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Training Type: **Intermediate to Advanced**

Working HR Zones: **Zone 3-4**

Class Length: **45 minutes**

PROFILE DESCRIPTION

This workout is to improve sustainable strength and increase muscle fiber recruitment while working aerobically. The workout consists of pedaling at very low cadence (about 50-55 rpm) in a big gear up a hill for five to 15 minutes at a time in the saddle, focusing on smooth pedaling. The workout should remain aerobic in terms of heart rate. There is controlled and limited recovery between efforts equal to the length of the work period. This workout can be stressful on the knees and lower back.

OBJECTIVE AND INTENSITY

The design of the training is to maintain a low cadence (50-55 rpm) while turning high resistance. The purpose of the lower cadence is to allow you to limit heart rate, increase muscular work and compel you to concentrate on your pedal stroke without the benefit of pedal momentum. Stay seated during the work efforts.

Initially, pedaling this slow with high resistance is going to cause the pedal stroke to be uneven. Correct form must be strictly maintained. Strong concentration is needed to keep your upper body smooth and relaxed while concentrating on correct pedaling technique. You will see your students pushing hard through the downstroke (mashing). Encourage them minimize the side-to-side action (without “freezing”) that will naturally occur. Always apply force to the pedal in a direction that is 90 degrees to the crank arm. One of the benefits of training at 50 rpm with resistance is that it allows you to exert power more specifically to various points in your pedal stroke.

One of the most important facets of Big-Gear Training is intensity. You can utilize heart rate, power or RPE as your guide. The key here is to keep the intensity from a cardiovascular perspective low to moderate, with the goal of keeping the workout mostly aerobic. If you already know your threshold heart rate, Big-Gear intervals will be optimally performed at approximately 80-90% of that heart rate. If you are using a Maximum HR formula, keep the intensity 80-85%. With most students, HR will be limited and not be able to achieve these levels. Power zones will usually be a bit higher at 84-94% and RPE is usually kept about 5-7 out of 10 or “moderate” to “somewhat hard.” From a muscular fatigue perspective, RPE is generally around 6-8 out of 10, depending on your current level of fitness.

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This make this profile very effective for winter training provided the student has trained enough to develop structural integrity and a solid riding position.

Big-Gear intervals can be ridden for 5 to 10 min, allowing the same time for recovery. Recovery is typically spinning at 100 rpm with limited recovery (drop the HR no more than 20 beats). Start with 2 or 3 repeats.

HISTORY AND DEBATE

In 1983, Dr. Aldo Sassi and Dr. Massimo Testa of the Mapei Sports Performance Training Center (Milan, Italy) developed a pedaling strength method, which was substantially aerobic by nature. Known as SFR's (Slow Frequency Repetitions), this on-bike strength workout offered a cycling specific benefit that focused on high torque, slow cadence and cardiovascular intensity.

Slow cadence/high resistance pedaling (also called Muscle Tension) has been under debate for some time. Many cyclists do it and many cyclists are critical of it. There is only anecdotal reference to its benefits. The criticism is generally:

- There is potential for injury.
- The training adaptation will be to make you an effective climber if you climb at 50 rpm.
- Your power output is limited (you can generate greater power with faster spinning).

All warrant consideration. However, like me, many riders will swear that it is perfectly safe with enough base training and that it has a significant impact on climbing ability. If you are used to climbing in a 53-17, when you climb in a 39- 21 you feel like you can fly uphill.

Last, the world of cycling has become about looking for the easiest way to get up the mountain. Lighter bikes and easier gears are the rage. When it comes to performance, I am in agreement that the bike and gears that will help you do your best are what you should use. However, part of the attraction of cycling is its grit. Changing your cog to limit your ability to spin or refusing to use you climbing gear on a training ride (even if it means walking up a hill) adds to your "toughness" which is my favorite characteristic of a great cyclist.

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THE PROFILE

WARM-UP

Length: 5:00
Intensity: 3-4 RPE
Cadence: 90-110 RPM

Center the rider and provide an overview of the ride's objective.

Roll your legs. Little to no resistance on the bike.

Pay attention and don't miss this part of the ride. The most precious time of every ride is the rollout. This is the time when you first spin the wheels and feel the gentle nudge of momentum. That invisible force that carries you down the road. We take its support for granted and often let the preoccupation of our minds distract us from its magic. The road begins to move past you more quickly and, suddenly, you feel as if you're flying.

Then a rhythm begins to develop. Do you feel it? A consistency in your pedaling. Take the resistance up slightly and build your cadence. Begin to coordinate your breathing with your pedaling and let me tell you what we're going to do today.

Today we are going to train in the foothills. We're going to climb but not the mountains. However, we're going to ride in a way that will not just make you strong but tough as well. That's because we are not going to use our climbing gears. We're going to climb seated and stay in our big chain-ring the entire time we're climbing. This is going to limit our cadence and control our heart rate. The overall intensity will be moderate and aerobic but you will challenge your muscular strength.

SPINNING 1

Length: 6:00
Intensity: 4-5 RPE
Cadence: 100 RPM

Progress the effort, describe the profile and prepare for the ride's first climb.

Start to use the rhythm of the music as a metronome. Turn your legs over at 100 RPM and add enough resistance to stabilize your HR at a comfortable aerobic level. Let the structure of the music help you turn a consistent cadence. This will become important when we begin to work in the hills. There are 6 songs in the body of today's ride. All are about 6 minutes long. The odd songs are for spinning and even songs are for climbing. We are riding to our first song right now. We need to bring the HR up to a good aerobic training level and then maintain that intensity as we move into the hills.

The difficulty will come in simulating what it is like to climb in our Big Gear. Our cadence will be slow. 50-55 RPM. We will set it to the tempo of the music. Then you must bring on enough resistance to keep your HR where it is. Also, I need you to commit to the saddle while we are

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climbing. No standing. The resistance will make you want to stand but the training requires that you stay seated. After each hill, we will spin and drop our HR but not more than 20 beats. There are 3 hills to climb today.

During the spinning intervals, you can stand and stretch but the object is to control and limit your recovery so you don't have to do much work to bring the HR back up.

This training not only challenges your muscular strength but also will improve your pedaling technique. Your tendency will be to mash on the pedals. I'm going to encourage you to continually work on smoothing out your pedal stroke and minimize the movement in your upper body.

Each song is recorded at about 100 BPM. So for the spinning intervals (like now) I want you to match your RPM to the BPM. When we climb we will halftime the BPM for our RPM.

One more thing – climbing in the Big Gear is hard and will place a new stress on your body if you have not been climbing that much. If you feel strain in the back or too much pressure in the knees, I want you to release the resistance a bit and sit or stand up as necessary.

Now stand up quickly and stretch before we begin our first climb.

CLIMB 1

Length: 6:00
Intensity: 5-7 RPE
Cadence: 50-55 RPM

Establish the cadence and commitment to the saddle. Engage the resistance. Climb the hill.

Take the resistance up and bring the cadence down. Halftime the beat of the music and you will be at 50-55 RPM. It will feel very slow. I want you to look at your leg speed and compare it to mine. If you are spinning faster than me, I want you to add resistance and match my cadence. If you can hear the beat in the music, great. If not, match my legs.

Perfect, now bring the resistance up as high as you can without the legs slowing down and without standing up. This will feel very hard. It is okay to let your body move but I want you to pay close attention to how you are pedaling. Keep the muscles pliable as you turn the Big Gear over and don't just put effort into the downstroke.

Always apply force to the pedal in a direction that is 90 degrees to the crank arm. That means that at the top of the pedal stroke (12 o'clock) you should be moving the pedal forward. At 6 o'clock you'd be moving the pedal backwards. The only time that you should be pushing directly down on the pedal is at exactly 3 o'clock. At 2 or 4 a clock you'd be moving the pedal slightly forward and down, or slightly back and down. Pull directly back at 6 o'clock and directly up at 9 o'clock.

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SPINNING 2

Length: 6:00
Intensity: 4-5 RPE
Cadence: 100 RPM

Recover and prepare the muscles for the 2nd climb.

Stand up as you need to during this song but you will get your best recovery in the seated position spinning your legs quickly. Limit how much resistance you take off and how far you drop the HR. 20 beats will be plenty.

That should not have challenged your cardiovascular system as much as your leg strength. If you feel yourself not able to continue turning the Big Gear over at any time, then reduce the resistance just enough so you feel you can continue and maintain the cadence.

This recovery interval will feel long. It is necessary for you clear your muscle of as many of the waste products you accumulated during that climb as possible. Your second interval is typically your best.

CLIMB 2

Length: 6:00
Intensity: 5-7 RPE
Cadence: 50-55 RPM

Establish the cadence and commitment to the saddle. Engage the resistance. Climb the hill.

Here we go again. Take the resistance up and bring the cadence down. Halftime the beat of the music and you will be at 50-55 RPM. Compare your leg speed to mine. If you are spinning faster than me, I want you to add resistance and match my cadence.

You know what to do. Typically you can elevate your level of effort in the second interval because of how much warmer you are after your first climb. Again, it is okay to let your body move but I want you to pay close attention to how you are pedaling.

Concentrate on smooth pedal strokes; relax the upper body, keeping it “quiet”. Relax the hands and neck. Really focus on the lower body. Hold the bars very lightly and feel how the legs become the primary focus when the upper body is relaxed.

Shift your hips back a bit and if you have the flexibility, make sure you are flexed forward at the hips. The more upright your body, the more you will be climbing with just your quads. Flexing forward to 90 degrees at the hip will involve more of your hip complex and glutes. This will give you more muscle mass with which to turn the Big Gear over.

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SPINNING 3

Length: 6:00
Intensity: 4-5 RPE
Cadence: 100 RPM

Recover and prepare the muscles for the 3rd climb.

Stand up as you need to during this song but you will get your best recovery in the seated position spinning your legs quickly. Limit how much resistance you take off and how far you drop the HR. 20 beats only.

That should have taken something out of you. If your legs are not feeling really tired, odds are you could have turned more resistance. Again, stand up here as needed but spinning will help you for the last climb.

Mastering this workout takes time. If this is the first time doing it, be patient. As you get the hang of it, you will find yourself with the ability to turn more resistance. Your body needs to adapt to the rigor of the Big Gear and develop its pedaling efficiency.

CLIMB 3

Length: 6:00
Intensity: 5-7 RPE
Cadence: 50-55 RPM

Establish the cadence and commitment to the saddle. Engage the resistance. Climb the hill.

This is the last climb. Take the resistance up and bring the cadence down. Halftime the beat of the music and you will be at 50-55 RPM. Compare your leg speed to mine. If you are spinning faster than me, I want you to add resistance and match my cadence.

Focus on all the working muscles: quads, hip flexors, glutes and hamstrings. Your heel usually drops down when doing them properly as you try to utilize the complete pedal stroke.

Focus only on heart rate and cadence. Move your body in slow motion. It will smooth out your technique.

This is where you must become tough. It would be so easy to spin or stand up but by limiting yourself you will gain strength. You may remember this training on a ride some day when you have been climbing for hours, are too tired to stand up and can only manage 50 RPM. Climbing is about commitment. The commitment you are showing right now to your position, your cadence and the training will bring you great benefit. Nice work. Don't ease up before the summit.

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COOL DOWN

Length: 4:00
Intensity: 2-3 RPE
Cadence: 100 RPM

Recover completely.

Cycling is defined by great climbs. As you become more confident on the bike, eventually ride outdoors and begin to ride your bike to the top of mountains you'll realize that every climb is best done one pedal stroke at a time.

Don't always be in a hurry to get to the summit and don't always look for the easiest way to climb a hill.

The Big Gear will make you strong and resilient and then some day, if your derailleur breaks on a climb and you're limited to your Big Gear, you won't think anything of it. You'll be tough.

<i>Song</i>	<i>Time</i>	<i>Artist</i>	<i>BPM/RPM</i>	<i>Focus</i>
Peace Prayer	4:54	Jataka	110	Warm Up
Plane Shift	6:14	Loop Guru	100/100	Spin
Souka Nayo	6:25	Baaba Maal	100/50	Climb
Free Man	6:23	Africa	100/100	Spin
Zingawele	6:23	James Asher	100/50	Climb
The Dubeliscious Groove	6:47	Crystal Method	100/100	Spin
PHD	6:27	Crystal Method	100/50	Climb
Something	3:37	Karmacoda	100/100	Cool Down