



# Congleton Cycling Club



[www.congletoncyclingclub.org.uk](http://www.congletoncyclingclub.org.uk)

## **Guide to Chain Ganging**

Winter 2012 sees the introduction of some winter training in the form of regular chain gangs. This guide is intended to explain the theory, techniques and above all to highlight the safety concerns with regards to riding in a chain gang.

It is not intended to teach you old sweats how to suck eggs, but is more geared towards less experienced riders, especially those who have not ridden in a chain gang before. Chain gangs have the potential to be quite dangerous and crashes at speed can result in bad injuries. In the chain gang you have to put your trust in the riders around you, as you are all jointly responsible for safety, especially so when you are on the front.



*Carnage on the morning commute after a wheel touch!*

### **Group Riding**

Most members will be familiar with group riding, such as Club Runs, where a loose group of riders follow the same route together. The difference between this type of riding and chain ganging is drafting and hence the proximity of riders within the group. Several techniques, hand signals and call outs are appropriate to both types of bunch riding and can therefore be utilised in the chain gang. Let's look at what is different, as this is important with regards to safety.

## Chain Ganging

Can be referred to by other terms, such as 'Pace Lining', or a 'Train', and consists of two or more riders travelling in a tight group in the draft of the rider(s) in front. If you are the leader(s) of this chain gang, then you are creating the draft for others. The draft envelope behind a single bicycle is about six feet long and behind a tandem is about eight feet. The closer your front wheel is to the rear wheel of the rider ahead of you, the stronger the draft. Riding in a chain gang draft can save 20 to 30% of your energy output. This energy saving is what allows the gang to travel at higher speeds. Concentration on what you are doing in a chain gang is essential. That is, there is no time for sight seeing!

Note that group riding also requires concentration on what the other riders and traffic are doing, but in chain gangs, concentration is essential. Hand signals to your fellow riding partners keep everyone alert to what is ahead of your group. Sometimes, voice signals are better and faster. In either case, hand signals and voice signals must be echoed from the front to the back and from rider to rider. If you break the communication chain, you may be responsible for injury to one or more fellow riders. So pass that hand and voice signal down the line. We will take a look later at the various hand and verbal signals.

## Draft Envelope

The Draft Envelope in a chain gang of fewer than six riders is about six (6) feet long (about the length of one bicycle). If you are further behind than six feet, you are out of the draft. Larger packs of riders riding in parallel will create wider and slightly longer drafts. The same is true for one or more tandems. Crosswinds change the position of this envelope. If the winds are coming from the left, then the envelope is moved to the right. When riders in a crosswind situation ride in a diagonal formation, it is known as an echelon. For winds coming from the left, then it is a right echelon. (Winds from the right generate a left echelon.) On the many narrow roads in Cheshire, it is difficult to safely ride in a left or right echelon. On wider main roads with the usual moderate to high traffic densities it is again almost impossible. It is also in contravention of the Highway Code Rule 66 (see below). For this reason we do not use the echelon formation on club chain gangs. It is a technique that should only be employed on closed roads.

## Chain Gang Safety Aspects

There are a few basic rules to ensure continued safety and these are;

- **Never allow your front wheel to overlap the rear wheel of the rider ahead of you**

If your front wheel overlaps the rider in front's rear wheel, even by only a few inches, if that rider moves off his current line and your wheels touch, you WILL go down. The rider in front probably will not, but there is every chance that several riders behind you will also come down. Just watch the Tour de France to see the consequences of a wheel touch in a big bunch! The rider in front cannot see where your front wheel is, so the crash will be your fault.

- **No weaving or drifting off line in a chain gang**

If you weave or drift in the line it can cause contact between you and either the rider coming off the front drifting back towards the rear in the case of a single line, or contact with the rider beside you in a double line chain gang. Touching handlebars can have a similar effect to touching wheels! For this reason, glance to the side only rather than turn to look behind if you are in any position in the line other than at the back.

- **Never suddenly slow down or attempt a complete stop until you are on the back of the chain**

Due to the extremely close proximity of the rider behind you in the chain gang, if you suddenly hit the brakes there is a good chance he will not be able to react in time and his front wheel will touch your rear wheel. We have discussed what happens subsequently, this time however the rider in front is to blame. Ensure communication of intention to slow or stop is verbalised clearly before the chain is slowed. (See below for hand signals & commands).

- **Keep your eyes up and don't just concentrate on the rear wheel of the rider in front of you**

The temptation is to fixate on the wheel in front to ensure you don't touch it. Resist this temptation and keep looking ahead, peeking around the rider in front to see what is happening. Use your peripheral vision to sense what is happening around you and to ensure your wheel does not meet the rider in front. Get used to the distance his (her) back is from you when you have a safe gap. Use that gap closing as your early warning that you are getting too close. If backing off your pedalling is not sufficient to re-establish the gap at a safe distance, try sitting up to 'air brake'. If this is still not sufficient 'feather' your brake(s) to just scrub off a little speed.

- **Always provide hand/ verbal signals for parked cars, debris, potholes, other riders, turns and other obstacles**

Remember when you are in front you are the eyes of the group and must take responsibility for pointing out hazards. Concentrate hard during your 'turn', you probably won't be thanked, but you will certainly be berated if you don't do this job properly!

- **Try to give all signals 3-5 seconds in advance of the obstacle**

Passing info down the line takes time when travelling at speed. Ensure your warnings from the front are timely.

- **Always pass hand and verbal signals down the line for riders behind**

For obvious reasons...

- **Maintain a constant speed and a constant direction, no surging which creates a bungee cord effect**

The lead rider is the one who sets the speed. Only they can increase the pace. If you can't maintain pace on the front then you should peel off (you've already left it too late!) If you are increasing the speed, do it slowly, don't accelerate too fast as this creates that bungee cord stretch effect and the riders behind have to react and sprint to get back into the draft.

*The first four points mentioned above are the critical safety aspects, the breach of any of which are the usual causes of chain gang accidents.*

## Hand Signals

Hand Signals need to be held for four to six seconds so the riders behind you have a chance to react and signal the riders behind them. If you are the current lead rider of the chain gang, then initiate your signal three to five seconds before reaching the location associated with its purpose. Below are some common hand signals.

## Voice Commands

When suddenly slowing or stopping or coming upon pot holes, communicating with loud voice commands, such as "**SLOWING!**" "**STOPPING!**" and "**HOLE!**" (or "**BELOW!**") are best. Incidentally, the current lead rider needs to plan and initiate a change in the travel path before the group encounters other riders, parked cars, debris, rocks, pot holes and the like. The leader needs to visualise his (her) bicycle as a vehicle towing many trailers and must hold the new travel path well past the parked cars, slower riders, debris, etc., until it is safe to move over to the left again slowly. All too often, the leader of one group of riders passing a slower group of riders will pull over to the left too quickly. The other riders will initiate the same manoeuvre; each successive faster rider gets closer to cutting off the lead rider of the slower pack.

A call of "**CAR BACK!**" from the rear rider(s) should be sent up the line to the lead rider(s) to indicate that a vehicle is behind the group wishing to pass. If you are not the rear rider, don't be tempted to look behind to check as this can send you off line; trust your colleagues behind. Depending on the size and formation of the chain(s), some action such as singling out may be considered prudent to allow the vehicle to pass, however no action may be the better course of action!

A call of "**STEADY!**" can be used to advise all behind to just knock the pace off by soft pedalling and to open a slightly bigger gap to the rider to their immediate front due to a potential hazard forward of the group, such as a car at a junction which looks like it has not seen the approaching group or perhaps the group is approaching a tight turn or T-junction on their route.

At junctions, the lead rider will call "STEADY!" or "SLOWING!" or "STOPPING!" as appropriate. If he can see that the junction is clear of oncoming traffic he can call "**CLEAR!**" This means that in his opinion it is safe for the next rider to negotiate the junction also. Always check yourself and if appropriate you may echo the "CLEAR!" call to the rider following you. It is still your responsibility to ensure your own safety.

If the way is not free of oncoming traffic a loud "**NO!**" call should be made to following riders. This means that in your opinion they should stop. **DON'T** call "CAR!" as this can easily be misheard as "CLEAR!"

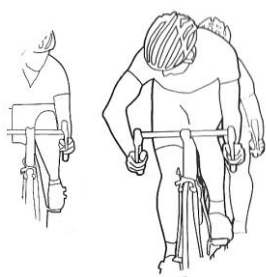
"CLEAR!" can also be called following the "STEADY!" call to inform others that the previously perceived hazard has passed.

"**LAST MAN!**" It can be useful in a large group to make this call as the rider who has peeled off reaches the last man in the line. He can then start to accelerate to tag on behind.

## Common Hand Signals with Accompanying Voice Commands



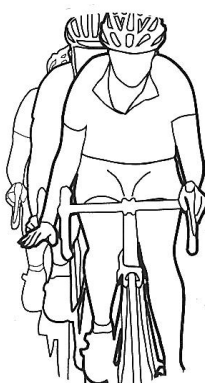
**Move out** Place your hand behind your lower back and point to indicate that following riders should move out in that direction due to an obstacle on the left (can be road furniture, parked car, a slower moving group of cyclists etc.)



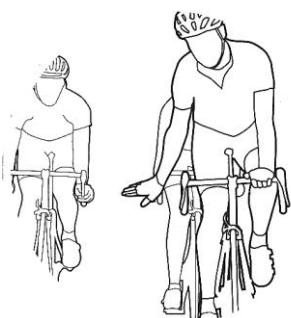
**Elbow flick** my turn on the front is done, peeling off. In a double chain, that is not constantly rotating the lead, it might be useful to tell the rider next to you "Change!" as an indication that he should soft pedal as you move across into his position.



**Pothole or Hazard** A simple point to the road hazard is usually enough to signal to following riders. Do this well before the hazard is near and predictably move over so you don't roll past too close to it. A call of "Holes!" or "Below!" can accompany this signal.



**Glass or Loose Gravel.** Almost like pointing to signal a pothole but using a waving action. This denotes that you're approaching a scattered hazard such as glass or gravel. Consider adding a call of "Glass!" or "Gravel!" to assist those following.



**Slowing or Stopping.** Hand turned palm facing down and back accompanied by a 'dog patting' motion (if sufficient time). Make a clear call of "Slowing!" or "Stopping!" to notify riders behind.

## Chain Gang Rotations



With a single line chain gang, as the lead rider you initiate the rotation process. This is commonly known as 'through and off' – you work your way through the chain to the front and then peel off. Be aware that you must not slow until you are completely to one side of the chain. Which side you peel off should be decided by the Ride Leader before the gang gets going. If the peel is to the left (on UK roads), then the single rider is protected from traffic by the chain which rides slightly further out from the kerb. The new leader must be careful not to change the speed (pace) or sprint (which is what most beginners do). If the new leader wants to change the speed, then change it smoothly so that the other riders will not create a bungee cord effect. In chain gang lines, riders need to have a smooth cadence (RPM) wherever you are in the line. Once the previous leader is well to the side of the chain, then he (she) can slow. Many riders peel off and try to maintain a pace near that of the chain gang. However, your goal is to get to the back of the line and in a draft to rest. As you near the end of the line, it is useful to come up out of the saddle to stretch and regain the speed of the chain gang. NOW you can rest.

There are other permutations to the chain gang configuration, such as riding in two parallel lines. The peel off direction again needs to be established so that everyone knows the etiquette. Here, one of the lead riders starts to 'soft pedal', thus allowing his line to slow slightly. The other lead rider then moves across to fill this gap at the front of the opposite line. The rider originally following him then moves forward bringing his line up to resume the original configuration. In this configuration each rider will take a turn leading each line before working their way back through one line to the rear and then across to the opposite line before working their way forward through this line. Turns can be a set length of time, or almost none, in which case a more 'rotational movement' ensues with riders constantly rotating through the various positions within the lines.





There are advantages and disadvantages to each technique. For instance, with a 'double line' chain gang, for a given number of riders, the group will be shorter in overall length (compared to the same number of riders in a single chain), which can facilitate easier overtakes for following faster moving vehicular traffic. However, a weaker rider will find it harder to do 'two pulls' on the front and it is more difficult for them to position themselves to miss a turn without disrupting the whole line. If they wait until they are at the back of one of the lines they then face the prospect of dropping out of the draft in order to let the next rider coming back to take their place. They end up getting less respite and shelter, especially if they want to miss several 'rotations' and they are then constantly fighting to remain in touch with the chain gang.

There are other permutations of the double line chain gang peeling technique, such as both lead riders peeling off, either to each side or both to one side of the double chain. However, Highway Code Rule 66 should be borne in mind;

*Rule 66. You Should;*

- *never ride more than two abreast, and ride in single file on narrow or busy roads and when riding round bends*

The previously mentioned rotation technique complies with this, as does a single line chain gang employing the 'through and off' technique. However the double chain with both leaders peeling off together does not. In the single line a weaker rider upon reaching the front position immediately peels off, soft pedals and tags back on behind the last rider, thus exposing themselves out of a draft for very little time. A stronger rider can just sit on the front for longer pulling the group along before peeling off. A potential downside to the single line chain gang is that for a given number of riders the chain will be longer than with two lines. This can make it more difficult for vehicles to overtake as they may need to cross the centre line of the road for an extended period. This can then lead to frustration, an inappropriate overtake manoeuvre out of impatience and then the potential for cutting back into the middle of the line of riders if an oncoming vehicle appears in their path!

How long do you pull on the front of the chain before rotating to the back? The answer depends on the number of riders in the chain gang and their relative strength. If you are struggling to maintain speed at the front of the line, then it is past the time to rotate to the back. Note: some riders are stronger than other riders. However, every contribution, small or large, adds to the complete effort and provides additional rest for the stronger riders that they would not have had without your effort.

Stronger riders should not however 'hog' the front for too long; everyone wants a bit of a workout remember! In a group of equally strong riders, the ideal would be to up the pace a little more so all riders want to get a bit of shelter after their pull. If one rider is sitting on the front for an extended period then the chain is not moving as fast as it could.

Clearly, the length of each pull will decrease with more riders. For illustration purposes, let us assume that the strongest rider(s) pulls for 100 pedal strokes. Let us also assume that the weakest rider is only 70% as strong as the strongest rider. This often translates into a pull of 50 to 60 pedal strokes and less than 70% of 100 pedal strokes. The reason has to do with the higher cardiovascular efficiency levels at the higher speeds of the chain gang and the fact that the weaker rider's efficiency is lower than just the differences in strength. (Another reason to practice riding with higher RPMs is to increase your cardiovascular efficiency.) In a typical chain gang, of five or fewer riders, the stronger riders will be pulling for 60 to 80 pedal strokes. In larger gangs this should decrease to a range of 30 to 60 pedal strokes. Weaker riders should be down to 15 to 40 pedal strokes. These figures are just an example for illustration purposes; the reality is that if you set up a 'rotational' chain with one line moving up and the other back, if the lead rider is changing constantly then all riders will be doing a significantly shorter length of time on the front.



## Other Points and Glossary

- **Lead Rider:** The rider who is currently on the front of the chain gang.
- **Ride Leader:** The overall leader of the chain gang group, i.e. captain. Usually the organiser or his designate and the one who will dictate how the chain gang will be conducted.
- **Soft pedal:** If you feel like you're getting sucked into the rider in front of you, take a light pedal stroke or two to adjust your speed accordingly. If the command "STEADY!" has been called, keep soft pedalling until the hazard has ceased.
- **Air brake:** An easy (and safe) way to trim speed is to sit up and catch some wind. It'll slow you down a notch without disrupting the rhythm of the line.
- **Feather brake:** Gently squeeze the brake(s) while continuing to pedal. Used when soft pedalling and air braking are not enough. Remember, do it GENTLY, no sudden decelerations. You can scrub speed while shifting up or down as needed to alter your pace.
- **Single (or Singling) Out:** Where with 2 chains the *following* inside riders soft pedal (not the lead rider) and create a gap to the rider in front of them in order to allow the other outer chain riders to drop in behind their partner, thus going from a double to single chain formation.
- Make sure your bike is well maintained. Don't have loose or rattling bits, people will trust you less.
- Don't go out with a group which is much fitter than you. If you are struggling to keep up, it is more likely you will make a mistake. However, within Congleton CC we encourage all ability levels to turn up. If enough do, more gangs can be formed which ride at different paces, so there will be more opportunity to join a gang that suits your current level. As you get stronger join the faster gang and drop off when you can't sustain the pace. If you train and attend regularly your fitness level will increase enough to stay with the faster group!
- If you can, time taking a drink when you are towards the rear – a dropped bottle could cause problems in the group.
- If you have to clear your nose or throat, be considerate and again, try to accomplish this when you are at the rear.
- Conserve energy. If you feel tired, sit out a few turns until you're ready to take another pull. Simply open a spot for riders to re-join the line in front of you, or come to the front and immediately peel off and drift to the back. You'll do the pack a favour by staying with them rather than working yourself into the red and falling off the back, which makes the group slow down to let you catch up (if this has been agreed to before the start).
- During the hours of darkness, all riders must have suitable lights. Rear lights should be set to steady and not flashing mode and suitably angled so as not to be pointing upwards towards the following rider's eye line. Be considerate in your choice of rear light too – ultra bright very powerful LEDs may not be most suitable. Good front lights which illuminate your way are preferable to 'be seen' type lights. Spare mini

LED emergency lights are a good idea to have available should your main lights fail. Some form of reflective clothing is also a good idea at night.

- Obey ALL road rules, traffic lights, crossings, stop signs etc. Remember you are representing Congleton Cycling Club.
- Above all, enjoy your chain ganging and the skills and fitness it will provide you with but BE SAFE!



*Not a bad chain gang! - The quartet of Ed Clancy, Geraint Thomas, Steven Burke and Peter Kennaugh clocked three minutes 51.659 seconds to knock nearly a second off their own world record to take gold in the Team Pursuit at London 2012. (Note that we wouldn't let them ride in our Club chain gang as they have tri-bars and no brakes!!!)*