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Getting started [laser AM]

These operating instructions describe the handling, function and components for JOSAM laser AM.

Note! Check the calibration of your laser and angle gauge regularly.

Note! Check the rest of the equipment regularly for damages and play that can affect the measurements accuracy.

Operating the system

JOSAM laser AM, together with JOSAM Homebase installed on a PC, is a measuring equipment designed for wheel alignment.

JOSAM laser AM consists of JOSAM Homebase software, one or two lasers, an angle gauge, four scales and other equipment that are used to assemble the system on the vehicle. The lasers and electronic angle gauge are battery powered and will last for a normal working day.

JOSAM laser AM is portable and can perform its measurements on the vehicle without the need of any support of power or special locations. The measuring results are saved on the hard disc of the PC and can be printed out when the PC is connected to a printer.

Starting the software



Start the software by clicking the icon on the desktop or menu

Short steps to perform a measurement

- 1. At first perform the "Measurement preparations" before continuing with any measurement.
- 2. Fit all equipment to the vehicle.
- 3. Select "Quick start" in JOSAM Homebase to start a measurement without any additional information or create a work order in JOSAM Homebase with all options you want. See the JOSAM Homebase manual for further information.
- 4. Enter distance between front and rear scale by pulling the slider up or down, or manually typing the distance in the box.



Note: Use local decimal separator.

5. Select vehicle type and axle configuration. New Order



- 6. Perform a runout of the wheels of the axle that you want to measure, follow the instructions on the display to be guided though the process.
- 7. Follow the steps in the screen to do the complete measurement before



- 8. Adjust the wheel- and axle alignment using JOSAM laser AM
- 9. Perform a measurement after adjustment sand/or

Laser AM20-D1



А ON/OFF

- Full or В
- reduced output
- С
- power D

Charger connector

Laser beam shutter



Description

Battery



The measuring heads are supplied with NiMh batteries. When the unit is not in use it shall be kept with a charger connected to ?

Note: NiMh batteries are not environmentally friendly and should be disposed of according to local regulations.

Note: Charging <u>only</u> allowed in office environment.

Technical data and information

TYPE: AN SERIAL NO MANUFACTURE	120 D1 11795 ⊳ 2011	CE
	CAUTION - CLI Laser Radiatio Do not stare in	ASS 2 In When Open NTO The Beam
	EN-60825-1:200 Max Output Po Wavelength:	7 WER: <1mW 635 nm

Every measuring head is marked with a product number, serial number, year of manufacture and a CE symbol that certifies that the product is approved according to LVD and EMC directives, EN50081-2, EN50082-2.

Batteries	6pcs. R14 NiMh each 2000 mAh, 1.2V
Laser:	Class 2
Operating time:	24 hours
Charging time:	7 hours
Toe accuracy:	0,25 mm/m



See instruction manual T60 for operating and calibration instructions.

Battery



The measuring heads are supplied with NiMh batteries. When the unit is not in use it shall be kept with a charger connected to B.

Note: NiMh batteries are not environmentally friendly and should be disposed of according to local regulations.

Note: Charging <u>only</u> allowed in office environment.

Technical data and information

Box 419•SE-701 48 ÖREBRO SWEDEN Tel.: +46 19 30 40 00•Fax: +46 19 32 03 16		Every measuring head is marked
Prod. No: JS301	Version: A	with a product number, serial
Serial. No: #1	Made in Sweden	certifies that the product is approved according to LVD and EMC directives, EN50081-2, EN50082-2.
Batteries:		Battery pack: 2500 mAh, 7,2V
Operating time:		10 hours
Charging time:		14 hours
Caster/KPI range	:	-7,5° to +15°
Camber range:		-5° to +10°
Accuracy for angl	es =< 5°:	+/- 5'
Accuracy for angl	es > 5°:	+/- 10'

Updated 2012-08-29

Measurement preparations [laser AM]

Pre measurement checks



Before carrying out any measurements make sure that the vehicle has no excess play in the bushings and steering linkage, by using **JOSAM play detectors AM800 K/AM900 K**.

The following things should be checked before wheel and axle measurements are taken:

1. Tire pressure:

Tires (are the correct tires mounted or are different types of tires mounted on the same axle?).

2. Bearing play:

Unnecessary play in kingpins, steering gear, and the balancing arms support on support axle vehicles.

- 3. **The attachment of the axles** (Play in spring-eye bolts, shackles, broken centre rivets, broken springs and loose spring straps.)
- 4. Worn torsion bar bushings

Note: If any of the above mentioned points are not correct, these should be fixed before proceeding with the measurements.

Preparation

Place the wheel clamps, **AM10B / AM8B**, on the wheel set and the measuring heads on the axle.

Scales and gauges



Assemble the self-centering measuring gauges, **JT120**, gauge extensions, **AM5-1750A and B**, and the scales, **AM34** in the front and at the rear of the vehicle.



If the vehicle is a trailer or semi-trailer, use the special clamp **JT290** for tow eyelet or kingpin.

Windy environment

If the measuring procedure takes place in a windy or draughty environment, this may cause the target scales to sway or vibrate. Therefore, to prevent this the stabilizer bracket JT119 is attached to the hangers and secured to the chassis frame.

Adjustment of self centering gauges



Adjust until the extensions are horizontal by means of the adjusting device on the self-centering gauges, **JT120**. Check the spirit level on gauge extension.

Measurement preparations are now completed and the system is ready to start measuring.



Do not alter the position of the self centering measuring gauges, while measuring procedure is in progress. (The accuracy of the system depends on the position of the axle in relation to the target scales).

Updated 2012-03-23



The Main menu is the "hub" of the laser software. All main functions like measuring and adjusting can be accessed directly from this menu.

The Main menu is connected to a work order number (displayed at the bottom of the screen) which is automatically generated or chosen by the user.

Note! Before starting any new measurement you have to perform a runout

to calibrate the wheel adapters, this function can only be accessed from the main menu.

Measure all axles of the vehicle by following the instructions on the screen, the results are saved separately for each axle. For measurement of trailers and semi-trailer see separate instructions.

The first scale and angle gauge readings entered in the software are automatically stored as before adjustment readings.

After measurements the results per axle are shown, move from axle to axle the axle list on the left side of the screen.



The measuring results 'Before adjustment' are shown within parentheses (x.xx), after adjustment without parentheses.

Adjust mode for the selected axle can be accessed by pressing d



s ጆ for toe measurement (before or after can be chosen in next window).

Press measurement.

for measurement of steering angles or 4 definition for twinsteer

Menu icons

Measurement

Switch to toe measurement.



Adjust menu

Adjust button enters the toe adjustment menu.

This icon is only displayed when the axle has been measured "Before adjustment".



Measure other angles menu

Enter other angles, camber, caster, KPI, TOOT and

maximum turn angle.



Twinsteer axles menu

Measures the parallelism of 2 steering axles.



Runout

Perform a runout



Exit

Closes laser AM plugin and return to Homebase.

Updated 2012-08-29

Runout [laser AM]

Perform runout on both wheels of each axle that is to be measured ensure that the wheel clamp axle is parallel with the wheels axis.

Step 1:



Click in the main menu to enter the runout menu, then select the wheel to perform runout on. Lift the axle so both wheels can rotate freely.

LaserAM

Step: 1

Click on the wheel below which you will be doing the runout.







Step 2:

In the next step you prompted to align the laser with one of the adjustment arm with the white knob.



Adjust the laser and wheel adapter as shown on the picture to the left.





When ready press Sto continue.

Step 3:

Rotate the wheel so that the laser point at a scale 4-6 meters away from the axle. The scale can be placed on the floor or on the vehicle.



Read the value that the laser is pointing to and write the value in the blank space



When ready enter the position were the laser hits the scale in the edit box by:



A. entering the value directly into the edit box

B. click on the scale and point out the position were the laser hits the scale



C. using the up / down arrow on the right side of the edit box



D. or a combination of the 3 mentioned above.

When ready press Sto continue.

Step 4:

Rotate the laser 180 degrees over the shaft.



Adjust the laser and wheel adapter as shown on the picture.





When ready press Oto continue.

Step 5:

Rotate the wheel 180 degrees so that the laser points at the scale again.



Read the value that the laser is pointing to and write the value in the blank space



When ready enter the position were the laser hits the scale in the edit box.

When ready press Sto continue.

Step 6:

Adjust the white knob until the displayed value is reached (in this case 214).



Rotate the white knob until it reaches the target value: 214





When ready press 💿 to continue.

Step 7:

Rotate the laser 90 degrees over the shaft, and align it with the black knob.

LaserAM



Adjust the laser and wheel adapter as shown on the picture.





When ready press Oto continue.

Step 8:

Rotate the wheel 90 degrees so that the laser points at the scale again. Adjust the black knob until the displayed value is reached (in this case 214).



Rotate the black knob until it reaches the target value: 214





When ready press Oto continue.

Step 9:

Validate the operation by rotating the wheel while keeping the laser pointed to the scale, the reading should not vary more then 1 mm from the displayed value (in this case 214).



You should now be able to rotate the wheel without the laser moving from 214





When ready press:

- G to return to the previous step, or
- wo restart,or
- ŀ to exit to the main menu.

Menu icons Next step Proceed to the next step in the process. **Previous step**

Return to the previous step in the process.



Ð

a

Restart

Repeat runout process.



Exit

Return to the main menu.



Exit

Closes laser AM plugin and return to Homebase..

Updated 2012-09-04



Select the axle to be measured in the axle dialog on the left side of the screen,

then perform a runout on both wheel adapters of the selected axle before entering the measuring mode:

- If the second sec
- for adjustment of toe (see separate chapter), or

مر for i

for measuring camber.

To measure all axles on a vehicle you just repeat this operation on all axles in the order you prefer.

Toe and camber measurements, conditions

A. Perform the runout procedure.

- **B.** Non-steering axle standing on the floor NOT jacked up.
- C. Axle in level.
- D. Mount the lasers on the wheel adapters.

Menu icons

Toe measurement

Switch to toe measurement.



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Toe adjust menu

Adjust button enters the toe adjustment menu.

This icon is only displayed when the axle has been measured "Before adjustment".



Camber measurement

Switch to camber measurement.



Exit

Closes laser AM plugin and return to Homebase..

Updated 2012-05-21

Toe measurement [laser AM]

After pressing sthe following dialog will show on the display. Since the axle has not been measured before it automatically selects before adjustment mode

🞼. When re-entering the measurement menu you can choose to store the

values as before bears or after measurement in the left top of the window.



Enter scale readings for all four scales, left front, left rear, right front and right rear by:

A. entering the value directly into the edit box



B. click on the scale and point out the position were the laser hits the scale



C. using the up / down arrow on the right side of the edit box



D. or a combination of the 3 mentioned above.

When all values have been entered the measured toe, out of square and in applicable parallelism are displayed in the center of the screen.





After adjustment

Switch to after adjustment mode



Exit

Closes laser AM plugin and return to Homebase..

Updated 2012-08-29

Camber measurement [laser AM]

the following dialog will show on the display. Since the After pressing axle has not been measured before it automatically selects before adjustment

mode **press**. When re-entering the measurement menu you can choose to

store the values as before **press** or after **the store** measurement in the left top of the window.



Enter readings for both sides by entering the values directly into the edit boxes

0 15

. Note that when degrees and minutes are selected in the settings they are entered in 2 separate boxes. See further instructions on how to measure in the scroll box.

Continue by clicking

35

0



save and exit to main screen.

Menu icons



Save and exit

Save measured values and return to the main window.

Before adjustment

Switch to before adjustment mode



After adjustment

Switch to after adjustment mode



Exit

Closes laser AM plugin and return to Homebase..

Updated 2012-08-29

Adjust toe and out of square [laser AM]

In this mode you can get help adjusting the axle to the preferred settings for toe and out of square. First check if all conditions are fulfilled, enter the require information followed adjusting the axle.

When you have finished adjusting tighten all bolts/nuts and press exit, laser AM will automatically save the results as after adjustment.

Toe adjustment, conditions

- A. Runout procedure performed.
- **B.** Axle standing on the floor NOT jacked up.
- C. Axle in level.
- D. Mount the lasers on the wheel adapters.

Toe adjustment

After pressing *f* the following dialog will show on the display.

Enter scale distance from the axle to the front scales by:

A. entering the value directly into the edit box

8.5	*
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Note: Use local decimal separator.

B. pulling the axle down using the mouse



C. using the up / down arrow on the right side of the edit box



D. or a combination of the 3 mentioned above.

*

Enter the target value for toe and out of square in the edit boxes on the right side. **Note:** Use local decimal separator.



Continue by:

- A. Ocontinue the adjustment process
- B. Pexit to the main window

After pressing vertice the adjustment process begins. The red dots on the screen show the current position were the laser hit the scale, while the green dots indicated the target position to reach the preferred toe and out of square entered

in the dialog before. **A Note:** The software will always choose the scales with the biggest distance to the scales in the front or rear of the vehicle.

LaserAM
×
0 50 100 150 200 250 300 350 350 350 250 200 150 100 50 Image: Contract of the state of the st
164 153 155 157
-0,2
-2,0 1,8

During the adjustment process you can update the left and right scale

Continue by:

- A. A. save and exit to the main menu
- B. Kexit laser AM and return to Homebase

Menu Icons	5
🔚 🕈 🦻 s	Save and exit
	Save measured values and return to the main menu.
Ð	Proceed
	Continue adjustment process
*	Exit

Closes laser AM plugin and return to Homebase..

Updated 2012-08-29

Steering axle [laser AM]



Select the axle to be measured in the axle dialog on the left side of the screen,

then perform a runout on both wheel adapters of the selected axle before entering the measuring mode:

- Jer measuring toe, or
- for adjustment of toe (see separate chapter), or
 - for measurement of twinsteer axles, or
- A for measurement of steering box position, or
- •

for measuring camber.

To measure all axles on a vehicle you just repeat this operation on all axles in the order you prefer.

Menu icons



Toe measurement

Switch to toe measurement.



Toe adjust menu

Adjust button enters the toe adjustment menu.

This icon is only displayed when the axle has been measured "Before adjustment".



Twinsteer measurement

Switch to twinsteer measurement.



Steering box position

Switch to measurement of steering box position.



Camber measurement

Switch to camber measurement.



Exit

Closes laser AM plugin and return to Homebase..

Updated 2012-05-21

Toe measurement [laser AM]

After pressing the following dialog will show on the display. Since the axle has not been measured before it automatically selects before adjustment mode

* When re-entering the measurement menu you can choose to store the

values as before bears or after measurement in the left top of the window.







Enter scale readings for all four scales, left front, left rear, right front and right rear by:

A. entering the value directly into the edit box



B. click on the scale and point out the position were the laser hits the scale



C. using the up / down arrow on the right side of the edit box



D. or a combination of the 3 mentioned above.

When all values have been entered the measured toe, out of square and in applicable parallelism are displayed in the center of the screen.



adjustment menu.



Save and measure camber

Save measured values and continue to measure camber.



Before adjustment

Switch to before adjustment mode



After adjustment

Switch to after adjustment mode



Exit

Closes laser AM plugin and return to Homebase..

Updated 2012-05-21

Camber, caster, KPI, toe out on turns and max. turn measurement [laser AM]

After pressing the following dialog will show on the display. Since the axle has not been measured before it automatically selects before adjustment

mode **********. When re-entering the measurement menu you can choose to

store the values as before **beause** or after **beause** measurement in the left top of the window.



Enter readings for both sides by entering the values directly into the edit boxes

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selected in the settings they are entered in 2 separate boxes. See further instructions on how to measure in the scroll box, use the scroll on the right to get all instructions about measurement of the selected wheel angle.

Continue by clicking



save and exit to main screen.

Menu icons



Save and exit

Save measured values and return to the main window.



Before adjustment

Switch to before adjustment mode



After adjustment

Switch to after adjustment mode



Exit

Closes laser AM plugin and return to Homebase..

Updated 2012-09-04

Measure steering box position [laser AM]

After pressing *k* the following dialog will show on the display, the software chooses to measure this on the left or right side depending on vehicle criteria (Left hand drive or Right hand drive). Since the axle has not been measured

before it automatically selects before adjustment mode . When reentering the measurement menu you can choose to store the values as before



measurement in the left top of the window.







Enter scale readings for both scales, left front and left rear or right front and right rear by:



A. entering the value directly into the edit box

B. click on the scale and point out the position were the laser hits the scale



C. using the up / down arrow on the right side of the edit box



D. or a combination of the 3 mentioned above.

When all values have been entered the measured toe is displayed in the center of the screen.









Menu icons



Save and exit

Save measured values and return to the main window.



Before adjustment

Switch to before adjustment mode



After adjustment

Switch to after adjustment mode



Exit

Closes laser AM plugin and return to Homebase..

Updated 2012-05-21

Twinsteer measurement [laser AM]

After pressing the following dialog will show on the display. Since the axle has not been measured before it automatically selects before adjustment mode to the walk of the measurement menu you can choose to store the values as before the values the values as before the values as before the values the value the values the value the valu

top of the window.

Twinsteer adjustment, conditions

- A. Runout procedure performed.
- B. Axles standing on anti friction plates, NOT jacked up.
- C. Mount the lasers on the wheel adapters.



Enter scale distance from the **first** axle to the front scales by:

* 8.5 A. entering the value directly into the edit box

Note: Use local decimal separator.

B. pulling the axle down using the mouse



- C. using the up / down arrow on the right side of the edit box *
- D. or a combination of the 3 mentioned above.

Continue by:

8.5



B. exit to the main window



Enter scale distance from the **second** axle to the front scales, as described before.









Put the **first** axle straight ahead, the laser should aim at the same value on the front and rear scale (162 in this example).







Put the **second** axle straight ahead, the laser should aim at the same value on the front and rear scale (159 in this example).







Point the laser on the **first** axle to the rear scale. Turn the front 180 degrees to the **right**, turn slowly back until you reach the target value (162 in this example). If you pass this target value turn, repeat this operation.





Point the laser on the **second** axle to the rear scale, and enter the scale value in the box after S2 =.







Point the laser on the **first** axle to the rear scale. Turn the front 180 degrees to the **left**, turn slowly back until you reach the target value (162 in this example). If you pass this target value turn, repeat this operation.





Point the laser on the **second** axle to the rear scale, and enter the scale value in the box after S2 =.



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•	the state
	288









Measurement of twinsteer including play is now completed.

Continue by:



Menu icons



Save and exit

Save measured values and return to the main window.



Save and adjust

Save measured values and continue to the toe adjustment menu.



Reasure camber

Save measured values and continue to measure camber.



Previous

Back to previous operation



Continue

Continue adjustment process



Before adjustment

Switch to before adjustment mode



After adjustment

Switch to after adjustment mode



Exit

Closes laser AM plugin and return to Homebase..

Updated 2012-09-04

Adjust toe and out of square [laser AM]

In this mode you can get help adjusting the axle to the preferred settings for toe and out of square. First check if all conditions are fulfilled, enter the require information followed adjusting the axle.

When you have finished adjusting tighten all bolts/nuts and press exit, laser AM will automatically save the results as after adjustment.

Toe adjustment, conditions

- A. Runout procedure performed.
- **B.** Axle standing on the floor NOT jacked up.
- C. Axle in level.
- D. Mount the lasers on the wheel adapters.

Toe adjustment

After pressing the following dialog will show on the display.

Enter scale distance from the axle to the front scales by:

- A. entering the value directly into the edit box *Note:* Use local decimal separator.
- B. pulling the axle down using the mouse
- C. using the up / down arrow on the right side of the edit box
- D. or a combination of the 3 mentioned above.

Enter the target value for toe and out of square in the edit boxes on the right side. *Note:* Use local decimal separator.

Continue by:

- A. continue the adjustment process
- B. exit to the main window

After pressing the adjustment process begins. The red dots on the screen show the current position were the laser hit the scale, while the green dots indicated

the target position to reach the preferred toe and out of square entered in the dialog before. *Note:* The software will always choose the scales with the biggest distance to the scales in the front or rear of the vehicle.

During the adjustment process you can update the left and right scale

Continue by:

- A. save and exit to the main menu
- B. exit laser AM and return to Homebase

Menu Icons

Save and exit

Save measured values and return to the main menu.

Proceed

Continue adjustment process

Exit

Closes laser AM plugin and return to Homebase..

Updated 2012-08-29

Twinsteer adjustment [laser AM]

In this mode you can get help adjusting the twinsteer to the preferred setting. First check if all conditions are fulfilled, enter the require information followed adjusting the axle.

When you have finished adjusting tighten all bolts/nuts and press exit, laser AM will automatically save the results as after adjustment.

Twinsteer adjustment, conditions

- A. Runout procedure performed.
- B. Axles standing on anti friction plates, NOT jacked up.
- C. Mount the lasers on the wheel adapters.
- D. Lock the steering wheel.

Twinsteer adjustment



During the adjustment process you can update the scale value.

Note: The results are not stored as after adjustment values due to play within the linkage, they have to be re-measured.

Continue by:

- A. Pexit to the main menu
- B. Kexit laser AM and return to Homebase

Menu Icons



Save and exit

Save measured values and return to the main menu.



Exit

Closes laser AM plugin and return to Homebase..

Updated 2012-08-29