Heavy Commercial Vehicles

| Information bulletin to be circulated | Service Manager | Warranty Manager | Parts Manager | Master Technician | Service Consultant | BMIS |
|---|--------------------|---------------------|------------------|----------------------|-----------------------|--------------|
| to: | \checkmark | ~ | \checkmark | \checkmark | \checkmark | \checkmark |

| Subject | Wheel Alignment Process and Specification |
|---------|---|
| Variant | 4x2 Vehicles (F-MAX and Legacy Vehicles) |

Contents of Bulletin:

- Important Points to be considered
- > Wheel Alignment Specification Table
- Wheel Alignment Measurement
- Wheel Alignment Adjustment
- > Example Reports of Wrong Measurement

Attention:

- <u>Tyre Pressure should be checked according to specification label</u> <u>before start Wheel Alignment Process.</u>
- Wheel Alignment Device's calibration must be OK. Certificated operator should conduct all operation.
- <u>Vehicle should be placed on a flat surface and tires should be</u> positioned 0° degree.
- Frictionless Rotating table must be used under the tires!
- Front and Rear Hanging Plates should be placed in correct position!
- If total toe value is in tolerance, Wheel Adjustment should not be performed!

4x2 Vehicles and F-MAX Wheel Alignment Spec Table:

| | Toe (mm/m) | Toe (Angle) | Crab Angle (mm/m) | Wheelbase Difference L-R (mm) | Steering Angle (°) |
|---------------------|---------------|----------------|----------------------|-------------------------------------|-----------------------|
| 1850 F-MAX | 0 - 1.7 | 0-0°6' | 0±5.5 | 10 | 0±3 |
| 1842 / 1848 Tractor | 0 - 1.7 | 0-0°6' | 0±5.5 | 10 | 0±7 |

Important 2:

- Tires should be swapped between left and right side every 40.000 km to prevent tyre wearing problem.
- Tyre Pressure should be checked periodically. Low / High Tyre Pressure is the one of root cause of wearing problem.



Wheel Alignment Measurement

Below steps should be applied respectively.

1. Take the vehicle to the platform and prepare for the measurement.

- During the target plate positioning the vehicle, it is important to connect target plate stable location of the vehicle.
- Water gauge on the target board needs to be balanced position.



• After the connection of target beam to the chassis left and right side, distance must be the same. Target plates **must be parallel with the wheels**. You should use the number on the beam in order to make correct distance adjustment.



- There are numbers on the beam to make better distance adjustment.
- The hanger which provides to connect target beam to the chassis should be used as below photos. Both sides should look same direction.



• It is important to put correct target plate for the correct position. Please see the direction remarks on the target plate during this operation.





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Important!: After making sure all connection equipment connect correctly, wheel alignment operation can be start.

• Clamps should be connected to the wheel rim and camera should be put on it. The tightening arm (shown in red circle below) must be look on upper side while making the connection. Then on the program side correct vehicle type must be selected.



Run Out

Run out process must be done before starting the wheel adjustment operation. This operation is critical to observe if there is any misalignment on the wheel rim or avoid failure during the connection of the wheel rim clamp.

• After selection of axles that we put the wheel rim clamp and camera, on the screen wheel needs to be rotate 180 degree (Please see below pictures)



• After rotating the wheel half turn, it can be observed tightening arm goes to the down.



• Run Out must be done for each wheel.

Toe Adjustment For 1st axle;

During run out process you may put rotating table under the wheels. You will need 4 rotating table for this operation.

- After run out operation you can observe the camber & toe values from the screen.
- Adjust toe values for both axles to the specification limit.

Wheel Alignment Adjustment



Name of the parts shown on above picture;

- 1. 1st axle short rod (Drag link)
- 2. 1st axle long rod (Tie rod)

Both clamps need to be untightened on tie rod side. Adjustment of the tie rod length must be done by rotating the tie rod. Adjustment of the tie rod length must be done by rotating the tie rod until total toe value in tolerance. (**Please see wheel alignment spec table**)

After adjustment, both tie rod clamp must be tightened. Rod will be torqued to 150 Nm

After adjusting the total toe value both tires toe in values must be **between 0 - 1.7 mm**. If it is not, below steps needs to be followed;

Example of Wrong Measurements:

Left and Right Toe Values (Before Adjustment) must not be 'negative' and 'positive' values together. If one of them is negative and the other values is positive, it means that wheels are directed left or right! (not in 0 degree direction) Please make them at 0
 Position before measurement and adjustment.



• If **total** value is **negative** after adjustment, it means that wheel alignment is performed wrong. Process needs to be performed again!

Important: After Alignment, Both Toe Values should be between 0-1,7 mm/m!



- Below Report formats are not acceptable. Reports should be provided in English.
- **The Attached Draft Report (Attachment.1)** must be filled manually and should be provided with original report, if the reports are received with below formats.

Not Acceptable Report 1



Not Acceptable Report 2

| Attuale | Prima | Campo Sp | ecifica | | | Attuale | Prima | Campo Engelia |
|------------------------------------|---|--|--|--|---|-----------------------------------|--|--|
| 0°06' | 0°08' | -0°18' 1°00' | | Inclin | azlone | 0°26' | 0005' | 0°40' 4000' |
| 4°11' | 3°25' | 2°30' 3°30' | | Incidenza | | 5°33' | 3025 | 2:30' 3:30' |
| 0'04' | -'04' -0°03' 0°03' 0°06' | | °06' | Conve | rgenza | 0°04' | -0°03' | 0*03' 0*06' |
| 7*37' | 6°15' 6°06' | | | S | AI | 6*34' | 6*63' | 0 00 0 00 |
| 7*31' | | | Angolo | Incluso | 6"08' | 6*28 | | |
| | | | | Diff. Angolo di Sterz | | | | |
| | | | | | | | | |
| | | | | Asse ant | teriore 1 | | | |
| | 1994 (MA) | | Alluale | Prime | Campo Sp | ecifica | | |
| | Diff. Incli | nazione | 0°19' | 0°17' | | | | |
| D | ifferenza | Incidenza | -1°21' | -0°03' | | | | |
| Diff. SAI 1°0 | | 1"03" | -0°38' | | | | | |
| - | Uin. | | and the second second | | | | | |
| c | onvergen | za Totale | 0-091 | -0-06 | 0°06'0° | 12 | | |
| c | Diff. Sto | za Totale orzata | 0-09' | -0°08' | 0°06' 0° | 12 | | |
| c | Diff. Sto Set B | za Totale orzata ack | 0-09' -0°35' | -0°06' | 0°06' 0° | 12 | | |
| c | onvergen Diff. Sto Set B | za Totale orzata ack | 0°09' -0°35' | -0°06' | 0.06, 0. | 12 | | |
| Asse | onvergen Diff. Sto Set B | za Totale orzata ack re 1 : Sinistr | -0°35' | <u>-0</u> °08' | 0.06, 0. | A33 | e posterio | ore 1 : Destra |
| Asse | onvergen Diff. Sta Set B posterio Prima | za Totale orzata ack re 1 : Sinistr Campo Sp | -0°35' | <u>-0</u> °06' | 0.06, 0. | Ass | e posterio Prima | ore 1 : Destra |
| Asso Attuale 0°22' | Diff. Sto Set B Posterio Prima 0°19' | za Totale orzata ack re 1 : Sinistr Campo Sp -0°10'0' | -0°35' | -0°06' | 0°06' 0° | Ass Attuale | e posterio | Campo Specific |
| Asso Attuale 0°22' -0°16' | Prima 0°19' -0°17' | za Totale orzata ack re 1 : Sinistr Campo Sp -0°10' 0' -0°01' 0' | -0°35' -0°35' ecifica '10' | Inclin: Conve | azione | Ass Attuale -0°08' 0°14' | e posterio Prima -0°07' 0°13' | Campo Specific -0*10' 0*10' -0*01' 0*01' |
| Asse Attuale 0°22' -0°16' | posterio Prima 0°19' -0°17' | za Totale orzata ack re 1 : Sinistr Campo Sp -0°10' 0' -0°01' 0' | -0°35' -0°35' eclfica '10' '01' | Inclina Conve | azione rgenza | Ass Attuale -0°03' 0°14' | e posterio Prima -0°07' 0°13' | Campo Specific -0°10' 0°10' -0°01' 0°01' |
| Asso Attuale 0°22' -0°16' | posterio Prima 0°19' -0°17' | za Totale orzata ack re 1 : Sinistr Campo Sp -0°10' 0' -0°01' 0' | -0°36' -0°36' ecifica '10' '01' | Incline Conve | azione rgenza | Ass Attuale -0°03' 0°14' | e posterio Prima -0°07' 0°13' | Campo Specific -0°10' 0°10' -0°01' 0°01' |
| Asse Attuale 0°22' -0°16' | posterio Prima 0°19' -0°17' | za Totale orzata ack re 1 : Sinistr Campo Sp -0°10' 0' -0°01' 0' | -0°35' -0°35' eclifica '10' '01' | Incline Conve Asse pos | azione rgenza | Ass Attuale -0°08' 0°14' | e posterio Prima -0°07' 0°13' | Campo Specific -0*10' 0*10' -0*01' 0*01' |
| Asse Attuale 0°22' -0°16' | Diff. Sta Diff. Sta Set B Posterio Prima 0°17' Diff. Inclin | za Totale orzata ack re 1 : Sinistr Campo Sp -0°10' 0' -0°01' 0' | 0-09' -0°35' ecifica '10' '01' '01' | Inclin Conve Asse pos Prima 0°27' | azione orgenza steriore 1 Campo Spe | Ass Attuale .0°08' 0°14' | e posterio Prima -0°07' 0°13' | Campo Specific -0*10' 0*10' -0*01' 0*01' |
| Asso Attuale 0°22' -0°16' | Diff. Sta Set B posterio Prima 0°19' -0°17' Diff. Inclii | za Totale orzata ack re 1 : Sinistr Campo Sp -0°10' 0' -0°01' 0' nazione za Totale | -0°35' -0°35' a ecifica '10' '01' '01' | Inclin: Conve Asse pos Prima 0°27' -0°03' | azione rgenza teriore 1 Campo Sp. -0°02' 0° | Ass Attuale .0°08' 0°14' | e posteric Prima -0°07' 0°13' | Ore 1 : Destra Campo Specific -0*10' 0*10' -0*01' 0*01' |

Not Acceptable Report 3

| 2022. 09. 12. 12:38 - 12:49 | |] | tés | | | | | |
|---|-------------------------|--------------------------------------|-----------|----------------|----------------|-------|-------------|---------|
| Rendszám: Ügyfél: | SUX-708 Futás | steljesítmény 0 | ViN-kód: | | | | | |
| Típus: | Heavy Duty>Fe | Heavy Duty>Ford>F Series>600/700/750 | | | Specifications | | Measurement | |
| | Paraméter neve: | | | Specifikációk: | | Mérés | | |
| | | | | Min | Max | | Előtte | Utána |
| 1980 - C. | 1 | Front Axle | Mellső te | engely | | В | efore | After |
| Left wheel alignment | Bal kerékösszetartá | s | | +0°09' | +0°12' | × | -0°02' | ✓ +0°1′ |
| Right wheel alignment | Jobb kerékösszetartás | | | +0°09' | +0°12' | × | -0°02' | × +0°12 |
| Full wheel alignment | Teljes kerékösszetartás | | | +0°19' | +0°25' | × | -0°04' | × +0°2 |
| | Középre állítás | | | -0°03' | +0°03' | 1 | -0°02' | 102 |

Example of Correct Measurement:

Both Side have positive values and it means that measurement is taken as correct. However the difference between left and right side (A1&A2) is '2,2 mm/m' and it's out of tolerance.

After adjustment, the values are changed as '0,5 left' and '0,5 right' side (B1&B2). The difference between left and right side is '1,0 mm/m' which means in tolerance.

The measurement and report is acceptable.



Best Regards,

Ford Trucks Service Engineering

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