FRONT SUSPENSION

Assemblies included In this group: -

3:1	K3601 021AA	LOWER WISHBONES
3:2	K3601 022AB	UPPER WISHBONES
3:3	K3601 023AA	STABILISER BAR
3:4	K3601 286AC	U PRIG HTS
3:5	K3601 183AB	FRONT STABILISER BAR LINKAGE

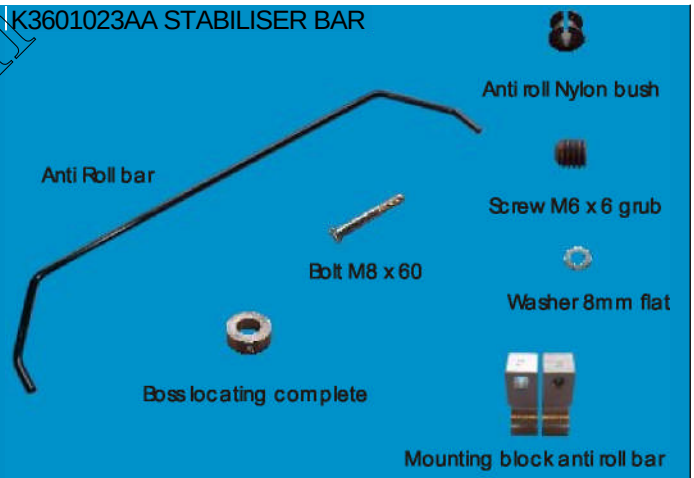
Tools required for assembly of this group: -	**Qty**
19mm Spanner	2
Torque Wrench with range 8 - 50 Nm	1
13mm Socket to fit torque wrench	1
Vernier Calliper or Measuring Tape (mm)	1
3mm Allen Key	1
*Snapon™ 60º 17mm Spanner (P# - SVSM17)	1
*Snapon™ 3/8 Drive Power / Breaker Bar (P# - F12L)	1
*Snapon™ 3/8 Drive 22mm Socket (P# - Fm22)	1
5mm Allen Key	1
10mm Spanner	1
* The manufacturers name and part numbers are mentioned as a reference to specialist tools required for the assembly of the wishbone ball joints to the upright assemblies.	

K3601 021AA LOWER WISHBONE KIT

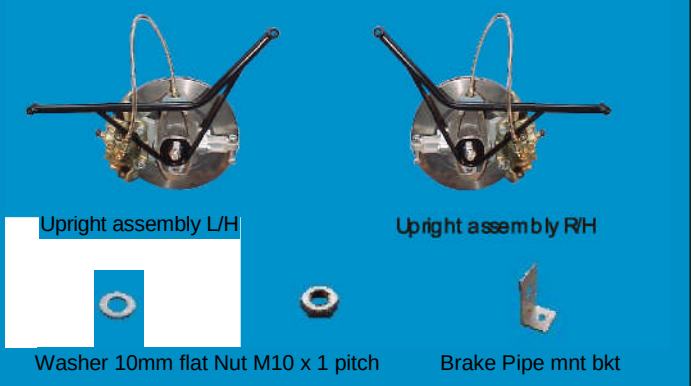
K3601 183AB FRONT STABILISER BAR LINKAGE

K3601 022AB UPPER WISHBONE KIT

K3601023AA STABILISER BAR



K3601024AC UPRIGHTS



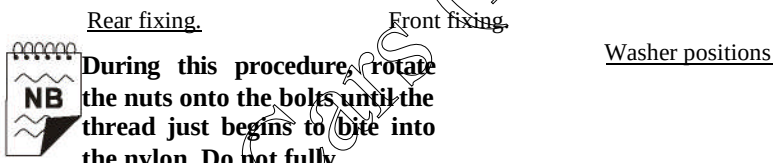
Components in this assembly		Qty	Part Number
I	Bolt M12 x 90	2	B5358057AA
ii	Nut M12 Nyloc	4	B5358060AA
iii	Washer 12mm Flat S/S	12	B5358061AA
iv	Bolt M12 x 100	2	B5358129AA
v	Lower wishbone assembly L/H	1	M3551048AB
vi	Lower wishbone assembly R/H	1	M3551049AB

Procedure

1. Offer the lower right hand wishbone assembly to the mounting points on the Right hand front of the chassis as illustrated.

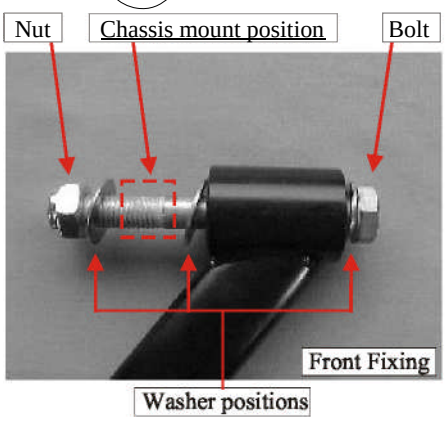
Ensure the ball joint is pointing up wards. Note the front fixing is situated at the end of the longer arm.

2. Secure the rear fixing to its chassis mounting point using a M12x90 bolt, three washers and a Nyloc nut in the positions illustrated below.

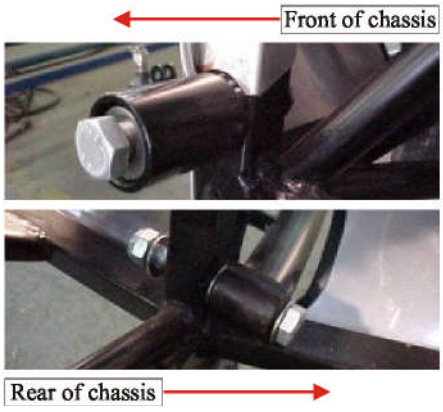


During this procedure, rotate the nuts onto the bolts until the thread just begins to bite into the nylon. Do not fully tighten. Torque settings and setup are described after the relative engine installation.

3. Secure the front fixing to its chassis mounting point using a M12x1 00 bolt, three washers and a Nyloc nut in the positions illustrated below.



To ensure steps 2 and 3 have been followed correctly, ensure the bolt head on the front fixing faces towards the front of the chassis and the bolt head on the rear fixing faces towards the rear of the chassis.



To ensure there is no sideways play (end float) in the installed wishbone, the following procedure must be

applied:

a. Standing directly in front of the chassis, firmly pull the wishbone towards you.

Lower Wishbone Procedure cont.

b. Still pulling the wishbone forward, view the front fixing from above to ascertain whether or not a clearance exists between the wishbone and the chassis as illustrated below.

If such a clearance does exist, it is important to take it up with the extra 12mm flat washer that is supplied.

4. Repeat the procedure starting with step 1 for the installation of the lower left hand wishbone.

Components in this assembly		Qty	Part Number
I	Bolt M12 x 60	2	B5358055AA
ii	Bolt M12 x 65	2	B5358056AA
iii	Bolt M12 x 95	2	B5358058AA
iv	Nut M12 Nyloc	6	B5358060AA
v	Washer 12mm Flat S/S	14	B5358061AA
vi	Upper wishbone	2	M3551050AB
vii	Wishbone shock spacer	2	M3851015AA

NB **It is advisable to fit the front shocks while fitting the upper wishbones. Birkin recommends that OE (original equipment) shocks and springs are fitted. Engine type and desired setup will determine the spring rate. For information on spring rates and setup, please contact your Birkin agent.**

K3601258AA - Shock Absorber Assembly. Zetec, available in Group 10 - Optional Extra's, have been used in this procedure.

Procedure

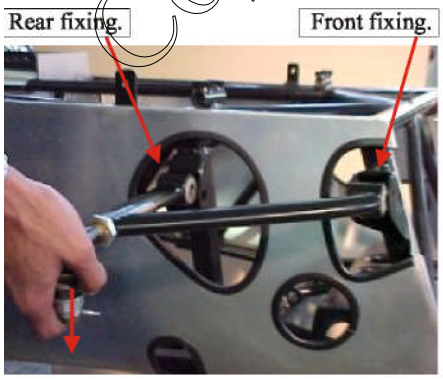
1. Offer the upper right hand wishbone assembly to the mounting points on the Right hand front of the chassis as illustrated.

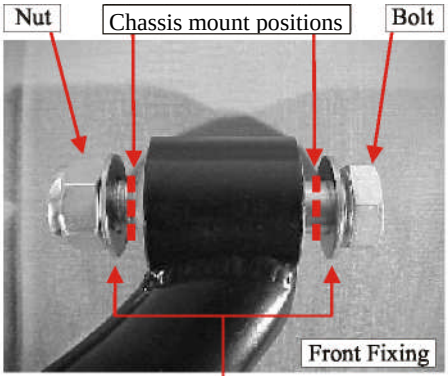
2. Secure the front fixing to its chassis mounting point using a M12x60 bolt, two washers and a Nyloc nut in the positions illustrated below.

NB **Before the shock and spring assemblies are installed in the steps that follow, it is important to note the different fixing points and the location of the shock adjustment control as illustrated below.**

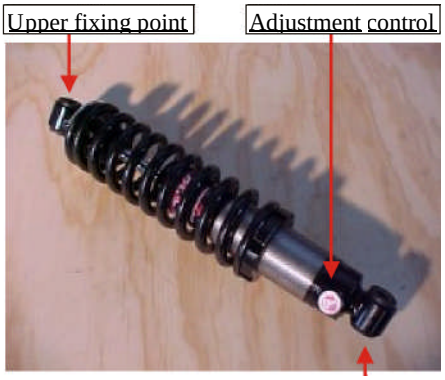
NB **Ensure the ball joint is pointing down. Note the front fixing is situated at the end of the longer arm.**

NB **Do not fully tighten any of the wishbone bolts during this procedure. Torque settings and setup are illustrated after the relative engine installation.**





Washer positions

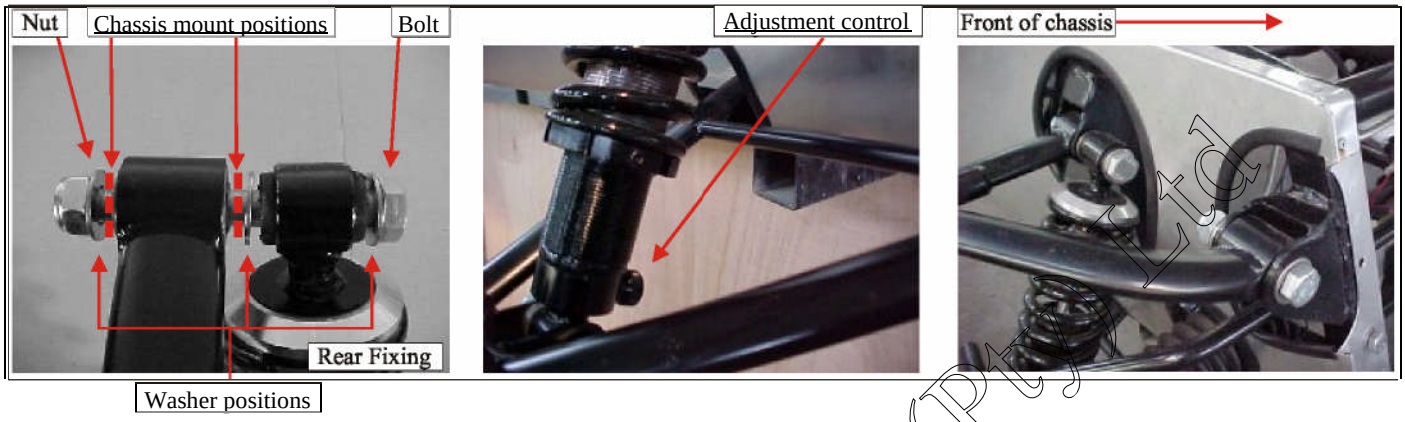


Lower fixing point

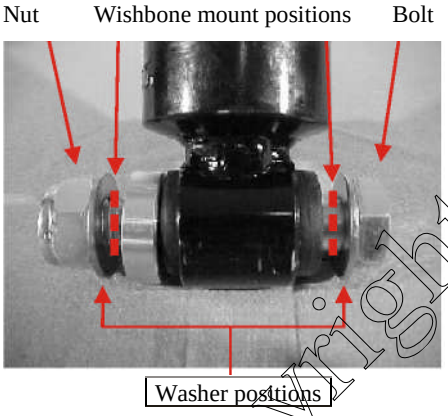
3. Using a M12x95 bolt, three washers and a Nyloc nut, fit the upper fixing point of the shock and spring assembly and the rear fixing point of the wishbone to the chassis

When installing shock assemblies, ensure the Shock adjustment control is facing towards the chassis.

Ensure that the heads of the bolts installed in steps 2 and three are facing the front of the chassis.



4. Using a M12x65 bolt, two washers , a shock spacer and a Nyloc nut, fit the lower fixing point of the shock and spring assembly to its mounting point on the lower wishbone as illustrated below.



5. Repeat steps 1 to 4 for the installation of the left hand upper wishbone. .

3:3 STABILISER BAR - K3601023AA

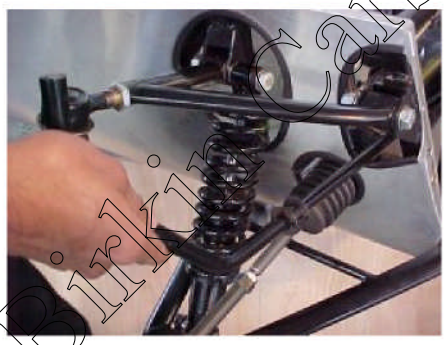
Components in this assembly		Qty	Part Number
I	Bolt M8 x 60	2	B5358085AA
ii	Washer 8mm flat	2	B5358088AA
iii	Grub screw M6 x 6	2	B5358125AA
iv	Anti-roll Nylon bush	2	B5451185AA
v	Anti-roll bar	1	M3401 162AA
vi	Anti-roll bar mounting block	2	M3801001AA
vii	Locating Boss	2	M3851058AA

Procedure

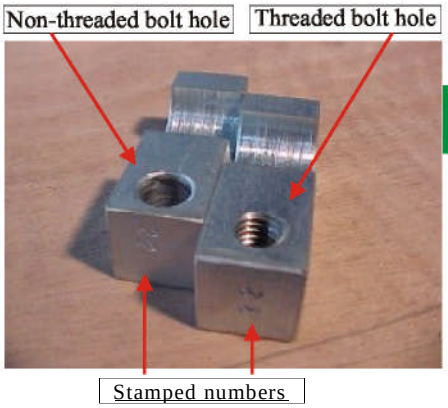
1. Fit the Nylon bushes to the mid section of the anti-roll bar as illustrated with one bush below.

2. Carefully feed the anti-roll bar through the cut out below the upper wishbone front mounting points.

NB **Ensure the ends of the anti-roll bar point towards the rear of the chassis.**

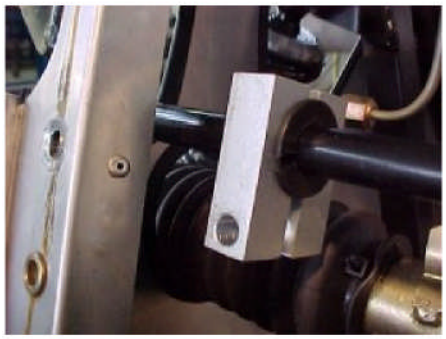


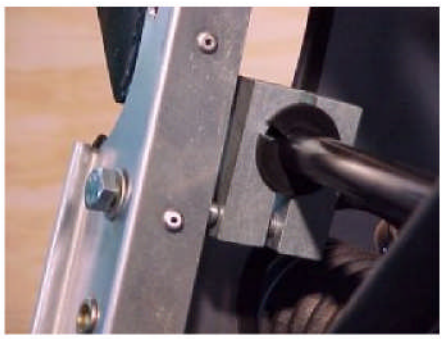
NB **The anti-roll bar mounting blocks are matched pairs, identified by stamped numbering however, the two halves are not identical. One of the halves has a threaded bolt hole.**



3. Place the matching pairs of the mounting blocks around the nylon bushes with the non-threaded block nearest the front of the chassis.

NB **The bolt holes must sit below the anti-roll bar.**





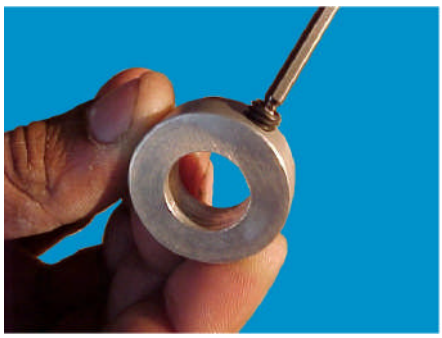
4. Secure both pairs by placing a M8x60 bolt complete with a washer through the chassis and the non-threaded bolt hole of the first block. Rotate the bolt into the threaded bolt hole of the second block but do not fully tighten.

NB

5. Centralise the anti-roll bar to the chassis by ensuring equal distances from the centre point of the bolt heads, securing the rear fixing point of the upper wishbone, to the ends of the anti-roll bar.

Torque the mounting block bolts to 34Nm.

6. Place the two, M6x6 grub screws halfway into the locating boss's.



7. Slide the two locating boss's over the ends of the anti-roll bar until they rest against the mounting block bushes then fully tighten the M6x6 grub screws.

Components in this assembly		Qty	Part Number
I	Nut M10x1 pitch	2	B5358034AA
ii	Washer 10mm flat	2	B5358132AA
iii	Upright assembly L/H	1	M3551071AB
iv	Upright assembly R/H	1	M3551072AB
v	Brake pipe mounting bracket	2	M3101038AA

All torque settings of bolts and nuts as well as bearing pre-loads on the upright assemblies are set before delivery. Do not adjust anything on the upright assemblies unless stated in the procedures that follow.

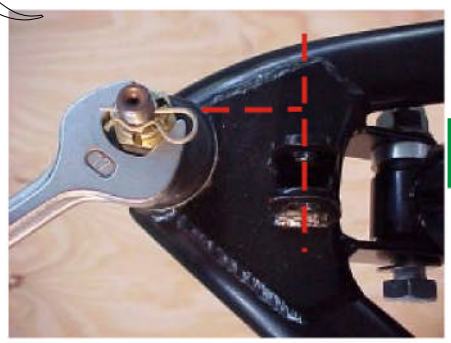
The ball joints are pre-aligned for upright installation before delivery however, incase of mis-alignment during shipment, it is essential they are checked and, only if necessary, realigned with the following procedure.

Alignment Procedure

The ball joints on the lower wishbones are correctly aligned when the straight length of the 'R-clip' is perpendicular to the stabiliser bar linkage mounting points as illustrated to the right.

Realignment

1. Remove the R-clip, castle nut and washer from the ball joint. Replace the castle nut and rotate in a tightening motion until it reaches the end of the thread. Replace the R-clip and then, using a 17mm spanner, turn the castle nut until the R-clip reaches alignment.



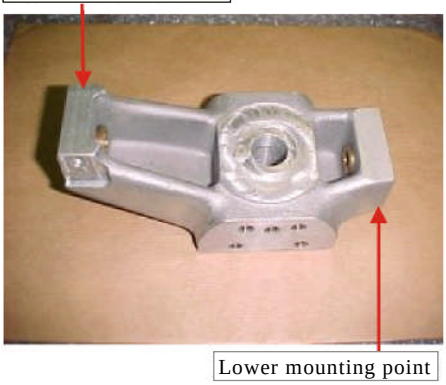
The ball joints on the upper wishbones are correctly aligned when the straight length of the 'R-clip' is parallel to the ball joint support bolt as A illustrated to the right.

Realignment

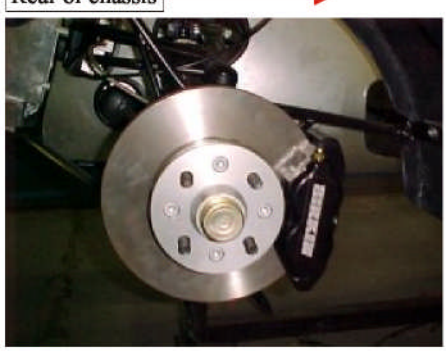
1. Remove the R-clip from the ball joint then rotate the castle in a tightening motion until it reaches the end of the thread. Replace the R-clip and then, using a 17mm spanner, turn the castle nut until the R-clip reaches alignment.

Installation Procedure

The upright assembly has an upper and lower mounting point as illustrated right.



The left hand and right hand uprights are determined by the position of the calliper. Eg. The calipers, when installed, must face towards the rear of the chassis as illustrated far right.

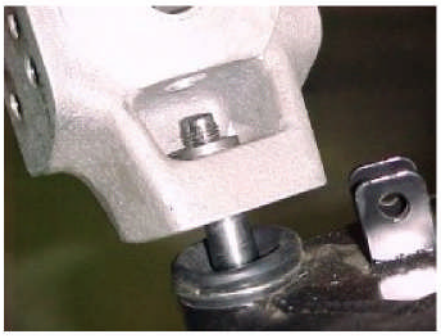


Upright Installation Procedure cont.

1. Remove the R-clip, M10 castle nut and washer from the right hand lower wishbone ball joint.

3. Remove the R-clip, M10 castle nut and washer from the right hand upper wishbone ball joint.

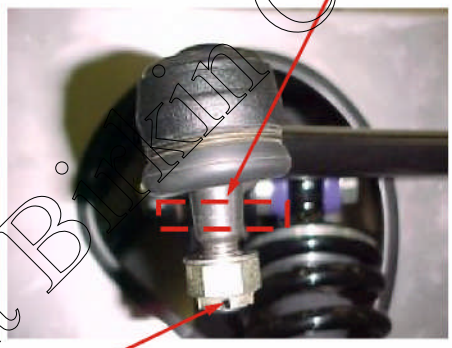
5. Place the right hand upright assembly's lower mounting point over the thread of the lower ball joint's bolt.



7. Replace the washer and the M10 Castle Nut. Tighten to 6Nm and then further tighten until a castle slot aligns with the hole for the 'R' clip. The 'R' clip must then be inserted.

5. Slide the right hand upper wishbone ball joint bolt into the uprights top mounting point.

6. Replace the washer and the M10 Castle Nut. Tighten to 6Nm and then further tighten until a castle slot aligns with the hole for the 'R' clip. The 'R' clip must then be inserted.



7. Repeat steps 1 to 6 to install the left hand upright assembly.

NB **The remaining Brake hose mounting brackets, washers and M10x1 pitch nuts must be stored in a safe place until the radiator is fitted in Group 5.**

3:5 FRONT STABILISER BAR LINKAGE - K3601183AB

Components in this assembly		Qty	Part Number
I	M8X30 Cap screw	2	B5358062AA
ii	M8 Nyloc nut	2	B5358092AA
iii	Linkage assembly	2	M3101006AB

NB **The Upright assemblies were removed from the chassis for the sake of photography only. They are not to be removed for the installation of the linkage assemblies.**

Procedure

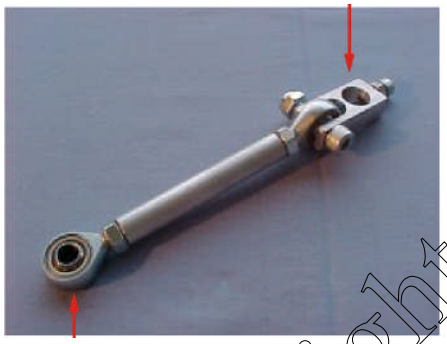
NB **The linkage assemblies have two mounting points, an upper, and a lower rose joint as illustrated below.**

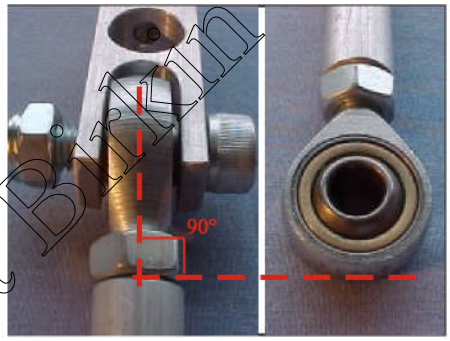
NB **The two rose joints of a linkage assembly are aligned at ninety degrees to each other before delivery. Ensure this is still the case before installation.**

1. Using a M8x30 cap screw and Nyloc nut, secure a lower mounting rose joint between the linkage tags on the lower left hand wishbone.

NB **Ensure the cap screw's head faces towards the front of the chassis then torque to 11Nm.**

Upper Mounting Point



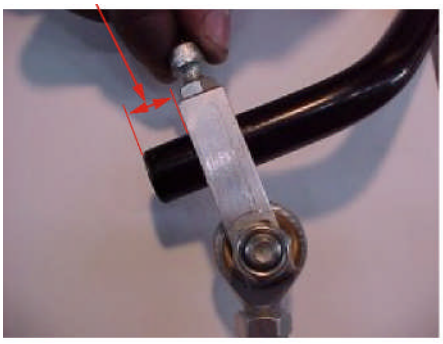


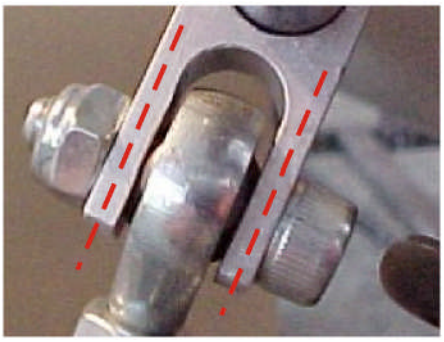
Lower Mounting Rose Joint

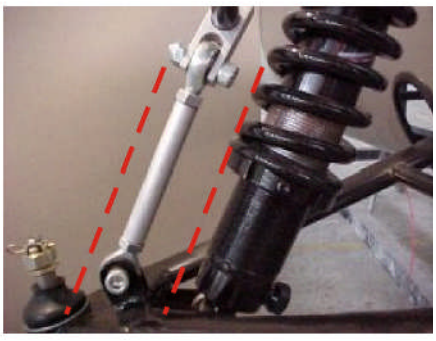
2. Slide the top mounting point of the linkage onto the anti-roll bar until it measures 10mm from the end then tighten the cap screw by hand.

NB **Viewing the linkage from the front of the chassis, ensure the following. The clearances between the upper rose joint and the mounting bracket are equal and parallel. The complete linkage assembly is parallel to the shock and spring assembly.**

10mm







Front Stabiliser Bar Linkage Procedure cont.

3. Using a 5mm allen key, from hand tight, tighten the cap screw a further ¼ turn.

4. Tighten the lock nut, located on the cap screw, against the mounting bracket.

5. Repeat steps 1 to 4 to connect the second linkage assembly to the right hand side lower wishbone and anti-roll bar.

Over-tightening of the cap screw may cause the thread in the mounting bracket to strip.

Cycle Fender Attachment Procedure

This procedure should only be executed after the cycle fenders have been painted.

1. Slide one of the M5x20 washers, removed from the mounting plate in Group 1, into place over the stud hole between the plate and its reinforcement.

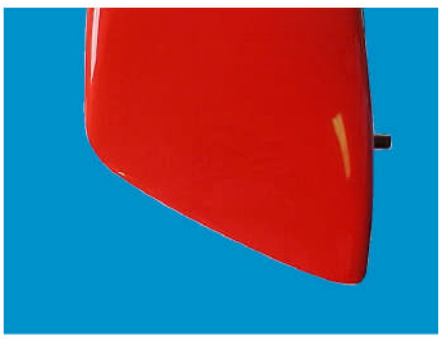
2. Still holding the washer in place, position the mounting plate with its rubber spacer onto the threaded studs that protrude underneath the cycle fender.

3. After positioning a second M5x20 washer onto the vacant stud, replace a M5 Nyloc nut onto each stud.

Tighten the Nyloc nuts by hand until the thread just begins to feed into the nylon of the nut. It is essential for the attachment of the cycle fender to its mounting brackets that the mounting plates remain loose.

Repeat steps 1 to 3 for all remaining mounting plates.

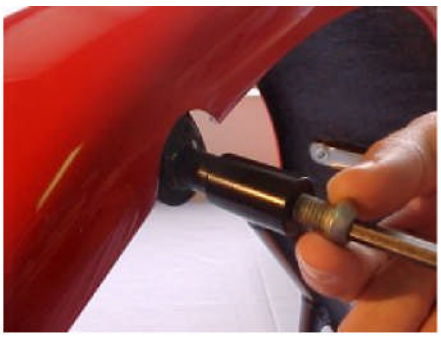
The slanted edge of the cycle fender must point towards the front of the chassis.



Cycle Fender Attachment Procedure cont.

4. Remove the M8x25 domehead screws from cycle fender mounting plates then slide the mounting plate studs into the sleeves of the cycle fender mounting brackets attached to the upright assemblies.

5. Using a 5mm allen key, replace and tighten the domehead screws.



6. Tighten all the M5 Nyloc nuts under the cycle fender until the thread protrudes the top of the nut by 1mm.