Drifting

Those of you that have followed racing techniques over the years will be aware of a change in riding styles amongst the really fast riders, who now drift their machines to quite a significant extent. Fig. 2.18 shows an extreme case of drifting, as would be experienced in speedway riding. This might at first sight just seem like an exaggerated case of "over-steering", but in fact there are quite significant additional effects.

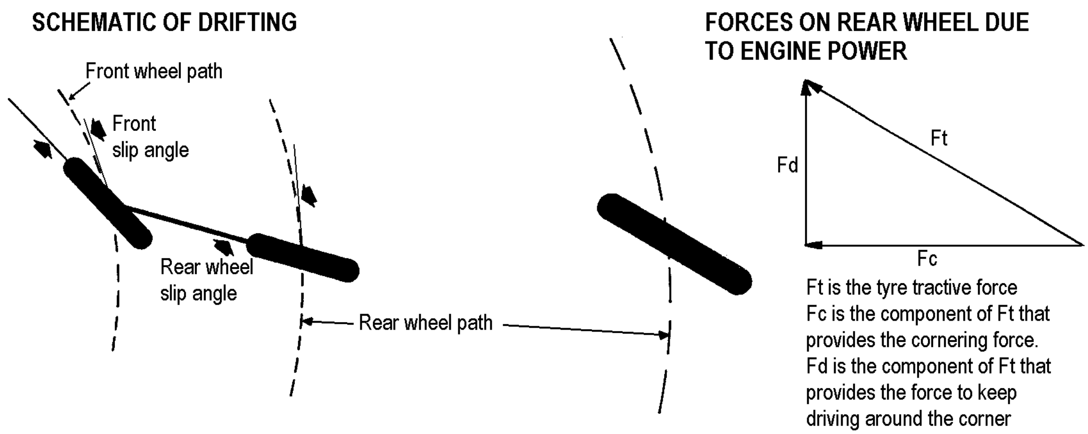

Fig. 2.18 **Showing the attitude of the bike and wheels during high levels of drifting, as for example in speedway.**

The cornering force is provided from two sources:

- Camber thrust and slip angle as described above,
- The component of the engine supplied driving force, that acts toward the centre of the corner. Fc in the above diagram.

This driving force itself, acts in line with the rear wheel, but as this is at a significant angle to the direction of travel it can be resolved into two components. One of which acts in the direction of travel and maintains the speed around the curve (Fd above), the other acts at right angles to this, and pushes the bike toward the centre of the curve (Fc above), i.e. provides some additional cornering force.

Because the front wheel is not driven it must produce its share of the cornering force by more normal means. But, as this wheel is more upright than in the non sliding case, camber thrust is reduced and so more of the cornering force must come from a slip angle, and the wheel will be turned more into the corner, than if the rear wheel was sliding less.

As a large part of the total cornering effort is derived from the engine power, it comes as no surprise that throttle position has a major influence over the cornering line. It has been demonstrated countless times in speedway that mid-corner engine failure or inexperienced shutting of the throttle, results in immediate intimate inspection of the perimeter fencing. This sudden loss of engine power results in an equally sudden loss of cornering power, and the bike succumbs to the effects of a lack of centripetal force.

The required lean angle varies as the angle of sliding changes (rear wheel slip angle), the reason for this can be seen in fig. 2.19. the over-balancing force acting on the bike is the component of the cornering force that acts at right angles to the machine. This force is less than the total cornering force which would act as the over-balancing force in the non drifting case.

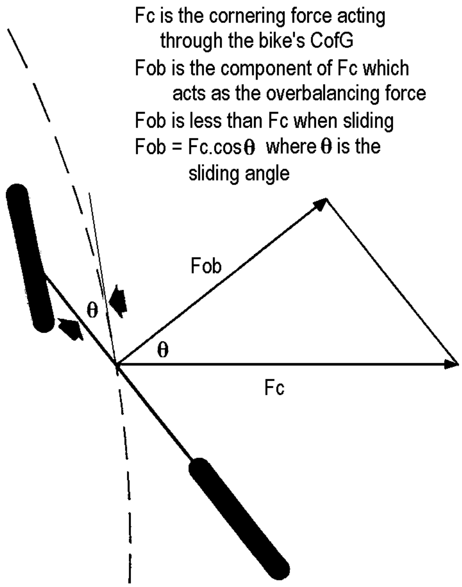

Fig. 2.19 **In this example of drifting we can see that the force F_{ob} tending to make the bike lean outward is reduced. Thus necessitating a lower lean angle than normal to establish balance.**

So the greater the sliding angle, the smaller the over-balancing tendency that needs compensating by leaning in. Thus, a smaller angle of lean is needed, but the effect of this is often over stated, as a few more figures will demonstrate.

Imagine a road racer cornering at 1G. lateral acceleration, and let's assume that the rear wheel is 300 mm. out of line with the front, and that the wheelbase is 1,450 mm, then the sliding angle is 12° . Without sliding at all the lean angle of the combined bike and rider would be 45° , but when sliding at 12° the required camber angle reduces to 44.4° , hardly a big difference! To return to speedway cornering styles, where a more typical slide angle may be, say 50° , then again for the 1G. case the lean angle reduces to 33°. So we can see that to reduce the lean angle by a significant amount requires a high degree of drifting, more in fact than is usual in road racing.