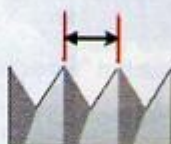


UNDERSTANDING THREADS ON VINTAGE MACHINERY AND VEHICLES

Understanding the threads encountered in the restoration of vintage motorcycles, cars and machinery can be a daunting task for those with little experience or engineering training, or a basic knowledge of the imperial measuring system. British and American threads are expressed firstly by the diameter of the bolt then the threads per inch [T.P.I.] this being the number of threads that fit into a one inch length of a given diameter i.e. 3/8x26 or 1/4x 24



i.e. 3/8 x 26 or 1/4 x24 as opposed to the metric method of measuring the diameter followed by the measurement between two adjoining threads expressed in millimetres i.e. 10 x 1.25 or 6 x 1



One exception is the...BA [British Association] thread listed below.

Common threads on British Machines

B.S.C.Y. [commonly known as cycle thread]

Cycle thread is the most common thread found on British motorcycles mostly 26 tpi over the full range of di-

DIA	TPI
1/8	40
5/32	32
3/16	32
7/32	26
1/4	26
9/32	26
5/16	26
3/8	26
7/16	26 OR 20
1/2	26 OR 20
9/16	26 OR 20
5/8	26 OR 20
11/16	26 OR 20
3/4	26 OR 20

ameters and has a 60 degree angle [angle of the V of the thread]. however small diameter threads have a finer pitch and a 20 tpi version exists from 7/16 up.

26TPI threads are often found on many parts of vintage motorcycles in much larger diameters such as steering head tubes, manual oil pumps, filler caps etc and must be regarded as special threads

B.S.F [British standard fine]

Another common thread which has a pitch [TPI] that varies with diameter and has a 55 degree angle.

DIA	TPI
3/16	32
1/4	26
5/16	22
3/8	20
7/16	18
1/2	16
9/16	16
5/8	14
3/4	12

BRASS

This thread has a 26 TPI pitch through the whole range and is often confused with Cycle thread the difference being that brass thread has an angle of 55 degrees and Cycle is 60 degrees. Brass threads are usually confined to fittings and adjusters on cables.

Brass thread taps and dies are often sold and advertised as 26 tpi and are usually identified by the letter B marked on them, they are not the same as cycle taps and dies

DIA	TPI
1/4	26
5/16	26
3/8	26
7/16	26
1/2	26
9/16	26
5/8	26
3/4	26
7/8	26
1 inch	26

which are rare and expensive.

B.S.W [WHITWORTH]

This is the most common of all British threads in general use. It is a coarse thread with a pitch that varies with the diameter, not used in nut and bolt fixing on old bikes but is sometimes used in castings for tapped holes to accept bolts and studs. Easy to identify and still available.

Sizes continue to 2 inches not used on bikes

DIA	TPI	
1/16	60 RARE ON BIKES	
3/32	48 RARE ON BIKES	
1/8	40 RARE ON BIKES	
5/32	32 RARE ON BIKES	
3/16	24	
7/32	24	I have found this thread on tank fixing bolts on T S Douglas, seems to be discontinued in modern range.
1/4	20	
5/16	18	
3/8	16	
7/16	14	
1/2	12	
9/16	12	
5/8	11	

B.A [British Association??]

This is the thread that does not seem to belong in the British range it is measured in millimetres between adjacent threads as in metric threads rather than the TPI method and has a thread angle of 47.5 degrees. Confined mostly to electrical and magneto use.

Identified by numbers rather than diameter sizes.

Even number threads can sometimes be found in old electrical appliances and electronic stores odd numbers are rare and are used in old magnetos.

SIZE PITCH [in mm]	
0	1.00
1	0.90
2	0.81
3	0.73
4	0.66
5	0.59
6	0.53
7	0.48
8	0.43
9	0.39
10	0.35
11	0.31
12	0.28

B.S.P British Standard Pipe

[taper or parallel]

Try these for tank and petrol fittings

SIZE in T.P.I	
1/8	28
1/4	19
3/8	19
1/2	14

AMERICAN THREADS

American threads are a lot less complicated than British threads, consisting of two common and easily obtained thread patterns known as U. N.F and U.N.C.

U.N.F [national fine] is exactly the same as the old S.A.E [standard American engineers] that existed before

DIA	UNC	UNF
0	---	80
1	---	72
2	56	64
3	48	56
4	40	48
5	40	44
6	32	40
8	32	36
10	24	32
12	24	28
1/8	40	40
5/32	32	32
3/16	24	32
7/32	24	32
1/4	20	28
5/16	18	24
3/8	16	24
7/16	14	20
1/2	13	20
9/16	12	18
5/8	11	18
3/4	10	16
7/8	9	14
1	8	12
1 1/8	7	12
1 1/4	7	12
1 3/8	6	12
1 1/2	6	12
1 3/4	5	---
2	4.5	---

threads were unified. U.N.C [national coarse] roughly derived from the British Whitworth introduced with early machines exported into the colony and evolved through a number of early American thread systems, such as Sellers, United States Standard, A.N.C. and finally U.N.C., it has the same pitches except 1/2 in dia where Whitworth is 12 tpi and U.N.C is 13 tpi. Both these threads are 60 degree angle.

Early Harley and Indian motorcycles used 24tpi threads on most diameters 5/16 and 3/8 UNF are both 24tpi but 1/4 UNF is 28 tpi and a special 1/4 x 24 thread must be used. 7/32 x 24 UNC is an obsolete thread and will be hard to source.

SPANNERS

British spanners are complicated in their markings. Early Whitworth nuts and bolts were larger than British Standard nuts [BSF-BSCY] for example, a 5/16 Whitworth nut was

the same size as a 3/8 British Standard nut. This meant that early spanners were marked one size too big for modern nuts, later they were marked in both Whitworth and British Standard i.e. 5/16 Whitworth 3/8 British Standard. Later on, Whitworth was changed to B.S.W. [British Standard Whitworth] and the nut size was the same as BSF for the same diameter bolt. and the spanner carried one marking either BSW or BS. Make sure you are buying the right size spanner for the head size.

American spanners are much simpler, early spanners were marked with diameter, followed by SAE i.e. 3/8 SAE. Later spanners are simply marked AF, which means across flats. A 7/16 AF spanner fits a nut which is 7/16 across the flats of the hex head. A 7/16 AF fits a 1/4" inch bolt, 1/2" AF fits a 5/16 bolt and so on.

The story on the one way valves comes courtesy of Warwick Ward, Dick Turpin and John Loftus, who all worked in some way to get the information into my lap top. The thread and spanner size information comes from Dick Turpin and is reprinted by courtesy of John Victor the publisher of the "Oily Rag" Magazine.