SHORTEN THE LEARNING CURVE

NEXT-GENERATION USER INTERFACE WITH INTELLIGENT PREDICTIVE ALIGNMENT FLOW FOR EASY OPERATION BY ANY TECH

Who We Are

Snap-on Incorporated is a leading global innovator, manufacturer and marketer of:

- TOOLS
- EQUIPMENT
- DIAGNOSTICS
- REPAIR INFORMATION AND SYSTEMS SOLUTIONS

for professional users performing critical tasks **WHERE SECOND BEST IS NOT AN OPTION**

What we make

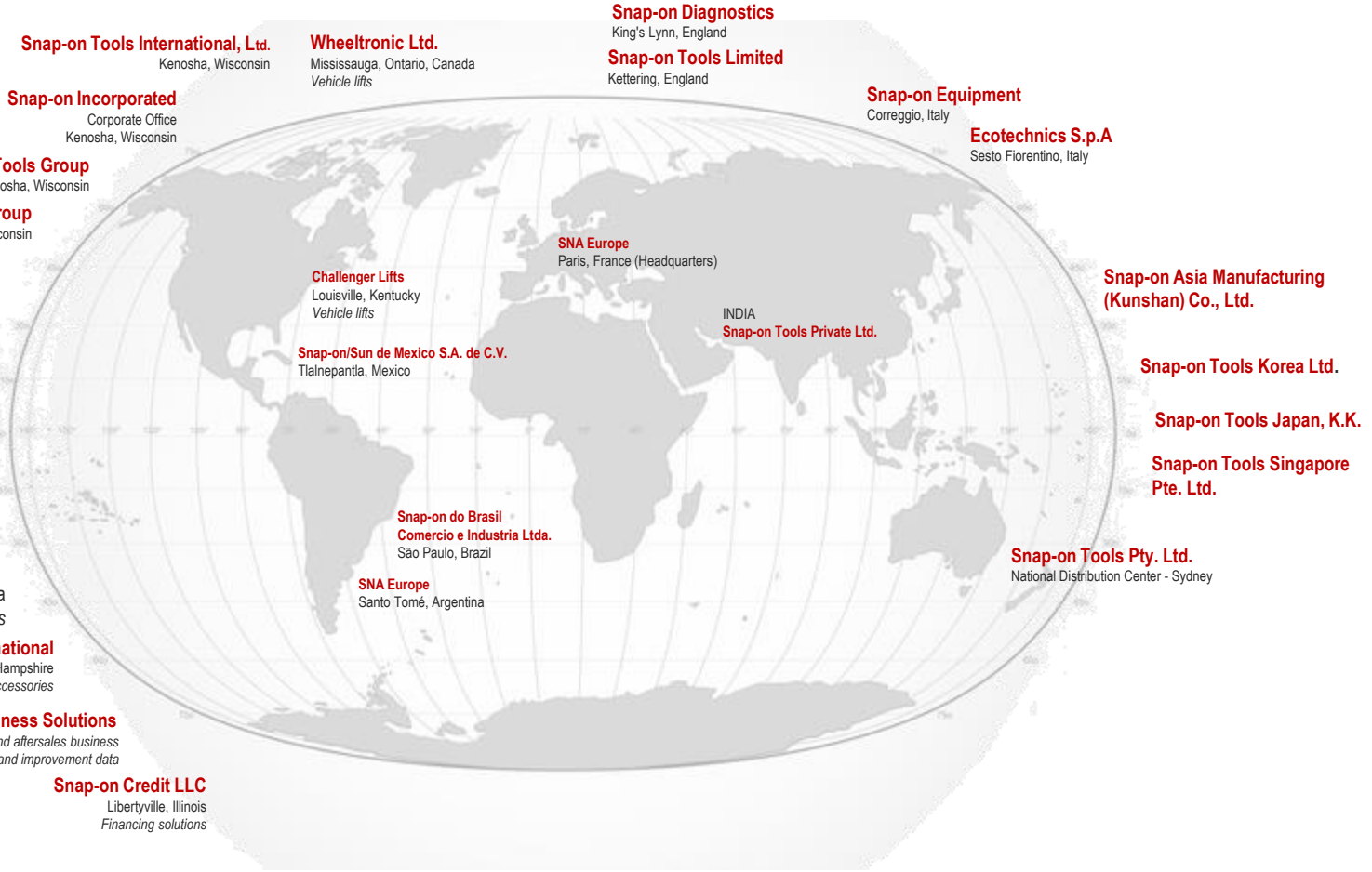
Products and services include:

- HAND AND POWER TOOLS
- TOOL STORAGE
- DIAGNOSTICS SOFTWARE
- INFORMATION AND MANAGEMENT SYSTEMS
- SHOP EQUIPMENT

OUR WORLDWIDE FOOTPRINT

PRODUCT MANUFACTURING
PRODUCT DEVELOPMENT
DISTRIBUTION
ENGINEERING
TRAINING

GLOBAL



Snap-on Tools International, Ltd.
Kenosha, Wisconsin

Wheeltronic Ltd.
Mississauga, Ontario, Canada
Vehicle lifts

Snap-on Diagnostics
King's Lynn, England

Snap-on Tools Limited
Kettering, England

Snap-on Incorporated
Corporate Office
Kenosha, Wisconsin

Snap-on Equipment
Correggio, Italy

Ecotechnics S.p.A
Sesto Fiorentino, Italy

Snap-on Tools Group
Kenosha, Wisconsin

Commercial & Industrial Group
Kenosha, Wisconsin

Repair Systems & Information Group
Kenosha, Wisconsin

SNA Europe
Paris, France (Headquarters)

Challenger Lifts
Louisville, Kentucky
Vehicle lifts

INDIA
Snap-on Tools Private Ltd.

Snap-on Asia Manufacturing (Kunshan) Co., Ltd.

Snap-on/Sun de Mexico S.A. de C.V.
Tlalnepantla, Mexico

Snap-on Tools Korea Ltd.

Snap-on Tools Japan, K.K.

Snap-on Tools Singapore Pte. Ltd.

Snap-on Diagnostics
Lincolnshire, Illinois
San Jose, California
Handheld and PC-based diagnostics products, service and repair information products and diagnostic software solutions

Snap-on Industrial Group
Crystal Lake, Illinois
Kenosha, Wisconsin

Snap-on Conway AR
Undercar equipment manufacturing

Snap-on do Brasil Comercio e Industria Ltda.
São Paulo, Brazil

Snap-on Tools Pty. Ltd.
National Distribution Center - Sydney

Mitchell 1
Poway, California
Vehicle repair information and business management systems

SNA Europe
Santo Tomé, Argentina

Pro-Cut International
West Lebanon, New Hampshire
On-car brake lathes, related equipment and accessories

Snap-on Business Solutions
Richfield, Ohio *Leading solutions provider for electronic parts and aftersales business performance and improvement data*

Snap-on Credit LLC
Libertyville, Illinois
Financing solutions

SNAP-ON IS THE LARGEST AUTOMOTIVE EQUIPMENT MANUFACTURER IN THE WORLD

We help more people daily, with critical task solutions worldwide, than any other automotive service equipment company

OUR PARTNERS WORLDWIDE

OEM partners worldwide.
North and Latin America may include Asian and European partners as well

OUR LEGACY

Patents

Method and apparatus for determining the alignment of motor vehicle wheels

US 5535522 A

Find prior art | Discuss

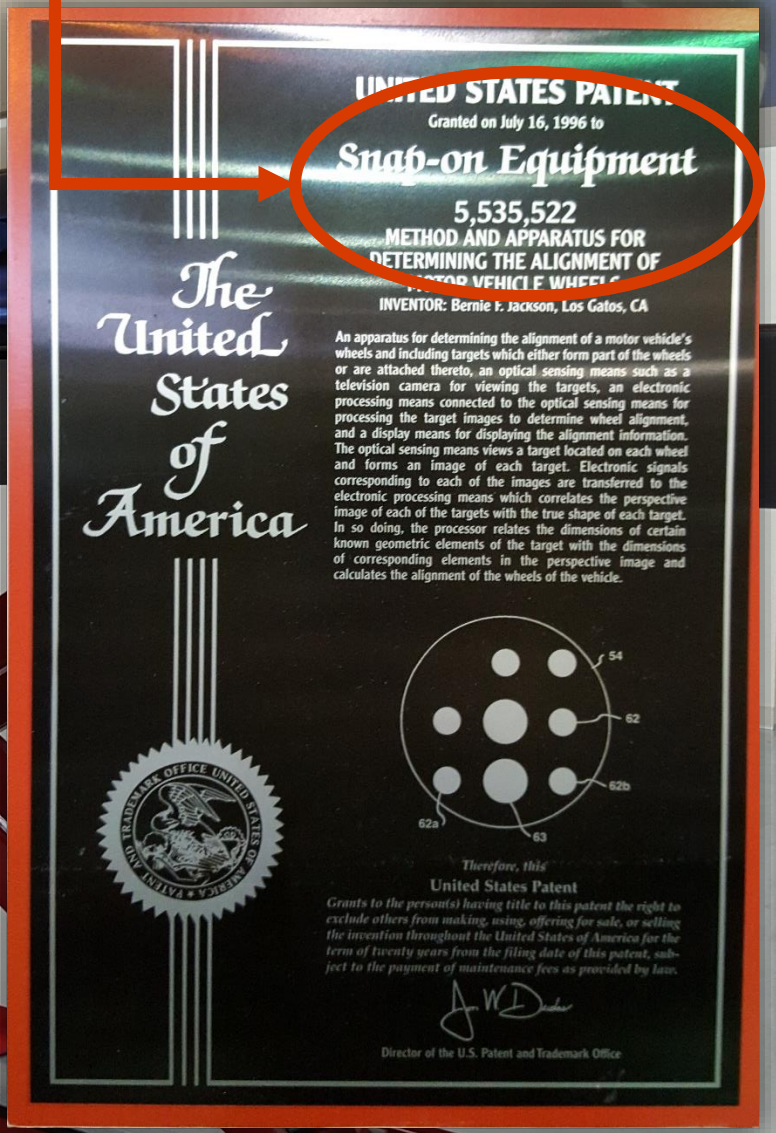
Publication number	US5535522 A
Publication type	Grant
Application number	US 08/122,550
PCT number	PCT/US1993/008333
Publication date	Jul 16, 1996
Filing date	Sep 3, 1993
Priority date	Sep 4, 1992
Fee status	Paid
Also published as	CA2143844A1, 7 More »
Inventors	Bernie F. Jackson
Original Assignee	Jackson; Bernie F.
Export Citation	BiBTeX, EndNote, RefMan

Patent Citations (3), Referenced by (146), Classifications (11), Legal Events (6)

External Links: USPTO, USPTO Assignment, Espacenet

ABSTRACT

An apparatus for determining the alignment of a motor vehicle's wheels and including targets (22L, 22R, 24L, 24R) which either form part of the wheels or are attached thereto, an optical sensing means such as a television camera (30) for viewing the targets, an electronic processing means (32) connected to the optical sensing means for processing the target images to determine wheel alignment, and a display means (34, 36) for displaying the alignment information. The optical sensing means (30) views a target located on each wheel and forms an image of each target. Electronic signals corresponding to each of the images are transferred to the electronic processing means (32) which correlates the perspective image of each of the targets with the true shape of each target. In so doing, the processor (32) relates the dimensions of certain known geometric elements (62, 63) of the target with the dimensions of corresponding elements in the perspective image and calculates the alignment of the wheels of the vehicle.

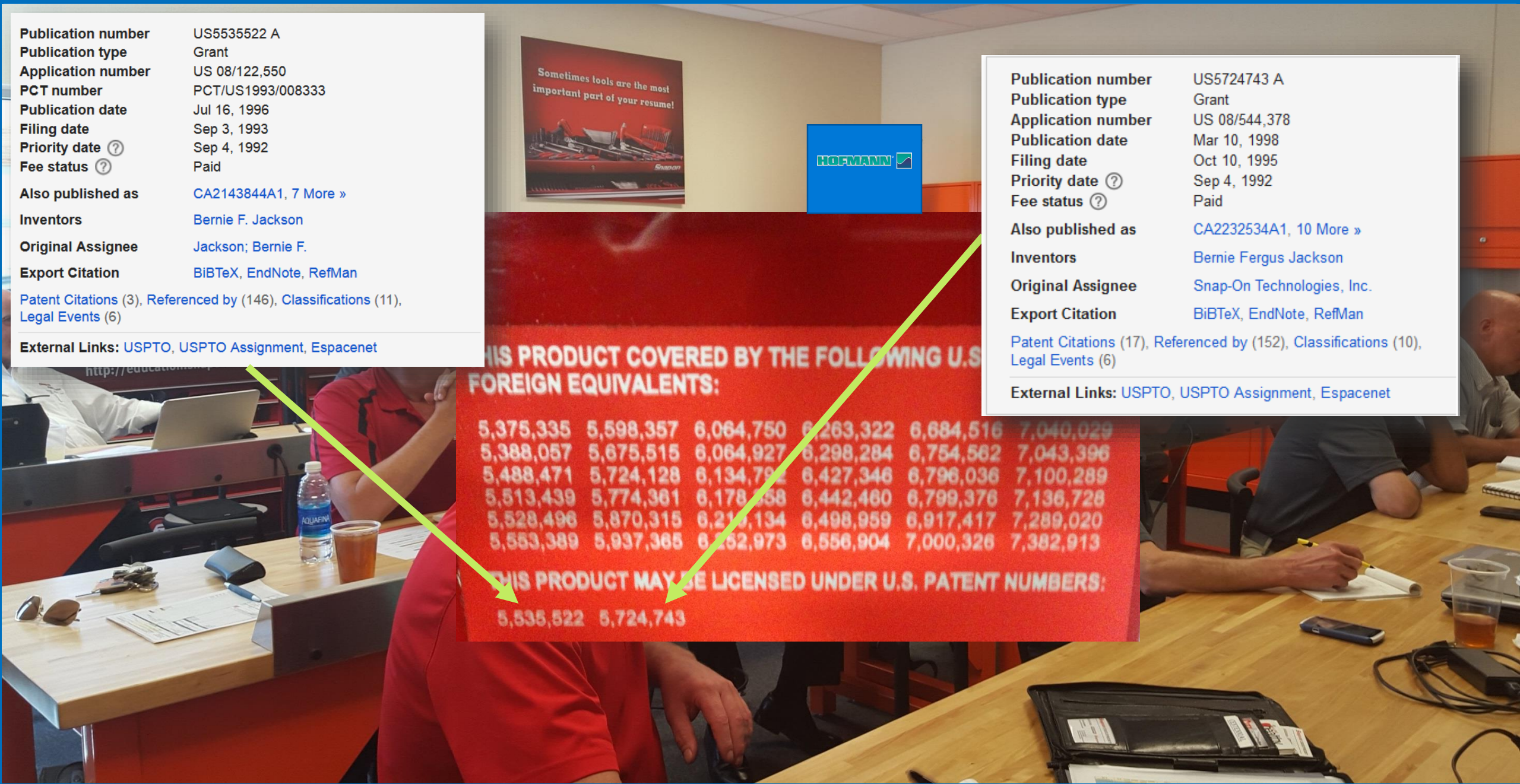


OUR COMPETITORS USE OUR TECHNOLOGY

Publication number	US5535522 A
Publication type	Grant
Application number	US 08/122,550
PCT number	PCT/US1993/008333
Publication date	Jul 16, 1996
Filing date	Sep 3, 1993
Priority date ⓘ	Sep 4, 1992
Fee status ⓘ	Paid
Also published as	CA2143844A1, 7 More »
Inventors	Bernie F. Jackson
Original Assignee	Jackson; Bernie F.
Export Citation	BiBTeX, EndNote, RefMan

Patent Citations (3), Referenced by (146), Classifications (11), Legal Events (6)

External Links: USPTO, USPTO Assignment, Espacenet



Publication number	US5724743 A
Publication type	Grant
Application number	US 08/544,378
Publication date	Mar 10, 1998
Filing date	Oct 10, 1995
Priority date ⓘ	Sep 4, 1992
Fee status ⓘ	Paid
Also published as	CA2232534A1, 10 More »
Inventors	Bernie Fergus Jackson
Original Assignee	Snap-On Technologies, Inc.
Export Citation	BiBTeX, EndNote, RefMan

Patent Citations (17), Referenced by (152), Classifications (10), Legal Events (6)

External Links: USPTO, USPTO Assignment, Espacenet

HOFMANN

geoliner770

IMAGING ALIGNER

FAST, EASY TO USE

Built from the ground up

for ***SPEED***, with

mobility, flexibility,

and productivity in mind

geoliner770

IMAGING ALIGNER

WE'VE MADE IT EASY TO MOVE

- 4 swivel casters with brakes
- Lightweight platform
- Compact design

Perform alignment checks in one bay (built-in fast alignment check)

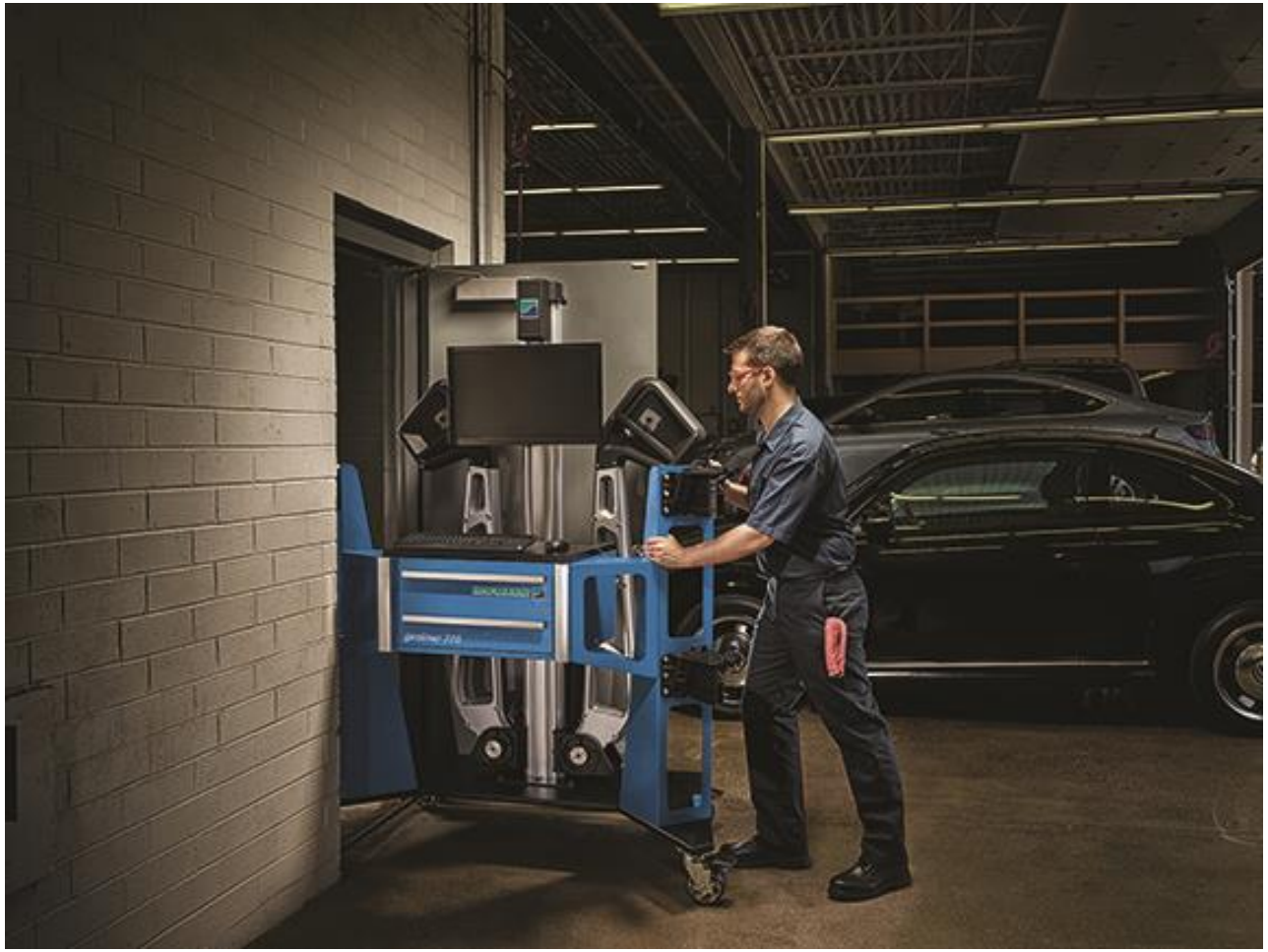
Align the cars in another bay

geoliner770

IMAGING ALIGNER

SLIM DESIGN

- Fits through a standard commercial door
- Gives you more floor space than ever before
- Rolls nicely in a standard bay



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IMAGING ALIGNER

Low profile enhances the stability when moving the unit to another rack inside a crowded shop

Unit is shown in transport mode, camera beam folded and retracted.

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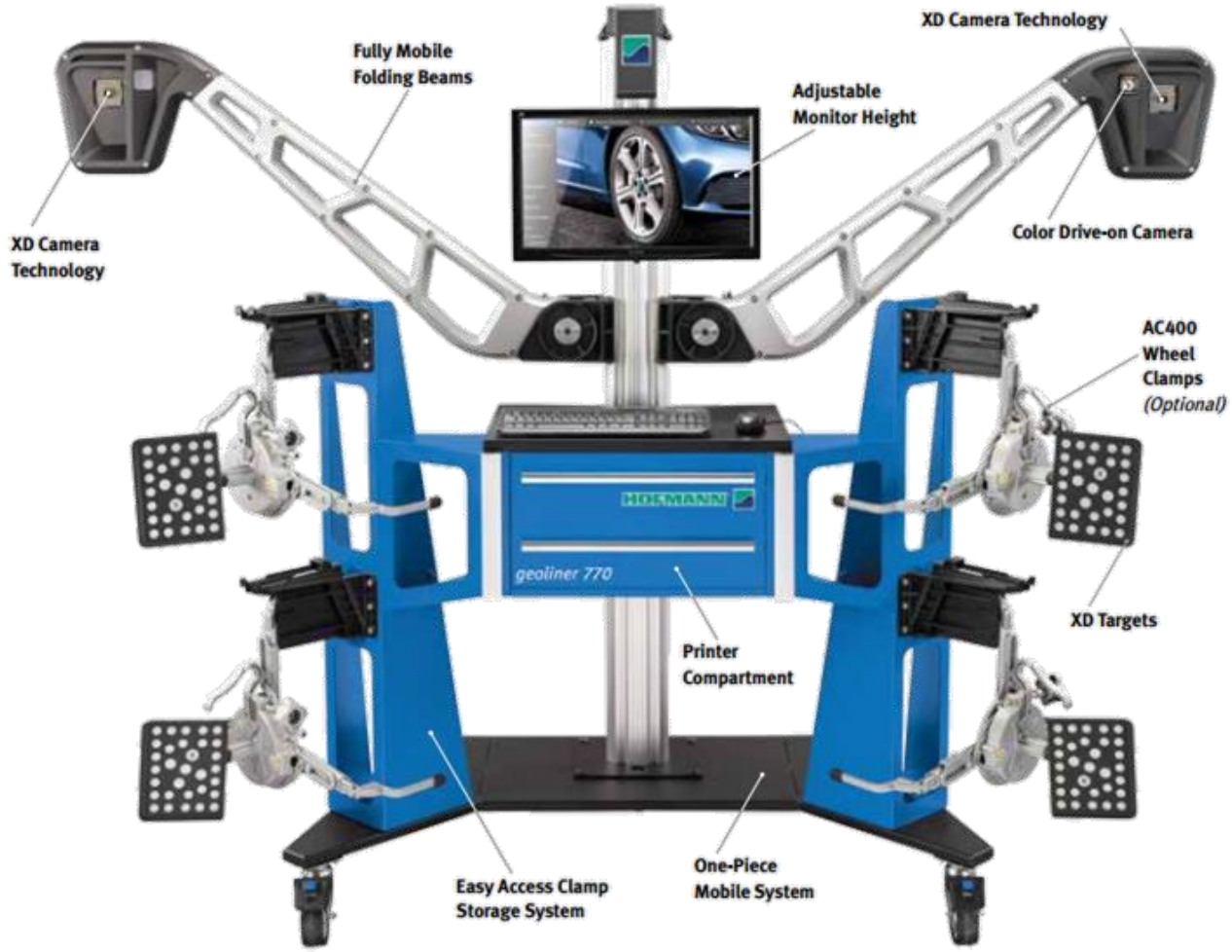
IMAGING ALIGNER

UNIQUE AND PATENTED 3 CAMERA SYSTEM

- Eliminates periodic system calibration
- Lower yearly maintenance cost
- Faster return on investment
- Better wheel alignments



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IMAGING ALIGNER
With AutoTracking™

Camera height automatically adjust to the vehicle height when the alignment platform is elevated or lowered

- Increase productivity
- Faster alignment time
- Less walking back and forth between the car and the console

geoliner770

IMAGING ALIGNER
Built in drive-on camera

Color drive-on camera aids assists the technician in properly positioning of the vehicle on the alignment rack without any help

Take a picture of the car and put in on the final alignment report

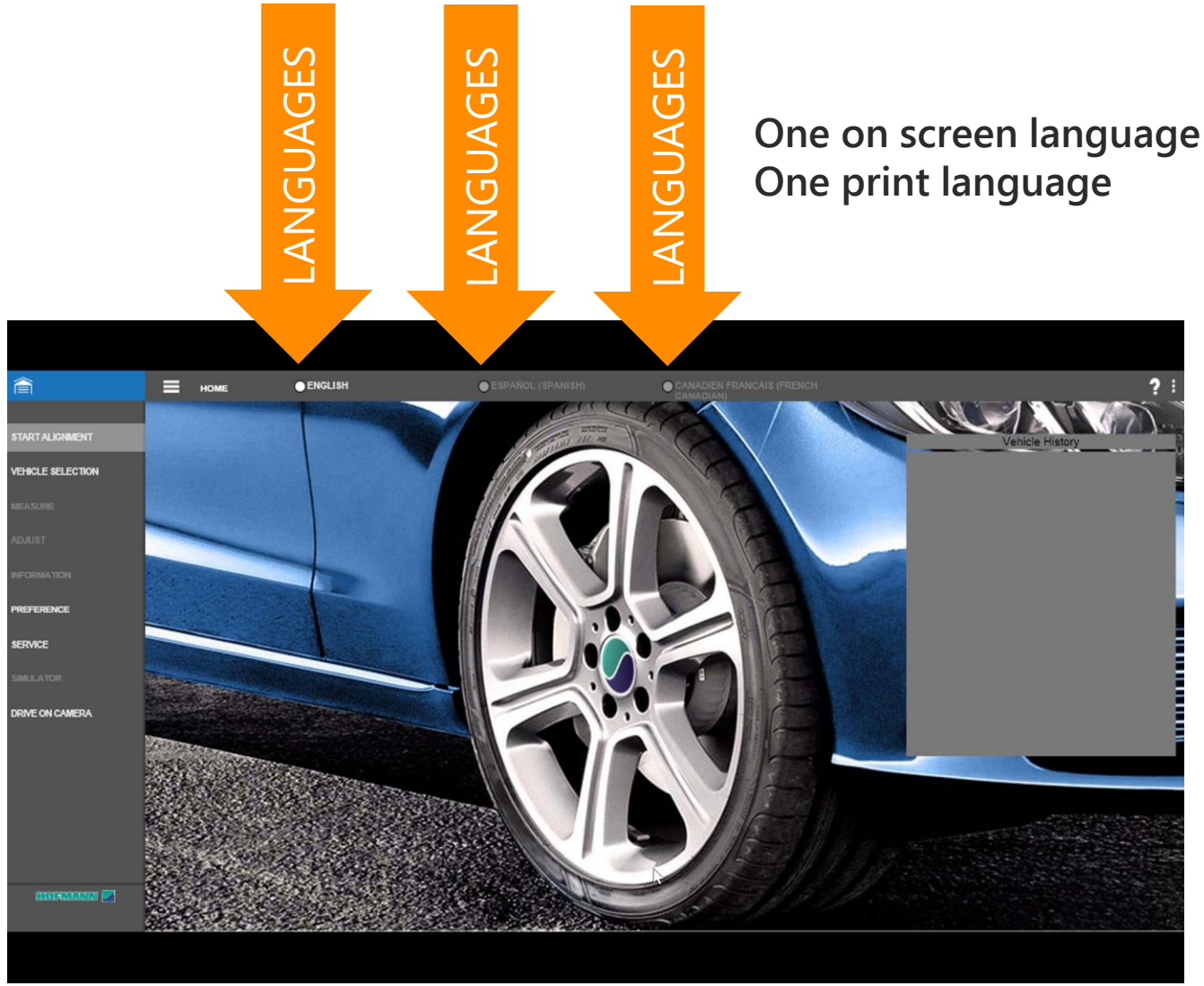
Productivity tool | saves time

geoliner770

IMAGING ALIGNER
Language Selection

Multiple languages of your choice, are conveniently positioned on the top tool bar for simple and fast selection

Chose one language for display while using another for printing



One on screen language
One print language

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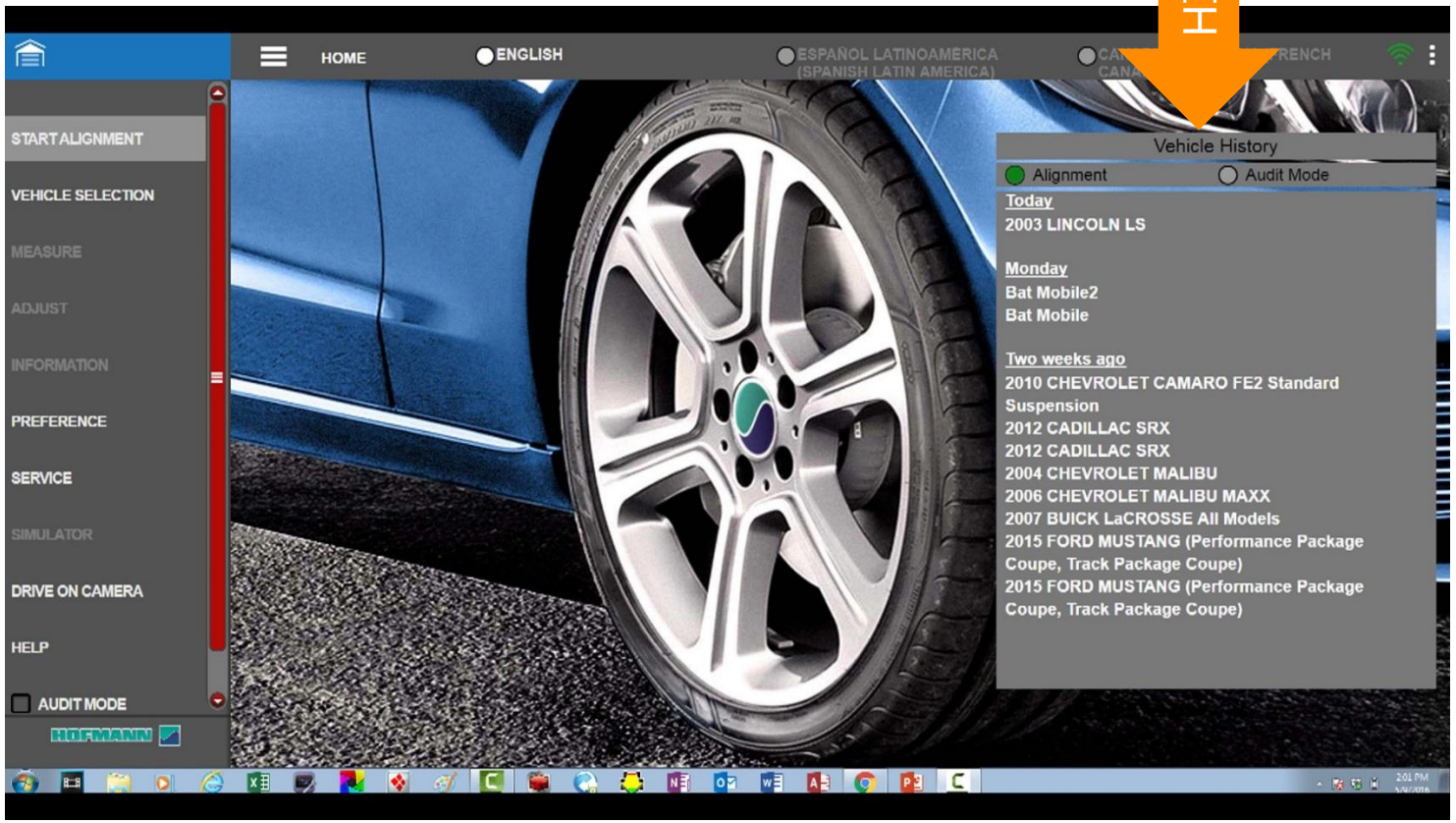
IMAGING ALIGNER
Vehicle Selection

3 methods of selecting the car

1 VIN reader (linear and QR codes)
2 Manual (Make, Model, Model Year)
3 From the vehicle history file

- Faster vehicle selection
- Manual entry has predictable search



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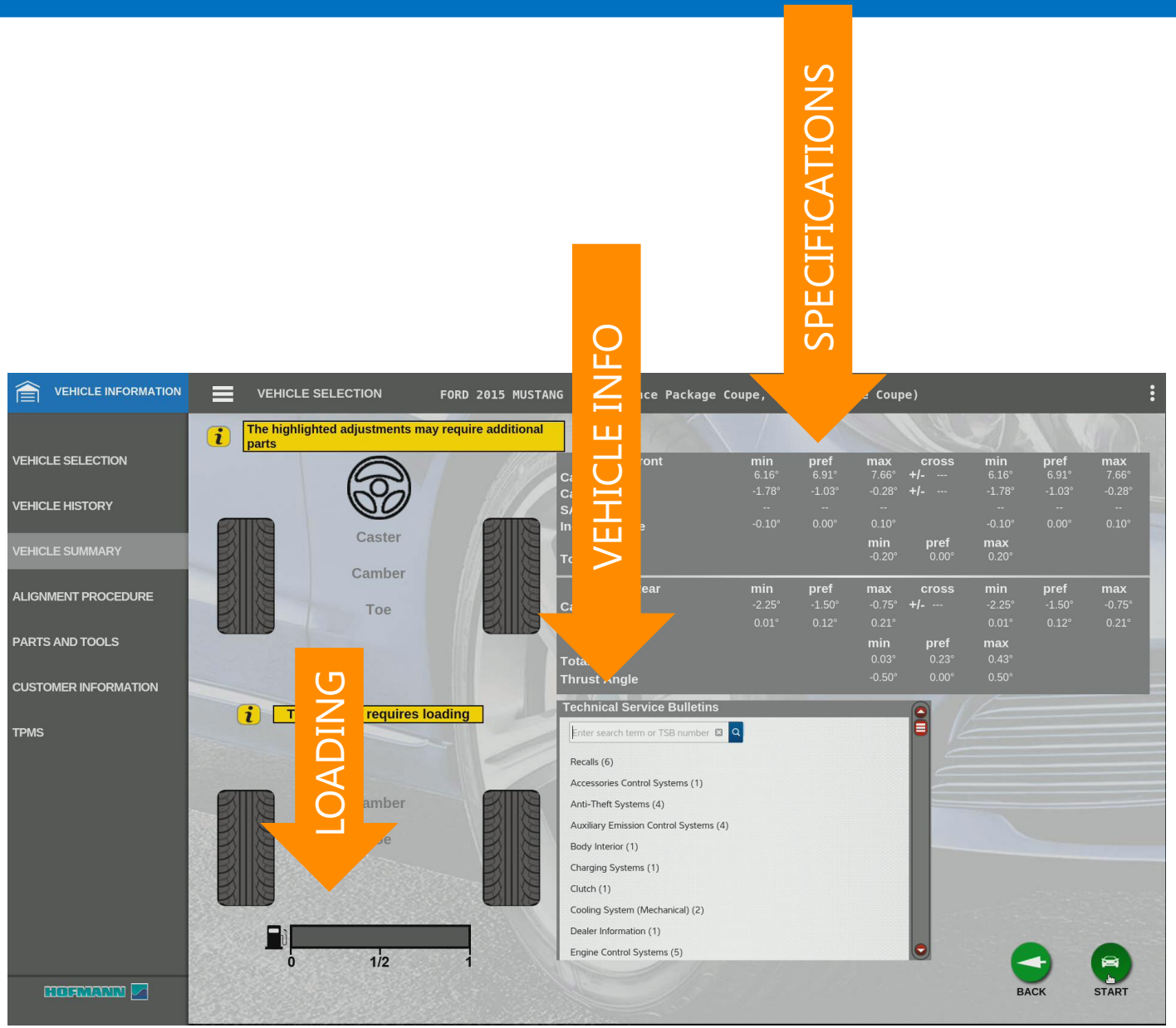
IMAGING ALIGNER
Vehicle Summary

Alignment specifications

TSB' Recalls Info

Special pre-alignment requirements



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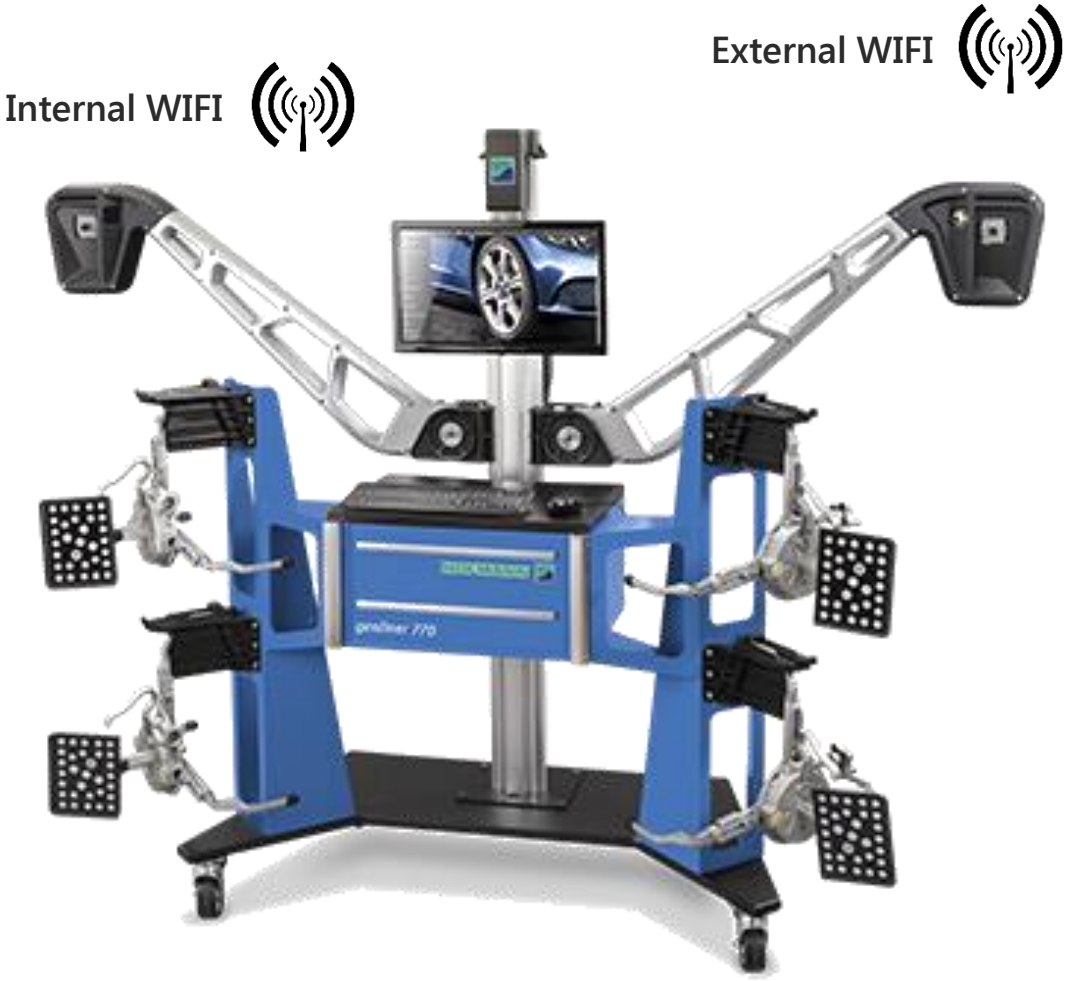
IMAGING ALIGNER
Connected and Informed

Instant software updates
OVER THE AIR specs

Vehicle undercar repair information

Always be up-to-date



HOFMANN

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IMAGING ALIGNER

Technical Service Bulletins
Recalls

Specifications
Torque specs
Suspension information
Steering information
Repair information

ALL WHEEL DRIVE POWER TRANSFER UNIT FAILURE

TECHNICAL SERVICE BULLETIN

Reference Number(s): 21-05-00, Date of Issue: July 28, 2000
Related Ref Number(s): 21-05-00

ARTICLE BEGINNING

ALL WHEEL DRIVE POWER TRANSFER UNIT FAILURE

Model(s): 1996-2000 Chrysler (NS) Town & Country: 1996-2000 Dodge (NS) Caravan: 1996-2000 Plymouth (NS) Voyager: 1996-2000 Chrysler (GS) Voyager (International Markets): 2001 Chrysler (RS) Town & Country: 2001 Dodge (RS) Caravan: 2001 Plymouth (RS) Voyager: 2001 Chrysler (RG) Voyager (International Markets)

Group: Transmission

Bulletin No.: 21-05-00

Date: July 28, 2000

DISCUSSION

The All Wheel Drive (AWD) system used on Minivans uses a Power Transfer Unit (PTU) that connects the front drive components to the rear drive components. The PTU may fail if identical tires are not used on all four wheels. This kind of PTU failure is the result of extreme heat build up caused by a continuous difference of rotation speeds and torque transfer between the front and rear drive components when different size tires are used on the front wheels versus the rear wheels.

A difference in tire circumference measurements as small as 0.5% is enough to cause a PTU failure PTU failures related to mismatched tires are not warrantable.

Important points to be remembered and to remind AWD minivan vehicle operators:

- Tires should be rotated every 7,500 miles or less to maintain even tread wear.
- Correct tire air pressure must be maintained.
- When tire replacement is necessary all 4 tires must be replaced with a matched (same manufacturer, model, and size) set.

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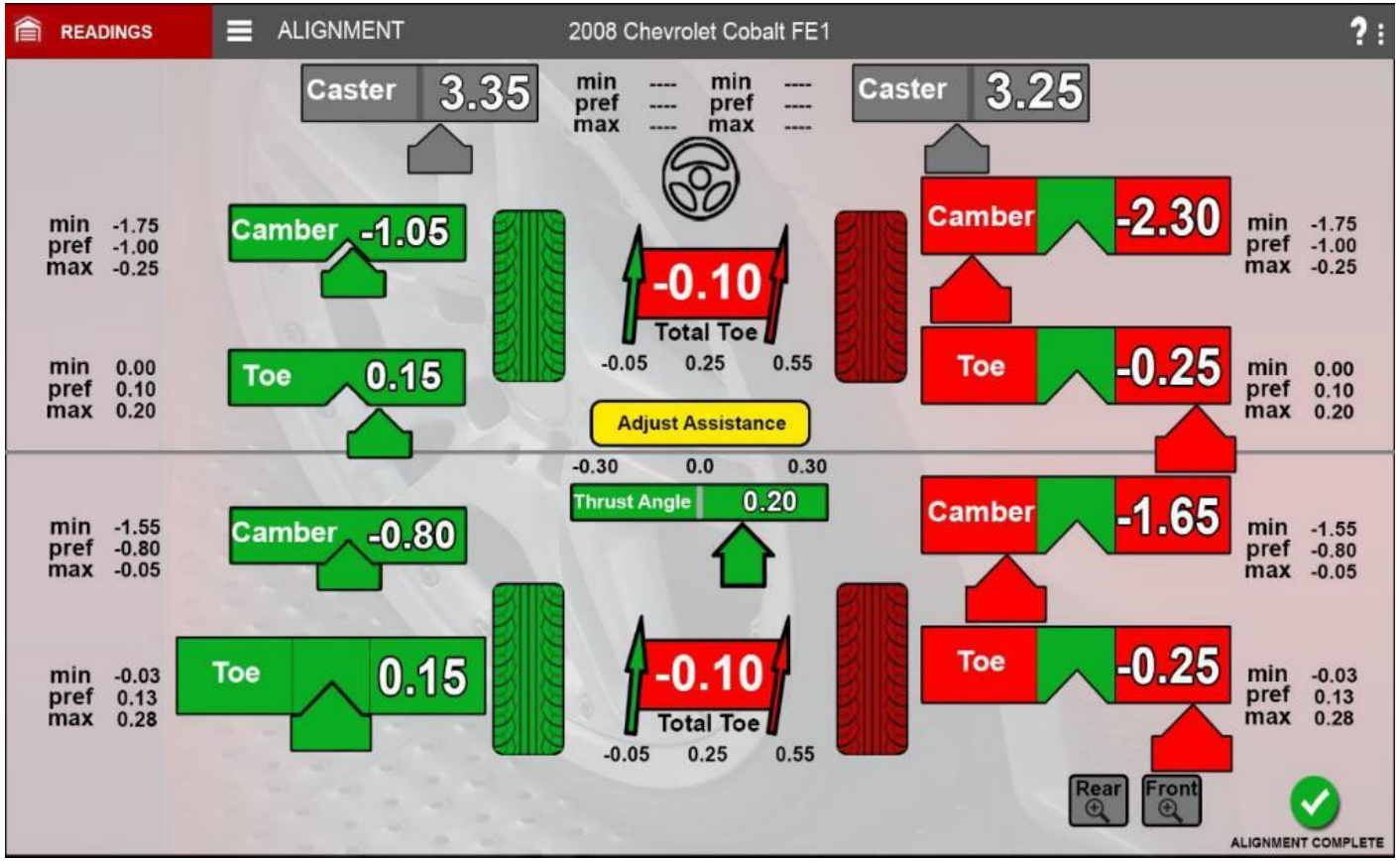
IMAGING ALIGNER
Easy to Read Meters

Simple meters deliver a powerful visual aid for fast and precise adjustments with real time feel and Dock and Lock feature

Watch it here in real time



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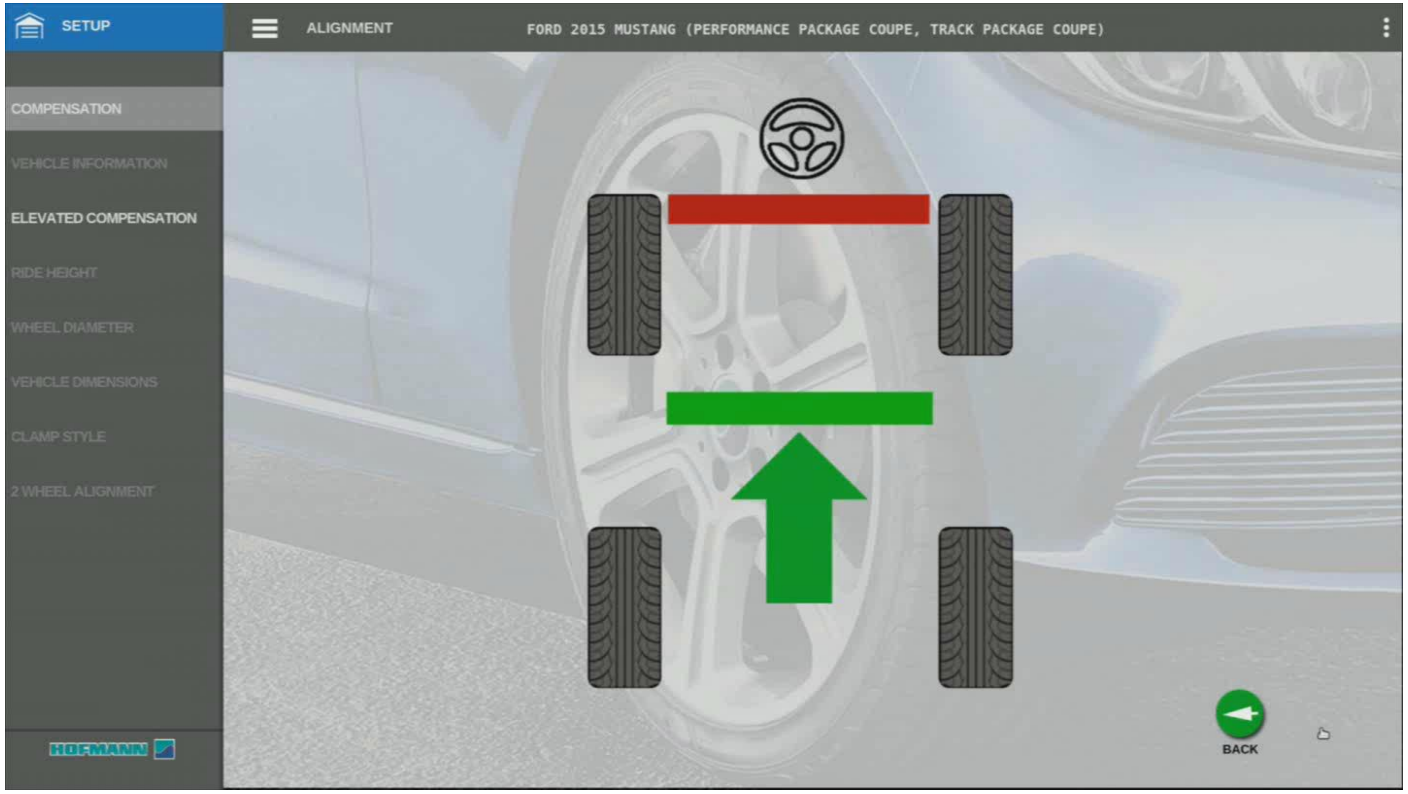
IMAGING ALIGNER
No Wait Positioning

Fast and no wait vehicle positioning means you get to the numbers in less time

Start adjusting faster
Get more alignments out the door

Watch it here in real time



Video should start automatically

geoliner770

IMAGING ALIGNER

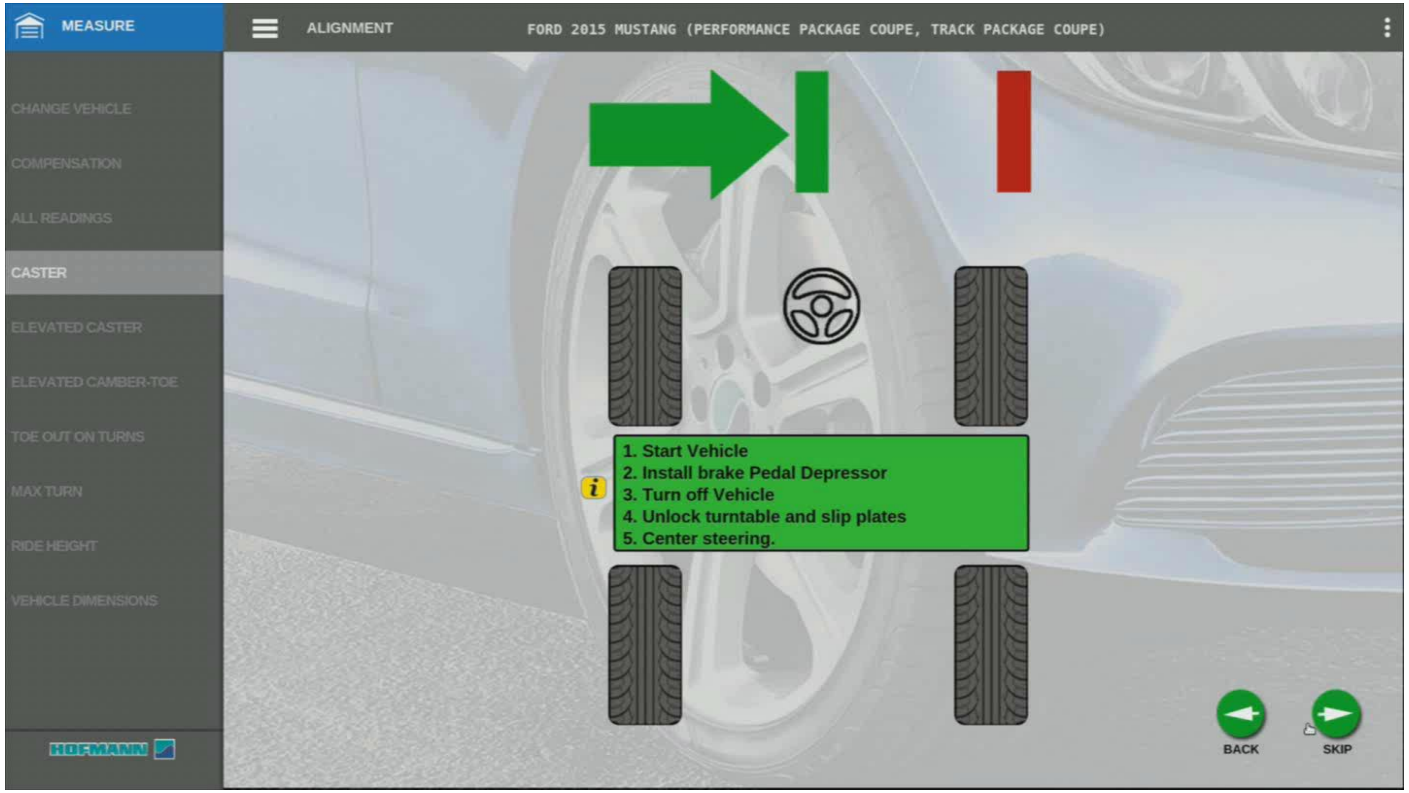
Ultra Fast Caster Measurement

No wait and no stop caster | SAI measurements

Continuous uninterrupted measurement

More speed where it counts

Watch it here in real time



Video should start automatically

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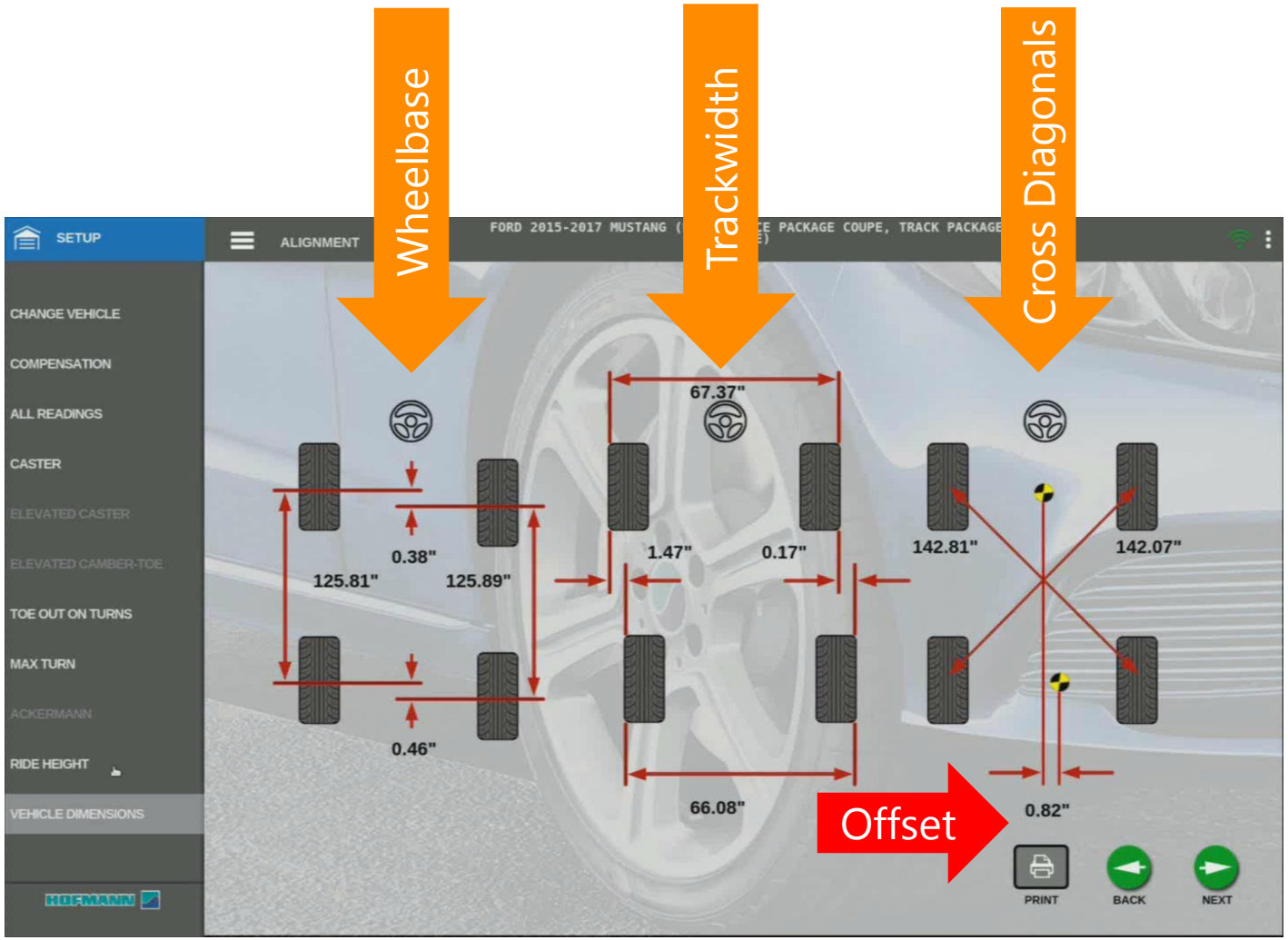
IMAGING ALIGNER
Vehicle Dimensioning

Intelligent application screen only displays if there is a reason for it

- Vehicle has been in a crash
- Came from a body shop
- Powerful diagnostic tool
- Frame is not square
- Cradle has shifted



How would you like to know if the know of the vehicle can be adjusted before you start?

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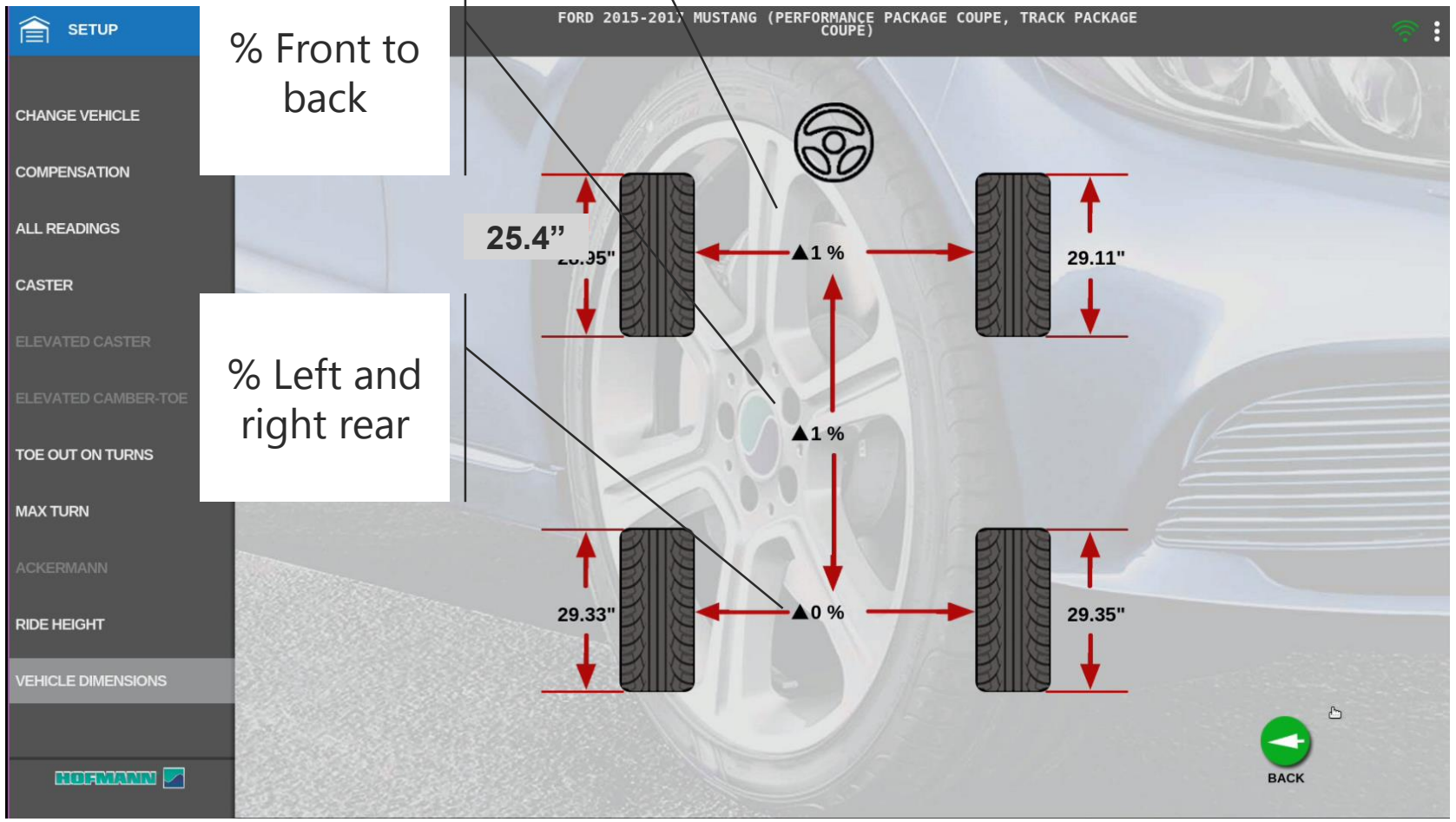
IMAGING ALIGNER
Rolling Radius

% Left and right front

% Front to back

% Left and right rear



ABS ESC light “ON”

Check for rolling radius in less than a minute

- No chalk
- No floor markings
- No rolling the vehicle

That’s 15 to 30 times faster than the standard procedure

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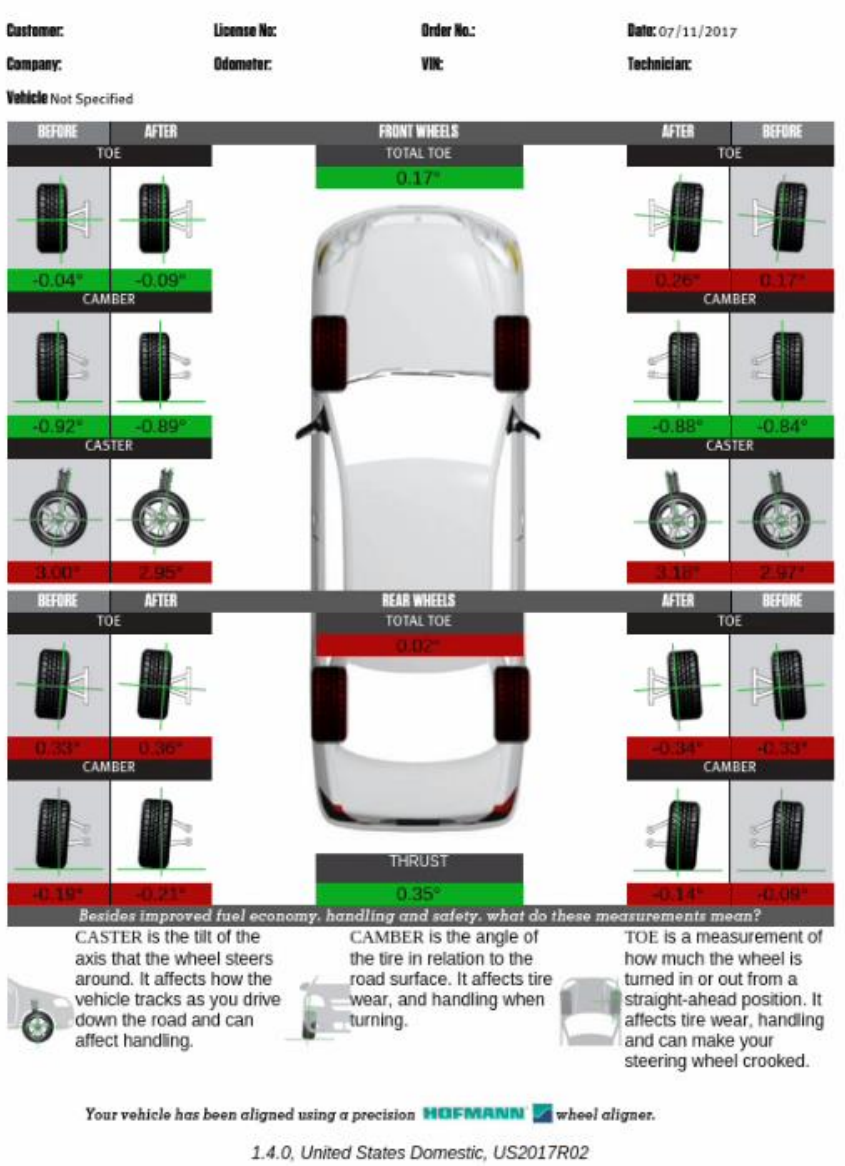
IMAGING ALIGNER
Reports

Selection of various printout options to suite your taste

- Customer friendly before and after print out



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IMAGING ALIGNER Reports

Selection of various printout options to suite your taste

- Technician's report
- All angles on one easy to read page

Date:07/11/2017
Technician:
Order No.:

Customer:
Company:

License No:
Odometer:

Vehicle Not Specified
VIN:

		LEFT						RIGHT					
		FACTORY SPECIFICATION						FACTORY SPECIFICATION					
		INITIAL	Min	Preferred	Max	FINAL		FINAL	Min	Preferred	Max	INITIAL
FRONT	TOE	-0.04°	-0.10°	0.00°	0.10°	-0.09°		0.26°	-0.10°	0.00°	0.10°	0.17°
	CAMBER	-0.92°	-1.78°	-1.03°	-0.28°	-0.89°		-0.88°	-1.78°	-1.03°	-0.28°	-0.84°
	CASTER	3.00°	6.16°	6.91°	7.66°	2.95°		3.18°	6.16°	6.91°	7.66°	2.97°
REAR	TOE	0.33°	0.01°	0.12°	0.21°	0.36°		-0.34°	0.01°	0.12°	0.21°	-0.33°
	CAMBER	-0.19°	-2.25°	-1.50°	-0.75°	-0.21°		-0.14°	-2.25°	-1.50°	-0.75°	-0.09°
SAI		14.18°	----	----	----	14.18°		14.21°	----	----	----	14.21°
INCLUDED ANGLE		13.26°	----	----	----	13.29°		13.33°	----	----	----	13.37°
TOE OUT ON TURNS		----	----	----	----	----		----	----	----	----	----
MAXIMUM TURNS		----	----	----	----	----		----	----	----	----	----
TOE CURVE CHANGE		----	----	----	----	----		----	----	----	----	----
FRONT RIDE HEIGHT		----	1.45"	1.92"	2.39"	----		----	1.45"	1.92"	2.39"	----
REAR RIDE HEIGHT		----	0.87"	1.26"	1.65"	----		----	0.87"	1.26"	1.65"	----

TOTAL MEASUREMENT					
	INITIAL	Min	Preferred	Max	FINAL
TOTAL FRONT TOE	0.13°	-0.20°	0.00°	0.20°	0.17°
TOTAL REAR TOE	0.00°	0.03°	0.23°	0.43°	0.02°
REAR THRUST	0.33°	-0.50°	0.00°	0.50°	0.35°
FRONT SETBACK	0.37"	----	----	----	0.37"
REAR SETBACK	0.44"	----	----	----	0.46"
TRACK WIDTH DIFF.	1.28"	----	----	----	1.29"
WHEEL BASE DIFF.	0.07"	----	----	----	0.09"
FRAME ANGLE	0.00°	----	----	----	0.00°

Your vehicle has been aligned using a precision HOFMANN wheel aligner.

1.4.0, United States Domestic, US2017R02

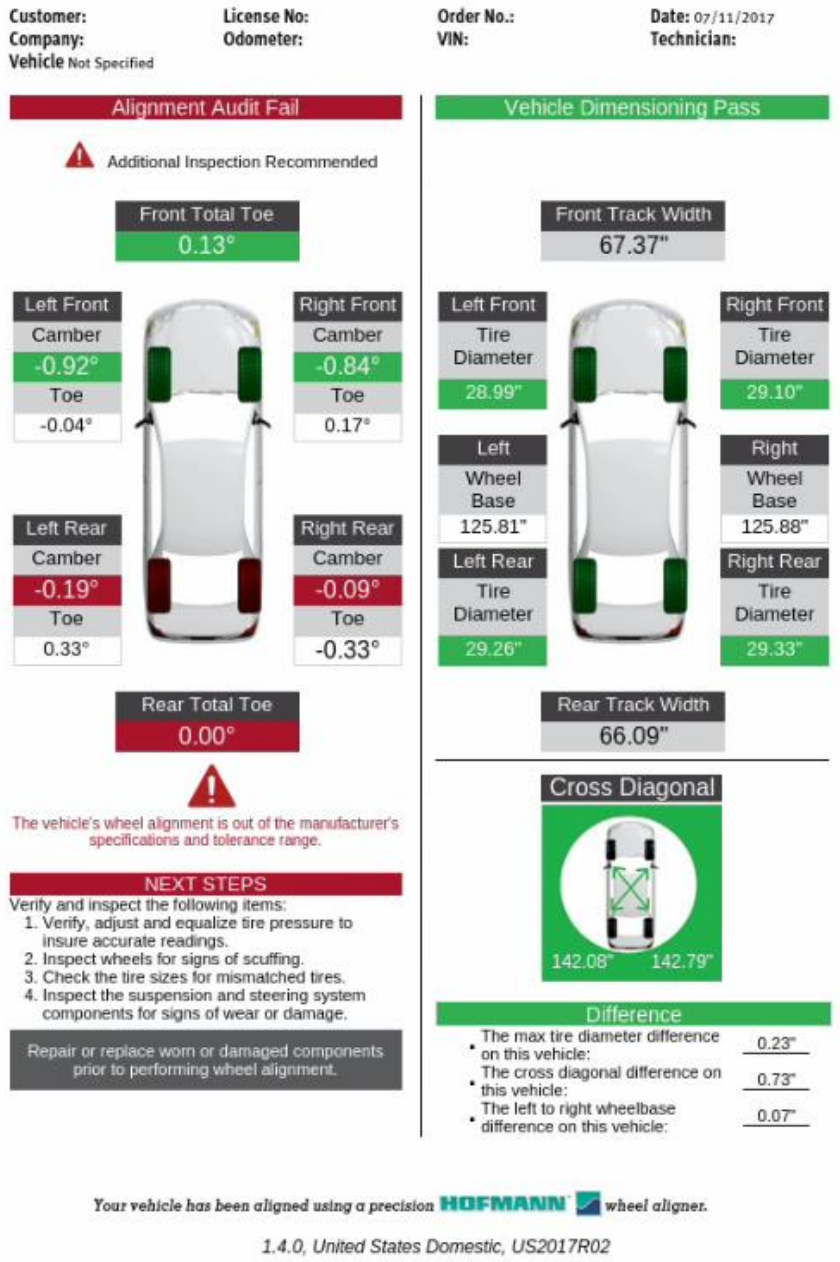
Video should start automatically

geoliner770

IMAGING ALIGNER
Reports

Selection of various printout options to suite your taste

- Audit report with vehicle dimensioning



Customer:
Company:
Vehicle Not Specified

License No:
Odometer:

Order No.:
VIN:

Date: 07/11/2017
Technician:

Alignment Audit Fail

Additional Inspection Recommended

Front Total Toe: 0.13°

Left Front	Right Front
Camber: -0.92°	Camber: -0.84°
Toe: -0.04°	Toe: 0.17°
Left Rear	**Right Rear**
Camber: -0.19°	Camber: -0.09°
Toe: 0.33°	Toe: -0.33°

Rear Total Toe: 0.00°

The vehicle's wheel alignment is out of the manufacturer's specifications and tolerance range.

NEXT STEPS

Verify and inspect the following items:
1. Verify, adjust and equalize tire pressure to insure accurate readings.
2. Inspect wheels for signs of scuffing.
3. Check the tire sizes for mismatched tires.
4. Inspect the suspension and steering system components for signs of wear or damage.

Repair or replace worn or damaged components prior to performing wheel alignment.

Vehicle Dimensioning Pass

Front Track Width: 67.37"

Left Front	Right Front
Tire Diameter: 28.99"	Tire Diameter: 29.10"
Left	**Right**
Wheel Base: 125.81"	Wheel Base: 125.88"
Left Rear	**Right Rear**
Tire Diameter: 29.26"	Tire Diameter: 29.33"

Rear Track Width: 66.09"

Cross Diagonal: 142.08" / 142.79"

Difference

The max tire diameter difference on this vehicle:	0.23"
The cross diagonal difference on this vehicle:	0.73"
The left to right wheelbase difference on this vehicle:	0.07"

Your vehicle has been aligned using a precision HOFMANN wheel aligner.

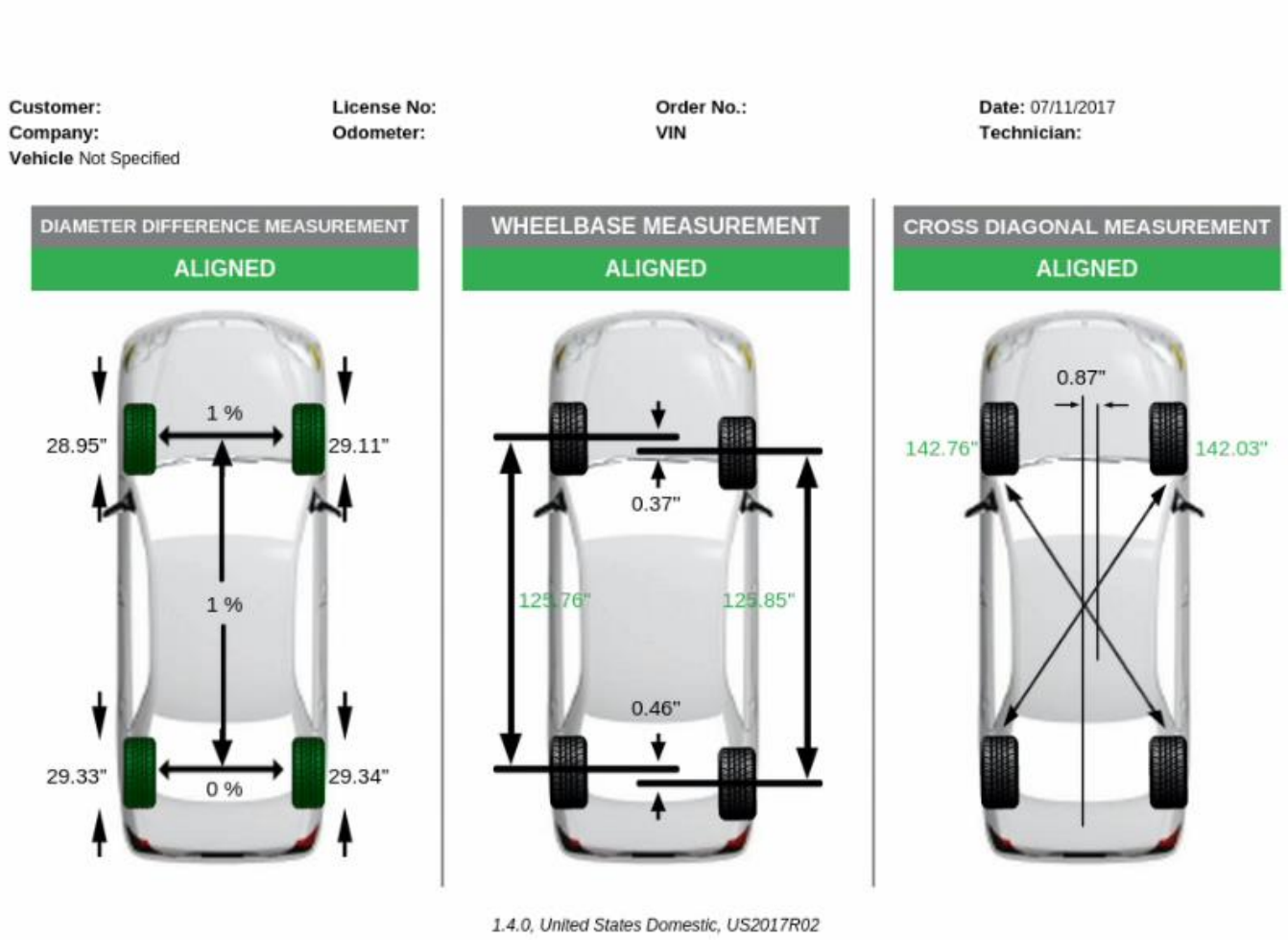
1.4.0, United States Domestic, US2017R02

geoliner770

IMAGING ALIGNER
Reports

Selection of various printout options to suite your taste

- Collision blueprint report
- Vehicle dimensioning
- Cross diagonal
- Offset



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IMAGING ALIGNER

SMART

WARN | COMPENSATE | ALERT

Like having a buddy
watching your back

geoliner770

IMAGING ALIGNER
Error Reporting

A unique feature of the geoliner770 is the ability to detect circumstances that would lead to a bad alignment

There are three levels of error detection

COMPENSATE

WARN

ALERT

geoliner770

IMAGING ALIGNER
Error Reporting

Level 1

The machine has detected a potential error and will compensate or make the necessary corrections

You will have a great alignment

COMPENSATE

WARN

ALERT

geoliner770

IMAGING ALIGNER
Error Reporting

Level 2

The machine has detected a potential error and will compensate or make the necessary corrections and is advising you of the condition

You will still have a great alignment

COMPENSATE

WARN

ALERT

geoliner770

IMAGING ALIGNER
Error Reporting

Level 3

The machine has detected an issue and is informing you that this may not be a good alignment

Please proceed and fix the issue

COMPENSATE

WARN

ALERT

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IMAGING ALIGNER

FAST, EASY TO USE

Built from the ground up
for ***SPEED***
with mobility, flexibility,
and productivity in mind

geoliner770

IMAGING ALIGNER

PROFITABLE

Example of a successful
Investment summary

HOFMANN

INVESTMENT SUMMARY

SUMMARY								
1	Base on	123	Cars per week					
2	On a	4	Additional wheel alignments per day					
3	and paying the technician	$ 25.00	per hour or per alignment					**5 years later**
4	Initial investment	$ 43,000.00		40,000	placed in a CD for 5 years		1.85%	**$3,700.00**
5	Year 1 return	$ 59,012.51						
6	Year 2 return	$ 63,893.66	with a 5% increase in wheel service charge					
7	Year 3 return	$ 69,018.87	with a 5% increase in wheel service charge					
8	Year 4 return	$ 74,400.34	with a 5% increase in wheel service charge					
9	Year 5 return	$ 80,050.88	with a 5% increase in wheel service charge					
10								
11	Equipment capitlization over 5 years	$ 57,389.52						
12	Net revnue of alignment service	$ 403,765.78						
13	**Net profit over 5 years**	**$ 346,376.26**	**From wheel alignment only no parts no labor**					

HOFMANN®

GEOLINER770 VIDEO

geoliner770

WORKSPACE MONITORING

PUT ONE TO WORK IN YOUR SHOP TODAY

Perfect alignment every time