

British Cycling Federation Training Log

Record the time in hours and minutes you spend training in the appropriate intensity column. If you found a particular session very difficult, then note the reason for this in the comments column. Record your weight first thing in each morning after you have been to the toilet but before eating or drinking. Take your pulse soon after you wake up - the best way is to relax for a minute sitting beside your bed, count the number of beats in 30 seconds and double it.

Day/Date	Weight	Pulse	Level 1	Upper/Lower 2	Level 3	Level 4	Comments
Monday							
Tuesday							
Wednesday							
Thursday							
Friday							
Saturday							
Sunday							

BRITISH CYCLING FEDERATION

TRAINING GUIDELINES



Approved and recommended by

Doug Dailey

National Coach of the British Cycling Federation

Introduction

As a direct result of several years of Cycling Specific Research, conducted by Peter Keen, BCF Consultant Exercise Physiologist, based at Bishop Otter College, Chichester, the following training guidelines have been prepared with assistance from Tony Yorke, BCF Coaching Development Officer. This research programme is continuing and is funded through a National Coaching Foundation Sports Science Education Grant, provided by the Sports Council and administered by the British Cycling Federation.

Four Levels of Training Intensity

Each of the Four Levels of Training Intensity identified by Peter Keen is controlled by working at a specified heart rate, in beats per minute (BPM), relative to your individual maximum heart rate (MHR). Alternatively, the guide provides a description of how each of the Four Levels should 'feel' when being performed correctly, and these sensations should remain constant at each level during training, irrespective of the degree of fitness achieved. Note that if, whilst training at a particular level, the effort made is either too hard or too easy against the indicated heart rate range for that level, then the training effect will shift to either the level above, or the level below, the one intended. This is a particular problem when training in a group situation. Training at Levels 1 and 2 can be performed in a group, where additional skills may be simultaneously acquired, but there is a real danger of losing control of the purpose of your training session. Avoid being compelled by other members of the group to train at a level which is not right for you for that session.

Maximum Heart Rate (MHR)

Your maximum heart rate, whilst performing on the bike, is individual to you, and it is imperative that you obtain an accurate measure of your maximum, regularly updated. This measurement will be automatically taken during a Performance Potential Test on the Kingcycle Test Rig, normally referred to as a 'Ramp Test'. These tests must be performed on a regular basis at your Centre of Excellence, or by referral to Bishop Otter College. Access to regular use of a reliable Pulse Monitor is also essential.

Training Level 1

Heart Rate: Level 1 Training intensity is typically performed by riding at a heart rate of 45 to 50 BPM or more below your measured maximum heart rate. If your MHR is 200, then Level 1 training effects would take place at below 150-155 BPM.

Sensation: At this work intensity the sensation of effort would be very low and concentration is not required to maintain the riding pace. You should be unaware of your rate and depth of breathing and continuous conversation with training companions is possible. For an elite cyclist Level 1 will not be stressful, and could be maintained continuously for several hours.

Purpose: The real value of Level 1 training is as a controlled, active recovery exercise, performed between more stressful workouts, or at times when higher levels of training are undesirable for mental or physical reasons. It is below the level of intensity at which a significant strain is placed on the body functions that limit cycling performance. Only slow, oxygen-using muscle fibres will be working. There is a possibility that muscle sugar stores could actually increase during Level 1 training, provided that there is a high intake of carbohydrate during the ride. Furthermore this low intensity level is ideal for improving basic skills, adjusting riding technique and acclimatising the body to long periods in the saddle. Level 1 is the basis of most club runs, and a very pleasant activity, but should not be confused with serious race training.

Limiting Factors: The major factors that limit training at this level are energy reserves in the form of blood sugar and fluid loss. Appropriate food and drink should therefore be carried on rides in excess of one to two hours. In an elite endurance cyclist the major fuel source for energy will be fat.

Frequency: This type of cycling is essential for riders returning to training following enforced inactivity due to accident, injury or sickness. Level 1, used as a regular recovery ride, could assist in avoiding chronic fatigue and the destructive effects of overtraining. However, it will not result in large improvements in performance and cannot be considered as a suitable training intensity, even for long rides. See Section 'Low Level 2'.

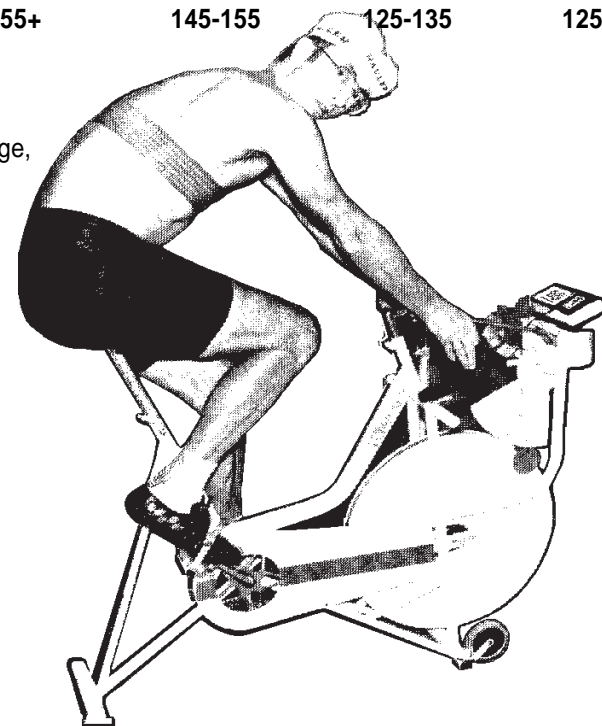


RECOMMENDED TRAINING HEART RATES

Based on Measured Maximum Heart Rate, ideally taken from a Kingcycle Test.

MAXIMAL HEART RATE	LEVEL 4 RANGE	LEVEL 3 RANGE	LEVEL 2 RANGE	LEVEL 1 MAXIMUM
210	195+	185-195	165-175	165-
205	190+	180-190	160-170	160-
200	185+	175-185	155-165	155-
195	180+	170-180	150-160	150-
190	175+	165-175	145-155	145-
185	170+	160-170	140-150	140-
180	165+	155-165	135-145	135-
175	160+	150-160	130-140	130-
170	155+	145-155	125-135	125-

Source:
Peter Keen
Bishop Otter College,



Training Level 4

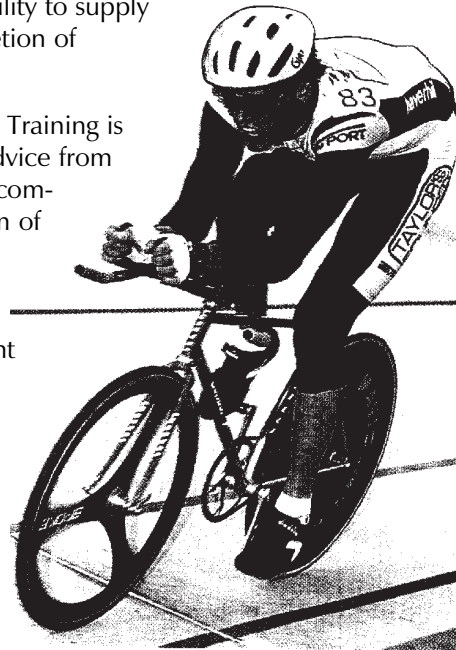
Heart Rate: Level 4 training is based on repetitions of intervals of hard effort and recovery, with the work efforts near, or at your maximum heart rate.

Sensation: Training at Level 4 requires you to work at intervals of intensity *above* your critical threshold, so steady-state exercise is no longer physically possible. Recovery time between each of a series of work repetitions will vary, depending on the type of training being undertaken and whether full or partial recovery is desired. The duration of the work efforts should be between 30 seconds and 3 minutes, and rest intervals from around 1 to 2 minutes, depending on the cycling discipline you are training for.

Purpose: As the primary objective of interval training is to near-maximally load the cardiovascular system by repeatedly pushing yourself almost to the point of exhaustion, the major benefit is the resistance to short-term fatigue. There are training effects throughout all muscle fibres, and maximum power is developed by increasing the rate at which carbohydrate can be broken down to lactate in the muscles. Therefore, specific skills such as sprinting and climbing are enhanced.

Limiting Factors: Carbohydrate is the only fuel source for Level 4 training. Since the efforts involved require the full recruitment of muscle fibres, the training will be limited by a failure to supply energy to the muscles at the rate required to maintain power output. This failure will be the result of a combination of large increases in muscle acidity, inability to supply sufficient oxygen to the muscles, and a depletion of carbohydrate stores.

Frequency: Detailed information on Interval Training is beyond the scope of these guidelines, and advice from your Coach, or further reading, is strongly recommended. Level 4 is the most demanding form of training both physically and psycho-logically and it will not replace the vital endurance training as performed at Levels 2 and 3. In practical terms Level 4 training can be thought of as the 'icing on the cake' of a training programme, in that it tunes all the basic fitness work into real race conditioning. Sessions should therefore be added to the pre-season training programme close to the commencement of actual racing. Begin each Level 4 session with at least a 15-minute warm-up and follow actual training with a warm-down routine.



Training Level 2

Heart Rate: Level 2 is the training intensity at which the major biological mechanisms which determine your performance as a cyclist start to become taxed. For most riders this level equates to a heartbeat in the range of 35 to 45 BPM below measured maximum heart rate.

Sensation: Although this intensity is at a relatively comfortable pace, Level 2 training requires a marked increase in concentration over Level 1. Without this higher degree of concentration the effort can easily drop back to Level 1. Breathing rate becomes more rhythmic and is noticeably deeper. Conversation is possible, but frequent pauses are necessary to regain breathing pattern.

Purpose: Training at Level 2 results in a number of important physiological changes. These include: the improvement of the supply of oxygen to the working muscles by an increase in the heart's capacity to pump blood; a rise in the total volume of blood; the growth of small blood vessels within the muscles; and the fine tuning of controlled blood flow in the body. The ability of the muscles to use oxygen also improves, through changes in the biochemistry of the muscle fibres, enabling you to work more efficiently, and at higher work intensities, without the onset of fatigue. A further effect is to encourage the body to use fat as a fuel source in preference to the all-important carbohydrate stores.

Limiting Factors: Frequent rides over 1½ hours at this pace are possible, but longer training rides at this intensity are very draining (See Section: 'Low Level 2'). There is a strong risk of dehydration and of the body's carbohydrate stores becoming exhausted. This causes blood sugar levels to become very low and can lead to distressing symptoms of muscle weakness and dizziness. This can be avoided by adequate carbohydrate intake during and immediately following Level 2 training. These sessions should not exceed two hours when performed on a daily basis.

Frequency: Because Level 2 training is fundamental to improved cycling performance,



rides at this intensity should figure prominently in an elite rider's training programme. At least three Level 2 sessions per week are essential, best performed alone, or in a small group as a steady line-out.

Training Level, Low Level 2

Heart Rate: For the road rider particularly there are occasions when an extended long ride at the bottom end of Level 2 is desirable. These rides would typically be performed at around 45 BPM below MHR and be between 3 and 5 hours in duration.

Purpose: Long training rides at Low Level 2 will have a similar training effect as normal Level 2, but additionally the body will be forced to continuously recruit, with-in the working muscles, as many muscle fibres as possible in order to obtain adequate supplies of muscle glycogen. Also, the ability to use fat as a fuel source will be further enhanced. It is important during Low Level 2 training that plenty of fluid is consumed without restriction, to avoid dehydration, and there must be a continuous intake of carbohydrate, throughout the ride, to maintain the blood glucose level. Both requirements can be accommodated by using a polymer glucose drink in a concentration that will supply about 40 grammes of glucose per hour. It is important that, once the ride has been completed, carbohydrate is consumed immediately, either in the form of a higher concentration polymer glucose drink, or from a light meal high in complex carbohydrates. *Unless this glycogen replacement process is started immediately and followed by normal meals high in carbohydrate, the ability to train on subsequent days will be severely restricted.*

Frequency: Because of the debilitating effects of exhausting the body's glycogen stores, long duration Low Level 2 training should be relatively infrequent: pre-season maximum once per week, and possibly reducing to once every ten days or so in season, depending on racing commitments. At least 24 hours recovery is required before performing more training at Levels 2, 3 or 4.



Training Level 3

The physiological reasons for Level 3 training are somewhat complicated but the basic principle lies in the fact that a critical level of effort exists, beyond which you are incapable of maintaining a steady pace without rapidly fatiguing. You will have experienced this phenomenon in middle-distance individual time trials, where it is crucial that you ride at a pace that does not exceed this critical work threshold.

Heart Rate: The Kingcycle Performance Potential Test should give a clear indication of your correct heart rate intensity for Level 3 training. However, a good approximation is to work in the range of 15 to 25 BPM below your measured maximum heart rate.

Sensation: Level 3 training is best performed as a continuous steady effort, and the intensity is such that it can only be sustained for relatively short periods. In practice this should be rides which last between 25 and 30 minutes, plus both a warm-up and warm-down of around 15 minutes each. Breathing rate would be rapid and powerful, but should remain regular. If on completion you feel that you could have continued the effort for a longer period, then it is unlikely that the work rate was high enough. Conversely, if during the session you become progressively exhausted, with heart rate, breathing rate and muscular pain rising continuously, then the load is too great. Level 3 training requires intense concentration and is psychologically very demanding.

Purpose: The object of Level 3 training is to exercise for a sustained period just at your critical threshold. Such a work-out places a very high load on the body's ability to supply oxygen to the working muscles. Equally important, it stresses the mechanisms which control the fatigue-causing processes that occur within the muscles at high work rates. Training at this intensity ensures a heavy aerobic stress and should improve the power output you can sustain before the onset of fatigue.

Limiting factors: The major factor limiting Level 3 training is the discomfort associated with the failure of the body to maintain control of the fatigue-causing processes. The depletion of the body's carbohydrate store dramatically affects this type of training, so it is important to ensure that you are fully recovered from any previous training session. If you perform Level 3 training on indoor apparatus, heat build-up can be a problem. It is important to make sure that you can dissipate the heat produced by the body, and a large cooling fan is considered essential in warm environments.

Frequency: Although mentally taxing, since Level 3 training will accustom the body to the physical load that will be encountered in most racing situations, it must be included as an important element of your training programme. Two sessions per week at Level 3 intensity, performed alone, are therefore, highly recommended.

