

Front End Seminar Outline
(National Convention - Reno 1998)
Presented By
Les Andrews and Vern Harms

This Seminar will be presented in two (2) 30 minute segments:

SEGMENT 1 **Front End Inspection & Repairs**
(20 minute Discussion + 10 minute Q&A)

Inspection Describes how all front end components are designed to function, their purpose, and how they work together. What to look for (inspection) when checking for wear, fit, and adjustment of the components;

Wheel Bearings, King Pins, Tie-Rod/Drag Link,
Springs & Shackles, Spindle Arm Ball Studs, Tow-In, Caster
Do's, Don'ts, and Safety Precautions

Repairing or Replacing Describes procedures to remove, replace, and repair.
Do's, Don'ts, and safety precautions, and Tools Needed

(1) King Pins, (2) Tie-Rod/Drag Link, (3) Springs & Shackles,
(4) Spindle Arm Ball Studs
Do's, Don'ts, and Safety Precautions

Questions and Answers (10 minutes)

SEGMENT 2 **Front End Adjustments**
(20 minute Demonstration + 10 minute Q&A)

Tools Needed

Tie-Rod/Drag Link End Plugs

- Checking
- Adjusting

Wheel Bearings

- Checking
- Adjusting

Caster

- Measuring
- Adjusting

Toe-In

- Measuring
- Adjusting

Do's, Don'ts, and safety precautions

Questions and Answers (10 minutes)

Model A Front End Seminar

(National Convention - Reno 1998)

Front End Inspection and Repairs

Condition of the front end mechanical assemblies will determine how well your Model A will handle and ride. The mechanical assemblies that most affect the front end handling are front wheel bearings, king pins, tie-rod/drag link connections, front leaf spring condition, toe-in setting, and front end caster. This seminar will discuss these assemblies and the adjustments. The first secession will discuss Front End Inspection and Repairs. The second secession will discuss Front End Adjustments.

The Front End of the Model A should be considered ONE total assembly. Every part of that assembly must be inspected, repaired, and/or adjusted to within set specifications if satisfactory results are to be expected.

1. TIE-ROD/DRAG LINK END PLUGS

Move the steering enough to turn the front wheels. While moving the steering wheel, observe the movement of the pitman arm in the drag link connection. If the pitman arm moves inside the drag link before the wheels move, the end plugs in the drag link are too loose. Make note to tighten. Make the same check at the front end of the drag link and at both ends of the tie-rod. There should be very little to no free movement at each end connection before the tie rod moves the spindle.

2. TIE-ROD/DRAG LINK WEAR

Check for wear on both the tie-rod and the drag link, where the drag link crosses over the tie-rod. Turn the front wheels to the right most turning position. There should be 1/8 -1/4" clearance between the two rods.

CAUTION

The tie-rod is a hollow rod. If wear on the tie-rod (caused by drag link rubbing), is excessive, the tie rod can be weakened, causing possible bending or breaking. Wear on the tie-rod, caused by contact with the drag link, is caused by a weak and sagging front spring.

3. FRONT SPRING

Check the clearance between the spring shackle and the axle. If the shackle is sitting on the axle, the front spring is weak and sagging. This condition must be corrected to prevent the drag link and tie-rod from rubbing. There should be approximately 1/4" clearance between the spring shackle and the top of the axle.

4. FRONT WHEEL BEARINGS

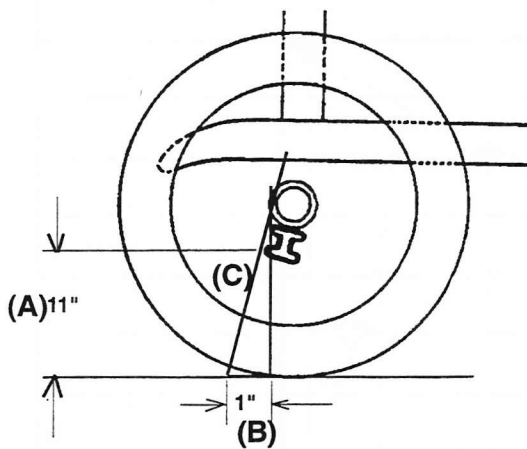
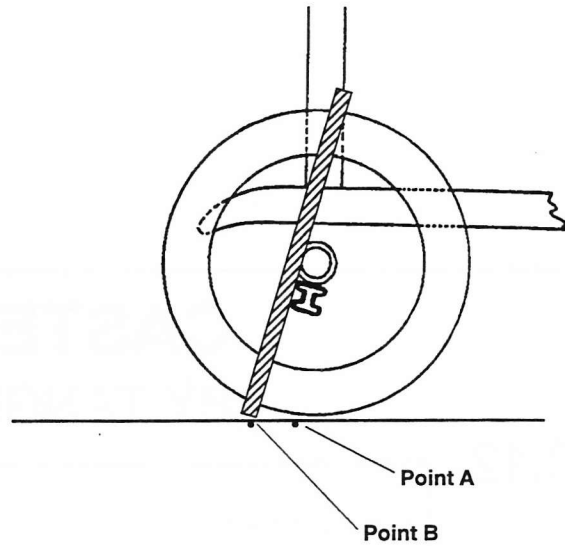
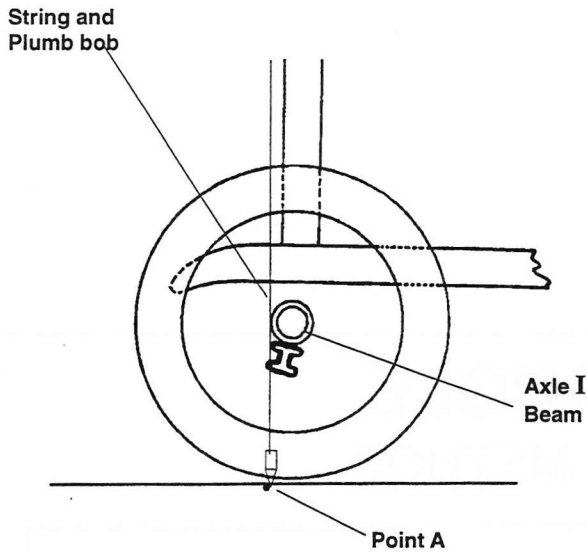
Check the front wheel bearings for correct adjustment: (a.) With the front wheels off the ground, spin the front wheel while tightening the axle nut. Tighten the axle nut until a drag is felt on the wheel. Turn the axle nut back one castle position and insert the cotter pin. There should be no binding when the wheel is rotated, and no side movement is detected.

NOTE : It may be necessary to back off on the break adjustment to enable detection of the wheel bearing adjustment. (It is better for this adjustment to be a little on the loose side rather than too tight.)

5. KING PIN THRUST BEARING AND BUSHINGS

With the front wheels on the ground (not jacked up) try rotating the king pin thrust bearing with your fingers. Now try to rotate the felt washer cup located between the bottom of the axle and the spindle. The top thrust bearing should not be able to be rotated if the weight of the car is on the bearing as needed for correct action. Likewise, the lower felt washer cup should be free and turnable with the fingers. If the bearing can be moved, the bearing will need replaced and possibly shimmed. Check wear on the king pin bushings by grabbing the wheel at the top and rocking it back and fourth. There should be no to very little movement at the king pin. Place a finger across the joint between the axle and the spindle, where the king pin (spindle bolt) goes through. Move the wheel back and fourth as stated above, and check for movement between the spindle and axle. If more than .003 - .004" movement, the bushings are worn and should be replaced.

Caster Measurement



Measuring Caster

1. Place the car on a level driveway. Make a reference chalk mark on the front axle 5" to the inside of the spring perch bolt.
2. Measure and record the distance from the reference mark to the driveway. It should be between 11" to 12", depending on wheel size and variation of tire manufacturer size.
3. Use a string and plumb bob to locate a point directly below the axle reference point. Make a mark on the driveway and call it point A.
4. Lay a straight edge along the axle I beam, extended to the ground. Make a mark at ground point. Mark this point B.
5. Measure the distance between point A and point B. The distance should be about 1 inch, depending on the height from the axle reference point to ground.

At a reference height of eleven (11) inches from the bottom ridge on the axle to ground, and a 1 inch spread between points A and B, is equivalent to 5° caster.

6. Caster is calculated as: $\frac{B}{A} = \text{Angle C}$

TANGENT of Angle (C) = Caster Degree

$$\frac{1}{11} = .09$$

TANGENT OF .09 = 5.1 degrees