EAGLE WINGS MOTORCYCLE ASSOCIATION

Friends for Fun, Safety & Riding

2 vs 3 information
Instructor Guide

Audience: Anyone thinking about a trike vs 2 wheels

Length: Approximately 40 minutes

Resources: One LCD projector and screen
Computer
One meeting area - size to accommodate attendees

Objective: Finish information regarding the difference between 2 wheels and 3 wheels

Outcome: A better understanding of comparing 2 to 3 wheel riding

Slide 2
NOTE: The following is to be read outload prior to the presentation:

This presentation is informational only!
Making a decision to ride a Trike (3-wheeler) is a personal choice.

Slide 3 We will cover some of the differences between 2-wheel and 3-wheel motorcycles.

- ⇒ Trike motorcycles come in “standard” configuration (2 wheels in the back) and the reverse configuration with 2 wheels in the front.
- ⇒ Trikes take more effort ride at slow speeds: whereas 2-wheelers take less effort at high speeds.

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Slide 4 Talk to friends about their trikes, but Review, compare, and test drive BEFORE you buy.

Trikes and trike kits have some features with variations on the manufacturer: Some features to review are (not implemented on all):

- ⇒ Some features variations
  - ⇒ Wheel Base — horizontal distance between the centers of the front and rear wheels
  - ⇒ Track— the distance between the centerline of two wheels on the same axle
  - ⇒ Front fork Rake—if any
  - ⇒ Suspension—independent, straight axel, air ride, etc.
- ⇒ Length (wheelbase)
- ⇒ Seat Height
- ⇒ Load limits
  - ⇒
  - ⇒ Differential gear ratio
  - ⇒ Service intervals
  - ⇒ Price

3-wheel vendor differences

- ⇒ Track and overall width, with fenders
- ⇒ Rear axle width
- ⇒ Rear Suspension
- ⇒ Rear End (differential) Gear ratio
- ⇒ Rear Brakes (some drum, some disc)

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Slide 8

STEERING

- ⇒ Counter steer vs push-pull
  - ⇒ In riding a 2-wheeler, the rider and the bike act in unison. When riding a 3-wheeler (trike), the Driver (and Passenger) riding on the top of trike, Push-Pull steering in-stead of Counter Steering
  - ⇒ Trikes take more ‘work’ to steer at highway speeds especially with side winds and curvy roads.
  - ⇒ Experienced trike riders can ride curvy roads at a good rate, but it is more ‘work’ for the upper body.
- ⇒ 2 Wheel - Counter Steering
  - ⇒ Counter steering is a motorcycle technique that involves turning the handlebars in the opposite directions of the turn to initiate a turn. For example, the make a right turn, you would turn the handlebars to the left. This causes the wheels to be pushed out from
  - ⇒ Under the bike, which helps it to lean in the desired direction
- ⇒ 3 Wheel - Push-Pull Steering
  - ⇒ The rider simultaneously pushes on the outboard handlebar and pulls on the inside handlebar being careful not to introduce any adverse throttle inputs. These basic principles are valid in all turns. However, some corners or turns may require more or less pronounced actions.
  - ⇒ Do these techniques apply in all circumstances in all turns?

Riding a trike is the same experience as driving a 4-wheel ATV. Before riding a Trike for the first time, think about riding a ATV and start slow—steer and do not try to lean.

Slide 9

RAKE ANGLE

- ⇒ Front Rake Angle: the front rake angle is the angle that the front forks are angled forward. The angle determines the ease and quickness of response to steering inputs to the front tire. The new Wings are essential the same.
  - ⇒ 2 Wheel
    - ⇒ Stock GL1800 has a rake of 29-1/2 degrees with a trail of approximately 4”
    - ⇒ Harley-Davidson Touring has a rake of 26 degrees
  - ⇒ 3 Wheels
    - ⇒ The Trike Rake Kits increase the rake angle and the trail distance.
    - ⇒ Some manufacturers add an extended front rake kit (typically moves the fork angle forward an additional 3-6 degrees). Kits have been called Power Trak or EZ-steer and make be known by other names.
    - ⇒ The purpose of these kits is to make steering easier for the rider. Once again, the choice to have an alter rake angle kit installed is entirely up to you. The only caution is to understand that by changing the angle of the front rake, the steering many become a little easier, but also may be more sensitive and react differently.
    - ⇒ An increase in the rake angle increases the wheelbase and turning radius.
    - ⇒ New riders may have a tendency to oversteer so, take it easy until you get used to it.

Slide 10

Suspension

- ⇒ 2-Wheel
- ⇒ 3-Wheel
  - ⇒ Rear Suspension - Independent vs straight axle
    - ⇒ What are some of the advantages to an independent suspension?
    - ⇒ How about disadvantages?
    - ⇒ Each Trike manufacturer has excellent reasons for choosing the type of suspension for your Trike.
    - ⇒ The brand, style, and configuration are your to choose.
    - ⇒ Each manufacturer will provide you with advantages for their design.
    - ⇒ Greater traction through mor constant and consistent tire contact patch.
    - ⇒ Potentially less “roll”
    - ⇒ Disadvantages?
      - ⇒ More mechanical parts and greater complexity.
    - ⇒ In general the choice of rear suspension in a personal one!

Slide 11

Rear End (Differential) Gear Ratio

- ⇒ Many Trike kits will include a change in the rear end gear ratio, which may change the engine RPM at any given speed. The change in the gear ratio may also affect fuel mileage an acceleration. The do this to compensate for the added weight and wind resistance caused by the larger fenders and tires.
- ⇒ All that mean to us as riders is that the RPM and speedometer readings may not have the same relationship as they did before the kit was installed.
- ⇒ Check with the manufacturer on RPM vs speed on a 2-wheel vs 3-wheel at highway
- ⇒ speeds

Slide 12

Tires

- ⇒ **Front tire**
  - ⇒ Some riders are of the opinion that because the trike does not lean, they can, or should lower tire pressure in the front tires to keep more rubber on the road (create a larger contact patch). The contact patch is larger, but:
    - ⇒ Tire flexes creating more heat due to increased sidewall flexing.
    - ⇒ Results in more wear.
    - ⇒ The heat and flex will accentuate any weakness in the tire construction resulting in possible failure.
  - ⇒ The front tire is subjected to greater side pressure and roll.
  - ⇒ That pressure combined with excessive heat and flexing could be severe enough to break the bead seal with the rim.
- ⇒ **Rear tires**
  - ⇒ Typically automobile tires
    - ⇒ Designed to hold a much heavier weight
    - ⇒ Absorb greater flexure and sidewall force.
    - ⇒ Check with the Trike manufacture for specific tire pressure

Slide 13

Stopping Distance

Trikes generally have a shorter stopping distance due to the large contact patch with the larger tires.

- ⇒ Front wheel locks up
  - ⇒ Trike will attempt to travel in a straight line.
    - ⇒ Straighten the handlebars and ease up on the brake to regain traction.
      - ⇒ If you keep the handlebars turned and regain traction you my finds the Trike will want to rollover!
- ⇒ Real wheel lock up on hard surface.
  - ⇒ Ease off the rear brake until you regain traction.

Slide 14

Leaning

- ⇒ On 2-wheelers, the Bike leans: on most 3-wheelers, the trikes do not lean (Drivers should lean to move the center of mass/stability triangle). There are some trikes that lean.
- ⇒ Rear suspension
- ⇒ At highway speeds, 2-wheelers lean to turn - even with side winds and curvy roads.

Slide 15

Center of Mass/Stability triangle

- ⇒ As we sit on the Trike, or ride in a straight line, our body weight is within the " triangle of stability ".
- ⇒ **Riders**
  - ⇒ Shift your rear end in the seat to the inside of turn and rearward.
- ⇒ **Co-riders**
  - ⇒ Put you hands on your thighs and push back against the backrest to gain mor stability for both you and the rider.