Pacelining and Sprint Leadouts

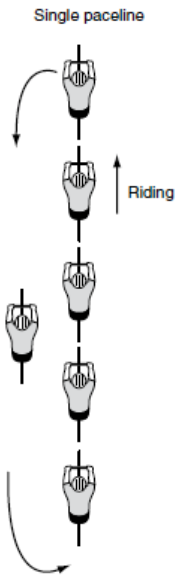
A rider is approximately 30 percent more efficient when sitting in the draft of another rider. The draft is a position behind or to the side of a rider that enables another rider to stay out of the wind. Air resistance is an exponential function of speed, meaning that as you increase speed it becomes exponentially harder to ride because of wind resistance. Therefore, as you ride harder, sharing the work by pacelining makes sense. In pacelining, a group of cyclists are organized to efficiently take turns riding in the wind and "sitting in" protected from the wind.

Pacelining is a necessary skill for maintaining and increasing speed on group rides, chasing down or driving breaks in races, or working together to move through a windy section quickly. Pacelining should be practiced. A chain is only as strong as its weakest link, and this is the case in pacelining. Learn the skill and be a strong link in the chain.

Cyclists in a paceline ride inches apart front to back (and side to side in some instances). If you learn to properly pull off and pull through, pacelining will be enjoyable. Pacelining is illegal in individual time trials, where drafting is not permitted.

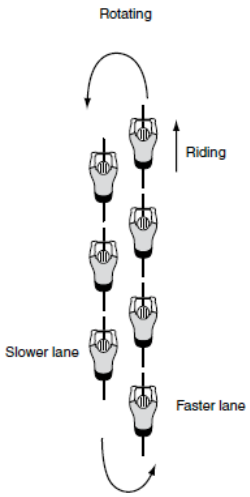
Pulling Off

If you are in a single paceline, do not wait until you are exhausted to pull off. The rule is, the greater the amount of riders, the shorter the pull. For example, in a single paceline of 4 riders, you might each take 30-second to 1-minute pulls. Try to verbally agree on how long you each will pull based on either time or miles. When pulling off, do so into the wind. For example, if the wind is from the right, then pull off to the right. By pulling off into the wind, you momentarily protect the rider moving into the lead position from the wind. Always look over your shoulder, without decreasing your speed, to ensure that your path is clear before pulling off. This is especially important on roads with traffic and little room for bicycles. Do not decrease speed until you are clear of the line, but remain laterally very close to the paceline, because riders will benefit from your draft even though you are off the front. Once clear,



decrease speed evenly, and move to the back of the line as quickly as possible without braking. Sit on the back and move up the line accordingly.

In a rotating paceline, or double paceline, each rider comes to the front in an ascending line and then moves back in a descending line. Once a rider coming to the front is clear of the descending line, the rider pulls into the descending line. As you reach the front, the lead rider in the descending paceline should say "Clear" when your rear wheel is far enough in front of her front wheel to allow you to leave the ascending line and enter the descending line. Turns in a rotating paceline are extremely short, because you are either descending or ascending at all times. Echelons and mirror double pacelines are more advanced double-paceline techniques, and these techniques should only be practiced by and with experienced riders.



Pulling Forward or Pulling Through

When pulling through, do so at the same speed that the paceline was traveling before your move to take the lead. Never accelerate into the lead position. It is the responsibility of the rider who has pulled off the front to stop pedaling and slide back into the rear position.

For example, if the paceline is traveling on flat ground at 25 mph, you should apply power to maintain that pace as you pull through; do not apply more power to increase the speed to 26 mph to pass the lead rider pulling off. This is a waste of your precious power, and it causes the paceline members to accelerate in order to hold your wheel, wasting their power. In essence, a pull-through is just passively maintaining the pace, while the actual action is taken by the lead rider actively pulling off.

It is always a bad idea for a rider who is not in the second position to race to the front to lead the paceline. This will leave gaps, change the paceline speed, and force people to decelerate or accelerate. Instead, encourage your fellow riders to continue pacelining properly by saying "Pull through," "Even pace," and "Pull off." Encouragement always works better than negative ranting or aggressive moves to the front to take over the pace.

If you are tired in a single paceline, do not just pull off behind the lead rider as that person pulls off. Doing so would leave the person in third position in the lurch and would obstruct the lead rider's ability to return to the back of the line quickly. Instead, let the lead rider pull off and descend; then you can immediately pull off and descend, maintaining the paceline integrity.

Maintaining Consistent Power in a Paceline

The key to paceline success is a constant level of power—notice that it is not a constant level of speed. In most instances, the wind will ebb and flow, and the terrain will pitch and flatten; therefore, a constant speed is nearly unattainable, but a constant power is attainable. If riding without a power meter,

you should just measure your effort by not increasing or reducing miles per hour quickly; ride smoothly and consistently.

When on the front and entering a hill, you should maintain your pace as you hit the bottom of the hill so that the paceline does not bunch up; however, decrease your speed as you climb so that you are not forcing the riders to work any harder than they were on the flats. You may have to reduce power as well, because riders behind benefit from draft more on flats than climbing.

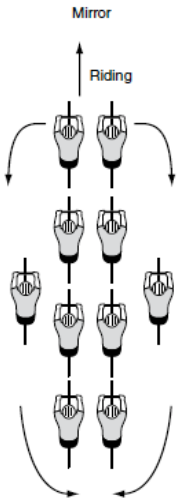
When on the front and going downhill, you should pedal to maintain your power and subsequently your speed or to increase your speed (only to the point of the previous power on flat land). Avoid having riders behind you hit their brakes, which sometimes occurs because they are speeding up in your draft on a downhill and you are being slowed by wind resistance.

When moving in the paceline, ensure that you leave no gaps to the rider in front of you. Gaps cause different speeds and accelerations within the paceline, causing riders to waste precious energy. If a gap forms, slowly close it; closing the gap quickly only leaves the rider behind you in the lurch as you accelerate unexpectedly.

Skipping Turns

Although it is not recommended, you may sometimes need to skip turns in a paceline. In race situations, this can cause friction, because other racers may think that you are not doing your share of the work. In group ride situations, it is more acceptable. Keep in mind that if you feel too tired to share pace, pulling out of the paceline and sitting on the back may be tougher than just sitting in and taking very short pulls—that is, rotating up to the front and off immediately. When sitting on the back, you may have to accelerate and decelerate to hold on to the back as the paceline rotates, thereby wasting your energy.

If sitting on the back of a paceline, you need to announce your intentions. This alerts descending riders to go in front of you—not behind you—when they head to the back of the line. A good cue you may use in this situation is to move out into the descending path as the rider approaches and to call out "Sitting on" or "Your last." This leaves a clear indication of the space you just vacated on the back of the paceline. Follow the descending rider onto the back of the line, preventing gaps between you and him or her as much as possible. After a few rotations, the other riders will realize you are sitting on.

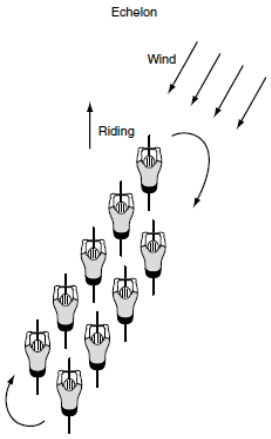


If you have a rider sitting on your group, do not chastise the rider. Sitting on the back is the rider's prerogative in group rides, and in most instances, the person is truly too fatigued to work. If entering the end of a race or sprint, you may not be so kind, and you may encourage the rider to start sharing the work.

Wheel Following

When following wheels in a paceline, make sure you do not leave any gaps. Try not to overlap wheels, unless in an echelon, meaning

that your front wheel should not be to the immediate left or right of the rear wheel of the rider in front of you. Keep your head up, looking to the riders in the lead of the paceline, because their movements will dictate changes in speed or direction for the paceline. Stay laterally close to the riders either ascending or descending as you move through the paceline; this will help your draft and their draft.



Never brake or stand in a paceline, unless you are the rider on the back. Save your eating and drinking for when you are on the back of the line. When descending down to the back of a paceline, move quickly into the draft of the last rider—each second out in the wind is a waste of your energy.

Sprint Leadouts

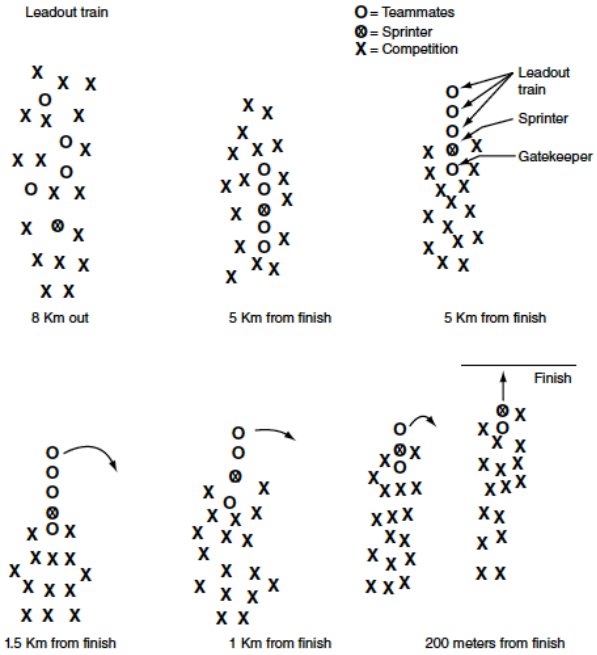
Practice with your team numerous times before executing a lead-out in a race. Leading out is a carefully coordinated effort, and if it is handled sloppily, it can lead to crashes.

A proper lead-out makes sprinting safer. In a proper lead-out, the speed is higher, providing an environment where there is less chance of multiple people crossing the line simultaneously. The lead-out needs to start miles from the finish and not in the finishing straight. Keep the speed high in the last few miles to deter attacks.

Most racers are thankful for lead-outs; therefore, being courteous and asking for slots in the run-in by announcing a lead-out intention will win graces. Paceline the lead-out at a constant speed. Increase the speed as the finish line grows closer.

Move lead-out teammates toward the front at least 8 kilometers (5 miles) from the finish, and start moving together in the pack and controlling the speed.

Within the final 2 kilometers of the finish, each lead-out person should do a hard, even pull that does not drop his teammates. The



lead-out teammate should pull off after a hard pull and should move out of the peloton's way, dropping off on the side to the back.

The sprinter, who is second to last, should be verbally directing his lead-out teammates, announcing which side to pull off on and telling them to increase speed as necessary.

The last lead-out person should pull only a short distance (100 to 500 meters), and the effort should be a sprint. This lead-out person needs to pull off so the sprinter can launch within the last 200 meters. The last lead-out person often needs to keep sprinting to the best of his ability in order to avoid being swallowed up dangerously by a fast-moving pack. This is a safe way to finish.

The last person in the group situated behind the sprint is the gatekeeper, who keeps other sprinters off the wheel of the team sprinter. This will lessen the chance of the competition using the lead-out team as a lead-out train that they can ride to victory.

CONCLUSION

Pacelining is a necessary skill for maintaining and increasing speed on group rides, chasing down or driving breaks in races, or working together to move through a windy section quickly. Racing cyclists must be confident of their pacelining skills if they wish to control the peloton to their advantage. These skills are realized via many hours of individual and team practice. Ultimately, practicing pacelines as a team will lend itself to successful sprint leadouts in races.