

GROUP RIDING GUIDELINES

Rubber-Band ("Yo-yo") Effect

Reaction time for a motorcyclist when confronted with an unexpected threat is, on average, about one second. If the need to react is anticipated (such as when a turn has been announced), then riders can usually react within about half a second after the bike ahead begins to react. When a group of riders change speeds very gradually, however, it usually takes two or three seconds for a rider to recognize this and begin to change his speed to maintain his position in the group.

This doesn't sound like much time, but experienced group riders manage their risks reasonably well with a minimum one-second interval between each bike and a minimum two-second interval between bikes that are traveling in the same track. When the group has more than six bikes in it, however, gradual changes in speed within the group can become tricky.

When a Lead Bike begins to accelerate, the second bike doesn't instantly start to travel at the faster rate. Instead, a gap grows between them while the second bike is reacting -- and it continues to grow until the second bike is fully up to the increased, stable speed of the Lead Bike. Clearly, once the speeds are the same, the gap will remain the same size. However, since most groups prefer to keep a one-second minimum interval between bikes (two seconds between bikes in the same track), the new gap caused by the Lead Bike's acceleration may be larger than is desired. When this occurs, the second bike must go faster than the first one for a brief time in order to "catch up".

If we assume that the Lead Bike speeds up from 60 to 70 mph over a period of two seconds, the second bike will have to ride at 75 mph for two seconds (after his reaction time passes) in order to close the gap. Then he will take another one second to decelerate back to 70 mph to create a gap of the proper size.

If there were only two bikes in the group, this example is easy to follow. But when the group is larger, and the bikes involved are riding further back in the pack, the "rubber band" effect can be especially dangerous to all bikes from the middle of the group to the Drag Bike.

For example, the third bike in the group has this problem: About two seconds after the second bike has begun to accelerate, the third bike responds. Now, however, the second bike is moving at 75 mph rather than at 70 mph like the Lead Bike. The third bike must use even more effort to catch up to the second bike than the second bike did to match his speed to the Lead Bike's new speed, if the gap is to stay relatively constant. He will have to move at 75 mph for four seconds, not two, to catch up. The fourth bike will have to accelerate to 80 mph!

In a group of only six motorcycles, the last one will find the gap between himself and the fifth bike has grown to 143 feet before it begins to close, once he starts to speed up, given these average reaction times. And it will be at least 11 seconds after the Lead Bike first began to accelerate before the sixth bike does so.

Now, imagine what happens in the group if, while this is taking place, the Lead Bike must apply his brakes! This rubber-band effect becomes extremely important if the Lead Bike happens to make an abrupt and major change of speed at certain critical moments, such as when approaching a sharp turn or a tricky curve.

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Following these guidelines can help reduce the rubber-band effect:

- Lead Bike changes speed more gradually.
- Lead Bike announces speed changes by hand signals.
- Lead Bike accelerates slowly from stop signs or lites or from an intersection turn.
- All riders restrain the impulse to "crank it up" in order to quickly re-establish normal spacing (ex. Turning at an intersection, leaving stop signs or lites).
- All riders watch farther ahead than just the bike immediately in front of them in order to notice changes in speed and react accordingly.
- Lead Bike does not increase speed within 15 seconds of entering a curve which may require braking or some slowing down to maneuver it safely.
- All riders abandon the one-second spacing rule when riding twisting curves.
- Break the group down into smaller ones.

This problem has been described with respect to the acceleration of the Lead Bike. When the rubber band effect is considered in reverse -- that is, when the Lead Bike is suddenly braking -- these tips on how to avoid the rubber-band effect can be even more important. Those who ride as Lead Bike for their group should be aware of the importance of avoiding sudden changes in speed if at all possible, so as to reduce the risks to those following.