DEXTER AXLE

ENGINEERING PROCEDURES

NO. EP-1002

TITLE: AXLE ALIGNMENT PROCEDURE

WARNING
If you do not have the proper tools, including the jack stands as mentioned below, take your vehicle to an axle alignment shop so work can be done accurately and safely by experienced personnel.

Improper axle alignment with the vehicle frame or chassis can cause excessive tire wear and vehicle dog-tracking. In extreme cases of misalignment and depending on trailer length, the outer tire of the right wheel may have little or no contact with the road (right side outer dual tier overhanging the edge of the road). This causes the entire right wheel load to be carried by the inner tire. Vehicles that dog-track will not have identical right and left turning characteristics, which may complicate driving in urban areas with narrow streets and sharp turns.

The trailer axle(s) should be installed on the trailer so it will be parallel to the rear axle of the towing vehicle, when the combined units are moving straight ahead on a level surface. This will eliminate dog-tracking to the right or left, poor vehicle control during turning and excessive tire wear.

It is important that the center of the fifth wheel king pin (or hitch ball coupler) be located on the trailer longitudinal centerline. The maximum variation should not exceed 1/8" to the right or left.

The adjustable spring seat will be mounted on the left hand (road side of the vehicle). The stationary, non-adjustable spring seat will be mounted on the right hand (curb side of the vehicle).

SPECIFIC ALIGNMENT PROCEDURE FOR ADJUSTABLE SPRING SEAT

SINGLE AXLE ADJUSTMENT

Jack the trailer up on a level solid surface and place appropriate jack stands of sufficient capacity to support the load under the axle near the spring seat areas.

Lower the vehicle onto the jack stands and assure that the axle beam is perfectly level across it's transverse axis. Remove wheels, hub and drum to expose the spindles on each side.

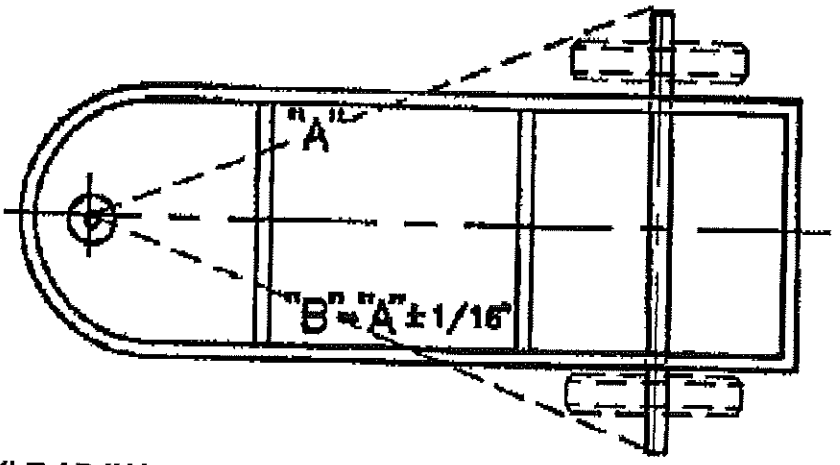
Measure from king pin to spindle center on each side (see Figure #1). As a suggestion to facilitate ease of measuring, plumb lines may be dropped from the king pin and from the centerline of each spindle end. Measurements "A" and "B" can then be taped on the floor to eliminate any miss measurement due to sagging of the tape long measurements.

Compare A and B measurements. If unit needs adjusting, then lift unit off of the jack stands slightly letting the axle and suspension hang loose. (Unit weight must be off of axle(s) when adjuster screws are turned on the adjusting spring seat.)

Loosen the U-bolt nuts slightly on the adjuster spring seat side and move the axle assembly with the adjusting screws, located on the front and rear of the spring seat. Move front axle to correct alignment position based on previous findings of A and B measurements. Make sure both front and rear adjusting screws are snug after axle is realigned. Then, re-tighten the U-bolt nuts to the proper torque values.

Set unit down on jack stands again and re-measure A and B, as before, to assure that "A" and "B" dimensions are within 1/16" of each other. If dimensions are not to specification, then repeat adjustment procedure.

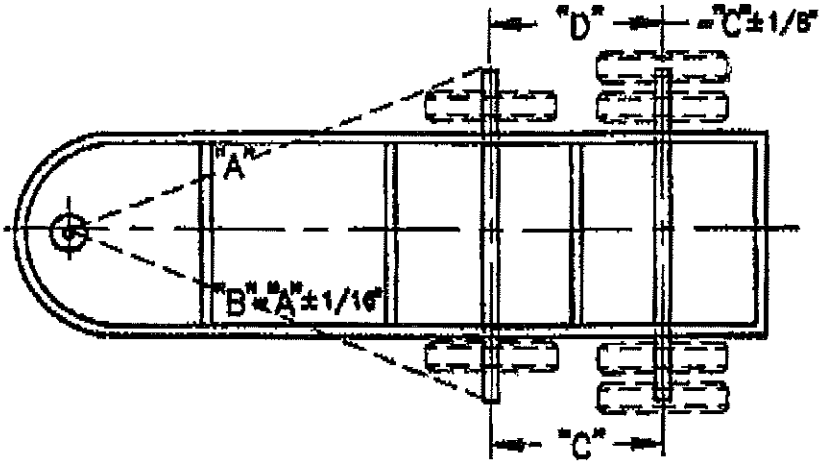
Figure #1



TANDEM AXLE ADJUSTMENT

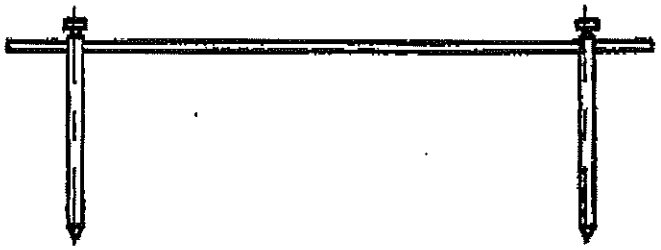
Adjust the second axle using it's left hand spring seat adjuster to assure distances "C" and "D" are within tolerance. Refer to tandem paragraph Figure #2 and #3.

Figure #2



Measure the distances "C" and "D" between the front and rear tandem axles. These distances must be within 1/8" of each other.

Figure #3



(The small gauge shown in Figure #3 simplifies measuring the axle distances "C" and "D". The gauge can be made of drill rod or pipe fittings. The material and details are not important as long as the parts are rigid and true. The pointer arms of the gauge should be parallel and held in the same plane).

After alignment is completed make sure all nuts and bolts are tightened to their respective torque values before reinstalling the hub and drum and wheels.

If any of these measurements do not fall within the stated tolerance limits, the suspension system should be thoroughly inspected for loose, worn or broken parts. Adjustments in the suspension and the replacement of worn or broken parts should be made to bring the axles into alignment.

The limits of 1/16" and 1/8" appear very small in comparison to the overall dimensions of the vehicle but they are recognized as the maximum permissible limit of misalignment. Also, the relatively small size of those limits makes accurate measurements important.

WHEEL ALIGNMENT CHECK
PROCEDURE - TRAILERS

1. Position vehicle on level surface and insure that vehicle itself is level.

2. Mark the horizontal centerline of each tire with a line parallel to the ground or floor.

3. Using a 36" straight edge, hold it against the horizontal centerline of each tire and measure the distance into the frame rail at each end of the straight edge. Make sure that the straight edge is centered on the wheel when taking the measurements. Record the measurements as front dimension and rear dimension for each wheel. Also note which wheel the dimensions apply to such as right front, right rear, etc.

4. Roll the vehicle forward exactly one half revolution of the wheels. Repeat the measuring procedure taking care to position the straight edge exactly on the horizontal centerline marks on the tires. Record the measurements as before.

5. Add the measurements for each position taken in step #3 to those taken in step #4 for each wheel. Divide the sums for each position by two. The results will be the average measurement that eliminates any wheel and tire runout that may be present. Failing to average the measurements may result in erroneous wheel alignment values.

6. The difference between the dimension taken at the front of each wheel and the rear of each wheel will be the amount of alignment error. This difference, divided by the length of the straight edge (36" in this example) equals the toe error in inches/inch. This error can be converted to the angular value by dividing the result by .017, which is the sine of one degree.

   Acceptable values are:

   Torflex axles - 0 degrees toe out per wheel end
   .31 degrees toe in (.0054"/ inch)

   Leaf spring axles - .25 degrees toe out (.004"/ inch)
   .25 degrees toe in (.004" / inch)

7. If the distance to the frame at the front of the wheel is greater than that at the rear of the wheel, the wheel is toed-out. If the difference is the opposite, the wheel is toed-in.

NOTE: The preceding measurements are only valid if the frame rails are straight. (parallel to each other)

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