

Technical note “Evoluzioni MP3 – Fuoco”

In response to a number of operational difficulties noted, we have introduced a set of unified procedures to resolve the main problems encountered.

Please note that these procedures are highly specific and must be implemented on the basis of your own experience.

3. Checking toe-in/toe-out of front wheels

3.1. Premise

3.2. Assembling and adjusting the tool

3.3. Checking toe-in/toe-out

3.4. Adjusting toe-in/toe-out

3.1. Premise

For the MP3 and Fuoco, new steering control U-joints have been introduced with new washers for adjustment.

Complete joint, Part No. 666545



1.5 mm adjustment washer, Part No.
666546



0.5 mm adjustment washer, Part No.
XXXXXX



This new solution is similar to the original solution, but offers a broader range for adjusting toe-in/toe-out.

The new solution is interchangeable with the former solution and must only be used in cases where the original joints do not permit a sufficient adjustment range to achieve optimum toe-in/toe-out.

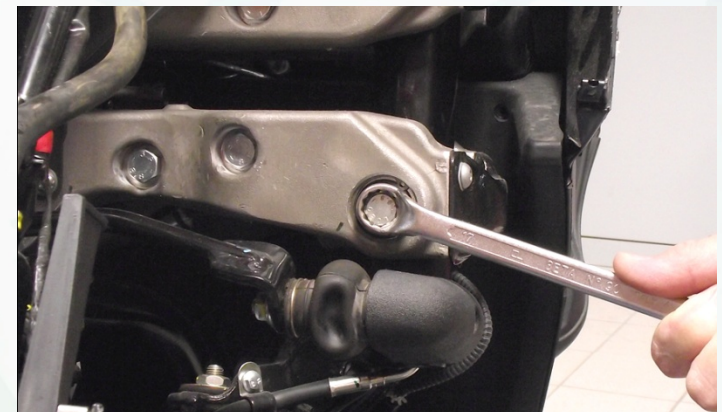
3.2. Assembling and adjusting the tool

To implement the new solution correctly, proceed as follows:

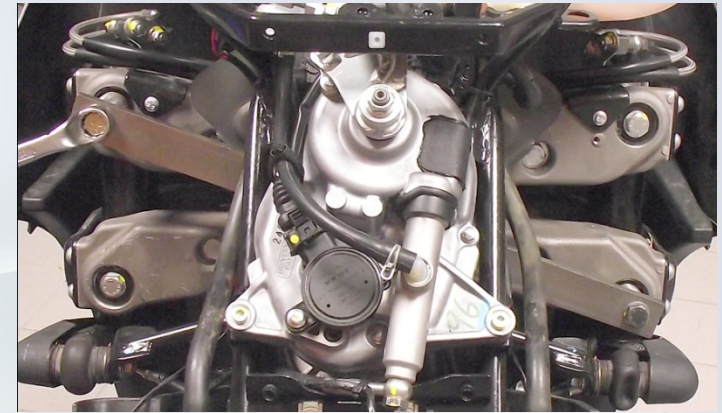
- Ensure that the tyres are inflated to the specified pressure

NOTE: to illustrate the procedure more clearly, the photographs for certain steps have been taken with the bodywork removed. However, these operations may be performed with the bodywork fitted.

- Undo the upper right hand parallelogram fastener screw
- Undo the lower left hand parallelogram fastener screw



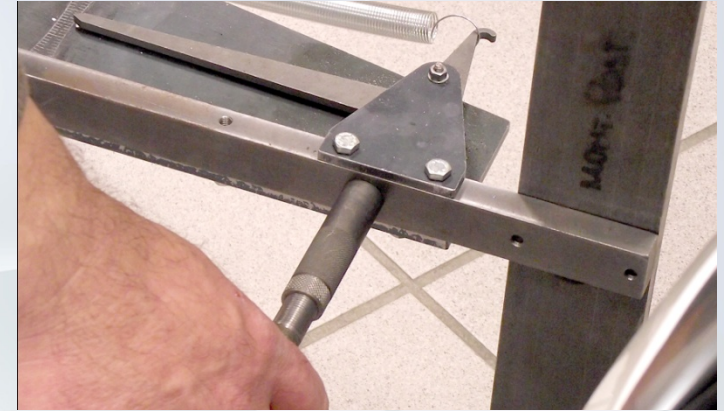
- Install the parallelogram lock tool, using the screws supplied and, if necessary, adjusting the vertical position of the vehicle to enable installation
- Assemble the components as shown in the figure using the screws supplied, then tighten the screws to the specified torque, the components themselves as square as possible relative to one another
- Install the calibration pin with the threaded cursor and the knurled ring. Adjust the position of the cursor to a depth of 36 mm, with the knurled ring locked. This assembly constitutes the calibration template



- Install the template between the toe-in measurement cursors
- Ensure that the pointers are centred
- Using the adjustment slots, position the pointer mounting pin so that the centre position is indicated



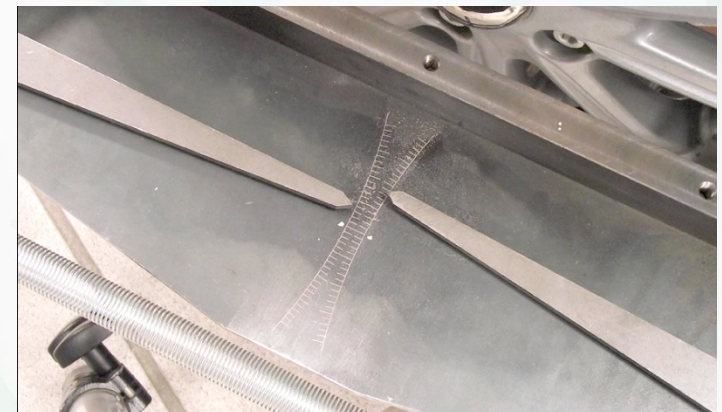
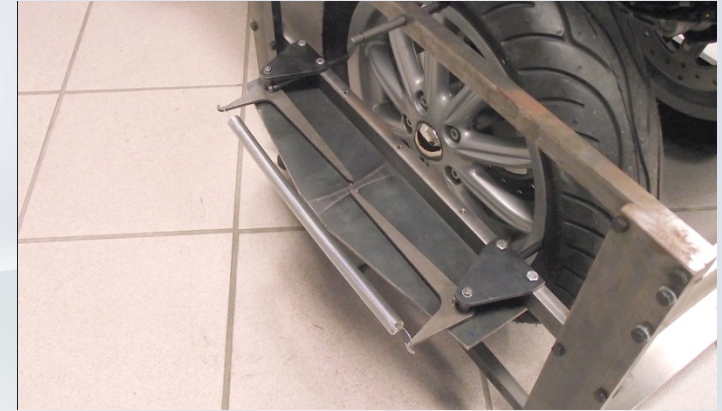
- Repeat the procedure for the other pair of pointers, using the template with the threaded cursor on the same side
- Remove the rear cross piece of the tool
- Position the tool around the front wheels of the vehicle



- Refit the rear cross piece of the tool and tighten the fastener screws to the specified torque
- Adjust the position of the tool to that all the cursors are in contact with the wheel, and not with the tyre
- Using the camber measurement cursors as reference, correct the vertical position of the vehicle by adjusting the shock absorber lock system



- Fit the pointer spring on one side
- Fit the pointer spring on the other side and adjust the lateral position of the structure to obtain an optimum working position for the pointers
- Adjust the steering with the handlebar to obtain the same excursion on both pairs of pointers, then count the number of notches between each pair of pointers

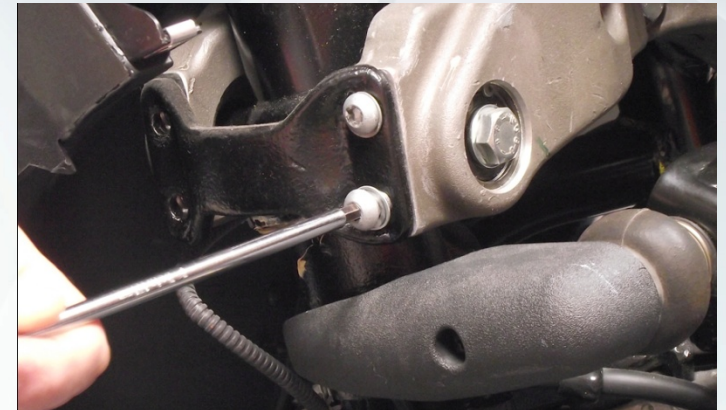


3.3. Checking toe-in/toe-out

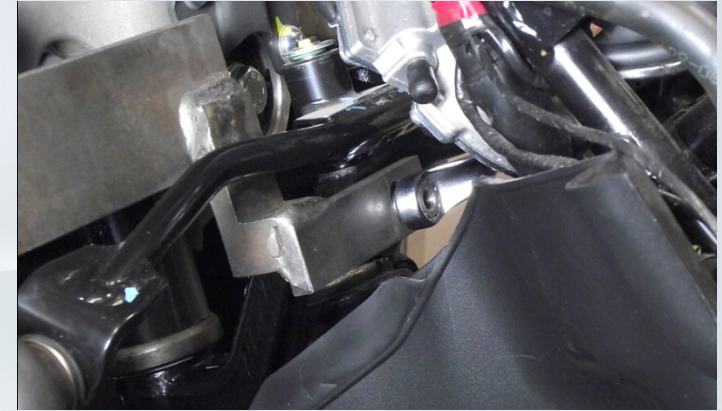
CENTRED TOE-IN/TOE-OUT (pointers at same value)

Number of notches counted	Result after removing joint	Solution
From 0 to 4	---	No adjustment necessary. Toe-in/toe-out at optimum values
From 5 to 20	Original joint One washer on outside and One washer on inside	Toe-in/toe-out may be corrected, to bring value within acceptable range
	Original joint Two washers on outside or Two washers on inside	Correction not possible with short joint. Joints must be replaced with the new components
From 20 to 40	---	Correction not possible with short joint. Joints must be replaced with the new components

- For excursions above 40 notches, the tool must be installed and the steering oriented as follows
- Undo the screws fastening the lower right hand bracket connecting the parallelogram arms
- Remove the nut fastening the steering arm



- Install the steering orientation tool with the special nut provided
- Fasten the steering orientation tool to the parallelogram with the original screws
- Reposition the vehicle in the tool and repeat measurement of toe-in/toe-out. Check whether the error is relative to the suspension on both wheels or on just one wheel



3.4. Adjusting toe-in/toe-out

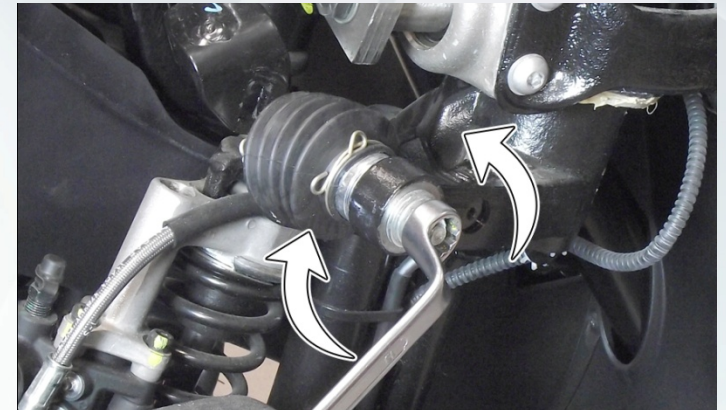
- Undo the screw fastening the plastic joint cover and remove
- Undo the nut fastening the joint on the suspension side and retrieve the end washer and, if fitted, the toe-in/toe-out adjustment washer
- detach the suspension and retrieve the toe-in/toe-out adjustment washer, if fitted



- Remove the nut fastening the joint on the steering arm and retrieve the end washer
- Fit the new joint, with six washers between the joint and the suspension arm
- Tighten the nut fastening the joint onto the suspension to the specified torque



- Separate the suspension from the steering arm so that the joint is free to move
- Check that the joint can turn freely in both directions
- If not, try turning the end washer around. If the joint still cannot turn freely, replace the set of six washers



After fitting the new joint, position the vehicle in the tool again and repeat the measurement of the toe-in/toe-out. With the new joints and the 1.5 mm washers, larger toe-in/toe-out errors may be corrected.

The corrective actions necessary for excursions measured from the centre position (with one 1.5 mm washer on the insider and one on the outside of the suspension arm) are as follows:

1) From 0 to 11 notches	No correction. Toe-in/toe-out at optimum values
2) From 11 to 32 notches	Correct with 1 x 1.5 mm washer
3) Over 32 notches	Correct with 2 x 1.5 mm washers

In situation 2, block the steering in the straight ahead position in order to precisely identify the side on which corrective action is necessary.

With the new joints and the 1.5 mm washers, toe-in/toe-out errors smaller than 2.2 mm in total cannot be corrected.

For finer adjustment to approach theoretical values, six 0.5 mm washers may be used together with the new joints to achieve the same thickness as two 1.5 mm washers.

After checking that the new joint can turn freely with the set of six 0.5 mm washers, proceed as follows for the excursions indicated below, measured from the nominal position with three washers on the suspension arm side, three on the joint side and the same number of notches on both wheels:

1) From 0 to 3.5 notches	No correction. Toe-in/toe-out at optimum values
2) From 3.5 to 10.5 notches	Correct with 1 x 0.5 mm washer
3) From 10.5 to 17.5 notches	Correct with 2 x 0.5 mm washers
4) From 17.5 to 24.5 notches	Correct with 3 x 0.5 mm washers
5) From 24.5 to 31.5 notches	Correct with 4 x 0.5 mm washers
6) From 31.5 to 38.5 notches	Correct with 5 x 0.5 mm washers
7) Over 38.5 notches	Correct with 6 x 0.5 mm washers

After defining the number of washers to be removed or added, preferably block the steering the in straight ahead position to identify individual changes more clearly and determine the necessary corrections.

With toe-in on one wheel and toe-out on the other, correct with the predetermined number of washers plus the same amount again to realign the steering.

The amount of correction applied must be distributed correctly between the two sides to ensure that the steering geometry is correct.

This solution allows corrections in toe-in/toe-out up to 0.7 mm in total