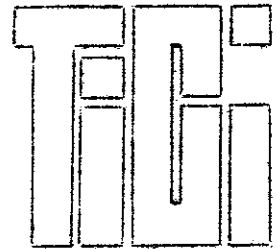


TiCi Sales Limited  
6 Mansfield Road  
Sutton-in-Ashfield  
Notts

Sutton-in-Ashfield  
2311-2



## TiCi DESCRIPTION

### The Car

TiCi is a two seater city/sports convertible car. It is the shortest road car produced and is based upon B L Mini mechanical components. The ubiquitous Minis are available in most Western Countries and early cars are now being rendered unroadworthy due to body corrosion. Frequently their mechanical components are still good and can be re-conditioned at a modest cost. Mechanical parts in near new condition are also readily available from damaged cars. Purchase of a TiCi kit can provide an ideal means of converting a Mini into THE kit car of the '70s.

TiCi is over 400 lbs lighter than a Mini and the resulting performance and fuel economy is improved. The rear engine location, coupled with low weight, gives snappy scrabble free acceleration. Since the engine is in front of the rear wheels TiCi is in effect a mid engined car and overall balance is excellent. No other Kit builders have used the advantages of the Mini layout to such obvious good effect.

TiCi feels unlike larger heavier cars to drive. It possesses instant controlability. Handling is light and roadholding is excellent.

The car is basically an open two seater with rollover protection. A detachable hard top and Q D doors are available and a folding soft top will soon become an option.

### The TiCi Structure

The TiCi body/chassis unit is an extremely strong monocoque structure. It has been designed to give high primary strength. Generous box sections both fore and aft and alongside the seats ensure the occupants have a high degree of built in protection from crushing.

The complete inside including seats, headrests, storage compartments etc., is one half, and a second fullsize moulding comprizing the complete lower part of the car is bonded to it all around the edges and at important points so that stresses can be fed through the complete structure. Mechanical

contd.....

units are bolted to the monocoque through local steel reinforcement. Necessary holes are pre-drilled for accuracy and your ease of build. Body mouldings are high quality three and four ounce glass fibre. Great effort has been taken to ensure the very best standards of moulding and primary construction. Colour is impregnated and no maintenance is necessary. A strong roll over bar is a standard fitment. The windscreen pillars and header rail are reinforced with a steel tube hoop.

Seat belt anchorage points enable a standard 'Kangol' consol to be fitted plus matching Mini seat belts.

### The TiCi Kit

The kit comprises all the necessary non Mini components. So far as possible all assembly is carried out by TiCi Cars Limited. Only Mini parts have to be attached by the customer plus any special adapter parts. The kit effectively is a fully trimmed and assembled body. It has all new lamp units, primary wire harness, hydraulic lines with special master cylinders and dual reservoir, 6 gallon steel petrol tank, special exhaust system, laminated windscreen, integrally moulded seats with padded headrests and a high quality carpet surface that can be simply removed for cleaning.

Necessary adapter parts such as gear change linkage, steering column universal joint, rear wheel anti-steer link, control and speedometer cables are part of the TiCi kit installed where possible. Girling spring/damper units are attached for the front suspension.

B L Mini Components required include:

1. At the TiCi rear  
Engine, transmission, suspension, brakes and wheels complete as a sub assembly mounted upon a 'dry' Mini subframe.
2. At the TiCi front  
Mini front suspension links, brake units, wheel carriers complete with bearings and drive shaft outer ends, the steering rack, steering column and wheel, windscreen wiper motor and rack unit complete, also the washers, the foot pedals and frame unit, handbrake and toggles, the voltage control and fuse blocks plus the battery.

20th October 1972

2.00 MINI MECHANICAL REQUIREMENTS

- 2.01 A 'dry' type Mini front subframe. This is rear mounted in TiCi. All standard Mini engine/gear box units will fit.
- 2.02 The standard type Mini gear change is used together with the long gear lever (cut short). It is neither desirable nor possible to use any of the Mini gear change extension systems such as proprietary or 'Cooper' types.
- 2.03 The standard radiator and mounting.
- 2.04 Standard 'dry' type front Mini suspension complete.
- 2.05 'Front' brakes (which will be TiCi rear brakes) must be of the early single leading shoe type. Neither disc nor 2 LS types can be used at the back.
- 2.06 The standard Mini steering rack with U bolts.
- 2.07 The steering wheel and Mini column unit, complete with nacelle, electrical switch gear (indicators, horn button, flasher, or the new ignition/steering lock) and 'C' column clamp.
- 2.08 The standard wiper motor, wiper rack and spindle units.
- 2.09 The handbrake, cables, toggle mechanisms and gaiters from rear brake back plates.
- 2.10 The instruments and switch gear (including dip switch if necessary) also the control box, the fuse block, and petrol pump (mechanical or earlier electric type to suit).
- 2.11 Saloon type petrol tanksender unit (old type - Smiths no FT2330/05 or FT 2330/55 12v with new cork gasket) N.B. This must be used in conjunction with Smiths fuel contents gauge no. FG.623304/PM (no stabiliser is used)
- 2.12 The above can be obtained from one suitable car. Additional is a further set of front suspension units. Wheel posts with upper and lower links and tie rods, front brakes (preferably 2 LS but single LS will do). Since the outer section of the shafts holds the bearings in place one pair of splined drive shafts outer ends is required.
- 2.13 Five road wheels and tyres.
- 2.14 Mini foot pedal frame unit with clutch and brake pedals, also the accelerator pedal.

### 3.00 PREPARATION OF MINI PARTS

Preparation of Mini parts is a most vital pre-requisite. It is quite possible to obtain scrap yard Minis for very low prices. Frequently these will require you to expend some time and trouble, and perhaps cost in renovation. We do not recommend that you should skimp at this stage and jeopardize your project. Below is listed some of the items to look for in your preparations. These are apart from the obvious checks to ascertain that the engine and gear box are in sound mechanical condition. Once you have completed the preparation TiCi is ready to be completed.

3.01 The front Mini subframe must be in a sound undamaged rust free condition. If there is any doubt it is wise to use a new subframe, especially if the unit you contemplate has been involved in a frontal collision. Any misalignment will cause great problems in fitting to TiCi. Make sure the subframe has a complete coverage of paint.

3.02 The gear change mechanism should be free of slop and lightly greased. Tighten the actuating ball and socket rod ends above the gear box rear. If these are loose upon their spines gear changing will lack precision.

3.03 The cooling system must be completely clear of blockages. Renew hoses. The heater will not be used and the tap should be closed and a length of heater hose used to join the heater inlet and outlet pipes. Alternatively fit a straight radiator hose and fit a blanking plate to the engine outlet.

3.04 The standard 'dry' Mini rubber suspension units are used. They will provide TiCi with a rather harsh ride. Several solutions to soften these have proved effective. Four 5/16" diameter holes drilled equidistant through the rubbers will make a useful improvement. Rubber units soften with age. Elderly units should first be tried and modified only if proved to be necessary. Oversoft rear suspension will tend to induce understeer.

3.05 Single leading shoe 'front' brakes can be modified to allow insertion of the standard handbrake toggle mechanism (described in 4.05). It is important to ensure that the back plate is in good condition and rust free.

- 3.06 The steering rack should be free from undue wear and reconditioned if necessary. Steering rod ends must be renewed if there is suspicion of undue wear. New shakeproof nuts should be used with 'U' bolts.
- 3.07 Steering wheel. You may consider that the uses of the large Mini steering wheel is out of place on TiCi and decide to replace it with a smaller wheel. Post 1970 Minis have been fitted with a steering column lock and a shorter switch stalk nacelle. Either this or the previous type may be used. Ensure that the inner column is straight if the Mini has been in an accident.
- 3.08 The wiper rack and spindle units should be checked, cleaned and lightly oiled. Replace worn spindles.
- 3.09 The handbrake cables should be carefully inspected and replaced with new ones if they appear rusted or frayed. Handbrake toggle mechanisms and gaiters can be simply removed from the Mini rear brake back plates after removal of the drums and shoes. Any wear in the pivot rivets should be rectified, or new toggles obtained.
- 3.10 Standard Mini instruments and switches should be checked and replaced where necessary. If engine and electrics are taken from different cars then you should ensure their compatibility i.e. there are several types of speedometer and fuel contents gauges.
- 3.11 The fuel tank sender unit should be fitted with a new cork washer before fitment to the TiCi tank.
- 3.12 Front suspension  
Check the condition of the steering swivels on the units to be used at the front, and replace or re-shim as necessary. Wheel bearings should be checked and re-packed with grease. The tie rod and lower link rubber bushes should be renewed if they look at all worn or frayed. Should the tie rod ends appear badly corroded or the front threaded portion be worn then replacement tie rod kits should be bought as a safety precaution. In any case new shakeproof nuts must be used. New rubber dust seals may be needed for the upper links. The outer drive shaft sections can be obtained by dismantling or breaking the 'Birfield' constant velocity joint of the driveshafts with a chisel. Do not fit disc brake units to TiCi. Either 2LS or single leading shoe units can be used. No fluid pressure limited device is

3.12 continued....

employed on TiCi. If the flexible hydraulic pipes are worn these must be renewed.

3.13 Wheels

We do not recommend that you should fit non standard wheels or tyre sizes - certainly not wider than 5J wheels and 145 x 10" tyres. Wheel spacers must under no circumstances be used as they will provide a fouling condition within the front wheel arches besides requiring extension wheel arch flares. Either radial or crossply tyres can be used but these must NOT be mixed (even 'legal' mixing). It is wise to ensure that tyres are of the same type and in good condition.

3.14 Renew worn pedal rubbers.

## 4.00 MODIFICATION TO MINI PARTS

Several Mini items require small detail modifications as listed below

- 4.01 The lower link tie rods for TiCi front suspension. They must be shortened from  $16\frac{3}{4}$ " long to  $14\frac{7}{8}$ " long. Bend the rod into a U shape in a heavy vice to shorten. This can be done cold either by hand or with a heavy hammer.
- 4.02 The steering column and column cover tube have to be shortened.
- Place the lower part of the complete column/shroud assembly in the vice and cut through both cover and inner columns  $13\frac{1}{8}$ " from the inner column lower end. (In the case of post 1970 shortened shrouds incorporating a flasher switch and steering lock 14" may be removed if it is found that the driver would prefer to have a lower steering wheel position.)
  - A further  $1\frac{1}{4}$ " must be cut from the outer tube only after removal from the central column, and the column 'C' clamp located on the tube below the plastic shroud.
  - A circular felt brush will be found in the discarded outer tube end, remove and fit into the shortened tube end.
  - The steering universal joint supplied with the kit is fitted to the inner column by means of drilling the column with a  $5/32$ " diameter hole and tapping in the tension pin supplied (see 5.05). This operation should be left until the driver is satisfied with the precise column location.
- 4.03 The wiper motor and rack requires to be re-arranged.
- Undo the two slotted screws each side of one of the two wiper spindles, and remove the back plate.
  - The front plate and splined spindle will now drop free. This should be re-fastened upsidedown to its previous location. Note that the flared ends of the rack outer tubes slot into the plate.
  - Having completed one unit, using the other as a reference now turn around the second unit.
  - The first section of the wiper rack is curved. This curve will need to be fractionally increased. We suggest this is done at the time of assembly and care must be taken not to kink the outer tube. This can most simply be done by grasping the rack in each hand and pressing up carefully with the thumbs. Pressure should be exerted only until the rack is felt to 'give'

4.04 The accelerator pedal requires to be bent slightly. Place the pedal in the vice as shown and bend the cable operating 'leg' until it lies parallel with the pedal end by striking with a heavy hammer i.e. by approximately 90°.

N.B. The pedal must NOT be bent by twisting the centre section since this will break the pedal.

This pedal sharing alone is suitable for most people but small changes in distance from the brake pedal can also be made by sideways bending, if necessary.

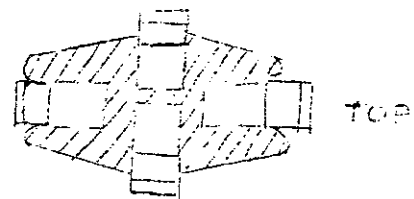
4.05 The standard (long) gear level requires to be shortened. It must be made to measure 5 $\frac{3}{4}$ " from the small ball end.

4.06 The handbrake

Since the standard Mini 'front' subframe and brakes are used at the back of TiCi provision has to be made for a handbrake. Twin leading shoe brake units cannot be satisfactorily modified. The mini rear brake back plate would require both its centre hole to be enlarged and new fixing holes to be drilled to fit the front wheel post.

We recommend modifying the single leading shoe brake unit fitted to the early Minis.

- a. Before commencing the modification ensure that the front left hand back plate is compared with the rear left hand back plate. (The toggle will be at the FRONT of the plate when viewed from the side).
- b. By comparing this with the rear back plates you will see that a hole exists through which the handbrake toggle lever can pass. (The brake shoes will all accommodate the toggle).
- c. The hole for the toggle lever can be made by drilling out and filing the shape as shown. The tags can then be bent outwards to grip the sides of the gaiter after cleaning up with a file.



- d. Fit a gaiter around this to prevent ingress of water and dirt. The handbrake toggles are 'handed' (i.e. LHS and RHS) and must be correctly fitted.



4.07 The handbrake cables will be required with the end fittings. An outer cable is in the kit.

- a. The cables must be cut short to measure  $3'11\frac{1}{2}"$  from the end of the threaded adjuster.
- b. The outer cable should next be slid on followed by the TiCi brake stop plate (no TH/M/76). The cable is passed through its outer small hole.
- c. Next the spring and clevis should be located and finally the outer cable and nipple supplied must be soldered in place so that the whole measures  $3'11\frac{1}{2}"$  overall.

N.B. The correct way to fix the nipple is to pass the cable through the non countersunk end. The  $\frac{1}{8}"$  (3mm) protruding should be flared out to fill the countersink. Fixing should be by lead solder. This should be seen to flow through the nipple and the countersunk end should be well fitted and resemble a domed appearance. Under no circumstances should brazing or silver soldering be used since the heat required will weaken the cable with possible disastrous consequences.

4.08 The fuel tank sender unit

The sender unit (see 2.11) requires bending as shown (see diagram). It is turned around and the letters TOP will have to appear alongside the lower left fixing hole in the tank. This is marked with a red blob. X

4.09 Subframe nose cross member

Drill one  $\frac{3}{8}"$  diameter hole 6" from each end for attachment of the battery strap and main battery lead (off side) and the electric fuel pump (near side). (The other end of the battery strap is connected to the clutch bell housing together with the black wire from the loom)

4.10 Drill and fix the bracket for the clutch hydraulic hose linking flexible slave cylinder section to the 'bundy' pipe. This bracket should be located on the front face of the offside suspension tower.

5.00 TiCi CONSTRUCTION

It is wise to commence building your TiCi only after you have collected and modified all the Mini components you will need.

5.01 The TiCi body should be placed upon wood blocks (preferably) or bricks capped with a board. The front and rear wheel arches should be approximately 24 inches from the ground.

5.02 Remove the fascia (instrument panel) by first unscrewing the retaining nuts at each side and sliding it gently away.

5.03 The control box

- a. Screw into the glassfibre behind the nearside front flasher lamp for location. Woodscrews are suitable.
- b. Remove control box.
- c. The ends of the wiring loom adjacent should be pressed into place in the following order. See diagram.

5.04 The steering rack

- a. Remove the petrol tank (see 5.06)
- b. The U bolts securing the rack pass through the holes provided in the vertical surface facing the front of the fuel tank.
- c. The splined boss passes through the hole provided in the yellow shell.
- d. The U bolts can be tightened up from inside the car on the rear face of each foot well. It is important to ensure that the offside bolt passes between the diecast ridges on the outer end of the rack. These serve to preserve its location. Leave the nuts slack.

5.05 The steering wheel and column

- a. With the universal joint slid onto the exposed inner column the splined end should be inserted through the hole in the column support (part of the inner car moulding at the centre of the driver's seat).
- b. The column 'C' clamp should have the bolt holes to the rear as it is inserted into the support. The spline should be slid over the steering rack spline.
- c. A 5/16" bolt provided should be passed through the holes in the column support and the column clamp from the offside. This may require the steering rack to be rotated slightly so they align. Note that the spacer tube passes through the U/S hole.

5.05 The steering wheel and column (cont'd)

- d. Tighten the nuts to check the final steering wheel position.
- e. If the more recent shortened indicator shroud is used you may decide to lower the wheel position by removing a further 1" from the column outer tube. The longer shroud can itself be shortened if required but it will then be necessary to bind the halves together with black PVC tape since the fixings will also have been cut off.
- f. It is important when you are checking the wheel position that you ensure that the column is pressed into the U/J link tube as far as it will go.
- g. When the location is decided you must remove the column and U/J complete.
- h. The U/J link tube is part drilled with a 5/32" hole. Place the link tube in the vice with the hole uppermost. Check again that the column is in the tube as far as possible. Carefully, using the first hole as a starter, drill through the column and other side of the link tube. Only use the correct drill size, 5/32", and preferably use an electric drill.
- i. Tap home the tension pin so it looks identical to the other pin already in place alongside.
- j. Fit the column. First locate the U/J spline, and using the nut and bolt from the discarded Mini column end, it must be tightened properly from underneath the car.
- k. Pass the long bolt through the column support and the pinch 'C' clamp and tighten. Note that the direction indicators can be on the left or the right hand side. Make sure that the proper washers supplied with the kit are fitted.
- l. Tighten the nuts on the 'U' bolts.

- 5.06 The petrol tank should be removed by unscrewing the plates locating its centre rod. The Mini sender unit (see 2.11) modified as described in 4.08, should be screwed firmly home onto a new gasket. After relocation of the tank and after you are sure it is tightly screwed in place, the wire and terminal should be fitted as shown on the wiring diagram.
- (The black wire is connected to the larger terminal leaving a fly lead to be connected to one of the adjacent screws on the steering rack. This wire forms an earth for the horn.

- 5.07 The accelerator pedal. Screw through the glass fibre on the top right side of the vertical toe board (two self tapping screws are provided).
- 5.08 The AP hydraulic master cylinders
- Screw to the Mini pedal frame in place of the original units and the clevis and split pins located as previously. The hydraulic fluid inlets should be to the right side.
  - The two 'ears' at the front of the frame should be screwed to the U shaped steel hoops protruding from the sloping front panel. Take care not to allow the screw to press onto the glass fibre or a star shaped bruise will be made on the outside of the panel.
  - The pedal load reaction tube (part no TH/M/75) screws to the pointed end of the pedal frame, also to the floor by means of a  $\frac{3}{8}$ " screw passing from the outside of the car.
  - The two flexible hydraulic fluid pipes should be fitted to the master cylinders and secured by clips.
- 5.09 The windscreen wiper motor and rack
- Remove the two nuts on each spindle of the altered unit (see 4.03). The spindles pass through holes in the front panel and the nuts will secure. Discard the shaped rubber washers.
  - Strap the motor to the steel plate beneath the LH head-lamp with a jubilee clip or wire. When the early type of motor is used the three original fixing studs will be redundant, and can be unscrewed.
  - Leave electrical connections until later.
- 5.10 Hydraulic fluid lines. Screw into the master cylinder tops after removal of the blue plastic bungs.
- 5.11 The fascia panel

Reposition by slotting the ends over the screw studs in the front panel sides.

No holes have been made in the fascia deliberately because of the variety of different types of instrumentation and switchgear, and the variety of individual requirements. A scribe line is marked on the panel for the best location of the standard 5" speedometer if this is to be used.

We very strongly recommend you to assemble all the dials and switches to be fitted and first mark their location on their panel with paper cut outs. It is easier to cut holes than to fill them in if you change your mind !

/cont'd...

5.11 The fascia panel (cont'd)

- a. The final hole for the speedo must be carefully filed to size with a cross cut half round file. The bezel must be a wedge fit if no fixing holes are to be drilled into the panel, so care is essential. Remember that you should always file from the outside surface towards the underside. If you file the other way the shiny fascia surface gel coat may be chipped.
- b. Holes for the switches are best drilled undersize and enlarged by using a round 'rat's tail' file in the same way as described above. This will ensure you do not get a ragged hole.
- c. When all the switches are in place the panel can be screwed in place, the clutch and brake master cylinders should be linked to the outlets at the bottom of the dual fluid reservoirs on the offside of the fascia, and the ends fixed with clips. If difficulty is experienced in sliding the tube in place the ends can be softened by placing in boiling water for a few seconds.
- d. The speedo cable can now be screwed in place and the secondary wiring completed.
- e. The fuse block and the flasher unit can be screwed onto the back of the speedometer casing using suitable PK screws. Since the speedo is a tight fit into the fascia the previous mounting flanges can be used for this purpose. The wire colours are to standards used throughout the motor industry - the same as used on the Mini for example.

5.12 The front suspension should be built before engine

- installation. This facilitates accurate location and enables the near complete TiCi to be 'wheel barrowed' on the front wheels.
- a. Fix the lower links. First assemble the tie rod and lower link. Check which link is left and which is right through observation of the built up Mini unit destined for the back. The 'U' section should drop below the centre axis of the rods. Unbolt the lower bracket from TiCi observing which way round it faces i.e. angled rearwards.
  - b. Locate and press home the new rubber half bushes and insert the link end into the bracket. Align the holes (a Posidriver can assist centralization). Press the  $\frac{1}{2}$ " bolt through and tighten the nut.

5.12 The front suspension (cont'd)

- c. Bolt the tie rod end to the front brackets. Note the order of the rubber and steel washers from the Mini - this is VERY important. The nylon insert nut must be tightened until the tie rod thread just protrudes. Bolt down the lower link bracket to its location.
- d. The top link can be fitted after removal of the front bracket on each side. DO NOT undo the rear top brackets.  
There are two thick grease retaining washers with the top link assembly, the more thick of the two should be located at the front end of the link.
- e. First remove the screws and position the rubber grease retaining rings over the thick washers as they were. Insert the rear end. Locate the front bracket and fix the bracket to the body by passing the bolts through from the inside. Tighten all the nuts starting with the link pin nuts.
- f. Insert the tapered swivel pins of the assembled wheel into the top and bottom link ends and tighten the units over spring washers. Remember to locate the rubber swivel covers.
- g. Attach the flexible front brake hydraulic hoses to the bracket inside the wheel arches.
- h. Fix the steering rod ends to the drag links. Lock nuts must be used. Nylon nuts must not be re-used.
- i. Fit the spring unit lower ends to the shock absorber pegs on the top links. New lock nuts should be used and large washers fitted to prevent the unit sliding off the peg.
- j. Fit the front wheels and remove the chocks from the front end.

The design of the secondary wiring depends upon your individual panel design. Several suggestions are made and if your layout is near standard these will assist you.

If you should have different requirements then it is important to consult an experienced auto electrician. Do not guess at electrical wiring since incorrect wiring can lead to trouble. Further information can be obtained from Windolec (Contractors) Ltd., 2 Bridge Street, Shepshed, Leics. Telephone Shepshed 2357.

5.13 Engine/subframe, suspension, wheels assembly.

The whole must be complete in running condition with all accessories in place.

- a. Fix the anti-steering link. Position the unit on its wheels with the subframe nose cocked up. A level surface is helpful. The distance from the top surface of the front subframe rail to the ground should measure inches.

The links are right and left handed. Remove the nuts from the top and bottom of the suspension link pivots. Screw the link plate to the rear end of the top and lower link bolts. Check tightness.

- b. Attach the rod end to the drag link.

Leave wheel alignment until the car is complete.

- c. Undo the rear end of the gear change assembly from the rear of the car, and locate it underneath the gear box.

- d. 'Wheelbarrow' TiCi body on its front wheels and lower over the engine/subframe assembly.

- e. Align the body and engine unit (The engine may need to be rocked forward on its mountings as the body is lowered into place).

Take care not to knock the radiator cap - this may damage the seal. It is advisable to remove the cap and tape over the filler whilst fitting is undertaken.

- f. When the body is in place press home the  $\frac{3}{8}$ " bolts supplied through the lower lugs in the under shell and the holes at the front end of the Mini subframe.
- g. Ensure that both the original plates and the two rubber strips are in place on the suspension towers.
- h. Pass the bolts supplied through the two holes in each tower top and tighten these and the subframe nuts.

- i. Remove chocks.

- j. Bolt the engine steady to the underside of the bulge in the monocoque with the  $\frac{1}{2}$ " bolt provided.

N.B. BMC part No. should replace the steady rubber at the body end. Fit an oversize washer to prevent the steady sliding off the lower bolt end.

- k. Connect the fuel feed pipe to the petrol pump. If the early type electric pump is used this must be fitted to the nearside subframe nose. See wire diagram for connections. Wires provided should be taped up if a mechanical pump is used (later type).

- 5.13 Engine/subframe, suspension, wheels assembly (cont'd)
1. Cut the  $\frac{1}{4}$ " petrol tube supplied to length to suit the pump location. All connections should be properly screw clipped to prevent petrol loss and seepage.

- 5.14 Handbrake
1. Remove the steering drag link from the wheel carrier.
  2. Locate the plate between the drag link and wheel carrier and bolt down using the  $1\frac{3}{4}$ " x  $\frac{3}{8}$ " bolts supplied. N.B. It is dangerous to use the original bolts which are too short for safety.
  3. Fix the clevis to the handbrake toggle and ensure you use a new split pin.



5.13 (cont'd)

- f. Insert the tapered swivel pins of the assembled wheel into the top and bottom link ends and tighten the units over spring washers. Remember to locate the rubber swivel covers.
- g. Attach the flexible front brake hydraulic hoses to the bracket inside the wheel arches.
- h. Fix the steering rod ends to the drag links. Lock nuts must be used. Nylon nuts must not be re-used.
- i. Fit the spring unit lower ends to the shock absorber pegs on the top links. New lock nuts should be used and large washers fitted to prevent the unit sliding off the peg.
- j. Fit the front wheels and remove the chocks from the front end.

5.14 Engine/subframe, suspension, wheels assembly

The whole must be complete in running condition with all accessories in place.

- a. Fix the anti-steering link. Position the unit on its wheels with the subframe nose cocked up. A level surface is helpful. The distance from the top surface of the front subframe rail to the ground should measure 15 inches.  
The links are right and left handed. Remove the nuts from the top and bottom of the suspension link pivots. Screw the link plate to the rear end of the top and lower link bolts. Check tightness.
- b. Attach the rod end to the drag link.  
Leave wheel alignment until the car is complete.
- c. Undo the rear end of the gear change assembly from the rear of the car, and locate it underneath the gear box.
- d. 'Wheelbarrow' TiÇi body on its front wheels and lower over the engine/subframe assembly.
- e. Align the body and engine unit (The engine may need to be rocked forward on its mountings as the body is lowered into place).  
Take care not to knock the radiator cap - this may damage the seal. It is advisable to remove the cap and tape over the filler whilst fitting is undertaken.
- f. When the body is in place press home the  $\frac{3}{8}$ " bolts supplied through the lower lugs in the under shell and the holes at the front end of the Mini subframe.

5.14

Engine/subframe etc. (cont'd)

- g. Ensure that both the original plates and the two rubber strips are in place on the suspension towers.
- h. Pass the bolts supplied through the two holes in each tower top and tighten these and the subframe nuts.
- i. Remove chocks.
- j. Bolt the engine steady to the underside of the bulge in the monocoque with the  $\frac{1}{2}$ " bolt provided.  
N.B. BMC part No. 21A 1882 should replace the steady rubber at the body end. Fit an oversize washer to prevent the steady sliding off the lower bolt end.
- k. Connect the fuel feed pipe to the petrol pump. If the early type electric pump is used this must be fitted to the nearside subframe nose. See wire diagram for connections. Wires provided should be taped up if a mechanical pump is used (later type).
- m. Cut the  $\frac{1}{4}$ " petrol tube supplied to length to suit the pump location. All connections should be properly screw clipped to prevent petrol loss and seepage.

5.15

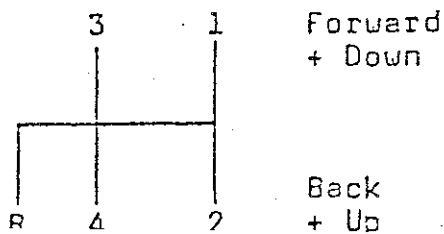
Handbrake

1. Remove the steering drag link from the wheel carrier.
2. Locate the plate between the drag link and wheel carrier and bolt down using the  $1\frac{3}{4}$ " x  $\frac{3}{8}$ " bolts supplied.  
N.B. It is dangerous to use the original bolts which are too short for safety.
3. Fix the clevis to the handbrake toggle and ensure you use a new split pin.

5.16

The Gear Linkage

- a. Remove the shortened gear lever (see 4.05)
- b. Tap the short tube forming part of the rear end of the linkage lightly until it wedges over the lever. Check that the groove in the lever ball is either to the left or the top side (according to the type of gear box casting) and if necessary rotate the lever in the tube with grips until they align.
- c. Fit gear lever and tighten retaining plate
- d. Check the gear change from inside the car.



FRONT  
↑

5.17 The battery is fitted at the passenger side using the standard Mini battery clamp, bolts and bar. The clamp hook ends are inserted into holes in the forward corners of the battery bay. The standard battery cover should be used.

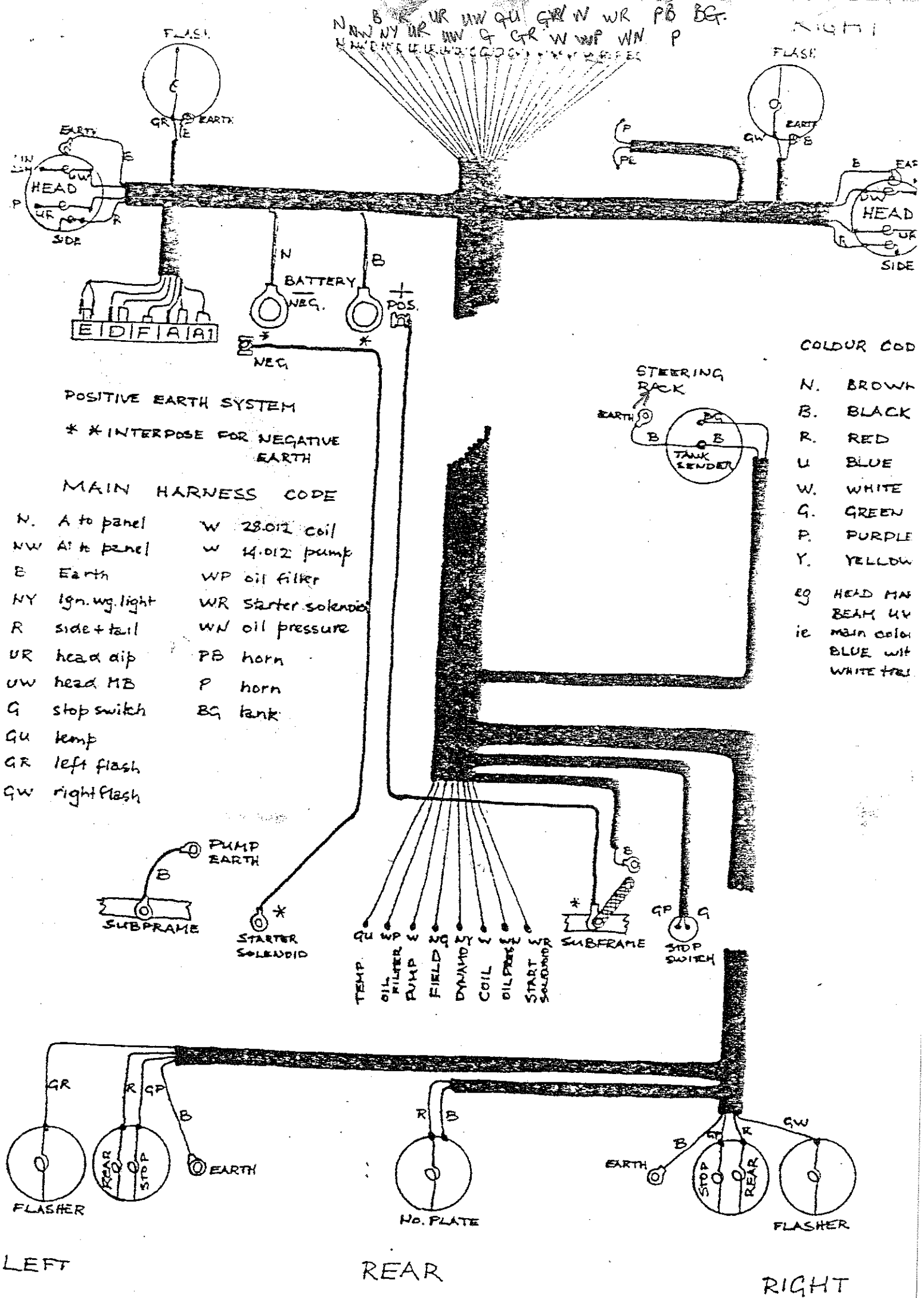
5.18 Align TRACK of front and rear wheels. Ensure that each side is parallel to the car centre line or else it will 'crab'. The rear wheels should be set with  $\frac{1}{8}$ "-0" (3mm - 0mm) toe in and the front with 1/16" toe out if standard springs are used.

If softened rear springs are used you may find  $\frac{1}{8}$ " toe in at the front wheels improves straight line running.

5.19 Check tightness of all nuts, bolts and screws. Complete routine items i.e. brake bleeding, battery check up.

N.B. In several locations bolts securing suspension and subframe members are passed through a sandwich of steel and two glassfibre layers. With use some small compression will take place. It is vital to check the tightness of these fixings, particularly those securing the front suspension, after initial bedding in.

Checks must be made at 50, 250 and 500 miles and thereafter at regular intervals. DO NOT use brute force !



COLOR CODE

N.	BROWN
B.	BLACK
R.	RED
U.	BLUE
W.	WHITE
G.	GREEN
P.	PURPLE
Y.	YELLOW
EG	HEAD MAIN BEAM HV
ie	MAIN COLOR BLUE WITH WHITE TAIL

POSITIVE EARTH SYSTEM

\* \* INTERPOSE FOR NEGATIVE EARTH

MAIN HARNESS CODE

N.	A to panel	W	28.012 coil
NW	A to panel	w	14.012 pump
E	Earth	WP	oil filter
NY	ign. wg. light	WR	starter solenoid
R	side + tail	WN	oil pressure
UR	head dip	PB	horn
UW	head MB	P	horn
G	stop switch	BG	tank
GU	kemp		
GR	left flash		
GW	right flash		

- TEMP.
- OIL FILTER
- PUMP
- FIELD
- DYNAMO
- COIL
- OIL PRESS
- START SOLENOID

LEFT    REAR    RIGHT