



# COMPETITION BUILD MANUAL

NOVA/CORSA





COMPETITION  
**BUILD**  
MANUAL

NOVA/CORSA

*COMPILED*

*AND*

*DEvised*

*BY*

*Andrew Duerden*

*WITH*

*Gordon Birtwistle*


 **EUROSPORT**

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2nd Edition

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Ever since the basic Nova appeared on the competition scene back in 1985, clubmen have been recording success after success. In its first year of rallying, the potent GM Dealer Sport Nova GTE in the hands of Dave Metcalfe, showed a fantastic turn of speed, emphasising its competitiveness and serving notice of its potential for honours.

That initial Nova GTE was put together by Engineer Brian Ashwood and his team. Their background work prepared the foundation for the new Nova/Corsa project, the Motor Sport Development engineers - David Gray, in particular - developing and acquiring the many and varied parts and components to produce the "Clubmans" Kit. The kit, together with this manual now ensures that anyone can faithfully reproduce the factory specification, relying on the techniques and experience gathered from many years of successful competition and, hopefully, gain the results that have now been shown to be within the Nova/Corsa's capability.

This manual sets new standards in providing an exact and detailed guide to the preparation of a vehicle for motorsport use. Andrew Duerden, together with Gordon Birtwistle, has tapped that vast reservoir of specialist knowledge held by the Motor Sport Developments engineering staff to produce a unique reference book. The mystique behind building a top-flight competition car has now been removed - now its down to the driver.

Good Luck.

Melvyn Hodgson  
Chairman and Managing Director  
Motor Sport Developments



Every effort has been made to ensure that the contents of this publication were accurate and up-to-date at the time of going to press. No liability can be accepted by the authors or publishers for loss, damage or injury caused by errors in, or omission from, the information given.

Motor sport can be hazardous and the inclusion of any information does not necessarily make it safe to use in any form of competition or testing.

The modifications described in this publication are, in some cases, of an extensive nature but have all been specifically designed to give the ultimate performance. These may adversely affect the normal life of standard parts and may thus affect the New Vehicle Warranty. This does not mean that the performance car will be unreliable - in fact, it may be assumed that it will be at least as reliable as other cars of comparable performance.

Any inclusion of performance parts in the Clubmans Kit or parts described in this booklet does not necessarily mean that the parts comply with the relevant homologation regulations or National Type Approval requirements. It is the competitors responsibility to ensure that his vehicle complies with regulations and is eligible for the specific homologation category for which the vehicle is entered.

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Nova GSi Super Challenge competitors on the Ypres rally



This manual has been specifically produced in conjunction with the GM Euro Sport package of parts assemblies and components produced by Motor Sport Developments and known as the "Clubmans Kits". Consequently, the text refers exclusively to the preparation of a Nova/Corsa model to FIA International Group A level to the specification within the Clubmans Kit. Other parts and assemblies can be used in preparation of a group A Nova/Corsa, but they are not included in this manual and do not form part of the GM Euro Sport package.

The manual has been laid out with easy-to-read pages within well - defined sections. The preparation chapter has been sub-divided into various sections referring to vehicle sections - bodyshell, running gear, etc - this has then been subdivided into the separate divisions relating to specific components. At the end of each section, you will find a parts diagram together with a list of parts and assemblies referred to within that section. The actual pricing list is in a separate booklet supplied with this manual.

Now you have received the manual, it is of paramount importance that the registration card at the front is completed and returned. This card is the only method by which to ensure further updates for the 12 month period following registration will be sent to you. As new equipment is developed or a component is evolved, bulletins to update the manual will automatically be sent to those who have registered on the cards provided.

This manual is designed to provide you with the fullest information on the preparation of a Nova/Corsa model for international rallying. We are always interested to know your comments in writing on any aspect that you feel could be improved or modified. We will also be happy to receive any details of omissions or items that you would like to see in the manual. Only by feedback can we continue to improve on what is hoped will be a helpful and informative book.



## MODEL AVAILABILITY

When preparing a vehicle to the clubmans specification contained in this manual, it is intended that the base vehicle used will be an existing Nova GTE or Corsa GSi. These models are identical save for badging and very small differences in trim. Additionally, some slight variations on standard specification occurs, territory to territory. For instance, most Nova GTE models sold in the U.K. come equipped with central locking and sunroofs. Corsa GSi models sold in right hand drive form in the Republic of Ireland do not have these two items fitted as standard. However, apart from these minor differences, the main mechanical characteristics remain the same.

The motive unit is a "Family One", nominal 1600 cc, overhead camshaft, fuel injected type which is designated 1600 SE and, currently, is not fitted to any other vehicle. The 'Family One' group of engines (which includes the 1200 cc and 1300 cc version with different bore/stroke configurations) also includes a carburettored 1600 cc unit (known as 1600 SV type) which has a different cylinder head and distributor to the SE motor, but in most other respects remains the same.

The transmission is known as the F13 type and the basic production unit is fitted, in five speed form, to all GM 1600 cc Family One engined Vauxhall and Opel cars.

The 1600cc injected Nova and Corsa GTE/GSi models were first introduced in the spring of 1988 and received no major revisions to the standard specification until late 1990 when a facelifted version was introduced. This model incorporated revised bumpers, grille, front wings and headlamps coupled with a new interior styling package, and was referred to as a GSi in both Nova and Corsa livery.

Although this manual concentrates on the preparation of vehicle using a Nova/Corsa GTE/GSi as a base, the section concerning bodyshell preparation does include details on the minor differences in bodyshells, if preparing a car from another hatchback bodyshell from the range of various cubic capacity Nova/Corsa models.



Vauxhall Nova GSi

## HOMOLOGATION



The Vauxhall Dealer Sport Nova in Scrutineering



The use of production series cars in international motorsport is governed by a set of rules and regulations laid down in the annual 'Year Book of Automobile Sport' issued by the FIA (the governing body) and specific vehicles require documents to verify their approval for use, and these are issued by the International Motor Sport Federation (FISA) as the Sporting Ministry of the FIA, and are contained in Homologation Papers.

The 1.6 injected Nova and Corsa models are contained in one document covering both badged variants. The relevant document has been issued with the FISA Number A-5375 and is obtainable from the ASN or National Sporting Authority of the country in which you are based. At all events in which a car is entered within the group A classification, the vehicle must have the FISA Homologation Papers. The responsibility of obtaining these papers from the ASN is that of the entrant and/or driver.

As a guide, a set of specimen homologation papers for the Nova GTE/Corsa GSi are included in this manual. These papers CANNOT be used as homologation documents at event scrutineering.

From the specimen set, you will see that the first 16 pages refer to the basic specification of the production vehicle. The following pages then refer to specific items used in motorsport and unless the item is included within these pages, it cannot be used on a vehicle prepared for group A classification. You will find that the "extension" papers (i.e. those pages after the first 16 basic sheets) refer to a number of the same items but to different specification or dimensions. For the purpose of the Clubmans Kit, all items are homologated and are recommended fitment, even if there are other similar items homologated. It is the case that although, say, a number of brake disc/caliper combinations have been homologated and tried on the Nova/Corsa models, the actual unit used in the clubmans kit, and referred to in the text, has been found to be the best alternative and has been developed specially for the Clubmans Kit package. Therefore it is the only unit that should be fitted.

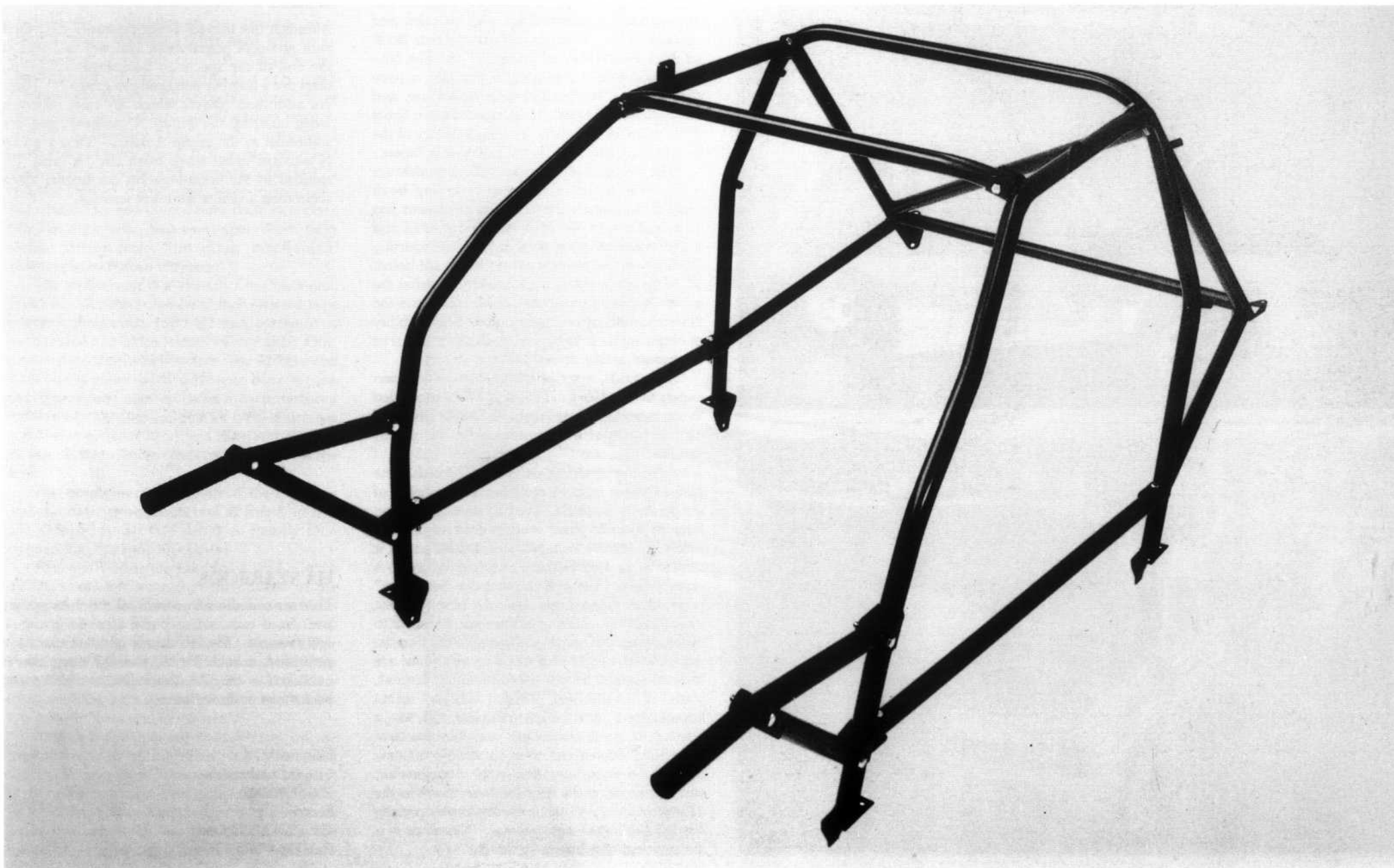
## GROUP N

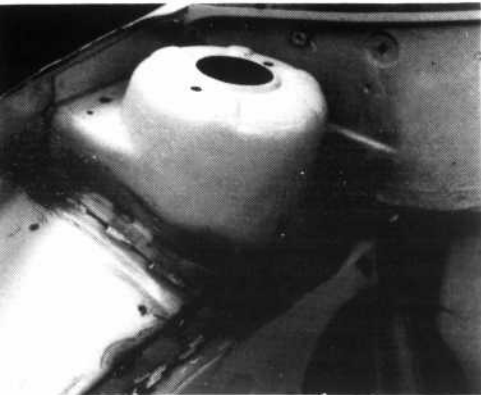
Although this manual is not primarily concerned with group N preparation, you will find that at the end of the specimen homologation sheets, there are a number pertaining to group N. These are additional sheets which are only required when entering the group N category, and are additional to the group A sheets. Thus a group N entrant must have both the 'A' and 'N' sections of the homologation documents when submitting a vehicle for event scrutiny.

## FIA YEARBOOK

This manual should provide all the information and detail required to build a car to group A specification. The full details of what exactly is permitted in both the 'A' and 'N' categories is published in the FIA Yearbook, available from bookshops or direct from:-

Editions V.M.  
116, bd Malesherbes  
75017 PARIS  
France  
Tel: (1) 42.27.25.44  
Fax: (1) 47.66.57.74

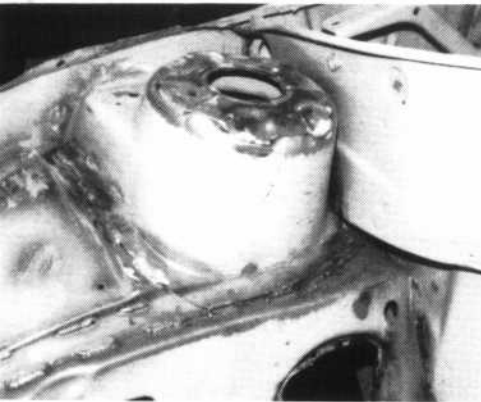




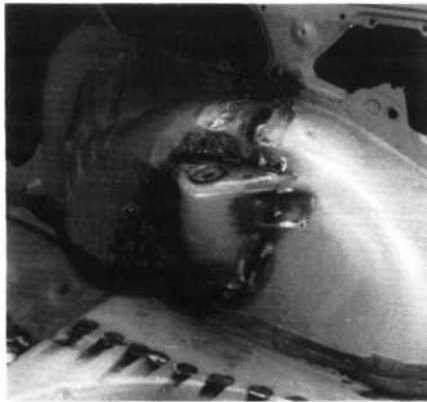
*The standard front turret*



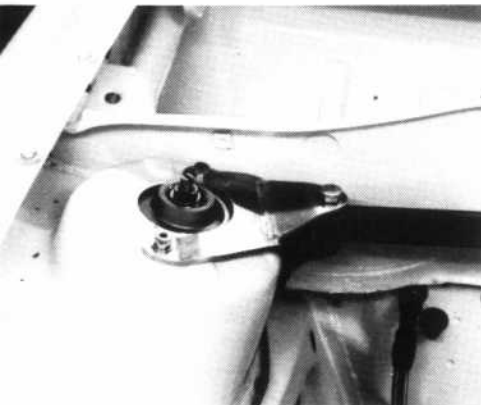
*Interior rear wheel arch*



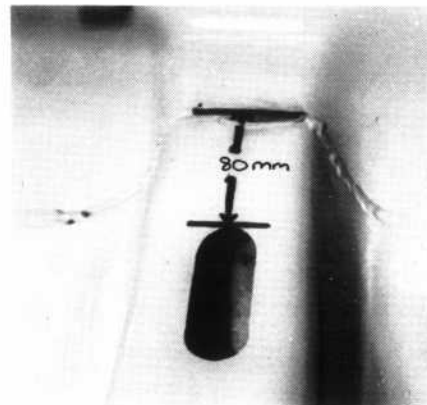
*As above but with reinforcing plate*



*As above with brackets removed*



*The suspension brace installed*



*Gear linkage access hole*

The Bodyshell preparation and strengthening procedures outlined in this manual are fundamental to the success of the finished project. They will both extend the competition life of the shell and by increasing its torsional stiffness contribute favourably towards the handling characteristics of the finished vehicle. FIA Regulations, Appendix "J" for Touring cars, Group A permit a limited amount of bodyshell reinforcement, but it is important to adhere strictly to the definitions of the particular Article No. 5.7:1 Lightening and Reinforcements. All modifications outlined within this chapter are in compliance with these guidelines.

General Motors Europe have extensive motorsport experience with the Nova/Corsa model and have developed a body strengthening kit specifically for use in conjunction with the 1600cc. model range. This kit includes all the additional reinforcement plates required for the suspension pick-up points, engine mounting points, roll cage pick-up points and a side jacking point, etc. When fitted in conjunction with the requisite additional welding as described, will give an adequate degree of increased strength and durability demanded by a motorsport environment.

A specially designed roll cage has been developed and homologated for this model. This cage also incorporates the rear mounting points for the safety harnesses.

Due to the nature of the modifications, they can only be effectively carried out on a bare bodyshell, so if your starting point is either a new 1600 Nova GTE or Opel Corsa GSi, then all mechanical, trim and electrical components must be completely removed from the vehicle before embarking on any aspects of bodyshell preparation. Whilst this section applies primarily to bodysells with Part Number 90297213 LHD, or 90297215 RHD, bodysells from other sources can be used, although they may differ in several basic respects. The main differences being confined to the front suspension turrets and the inner and outer chassis rails. They have already been additionally strengthened in the 1600 models. From experience these bodysells

do not present any problems under motorsport conditions, and are equally as good as the 1600 shell when fully prepared with the body strengthening kit. Obviously some additional plating and welding could be required particularly in these areas on bodysells from an alternative source.

Before commencing any bodysell preparation operations, both front wings, doors and tailgate must be removed from the bodysell. All sound deadening material and general sealants around all body seams can then be removed to provide more favourable welding conditions. The application of heat to the required area will enable any surplus material to be scraped off more readily, finishing off the operation with a wire brush. It's a fairly laborious task but very important and if thoroughly carried out will pay dividends at the welding and later stages of preparation.

Any surplus brackets, unused supports such as brakepipe/petrol pipe clip attachment points can be removed, and to enable a revised seat mounting system to be fitted, the standard seat adjustment/mounting brackets should also be removed with care. This will enable a much more satisfactory installation of a wide range of competition type seating for both driver and co-driver. Also carefully remove both the gearlever gaiter support bracket and the centre support shelf from the centre tunnel section, in readiness for the installation of the revised gearshift and linkage at a later stage. Once the carpet centre support has been removed, an elongated hole, approximately 80mm by 25mm must be formed in the centre section of the floor panel, along its centreline, starting 80mm rearward of the tunnel to bulkhead bodyseam. This is to give access to the engine bay for the revised gear linkage. The area of centre tunnel and exposed hole immediately below the gearlever support bracket can be closed off and strengthened using the shaped blanking plate supplied. This should be welded into place.

The gear-linkage forward support bearing housing bracket should be welded into position at the forward end of the centre tunnel.

Access for this operation is from the underbonnet and underside of the bodyshell. However, before welding this bracket into place, the bearing housing itself should be modified to fit the bracket correctly. This will entail cutting away a portion of the bearing housing flange just below two of the attachment holes. Three holes should then be drilled through the housing and bracket, using the housing as a template. Three nuts should then be tack welded to the rear face of the bracket. This will enable easy attachment of the bearing housing to the bracket after it has been welded into position.

This bracket is shaped to fit the exact position required, and when measured should be 65mm rearwards from the face of the steering rack mounting plate. This should then exactly locate the bracket in its correct position, which when measured should be 65mm rearwards from the face of the steering rack mounting plate.

**NOTE:** This is a delicate operation as the positioning of this support bracket is crucial for satisfactory gear linkage operation.

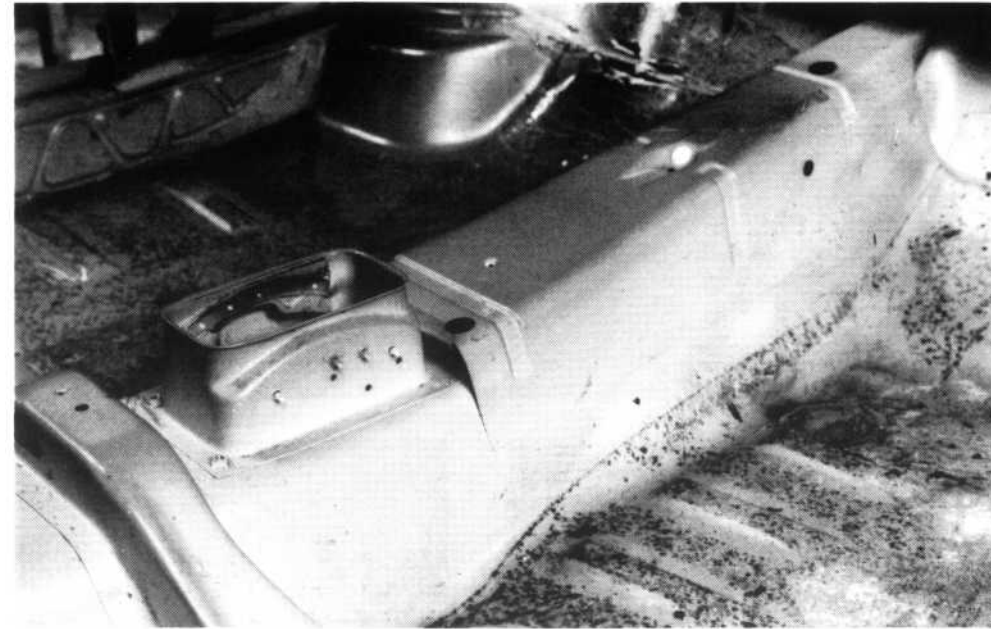
The aperture in the steering rack mounting bracket where it meets the lower chassis region must also be increased in size along the lower edge by removing 10mm from this flange. Seam weld the section after removing this metal.

**NOTE:** This **MUST** be carried out at this stage to give adequate clearance for the revised gearchange mechanism.

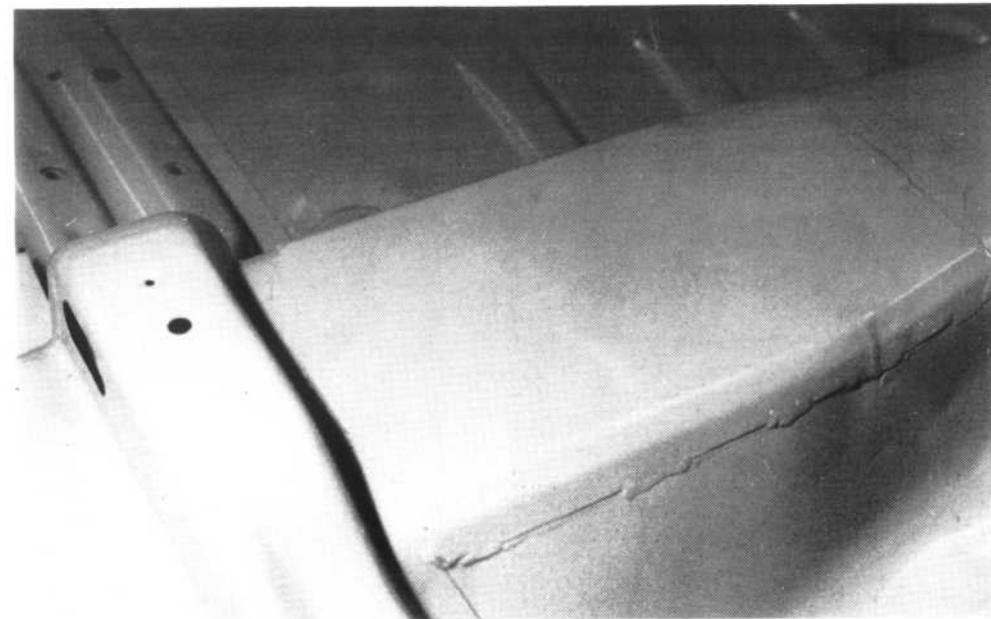
Refer to the diagrams for guidance.

The bodyshell, now free from all unwanted items, can be cleaned off in readiness for the seam welding and strengthening operation. All exposed body seams throughout the bodyshell that are actually spotwelded in the production process require further "stitching", preferably with a MIG-type welder. This entails making an additional 25mm run of weld every 35mm along **EACH** visible body seam throughout the bodyshell, and applies equally to the underside, underbonnet and bulkhead areas. However, the lower flanges of the front chassis rails where they join the inner wheelarch require special attention. Using either a spotweld cutting tool or drill bit, carefully cut through **ONE THICKNESS** of the

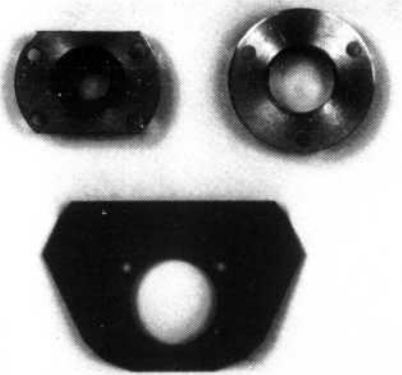
seam in between each production spotweld and fill hole with weld, forming a "puddle weld". In addition to this operation, certain areas require further reinforcement by welding on additional, specially profiled mild steel plates. These are supplied in the kit, their profile following that of the original area and by double skinning give the additional strength required. Final positioning will be apparent when the plates are placed against the designated area, and should not require further modification prior to welding in place. The inner pivot point for the bottom wishbone can be further strengthened by welding a large metal washer onto the forward face. The hole through the pivot should then be opened out to 12mm, to accommodate the larger diameter bolt. The bodyshell also has in excess of 20 drain holes in the floorpan, these must be closed off by welding the circular discs supplied over the holes. The side lift jacking point can now be fitted. Place the strengthening plate against the sill and mark the centre of the hole required. This should be 22.5cm rear of the front wing joint on the sill. Cut a 35mm. hole through outer skin only. The inner 35mm. hole should be formed with its centre 55mm. above the floor panel, so that when the tube is introduced it is not parallel to the ground, but slopes upwards towards the inside of the bodyshell. The tube can now be inserted through the plate and sill, before finally welding into place.



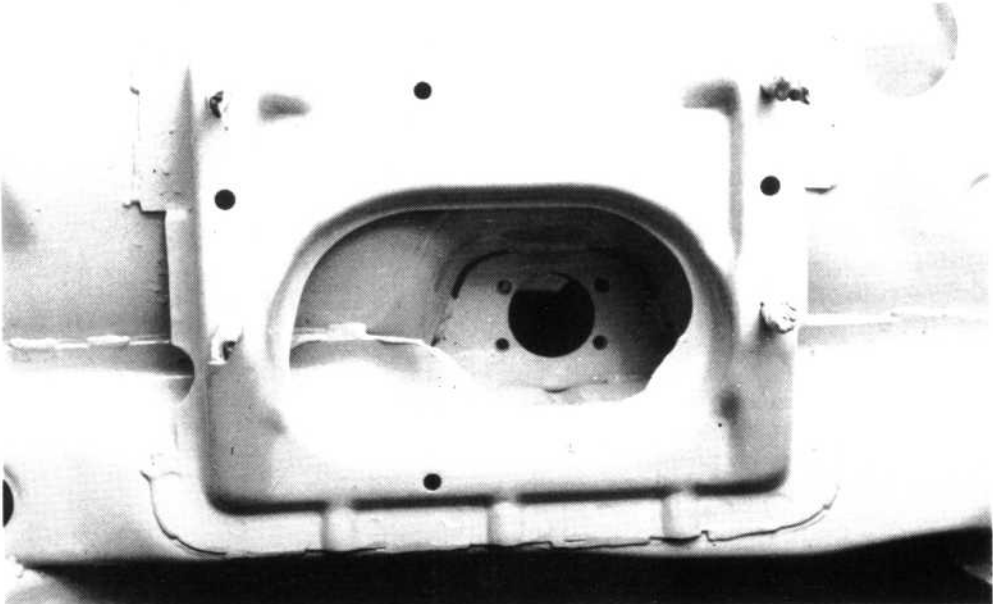
*Centre tunnel prior to modification*



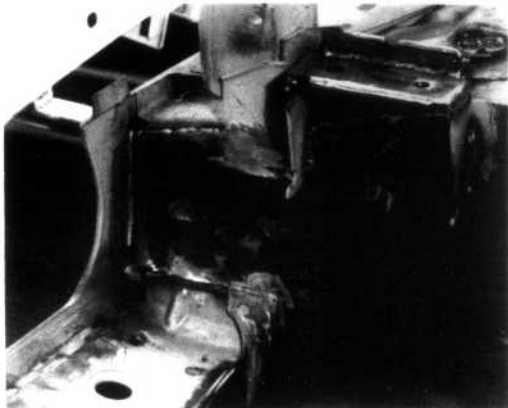
*The blanking plate in position*



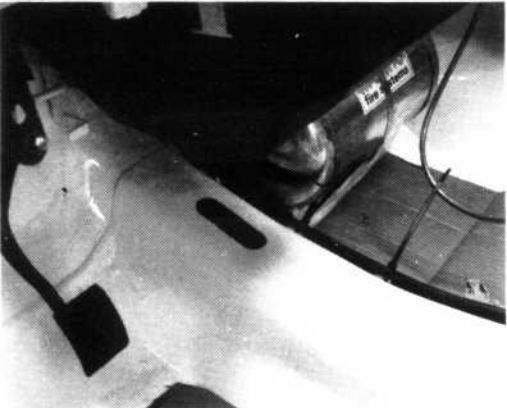
*Gear linkage bearing/bracket*



*Looking rearward through to the bearing housing bracket*



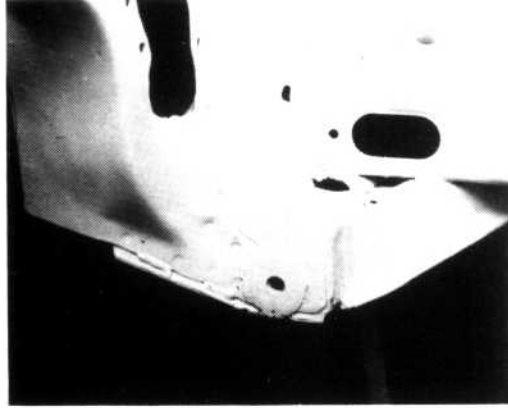
*Front valence bracket mounting*



*Gearshift linkage access*



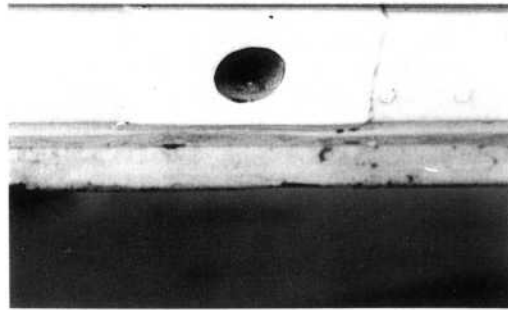
*The completed inner wing — note 'stitch welding'*



*Washer added to suspension mount*



*Reinforced lower arm mounting*



*Jacking point in the sill*

Please note that both front wings **MUST** be removed for this operation.

Thoroughly check items supplied against the component parts list to make sure that there are no shortages. It is advisable with a complex, multi-point cage such as this to loosely assemble the cage prior to making any attempts to actually fit the structure to the car. Reference to the roll cage assembly drawing will give a clear indication of the intended final construction. You **will** then be more familiar with the individual components and where they will eventually be secured. Once this has been established the cage can be split into sections ready for assembly into the bodyshell.

Position the rear frame alongside the bodyshell, and tilt it forward such that the mounting points for the rear suspension turrets are uppermost. Maintaining this position, pass the frame through the door aperture, into the bodyshell and locate the foot mountings onto the sill. The frame, still tilted forward at the top, can now be moved towards the rear of the bodyshell, then turned to an upright position and further rearward until the rear suspension turret mountings can be located centrally onto the rear suspension turret tops. Now drill a 10mm. hole on each rear turret mounting and insert a bolt. The rear part of the roll cage is now located in its correct position.

Position the foot mounting brackets (Sill Mounts), making sure that they are seated correctly on the sills and accurately mark out the six attachment bolt holes. Detach the rear turret mountings and move the frame forwards so that the six holes marked out can now be made to 25mm diameter. Attach the foot mountings to the rear frame and bolt up fully before returning the frame to its fitted position. Drill out the remaining rear turret mounting bolt holes and fully attach with the 10mm bolts. The foot mountings can now be welded in position to the sills. It is important to clean this area thoroughly to ensure good welding conditions for this operation.

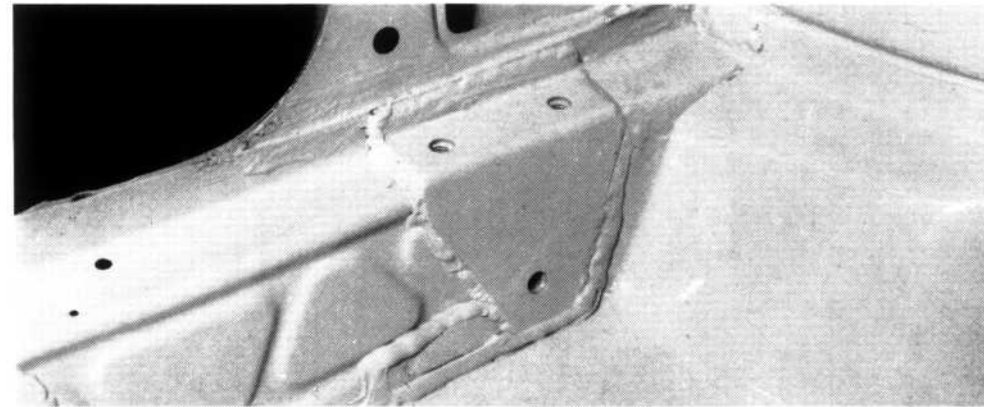
Now the two rails can be positioned and attached to the rear frame with bolts. Fit the front roof rail to prevent the side rails from

falling inwards, whilst the front frame foot mountings are positioned on the sill. Mark out and attach these to the sill in the same manner as at the rear.

Two mounting blocks are provided, with tabs to give additional attachment for the side rails. These attach to the roof stiffening rail above the door aperture. Position these, drill the two holes and bolt into position. The door rails and the front roof rail should be loosely bolted in position at this stage.

There are two forward facing brackets on each of the side rails, which are to carry the arms that attach to the front suspension turret area. The upper bracket on each side should ideally be close to or in contact with the actual door pillar at that point. However, because of tolerances in both the bodyshell and rollcage a spacing washer may be required to 'bridge the gap' prior to tightening the attachment bolt to the door pillar. Using this bracket as a guide, with extreme caution, pass a 10mm. drill through the bracket and drill outwards through the shell until the point of the drill **JUST** starts to **SHOW** on the outside of the shell, then **STOP** drilling. Using a hole saw, the drill bit acting as centre, open out this hole to 25mm from the **OUTSIDE** of the car through only **TWO** of the panel thicknesses, **LEAVING** the pilot hole in the **INNER** skin at 10mm diameter.

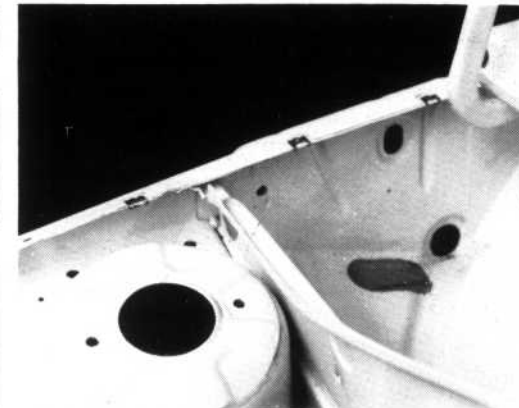
The front suspension turret/front tower arms can now be fitted. A template is supplied to assist in marking out the holes required through the bulkhead area and into the windscreen wiper motor well for these front support arms. The template is for the **RIGHT** side of the car looking forwards, the position for the other side can then be judged having completed the operation on this right hand side unit. Take extra care when cutting out these holes, it is better to make them too small initially and progressively increase them to give a close-fitting. This then leaves less of a gap to be filled after final completion of the roll cage installation, and maintains compliance with the fireproofing requirements. Now feed this support arm into position from the front of the car and bolt to the side rail top mounting. Mark out



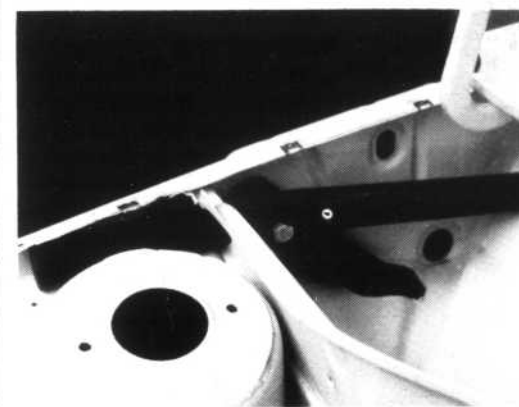
*Foot mounting welded in position*



*Upright close to door position*

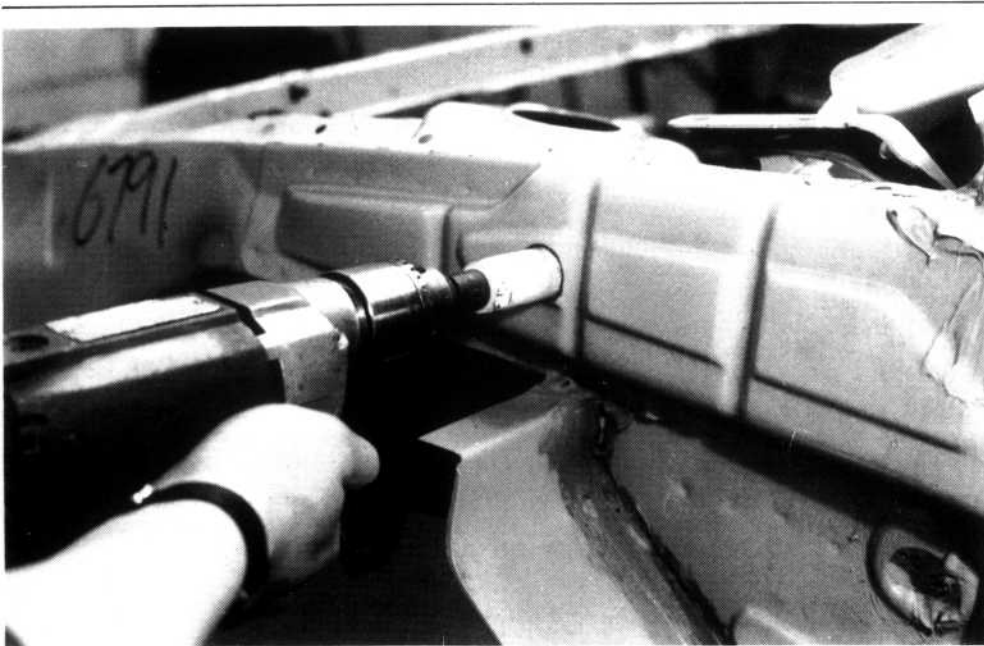


*Holes in bulkhead*

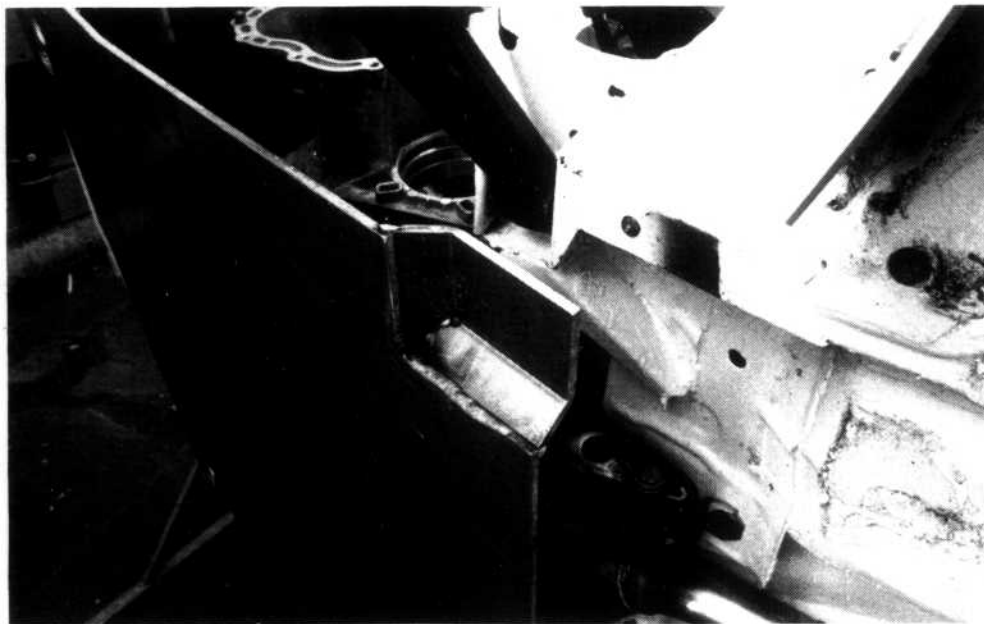


*Front extension arms installed*





*Opening of the hole from the outside of the car*



*Marking the rear shield attachment point*

the two holes alongside the suspension turret and drill out to 10mm. A third 10mm. hole has to be drilled at the point where the diagonal support meets the front tower arm, but opened out to 25mm on the outer skin of the chassis member, to enable the fixing bolt to be inserted and tightened. Bodysell and rollcage tolerances again may require spacing washers to be fitted to 'bridge the gap' between the tower arm and the body panel prior to tightening the attachment bolt. Again, use the 10mm. hole as the pilot hole for the hole saw. The diagonal support arm can now be passed down through the wiper motor well area to the lower attachment point, the front tower arm can then be positioned and the assembly fully secured. Repeat this procedure for the other side of the car.

Four heavy gauge washers and fixing blocks are now left. These are for additional attachment of the sides of the rear frame. Drill 10mm holes through the INNER SHELL ONLY, at the four rear frame side mounting points. Pass the upper fixing block upwards inside the shell, position a heavy gauge washer between the shell and the frame, then retain by inserting the bolt. Repeat for the lower fixing points. Check that all bolts and component parts are in place and that you are content with the general fit.

Now go round ALL attachment points and thoroughly tighten all bolts.

The strengthening and preparation is now complete but it is suggested that the roll cage is removed whilst the bodysell is painted.

#### FRONT SUSPENSION BRACE

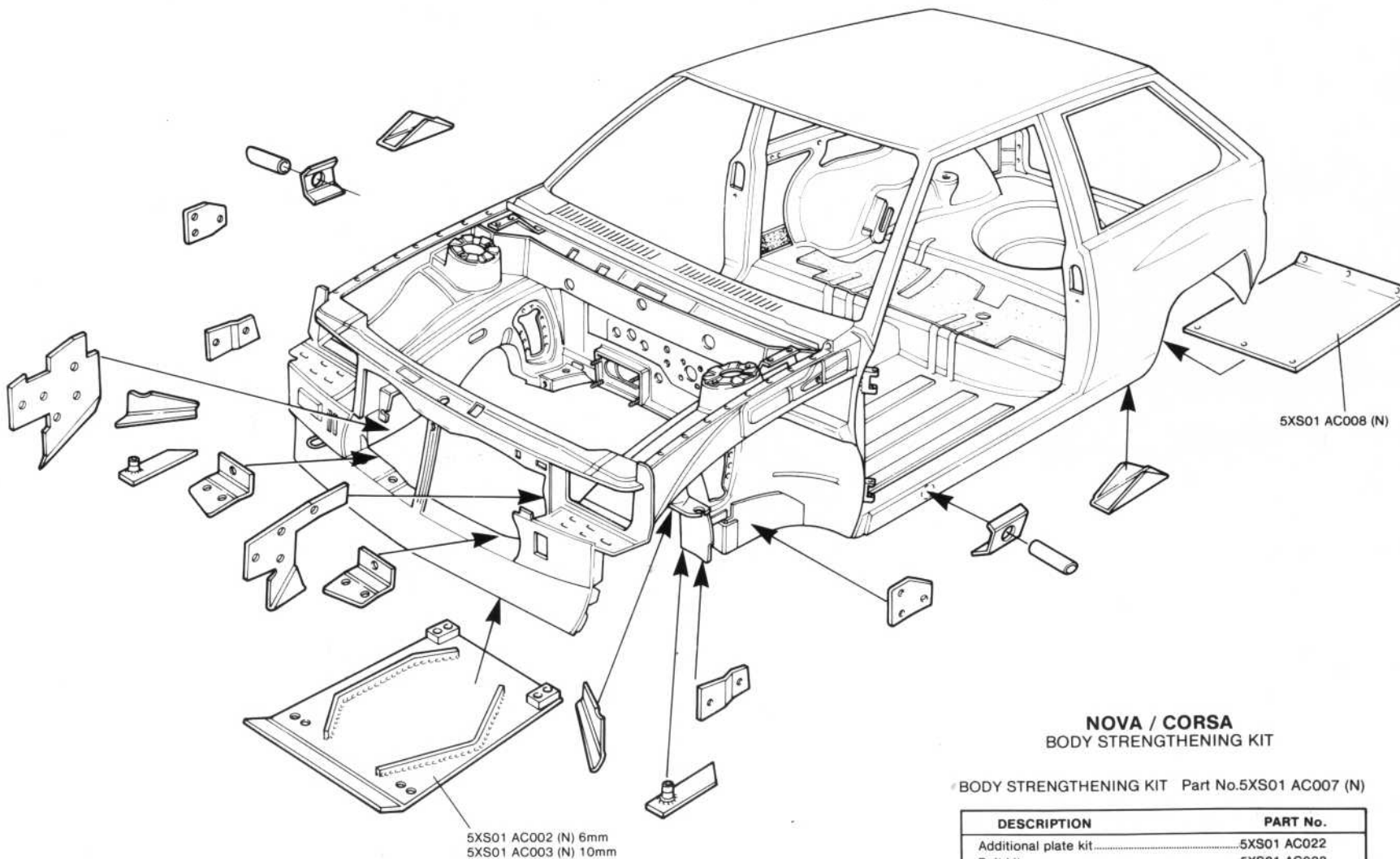
This is the last item under the general description of body strengthening, and must be fitted to the car by attaching to the front suspension top mounting bolts. This can be left until all the other operations have been carried out. Spacers may be required to give adequate clearance between the brace and the manifold on certain vehicles.

#### SUMP AND TANK SHIELDS

An undershielding kit has been developed for the Group A car. This front shield protects the engine sump and transmission assembly, and attaches by four bolts to the front mounting points for the forward facing, lower suspension arms. The rear of the shield is attached by two bolts, adjacent to the inner pivot points for the lower wishbones. A threaded insert is already incorporated in the strengthening plate supplied for this area and should have been fitted during the bodysell preparations. The rear attachment points are not pre-drilled in the sumpguard. These must be marked out to suit the individual vehicle with the front of the sumpguard correctly attached. The holes must then be drilled out to size (12 to 12.5mm) for positive location of the sumpguard, since this then becomes an integral part of the chassis.

**NOTE:** The hole positions can easily be marked on to the shield by the following method. Remove the head from a 12mm bolt, screw this remaining threaded portion into the rear attachment point leaving approximately 5mm of thread above the surface. Fit the shield to front attachments and apply pressure to the rear of the shield at each attachment point, the threaded section should then clearly mark the shield accurately where the holes should be drilled.

The lighter gauge rear shield is profiled to fit around the fuel tank area. The rear part of the shield attaches to the rear tank mounting points. Three holes must be drilled on either side of the shield, for bolting through the floor.



**NOVA / CORSA**  
BODY STRENGTHENING KIT

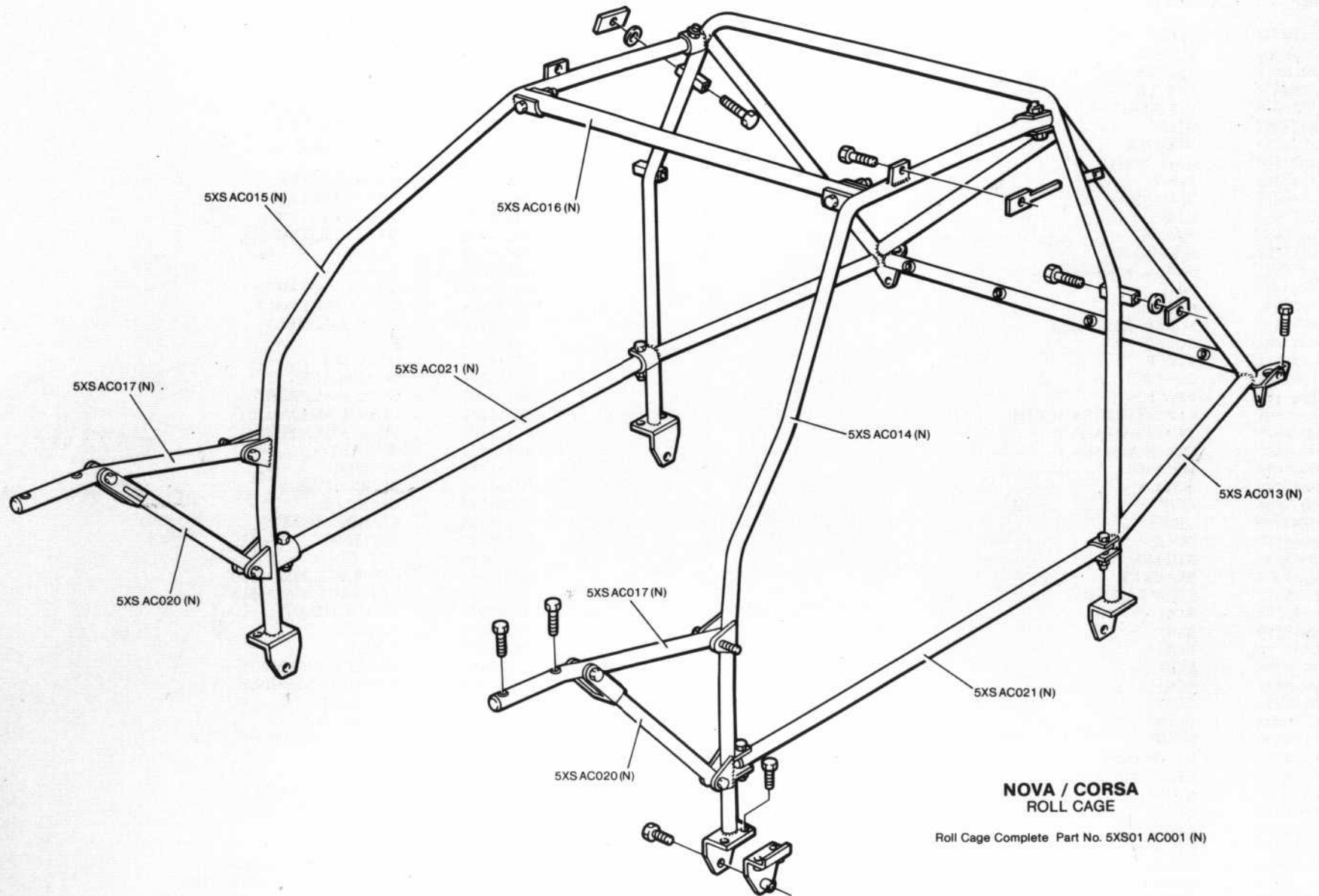
Ⓢ BODY STRENGTHENING KIT Part No.5XS01 AC007 (N)

DESCRIPTION	PART No.
Additional plate kit.....	5XS01 AC022
Bolt kit .....	5XS01 AC023
Heated screen.....	5XS01 AC024 (N)

BODYSHELL PARTS LIST



Part number	Description	Car Qty			
SUB GROUP 01 — BODYSHELL					
3458232	PLUG	20	90120039	RAIL ASSEMBLY	1
3466306	BUFFER	10	90120040	RAIL ASSEMBLY	1
3466675	SPACER	2	90120049	RAIL ASSEMBLY	1
3466674	SPACER	2	90120050	RAIL ASSEMBLY	1
7978459	STRIKER	2	90120387	CLIP	4
8944952	CLIP	2	90120519	GLASS ASSEMBLY	1
8970517	WASHER	2	90120522	WEATHERSTRIP	1
8975570	BALL PIVOT	1	90120512	WINDSHIELD	1
9287242	BOLT	10	90120524	STRIP	1
11010091	WASHER	100	90126615	WEATHERSTRIP	1
11037971	CLIP	2	90126616	WEATHERSTRIP	1
11038552	SCREW	5	90126619	WEATHERSTRIP	1
11052752	SPRING PIN	20	90126620	WEATHERSTRIP	1
11054132	SCREW ASSEMBLY	3	90126623	CLAMP	12
11063471	NUT	10	90126697	SCREW	20
11072042	CIRCLIP	20	90127137	SPRING ASSEMBLY	1
11078822	SCREW ASSEMBLY	20	90127601	CHECK ASSEMBLY	2
11080401	SCREW	20	90127901	LOCK ASSEMBLY	1
11081011	RIVET	50	90138963	SHIM	1
11085301	SCREW	4	90139737	LOCK SET	1
11086102	RIVET	50	90151294	BUSH BLACK	10
11092501	COUNTERSUNK SCREW	4	90151890	GUSSET ASSEMBLY	1
90008419	DOOR ASSEMBLY	1	90151892	GUSSET ASSEMBLY	1
90008420	DOOR ASSEMBLY	1	90151902	STRIP ASSEMBLY	2
90035052	SUPPORT	2	90158326	WASHER	2
90037240	BOLT	5	90191511	BUMPER	2
90039884	CLIP	10	90191855	REGULATOR	2
90043397	CLIP	20	90191912	GUDGEON	1
90046285	BOLT	1	90197144	BEARING PLATE	2
90055545	ROLLER	2	90198717	FASTENER	20
90119275	BRACKET	2	90203106	BUTTON	2
90119317	STRIP ASSEMBLY	1	90203883	CONTACT ASSEMBLY	1
90119793	ROD	1	90203903	CONTACT ASSEMBLY	1
90119794	ROD	1	90203903	ESCUTCHEON	2
90119795	ROD	1	90207043	HANDLE	2
90119796	ROD	1	90208004	PANEL	1
90119811	ROD	2	90221455	HANDLE ASSEMBLY	1
90119819	ROD	2	90221456	HANDLE ASSEMBLY	1
90120003	STRIP	1	90226139	TAILGATE	1
90120004	STRIP	1	90226099	CLAMP NUT	4
90120010	CHANNEL	2	90226113	SCREW ASSEMBLY	4
90120011	GLASS ASSEMBLY	1	90226495	PULL ROD	1
90120012	GLASS	1	90270224	GASKET	2
90120021	GLASS	1	90296063	MIRROR ASSEMBLY	1
90120022	GLASS	1	90296097	MIRROR ASSEMBLY	1
90120025	GLASS	1	90320209	FRAME	1
90120026	GLASS	1	90320210	FRAME	1
90120033	WEATHERSTRIP	1	5XS01AC001	ROLL CAGE ASSEMBLY	1
90120034	WEATHERSTRIP	1	5XS01AC002	SUMPGUARD — 6MM THICK	1
			5XS01AC003	SUMPGUARD — 10MM THICK	1
			5XS01AC004	STRUT BRACE (TUBE)	1



BODYSHELL PARTS LIST



SUB GROUP 14 — EQUIPMENT

5XS01AC005	STRUT BRACE BRACKET (LH)	1	8943550	BASE	1
5XS01AC006	STRUT BRACE BRACKET (RH)	1	8971279	ARM	1
5XS01AC007	BODY STRENGTHENING KIT COMPLETE	1	90116970	BRACKET	2
5XS01AC008	FUEL TANK GUARD	1	90162259	SUN VISOR	1
5XS01AC009	OIL COOLER MOUNTING BRACKET	1	90162808	MIRROR ASSEMBLY	1
5XS01AC010	HANDBRAKE BRACKET	1	90166622	KIT	1
5XS01AC013	ROLL CAGE MAIN HOOP (REAR)	1	90166624	KIT	1
5XS01AC014	ROLL CAGE SIDE RAIL L/H	1	90172597	SUN VISOR	1
5XS01AC015	ROLL CAGE SIDE RAIL R/H	1	90204465	PANEL ASSEMBLY	1
5XS01AC016	ROLL CAGE (SCREEN RAIL)	1	90204466	PANEL ASSEMBLY	1
5XS01AC017	ROLL CAGE (BAR TO STRUT TOP)	2	90283671	PANEL GREY	1
5XS01AC020	ROLL CAGE FOOTWELL BAR ASSEMBLY	2	90283672	PANEL GREY	1
5XS01AC021	ROLL CAGE (DOOR BAR)	2	90302206	GRILLE ASSEMBLY	1
5XS01AC022	PLATE KIT (ADDITIONAL BODY STRENGTHENING)	1	90302010	BUMPER ASSEMBLY	1
5XS01AC023	BOLT KIT	1	90302256	BUMPER ASSEMBLY	1
5XS01AC024	WINDSCREEN, FRONT (HEATED)	1	90309921	REST GREY	2
			90320013	LETTER GTE	1

SUB GROUP 11 — BODY PANELS

2878335	HOOD ASSEMBLY	10
2890670	WASHER	20
2899421	SPRING	1
3466309	CONNECTION	20
8936749	BOLT	1
9282535	SPRING	1
9285234	BEARING	1
11052432	NUT	1
11054062	WASHER	20
11072461	NUT	5
11072641	SCREW	5
11079311	RIVET	1
90043251	BUMPER	2
90052801	SPRING	10
90119338	CABLE ASSEMBLY	1
90119868	FENDER ASSEMBLY	1
90119869	FENDER ASSEMBLY	1
90124865	BRACKET	2
90126931	SHANK L/H	1
90126932	SHANK R/H	1
90149859	HOUSING	1
90306547	HOOK	1
90320486	SUPT. BONT.	1
90320483	BONNET	1

The basic concept of the standard road car's suspension layout has been retained but extensive modifications have been made to the way that the components have been constructed. A revised front suspension assembly has been designed, fabricated and homologated specifically for use in Group A motorsport, and **MUST** be used as a complete package. There is no compatibility between individual components and those found on the standard car.

This new assembly consists of a modified knuckle assembly, fabricated lower control arm incorporating spherical joints, an adjustable, tubular lower suspension arm/caster control link, complete with spherical bearing and reinforced front attachment bracket. The heavy duty front strut body with adjustable spring platform position, is fitted with a De Carbon monotube, gas filled shockabsorber insert. This attaches to the knuckle assembly and incorporates a wheel camber adjustment facility in the top securing bolt. The alloy top mounting uses a spherical joint housed eccentrically to allow further castor and camber adjustment. The knuckle assembly supplied in the kit is derived from the normal production component but has been further machined within the wheel bearing housing to accept the larger diameter wheel bearing, and the top mounting bolt hole enlarged to 14mm.

To complement this package, a selection of 'superprogressive' road springs and suitably matched dampers have been developed to cover tarmac and gravel applications.

These springs are constructed from tapered wire and offer a wheel travel capability coupled with increased spring rate, unattainable from conventionally constructed, constant wire diameter springs.

#### ASSEMBLY PROCEDURE

Ensure that all components are thoroughly cleaned and bushes lightly lubricated prior to assembly. Assemble under clean conditions at all times. The spherical joints are located both in the lower control arm and strut top mounting plate by circlips. Attach lower control arm to chassis

pick-up point using the larger 12mm bolt supplied. This hole should have been enlarged to suit this bolt during the bodyshell preparation.

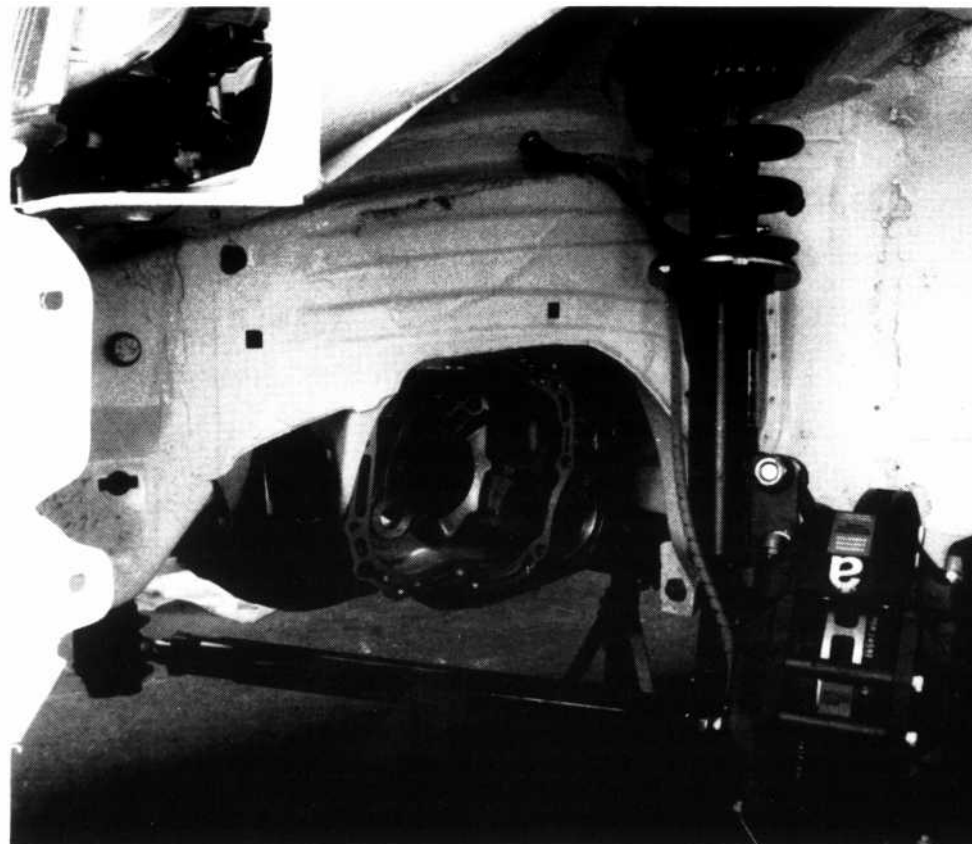
Prior to assembly, fit the front wheel bearing to its housing in the knuckle and retain with the two circlips. At this stage, press the drive flange into the wheel bearing, and fit the wheel studs to this assembly. Fit the threaded insert into the mounting post clamp from the TOP face, secure by clamping with standard pinch bolt. The knuckle assembly can now be attached to the lower control arm by a cap headed bolt and washer inserted through the underside of the outer spherical joint, into this threaded insert.

The lower suspension arm is attached to the lower control arm at one end by a bolt, but the spherical joint at the opposite end locates with a bracket attached to the front crossmember.

This has been profiled to fit the crossmember AFTER the strengthening plate for this point has been attached, and has been designed to fit in this original position using the three original mounting bolts. This bracket is also designed to be used as the front attachment for the sumpguard.

The shockabsorber insert should be fitted to the strut body, to be secured by a single nut, but lightly lubricate the bearing surfaces and make sure that the bump stop rubber is in place on the shockabsorber rod before assembly. The lower spring guide ring, chosen road spring (spring clamp required for this operation), top spring plate, followed by the top mounting assembly can then be secured by a single nut. There is provision for a grease nipple to be fitted to the top part of the strut body, just above the threaded section. Access to this nipple can be made between the lower coils of the road spring for occasional lubrication with a proprietary graphited grease.

The completed shockabsorber and spring assembly is attached to the knuckle using the special bolt supplied. This 14mm. top bolt is handed since it has an 'eccentric' head to enable wheel camber adjustment. The offset head of this bolt fits between the two small angled plates on the strut body, the lock nut and special



*Front suspension installed*



*Camber adjustment bolt*



*Front attachment bracket*



Range of front springs



Access to grease nipple

Platform set height

hardened washer supplied should be fitted to the plain side.

These bolts must be tightened by a torque wrench immediately after the geometry has been set to the required figures. This is a very critical area on the suspension, and as a precaution the torque figure should be checked as a service operation during vehicle use.

**TIGHTENING TORQUES**

Top Bolt, 14mm to 18kg/m. (130 lb/ft.)  
 Bottom Bolt, 12mm to 12kg/m. ( 90lb/ft.)

**FRONT SUSPENSION DATA**

As a direct result of National and International rallying experience with this model, the GM Eurosport development engineers in conjunction with their 'team' drivers have optimised the suspension settings for different types of event and surfaces. It is suggested that these are adhered to particularly for the first competitive outing, after which some drivers may prefer to make their own subtle changes to these settings to give slightly different handling characteristics. The package has been developed for optimum performance without a front anti-roll bar.

When setting the castor and camber angles, it is vitally important that both sides of the car measure similarly. The tracking figures should also be regularly checked, sudden discrepancies in the measured data could indicate that some component has been damaged. In Group A specification this is a very responsive vehicle and to maintain driver friendliness attention to the geometry settings is a priority.

**FRONT GEOMETRY DATA**

DESCRIPTION	GRAVEL and OFF ROAD	EURO TARMAC	LOW TARMAC:
TRACKING	2mm toe out		2mm toe out
CASTOR:	4 degrees +ve.		4 degrees +ve.
CAMBER:	1 1/2 degrees -ve.		2 degrees -ve.

NOTE: For predominantly radiused road surface, as found in Ireland for example, reduce front wheel camber to 1 1/2 degrees -ve.

**FRONT ROADSPRING DATA**

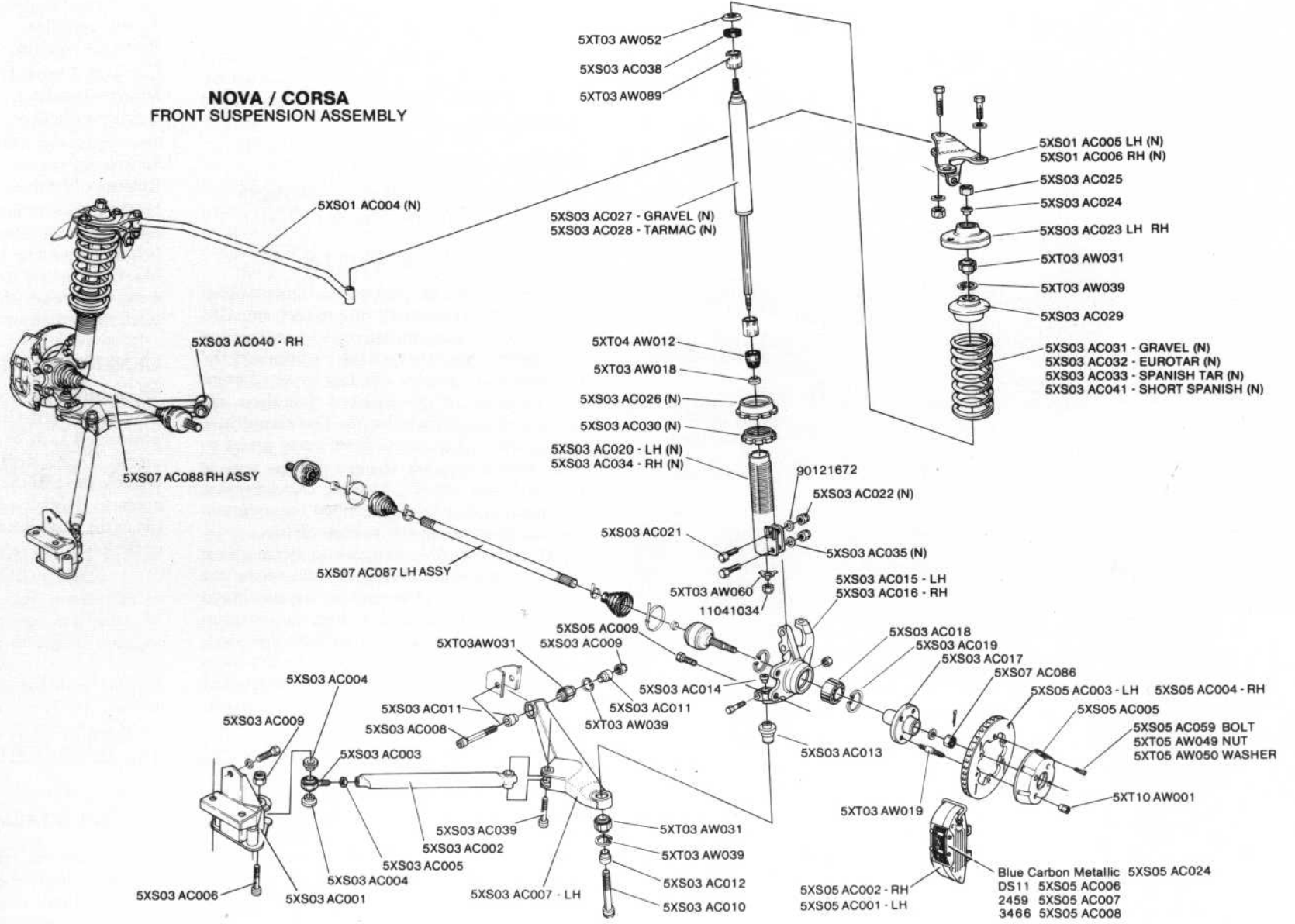
Gravel and Off-Road Events.  
 Superprogressive.  
 Reference Number: 5XS03AC031  
 European Tarmac Events.  
 Superprogressive.  
 Reference Number: 5XS03AC032  
 Smooth Tarmac.. Spain or similar.  
 Superprogressive.  
 Reference Number: 5XS03AC033

NOTES: The springs have been designed to give optimum performance and correct vehicle ride height, when the lower spring guide ring or platform is set at 140mm. This is when measured from the top edge of the spring platform to the knuckle attachment lugs.

**GENERAL COMMENTS**

When setting the suspension in the first instance, it is suggested that the top mountings be positioned such as to give maximum positive castor. That is with the top of the strut as far as possible towards the rear of the suspension turret aperture. Further adjustment can then be carried out at the knuckle and the spherically jointed end of the lower arm as required.

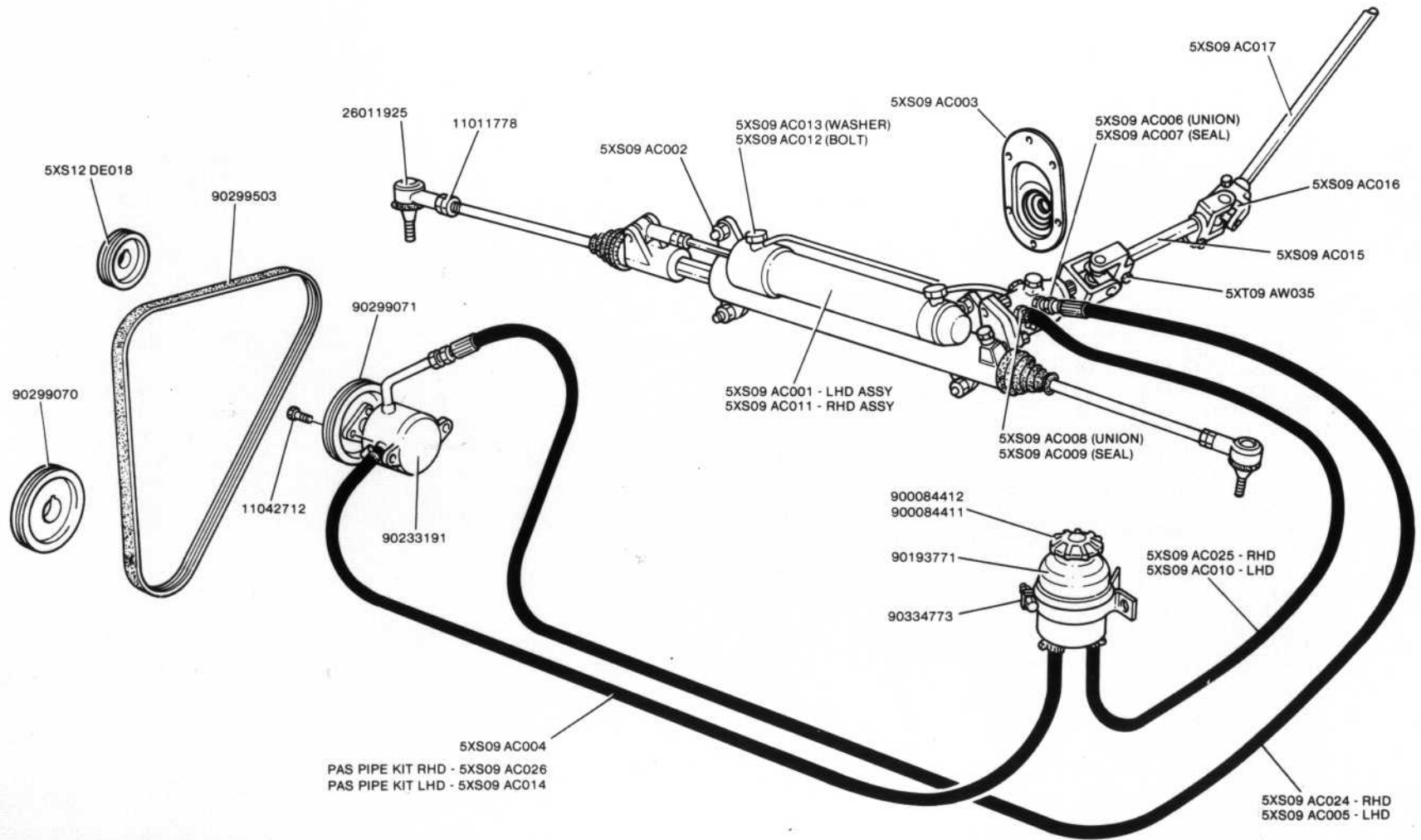
**NOVA / CORSA  
FRONT SUSPENSION ASSEMBLY**



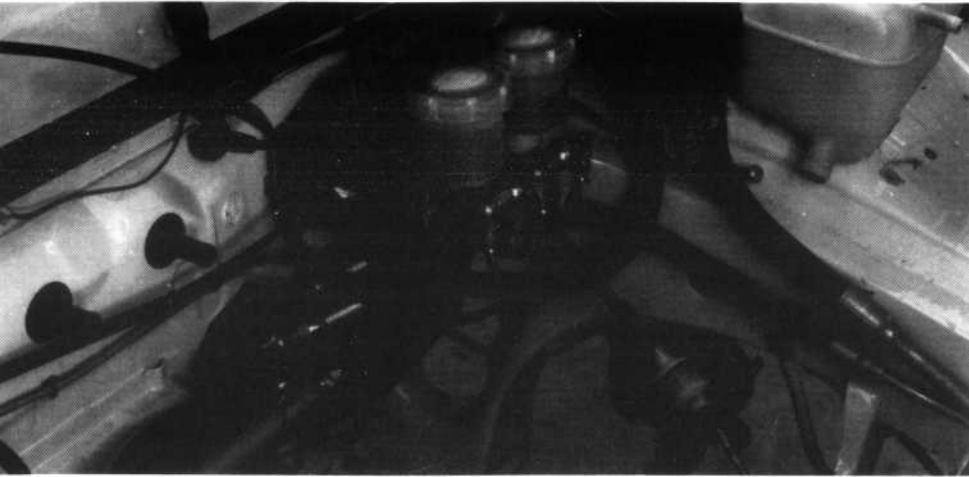


## SUB GROUP 03 — FRONT SUSPENSION

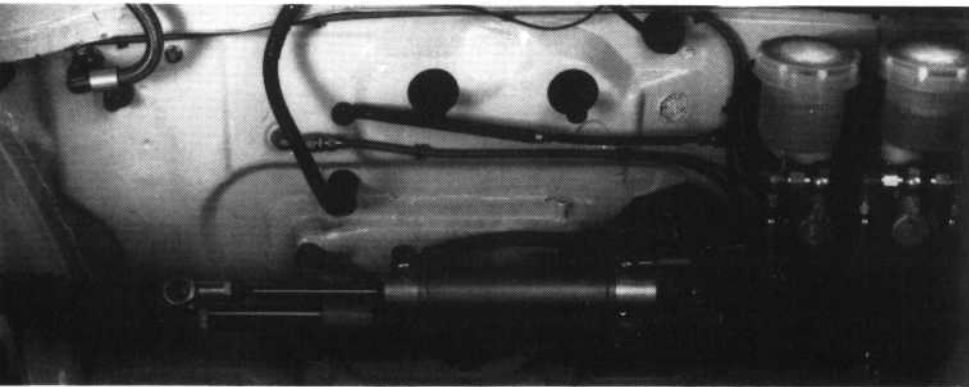
11011191	WASHER	4	5XT03AW039	CIRCLIP	6
11041034	DAMPER NUT	6	5XT03AW052	STRUT SEAL RETAINER	2
11071988	NUT	2	5XT03AW060	LOCK TAB	2
11085941	NUT M10	4	5XT04AW012	BUMP RUBBER	2
11086131	BOLT M10 × 76	4			
11086032	BOLT M10 × 22	2			
90129661	BOLT M12 × 55	1			
90157191	STEERING KNUCKLE L/H STD.	1			
90157192	STEERING KNUCKLE R/H STD.	1			
5XS03AC001	FRONT CASTOR BRACKET	2			
5XS03AC002	TIE ROD	2			
5XS03AC003	ROD END BEARING	2			
5XS03AC004	BUSH	4			
5XS03AC005	LOCKNUT FOR ROD END	2			
5XS03AC006	BOLT ROD END TO BRACKET	2			
5XS03AC007	LOWER CONTROL ARM LEFT	1			
5XS03AC008	BOLT LCA TO CHASSIS	2			
5XS03AC009	NUT METAL LOCK	2			
5XS03AC010	BOLT LCA TO KNUCKLE	2			
5XS03AC011	BUSH INNER LOWER CONTROL ARM	4			
5XS03AC012	BUSH BOTTOM POST	2			
5XS03AC013	MOUNTING POST LOWER CONTROL ARM	2			
5XS03AC014	POST RETAINER	2			
5XS03AC015	STEERING KNUCKLE L/H MOD.	1			
5XS03AC016	STEERING KNUCKLE R/H MOD.	1			
5XS03AC017	FRONT HUB DRIVE FLANGE	2			
5XS03AC018	FRONT HUB BEARING	2			
5XS03AC019	FRONT HUB CIRCLIP	4			
5XS03AC020	DAMPER HOUSING	2			
5XS03AC021	ECCENTRIC ADJUSTER BOLT	2			
5XS03AC022	NUT M14	2			
5XS03AC023	TOP STRUT MOUNTING	2			
5XS03AC024	BUSH	2			
5XS03AC025	NUT DAMPER TOP	4			
5XS03AC026	LOWER SPRING SEAT	2			
5XS03AC027	SHOCK ABSORBER GRAVEL	2			
5XS03AC028	SHOCK ABSORBER TARMAC	2			
5XS03AC029	UPPER SPRING SEAT	2			
5XS03AC030	SPRING SEAT LOCK RING	2			
5XS03AC031	ROAD SPRING	2			
5XS03AC032	ROAD SPRING	2			
5XS03AC033	ROAD SPRING	2			
5XS03AC034	DAMPER HOUSING R/H	1			
5XS03AC035	WASHER (STRUT TO KNUCKLE BOLT)	2			
5XS03AC038	SEAL (FRONT STRUT)	2			
5XS03AC040	LOWER CONTROL ARM RIGHT	1			
5XS03AC041	ROAD SPRING LOW OR SHORT SPANISH TAR	2			
5XT03AW018	DAMPER STEM NUT	2			
5XT03AW019	WHEEL STUD O.Z.	8			
5XT03AW020	WHEEL STUD REVOLUTION	8			
5XT03AW031	SPHERICAL BEARING	6			



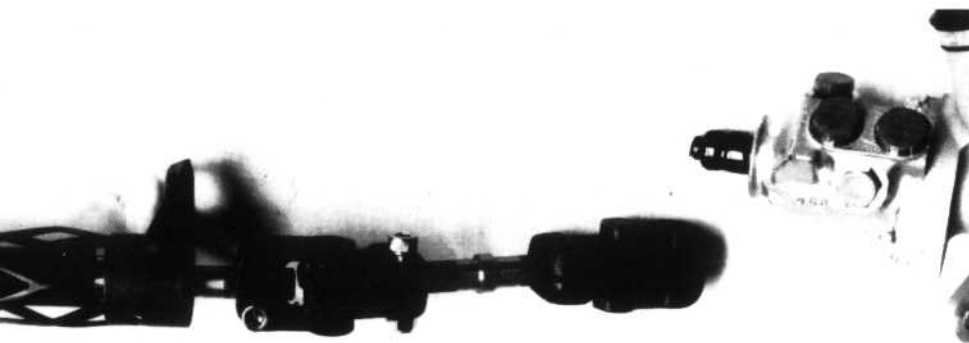
**NOVA / CORSA**  
POWER STEERING ASSEMBLY



Steering rack installed



Rack on mountings



Universal joints

A power assisted, high ratio, steering rack system has been designed and developed as a complete package for the Group A car. This includes the steering rack, steering pump, external power ram, oil reservoir, mounting brackets, all oil pipes and fittings. The power assistance characteristics closely match those developed for the Group A Kadett GSi and Astra GTE models. This minimises the torque steer effects usually associated with high powered front wheel drive cars and considerably reduces driver fatigue.

### INSTALLATION

Before attempting to fit the steering rack assembly, the hole in the bulkhead where the steering column enters the engine compartment must be enlarged significantly to accommodate the power steering valve body. A template of this hole is provided as a single removable page in the rear of the manual. To prevent the possibility of the power assistance ram becoming loose at its attachment points on to the actual steering rack, the two bolts must be removed and drilled prior to reassembling, and then safety wired. The steering rack assembly can now be placed on its mountings, but before tightening the securing nuts establish that the rack body sits correctly on the bulkhead mounting positions. Tolerances in the body shell may dictate that some metal may have to be removed from the steering rack body to improve this condition. The steering rack can now be attached to the bulkhead. A body sealing rubber gaiter is provided and fits over the valve body from the inside of the vehicle prior to fitting the column assembly. This gaiter will require slight 'trimming' to achieve a satisfactory fit around the valve body, prior to attaching it permanently to the bulkhead using adhesive or other means. The oil reservoir can be attached to the left hand suspension turret using the bracket supplied. All the pipes are made to the correct length and have the appropriate end fittings such that they can only be fitted in the correct way.

The power steering pump is attached to the engine by two bolts and driven from the

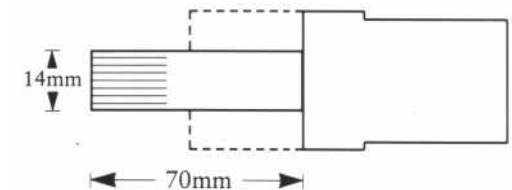
crankshaft pulley by a common 'poly-vee' drive belt that also drives the alternator.

Two universal joints and two mini-shafts are provided to connect the steering column to the power steering rack assembly. One shaft fits between the two U.J's, the other fits into the end of the steering column having first removed and discarded the original lower column shaft. **NOTE:** On certain vehicles, the replacement lower column shaft may require further machining before it can be correctly fitted into the existing lower column support bush. In this case refer to the diagram showing the revised, machined condition.

The steering column can now be connected to the power steering rack by attaching the two U.J's. Tighten all clamping bolts thoroughly!

Initially the system will require bleeding to remove any air pockets. Top up the pump reservoir with new fluid (Dexron 90 020 172), to the edge of the filler neck. Start engine and immediately switch off, repeating this procedure until the fluid level is at the 'MIN' mark with the engine stationary. To bleed the system, start engine and allow to idle whilst the steering wheel is turned from lock to lock. Finally check the fluid level in the system when the system is cold and the engine not running. The level should then reach the 'MIN' mark. At normal operating temperature the level should not be above the 'MAX' mark. If the fluid level drops particularly low, check the system for leaks. Under no circumstances allow the pump to be driven with insufficient or no fluid in the system.

**NOTE:** Do not use the vehicle with the power assistance disconnected, this could lead to damage within the valve assembly.

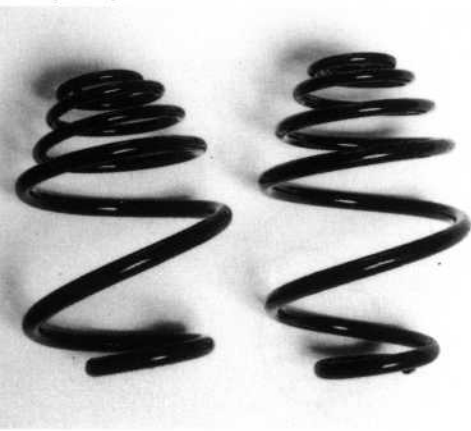


## SUB GROUP 09 — STEERING

3451666	PLATE	1
3460213	BEARING	1
6665033	WASHER	1
7837496	RING	1
7838084	RING	1
7838204	SHAFT ASSEMBLY	1
7840453	TRACK CONTROL ROD	2
7847036	COLUMN ASSEMBLY	1
11011778	NUT	1
11042712	BOLTS PULLEY TO PUMP	1
26011925	TRACK ROD END	2
90008411	RESEVOIR CAP	1
90008412	RESEVOIR CAP SEAL	1
90052498	SWITCH ASSEMBLY	1
90052550	BOLT	10
90105246	SPRING	1
90125328	BOLT	20
90157076	SEAL	1
90157258	CLAMP	2
90167063	COVER ASSEMBLY	1
90170401	NUT TRACK ROD TO KNUCKLE	2
90191415	HOUSING	1
90193771	POWER STEERING FLUID RES.	1
90233191	POWER STEERING PUMP	1
90250338	RESEVOIR BRACKET	1
90296436	ALTERNATOR PULLEY	1
90299503	POLY V BELT	1
90299070	CRANKSHAFT PULLEY	1
90334860	BEARING	1
94115831	PULLEY PUMP	1
5XS09AC001	POWER STEERING RACK	1
5XS09AC002	NUT STEERING RACK TO B/HEAD	4
5XS09AC003	GAITER RACK TO B/HEAD	1
5XS09AC004	PIPE RESEVOIR TO PUMP	1
5XS09AC005	PIPE PUMP TO RACK	1
5XS09AC006	RACK INLET UNION	1
5XS09AC007	RACK INLET DOWTY SEAL	2
5XS09AC008	RACK OUTLET UNION	1
5XS09AC009	RACK OUTLET ALLY CRUSH WASHER	2
5XS09AC010	PIPE RACK TO RESEVOIR	1
5XS09AC011	PIPE VALVE BODY TO RAM	1
5XS09AC012	BANJO BOLT	1
5XS09AC013	COPPER WASHER	2
5XS09AC014	LOWER UNIVERSAL JOINT	1
5XS09AC015	JOINING SHAFT	1
5XS09AC016	'U' JOINT	1
5XS09AC017	UPPER SHAFT	1
5XS09AC026	KIT PIPES, RHD	1
5XT09AW035	UPPER UNIVERSAL JOINT	1



Rear suspension from underside



Rear springs



OZ Wheel

The standard rear axle beam is retained for the Group A specification, and does not require additional strengthening. Special competition bushes are supplied in the kit, and should be fitted to the body mounting pivot point of the rear axle. De-carbon gas filled shock absorbers have been developed in conjunction with superprogressive 'minibloc' rear springs for gravel and tarmac events. These must be used in conjunction with the corresponding front springs and shock absorbers, as they are part of a fully integrated package. The 18mm. diameter anti-roll bar, standard fitment on the GTE/GSi models, must be fitted for tarmac surface applications. However, certain drivers may also prefer the loose surface handling characteristics resulting from running with a rear anti-roll bar fitted.

**REAR ROADSPRING DATA**

Gravel and Off-Road Events.  
Minibloc.

Reference Number: 5XS04A0004

All Tarmac Events.  
Minibloc.

Reference Number: 5XS04A0005

NOTE: An additional spacer may be required under the springs to achieve the correct rear ride height and appearance when using the European tarmac front spring.

**REAR SUSPENSION GEOMETRY**

All conditions of use.

CAMBER: From 0 degrees 40 mins. negative to 1 degree 35 mins negative.

(Maximum deviation Left to Right, 30 mins.)

TRACKING: From 0.5mm. (5mins.) Toe Out to 4.0mm. (40 mins.) Toe In.

These parameters cannot be adjusted, and if they fall outside of the above limits it would suggest that the rear beam has become distorted.

Wheels have been specially produced for this car by O.Z. These are available in 15 inch diameter, with a 6 inch rim width. Experience has shown that this gives the best possible wheel/tyre configurations from a performance point of view for both tarmac and loose surface use. They also give compatibility with a wide range of tyres and sizes permitted within this engine capacity class from most major tyre manufacturers.

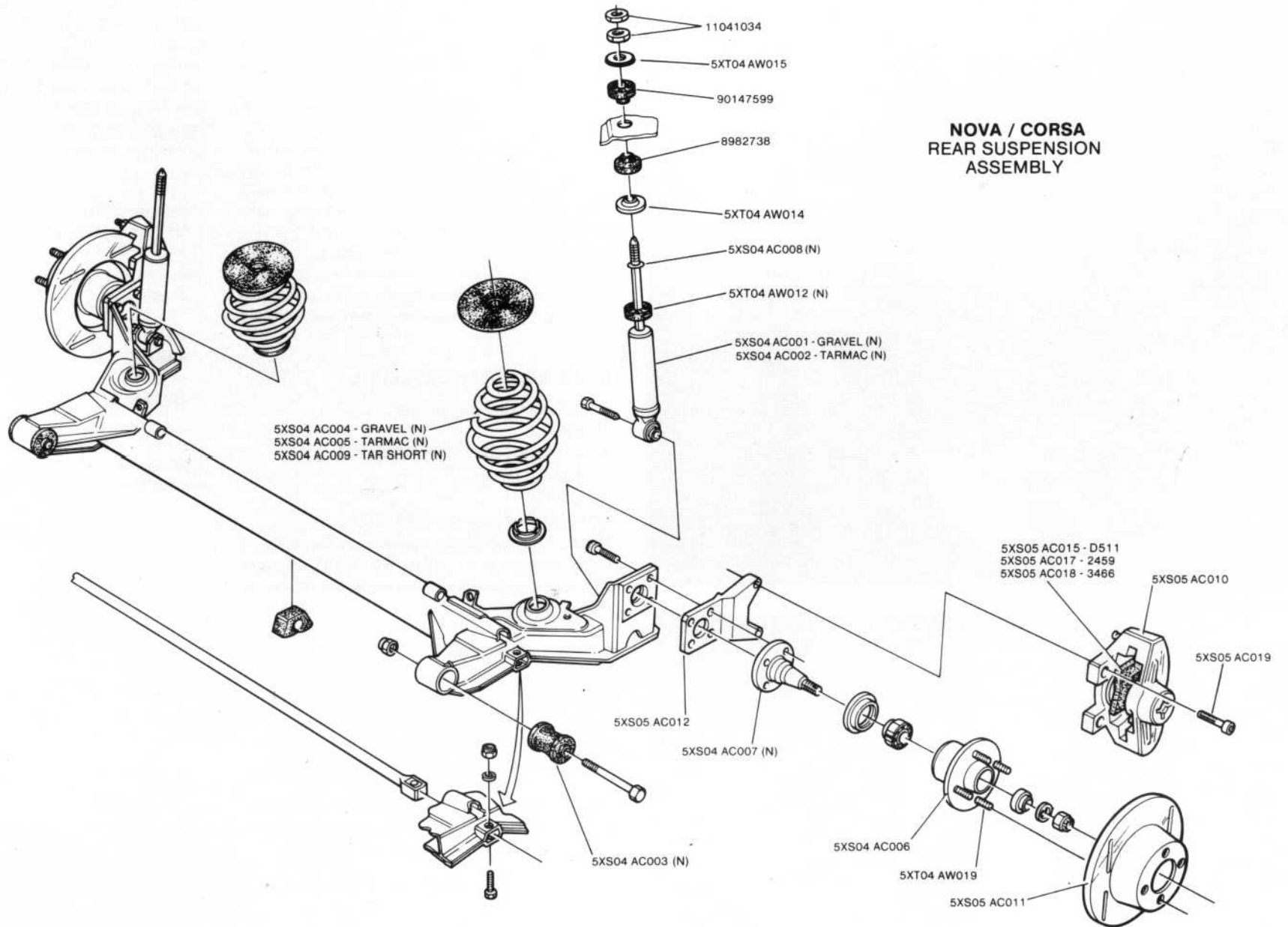
**PERFORMANCE DATA:**

Fifth gear @ 7600 RPM

Final Drive Ratio	Racing Tyres 18/56-14 KPH/MPH	Gravel Tyres 14/60-14 KPH/MPH
4.53:1	166.5/102.7	175.6/108.3
4.86:1	155.3/95.8	163.9/101.1

**TYRE PRESSURES:**

	FRONT	REAR
Racing tyres	2.0 Bar	1.6 Bar
Gravel Tyres	1.8 Bar	1.6 Bar



## REAR SUSPENSION PARTS LIST



### SUB GROUP 04 — REAR SUSPENSION

6696899	REAR HUB DUST CAP	2
8967950	NUT	2
8982738	DAMPER BOTTOM RUBBER	2
9028814	BOLT STUB AXLE TO BEAM	8
11029779	WASHER	2
11041034	TOP DAMPER NUT	6
11054489	HUB BEARING OUTER	2
11062003	NUT	4
11062003	NUT METAL LOCK M10	2
11062003	NUT M10	2
11070311	HUB BEARING INNER	2
11082434	SCREW	2
11086161	SCREW HEX. HEAD	
11086161	BOLT M10 × 84	2
11086682	SHOCK ABSORBER BOLT M10 × 63	2
90121753	WASHER	2
90129572	BOLT ASSEMBLY (STUB AXLE)	6
90129572	STUB AXLE	2
90142944	ANTI ROLL BAR 13MM	1
90147599	DAMPER TOP RUBBER	2
90157548	ANTI ROLL BAR 16.5MM	1
90168139	BOTTOM SPRING RUBBER	2
90217059	HUB OIL SEAL	2
90223659	REAR BEAM	1
90223644	TOP SPRING RUBBER	2
90278814	SCREW	30
90288688	SHAFT	2
90288688	ANTI ROLL BAR 18MM	1
90304054	DAMPER	2
5XS04AC001	SHOCK ABSORBER — GRAVEL	2
5XS04AC002	SHOCK ABSORBER — TARMAC	2
5XS04AC003	REAR BEAM BUSH	2
5XS04AC004	REAR SPRING — GRAVEL	2
5XS04AC005	REAR SPRING — TARMAC	2
5XS04AC006	ALLUMINIUM REAR HUB	12
5XS04AC007	STUB AXLE — DRILLED FOR TRIP CABLE	2
5XS04AC008	SPACER (REAR DAMPER TOP)	2
5XS04AC009	REAR SPRING - TARMAC, SHORT	2
5XT04AW012	BUMP RUBBER 52MM	4
5XT04AW014	FLAT WASHER	2
5XT04AW015	CUP WASHER	2
5XT04AW019	WHEEL STUD O.Z.	8
5XT04AW020	WHEEL STUD REVOLUTION	8

### SUB GROUP 10 — WHEELS

5XS10AC002	WHEEL (6" x 15")	4
5XT10AW001	WHEEL NUT	16

A dual circuit hydraulic system, with in-car brake balance control, actuates Automotive Products four-pot calipers at the front, fitted to 267mm diameter by 25.4mm thick ventilated discs. Solid rear discs, 251mm diameter by 9.6mm thick are supplied complete with appropriate caliper mounting brackets and alloy hubs. An hydraulic handbrake conversion kit is supplied, and includes the modified bracket, spacer and hydraulic cylinder. Aircraft specification, stainless steel 'Aeroquip' type brake pipes have been developed and come as a package, complete with all the necessary elbows and bulkhead fittings. The designated brake pipe layout is shown in the accompanying diagram, and the individual pipe lengths have been optimised for installation in accordance with that scheme.

#### INSTALLATION AND ASSEMBLY

Care must be taken whilst handling ALL brake system components, and before connecting individual pipes and fittings together it is suggested that they are 'blown out' with an airline to ensure they are free from dirt, etc.

Lay the flexible pipes roughly in place inside the shell to get the general idea as to where they will be finally sited. Reference to the general schematic diagram will indicate the position in more detail. Because the pipe lengths are fixed, it is advisable to partially secure the pipe-run to the bodyshell before marking out the positions where the pipes pass through bulkhead panels. Holes can then be made for the appropriate bulkhead fittings, and once the pipes are connected up in their correct positions, they can be finally secured neatly, to the panels using proprietary clips.

The twin master cylinder pedal-box assembly attaches to the original brake servo mounting studs. The 0.7" cylinder is for the FRONT brake system, the 0.75" cylinder is for the REAR brake system. A flexible drive cable, fitted with a hand control that can be mounted on an auxiliary bracket or on the centre console, connects to one end of the brake balance

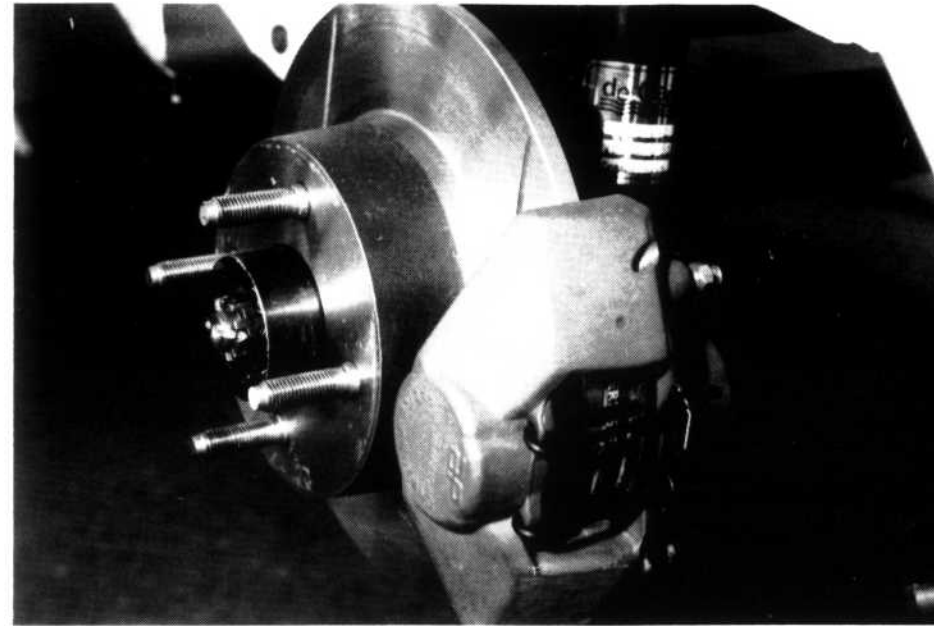
adjustment beam. This operates the brake balance adjustment beam from within the car.

Special brackets are supplied to convert the handbrake to hydraulic actuation. The master cylinder support bracket should be welded to the centre tunnel, behind the handbrake lever. Refer to the photograph for exact position. The 5/8" master cylinder attaches to this bracket complete with the spacer block. The pushrod is then attached to the handbrake lever using the adaptor brackets supplied, and they should be welded to the handbrake lever. They should be positioned such that when the handbrake lever is in the 'OFF' position the pushrod is 'FULLY' extended from the master cylinder. Remember, this handbrake is NOT fly-off action, and should this be required is left to the discretion of the vehicle builder.

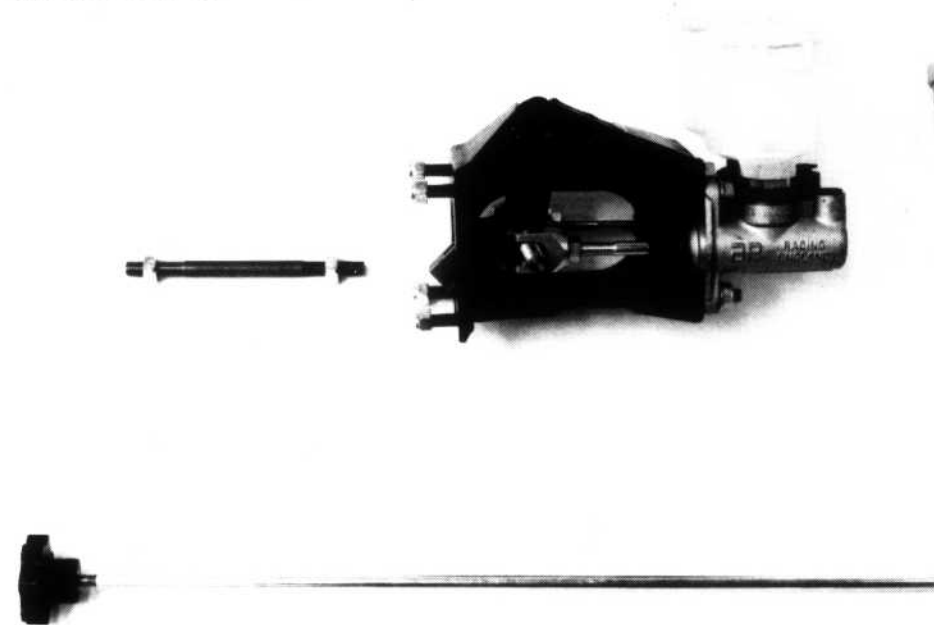
The front brake disc, is first attached to an alloy adaptor plate which is then placed over the drive flange. The brake caliper can then be fitted over the disc assembly and attached to the knuckle using the high-tensile cap headed set screws. The front discs are handed, and to maximise the brake cooling advantages must be fitted such that air is drawn through the disc from the inside of the disc, by the webs in the casting during forward motion of the vehicle. The front brake pipes must be connected as shown in the diagrams and photographs. However, check the installation to ensure that they have sufficient articulation throughout the available suspension travel and wheel lock angles.

A special alloy bracket is provided to attach the rear brake calipers to the rear suspension beam. These brackets fit between the stub axle and the rear axle beam. Fit the wheel bearings and the grease seal into the alloy rear wheel hub supplied, and fit the wheel studs.

Assemble on to the stub axles, securing the outer taper roller bearing with its locking washer, castle nut and split pin, following the normal service procedure at all times for this operation. The brake discs and calipers can now be fitted. Connect up brake pipes and secure neatly to rear axle beam where required.

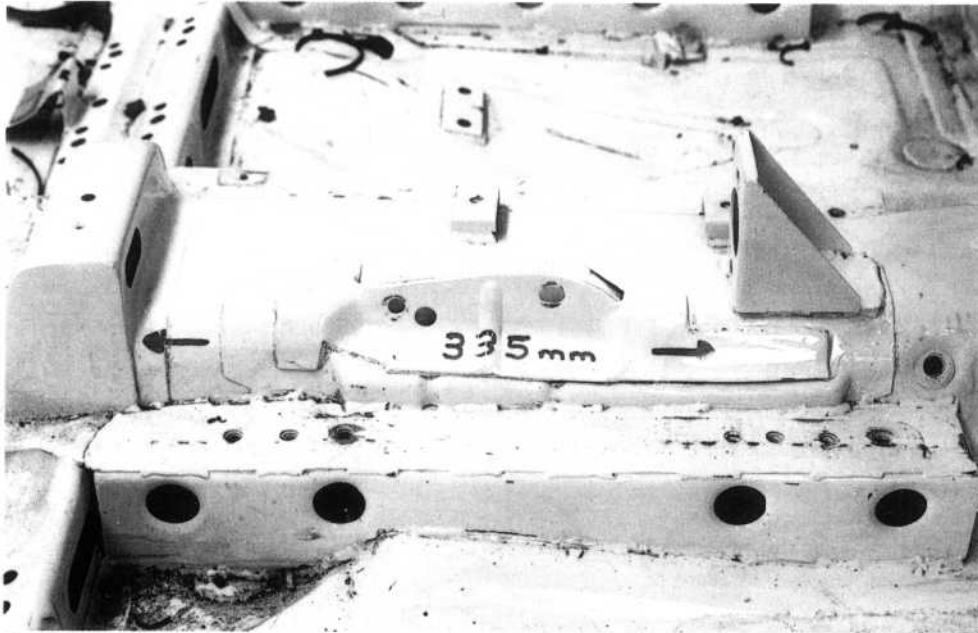


*Rear wheel brake assembly*

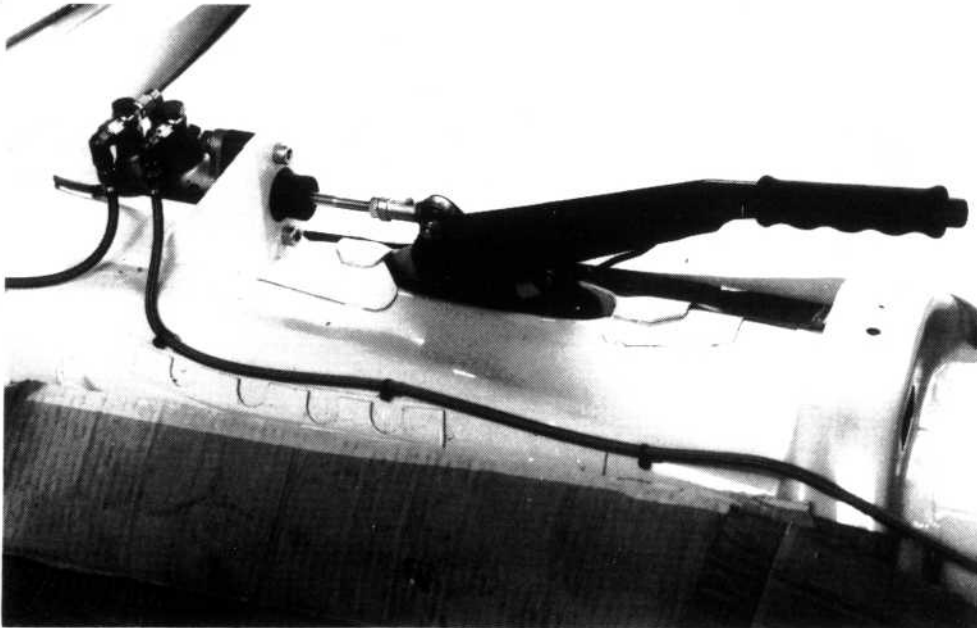


*Brake pedal box and adjuster*





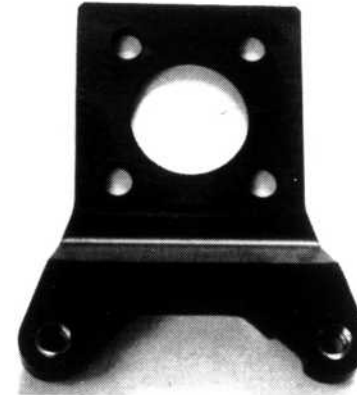
*Handbrake bracket in position*



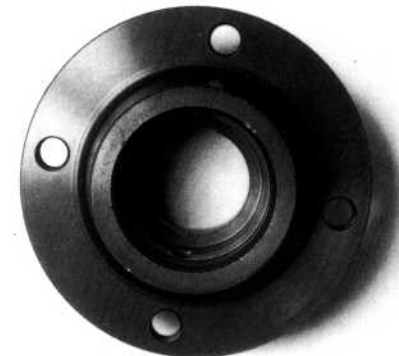
*Hydraulic handbrake fully installed*



*A selection of pads*



*Caliper bracket*



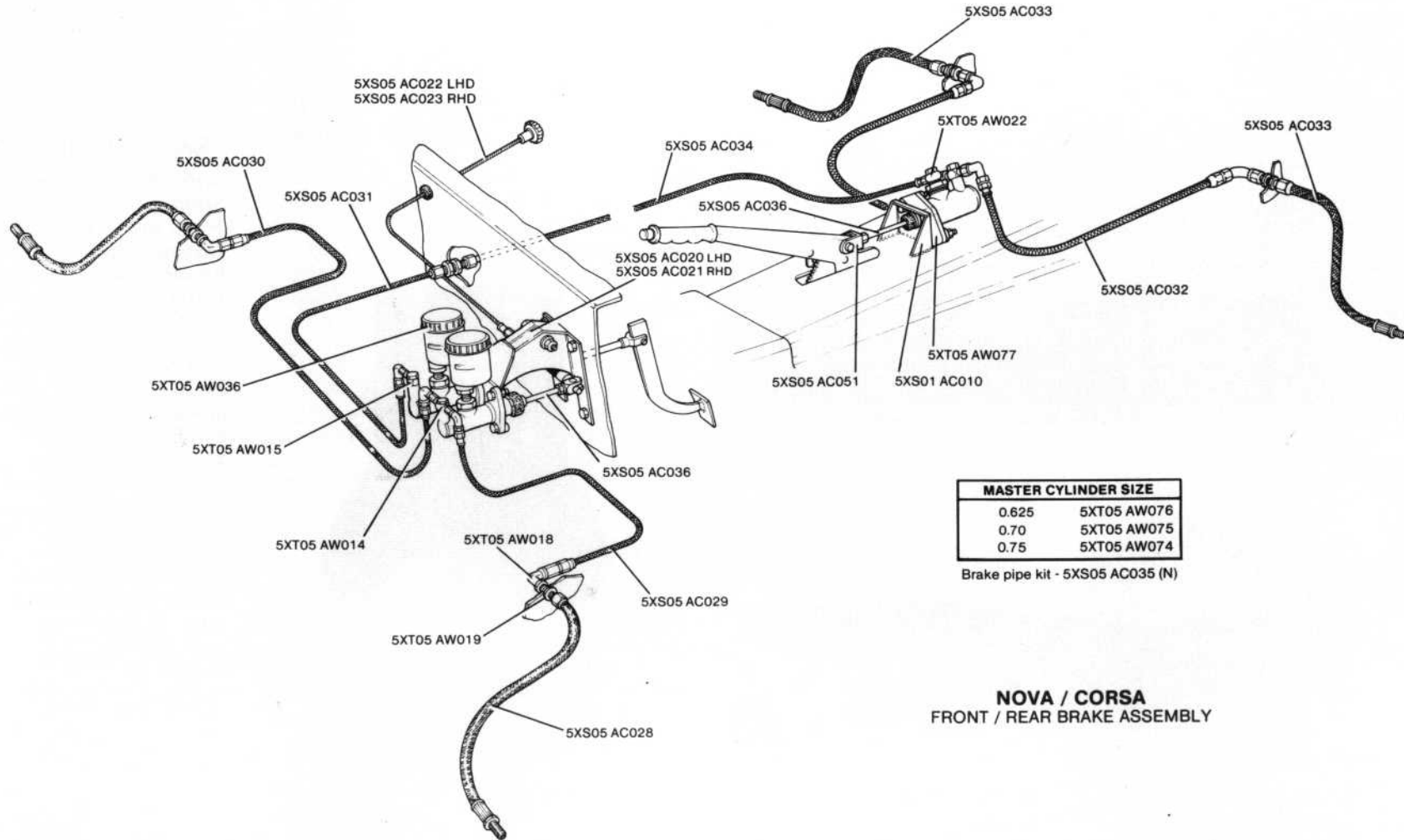
*Alloy hub*

NOTE: The brake master cylinder combination supplied will give adequate brake balance compensation for almost every surface condition. However, should the balance become a problem on events that include a large percentage of extremely tortuous downhill sections on dry tarmac, the rear braking can be reduced even further by fitting a 7/8" master cylinder to the REAR brake system.

#### **BRAKE MATERIAL INFORMATION**

From our experience we would suggest fitting Ferodo 2459 material for both front and rear brake pads. This will give good all round braking performance and satisfactory brake balance control for both tarmac and loose surface conditions. There are of course, alternatives - Ferodo 3466 is a softer material and DS 11 a much harder material.

Under some operating conditions a harder material on the front pads may be a consideration. However, since there is the possibility that the DS11 material may not always be running within its optimum temperature range, the brake balance could become inconsistent, and very REAR biased, even to the extent of continuous rear wheel locking. Should these circumstances prevail, the choice of DS 11 has not been the correct decision. Revert to the recommended Ferodo 2459.



MASTER CYLINDER SIZE	
0.625	5XT05 AW076
0.70	5XT05 AW075
0.75	5XT05 AW074

Brake pipe kit - 5XS05 AC035 (N)

**NOVA / CORSA**  
FRONT / REAR BRAKE ASSEMBLY

## BRAKES PARTS LIST

## SUB GROUP 05 — BRAKES

8952997	COVER	5	5XT05AW076	HANDBRAKE MASTER CYL. 0.625	1
90125799	LEVER ASSEMBLY	2	5XT05AW077	H/BRAKE MASTER CYL. ADAPTOR	1
90142222	BRACE ASSEMBLY	1			
90142226	BRACE ASSEMBLY	1			
90157720	PULL ROD	2			
5XS05AC001	FRONT CALLIPER L/H	1			
5XS05AC002	FRONT CALLIPER R/H	1			
5XS05AC003	FRONT DISC L/H	1			
5XS05AC004	FRONT DISC R/H	1			
5XS05AC005	DISC MOUNTING BELL	2			
5XS05AC006	PAD DS11	4			
5XS05AC007	PAD 2459	4			
5XS05AC008	PAD 3466	4			
5XS05AC009	FRONT CALLIPER MOUNTING BOLT	4			
5XS05AC010	REAR CALLIPER	2			
5XS05AC011	DISC REAR	2			
5XS05AC012	REAR CALLIPER MOUNTING BRACKET	2			
5XS05AC015	PAD DS11	4			
5XS05AC017	PAD 2459	4			
5XS05AC018	PAD 3466	4			
5XS05AC019	REAR CALLIPER MOUNTING BOLT M10 × 30	4			
5XS05AC020	BRAKE PEDAL BOX LHD	1			
5XS05AC021	BRAKE PEDAL BOX RHD	1			
5XS05AC022	BALANCE BAR ADJUSTER	1			
5XS05AC023	BALANCE BAR ADJUSTER	1			
5XS05AC024	PAD FRONT, BLUE	4			
5XS05AC028	PIPE INNER WING TO CALLIPER	2			
5XS05AC029	PIPE L/H INNER WING TO MASTER CYLINDER	1			
5XS05AC030	PIPE R/H INNER WING TO MASTER CYLINDER	1			
5XS05AC031	PIPE RR. MASTER CYL. TO B/HEAD	1			
5XS05AC032	PIPE H/BRAKE MASTER CYL. TO FLOOR	2			
5XS05AC032	PIPE H/BRAKE M/CYL TO FLOOR	2			
5XS05AC033	PIPE FLOOR TO REAR CALLIPER	2			
5XS05AC034	PIPE BULKHEAD TO H/BRAKE M/CYL.	1			
5XS05AC035	BRAKE PIPE KIT	1			
5XS05AC036	PUSH ROD	1			
5XS05AC051	YOKE - HANDBRAKE	1			
5XS05AC059	CAPSCREW (DISC TO BELL)	12			
5XT03AW010	-3 STRAIGHT UNION	8			
5XT05AW011	90-UNION	8			
5XT05AW014	SINGLE BANJO	1			
5XT05AW015	TWIN OUTLET BANJO	2			
5XT05AW018	90B/HEAD UNION	5			
5XT05AW019	NUT	5			
5XT05AW021	OUTLET BANJO BOLT	2			
5XT05AW022	INLET BANJO	2			
5XT05AW036	BRAKE FLUID RESEVOIR	2			
5XT05AW049	NUT - DISC TO BELL	12			
5XT05AW050	WASHER - DISC TO BELL	12			
5XT05AW074	REAR MASTER CYL. 0.75	1			
5XT05AW075	FRONT MASTER CYL. 0.7	1			

The Group A engine specification has been fully developed in the International rallying arena during 1989 and has shown to be powerful and very reliable. The special components required to build a replica power unit form the basis of the Group A engine parts kit. Heavy duty engine mounting rubbers are included and fit as a direct replacement for the standard components.

Competition engine preparation is really a very specialised operation and requires equipment and skills beyond the scope of a skilled vehicle mechanic. In spite of this, to assemble the Nova/Corsa 1600 engine and Group A parts kit, would be a relatively easy task for most competent vehicle mechanics. The basic engine design, the machined, cast and die cast finishes are to such a high standard on the production unit that the need for excessive individual component preparation is minimal. By following the guidelines of this chapter, using the special components supplied, correctly assembled would produce a fairly powerful and reliable power unit. The basic cylinder head is very efficient in its standard form, and the procedures outlined in this chapter do not extend to further modification of the standard component.

Obviously there is scope for optimisation of power output by subtle modifications to both the cylinder head, manifolds, and valve installation, although ALL dimensions must conform to those homologated. The nature of the possible modifications is such that they should ONLY be carried out by a competition engine preparation specialist. Cylinder head and manifold modification, to realise a worthwhile gain in power, requires knowhow combined with careful and laborious attention to detail. Yet to throw power away by an incorrect approach to the modifications is all too easy.

Please remember, that a good competition engine can only be developed from a good standard production unit. If at all possible always use a new or very lightly used engine unit as the basis for conversion to Group A specification. Cleanliness and careful assembly is the keynote to successful engine assembly.

A correctly prepared and assembled unit should produce between 140 and 150 BHP, with maximum power developed at between 6800 and 7000 RPM.

### ENGINE PREPARATION PROCEDURE

#### NOTE: IMPORTANT DETAILS

Before commencing the stripdown of the standard engine unit and whilst the engine is in running order, ensure that the ignition timing is correctly adjusted. This should be 10 degrees BTDC at idling speed. Then mark the distributor-to-cylinder head position so that this correctly timed position is not lost when the distributor is removed. Failure to do this will prevent correct repositioning of the distributor after the rebuild, and it would then require access to special electronic instrumentation to establish the position.

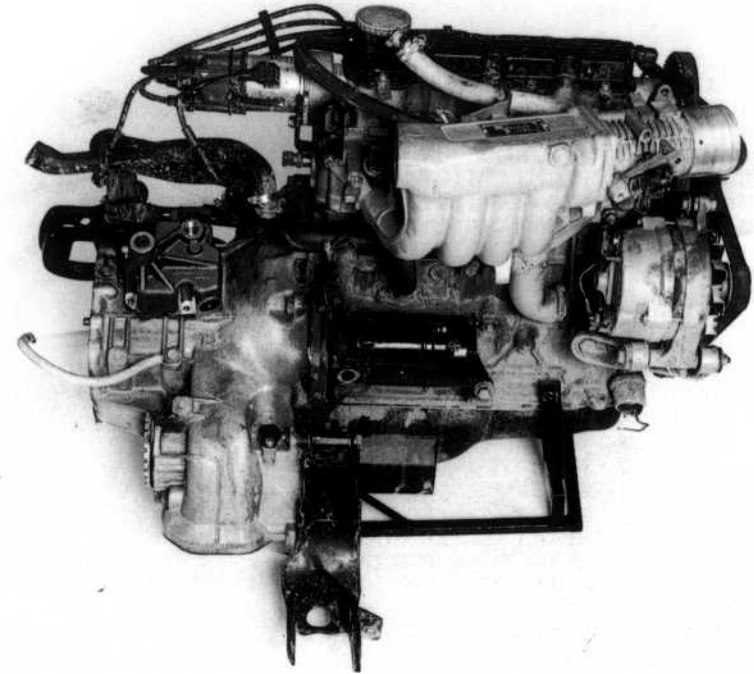
The big-end caps, whilst they are each matched to their conrod during machining, are NOT marked when fitted to the standard production engine. Before removal, mark the big-end cap to conrod position to ensure rebuild is in correctly matched order.

### SUMP PAN

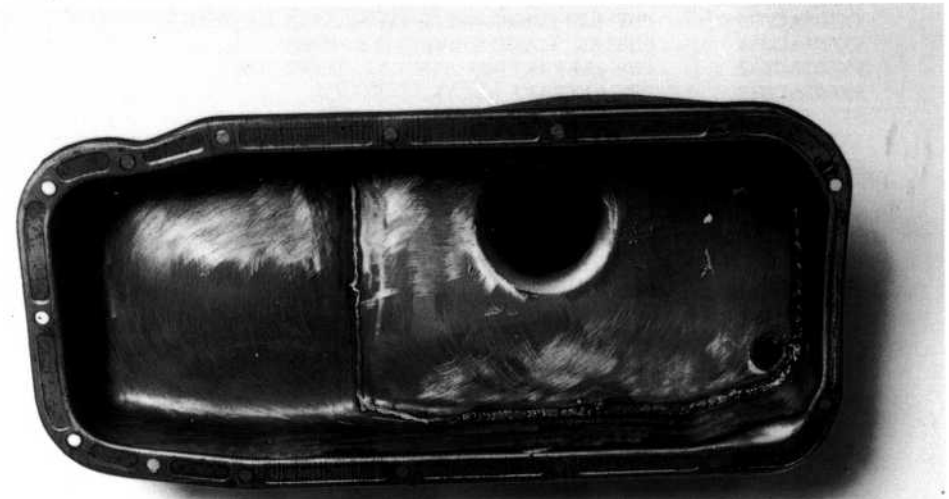
The standard sump pan is retained but requires an additional baffle plate and pick-up pipe protector to prevent oil surge during braking and hard cornering manoeuvres. This specially profiled baffle plate and the protector should be attached by 'brazing' to the sump pan in the positions shown in the diagram. It is important not to exceed the maximum oil level marks on the dipstick prior to subsequent competition use. The oil surface could easily be picked-up by the rotating crankshaft, significantly increasing the drag with a subsequent detrimental effect on power output.

### CRANKSHAFT

If there is any doubt as to the type of use that the engine may have already had, measure the crankshaft for wear and crack detect as a precaution. Production balance levels are



*Engine ready for installation*

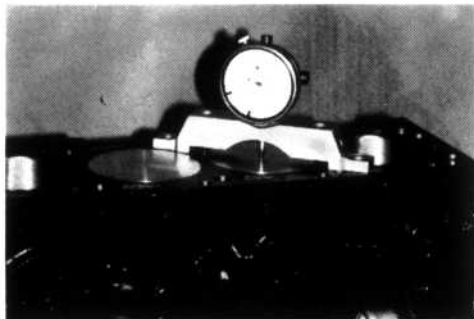


*Baffled sump pan*

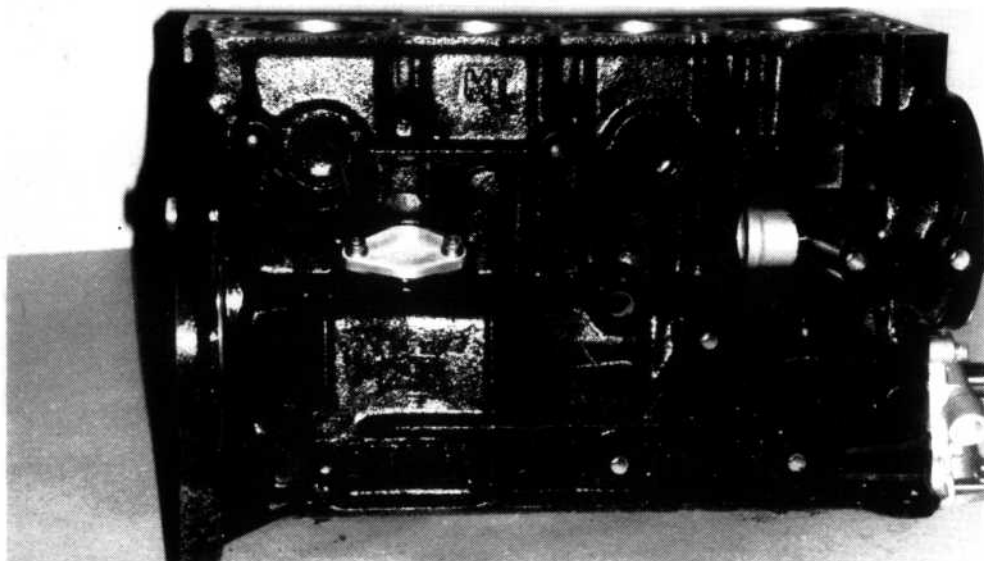
## ENGINE



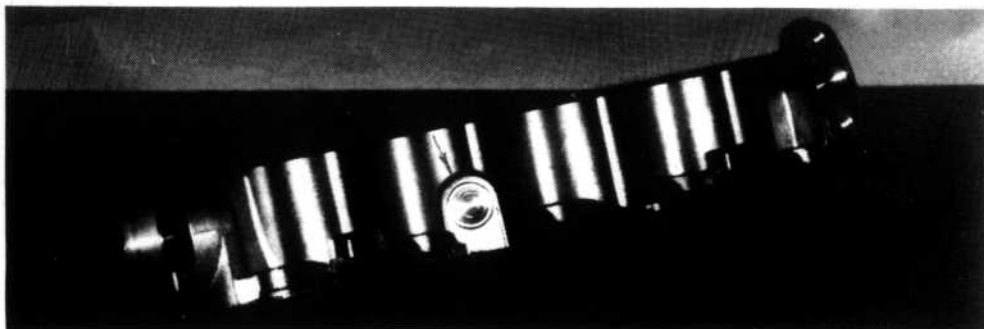
Cosworth piston



Measuring 'deck height'



The block with blanking plate in position



Cam housing with blanking plug installed

already very good and no further balancing is required. If the crankshaft is not as new, lightly polish the journals with a suitable grade of crankshaft finishing tape. Thoroughly clean the component with petrol or other suitable solvent. Blow out the oil passages with compressed air prior to reassemble. The main bearing shells and bolts are as production.

**PISTONS AND CONRODS**

To give the correct increase in the compression ratio and increased durability, Cosworth, light skirt, forged pistons are supplied. These have a lighter gudgeon pin which is a pressed fit into the small end bearing, as in the normal production condition. The Cosworth pistons are sized to be compatible ONLY with the standard production bore dimensions. These are in fact graded, but the increased operating clearances with the Cosworth piston easily accommodates any slight variance in bore size.

The Cosworth piston is a direct replacement for the standard unit, which can be discarded. Circlip grooves are evident around the gudgeon pin housing on the Cosworth piston, these must be completely disregarded as circlips are not required for this application. As a precaution the conrods should be crack detected after the standard pistons have been removed and prior to assembly with the replacement pistons. However, both the removal and fitting of the pistons to the conrods is a specialised operation and must be carried out by appropriately qualified and equipped personnel. Heavy duty conrod bearing cap retaining bolts are supplied which also give more positive bearing cap alignment.

The pistons have a designed 'deck height' to give a compression ratio of approximately 11.4:1, and when installed should protrude above the block face at top dead centre by 0.4mm. plus or minus 0.10mm. (0.016ins. plus or minus 0.004ins.) This dimension should be checked in case of block discrepancies.

**ENGINE BLOCK**

The bore size must be standard to remain within the 1600cc maximum capacity limits and should therefore conform to the following dimensions.

[78.995mm to 79.025mm](#)  
[3.11ins. to 3.112ins.](#)

An oversize, competition piston has not been developed. Prior to assembly, deglaze bores to a micro finish and 45 degree hatch pattern. The take-off hole for the standard engine breather tower assembly, situated on the inlet side of the block, must be blanked off with the plate supplied. See photograph for the detail. Assemble in accordance with normal build procedures.

**CYLINDER HEAD ASSEMBLY**

Carefully dismantle the cylinder head, placing each component in numbered removal order so that the parts required can be reassembled in their original positions.

Prior to further cylinder head preparations, a modification to give increased oil supply to the hydraulic lifters, thus ensuring adequate oil pressure under high oil temperature and sustained high engine speed operating conditions MUST be carried out. The oil pressure feed hole in the cylinder head casting, situated at the exhaust side of the cylinder head face should be increased in diameter. This operation requires extra care, and entails drilling out the existing 'angled' 2mm. hole to 3mm. The hole must be enlarged throughout its depth (approximately 40mm.), until it joins with the larger diameter part of the 'gallery' section, taking extra care to follow the path of the existing 'angled' hole. Make sure that the oil passages do not contain any residual swarf after completion of the modification. Follow standard procedures for cylinder head refurbishing.

The production Nova/Corsa 1600 engine features exhaust gas recirculation. This is part of the emission control system, where regulated quantities of the exhaust gasses are recycled through the inlet tracts under certain throttle

opening conditions. The take-off position for this system can be found on the inlet face of the cylinder head below the inlet ports for cylinders No.2 and 3. This hole must be blanked off, using the alloy blanking plug provided. The hole in the angled abutment on the camshaft housing (camshaft case), for the standard breather system should also be blanked off. Apply 'studlock' or similar product to give additional retention. The photographs show the two finished conditions.

The standard valves must be retained. They can be slightly modified behind the valve head to improve gas flow, and the stem heights above the cylinder head face can be adjusted for optimum performance, but these operations should only be carried out by suitably qualified personnel, AND with close reference to the homologated dimensions.

Heavy duty valve springs, large diameter lower spring platforms (valve washers), modified top retainers (valve spring cups) and thrust pads are provided and must be assembled in the following sequence.

#### INLET VALVE

Place large diameter lower spring platform over valve guide boss. Fit appropriate valve through guide and press valve stem oil seal into place. Fit valve spring, followed by the modified top retainer and secure with split collets (valve stem keys).

#### EXHAUST VALVE

Place standard rotator platform over valve guide boss. Finish off assembly as for inlet valve.

#### CAMSHAFT

The design data for the camshaft supplied is as a direct result of extensive dynamometer testing and competition experience with this power unit. Camshaft lubricant is provided and must be applied liberally to the lobes prior to assembly. During the fitting of this camshaft to the housing (camshaft case), take care not to damage the

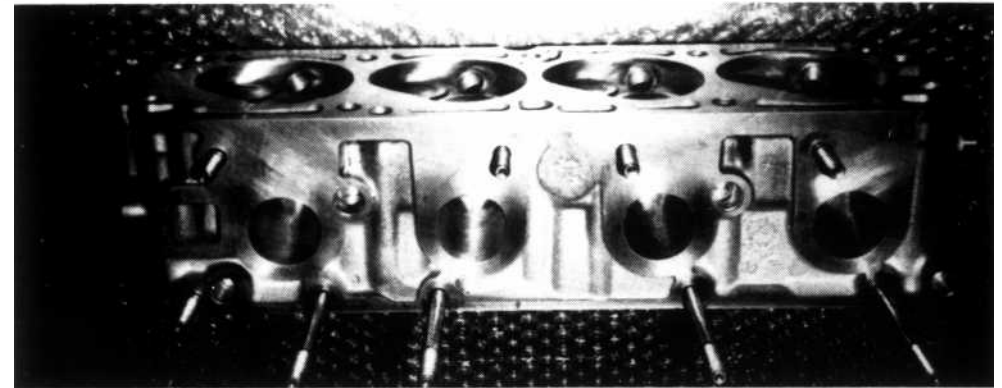
oil seal with the lobes of the camshaft. The standard timing marks should be used for final assembly, and experience has shown that in the majority of cases they represent almost optimum timing for this cam. Again there is scope for optimising the valve timing, as tolerances in the engine block dimensions do have an effect on the actual timing. The correct timing for this camshaft is confirmed by measurement of the INLET valve lift at top dead centre, and this should be 4.4mm. (0.1732ins.) when measured with zero valve clearance.

The cylinder head is attached by heavy duty cylinder head bolts and must be fitted along with the heavy duty, competition gasket supplied. Make sure that the head face is thoroughly clean and dry, fit with dry gasket. No grease or sealants to be used. Make sure that the head is properly located on the locating dowels before any attempt is made to secure. Ensure that the mating faces of the camshaft housing and cylinder head are also thoroughly clean, then apply recognised sealant to both faces prior to final assembly. Lightly lubricate the thread area of the bolts to minimise thread friction during the tightening procedure. The bolts should be tightened in three stages, adopting a spiral pattern sequence from the centre of the cylinder head.

- 1st. stage: 3.5 kg/m. (25 Ib/ft.)
- 2nd. stage: 6.0 kg/m. (45 Ib/ft.)
- Final stage: 9.0 kg/m. (65 Ib/ft.)

The three tightening stages should be carried out operating the torque wrench in a CONTINUOUS angular movement until the required torque figure has been reached. This will almost eliminate the errors introduced by the friction in the threads and under the bolt head. The gasket thickness when fully clamped is 1.2mm. (0.047in.) which is equivalent to a volume of 6.1 cc.

As the standard engine breather system has been deleted, an external breather must be provided. Connected to the camshaft top cover this pipe should then lead into an auxiliary catch tank with a minimum capacity of 2 litres. This container could be made out of plastic but if



*Blanking plug in cylinder head*

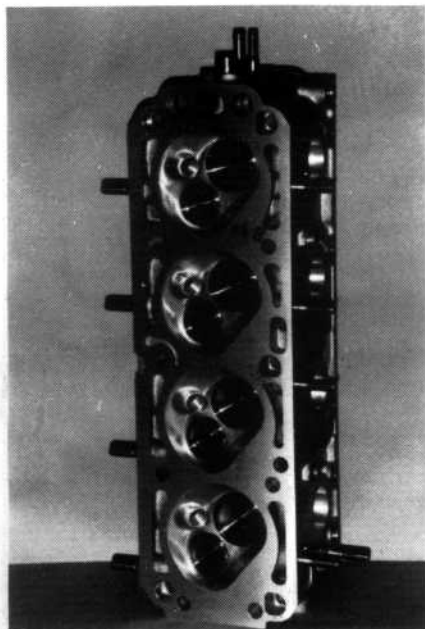


*Priming the lifters*

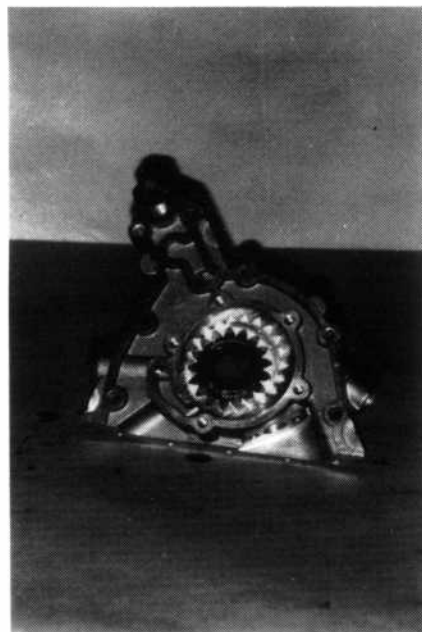


*The new external breather connector*

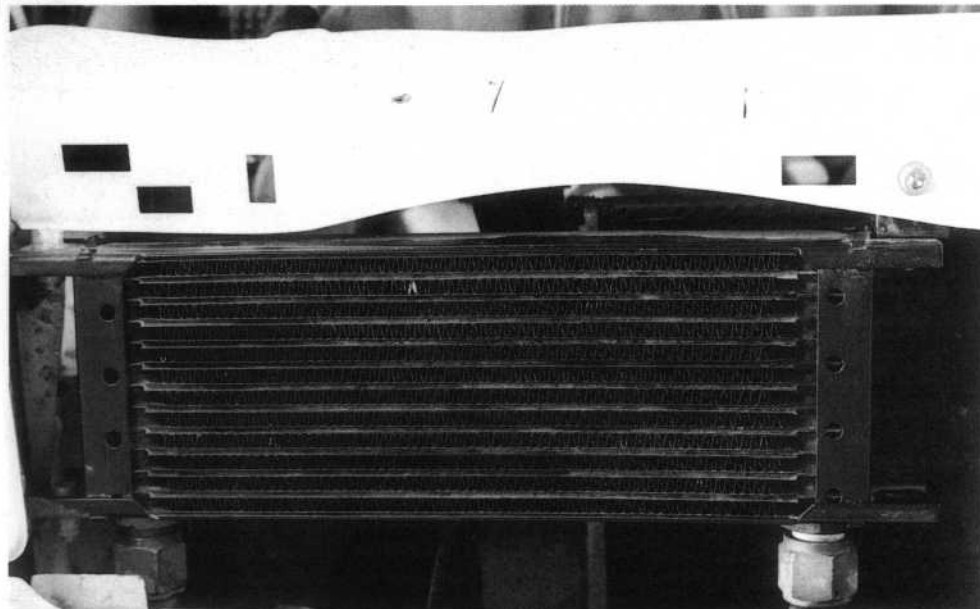
## ENGINE



*The finished head*



*Oil pump packed with grease*



*Oil cooler in position*

made from a non-translucent material must include a transparent window for compliance with Appendix `J' Group A. See photograph showing additional elbow in place.

#### LUBRICATION SYSTEM

The standard oil pump is retained and is capable of giving adequate flow and pressure for this engine specification. However, in view of the modifications to the oil feed in the cylinder head casting, the oil pressure relief valve must be adjusted to compensate. This entails the fitting of a 3mm. shim behind the pressure relief valve spring to increase its pre-load. The oil cooler connects to the engine by a sandwich plate that attaches to the block, between the oil filter unit. The high pressure pipes are made to the correct length for connection to the oil cooler radiator when fitted to the left hand side of the front panel, viewed from the front of the car. A special attachment bracket is supplied. Before assembly, fill oil radiator and pipes with chosen engine oil.

Difficulty can be experienced in generating oil pressure on initial start-up, after a major engine rebuild. This is due to problems in getting the oil pump and system primed. To overcome this, it is suggested that the oil pump rotor be packed with `light' assembly grease before the oil pump is fitted. To do this, the backplate will have to be removed from the pump casing to expose the rotor assembly. Refit backplate correctly after packing with grease.

#### CRANKSHAFT PULLEY

The standard single-vee belt pulley must be replaced by the poly-vee belt pulley provided. This belt specification is essential as it drives both the alternator and the power steering pump. The power steering pump is attached by bolting to the block face below the camshaft driven gear.

#### FLYWHEEL

The standard item is retained. However, it is advisable to check the weight of the unit prior to assembly as there is a minimum homologated weight requirement for the flywheel and starter ring gear assembly.

#### INLET AND EXHAUST MANIFOLD

Discard the E.G.R. valve assembly, situated between the injectors for cylinders 2 and 3. Fit blanking plate to the exposed hole, making sure that the blanking plate is completely sealed to the face of the manifold.

The standard injectors are inadequate for this degree of engine performance. Injectors with a much higher discharge capacity are supplied in the engine build kit. These are taken from the GSi 2000 16 valve engine unit.

The standard cast exhaust manifold must be retained under Group A regulations, but a modified system from the manifold is permitted and has been developed for this engine specification.

#### ENGINE MANAGEMENT SYSTEM

The Nova/Corsa' 1600 engine was introduced in early 1988 and featured the Bosch L3.1 Jetronic fuel injection system. Since then certain evolutionary changes have been made to the engine management system during the production process, as alternative suppliers have been introduced to supply similarly functioning components. The advent of the exhaust catalyst to meet certain market legislation has also lead to a completely different management system just for the catalysed engine specification.

The Group A parts kit was initially fully developed around the original Bosch L3.1 Jetronic system. This incorporates a Bosch ignition ECU, Bosch ignition distributor and Bosch air flow sensor/ECU.

Donor vehicles fitted with the Siemens ignition ECU and Lucas ignition distributor must be converted to the Bosch specification, as the other units cannot be modified to match the Group A engine requirements.

Donor vehicles running with a catalyst are fitted with the Bosch Motronic system. While this is far superior to the Bosch L3.1 Jetronic system, it has not been further developed as a part of the Clubman Group A engine parts kit. In this case the whole system would have to be replaced by the Bosch L3.1 Jetronic components.

There is an alternative solution for donor vehicles that do not comply and for those requiring a better management system than the Bosch L3.1 Jetronic anyway. Since the introduction of the Group A engine parts kit, several engine preparation specialists associated with Nova/Corsa engine building have been developing their own alternative engine management systems. These are all Group A legal and in most cases the ultimate power is slightly increased, but with significantly improved mid-range performance and drivability. Whilst there is a cost penalty for the improved system it is worthwhile consideration even if your donor car already has Bosch L3.1 Jetronic set up, simply because of the increased performance readily available. This becoming a more obvious decision should your donor car be to one of the completely non-compatible specifications!

If the engine is equipped with the full Bosch L3.1 Jetronic system, both ignition and fuel requirements are controlled individually. The major changes to the camshaft characteristics and compression ratio in full Group A tune, dictate different fuel and ignition requirements. The ignition system is electronically programmed by a unit mounted to the underbonnet bulkhead. This is replaced in the kit by a similar component matched to the requirements of this engine specification, and is plugged in as a direct replacement.

The electronic control unit, ECU, for the injection system is integrated with the air flow sensor and mounted in a cast alloy housing on top of the air flow sensor. A reprogrammed unit is supplied and can be fitted as a direct replacement. Remove the standard ECU by slackening the four attachment screws around the housing.

**NOTE:** This engine has been developed to run on **FOUR STAR PREMIUM LEADED FUEL**.

Before setting the idle speed and C.O. levels, check the dynamic ignition timing. This should be set with the engine running without load on part throttle at 2000 RPM, and should be 32

## FUEL

degrees BTDC. The idle speed adjusting screw is located on the inlet manifold throttle butterfly housing. To increase idle speed, turn screw outwards. The C.O. levels are controlled by a potentiometer in the ECU housing, and adjusted by a screw concealed by a tamperproof plug. Idle on this engine may be slightly erratic, but should be set to between 1300 to 1500 RPM and with 1 1/2 to 2% C.O. level.

If the engine can be run on a dynamometer, or the complete vehicle on a rolling road, the ignition can be further adjusted on full load at 5000 RPM and should be set to 20 degrees BTDC.

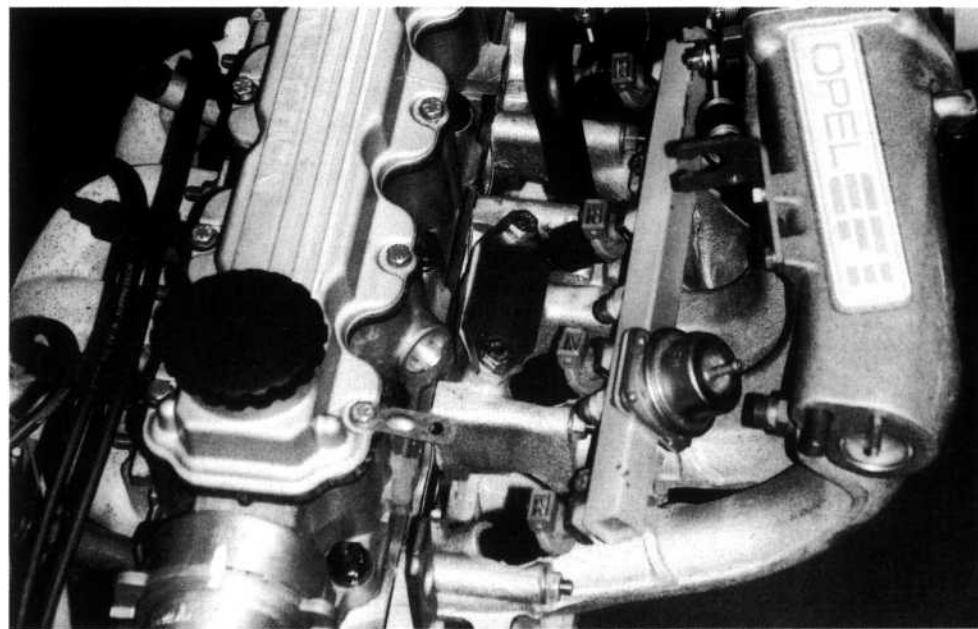
### BOLT TORQUES.

Cylinder Head 1st stage:	3.5 Kg/m. (2516/ft.)
2nd stage:	6.0 Kg/m. (45 lb/ft.)
3rd stage:	9.0 Kg/m. (65 lb/ft.)
Main Bearing Cap:	8.0 Kg/m. (58 lb/ft.)
Con. Rod. Cap:	4.0 Kg/m. (30 lb/ft.)
Camshaft Pulley:	5.5 Kg/m. (40 lb/ft.)
Crankshaft Pulley:	6.0 Kg/m. (45 lb/ft.)
Flywheel:	6.0 Kg/m. (43 16/ft.)

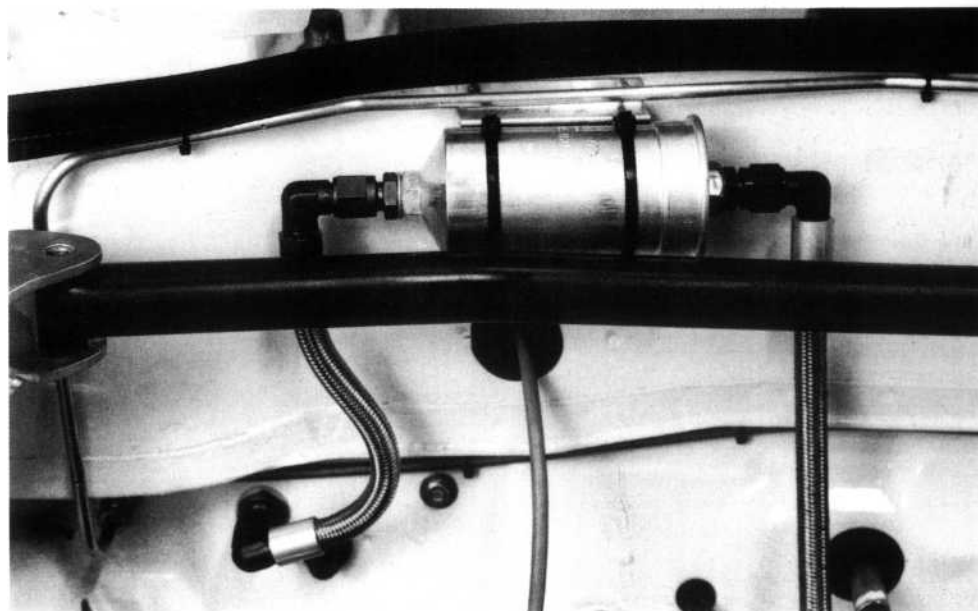
### FUEL SYSTEM

The standard 42 litre (9.2 gallons) steel petrol tank is retained. The standard high pressure delivery pump is also retained, but must be repositioned to the area between the fuel tank and spare wheel well. The existing mounting bracket can be modified for use in this revised location. The fuel filter supplied should be mounted on the special bracket and attached to the bulkhead as shown in the photograph. Armoured fuel lines (Aeroquip type) are supplied to the correct length for running through the inside of the vehicle and for connection to the injection system. These can be fitted by following the guidelines in the chapter for the installation of brakepipes.

**NOTE:** Under certain extreme conditions of vehicle use, for example tortuous 'Alpine' ascents on dry tarmac, intermittent fuel surge may occur particularly when running with a low fuel content. Keeping the fuel level ABOVE half full will prevent this condition.



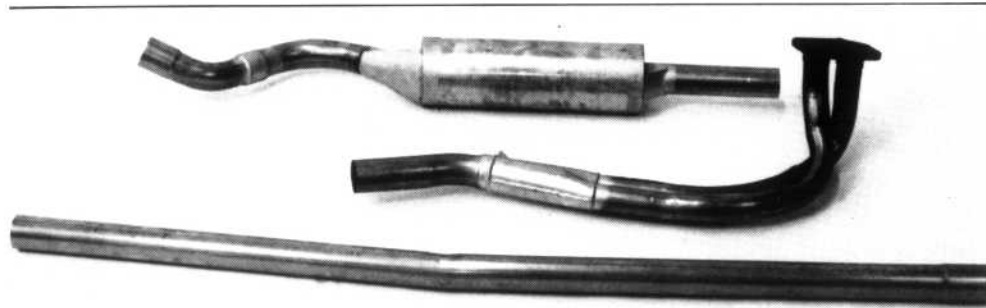
*Blanking plate installed in inlet manifold*



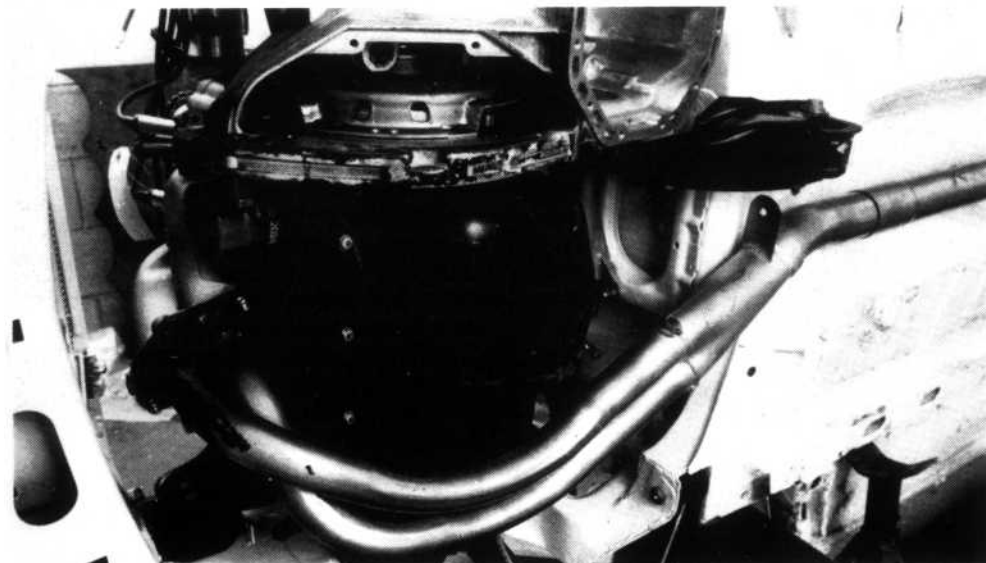
*Fuel filter in position*



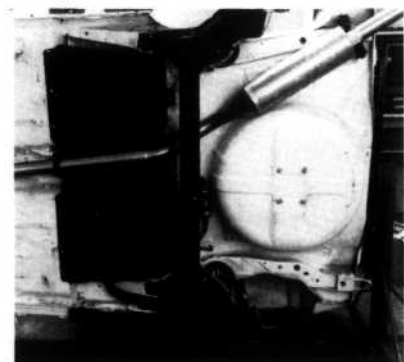
## THE EXHAUST SYSTEM



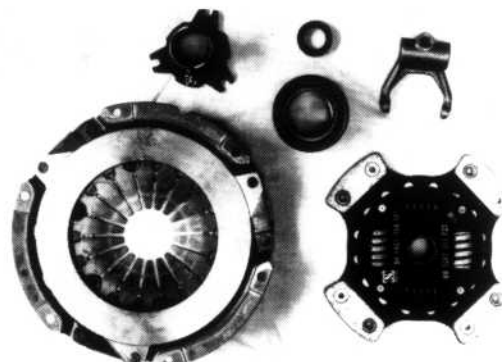
Exhaust system



Downpipe installed



Rear section installed



Clutch parts. (Paddle clutch may be subject to change).

A revised front downpipe, centre pipe and tail silencer have been developed in conjunction with the engine development programme. The dimensions selected for the front downpipe and centre pipe enhance the torque characteristics of the Group A engine, and the engine management system has been optimised for this system. Whilst the total system is considered effective as a silencing device and meets current U.K. Traffic Regulations, it is the responsibility of the competitor to ensure conformity with the traffic regulations of the countries through which the event is run.

## FITTING GUIDE

Mounting brackets for this exhaust system have not been attached. Experience has shown that it is easier to mark the exact position for the mounting brackets with the system in place. This allows for some variation between vehicles and exhaust systems to be catered for.

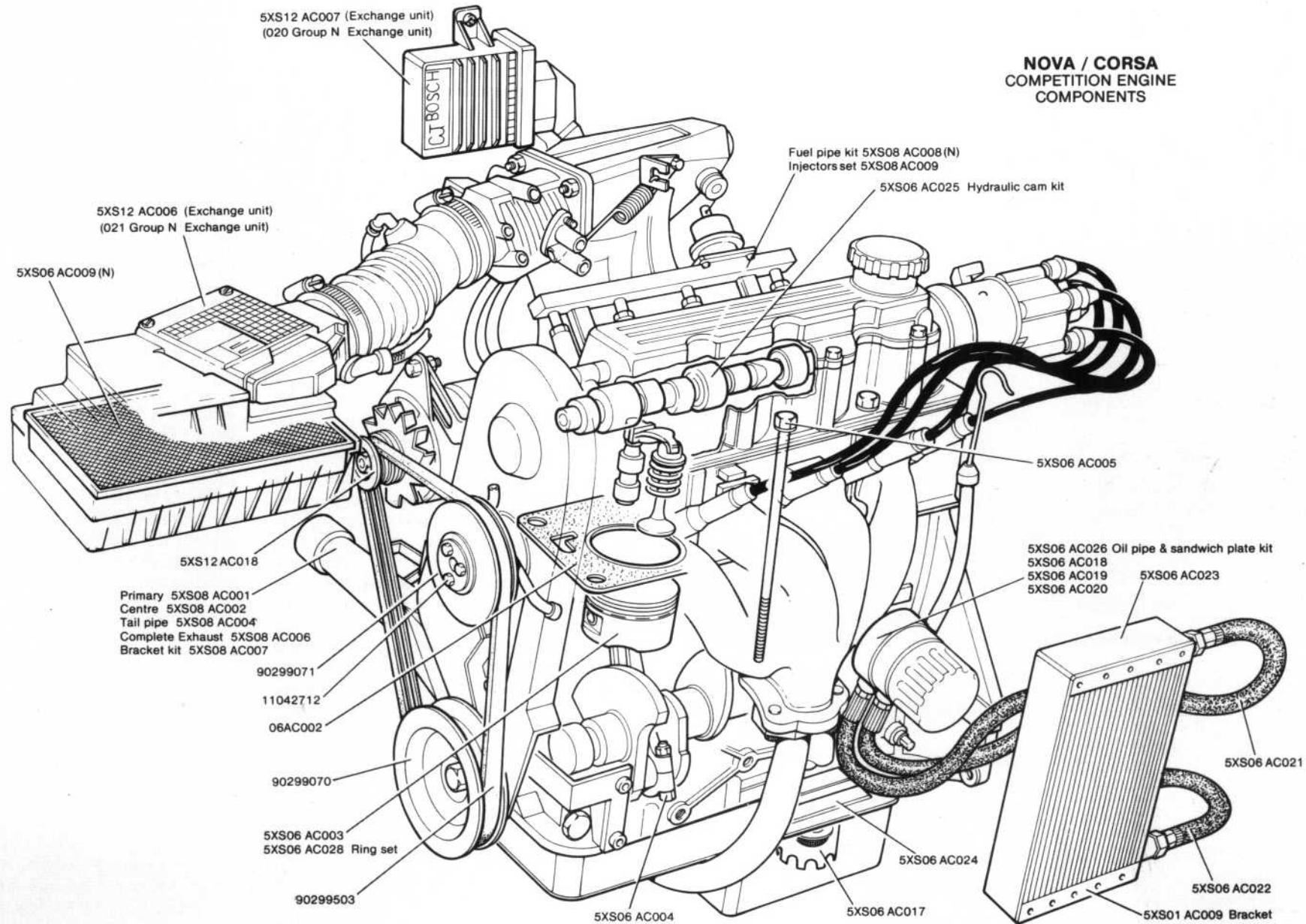
The chassis mounted rear bracket should first be removed from the car. Replace with and weld into place, the modified bracket supplied. The front bracket should be welded on to the rear gearbox mounting centre bracket. The position can be determined by attaching the front downpipe to the exhaust manifold. The other part of this bracket can then be tack welded to the front pipe to line up with it. Now remove the front pipe and complete the welding operation on the bracket. Refit front pipe and fully secure to gearbox mounting point. The centre pipe section and rear silencer box should now be offered into place. By twisting each section relative to each other, the optimum position can be determined giving satisfactory clearance over the rear axle beam, spare wheel well etc. Mark position for the rear mounting bracket and tack weld in place if possible. Remove from car for final welding operation. It is suggested that short lengths of small diameter tubing are welded to the pipes on either side of the sleeve joints to create a facility for lockwiring the pipes together rather than using exhaust clamps. This gives a quick release attachment,

## CLUTCH

invaluable for on event servicing or replacement if damaged. The system can then be attached using the standard exhaust mounting rubbers.

## CLUTCH ASSEMBLY

A sachs 190mm diameter, solid disc centreplate competition clutch with heavy duty diaphragm cover has been developed. This unit is supplied in the Clubmans Kit and fits the standard flywheel without any modifications. However, it does require a special release bearing which is supplied complete with a special bearing carrier. This carrier requires detailed modification for it to fit the existing gearbox casing, as follows. One of the three locating flanges must be reduced in thickness to give clearance against the gearbox casing at one point. This can be achieved by carefully grinding away the excess material thus 'thinning' the selected flange around its outside diameter. The three attachment holes around the carrier must then be slotted and elongated to adapt to the smaller pitch circle radius of the threaded holes in the casing. Assemble by first fitting the 'O' ring seal followed by the thin spacer ring. Secure in position by attaching the bearing carrier to the gearbox casing with the three bolts. Clutch cable adjustment procedure follows that for the standard car.



## SUB GROUP 06 — ENGINE

5XS06AC002	CYL. HEAD GASKET (1.2MM)	1
5XS06AC003	PISTON C/W RINGS	4
5XS06AC004	CON. ROD BOLTS	8
5XS06AC005	CYLINDER HEAD BOLTS	10
5XS06AC006	ENGINE MOUNTING L/H	1
5XS06AC007	ENGINE MOUNTING R/H	1
5XS06AC008	ENGINE MOUNTING REAR	1
5XS06AC009	COMPETITION AIR FILTER	1
5XS06AC017	OIL PICK UP PROTECTOR	1
5XS06AC023	OIL COOLER	1
5XS06AC024	SUMP BAFFLE PLATE	1
5XS06AC025	CAMSHAFT KIT	1
5XS06AC026	OIL PIPE KIT	1
5XS06AC027	LASH PAD	8
5XS06AC028	PISTON RING SET	1

## SUB GROUP 08 — FUEL AND EXHAUST

2877481	PEDAL COVER	5
8960970	CLAMP	10
9292730	HOSE	1
11041182	SCREW	2
11048672	SCREW	6
11082881	CLAMP	1
25055364	FUEL FILTER	1
90009241	HOSE 10 METRE	1
90076083	GASKET	1
90076329	CAP LOCKING	1
90080026	PLATE	1
90087290	RIVET	20
9008980	CAP	1
90095603	COVER	1
90096765	GASKET	1
90118441	BUSHING	1
90128184	SLEEVE	1
90136269	BUFFER	1
90136928	VALVE	1
90136950	PUMP FUEL	1
90144386	NECK ASSEMBLY	1
9014442	CLAMP ASSEMBLY	1
90144686	STRAP ASSEMBLY	1
90144687	STRAP ASSEMBLY	1
90144696	GASKET	1
90147917	WEATHERSTRIP	1
90156374	GROMMET	1
90156315	SPRING	1
90156344	CLAMP ASSEMBLY	1
90156361	ELBOW	1
90156883	VALVE	2
90166406	HOSE 10 METRE	1
90233169	HOSE	1
90234259	HOUSING	1

90234260	FILTER AIR	2
90234261	HOUSING	1
90234613	CLAMP ASSEMBLY	1
90264020	NUT	2
90281492	SUPPORT	1
90284248	CLIP	1
90297337	TANK ASSEMBLY	1
90298933	SOCKET	1
90298947	HOSE ASSEMBLY	1
90299441	HOSE	1
90299839	BRACKET ASSEMBLY	2
90322066	TUBE AIR	1
90322926	BRACKET ASSEMBLY	1
5XS08AC001	EXHAUST PRIMARY PIPE	1
5XS08AC002	EXHAUST SECONDARY PIPE	1
5XS08AC004	EXHAUST TAIL PIPE	1
5XS08AC006	COMPLETE EXHAUST SYSTEM	1
5XS08AC007	KIT, BRACKETS	1
5XS08AC008	KIT, FUEL PIPES	1
5XS08AC009	SET OF INJECTORS	1

## SUB GROUP 13 — COOLING

5508521	VALVE PRESSINGS	1
8977239	WASHER	2
8977239	WASHER	2
11013122	NUT	2
11061401	SCREW	1
11067237	NUT M10	5
11081411	SCREW	6
11081921	SCREW	2
11082101	SCREW	20
16501079	GASKET	1
16501080	GASKET	1
22061380	FAN	1
90065239	SCREW	20
90091989	BUMPER	10
90106190	BUSHING	2
90112004	SCREW	2
90119426	RETAINER	1
90126547	CLAMP	2
90128703	FUNNEL	1
90128168	BUMPER	10
90128625	BRACKET	1
90128691	TANK	1
90136753	RADIATOR	1
90166406	HOSE 10M	1
90169058	RING	2
90190757	BUSH ASSEMBLY	2
90223659	CARRIER ASSEMBLY	1
90226607	HOSE	1
90278895	BRACKET R/H	1
90279158	BRACKET L/H	1
90298318	RADIATOR	1
90298963	HOSE	1
90298964	HOSE	1
90302205	SPOILER	1
90323360	PIPE ELBOW	1
90324040	HOSE	1
90324041	HOSE	1
90324057	HOSE	1
90343325	CLAMP SPRING	1
90344306	BRACKET	1

## SUB GROUP 18 — HEATER

3023773	SEAL	1
3033435	CLIP	1
3048824	SCREW ASSEMBLY	3
3050567	LEVER	1
3050577	LEVER	1
3050579	CLAMP	1
3050581	ROD LINK	1
3050583	VALVE	1
3050584	GEAR	1
3050588	SHAFT	1
3050602	RADIATOR	1
3051159	VALVE	1
3052061	HOUSING ASSEMBLY	1
3052207	CLIP	1
3053289	WASHER	1
3053291	LEVER	1
3058407	CLAMP	1
8974979	GROMMET	2
11038826	SCREW	10
11063471	NUT	10
11068521	SCREW	10
11072641	SCREW	50
11074201	NUT	1
11075092	SCREW ASSEMBLY	2
11076991	NUT	2
11505830	SCREW	10
52450241	CHAMBER	1
52450254	CHAMBER	1
52450259	LEVER	1
90034826	HOUSING	1
90038150	GASKET	1
90038348	CLAMP	2
90053836	GASKET	1
90120333	HOUSING	1
90120363	FLAP	2
90120378	CONTACT ASSEMBLY	1
90126694	GASKET	1
90139062	HOUSING	1
90158239	RETAINER	1
90196859	HOUSING	1
90208107	COVER	2
90219865	INSERT ASSEMBLY	2
90219866	INSERT ASSEMBLY	2
90221198	CLIP	50
90221467	CLIP	10
90227051	BLOWER ASSEMBLY	1
90320270	CABLE	1



Leading Belgian driver, Bernard Munster, has produced some startling results across Europe in his Corsa GSi.

A close ratio 'dog type' gearbox kit has been specially developed for this model. This gearbox utilises the casing and intermediate housing or 'sandwich plate' from the standard car's F13 speed gearbox but the component parts of the close ratio kit must be assembled along with a revised end cover and gearshift cover assembly. As this is a heavy-duty gearbox unit, many of the component parts are larger than the corresponding standard item. To accommodate these some detailed internal modifications must be carried out on the casing BEFORE commencing assembly operations.

### CASING MODIFICATIONS

The following operations are required within the area normally containing the DIFFERENTIAL UNIT.

Remove the speedometer drive gear assembly and blank off the hole with the blanking plug supplied. The speedometer drive gear support lug can now be removed by grinding away the excess material. Also 'chamfer' the region adjacent to this blanking plug and remove excess material by creating a 'flattened' profile to the area immediately above the centreline of the differential bearing housings. This will give the additional clearance required for easy installation of the differential assembly. Clean off all internal rough edges due to variances in castings to give clearance for the crown wheel.

The following operations are required within the area normally containing the GEARBOX ASSEMBLIES.

The reverse gear shaft support housing is already machined to 'convex' profile, this must be further modified by grinding to a 'rounded' profile. To ensure COMPLETE engagement of the dog teeth in 4th gear, the 1st/2nd and 3rd/4th gear selector shaft support housing must be spot-faced, removing 1.5mm from the entire face of the casting at this point. The casting must also be relieved by further radiuses in the corner of this area, to give additional clearance between the casing and the selector fork enabling it to butt against this machined face. The amount to be

removed can easily be determined by inserting the selector fork and shaft into position in the casing as a guide. Since the 4th gear wheel is larger than the standard item, a considerable amount of material must be removed from the casing at the point where the gear cluster encroaches into the differential housing. Approximately 2mm clearance is called for when assembled, and this clearance can be viewed through the aperture in differential case when the gearbox cluster is fitted into the casing.

Modifications to INTERMEDIATE HOUSING or SANDWICH PLATE.

The mainshaft bearing housing will foul on the 1st gear wheel unless the casting marks are removed by rounding off the affected area before assembly. The amount of material to be removed can easily be confirmed by offering up the mainshaft complete with the gear. All the above mentioned points are highlighted in the illustrations for this chapter.

### GEARBOX ASSEMBLY PROCEDURE

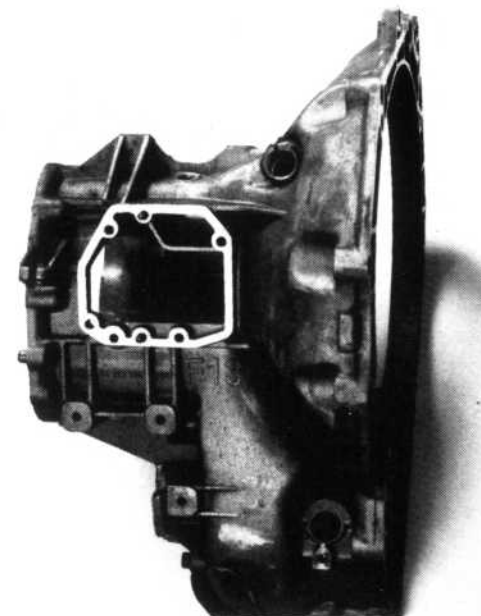
It is very important that all the parts required are thoroughly cleaned prior to commencing reassembly of the gearbox and a clean, swarf-free area is reserved for the build.

Carefully remove all gears from the mainshaft, since they have only been fitted loosely to the shaft for packaging purposes. It may be prudent to note the sequence of this assembly and confirm with the diagrams provided.

The final drive gear pinion is integral with the mainshaft, but prior to further assembly carefully fit the spacing washer behind the gear, making sure that the small locating ball is correctly located in the small hole provided in the shaft and spacer, thus preventing the spacer from revolving.

Now lightly lubricate the roller bearings and slide over the mainshaft, along with the gear wheels and selector hubs in the order and position shown by the exploded diagrams and photographs.

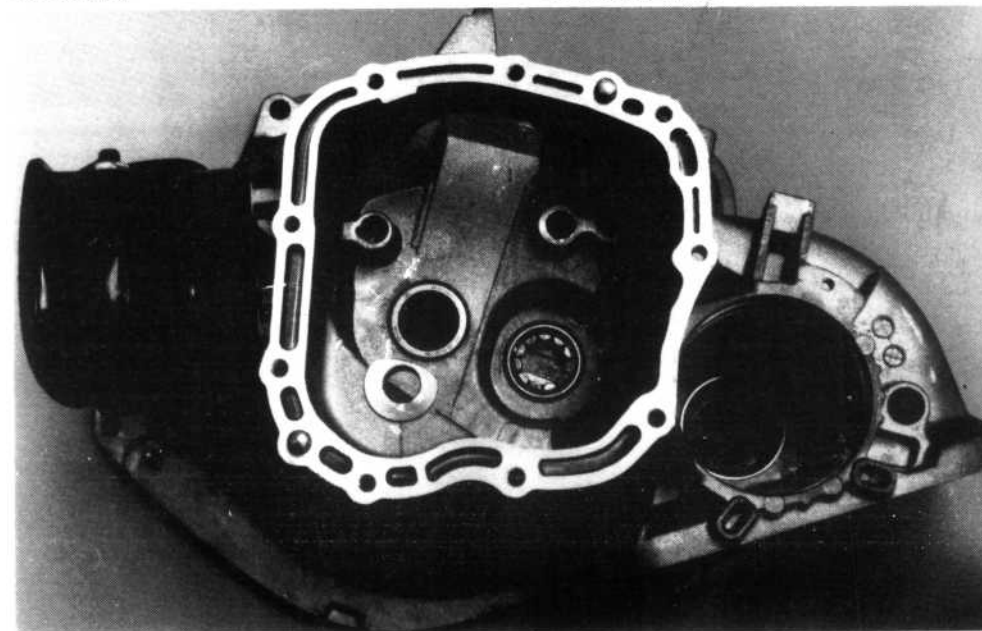
NOTE: If the donor gearbox has already covered a significant distance, renew the mainshaft



The F13 casing



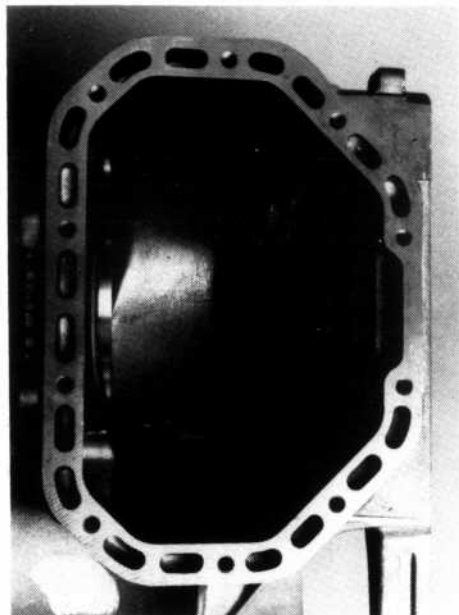
Blanking plug installed



Looking into gear compartment



Chamfer completed



Diff casing



Casing detail



Sandwich plate detail

and 1st motion shaft bearings as a precaution.

Now at this stage the mainshaft bearing can be fitted into its housing in the sandwich plate and secured with the correct circlip. For ease of assembly, press the other bearing on to the 1st motion shaft and loosely position its large retaining circlip behind the bearing in readiness for final assembly. This circlip **CANNOT** be fitted **AFTER** this shaft and bearing have been pressed into the sandwich plate. The sandwich plate must now be supported in a vice with the gearbox side facing towards you. Take hold of the two assemblies, (mainshaft and 1st motion shaft) and whilst holding the two 'in mesh', simultaneously introduce the shafts to their respective positions 'through' the sandwich plate. That is the mainshaft into its bearing, the 1st motion shaft and bearing into its housing, securing the 1st motion shaft with the large circlip behind the bearing.

Now reposition this assembly in the vice, turning it through 180 degrees such that the gear clusters are behind the sandwich plate and facing away from you.

Place the 1st/2nd gear selector fork around its hub and press the selector shaft through this fork and into the sandwich plate. Ensure that the detent grooves are uppermost and then carefully secure the fork to the shaft with two roll-pins. The 5th gear selector rod assembly can now be inserted through the sandwich plate and the 3rd/4th gear selector fork placed around its hub.

Engage 2ND GEAR and push the mainshaft away from you to the full extent of the available free movement. This will give better access to install and secure the interlock pin assembly to the sandwich plate with two cap headed bolts. Once this is fitted, the mainshaft can be returned to its correct position up against the bearing, and the 1st/2nd gear selector rod returned to the NEUTRAL position. The 3rd/4th gear selector rod can now be inserted through the axis of the 5th gear selector assembly, into the 3rd/4th gear selector fork and secured with care by roll-pins. The 5th gear pawl assembly should now be attached to the sandwich plate using two

cap-headed bolts, making sure that the slot in the 3rd/4th gear selector rod located the end of the pawl.

The 5th gear complete with its hub and selector fork can now be fitted to the end of the mainshaft. The selector fork locates on the end of the 5th gear selector rod assembly. Secure the gear to the shaft with the 33mm nut, **NOTE LEFT HAND THREAD**, and tighten to a torque of 14kg/m.(100lb/ft.), **THEN** indent the locking collar. Insert the small blanking plug into the hole in the end of the 5th gear selector shaft assembly, Please ensure that the small holes in the shaft, blanking plug and selector fork **ALL** align with each other **BEFORE** securing with two roll-pins.

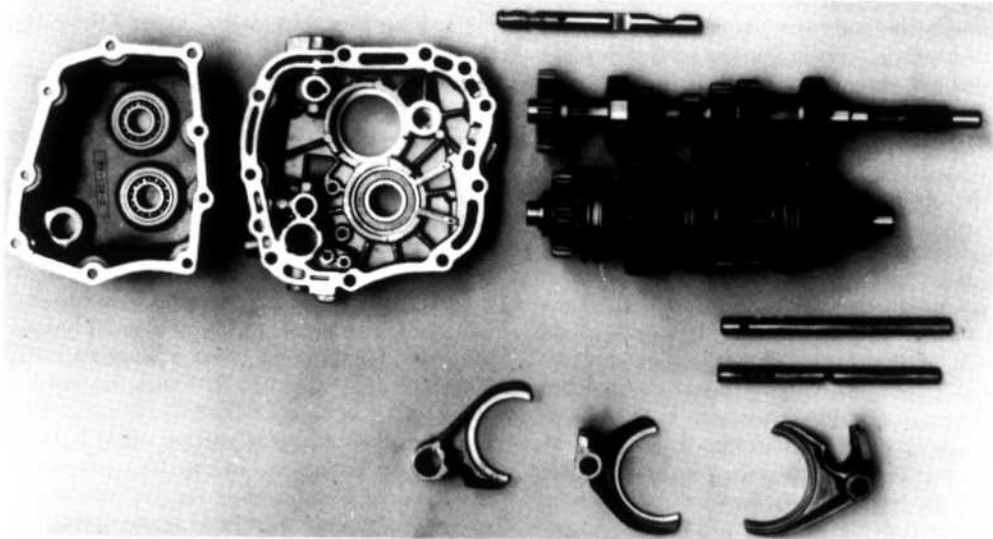
The other 5th gear can be fitted with the spacer ring to the end of the 1st motion shaft and secured by a circlip. Fit the reverse gear to its shaft with the thick spacer positioned between the gear and the sandwich plate. The reverse gear thrust washer must not be fitted, as it would prevent full engagement of the gear in this gearbox. Carefully insert this shaft assembly into the hole in the sandwich plate making sure that the small **LOCATING BALL** is aligned with the machined groove in the sandwich plate. Using a copper faced hammer, drift the shaft fully into the hole.

The long interlocking pin can now be inserted into position through the reverse gear detent hole. Fit reverse gear selector fork to shaft, fit into sandwich plate and secure fork to shaft with roll-pin.

The **FOUR** detent pins and springs can now be inserted. and retained using the force-fit plugs.

The gearbox cluster assembly is now complete and can be checked for correct operation before final installation into the gearbox casing.

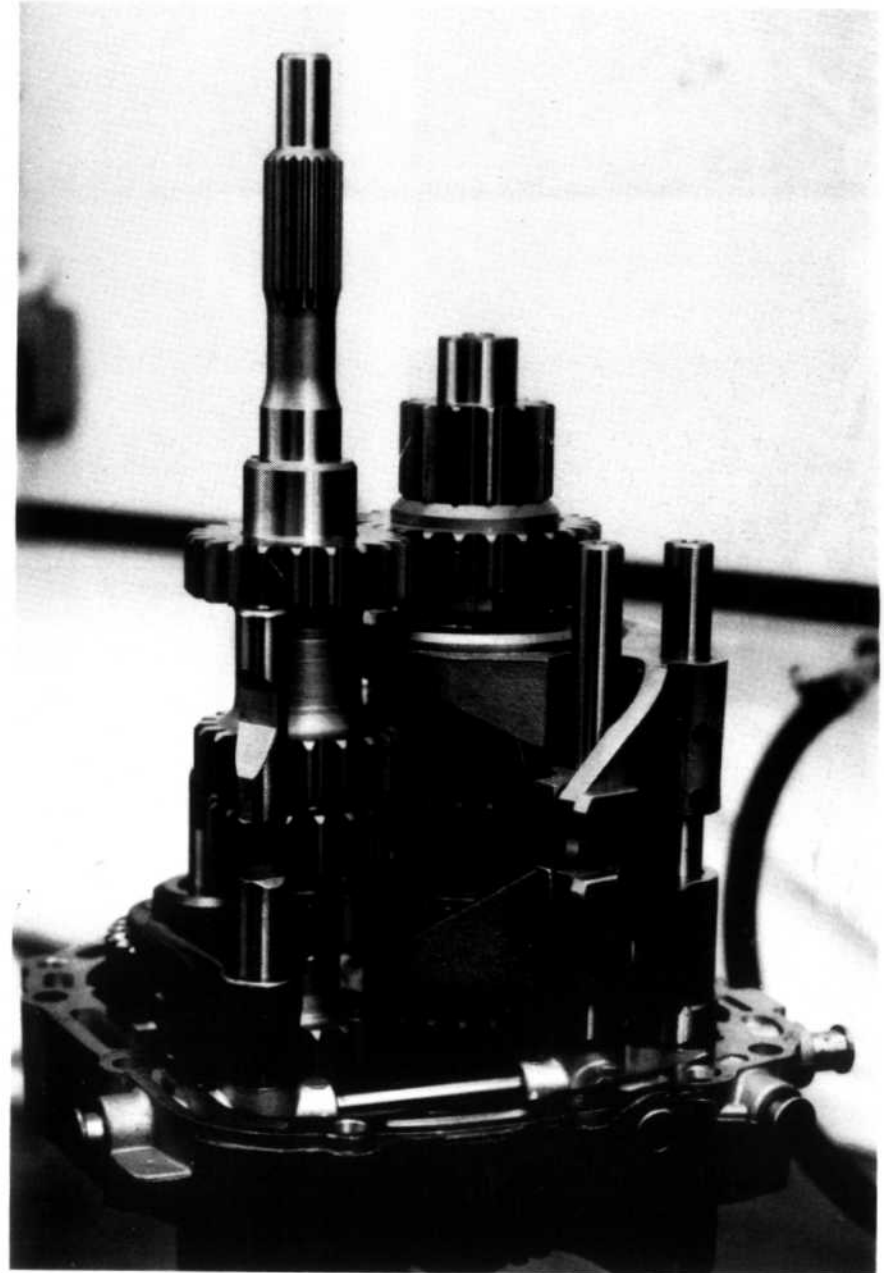
**NOTE:** This unit must be fitted to the gearbox casing **BEFORE** the special end cover is attached. To re-check clearance of 4th gear to casing, refer to previous instructions regarding casing modifications.



*Cluster and plates before assembly*

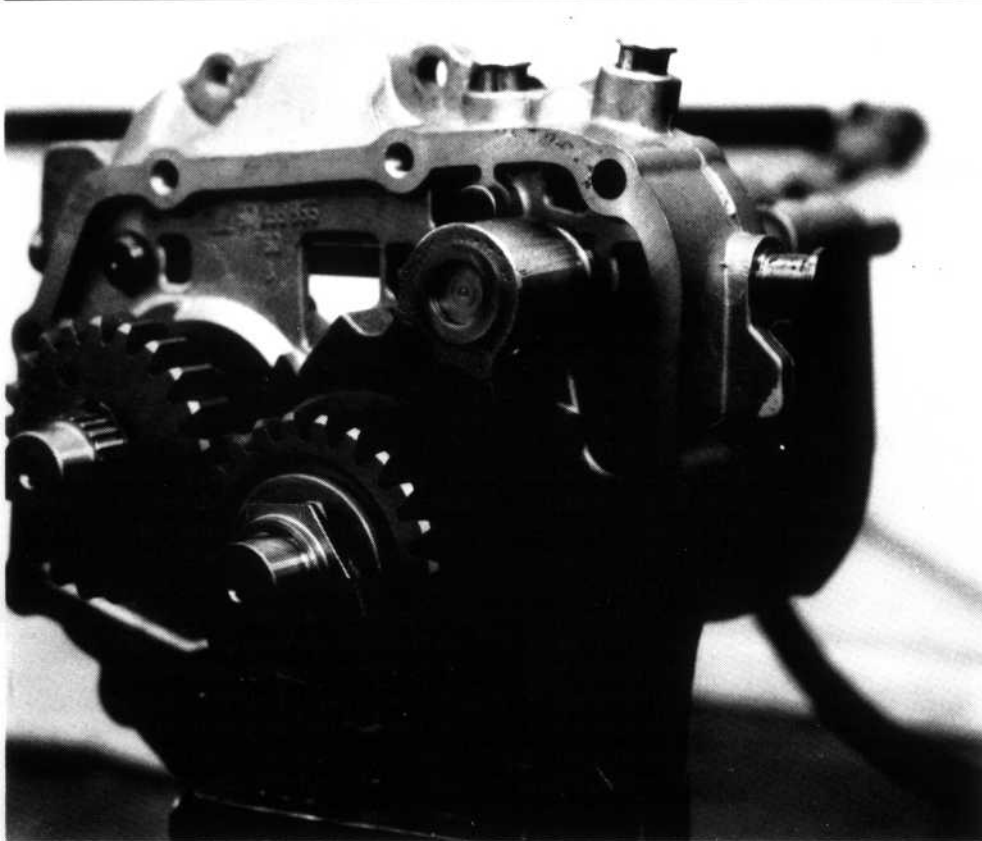


*Introducing the shafts onto the sandwich plate*

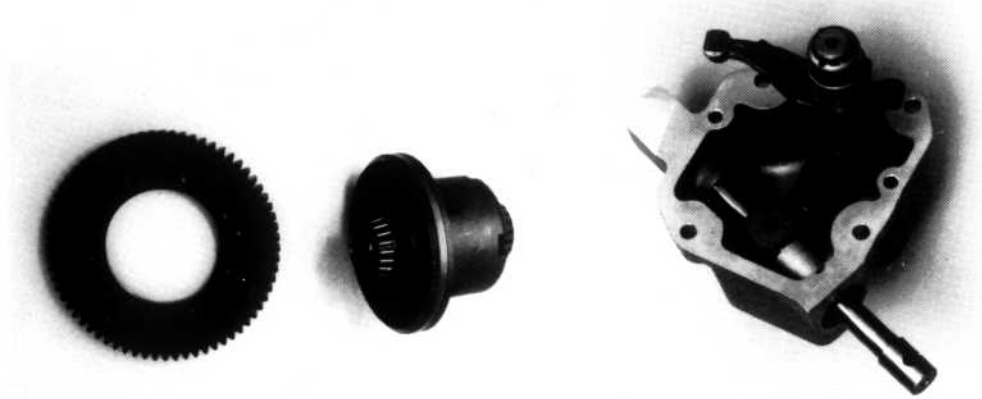


*The gearbox cluster assembled*





Gear selector fork installed



Diff and crown wheel

Gear shift cover

In conjunction with this gearbox a revised gearshift mechanism has been developed ensuring precision gearchange characteristics and better durability.

The standard gearshift cover assembly is replaced by a modified assembly supplied as a complete unit. This is a heavy duty construction, and is compatible with the redesigned gearchange linkage.

#### DIFFERENTIAL ASSEMBLY PROCEDURE

Alternative final drive ratios in heavy duty form and a six-pack limited slip differential assembly have been fully developed for use in conjunction with this gearbox unit.

The increased size of this crown wheel does not allow sufficient space to retain the speedometer drive gear. The limited slip differential is supplied fully assembled and is pre-set to give approximately 75% lock-up. This figure has been determined by extensive rallying experience with the model and gives good traction characteristics, yet remaining easy to drive. There is scope within the limited slip unit for this figure to be altered, by alternative shim configuration, but would suggest that the 75% figure will more that satisfy the needs of the majority of drivers.

Assembly of this differential unit to the crown wheel follows the normal service procedure for the Nova/Corsa model.

Don't forget the general rule that if the donor transmission has already covered a considerable distance, rebuild with new bearings. If in doubt, fit new.

**IMPORTANT PLEASE NOTE:** This heavy duty differential assembly CANNOT be FITTED to, or REMOVED from the differential housing until the gearbox assembly is withdrawn from its casing by a minimum of 5mm.

#### DRIVESHAFTS

To transmit the extra power developed by the engine in Group A trim, it has been necessary to design and develop special heavy duty driveshafts. These are fitted with much larger

constant velocity joints and special drive flanges running in larger diameter wheel bearings. These shafts are capable of handling the torque from the 2-litre engine, so the competition life in this application is considerably improved.

The driveshafts must be fitted in accordance with workshop procedures for the standard car.

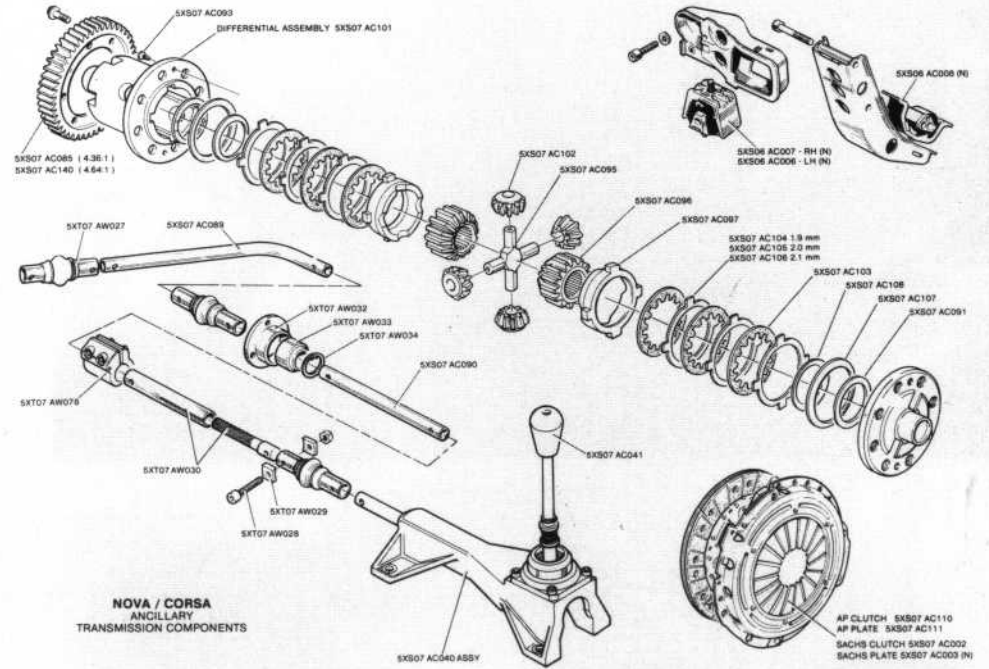
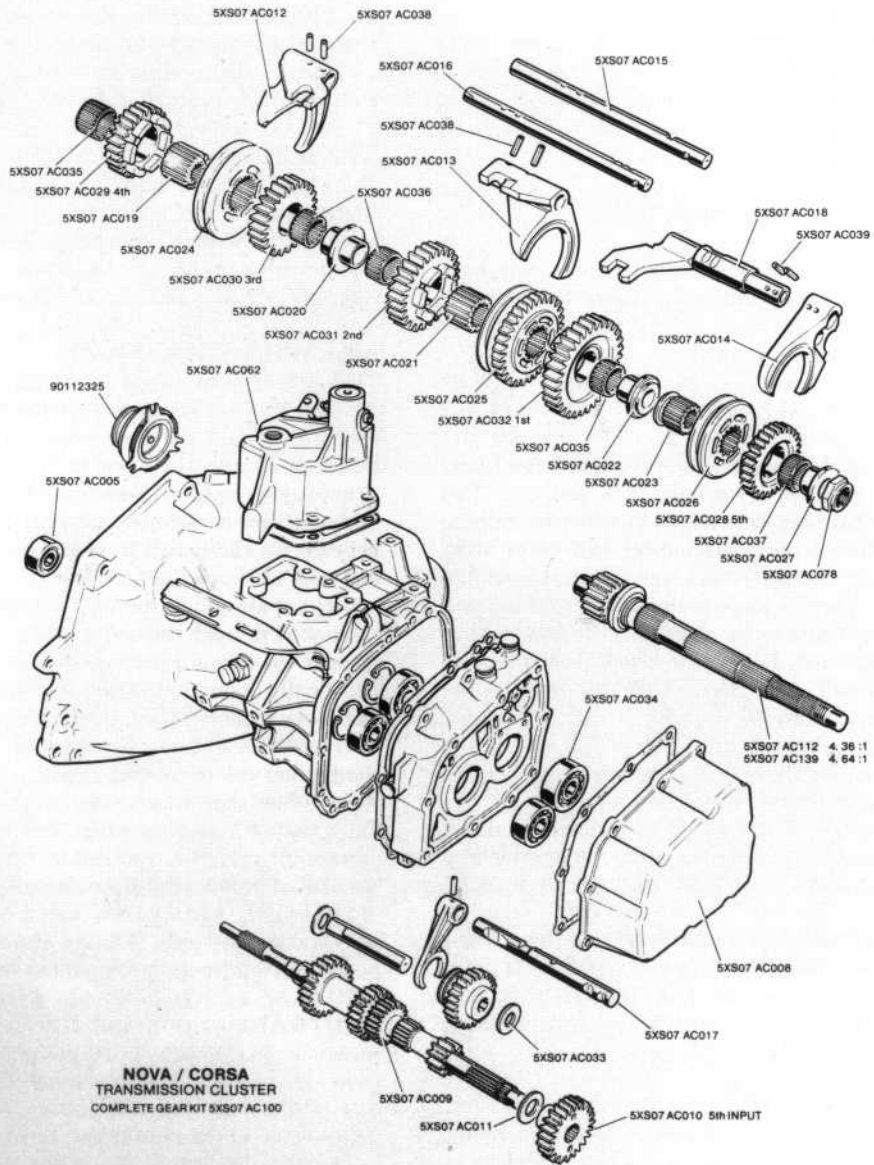
#### GEARCHANGE MECHANISM

Three `Apex' joints, shaped connecting rod, long straight shaft, short hollow shaft, shaft support bearing and housing, gearchange lever assembly and joining block are supplied. This is a complete assembly and can only be used as such.

#### ASSEMBLY PROCEDURE

This can only be fitted in the first instance, AFTER the engine and gearbox have been installed. Attach the shaft support bearing and housing to the forward mounted bracket previously welded into place during the bodysell preparations. Fit one `Apex' joint between the short shaft from gearshift cover and one end of shaped connecting rod. The long straight shaft should be lightly lubricated and positioned through the hole in the centre tunnel, through the forward positioned spherical bearing and finally connected to the shaped connecting rod using another `Apex' joint. The gearchange lever assembly can now be joined to this straight shaft using the remaining `Apex' joint and the short hollow shaft which slides over the end of it. This forms a sliding joint for gearchange adjustment purposes, and can be firmly fixed in the desired position using the clamping block.

**BEFORE MARKING OUT** where the gearchange assembly is to be attached to the centre tunnel, the gearbox should be placed in NEUTRAL gear position, the gearchange in NEUTRAL position and the sliding joint provisionally clamped in mid position. With the gearchange assembly firmly attached, check the availability of the six gears. Any final adjustments to the linkage can be made by first slackening the four bolts on the sliding joint clamping block, this will then allow the lever to be repositioned.



TRANSMISSION PARTS LIST

SUB GROUP 07 — TRANSMISSION

11031269	CIRCLIP	1	5XS07AC041	GEAR LEVER KNOB	1	5XS07AC102	DIFF BEVEL GEAR	1
11075391	SHIM	2	5XS07AC042	GEARCHANGE SPINDLE	1	5XS07AC103	DIFF MOLY PLATE	1
90086806	CIRCLIP 5TH GEAR INPUT SHAFT	1	5XS07AC043	CRANK	1	5XS07AC104	FRICTION PLATE 1.9	1
90092175	PLATE STOP	1	5XS07AC045	BLOCK REV. INTERLOCK	1	5XS07AC105	FRICTION PLATE 2.0	1
90105504	SPRING	1	5XS07AC046	REMOTE MOUNTING	1	5XS07AC106	FRICTION PLATE 2.1	1
90120399	CABLE HEATER	1	5XS07AC047	COVER PLATE	1	5XS07AC107	BELLVILLE WASHER	1
90121287	SPRING	1	5XS07AC048	GEAR LEVER SPACER	1	5XS07AC108	BELLVILLE WASHER, SMALL	2
90121529	SHAFT	1	5XS07AC049	SPRING SEATING	1	5XS07AC109	SEAL (BEARING SLIDE)	1
90121286	CLUTCH PEDAL	1	5XS07AC050	BALL JOINT	1	5XS07AC110	AP CLUTCH	1
90135901	PEDAL CLU	2	5XS07AC051	SPRING RING INTERNAL	1	5XS07AC111	AP CLUTCH PLATE	1
90135918	PEDAL ASSEMBLY	1	5XS07AC052	CIRCLIP EXTERNAL	1	5XS07AC112	OUTPUT SHAFT 4.36:1	1
90136166	PEDAL ASSEMBLY	1	5XS07AC053	SPRING	1	5XS07AC113	AP RELEASE BEARING GUIDE	1
90136230	CAP ACCELERATOR	1	5XS07AC054	SCREW M6 × 15 × 1	1	5XS07AC114	AP RELEASE BEARING CARRIER	1
90278159	BRACE PEDAL	1	5XS07AC055	SCREW M6 × 25 × 1	1	5XS07AC115	AP RELEASE BEARING	1
0320269	CABLE HEATER	1	5XS07AC056	SCREW 2BA × 1/2	1	5XS07AC118	PLUG SPEEDO BLANK	1
5XS07AC001	CLUTCH COVER (190MM)	1	5XS07AC057	SCREW M6 × 12 × 1	1	5XS07AC119	CAPSCREW AP CLUTCH COVER	6
5XS07AC002	CLUTCH COVER	1	5XS07AC058	SPRING WASHER	1	5XS07AC139	OUTPUT SHAFT 4.64:1	1
5XS07AC003	CLUTCH DRIVEN PLATE (5/8 × 20 SPLINE)	1	5XS07AC059	SPRING WASHER	1	5XS07AC140	RING GEAR 4.64:1	1
5XS07AC005	CLUTCH RELEASE BEARING	1	5XS07AC060	SPRING PIN	1	5XT07AW027	APEX JOINT MOD.	3
5XS07AC006	CLUTCH RELEASE HOUSING	1	5XS07AC061	GAITER	1	5XT07AW028	BOLT FOR APEX JOINT M6 x 45	6
5XS07AC008	END COVER	1	5XS07AC062	TURRET HOUSING	1	5XT07AW029	SADDLE WASHER	6
5XS07AC009	INPUT SHAFT CLUSTER	1	5XS07AC063	GUIDE BOLT	1	5XT07AW030	ADJUSTER ASSEMBLY (FRONT)	1
5XS07AC010	5TH GEAR INPUT SHAFT	1	5XS07AC064	SPINDLE	1	5XT07AW031	ADJUSTER CLAMP	1
5XS07AC011	SPACER COLLAR 5TH GEAR	1	5XS07AC065	INNER STOP RING GUIDE BOLT	1	5XT07AW032	BULKHEAD BEARING HOUSING	1
5XS07AC012	SELECTOR FORK 1	1	5XS07AC066	SCREW M8 × 20 × 1.5	1	5XT07AW033	SPHERICAL JOINT	1
5XS07AC013	SELECTOR FORK 2	1	5XS07AC068	SPRING WASHER M10	1	5XT07AW034	CIRCLIP FOR B.HEAD BRG. HSG.	1
5XS07AC014	SELECTOR FORK 3	1	5XS07AC069	SPRING WASHER M8	1			
5XS07AC015	SELECTOR ROD 1	1	5XS07AC070	BUSH	1			
5XS07AC016	SELECTOR ROD 2	1	5XS07AC071	OIL SEAL	1			
5XS07AC017	SELECTOR ROD 3	1	5XS07AC072	ROLL PIN OPERATING BALL	1			
5XS07AC018	SELECTOR ROD 4	1	5XS07AC073	CIRCLIP GUIDE BOLT	1			
5XS07AC019	SPLINED SLEEVE/DRIVE DISC	1	5XS07AC074	INTERMEDIATE LEVER	1			
5XS07AC020	BEARING SLEEVE	1	5XS07AC075	OUTER SPRING INTER. LEVER	1			
5XS07AC021	SPLINED SLEEVE/DISC DRIVE	1	5XS07AC076	INNER SPRING INTER. LEVER	1			
5XS07AC022	BEARING SLEEVE	1	5XS07AC077	OPERATING BALL	1			
5XS07AC023	SPLINED SLEEVE/DRIVE DISC	1	5XS07AC078	L/H NUT OUTPUT SHAFT	1			
5XS07AC024	DRIVE DISC	1	5XS07AC080	THRUST WASHER	1			
5XS07AC025	DRIVE DISC	1	5XS07AC082	STEEL BALL	1			
5XS07AC026	DRIVE DISC	1	5XS07AC084	OUTPUT SHAFT 4.53:1 (15T)	1			
5XS07AC027	BEARING TRACK 5TH GEAR	1	5XS07AC085	DIFF. GEAR 4.53:1 (68T)	1			
5XS07AC028	5TH GEAR OUTPUT	1	5XS07AC086					
5XS07AC029	4TH GEAR OUTPUT	1	5XS07AC087	DRIVESHAFT L/H	1			
5XS07AC030	3RD GEAR OUTPUT	1	5XS07AC088	DRIVESHAFT R/H	1			
5XS07AC031	2ND GEAR OUTPUT	1	5XS07AC089	GEAR LINKAGE ROD, ANGLED	1			
5XS07AC032	1ST GEAR OUTPUT	1	5XS07AC090	GEAR LINKAGE ROD, STRAIGHT	1			
5XS07AC033	STOP RING REV. IDLER	1	5XS07AC091	THRUST WASHER	1			
5XS07AC034	BEARING END COVER	1	5XS07AC093	SCREW (CSK M6 x 8)	8			
5XS07AC035	BEARING NEEDLE CAGE	1	5XS07AC094	DIFF CASING	1			
5XS07AC036	BEARING NEEDLE CAGE	1	5XS07AC095	CROSSPIN	1			
5XS07AC037	BEARING NEEDLE CAGE	1	5XS07AC096	SIDE GEAR	1			
5XS07AC038	SELLOCK PIN	1	5XS07AC097	RAMP	2			
5XS07AC039	SELLOCK PIN	1	5XS07AC100	F13 GEAR ASSEMBLY	1			
5XS07AC040	GEAR LEVER	1	5XS07AC101	DIFF ASSEMBLY	1			



## GEARBOX & FINAL DRIVE DATA

The Homologated ratios for the heavy duty gearbox are as follows. It is important to remember that these are internal and not the overall ratios.

RATIO	NUMBER OF TEETH
1st .... 2.54:1	33:13
2nd .... 1.76:1	30:17
3rd .... 1.42:1	27:19
4th .... 1.19:1	25:21
5th .... 1.04:1	24:23
Rev .... 3.31:1	29:13 × 43:29

Several optional final drive ratios have been homologated but the crown-wheel and pinion sets that equate to the ratios are not necessarily readily available.

The following ratios are currently being used successfully:

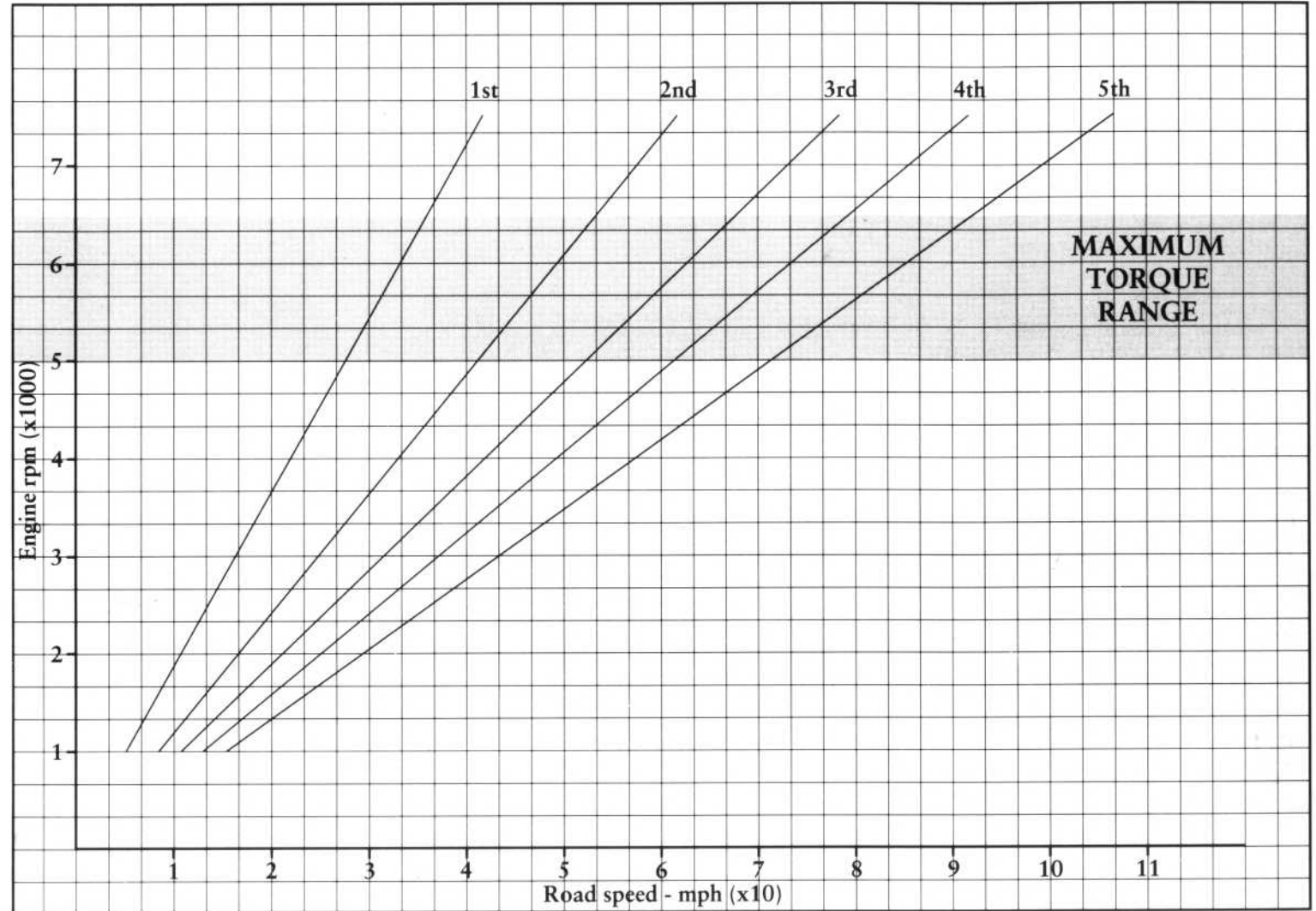
Gravel. 4.64:1  
 Tarmac. 4.36:1

### PERFORMANCE DATA: Fifth gear

$c_g$  7500 RPM

Final Drive

Ratio	Racing Tyres	Gravel Tyres
	18/56-14	14/60-14
	KPH/MPH	
4.64:1	161.10/100.05	
4.36:1	171.433/106.48	

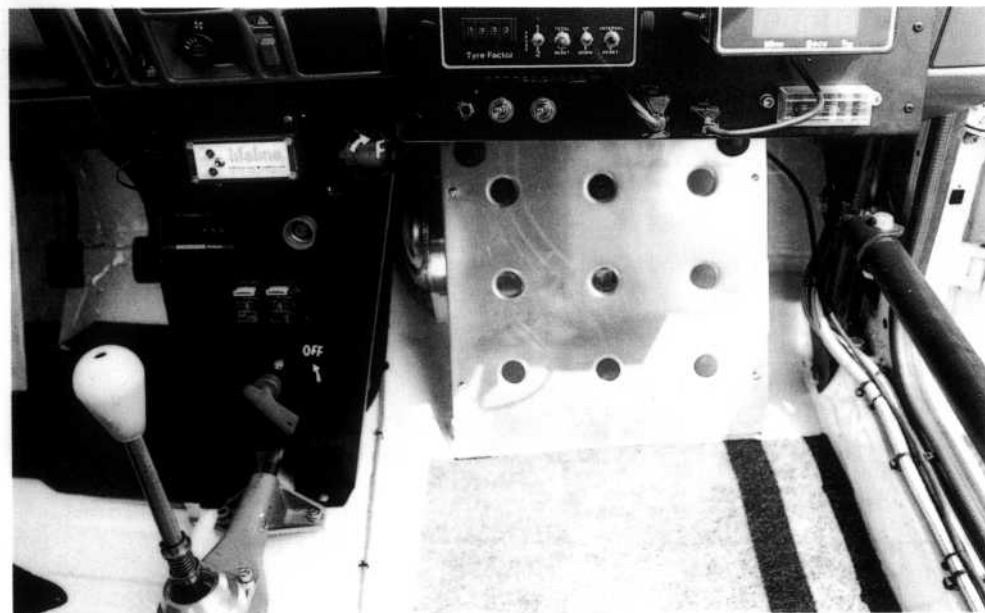


## SPEEDS IN GEARS AT 7500 rpm

4.36:1 Final Drive  
 18/56 - 14 Michelin Racing Tyres



Interior shot



## ELECTRICAL SYSTEM

The standard wiring loom and 55 ampere alternator are completely satisfactory and need only be modified when several extra electrical components are to be fitted. Under certain event conditions, four additional driving lamps, a short wave radio and additional navigational instruments may be required. Under these circumstances we would advocate the fitment of a 90 ampere alternator and additional individual wiring harnesses appropriately relayed and fused. The 1600 model is fitted with a 44 ampere hour capacity, maintenance-free battery. This is completely satisfactory for all competition applications.

When refitting the wiring loom following a major vehicle rebuild such as this, certain precautions must be taken to ensure satisfactory performance of all electrical components. Wherever possible secure the wiring to the bodyshell using proprietary clips and always use grommets where the wiring passes through metal panels. Additional care when making cable runs will pay dividends... neat, tidy and secure means safe and reliable! Ensure all plug-in connectors are clean and completely engaged when assembled. Special attention must be given to all the earthing points around the vehicle, as some of these may have become insulated during the painting process. Thoroughly scrape away excess paint from these positions to ensure a good connection.

Certain additional electrical items are obligatory under FIA Appendix J regulations concerning safety. A general circuit breaker must be fitted to cut out all electrical circuits and must now be wired in such a way that it also stops a running engine.

A foot switch to operate the horn from the co-driver's side of the car must also be fitted. To fit these and other important items, the following procedures should be adopted.

### CIRCUIT BREAKER (Master Switch)

An ideal position for mounting this is the centre console, just above the gearlever linkage (see photo).

Using the existing wiring loom, take the thickest

battery +ve lead (16mm) and re-run it through the bulkhead to the switch terminal.

Connect the other switch terminal directly to the starter motor using similar 16mm cable. Replace the link lead from the starter motor to the alternator with 16mm cable. This will now be suitable for use with a larger output alternator if required.

Now take the remaining smaller diameter (10mm) battery +ve lead, re-route and attach it directly to the alternator.

To ensure that the engine is also cut when the master switch is moved to the off position, the coil -ve terminal must be connected to one of the two small 'W' contacts on the master switch. The second 'W' contact must be connected to chassis ground.

A coil -ve terminal can easily be found on the rear face of the instrument cluster as this lead is also the tachometer pulse supply lead (light green). Run an additional wire from this connection point to the appropriate 'W' terminal on the master switch, following the path of and taped to the existing harness where possible for support.

NOTE: Certain event regulations require that this switch can also be actuated from outside the vehicle. In this case a choke or bonnet release cable assembly can be adapted to operate the switch from a cable pull mounted on the bulkhead.

### FOOT SWITCH

This switch requires a lead from the -ve side of the horn (brown/white), and a return to chassis ground. We would suggest making the connection with the -ve side of the horn in the region of the horn push, where the lead emerges at the top of the steering column and connects to a contact ring, rather than breaking into the harness at the lower end of the steering column. Again follow the path of and tape to the existing harness for support.

**NAVIGATIONAL EQUIPMENT AND RADIO**

Take two feeds, one from each main terminal on the master switch and connect into a fuse box. This then gives the option of a permanent live feed (for radio) or switched feed (for instruments).

**AUXILIARY LIGHTING**

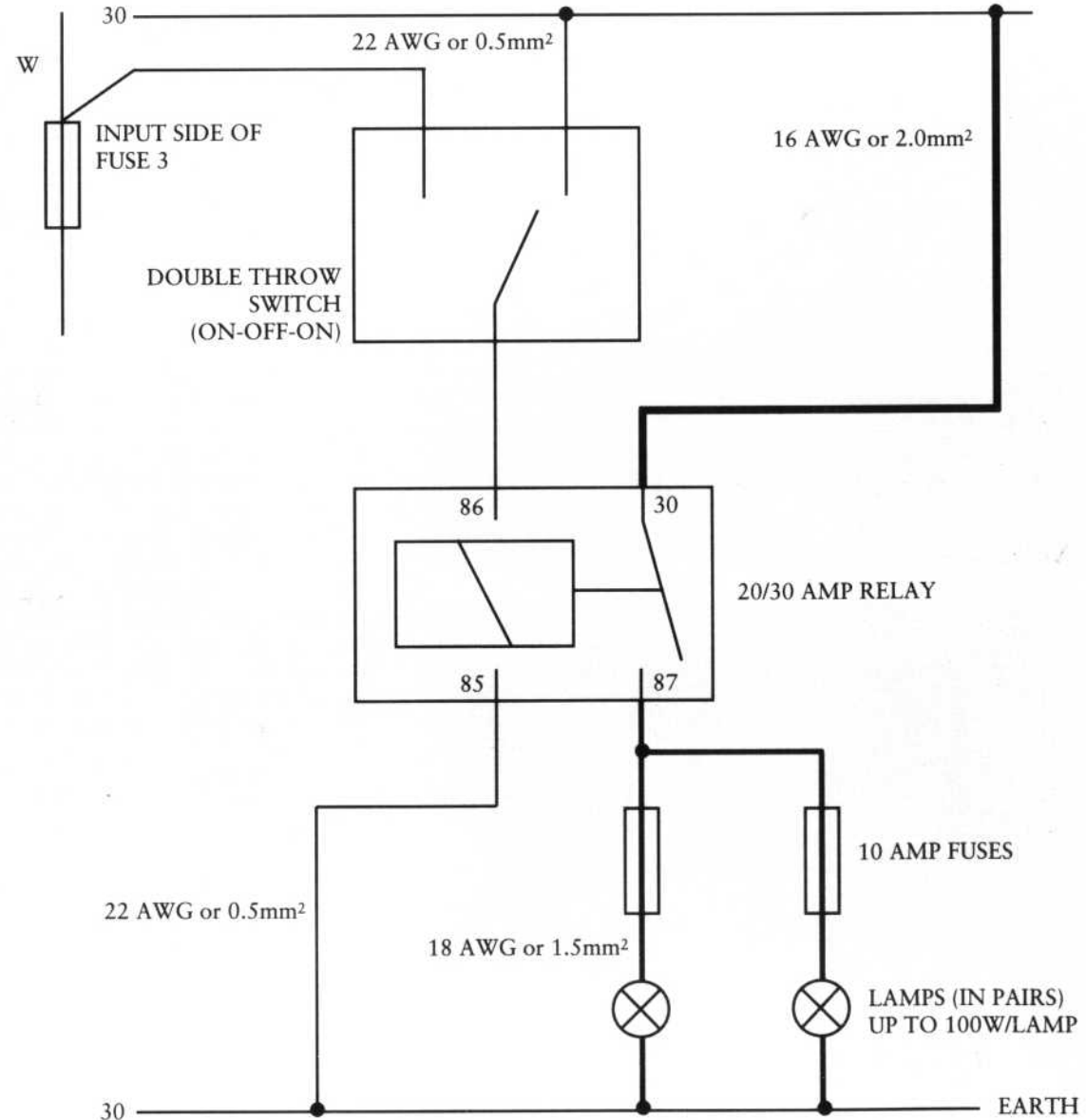
The main supply should be taken directly from the master switch and connected to the power input supply of the relay/s. To comply with technical vehicle regulations, additional driving lights should be switched off when the headlights are on dipped beam. Control switching of the relay/s must therefore be taken from the main beam circuit, and we would suggest taking this supply from the input side of fuse number three. The wire will require soldering to this terminal.

By using double throw switches with on-off-on sequence, they can be fitted such that in the UP position the additional lights are switched on and off by the main beam (i.e. legal) and in the DOWN position they would be on at all times regardless. Refer to the line diagram showing a typical auxiliary lights wiring circuit for a 'works team' car.

**INSTRUMENTATION**

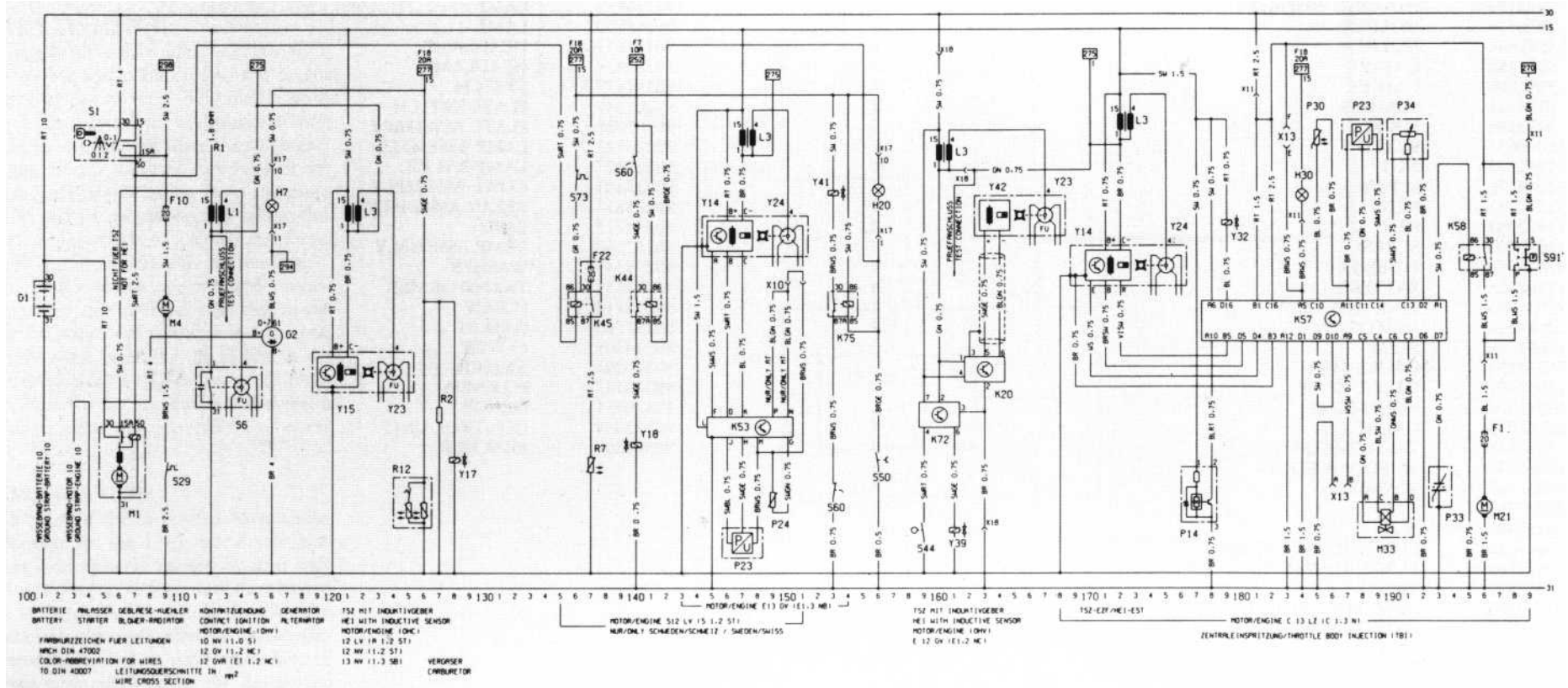
The introduction of the face-lifted Nova/Corsa GSi model range for the 1991 model year also gave the car a completely revised interior trim package including a redesigned dashboard assembly. In Group A, the standard dashboard must be retained, although different instruments may be fitted to it, and in a different layout. However the trimmings below the dashboard and which are not a part of it may be removed. The standard centre console can therefore be removed and replaced by a panel for the mounting of auxiliary components, such as the battery master switch, fire extinguisher controls and fuses etc.

As the speedometer is inoperative, reference to the tyre section will give the miles/kilometres per hour per 1000 RPM in 5th gear so that the rev counter can also be used as a speed indicator.

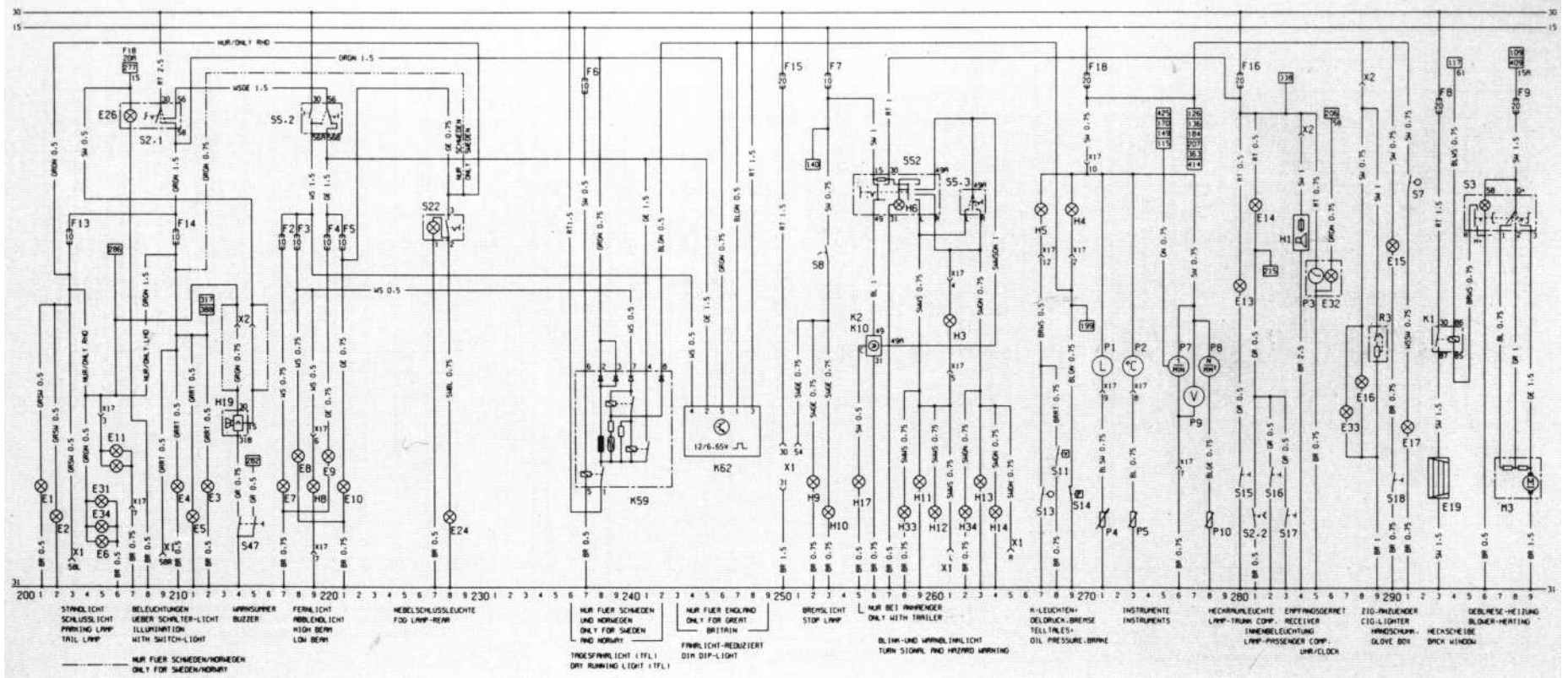


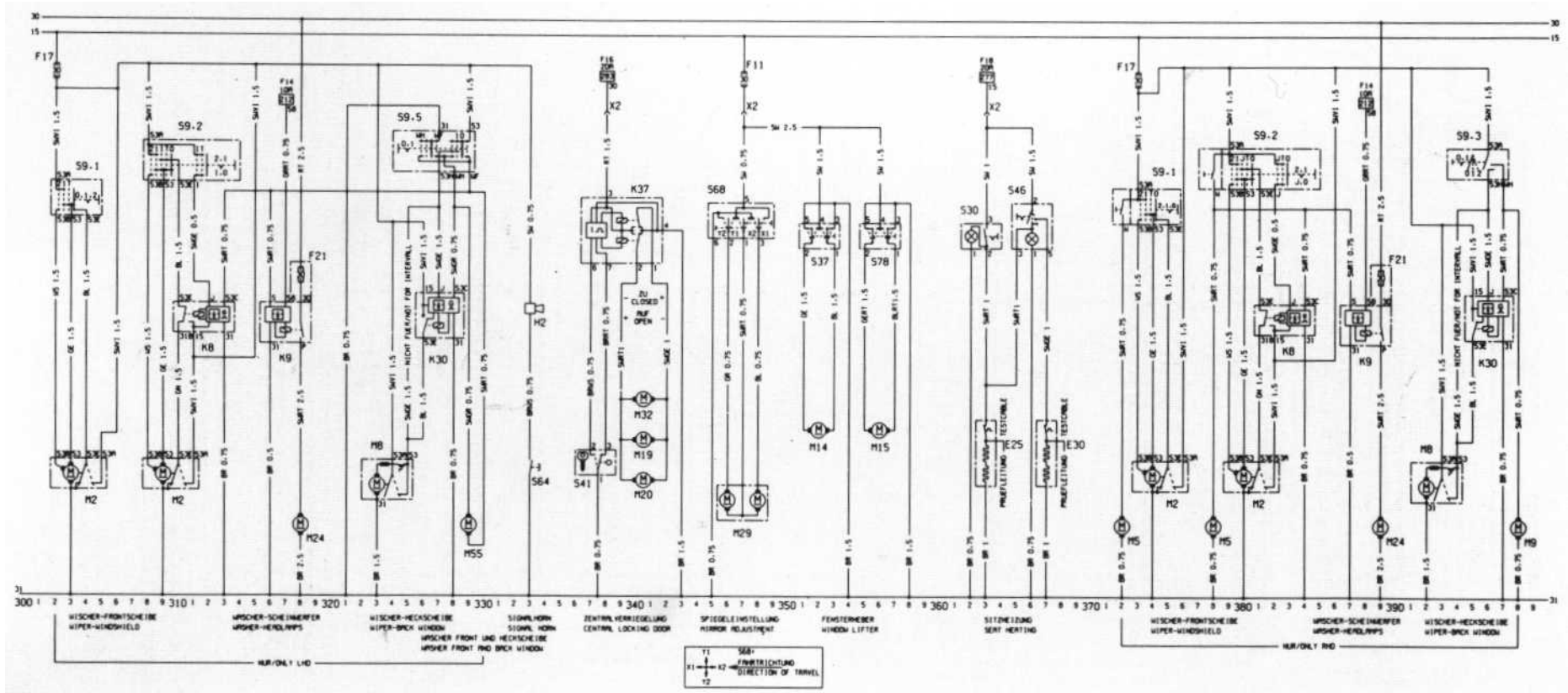
## SUB GROUP 12 — ELECTRICAL EQUIPMENT

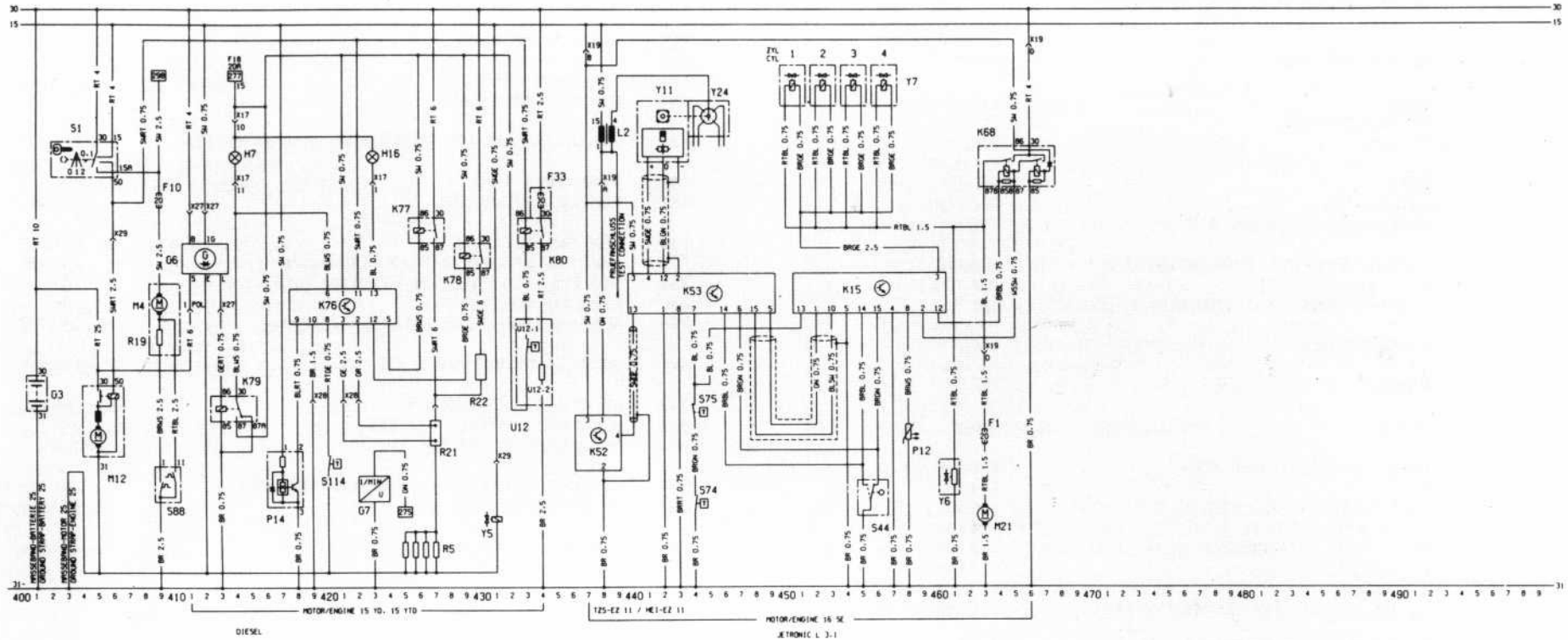
2539604	WASHER	5	90126713	SWITCH	1
2875025	CONNECTION	1	90128703	FUNNEL	1
3440489	RELAY	1	90138193	STRAP	20
3466309	CONNECTION	20	90155309	COVER	1
5973881	PLATE	1	90158391	CLAMP	20
5973882	PLATE	1	90166684	HORN ASSEMBLY	1
7838194	HOUSING ASSEMBLY	1	90166992	LAMP	2
7976636	HOLDER	5	90166993	LAMP	2
7976636	HOLDER	5	90187653	HEADLAMP	1
9281299	GASKET	1	90187654	HEADLAMP	1
9281299	GASKET	1	90191677	SWITCH	1
9285485	FLASHER	1	90207947	PLATE SWITCH	1
9287542	SOCKET	5	90209022	PLATE ASSEMBLY	1
11040051	SCREW	2	90225422	LAMP ASSEMBLY	1
11042153	NUT	10	90225427	LAMP R/H RR.	1
11054192	SCREW	5	90225483	COWL ASSEMBLY	1
11072781	NUT	2	90225811	RELAY ASSEMBLY	1
11072781	NUT	2	90241775	COIL	1
11079701	SCREW	3	90257160	LAMP ASSEMBLY	1
12015845	FUSEBOX	1	90274345	WASHER	2
19808425	BATTERY	1	90274651	TRANSFORMER	1
22031055	LINK ASSEMBLY	1	90278814	SCREW	8
22084016	MOTOR	1	90297763	GASKET	1
25061216	STEM	1	90314309	COVER	1
25061898	GAUGE FUEL	1	90320505	SWITCH	1
25061900	GAUGE TEMP.	1	90320537	HARNESS	1
25061902	VOLTMETER	1	90320551	GAUGE	1
25061903	GAUGE OIL	1	90322064	CONTROL UNIT	1
25061896	TACHOMETER	1	90344306	BRACKET	1
25065331	SPEEDOMETER	1			
90016767	SOCKET	1			
90037242	CAP	5			
90038440	NUT	10			
90045820	ELECTRIC FUEL PUMP	1			
90053508	BLADE ASSEMBLY	2			
90059582	SWITCH	1			
90069100	SWITCH ASSEMBLY	1			
90069102	SWITCH ASSEMBLY	1			
90069132	FASTENER	1			
90069864	RELAY ASSEMBLY	1			
90087070	HORN ASSEMBLY	1			
90087621	NOZZLE ASSEMBLY	20			
90091989	BUMPER	20			
90114142	HOSE 10M	1			
90119046	HOUSING	1			
90119074	PLATE ASSEMBLY	1			
90119143	TANK ASSEMBLY	1			
90119222	SPACER	2			
90119222	ARM ASSEMBLY	2			
90119429	SWITCH ASSEMBLY	1			
90119429	SWITCH ASSEMBLY	1			













## ELECTRICAL WIRING DIAGRAM

F10	FUSE (IN FUSE BOX)	109	Y39	SOLENOID VALVE-COASTING. FUEL CUT OFF	161
G1	BATTERY	101	Y41	SOLENOID VALVE-IDLING CONTROL	153
G2	ALTERNATOR	116	Y42	INDUCTIVE SENSOR-HEI	163.164
H7	CHARGING INDICATOR LIGHT	116	X10	CONNECTOR-IGNITION ADJUSTMENT	150.151
L1	IGNITION COIL	112.113	X17	CONNECTOR-INSTRUMENT	156
L3	IGNITION COIL-HEI. INDUCTIVE SENSOR SYSTEM	121.122	X18	CONNECTOR-WIRING HARNESS. HEI.3 PINS	160.162.163
M1	STARTER	105.107	F1	FUSE (IN FUSE BOX)	196
M4	MOTOR-BLOWER RADIATOR	109	H30	TELLTALE-ENGINE. TBI	184
R1	RESISTOR CABLE	112	K57	CONTROL UNIT-TBI	178.193
R2	CARBURETTOR PREHEATING	127	K58	RELAY-PUMP. FUEL	195.196
R12	AUTOMATIC CHOKE	126	L3	IGNITION COIL-HEI. INDUCTIVE SENSOR SYSTEM	172.173
S1	SWITCH-STARTER	106.107	M21	PUMP-FUEL	196
S6	IGNITION DISTRIBUTOR	112.114	M33	POWER UNIT-IDLING	188.191
S29	SWITCH-TEMPERATURE. COOLING AGENT	109	P14	SENSOR-DISTANCE	177.178
Y15	INDUCTIVE SENSOR WITH IGNITION MODULE	120.121	P23	VACUUM SENSOR-INTAKE MANIFOLD	187.189
Y17	SOLENOID VALVE-IDLE CUT OFF	128	P30	TEMPERATURE SENSOR-COOLING AGENT	185
Y23	IGNITION DISTRIBUTOR-HEI. INDUCTIVE SENSOR SYST.	124	P33	LAMBOA SENSOR	193
X17	CONNECTOR-INSTRUMENT	116	P34	SENSOR-THROTTLE VALVE POSITION	190.192
F22	FUSE (IN FUSE BOX)	137	S91	SWITCH-OIL PRESSURE. TBI	198.199
H20	TELLTALE-CHOKE	156	Y14	INDUCTIVE SENSOR-EST	169.172
K20	IGNITION MODUL-IGNITION COIL. HEI	162.164	Y24	IGNITION DISTRIBUTOR-EST	175
K44	RELAY-DASHPOT	140.141	Y32	INJECTION VALVE-TBI	179
K45	RELAY-MIXTURE PREHEATING	136.137	X11	CONNECTOR-WIRING HARNESS. TBI.5 PINS	181.184.196.199
K53	TIMING CONTROL-EST	144.151	X13	TEST CONNECTOR	183.186.187
K72	RELAY-COASTING. FUEL CUT OFF	159.161	E1	PARKING LAMP-LEFT	201
K75	RELAY-IDLING CONTROL	153.154	E2	TAIL LAMP-LEFT	202
L3	IGNITION COIL-HEI. INDUCTIVE SENSOR SYSTEM	147.148.160.161	E3	LAMP-LICENCE PLATE	212
P23	VACUUM SENSOR-INTAKE MANIFOLD	146.148	E4	PARKING LAMP-RIGHT	210
P24	SENSOR-OIL TEMPERATURE. EST	149	E5	TAIL LAMP-RIGHT	211
R7	MIXTURE-PREHEATING	137	E6	LAMP-ENGINE COMPARTMENT	205
S50	SWITCH-BOWDEN CABLE. CHOKE	156	E7	HIGH BEAM-LEFT	217
S60	SWITCH-CLUTCH PEDAL	140.153	E8	HIGH BEAM-RECHTS	218
S44	SWITCH-THROTTLE VALVE	159	E9	LOW BEAM-LEFT	220
S73	SWITCH-TEMPERATURE. MIXTURE PREHEATING	136	E10	LOW BEAM-RIGHT	221
Y14	INDUCTIVE SENSOR-EST	145.147	E11	LIGHTS-INSTRUMENT	206
Y18	SOLENOID VALVE-DASHPOT	140	E24	FOG LAMP-REAR	229
Y23	IGNITION DISTRIBUTOR-HEI. INDUCTIVE SENSOR SYST.	167	E26	LAMP-SWITCH. LIGHT	207
Y24	IGNITION DISTRIBUTOR-EST	150	E31	LAMP-SYMBOL INSERT. SWITCH	205
			E34	LAMP-HEATER CONTROL	205
			F2.F3.F4.F5.	FUSE (IN FUSE BOX)	217.218.220.221
			F13.F14	FUSE (IN FUSE BOX)	203.210

H8	TELLTALE-HIGH BEAM	219	K1	RELAY-BACK WINDOW. HEATED	293.294
H19	BUZZER-HEADLAMPS-ON WARNING	214.215	M3	MOTOR-BLOWER. HEATED	297.299
S2	SWITCH ASM-LIGHT		P1	FUEL INDICATOR	271
S2.1	SWITCH LIGHT	209.210	P2	TEMPERATURE INDICATOR-COOLING AGENT	273
S5	TURN SIGNAL SWITCH ASM		P3	CLOCK	285
S5.2	SWITCH LOW BEAM	219.220	P4	SENSOR-FUEL	271
S22	SWITCH-FOG LAMP. REAR	228.229	P5	SENSOR-TEMPERATURE. COOLING AGENT	273
S47	CONTACT SWITCH-DOOR AND HEADLAMPS-ON WARNING	214.215	P7	TACHOMETER	276
X1	SOCKET-TRAILER	203.209	P8	GAUGE-OIL PRESSURE	278
X2	CONNECTOR-AUXILIARY USERS	214.215	P9	VOLTMETER	277
X17	CONNECTOR-INSTRUMENT	205.207.219	P10	SENSOR-OIL PRESSURE	278
F6.F7.F15	FUSE (IN FUSE BOX)	237.253.250	R3	CIGARETTE LIGHTER	289
H3	TELLTALE-TURN SIGNAL LAMP	261	S2	SWITCH ASM-LIGHT	
H6	TELLTALE-HAZARD WARNING SYSTEM	257	S2.2	SWITCH-LIGHT. PASSENGER COMPARTMENT	281
H9	STOP LAMP-LEFT	252	S3	SWITCH-BLOWER. HEATER AND BACK WINDOW. HEATED	295.299
H10	STOP LAMP RIGHT	253	S7	SWITCH-BACK UP LAMP	291
H11	TURN SIGNAL LAMP-FRONT LEFT	259	S11	CONTROL SWITCH-BRAKE FLUID	268
H12	TURN SIGNAL LAMP-REAR LEFT	260	S13	SWITCH-PARKING BRAKE	267
H13	TURN SIGNAL LAMP-FRONT RIGHT	263	S14	SWITCH-OIL PRESSURE	269
H14	TURN SIGNAL LAMP-REAR RIGHT	263	S15	SWITCH-LAMP. TRUNK COMPARTMENT	280
H17	TELLTALE-TURN SIGNAL LAMP. TRAILER	255	S16	CONTACT SWITCH-DOOR. DRIVER	282
H33	AUXILIARY TURN SIGNAL LAMP-LEFT	258	S17	CONTACT SWITCH-DOOR. CO-DRIVER	283
H34	AUXILIARY TURN SIGNAL LAMP-RIGHT	262	S18	SWITCH-LAMP. GLOVE BOX	290
K2	FLASHER UNIT	256	X2	CONNECTOR-AUXILIARY USERS	284.288
K10	FLASHER UNIT-TRAILER	255.256	X17	CONNECTOR-INSTRUMENT	267.269.270.273.276
K59	RELAY-RUNNING LIGHT	236.242	F17	FUSE (IN FUSE BOX)	302
K62	CONTROL UNIT-DIM DIP LIGHT	244.248	F21	FUSE — WASHER UNIT. HEADLAMPS	318
S5	TURN SIGNAL SWITCH ASM		H2	SIGNAL HORN	333
S5.3	SWITCH-TURN SIGNAL	262.263	K8	RELAY — INTERVAL. WIPER WINDSHIELD	310.313
S8	SWITCH-STOP LAMP	253	K9	RELAY — TIME DELAY. WASHER UNIT. HEADLAMPS	316.318
S52	SWITCH-HAZARD WARNING	256.260	K30	RELAY — INTERVAL. WIPER. BACK WINDOW	326.328
X1	SOCKET-TRAILER	250.251.261.265	M2	MOTOR — WIPER. WINDSHIELD	302.305.308.311
X17	CONNECTOR-INSTRUMENT	261	M8	MOTOR — WIPER. BACK WINDOW	323.325
E13	LAMP-TRUNK COMPARTMENT	280	M24	PUMP — WASHER. HEADLAMPS	318
E14	LAMP-PASSENGER COMPARTMENT	281	M55	PUMP — WASHER. WINDSHIELD AND BACK WINDOW	329
E15	LAMP-GLOVE BOX	290	S9	SWITCH ASM — WIPER UNIT	
E16	LAMP-CIGARETTE LIGHTER	288	S9.1	SWITCH — WIPER WINDSHIELD	302.306
E17	BACK UP-LAMP LEFT	291	S9.2	SWITCH — WIPER WINDSHIELD. INTERVAL	308.311
E19	BACK WINDOW-HEATED	293	S9.5	SWITCH — WIPER BACK WINDOW AND WASHER UNIT	327.329
E32	LAMP-CLOCK	286	S64	SWITCH — SIGNAL HORN	333
E33	LAMP-ASHTRAY	287	E25	HEATING MAT — FRONT SEAT. LEFT	363
F8.9.16.18	FUSE (IN FUSE BOX)	293.298.280.270	E30	HEATING MAT — FRONT SEAT. RIGHT	367
H1	RECEIVER	284	F11	FUSE (IN FUSE BOX)	347
H4	TELLTALE-OIL PRESSURE	269	K37	RELAY — CENTRAL LOCKING. DOOR	337.343
H5	TELLTALE-CLUTCH. BRAKE FLUID AND PARKING BRAKE	267			



## ELECTRICAL WIRING DIAGRAM

M14	MOTOR — WINDOW LIFTER, FRONT LEFT	351.353	R5	GLOW PLUGS	425.427
M15	MOTOR — WINDOW LIFTER, FRONT, RIGHT	355.357	R19	PRERESISTOR — BLOWER, RADIATOR	409
M19	MOTOR — CENTRAL LOCKING DOOR, REAR LEFT	339.342	R21	SENSING RESISTOR	427
M20	MOTOR — CENTRAL LOCKING DOOR, REAR RIGHT	339.342	R22	PRERESISTOR — GLOW PLUGS	430
M29	OUTSIDE MIRROR — ADJUSTMENT, RIGHT	346.348	S1	SWITCH — STARTER	405.406
M32	MOTOR — CENTRAL LOCKING, CO-DRIVER DOOR	339.342	S88	SWITCH — TEMPERATURE, COOLING AGENT, RADIATOR	409.410
S30	SWITCH — HEATING MAT, FRONT SEAT LEFT	362.363	S114	SWITCH — TEMPERATURE, COOLING AGENT, ENGINE	420
S37	SWITCH — WINDOW LIFTER, FRONT LEFT	351.354	U12	FILTERHEATING ASM	433.434
S41	SWITCH — CENTRAL LOCKING, DRIVER DOOR	337.338	U12.1	SWITCH — TEMPERATURE	433
S46	SWITCH — HEATING MATS, FRONT SEATS	365.367	U12.2	HEATING RESIST	434
S68	SWITCH — OUTSIDE MIRROR ADJUSTMENT	345.348	Y5	SOLENOID VALVE — FUEL	431
S78	SWITCH — WINDOW LIFTER, FRONT RIGHT	355.358	X17	CONNECTOR — INSTRUMENT	414.423
X2	CONNECTOR — AUXILIARY USERS	338.347.363	X27	PLUG CONNECTION — ALTERNATOR, 3 PINS	411.413
F17	FUSE (IN FUSE BOX)	373	X28	PLUG CONNECTION, 3 PINS	419.422
F21	FUSE — WASHER UNIT, HEADLAMPS	389	X29	PLUG CONNECTION, 2 POLIG	406.431
K8	RELAY — INTERVAL, WIPER WINDSHIELD	381.384	F1	FUSE (IN FUSE BOX)	463
K9	RELAY — TIME DELAY, WASHER UNIT, HEADLAMPS	387.389	K15	TIMING CONTROL — INJECTION UNIT, FUEL	451.460
K30	RELAY — INTERVAL, WIPER BACK WINDOW	395.397	K52	IGNITION MODUL — IGNITION COIL, EZ 11	437.440
M2	MOTOR — WIPER, WINDSHIELD	373.376.379.382	K53	TIMING CONTROL — EZ 11	440.449
M5	PUMP — WASHER, WINDSHIELD	372.378	K68	RELAY — INJECTION UNIT, FUEL	463.466
M8	MOTOR — WIPER, BACK WINDOW	392.394	L2	IGNITION COIL — HEI, HALL SENSOR SYSTEM, EZ 11	438.439
M9	PUMP — WASHER, BACK WINDOW	398	M21	PUMP — FUEL	463
M24	PUMP — WASHER, HEADLAMPS	389	P12	SENSOR — TEMPERATURE, COOLING AGENT	458
S9	SWITCH ASM — WIPER UNIT		S44	SWITCH — THROTTLE VALVE	455.456
S9.1	SWITCH — WIPER, WINDSHIELD	372.375	S74	SWITCH — ENGINE (HOUSING)	444
S9.2	SWITCH — WIPER, WINDSHIELD, INTERVAL	378.382	S75	SWITCH — TEMPERATURE, ENGINE OIL	444
S9.3	SWITCH — WIPER, BACK WINDOW, INTERVAL	396.397	Y6	SLIDE VALVE — AUXILIARY AIR	461
F10	FUSE (IN FUSE BOX)	409	Y7	SOLENOID VALVES — FUEL INJECTION	450.457
F36	FUSE — FILTER HEATING	434	Y11	HALL SENSOR	441.443
G3	BATTERY — DIESEL	401	Y24	IGNITION DISTRIBUTOR — EST	445
G6	GENERATOR — DIESEL	411.413	X19	CONNECTOR — WIRING HARNESS, ETRONIC, 7 PINS	437.438.463.466
G7	SENSOR — ENGINE REVOLUTION	423			
H7	CHARGING INDICATOR LIGHT	414			
H16	TELLTALE — PREHEATING TIME	423			
K76	CONTROL UNIT — PREHEATING TIME	418.424			
K77	RELAY — SENSING RESISTOR	426.427			
K78	RELAY — PRE RESISTOR	429.430			
K79	RELAY — CHARGING INDICATOR	413.416			
K80	RELAY — FILTER HEATING	433.434			
M4	MOTOR — BLOWER, RADIATOR	409			
M12	STARTER — DIESEL	405.406			
P14	SENSOR — DISTANCE	417.418			

## GROUP N GUIDELINES



A Group N car is fundamentally a standard production car fitted with obligatory additional safety items such as a roll cage, safety harnesses and plumbed-in fire extinguishers, to comply with specific FIA Regulations for Touring Cars - Group N. In addition you will have to carry out some further permitted modifications to make the car more competitive.

Starting with the engine, not a great deal can be done to a normally aspirated engine under Group N regulations apart from blueprinting, which is not cost effective. The basic engine design and component finish is to such a high standard that the need for excessive individual component preparation is minimal. However, there is some scope for a power increase as a result of re-programming the ignition and fuel electronic control units, and these modified components are now generally available on the aftermarket.

Suspension modifications are permitted, in that the springs and shock absorbers may be replaced with uprated units, but their working principle and attachment points must remain unchanged. The ride height of the vehicle must conform to the homologated dimensions. Flexible bushes at the suspension pivot points may be changed for mechanically similar bushes, but made from a harder compound.

The dimensions of the brakes must remain as normal production specification for the model but the pad/lining material can be changed. The handbrake may be converted to 'fly-off' action and aviation type brake lines are permitted, but no form of brake balance adjustment is allowed.

The exhaust system can be modified from the first silencer box to the exit, provided that the pipe size does not exceed that forward of the first silencer box.

### BODYSHELL

The reinforcement procedures and the body strengthening components featured in the Group A Kit, outlined earlier in this manual for the Group A car can be followed, as seam welding and strengthening of the suspended part is allowed under Group N regulations. Please note

that the carpet and gearlever gaiter supports referred to in that section CANNOT be removed. The seat mounting system can be modified to accept seats from a different source, but the alternative seats must have at least the same MINIMUM weight as the original seats. This can be achieved by ballasting if necessary. Ballast must be securely attached to the replacement seats for both safety and eligibility reasons. All the interior trim must be fitted to the car, including the rear seats, although they may not necessarily function as a seat once the roll cage is installed!

### ROLL CAGE

The Group A Clubman Kit safety roll cage can be fitted, and holes through the trim panels can be made if necessary to enable this component to be attached. The section in this manual specifically outline the fitting procedure for the Group A car, but applies equally for a Group N installation.

A front suspension brace is permitted between the suspension mounting points on condition that it is fixed exclusively by bolts on to the suspension mounting points.

### ELECTRICAL

This section of the manual applies equally to Group N preparation. Brakes, transmission, exhaust, suspension and engine preparation chapters are exclusively for the Group A car and have no compatibility with the requirements of Group N.

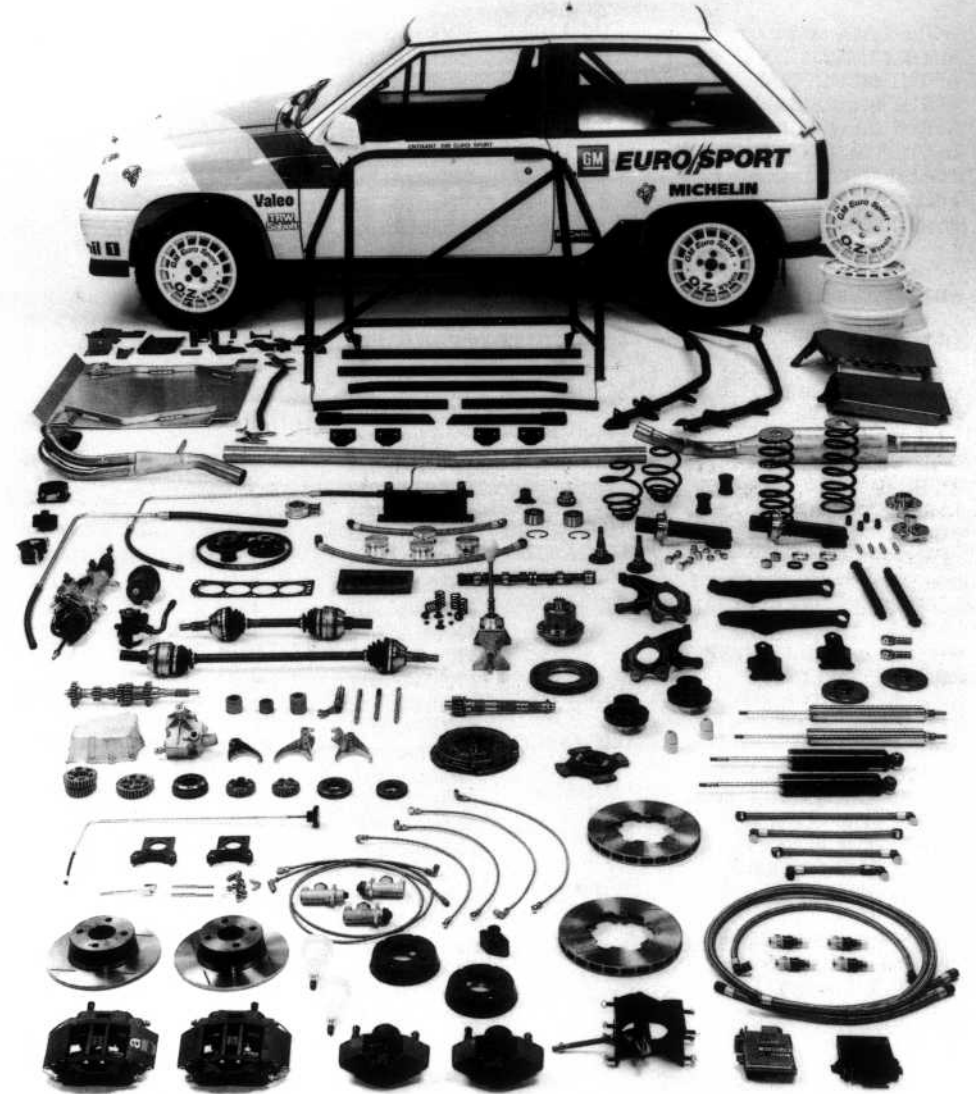
GM Eurosport do not have any specific components for the Group N car, although certain components from the Group A Clubmans Kit can be used. These are restricted to the following parts:

- Body Strengthening Kit
- Fuel tank Guard
- Strut brace (tube), Strutbrace brackets LH/RH
- Roll cage assembly
- Rear beam bushes
- Rear road springs
- Rear shock absorbers
- Engine mounting rubbers (set of 3)



Dave Metcalfe in the Vauxhall Dealer Sport Nova GSi.







## CLUBMANS KIT BUILD LIST

THE ASTERIX ON THE RIGHT HAND SIDE OF THE PAGE DENOTES THAT PARTICULAR PART IS NOT INCLUDED IN THE KIT!

### BODYSHELL BUILD LIST

5XS01AC

DESCRIPTION	PART NUMBER	CAR QTY	NOT INCL
ROLL CAGE ASSY.	5XS01AC001	1	
SUMP GUARD	5XS01AC002	1	
STRUT BRACE TUBE	5XS01AC004	1	
STRUT BRACE BRKKT (L/H)	5XS01AC005	1	
STRUT BRACE BRKT (R/H)	5XS01AC006	1	
BODY STRENGTHENING PLATE KIT	5XS01AC007	1	
FUEL TANK GUARD	5XS01AC008	1	
OIL COOLER MTG BRKT	5XS01AC009	1	
HAND BRAKE MTG BRKT	5XS01AC010	1	

### FRONT SUSPENSION BUILD LIST

5XS03

DESCRIPTION	PART NUMBER	CAR QTY	NOT INCL
CASTOR BRACKET	5XS03AC001	2	
BOLT M10 × 76	11086131	4	*
NUT M10	11085941	4	
BOLT M10 × 22	11086032	2	*
TIE ROD	5XS03AC002	2	
ROD END BEARING	5XS03AC003	2	
BUSH	5XS03AC004	4	
LOCKNUT FOR ROD END	5XS03AC005	2	
BOLT-ROD END TO BRKT	5XS03AC006	2	
LOWER CONTROL ARM (L/H)	5XS03AC007	1	
LOWER CONTROL ARM (R/H)	5XS03AC040	1	
BOLT LCA TO CHASSIS	5XS03AC010	2	
BUSH INNER LCA	5XS03AC011	4	
BUSH BOTTOM POST	5XS03AC012	2	
MOUNTING POST — LCA	5XS03AC013	2	
POST RETAINER	5XS03AC014	2	
STEERING KNUCKLE L/H	5XS03AC015	1	
STEERING KNUCKLE R/H	5XS03AC016	1	
FRONT HUB FLANGE	5XS03AC017	2	
FRONT HUB BEARING	5XS03AC018	2	
FRONT HUB CIRCLIPS	5XS03AC019	4	
WHEEL STUD	5XT03AW019	8	
WHEEL NUT	5XT10AW001	6	
DAMPER HOUSING L/H	5XS03AC020	1	
DAMPER HOUSING R/H	5XS03AC034	1	
ECCENTRIC BOLT	5XS03AC021	2	
NUT M14	5XS03AC022	2	
WASHER	11011191	2	*
NUT	11071988	2	*
SHOCK ABSORBER (GRAVEL)	5XS03AC027	2	
SHOCK ABSORBER (TARMAC)	5XS03AC028	2	
BUMP RUBBER	5XT04AW012	2	
DAMPER STEM NUT	5XT03AW018	2	

LOCK TAB	5XT03AW060	2	
DAMPER BOT. NUT	11041034	2	*
TOP STRUT MOUNT	5XS03AC023	2	
BUSH — TOP MOUNT	5XS03AC024	2	
NUT — DAMPER TOP	5XS03AC025	2	
LOWER SPRING SEAT	5XS03AC026	2	
UPPER SPRING SEAT	5XS03AC029	2	
LOCK RING FOR SEAT	5XS03AC030	2	
SPRING (GRAVEL)	5XS03AC031	2	
SPRING (EUROTAR)	5XS03AC032	2	
SPRING (SPANISH TAR)	5XS03AC033	2	
SPRING (LOW SPANISH TAR)	5XS03AC041	2	
SPHERICAL BEARING	5XT03AW031	6	
CIRCLIP	5XT03AW039	6	
STRUT SEAL	5XS03AC038	2	
STRUT SEAL RETAINER	5XT03AW052	2	

### REAR SUSPENSION BUILD LIST

5XS04

DESCRIPTION	PART NUMBER	CAR QTY	NOT INCL
REAR BEAM	90223659	1	*
REAR BEAM BUSHES	5XS04AC003	2	
BOLT M10 × 84	11086161	2	*
NUT M10	11062003	2	*
REAR SPRING (GRAVEL)	5XS04AC004	2	
REAR SPRING (TARMAC)	5XS04AC005	2	
TOP SPRING RUBBER	90223644	2	*
BOT. SPRING RUBBER	90168139	2	*
SHOCK ABSORBER (GRAVEL)	5XS04AC001	2	
SHOCK ABSORBER (TARMAC)	5XS04AC002	2	
TOP SHOCKER RUBBER	90147599	2	*
BOTTOM SHOCKER RUBBER	8982738	2	*
CUP WASHER	5XT04AW015	2	*
FLAT WASHER	5XT04AW016	2	*
TOP DAMPER NUT	11041034	4	*
BEARING INNER	11070311	2	*
BEARING OUTER	11054489	2	*
OIL SEAL	90217059	2	*
DUST CAP	6696899	2	*
NUT	8967950	2	*
WASHER	90121753	2	*
LOCKTAB	5XT04AW033	2	*
SHOCK ABSORBER KIT	11086682	2	*
STUB AXLE	5XS04AC007	2	
BOLT — STUB AXLE	90278814	8	*
ANTI ROLL BAR (13MM)	90142944	1	*

ANTI ROLL BAR (16.5MM)	90157548	1	*
ANTI ROLL BAR (18.0MM)	90288688	1	*
SCREW M10 x 35	11082434	2	*
NUT M10	11062003	2	*
WHEEL STUD	5XT04AW019	8	

**BRAKE SYSTEM BUILD LIST**

5XS05

DESCRIPTION	PART NUMBER	CAR QTY	NOT INCL
FRONT CALIPER L/H	5XS05AC001	1	
FRONT CALIPER R/H	5XS05AC002	1	
FRONT DISC L/H	5XS05AC003	1	
FRONT DISC R/H	5XS05AC004	1	
DISC MTG BELL	5XS05AC005	2	
PAD (2459)	5XS05AC007	4	
FR. CALIPER MTG BOLT	5XS05AC009	4	
REAR CALIPER	5XS05AC010	2	
REAR DISC	5XS05AC011	2	
CALIPER MTG BRKT	5XS05AC012	2	
REAR PAD (2459)	5XS05AC017	4	
Rr. CALIPER MTG BOLT	5XS05AC019	4	
PEDAL BOX	5XS05AC020	1	
BALANCE BAR ADJUSTER	5XS05AC022	1	
BRAKE FLUID RESERVOIR	5XT05AW024	2	
FRONT MASTER CYL. (0.7)	5XT05AW025	1	
REAR MASTER CYL. (0.75)	5XT05AW026	1	
HANDBRAKE MASTER CYL. (0.625)	5XT05AW027	1	
HANDBRAKE CYL. ADAPTER	5XT05AW077	1	
PIPE INNER WING TO CALIPER	5XS05AC028	2	
L/H INNER WING TO M/CYL.	5XS05AC029	1	
R/H INNER WING TO M/CYL.	5XS05AC030	1	
Rr. M/CYL. TO BULKHEAD	5XS05AC031	1	
BULKHEAD TO H/BRAKE M/CYL.	5XS05AC034	1	
H/BRAKE M/CYL TO FLOOR	5XS05AC032	2	
FLOOR TO REAR CALIPER	5XS05AC033	2	
TWIN OUTLET BANJO	5XT05AW015	2	*
BANJO BOLT	5XT05AW021	2	*
SINGLE OUTLET BANJO	5XT05AW014	1	
90 DEG. B/HEAD UNION	5XT05AW018	2	*
90 DEG. UNION	5XT05AW011	7	*
STRAIGHT UNION	5XT05AW010	2	*
B/HEAD UNION NUT	5XT05AW019	2	*

**ENGINE BUILD LIST**

5XS06

DESCRIPTION	PART NUMBER	CAR QTY	NOT INCL
CYLINDER HEAD GASKET 1.2MM	5XS06AC002	1	
PISTON ASSY. COMPLETE	5XS06AC003	4	
CON ROD BOLTS	5XS06AC004	8	

CYLINDER HEAD BOLTS	5XS06AC005	1	
ENGINE MTG L/H	5XS06AC006	1	
ENGINE MTG R/H	5XS06AC007	1	
ENGINE MTG REAR	5XS06AC008	1	
AIR FILTER REPLACEMENT	5XS06AC009	1	
CAMSHAFT KIT	5XS06AC025	1	
VALVESPRINGS	5XS06AC011	8	
VALVESPRING TOP CAP	5XS06AC012	8	
LASH PAD	5XS06AC013	8	
UNDERLAY WASHER (INLET)	5XS06AC014	4	
UNDERLAY WASHER (EXHAUST)	5XS06AC015	4	
VALVELIFTER	5XS06AC016	8	
OIL PICK UP PIPE PROTECTOR	5XS06AC017	1	
OIL SANDWICH PLATE	5XS06AC018	1	
SANDWICH PLATE ADAPTOR	5XS06AC019	1	
SANDWICH PLATE 'O' RING	5XS06AC020	1	
PIPE — S/PLATE TO COOLER	5XS06AC021	1	
PIPE — COOLER TO S/PLATE	5XS06AC022	1	
OIL COOLER	5XS06AC023	1	
SUMP BAFFLE PLATE	5XS06AC024	1	

**EXHAUST SYSTEM BUILD LIST**

5XS08

DESCRIPTION	PART NUMBER	CAR QTY	NOT INCL
INJECTORS	5XS08AC009	1	
PRIMARY PIPE	5XS08AC001	1	
SECONDARY PIPE	5XS08AC002	1	
TAIL PIPE	5XS08AC004	1	
PIPE KIT	5XS08AC006	1	

**POWER STEERING BUILD LIST**

5XS09

DESCRIPTION	PART NUMBER	CAR QTY	NOT INCL
POWER STEERING RACK	5XS09AC001	1	
NUT — RACK TO BULKHEAD	5XS09AC002	4	
TRACK CONTROL ROD	07840453	2	*
NUT — TRACK ROD TO KNUCKLE	90170401	2	*
GAITER — RACK TO B/HEAD	5XS09AC003	1	
POWER STEERING RESERVOIR	90193771	1	
RESERVOIR CAP	90008411	1	
RESERVOIR CAP SEAL	90008412	1	
RESERVOIR BRACKET	90334773	1	
PIPE — RESERVOIR TO PUMP	5XS09AC004	1	
POWER STEERING PUMP	90233191	1	
PUMP — POLY 'V' PULLEY	90299071	1	
BOLT — PULLEY TO PUMP	11042712	3	
POLY 'V' BELT	90299503	1	
CRANKSHAFT PULLEY	90299070	1	
ALTERNATOR PULLEY	90296436	1	
PIPE PUMP TO RACK	5XS09AC005	1	
PUMP OUTLET UNION	5XS09AC018	1	



## CLUBMANS KIT BUILD LIST

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UNION SEAL	5XS09AC019	1
RACK INLET UNION	5XS09AC006	1
RACK INLET UNION SEAL	5XS09AC007	1
RACK OUTLET UNION	5XS09AC008	1
RACK OUTLET UNION SEAL	5XS09AC009	1
BANJO BOLT	5XS09AC012	1
PIPE — RACK TO RESERVOIR	5XS09AC010	1
LOWER UNIVERSAL JOINT	5XS09AC014	1
JOINING SHAFT	5XS09AC015	1
UPPER UNIVERSAL JOINT	5XS09AC016	1
TOP SHAFT	5XS09AC017	1

### ENGINE MANAGEMENT SYSTEM BUILD LIST 5XS12

DESCRIPTION	PART NUMBER	CAR QTY	NOT INCL
IGNITION CONTROL UNIT (STD)	90241189	1	*
IGNITION C.U. MODIFIED	5XS12UK004	1	EXCHANGE
IGNITION COIL AMPLIFIER	90241775	1	*
FUEL CONTROL UNIT (STD)	90322064	1	*
FUEL CONTROL UNIT (MOD)	5XS12UK005	1	EXCHANGE
ENGINE WIRING HARNESS	90225910	1	*
MAIN IGNITION RELAY	90225811	1	*
FUEL INJECTOR (STD. 16V)	0280150774	4	*



