early BN1s will have a higher percentage of Whitworth fasteners than the last BN2s or even the later BN1s. So how many thread forms are in a 100?

Whitworth

British Standard Fine (BSF) **Most of the engine, gearbox, rear axle and suspension bolts on BN1/2s*

British Standard Whitworth (BSW) **Very few fasteners were BSW, most notably the lower generator adjusting link to the taped hole in the generator front plate.*

British Standard Pipe Parallel (BSPP) **Most water and oil pipes.*

British Standard Pipe Tapered (BSPT) **Rare, but used on some drain plugs.*

British Standard Brass (BSB) **Thin walled tubing e.g., the Lucas 576 and 700 driving and fog lamp mounting shafts. All BSB diameters are 26tpi.*

Other British fasteners

British Association (BA)

British Standard Cycle (BSC) **Non-adjustable steering wheel nut threads, 26 tpi.*

Unified National Fine (UNF)

Unified National Coarse (UNC)

Unified Numbered Machine Screws. These machine screws are just an extension of UNF and UNC fasteners. (Most common are n. 10-32 Phillips head screws found extensively on all big Healeys and Sprites.)

Other miscellaneous thread forms

SAE Standard threads for spark plugs

Various wood and sheet metal screw threads

Tyre valve threads