

STEERING: BEAM AXLE WITH CROSS STEERING.

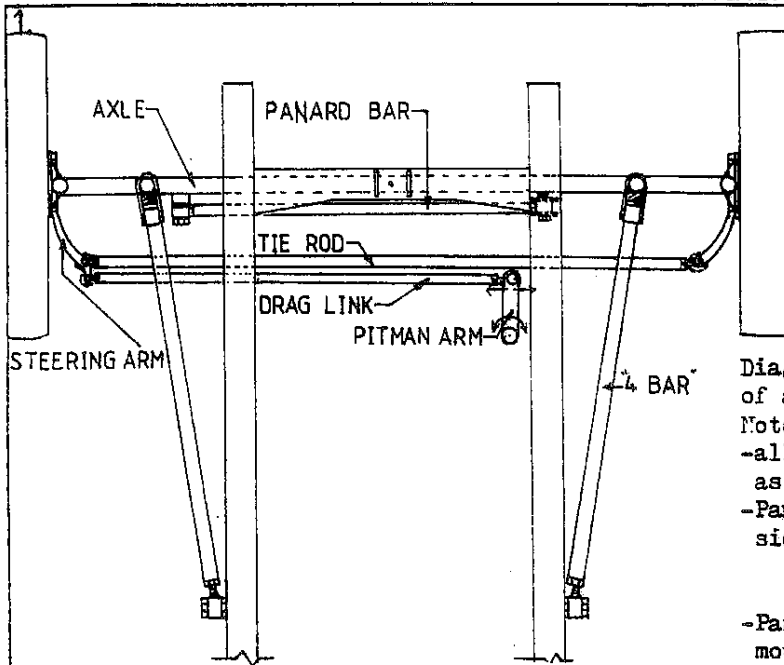


Diagram 1- Shows a plan view of a typical installation.

Note:

- all bars as close to parallel as possible.
- Panard bar necessary to reduce side sway on shackles due to;
 - jacking by steering box.
 - cornering forces.
- Panard bar should always be mounted to the chassis rail that the steering box is mounted to; IE. The right hand side in Australia.

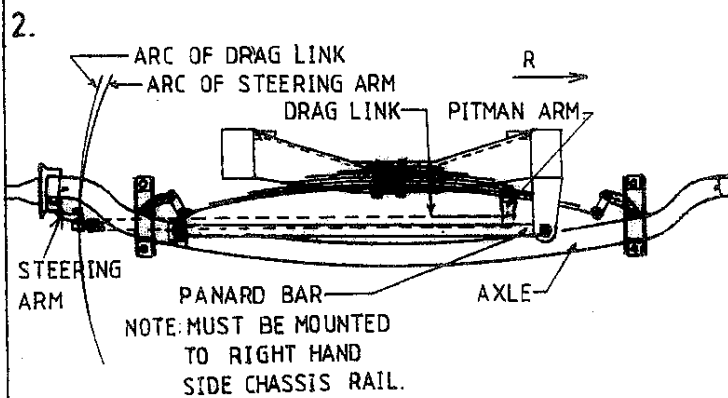


Diagram 2- Shows an elevation of a typical installation.

The movements of the various components are illustrated. Note that over normal suspension travel there is minimal difference in the arcs of the drag link and steering arm. Ideally the Panard bar and the drag link should be :-

- parallel at ride height.
- horizontal at ride height.
- close to the same length.
- as long as possible.
- parallel to the tie rod.

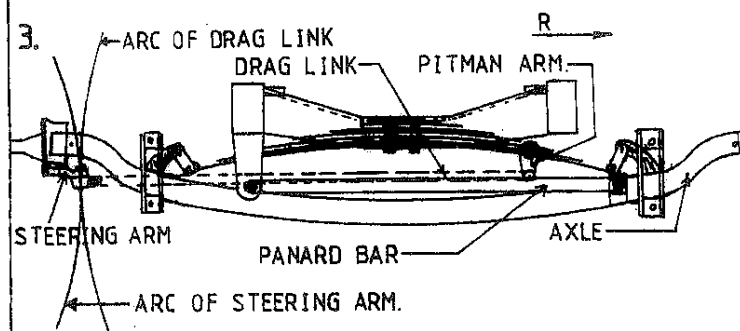


Diagram 3- Shows the affect of mounting the Panard bar to the opposite side chassis rail to the steering box.

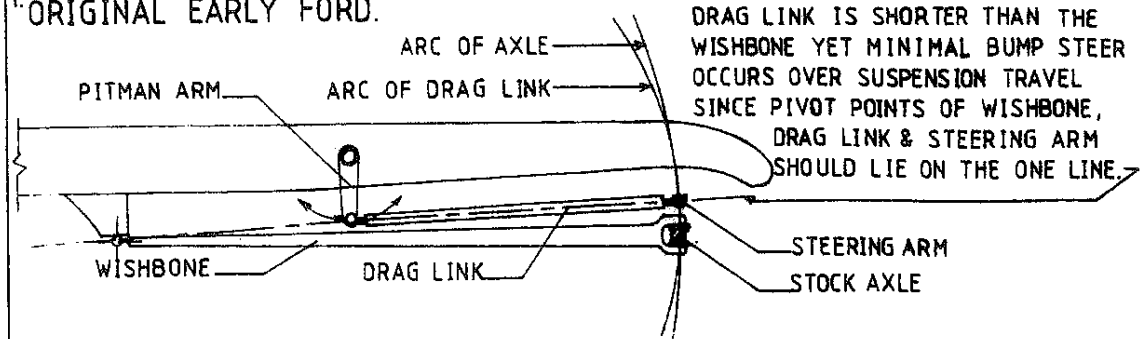
As can be seen the axle is constrained to move on an arc defined by the Panard bar and the drag link arcs in the opposite direction therefore creating a bump steer situation.

BUMP STEER ON BEAM AXLES.

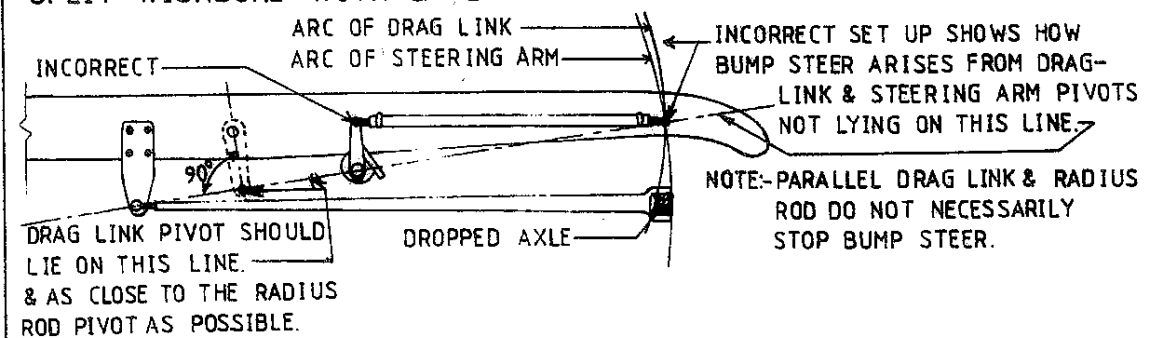
In most beam axle applications, not only those illustrated above, steering is achieved by steering one side directly with the opposite side being steered via a tie rod. Therefore when bump steer occurs it is very obvious since both sides turn the same way resulting in the car wandering over the road. If the steering box is connected to both sides as it is on an independent front suspension and bump steer occurs it shows up in the form of toe in or toe out (with its associated handling problems), since the bump steer on each side is in opposite directions.

STEERING: BEAM AXLE WITH SIDE STEERING.

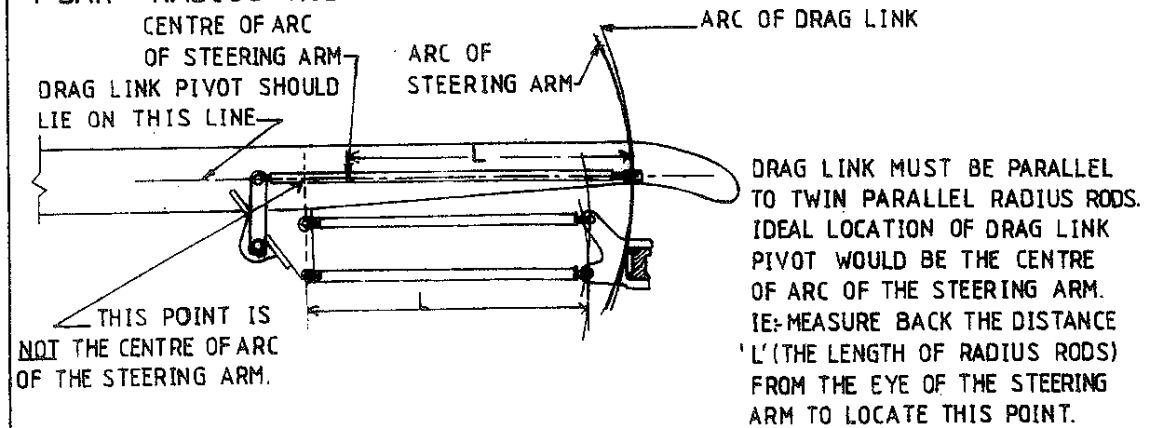
1. ORIGINAL EARLY FORD.



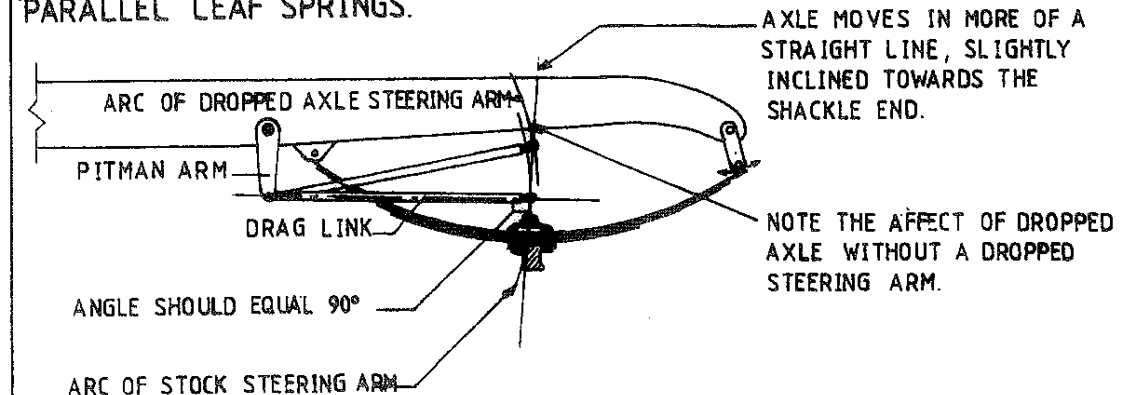
2. SPLIT WISHBONE WITH LATE MODEL STEERING.



3. "4-BAR" RADIUS RODS WITH LATE MODEL STEERING.



4. PARALLEL LEAF SPRINGS.



STEERING: BEAM AXLE WITH RACK AND PINION STEERING.

1. CROSS STEERING.

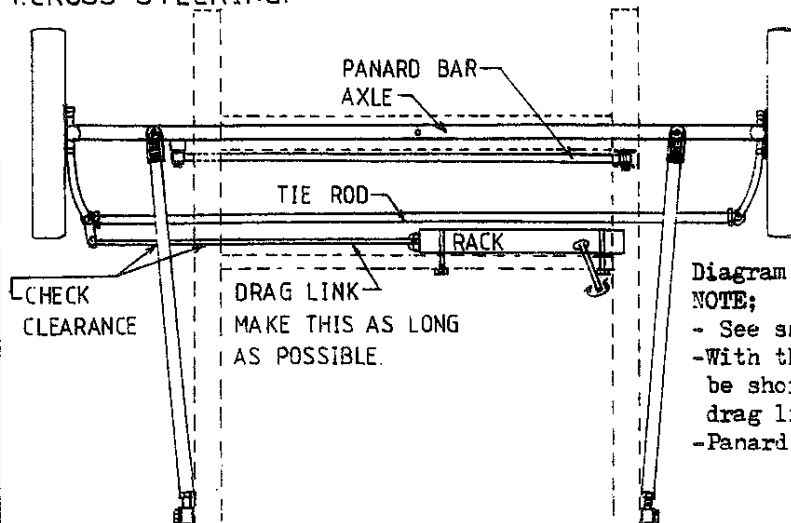


Diagram 1- Shows typical set up.
NOTE;
- See sheet on cross steering.
- With this system the rack must be shortened such that the drag link is as long as possible
- Panard bar will be necessary.

With this system one end only is connected to the left hand side wheel via a drag link and steering arm and the other wheel is steered via the tie rod in much the same way as the normal cross steering system. Never attempt to mount a rack and pinion to the chassis and hook up both sides to the steering arms.

2. SIDE STEERING.

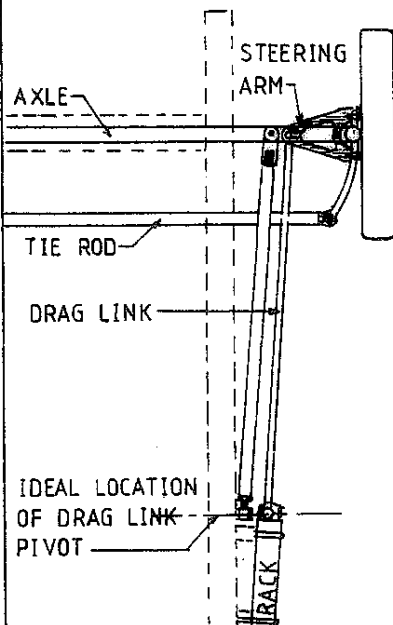


Diagram 2- shows typical set up often seen on 'T' Buckets. Here the steering rack is placed alongside the chassis rail and is attached as shown. The geometric behaviour is illustrated in the section dealing with side steering.

3. RACK MOUNTED DIRECTLY TO AXLE.

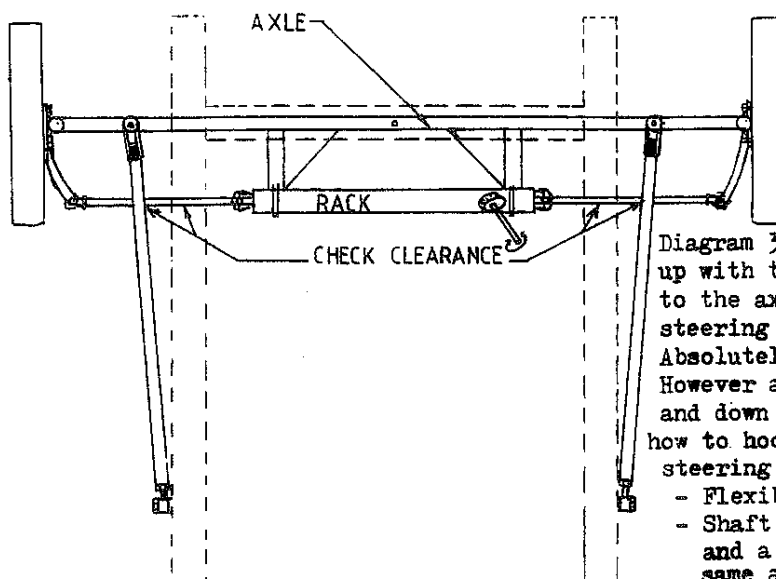


Diagram 3- Shows a possible set up with the rack mounted directly to the axle and hooked up to the steering arms on both sides. Absolutely no bump steer results. However as the axle must move up and down there is a problem of how to hook up the rack to the steering column; there are 2 ways:
- Flexible steering shaft,
- Shaft with two universals and a slip yoke, much the same as a tailshaft on a live