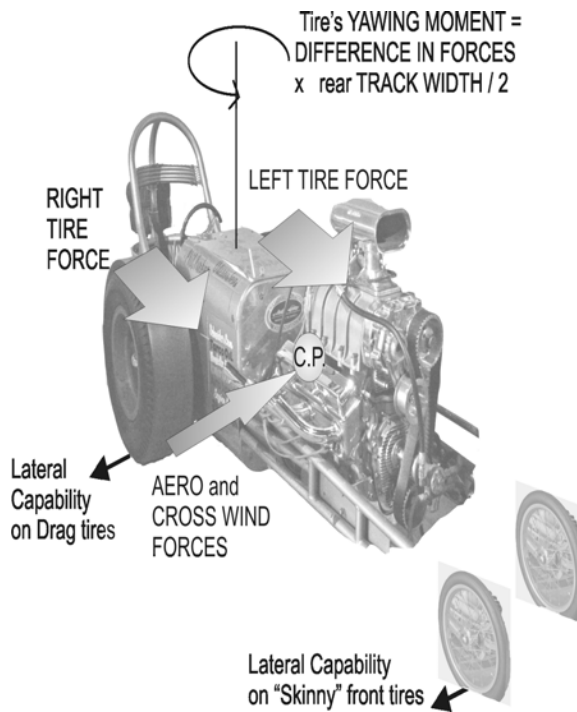


# Chapter 12 Straight-Line HANDLING



**FIG. 12.1 Dragster with Lateral & Longitudinal Forces and a Yawing Moment**  
(Photo taken at NHRA Motorsports Museum, 2004)

For safety reasons, straight-line (drag & land speed) racers must insure that yawing moments and side-forces can be controlled. Figure 12.1 illustrates typical forces and yawing moment acting on an old-timer ('60's) dragster raced by Phil Parker. Since current day ¼ mile ("trap") speeds are about double those of an old-time dragster, the aerodynamic side forces are 4 to 5 times larger. The aerodynamic and cross-wind forces must be balanced by the lateral (tire slip-angles) capability of the rear and front tires. Otherwise, the dragster will rotate and/or drift sideways out of his/her lane – a dangerous situation. Similarly, land-speed vehicles will experience parasitic power-loss and may drift or spin into unwanted regions. A more safe setup requires perusing three short technical laps: 1. *Balancing Side-Force*, 2. *Balancing Yawing-Moment*, and 3. *Balancing Both*. Anyone, who does some drag racing, will get insights from all three tech-laps.

## Section Details

- 1. Balancing Side-Force:**  
Neutral Vehicle, and Induced Yawed-Position.
- 2. Balancing Yawing-Moment.**
- 3. Balancing Both:**  
General Behavior, Max-angles, and Detailed Behavior.

**Total number of safety ideas = 29**  
**Total number of safety principles = 10**  
**Total number of illustrations = 21**  
**Total number of examples = 10**