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JOSAM PRODUCTS

# Laser action aligns truck wheels accurately

Incorrectly aligned wheels and axles on trucks and trailers pose a never-ending problem for fleet and individual operators everywhere—in terms not only of premature tire and component wear, poor fuel economy and extra downtime for servicing but also of road safety.

Over the years, various systems have been developed for the precise measurement of angles and adjustments so that corrective action can be taken, and while these systems have proved satisfactory within their own limitations, they cannot match the accuracy by modern laser technology.

A Swedish company, JOSAM Products AB, has been a pioneer in adapting the laser to commercial vehicle alignment diagnosis.

It also has simplified procedures for mechanics by using millimeter per meter for all measurements.

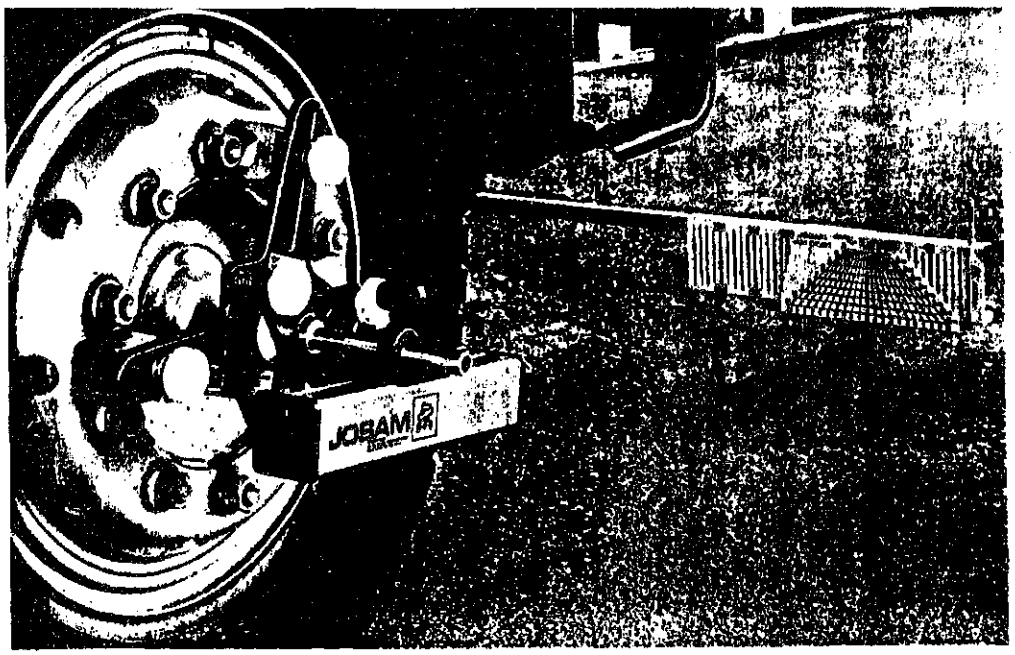
Previous systems measured in degrees and tenths of degrees. If an axle was misaligned by 10 minutes, it often would be difficult to determine whether that axle was within acceptable tolerances or not. However, when the rolling direction of the wheel on the misaligned axle is measured in millimeters per meter and a toe-out of 10 mm is found, it becomes alarmingly obvious that the wheel is straying in the wrong direction at a rate of 10 meters per kilometer—a sure sign that problems and unnecessary costs lie on the horizon.

With the JOSAM system, stepless, self-centering gauges are hung from the frame to line up the center line at the side of the truck; this makes it easier to do the actual work and avoid incorrect readings. A laser projector is attached to the wheel with a special adapter that is adjustable for different sized rims. Damaged rims do not affect the reliability or accuracy of the laser since it is easy to control and adjust for the distortion.

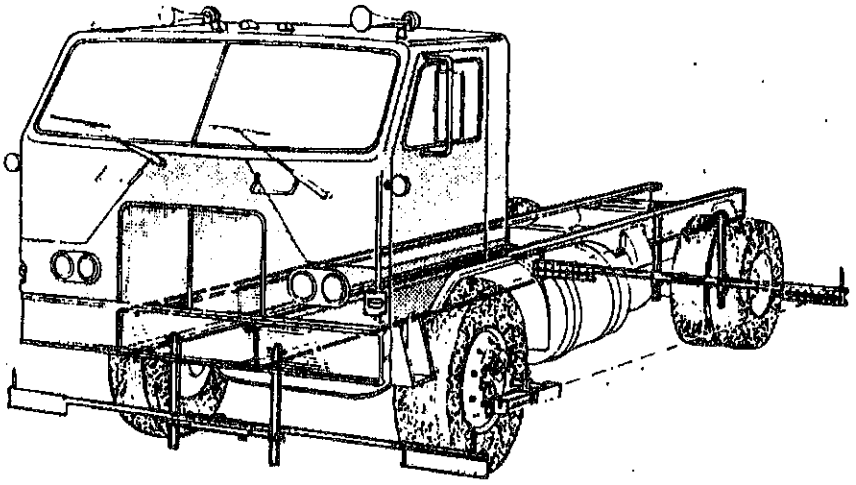
A laser beam is then projected onto scales at both ends of the truck. Contrary to other measuring methods, the laser-based system uses the entire length of the vehicle as a reference and this results in precise readings.

## Five times more accuracy

The length of the vehicle is usually five meters or more so that conse-

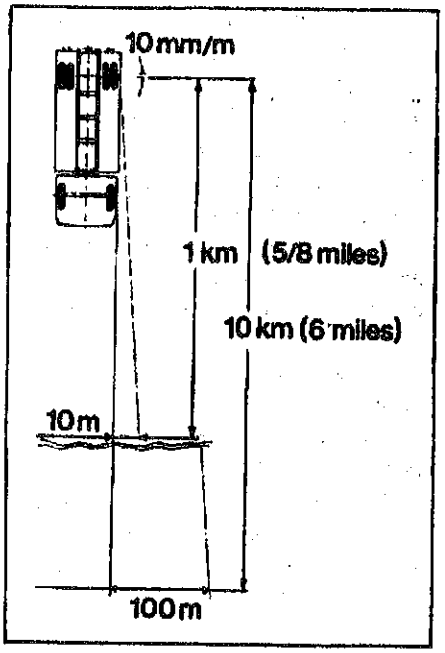



Laser generator mounted on wheel projects beam onto scale attached to self-centering gauge suspended from frame to determine true centerline of vehicle and provide precise reading of angle of axis to that line.



Left: Scales are located at both ends of truck so that entire vehicle lenght is used as measuring reference, resulting in extremely accurate readings.

Below: All measurements are in millimeters per meter. Toe-out of 10 mm indicates that wheel es straying in wrong direction at rate of 10 meters per kilometer—a sure sign of trouble.




quently the rolling direction of the wheel in relation to the frame, or in relation to the wheel on the other side of the vehicle, can be measured with at least five times more accuracy as opposed to those systems which utilize only the wheel diameter as a measuring reference.

It has long been a common belief that the front axle is the most important to keep correctly adjusted. Also, with previous alignment systems it often has been complicated to measure rigid rear axles.

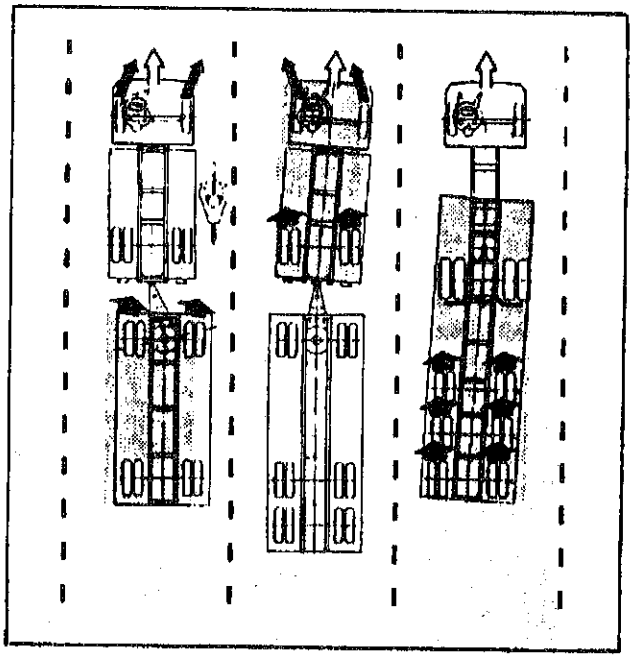
However, the vehicle usually has many more tires on the rigid rear axles than on the front axle and it is equally important to keep these wheels rolling straight ahead. Incorrectly aligned rear axles also cause wear on the front tires as well.

The new patented laser AM system makes it very easy to detect misalignment in the rear axles. A rear axle should sit at a 90° angle to the frame. Deviations from this make the truck tend to go off the road and sometimes an illegal situation is created because the truck takes up more space than the maximum allowed legal width.

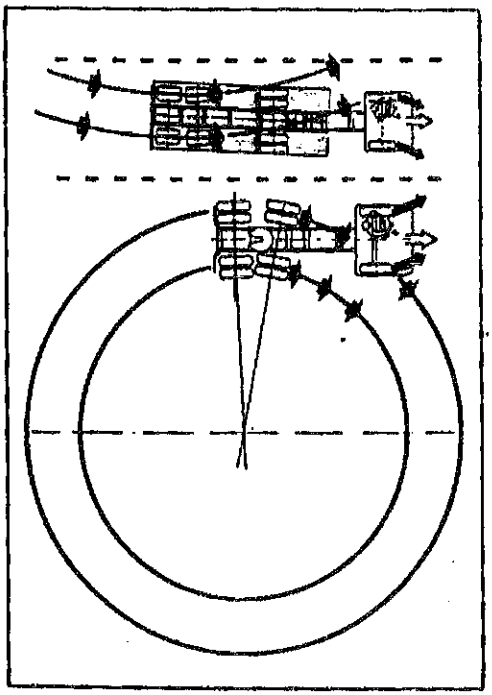
Trucks and trailers equipped with tandem axles that are not parallel cause extensive tire wear on the front wheels. This is because the rear wheels want to go in a circle and the driver has to compensate with the front wheels in order to get the vehicle to move straight ahead.

### Bent axle problems

A rear axle can also be bent and this results in too much toe-in, toe-out or camber. The laser AM system gives an instant and accurate reading of whether the axles are square to the frame, parallel with each other and/or

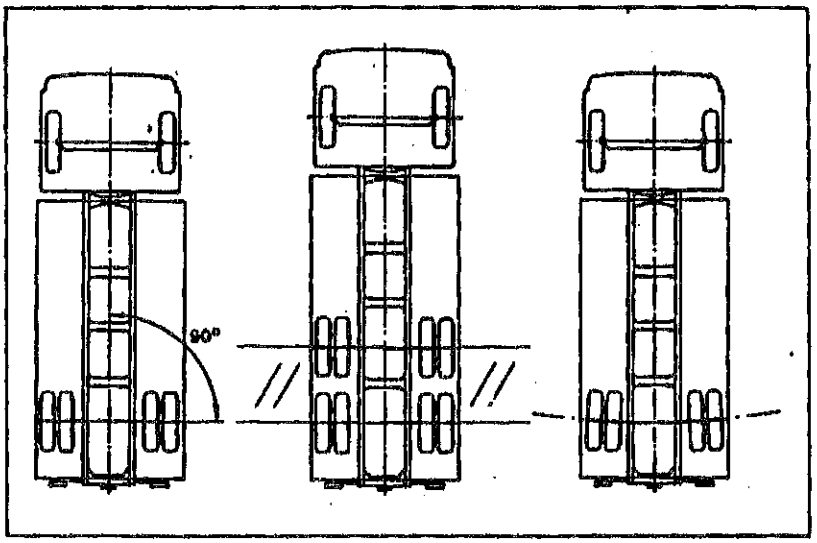


Rear axle should always sit at 90 degree angle to frame. Deviations male truck want to go off road and can also create illegal situation because truck takes up more space than maximum legal width.



Left: Tandem rear axles out of parallel cause extensive wear on front tires. This is because rear axles want to go in circle and driver has to compensate with front wheels to keep vehicle straight.

Below: Bent rear axles can result in toe-in, toe-out or camber. Laser system tells instantly if axles are square to frame, parallel with each other, or bent.




bent. This is essential to a complete diagnosis so that correct alignment adjustments can be made.

Previous methods of measurement often gave imprecise readings for squareness in relation to the frame if one axle was set off sideways in relation to the frame or to another axle. The laser AM method gives a correct reading regardless of whether the axle is set off or not.

Axles set off sideways do not always affect tire wear itself so long as all the wheels are rolling in the same direction, but they have caused incorrect diagnosis which in turn has resulted in incorrect adjustments.

### Camber always important

A correct camber angle is always important. It is even more important on an axle with dual wheels because the distance between the road surface and the inner side of the inner tire and the outer side of the outer tire is much larger than on single wheel.

In the past, the camber angle on the rear axles has often been neglected but with the laser-based method this critical measurement does not have to be ignored. It does not require any special or extra arrangements and it is taken in a matter of minutes.

Customers who have had their trucks and trailers aligned with this new method have reported that they can drive up to 400,000 km on their tires.

The same equipment is used to measure both front and rear axles. In addition, JOSAM has developed a new turn-angle gauge to replace the conventional turn-plate. The new gauge eliminates the incorrect readings that often occur when using turn-plates; this happens because slippage sometimes takes place between the plate and the tire.

Another advantage of the new system, the firm says, is the ease with which it is calibrated. It is controlled the same way as a water level—just by turning the laser projector, the camber gauge and the self-centering frame gauges. No special tools are required.

### Heat-shrinking method

More than 10 years ago, JOSAM began to use heat-shrinking in Scandinavia as a quick and easy method to adjust for incorrect toe-in and toe-out on rigid rear axles. This can be done without removing the axle and thus saves a large amount of time and money.

Some axle manufacturers accept up to 3 mm toe-out in their specifications. JOSAM believes this is for practical and economic reasons in production. The company notes that everyone working in truck alignment knows that all wheels on non-driving axles should have a little toe-in; the rolling resistance always bends the wheels outward somewhat so that a 2 mm toe-in on a vehicle standing still will change to 0 mm when the wheels are rolling.

The firm adds that since all wheels must be parallel to one another when in motion, there must be a little toe-out when adjusting a drive axle; this compensates for the force that pushes or bends the axle toward toe-in when driving.

Although a correctly aligned vehicle saves a lot of money in tires, the company says many of its customers report even greater saving in fuel. ■