

FCA

FIAT CHRYSLER AUTOMOBILES

Vehicle Pulling to LH diagnosis & repair

APAC
REGION



CHRYSLER

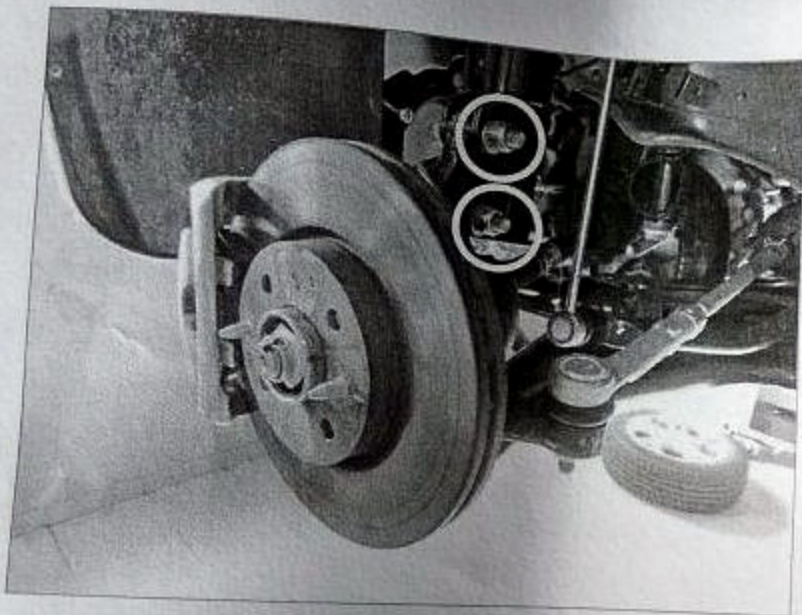


Jeep

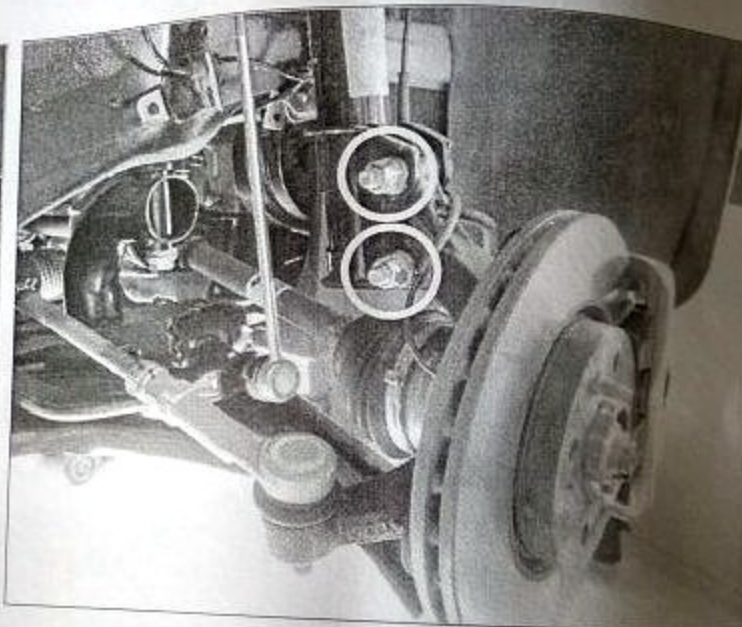


Step-1

- ❑ Carry out the wheel alignment to note down the deviation in values.
- ❑ Loosen the front both side knuckle Nuts by five-six threads



LH Knuckle



RH Knuckle

Step-1

- ❑ Pull the Knuckle in the direction shown
- ❑ While pulling / pushing the knuckle in the direction shown, simultaneously tighten the knuckle bolts with the help of another technician
- ❑ Torque tighten the nuts to 100 Nm



LH Knuckle

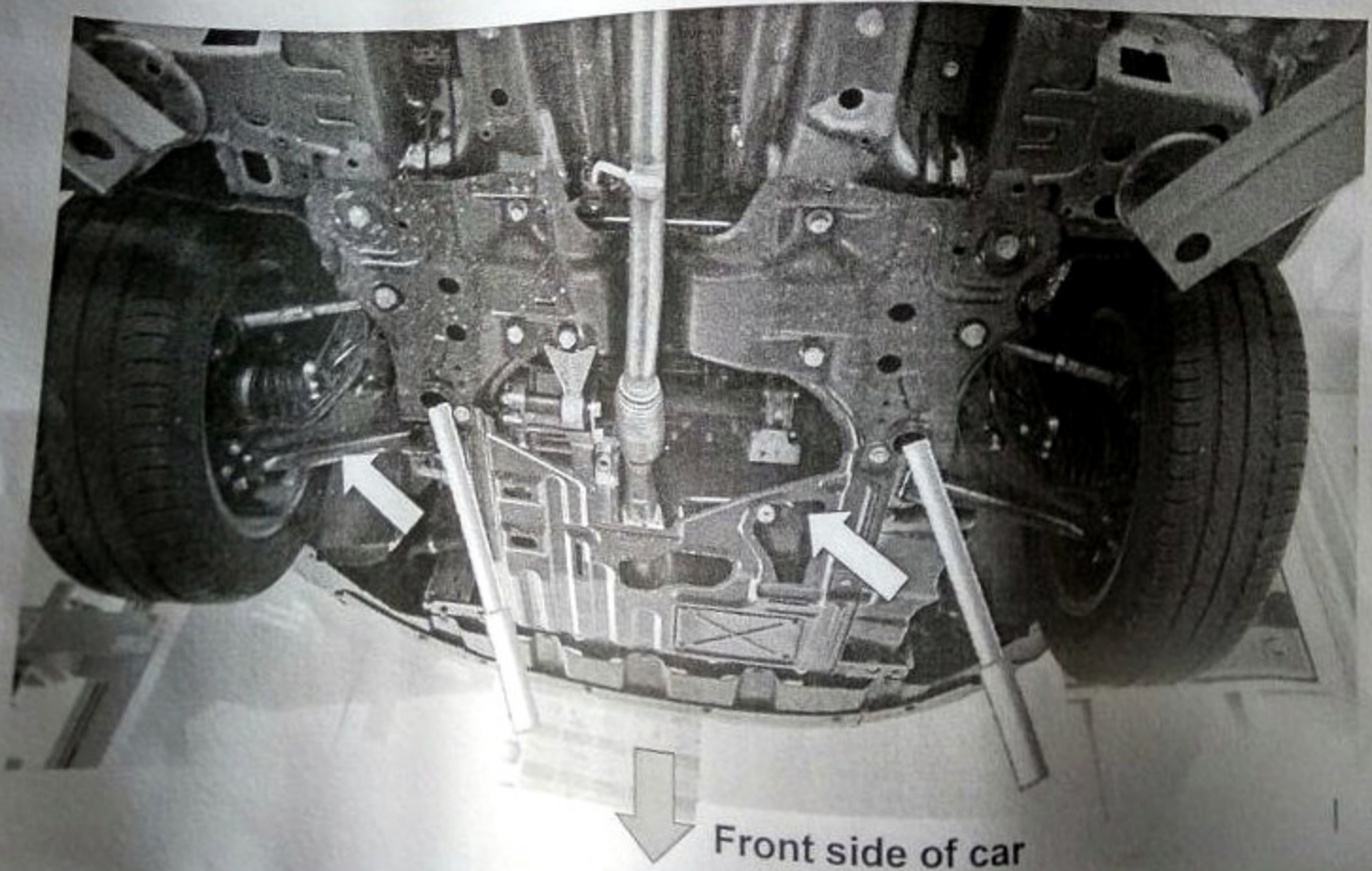


RH Knuckle

Step-2

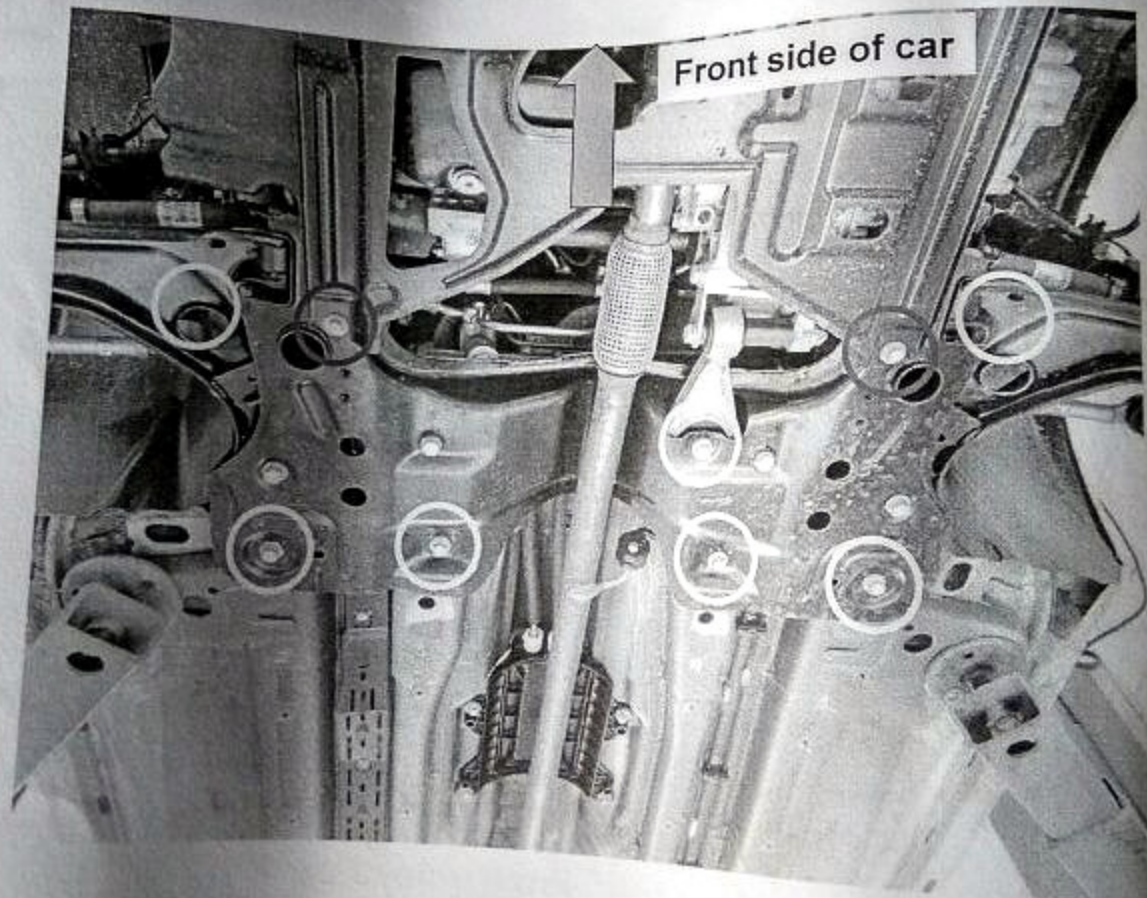
- ❑ Diagonally Push the sub frame with pry bars to the left side in the direction shown
- ❑ While simultaneously pushing the sub frame in the direction from two places, tighten the sub frame bolts with the help of another technician
- ❑ Torque tighten the bolts to 125- 130 Nm

Note : Do not use pneumatic gun for tightening the bolts.



Step-2

- Loosen the sub frame bolts & C mounting bolts (marked yellow) by five-six threads
- Loosen the under shield bolts (marked blue) by five-six threads.

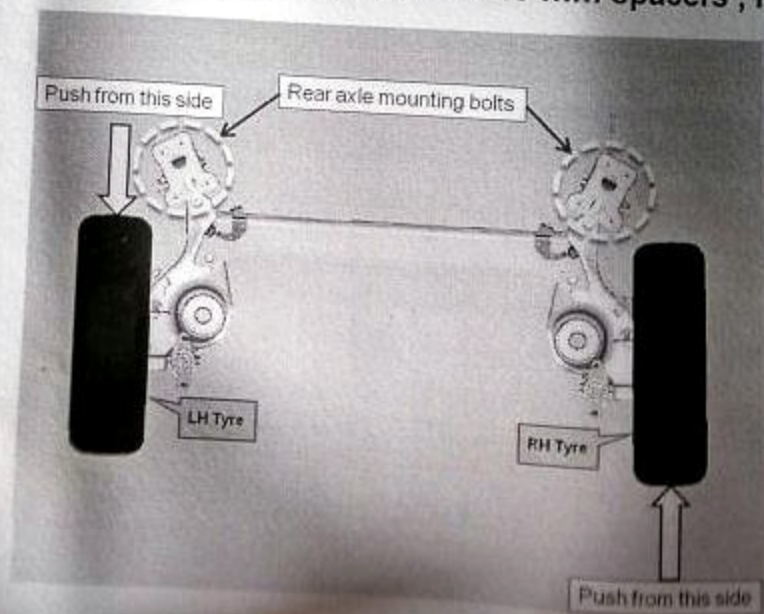


Step-3

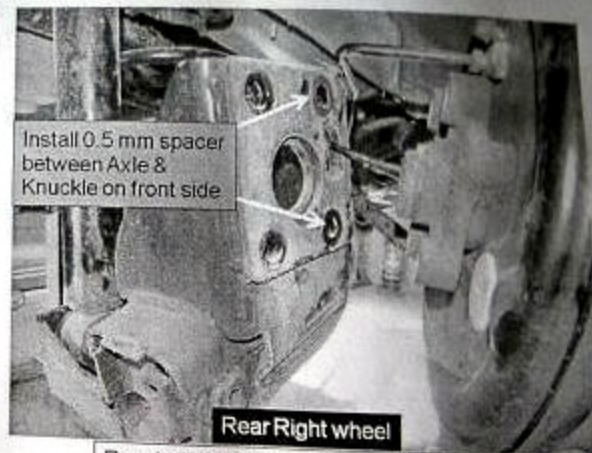
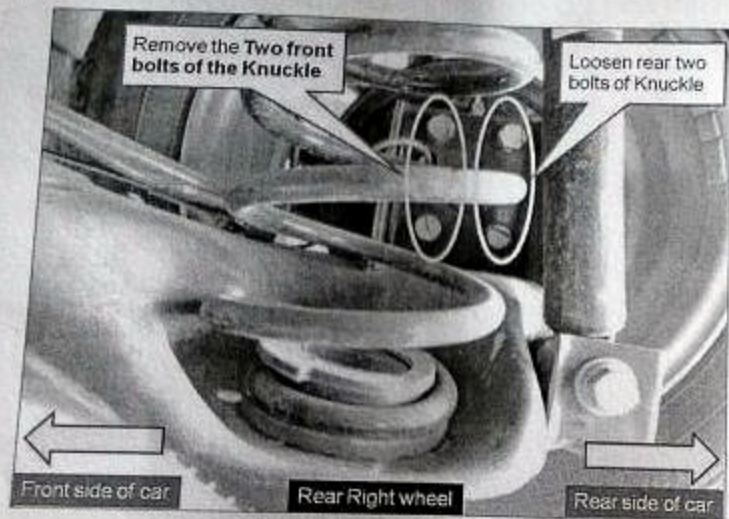
Procedure of adjusting rear axle

- ❑ Lift the vehicle in a hoist
- ❑ Loosen the Rear axle mounting bolts by five to six threads
- ❑ Adjust the rear axle as shown in the fig, While keeping the axle pushed in the direction shown, tighten the rear axle bolts with the help of another technician.
- ❑ **Rear Thrust angle Specification $0^{\circ}00'$ to $\pm 0^{\circ}03'$**
- ❑ Torque tighten the bolts to 100-110 Nm.

Note : If the axle is adjusted as per the as per step-3, the REAR RIGHT wheel toe-in should be corrected as per step-4 with 0.5 mm spacers , if not the tyre will wear out.



Step-4



Rear individual wheel Toe-in specification
0°08' to 0°24' or 0.7mm to 2.7 mm

Rear Right wheel toe-in correction

Step-5

- ❑ Change the face of the tyre inside out. Keep the yellow dot mark on the inner side (remove the front tyres from the wheel rim and flip the tyre inside out)
- ❑ Carry out wheel alignment
- ❑ Road test the vehicle.



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- Vehicle system checks
- Road testing
- Repair procedure for pulling – Step 1 to Step-5

Vehicle system checks

Suspension system : Check underbody for any damage or dent, rectify if necessary.

Tyres : Check tire pressure., fix the best evenly worn out tyres at the front.

Brake System: Check for brake dragging , brake binding and abnormal wear on the pads or discs.

Steering system: Check the steering wheel for off center. The Steering wheel off center can not be corrected by removing the steering wheel or steering column. Check wheel alignment and correct it to the specification to centralize the steering wheel.

Wheel alignment : Set the tyre pressure to 3 bar for wheel alignment purpose only

Note:

1. If any abnormality noticed on the above systems, please carry out necessary corrections before proceeding for road test.
2. Ensure the wheel alignment machine is calibrated.

Customer may experience following problems.

- The vehicle pulls to the left.
- The driver has to steer to the left for straight driving.

Test conditions to test vehicle pulling: (Drive along with customer)

- Set the tyre pressure to specification.
- Go for test drive with customer to understand the problem.
- Select a flat road where vehicle can be driven in straight line for 100 Meters at constant speed of 80 Kmph. (Follow the test conditions as given below)
- Occupants : Driver + 1 only
- Road Slope: Normal road 1 to 2° slope (Flat road with very less slope)
- Lateral Wind Speed < 2 m/s. (There should not be high wind)
- Test vehicle speed: 80 kmph, select appropriate gear , do not accelerate suddenly
- Test for approximately 100 m of travel. Make sure vehicle is moving straight and there is no bias of steering input.
- Hold the steering wheel lightly to allow steering wheel movement if it tends to pull.

Road testing

Explanation

- Explain the definition of pulling to the customer along with the effect of road camber on the steer-ability of the car.

Judgment:

Confirm the problem

- a) Vehicle goes straight but steering wheel has some angle.
This is case of Steering off centre, to resolve the same do the wheel alignment.
- b) On a flat road there will be alignment induced drift, should not be considered as pulling.
- c) Vehicle does not go straight – Vehicle pulls to left (Check the direction of pulling and the severity of pulling) more than 1 meter to left in 100 m travel at 80 kmph,

Acceptable Pull Limits : $< \pm 1$ m drift in 100 m of travel.

If the pulling is observed during test drive and it is more than the specification given above, please follow the procedure given in Step1 – Step 5

Warning: Please choose a road which has relatively low traffic condition for test driving, as driving with hands off the steering wheel is very dangerous. Maintain or reduce the speed during test drive.

Important points

- Ensure the wheel alignment machine is calibrated
- Set tyre pressure to 3 bar for alignment purpose only- very important
- Set the front toe-in values to $0^{\circ}01'$ or 0.1 mm
- Set the rear toe-in values to the minimum value
(spec – 0.7 to 2.7 mm or $0^{\circ}08'$ to $0^{\circ}24'$)
- Reset the tyre pressure to normal specification before road test.

Alignment report verification

- Refer the first wheel alignment report carried out at the beginning of this exercise.
- Note the Rear thrust angle value in the wheel alignment report,
- If the Rear thrust angle is on the positive range, then only adjust the rear axle as per step-3. (sample wheel alignment report attached for reference; check thrust angle)
- If the thrust angle is already in negative value then go to step-5

Sample wheel alignment report						
Customer :			Date :			
Company :			VIN :			
License No :			Technician :			
Odometer :			Order No :			
VEHICLE ALIGNMENT REPORT						
FIAT GRANDE PUNTO MY12 ONWARDS						
Primary Angles			Initial	Specifications		Final
				Min	Max	
Front	Caster	Left	2°37'	2°20'	3°20'	2°37'
		Right	1°29'	2°20'	3°20'	1°29'
	Camber	Left	-0°43'	-1°00'	0°00'	-0°43'
		Right	-0°47'	-1°00'	0°00'	-0°47'
	Toe	Left	0°25'	-0°05'	0°03'	-0°01'
		Right	-0°11'	-0°05'	0°03'	-0°01'
Total		0°14'	-0°10'	0°06'	-0°02'	
Rear	Camber	Left	-0°25'	-0°57'	-0°17'	-0°25'
		Right	-0°41'	-0°57'	-0°17'	-0°41'
	Toe	Left	0°19'	0°08'	0°24'	0°19'
		Right	0°14'	0°08'	0°24'	0°14'
		Total	0°33'	0°16'	0°48'	0°33'
	Max Thrust Angle		+0°09'			+0°09'

Fiat Models Linea and Punto versions

AS/SN/Mar/15/86

18th March 2015

Revision 1

This Service News supersedes

Service News - AS/SN/January 14/24 dated 29-Jan-2014

Handling of vehicle pulling and rear tyre wear complaints in Linea & Punto

All Fiat Dealerships

Vehicle pulling complaint diagnosis procedure

Dear Dealer Partners,

Introduction : This bulletin contains information on diagnosis and repair of vehicle pulling complaints along with explanation to be given to customer on pulling.

Explanation of Vehicle Pulling : The vehicle pulling may be contributed due to several factors. In most of the cases it is experienced due to the road camber or the roads being inclined to left (for right hand drive markets) to enable drainage of rain water. The customer may find this phenomenon more prominent when they upgrade from a small to mid size or sedan cars.

While few customers who complain that they are experiencing left pulling, which may be due to external factors mentioned above, the customer may try to confirm this feeling by driving with his hands off the steering wheel. In the interest of safety, this is not a standard driving or the checking method. Driving the vehicle without holding the steering wheel should not be attempted.

However, in some cases the pulling could be related to wheel alignment. The factors like customer driving habits, bumpy and uneven roads, and pot holes further disturb the wheel alignment and may cause pulling. In order to improve the vehicles performance, if there is actual pulling is observed, please carry out the repair procedure enclosed.

After vehicle has been attended with the repair procedure, please take a joint test drive along with customer and take satisfaction note and explain the customer about the phenomenon of pulling (detailed information given in the repair procedure)

The enclosed information is applicable at the time of release and subject to modification. For circulation within Fiat Authorized service network only



Rear wheel Toe-In correction procedure for resolving Rear tyre outer wear

If the rear tyres show signs of outer tyre wear, the toe-in values to be corrected to specification. Refer the wheel alignment report and check the individual toe-in values. If the rear toe-in values are out of specification, it has to be corrected as given below.

Note :

The Rear toe-in to be corrected when the individual wheel toe-in value is greater than $0^{\circ}24'$ or 2.7 mm and has signs of outer tyre wear

Rear Toe-in Specification : $0^{\circ}08'$ to $0^{\circ}24'$ or 0.7mm to 2.7 mm

Selection of spacer for Rear Toe-In correction :

Refer the following table for choosing the correct thickness of spacer for Rear Toe-In correction.

Rear wheel Individual Toe-In value	Spacer thickness required	Correction value obtained	Final Individual wheel Toe-In value (approx)
$0^{\circ}24'$ to $0^{\circ}40'$	0.50 mm	$0^{\circ}19'$	till $0^{\circ}21'$
$0^{\circ}40'$ to $0^{\circ}50'$	1.00 mm	$0^{\circ}38'$	till $0^{\circ}12'$

Rear Left wheel Toe-In correction :

The Rear left wheel toe-in to be corrected as per below given procedure.

Procedure :

1. Check the four wheel alignment - after carrying out the Rear Thrust angle correction.
2. Identify which side of rear wheel has excessive toe-in value above $0^{\circ}24'$ or 2.7 mm and needs to be corrected to bring within specification.
3. Lift the vehicle on the hoist and remove the rear left wheel
4. Remove the front two bolts of knuckle & loosen the rear two bolts
5. Insert the 0.5 mm spacer between the axle & knuckle for the front two bolts as shown in below fig.
6. Torque tighten the knuckle bolts to 100-110 Nm specification and re-fix the tyre.
7. Carry out four wheel alignment and confirm the Rear toe-in values are within specification

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Rear Right wheel Toe-in correction

The Rear right wheel toe-in to be corrected as per below given procedure.

Procedure :

1. Check the four wheel alignment- after carrying out the Rear Thrust angle correction.
2. Identify which side of rear wheel has excessive toe-in value above $0^{\circ}24'$ or 2.7 mm and needs to be corrected to bring within specification.
3. Lift the vehicle on the hoist and remove the rear right wheel
4. Remove the front two bolts of knuckle & loosen the rear two bolts
5. Insert the 0.5 mm spacer between the axle & knuckle for the front two bolts as shown in below fig.
6. Torque tighten the bolts to 100-110 Nm specification and refix the tyre
7. Carry out four wheel alignment and confirm the Rear toe-in values are within specification

Note :

The Rear toe-in to be corrected when the individual wheel toe-in value is greater than $0^{\circ}24'$ or 2.7 mm and has signs of outer tyre wear

Rear Toe-in Specification : $0^{\circ}08'$ to $0^{\circ}24'$ or 0.7mm to 2.7 mm

Please mention in the DIR the repair process carried out and enclose the Before and After wheel alignment report and send to Technical section on the following email ids.

donald.pinto@fcagroup.com

gaurav.pardeshi@fcagroup.com

Note :

1. For vehicle pulling concerns shock absorbers, lower arms, suspension & steering components should not be replaced without consulting technical team, as these parts found OK during analysis.
2. Ensure the wheel alignment machine has been calibrated for accuracy before carrying out the procedure.

The contents of the circular to be informed to all the concerned in the workshop.

In case of any clarification contact

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