# FAMOUS BRITISH TEST HILLS.


***Gradients, Lengths, and Brief Details of Some of the Most Noted British Acclivities. Useful Hints on How to Make a Simple Gradient Meter.***

THERE is a strange fascination in tackling successfully any famous gradient. For one thing, some hills are so well known to motorists in the immediate locality that the performances of cars on them form a useful basis for comparison between enthusiastic owner-drivers, and often enough reference will be made in "Readers' Replies to Queries," which form a regular feature of *The Autocar*, to some such hill, the reply possibly stating that the 12 h.p. Blank, with four up, climbed such-and-such a hill on third gear at 30 m.p.h.

In the following pages there appear particulars of some of the most famous test hills in Great Britain, some of which are well known because they lie on main roads, for example, Dashwood, Sunrising, and Porlock, while others have been made famous by hill-climbs, such as Kop, Shelsley Walsh, and Spread Eagle; or, still others, by their inclusion in famous reliability trials.

### Hills and Car Design.

To these famous hills some credit must be given for the development of the modern car. The steepest hills are often what are known as "freak" hills, by reason of their excessive gradients and rough surfaces; and while in some cases they lie off the beaten track, in others they have to be negotiated constantly by local motorists unless lengthy detours are to be made. A car which is called upon to negotiate such hills must, therefore, have ample engine power. Furthermore, its suspension system must be good, or the driving wheels will bounce on the poor surface so that they lose their grip.

Similarly, some of the longer hills of less severe gradient call for adequate cooling, and an excellent example is found in Sutton Bank. Even to-day it is a good car which will negotiate Sutton Bank without boiling its cooling water if the wind be astern, *i.e.*, blowing up the hill. Moreover, one cannot ascend a hill without sooner or later having to descend again, although the gradient of descent may be spread over a longer distance and may be less severe. In any case it will constitute a strenuous brake test for the car.

### Making a Gradient Meter.

Possibly the owner-driver who resides in flat country has never needed to think what he owes to his fellow motorists who live in mountainous districts. When considering the purchase of a new car, his thoughts will naturally turn to such factors as speed and fuel economy, but his *confrère* in a hilly district will first of all enquire as to the hill-climbing ability of the engine, and the efficiency and ease of adjustment of brakes.

At the present time promoters of trials are very fond of including freak ascents in their tests, and all sorts of rumours are spread about concerning the steepness of these gradients.

When a gradient is stated as the angle from the horizontal, there can be no ambiguity; for an angle, say, of 10 degrees, can mean but one thing. But the usual way of describing a gradient in this country is to say that it is 1 in so much, or so much per cent. in some other countries. Now, 1 in 10, or 10 per cent., may mean 1 foot rise in 10 feet measured horizontally, or 1 foot rise in 10 feet measured over the surface of the road. The first method is the most convenient to map makers, the second to road or railway engineers.

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The second method also facilitates calculations of horse-power, because, when a car is running at any given speed, it is moving over the surface of the road, and its power or thrust on the road is delivered in a direction parallel to the road surface, and not necessarily always in a horizontal direction. If, therefore, it is climbing 1 in 10,

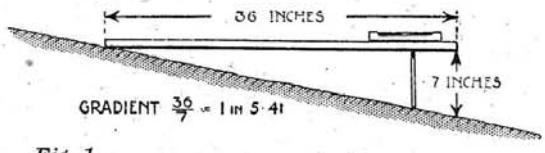


*Fig. 1.*

it is lifting its weight at exactly one-tenth of its road speed, whereas if the 10 feet is measured horizontally, the weight lifting will be done at a speed equal to $\frac{1}{\sqrt{101}}$ of the road speed.

To measure a gradient is an exceedingly simple matter, and can be accomplished by the help of a straight piece of wood, something on which to support it, a tape measure, and a carpenter's level. The straight-edge must be set up and levelled, and the distance from its lower edge to the ground measured (see fig. 1). This distance is then divided into the length of the piece of wood, or of that part of the road between the point where the

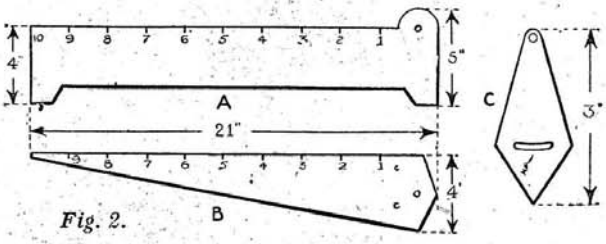


*Fig. 2.*

wood touches and the place where the perpendicular distance is measured.

If several gradients have to be measured, it is better to make a small instrument for the purpose. This is easily within the power of anyone who can use carpenters' tools. Three pieces of wood are required, two strips of brass, a bolt and wing nut, and four screws. The wood should be about $\frac{3}{8}$in. thick and the metal about $\frac{1}{8}$in.

The first piece of wood should be cut 21in. long and 5in. wide, properly squared, and with the edges parallel. A 1in. strip should then be taken off one side for a length of 19in., and the projecting bit can be rounded, and a $\frac{1}{4}$in. hole drilled in it 1in. from the end, and exactly in a line with the new edge. Part of the other side may also be cut away, leaving a projection at either end to meet the road (see fig. 2, A).

The second piece should be 21in. long, and the third 7in., both tapered from 4in. almost to a point and shaped as shown (fig. 2, B), and drilled like the first piece 1in. from the thick end and 2in. from the side. From the perpendicular, drawn from the centre of the hole to this side, spaces of 2in. are marked off to the smaller end, and similar spaces on the first piece from the hole.

Two plummets are now cut out of the brass, shaped as shown (fig. 2, C), and fixed to the two taper pieces to indicate when the top edges are horizontal. The three

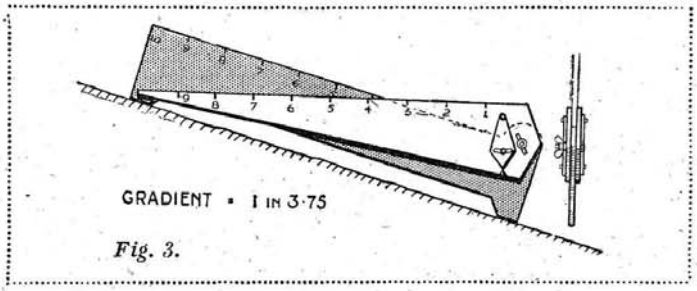


*Fig. 3.*

pieces are then fixed together by the bolt, with the plummets on the outside suspended by small screws, and their movement restricted by a round-headed screw put through a slot which can be made by drilling a hole and extending it with a rat-tail file. Fig. 3 shows the complete instrument. When this is placed in position, the gradient can be read off at once, without the need for any calculations, in either manner.

With the dimensions given, any possible gradient up to 1 in 10 can be measured. If slighter gradients need checking, a second hole can be bored in the longer taper piece on the perpendicular already drawn 1in. from the top, or calibrated edge, and the reading doubled. The shorter piece is for measuring the steeper gradients when the longer would foul the ground. The calibrations will be most convenient if marked on the edge.

## NAMES, LOCALITIES, MAXIMUM GRADIENTS AND LENGTHS OF FAMOUS BRITISH HILLS.

| | Maximum Gradient. | Length. |
|---|---|---|
| **ALMS HILL,** near Henley-on-Thames. Bad surface, two bends. Includes 600 yd. of 1–5½. Very greasy in wet weather | 1–3 | 1,200 yd. |
| **AMBLESIDE.** Rises 1,300ft. | 1–4.25 | 2 m. 7 fur. |
| **ANGEL BANK,** near Cleobury Mortimer, Shropshire | 1–8 | Approx. ½m. |
| **ALDERWASLEY,** near Wirksworth | 1–5 | 1½ miles |
| **ALT-Y-BADY,** Llangollen. Rocky surface | 1–3.5 | ½ mile |
| **AMERSHAM** near High Wycombe | 1–9 | 565 yd. |
| **AMULREE,** Perthshire. Acute Z bend | 1–4 | 1 mile |
| **APPLECROSS,** Ross-shire. Three bad bends | 1–7 | 5 miles |
| **ASTON CLINTON,** near Tring. A long rise, which includes a right-angle corner and severe left-hand curve | 1–8.5 | 1,400 yd. |
| **AULTNAHARIE,** Ross-shire. One bad corner | 1–6 | ½ mile |
| **BAKEWELL LANE,** near Bakewell | 1–5 | ¼ mile |
| **BARBROOK MILL HILL** (Beggar's Roost), near Lynmouth. Fairly straight, bad surface. Rises 343ft. | 1–3.64 | 906 yd. |
| **BIRDLIP,** near Gloucester. No sharp corners, three curves. Easiest gradient is 1–15 | 1–5 | 1 m.140 yd. |
| **BISMORE,** Stroud | 1–4 | ¼ mile |
| **BLAKE ST.,** Sheffield. Cobbled surface. Commences with acute right-angle bend | 1–5 | ⅓–½ mile |
| **BLUEHILLS MINE.** Very sharp left-hand hairpin bend, where gradient reaches 1–3 | 1–3 | Approx. ½m. |
| **BOX HILL,** near Dorking. Left-hand bend and sharp right-hand hairpin | 1–14 | Approx. 1m. |
| **BRASTED.** Two bends, between which lie the steepest portion. Surface good, neither bend severe | 1–5.5 | Approx. ½m. |
| **BUFFAGE,** Stroud | 1–4 | ¼ mile |
| **BURY HILL,** near Arundel | 1–9 | 1,300 yd. |
| **BUSHCOMBE,** near Cheltenham | 1–5 | ½ mile |
| **BUTTERMERE HAUSE,** near Crummock Water, Keswick. Includes several corners with gradients of 1–4½. Rises 700ft. | 1–3.75 | Approx. 1½ m |
| **BWLCH-Y-GROES,** near Pont-y-Pennant. Dinas Mawddwy side. Average gradient 1–7. Rises 1,250ft. | 1–4.5 | 2,660 yd. |
| **BYBER'S HILL** (Waterrow), Somerset. Includes one right-angle turn, a bend, 100 yd. of 1–7 and a portion of 1–8 | Approx. 1–4.5 | Approx. ½ mile |
| **CAERPHILLY,** near Caerphilly. Rises 387ft. Average gradient 1–8.6 | 1–6.2 | 1,194 yd. |
| **CAIRN O' MOUNT,** Aberdeenshire. Average 1–9.9. Bad hairpin bend | 1–5.4 | 2 m. 35 yd. |
| **CATSASH,** near Newport. Straight. Average gradient 1–15 | — | 800 yd. |
| **CARMICHAEL CHURCH HILL** | 1–6 | — |
| **CHEW HILL,** near Bristol | 1–7 | ⅜ mile |
| **CLAPTON-IN-GORDANO** (Bristol Club). A fairly straight hill with an average gradient of 1–7.22 | Approx. 1–6 | Approx. ¾m |
| **COLD FELL,** near Gosforth (Lake District). Good surface, but about fifty gulleys cut across the road | Approx. 1–5 | Approx. ¼ mile |
| **COLLIER'S HILL,** near Broomfield (Taunton) | 1–5.5 | — |
| **COPPICE HILL,** near Accrington. Portions of 1–3.9 | 1–2.6 | 400 yd. |
| **CORFE HILL,** Somerset | 1–5 | 1 mile |
| **COUNTISBURY,** Lynmouth. Rises 900ft. No dangerous corners. Steepest near bottom | 1–5.25 | Approx. 2m. |
| **COWDALE LANE,** near Buxton. Two bad corners | 1–5 | 1 mile |
| **CRAWLEYSIDE,** near Stanhope | 1–8 | — |
| **CROSSDALE,** near Ennerdale. Includes four bends | 1–4 | — |

## Famous British Test Hills.

| | Maximum Gradient. | Length. |
|---|---|---|
| **CROSSDALE HILL,** near Ennerdale. Includes five turns | 1-4 | — |
| **CREECH HILL,** near Bournemouth. Fairly straight, good surface | 1-7 | Approx. ¼m. |
| **CUDHAM HILL** (from Downe). Average gradient, 1-6.8. One of the most severe hills near London. Good surface | 1-4.1 | 233 yd. |
| **CUDHAM CHURCH HILL.** Average gradient about 1-8. Includes one nasty bend on steepest portion | 1-5.34 | 416⅔ yd. |
| **CURBAR,** Sheffield District. Averages 1-6 | — | ¾ mile |
| **DACRE BANK,** Ullswater. Rises 400ft. with steepest portion at top | 1-4 | ¾ mile |
| **DASHWOOD** (High Wycombe). Average gradient 1-16. Straight 352 yd. of max. gradient | 1-10.9 | 1,180 yd. |
| **DUNMAIL RAISE,** near Ambleside. A straightforward hill. Good surface | 1-7 | 1 mile |
| **EDGE HILL,** Kineton. Rises 360ft. Three bends, the first being the most severe. Good surface | 1-7 | Approx. ⅜m. |
| **FARLOW BANK.** One hairpin corner to left; two bad corners | 1-5 | Approx. ½m. |
| **FISH HILL,** near Broadway | 1-11 | 2,150 yd. |
| **FOOLSTEP,** near Ambleside. A short hill. Includes sharp double turn near top, which is the steepest portion | 1-3.3 | 220 yd. |
| **GARROWBY,** near Stamford Bridge. Usually rough | 1-6.5 | Approx. 1m. |
| **GIDDYNAP,** Stroud | 1-4 | ⅛ mile |
| **GLEN DOE,** near Caledonian Canal. Recently much improved. Average 1-7.7 | 1-6 | 1,260 yd. |
| **GREEN HILL,** near Wirksworth (Sheffield) | 1-4 | — |
| **GREENHOW HILL,** Pateley Bridge, Yorks. Rises 1,000ft. Two bad corners on steep part | 1-5.4 | Approx. 2¼m |
| **GROSMONT BANK,** Yorks. Surface loose at top | 1-6 | ½ mile |
| **GRUINARD,** Ross-shire. Average 1-7.8. | — | 592 yd. |
| **GUMMER'S HOW,** near Windermere. A straightforward hill. Rises 550ft. | 1-4.5 | Approx. 1m. |
| **HARD KNOTT PASS,** Lake District. Includes twelve hairpin bends. Bad surface | 1-3.25 | — |
| **HIGH FELL,** near Carlisle | 1-5 | — |
| **HIGHER LATH HILL,** near Ulverston. Road twists considerably, and includes a difficult left turn. Middle portion is steepest | 1-3.75 | — |
| **HIGH OAK,** Bewdley. Loose and wet surface | 1-4 | ¼ mile |
| **HOLME MOSS,** near Huddersfield. Four bad bends. Surface fair | 1-9 | Approx. 1¼m |
| **HOLMSIDE HILL,** Durham. Includes several bad corners. Rough surface. Steepest at bottom | Approx. 1-3.5 | Approx. 1m. |
| **HOLNE CHASS,** Dartmoor. Road rises 850ft. Surface fairly good. Near Holne Bridge an acute right-handed turn with maximum gradient | 1-3.5 | 2 miles |
| **HONISTER PASS,** Lake District. Buttermere side. Includes many portions of 1-4½ | 1-3.25 | Approx. 1¼m |
| **JACOB'S LADDER,** near Hathersage. A narrow winding climb | 1-4.5 | 350 yd. |
| **JAWBONES,** Dartmouth. Starts with a right-angle turn and a gradient of 1-8, increasing to maximum, and finishing with another sharp turn to right | Approx. 1-4 | — |
| **KENMORE,** near Amulree | 1-5 | 1 mile |
| **KILN PARK BROW,** near Broughton-in-Furness. A long climb, which includes many turns with 1-4½ gradient | 1-4.5 | 1 mile |
| **KIRKBY MOOR HILL,** near Ulverston. Includes long stretches of 1-4½ and 1-5 gradients. Rises nearly 900ft. | 1-4.5 | Approx. 2m. |
| **KIRKSTONE PASS,** near Ambleside (Ullswater side). A long steady climb. Steepest portion near the top | 1-4.75 | 1½ miles |
| **KOP HILL,** Princes Risboro'. No bad corners. Surface fair. Steepest part near summit | Approx. 1-5 | ¾ mile |
| **LITTON STACK.** Surface bad. Starts with acute hairpin. Steepest portion at top. Narrow road | Approx. 1-3 | 420 yd. |
| **LLANBERIS PASS** | 1-6 | 2 miles |
| **LOCH-NA-CRAIG.** Average 1-17 | — | 3 m. 484 yd. |
| **LOWER BRADFIELD,** near Sheffield. Includes several stretches of 1-5 | 1-5 | — |
| **LYNTON HILL,** Lynmouth. Average gradient 1-6. One of the steepest hills in England. One bad corner near bottom. Surface usually bad | 1-4.5 | Approx. ½m. |
| **MAM RATACHAN,** near Glenelg. Average gradient 1-7 | Approx. 1-3 | 1½ miles |
| **MATLOCK BANK,** near Matlock Bath. Fair surface | 1-5 | 440 yd. |
| **MONUMENT HILL,** Taunton. On Blackdown Hills | 1-5 | Approx. 1m. |
| **MOORSHOP** and **MERIVALE,** Tavistock-Two Bridges. Both hills have long pulls of single-figure gradients. Surface usually good | — | — |
| **MUSWELL HILL,** Crouch End, New Southgate. Average gradient 1-12. A convenient hill for Metropolitan riders | 1-9.5 | 793½ yd. |
| **MYTHOLM RISE,** near Todmorden. Includes several acute bends, and a final hairpin. Surface very bad | Approx. 1-5 | — |
| **NAILSWORTH LADDER,** near Stroud. Average gradient 1-3½. First portion very steep. Bad surface | 1-2.5 | App. 300 yd. |
| **NAZE HILL,** near Todmorden. Very bad surface, with deep ruts. First bend is a severe hairpin. A dangerous hill | 1-2.5 | — |
| **NETHERHALL GARDENS,** Hampstead. Average gradient 1-18. Worst portion is just before the left-hand turn | 1-7.25 | 760 yd. |
| **NEWNHAM HILL,** near Daventry. Surface usually bumpy. Hill commences just outside Newnham Village. Steepest portion near summit | 1-6 | Approx. ¾m. |
| **OLD HORSE SHOE FALLS PASS,** N. Wales. Average gradient 1-10. Numerous cross gulleys. Bad surface | 1-4.1 | 1 mile |
| **OLD WYCHE,** near Malvern. The old road leading up to the Wyche Cutting. Now closed to motor traffic | 1-3 | App. 880 yd. |
| **OXENFELL,** Coniston Valley. Includes two hidden corners. Steepest near the top | 1-5 | Approx. ½m. |
| **PANNE HILL,** between Llandrindod Wells and Brecon. Average gradient 1-12 | — | 2¼ miles |
| **PARK HEAD,** near Kendal. Rises 500ft. Average about 1-10 | — | Approx. 1m. |
| **PARRACOMBE,** North Devon. Two hills out of Parracombe Village. Surface usually good | 1-5 | ¼ mile |
| **PEAK,** near Sidmouth | 1-5 | 1 mile |
| **PEAT HILL,** Westgate-in-Weardale. Hill is 27 miles from Durham. Excellent surface. No really bad bends | 1-4 | |
| **PEBBLECOMBE,** near Dorking. Surface loose near top | 1-6.5 | Approx. ½m. |
| **PEN-Y-BALL,** Holywell, Flintshire. Average gradient 1-6 | — | ¾ mile |
| **PEPPARD,** near Reading | 1-6.5 | 300 yd. |
| **PETERSHAM HILL,** Richmond. Average gradient 1-15. Good surface. Easy bends | 1-9.5 | 600 yd. |
| **PINK HILL,** near Kop, Chiltern Range | 1-5 | ¾ mile |
| **PORLOCK,** Somerset. Road rises 1,200ft. Surface very bad. Includes two bad corners and one bend | 1-4 | Approx. 2½m |
| **RANZE HILL,** near Dore. Includes an S-bend, with steepest portion near top | Approx. 1-4 | — |
| **RED BANK,** near Ambleside. Good surface and easy corners. Steepest on the middle section | 1-3.6 | 880 yd. |
| **RISING SUN** (Gambles Lane), near Cheltenham. Steepest portion at top. Surface poor. Several gulleys running across road | 1-4.5 | 480 yd. |
| **RIVER HILL,** Sevenoaks. Average gradient 1-13.4. Good road. Easy curves | 1-9.8 | 1,444 yd. |
| **REST-AND-BE-THANKFUL.** Average 1-11 | — | 1,706 yd. |
| **ROSEDALE ABBEY BANK,** North East Yorks. Loose stones, bad gulleys | 1-4 | ½ mile |
| **SAINTBURY,** Broadway. Average gradient 1-11.9. Moderate surface | 1-6.1 | 2,341⅔ yd. |
| **SALCOMBE,** South Devon. One S bend. Surface usually muddy | Approx. 1-7 | Approx. 1m |
| **SALTERSFORD,** near Ballington | 1-5 | Approx. ¾m. |
| **SCREW HILL,** Nevin, Carnarvonshire. Not safe for cars | 1-3 | ¾ mile |
| **SHELSLEY WALSH,** near Worcester. Private road. Includes bad S-bend | 1-6.26 | Approx. 1,100 yd. |
| **SIR WILLIAM,** near Grindleford, Sheffield. A tricky ascent. Surface rough. Two hundred yards of maximum gradient | 1-4.5 | Approx. 2m. |
| **SLACK HILL,** near Chesterfield. Includes two bends | Approx. 1-6 | Approx. 1m. |
| **SNAKE HILL,** Glossop. Includes every variety of surface and a hairpin bend | 1-4 | Approx. 1m. |
| **SOUTH HARTING,** near Midhurst. Several bends | Approx. 1-6 | Approx. 1m. |
| **SPREAD EAGLE,** near Shaftesbury. Surface rough and loose. Includes slight bends. Average gradient 1-11 | 1-6 | App. 1,200yd |
| **STANTAFORD'S HILL,** Torquay | 1-4 | — |
| **STATION HILL,** Coniston. Includes many corners. Bad surface | 1-3.5 | — |
| **STILE COP,** near Rugeley. One big sweep, nearly straight | Approx. 1-8 | 7/8 mile |
| **STONELEIGH** (Motslow Hill), Coventry. Approached by right-angle bend. A Coventry test hill | 1-9.34 | 452½ yd. |
| **STONEY BROW,** Manchester | 1-7 | — |
| **SUDELEY,** near Winchcombe. Surface poor and often greasy. A long hill, starting with an easy gradient. No serious corners | 1-5 | 1,200 yd. |
| **SULHAM,** near Reading | 1-6 | 600 yd. |
| **SUNDON HILL,** near Barton-in-the-Clay | 1-8 | — |
| **SUNRISING,** Stratford-on-Avon—Banbury. Two sharp corners and a curve. Surface good. Steepest portion near top | 1-6.43 | 1,093½ yd. |
| **SUTTON BANK,** Thirsk, Yorks. Average 1-7 | 1-4 | 1 mile |
| **TELEGRAPH HILL,** on Teignmouth Road | 1-7.5 | — |
| **THWAITE HEAD,** near Windermere | 1-4.5 | — |
| **TITSEY HILL,** Godstone | 1-6 | ⅛ mile |
| **TOWTOP.** Includes a series of twelve sharp corners and several portions of 1-3½. Ninth corner is worst | 1-3.75 | 1,160 yd. |
| **TRESCOMBE HILL,** near Taunton. Road rises 450ft. On the Quantock Range | 1-6 | 1,000 yd. |
| **TROW HILL,** Sidford. Average gradient 1-8 | 1-5.5 | 1 mile |
| **TUMMEL BRIDGE,** Perthshire. Average 1-27.95 | — | 2m. 1,160yd. |
| **TYSOE HILL,** on Edge Hill Range. Rather twisty, with fair surface, but greasy in bad weather | Approx. 1-7 | Approx. ⅜m. |
| **UNDERWOOD HILL,** Lake District. Includes three sharp turns | 1-4.5 | 1½ miles |
| **UP-PACK HILL** near S. Harting (Sussex) | 1-6 | — |
| **VALE ST.,** Bristol. A side street near the river. Includes two bends | 1-2.44 | 480 yd. |
| **WATERMILLOCK,** near Penrith. Three sharp turns on upper portion | 1-4.5 | Approx. 1¼m |
| **WATTY SCOUT HILL,** near Todmorden | 1-3 | — |
| **WEST HILL,** Highgate | 1-9 | — |
| **WESTERHAM HILL.** Average gradient 1-13.4. One sharp bend to left. Good surface | 1-7.8 | 1,764½ yd. |
| **WESTON LANE,** near Bath. Includes an S-bend | 1-4.75 | ⅜ mile |
| **WHINLATTER PASS,** near Keswick. Rises 720ft. Has two steep patches in the lower part | 1-5½ | 2 miles |
| **WHITE LEAFE,** near Kop. Chiltern Range. Surface rough and loose on bend | Approx. 1-6 | ½ mile |
| **WHITE DOWNS,** to left of road from Abinger Hammer—Dorking. Loose rutty surface and bends | Approx. 1-6 | Approx. ¼m. |
| **WHITE SHEET,** near Beaminster. Long steady climb. Surface fair, loose in parts | Approx. 1-5.5 | Approx. ¾m. |
| **WILLERSLEY HILL,** Broadway. Road rises 406.3ft. One abrupt corner. Very greasy in wet weather. Surface usually poor | 1-5.9 | 1,206⅔ yd. |
| **WRYNOSE PASS,** Lake District. Includes portions of 1-4. Bad surface. Twisty route | 1-3.5 | Approx. 2m. |
| **YEW TREE HILL,** near Coniston Water. Includes portions of 1-4½ and 1-4¾ | 1-3.5 | Approx. 1m |