Steering Bars Replacement (Alfa 33 Nuova - series 907)

Well ... today I am demonstrating a nice opportunity I had come across some months ago. I managed to salvage for free a complete pair of adjustable steering rack bars from a late production crashed Alfa 33 Imola. My car had factory equipped power assisted steering but fitted with the mechanical rack bars; this meant that I couldn't obtain precise wheel alignment compared to the adjustable ones. Adjusting the alignment with old style bars means removing the ball joint from strut and either rotating it CW or CCW to adjust TOE-IN which in turn alters the semi TOE-IN by 1 mm positive or negative respectively. The adjustable bars don't require ball joint extraction and provide accurate adjustment of steering geometry.

A quick search on the workshop manuals revealed that cars from chassis number 05756203 had new solution fitted with adjustable steering bars. This fact and my car being 057506** chassis number explains why I had the old style non adjustable steering bars.

Parts needed:

Item	Product Code	Quantity
Steering bars	60572858	2
Connection	60572854	2
Lock nuts	60572857	2
Bush	60525675	2
Fender well protection (LH)	60501074	1
Fender well protection (RH)	60502764	1

Let's go on.

Here you can see the complete set of the steering bars as taken out from the donor car

A close up shows the bush side of the bars, the metal plate and 2 x 24 mm bolts that keep the bars firm to the steering box and finally the lock rings that eliminate the possibility of the bolts being unbolted.

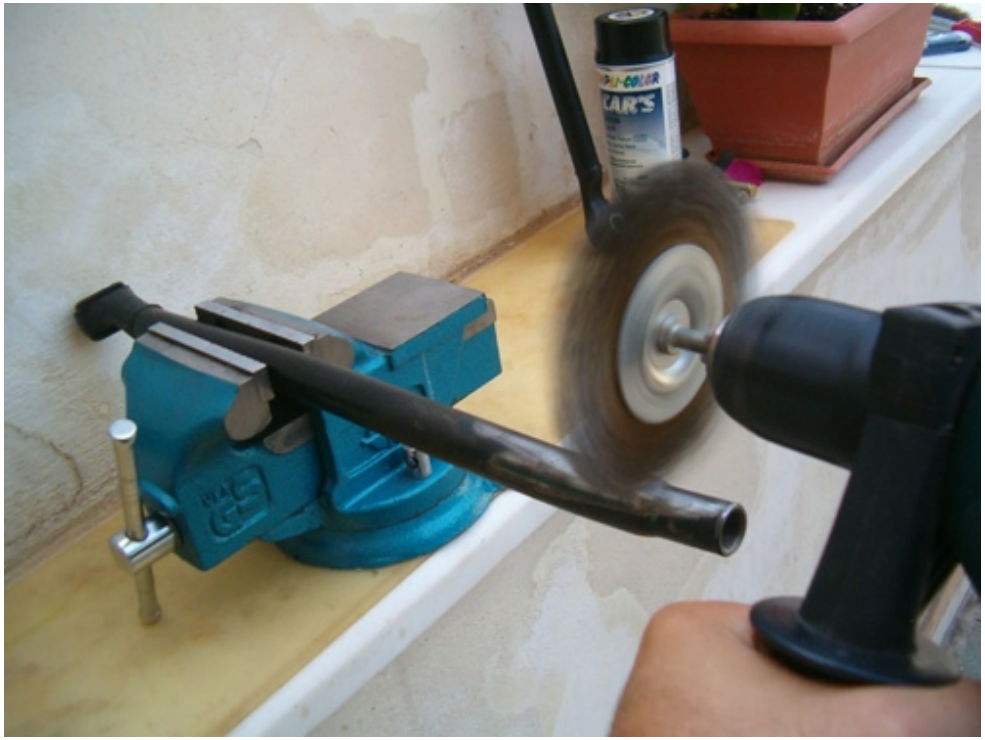
A close up of the adjustable connection. A note here about the threaded part of the connection; it is a reverse thread meaning that the lock nut bolts in CCW and not CW.

Also a close up of the bush and the 24 mm bolt. Both bushes will be renewed.

Parts all together

Small amount of rust which will be remove. Rust forms when original paint is rubbing on the protective flaps of the fender well

---



Wire brush does miracles...

Getting ready to paint ...

Black paint in can ...

... bars are ready!

Let's now fit the new bushes ...

A puller will help us a lot to move the bush a bit

Here you can see a DIY patent when the home garage misses a hydraulic press. Puller pushes the bush and the bar is supported by a 36 mm wrench ...

Bush is way out ...

... finally tweaking around with a screwdriver pops the bush out

---

Let's now press in the new bush; you will need a vise and a lot of patience since the bush must slip in a straight manner. If it slips in out of alignment, then you will definitely ruin the bush.

Bush is in and it is high time to get under the car.

Locate the centre of the steering box and remove the securing pin

Head bolts (24 mm) are exposed and slackened.

Extract the ball joint with the extractor ...

... and at last the bars are out.

Loosen the ball joint lock nut ...

... and remove ball joint.

Align the bars so that the connector roughly sits in length in relation to the old one. Don't worry too much is you miss a couple of mm, as the car will be taken for wheel alignment right after installation.

Rubber protection items for the fender wells.

These are the worn out protection pads that will be replaced.

Restore the bars at their position in the steering box along with the relative plate. Torque down the bolts at 39 - 48 Nm

Restore lock rings ...

... and finalize the setup with the securing pin. Let's now head to the garage for wheel alignment.

The car sits on the alignment ramp, tyres are carefully inflated at 28 psi and alignment bars are attached to the rim lips on the left side

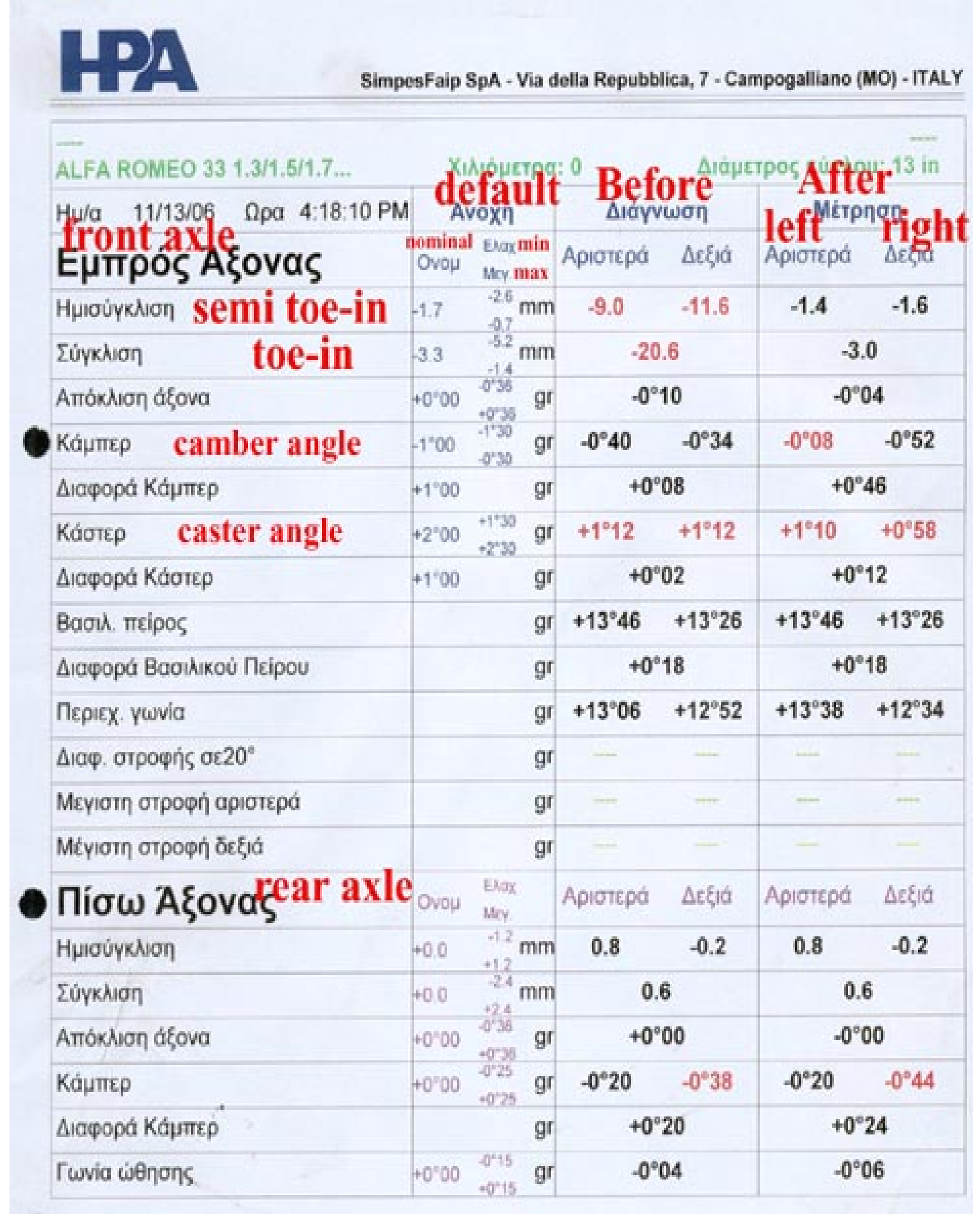
---

Apostolos hard at work attaching the reflector devices on the left side ...

... and he does the same on the right side.

Hardly seen on the PC monitor is the centre of the steering radius designated by a black mark on the upper yellow bar.

Measurements are displayed on the monitor and adjustments are done to the geometry by the mechanic.



HPA

SimpesFaip SpA - Via della Repubblica, 7 - Campogalliano (MO) - ITALY

ALFA ROMEO 33 1.3/1.5/1.7... Χιλιόμετρα: 0 Διάμετρος ζάντας: 13 in

Ημ/α 11/13/06 Ωρα 4:18:10 PM

Εμπρός Άξονας (front axle)	Ανοχή (default) Ονομ (nominal)	Ελαχ (min) / Μεγ (max)		Διάγνωση (Before) Αριστερά	Διάγνωση (Before) Δεξιά	Μέτρηση (After) Αριστερά (left)	Μέτρηση (After) Δεξιά (right)
Ημισύγκλιση (semi toe-in)	-1.7	-2.6 / -0.7	mm	-9.0	-11.6	-1.4	-1.6
Σύγκλιση (toe-in)	-3.3	-5.2 / -1.4	mm	-20.6		-3.0	
Απόκλιση άξονα	+0°00	-0°36 / +0°36	gr	-0°10		-0°04	
Κάμπερ (camber angle)	-1°00	-1°30 / -0°30	gr	-0°40	-0°34	-0°08	-0°52
Διαφορά Κάμπερ	+1°00		gr	+0°08		+0°46	
Κάστερ (caster angle)	+2°00	+1°30 / +2°30	gr	+1°12	+1°12	+1°10	+0°58
Διαφορά Κάστερ	+1°00		gr	+0°02		+0°12	
Βασιλ. πείρος			gr	+13°46	+13°26	+13°46	+13°26
Διαφορά Βασιλικού Πείρου			gr	+0°18		+0°18	
Περιεχ. γωνία			gr	+13°06	+12°52	+13°38	+12°34
Διαφ. στροφής σε20°			gr	---	---	---	---
Μεγιστη στροφή αριστερά			gr	---	---	---	---
Μέγιστη στροφή δεξιά			gr	---	---	---	---
Πίσω Άξονας (rear axle)	Ονομ	Ελαχ / Μεγ		Αριστερά	Δεξιά	Αριστερά	Δεξιά
Ημισύγκλιση	+0.0	-1.2 / +1.2	mm	0.8	-0.2	0.8	-0.2
Σύγκλιση	+0.0	-2.4 / +2.4	mm	0.6		0.6	
Απόκλιση άξονα	+0°00	-0°36 / +0°36	gr	+0°00		-0°00	
Κάμπερ	+0°00	-0°25 / +0°25	gr	-0°20	-0°38	-0°20	-0°44
Διαφορά Κάμπερ			gr	+0°20		+0°24	
Γωνία ώθησης	+0°00	-0°15 / +0°15	gr	-0°04		-0°06	

Very important task is to lock the steering wheel on the centre, so that **alignment is done with the wheel on the center**. Otherwise the car will coast straight and the steering will be out of centre. Also notice the bar fully depressing the brake pedal, so that any possible movement of the car is avoided.

Finally wheel adjustment is complete and the results are shown in the PC printout.

Notice the semi toe-in values before the adjustment. TOE-IN was way out of the nominal value; measured value was 20.6 mm (9.0 mm + 11.6 = 20.6 mm) instead of 3.3 mm of the nominal value. This huge difference could also be felt when driving the car; a distance of approximately 1km from home to the garage was a real pain to drive. The steering was way too light and precision when turning had disappeared; the chances to lose control of the car were many ...

After wheel alignment, the value for TOE-IN is 3.0 mm (1.4mm + 1.6 mm = 3.0 mm) falling inside the range.

Note that electronic wheel alignment equipment are very sensitive while measuring values. During adjustment even the slack between the threads of the steering bar and the connection were detected by the PC and shown in the monitor. Such values represent very low tolerances that otherwise would be not detected if we used the traditional alignment equipment (light beam aiming to calibrated scale).

1991 Alfa 33 1.4 IE

Athens - Greece